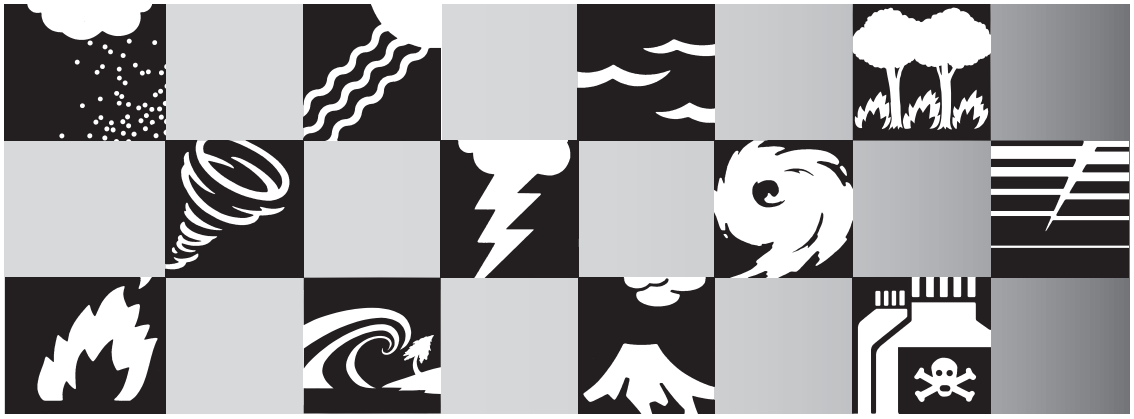
Talking About Disaster

Guide for Standard Messages



PUBLISHED BY THE NATIONAL DISASTER EDUCATION COALITION

American Geological Institute
American Red Cross
Disability Preparedness Center
Home Safety Council
The Humane Society of the United States
Institute for Business & Home Safety
International Association of Emergency Managers
National Fire Protection Association
National Science Foundation
U. S. Consumer Product Safety Commission
U. S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Food Safety and Inspection Service
U. S. Department of Commerce
NOAA/National Weather Service
U. S. Department of Health and Human Services
Centers for Disease Control and Prevention
Food and Drug Administration
U. S. Department of Homeland Security
Federal Emergency Management Agency
United States Fire Administration
U. S. Department of the Interior
United States Geological Survey

August 2004

(Inside front cover blank)

August 2004

Talking About Disaster: Guide for Standard Messages

Produced by the National Disaster Education Coalition

http://www.disastereducation.org/

Talking About Disaster: Guide for Standard Messages

Table of Contents

*** Note:** chapters are dated by month and year. As chapters are updated, they will be posted at http://www.disastereducation.org. To check if you have the latest chapters, compare the dates for each chapter listed above with the dates at the top of the chapters you have in print. If there are later dates in the Table of Contents than on chapter(s) that you have, then download the chapter(s) from the web site with the later date, print it out, and replace the chapter(s) with the newer version(s).

Visit http://www.disastereducation.org/ **for additional and updated information and links and resources related to the topics covered in this guide.**

Talking About Disaster: Guide for Standard Messages

Produced by the National Disaster Education Coalition

Acknowledgments

Development of this guide was made possible by a grant from the Home Safety Council, a 501(c)(3) nonprofit organization dedicated to helping prevent the nearly 21 million medical visits that occur on average each year from unintentional injuries in the home. Through national programs and partners across America, the Home Safety Council works to educate and empower families to take actions that help keep them safe in and around their homes. To learn more about the council's programs, partnerships, and resources, visit the Home Safety Council at www.homesafetycouncil.org.

This guide is the product of the hard work and collaboration of many professionals affiliated with the organizations composing the National Disaster Education Coalition, which represents the expertise and commitment of the following organizations:

- American Geological Institute
- American Red Cross
- Disability Preparedness Center
- Home Safety Council
- The Humane Society of the United States
- Institute for Business & Home Safety
- International Association of Emergency Managers
- National Fire Protection Association
- National SafeKids Campaign
- National Science Foundation
- U.S. Consumer Product Safety Commission
- U.S. Department of Agriculture
  - -Cooperative State Research, Education, and Extension Service
  - -Food Safety and Inspection Service
- U.S. Department of Commerce
  - - NOAA/National Weather Service
- U.S. Department of Health and Human Services
  - - Centers for Disease Control and Prevention
  - - Food and Drug Administration
- U.S. Department of Homeland Security
  - -Federal Emergency Management Agency
  - -U.S. Fire Administration
- U.S. Department of Interior
  - - U.S. Geological Survey

http://www.disastereducation.org/

Introduction and Purpose

The purpose of this guide is to assist those who provide disaster safety information to the general public. The information presented is based on historical data for the United States and is appropriate for use in the United States and its territories. Some of the information may not apply to other countries. Users of this guide may include emergency managers, meteorologists, teachers, disaster (natural and human-caused) educators, public affairs/public relations personnel, mitigation specialists, media personnel, and communicators. If you would like more in-depth or scientific information, please contact your local emergency management office, local National Weather Service office, local American Red Cross chapter, state geological survey office, state foresters office, or local fire department.

The member organizations of the National Disaster Education Coalition, which work to deliver disaster preparedness information to the public, recognize that it is important for all agencies to provide consistent disaster safety messages. As a result, relevant messages in this guide have been reviewed and approved at the national level by the member organizations with expertise in those areas.

Many affiliates of the National Disaster Education Coalition's member organizations have contributed to this guide, and their national organizations encourage them and their members to use the messages.

The messages and the information that supports them are intended to be used in educational presentations, displays and bulletin boards, print and electronic media, radio and television, and any other medium in which disaster safety is communicated to the public. **The information is in the public domain and is intended to be used and shared without copyright restrictions.** If you wish to cite the source when you use this material, the following is suggested: From: *Talking About Disaster: Guide for Standard Messages.* Produced by the National Disaster Education Coalition, Washington, D.C., 2004.

What Is in This Guide

This guide contains awareness and action messages intended to help people reduce their risk of injury or loss in the event of natural and human-caused disasters. Awareness messages provide general information about the threats presented by each type of disaster. These are found at the beginning of each chapter in a question-and-answer format. Action messages describe what people should do to prepare for and get safely through a disaster. These are found above detailed explanations of how to do it. Also included are statistics and other supporting information that reinforce the credibility and importance of each message.

New to this edition of the guide is a section in most chapters on "Facts and Fiction." This section describes some of the common folklore, or fiction, about hazards and provides factual information that refutes the fiction. "Facts and Fiction" will help you answer commonly asked questions and communicate accurate information to the public, as well as help you avoid unintentionally passing on information that is not true.

Using This Guide

To use this guide, you should first get to know your intended audience. Consider the ages and socioeconomic, ethnic, and educational backgrounds of the audience members. Be sensitive: audience members who are struggling to provide food for their families may be unable to purchase supplies and foreign-born audience members who learned safety actions in their native countries may be wary of information that contradicts what they were previously told. Also, remember that persons with disabilities may have difficulty hearing, seeing, or understanding warnings and other critical messages. Announcements should be concise, clear, and calm. Open captions of verbal information should be used in emergency telecasts, and scrolling should not be allowed to block captions. Television announcers should provide clear, verbal descriptions of events for persons who are blind or have low vision. It is also important to consider your area's specific hazards and disaster history. The East Coast will not prepare for volcanic eruptions, and the West Coast will not prepare for hurricanes.

When you deliver “what to do” action messages, word them in a positive manner that helps those hearing or reading the message know how to act. For example, in fire education, instead of saying, "Do not panic," you might say, "Remain calm. Get out as quickly and safely as possible.” This allows those hearing or reading the message to focus on what they can and should do in case of fire. For this message, you might next offer submessages on what "safely" means (crawl low under smoke to your exit; feel the doorknob and the space around the door with the back of your hand before opening the door; etc.).

In addition, you can use awareness messages to reinforce the importance of knowing what to do. Awareness messages help people realize that disasters do happen in their communities and that they can take steps to prepare for disaster and lessen its effects.

Everyone has seen the horrific results of disasters on the evening news, but viewers often do not perceive them as real or as local. In fact, seeing too much disaster news often causes people to “tune it out,” because they feel there is nothing they can do to protect themselves or their property. For some people, testimonials from local residents about their personal experiences with disaster can bring the reality of disaster closer to home; for others, hearing statistics on area disasters can be a wake-up call.

If you are preparing a presentation, news release, or article about a particular type of disaster, consider selecting three to seven messages from the relevant chapter. Feature your chosen messages and add to them with submessages and supporting information from the guide.

If time or space is limited, evaluate your audience and the chosen topic to determine the most important messages. For disasters with little or no warning, what to do during the disaster is generally most important. For disasters with plenty of warning time, preparation may be most important.

Whatever your message, physical props will help you provide the greatest learning experience. Try to use, for example, photos or drawings for print materials, soundtracks

for radio presentations, videos for television, and aids like videos, posters, Disaster Supplies Kit items, and mock-ups to make presentations interactive. Keep in mind that your audience will include persons with disabilities who may have difficulty seeing, hearing, or understanding your messages.

If you would like further information, brochures, or materials about disaster safety or information about developing community disaster education presentations, you may contact any of the National Disaster Education Coalition member agencies or their local counterparts. Keep in mind that the local affiliates of these national agencies may have additional resources and information specific to your audience.

Remember, the five actions for emergency preparedness that everyone can take are:

1. Make a plan.
2. Build a kit.
3. Get trained.
4. Volunteer.
5. Give blood.

Talking to Children About Disasters

You should not worry that talking about disasters will make children fearful. On the contrary, children are usually more frightened by what is whispered or not mentioned aloud than by matter-of-fact discussion. Let children speak feely about what scares or puzzles them—for example, “What will happen to my puppy if we have to evacuate?” “If there’s a flood and I’m at school, I won’t be able to find you.” Try to answer questions and address concerns with concrete, easy-to-follow information.

When helping children learn how to prepare for, respond safely during, and recover from a disaster, it is important to adapt your discussions, instructions, and practice drills to their skills and abilities. Be aware that young children can easily confuse messages such as “drop, cover, and hold on” (response during an earthquake) and “stop, drop, and roll” (response if your clothes catch on fire).

Tell children that a disaster is something that happens that could hurt people, cause damage, or cut off utilities, such as water, telephones, or electricity. Explain to them that nature sometimes provides "too much of a good thing"—fire, rain, wind, snow. Talk about typical effects of disasters that children can relate to, such as loss of electricity, water, and telephone service.

Give examples of several disasters that could happen in your community. Help children recognize the warning signs for each. Discussing disaster ahead of time reduces fear and anxiety and lets everyone know how to respond.

Be prepared to answer children’s questions about scary things that they have heard about or seen on television, such as terrorist attacks. Give constructive information about how they can be prepared to protect themselves.

Teach children how and when to call for help. Teach them to call 9-1-1 or your local emergency telephone number. At home, post emergency telephone numbers by all phones and explain when to call each number. Include the work numbers and cell phone numbers of household members. Even very young children can be taught how and when to call for emergency assistance. If a child cannot read, make an emergency phone number chart with pictures or icons for 911, “daddy,” and “mommy” that may help the child identify the correct number to call.

Tell children that in a disaster there are many people who can help them. Talk about ways that an emergency manager, American Red Cross volunteer, police officer, firefighter, teacher, neighbor, doctor, or utility worker might help after a disaster.

Teach children to call your out-of-town contact in case they are separated from the family and cannot reach family members in an emergency. Tell them, “If no one answers, leave a voice message if possible and then call the alternative contact.” Help them memorize the telephone numbers, and write them down on a card that they can keep with them.

Quiz your children every six months so they will remember where to meet, what phone numbers to call, and safety rules.

Explain that when people know what to do and practice in advance, everyone is able to take care of themselves better in emergencies.

By including all members of your household—regardless of age—in disaster preparedness discussions, you will emphasize each person’s importance as a member of the safety team.

http://www.disastereducation.org/

Page IN-6 blank

Chemical Emergencies at Home

Learn about the chemicals that could pose a threat to you and members of your household. Contact agencies with expertise on hazardous household materials, such as the Poison Control Center, local public health department, or county or municipal office responsible for environmental protection. Get information from them about potentially dangerous household products and what to do if someone becomes poisoned with them. Ask specifically about how to treat poisoning caused by cleaners, germicides, deodorizers, detergents, drain and bowl cleaners, gases, home medications, laundry bleaches, liquid fuels, and paint removers and thinners. **Always call the Poison Control Center first (1-800-222-1222) before treating these or any other poisoning.**

AWARENESS MESSAGES

Why talk about home chemical emergencies?

Chemicals are a natural and important part of our environment. We use chemicals every day. They are found in our kitchens, medicine cabinets, basements, garages, and gardens. Chemicals help us keep our food fresh and our bodies clean. They help plants grow and fuel our cars. And chemicals help us to live longer, healthier lives.

When used properly, the chemicals normally found in a home pose little threat. When used improperly, in adverse conditions, or for jobs for which they were not intended, chemicals can be harmful, even deadly.

Knowing how to handle chemical products and how to react if an emergency should occur can reduce the risk of injury.

What is a home chemical emergency?

A home chemical emergency is a dangerous situation that arises when chemicals are spilled, accidentally released, or used improperly. Some chemicals that are safe, and even helpful in small amounts, can be harmful in larger quantities or under certain conditions. Most chemical accidents occur in our own homes and can be prevented.

How can I protect myself from chemical emergencies at home?

Anyone of any age can be adversely affected by chemicals or other substances through breathing, swallowing, or touching. A person can be exposed to a chemical even though he or she does not see or smell anything unusual. The best way to avoid chemical accidents is to read and follow the directions for use, storage, and disposal of chemical products.

What is the best source of information if a chemical emergency occurs at home?
If a chemical spills from the container of a household product, read the product label for instructions or call 9-1-1 or your local emergency number. If you know or have reason to believe that exposure to the chemical may cause poisoning, call the Poison Control Center at 1-800-222-1222. If your pet appears to have been exposed to a poison or other toxin, call your veterinarian or the Animal Poison Control Center at 1-888-426-4435.

How can I properly dispose of household hazardous waste?
People sometimes dispose of household hazardous wastes improperly, causing danger to humans, animals, the environment, sanitation systems, etc. Call your local or state solid waste officials or recycling or environmental agency to learn how to dispose of specific hazardous wastes so they will not cause harm.

ACTION MESSAGES
Be Prepared for Household Chemical Emergencies
Protect Yourself

CORE ACTION MESSAGES
- **Use, store, and dispose of chemicals according to instructions.**
- **Post the Poison Control Center number by every telephone.**
- **Know the symptoms of chemical poisoning.**

You should:

- **Dispose of chemicals according to the instructions on each product's label.** Disposing of chemicals properly ensures that they will not adversely affect the safety of the environment and the health and well being of the public, including your household.

Note: If you have questions about how to dispose of chemicals or products that may contain chemicals, call your local or state solid waste officials or recycling or environmental agency.

- **Read the instructions before using a new chemical product and be sure to store household chemicals according to the instructions on the label.**
- **Store chemicals in a safe, secure location, preferably up high and always out of the reach of children.**
- **Avoid mixing household chemical products.** Deadly toxic fumes can result from the mixture of chemicals, such as chlorine bleach and ammonia.

- **Never smoke while using household chemicals. Avoid using hair spray, cleaning solutions, paint products, or pesticides near an open flame, pilot light, lighted candle, fireplace, wood-burning stove, etc.** Although you may not be able to see or smell them, vapor particles in the air could catch fire or explode.
- **Clean up spilled chemicals immediately with rags.** Protect your eyes and skin by wearing gloves and goggles or safety glasses. Allow the fumes in the rags to evaporate outdoors, and then dispose of the rags by wrapping them in newspaper, placing them in a sealed plastic bag, and putting them outside in your trash can.
- **Buy only as much of a chemical as you think you will use.** If some of the chemical is left over, try to give it to someone who will use it or dispose of it according to the instructions. Storing hazardous chemicals increases the risk of chemical emergencies.
- **Keep an A-B-C-rated fire extinguisher in your home.** Get training from your local fire department in how to use it. (See Appendix: Fire Extinguishers.)
- Protect your pets and other animals from possible exposure to all chemicals
- **Post by all telephones the Poison Control Center number (1-800-222-1222), the Animal Poison Control Center number (1-888-426-4435), and your local emergency number (9-1-1 or the emergency number in your area).**
- **Recognize the symptoms of chemical poisoning:**
    - Difficulty breathing
    - Irritation of the eyes, skin, throat, or respiratory tract
    - Changes in skin color
    - Headache or blurred vision
    - Dizziness
    - Clumsiness or lack of coordination
    - Cramps or diarrhea
    - Nausea

What to Do if a Chemical Emergency Occurs at Home

CORE ACTION MESSAGES

- **For chemical poisoning, immediately call the Poison Control Center and begin treatment.**
- **If fire or explosion threatens, get out, and then call for help.**

If a person eats or drinks a non-food substance, you should immediately:

- **Find the container the substance came in and take it to the telephone. (**Medical professionals may need specific information from the container to give you the best emergency advice.)
- **Call the Poison Control Center at 1-800-222-1222.**
- **If directed to do so, call 9-1-1 or the emergency number in your area.**
- **Follow carefully the instructions of the Poison Control Center operator and the EMS dispatcher. Be aware that the first aid advice found on containers may not be appropriate. Do not give anything by mouth unless medical professionals advise you to do so.**

If a chemical gets into a person's eyes, you should immediately:

- **Call the Poison Control Center at 1-800-222-1222.**
- **Flush the eyes with clear water for a minimum of 15 minutes** or take other action as directed by the Poison Control Center. Delaying first aid can greatly increase the likelihood of permanent injury.

If a person is burned by chemicals, you should immediately:

- **Call 9-1-1 for emergency help.**
- **Administer first aid.**
- **Remove clothing and jewelry from around the injury.**
- **Pour clean, cool water over the burn for 15 to 30 minutes.**
- **Loosely cover the burn with a sterile or clean dressing** so it will not stick to the burn.

If there is danger of a chemical fire or explosion, you should:

- **Get out of the building immediately.** Do not waste time collecting items or calling the fire department.
- **Once you are safely away from danger, call the fire department from outside using a cell phone or a neighbor's telephone**
- **Stay upwind and away from the building to avoid breathing toxic fumes.**

If you have been exposed to toxic chemicals, you should:

- **Wash your hands, arms, or other body parts that may have been exposed to a toxic chemical.** Chemicals may continue to irritate the skin until they are washed off.
- **Remove your clothing,** being careful not to pull it over your face. Cut the clothing off if necessary.
- **Discard clothing that may have been contaminated by toxic chemicals.** Some chemicals may not wash out completely. Discarding clothes will prevent potential future exposure.

Protect your animals. Be aware that animals are more likely to explore substances within their reach, particularly those with an attractive odor (including substances such as chocolate which are toxic to most pets). Animals will often lick their paws, fur, or skin and swallow a substance that they have walked in. Wash your animals' paws and coat if necessary and prevent licking as much as possible until you have taken the animal to your veterinarian.

Disaster Supplies Kit

AWARENESS MESSAGES

Why talk about a Disaster Supplies Kit?

After a disaster, local officials and relief workers will be on the scene, but they cannot reach everyone immediately. You could get help in hours, or it may take days. Basic services, such as electricity, gas, water, sewage treatment, and telephones, may be cut off for days or even weeks. You may have to evacuate at a moment's notice and take essentials with you. You probably will not have the opportunity to shop or search for the supplies you will need. A Disaster Supplies Kit can help your family stay safe and be more comfortable after a disaster.

What is a Disaster Supplies Kit?

A Disaster Supplies Kit is a collection of basic items that members of a household would probably need in the event of a disaster. The items are stored in a portable container(s) near, or as close as possible to, the exit door. Every household should assemble a Disaster Supplies Kit and keep it up to date. The number of people in a household and their ages and abilities will determine how many containers will be required to carry the kit items.

What to Tell Children

Parents and caregivers should:

- Involve children in disaster preparedness at home so they are aware of the need to prepare and know what is being done. As they are able, have children help plan and assemble kits and put them where they will be ready if needed. Involving children is the first step in helping them know what to do in an emergency.
- Ask children to help the household remember to keep the kits updated by rotating the emergency food and water or replacing it every six months, and by replacing batteries as necessary. Children could make calendars and mark the dates for checking emergency supplies.
- Ask children to think of items that they would like to include in a Disaster Supplies Kit, such as books or games or nonperishable food items.
- Involve children in preparing plans and disaster kits for pets and other animals.

ACTION MESSAGES
Assemble a Disaster Supplies Kit

CORE ACTION MESSAGES

- **Assemble and maintain a Disaster Supplies Kit.**
- **Keep emergency supplies in every vehicle.**

You should assemble and maintain a portable Disaster Supplies Kit that you can use at home or can take with you if you must evacuate. In addition, if you have a vehicle, you should always keep it stocked with basic emergency supplies. (See Appendix: Emergency Supplies for Your Vehicle.)

In a disaster situation, you may need access to your Disaster Supplies Kit quickly—whether you are sheltering at home or evacuating. Store the items in your kit in sturdy, clearly labeled, easy-to-carry containers near the door, if possible. Duffle bags, backpacks, and covered trash receptacles are good candidates for containers. In addition to the three-day supply of food and water in your Disaster Supplies Kit, you should consider maintaining a two-week supply of food and water in your home. (See Appendix: Foods to Stock at Home and in Your Disaster Supplies Kit and Storing Water.) Following a disaster, having the right supplies can help your household endure home confinement or evacuation.

Assemble the following items for use at home or in case you must evacuate. Pack them in easy-to-carry containers and label the containers clearly. (See Appendix: Tips for Preparing Your Disaster Supplies Kit.)

- Portable, battery-powered radio or television and extra, fresh batteries.
- Flashlight and extra, fresh batteries.
- First aid kit. (See Appendix: First Aid Kit.)
- Cash and coins.
- Copies of personal identification, such as driver's licenses, passports, and work identification badges, and copies of medical prescriptions and credit cards.
- An extra set of car keys and house keys.
- Matches in a waterproof container.
- Map of the area marked with places you could go and their telephone numbers.
- Items for infants, such as formula, diapers, bottles, pacifiers, powdered milk, and medications not requiring refrigeration.
- Special items, such as denture needs, contact lenses and supplies, extra eyeglasses, and hearing aid batteries.
- Items for seniors, disabled persons, or anyone with serious allergies.
- Food—a three-day supply in the kit and at least an additional four-day supply readily accessible for use if you are confined to home. You may want to consider stocking a two-week supply of food and water in your home.(See Appendix: Foods to Stock at Home and in Your Disaster Supplies Kit for a list of suggested foods, packaging options, and food safety tips, and Keeping Refrigerated Food Safe if the Power Goes Out.)
- Medications—Prescription and non-prescription that are regularly used. Check with your physician or pharmacist on storage requirements.

- Water—three gallons per person in the kit and an additional four gallons per person readily accessible for use if you are confined to home. (See Appendix: Storing Water, and, for information on treating water of questionable purity, see Appendix: Drinking Water Safety.)
- Kitchen accessories: manual can opener; mess kits or disposable cups, plates, and utensils; utility knife; sugar and salt; aluminum foil and plastic wrap; resealable plastic bags.
- Household liquid bleach.
- For each person, one complete change of clothing and footwear, including sturdy work shoes or boots, raingear, and other items adjusted for the season, such as hat and gloves, thermal underwear, sunglasses, dust mask.
- Blankets or sleeping bag for each person.
- Small tent, compass, small shovel.
- Paper, pencil; needles, thread; small A-B-C-type fire extinguisher (see Appendix: Fire Extinguishers); medicine dropper; whistle; emergency preparedness manual.
- Sanitation and hygiene items: toilet paper, towelettes, soap, hand sanitizer, liquid detergent, feminine supplies, shampoo, deodorant, toothpaste, toothbrushes, comb and brush, lip balm, sunscreen, plastic garbage bags (heavy-duty) and ties (for personal sanitation uses), medium-sized plastic bucket with tight lid, disinfectant, household chlorine bleach.
- Entertainment, such as games and books. Favorite comfort dolls, stuffed animals for small children.
- Roll of duct tape (10 millimeters thick) and scissors.
- Plastic sheeting pre-cut to fit shelter-in-place room openings.

NOTE: In the unlikely event that a certain type of chemical hazard causes officials to advise people in a specific area to **shelter-in-place in a sealed room**, households should have in the room they have selected for this purpose:

- Plastic sheeting pre-cut to fit room openings
- Duct tape and scissors.

Ten square feet of floor space per person will provide sufficient air to prevent carbon dioxide buildup for up to five hours. (See Appendix: How to Shelter-in-Place.) Local officials are unlikely to recommend the public shelter in a sealed room for more than 2-3 hours because the effectiveness of such sheltering diminishes with time as the contaminated outside air gradually seeps into the shelter.

NOTE: **Always keep a shut-off valve wrench near the gas and water shut-off valves in your home.**

Disaster Supplies Checklist for Pets

Prepare a pet disaster supplies kit that includes:

- Medications and medical records stored in a waterproof container and a first aid kit. A pet first aid book also is good to include. (See Appendix: First Aid Kit for Pets.)
- Sturdy leashes, harnesses, and carriers to transport pets safely and to ensure that your pets cannot escape. A carrier should be large enough for the animal to stand comfortably, turn around, and lie down. Your pet may have to stay in the carrier for hours at a time while you have taken shelter away from home. Be sure to have a secure cage with no loose objects inside it to accommodate smaller pets. These may require blankets or towels for bedding and warmth, and other special items.
- Current photos and descriptions of your pets to help others identify them in case you and your pets become separated and to prove that they are yours.
- Food and water for at least three days for each pet, bowls, cat litter and litter box, and a manual can opener.
- Information on feeding schedules, medical conditions, behavior problems, and the name and telephone number of your veterinarian in case you have to board your pets or place them in foster care.
- Pet toys and the pet's bed, if you can easily take it, to reduce stress.
- Other useful items include newspapers, paper towels, plastic trash bags, grooming items, and household bleach.

Drought

AWARENESS MESSAGES

Why talk about drought?

Droughts have wide-ranging adverse economic, environmental, and social impacts as rivers, reservoirs, groundwater levels, and soil moisture all drop. Lack of rain for an extended period can cause losses to crops, timber, livestock, and fisheries. Water shortages for home use and industry may result, affecting personal and environmental sanitation. Environmental losses from water shortages may occur due to an increase in the number of fires and the amount of dust and concentrated water pollution.

What is a drought?

A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance, causing, for example, crop damage and shortages in the water supply. The severity of a drought depends on the degree of moisture deficiency, the duration, and the size of the affected area. Drought can be defined four ways:

- Meteorological Drought—when an area gets less precipitation than normal. Due to climatic differences, what is considered a drought in one location may not be a drought in another location.
- Agricultural Drought—when the amount of moisture in the soil no longer meets the needs of a particular crop.
- Hydrological Drought—when the surface and subsurface water supplies are below normal.

ACTION MESSAGES

Conserve Water

CORE ACTION MESSAGE

- **Do not waste water inside or outside your home.**

Communities must know how to conserve fresh water and be able to differentiate between essential and non-essential uses of water in times of shortage. **Everyone should learn and practice the water-saving actions that follow:**

Indoors

- **Never pour water down the drain when there may be another use for it.**
- **Make sure your home faucets and toilets are leak-free.**
- **Consider purchasing a low-volume toilet** that uses less than half the water of older models.
- **Put a brick, or another large solid object, in your toilet tank** to reduce the amount of water used in flushing.
- **Avoid flushing the toilet unnecessarily.** Dispose of tissues, insects, etc. in the trash.

- **Take shorter showers.**
- **Replace your showerhead with an ultra-low-flow version.**
- **Do not let the water run while brushing your teeth, washing your face, or shaving.**
- **Operate the automatic dishwasher only when it is fully loaded.**
- **Use two containers—one with soapy water and the other with rinse water—when washing dishes by hand.**
- **Operate the automatic clothes washer only when it is fully loaded, or set the water level for the size of your load.**
- **Retrofit all household faucets with aerators with flow restrictors.**
- **Consider installing an instant hot water heater on your sink.**
- **Insulate your water pipes to prevent them from breaking if you have a sudden and unexpected spell of freezing weather** and to reduce heat loss.
- **Install a water-softening system only when the minerals in the water would damage the pipes.** Turn the softener off while on vacation.
- **When purchasing a new appliance, choose one that is more energy and water efficient.** If you are considering installing a new heat pump or air-conditioning system, be aware that the new air-to-air models are just as efficient as the water-to-air and do not waste water.

Outdoors

- **Check your well pump periodically** if you have a well at home. If the pump turns on and off while water is not being used, you have a leak and should have it repaired immediately.
- **When washing your car, use a shut-off nozzle on your hose** that can be adjusted down to a fine spray, so that water flows only as needed. Consider using a commercial car wash that recycles water.
- **Do not over-water your lawn.** If it does not rain, lawns need to be watered only every five to seven days in the summer and every 10 to 14 days in the winter. Most of the year, lawns need only one inch (2.5 centimeters) of water per week. Buy a rain gauge so that you can better determine when to water. Avoid watering during the hottest time of day and avoid watering paved areas.
- **Raise your lawn mower blade to at least three inches (7.6 centimeters) or to its highest level and avoid over-fertilizing your lawn.**
- **Consider installing a new water-saving pool filter** if you have a swimming pool. Cover pools and spas when not in use to reduce evaporation of water.
- **Plant native and/or drought-tolerant grasses, ground covers, shrubs, and trees.** Once established, they do not need water as frequently and usually will survive a dry period without watering. They also require less fertilizer and fewer herbicides.
- **Install irrigation devices that are the most water efficient for each use.** Micro and drip irrigation and soaker hoses are examples of efficient devices.
- **Use mulch to retain moisture in the soil.**
- **Do not buy water toys that require a constant stream of water.**
- **Do not install ornamental water features (such as fountains) unless they use recycled water**.
- **Make sure that any animals, particularly those housed outdoors, have plenty of clean water**.

Facts and Fiction

Fiction: A few days of heavy rain will end a drought.
Facts: It takes a long time for a drought to develop and a long time for it to end. An overall rainfall deficit and a low water table will usually not be eliminated by one rainfall. However, a heavy rain, while not ending a drought, can help alleviate its effects on agriculture.

Fiction: It is best to water the lawn in the afternoon.
Facts: You should avoid watering during the hottest time of the day. It is best to water in the early morning hours or in the late afternoon so that the water does not evaporate as quickly.

Fiction: You will know your area is in a drought because everything will be dry and vegetation will be brown.
Facts: A rainfall of short duration may make vegetation green up but will not alleviate a drought. Droughts take many months to begin, and they can take months or years to end. A drought is a long-term situation.

Page DR-4 blank

Earthquakes

Learn if earthquakes are a risk in your area by contacting your local emergency management office, local American Red Cross chapter, or state geological survey or department of natural resources. Information about earthquake risk is also available from the Web site of the U.S. Geological Survey National Seismic Hazards Project: http://eqhazmaps.usgs.gov/ .

AWARENESS MESSAGES

Why talk about earthquakes?

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States approach $200 billion.

Forty-five states and territories in the United States are at moderate to very high risk of earthquakes, and they are located in every region of the country. California has experienced the most frequent damaging earthquakes; however, Alaska has experienced the greatest number of large earthquakes—many of which caused little damage because of the area's low population density at the time.

In November 2002, a magnitude 7.9 earthquake in south-central Alaska ruptured the Denali Fault in the Alaska Mountain Range, about 90 miles (145 kilometers) south of Fairbanks. Although this was the strongest earthquake ever recorded in the interior of Alaska, it caused no deaths and little damage to structures because the region was sparsely populated. In February 2001, the 6.8 magnitude Nisqually earthquake struck the Puget Sound area 12 miles (20 kilometers) northeast of Olympia, Washington. Hundreds of people were injured and damages were estimated at more than $3.5 billion. In January 1994, the Los Angeles region of southern California was struck by a 6.7 magnitude earthquake centered in the San Fernando Valley town of Northridge. The Northridge earthquake killed 57 people, injured 9,000, and displaced 20,000 from their homes. It was one of the costliest earthquakes in U.S. history, destroying or damaging thousands of buildings, collapsing freeway interchanges, and rupturing gas lines that exploded into fires.

The most widely felt sequence of earthquakes in the contiguous 48 states was along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three with estimated magnitudes of 7.6, 7.7, and 7.9 on the Richter Scale. These earthquakes were felt over the entire eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Where earthquakes have occurred in the past, they will happen again.

What are earthquakes and what causes them?
An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the surface move slowly over, under, past, and away from each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy as they bend or stretch. When the forces grow strong enough, the plates suddenly break free causing the ground to shake. Most earthquakes occur at the boundaries where two plates meet; however, some earthquakes occur in the middle of plates.

Aftershocks are smaller earthquakes that follow the main shock and can cause further damage to weakened buildings. Aftershocks can occur in the first hours, days, weeks, or even months after the quake. Some earthquakes are actually foreshocks that precede a larger earthquake.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and telephone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive, seismic sea waves called tsunamis. Buildings with foundations resting on unconsolidated landfill and other unstable soils are at increased risk of damage. Also, mobile homes and homes not attached to their foundations are at particular risk because they can be shaken off their foundations during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

The Northridge, California, earthquake of January 17, 1994, struck a modern urban environment generally designed to withstand the forces of earthquakes. Its economic cost, nevertheless, was estimated at $20 billion. Fortunately, relatively few lives were lost. Exactly one year later, Kobe, Japan, a densely populated community less prepared for earthquakes than Northridge, was devastated by one of the most costly earthquakes ever to occur. Property losses were projected at $96 billion, and at least 5,378 people were killed. These two earthquakes tested building codes and construction practices, as well as emergency preparedness and response procedures.

How can I protect myself in an earthquake?
Ground vibrations during an earthquake are seldom the direct cause of death or injury. Most earthquake-related injuries and deaths result from collapsing walls, flying glass, and falling objects caused by the ground shaking. It is extremely important for a person to move as little as possible to reach the place of safety he or she has identified, because most injuries occur when people try to move more than a few feet during the shaking.

Much of the damage caused by earthquakes is predictable and preventable. We must all work together in our communities to apply our knowledge to enact and enforce up-to-date building codes, retrofit older unsafe buildings, and avoid building in hazardous areas, such as those prone to landslides. We must also look for and eliminate hazards at home, where our children spend their days, and where we work. And we must learn and practice what to do if an earthquake occurs.

ACTION MESSAGES
Be Prepared for an Earthquake
Protect Yourself

CORE ACTION MESSAGES
- **Pick "safe places" in each room.**
- **Practice drop, cover, and hold on.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take earthquake-specific precautions and plan and practice what to do in the event of an earthquake.

If you are at risk from earthquakes, you should:

- **Discuss with members of your household the possibility of earthquakes and what to do to stay safe if one occurs.** Knowing how to respond will help reduce fear.
- **Pick "safe places" in each room of your home and your office or school.** A safe place could be under a piece of furniture, such as a sturdy table or desk, or against an interior wall away from windows, bookcases, or tall furniture that could fall on you. The shorter the distance to your safe place, the less likely it is that you will be injured by furnishings that become flying debris during the shaking. Injury statistics show that persons moving more than five feet (1.5 meters) during an earthquake's shaking are the most likely to experience injury.
- **Practice drop, cover, and hold on in each safe place.** Drop to the floor, take cover under a sturdy piece of furniture, and hold on to a leg of the furniture. If suitable furniture is not nearby, sit on the floor next to an interior wall and cover your head and neck with your arms. Responding quickly in an earthquake may help protect you from injury. Practice drop, cover, and hold on at least twice a year.
- **Keep a flashlight and sturdy shoes by each person's bed**.
- **Talk with your insurance agent about earthquake protection**. Different areas have different requirements for earthquake protection. Study the locations of active faults, and, if you are at risk, consider purchasing earthquake insurance.
- **Inform guests, babysitters, and caregivers of earthquake plans.** Everyone in your home should know what to do if an earthquake occurs, even if you are not there at the time.

Protect Your Property

CORE ACTION MESSAGES

- **Secure your home's structure and objects inside and outside.**

If you are at risk from earthquakes, you should:

- **Make sure your home is securely anchored to its foundation.** Depending on the type of construction and the materials used in building your home, you may need to have it bolted or secured in another way to its foundation. If you are not sure that your home is securely anchored, contact a professional contractor. Homes securely attached to their foundations are less likely to be severely damaged during earthquakes, while homes that are not are frequently ripped from their foundations and become uninhabitable.
- **Bolt and brace water heaters and gas appliances to wall studs.** If the water heater tips over, the gas line could break, causing a fire hazard, and the water line could rupture. The water heater may be your best source of drinkable water following an earthquake. Consider having a licensed professional install flexible fittings for gas and water pipes.
- **Bolt bookcases, china cabinets, and other tall furniture to wall studs.** Brace or anchor high or top-heavy objects. During an earthquake, these items can fall over, causing damage or injury.
- **Hang heavy items, such as pictures and mirrors, away from beds, couches, and anywhere people sleep or sit.** Earthquakes can knock things off walls, causing damage or injury.
- **Brace overhead light fixtures.** During earthquakes, overhead light fixtures are the most common items to fall, causing damage or injury.
- **Install strong latches or bolts on cabinets.** The contents of cabinets can shift during the shaking of an earthquake. Latches will prevent cabinets from opening and spilling out the contents. Place large or heavy objects on shelves near the floor.
- **Secure large items that might fall and break** (televisions, computers, etc.).
- **Store weed killers, pesticides, and flammable products securely in closed, latched metal cabinets.**
- **Evaluate animal facilities and places your pets like to hide in, to ensure that any hazardous substances or structures are dealt with.**
- **Consider having your building evaluated by a professional structural design engineer.** Ask about home repair and strengthening tips for exterior features, such as porches, front and back decks, sliding glass doors, canopies, carports, and garage doors. This is particularly important if there are signs of structural defects, such as foundation cracks. Earthquakes can turn cracks into ruptures and make smaller problems bigger. A professional can give you advice on how to reduce potential damage.
- **Follow local seismic building standards and land use codes** that regulate land use along fault lines, in areas of steep topography, and along shorelines. Some municipalities, counties, and states have enacted codes and standards to protect property and occupants in case of an earthquake. Learn about your area's codes before you begin construction.

What to Do During an Earthquake

CORE ACTION MESSAGES

- **If inside when the shaking starts, move no more than a few steps and drop, cover, and hold on.**
- **If outside, find a clear spot and drop.**

If you are inside when the shaking starts, you should:

- **Drop, cover, and hold on.** Move only a few steps to a nearby safe place. Most people injured in earthquakes move more than five feet (1.5 meters) during the shaking.
- **If you are elderly or have a mobility impairment, remain where you are, bracing yourself in place.**
- **If you are in bed, stay there, hold on, and protect your head with a pillow.** You are less likely to be injured if you stay in bed. Broken glass on the floor can injure you.
- **Stay away from windows**. Windows can shatter with such force that you can be injured by flying glass even if you are several feet away.
- **Stay indoors until the shaking stops and you are sure it is safe to exit.** In buildings in the United States, you are safer if you stay where you are until the shaking stops. If you go outside, move quickly away from the building to prevent injury from falling debris.
- **Be aware that fire alarm and sprinkler systems frequently go off in buildings during an earthquake, even if there is no fire.** Check for and extinguish small fires, and exit via the stairs.
- **If you are in a coastal area, drop, cover, and hold on during an earthquake and then move immediately to higher ground when the shaking stops.** Tsunamis (large ocean waves) are often generated by earthquakes. (See “Tsunamis.”)

If you are outdoors when the shaking starts, you should:

- **Find a clear spot away from buildings, trees, streetlights, and power lines.**
- **Drop to the ground and stay there until the shaking stops.** Injuries can occur from falling trees, streetlights, power lines, and building debris.
- **If you are in a vehicle, pull over to a clear location, stop, and stay there with your seatbelt fastened until the shaking stops.** Trees, power lines, poles, street signs, overpasses, and other overhead items may fall during earthquakes. Stopping in a clear location will reduce your risk, and a hard-topped vehicle will help protect you from flying or falling objects. Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.
- **If you are in a mountainous area or near unstable slopes or cliffs, be alert for falling rocks and other debris** that could be loosened by the earthquake. Landslides are often triggered by earthquakes. (See “Landslides.”)

What to Do After an Earthquake

CORE ACTION MESSAGES

- **Expect aftershocks.**
- **Check yourself and then others.**
- **Look for fires.**

When the shaking stops, you should:

- **Expect aftershocks.** Each time you feel one, drop, cover, and hold on. Aftershocks frequently occur minutes, days, weeks, and even months following an earthquake.
- **Check yourself for injuries and get first aid if necessary before helping injured or trapped persons.**
- **Put on long pants, a long-sleeved shirt, sturdy shoes, and work gloves** to protect yourself from injury by broken objects.
- **Look quickly for damage in and around your home and get everyone out if your home is unsafe.** Aftershocks following earthquakes can cause further damage to unstable buildings. If your home has experienced damage, get out before aftershocks happen. Use the stairs, not an elevator.
- **Listen to a portable, battery-operated radio or television** for updated emergency information and instructions. If the electricity is out, this may be your main source of information. Local radio and television stations and local officials will provide the most appropriate advice for your particular situation.
- **Check the telephones in your home or workplace.** If a phone was knocked off its cradle during the shaking of the earthquake, hang it up. Allow 10 seconds or more for the line to reset. If the phone lines are undamaged, you should get a dial tone. Use a telephone or cell phone only to make a brief call to your Family Disaster Plan contact and to report life-threatening emergencies. Telephone lines and cellular equipment are frequently overwhelmed in disaster situations and need to be clear for emergency calls to get through. Cellular telephone equipment is subject to damage by quakes and cell phones may not be able to get a signal, but regular “land line” phones may work.
- **Look for and extinguish small fires**. Fire is the most common hazard following earthquakes. Fires followed the San Francisco earthquake of 1906 for three days, creating more damage than the earthquake.
- **Clean up spilled medications, bleach, gasoline, or other flammable liquids** immediately. Avoid the hazard of a chemical emergency.
- **Open closet and cabinet doors cautiously.** Contents may have shifted during the shaking and could fall, creating further damage or injury.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Watch out for fallen power lines or broken gas lines,** and stay out of damaged areas. Hazards caused by earthquakes are often difficult to see, and you could be easily injured.

- **Watch animals closely**. Keep all your animals under your direct control. Pets may become disoriented, particularly if the disaster has affected scent markers that normally allow them to find their home. Pets may be able to escape from your house or your fence may be broken. Be aware of hazards at nose and paw level, particularly debris, spilled chemicals, fertilizers, and other substances that might seem to be dangerous to humans. In addition, the behavior of pets may change dramatically after an earthquake, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.
- **Stay out of damaged buildings.** Damaged buildings may be destroyed by aftershocks following the main quake.
- **If you were away from home, return only when authorities say it is safe**. **When you return home:**
    - Be alert for and observe official warnings.
    - Use extreme caution. Check for damages outside your home. Then, if the structure appears safe to enter, check for damages inside. Building damage may have occurred where you least expect it. Carefully watch every step you take. Get out of the building if you think it is in danger of collapsing. Do not smoke; smoking in confined areas can cause fires.
    - Examine walls, floors, doors, staircases, and windows.
    - Check for gas leaks. If you smell gas or hear a blowing or hissing noise, open a window and get everyone out quickly. Turn off the gas, using the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
    - Look for damage to the electrical system. If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice.
    - Check for damage to sewage and water lines. If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water from undamaged water heaters or by melting ice cubes. (See Appendix: Drinking Water Safety.)
    - Watch for loose plaster, drywall, and ceilings that could fall.

(See “Evacuation and Sheltering, and Post-disaster Safety.”)

For information on **portable-generator safety** and **carbon monoxide poisoning,** see Appendix: Portable Generators.

Media and Community Education Ideas

- Ask your community to adopt up-to-date building codes. Building codes are the public's first line of defense against earthquakes. National model building codes are available to communities and states. These codes identify construction techniques for buildings that help them withstand earthquakes without collapsing and killing people. Codes are updated regularly to make use of information learned from recent damaging earthquakes, so adopting and enforcing up-to-date codes are essential.

- If your area is at risk from earthquakes, ask your local newspaper or radio or television station to:
  -Present information about how to respond if an earthquake occurs.
  -Do a series on locating hazards in homes, workplaces, day care centers, schools, etc.
  -Provide tips on how to conduct earthquake drills.
  -Run interviews with representatives of the gas, electric, and water companies about how individuals should prepare for an earthquake.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office, local American Red Cross chapter, and state geological survey or department of natural resources.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

Facts and Fiction

Fiction: During an earthquake, you should get into a doorway for protection.
Facts: In modern homes, doorways are no stronger than any other parts of the structure and usually have doors that will swing and can injure you. During an earthquake, you should get under a sturdy piece of furniture and hold on.

Fiction: During an earthquake, the earth cracks open and people, cars, and animals can fall into those cracks.
Facts: The earth does not crack open like the Grand Canyon. The earth moves and rumbles and, during that movement, small cracks can form. The usual displacements of the earth during an earthquake are caused by up-and-down movements, so shifts in the height of the soil are more likely than chasm-like cracks.

Fiction: Animals can sense earthquakes and give advanced warning.
Facts: Animals may be able to sense the first low-frequency waves of an earthquake that occurs deep within the earth, but the damage-causing primary and secondary waves follow just seconds behind. Animals do not make good earthquake warning devices.

Fiction: Big earthquakes always happen in the early morning.
Facts: Several recent damaging earthquakes have occurred in the early morning, so many people believe that all big earthquakes happen then. In fact, earthquakes occur at all times of day. The 1933 Long Beach earthquake was at 5:54 p.m. and the 1940 Imperial Valley event was at 9:36 p.m. More recently, the 1989 Loma Prieta event was at 5:02 p.m.

Fiction: It's hot and dry—earthquake weather!
Facts: Many people believe that earthquakes are more common in certain kinds of weather. In fact, no correlation with weather has been found. Earthquakes begin many kilometers below the region affected by surface weather. People tend to notice earthquakes that fit the pattern and forget the ones that do not. In all regions of the world, “earthquake weather” is whatever type of weather prevailed at the time of the region’s most memorable earthquake.

Fiction: Someday there will be beachfront property in Arizona.
Facts: The ocean is not a great hole into which California can fall, but is itself land at a somewhat lower elevation with water above it. The motion of plates will not make California sink—California is moving horizontally along the San Andreas Fault and up around the Transverse Ranges (coastal California mountains).

Fiction: We have good building codes so we must have good buildings.
Facts: The tragedy in Kobe, Japan, one year after the Northridge earthquake, painfully reminds us that the best building codes in the world do nothing for buildings built before that code was enacted. In many earthquake-prone areas of the United States, the building codes are out of date and therefore even new buildings are very vulnerable to severe earthquake damage. Fixing problems in older buildings—retrofitting—is the responsibility of the building's owner.

Fiction: Scientists can now predict earthquakes.
Facts: Scientists do not know how to predict earthquakes, and they do not expect to know how any time in the foreseeable future. However, based on scientific data, probabilities can be calculated for potential future earthquakes. For example, scientists estimate that during the next 30 years the probability of a major earthquake occurring is 67 percent in the San Francisco Bay area and 60 percent in southern California.

Page EQ-10 blank

Evacuation and Sheltering, and Post-disaster Safety

AWARENESS MESSAGES

Why talk about evacuation?

At any time of the year, at any time of the day or night, a disaster or threat of a disaster could force people to leave their homes, offices, and schools or even the community in which they live. People evacuate a dangerous place to go to a safer place, and they usually need to act in a hurry. Preparing before an emergency by learning about the community's warning systems and evacuation routes and by making evacuation plans and discussing them with household members is the best way to be ready in case an evacuation is necessary. Making plans at the last minute can be upsetting, create confusion, and cost precious time.

Why talk about sheltering?

Sometimes, a disaster or threat of disaster mandates that people find shelter in their home or in whatever building they happen to be. Safe shelter requires having a safe place to go and having the time to get there. It is important to know which room to shelter in and what to do to stay safe while there. At other times, people are forced to evacuate the immediate area, or even the entire region, and to shelter at public facilities. Knowing in advance what to expect and preparing for all sheltering scenarios will make sheltering experiences safer and more comfortable.

What if you have pets?

Because evacuation shelters generally do not accept pets, except for service animals, you must plan ahead to ensure that your family and pets will have a safe place to stay. Do your research early.

Contact hotels and motels outside your immediate area to check policies on accepting pets. Ask about any restrictions on number, size, and species. Ask if "no pet" policies would be waived in an emergency. Make a list of pet-friendly places and keep it handy. Call ahead for a reservation as soon as you think you might have to leave your home.

Check with friends, relatives, or others outside your immediate area. Ask if they would be able to shelter you and your animals, or just your animals if necessary. If you have more than one pet, you may have to be prepared to house them separately.

Make a list of boarding facilities and veterinary offices that might be able to shelter animals in emergencies and include 24-hour numbers.

Ask your local animal shelter if it provides foster care or shelter for pets in an emergency. This should be your last resort, as shelters have limited resources and are likely to be stretched to their limits during an emergency.

ACTION MESSAGES
Evacuation

CORE ACTION MESSAGES
- **Keep listening to local radio or television stations.**
- **If authorities tell you to evacuate immediately, grab essentials and go.**
- **If you have more time, prepare your home.**

Consider your transportation options in case you have to evacuate. If you do not own or drive a car, ask your local emergency manager about plans for people without private vehicles.

If you are in an area that is being evacuated:

- **Evacuate immediately if told to do so by authorities.** Authorities do not ask people to leave unless they conclude that lives may be in danger.
- **Listen to a local radio or television station and follow the instructions of local emergency officials.** Local officials know the most appropriate advice for your particular situation.
- **Wear long pants, a long-sleeved shirt, and sturdy shoes.** The most common injury following disasters is cut feet.
- **Lock your home**. Secure your home as you normally would when leaving for an extended period.
- **Take your pets with you when you leave,** provided you can do so without endangering yourself.
- **Use travel routes specified by local authorities.** Since certain areas may be impassable or dangerous, avoid shortcuts. Do not drive through moving water. Barriers are placed for your safety; if you come upon a barrier, follow posted detour signs.

If you have only moments before leaving, grab your Disaster Supplies Kit and go. If it is impossible for you to take your Disaster Supplies Kit, at least try to take the following:

- **Any pets that you can get without endangering yourself.** You may not be able to come back for them later, as it may be too dangerous to return.
- **First aid kit,** including prescription medications, dentures, extra eyeglasses, and hearing aid batteries
- **A change of clothes and a sleeping bag or blankets for each household member**
- **Flashlight, radio, and water**
- **Car keys and house keys**
- **Cash and personal identification**

If you have time before leaving and local officials have not advised an immediate evacuation, prepare your home before evacuating. Quickly take steps to protect your home and belongings. Depending on the threat, you should:

- **Bring all pets into the house and confine them to one room,** if you can. If necessary, make arrangements for your pets. Pets may try to run if they feel threatened. Keeping them inside and in one room will allow you to find them quickly if you need to leave. If you have large, unusual, or numerous animals, start evacuating them or moving them to your shelter area (if you are sheltering in place) as soon as you are aware of impending danger. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic, high winds, and heavy rain.
- **Put your Disaster Supplies Kit in your vehicle or by the door** if you are being picked up or may be leaving on foot. In some disaster situations, such as tsunami or wildland fire, it is better to leave by foot than wait for transportation. Carry what you can, selecting the items most essential to your health and safety.
- **Tell your out-of-town contact in your Family Disaster Plan where you are going and when you expect to get there.** Relatives and friends will be concerned about your safety. Letting someone know your travel plans will help relieve the fear and anxiety of those who care.
- **Bring things indoors.** Lawn furniture, trash cans, children's toys, garden equipment, clotheslines, hanging plants, and any other objects that may be blown around or swept away should be brought indoors.
- **Look for potential hazards.** Look for coconuts, unripened fruit, and other objects in trees around your property that could blow or break off and fly around in strong winds. Cut these objects off and store them indoors until the storm is over. If you have not already cut away dead or diseased branches or limbs from trees and shrubs, leave them alone. Local rubbish collection services will not have time before a major storm to pick anything up.
- **Turn off electricity at the main fuse or breaker, and turn off water at the main valve.**
- **Leave natural gas on,** unless local officials advise otherwise, because you will need it for heating and cooking when you return home. If you turn gas off, a licensed professional is required to turn it back on, and it may take weeks for a professional to respond.
- **Turn off propane gas service valves.** Propane tanks often become damaged or dislodged in disasters.
- **If strong winds are expected, cover the outside of all the windows of your home.** Use shutters that are rated to provide significant protection from windblown debris, or put pre-fit plywood coverings over all windows.
- **If flooding is expected, consider using sand bags to keep water away from your home**. It takes two people about one hour to fill and place 100 sandbags, giving you a wall one-foot (0.3-meter) high and 20-feet (6-meters) long. Make sure you have enough sand, burlap or plastic bags, shovels, strong helpers, and time to place them properly.

Sheltering

CORE ACTION MESSAGE
- **Prepare to be self-sufficient for at least three days.**

Taking shelter, having a safe place to go and having the time to get there, are often a critical element in protecting yourself and your household in times of disaster. Sheltering can take several forms. Sheltering-in-place is appropriate when conditions require that you take protection in your home, place of employment, or other location where you are when a disaster strikes.

How and where to shelter-in-place depend entirely on the emergency situation. For instance, during a tornado warning you should go to an underground room or a "wind safe" room, if such a room is available. (See Appendix: "Wind Safe" Room.) During a chemical release, on the other hand, you should take shelter in a room above ground level. Because of these differences, short-term in-place shelter is described in the chapters dealing with specific hazards. See the chapters on "Thunderstorms," "Tornadoes," "Hazardous Materials Incidents," and "Terrorism" for more information on short-term sheltering.

Shelter-in-Place/Fallout Shelter
- **In case of a chemical attack, take shelter on an upper floor** in an interior space without windows if possible. Seal the space using plastic sheeting and duct tape. Ten square feet of floor space per person will provide sufficient air to prevent carbon dioxide buildup for up to five hours. Local officials are unlikely to recommend the public shelter in a sealed room for more than 2-3 hours because the effectiveness of such sheltering diminishes with time as the contaminated outside air gradually seeps into the shelter. (See Appendix: How to Shelter-in-Place for details on preparing a shelter-in-place room.)
- **In case of nuclear attack, take shelter from fallout radiation below ground** in an interior space without windows if possible. Put as much heavy, dense material between you and the outside as possible. (See Appendix: Factors for Protection from Radioactive Fallout for details on preparing a fallout shelter.)

Taking shelter may also be longer term, as when you stay in your home for several days without electricity or water services following a winter storm. "Shelter" also refers to a place where people displaced by a disaster are housed and fed by an organization like the American Red Cross. The following information pertains to long-term, in-place sheltering.

Long-Term Sheltering at Home

CORE ACTION MESSAGE
- **Stay put until authorities say you can leave.**

Sometimes, disasters make it unsafe for people to leave their residences for extended periods. Winter storms, floods, and landslides may isolate individual households and make it necessary for each household to take care of its own needs until the disaster abates, such as when snows melt and temperatures rise, or until rescue workers arrive. Your household should be prepared to be self-sufficient for at least three days if cut off from utilities and from outside supplies of food and water. Being prepared for two weeks is safer.

If you are sheltering at home, you should:
- Stay in your shelter until local authorities say it is safe to leave. The length of your stay can range from a few hours to two weeks.
- Maintain a 24-hour communications watch. Take turns listening to local radio or television stations. Listen to battery-operated radio or television for local news updates for short periods of time to preserve the batteries.

For information on **portable-generator safety** and **carbon monoxide poisoning,** Appendix: Portable Generators.

Staying Safe After a Disaster

CORE ACTION MESSAGES
- **Follow your plan.**
- **Stay alert to hazards.**
- **Do not use candles.**

After a disaster occurs, you may be in your home, in a public shelter in your community, or far away from your home. No matter where you are, it is probable that many other people are experiencing what you are going through. You will be glad that you and the other members of your household made a plan and practiced it. **No matter where you are after a disaster, you should:**
- **Remain calm and patient.** Staying calm and patient will help you move safely and avoid delays or accidents caused by irrational behavior. Many people will be trying to accomplish the same things you are for the safety of their families. Patience will help everyone get through a difficult situation more easily.
- **Put your Family Disaster Plan into action**.
- **Listen to a local radio or television station** for news and instructions. Local authorities know the most appropriate advice for your community's particular situation.
- **Check for injuries.** Give first aid and get help for seriously injured people. Taking care of yourself first will allow you to help others safely until emergency responders arrive.

- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Use your Disaster Supplies Kit.**

If you are at home, or when you return home, you should:

- **Wear a long-sleeved shirt, long pants, and sturdy shoes.** Disaster areas and debris contain many hazards. The most common injury following disasters is cut feet.
- **Check for damage in your home.** Disasters can cause extensive damage, sometimes in places you least expect. Look carefully for any potential hazards.
- **Use battery-powered lanterns or flashlights** when examining buildings. Battery-powered lighting is the safest and easiest and does not present a fire hazard for the user, occupants, or building.
- **DO NOT USE CANDLES.** Candles can easily cause fires. They are quiet and easily forgotten. They can tip over during earthquake aftershocks or in a gust of wind. Candles invite fire play by children.
- **Look for fire hazards,** such as broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances.
- **Check for gas leaks**. If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly. Turn off the gas at the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
- **Look for electrical system damage**. If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.
- **If you have no electricity, take precautions to keep food safe.** (See Appendix: Keeping Refrigerated Food Safe if the Power Goes Out.)
- **Check for damage to sewage and water lines**. If you suspect sewage lines are damaged, avoid using the toilets and drains and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap.
- **If your tap water is not working or is not safe, ensure that you drink only clean water.** (Appendix: Drinking Water Safety.)
- **If you need to dispose of sewage, ensure that you do it properly.** (See Appendix: Emergency Sanitation.)
- **Clean up spills immediately**. Especially important to clean up are spilled medicines, bleach, gasoline, and other flammable liquids.
- **Watch for loose plaster and ceilings that could fall.**
- **Take pictures of the damage,** both of the building and its contents, for insurance claims.
- **Watch animals closely.** Keep all your animals under your direct control. Pets may become disoriented, particularly if the disaster has affected scent markers that normally allow them to find their homes. Pets may be able to escape from your home or your fence may be broken. Be aware of hazards at nose and paw or hoof level, particularly debris, spilled chemicals, fertilizers, and other substances that might not seem to be dangerous to humans. In addition, the behavior of pets may change dramatically after an earthquake, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

- **Let your out-of-town contact know you have returned home, and then do not use the telephone again during the emergency period unless it is to report a life-threatening emergency.** Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls to get through.
- **Make sure you have an adequate water supply in case service is cut off.** Water is often contaminated after major disasters. (See Appendix: Storing Water and Drinking Water Safety.)
- **Stay away from downed power lines and report them immediately.** Getting damaged utilities turned off will prevent further injury or damage. If you see downed power lines, set out a flare and stay on the scene to warn others until authorities arrive if possible.

Carbon Monoxide Alarms

- Every home should have properly installed and maintained carbon monoxide (CO) alarms. Install battery-operated CO alarms or plug-in CO alarms with battery back-up in your home, according to the manufacturer's installation instructions. CO alarms should be certified to the requirements of the latest safety standards for CO alarms (UL 2034, IAS 6-96, or CSA 6.19.01). It is especially important to have a CO alarm near sleeping areas.
- Test and maintain your CO alarms according to the manufacturer's instructions.

CO alarms can help detect CO, a colorless, odorless gas produced by burning any fuel. Exposure to high levels of CO can cause death. The initial symptoms of CO poisoning are similar to the flu and include dizziness, fatigue, headache, nausea, and irregular breathing.

Because of the risk of CO poisoning, never operate unvented fuel-burning appliances in any closed room or where people are sleeping. CO poisoning from fuel-burning appliances kills people in the United States each year.

CO can leak from faulty furnaces or fuel-fired heaters or can be trapped inside a home by a blocked chimney or flue. Burning charcoal inside a home produces CO. Running an automobile engine in an attached garage can cause CO to enter a home and so can running a portable generator if it is near windows, doors, or vents, even if it is outdoors.

Never use gas appliances such as ranges, ovens, or clothes dryers for heating your home. **Never** use a portable generator in an enclosed or partially enclosed space, including in your home or in a garage, basement, crawl space, or other partially enclosed area, even with ventilation. Locate a generator outdoors and away from doors, windows, and vents that could allow CO to come indoors. Generators can produce high levels of deadly CO very quickly. (See Appendix: Portable Generators.)

Page ES-8 blank

Family Disaster Plan

AWARENESS MESSAGES

Why talk about a Family Disaster Plan?

Disaster can strike quickly and without warning. It can force you to evacuate your neighborhood or confine you to your home. What would you do if basic services, such as water, gas, electricity, or telephones, were cut off? Local officials and relief workers will be on the scene after a disaster, but they cannot reach everyone right away.

You and the other members of your household could be separated during a disaster. Having a plan will help you find each other.

Families can and do cope with disaster by preparing in advance and working together as a team. Knowing what to do is your best protection and your responsibility. Learn more about Family Disaster Plans by contacting your local emergency management office or local American Red Cross chapter.

What is a Family Disaster Plan?

A Family Disaster Plan is a personalized action plan that lets each member of a household know what to do in particular disaster situations and how to be prepared in advance. A functional Family Disaster Plan helps alleviate fears about potential disasters, makes actual disaster situations less stressful, and saves precious time in the face of disasters.

Watch, Warning

- A **National Weather Service (NWS) WATCH** is a message indicating that conditions favor the occurrence of a certain type of hazardous weather. For example, a severe thunderstorm watch means that a severe thunderstorm is expected in the next six hours or so within an area approximately 120 to 150 miles (193 to 241 kilometers) wide and 300 to 400 miles (483 to 644 kilometers) long. The NWS Storm Prediction Center issues such watches. Local NWS forecast offices issue other watches (flash flood, winter weather, etc.) 12 to 36 hours in advance of a possible hazardous-weather or flooding event. Each local forecast office usually covers a state or a portion of a state.
- An **NWS WARNING** indicates that a hazardous event is occurring or is imminent in about 30 minutes to an hour. Local NWS forecast offices issue warnings on a county-by-county basis.

What to Tell Children

Parents and caregivers should:

- Tell children that a disaster is something that happens that could hurt people, cause damage, or cut off utilities, such as water, telephones, or electricity. Explain to them that nature sometimes provides "too much of a good thing"— fire, rain, wind, snow. Talk about typical effects that children can relate to, such as loss of electricity, water, and telephone service.
- Give examples of several disasters that could happen in your community. Help children recognize the warning signs for each. Discussing disaster ahead of time reduces fear and anxiety and lets everyone know how to respond.
- Be prepared to answer children's questions about scary things that they have heard about or seen on television, such as terrorist attacks. Give constructive information about how to be prepared to protect themselves and how to respond.
- Teach children how and when to call for help. Teach them to call 9-1-1 or your local emergency telephone number. At home, post emergency numbers by all telephones and explain when to call each number. Include the work numbers and cell phone numbers of household members. Even very young children can be taught how and when to call for emergency assistance. If a child cannot read, make an emergency telephone number chart with pictures or icons for 911, "daddy," and "mommy" that may help the child identify the correct number to call.
- Tell children that in a disaster there are many people who can help them. Talk about ways that an emergency manager, American Red Cross worker, police officer, firefighter, teacher, neighbor, doctor, or utility worker might help after a disaster.
- Teach children to call your out-of-town contact in case they are separated from the family and cannot reach family members in an emergency. Tell them, "If no one answers, leave a voice message if possible and then call the alternative contact." Help them memorize the telephone numbers, and write them down on a card that they can keep with them.
- Quiz children every six months so they will remember where to meet, what telephone numbers to call, and safety rules.
- Explain that when people know what to do and practice in advance, everyone is able to take care of themselves better in emergencies. Tell them that is why you need to create a Family Disaster Plan.
- Allay children's fears by emphasizing that, in an emergency, a parent or caregiver will be there to help.

ACTION MESSAGES
Be Prepared for Disasters
Make a Plan

CORE ACTION MESSAGES

- **Find out what could happen.**
- **Create a Family Disaster Plan.**
- **Make and complete a checklist.**
- **Practice and maintain your plan.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take precautions specific to the types of disasters that could affect the local community and plan for and practice what to do if these disasters occur.

- **Find out what could happen to you.** By learning what disasters could occur in your community and what your risks may be (for example, living in a floodplain), you can prepare for the disasters most likely to occur in your area. Learn more by contacting your local emergency management office or American Red Cross chapter. Be prepared to take notes. Ask the following:
  - What types of natural disasters are most likely to happen in your community? What types of human-caused or technological disasters could affect your region? Ask about chemical emergencies, which can occur anywhere chemical substances are stored, manufactured, or transported.
  - Find out if your home is in a floodplain. Check with your local emergency management agency.
  - How should you prepare for natural and human-caused disasters?
  - What can you do to protect your home and avoid or reduce the impact of the disasters that could occur where you live?
  - Does your community have a public warning system? How will your local radio and television stations alert the community if there is an emergency? What do your community's warning signals sound like and what should you do when you are notified?
  - If you care for young or elderly people or people with disabilities, how can you help them in a disaster situation? What might be some special needs to consider?
  - What about animal care after a disaster? Pets (other than service animals) usually are not permitted in public shelters or other places where food is served. Where could you take your pets if you had to go to a public shelter? Contact your local emergency management agency to find out about emergency animal shelters in your community, in the event that you have nowhere else to go and need to go to public shelter with your animals.

Then, **find out about the disaster plans at your workplace, your children's school or day care center, and other places where members of your family spend time.** You should be prepared wherever you may be in case disaster strikes and learn steps you can take to prevent or avoid disasters.

Create a Family Disaster Plan.

> **Note:** You can adapt the Family Disaster Plan to any household—couples, related or unrelated individuals, adults without children, adults with children. Even people who live alone should create a Family (Household) Disaster Plan.

Once you know what disasters are possible in your area, have a household meeting to talk about how to prepare and how to respond if a disaster should occur. Plan to share responsibilities and to work together as a team.

Know what to do in case household members are separated in a disaster. Disaster situations are stressful and can create confusion. **Keep it simple.**

- **Pick two places to meet:**
  1. Right outside your home in case of a sudden emergency, like a fire.
  2. Outside your neighborhood in case you cannot return home or are asked to leave your neighborhood.

- **Pick two out-of-town contacts:**
  1. A friend or relative who will be your household's **primary** contact.
  2. A friend or relative who will be your household's **alternative** contact.

  Both adults and children should know the primary and alternative contacts' names, addresses, and home and cell telephone numbers, or carry the information with them. In addition, include these contact numbers on your pet's identification tags, or use a national pet locator service that someone could call to report finding your pet.

  Separation is particularly likely during the day when adults are at work and children are at school. **If household members are separated from one another in a disaster, they should call the primary contact. If the primary contact cannot be reached, they should call the alternative contact.** Remember, after a disaster, it is often easier to complete a long-distance connection than a local call.

  Make sure that adults and children know how to tell the contact where they are, how to reach them, and what happened or to leave this essential information in a brief voice mail.
- **Discuss what to do if a family member is injured or ill.**
- **Discuss what to do in the rare circumstance that authorities advise you to shelter-in-place.** (See Appendix: How to Shelter-in-Place.)

  - **Discuss what to do if authorities advise you to evacuate.** Learn about public shelter locations in your community. Make "in-case-of-evacuation" arrangements for a place to stay with a friend or relative who lives out of town or with a hotel, motel, or campground you are familiar with that can be reached by an evacuation route you would expect to take.
  - **Be familiar with evacuation routes.** Plan several evacuation routes in case certain roads are blocked or closed. Remember to follow the advice of local officials during evacuation situations. They will direct you to the safest route; some roads may be blocked or put you in further danger.
  - **Plan how to take care of your pets.** Pets (other than service animals) usually are not permitted in public shelters or other places where food is served. Plan where you would take your pets if you had to go to a public shelter where they are not permitted. Many communities are developing emergency animal shelters similar to shelters for people. Contact your local emergency management agency to find out about emergency animal shelters in your community, in the event that you have nowhere else to go and need to go to public shelter with your animals.

- **Make and complete a checklist.** Include the following:
  - Post emergency numbers (fire, police, ambulance, etc.) by telephones. You may not have time in an emergency to look up critical numbers.
  - **Teach all responsible members of the household how and when to turn off the water, gas, and electricity at the main switches or valves.** Turn off utilities only if you suspect a leak or damaged lines, or if you are instructed to do so by authorities. If you turn the gas off, you will need a professional to turn it back on. Become familiar with the location and operation of shut-off valves. Do not actually turn any valve unless it is a real emergency. Place a tag on shut-off valves to make them easier to identify.
  - **Attach a shut-off valve wrench or other special tool in a conspicuous place close to the gas and water shut-off valves.**
  - **Check if you have adequate insurance coverage.** Homeowners' insurance does not cover flood losses. Ask your insurance agent to review your current policies to ensure that they will cover your home and belongings adequately. If you are a renter, your landlord's insurance does not protect your personal property; it protects only the building. Renters' insurance pays if a renter's property is damaged or stolen. Renters' flood insurance costs less than $15 a month in most areas of the country. Contact your insurance agent for more information.
  - **If you are especially vulnerable to floods, consider relocating.**

- **Be sure to have working smoke alarms and carbon monoxide (CO) alarms in your home.** Smoke alarms cut *nearly in half* your chances of dying in a home fire. For new homes, interconnected smoke alarms are required on every level of the home, outside each sleeping area, and inside each bedroom. Although this approach is ideal for all homes, as a minimum, existing homes should have smoke alarms on every level and outside each sleeping area. Install CO alarms following the manufacturer's instructions. It is especially important to have a CO alarm near sleeping areas. Use only CO alarms with labels showing they meet the requirements of the latest safety standards for CO alarms (UL 2034, IAS 6-96, or CSA 6.19.01). Test and maintain the smoke and CO alarms according to the manufacturer's instructions. (See Appendix: Smoke Alarms and Carbon Monoxide Alarms.)

- **Consider equipping your home with alternative heating sources, such as fireplaces, wood- or coal-burning stoves, or space heaters**. Be sure all heating sources are installed according to local codes and permit requirements and are clean and in working order. (See Appendix: Smoke Alarms and Carbon Monoxide Alarms.)

- **Get training from the fire department in how to use your fire extinguisher** (A-B-C type), and show household members where extinguishers are kept. Different extinguishers operate in different ways. Make sure that responsible members of the household know how to use your particular model. There is no time to read directions during an emergency. Only adults should handle and use extinguishers. (See Appendix: Fire Extinguishers.)
    - **Conduct a home hazard hunt.** During a disaster, ordinary objects in your home can cause injury or damage. Anything that can move, fall, break, or cause a fire is a home hazard. For example, during an earthquake or a tornado, a hot water heater or a bookshelf could turn over or pictures hanging over a couch could fall and hurt someone. Look for electrical, chemical, and fire hazards. Contact your local fire department to learn about home fire hazards. Inspect your home at least once a year and fix potential hazards. In your hazard hunt, include your barns, outbuildings, or any other structures that house animals. Be aware of hazards at nose and paw or hoof level, particularly debris, spilled chemicals, fertilizers, and other substances that may not seem to be dangerous to humans. Make sure your fences are sound and positioned to allow grazing animals to move to high ground in the event of flooding.
    - **Consider your need to add physical protection measures to your home.** Add a "wind safe" room (see Appendix: "Wind Safe" Room) and tie your roof to the main frame of your house securely with metal straps for protection in case of hurricanes or tornadoes; bolt your house to the foundation to reduce earthquake damage; or take other measures you may find on www.fema.gov (click on Preparation and Prevention). Ensure that access and evacuation are manageable for elderly members of your household or those with disabilities.
    - **Assemble a Disaster Supplies Kit and stock emergency supplies.** Keep readily accessible in a portable container supplies that would meet your needs for at least three days. You can use these if you shelter at home or if you evacuate. Also, stock enough food and water for up to two weeks in your home. Keep an emergency kit in your vehicle. (See Appendix: Tips for Preparing Your Disaster Supplies Kit, Foods to Stock at Home and in Your Disaster Supplies Kit, and Emergency Supplies for Your Vehicle.)
    - **Keep a portable, battery-operated radio or television and extra batteries in your Disaster Supplies Kit.** Maintaining a communication link with the outside is a step that can mean the difference between life and death. Make sure that everyone knows where the portable, battery-operated radio or television is located, and always keep a supply of extra, fresh batteries.
    - **Consider buying a NOAA Weather Radio with a tone-alert feature.** NOAA Weather Radio is the best way to receive warnings from the National Weather Service. The National Weather Service recommends a NOAA Weather Radio that has both a battery backup and a Specific Area Message Encoder (SAME) feature, which automatically alerts you when a watch or warning is issued for your county.
    - **Take an American Red Cross first aid and CPR class** and have other household members take one too. You will learn basic safety measures and skills that can be indispensable in an emergency. These classes can be fun for older children.

- **Plan home escape routes.** Determine the best escape routes from inside your home in case a fire or other emergency requires you to leave the house quickly. Find two ways out of each room.
  - **Find the safe places in your home for shelter during different types of disaster.** Certain disasters require specific types of safe places. While basements are appropriate for tornadoes, they could be deadly in a hazardous materials emergency. In this guide, safe places recommended for a particular type of disaster are discussed in the chapter covering that disaster.
  - **Make a complete inventory of your home, garage, and surrounding property.** The inventory can be written or videotaped. Include information such as serial numbers, make and model numbers, physical descriptions, and what you paid (receipts, if possible). This inventory could help you prove the value of what you owned if your possessions are damaged or destroyed and can help you claim deductions on taxes. Do this for all items in your home, on all levels.
  - **Keep the originals of important documents in a safe deposit box,** if possible, and make two copies of each document. Keep one set of copies in a waterproof, fire-resistant, portable container in your home and give the other set of copies to an out-of-town relative or friend. Important documents include:

    -Wills, insurance policies, contracts, deeds, vehicle titles, stocks and bonds
    -Passports, driver's licenses, work identification badges, social security cards, immunization records
    -List of bank account names and numbers and credit card names and numbers
    -Inventory of valuable household goods
    -Important telephone and cell phone numbers
    -Family records (birth, marriage, adoption, and death certificates)
    -For your pets, vaccination and veterinary records, photographs showing your pet clearly (best with you in the photos), and any other special records

- **Practice and maintain your plan.** Practicing your plan will help you respond appropriately and quickly during an actual emergency. **To make sure your household is ready for disaster:**
  - **Review your Family Disaster Plan and your Disaster Supplies Kit at least every six months.** You may need to update them.
  - **Observe the expiration or "use by" date on stored food and water. If you have prepared you own containers of water, replace them every six months** to ensure freshness.
  - **Conduct fire and emergency evacuation drills at least twice a year.**

    -At home, practice escaping from various rooms, particularly bedrooms, and meeting at the place you have selected right outside your home.
    -Have each driver actually drive evacuation routes so each will know the way. Select alternative routes and familiarize drivers with them in case the main evacuation route is blocked during an actual disaster.
    -Mark your evacuation routes on a map and keep the map in your Disaster Supplies Kit. Remember to follow the advice of disaster officials during an evacuation. They will direct you to the safest route, away from roads that may be blocked or put you in further danger.

- I**nclude your pets in your evacuation and sheltering drills.** Practice evacuating your pets so they will get used to entering and traveling calmly in their carriers. If you have horses or other large animals, be sure that they are accustomed to entering a trailer. Practice bringing your pets indoors, into your safe room, so that if you are required to shelter-in-place, they will be comfortable.
- **Use the test button to test your smoke alarms once a month.** The test feature tests all electronic functions and is safer than testing with a controlled fire (match, lighter, or cigarette). If necessary, replace batteries immediately. Vacuum cobwebs and dust from the mechanisms once a month. Make sure your children know what your smoke alarm sounds like.
- **Replace batteries at least once a year in battery-powered smoke alarms.** (Replace the batteries in your CO alarms at the same time you replace your smoke alarm batteries.) Some agencies recommend that you replace batteries when the time changes from standard to daylight savings time each spring and then back again in the fall: "Change your clock, change your batteries." Replacing batteries this often certainly will not hurt; however data show that fresh batteries will last at least a year, so more frequent replacement is not necessary unless the smoke alarm begins to chirp. Also, Arizona, Hawaii, the eastern portion of Indiana, Puerto Rico, American Samoa, and Guam do not use daylight savings time. Pick an easy-to-remember anniversary, such as your birthday or a national holiday, as the day to change the batteries each year.
- **Replace your smoke alarms every 10 years.** That is the recommendation of the National Fire Protection Association and the U. S. Consumer Product Safety Commission. Smoke alarms become less sensitive over time.
- **Look at your fire extinguisher to ensure that it is properly charged.** Fire extinguishers will not work properly if they are not properly charged. Use the gauge or test button to check that there is proper pressure. Follow the manufacturer's instructions for replacing or recharging fire extinguishers. If the unit is low on pressure, damaged, or corroded, replace it or have it professionally serviced.

For People With Disabilities

CORE ACTION MESSAGE

- **If you or anyone in your household has a disability or a mobility problem, make special plans.**

Note: If a member of your household has a disability or a mobility problem, such as some elderly persons do, or if you are planning to assist someone else who does, you should review the following steps.

If you have a disability or a mobility problem, you should consider adding the following steps to the usual preparations:

- **Create a network of relatives, friends, or co-workers to assist in an emergency**. If you think you may need assistance in a disaster, discuss your disability with relatives, friends, or co-workers and ask for their help. For example, if you need help moving or help getting necessary prescriptions, food, or other essentials, or if you require special arrangements to receive emergency messages, make a plan with friends or helpers. Make sure they know where you keep your Disaster Supplies Kit. Give a key to a neighbor or friend who may be able to assist you in a disaster.
- **Maintain a list of important items and store the list with your Disaster Supplies Kit.** Give a copy to another member of your household and a friend or neighbor. Important items might include:
  - -Special equipment and supplies, for example, hearing aid batteries.
  - -Current prescription names, sources, and dosages.
  - -Names, addresses, and telephone numbers of doctors and pharmacists. If you get prescriptions by mail, confirm where you will be able to get them locally in an emergency.
  - -Detailed information about the specifications of your medication or medical regimen, including a list of things incompatible with medication you use, for example, aspirin.
- **Contact your local emergency management office now.** Many local emergency management offices maintain registers of people with disabilities and their needs so they can be located and assisted quickly in a disaster.
- **Wear medical alert tags or bracelets to identify your disability** in case of an emergency. These may save your life if you are in need of medical attention and unable to communicate.
- **Know the location and availability of more than one facility if you are dependent on a dialysis machine or other life-sustaining equipment or treatment.** There may be other people requiring equipment, or facilities may have been affected by the disaster.
- **If you have a severe speech, language, or hearing disability:**
  - -When you dial 9-1-1 (or your local emergency number), tap the space bar to indicate a TDD call.
  - -Store a writing pad and pencils to communicate with others.
  - -Keep a flashlight handy to signal your whereabouts to other people and for illumination to aid in communication.
  - -Remind friends that you cannot completely hear warnings or emergency instructions. Ask them to be your source of emergency information as it comes over the radio. Another option is to use a NOAA Weather Radio with an alert feature connected to a light. If a watch or warning is issued for your area, the light would alert you to potential danger.
  - -If you have a hearing ear dog, be aware that the dog may become confused or disoriented in an emergency. Store extra food, water, and supplies for your dog. Trained hearing ear dogs will be allowed to stay in emergency shelters with their owners. Check with local emergency management or American Red Cross officials for more information.

- **If you have a service animal:**
  -Be aware that the animal may become confused or disoriented in an emergency. Disasters may often mask or confuse scent markers that are part of your service animal's normal means of navigation.
  -If you are blind or visually impaired, keep extra canes placed around your home and office, even if you use a guide dog.
  -If you have a guide dog, train the dog to know one or two alternate routes out of your home or office. A guide dog familiar with the building may help you and others find a way out when no one else can see.
  -Be sure your service animal has identification and your phone numbers attached to its collar, including emergency contact information through a national pet locator service.
  -Have a complete pet disaster kit with food and water, medical records and identification, bowls, extra leash, a favorite toy, and a pet first aid kit. See "Disaster Supplies Kit."
  -Trained service animals will be allowed to stay in emergency shelters with their owners. Check with your local emergency management agency or American Red Cross officials for more information.
- **If you use a wheelchair:**
  -Show friends how to operate your wheelchair or help you transfer out of your chair so they can move you quickly if necessary.
  -If you use a power wheelchair, make sure friends know the size of your wheelchair, in case it has to be transported, and know where to get a battery if needed.
  -Inquire about emergency equipment that would make it easier for others to help you get out if you live or work in a high-rise building and might have to evacuate via a stairwell. Make arrangements with others to be carried out, if necessary, and practice doing that.
- **Listen to the advice of local officials.** People with disabilities have the same choices as other community residents about whether to evacuate their homes and where to go when an emergency threatens. Decide whether it is better to leave the area, stay with a friend, or go to a public shelter. Each of these decisions requires planning and preparation.

Plan for Your Pets

CORE ACTION MESSAGE
- **Know in advance how to care for your pets in a disaster situation.**

If you have pets, you should:
- **Take your pets with you if you evacuate.** If it is not safe for you, it is not safe for them. Leaving them may endanger you, your pets, and emergency responders.
- **Plan in advance where you will go if you evacuate,** as pets (other than service animals) are usually not allowed in public shelters. Some communities have established sheltering options for pets. Contact your local emergency management agency to see if there are any emergency animal shelters in your community or along your evacuation roué.

- **Contact hotels and motels outside your immediate area to check their policies on accepting pets** and restrictions on the number, size, and species. Ask if "no pet" policies could be waived in an emergency.
- **Ask friends, relatives, or others outside your area if they could shelter your animals**. If you have two or more pets, they may be more comfortable if kept together, but be prepared to house them separately.
- **Prepare a list of boarding facilities and veterinarians who could shelter animals in an emergency;** include 24-hour telephone numbers. Ask local animal shelters if they provide emergency shelter or foster care for pets in a disaster situation. Animal shelters may be overburdened, so this should be your last resort unless you make such arrangements well in advance.
- **Keep a list of "pet friendly" places, including their telephone numbers, with other disaster information and supplies.** If you have notice of an impending disaster, call ahead for reservations. Hotels and motels with “no-pet” policies may waive these policies during a disaster, particularly if the pet is housed in a carrier. Contact establishments along your evacuation route to see if they will waive “no-pet” rules, and make sure you have adequate facilities and supplies for your pets.
- **Carry pets in a sturdy carrier.** Animals may feel threatened by some disasters, become frightened, and try to run. Being in its own carrier helps reassure a pet.
- **Have identification, collar, leash, and proof of vaccinations for all pets.** At some locations, you may need to provide veterinary records before boarding your pets. If your pet is lost, identification will help officials return it to you.
- **Assemble a portable pet disaster supplies kit.** Keep food, water, and any special pet needs in an easy-to-carry container.
- **Have a current photo of your pets** in case they get lost.
- **Create a plan in case you are not at home during an emergency** to ensure that someone takes care of your pets, even evacuating them if necessary. The plan should include these elements:
  - Give a trusted neighbor the key to your home and instructions, as well as your daytime (work or school) contact information.
  - Make sure the neighbor is familiar with your pets and knows the location of your pet emergency kit.
  - Make sure the neighbor listens to a local radio or television station for emergency information and puts your shelter-in-place or pet evacuation plan into action.
  - Have a plan to communicate with your neighbor after the event. You will want to arrange a meeting place in a safe area so you can be reunited with your pets.
- Contact your local emergency management agency, humane society, and animal control agency to see if your community has sheltering options for animals and for families with pets. If not, learn more about emergency animal shelters and volunteer to include this option in local disaster preparedness efforts.
- Learn pet first aid and keep your pet first aid kit up to date.

Media and Community Preparedness Ideas

- Work with local print, radio, and television reporters to:
  -Get the word out about how to make a Family Disaster Plan and how important it is for each household to have one and to keep it up to date.
  -Publicize information from local emergency services and American Red Cross officials on how people with mobility impairments or disabilities should plan for a disaster.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office and local American Red Cross chapter.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

- Within neighborhood organizations, such as homeowners associations or crime watch groups, introduce disaster preparedness activities that help people think about how they can prepare for a disaster, stay safe during a disaster, and help each other should a disaster occur. For example:
  -Encourage neighborhood residents to prepare Family Disaster Plans and keep them up to date.
  -Encourage neighborhood residents to create Disaster Supplies Kits and keep them up to date.
  -Encourage neighborhood residents to plan how they could work together after a disaster until help arrives. Have them also consider ways they can cooperate with each other during recovery. Working with neighbors can save lives and property.
  -Check with your local fire department or emergency management training is offered for interested residents.
  -Create a neighborhood map with names and home and cell phone numbers next to each address so neighbors can contact each other in an emergency.
  -Encourage people to find out their neighbors' special skills (for example, medical, technical) and consider how they could help in a disaster situation.
  -Identify elderly and disabled people in the neighborhood, single parents with young children, or others who might need help. Determine how neighbors can help them if a disaster threatens (transportation, securing the home, getting medications, etc.).
  -Encourage parents to make plans with neighbors for child care in case parents cannot get home in an emergency situation.

Fires, Residential

AWARENESS MESSAGES

Why talk about residential fires?

Fire was the sixth leading cause of unintentional death due to injury in the United States in 2002. Fires and burns also rank as the third leading cause of unintentional home injury for children under the age of 15.

About 79 percent of all fire deaths in 2002 resulted from home fires. A disproportionate share of fatal fires occurs at night when people are likely to be less alert. Nearly one-half of home fire deaths result from fires reported between 10:00 p.m. and 6:00 a.m.

Most structure fires are preventable, including arson fires. Half (49.5 percent) of the people arrested in 2001 for arson were under 18 years of age. With education and counseling, fire-setting behavior can be prevented or deterred.

According to the National Fire Protection Association (NFPA), in the year 2002, home fires killed 2,670 people in reported home fires in the United States—roughly seven people per day. In addition, thousands of people were injured, many of them hospitalized for severe burns, and some disfigured for life. Victims are disproportionately young children or older adults. One-third of the fire-related deaths of children under age six result from children playing with fire.

Asphyxiation kills two to three times as many people as burns. Fire consumes the oxygen in the air, while increasing the concentration of deadly carbon monoxide and other toxic gases in the atmosphere. Inhaling carbon monoxide can cause loss of consciousness or death within minutes.

The heat from a major fire exceeds anything to which a person is normally exposed. A fully developed room fire has temperatures over 1,100° F (593° C).

How can I protect myself from residential fire?

The most effective way to protect yourself and your home from fire is to prevent a fire from starting. Identifying and eliminating fire hazards in and around your home are your first line of defense.

If a fire should start in your home, smoke alarms can be the difference between safety and catastrophe. For new homes, interconnected smoke alarms are required on every level of the home, outside each sleeping area, and inside each bedroom. Although this approach is ideal for all homes, as a minimum, existing homes should have smoke alarms on every level and outside each sleeping area. The risk of dying from fires in homes without smoke alarms is twice as high as in homes that have working smoke alarms. Most fire victims die from inhalation of smoke and toxic gases, not as a result of burns. Most deaths and injuries caused by fire occur in fires that happen at night while the victims are asleep. A fire sprinkler system can also help protect you and your property.

It is imperative that all members of a household be thoroughly familiar with what to do in case of fire. Fires produce thick, dark smoke that irritates the eyes and breathing passages and can cause confusion. People who have become disoriented in fires have been found in closets, stairwells, and laundry rooms, thinking they were exits. It is impossible to navigate through such smoke, so fire escape routes should include at least two exits from every room—a primary route and a secondary route to use in case the primary route is blocked. Planning escape routes and physically practicing before a fire can save your life.

What to Tell Children

Parents and caregivers should:

- Teach children how to prevent and survive a fire. In a calm, positive manner, adults should explain why fire safety is important and demonstrate safe behaviors when using fire, fire tools, and other heat sources.
- Include children, beginning when they are very young, in planning and practicing home fire drills. Very young children will need assistance in escaping a fire, but, as children mature, they can learn what to do to be safe even if an adult is not immediately on hand to help. The key is to conduct regular fire drills, at least twice a year, to allow children to practice using their primary and secondary escape routes. Allow children to master fire escape planning and practice before holding a fire drill at night when they are sleeping. The objective is to practice, not to frighten, so a drill that you have told the children about before they went to bed can be as effective as a surprise drill.
- If secondary escape routes involve going out of a second- or third-floor window, consider purchasing a window ladder. Young children are not strong enough to handle these ladders by themselves and will need adult assistance. Since exiting from a window poses the threat of a fall, you might wisely choose not to physically practice this. Explain to children which window is planned as a secondary escape route and tell them to meet there if smoke, heat, or flames prevent them from using the primary escape route.
- Some studies have shown that some children may not awaken to the sound of the smoke alarm. Know what your child will do before a fire.
- Be aware that children have a tendency to confuse “stop, drop, and roll” with messages about what to do during an earthquake, so be sure they understand that "stop, drop, and roll" is to be used only when clothing catches on fire.
- Tell children that firefighters are our friends and that they will help in case of a fire. Take children to visit a fire station to help ease their fears. If possible, introduce children to a firefighter who is dressed in a fire suit and mask, because a person wearing this gear can look frightening and children unfamiliar with it may try to hide from a firefighter in an emergency situation.
- Emphasize that matches and lighters are tools for "grown-ups." These tools help adults use fire for appropriate purposes. Instruct children to tell an adult right away if they find matches or lighters or see someone playing with fire, matches, or lighters. National Fire Protection Association research has shown that children associate tools with grown-ups, and "grown-up" is a term children use for someone in authority. Matches and lighters should be stored up high out of the reach of children, preferably in a locked cabinet.

ACTION MESSAGES
Be Prepared for a Residential Fire
Protect Yourself

CORE ACTION MESSAGES

- **Identify two escape routes from every room and practice using them.**
- **In case of fire, get out first; then call for help.**
- **Install smoke alarms on every level of your home, outside sleeping areas, and inside bedrooms.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, since all homes are at risk for fire, every household should take fire-specific precautions and plan and practice what to do in the event of a fire. You can learn more about fire safety by contacting your local fire department, emergency management office, or American Red Cross chapter, or by contacting national organizations such as the National Fire Protection Association and the U.S. Fire Administration.

You should **install and maintain smoke alarms on every level of your home, outside sleeping areas, and inside bedrooms,** according to the manufacturer's instructions**.** Also consider keeping at least one working **fire extinguisher** and installing **arc-fault circuit interrupters (AFCIs)** and a **fire sprinkler system** in your home. (See Appendix: Smoke Alarms, Fire Extinguishers, Arc-Fault Circuit Interrupters, and Home Fire Sprinkler Systems.)

To make your household fire escape plan, you should:

- **Draw a floor plan of your home; mark two fire escape routes from each room**—the primary route and the secondary route. In thick, heavy, dark smoke it is easy to become disoriented. Physically walking through your plan and identifying two escape routes greatly helps everyone understand the best ways to get out safely during a frightening emergency. Be sure the window exits you plan to use can be opened.

- **Consider getting escape ladders for sleeping areas on the second or third floor**. Learn how to use them, and store them near the windows. If the primary escape routes via stairs are blocked by smoke or fire, the windows may be your only alternative. Escape ladders permit quick exits, reducing time spent in smoke-filled, toxic environments while waiting for firefighters.
- **Use quick-release devices on barred window and doors.** Security bars without release devices can trap you in a deadly fire. If you have security bars on your windows, be sure one window in each sleeping room has a release device. If smoke or fire is blocking the primary exit, you must be able to use your secondary routes quickly. Fire deaths have occurred when people were trapped by security bars and were unable to get out and firefighters were unable to get in.
- **Select a safe outside meeting place** for everyone to meet after escaping from a fire. Make sure it will be a safe distance from heat, smoke, and flames. Family members may use different escape routes, exiting on different sides of the home. Gathering in a specific meeting place in front of the home will quickly let you know who is out, and allow you to advise firefighters of who may need help and their probable location inside. (See "Family Disaster Plan.")
- **Learn the emergency number for reporting a fire.** After leaving your home, you will need to call this number from an outside phone or from a neighbor's home.
- **Make sure your house number is easily readable from the street, even at night.**
- **Make sure that street signs in your neighborhood are clear and easy to find.**

Practice escaping. With each member of your household in his or her bedroom, yell, "Fire," several times to alert everyone that they must get out. **Each person should:**

- **Crawl low under smoke to your exit.** "Crawling low" means crawling with your head one to two feet above the ground. You should crawl low when you practice because in a real fire there may be deadly smoke along your escape route. If you are escaping in a real fire and there is no smoke, you should get out of the building as quickly as possible.
- **Practice feeling the doorknob and the space around the door with the back of your hand.**
- **Close doors after crawling through.**
- **Go to the specified meeting place.**

Practice getting out of your home during the day and night. Fire can happen at any time. Practicing your routes at night will help you move more quickly should a fire strike in the dark.

Practice the escape plan at least twice a year, making sure that everyone is involved—from kids to grandparents. If children or others do not readily waken to the sound of the smoke alarm, or if there are infants or family members with mobility limitations, make sure that someone is assigned to assist them when you practice and in the event of an emergency.

When you practice your escape plan, also practice taking your pets with you. Train them to come to you when you call. However, once you are out of a burning building, stay out and do not return for any pets you may have left behind.

Be sure that everyone in your household knows:

- **To get out first, and then call for help** from outside the burning building, away from toxic smoke and gases. If a portable phone is handy during your escape, you may take it with you, but do not waste precious time looking for one. Use your neighbor's phone, a cell phone, or nearby pay phone to call for help.

- **The two escape routes from each room.**
- **The location of the outside meeting place.**
- **If you cannot get out, stay in a room with the door closed and open the window for ventilation and to signal to firefighters.**

Discussing disaster ahead of time helps reduce fear and lets everyone know how to respond during a fire.

Be sure to emphasize "once out, stay out." Only professional firefighters should enter a building that is on fire—even if the residents' pets or prized possessions are inside.

Get first aid training from your local American Red Cross chapter.

Protect Your Property

CORE ACTION MESSAGES

- Take steps to keep fires from starting.
- Make sure firefighters can find your home.

(See Appendix: Smoke Alarms, Fire Extinguishers, Arc-Fault Circuit Interrupters, and Home Fire Sprinkler Systems.)

To help prevent fires in your home, you should:

- **Conduct a fire-hazard hunt in and around your home.** Many things around the home can be fire hazards. Taking time to look for and eliminate hazards greatly reduces your risk. In your hazard hunt, include your barns, outbuildings, or any other structures that house animals. Invite your local fire department to examine your barns and outbuildings and give you suggestions.
- **Avoid smoking in bed, or when drowsy or medicated.** Bed linens are highly combustible. It is easier to be burned, and highly likely individuals will suffer severe burns, when fires start in beds. Drowsy or medicated people may forget lit materials, resulting in fire.
- **Provide smokers with deep, sturdy ashtrays.** Douse cigarette and cigar butts with water before disposal. Smoking materials are the leading cause of residential fire deaths in the United States.
- **Keep matches and lighters up high,** away from children, preferably in a locked cabinet. Children are fascinated by fire and may play with matches and lighters if they are not kept out of reach.
- **Make sure your home heating sources are clean and in working order.** Many home fires are started by poorly maintained furnaces or stoves, cracked or rusted furnace parts, or chimneys with creosote buildup.
- **Be sure all portable and fixed space heaters have been certified by an independent testing laboratory.** Keep blankets, clothing, curtains, furniture, and anything that could get hot and catch fire at least three feet away from all heat sources. Plug heaters directly into the wall socket rather than using an extension cord and unplug them when they are not in use.
- **Use kerosene heaters only if permitted by law in your area.** Refuel kerosene heaters only outdoors and after they have cooled. Kerosene has a low flash point. If mistakenly dripped on hot surfaces, it can cause fires. Do not substitute gasoline for kerosene in the heater.

- **Have chimneys and wood stoves inspected annually and cleaned if necessary.** Chimneys and wood stoves build up creosote, which is the residue left behind by burning wood. Creosote is flammable and needs to be professionally removed periodically. Store ashes in a metal container with a tight-fitting lid.
- **Keep the stove area clean and clear of combustibles,** such as towels, clothing, curtains, bags, boxes, and other appliances. Combustible materials near stoves may catch fire quickly when your attention is elsewhere.
- **Cook with short or restrained sleeves.** Loose sleeves can catch fire quickly if dragged across a hot burner.
- **If you are cooking and a fire starts in a pan, slide a lid over the burning pan and turn off the burner.** Leave the lid in place until the pan is completely cool. Using a lid to contain and smother the fire is your safest action. Getting the fire extinguisher or baking soda to extinguish the fire delays action. Flour and other cooking products can react explosively to flame and should never be sprinkled over fire. Moving the pan can cause serious injury or spread the fire. Never pour water on grease fires.
- **If you try to use a fire extinguisher on a fire and the fire does not immediately die down, drop the extinguisher and get out.** Most portable extinguishers empty in 8 to 10 seconds. After some residential fires, people have been found dead with fire extinguishers near them or in their arms.
- **Use only flashlights when the power is out, not candles.**
- **Never leave a burning candle unattended, even for a minute.**
- **Check electrical wiring in your home.** Fix or replace frayed extension cords, exposed wires, or loose plugs.
- **Make sure wiring is not under rugs, attached by nails, or in high traffic areas.**
- **Make sure electrical outlets have cover plates and no exposed wiring.**
- **Avoid overloading outlets or extension cords.**
- **Purchase only appliances and electrical devices that bear the label of an independent testing laboratory.**
- **Buy only heaters certified for safety by an independent testing laboratory** and follow the manufacturer's directions. Heaters that have gone through rigorous testing and are approved for use in the home are less likely to cause fire.
- **Store combustible materials in open areas away from heat sources.**
- **Place rags used to apply flammable household chemicals in metal containers with tight-fitting lids.**

What to Do if a Fire Starts

CORE ACTION MESSAGES

- **In case of fire, alert others and get out.**
- **Once out, call the fire department and stay out.**
- **If you cannot get out, stay in a closed room, ventilate the room, and signal to firefighters.**

If a fire starts in your home or you hear the smoke alarm, remain calm, and carry out your escape plan, as you have practiced. **You should:**

- **Yell "Fire!" several times and go outside right away.** Smoke alarms go off because there is enough smoke and toxic gas to cause harm. Yell to let people know the emergency is real, and they should get out. If you live in a building with elevators, use the stairs. Never try to hide from fire. Leave all your things where they are and save yourself.
- **If your escape route is filled with smoke, use your second way out.** It is very hard to find your way through thick, heavy smoke. Using your second way out will provide a safer alternative.
- **If you must escape through smoke, crawl low under the smoke to your exit.** Fires produce many poisonous gases. Some are heavy and will sink low to the floor; others will rise, carrying soot toward the ceiling. Crawling with your head at a level of one to two feet above the ground will temporarily provide the best air. Close doors behind you.
- **If you are escaping through a closed door, feel the doorknob and the space around the door with the back of your hand before opening the door.** If it is cool and there is no smoke at the bottom or top, open the door slowly. If you see smoke or fire in your exit path, close the door and use your second way out. If the doorknob or the space around the door is warm, use your second way out. It is a natural tendency to automatically use the door, but fire may be right outside. Feeling the doorknob and the space around the door will warn you of possible danger. The back of your hand is more sensitive to heat than the palm or fingers. Never use your palm or fingers to test for heat because burning those areas could make escaping more difficult by impairing, for example, your ability to crawl or use a ladder.
- **If smoke, heat, or flames block your exit routes and you cannot get outside safely, stay in the room with the door closed.** Open the window a few inches at the top and bottom for ventilation, turn on a light, and hang a light-colored object outside the window to alert firefighters to your presence. Hang anything white or light-colored you can find—the bigger the better—for example, a sheet, shirt, jacket, window shade or blind, or poster with the white back facing out. If there is a phone in the room, call the fire department and tell where you are. Seal around doors and vents with duct tape, towels, or sheets to help slow the entry of deadly smoke into the room. Wait by the window for help. The first thing firefighters will do when they arrive at a fire is check for trapped persons. Hanging a sheet out lets them know where to find you.
- **Get out as safely and quickly as you can.** The less time you are exposed to poisonous gases, heat, or flames, the safer you will be.
- **Once you are outside, go to your meeting place and then send one person to call the fire department.** Everyone in the household should know where the outside meeting place is and should go directly to this meeting place in case of a fire and stay there. Gathering in a specific outside location in front of the home will quickly let you know who is outside, and allow you to advise firefighters of who may need help and their probable location inside.
- **Once you are out, stay out.** Children as well as adults are often concerned about the safety of their pets, so discuss and plan for this before a fire starts. The safest option is for pets to sleep in the room of a family member. If escape is needed, grab your pet on the way out, but only if you can do this without delaying and endangering yourself or family members. Many people are overcome by smoke and poisonous gases while trying to rescue others, pets, or possessions. No one should go into a burning or smoking building except a trained firefighter who has the proper breathing apparatus and protective clothing.

What to Do If Your Clothes Catch on Fire

CORE ACTION MESSAGES

- **If your clothes are on fire, stop, drop, and roll.**
- **Do not run.**

If your clothes catch on fire, you should:

- **Stop** what you are doing.
- **Drop** to the ground and cover your face if you can.
- **Roll** over and over or back and forth until the flames go out. Running will only make the fire burn faster. Practicing can help you respond properly and more quickly in an actual emergency situation.

THEN

- Once the flames are out, **cool** the burned skin with water for three to five minutes**. Call** for medical attention.

What to Do After a Fire

CORE ACTION MESSAGES

- **Protect yourself.**
- **Protect your property.**

●**Give first aid where needed.** After calling 9-1-1 or your local emergency number, cool and cover burns to reduce the chance of further injury or infection. People and animals that are seriously injured or burned should be transported to professional medical or veterinary help immediately.

●**Stay out of fire-damaged homes until local fire authorities say it is safe to re-enter.** Fire may have caused damage that could injure you or your family. There may be residual smoke or gases that are unsafe to breathe.

●**Look for structural damage.** Fire authorities may allow you to re-enter, but they may not have completed a thorough inspection. Look for damage that will need repair.

●**Check that all wiring and utilities are safe.** Fire may cause damage to inside walls and utility lines not normally visible.

●**Discard food that has been exposed to heat, smoke, or soot.** The high temperatures of fire and its by-products can make food unsafe.

●**Contact your insurance agent.** Do not discard damaged goods until an inventory has been taken. Save receipts for money spent relating to fire loss. Your insurance agent may provide immediate help with living expenses until you are able to return home and may offer assistance for repairs.

Media and Community Education Ideas

Have your local newspaper or radio or television station:

- Do a series on how to recognize potential fire hazards in the home and workplace.
- Do a story featuring interviews with local fire officials about how to make homes fire-safe.
- Provide tips on conducting fire drills in the home, mentioning the need for multiple escape routes and a meeting place outside the home.

- Highlight the importance of home smoke alarms by running monthly "test your smoke alarm" reminders.
- Run public service ads about fire safety.

Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide business telephone numbers for the local emergency management office and American Red Cross chapter.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

Facts and Fiction About Residential Fires

Fiction: Water can be used to put out any fire.
Facts: Some fires, like those caused by grease, can be spread by throwing water on the fire. If a fire starts in a pot on the stove, you should slide a lid on the pot and turn off the burner.

Fiction: If a fire starts in my home, I can put it out with my fire extinguisher and not trouble the fire department.
Facts: While home fire extinguishers can put out some small fires, many fires start out small and grow quickly. Each year, hundreds of people die trying to put out fires. Much more damage to homes is caused by delaying a call to the fire department while trying to put out a fire. If you use a fire extinguisher on a small fire and the fire does not die down immediately, get out and call the fire department from outside.

Fiction: It's easy—anyone can use a fire extinguisher.
Facts: Only people who have been properly trained should attempt to put out a fire with a fire extinguisher.

Fiction: I'm a light sleeper and would smell a fire, even if I were asleep.
Facts: Smoke contains toxic substances/poisons that can put you into a deeper sleep. That's why for new homes, interconnected smoke alarms are required on every level of the home, outside each sleeping area, and inside each bedroom. Although this approach
is ideal for all homes, as a minimum, existing homes should have smoke alarms on every level and outside each sleeping area.

The best advice is: In case of fire, get out and, once outside, call the fire department right away from a neighbor's home, cell phone, or public pay phone.

Fiction: If one fire sprinkler goes off, they all will go off.
Facts: Fire sprinkler heads operate independently and are triggered individually by the heat of a fire.

Page FR-10 blank

Fires, Wildland

AWARENESS MESSAGES

Why talk about wildland fire?

More and more people are making their homes in woodland settings in or near forests, rural areas, or remote mountain sites. There, residents enjoy the beauty of the environment but face the very real danger of wildland fire. Wildland fires often begin unnoticed. They spread quickly, igniting brush, trees, and homes.

What are wildland fires?

There are three different classes of wildland fires. **Surface fires** are the most common type. They burn along the forest floor, killing or damaging young trees. **Ground fires** are usually started by lightning. They burn on or below the forest floor in the humus layer down to the mineral soil. **Crown fires** jump along the tops of trees and are spread rapidly by wind.

More than four out of every five wildland fires are started by people. Negligent human behavior, such as smoking in forested areas or improperly extinguishing campfires, is the cause of many wildland fires. Lightning is another cause.

How can I protect myself from wildland fire?

All people who live, work, or play in areas prone to wildland fire should carefully consider how to get out of the area quickly and safely in case of fire. In addition, residents in areas at risk for wildland fire should do everything possible to minimize their vulnerability. One of the most important ways to protect yourself and your property is to use fire-resistant materials outside and inside your home. You should also maintain a buffer zone around your home to reduce the odds that a wildland fire could reach your home.

What is the best source of information in the event of a wildland fire?

Local radio and television stations are the best sources of information about wildland fire in your area.

Prevent Wildland Fires

Small fires can quickly spread out of control**. Always:**

- **Build fires for debris burning, campfires, etc. away from nearby trees or bushes**. Embers and firebrands can float in the air and can start wildland fires where they fall.
- **Have handy a way to extinguish the fire quickly and completely** (water, sand, fire extinguisher).
- **Stay with a fire.** Never leave a fire—even a cigarette—burning unattended.

ACTION MESSAGES
Be Prepared for Wildland Fire
Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Make your home easy to find and easy to access.**
- **Identify and maintain outside water sources.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, households at risk for wildland fire should take fire-specific precautions and plan and practice what to do in the event of a fire.

Learn about your area's wildland fire risk. Contact your local fire department, state foresters office, or other emergency response agencies for information on fire laws and wildland fire risk.

If you are at risk for wildland fire, you should:

- **Talk with members of your household about wildland fires—how to help prevent them and what to do if one occurs.**
- **Make sure that fire vehicles can get to your home by clearly marking all driveway entrances and displaying your name and address.** Make sure the driveway is wide enough to allow fire emergency vehicles easy access to the home with ample turnaround space. Keep the driveway in good condition.
- **Post fire emergency telephone numbers by every phone in your home.** In a wildland fire, every second counts.
- **Plan and practice two ways out of your neighborhood.** Your primary route may be blocked; know another way out just in case. (See “Evacuation and Sheltering, and Post-disaster Safety.”)
- **Identify and maintain an adequate water source outside your home,** such as a small pond, cistern, well, swimming pool, or hydrant. Keep a garden hose that is long enough to reach any area of the home and other structures on the property. Install freeze-proof exterior water outlets on at least two sides of the home and near other structures on the property. Install additional outlets at least 50 feet (15 meters) from the home. Firefighters may be able to use them.
- **Keep handy household items that can be used as fire tools:** a rake, ax, hand saw or chain saw, bucket, and shovel. You may need to fight small fires before emergency responders arrive. Having this equipment will make your efforts more effective.
- **Develop a wildland fire-specific evacuation plan** and coordinate it with your Family Disaster Plan.

Protect Your Property

CORE ACTION MESSAGES

- **Design or modify your structures and landscaping to make them as wildland fire resistant as possible.**
- **Maintain your structures and outside areas to decrease the risk of wildland fire.**

If you live in an area at risk for wildland fire, you should:

- **Design and landscape your home and outbuildings with wildland fire safety in mind.** Obtain local building codes and weed-abatement ordinances for structures built near wooded areas. There may be restrictions on the types of materials or plants allowed in residential areas. Following local codes or recommendations will help reduce the risk of injury to you and damage to your property.
- **Select building materials and plants that can help resist fire** rather than fuel it. Use fire-resistant or noncombustible materials (tile, stucco, metal siding, brick, concrete block, or rock) on the roof and exterior structure of the dwelling. Treat wood or combustible materials used in roofs, siding, decking, or trim with fire-retardant chemicals that have been listed by the Underwriter's Laboratory (UL) or other certification laboratories. Avoid using wooden shakes and shingles for a roof. Use only thick, tempered safety glass in large windows. Sliding glass doors are already required to be made of tempered safety glass.
- **Have electrical lines installed underground** if you live in an area where this is an option. There is a greater chance of fire from overhead lines that fall or are damaged, such as in an earthquake or storm.
- **Create safety zones** to separate your home and outbuildings, such as barns, from plants and vegetation. (Consult your local fire department for recommendations about the safety zones for your property.) Maintain the greatest distance possible between your home and materials that may burn in a wildland fire. Within this area, you can take steps to reduce potential exposure to flames and radiant heat. Stone walls can act as heat shields and deflect flames. Swimming pools and patios can help define safety zones.
- **If your home sits on a steep slope,** standard protective measures may not suffice. Fire moves quickly up steep slopes. A larger safety zone may be necessary. Contact your local fire department or state foresters office for additional information.
- **Regularly clean roofs and gutters.** Remove all dead limbs, needles, and debris that spread fire.
- **Equip chimneys and stovepipes with a spark arrester** that meets the requirements of National Fire Protection Association Standard 211. (Contact your local fire department for exact specifications.) This will reduce the chance of burning cinders escaping through the chimney, starting outdoor fires.
- **Have a fire extinguisher ("A-B-C" rated) and get training from the fire department in how to use it.** Different extinguishers operate in different ways. Unless you know how to use your extinguisher, you may not be able to use it effectively. There is no time to read directions during an emergency. (See Appendix: Fire Extinguishers.)

- **Consider installing protective shutters or heavy fire-resistant drapes**. The extreme heat created by the fire causes windows to break, permitting burning cinders and superheated air to enter and ignite the interior of the building. The right shutters or drapes can reduce the potential for these cinders to cause your home to burn.
- **Keep a ladder handy that will reach the roof**. You may need to get on the roof to remove combustible debris.
- **Plant fire-resistant shrubs and trees in your safety zone** and on the remainder of your property. Fire-resistant plants are less likely to ignite and spread fire closer to your home. For example, hardwood trees are more fire-resistant than pine, evergreen, eucalyptus, or fir trees.
- **Clear all combustible vegetation and remove wooden lawn furniture** to reduce the fuel load. Rake away leaves. Remove leaves, rubbish, dead limbs, and twigs from under structures and dispose of them properly. Have a professional tree service create a 15-foot (5-meter) space between tree crowns, and remove limbs within 6 to 10 feet (2 to 3 meters) of the ground. This will help reduce the chance of fire spreading from tree to tree or from ground to tree.
- **Remove dead branches from all trees**. Dead branches are very combustible.
- **Keep trees adjacent to buildings free of dead or dying wood and moss.**
- **Remove tree branches and shrubs within 15 feet (5 meters) of a stovepipe or chimney outlet.**
- **If you have horses or livestock,** be sure to store hay and other burnable feed away from the building that houses the animals.
- **Keep all tree and shrub limbs trimmed so they do not come in contact with electrical wires**. Electrical wires can be easily damaged or knocked loose by swaying branches.
- **Ask the power company to clear branches from power lines.** High-voltage power lines can be very dangerous. If a line falls, it can cause injury or start a fire. Only authorized and trained professionals should work around power lines.
- **Remove vines from the walls of your home.** Even live vines can spread fire quickly.
- **Mow and water grass regularly**. This will help reduce the fuel available for fire.
- **Place propane tanks at least 30 feet (9 meters) from the home or other structures.** Propane tanks can explode under certain conditions.
- **Clear a 10-foot (3-meter) area around propane tanks and the barbecue**. Place a metal screen over the grill. Use noncombustible screen material with mesh no coarser than one-quarter inch.
- **Regularly dispose of newspapers and rubbish at an approved site.** Follow local burning regulations. Regular disposal of combustible/flammable items will reduce the fuel available for fire.
- **Place stove, fireplace, and grill ashes in a metal bucket,** soak in water for two days, then bury the cold ashes in mineral soil. Fires can start quickly from hidden cinders or burnt materials that are still hot. Once they are burned, chunks of flammable items can ignite at lower temperatures. Bury ashes to avoid potential fires.
- **Stack firewood at least 30 feet (9 meters) away and uphill from your home.** Clear combustible material within 20 feet (6 meters) of the stack. Fire tends to travel uphill, so keep highly combustible firewood and other materials above your home.

- **Use only wood-burning devices that are listed by UL** or other certification laboratories.
- **Box eaves to prevent sparks from entering the structure under the roof line.**
- **Place metal screens over openings to prevent collection of litter**. Cover openings to windows, floors, roof, and attic with screen (not vinyl screen). Use at least quarter-inch screen beneath porches, decks, floors, and the home itself. Eighth- or sixteenth-inch mesh screen is better. Litter, such as leaves, branches, twigs, and loose papers, quickly increases the fuel available for a fire.
- **Avoid open burning completely,** especially during the fire season. Ash and cinders can float in the air, and they may be blown into areas with heavy fuel load and start wildland fires.
- **Report hazardous conditions** that could cause a wildland fire. Community responders may be able to eliminate or reduce conditions that could cause fire.

What to Do When Wildland Fire Threatens

CORE ACTION MESSAGES

- **Keep informed.**
- **Get ready to leave at a moment's notice.**
- **If you have time, take steps to protect your home.**

If there are reports of wildland fires, you should:

- **Listen regularly to local radio or television stations for updated emergency information.** Follow the instructions of local officials. Local officials will be able to advise you of the safest escape route, which may be different than you expect. Wildland fires can change direction and speed suddenly. In addition to listening to radio and television reports, go outside to look at the fire from time to time. If you believe the fire is too close to your location, evacuate immediately. The fire may move too fast for officials to issue evacuation notifications.
- **Back your car into the garage or park it in an open space facing the direction of escape.** Shut the car doors and roll up the windows. Leave the key in the ignition. Close garage windows and doors. Remove all obstacles to a quick escape.
- **Confine pets to one room.** Make plans to care for your pets in case you must evacuate. Pets may try to run if they feel threatened by fire. Keeping them inside and in one room will allow you to find them quickly if you need to leave. If you think an evacuation may be advised, and if you have large, unusual, or numerous animals, start evacuating them out of harm's way as soon as you are aware of impending danger. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic and thick smoke.
- **Arrange temporary housing at a friend's or relative's home outside the threatened area.** You will be more comfortable in someone's home than in a public shelter. Plus, many shelters do not allow pets.
- **If you are sure you have time, take steps to reduce the chance of your home catching fire** or lessen the amount of damage from a nearby fire:
  - **Shut off gas at the meter only if advised to do so by local officials** on the radio or television.

-If you have a propane tank system, turn off the valves on the system, and leave the valves closed until the propane supplier inspects your system.
-**Open fireplace dampers. Close fireplace screens.** Burning embers will not be "sucked down" into a home from the outside. Moreover, if a spark arrestor is used on the chimney to prevent embers from getting out, it will also prevent embers from getting in.
-Close windows, vents, doors, blinds, or noncombustible window coverings, and heavy drapes. Remove lightweight drapes and curtains.
-Move combustible furniture into the center of the home away from windows and sliding-glass doors.
-Close all doors and windows inside your home to prevent draft.
-Place valuables that will not be damaged by water in a pool or pond.
-Place sprinklers up to 50 feet (15 meters) away from the structures to raise the moisture level of nearby vegetation.
-Seal attic and ground vents with precut plywood or commercial seals.
-Remove combustible items from around the home, lawn, and poolside-furniture, umbrellas, tarp coverings, firewood.
-Connect the garden hose to outside taps.
-Gather fire tools (shovels, hoes, hoses). **Note:** In the unlikely event that you choose not to evacuate, make sure all fire tools are outside and easy to access, including hoses in the front and back yards. Be aware that water pressure will probably decrease because of the heavy demand for firefighting, or water may not be available at all because electric pumps have failed or water reservoirs are drained.

What to Do if You Must Evacuate

CORE ACTION MESSAGES

- **Leave as early as possible.**
- **Prepare your home if you have time.**
- **If you think you should or if authorities tell you to evacuate immediately, go right away; delay could be deadly.**

If advised to evacuate immediately, do so immediately. You may have only minutes to act. Save yourself and those with you.

If advised to evacuate as soon as possible, you should:

- **Wear protective clothing**—sturdy shoes, cotton or wool long pants and long-sleeved shirt, and gloves. Bring a handkerchief to protect your face. Hot embers or cinders can burn your skin if you come in contact with them. Smoke can make it difficult to breathe and damage breathing passages.
- **Prepare your home and leave early.** If you wait until the last minute, you place yourself at risk and also interfere with fire department response.
- **Take your Disaster Supplies Kit** in which you have placed prescription medications for household members, as well as copies of essential papers and identification items. Also, if time permits, load your vehicle with other essential items that could not be replaced if they were destroyed by fire.

- **Take your pets and your pet disaster supplies with you.**
- **Lock your home.** There may be others who evacuate after you or return before you. Secure your home as you normally would.
- **Call the out-of-town contact** you chose when creating your Family Disaster Plan and tell him or her what has happened and where you are going.
- **Choose a route away from the fire.** Watch for changes in the speed and direction of fire and smoke. Staying as far away as possible will provide you with the greatest safety. Continue to listen to a local radio or television station for evacuation information.
- **If you are trapped, crouch in a pond, river, or pool.** Do not put wet clothing or bandanas over your nose or mouth because moist air causes more damage to airways than dry air at the same temperature. If there is no body of water, look for shelter in a cleared area or among a bed of rocks. Lie flat and cover your body with soil. Breathe the air close to the ground to avoid scorching your lungs or inhaling smoke. You cannot outrun a fire. Wildland fires move very fast and create their own wind, helping them to move even faster and burn even hotter.

What to Do When You Are Allowed to Return After a Wildland Fire

CORE ACTION MESSAGES

- **Get permission from fire officials before entering a burned wildland area.**
- **Look out for hazards, such as fallen wires and poles and ash pits.**
- **Be alert to the possibility of re-ignition.**
- **Take precautions while cleaning up.**
- **Make sure the water is safe to drink.**

When you return to your home after a wildland fire, you should:

- **Obtain permission from officials before entering a burned wildland area.**
- **Use caution** and exercise good judgment when re-entering a burned wildland area. Hazards may still exist, including hot spots, which can flare up without warning.
- **Avoid damaged or fallen power poles or lines, and downed wires.** Immediately report electrical damage to authorities. Electric wires may shock people or cause further fires. If you come across dangerous wires, if possible, remain on the scene to warn others of the hazard until a repair crew arrives.
- **Be careful around burned trees and power poles.** They may have lost stability because of fire damage.
- **Watch for ash pits and mark them for safety.** Ash pits are holes full of hot ashes created by burned trees and stumps. You can be seriously burned by falling into an ash pit or landing on one with your hands or feet. Warn your family and neighbors to keep clear of the pits.
- **Watch animals closely.**

  -Keep all your animals under your direct control. Hidden embers and hot spots could burn your pets' paws or hooves.

  -Pets may become disoriented, particularly because fire often affects scent markers that normally allow them to find their homes.

-Your pets may be able to escape from your home or through a broken fence.
-In addition, the behavior of pets may change dramatically after a fire, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

- **If there is no power, check to make sure the main breaker is on.** Fires may cause breakers to trip. If the breakers are on and power is still not present, contact the utility company.
- **Take precautions while cleaning your property.** You may be exposed to potential health risks from hazardous materials.
  -Keep children away from these hazardous sites.
  -Debris should be wetted down to minimize health impacts from breathing dust particles.
  -Use a two-strap dust particulate mask with nose clip and coveralls for protection.
  -Wear leather gloves and heavy-soled shoes to protect hands and feet from sharp objects while removing debris.
  -Wear rubber gloves when working with outhouse remnants, plumbing fixtures, and sewer piping. They can contain high levels of bacteria.
  -Hazardous materials such as kitchen and bathroom cleaning products, paint, batteries, contaminated fuel, and damaged fuel containers need to be properly handled to avoid risk. Check with local authorities for hazardous disposal assistance.
- **If you turned off the valves on a propane tank system,** contact the propane supplier, and leave the valves closed until the supplier inspects your system. Tanks, brass and copper fittings, and lines may have been damaged by the heat and be unsafe. If fire burned the tank, the pressure relief valve probably opened and released the contents.
- **If you have a heating oil tank system,** contact a heating oil supplier for an inspection of your system before using it. The tank may have shifted or fallen from the stand and fuel lines may have kinked or weakened. Heat from the fire may have caused the tank to warp or bulge. Nonvented tanks are more likely to bulge or show signs of stress. The fire may have loosened or damaged fittings and filters.
- **Visually check the stability of trees.** Any tree that has been weakened by fire may be a hazard. Winds are normally responsible for toppling weakened trees. The wind patterns in your area may have changed as a result of the loss of adjacent tree cover.
  -Look for burns on the tree trunk. If the bark on the trunk has been burned off or scorched by very high temperatures completely around the circumference, the tree will not survive. If fire has burned deep into the trunk, the tree should be considered unstable.
  -Look for burned roots by probing the ground with a rod around the base of the tree and several feet away from the base. Roots are generally six to eight inches (15 to 20 centimeters) below the surface. If the roots have been burned, the tree could be toppled by wind.
  -A scorched tree is one that has lost part or all of its leaves or needles. Healthy deciduous trees are resilient and may produce new branches and leaves as well as sprouts at the base of the tree. Evergreen trees may survive when partially scorched. An evergreen tree that has been damaged by fire is subject to bark beetle attack. Seek professional assistance from the state foresters office concerning measures for protecting evergreens from bark beetle attack.

- **Discard food that has been exposed to heat, smoke, or soot.** The high temperatures of fire and its by-products can make food unsafe. (See Appendix: Food and Water Exposed to Floodwater, Fire, and Chemicals.)
- **If you are in doubt about the safety of your water, contact local public health officials.** Wells at undamaged homes should be safe, unless affected by a fuel spill. If you use water from a public well, have a water sample collected and tested before consuming it. Water may have been contaminated with bacteria due to a loss of water pressure in the plumbing. (See Appendix: Drinking Water Safety.)
- **Stay out of a canyon below a burned hill or mountain if there is even a chance of rain.** Such canyons are dangerous if it has rained heavily recently, if it is currently raining in the canyon, or if it is raining or could rain in the hills or mountains above the canyon. Risks for mudslides and debris flows are high in such burned areas for three to five years after a wildland fire.

Media and Community Education Ideas

- Encourage your community to learn how to manage the wildland fire hazards of the wildland/urban interface by becoming a Firewise Community. Firewise programs provide residents with the knowledge needed to maintain an acceptable level of fire readiness and to provide optimal conditions for firefighters during an emergency. Visit www.firewise.org to learn more about the Firewise Community/USA program.

- Talk to your neighbors about wildland fire safety. Plan how the neighborhood could work together before and after a wildland fire. Make a list of your neighbors' skills, such as medical or technical. Consider how you could help neighbors who have special needs, such as elderly or disabled persons. Make plans to take care of children who may be on their own if parents cannot get home.

- Ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of wildland fires and emphasize the areas most at risk for wildland fires.
  - -Inform people about the advantages of creating a fire safety zone around structures and of using fire-resistant roofing materials when building or reroofing.
  - -Highlight the importance of staying informed about local weather conditions.
  - -Run public service ads about how to protect lives in wildland fire.
  - -Report on the advantages of regular chimney sweepings.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide business telephone numbers for the local emergency management office and American Red Cross chapter.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

- Educate homeowners about local building codes and weed-abatement ordinances for structures built near wooded areas.

- Periodically inform your community of local public warning systems.

- Contact your local emergency management agency, humane society, and animal control agency to see if your community has sheltering options for animals and for families with pets. If not, learn more about emergency animal shelters and volunteer to include this option in local disaster preparedness efforts.

Floods and Flash Floods

Learn about your flood risk. Contact your local American Red Cross chapter, emergency management office, local National Weather Service office, or planning and zoning department to find out about your area's flood risk.

AWARENESS MESSAGES

Why talk about floods?

Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. As much as 90 percent of the damage related to all natural disasters (excluding drought) is caused by floods and associated debris flows. From 1992 to 2001**,** floods cost the nation, on average, more than $4.1 billion annually. Between 1972 and 2001, on average, 127 people a year were killed by floods—mostly by flash floods.

Most communities in the United States can experience some kind of flooding. Melting snow can combine with rain in the winter and early spring; severe thunderstorms can bring heavy rain in the spring and summer; or tropical cyclones can bring intense rainfall to coastal and inland states in the summer and fall.

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases runoff two to six times more than what would occur on natural terrain. During periods of urban flooding, streets can become swiftly moving rivers, while basements and viaducts can become death traps as they fill with water.

What causes floods and flash floods?

Several factors contribute to flooding. Two key elements are rainfall intensity and duration. Intensity is the rate of rainfall, and duration is how long the rain lasts. Topography, soil conditions, and ground cover also play important roles.

Flooding occurs in known floodplains when prolonged rainfall over several days, intense rainfall over a short period of time, or an ice or debris jam causes a river or stream to overflow and flood the surrounding area. Floods can be slow- or fast-rising, but generally develop over a period of hours or days.

Most flash flooding is caused by slow-moving thunderstorms, thunderstorms repeatedly moving over the same area, or heavy rains from hurricanes and tropical storms. Flash floods take from several minutes to several hours to develop. Flash floods occur within six hours of a rain event, or after a dam or levee failure, or following a sudden release of water held by an ice or debris jam. Flash floods can occur without warning.

Floods can roll boulders, tear out trees, destroy buildings and bridges, and scour new channels. Floodwater can reach heights of 10 to 20 feet (3 to 6 meters) and often carries a deadly cargo of debris. Flood-producing rains can also trigger catastrophic debris slides.

How can I protect myself in a flood?
Regardless of how a flood occurs, the rule for being safe is simple: head for higher ground and stay away from floodwater. Even a shallow depth of fast-moving floodwater produces more force than most people imagine. It is exceedingly dangerous to try to walk, swim, or drive in floodwater. Two feet (0.6 meters) of water will carry away most vehicles, including sport utility vehicles (SUVs) and pickup trucks. You can protect yourself best by being prepared and having time to act. You can protect your home best by taking measures to reduce potential flood damage (called mitigation) and buying flood insurance in advance.

What is the best source of information in a flood situation?
Local radio or television stations or a NOAA Weather Radio are the best sources of information in a flood situation for official weather and weather-related bulletins.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information about floods and other hazards is issued for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Is your community StormReady? To help people prepare for the ravages of hazardous weather, the National Weather Service has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

ACTION MESSAGES
Be Prepared for a Flood
Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Prepare members of your household.**
- **Consider flood insurance.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take flood-specific precautions and plan for and practice what to do if a flood occurs.

If you are at risk from floods, you should:

- **Find out the elevation above flood stage of your home, outbuildings, and pastures or corrals.** Knowing the elevation of your property in relation to nearby streams and dams will let you know if forecasted flood levels will affect your home.
- **Find out if local streams or rivers flood easily.**
- **Talk with members of your household about the possibility of floods and flash floods and what to do to stay safe if one occurs.** Knowing how to respond will reduce fear and save precious time in an emergency.
- **Find out about the flood evacuation routes in your area and develop a flood evacuation plan for your household.** (See chapter on "Evacuation and Sheltering, and Post-disaster Safety.") All members of the household should know where to meet each other, where to evacuate to, and what route(s) to take if they have to leave. Making plans well in advance will help you avoid last-minute confusion.
- **Find out if you are located in a floodplain,** which is considered a Special Flood Hazard Area. If you are, you are still eligible for flood insurance. Check with your city or county government (start with the Building or Planning Department) to review the Flood Insurance Rate Maps, published by the Federal Emergency Management Agency (FEMA). If your home is especially vulnerable, consider relocation.
- **Talk to your insurance agent.** Homeowners' policies do not cover flooding. Ask about the National Flood Insurance Program (NFIP) (www.fema.gov/nfip).
- **Use a NOAA Weather Radio or listen to local stations on a portable, battery-powered radio or television for updated emergency information.**
- **If you live in a frequently flooded area, stockpile emergency building materials.** These include plywood, plastic sheeting, lumber, nails, hammer and saw, pry bar, sand, shovels, and sandbags.

Protect Your Property

CORE ACTION MESSAGES

- **Build with flooding in mind.**
- **Protect important papers and equipment.**

If you are at risk from floods, you should:

- **Avoid building in a floodplain unless you elevate and reinforce your home.** Some communities do not permit building in known floodplains. If there are no restrictions and you are building in a floodplain, take precautions to make it less likely your home will be damaged during a flood.

- **Keep insurance policies, documents, and other valuables in a safe-deposit box.** You may need quick, easy access to these documents. Keep them in a safe place less likely to be damaged during a flood.
- **Raise your furnace, water heater, and electric panel to higher floors or the attic if they are in areas of your home that may be flooded.** Raising this equipment will prevent damage. An undamaged water heater may be your best source of fresh water after a flood.
- **Install check valves in plumbing to prevent floodwater from backing up into the drains of your home.** As a last resort, when floods threaten, use large corks or stoppers to plug showers, tubs, or basins.
- **Construct barriers such as levees, berms, and flood walls to stop floodwater from entering the building.** Permission to construct such barriers may be required by local building codes. Check local building codes and ordinances for safety requirements.
- **Seal walls in basements with waterproofing compounds to avoid seepage through cracks.**
- **Consult with a construction professional for further information about these and other damage-reduction measures.** Check local building codes and ordinances for safety requirements.
- **Contact your local emergency management office for more information on mitigation options to further reduce potential flood damage.** Your local emergency management office may be able to provide additional resources and information on ways to reduce potential damage.
- **Ensure that any outbuildings, pastures, or corrals are protected in the same way as your home.** When installing or changing fence lines, consider placing them in such a way that your animals are able to move to higher ground in the event of flooding.

Sand Bags

If flooding is expected, consider using sand bags to keep water away from your home. It takes two people about one hour to fill and place 100 sandbags, giving you a wall one foot (0.3 meter) high and 20 feet (6 meters) long. Make sure you have enough sand, burlap or plastic bags, shovels, strong helpers, and time to place them properly.

Avert the Dangers of Flood and Flash Flood

CORE ACTION MESSAGES

- **Listen for and respond to watches and warnings.**
- **If advised to evacuate or if you think you are in danger, leave immediately.**
- **Prepare your home if you have time.**

Even when there are no signs of a flood, be alert to conditions that can cause floods:

- Heavy rain for several hours, or steady rain for several days, can saturate the ground and cause a flood.
- Distant thunder indicates a distant thunderstorm that could send runoff your way. Runoff can produce a deadly flash flood that appears with no warning, particularly in certain types of terrain, for example, in an arroyo or streambed.
- Other distant events, such as a dam break or the sudden unclogging of an ice jam, can cause flash floods.

Park a vehicle or set up camp away from streams and washes, particularly during threatening conditions. Floodwater can rise quickly and carry you, your vehicle, or your belongings away.

Listen for watches and warnings on NOAA Weather Radio or a local radio or television station.

Watch, Warning

A **Flood WATCH** means a flood is possible in your area.
A **Flood WARNING** means flooding is already occurring or will occur soon in your area.
A **Flash Flood WATCH** means flash flooding is possible in your area.
A **Flash Flood WARNING** means a flash flood is occurring or will occur very soon.

Watches and warnings are issued by the National Weather Service (NWS) and broadcast on NOAA Weather Radio and on local radio and television stations.

A watch is the first official alert that a flash flood or flood may occur in a specific area. People in a watch area should review their flood plans (Family Disaster Plan, Disaster Supplies Kit, evacuation routes), keep informed, and be ready to act if a warning is issued or if flooding occurs.

What to Do Before a Flood

CORE ACTION MESSAGES

- **Use NOAA Weather Radio or listen continuously to a local radio or television station.**
- **Be ready to evacuate immediately.**
- **Follow authorities' instructions.**
- **Save lives, not belongings.**

If a flood or flash flood watch is issued for your area, you should:

- **Use a NOAA Weather Radio or listen continuously to a local station on a portable, battery-powered radio or television.**
- **Be ready to act quickly.** Floods and flash floods can happen quickly and without warning. Be ready to act immediately.
- **Be alert to signs of flooding, and, if you live in a flood-prone area, be ready to evacuate at a moment's notice.** Floods can happen quickly and you may need to leave with little or no notice.
- **Follow the instructions and advice of local authorities.** Local authorities are the most informed about affected areas and the most knowledgeable about areas you should avoid.
- **If your home is in a flood-prone area:**

  -Fill plastic bottles with clean water for drinking. (See Appendix: Storing Water.) Water may become contaminated or water service may be interrupted.

  -Fill bathtubs and sinks with water for flushing the toilet or washing the floor or clothing. Adults can use this water for bathing, but young children should not bathe in water that has been stored in glazed tubs and sinks because over time lead can leach into the water from the glaze.

  -Bring outdoor belongings, such as patio furniture, indoors. Unsecured items may be swept away and damaged by floodwater.

  -Move your furniture and valuables to higher floors of your home. If floodwater affects your home, higher floors are less likely to be damaged.

  -Turn off utilities if told to do so by authorities. Authorities may ask you to turn off water or electric utilities to prevent damage to your home or within the community. Most of the time they will tell you to leave the gas on because, if you shut if off, a professional is required to turn your gas back on, and it may be several weeks before you receive service.

  -**Turn off propane tanks.** Propane tanks may be damaged or dislodged by strong winds or water. Turning them off reduces the fire potential.

  -**Unplug small appliances.** Small appliances may be affected by electrical power surges that may occur. Unplugging them reduces potential damage.

  -Keep your previously assembled Disaster Supplies Kit near. You may need to act quickly. Having your supplies ready will save time.

  -Fill your car's gas tank, in case an evacuation notice is issued. If electric power is cut off, gas stations may not be able to operate pumps for several days.

  -Be prepared to evacuate. Local officials may ask you to leave if they conclude that your home is at risk from floodwater.

- **Consider a precautionary evacuation of your animals,** especially any large or numerous animals. Waiting until the last minute could be fatal for them and dangerous for you. Where possible, move livestock to higher ground. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic and thick smoke.

If a flood or flash flood warning is issued for your area, you should:

- **Use a NOAA Weather Radio or listen continuously to a local station on a portable, battery-powered radio or television.**
- **Be alert to signs of flooding.** A warning means a flood is imminent or is happening in the area.
- **Bring your companion animals indoors and maintain direct control of them.** Be sure that your pet disaster kit and your family Disaster Supplies Kit are ready to go in case you need to evacuate.
- **If you live in a flood-prone area or think you are at risk, evacuate immediately.** Move quickly to higher ground. Save yourself, not your belongings. The most important thing is your safety.
- **If advised by authorities to evacuate, do so immediately.** Move to a safe area before access is cut off by floodwater. Evacuation is much simpler and safer before floodwater becomes too deep for vehicles to drive through.
- **Follow the instructions and advice of local authorities.** Local authorities are the most informed about affected areas and the most knowledgeable about areas you should avoid.
- **Follow recommended evacuation routes.** Shortcuts or alternative, non-recommended routes may be blocked or damaged by floodwater.
- **Leave early enough to avoid being marooned by flooded roads.** Delaying too long may allow all escape routes to become blocked.
- **If you evacuate, take your animals with you.** If it is not safe for you, it is not safe for your animals.

What to Do During a Flood or Flash Flood

CORE ACTION MESSAGES

- **Climb to high ground.**
- **Get away from standing, flowing, or rising water.**

If you are outdoors, you should:

- **Stay out of areas subject to flooding.** Dips, low spots, canyons, washes, etc. can become filled with water.
- **Climb to high ground and stay there.** Move away from dangerous floodwater.
- **If you come upon a flowing stream where water is above your ankles, stop, turn around, and go another way.** Never try to walk, swim, or drive through swift water. Most flood fatalities are caused by people attempting to drive through water, or people playing in high water. If it is moving swiftly, even water six inches (15 centimeters) deep can sweep you off your feet.

If you are driving, you should:

- **Avoid already flooded areas, and areas subject to sudden flooding.** Do not attempt to cross flowing streams. Most flood fatalities are caused by people attempting to drive through water, or people playing in high water. The depth of water is not always obvious. The roadbed may be washed out under the water, and you could be stranded or trapped. Also, standing water may be electrically charged from underground or downed power lines. Rapidly rising water may stall the engine, engulf the vehicle and its occupants, and sweep them away. Look out for flooding at highway dips, bridges, and low areas. Two feet (0.6 meters) of water will carry away most vehicles, including SUVs and pickup trucks.
- **Stay away from underpasses.** Underpasses can fill rapidly with water, while the adjacent roadway remains clear. Driving into an underpass can quickly put you in five to six feet (1.5 to 1.8 meters) of water.
- **Turn around and find another route if you come upon rapidly rising water.** Move to higher ground away from rivers, streams, creeks, and storm drains. If your route is blocked by floodwater or barricades, find another route. Barricades are put up by local officials to protect people from unsafe roads. Driving around them can be a serious risk.
- **Abandon your vehicle immediately and climb to higher ground if the vehicle becomes surrounded by water or the engine stalls, and if you can safely get out.** When a vehicle stalls in the water, the water's momentum is transferred to the car. The lateral force of a foot (0.3 meter) of water moving at 10 miles (16 kilometers) per hour is about 500 pounds (227 kilograms) on the average vehicle. The greatest effect is buoyancy—for every foot (0.3 meter) that water rises up the side of a car, it displaces 1,500 pounds (680 kilograms) of the car's weight. So, two feet (0.6 meter) of water moving at 10 miles (16 kilometers) per hour will float virtually any car, SUV, or pickup truck. Use caution when abandoning your vehicle, and look for an opportunity to move away quickly and safely to higher ground.

What to Do After a Flood or Flash Flood

CORE ACTION MESSAGES

- **Help yourself, then help others.**
- **Stay away from damaged areas.**

- **Get medical care at the nearest hospital or clinic, if necessary.** Contaminated floodwater can cause infection. Severe injuries will require medical attention.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Stay away from damaged areas.** Your presence might hamper rescue and other emergency operations, and put you at further risk from the residual effects of floods, such as contaminated water, crumbled roads, landslides, mudflows, and other hazards.
- **Continue to listen to NOAA Weather Radio or a local radio or television station and return home only when authorities indicate it is safe to do so.** Flood dangers do not end when the water begins to recede; there may be flood-related hazards within your community, which you could hear about from local broadcasts.

- **Stay out of any building if floodwater remains around the building.** Floodwater often undermines foundations, causing sinking. Floors can crack or break and buildings can collapse.
- **Avoid entering any building (home, business, or other) before local officials have said it is safe to do so.** Buildings may have hidden damage that makes them unsafe. Gas leaks or damage to electric lines or water lines can create additional problems.
- **Report broken utility lines to the appropriate authorities.** Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury.
- **Avoid smoking inside buildings.** Smoking in confined areas can cause fires.
- **When entering buildings, use extreme caution.** Building damage may have occurred where you least expect it. Watch carefully every step you take.
- **Wear long pants, a long-sleeved shirt, and sturdy shoes.** The most common injury following a disaster is cut feet.
- **Use battery-powered lanterns or flashlights when examining buildings**. Battery-powered lighting is the safest and easiest to use, and it does not present a fire hazard for the user, occupants, or building. DO NOT USE CANDLES.
- **Examine walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing.**
- **Inspect foundations for cracks or other damage.** Cracks and damage to a foundation can render a building uninhabitable.
- **Look for fire hazards.** There may be broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances. Flammable or explosive materials may have traveled from upstream. Fire is the most frequent hazard following floods.
- **Check for gas leaks.** If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly. Turn off the gas at the outside main valve if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
- **Look for electrical system damage.** If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.
- **Check for damage to sewage and water lines.** If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water from undamaged water heaters or by melting ice cubes that were made before the pipes were damaged. Turn off the main water valve before draining water from these sources.
- **Watch out for wild animals, especially poisonous snakes, that may have come into buildings with the floodwater.** Use a stick to poke through debris. Floodwater flushes snakes and many animals out of their homes.
- **Watch for loose plaster, drywall, and ceilings that could fall.**
- **Take pictures of the damage,** both of the building and its contents, for insurance claims.

- **Watch your animals closely.** Keep all your animals under your direct control. Hazardous materials abound in flooded areas. Your pets may be able to escape from your home or through a broken fence. Pets may become disoriented, particularly because flooding usually affects scent markers that normally allow them to find their homes. The behavior of pets may change dramatically after any disruption, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

After returning home, you should:

- **Throw away food and drinking water that has come in contact with floodwater, including canned goods.** It is impossible to know if containers were damaged and the seals compromised. Food contaminated by floodwater can cause severe infections.
- Discard wooden spoons, plastic utensils, and baby bottle nipples and pacifiers if they have been covered by floodwater. There is no way to safely clean them.
- Disinfect metal pans and utensils by boiling them in clean or properly treated water.
- **If water is of questionable purity, boil the water or add bleach to it, and then distill the water if you will be drinking it.** (See Appendix: Drinking Water Safety.) Wells inundated by floodwater should be pumped out and the water tested for purity before drinking. If in doubt, call your local public health authority. Ill health effects often occur when people drink water contaminated with bacteria and germs.
- **Avoid drinking or preparing food with tap water until you are certain it is not contaminated.** Floodwater may have contaminated public water supplies or wells. Local officials should advise you on the safety of the drinking water.
- **Pump out flooded basements gradually (about one-third of the water per day) to avoid structural damage.** If the water is pumped out completely in a short period of time, pressure from water-saturated soil on the outside could cause basement walls to collapse.
- **Service damaged septic tanks, cesspools, pits, and leaching systems as soon as possible.** Damaged sewage systems are health hazards.

For information on **portable-generator safety** and **carbon monoxide poisoning,** see Appendix: Portable Generators.

Media and Community Education Ideas

- Have your community join the National Flood Insurance Program (NFIP). Any community may join the NFIP. Check with your local emergency management office for more information.
- Ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of floods and flash floods.
  - -Do a story featuring interviews with local officials about land use management and building codes in floodplains.
  - -Highlight the importance of staying informed about local weather conditions.
  - -Run public service ads about how to protect lives and property in a flood.

Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office and local American Red Cross chapter.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.
- Periodically inform your community of local public warning systems. Explain the difference between flood watches and warnings.
- Help hospitals and other operations that are critically affected by power failures to obtain auxiliary power supplies.
- Contact your local National Weather Service (NWS) office or emergency management agency for information on local flood warning systems. Advanced warning provided by early detection is critical to saving lives. Automatic flood detection systems are available commercially for flood-prone communities.
- Publish emergency evacuation routes for areas prone to flooding.

Facts and Fiction

Fiction: A 100-year flood occurs only once every 100 years.
Facts: The 100-year flood is a climatic average; the same area could experience, for example, two 100-year floods in the same year.

Fiction: Flash floods occur mainly in the eastern United States.
Facts: Flash floods occur in all 50 states, including Alaska and Hawaii.

Fiction: Flash floods occur only along flowing streams.
Facts: Flash floods can occur in dry arroyos and in urban areas where no streams are present.

Fiction: Flash floods occur mainly in the late afternoon and evening.
Facts: Flash floods occur at any time.

Fiction: Homeowners' insurance policies cover flooding.
Facts: Unfortunately, many homeowners do not find out until it is too late that their homeowners' policies do not cover flooding. Contact your insurance company or agent to buy flood insurance. It takes 30 days for flood insurance to take effect.

Fiction: You cannot buy flood insurance if your property has been flooded.
Facts: You are still eligible to purchase flood insurance after your home, apartment, or business has been flooded, provided your community participates in the National Flood Insurance Program (NFIP). Any community may join the NFIP. Check with your local emergency management office for more information.

Fiction: Larger vehicles, such as SUVs and pickup trucks, are safe to drive through floodwater.
Facts: Two feet (0.6 meters) of rushing water can carry away most vehicles, including SUVs and pickup trucks.

Fiction: Water stored in bathtubs and sinks is a good source of drinking water if flooding interrupts or contaminates the public water supply.
Facts: Over time, lead can leach from the glaze in bathtubs and sinks into water stored in them. Water stored in bathtubs and sinks should never be used for drinking or for bathing young children. You can use water stored in bathtubs and sinks for tasks such as flushing the toilet or washing the floor or clothing.

Hazardous Materials Incidents

Find out what types of hazardous materials incidents could occur in your area. Ask your Local Emergency Planning Committee (LEPC) or local emergency manager about the storage and use of hazardous chemicals in your area.

AWARENESS MESSAGES

Why talk about hazardous materials incidents?

From industrial chemicals and toxic waste to household detergents and air fresheners, hazardous materials are part of our everyday lives. Affecting urban, suburban, and rural areas, hazardous materials incidents can range from a chemical spill on a highway to the contamination of groundwater by naturally occurring methane gas.

Chemical plants are one source of hazardous materials, but there are many others. Your local service station stores gasoline and diesel fuel, hospitals store a range of radioactive and flammable materials, and there are about 30,000 hazardous materials waste sites in the country.

Many communities have a Local Emergency Planning Committee (LEPC) that identifies industrial hazardous materials and keeps the community informed of the potential risks. All companies that have hazardous chemicals must adhere to the reporting requirements of the local government and/or LEPC. The public is encouraged to participate in LEPCs. Contact your local emergency management office to find out if your community has an LEPC and how you can participate.

What are hazardous materials?

Hazardous materials are substances that, because of their chemical nature, pose a potential risk to life, health, or property if they are released. Hazards can exist during production, storage, transportation, use, or disposal of such substances.

How can I protect myself in the event of a hazardous materials incident?

The best ways to protect yourself are to be familiar with the potential dangers, know the warning system in your community, and be prepared to evacuate or shelter-in-place.

Increased awareness about possible hazardous materials threats in your area will help you remain alert to these threats and contribute to your safety. For example, learning to detect the presence of a hazardous substance, researching response and evacuation plans, and becoming familiar with local warning systems will help you protect yourself and those around you. In addition, you can contribute to Local Emergency Planning Committee or local emergency management office discussions about hazardous materials issues that directly affect your community.

What is the best source of information in the event of a hazardous materials incident?
Depending on where you live, sirens, warning signals, and local radio and television stations may be used to alert residents if a hazardous materials incident occurs. However you learn of a hazardous materials incident, listen to a local radio or television station for further emergency information. Local officials are the best source of information in the event of a hazardous materials incident.

ACTION MESSAGES
Be Prepared for a Hazardous Materials Incident
Protect Yourself

CORE ACTION MESSAGES
- Determine your risk.
- Prepare members of your household.
- Be ready to evacuate or shelter-in-place.

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, all households should take specific precautions to protect themselves in the event of a hazardous materials incident and plan and practice what to do if one should occur.

You should:

- **Evaluate the risks to your household** using information from your Local Emergency Planning Committee (LEPC) and local emergency management office. Determine how close you are to factories, freeways, or railroads that may produce or transport toxic waste. Remember that some toxic chemicals are odorless.
- **Learn about your community's plans for responding to a hazardous materials incident** at a plant or other facility, or a transportation incident involving hazardous materials. Talk to your LEPC or emergency management office.
- **Find out from the fire or police department what the hazardous materials warning procedures are for your area.** These could include:
  - Outdoor warning sirens or horns
  - Information provided on radio and television
  - "All-Call" telephoning—an automated system for sending recorded messages by telephone
  - News media—radio, television, and cable
  - Residential route alerting—messages announced to neighborhoods from vehicles equipped with public address systems

- **Choose and prepare your shelter-in-place room.** (See Appendix: How to Shelter-in-Place.)
- **Be ready to evacuate or shelter-in-place.**
- **Take your pets with you if you evacuate and keep them with you of you are sheltering-in-place.**

What to Do During a Hazardous Materials Incident

CORE ACTION MESSAGES
- **Avoid the incident site.**
- **Evacuate or find shelter.**

During a hazardous materials incident:

- **If you witness (or smell) a hazardous materials release, call 9-1-1 or your local emergency number, or the fire department as soon as safely possible.**
- **If you hear a warning signal, listen to a local radio or television station for further information.** Follow instructions carefully.
- **Stay away from the incident site** to minimize the risk of contamination.
- **If you are caught outside during an incident, try to stay upstream, uphill, and upwind.** Remember that gases and mists are generally heavier than air and hazardous materials can quickly be transported by water and wind. In general, try to go at least one-half mile (10 city blocks) from the danger area; for many incidents you will need to go much farther.
- **If you are in a motor vehicle, stop and find shelter in a permanent building if possible.** If you must remain in your car, keep the car windows and vents closed and shut off the air conditioner and heater.
- **If asked to evacuate your home, do so immediately.** Take your animals with you, but do not endanger yourself to do so. If authorities indicate there is enough time, close all windows, shut vents, and turn off attic, heating, and air conditioning fans to minimize contamination. (See "Evacuation and Sheltering, and Post-disaster Safety.")

Note: **Be aware that, if there is a hazardous materials incident while your children are at school, you probably will not be permitted to pick them up.** Schools and other public buildings may institute procedures to shelter-in-place. Even if you go to the school, the doors will probably be locked to keep your children safe. Follow the directions of your local emergency officials.

- **If you are told to stay indoors (shelter-in-place) rather than evacuate:**
- **Follow all instructions given by emergency authorities.**
- **Get household members and pets inside as quickly as possible.**
- **Close and lock all exterior doors and windows. Close vents, fireplace dampers, and as many interior doors as possible.**

- **Turn off air conditioners and ventilation systems.** In large buildings, building superintendents should set all ventilation systems to 100 percent recirculation so that no outside air is drawn into the building. If this is not possible, ventilation systems should be turned off.
- **Go into the pre-selected shelter room** (an above-ground room with the fewest openings to the outside). Ten square feet of floor space per person will provide sufficient air to prevent carbon dioxide buildup for up to five hours. Local officials are unlikely to recommend the public shelter in a sealed room for more than 2-3 hours because the effectiveness of such sheltering diminishes with time as the contaminated outside air gradually seeps into the shelter.
- **Take a battery-powered radio, water, sanitary supplies, a flashlight, and the shelter kit containing pre-cut plastic sheeting, duct tape, and scissors. Take your Disaster Supplies Kit.**
- **Close doors and windows in the room and seal the room** using the pre-cut plastic sheeting, duct tape, and modeling clay or other material:
    - Tape around the sides, bottom, and top of the door.
    - Cover each window and vent in the room with a single piece of plastic sheeting, taping all around the edges of the sheeting to provide a continuous seal.
    - If there are any cracks or holes in the room, such as those around pipes entering a bathroom, fill them with modeling clay or other similar material.
- **If authorities warn of the possibility of an outdoor explosion, close all drapes, curtains, and shades in the room.** Stay away from windows to prevent injury from breaking glass.
- **Remain in the room, listening to a local radio or television station until you hear that authorities advise you to leave your shelter.**
- **When authorities advise people in your area to leave their shelters, open all doors and windows and turn on the air conditioning and ventilation systems.** These measures will flush out any chemicals that infiltrated the building.
- **Avoid contact with spilled liquids, airborne mists and powders, and condensed solid chemical deposits.** Keep your body fully covered to provide some protection. Wear gloves, socks, shoes, pants, and long-sleeved shirts. Prevent your animals from contacting any of these substances. Most animals will groom themselves by licking, and may ingest toxins more readily this way.
- **Do not eat food or drink water that may have been contaminated.**
- **Be prepared to turn off the main water intake valve in case authorities advise you to do so.**

What to Do After a Hazardous Materials Incident

CORE ACTION MESSAGES

- **Stay away until officials say it is safe to return.**
- **Use proper decontamination procedures.**

After a hazardous materials incident:

- **Do not return home until local authorities say it is safe.**
- **Upon returning home, open windows and vents and turn on fans to provide ventilation.**
- **Be aware that a person or item that has been exposed to a hazardous chemical may be contaminated and could contaminate other people or items.**
- **If you or your animals have come in contact with or have been exposed to hazardous chemicals, you should:**
    - **Follow decontamination instructions from local authorities.** (Depending on the chemical, you may be advised to take a thorough shower, or you may be advised to stay away from water and follow another procedure.) Get medical treatment for unusual symptoms as soon as possible.
    - **If medical help is not immediately available and you think you might be contaminated, remove all of your clothing and shower thoroughly (unless local authorities advise you to do otherwise).** Change into fresh, loose clothing and get medical help as soon as possible.
    - **Place exposed clothing and shoes in tightly sealed containers,** for example plastic bags with twist-ties**.** Do not allow them to contact other materials. Call local authorities to find out about proper disposal.
    - **Advise everyone who comes in contact with you that you may have been exposed to a toxic substance.**
- **Find out from local authorities how to clean up your land and property.**
- **Report any lingering vapors or other hazards to your local emergency services office.**

Page HM-6 blank

Heat (Heat Wave)

Learn what heat hazards may occur where you are and how to plan for excessive heat should it occur in your area. Different areas have different risks associated with prolonged heat. Contact your local emergency management office, National Weather Service office, or American Red Cross chapter for information.

(Review acknowledgment: The Environmental Protection Agency, Office of Atmospheric Programs, Global Programs Division, Global Change Information Branch, reviewed this chapter, in addition to the agencies listed in the acknowledgments and on the cover of *Talking About Disaster: Guide for Standard Messages.*)

AWARENESS INFORMATION

Why talk about excessive heat?

In recent years, excessive heat has caused more deaths than all other weather events, including floods. The American Meteorological Society reports that on average heat kills more than 1,000 people each year. During the July 1995 heat wave in Chicago, more than 700 people died as a result of excessive heat.

What is a heat wave?

A heat wave is a prolonged period of excessive heat, often combined with excessive humidity. Generally, excessive heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region during summer months, last for a prolonged period of time, and often are accompanied by high humidity.

What is the heat index?

The heat index is the temperature the body feels when the effects of heat and humidity are combined. Exposure to direct sunlight can increase the heat index by up to 15°F.

What are heat cramps, heat exhaustion, heatstroke, and sunstroke?

Heat cramps are muscular pains and spasms caused by heavy exertion in high heat. Heat cramps are often the first sign that the body is having trouble with the heat.

Heat exhaustion typically involves the loss of body fluids through heavy sweating when someone strenuously exercises or works in high heat and humidity. In someone suffering from heat exhaustion, blood flow to the skin increases while blood flow to vital organs decreases, resulting in a mild form of shock. If not treated, body temperature will continue to rise and the person may suffer heatstroke.

Heatstroke (also known as sunstroke) is a life-threatening condition in which a person's temperature control system, which produces sweating to cool the body, stops working. The body temperature of someone suffering from heatstroke can rise so high that brain damage and death may result if the body is not cooled quickly.

How can I protect myself in a heat wave?
The best ways to be protected from the ill effects of excessive heat are to dress appropriately, stay indoors, refrain from strenuous work or exercise during the hottest part of the day, and stay hydrated. Spending at least two hours a day in air conditioning significantly decreases a person's risk of heat-related illnesses.

Heat can kill by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in excessive heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

Elderly people, young children, and those who are sick or overweight are more likely to become victims of excessive heat. Because men sweat more than women do, they become more quickly dehydrated and are more susceptible to heat illness.

The duration of excessive heat plays an important role in how people are affected by a heat wave. Studies have shown a significant rise in heat-related illnesses when excessive heat lasts more than two days.

People living in urban areas may be at greater risk from the effects of a prolonged heat wave than are people living in rural regions. An increased health problem, especially for those with respiratory difficulties, can occur when stagnant atmospheric conditions trap pollutants in urban areas, thus adding unhealthy air to excessively hot temperatures. In addition, asphalt and concrete store heat longer and gradually release heat, resulting in significantly higher temperatures, especially at night—an occurrence known as the "urban heat island effect."

Pets, horses, and livestock are also susceptible to difficulties from excessive heat. Animals do not perspire and rely on panting, wetting down, shade, cool earth, and drinking water for cooling. Animals cannot explain their needs, so it is up to people to take extra care that during heat waves, their needs are met.

What is the best source of information in a heat wave?
Local radio, television stations, and NOAA Weather Radio are the best sources of information in a heat wave.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important excessive heat information is issued for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Watch, Warning, Advisory
The National Weather Service issues alerts for excessive heat on a county-by-county basis. **The alerts are broadcast on NOAA Weather Radio and on local radio and television stations.** The parameters of an excessive heat watch, warning, and advisory vary by location. Generally:

- **Excessive Heat WATCH** means conditions are favorable for an event to meet or exceed local excessive heat warning criteria in the next 12 to 48 hours. .
- **Excessive Heat WARNING** means that heat values are forecast to meet or exceed locally defined warning criteria for at least two days.
- **Excessive Heat ADVISORY** means hazardous heat conditions have begun or will begin within 36 hours and, if caution is not exercised, they could become life threatening.

ACTION MESSAGES
Be Prepared for a Heat Wave
Protect Yourself

Core Action Messages

- **Learn the risks.**
- **Prepare members of your household.**
- **Plan how to get relief from and avoid the dangerous effects of excessive heat.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, households at risk from heat waves should take precautions to stay safe in case one occurs. Review your Family Disaster Plan before summer heat is expected and be sure to stock additional water.

If you are at risk from excessive heat, you should:

- **Discuss with members of your household the precautions they should take to stay safe in excessive heat.** Everyone should know what to do in the places where they spend time. Some places may not be air conditioned or safe during a heat wave, so plan alternatives.

- **If your home does not have air conditioning, choose other places you could go to get relief from the heat during the warmest part of the day.** Schools, libraries, theaters, and other community facilities often provide air-conditioned refuge on the hottest days. See if your area designates cooling centers. Air conditioning provides the safest escape from excessive heat. During the 1995 Midwest heat wave, most deaths happened to people who were not in air conditioned places.

- **Plan how you can change daily activities to avoid strenuous work during the warmest part of the day.** Ill effects of heat can quickly overcome the healthiest people, if they perform strenuous work during the warmest parts of the day. Symptoms of dehydration are not easily recognized and are often confused with symptoms of other conditions. Dehydration occurs fast and makes you ill very quickly.
- **Discuss with a physician any concerns about members of the household who are taking medications or have medical conditions that may cause poor blood circulation or reduced ability to tolerate heat.** A physician can advise you about temporary changes to medication or other activities that can relieve the effects of heat.
- **Plan to check on family, friends, and neighbors who do not have air conditioning or who spend much of their time alone.** Elderly persons who live alone or with a working relative might need assistance on hot days. The majority of people who died because of the 1995 Midwest heat wave were persons who were alone.
- **Plan to wear lightweight, light-colored clothing.** Light colors will reflect away the sun's rays more than dark colors, which absorb the sun's rays.
- **Get training.** Take an American Red Cross first aid course to learn how to treat heat emergencies and other emergencies. Everyone should know how to respond, because the effects of heat can happen very quickly.
- **Ensure that your animals' needs for water and shade are met.** Bring companion animals into cooler areas.

What to Do During a Heat Wave

CORE ACTION MESSAGES

- **Never leave a child or pet alone in a vehicle.**
- **Take it easy and stay indoors in excessive heat.**
- **Drink plenty of water and eat lightly.**

During a heat wave, you should:

- **Listen to NOAA Weather Radio or local radio or television stations for up-to-date information.**
- **Never leave children or pets alone in closed vehicles.** Temperatures inside a closed vehicle can reach more than 140°F (60° C) within minutes. Exposure to such high temperatures can kill in minutes. Even on days that feel pleasantly warm outside, temperatures in a closed vehicle can raise high enough to kill children and pets.
- **Slow down. Avoid strenuous activity.** Reduce, eliminate, or reschedule strenuous activities. High-risk individuals should stay in cool places. Get plenty of rest to allow your natural "cooling system" to work. If you must do strenuous activity, do it during the coolest part of the day, which is usually in the early morning. Many heat emergencies are experienced by people exercising or working during the hottest part of the day.
- **Take frequent breaks if you must work outdoors.** Frequent breaks, especially in a cool area, can help people tolerate heat better.
- **Use a buddy system when working in excessive heat.** Partners can keep an eye on each other and can assist each other when needed. Sometimes exposure to heat can cloud judgment, and, if you work alone, you may not notice this.
- **Watch for signs of heat exhaustion and heatstroke. (**See Appendix: How to Recognize and Treat Heat Exhaustion and Heatstroke.)

- **Avoid too much sunshine.** Sunburn slows the skin's ability to cool itself. The sun will also heat the inner core of your body, resulting in dehydration. Use a sunscreen lotion with a high sun-protection factor (SPF) rating.
- **Postpone outdoor games and activities.** Excessive heat can threaten the health of athletes, staff, and spectators of outdoor games and activities.
- **Avoid extreme temperature changes.** A cold or even a cool shower taken immediately after coming indoors from hot temperatures can result in hypothermia, particularly for elderly and very young people.
- **Stay indoors as much as possible.** If air conditioning is not available, stay on the lowest floor, out of the sunshine. Even in the warmest weather, staying indoors, out of sunshine, is safer than long periods of exposure to the sun.
- **Keep heat outside and cool air inside.** Close any registers that may allow heat inside. Install temporary reflectors, such as aluminum foil-covered cardboard, in windows and skylights to reflect heat back outside.
- **Conserve electricity not needed to keep you cool.** During periods of excessive heat, people tend to use a lot more power for air conditioning. Conserve electricity not used to keep you cool so power can remain available and reduce the chance of a community-wide outage.
- **Vacuum air conditioner filters weekly during periods of high use.** Air conditioner filters can become clogged or filled with dirt, making them less efficient. Keeping them clean will allow your air conditioner to provide more cool air.
- **If your home does not have air conditioning, go to a public building with air conditioning each day for several hours.** Air conditioned locations are the safest places during excessive heat because electric fans do not cool the air. Fans do help sweat evaporate, which gives a cooling effect. However, when temperatures exceed 90^{o} F (32^{o}C), fans become ineffective in reducing heat-related illness.
- **Dress appropriately:**
  -Wear loose-fitting, lightweight, light-colored clothing that will cover as much skin as possible. Lightweight, light-colored clothing reflects heat and sunlight and helps maintain normal body temperature. Cover as much skin as possible to avoid sunburn and the over-warming effects of sunlight on your body.
  -Protect your face and head by wearing a wide-brimmed hat. A hat will keep direct sunlight off your head and face. Sunlight can burn and warm the inner core of your body.
- **Drink plenty of fluids even if you do not feel thirsty.** Drink regularly and often. Your body needs water to keep cool. Water is the safest liquid to drink during heat emergencies. Injury and death can occur from dehydration, which can happen quickly and be unnoticed until too late. Symptoms of dehydration are often confused with symptoms of other conditions.
- **People who have epilepsy or heart, kidney, or liver disease; who are on fluid-restricted diets; or who have a problem with fluid retention should consult a doctor before increasing liquid intake.**
- **Avoid drinks with alcohol or caffeine.** They can make you feel good for a little while, but they make the heat's effects on your body worse. This is especially true about beer, which actually dehydrates the body.
- **Eat small meals and eat more often.** Large, heavy meals are more difficult to digest and cause your body to increase internal heat to aid digestion, worsening overall conditions. Avoid foods that are high in protein, such as meats and nuts, which increase metabolic heat.

- **Avoid using salt tablets unless directed to do so by a physician.** Salt causes the body to retain fluids, resulting in swelling. Salt impedes sweating, which helps keep you cool.
- **Check on your animals frequently** to ensure that they are not suffering stress from the heat. Make sure they are indoors or in the shade. Use fans to cool areas that are not air conditioned or open to breezes. Provide plenty of water for drinking as well as for cooling the animals. If you see signs of heat stress, call your veterinarian. Very young and older animals, as well as animals with short snouts, are more susceptible to problems with heat.

How to Make Your Home Safer for Occupants in a Heat Wave

CORE ACTION MESSAGE
- **Keep heat out of your home and cooler air in.**

To make your home safer during a heat wave, you should:

- **Install window air conditioners snugly.** Insulate spaces around air conditioners for a tighter fit. An air conditioner with a tight fit around the windows or wall openings will make less noise and allow less hot air in from the outside.
- **Make sure your home is properly insulated.** This will help you to conserve electricity and reduce your home's power demands for air conditioning. Put weather stripping around doors and windows to keep cool air inside.
- **Consider keeping storm windows installed throughout the year.** Storm windows can keep the heat out of a house in the summer the same way they keep the cold out in the winter.
- **Check air-conditioning ducts for proper insulation.** Insulation around ducts prevents cool air from leaking and keeps it directed through the vents.
- **Protect windows from the sun.** Hang shades, draperies, awnings, or louvers on windows receiving morning or afternoon sun. Outdoor awnings or louvers can reduce the heat entering the house by as much as 80 percent.
- **Use an attic fan.** If you have a fan installed to vent warm air out of your attic, use it to help keep your home cool.
- **Check buildings that house animals.**

How to Recognize and Treat Heat Exhaustion and Heatstroke

CORE ACTION MESSAGE
- **Cool down the body as quickly as possible.**

Heatstroke

The signs of heatstroke in a person are hot, red skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. A person experiencing heatstroke can have a very high body temperature—sometimes as high as 105°F (41° C). If the person was sweating from heavy work or exercise, the skin may be wet; otherwise, it will feel dry.

Heatstroke is a life-threatening situation. If you suspect someone is suffering from heatstroke, call 9-1-1 or your local emergency number immediately. Move the person to a cooler place. Quickly cool the person's body— immerse it in a cool bath or wrap it in wet sheets and fan it. Watch for signs of breathing problems. Keep the person lying down and continue to cool the body any way you can. If the person refuses water, is vomiting, or exhibits changes in the level of consciousness, do not give him or her anything to eat or drink.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Heat Exhaustion
The signs of heat exhaustion in a person are cool, moist, pale, or flushed skin; heavy sweating; headache; nausea or vomiting; dizziness; and exhaustion. A person experiencing heat exhaustion may have a normal body temperature, or it is likely to be rising.

If you suspect someone is suffering from heat exhaustion, move the person to a cooler place. Remove or loosen tight clothing and apply cool, wet cloths, such as towels or sheets dipped in water. If the person is conscious, give him or her cool water to drink. Make sure the person drinks slowly. Give a half glass of cool water every 15 minutes. Let the person rest in a comfortable position, and watch carefully for changes in his or her condition.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Heat Cramps
Heat cramps are muscle spasms that are caused by excessive sweating that results in a deficiency of salt. Although not as serious as heat exhaustion or heatstroke, heat cramps sometimes precede them. **If someone is suffering from heat cramps, move the person to a cooler place** and have him or her rest in a comfortable position. Lightly stretch the affected muscle and replenish fluids. Give a half glass of cool water every 15 minutes.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Heat Stroke in Animals
Animals are also susceptible to heat stroke, or hyperthermia, which is considered an emergency as it is with people. Signs in animals include excessive panting; increased body temperature, heart rate, or respiratory rate; unusual salivation; collapse, stupor, seizures, or coma; redder than normal mucous membrane (gums, for example); or capillary refill that is too fast. Be aware also of signs of dehydration, which is also an emergency. For more information about first aid for cats and dogs, refer to *Pet First Aid,* by Barbara Mammato, DVM, MPH, a handbook sponsored by the American Red Cross and The Humane Society of the United States. For information about other animals, talk with your veterinarian.

If you suspect heat stroke, get the animal out of direct heat and spray it with cool water or place water-soaked towels on its head, neck, feet, chest, and abdomen. The consequences of heat stroke may be life-threatening, but might not be visible to you for several hours, so take the animal to your nearest veterinary hospital right away.

Media and Community Education Ideas

- Ask your local newspaper or radio or television station to:
  -Do a series with information about excessive heat emergencies. Help the reporters to localize the information by providing the telephone numbers of local emergency services offices, the local American Red Cross chapter, and nearby hospitals.
  -Do a story featuring interviews with local physicians about the dangers of sunburn, heat exhaustion, heatstroke, and other conditions caused by excessive heat.
  -During a drought, run a series suggesting ways individuals can conserve water and energy in their homes and their workplaces.
  -Interview local officials and representatives of the U.S. Department of Agriculture about special steps farmers can take to establish alternative water supplies for their crops and ways to protect livestock and poultry from the effects of excessive heat.
- Sponsor a "Helping Your Neighbors" program through your local school system to encourage children to think of how they can help people who require special assistance during severe weather conditions, such as elderly people, infants, or people with disabilities.
- Arrange for air-conditioned shelters to be opened when necessary for community members who do not have air conditioning at home.
- Arrange for special programs to provide air conditioners to vulnerable people in their homes.

Facts and Fiction

Fiction: Beer and other alcoholic beverages satisfy thirst in excessive heat.
Facts: Although beer and alcoholic beverages appear to satisfy thirst, they actually cause further body dehydration. You should limit your intake of alcoholic beverages in excessive heat. Drink plenty of water. Your body needs water to keep cool. Drink plenty of fluids even if you do not feel thirsty. (People who have epilepsy or heart, kidney, or liver disease; are on fluid-restricted diets; or have a problem with fluid retention should consult a physician before increasing their consumption of fluids.)

Fiction: It's always good to exercise, no matter how hot it is.
Facts: Many heat emergencies are experienced by people exercising or working during the hottest parts of the day. Reduce, eliminate, or reschedule strenuous activities. If you must do strenuous activity, do it during the coolest part of the day which is usually in the morning between 4:00 a.m. and 7:00 a.m.

Fiction: A heatstroke (sunstroke) is not life-threatening.
Facts: A heatstroke or sunstroke is life threatening. If someone has heatstroke, his or her temperature control system, which produces sweat to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

Fiction: You will get sunburned only on really hot days.
Facts: Sunburn (and tanning) results from exposure to ultraviolet (UV) radiation, which is distinct from the light and heat emitted by the sun. You cannot see or feel UV rays. They can, however, be quite damaging. UV exposure has been linked to skin cancer and other skin disorders, cataracts and other eye damage, and immune-system suppression. The ozone layer absorbs most of the sun's harmful UV rays, but this layer has thinned in recent years as a result of the emission of ozone-depleting chemicals. This thinning can lead to a greater chance of overexposure to UV radiation. To protect yourself:

- Limit time in the midday sun.
- Seek shade.
- Use a broad-spectrum sunscreen of at least SPF15+ and reapply it every two hours.
- Wear a hat, protective clothing, and sunglasses.
- Watch for the UV Index (reported in local news and newspapers).

UV exposure is a year-round issue—you can sustain damage on the ski slopes just as easily as on the beach, and clouds provide only partial protection. For more information, visit http://www.epa.gov/sunwise.

Page HW-10 blank

Hurricanes and Tropical Storms

Learn about your community's hurricane risk. Contact your local emergency management office, National Weather Service office, or American Red Cross chapter for more information on hurricanes and how to prepare for them. Contact your local emergency management office or planning and zoning office to find out if you live in an area prone to flooding during a hurricane or heavy rains. If you live in a risk area, learn what types of supplies should be stored to protect your home from floodwater. Knowing the elevation of your property will let you know if forecasted flood levels will affect your home.

AWARENESS MESSAGES

Why talk about hurricanes?

There are no other storms like hurricanes on earth. Each year, on average, 10 tropical storms (of which six become hurricanes) develop over the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico. Many of these storms remain over the ocean. However, on average, five hurricanes strike the United States coastline every three years. Of these five, two are major hurricanes, category 3 or higher on the Saffir-Simpson Hurricane Scale. Major hurricanes have sustained winds above 110 miles (177 kilometers) per hour.

Timely warnings have greatly diminished hurricane fatalities in the United States. In spite of this, property damage continues to mount. There is little we can do about the hurricanes themselves; however, we can prepare for hurricanes and alert people when a hurricane threatens. To this end, the National Oceanic and Atmospheric Administration's National Weather Service (NWS) field offices and Tropical Prediction Center cooperate with other federal, state, and local agencies; rescue and relief organizations; the private sector; and the news media in a huge warning and preparedness effort.

What are hurricanes?

Hurricanes and tropical storms are cyclones with tropical origins (tropical cyclones). Tropical storms have winds of 39 to 73 miles (63 to 117 kilometers) per hour. When these winds reach 74 miles (119 kilometers) per hour or more, the storm is called a hurricane. Hurricane winds blow in a large counterclockwise spiral around a relatively calm center known as the "eye." The eye is generally 20 to 30 miles (32 to 48 kilometers) wide and the storm may have a diameter of 400 miles (644 kilometers). A single hurricane can last more than two weeks over open waters and can run a path along the entire length of the eastern U.S. seaboard.

What hazardous conditions do hurricanes cause?

Hurricanes bring a variety of life-threatening hazards—chief among them is flooding. Most deaths due to tropical cyclones are flood related.

Hurricanes commonly cause inland flooding. Torrential rains from decaying hurricanes and tropical storms can produce extensive urban and river flooding, landslides, and mudslides in mountainous regions. Winds from these storms can drive ocean water up the mouth of coastal rivers, compounding the severity of inland flooding.

The storm surge, though, remains the greatest threat from a hurricane. A storm surge is the rise in ocean level along a coastline caused by a hurricane. It can be a dome of ocean water 20 feet (6 meters) high at its peak and 50 to 100 miles (80 to 161 kilometers) long. If a storm surge occurs near the time of high tide, the height of the water will be even greater. A storm tide is the combination of storm surge and high tide. A storm surge can devastate coastal communities as it sweeps ashore. In recent years, the fatalities associated with storm surge have been greatly reduced as a result of better warning and preparedness in coastal communities.

Strong winds can create large areas of devastation, destroying mobile homes, tearing off roofs, and toppling power lines and trees. Hurricane-force winds can extend well inland from the coast, with the strongest sustained winds normally in the eastern half of the storm. In addition, hurricanes can spawn tornadoes, which add to the destructiveness of the storm.

How can I protect myself in a hurricane situation?
Preparation is the best protection against the dangers of a hurricane. Well before a hurricane threatens, people should make their homes as “hurricane proof” as possible and plan and practice what they will do if they are advised to evacuate. And most important, people should evacuate the area if advised by authorities to do so, even if they themselves do not think the situation looks threatening.

Eighty to 90 percent of the people who live in hurricane-prone areas have never experienced the core of a major hurricane. Many of these people have been through weaker storms and have a false impression of a hurricane's damage potential. This can lead to complacency and delayed actions that result in injuries and death. Over the past several years, the hurricane warning system has provided adequate time for people on barrier islands and the immediate coastline to move inland when hurricanes threaten. However, it is becoming more difficult to evacuate people from the barrier islands and other coastal areas because road construction has not kept pace with the rapid population growth. If authorities advise people to evacuate, it is best to leave as soon as possible to avoid traffic tie-ups.

The best ways to protect your home are to install permanent hurricane shutters on windows and doors, tie the roof to the mainframe of your home with metal straps, and prepare a “wind safe” room. (See Appendix: “Wind Safe” Room.) NOTE: a “wind safe” room would be used only for locations where residents have not been asked to leave or evacuate. If you do not have permanent hurricane shutters, use plywood. Well before there is the threat of a hurricane, buy half-inch plywood boards suitable for outside use—marine plywood is best. Cut the boards to fit the outside frame of each window and door; drill the holes for the screws and install the anchors so you can quickly board up your home if necessary. Write on each board which opening it fits. Do not tape glass. Taping does not prevent glass from breaking and takes critical time from more effective preparedness measures.

Every home in hurricane-prone areas should have ready the items needed to board up windows and doors. When a hurricane threatens, supplies are quickly sold out at stores. Most homes destroyed during recent hurricanes had no window protection. When wind enters a home through broken windows, the pressure that builds against the walls can lift a roof and cause walls to collapse.

Make sure that you protect any outbuildings that may house animals in the same way you protect your home.

What is the best source of information in a hurricane situation?
Local radio or television stations or a NOAA Weather Radio are the best sources of information in a hurricane situation for official weather and weather-related bulletins.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information is issued about hurricanes or other weather-related hazards for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Watch, Warning

- A **Hurricane/Tropical Storm WATCH** means there is a threat of hurricane/tropical storm conditions within 36 hours. People in a watch area should review their hurricane plans (Family Disaster Plan, Disaster Supplies Kit, evacuation routes), keep informed, and be ready to act if a warning is issued.
- A **Hurricane/Tropical Storm WARNING** means hurricane/tropical storm conditions are expected in 24 hours or less. When a warning is issued, people should complete their storm preparations and leave the threatened area if directed to do so by local officials.

A **hurricane/tropical storm local statement,** issued every two to three hours by local National Weather Service (NWS) offices, summarizes all of the watches and warnings, evacuation information, and most immediate threats to an area.

Watches and warnings for hurricanes and tropical storms are issued by the NWS and broadcast on NOAA Weather Radio and on local radio and television stations.

Is your community StormReady? To help people prepare for the ravages of hazardous weather, the National Weather Service has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

ACTION MESSAGES
Be Prepared for a Hurricane
Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Consider flood insurance.**
- **Make an evacuation plan.**
- **Prepare members of your household.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take hurricane-specific precautions and plan for and practice what to do in a hurricane situation.

If you are at risk from hurricanes, you should:

- **Talk to your insurance agent.** Homeowners' policies do not cover flooding from hurricanes. Ask about the National Flood Insurance Program (NFIP) or visit www.fema.gov/nfip.
- **Ask about your community's hurricane preparedness plan.** The local emergency management office or local chapter of the American Red Cross should be able to provide you with details of this plan, including information on the safest evacuation routes, nearby shelters, and what conditions would trigger a recommendation to evacuate certain areas.
- **Develop a hurricane evacuation plan.** (See Appendix: "Evacuation and Sheltering and Post-disaster Safety.") All members of your household should know where to go if they have to leave. Making plans well in advance will help you avoid last-minute confusion.
- **Discuss hurricanes with members of your household.** Everyone should know what to do in case all members are not together. Discussing hurricanes and reviewing flood safety and preparedness measures ahead of time will help reduce fear and save precious time in an emergency.
- **Determine where to move your boat in an emergency.** Marinas and other storage facilities may fill up quickly. Some locations may have less risk of damage than others. You may be required to secure your boat well in advance of an approaching hurricane.
- **Protect your animals.** Ensure that any outbuildings, pastures, or corrals that house animals are protected in the same way as your home. When installing or changing fence lines, consider placing them in such a way that your animals are able to move to higher water in the event of flooding. Get rid of debris around your home and any outbuildings as well as in pastures.
- **Know where to go with your animals.** Because evacuation shelters generally do not accept pets, except for service animals, you must plan ahead to ensure that your family and pets will have a safe place to stay. Do this research well before disaster strikes. See chapter on **Evacuation and Sheltering, and Post-disaster Safety** for more information on planning for evacuating your animals.

Protect Your Property

CORE ACTION MESSAGES

- **Keep an "in case of hurricane" to-do list.**
- **Get proper protection for all windows and doors.**

If you are at risk from hurricanes, well before a hurricane threatens, you should:

- **Make a list of items to bring inside in the event of a storm.** A list will help you remember anything that can be broken or picked up by strong winds.
- **Install permanent hurricane shutters if possible.**
- **If you do not have hurricane shutters, buy the plywood and other items needed to board up windows and doors.** Get half-inch outdoor plywood— marine plywood is best. Cut it to fit the outside frame of each window and door and drill the holes and install the anchors for the screws. Write on each board which window it fits. **Do not tape windows.** Taping does not prevent windows from breaking and takes critical time from more effective preparedness measures.
- **Remove any debris or loose items in your yard.** Hurricane winds, often in excess of 100 miles (161 kilometers) per hour, can turn unanchored items into deadly missiles.
- **Keep trees and shrubbery trimmed.** Make trees more wind resistant by removing diseased or damaged limbs, then strategically remove branches so that wind can blow through. Hurricane winds frequently break weak limbs and hurl them at great speed, damaging whatever they hit. Debris collection services may not be operating just before a storm, so it is best to do this well in advance of an approaching storm.
- **Fix loose rain gutters and downspouts and clear them if they are clogged.** Hurricanes often bring long periods of heavy rain. Cleaning and securing drainage systems will help protect your home from water damage.
- **Strengthen garage doors.** Hurricane winds can enter through a damaged garage door, lift the roof, and destroy the home.
- **Have an engineer check your home and tell you about ways to make it more resistant to hurricane winds.** There are a variety of ways to protect your home. Professionals can advise you of engineering requirements, building permits, or local planning and zoning regulations that could help you protect your home, and can inspect your home to see if the roof is tied to the mainframe securely with metal straps, the house is bolted to its foundation, and the best place in your home to prepare a "wind safe" room.
- **Elevate coastal homes.** Raising structures to a certain height will make them more resistant to hurricane-driven water. There may be many local codes affecting how and where homes can be elevated. Meet with your emergency manager or planning and zoning official to learn about having your home elevated. Community funds may be available for such measures.
- **If you live in a floodplain or area prone to flooding, follow flood preparedness precautions.** Tropical cyclones can bring great amounts of rain and frequently cause floods. Some hurricanes have dropped more than 10 inches (25 centimeters) of rain in just a few hours.
- **Take similar measures to protect your animals.** Make sure that you strengthen and protect any outbuildings that may house animals in the same way you protect your home.

- **Explore sheltering options for your pets.** Contact relatives, friends, hotels and motels, and other facilities to make a definite plan for sheltering your animals. Many communities are developing emergency animal shelters similar to shelters for people. Contact your local emergency management agency to find out about emergency animal shelters in your community, in the event that you have nowhere else to go and need to go to public shelter with your animals.
- **Include your pets in your evacuation and sheltering drills.** Practice evacuating your pets so they will get used to entering and traveling calmly in their carriers. If you have horses or other large animals, be sure that they are accustomed to entering a trailer. Practice bringing your pets indoors, into your safe room, so that if you are required to shelter in place, they will be comfortable.

What to Do During a Hurricane/Tropical Storm Watch

CORE ACTION MESSAGES

- **Listen to and watch local news.**
- **Prepare your home.**
- **Evacuate if advised by authorities.**
- **Avoid floodwater.**

You should:

- **Use a NOAA Weather Radio or listen continuously to a local station on a portable, battery-powered radio or television.** Hurricanes can change direction, intensity, and speed suddenly. What was a minor threat several hours ago can quickly escalate to a major threat.
- **Heed the advice of local officials, and evacuate if they advise it.** (See Appendix: What to Do if Evacuation Is Necessary Because of a Storm.) Following their advice is your best protection. Avoid flooded roads and watch for washed-out bridges. Local officials may close certain roads, especially near the coast, when effects of the hurricane reach the coast.
- **Prepare your property for high winds.** Hurricane winds can lift large, heavy objects and send them crashing into homes. Anything not secured may become a deadly or damaging projectile.
  - •Bring lawn furniture inside, as well as outdoor decorations or ornaments, trash cans, hanging plants, or anything else that can be picked up by the wind.
  - •Secure your home by closing the windows and doors and then closing the hurricane shutters. If you do not have hurricane shutters, close and board up all windows and doors.
  - •If possible and if it can be safely done, remove outside antennas.
  - •Moor a boat securely or move it to a designated safe place. Use rope or chain to secure a boat to a trailer. Use tie-downs to anchor a trailer to the ground or to a building.
- **Fill your car's gas tank.** If advised to evacuate, you may have to travel a long distance or you may be stuck in traffic for a long time. Gas stations along the route may be closed.
- **Stock up on prescription medications.** Stores and pharmacies may be closed after the storm.

- **If you are in a mobile home, check the tie-downs.** Mobile homes may be less affected by strong winds if they are tied down according to the manufacturer's instructions. Properly tied-down homes are more likely to stay fixed to their foundations. Historically, mobile homes suffer the greatest amount of damage during hurricanes. Prior to 1994, most mobile homes were not designed to withstand even moderate winds.
- **Check your Disaster Supplies Kit.** Some supplies may need to be replaced or restocked.
- **Turn the refrigerator and freezer to the coldest setting.** Open them only when absolutely necessary, then close them quickly. Keeping the coldest air in will help perishables last much longer in the event of a power failure.
- **Store valuables and personal papers in a safety deposit box in a waterproof container on the highest level of your home.** Hurricanes can cause much water damage inside homes. Protecting valuables in this manner will provide the best security.
- **Turn off utilities if told to do so by authorities.** Authorities may ask you to turn off water or electric utilities to prevent damage to your home or within the community. Most of the time they will tell you to leave the gas on because, if you shut if off, a professional is required to turn your gas back on, and it may be several weeks before you receive service.
- **Turn off propane tanks.** Propane tanks may be damaged or dislodged by strong winds or water. Turning them off reduces the fire potential.
- **Unplug small appliances.** Small appliances may be affected by electrical power surges that may occur as the storm approaches. Unplugging them reduces potential damage.
- **Review your evacuation plan.** Make sure your planned route is the same as the currently recommended route. Sometimes roads may be closed or blocked, requiring a different route.
- **Stay away from floodwater.** If you come upon a flooded road, turn around and go another way. Abandon your vehicle immediately and climb to higher ground if the vehicle becomes surrounded by water or the engine stalls, and if you can safely get out. Most hurricane-related deaths are caused by floods, and most flood fatalities are caused by people attempting to drive through water. The depth of water is not always obvious. The roadbed may be washed out under the water, and you could be stranded or trapped. Rapidly rising water may stall the engine, engulf the vehicle and its occupants, and sweep them away. Two feet (0.6 meter) of water will carry away most automobiles, SUVs, and pickup trucks.
- **Consider a precautionary evacuation of large or numerous animals.** If you think an evacuation might be advised or ordered and if you have large, unusual, or numerous animals, start evacuating them as soon as you are aware of impending danger. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic. The winds or water may be too high, or other hazards may make this too dangerous for you and for them.

What to Do During a Hurricane/Tropical Storm Warning

CORE ACTION MESSAGES

- **Listen to and watch local news.**
- **Evacuate if advised by authorities, or stay inside.**
- **If in a mobile home, evacuate immediately.**
- **Avoid floodwater.**

You should:

- **Use a NOAA Weather Radio or continuously listen to a local station on a portable, battery-powered radio or television.** Hurricanes can change direction, intensity, and speed suddenly.

- **If officials advise you to leave your home, go as soon as possible.** (See Appendix: What to Do if Evacuation Is Necessary Because of a Storm.) Take your Disaster Supplies Kit and go to a shelter or to the out-of-town contact identified in your Family Disaster Plan. Call your contact and tell him or her when you are leaving and where you are going. Local officials will advise you to evacuate only if they conclude that you are in danger. It is important to follow their instructions as soon as possible. Roads may become blocked and the storm can worsen, preventing safe escape.
- **If you evacuate, take your pets with you.** If it is not safe for you, it is not safe for them. Be sure to take your pet disaster kit with you. (See Disaster Supplies Kit for information about what should be in this kit.) Leaving them will endanger not only your pets, but also yourself and emergency responders.
- **If you are not advised to evacuate, stay indoors, away from windows, skylights, and doors, even if they are covered.** Stay on the floor least likely to be affected by strong winds and floodwater. A small interior room without windows on the first floor is usually the safest place. Have as many walls between you and the outside winds as possible. Sometimes strong winds and projectiles may tear hurricane shutters off, so stay away from windows even if they are covered. Lie on the floor under a table or other sturdy object. Being under a sturdy object will offer greater protection from falling objects.
- **Close all interior doors.** Secure external doors. Closed doors will help prevent damaging hurricane winds from entering rooms.
- **Have a supply of flashlights and extra batteries handy.** Flashlights provide the safest emergency lighting source. DO NOT USE CANDLES. Do not use kerosene lamps, which require a great deal of ventilation and are not designed for indoor use.
- **Store drinking water in clean plastic bottles and cooking utensils.** (See Appendix: Storing Water.) Public water supplies and wells may become contaminated, or electric pumps may be inoperative if power is lost. Often, a person's greatest need following a disaster is water.
- Fill bathtubs and sinks with water to use for flushing the toilet and washing floors and clothing. Do not use water that has been stored in glazed tubs or sinks for drinking or to bathe young children because over time lead can leach from the glaze into the water.
- **If power is lost, turn off major appliances to reduce the power surge when electricity is restored.** When electricity is restored, the surge from many major appliances starting at the same time may cause damage or destroy the appliances. Turning off or unplugging major appliances will allow you to decide when it is best to turn them back on.

- **If you are in a mobile home, recheck the tie-downs and evacuate immediately.**
- **Be aware that the calm "eye" is deceptive; the storm is not over.** Once the eye passes over your area, the winds increase and blow from the opposite direction. Trees, shrubs, buildings, and other objects damaged by the first winds can be broken or destroyed by the second winds. The opposing winds begin suddenly and have surprised and injured many people who ventured out during the eye.
- **Watch out for flooding.** Hurricanes and tropical storms often drop large amounts of rain and cause severe flooding, even when they are weakening or are no longer a named storm. "Weak" tropical storms are just as capable of producing heavy rain and flooding as major hurricanes.
- **Be alert for tornadoes.** Tornadoes can happen during a hurricane. If a tornado occurs in connection with a hurricane, remain indoors on a lower level, in the center of your home, in a closet or bathroom without windows.
- **Bring your companion animals indoors and maintain direct control of them.** Be sure that your pet disaster kit is ready to go, along with your family disaster kit, should you need to evacuate.
- **If the storm is predicted to be not very strong and if pastured animals have access to high ground, it is better to let them out into their pastures than to leave them in a barn**, unless that barn is very well constructed and protected. Horses and cattle are able to avoid windborne debris if they have enough area to move. In the last hours before a hurricane or tropical storm hits, it may be safer to do this than to attempt a last-minute evacuation.

What to Do After a Hurricane/Tropical Storm

CORE ACTION MESSAGES
- **Listen to and watch the news.**
- **Watch for floodwater.**
- **Check for dangers inside and outside.**

After a hurricane is over, you should:

- **Continue using a NOAA Weather Radio or listening to a local station on a portable, battery-powered radio or television.** Access may be limited to some parts of the community, or roads may be blocked.
- **If you evacuated, return home when local officials tell you it is safe.** Local officials on the scene are your best source of information about accessible areas and passable roads.
- **Stay alert for extended rainfall and subsequent flooding, even after the hurricane or tropical storm has weakened.** Hurricanes may stall or change direction when they make landfall, or they may bring a lot of rain upriver, causing additional flood hazards for hours or days after the storm.
- **Stay away from floodwater.** Drive only if absolutely necessary and avoid flooded roads and washed-out bridges. Continue to follow all flood safety messages. Floodwaters may last for days following a hurricane. If you come upon a flooded road, turn around and go another way. If you are caught on a flooded road and water is rising rapidly around your vehicle, if you can safely get out of the vehicle, do so immediately, and climb to higher ground. Never try to walk, swim, or drive through swiftly moving water. Most flood fatalities are caused by people attempting to drive through water or people playing in high water. If it is moving swiftly, even water six inches (15 centimeters) deep can sweep you

off your feet, and two feet (0.6 meter) can carry away most vehicles. Also, standing water may be electrically charged from underground or downed power lines.

- **If you come upon a barricade, follow detour signs or turn around and go another way.** Barricades are put up by local officials to protect people from unsafe roads. Driving beyond them can be a serious risk.
- **Help injured or trapped persons.** Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **If someone needs to be rescued, call professionals with the right equipment to help.** Many people have been killed or injured trying to rescue others in flooded areas.
- **Stay away from damaged areas.** Your presence might hamper rescue and other emergency operations, and put you at further risk from the residual effects of floods, such as contaminated water, crumbled roads, landslides, mudflows, and other hazards.
- **Avoid loose or dangling power lines;** immediately report them to the power company or the police or fire department. Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury.
- **Stay out of any building that has water around it.** Floodwater often undermines foundations, causing buildings to sink, floors to crack, or walls to collapse.
- **Wear long pants, a long-sleeved shirt, and sturdy shoes.** The most common injury following a disaster is cut feet.
- **Use battery-powered lanterns or flashlights when examining buildings.** Battery-powered lighting is the safest and easiest. It protects the user, the building occupants, and the building from fire hazards. DO NOT USE CANDLES.
- **Examine walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing.**
- **Look for fire hazards.** There may be broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances. Fire is the most frequent hazard following floods.
- **Check for gas leaks.** If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly. Turn off the gas, using the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
- **Look for electrical system damage.** If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.
- **Check for sewage and water line damage.** If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company, and avoid using water from the tap. You can obtain safe water from undamaged water heaters or by melting ice cubes made before the hurricane struck. Turn off the main water valve before using water from these sources.
- **Avoid drinking or preparing food with tap water until you are certain it is not contaminated.** Hurricane-driven floodwater may have contaminated public water supplies or wells. Local officials should advise you on the safety of the drinking water.
- **Check refrigerated food for spoilage.** (See Appendix: Keeping Refrigerated Food Safe if the Power Goes Out.) If power was lost, some foods may be spoiled. If in doubt, throw it out.

- **Watch out for animals,** especially poisonous snakes, that may have come into buildings with the floodwater. Use a stick to poke through debris. Floodwater flushes many animals and snakes out of their homes.
- **Watch for loose plaster, drywall, and ceilings that could fall.**
- **Take pictures of the damage, both of the building and its contents, for insurance claims.**
- **Open windows and doors to ventilate and dry your home.**
- **Pump out flooded basements gradually (about one-third of the water per day) to avoid structural damage.** If the water is pumped out completely in a short period of time, pressure from water on the outside could cause basement walls to collapse.
- **Service damaged septic tanks, cesspools, pits, and leaching systems as soon as possible.** Damaged sewage systems are health hazards.
- **Use the telephone only for emergency calls.** Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls to get through.
- **Watch animals closely.** Keep all your animals under your direct control. Pets may become disoriented, particularly if the disaster has affected scent markers that normally allow them to find their home. Pets may be able to escape from your home or your fence may be broken. Be aware of hazards at nose and paw or hoof level, particularly debris, spilled chemicals, fertilizers, and other substances that might not seem to be dangerous to humans. In addition, the behavior of pets may change dramatically after a disaster, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

For information on **portable-generator safety** and **carbon monoxide poisoning,** see Appendix: Portable Generators.

Media and Community Education Ideas

- Ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of hurricanes and the importance of evacuating when authorities advise it.
  - -Do a story featuring interviews with local officials about land-use management and building codes for coastal areas.
  - -Highlight the importance of staying informed about local weather conditions.
  - -Run public service ads about how to protect lives and property in a hurricane.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office and local American Red Cross chapter.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

- Sponsor a "Helping Your Neighbors" program at your local schools to encourage students to think about how to help people who require special assistance, such as elderly people, infants, or people with disabilities, and the people who care for them.

- Provide hurricane tracking charts to local schools.
- At the beginning of each hurricane season, encourage the emergency response organizations to review community hurricane disaster plans.
- Publicize and promote a hurricane awareness week.
- Stage a simulated evacuation to show your community what can happen.
- Periodically inform your community of local public warning systems.
- Publish emergency evacuation routes.

Facts and Fiction

Fiction: It is safe to go outside during the "eye" of the hurricane.
Facts: It is not safe to go outside during the "eye" of the hurricane. You have no way of knowing how long the light winds will last. Strong winds will return very quickly from the opposite direction. Stay indoors.

Fiction: Evacuations are ordered only because of liability.
Facts: Evacuations are ordered because there is a real danger of storm surge.

Fiction: Hurricanes strike only southern states.
Facts: Hurricanes have hit the coast from Texas to Maine.

Fiction: Hurricanes/tropical storms strike only during the official hurricane season of June 1 through November 30.
Facts: Hurricanes/tropical storms sometimes occur before or after the hurricane season. Tropical Storm Anna happened in April 2003. Hurricane Lili occurred in late December 1984.

Fiction: Hurricane destruction occurs only along the coast.
Facts: A hurricane's effects (flooding, tornado, and wind damage) can be felt well inland. For instance, during Hurricane Hugo (September 10-22, 1989), Charlotte, N.C., which is 100 miles (161 kilometers) inland, experienced winds of 87 miles (140 kilometers) per hour, resulting in a swath of downed trees and power lines 50 miles (80 kilometers) wide.

Fiction: Taping windows protects them as effectively in a hurricane as boarding them up.
Facts: Taping does not prevent windows from breaking and takes critical time from more effective preparedness measures. All tape does is help prevent broken glass from scattering inside your home.

Fiction: Water stored in bathtubs and sinks is a good source of drinking water if the public water supply is interrupted or contaminated.
Facts: Over time, lead can leach from the glaze in bathtubs and sinks into water stored in them. Water stored in bathtubs and sinks should never be used for drinking or for bathing young children. You can use water stored in bathtubs and sinks for tasks such as flushing the toilet or washing the floor or clothing.

Landslides

Learn if landslides, including debris flows, could occur in your area by contacting local officials, your state geological survey or department of natural resources, or the geology department of a state university. Get information on specific locations that are vulnerable to landslides. Request a professional referral for a detailed landslide-vulnerability analysis of your property, and take corrective measures if necessary.

AWARENESS MESSAGES

Why talk about landslides?

Landslides are a serious geologic hazard that occurs in almost all 50 states. Every year in the United States, they cause significant damages and 25 to 50 deaths. Globally, landslides cause billions of dollars in damages and thousands of deaths and injuries each year.

Debris flows—"muddy" or "liquefied" landslides—are most destructive when they are caused by volcanic eruptions. A spectacular example of a massive debris flow resulted from the 1980 eruptions of Mount St. Helens in Washington State. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same type of flows during future volcanic eruptions.

Wildfires can also lead to destructive debris flows. In July 1994, a severe wildfire swept Storm King Mountain in Colorado, denuding the slopes of vegetation. Heavy rains on the mountain in September resulted in numerous debris flows, one of which blocked Interstate 70 and threatened to dam the Colorado River.

What are landslides, and what causes them?

The term "landslide" describes many types of downhill earth movements ranging from rapidly moving catastrophic rock avalanches and debris flows in mountainous regions to more slowly moving earth slides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is generally the force driving landslide movement. Factors that trigger landslide movement include heavy rainfall, erosion, poor construction practices, freezing and thawing, earthquake shaking, and volcanic eruptions. Landslides are typically associated with periods of heavy rainfall or rapid snowmelt and tend to worsen the effects of flooding. Areas burned by forest and brush fires are particularly susceptible to landslides.

Debris flows—sometimes referred to as mudslides, mudflows, lahars, or debris avalanches—are common types of fast-moving landslides. These flows generally occur during periods of heavy rainfall or rapid snowmelt. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles (16 kilometers) per hour, but can exceed 35 miles (56 kilometers) per hour.

The consistencies of debris flows range from watery mud to thick, rocky mud that can carry such large items as boulders, trees, and cars. Debris flows from many different sources can combine in channels, and, when this happens, their destructive power can increase greatly as they flow downhill and through channels, growing in volume with the addition of water, sand, mud, boulders, trees, and other materials. When the flows reach flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas.

How do landslides affect us?
Landslides cause property damage, injury, and death and adversely affect a variety of resources. For example, water supplies, fisheries, sewage disposal systems, forests, dams, and roadways can be affected for years after a slide event.

The negative economic effects of landslides include the cost to repair structures, loss of property value, disruption of transportation routes, medical costs in the event of injury, and indirect costs, such as lost timber and fish stocks. Water availability, quantity, and quality can be affected by landslides. Geotechnical studies and engineering projects to assess and stabilize potentially dangerous sites can be costly.

How can I protect myself from landslide?
Landslides generally happen where they have occurred in the past, and in identifiable hazard locations. Areas that are prone to landslides include existing old landslides, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used.

Areas that are typically considered safe from landslides include areas that have not moved in the past; relatively flat areas away from sudden changes in slope; and areas at the top of or along ridges, but set back from the edge of slopes.

People can reduce their personal risk by learning about potential local landslide hazards and taking steps to reduce those hazards.

Landslides are usually isolated events occurring without public warning. If you live in a landslide-prone area, be alert, particularly during periods of heavy rainfall or snowmelt or after a wildfire. If you see signs of a landslide or suspect a landslide may occur, you yourself must make the decision to evacuate.

What is the best source of information in a landslide situation?
The best source of information in a landslide situation is a local radio or television station.

ACTION MESSAGES
Be Prepared for a Landslide
Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Prepare members of your household.**
- **Consult an expert and correct potential problems.**
- **Be alert to changes and patterns in the land.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household at risk from landslides should take landslide-specific precautions and plan for and practice what to do if a landslide occurs.

If you are at risk from landslides, you should:

- **Develop an evacuation plan.** If your home could be damaged in a landslide, you should know where to go if you have to leave. Making plans at the last minute can be upsetting, create confusion, and waste precious time. Contact local authorities to learn about the emergency response and evacuation plans for your area and develop your own emergency plans for your family and business.
- **Familiarize yourself with the land around you.** Knowing the land can help you assess your risk.
- **Watch the patterns of storm water drainage on slopes near your home** and especially the places where runoff water converges, increasing flow over soil-covered slopes. Watch the hillsides around your home for any signs of land movement, such as small landslides or debris flows, or progressively tilting trees. Noticing small changes could alert you to an increased threat of a landslide.
- **Discuss landslides and debris flows with members of your household.** Everyone should know what to do to stay safe if one occurs.
- **Be aware that, generally, landslide insurance is not available;** however, in some cases, debris flow damage may be covered by flood insurance policies from the National Flood Insurance Program (NFIP) (www.fema.gov/nfip).

What to Do During Severe Storms, Which Can Trigger Landslides

CORE ACTION MESSAGES
- **Monitor local news.**
- **Consider evacuating.**
- **Look and listen for signs of landslide.**

During a severe storm, if you are in an area susceptible to landslides, you should:

- **Stay alert and awake.** Many landslide fatalities occur when people are sleeping.
- **Listen to local stations on a portable, battery-powered radio or television or to NOAA Weather Radio** for warnings of heavy rainfall. Be aware that short bursts of heavy rain may be particularly dangerous, especially after longer periods of heavy rain and damp weather.
- **Consider leaving if it is safe to do so.** Remember that driving during a severe storm can be hazardous. If you remain at home, move to a second story if possible. Staying out of the path of a landslide or debris flow can save your life.
- **Listen for any unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together.** A trickle of flowing or falling mud or debris may precede a large landslide. Moving debris can flow quickly and sometimes without warning.
- **If you are near a stream or channel, be alert for any sudden increase or decrease in water flow and for a change from clear to muddy water.** Such changes may indicate landslide activity upstream, so be prepared to move quickly. Act quickly. Save yourself, not your belongings.
- **Be especially alert when driving.** Embankments along roadsides are particularly susceptible to landslides. Watch the road for collapsed pavement, mud, fallen rocks, and other indications of a possible debris flow.
- **Bring your companion animals indoors and maintain direct control of them.** Be sure that your pet disaster kit is ready to go, along with your family disaster kit, should you need to evacuate.
- **Consider a precautionary evacuation of large or numerous animals.** If you think an evacuation might be advised or ordered and if you have large, unusual, or numerous animals, start evacuating them as soon as you are aware of impending danger. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic. Road hazards may make this too dangerous for you and for them.
- **If you are ordered to or decide to evacuate, take your animals with you.** If it is not safe for you, it is not safe for your animals.

What to Do if You Suspect Imminent Landslide Danger

CORE ACTION MESSAGES
- **Contact local officials.**
- **Inform your neighbors.**
- **Get out.**

If you learn or suspect that a landslide is occurring or about to occur in your area, you should:

- **Contact your local fire, police, or public works department.** Local officials are the people best able to assess the potential danger.
- **Inform affected neighbors.** Your neighbors may not be aware of the potential hazard. Advising them of a threat may help save lives. Help neighbors who may need assistance to evacuate.
- **Leave.** Getting out of the path of a landslide or debris flow is your best protection. Take your pets with you when you leave, provided you can do so without endangering yourself.

What to Do During a Landslide

CORE ACTION MESSAGE

- **Get out of the landslide's path.**

If a landslide occurs, you should:

- **Quickly move out of the path of the landslide.** Moving away from the path to a stable area will reduce your risk.

What to Do After a Landslide

CORE ACTION MESSAGES

- **Stay away from the slide area.**
- **Help others.**
- **Report hazards.**

After a landslide, you should:

- **Stay away from the slide area.** There may be danger of additional slides.
- **Check for injured and trapped persons and animals near the slide, without entering the slide area.** Direct rescuers to their locations.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Listen to local stations on a portable, battery-powered radio or television** for the latest emergency information.
- **Watch for flooding,** which may occur after a landslide or debris flow. Floods sometimes follow landslides and debris flows.
- **Look for and report broken utility lines to appropriate authorities.** Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury.
- **Check your home's foundation, chimney, and surrounding land for damage.**
- **Replant damaged ground as soon as possible** because erosion caused by loss of ground cover can lead to flash flooding.

Media and Community Education Ideas

- If your area is prone to landslides, ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of landslides and debris flows.
  - -Do a story featuring interviews with local officials about land use management, zoning regulations, and building codes for landslide safety.
  - -Highlight the importance of staying alert to land and rainfall conditions.
  - -Run public service ads about how to protect lives and property in a landslide.
  - -Report on what city and county governments are doing to reduce the possibility of landslides.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office, local American Red Cross chapter, and state geological survey or department of natural resources.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

- Support your local government in efforts to develop and enforce land use and building ordinances that regulate construction in areas susceptible to landslides and debris flows. Buildings should be located away from steep slopes, streams and rivers, intermittent-stream channels, and the mouths of mountain channels.

Facts and Fiction

Fiction: Landslides are caused by the earth collapsing into a hole or a void.
Facts: Landslides exhibit vertical and horizontal movement down a slope, and most are triggered by heavy rain and snowmelt, earthquake shaking, volcanic eruptions, and gravity.

Fiction: Landslides are caused by human activities such as logging, road construction, and farming on steep slopes.
Facts: Although human activities may cause landslides on unstable slopes, most landslides are caused by natural forces or events, such as heavy rain and snowmelt, earthquake shaking, volcanic eruptions, and gravity.

Fiction: Landslides occur only on the West Coast.
Facts: California and the Pacific Northwest experience numerous landslides; however, landslides also occur in most states and territories in the United States. The Appalachian Mountain region on the East Coast, Puerto Rico, and Hawaii are highly susceptible to landslides.

Nuclear Power Plant Incidents

Find out what could happen to you. If there is a nuclear power plant in your area, contact the plant's community relations officials or contact local, state, or federal emergency planners. Ask about specific hazards that could affect people in your area, and find out about your area's warning system.

AWARENESS MESSAGES

Why talk about nuclear power plants?

Nuclear power plants operate in most states in the country and produce about 20 percent of the nation's power. Nearly three million people live within 10 miles (16 kilometers) of an operating nuclear power plant.

Nuclear power plants use the heat generated from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity. Nuclear radiation is a by-product of nuclear fission, and radioactive particles released into the air can be harmful to people, animals, crops, and the environment.

Although the construction and operation of nuclear power plants are closely monitored and regulated by the Nuclear Regulatory Commission (NRC), accidents at these plants are possible. An accident at a nuclear power plant could release dangerous levels of radiation that could affect the health and safety of the people living near the plant.

What plans are in place in case of an emergency?

Local and state governments, federal agencies, and electric utility companies have emergency response plans that would be activated in the event of a nuclear power plant emergency. The plans define two "emergency planning zones." The first zone covers the area within a 10-mile (16-kilometer) radius of the plant, where it is possible that people could be harmed by direct radiation exposure. The second zone covers a broader area, usually up to a 50-mile (80-kilometer) radius from the plant, where radioactive materials could contaminate water supplies, food crops, and livestock.

Find out if you live in a nuclear power plant "emergency planning zone," and, if you do, determine if you are in the first or second zone. Learn what actions you should take if there is an accident at the nuclear power plant.

What is radiation?

Radioactive materials are composed of atoms that are unstable. An unstable atom gives off its excess energy until it becomes stable. The energy emitted is radiation.

Each of us is exposed to radiation daily from natural sources, including the sun and earth. Small traces of radiation are present in food and water.

Radiation has a cumulative effect. The longer a person is exposed to radiation, the greater the risk. A high exposure to radiation can cause serious illness or death.

What is the potential danger from a nuclear power plant accident?
The potential danger from an accident at a nuclear power plant is exposure to radiation. This exposure could come from the release of radioactive material from the plant into the environment. The area the radioactive material may affect is determined by the amount released from the plant, wind direction and speed, and weather conditions. The major hazards to people in the vicinity are radiation exposure to the body and inhalation and ingestion of radioactive materials.

How can I protect myself in case of a nuclear power plant accident?
The three basic ways to reduce your exposure are through:

- **Time.** Decrease the amount of time you spend near the source of radiation.
- **Distance.** Increase your distance from a radiation source.
- **Shielding.** Increase the shielding between you and the radiation source. Shielding is anything that creates a barrier between people and the radiation source. Depending on the type of radiation, the shielding can range from something as thin as a plate of window glass or as thick as several feet of concrete. Being inside a building or a vehicle can provide shielding from some kinds of radiation.

What is the best source of information in case of a nuclear power plant accident?
If an accident at a nuclear power plant were to release radiation in your area, local authorities would activate warning sirens or another approved alerting system. They would also use the Emergency Alert System (EAS) on local television and radio stations to advise you about how to protect yourself.

ACTION MESSAGES
Be Prepared for a Nuclear Power Plant Accident

CORE ACTION MESSAGES

- **Determine your risk.**
- **Prepare household members.**
- **Learn the alert system.**
- **Make plans and practice them.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should make specific plans for what to do in the event of a nuclear power plant accident and practice the plans.

- **Learn the terms used to describe nuclear power plant emergencies** so you will quickly understand what actions you and members of your household should take in case of a nuclear power plant accident. See the box below for a list of important terms.
- **Learn about your community's warning system.** Nuclear power plants are required to install sirens and other warnings (for example, flash warning lights) to cover a 10-mile (16-kilometer) area around the plant. Find out when the warning system in your area will be tested. When it is tested, determine if you can hear the sirens and/or see the flash warning lights from your home. If you cannot, contact plant officials and let them know.

- **Obtain public emergency information materials** from the power company that operates your local nuclear power plant or from your local emergency services office. If you live within 10 miles of the power plant, you should receive these materials annually from the power company or your state or local government.
- **Learn the emergency plans for the schools, day care centers, nursing facilities, offices, and other places where members of your household spend time.** Find out where people in these places would go in case of evacuation.
- **Stay tuned to local radio and television stations.** Stay aware of events and conditions in your area by tuning to a local radio or television station.
- **Consider your transportation options in case you have to evacuate.** If you do not own or drive a car, ask your local emergency manager about plans for people without private vehicles.
- **Practice your Family Disaster Plan** and practice the steps recommended by the power company to protect yourself from radiation in the event of a nuclear power plant incident.

See “Evacuation and Sheltering, and Post-disaster Safety” for more information.

Terms Used to Describe a Nuclear Power Plant Emergency

- **Notification of Unusual Event**—A problem has occurred at the plant, but no radiation leak is expected. Federal, state, and county officials will be told right away. No action on your part is necessary.
- **Alert**—A problem has occurred at the plant, and small amounts of radiation could leak inside the plant. This will not affect you. No action on your part is necessary.
- **Site Area Emergency**—A more serious problem has occurred at the plant, and small amounts of radiation could leak from the plant. If necessary, state and county officials will act to ensure public safety. Area sirens may sound. Listen to local radio or television stations for information.
- **General Emergency**—A very serious problem has occurred at the plant, and radiation could leak outside the plant and off the plant site. Area sirens will sound. Listen to local radio or television stations for information. State and county officials will act to ensure public safety. Be prepared to follow instructions promptly.

What to Do During a Nuclear Power Plant Emergency

CORE ACTION MESSAGES
- **Follow local instructions.**
- **Evacuate or stay inside as advised.**

- **Listen carefully to the warning.** Not all incidents result in the release of radiation. The incident could be contained inside the plant and pose no danger to the public.
- **Stay tuned to a local radio or television station.** Local authorities will provide specific information and instructions. The advice given will depend on the nature of the emergency, how quickly it is evolving, and how much radiation, if any, is likely to be released.
- **Be aware that local instructions should take precedence over any advice given on national broadcasts or in books.**
- **Review the public information materials you received from the power company or government officials.**
- **Evacuate if you are advised to do so.**
  - Close and lock doors and windows.
  - Keep car windows and vents closed; use re-circulating air.
  - Listen to a local radio station for evacuation routes and other instructions.
  - Keep your pets with you and take them with you if you evacuate. You will not be allowed to return for them until local authorities say that it is safe to return.

  See chapter on "Evacuation and Sheltering, and Post-disaster Safety" for important details.
- **If you are not advised to evacuate, remain indoors.**
  - Shelter livestock and give them stored feed, if time permits.
  - Bring pets indoors with you.
  - Close doors and windows.
  - Turn off the air conditioner, ventilation fans, furnace, and other air intakes.
  - Go to a basement or other underground area if possible.
  - Keep a battery-powered radio with you at all times.
  - Use the telephone only to report life-threatening emergencies. Lines will be needed for emergency calls.
  - Wash uncovered food before eating it.
- **If you suspect you have come into contact with radioactive particles:**
  - Take a thorough shower.
  - Change your clothes and shoes.
  - Put exposed clothing in a plastic bag.
  - Seal the bag and place it outside.
  - If you suspect that your pets have also come into contact with radioactive materials, shower with your pet if at all possible. If you shower first and then deal with your pet, you may re-contaminate yourself. Be sure to lather fur and rinse thoroughly. Afterward, keep direct control of your pet to control what it contacts.

What to Do After a Nuclear Power Plant Emergency

CORE ACTION MESSAGES

- **Stay where you are until local officials say otherwise.**
- **Get medical treatment for unusual symptoms.**

- **If you were told to evacuate, do not return home until local authorities say it is safe.**
- **If you were advised to stay in your home, do not go outside until local authorities say it is safe.**
- **Get medical treatment for any unusual symptoms, like nausea, that may be related to radiation exposure.**
- **Until local authorities say it is safe, do not return home or, if you are sheltering at home, do not allow your pets to go outdoors for any reason.**

Facts and Fiction

Fiction: People exposed to radiation "glow" with radioactivity.
Facts: Radioactive material can burn the human body, but exposed people do not become radioactive themselves. Radiation never causes a person to "glow."

Fiction: I should stay well away from people who have been exposed to radioactive particles because, if I get too close, they will contaminate me.
Facts: While people exposed to radioactive particles may be burned and may become sick, as long as they do not have radioactive fallout or particles on their clothing or skin, they are not "carriers" of radioactivity. An exposed person cannot pass his or her exposure on to you.

Page NP-6 blank

Terrorism

What is terrorism?

Terrorism is the use of force or violence against persons or property for the purpose of intimidation, coercion, or ransom. Terrorists often use violence and threats to create fear among the public, to try to convince people that their government is powerless to prevent acts of terrorism, and to get immediate publicity for their causes.

Acts of terrorism can range from threats to actual assassinations, kidnappings, airline hijackings, bomb scares, car bombs, building explosions, mailings of dangerous materials, agroterrorism, computer-based attacks, and the use of chemical, biological, and nuclear weapons—weapons of mass destruction (WMD).

Why talk about terrorism?

In addition to the natural and technological hazards described elsewhere in this guide, people face threats of terrorism posed by extremist groups, individuals, and hostile governments. Terrorists can be domestic or foreign, and their threats to people, communities, and the nation range from isolated acts of terrorism to acts of war.

High-risk terrorism targets include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. They are capable of spreading fear by sending explosives or chemical and biological agents through the mail.

STAY INFORMED: KNOW HOW YOU WOULD RECEIVE ALERTS, WARNINGS, AND EMERGENCY INSTRUCTIONS

Officials will provide alerts, warnings, and emergency instructions to the general public, nearly always by radio and television. Sirens, ring-down telephone systems, and other warning systems may also be used. Broadcast stations (radio and television) licensed by the Federal Communications Commission (FCC) are required to participate in the Emergency Alert System (EAS) and broadcast warnings. Many cable television networks also carry emergency warnings and instructions. NOAA Weather Radio disseminates advisories, watches, and warnings through essentially the same radio and television stations, as well as directly through NOAA Weather Radio. In addition, many communities have specific sirens,

What is the Homeland Security Advisory System?

The Homeland Security Advisory System is a mechanism for disseminating information about the current risk of terrorist acts to federal, state, and local authorities and, through them and the media and to the public. The system provides graduated warnings—called threat conditions—that mandate increasing security measures as the risk of an act of terrorism increases. Each threat condition triggers a corresponding set of protective measures by federal departments and agencies to reduce vulnerability and increase response capability, including situation reports and, as appropriate, recommendations to states and local governments. You will be informed by local officials if you need to take specific actions where you live and work.

Preparedness and Threat Conditions
Under the Homeland Security Advisory System

The five threat conditions are:

Low (green): low risk of terrorist attacks
Guarded (blue): general risk of terrorist attacks
Elevated (yellow): significant risk of terrorist attacks
High (orange): high risk of terrorist attacks
Severe (red): severe risk of terrorist attacks

What is the best source of information in the event of a terrorist act?

In case of a terrorist act of any kind, you should pay close attention to official instructions via radio, television, and whatever other means of alert, warning, and providing instructions officials may use. In the immediate area of a terrorist act, officials of the local police, fire, and other safety departments are the best sources of information and instructions.

What general precautions can I take in advance to protect myself from a terrorist act?

Many of the steps you should take to prepare for the possibility of a terrorist act are the same steps you should take to prepare for natural or technological disasters: Stay informed; make a Family Disaster Plan and keep it up to date; assemble and maintain a Disaster Supplies Kit; learn and practice evacuation and sheltering procedures; and prepare for any special protective measures included in your plan.

Within the immediate area of a terrorist act, you would need to rely on police, fire, and other officials for instructions. However, you can be ready for terrorism in much the same way you would stay alert for other emergencies.

You should:

- Be aware of your surroundings.
- Move or leave if you feel uncomfortable or if something does not seem right.
- Be prepared to evacuate or to take shelter if officials instruct you to do so.
- Take precautions when traveling.
  - -Be aware of conspicuous or unusual behavior.
  - -Do not accept packages from strangers.
  - -Do not leave luggage unattended.
  - -Promptly report unusual behavior, suspicious or unattended packages, and strange devices to the police or security personnel.

- Learn where emergency exits are located in buildings you frequent. Plan how to get out in the event of an emergency.
- Know the location and availability of hard hats in buildings in which you spend a lot of time.
- Ask if your local radio and television stations participate in the Emergency Alert System (EAS).
- Be prepared to do without services you normally depend on—electricity, telephones, natural gas, gasoline pumps, cash registers, ATMs, and Internet transactions.
- Work with apartment and office building owners to ensure that the following items are located on each floor of the building:
  -Portable, battery-operated radio and extra batteries
  -Several flashlights and extra batteries
  -First aid kit and manual
  -Hard hats and dust masks
  -Bright colored tape to rope off dangerous areas

Employers:
If you are an employer—

- Make sure your workplace has a building evacuation plan that is regularly practiced.
- Take a critical look at your heating, ventilation, and air conditioning system to determine if it is secure or if it could feasibly be upgraded to better filter potential contaminants, and be sure you know how to turn it off if you need to.
- Think about what to do if your employees cannot go home.
- Make sure you have appropriate supplies on hand.

Respond Appropriately to Increases in the Five Threat Conditions of the Homeland Security Advisory System
To be prepared, no matter what the threat condition under the Homeland Security Advisory System, **you should:**

- Learn what the five threat conditions mean, and make sure members of your household know too.
- Discuss with children their fears about terrorists, terrorist attacks, or other hazards they may reveal as frightening to them.
- Update your Disaster Supplies Kit, emergency supplies for your vehicle, and Family Disaster Plan.
- Consider expanding your Family Disaster Plan by developing more detailed plans for communications with household members and out-of-area contacts.
- Choose the room your household would use to shelter-in-place for a short time, and gather and prepare the items needed to seal the room.

- Plan for someone to take care of your pets, even evacuating them if necessary, in case you are not home in an emergency but the pets are. Make sure the person is familiar with your pet, knows where the pet's emergency kit is and to take it along, and knows how to reach you so you can be reunited with your pet.
- Also choose the room or space for a tornado shelter and protection from radiation, preferably in the basement (See Appendix: "Wind Safe Room"), or for protection against a chemical agent, choose a room on a higher floor, preferably an inner room most easily sealed against outside air in which to "Shelter-in-Place".
- Learn what the plans are for each threat condition at your workplace, at your children's schools or daycare centers, or any other place members of your household spend time.
- Check with school officials to determine their plans for an emergency and procedures to reunite children with parents and caregivers.
- If you live in an apartment building, discuss with the building manager what preparations management has made and exactly what you should do during an emergency.
- If you have a mobility problem or other special need, make emergency plans for warning, evacuation, and shelter with your family, friends, employer, co-workers, and building manager.
- Contact your neighbors to discuss their plans and needs.
- Develop alternative routes to and from school, work, and other places to which you routinely travel. Have all drivers in your household practice them.
- Learn your community's public warning system. Learn what the warning signals sound like and what you should do when you are notified.
- Keep informed by routinely listening to a local radio or television station.
- In addition to your Family Disaster Plan, be prepared with a disaster plan at work, at school, or wherever you spend considerable time.
- Learn where emergency exits are located in buildings you frequent.
- Notice where exits are when you enter unfamiliar buildings.
- Plan how to get out of a building, subway, congested public area, or traffic in an emergency.
- Notice where staircases are located.
- Notice heavy or breakable objects that could move, fall, or break in an explosion.
- Ensure that you and your family can continue functioning even if you cannot return home by regularly updating the important documents you keep in safe places inside and outside your home. In your primary family vehicle, keep a copy of your Family Disaster Plan and copies of other items or information you would need if something were to prevent you or other family members from returning home for several days, or even longer. (Your Family Disaster Plan contains the phone numbers of family members and out-of-town contacts; postal and email addresses; prescription numbers and the phone numbers of prescribing physicians.)

In response to elevated threat conditions under the Homeland Security Advisory System:

- If the Homeland Security Advisory System threat condition is yellow (significant risk):
  -Be extra observant and report any suspicious activity to authorities.
- If the threat condition is orange (high risk), to the steps for yellow, add:
  -Avoid high-profile or symbolic locations.
  -Exercise caution when traveling.
  -If a need is announced, donate blood at a designated blood collection center.
- If the threat condition is red (severe risk), to the steps for orange and yellow, add:

-Follow official instructions about restrictions to normal activities.
-Contact your employer to determine whether or not to go to work.
-Avoid public gathering places, such as sports arenas, fairgrounds, theme parks, or other high-risk locations.
-Keep listening to a local radio or television station for possible warnings or instructions.
-Prepare to shelter-in-place or evacuate if instructed to do so by officials.

Get training in first aid and CPR/AED. Contact your local chapter of the American Red Cross for information.

Specific Types of Terrorism

What can I do to protect myself and my family from specific types of terrorism?

While there are general precautions you and your family can take to help prepare for various types of disasters, many protective measures, such as those that follow, are addressed to one or more specific kinds of hazards and the nature of the threats they pose.

Shelter-in-place applies to different types of terrorist attacks, but details vary. For example, you would use duct tape and plastic sheeting to seal an internal room against chemical agents. For sheltering against radiation dispersed by a radiological dispersion device (RDD or "dirty bomb") or radioactive fallout particles after a nuclear explosion, you would normally prefer a basement shelter to a higher floor; duct tape and plastic would help keep radioactive dust out, but primary protection from radioactive particles would be achieved by applying the principles of mass, distance, and time (see Factors for Protection From Radioactive Fallout).

Preparedness measures for the most commonly known and logically anticipated possibilities are covered in the following sections.

I. BUILDING EXPLOSION

What can I do before a terrorist attack to protect myself and my family from building explosions?

The most common terrorist attacks, those that have caused the most casualties and damage, have been explosions.

Being Prepared for an Explosion

Explosions can collapse buildings and cause fires. **If you live or work in a large or multi-level building, or visit one frequently, you should:**

- Know where emergency exits are located.
- Review and practice emergency evacuation procedures.

- Make sure that the following items are on your floor of the building and you know where to find them:
  - -Fire extinguishers in working order. (Make sure you know how to use them.)
  - -A portable, battery-operated radio or television and extra, fresh batteries.
  - -Flashlights and extra, fresh batteries.
  - -Hard hats.
  - -First aid kit and first aid manual.
  - -Bright-colored tape to rope off dangerous areas.

If an Explosion Occurs at Work or in a Public Building, Sports Arena, or Stadium

- Leave the building as quickly as possible. Do not stop to retrieve anything or to make phone calls.
- Take the stairs, not an elevator.
- If things are falling around you, get under a sturdy table or other object that can shield you until they stop falling. Then leave quickly, watching for weakened floors and stairs and falling debris as you exit.
- In an open arena or stadium without a dome, the open field may be the safest place, however crowded, until things stop falling.
- If there is a fire, stay low to the floor and exit the building as quickly as possible.

(For further information, see chapter on “Fire, Residential.”)

If you are trapped by debris*:*

- Do not light a match.
- Do not move about or stir up dust.
- Cover your mouth with a densely woven handkerchief or clothing.
- Rhythmically tap on a pipe or wall so that rescuers can hear where you are.
- Use a whistle if one is available.
- Shout only as a last resort when you hear sounds and think someone will hear you. Cover your mouth and nose with a handkerchief or cloth instantly after each shout to prevent dust inhalation. Shouting can cause a person to inhale dangerous amounts of dust.

II. CHEMICAL WEAPONS

What are chemical weapons of mass destruction (WMD) and what can I do to protect myself and my family?

Chemical agents are poisonous vapors, aerosols, liquids, and solids that have toxic effects on people, animals, or plants. They can be released by bombs or sprayed from aircraft, boats, and vehicles. They can be used as a liquid to create a hazard to people and the environment. Some chemical agents may be odorless and tasteless. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (2 to 48 hours). Chemical agents that are potentially lethal are difficult to deliver in lethal concentrations. Outdoors, the agents often dissipate rapidly. Chemical agents are also difficult to produce.

A chemical attack could come without warning. Signs of a chemical release include people having difficulty breathing, experiencing eye irritation, losing coordination, becoming nauseous, or having a burning sensation in the nose, throat, and lungs. Also, the presence of many dead insects or birds may indicate a chemical agent release.

What to Do to Be Prepared for a Chemical Weapon

- Check your Disaster Supplies Kit to make sure you have available and ready to use:
  -A roll of duct tape (recommended thickness of 10 millimeters) and scissors.
  -Plastic sheeting for doors, windows, and vents for the room in which you will shelter-in-place. To save critical time during an emergency, pre-measure and pre-cut the plastic sheeting for each opening (recommended thickness of 4 to 6 millimeters or greater).
- You may want to store these items that you would use to seal a room against chemical agents in the internal room selected as the place to shelter-in-place.
- Choose an internal room to shelter in, preferably one without windows and on the highest level.
- Pet owners should encourage local health authorities to have plans for people and their pets to be decontaminated together, where they can be treated quickly, to prevent repeated cross-contamination.

How to Shelter-in-Place (Chemical Incident)

Note: The following information is for safety in the event of a chemical incident. For information about where to go in the event of a nuclear/radiological incident (fallout shelter), see below.

If officials advise people in a specific area to **shelter-in-place** because of a short-term chemical release, **households should have the following in the shelter-in-place room:**

- Plastic sheeting pre-cut to fit room openings. (Cut the plastic a minimum of 6 inches wider than each opening. The thickness of the plastic should be 4 to 6 millimeters or greater.)
- Duct tape and scissors. (The thickness of the duct tape should be 10 millimeters or greater.)

A shelter-in-place room should be an interior room, preferably one without windows, that you can seal to block out air that may be contaminated by the short-term release of hazardous chemical agents. The room should be above the ground-level floor. In the case of a chemical threat, an above-ground location is preferable because some agents are heavier than air and may seep into basements even if the windows are closed.

Guidelines for sheltering-in-place are based on the need to shelter for only a few hours— more than sufficient time for a short-term release of airborne agents to dissipate. Ten square feet of floor space per person will provide sufficient air to prevent carbon dioxide build-up for up to five hours, assuming each person is resting and breathing at a normal rate. The cloud released by a terrorist's chemical weapon would have dissipated within three hours.

However, local officials are unlikely to recommend the public shelter in a sealed room for more than 2-3 hours because the effectiveness of such sheltering diminishes with time as the contaminated outside air gradually seeps into the shelter. At this point, evacuation from the area is the better protective action to take. In any event, follow instructions from local officials, and ventilate the shelter when the emergency has passed to avoid breathing contaminated air still inside the shelter.

What to Do During a Chemical Attack

The following are guidelines for what you should do in a chemical attack.

If you are instructed to shelter-in place in your home or office building, you should:

- Close and lock all windows and exterior doors.
- Keep your pets with you, and have additional food, water, and cleaning supplies for them.
- Turn off all ventilation, including furnaces, air conditioners, vents, and fans.
- Move to shelter in an internal room and take your Disaster Supplies Kit. Be sure you have a working battery-powered radio.
- Seal the room with duct tape, plastic sheeting, and modeling clay. Use duct tape with a minimum thickness of 10 millimeters and pre-cut plastic sheeting with a thickness of 4 to 6 millimeters or greater to seal all cracks around doors, windows, and vents, and all wall plugs, switch plates, and cables. Use duct tape to seal around pipes and to seal off drains or other such openings.
- If you are told there is danger of explosion, close the window shades, blinds, or curtains.
- Call your emergency contact. Ideally your room will have a hard-wired telephone. Cellular telephone service may be overwhelmed or damaged during an emergency. You will need a working phone if you have to report a life-threatening emergency.
- Keep listening to your radio or television until you are told all is safe or you are told to evacuate. Local officials may call for evacuation in specific areas at greatest risk in your community.

At home:

- Close the fireplace damper.
- Bring your pets with you, and be sure to bring additional food and water for them.
- Keep pets under your direct control. If you have to evacuate, you will not lose time trying to find them.
- Have plenty of plastic bags and newspapers (puppy training pads are also useful for this), as well as containers and cleaning supplies to deal with pet waste.

If you are caught in an unprotected area, you should:

- Move away immediately.
- Get upwind of the contaminated area.
- Find shelter as quickly as possible.

What to Do After a Chemical Attack

Decontamination is needed within minutes of exposure to minimize health consequences. Do not leave the safety of a shelter to go outdoors to help others until authorities announce it is safe to do so.

A person affected by a chemical agent requires immediate medical attention from a professional. If medical help is not immediately available, decontaminate yourself and assist in decontaminating others.

Pets should be decontaminated along with their owners, according to the best practices for each type of hazard. Any pet with you when you become contaminated may then contaminate you or others (cross-contamination). If you and your pet may have been contaminated together, contact your local health authorities as well as your doctor and veterinarian.

Chemical decontamination guidelines:

- Use extreme caution when helping others who have been exposed to chemical agents.
- Remove all clothing and other items in contact with the body. Contaminated clothing normally removed over the head should be cut off to avoid contact with the eyes, nose, and mouth. Put contaminated clothing and items into a plastic bag and seal it. Decontaminate hands using soap and water. Remove eyeglasses or contact lenses. Put glasses in a pan of household bleach to decontaminate them, and then rinse and dry them.
- Flush eyes with water.
- Gently wash face and hair with soap and water; then thoroughly rinse with water.
- Decontaminate other body areas likely to have been contaminated. Blot (do not swab or scrape) with a cloth soaked in soapy water and rinse with clear water.
- Change into uncontaminated clothes. Clothing stored in drawers or closets is likely to be uncontaminated.
- Proceed to a medical facility for screening and professional treatment**.**

III. BIOLOGICAL WEAPONS

What are biological weapons of mass destruction (WMD) and what can I do to protect myself and my family?

Biological agents are organisms or toxins that can kill or incapacitate people, livestock, and crops. The three basic groups of biological agents that would likely be used as weapons are bacteria, viruses, and toxins. Most biological agents are difficult to grow and maintain. Many break down quickly when exposed to sunlight and other environmental factors, while others, such as anthrax spores, are very long lived. Terrorists can disperse biological agents by spraying them into the air, by infecting animals that carry the disease to humans, and by contaminating food and water. Delivery methods include:

- **Aerosols—**biological agents can be dispersed into the air as a fine mist or powder that may drift for miles. Inhaling the agent may cause disease in people or animals.
- **Animals—**some diseases can be spread by insects and animals, such as fleas, mice, flies, mosquitoes, and livestock.

- **Food and water contamination—**some pathogenic organisms and toxins can persist in food and water supplies. Most microbes can be killed and toxins deactivated by cooking food and boiling water. Most microbes are killed by boiling water for one minute, but some require more time. Follow official instructions.
- **Person-to-person—**a few infectious agents can be spread from person to person. Humans have been the source of infection for smallpox, plague, and the Lassa viruses.

Specific information on biological agents is available at the Centers for Disease Control and Prevention Web site, www.bt.cdc.gov.

What to Do Before a Biological Attack

- Check with your doctor to ensure that all required or suggested immunizations are up to date. Children and the elderly are particularly vulnerable to biological agents.
- Consider installing a High Efficiency Particulate Air (HEPA) filter in your furnace return duct. These filters remove particles in the 0.3- to 10-micron range and will filter out most biological agents that may enter your home. If you do not have a central heating or cooling system, a stand-alone portable HEPA filter can be used.

Filtration in Buildings
Building owners and managers should determine the type and level of filtration in their structures and the level of protection it provides against biological agents. The National Institute of Occupational Safety and Health (NIOSH) provides technical guidance on this topic in its publication, *Guidance for Filtration and Air-Cleaning Systems to Protect Building Environments from Airborne Chemical, Biological, or Radiological Attacks*. To obtain a copy, call 1-800-35NIOSH or visit http://www.cdc.gov/NIOSH\publist.html and request or download NIOSH Publication 2003-136.

If There Is a Biological Threat

Unlike an explosion, a biological attack may or may not be immediately obvious. While it is possible that you will see signs of a biological attack, as was sometimes the case with the anthrax mailings in 2001, it is perhaps more likely that local health care workers will report a pattern of unusual illness or there will be a wave of sick people requesting emergency medical attention. You will probably learn of the danger through an emergency radio or TV broadcast, or some other signal used in your community. You might get a telephone call or emergency response workers may come to your door.

In the event of a biological attack, public officials may not immediately be able to provide information on what you should do. It will take time to determine exactly what the illness is, how it should be treated, and who is in danger. However, you should watch TV, listen to the radio, or check the Internet for official news including the following:

- Are you in the group or area authorities consider in danger?
- What are the signs and symptoms of the disease?

- Are medications or vaccines being distributed?
- Where? Who should get them?
- Where should you get emergency medical care if you become sick?

What to Do During a Declared Biological Emergency

- If a family member becomes sick, it is important to be suspicious.
- Do not assume, however, that you should go to a hospital emergency room or that any illness is the result of the biological attack. Symptoms of many common illnesses may overlap.
- Use common sense, practice good hygiene and cleanliness to avoid spreading germs, and get medical advice.
- Consider if you are in the group or area authorities believe to be in danger.
- If your symptoms match those described and you are in the group considered at risk, immediately get emergency medical attention.

If you are potentially exposed:

- Follow instructions of doctors and other public health officials.
- If the disease is contagious, expect to receive medical evaluation and treatment. You may be advised to stay away from others.
- If you have been exposed, you might be quarantined.
- For non-contagious diseases, expect to receive medical evaluation and treatment.

If you become aware of an unusual and suspicious substance nearby:

- Quickly get away.
- Wash with soap and water.
- Contact authorities.
- Watch TV, listen to the radio, or check the Internet for official news and information including what the signs and symptoms of the disease are, if medications or vaccinations are being distributed, and where you should get medical attention if you become sick.
- If you become sick, get medical attention.

Using HEPA Filters
HEPA filters may be useful in biological attacks. If you have a central heating and cooling system in your home with a HEPA filter, leave it on if it is running or turn the fan on if it is not running. Moving the air in the house through the filter will help remove the agents from the air. If you have a portable HEPA filter, take it with you to the internal room where you are taking shelter and turn it on.

If you are in an apartment or office building that has a modern central heating and cooling system, the system's filtration should provide a relatively safe level of protection from outside biological contaminants.

HEPA filters will not filter chemical agents.

IV. RADIOLOGICAL DISPERSION DEVICE (RDD)

What is a radiological dispersion device (RDD) and what can I do to protect myself and my family?
Terrorists' use of an RDD—often called "dirty nuke" or "dirty bomb"—is considered far more likely than their use of a nuclear explosive device. An RDD combines a conventional explosive device—such as a bomb—with radioactive material. It is designed to scatter dangerous and sub-lethal amounts of radioactive material over a general area, but no nuclear explosion is involved. RDDs appeal to terrorists because they require limited technical knowledge to build and deploy compared with a nuclear device. Also, the radioactive materials in RDDs are widely used in medicine, agriculture, industry, and research and are easier to obtain than weapons-grade uranium or plutonium.

The primary purpose of terrorists' use of an RDD would be to cause psychological fear and economic disruption. Some devices could cause fatalities from exposure to radioactive materials. Depending on the speed at which the area of the RDD detonation was evacuated or how successful people were at sheltering-in-place against radiation, the number of deaths and injuries from an RDD might not be substantially greater than from a conventional bomb explosion.

The size of the affected area and the level of destruction caused by an RDD would depend on the sophistication and size of the conventional bomb, the type of radioactive material used, the quality and quantity of the radioactive material, and the local meteorological conditions, primarily wind and precipitation. The area affected could be placed off-limits to the public for several months during cleanup efforts.

What to Do Before an RDD Attack

There is no way of knowing how much warning time there might be before an attack by terrorists using an RDD or which measures the situation would call for, so being prepared in advance and knowing what to do and when are important. Be ready to take the same protective measures first that you would for a conventional explosion (see General Precautions on page TR-2 and Building Explosion on page TR-5). Also be ready to take additional measures you would for protection from fallout radiation after a nuclear blast. The force of the blast would be like a conventional explosion, not a nuclear blast. (See Nuclear Weapons below.)

During an RDD Attack

While the explosive blast of an RDD will be immediately obvious, the presence of radiation will not be known until trained personnel with specialized equipment are on the scene. Whether you are indoors or outdoors, at home or at work, be extra cautious if you witness an explosive blast. It would be safer to assume radiological contamination has occurred—particularly in an urban setting or near other likely terrorist targets—and take the proper precautions. As with any radiation, you want to avoid or limit exposure**.**

If you are outdoors:

- Move to shelter indoors immediately.
- If appropriate shelter is not available, move as rapidly as is safe upwind and away from the location of the explosive blast. Then, move to appropriate shelter as soon as possible.
- Continue listening to a local station on your radio or television for instructions from local officials, whether you have evacuated or sheltered-in-place.
- Do not return to or visit an RDD incident location for any reason.

If you are indoors:

- Consider the time you have available. If you have time, turn off ventilation and heating systems, close windows, vents, fireplace dampers, exhaust fans, and clothes dryer vents. Get your Disaster Supplies Kit and battery-powered radio and take them to your shelter room.
- Take shelter immediately, preferably underground or in an interior room of a building, placing as much distance and dense shielding as possible between you and the outdoors where the radioactive material may be.
- Listen for official instructions and follow directions.
- Seal windows and external doors that do not fit snugly with duct tape to reduce infiltration of radioactive particles. Plastic sheeting will not provide shielding from radioactivity or from blast effects of a nearby explosion.

What to Do After an RDD Attack

Contamination from an RDD could affect a wide area, depending on the amount of conventional explosives used, the quantity and type of radioactive material released, and meteorological conditions. Radiation dissipation rates vary, depending mostly on the decay rate of the radioactive materials dispersed by the RDD and how much of the radioactive material is concentrated in any particular spot after it is scattered by the explosion. Evacuation might be more practical than staying in shelter near any spots with relatively high radioactivity readings. An RDD will not produce a high-altitude cloud, so it cannot carry radioactive particles hundreds of miles as a surface-level nuclear blast would.

V. NUCLEAR WEAPONS

What are nuclear weapons and what can I do beforehand to protect myself and my family from a nuclear explosion ?
The explosion of a nuclear weapon produces a blast or shock wave, intense heat, thermal radiation, initial nuclear radiation, and residual nuclear radiation. Such nuclear devices can range from a weapon carried by an intercontinental missile launched by a hostile nation to a single weapon transported to a port or major city by terrorists. The danger of a massive strategic nuclear attack on the United States, involving many weapons, receded with the end of the Cold War in 1989. However, some terrorists have been supported by nations that have nuclear weapons programs.

Hazards of a Nuclear Explosion

All nuclear devices cause deadly effects when exploded, including blinding light, intense heat (thermal radiation), initial nuclear radiation, blast, fires started by the heat pulse, and secondary fires caused by damage to buildings, gas and electrical lines, etc. In addition, a nuclear explosion at or near the earth's surface produces radioactive particles that rise in a mushroom-shaped cloud, and ultimately fall as radioactive fallout. A nuclear weapon detonated high in or above the earth's atmosphere can create an electromagnetic pulse (EMP), a high-density electrical field that acts like a powerful stroke of lightning.

The extent, nature, and arrival time of these hazards are difficult to predict. The geographical dispersion of hazard effects will be defined by the following:

- Size of the device. A more powerful bomb will produce more distant effects.
- Height above the ground the device was detonated. This will determine the extent of blast effects.
- Very high altitude nuclear explosions can produce EMP (electromagnetic pulse) effects throughout a 1,000-mile radius on the surface of the earth.
- Nature of the surface beneath the explosion. Some materials are more likely to become radioactive and airborne than others. Flat areas are more susceptible to blast effects than hilly terrain.
- Existing meteorological conditions. Wind speed and direction will affect arrival time of fallout. Precipitation may wash fallout from the atmosphere, affecting where it falls, the amount of fallout affected areas receive, and where it settles as rain is absorbed, puddles or runs off of surfaces.

Blast and Fire

Most of the material damage caused by a nuclear explosion at or near the surface is due directly or indirectly to the shock (or blast) wave that accompanies the explosion. Fires that burn out remaining buildings may be caused by the force of the explosion breaking gas or electric lines or, closer to the explosion, caused by initial thermal radiation.

If there were threat of an attack from a hostile nation during a crisis, which is not currently a realistic threat, people living near potential targets could be advised to evacuate or they could decide on their own to evacuate to an area not considered a likely target. Protection from radioactive fallout would require taking shelter in an underground area or in the middle of a large building.

In general, potential targets of strategic or terrorist nuclear weapon attacks include:

- Strategic missile sites and military bases
- Centers of government such as Washington, D.C., and state capitals
- Important transportation and communication centers
- Manufacturing, industrial, technology, and financial centers
- Petroleum refineries, electrical power plants, and chemical plants
- Major ports and airfields

Radioactive Fallout

Even if individuals are not close enough to be directly affected by the blast, heat, or immediate radiation, they may be affected by the resultant radioactive fallout. Blasts that occur at or near the earth's surface create much greater amounts of fallout than blasts that occur at higher altitudes. This is because the tremendous heat produced from a nuclear blast causes an up-draft of air, which forms the familiar mushroom cloud. When a blast occurs near the earth's surface, millions of vaporized dirt particles are also drawn into the cloud. As the heat diminishes, radioactive materials that have vaporized condense on the particles and fall back to earth. The phenomenon is called radioactive fallout. This fallout material decays over a long period of time and is the main source of residual nuclear radiation.

Radioactive particles from a nuclear explosion may be carried aloft by wind currents for hundreds of miles if the right conditions exist. Effects from even a small portable device exploded at ground level can be potentially deadly.

Nuclear radiation cannot be seen, smelled, or otherwise detected by normal senses. Radiation can be detected only by radiation-monitoring devices. This makes radiological emergencies different from other types of emergencies, such as floods or hurricanes. Monitoring can project the fallout arrival times, which will be announced through official warning channels. However, any increase in surface buildup of gritty dust and dirt should be a warning to take protective measures.

Factors for Protection From Radioactive Fallout

The three factors for protecting oneself from radioactive fallout are **distance, shielding, and time.**

- **Distance**—the more distance between you and the fallout particles, the better. An underground area, such as a home or office building basement, offers more protection than the first (ground) floor of a building. A floor near the middle of a high-rise may be better, depending on what is nearby at that level on which significant fallout particles would collect. Flat roofs collect fallout particles, so the top floor is not a good choice, nor is a floor adjacent to a neighboring flat roof.
- **Shielding**—the heavier and denser the shielding materials—thick walls, concrete, bricks, books, and earth—between you and the fallout particles, the better.
- **Time** —fallout radiation loses its intensity fairly rapidly. In time, you will be able to leave the fallout shelter. Radioactive fallout poses the greatest threat to people during the first two weeks, after which time it has declined to only about one percent of its initial radiation level.

Remember that any protection, however temporary, is better than none at all; and the more shielding, distance, and time you can take advantage of, the better.

What to Do to Be Prepared for a Nuclear Explosion

- Modify your Disaster Supplies Kit so it is adequate for up to two weeks.
- Find out from officials if any public buildings in your community have been designated as fallout shelters. If none have been designated, make your own list of potential fallout shelters near your home, workplace, and school. These places would include basements or the windowless center area of middle floors in high-rise buildings.
- Subways and tunnels may be designated as fallout shelters, but should not be entered as long as there is immediate danger of nuclear attack because a blast over the area can convert them to a wind tunnel conveying a fatal shock wave.
- If you live in an apartment building or high-rise, talk to the manager about the safest place in the building for sheltering and about providing for building occupants until it is safe to go out.

Taking shelter before a nuclear explosion is absolutely necessary. There are two kinds of shelters—blast and fallout.

- **Blast shelters** are specifically constructed to offer some protection against blast pressure, initial radiation, heat, and fire; but even a blast shelter could not withstand a direct hit from a nuclear explosion.
- **Fallout shelters** do not need to be specially constructed for protecting against fallout. They can be any protected space, provided that the walls and roof are thick and dense enough to absorb the radiation given off by fallout particles.

In Case of Warning of a Nuclear Attack

If you hear a nuclear attack warning, you should:

- Take cover as quickly as you can, below ground if possible, and stay there unless instructed to do otherwise.
- Listen for official information and follow instructions.

If you are caught outside and unable to get inside before the explosion occurs, you should:

- Never look at the flash or fireball—it can blind you.
- Take cover behind anything that might offer protection.
- Lie flat on the ground and cover your head. If the explosion is some distance away, it could take 30 seconds or more for the blast wave to hit.
- Take shelter, as soon as you can, even if you are many miles from ground zero where the attack occurred—radioactive fallout can be carried by the winds for hundreds of miles. Remember the three protective factors: distance, shielding, and time.

After a Nuclear Attack

Decay rates of the radioactive fallout are the same for any size nuclear device. However, the amount of fallout will vary based on the size of the device and its proximity to the ground. Therefore, it might be necessary for those in the areas with highest radiation levels to shelter for up to a month.

The heaviest fallout would be limited to the area at or downwind from the explosion, and 80 percent of the fallout would occur during the first 24 hours.

People in most of the areas that would be affected could be allowed to come out of shelter within a few days and, if necessary, evacuate to unaffected areas.

Electromagnetic Pulse (EMP)

In addition to other effects, a nuclear weapon detonated in or above the earth's atmosphere can create an electromagnetic pulse (EMP), a high-density electrical field. An EMP acts like a stroke of lightning but is stronger, faster, and briefer. An EMP can seriously damage electronic devices connected to power sources or antennas, including communications systems, computers, electrical appliances, and automobile or aircraft ignition systems. The damage could range from a minor interruption to actual burnout of components. Most electronic equipment within 1,000 miles of a high-altitude nuclear detonation could be affected. Battery-powered radios with short antennas generally would not be affected. Although an EMP is unlikely to harm most people, it could harm those with pacemakers or other implanted electronic devices.

What measures can I take to protect electric and electronic appliances from the effects of EMP?

Primary protective measures apply the same basic principles as lightning arrestors (you may find them where telephone lines enter your home) and surge protectors for computers and other electronic equipment. Any wire cable with a series of receptacles that is not in use should be grounded at both ends. If a cable is in use, ground one end only. Electrical and electronic conduits (such as cable television leads) are conductors and should also be grounded. Metal shielding will provide some protection but would be practical only for small, unplugged appliances. Metal shielding should cover but not touch the item it protects, to prevent coupling to the protected item.

Grounding supplies are readily available at electrical and hardware stores. Lightning arrestors and surge protectors are also available at some electronics stores. For EMP protection, look for the strongest protection against the most rapidly peaking surge. Ideally that would be nanoseconds, which you are unlikely to find, or the smallest number if given in milliseconds.

If there is warning of an imminent nuclear attack, quickly do the following:

- Turn off your main power switch.
- Unplug all cables, extension cords, electrical appliances, and telephones.
- Disconnect wires connecting units of sound and video systems.
- Disconnect computers from the printer, monitor, keyboard, and other peripherals.
- Remove wireless phones from wired cradles.
- Fold up and/or disconnect all antennas.

Each of these measures helps a little, and helps more at the outer range of the EMP's reach, but could be inadequate against the EMP of a high-altitude nuclear explosion, depending on the range of the electrical field produced by the detonation of the nuclear device.

Because of the similar characteristics of lightning and EMP, the devices used for EMP protection will also provide a high degree of lightning protection, but the converse is not necessarily true.

Returning to Your Home

Any of the specific kinds of terrorist attacks described in the foregoing pages could make it necessary for you to evacuate your home. When you return, you should:

- Keep listening to the radio or television for news about what to do, where to go, and places to avoid.
- Stay away from damaged areas. Stay away from areas marked "radiation hazard" or "HAZMAT." Remember that radiation cannot be seen, smelled, or otherwise detected by human senses.

(For general information on returning home, see chapter on "Evacuation and Sheltering, and Post-disaster Safety.")

VI. AGROTERRORISM

What is agroterrorism and what can I do to protect myself and my family?

Agroterrorism involves the act of any person knowingly or maliciously using biological or other agents as weapons against the agricultural industry and the food supply—plants and especially animals. Experts believe outbreaks caused by the deliberate spread of animal diseases by terrorists are likely to have much higher costs than natural occurrences or epidemics, because terrorists will act strategically, that is, they will aim at causing as much damage as possible.

Agroterrorism does not require a high level of technical knowledge. It is relatively easy to acquire and spread the agents causing plant and animal diseases. In addition, the most likely agents, such as anthrax, hoof and mouth disease, or fungi-causing plant diseases—rusts, blast, and smuts—pose little risk to the potential terrorist. The low level of knowledge required and the low risk make agroterrorism an attractive option for terrorists.

The primary responsibility for prevention and public education rests on government agencies and research organizations that have the technical and scientific role and capability to identify plant and animal diseases, isolate and eliminate early cases, and direct countermeasures to control outbreaks when they occur.

Agricultural education and extension services inform farmers and livestock operators of the threats and work with farmers, veterinarians, and crop consultants to prevent and control plant and animal diseases.

Stay Informed

People concerned with agroterrorism should take steps to be informed. The consuming public should also be informed of the nature of agroterrorism and the forms it may take. Concerned individuals may also want to be involved at the local level to be sure that people involved with community disaster plans are aware of the process for dealing with outbreaks that threaten production of a healthy food supply and the local agricultural economy.

It is also important to be informed about what the threats are, what measures are taken to combat and control outbreaks of any kind, and what foods and food sources are unaffected and still safe. Keep informed of how outbreaks are managed and how the response and recovery proceed so you can have confidence in the food production system and the effectiveness of steps to deal with problems whenever they arise.

Follow Instructions

Follow instructions of officials when an outbreak occurs. It is especially important to cooperate fully with quarantine orders and instructions about what to avoid, and not to find ways to avoid the cost or inconvenience of efforts to quickly eliminate threats to a safe food supply.

VII. CYBER-TERRORISM

What is a cyber (computer-based) attack and what can I do to protect myself and my family?

Information technology, through the use of computers, has changed the way we transact business, run the government, conduct national defense, keep order, and communicate with our friends and families. All of these activities—both critical and mundane—are accomplished through an interdependent electronic and communications network. If the security of this network is compromised, services could be interrupted, including essential infrastructure services in areas such as telecommunications, energy, finance, manufacturing, water, transportation, health care, and emergency response.

Cyber attacks targeted against information technology can occur in the following ways:

- Hacking—an attack against the software of an information system by an unauthorized person who electronically enters the system from the outside.
- Sabotage—an attack against the software and/or hardware of an information system by a person on the inside who is trusted with access to the system.

To protect yourself from some of the effects of a cyber attack, you should:

- Be prepared to do without services you normally depend on that could be disrupted—electricity, telephones, natural gas, gasoline pumps, cash registers, ATMs, and Internet transactions. See chapters on "Disaster Supplies Kit" and "Family Disaster Plan."
- Keep handy a battery-powered radio or television and routinely listen to local broadcasts.

Be prepared to respond to official instructions if a cyber attack triggers other hazards, for example, a hazardous materials release, nuclear power plant incident, or dam or flood control system failure. You may need to evacuate the area, go to a public shelter, or shelter-in-place.

Page TR-20 blank

Thunderstorms, Severe

Learn about your area's severe thunderstorm risk. Severe thunderstorms can occur year-round and at any hour. Contact your local emergency management office, National Weather Service office, or American Red Cross chapter for more information.

More information about lightning and lightning safety is available at www.lightningsafety.noaa.gov/.

AWARENESS MESSAGES

Why talk about thunderstorms?

Despite their small size, all thunderstorms are dangerous. Every thunderstorm produces lightning, which kills more people each year than tornadoes and hurricanes. Heavy rain from thunderstorms can lead to flash flooding. Strong winds, hail, and tornadoes are also dangers associated with some thunderstorms. High winds from thunderstorms can cause damage to homes, overturn vehicles, and blow down trees and utility poles, causing widespread power outages.

Many strong thunderstorms produce hail. Large hail, and the glass it may break, can injure people and animals. Hail can be smaller than a pea, or as large as a softball, and can be very destructive to automobiles, glass surfaces (skylights and windows), roofs, plants, and crops.

Downbursts and straight-line winds associated with thunderstorms can produce winds of 100 to 150 miles (161 to 241 kilometers) per hour—enough to flip cars, vans, and pickup trucks. The resulting damage can equal the damage of most tornadoes.

What are severe thunderstorms?

Thunderstorms affect relatively small areas when compared with hurricanes and winter storms. The typical thunderstorm is 15 miles (24 kilometers) in diameter and lasts an average of 20 to 30 minutes. Of the estimated 100,000 thunderstorms occurring each year in the United States, only about 10 percent are classified as severe.

The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least three-quarters of an inch (2 centimeters) in diameter, has wind gusts of 58 miles (93 kilometers) an hour or higher, or produces a tornado.

Thunderstorms may occur singly, in clusters, or in lines. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time.

How can I protect myself in a severe thunderstorm?

Each year, many people are killed or seriously injured by severe thunderstorms despite advance warning. While some did not hear the warning, others heard the warning but did not heed it. The following preparedness information, combined with timely severe weather watches and warnings could save your life. Once you receive a warning or observe threatening skies, you yourself must make the decision to take shelter before the storm arrives. It could be the most important decision you will ever make.

In a hailstorm, take cover immediately. Pets and livestock are particularly vulnerable to hail, so bring animals into shelter before storms begin.

If a severe thunderstorm warning is issued, take shelter. Get out of structures, such as mobile homes, that are susceptible to being blown over in high winds. Stay away from downed power lines and report them immediately.

How dangerous is lightning?
Lightning is a major threat during a thunderstorm. Lightning produces thunder in a thunderstorm and is very unpredictable, increasing the risk to individuals and property.

According to the National Weather Service, lightning kills on average more than 70 people and injures at least 300 others each year in the United States. While only about 10 percent of those struck are killed, the large majority of the 90 percent who survive suffer long-term injuries, such as memory loss, dizziness, muscle spasms, depression, and fatigue. Lightning also causes about $5 billion in economic loss each year in the United States.

Lightning often strikes outside the area of heavy rain and may occur as far as 10 miles (16 kilometers) from any rainfall. Heat lightning is actually lightning from a thunderstorm too far away for thunder to be heard.

You are in danger from lightning if you can hear thunder. Because light travels so much faster than sound, lightning flashes can sometimes be seen long before the resulting thunder is heard. When the lightning and thunder occur very close to one another, the lightning is striking nearby. To estimate the number of miles you are from a thunderstorm, count the number of seconds between a flash of lightning and the next clap of thunder. Divide this number by five.

More than 50 percent of lightning deaths occur after the thunderstorm has passed. The National Weather Service encourages you to practice the 30/30 lightning safety rule: If the time between seeing the lightning and hearing the thunder is less than 30 seconds, you are in danger. Stay indoors for 30 minutes after hearing the last clap of thunder.

What is the best source of information about severe thunderstorms in my area?
Local radio or television stations or NOAA Weather Radio are the best sources of information about severe thunderstorms and other weather-related bulletins in your area.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazards information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information is issued about severe thunderstorms or other weather-related hazards in your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Watch, Warning

A **Severe Thunderstorm WATCH** means severe thunderstorms are possible in and near the watch area. People in a watch area should keep informed and be ready to act if a severe thunderstorm warning is issued.

A **Severe thunderstorm WARNING** means severe weather has been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property.

Is your community StormReady? To help Americans prepare for the ravages of hazardous weather, the NWS has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

See chapter on "Floods and Flash Floods," "Tornadoes," "Hurricanes and Tropical Storms," and "Evacuation and Sheltering and Post-disaster Safety."

ACTION MESSAGES
Be Prepared for Severe Thunderstorms
Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Prepare members of your household.**
- **Pick a safe place.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take precautions for severe thunderstorms and lightning and plan for and practice what to do if a thunderstorm occurs.

You should:

- **Discuss thunderstorm safety with members of your household**. Be aware that a thunderstorm could produce a tornado. Tornadoes develop from severe thunderstorms along and ahead of cold fronts. (See chapter on "Tornadoes.")
- **Pick a safe place in your home for household members to gather during a thunderstorm.** This should be a place where there are no windows, skylights, or glass doors, which could be broken by strong winds or hail and cause damage or injury. In preparation for possible tornado warnings, consider making your severe thunderstorm safe place on the lowest floor of the building. See Appendix: "Wind Safe" Room for information on how to build a reinforced room in your home or school.

- **Learn about your community's warning system for severe thunderstorms.** Make sure all members of your household understand the system. Use a NOAA Weather Radio or listen to a local radio or television station to keep aware of watches and warnings while you are indoors. Make sure everyone in your household knows the name of the county or parish where you live because severe thunderstorm watches and warnings are issued for counties or parishes. People should also know the name of the county or parish they are in if they are away from home.
- **Learn how to crouch low to the ground on the balls of your feet.** Place your hands on your knees and your head between your knees. Minimize your body's surface area, and minimize your contact with the ground. Lightning current often enters a victim through the ground rather than by a direct overhead strike.

Protect Your Property

CORE ACTION MESSAGES
- **Actively prepare your home.**
- **Check your insurance coverage.**

You should:

- **Make a list of items to bring inside in the event of a severe thunderstorm.** Having a list will help you remember things that may be broken or blown away in strong winds.
- **Keep trees and shrubbery trimmed.** Make trees more wind resistant by removing diseased or damaged limbs, then strategically remove branches so that wind can blow through. Strong winds frequently break weak limbs and hurl them at great speed.
- **Remove any debris or loose items from around your home and outbuildings and from pastures.** Branches and firewood may become missiles in strong winds.
- **Protect your animals.** Ensure that any outbuildings, pastures, or corrals that house animals are protected in the same way as your home. When installing or changing fence lines, consider placing them in such a way that your animals are able to move to higher ground in the event of flooding.
- **Consider installing permanent shutters to cover windows.** Shutters can be closed quickly and provide the safest protection for windows.
- **Install lightning rods on your home and on barns or any other building that house animals.** Lightning rods will carry the electrical charge of lightning bolts safely to the ground, greatly reducing the chance of a lightning-induced fire.
- **Insure crops against financial loss from storm damage through the Federal Crop Insurance Corporation of the U.S. Department of Agriculture.** If applicable, it is recommended that you obtain separate specific insurance to cover your crops. Losses are not covered through usual insurance policies. Each year, severe storms cause millions of dollars in crop damage. Hail, in particular, has been known to wipe out entire fields.

What to Do Before a Severe Thunderstorm

CORE ACTION MESSAGES
- **Stay informed.**
- **Prepare to shelter.**

You should:

- **Use a NOAA Weather Radio to keep you informed of watches and warnings issued in your area.**
- **If planning a trip or extended period of time outdoors, be aware of the weather forecast.** Knowing what the weather could be will help you be prepared to respond if necessary. Having a raincoat, umbrella, and disaster supplies kit available will make it easier to deal with severe weather if it occurs.
- **Postpone outdoor activities if thunderstorms are imminent.** Coaches of outdoor sports teams should use a NOAA Weather Radio during practice sessions and games. Threatening weather can endanger athletes, staff, and spectators. Remember that most people struck by lightning are not in an area where rain is falling. Postponing activities is your best way to avoid being caught in a dangerous situation.
- **Keep an eye on the sky.** Pay attention to weather clues around you that may warn of imminent danger. Look for darkening skies, flashes of lightning, or increasing wind, which may be signs of an approaching thunderstorm.
- **Be aware of your surroundings.** Look for places you could go if severe weather threatens.
- **Listen for the sound of thunder.** If you can hear thunder, you are close enough to the storm to be struck by lightning. Go to safe shelter immediately.
- **Even if there is no official thunderstorm warning, if you see signs of a thunderstorm, take precautions.**

What to Do During a Severe Thunderstorm Watch

CORE ACTION MESSAGES
- **Keep informed.**
- **Prepare to shelter.**
- **Avoid lightning attractors.**

You should:

- **Use a NOAA Weather Radio or listen to a local radio or television station.** Local authorities will provide you with the best information for your particular situation.
- **Avoid natural lightning rods, such as golf clubs, fishing poles, tractors, bicycles, and camping equipment.** Lightning is attracted to metal and poles or rods.
- **Be prepared to take shelter.** A sturdy building is the safest place to be during a severe thunderstorm. Avoid gazebos, rain or picnic shelters, golf carts, baseball dugouts, bleachers, and other isolated structures in otherwise open areas because such places are often struck by lightning. In addition, gazebos and picnic shelters are often poorly anchored and subject to being uprooted and blown around in strong thunderstorm winds. They also offer little protection from large hail.

- **If you perceive that a severe thunderstorm is approaching:**
  -**Secure outdoor objects such as lawn furniture that could blow away or cause damage or injury.** Take lightweight objects inside.
  -Bring your companion animals indoors and maintain direct control of them. Be sure that your pet disaster kit is ready to go.
  -If possible, bring horses and livestock into your barn. Do not allow horses or livestock to gather under an isolated tree or otherwise present a risk from a lightning strike.
  -**Shutter windows and close outside doors securely.** This will help protect your home from damaging winds or flying debris.
  -**Avoid electrical equipment and telephones.** Lightning could follow the wire. Television sets are particularly dangerous at this time. Use a battery-powered radio or television.
  -**Avoid bathtubs, water faucets, and sinks because metal pipes can transmit electricity.**

What to Do During a Severe Thunderstorm Warning

CORE ACTION MESSAGES
- **Stay informed.**
- **Go to shelter.**
- **Avoid lightning attractors.**

You should:

- **Use a NOAA Weather Radio or listen to a local station on a battery-powered radio or television for updated emergency information.** If the power goes out, you still will have access to important information.
- **Draw the blinds and shades over windows.** If windows break because objects are blown by the wind or large hail, the shades will help prevent glass from shattering into your home.
- **Unplug appliances** and avoid using the telephone or any electrical appliances. If lightning strikes, telephone lines and metal pipes can conduct electricity. Leaving electric lights on, however, does not increase the chances of your home being struck by lightning.
- **Avoid taking a bath or shower, or running water for any other purpose.** Metal pipes and plumbing can conduct electricity if struck by lightning.
- **Turn off the air conditioner.** Power surges from lightning can overload the compressor, resulting in a costly repair job.
- **Maintain direct control of your animals.** Many animals are unsettled by thunderstorms and it is more comforting and safe for them to be with you.

What to Do if You Are Outside and a Severe Thunderstorm Is Approaching

CORE ACTION MESSAGES
- **Get to shelter.**
- **Avoid likely lightning targets.**

You should:

- **Find shelter immediately. If you are boating or swimming, get to land, get off the beach, and find shelter immediately.** Stay away from rivers, lakes, and other bodies of water. Water is an excellent conductor of electricity. When lightning strikes nearby, the electrical charge can travel through the water. Each year, people are killed by nearby lightning strikes while in or on the water.
- **Take shelter in a substantial, permanent, enclosed structure,** such as a reinforced building. A sturdy building is the safest place to be. Avoid gazebos, rain or picnic shelters, golf carts, baseball dugouts, bleachers, and other isolated structures in otherwise open areas because such places are often struck by lightning. In addition, gazebos and picnic shelters are often poorly anchored and subject to being uprooted and blown around in strong thunderstorm winds. They also offer little protection from large hail.
- **If there is no reinforced building in sight, take shelter in a vehicle.** Keep the windows closed and avoid convertibles. Rubber-soled shoes and rubber tires provide no protection from lightning. However, the steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Although you may be injured if lightning strikes your vehicle, you are much safer inside a vehicle than outside.
- **If you are in the woods, find an area protected by a low clump of trees.** Never stand beneath a single large tree in the open. Be aware of the potential for flooding in low-lying areas.
- **As a last resort and if no suitable structure or vehicle is available, go to a low-lying, open place away from trees, poles, or metal objects**. Make sure the place you pick is not subject to flooding. Crouch low to the ground on the balls of your feet. Place your hands on your knees and your head between your knees. Minimize your body's surface area, and minimize your contact with the ground. Lightning current often enters a victim through the ground rather than by a direct overhead strike.
- **Avoid tall structures, such as towers, tall trees, fences, telephone lines, and power lines.** Lightning strikes the tallest objects in an area.
- **Stay away from natural lightning rods, such as golf clubs, tractors, fishing rods, bicycles, and camping equipment.** Lightning is attracted to metal and poles or rods.
- **If you are isolated in a level field or prairie and you feel your hair stand on end (which indicates that lightning is about to strike), crouch low to the ground on the balls of your feet.** Place your hands on your knees and your head between your knees. Minimize your body's surface area, and minimize your contact with the ground. Lightning current often enters a victim through the ground rather than by a direct overhead strike.

Note: Coordinators of outdoor events should monitor the weather with a NOAA Weather Radio and evacuate participants when appropriate.

Note: School buses are an excellent lightning shelter.

What to Do If You Are Driving During a Severe Thunderstorm or Heavy Rain

CORE ACTION MESSAGES
- **Pull over.**
- **Stay in the vehicle.**
- **Be alert for flooding.**

You should:

- **Pull safely onto the shoulder of the road and stop, making sure you are away from any trees or other tall objects that could fall on the vehicle.**
- **Stay in the vehicle and turn on the emergency flashers until the heavy rain subsides.** Heavy rain produced by thunderstorms can greatly reduce visibility. Emergency flashers will alert other drivers that you have stopped. Keep the windows closed. You are safer from lightning in a vehicle than out in the open.
- **Avoid contact with metal or other conducting surfaces outside or inside the vehicle.** Lightning that strikes nearby can travel through wet ground to your vehicle. The steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Rubber tires provide no protection from lightning. Avoid contact with potential conductors to reduce your chance of being shocked. Although you may be injured if lightning strikes your vehicle, you are much safer inside than outside.
- **Avoid flooded roads.** Most flood fatalities are caused by people attempting to drive through water or people playing in high water. The depth of water is not always obvious. The roadbed may be washed out under the water, and you could be stranded or trapped. Rapidly rising water may stall the engine, engulf the vehicle and its occupants, and sweep them away. Look out for flooding at highway dips, bridges, and low areas. Two feet (0.6 meter) of flowing water will carry away most automobiles, including SUVs and pickup trucks. (See Appendix: What to Do When There Is Flooding.)

What to Do After a Severe Thunderstorm

CORE ACTION MESSAGES
- **Stay informed.**
- **Be alert to hazards.**
- **Help others.**

You should:

- **Continue using a NOAA Weather Radio or listening to a local radio or television station for updated information and instructions.** Access may be limited to some parts of the community or roads may be blocked.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Stay away from storm-damaged areas** to avoid putting yourself at further risk from the residual effects of severe thunderstorms. Sightseers cause additional problems and hamper local responders assisting those in need.
- **Watch out for fallen power lines and report them immediately**. Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury. If assistance is needed in your area and telephone communications are disrupted, go to your nearest fire or police station to request assistance.

- **Watch animals closely.** Keep all your animals under your direct control. Pets may become disoriented before, during, and after severe thunderstorms. If there has been wind damage, pets may be able to escape from your home or your fence may be broken. Be aware of hazards at nose and paw or hoof level, particularly debris, downed power lines—things that can be dangerous to humans. In addition, the behavior of pets may change dramatically after a severe storm, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

For information on **portable-generator safety** and carbon monoxide poisoning, see Appendix: Portable Generators.

What to Do if Someone Is Struck by Lightning

CORE ACTION MESSAGES
- **Get help.**
- **Give first aid.**

You should:

- **Call for help.** Get someone to dial 9-1-1 or your local emergency number. Medical attention is needed as quickly as possible.
- **Give first aid.** If the person has stopped breathing, begin rescue breathing. If the person's heart has stopped beating, a trained person should give CPR. If the person has a pulse and is breathing, look for other possible injuries and care for them if necessary.
- **Check the person for burns in two places.** The injured person has received an electrical shock and may be burned both where the current entered and where it exited his or her body. Being struck by lightning can also cause nervous system damage, broken bones, and loss of hearing or eyesight. People struck by lightning carry no electrical charge that can shock other people, and they can be handled safely.

Media and Community Education Ideas

- Ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of thunderstorms and lightning and place special emphasis on what people should do if they are caught outside.
  - -Highlight the importance of staying informed about local weather conditions.
  - -Run public service ads about how to protect lives and property from severe thunderstorms and lightning.
  - -Interview officials of the U.S. Department of Agriculture about the Federal Crop Insurance Corporation.
  - -Inform the community about local public warning systems.
  - -Interview a representative of the American Red Cross about giving first aid to people who have been struck by lightning.
  - -Interview agents from various insurance companies about what kinds of severe thunderstorm and lightning damage homeowners' insurance does and does not cover.

Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide business telephone numbers for the local emergency management office and American Red Cross chapter.

- Ask a local meteorologist to speak to school and youth groups about the dangers of thunderstorms, lightning, and hail.

Facts and Fiction

Fiction: If it is not raining, there is no danger from lightning.
Facts: Lightning often strikes outside heavy rain and may occur as far as 10 miles (16 kilometers) away from any rainfall. This is especially true in the western United States where thunderstorms sometimes produce very little rain.

Fiction: The rubber soles of shoes or rubber tires on a vehicle will protect you from being struck by lightning.
Facts: Rubber-soled shoes and rubber tires do not provide protection from lightning. The steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Although you may be injured if lightning strikes your vehicle, you are much safer inside a vehicle than outside.

Fiction: People struck by lightning carry an electrical charge and should not be touched.
Facts: Lightning-strike victims carry no electrical charge and should be attended to immediately. Contact your local American Red Cross chapter for information on CPR/AED and first-aid classes.

Fiction: Heat lightning occurs after very hot summer days and poses no threat.
Facts: "Heat lightning" is a term used to describe lightning from a thunderstorm too far away for thunder to be heard. All lightning is dangerous.

Fiction: Lightning never strikes twice in the same place.
Facts: Just because lightning struck a place once does not make it less likely that it will strike again in the same place. In fact, it may indicate that the place is more vulnerable to lightning strikes than other places in the immediate area.

Tornadoes

Learn about the tornado risk in your area. While severe tornadoes are more frequent in the Plains States, tornadoes have happened in every state. Contact your local emergency management office, National Weather Service office, or American Red Cross chapter for more information on tornadoes.

AWARENESS MESSAGES

Why talk about tornadoes?

Tornadoes have been reported in every state. They generally occur during spring and summer, although they can happen in every season. Tornadoes can strike at any time of the day or night but are most likely between 3:00 p.m. and 9:00 p.m. No areas are immune to tornadoes; they have been reported in mountains and valleys, over deserts and swamps, from the Gulf Coast into Canada, in Hawaii, and even in Alaska. Regardless of the location or time of year, if conditions are right, a tornado can develop. More than 1,000 tornadoes are reported annually nationwide, and as our tornado detection systems improve, fewer tornadoes go undetected. Even so, tornadoes sometimes develop in areas in which no tornado watch or warning has been issued.

What are tornadoes?

A tornado is a violently rotating column of air extending from the base of a thunderstorm to the ground. Tornado intensities are classified on the Fujita Scale with ratings between 0 and 5. A storm of F0 is the weakest and F5 is the strongest. The most violent tornadoes have rotating winds of 250 miles (402 kilometers) per hour or more. They are capable of completely destroying well-made structures, uprooting trees, and hurling normally harmless objects through the air like deadly missiles. Most tornadoes are rated F0 and F1, and these usually span just a few dozen yards and touch down only briefly. Highly destructive violent tornadoes—F4 and F5—can carve out paths more than a mile (1.6 kilometers) wide and 50 miles (80 kilometers) long. Although these violent tornadoes comprise only two percent of all tornadoes, they are responsible for nearly 70 percent of tornado-related fatalities.

Waterspouts are similar to tornadoes but form over a body of water. They are most common along the Florida Gulf and Atlantic coasts and southeastern states. In the western United States, waterspouts occur in connection with storms in the late fall or winter, a time when they are least expected. Waterspouts occasionally move inland becoming tornadoes, causing damage and injuries.

How do tornadoes develop?

Tornadoes usually develop from severe thunderstorms in warm, moist, unstable air along and ahead of cold fronts. Such thunderstorms also may generate large hail and damaging winds. When intense springtime storm systems produce large, persistent areas that support tornado development, major outbreaks can occur. In the United States during the late spring, tornadic thunderstorms can develop in the southern High Plains along a "dry line," the interface between warm, moist air to the east and hot, dry air to the west. From the front range of the Rocky Mountains southward into the Texas Panhandle, a downslope flow of unstable air can cause

tornadic thunderstorms to develop. While generally smaller and less frequent, tornadoes occurring west of the Rocky Mountains also cause damage and threaten lives annually.

Tropical storms and hurricanes that come ashore can also generate tornadoes. In 1967, Hurricane Beulah produced 141 tornadoes as it made landfall. In 1992, Hurricane Andrew produced 62 tornadoes.

How can I protect myself from a tornado?
You can protect yourself by having a safe place to go and having the time to get there. Consider building a "wind safe" room in your home. (See Appendix: "Wind Safe" Room.) While tornadoes can be highly destructive and are potentially deadly, timely precautions can save lives and reduce property damage. During active weather, pay attention to the forecast by listening to local radio or television stations or by using a NOAA Weather Radio.

Each year, many people are killed or seriously injured by tornadoes despite advance warning. Some did not hear the warning, while others heard the warning but did not believe they were personally threatened. Timely tornado watches and warnings, combined with household preparedness, could save your life. Once you receive a warning or observe threatening skies, YOU must make the decision to take shelter before the tornado arrives. It could be the most important decision you will ever make.

What is the best source of information in a tornado situation?
Local radio or television stations or a NOAA Weather Radio are the best sources of information in a tornado situation for official weather and weather-related bulletins.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazards information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information about tornadoes and other hazards is issued for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Watch, Warning

- A **Tornado WATCH** means that tornadoes are possible in and near the watch area. People in a watch area should review their tornado plans (Family Disaster Plan, Disaster Supplies Kit, tornado safe room), and be ready to act if a warning is issued or they suspect a tornado is approaching.
- A **Tornado WARNING** means that a tornado has been sighted or indicated by weather radar. Tornado warnings indicate imminent danger to life and property. People in a warning area should go immediately to their safe room. If they are in a vehicle, they should get out of the vehicle and go to shelter in a nearby sturdy building or lie flat in a low spot away from the vehicle.

Watches and warnings for tornadoes are issued by the National Weather Service (NWS) and broadcast on NOAA Weather Radio and on local radio and television stations.

Is your community StormReady? To help people prepare for the ravages of hazardous weather, the National Weather Service has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

ACTION MESSAGES
Be Prepared for a Tornado
Protect Yourself

CORE ACTION MESSAGES

- **Prepare members of your household.**
- **Pick a tornado safe place.**
- **Know your community's warning**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take tornado-specific precautions and plan for and practice what to do in a tornado situation.

You should:

- **Pick a safe place in your home** where family members, including pets, could gather during a tornado. The safest place to be is underground, or as low to the ground as possible, and away from all windows. If you have a basement or storm cellar, make it your safe place. If you do not have a basement or storm cellar, consider an interior bathroom, closet, or hallway on the lowest floor. Putting as many walls as you can between you and the outside will provide additional protection. Less than two percent of all tornadoes are powerful enough to completely destroy a sturdy building. Make sure there are no windows or glass doors in your safe place and keep this place uncluttered.
- **Consider having your tornado safe place reinforced.** (See Appendix: "Wind Safe" Room.) Additional reinforcement will add more protection from the damaging effects of tornado winds. Get more information from the Federal Emergency Management Agency (FEMA) about building a "wind safe" room. Also, for more information, check out the Institute for Business and Home Safety at www.ibhs.org.
- **If you are in a high-rise building, pick a place in a hallway in the center of the building.** You may not have enough time to go to the lowest floor. Center hallways are often the most structurally reinforced part of a building.
- **If you live in a mobile home, choose a safe place in a nearby sturdy building.** A sturdy building provides greater protection. If your mobile home park has a designated shelter, make it your safe place. Mobile homes are much more vulnerable to strong winds than site-built structures. Prior to 1994, most mobile homes were not designed to withstand even moderate winds.

- **Learn about your community's warning system.** Different communities have different ways of providing warnings. Many communities have sirens intended for outdoor warning purposes. Use a NOAA Weather Radio to keep aware of watches and warnings while you are indoors. Make sure all family members know the name of the county or parish where you live or are traveling, because tornado watches and warnings are issued for a county or parish by name.
- **Conduct periodic tornado drills,** so everyone remembers what to do if a tornado approaches. Practice having everyone in the household go to your designated safe place. Have everyone get under a sturdy piece of furniture, hold on with one hand, and protect his or her head and neck with the other. Practicing your plan makes the appropriate response more of a reaction, requiring less thinking time during an actual emergency situation.
- **Check at your workplace and your children's schools and day care centers to learn about their tornado emergency plans.** Every building has different safe places. It is important to know where they are and how to get there in an emergency.
- **Discuss tornadoes with your family.** Everyone should know what to do in case all family members are not together. Discussing disaster preparedness ahead of time helps reduce fear and lets everyone know what to do in a tornado situation.

Protect Your Property

CORE ACTION MESSAGE
- **Prepare your home and property.**

You should:
- **Make a list of items to bring inside in the event of a storm.** Having a list will help you remember things that may be broken or blown away in strong winds.
- **Keep trees and shrubbery trimmed.** Make trees more wind resistant by removing diseased or damaged limbs, then strategically remove branches so that wind can blow through. Strong winds frequently break weak limbs and hurl them at great speed, causing damage or injury when they hit. Debris collection services may not be operating just before a storm, so it is best to do this well in advance of approaching storms.
- **Remove any debris or loose items in your yard.** Branches and firewood may become missiles in strong winds.
- **Consider installing permanent shutters to cover windows.** Shutters can be closed quickly and provide the safest protection for windows.
- **Strengthen garage doors.** Garage doors are often damaged or destroyed by flying debris, allowing strong winds to enter. As winds apply pressure to the walls, the roof can be lifted off, and the rest of the house can easily follow.

What to Do Before a Tornado

CORE ACTION MESSAGE
- **Watch for signs of a tornado.**

When the season, conditions, or forecast indicate the potential for tornadoes to form, you should:

- **Use a NOAA Weather Radio to keep informed of watches and warnings issued in your area.** If you do not have a NOAA Weather Radio, keep up with local forecasts and conditions via a local radio or television station.
- **If planning a trip or extended period of time outdoors, listen to the latest forecasts and take necessary action if threatening weather is possible.** Knowing what the weather could be helps you to be prepared. Have a raincoat, umbrella, and Disaster Supplies Kit handy so you can deal with severe weather if it occurs.
- **Watch for tornado danger signs.** Tornadoes may strike so quickly that warnings cannot be issued long in advance. Pay attention to weather clues around you that warn of imminent danger:
  - **Dark, often greenish clouds.** Sometimes one or more of the clouds turns greenish (a phenomenon caused by hail) indicating a tornado may develop.
  - **Wall cloud,** an isolated lowering of the base of a thunderstorm. The wall cloud is particularly threatening if it is rotating.
  - **Large hail.** Tornadoes are spawned from powerful thunderstorms, which are capable of producing large hail. Tornadoes frequently emerge from near the hail-producing portion of the storm.
  - **Cloud of debris.** An approaching cloud of debris can mark the location of a tornado, even if a funnel is not visible.
  - **Funnel cloud.** A visible rotating extension of the cloud base is a sign that a tornado may develop.
  - **Roaring noise.** The high winds of a tornado can cause a roar that is often compared with the sound of a freight train.

Tornadoes may occur near the trailing edge of a thunderstorm and be quite visible. It is not uncommon to see clear, sunlit skies behind a tornado. Tornadoes may also be embedded in rain and not visible at all.

If you live in a single-family home in a tornado-prone area, find out how to reinforce an interior room on the lowest level of your home (such as the basement, the storm cellar, a bathroom, a closet, or a hallway) to use as a shelter. (See Appendix: “Wind Safe” Room.) Plans for reinforcing an interior room to provide better tornado protection in your home are available from your local emergency management office or from the Federal Emergency Management Agency’s Web site at www.fema.gov/mit/saferoom/.

If a tornado watch is issued:

CORE ACTION MESSAGES:
- **Stay alert.**
- **Use a NOAA Weather Radio or listen to a local radio or television station.**

- **Listen to NOAA Weather Radio or local radio or television stations for updated information.** Tornadoes can change direction, intensity, and speed very quickly.
- **Be alert to changing weather conditions.** Tornadoes accompany severe thunderstorms, and weather conditions can change rapidly. Large hail, blowing debris, or the sound of an approaching tornado may alert you. Many people say approaching tornadoes sound like a freight train.
- **Bring your companion animals indoors and maintain direct control of them.**
- **Be prepared to go to your tornado safe place.**

If a tornado warning is issued:

CORE ACTION MESSAGES
- **Go to your tornado safe room.**
- **If you are outside, go to the basement of a sturdy building if possible or lie flat in a low spot.**

- **Listen to a battery-powered NOAA Weather Radio or a local radio or television station for updated information.** If the electricity goes out, you will still be able to receive emergency information.
- **If you are inside, you should:**

  -Go to your safe place to protect yourself from glass and other flying objects. Take your pets with you, provided you can do so without endangering yourself. Tornadoes can change direction, intensity, and speed very quickly. The tornado may be approaching your area.

  -**Get under a sturdy piece of furniture,** such as a workbench or heavy table, and hold on to it with one hand. Sturdy furniture will help protect you from falling debris. If tornado wind enters the room and the object moves, holding on with one hand will help you move with it, keeping you protected.

  -**Use your other arm and hand to protect your head and neck** from falling or flying objects. Your head and neck are more easily injured than other parts of your body. Protect them as well as you can.

  -**Stay away from windows.** Opening windows allows damaging winds to enter the structure. Leave the windows alone; instead, immediately go to your safe place. It is a myth that tornadoes cause houses to explode due to changes in air pressure. Flying debris can shatter glass. Violent winds and debris slamming into buildings cause the most structural damage.

- **If you are outside in a vehicle or mobile home, you should:**

  -Go immediately to the basement of a nearby sturdy building. A sturdy building is the safest place to be. Tornado winds can blow large objects, including cars and mobile homes, hundreds of feet away. Tornadoes can change direction quickly and can lift up a car or truck and toss it through the air; never try to out-drive a tornado. Mobile homes are particularly vulnerable. A mobile home can overturn very easily even if precautions have been taken to tie it down.

  -If there is no building nearby, lie flat in a low spot and use your arms and hands to protect your head and neck. Tornadoes cause a lot of debris to be blown at very high speeds. Dangerous flying debris can be blown under overpasses and bridges, and the structures themselves could be destroyed. You will be safer lying flat in a low-lying area where the wind and debris will blow above you. Tornadoes come from severe thunderstorms, which can produce a lot of rain. If you see quickly rising water or floodwater coming toward you, move to another spot.

  -Avoid places with wide-span roofs, such as auditoriums, cafeterias, large hallways, or shopping malls. Wide-span roofs are frequently damaged or destroyed in tornado winds; they provide less protection and more risk of injury than roofs over smaller rooms.

What to Do After a Tornado

CORE ACTION MESSAGES
- **Help yourself, then others.**
- **Beware of dangers.**

You should:
- **Continue listening to local radio or television stations or a NOAA Weather Radio** for updated information and instructions. Access may be limited to some parts of the community or roads may be blocked.
- **Check for injuries.** Give first aid and get help for injured or trapped persons. Taking care of yourself first will allow you to help others safely until emergency responders arrive.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Watch out for fallen power lines or broken gas lines and report them to the utility company immediately.** Reporting potential hazards will get the utilities turned off as quickly as possible, preventing further hazard and injury.
- **Avoid damaged areas.** Your presence might hamper rescue and other emergency operations and put you at further risk from the residual effects of tornadoes.
- **Stay out of damaged buildings.**
- **If you are away from home, return only when authorities say it is safe.**
- **Wear long pants, a long-sleeved shirt, and sturdy shoes.** The most common injury following a disaster is cut feet.
- **Use battery-powered lanterns or flashlights when examining buildings.** Battery-powered lighting is the safest and easiest. It protects the user, the building occupants, and the building from fire hazards. DO NOT USE CANDLES.
- **Examine walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing.**

- **Look for fire hazards.** There may be broken or leaking gas lines, or damage to electrical systems. Clean up spilled medications, bleaches, gasoline, or other flammable liquids immediately. Fire is the most frequent hazard following other disasters.
- **Check for gas leaks.** If you smell gas or hear a blowing or hissing noise, open a window and get everyone out quickly. Turn off the gas using the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
- **Look for electrical system damage.** If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.
- **Watch for loose plaster, drywall, and ceilings that could fall.**
- **Take pictures of the damage, both of the building and its contents, for insurance claims.**
- **Use the telephone only for emergency calls.** Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls to get through.
- **Watch your animals closely.** Keep all your animals under your direct control. Your pets may be able to escape from your home or through a broken fence. Pets may become disoriented, particularly because tornadoes and the heavy rains that accompany them will usually affect scent markers that normally allow animals to find their homes. The behavior of pets may change dramatically after any disruption, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

For information on **portable-generator safety** and **carbon monoxide poisoning,** see Appendix: Portable Generators.

Media and Community Education Ideas

- Ask your local newspaper or radio or television station to:
  -Do a series on the dangers of tornadoes and the importance of heeding tornado watches and warnings.
  -Highlight the importance of staying informed about local weather conditions.
  -Run public service ads about how to protect lives in a tornado and how to pick and set up a tornado safe room.

Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office and local American Red Cross chapter.

- Periodically inform the community of the local public warning systems.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do in a tornado situation.

- Sponsor a "Helping Your Neighbors" program at your local schools to encourage students to think about how to help people who require special assistance, such as elderly people, infants, or people with disabilities, and the people who care for them.

- Conduct a series of programs on how to protect yourself during a tornado if you are at home, if you are in a vehicle, if you are at the office, or if you are outdoors.

- Interview local officials about what people living in mobile home parks should do if a tornado warning is issued.

Facts and Fiction

Fiction: Areas near lakes, rivers, and mountains are safe from tornadoes.
Facts: No place is safe from tornadoes. A tornado near Yellowstone National Park left a path of destruction up and down a 10,000-foot mountain.

Fiction: The low pressure associated with a tornado causes buildings to “explode” as the tornado passes overhead.
Facts: Air pressure in a tornado does not cause buildings to explode. Buildings are damaged by violent winds associated with a tornado and by the debris blown at high velocities by a tornado’s winds.

Fiction: Windows should be opened before a tornado approaches to equalize pressure and minimize damage.
Facts: You should leave the windows alone. The most important action you can take is to go immediately to your tornado safe place. Damage happens when wind gets inside a home through a broken window, door, or damaged roof. Keep the windows closed and stay away from them. Flying debris could shatter the glass and cause injury.

Fiction: The southwest corner of a building is the safest place to be during a tornado.
Facts: In the past, some people advised going to the southwest corner of a building in case of a tornado. However, the southwest corner is no safer than any other corner. One corner on the lowest level away from windows is as safe as any other corner. If tornado winds enter the room, debris has a tendency to collect in corners. When selecting a tornado safe place, look for a place on the lowest level and away from windows—a basement or storm cellar is best. If there is no basement or storm cellar, pick a small room (closet, bathroom, hallway) in the center of the building. Small rooms are safer because their walls are closer together and provide more support to the roof than widely spaced walls. Rooms in the center of the building are safer because each wall between you and the outside provides protection.

Fiction: If you are driving and a tornado is sighted, you should turn and drive at right angles to the tornado.
Facts: Many people are injured or killed when they remain in their vehicles during a tornado. If you are in a vehicle during a tornado, the safest thing to do is go to a nearby sturdy building and go inside to an area on the lowest level without windows. If a sturdy building is not available, then get out of and move away from the vehicle, lie down in a low spot on the ground not subject to flooding, and protect your head and neck. Driving at right angles to a tornado will not protect you for many reasons, including the fact that tornadoes do not necessarily travel in straight lines; you cannot always tell where a tornado is coming from; the road may not be straight; and there may be more than one tornado.

Fiction: People caught in the open should take shelter under overpasses or bridges.
Facts: Do not take shelter under overpasses or bridges. If at all possible, take shelter in a sturdy, reinforced building. Dangerous flying debris can be blown under overpasses and bridges, and the structures themselves could be destroyed. If a building is not available, you will be safer lying flat in a low-lying area where the wind and debris will blow above you. Use your arms and hands to cover your head and neck.

Tsunamis

Learn whether tsunamis have occurred in your area by contacting your local emergency management office, state geological survey, National Weather Service (NWS) office, or American Red Cross chapter. Find out your area's flooding elevation.

AWARENESS MESSAGES

Why talk about tsunamis?

All tsunamis are potentially, if rarely, dangerous. Twenty-four tsunamis have caused damage in the United States and its territories in the past 200 years. Since 1946, six tsunamis have killed more than 350 people and caused significant property damage in Hawaii, Alaska, and along the West Coast. Tsunamis have also occurred in Puerto Rico and the Virgin Islands. When a tsunami comes ashore, it can cause great loss of life and property damage. Tsunamis can travel upstream in coastal estuaries and rivers, with damaging waves extending farther inland than the immediate coast. A tsunami can occur during any season of the year and at any time, day or night.

What are tsunamis?

Tsunamis are large ocean waves generated by major earthquakes beneath the ocean floor or major landslides into the ocean. Tsunamis caused by nearby earthquakes may reach the coast within minutes. When the waves enter shallow water, they may rise to several feet or, in rare cases, tens of feet, striking the coast with devastating force. People on the beach or in low coastal areas need to be aware that a tsunami could arrive within minutes after a severe earthquake. The tsunami danger period can continue for many hours after a major earthquake.

Tsunamis also may be generated by very large earthquakes far away in other areas of the ocean. Waves caused by these earthquakes travel at hundreds of miles per hour, reaching the coast several hours after the earthquake. The International Tsunami Warning System monitors ocean waves after any Pacific earthquake with a magnitude greater than 6.5. If waves are detected, warnings are issued to local authorities who can order the evacuation of low-lying areas if necessary.

How can I protect myself from a tsunami?

If you are in a coastal community and feel the shaking of a strong earthquake, you may have only minutes until a tsunami arrives. **Do not wait for an official warning.** Instead, let the strong shaking be your warning, and, after protecting yourself from falling objects, quickly move away from the water and to higher ground. If the surrounding area is flat, move inland. Once away from the water, listen to a local radio or television station or NOAA Weather Radio for information from the Tsunami Warning Centers about further action you should take.

Even if you do not feel shaking, if you learn that an area has experienced a large earthquake that could send a tsunami in your direction, listen to a local radio or television station or NOAA Weather Radio for information from the Tsunami Warning Centers about action you should take. Depending on the location of the earthquake, you may have a number of hours in which to take appropriate action.

What is the best source of information in a tsunami situation?
As part of an international cooperative effort to save lives and protect property, the National Oceanic and Atmospheric Administration's National Weather Service operates two tsunami warning centers: the West Coast/Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska, and the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii. The WC/ATWC serves as the regional Tsunami Warning Center for Alaska, British Columbia, Washington, Oregon, and California. The PTWC serves as the regional Tsunami Warning Center for Hawaii and as a national/international warning center for tsunamis that pose a Pacific-wide threat.

Some areas, such as Hawaii, have Civil Defense Sirens. Turn on your radio or television to any station when the siren is sounded and listen for emergency information and instructions. Maps of tsunami-inundation areas and evacuation routes can be found in the front of local telephone books in the Disaster Preparedness Info section.

Tsunami warnings are broadcast on local radio and television stations and on NOAA Weather Radio. NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day on more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information is issued about tsunamis or weather-related hazards for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Carry the radio with you when you go to the beach and keep fresh batteries in it.

Warning, Watch

A Tsunami WARNING means a dangerous tsunami may have been generated and could be close to your area. Warnings are issued when an earthquake is detected that meets the location and magnitude criteria for the generation of a tsunami. The warning includes predicted tsunami arrival times at selected coastal communities within the geographic area defined by the maximum distance the tsunami could travel in a few hours.

A Tsunami WATCH means a dangerous tsunami has not yet been verified but could exist and may be as little as an hour away. A watch—issued along with a tsunami warning—predicts additional tsunami arrival times for a geographic area defined by the distance the tsunami could travel in more than a few hours.

The West Coast/Alaska Tsunami Warning Center and the Pacific Tsunami Warning Center issue watches and warnings to the media and to local, state, national, and international officials. NOAA Weather Radio broadcasts tsunami information directly to the public.

Local officials are responsible for formulating, disseminating information about, and executing evacuation plans in case of a tsunami warning.

Is your community StormReady? To help people prepare for the ravages of hazardous weather, the National Weather Service has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

Is your community Tsunami Ready? Tsunami Ready is a program that promotes tsunami hazard readiness as an active collaboration among federal, state, and local emergency management agencies; the public; and the National Weather Service tsunami warning system. This collaboration supports better and more consistent tsunami awareness and mitigation efforts among communities at risk. The main goal is improvement of public safety during tsunami emergencies.
More information is available at http://wcatwc.gov/tsunamiready/tready.htm.

ACTION MESSAGES
Be Prepared for Tsunamis
Protect Yourself

Core Action Messages
- **Determine your risk.**
- **Prepare members of your household.**
- **Learn and practice evacuation routes.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household in coastal areas should take tsunami-specific precautions and plan for and practice what to do in a tsunami situation.

Be aware of signs that can mean a tsunami may be approaching:
- A strong earthquake lasting 20 seconds or more near the coast.
- A noticeable rapid rise or fall in coastal waters.

If you are in an area at risk from tsunamis, you should:
- **Find out if your home, school, workplace, or other frequently visited locations are in tsunami hazard areas.**
- **Know the height of your street above sea level and the distance of your street from the coast or other high-risk waters.** Evacuation orders may be based on these numbers. Also find out the height above sea level and the distance from the coast of outbuildings that house animals, as well as pastures or corrals.
- **Plan evacuation routes from your home, school, workplace, or any other place you could be where tsunamis present a risk.** If possible, pick areas 100 feet (30 meters) above sea level or go as far as two miles (3 kilometers) inland, away from the coastline. If you cannot get this high or far, go as high or far as you can. Every foot inland or upward may make a difference. You should be able to reach your safe location

on foot within 15 minutes. After a disaster, roads may become impassable or blocked. Be prepared to evacuate by foot if necessary. Footpaths normally lead uphill and inland, while many roads parallel coastlines. Follow posted tsunami evacuation routes; these will lead to safety. Local emergency management officials can advise you on the best route to safety and likely shelter locations.

- **If your children's school is in an identified inundation zone, find out what the school evacuation plan is.** Find out if the plan requires you to pick your children up from school or from another location. Telephone lines during a tsunami watch or warning may be overloaded and routes to and from schools may be jammed.
- **Practice your evacuation routes.** Familiarity may save your life. Be able to follow your escape route at night and during inclement weather. Practicing your plan makes the appropriate response more of a reaction, requiring less thinking during an actual emergency situation.
- **Use a NOAA Weather Radio or stay tuned to a local radio or television station to keep informed of local watches and warnings.**
- **Talk to your insurance agent.** Homeowners' policies do not cover flooding from a tsunami. Ask about the National Flood Insurance Program (NFIP) (www.fema.gov/nfip). NFIP covers tsunami damage, but your community must participate in the program.
- **Discuss tsunamis with your family.** Everyone should know what to do in a tsunami situation. Discussing tsunamis ahead of time will help reduce fear and save precious time in an emergency. Review flood safety and preparedness measures with your family.

If you are visiting an area at risk from tsunamis, check with the hotel, motel, or campground operators for tsunami evacuation information and find out what the warning system is for tsunamis. It is important to know designated escape routes before a warning is issued.

Protect Your Property

CORE ACTION MESSAGE
- **Actively protect your home.**

If you are at risk from tsunamis, you should:

- **Avoid building or living in buildings within several hundred feet of the coastline.** These areas are more likely to experience damage from tsunamis, strong winds, or coastal storms. For more information, check out the Institute for Business and Home Safety at www.ibhs.org.
- **Make a list of items to bring inside in the event of a tsunami.** A list will help you remember anything that can be swept away by tsunami water.
- **Elevate coastal homes.** Most tsunami waves are less than 10 feet (3 meters). Elevating your house will help reduce damage to your property from most tsunamis.
- **Take precautions to prevent flooding.** (See "Floods and Flash Floods.")
- **Have an engineer check your home and advise about ways to make it more resistant to tsunami water.** There may be ways to divert waves away from your property. Improperly built walls could make your situation worse. Consult with a professional for advice.
- **Ensure that any outbuildings, pastures, or corrals are protected in the same way as your home.** When installing or changing fence lines, consider placing them in such a way that your animals are able to move to higher ground in the event of a tsunami.

What to Do if You Feel a Strong Coastal Earthquake

CORE ACTION MESSAGE

- **Drop, cover, and hold on; then climb to higher ground.**

If you feel an earthquake that lasts 20 seconds or longer when you are in a coastal area, you should:

- **Drop, cover, and hold on.** You should first protect yourself from the earthquake. (See "Earthquakes.")
- **When the shaking stops, gather members of your household and move quickly to higher ground away from the coast.** A tsunami may be coming within minutes.
- **Avoid downed power lines and stay away from buildings and bridges** from which heavy objects might fall during an aftershock.

What to Do When a Tsunami Watch Is Issued

CORE ACTION MESSAGES

- **Stay informed.**
- **Be ready to evacuate.**

You should:

- **Use a NOAA Weather Radio or stay tuned to a Coast Guard emergency frequency station, or a local radio or television station for updated emergency information.** Most tsunami detection equipment is located at the coast. Seismic action may be the only advance warning before a tsunami approaches the coastline.
- **Check your Disaster Supplies Kit.** Some supplies may need to be replaced or restocked.
- **Locate household members and review evacuation plans**. Make sure everyone knows there are a potential threat and the best way to safer ground.
- **If any members of your household have special evacuation needs (small children, elderly people, or people with disabilities) consider evacuating early.**
- **If time permits, secure unanchored objects around your home or business.** Tsunami waves can sweep away loose objects. Securing these items or moving them inside will reduce potential loss or damage.
- **Be ready to evacuate.** Being prepared will help you to move more quickly if a tsunami warning is issued.
- **Bring your companion animals indoors and maintain direct control of them.** Be sure that your pet disaster kit is ready to go in case you need to evacuate.
- **Consider a precautionary evacuation of your animals,** especially any large or numerous animals. Waiting until the last minute could be fatal for them and dangerous for you. Where possible, move livestock to higher ground. If you are using a horse or other trailer to evacuate your animals, move early rather than wait until it may be too late to maneuver a trailer through slow traffic.

What to Do When a Tsunami Warning Is Issued

CORE ACTION MESSAGES
- **Stay informed.**
- **Climb to higher ground.**

- **Use a NOAA Weather Radio or stay tuned to a Coast Guard emergency frequency station, or a local radio or television station for updated emergency information.**
- **Follow instructions issued by local authorities.** Recommended evacuation routes may be different from the one you planned, or you may be advised to climb higher. Remember, authorities will issue a warning only if they believe there is a real threat from tsunami.
- If you are in a tsunami risk area, do the following:
  -**If you hear an official tsunami warning or detect signs of a tsunami, evacuate at once**. A tsunami warning is issued when authorities are certain that a tsunami threat exists, and there may be little time to get out.
  -**Take your Disaster Supplies Kit.** Having supplies will make you more comfortable during the evacuation.
  -**Get to higher ground as far inland as possible.** Officials cannot reliably predict either the height or local effects of tsunamis. Watching a tsunami from the beach or cliffs could put you in grave danger. If you can see the wave, you are too close to escape it.
  -Return home only after local officials tell you it is safe. A tsunami is a series of waves that may continue for hours. Do not assume that after one wave the danger is over. The next wave may be larger than the first one. In several cases, people survived the first wave and returned to homes and businesses only to be trapped and killed by later, sometimes larger, waves in the series.
- **If you evacuate, take your animals with you.** If it is not safe for you, it is not safe for your animals.

If you cannot escape a wave, climb onto a roof or up a tree, or grab a floating object and hang on until help arrives. Some people have survived tsunami waves by using these last-resort methods.

What to Do After a Tsunami

CORE ACTION MESSAGES
- **Stay informed.**
- **Take care of yourself and help others.**
- **Watch for hazards.**

After a tsunami, you should:
- **Continue using a NOAA Weather Radio or staying tuned to a Coast Guard emergency frequency station or a local radio or television station for updated emergency information.** The tsunami may have damaged roads, bridges, or other places that may be unsafe.

- **Check yourself for injuries and get first aid if necessary before helping injured or trapped persons.**
- **If someone needs to be rescued, call professionals with the right equipment to help.** Many people have been killed or injured trying to rescue others in flooded areas.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Avoid disaster areas.** Your presence might hamper rescue and other emergency operations and put you at further risk from the residual effects of floods, such as contaminated water, crumbled roads, landslides, mudflows, and other hazards.
- **Use the telephone only for emergency calls.** Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls to get through.
- **Stay out of a building if water remains around it.** Tsunami water, like floodwater, can undermine foundations, causing buildings to sink, floors to crack, or walls to collapse.
- **When re-entering buildings or homes, use extreme caution.** Tsunami-driven floodwater may have damaged buildings where you least expect it. Carefully watch every step you take.
- **Wear long pants, a long-sleeved shirt, and sturdy shoes.** The most common injury following a disaster is cut feet.
- **Use battery-powered lanterns or flashlights when examining buildings.** Battery-powered lighting is the safest and easiest to use, and it does not present a fire hazard for the user, occupants, or building. DO NOT USE CANDLES.
- **Examine walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing.**
- **Inspect foundations for cracks or other damage.** Cracks and damage to a foundation can render a building uninhabitable.
- **Look for fire hazards.** There may be broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances. Flammable or explosive materials may have come from upstream. Fire is the most frequent hazard following floods.
- **Check for gas leaks.** If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly. Turn off the gas using the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.
- **Look for electrical system damage.** If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.
- **Check for damage to sewage and water lines.** If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water from undamaged water heaters or by melting ice cubes that were made before the tsunami hit. Turn off the main water valve before draining water from these sources. **Use tap water only if local health officials advise it is safe.** (See Appendix: Drinking Water Safety.)
- **Watch out for wild animals,** especially poisonous snakes, that may have come into buildings with the water. Use a stick to poke through debris. Tsunami floodwater flushes snakes and animals out of their homes.

- **Watch for loose plaster, drywall, and ceilings that could fall.**
- **Take pictures of the damage,** both of the building and its contents, for insurance claims.
- **Open the windows and doors to help dry the building.**
- **Shovel mud before it solidifies.**
- **Check food supplies.** Any food that has come in contact with floodwater may be contaminated and should be thrown out. (See Appendix: Food and Water Exposed to Floodwater, Fire, and Chemicals.)
- **Expect aftershocks** if the earthquake was very large (magnitude 8 to 9+ on the Richter scale) and located nearby. Some aftershocks could be as large as magnitude 7+ and capable of generating another tsunami. The number of aftershocks will decrease over the course of several days, weeks, or months depending on how large the main shock was.
- **Watch your animals closely.** Keep all your animals under your direct control. Hazardous materials abound in flooded areas. Your pets may be able to escape from your home or through a broken fence. Pets may become disoriented, particularly because flooding usually affects scent markers that normally allow them to find their homes. The behavior of pets may change dramatically after any disruption, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

Media and Community Education Ideas

- If your community is at risk, build tsunami evacuation routes and publicize their locations. Post signs directing people to higher ground away from the coast.
- Review land use in tsunami hazard areas so no new critical facilities, such as hospitals and police stations; high-occupancy buildings, such as auditoriums or schools; or petroleum-storage tank farms are built where there is a tsunami hazard. Consider relocating existing critical facilities outside the tsunami hazard area when opportunities arise, or at least explore ways to reinforce facilities and structures, such as critical bridges needed for evacuation. Tsunami damage can be minimized through land use planning, preparation, and evacuation.
- Ask your local newspaper or radio or television station to:
  - -Do a series on the dangers of tsunamis and floods.
  - -Do a story featuring interviews with local officials about land use management and building codes in floodplains.
  - -Highlight the importance of staying informed about local conditions.
  - -Run public service ads about how to protect lives and property in a tsunami.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office, local American Red Cross chapter, and state geological survey or department of natural resources.
- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

- Periodically inform your community about local public warning systems.
- Interview local officials and insurance companies about the types of insurance that cover flood-related losses. Include information on the economic effects of disaster.

Facts and Fiction

Fiction: Tsunamis are giant walls of water.
Facts: Tsunamis normally have the appearance of a fast-rising and fast-receding flood. They can be similar to a tide cycle occurring over 10 to 60 minutes instead of 12 hours. Occasionally, tsunamis can form walls of water, known as tsunami bores, when the waves are high enough and the shoreline configuration is appropriate.

Fiction: A tsunami is a single wave.
Facts: A tsunami is a series of waves. Often the initial wave is not the largest. The largest wave may occur several hours after the initial activity starts at a coastal location. There may also be more than one series of tsunami waves if a very large earthquake triggers local landslides. In 1964, the town of Seward, Alaska, was devastated first by local tsunamis caused by submarine landslides resulting from the earthquake and then by the earthquake's main tsunami. The local tsunamis began even as people were still experiencing the shaking. The main tsunami, triggered at the site of the earthquake, did not arrive for several hours.

Fiction: A tsunami is the same thing as a tidal wave.
Facts: Tidal waves are regular ocean waves, and are caused by the tides. These waves are caused by the interaction of the pull of the moon's gravity on the earth. A "tidal wave" is a term used in common folklore to mean the same thing as a tsunami, but is not the same thing.

Fiction: Boats should move to the protection of a bay or harbor during a tsunami.
Facts: Tsunamis are often most destructive in bays and harbors, not just because of the waves but because of the violent currents they generate in local waterways. Tsunamis are least destructive in deep, open ocean waters.

Page TN-10 blank

Volcanoes

Learn about your community's risk from hazards created by volcanic eruptions. While you may be located far from a volcano, the ash from an explosive eruption could affect your area. Contact your local emergency management office, local American Red Cross chapter, or state geological survey or department of natural resources. Ask about the type of volcano hazards that could affect your area and what you can do to prepare.

AWARENESS MESSAGES

Why talk about volcanoes?

Volcanoes produce a wide variety of hazards that can kill people and destroy property. Volcanic eruptions fall into two broad types: (1) explosive and (2) quiet. Hazards from large explosive eruptions include widespread ashfall (fine glass particles), pyroclastic flows (mixtures of hot gases and pumice blocks), and massive lahars (volcanic mud or debris flows) that can endanger people and property nearby as well as tens to hundreds of miles away. Eruptions can even affect global climate. Hazards from quiet lava flows include igniting fires and producing chlorine-rich gas clouds where lava pours into the sea. Since 1980, as many as five volcanoes have erupted each year in the United States. Eruptions are most likely to occur in Hawaii and Alaska. In the Cascade Mountain Range in Washington, Oregon, and northern California, volcanoes erupt on the average of one to two or more each century.

Volcanic ash can affect people and equipment hundreds of miles from the volcano. Inhaling volcanic ash can cause serious respiratory problems for people with heart and lung ailments.

Explosive eruption columns pose a serious hazard to commercial aviation. The ash column can grow rapidly and reach more than 12 miles (19 kilometers) above a volcano in less than 30 minutes, forming an ash cloud. During the past 14 years, about 80 commercial jets have been damaged by inadvertently flying into ash clouds, and several have nearly crashed because of engine failure. Many federal agencies, including the U.S. Geological Survey, the Federal Aviation Administration, and the National Weather Service, are working together to issue timely warnings of airborne ash to airports and airline pilots.

What are volcanoes, and what causes them to erupt?

A volcano is a vent through which molten rock escapes to the earth's surface. Unlike other mountains, which are pushed up from below, volcanoes are built by surface accumulation of their eruptive products—layers of lava flows, ash flows, and ash. When pressure from gases within the molten rock becomes too great, gases drive the molten rock to the surface and an eruption occurs.

What damages can volcanoes cause?
In the past few thousand years, the volcanoes of the Cascade Mountain Range, which stretches from northern California into British Columbia, have produced more than 100 eruptions, most of them explosive. However, individual Cascade Range volcanoes can lie dormant for many centuries between eruptions, and the great risk posed by volcanic activity in the region is therefore not always apparent. When Cascade Range volcanoes do erupt, high-speed avalanches of hot ash and rock (pyroclastic flows), lava flows, and landslides can devastate areas 10 miles (16 kilometers) or more away, and huge mudflows of volcanic mud and debris (lahars) can inundate stream valleys at speeds of 20 to 40 miles (32 to 64 kilometers) per hour and travel more than 50 miles (80 kilometers) downstream.

Most eruptions at Hawaiian volcanoes are not explosive and are characterized by the relatively quiet outflow of very fluid lava. These quiet eruptions can produce spectacular lava fountains or lava flows that creep across the land at the relatively slow speed of 10 miles (16 kilometers) per hour or so. The speed at which lava moves across the ground depends on several factors, including the type of lava erupted, the steepness of the ground, and the rate of lava production at the vent. Because the temperature of the lava can be 1000° to 2000° F (538° to 1093° C), lava flows destroy everything in their path, often causing dangerous fires. While most lava moves slowly enough that people can get out of the way, wildland fires can advance rapidly. Before and during an eruption, many small earthquakes occur as molten rock forces its way through the upper parts of a volcano's interior. Such quakes often provide early warnings of changes in eruptive activity.

Volcanic eruptions can be accompanied by other natural hazards: earthquakes, mudflows and flash floods, rockfalls and landslides, wildland fires, and (given certain conditions) tsunamis.

How can I protect myself from the ill effects of a volcanic eruption?
You need to know the volcanic hazards associated with active and potentially active volcanoes where you live and where you visit. You must determine the varying degrees of your own risk and take actions to stay safe and protect your property.

Learning your community's warning system, developing and practicing a household evacuation plan, and being prepared to shelter-in-place should be important parts of your plan.

What is the best source of information in case of a volcano watch or warning?
Local radio or television stations are the best sources of information in a volcanic eruption situation.

Volcanoes usually give warning that they will erupt, and U.S. Geological Survey (USGS) scientists have developed a forecasting system to alert public officials and the general public of such warnings. The USGS Volcano Hazards Program, in collaboration with federal, state, and local government agencies, universities, and the private sector, operates five volcano observatories to reduce the risk from volcanic activity. The five observatories are the Alaska Volcano Observatory, the Hawaiian Volcano Observatory, the Cascades Volcano Observatory, the Long Valley Caldera Observatory, and the Yellowstone Volcano Observatory.

ACTION MESSAGES

Be Prepared for a Volcanic Eruption

Protect Yourself

CORE ACTION MESSAGES

- **Determine your risk.**
- **Prepare household members.**
- **Keep goggles and dust masks handy.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take volcano-specific precautions and plan for and practice what to do if a volcano erupts.

If you are at risk from volcanic activity, you should:

- **Learn about your community's warning systems and emergency plans.** Different communities have different ways of providing warnings and different response plans.
- **Keep handy a pair of goggles and a dust mask for each member of your household in case of ashfall.**
- **Develop an evacuation plan for volcanic eruptions** and make sure all members of your household know and practice it. (See chapter on "Evacuation and Sheltering, and Post-disaster Safety.") Be sure to include your animals in your evacuation plan. Making plans at the last minute can be upsetting and wastes precious time.
- **Discuss volcanoes with members of your household.** Discussing volcanic eruptions ahead of time helps to reduce fear and lets everyone know how to respond.
- **Review landslide and mudflow safety and preparedness measures with members of your household.** (See chapter on "Landslides.")
- **Talk to you insurance agent.** Find out what your homeowners' policy will or will not cover in the event of a volcanic eruption.

What to Do During a Volcanic Eruption

CORE ACTION MESSAGE

- **Evacuate or take shelter.**

You should:

- **Listen to a local station on a portable, battery-operated radio or television for updated emergency information and instructions.** If the electricity is out, this may be your main source of information. Local officials will give the most appropriate advice for your particular situation on local media.

- **Follow any evacuation orders issued by authorities, and put your Family Disaster Plan into action.** Although it may seem safe to stay at home and wait out an eruption, if you are in a hazard zone, doing so could be very dangerous. The best way to stay safe is to take the advice of local authorities.
- **If indoors, close all window, doors, and dampers** to keep volcanic ash from entering.
- **Put all machinery inside a garage or barn** to protect it from volcanic ash. If buildings are not available, cover machinery with large tarps.
- **Bring animals and livestock into closed shelters** to protect them from breathing volcanic ash.
- **If outdoors, take shelter indoors.** Your safest place is indoors, away from various hazards.
- **Stay out of designated restricted zones.** Effects of a volcanic eruption can be experienced many miles from a volcano.
- **Avoid low-lying areas, areas downwind of the volcano, and river valleys downstream of the volcano.** Debris and ash will be carried by wind and gravity. Stay in areas where you will not be further exposed to volcanic eruption hazards. Trying to watch an erupting volcano up close is a deadly idea.
- **If you are caught in an ashfall:**
  -Wear a dust mask designed to protect against lung irritation from small particles.
  -Protect your eyes by wearing goggles. Wear eyeglasses, not contact lenses.
  -Keep as much of your skin covered as possible.

What to Do After a Volcanic Eruption

CORE ACTION MESSAGES
- **Stay inside.**
- **Protect your lungs and eyes.**

You should:
- **Stay indoors and away from volcanic ashfall areas if possible.** The fine, glassy particles of volcanic ash can increase the health risks for children and people with respiratory conditions, such as asthma, chronic bronchitis, or emphysema.
- **Whether you are indoors or outdoors:**
  -Wear a dust mask designed to protect against lung irritation from small particles
  -**Protect your eyes by wearing goggles. Wear eyeglasses, not contact lenses.**
  -Keep as much of your skin covered as possible.
- **When it is safe to go outside:**
  -Clear roofs of ashfall. Ash is very heavy and can cause buildings to collapse, especially if made wet by rain. Exercise great caution when working on a roof.
  -Avoid driving in heavy ashfall. Driving will stir up volcanic ash that can clog engines and stall vehicles. Abrasion can damage moving parts, including bearings, brakes, and transmissions.

- **Keep animals away from ashfall and areas of possible hot spots.** Wash animals' paws and fur or skin to prevent their ingesting or inhaling ash while grooming themselves.

Media and Community Education Ideas

- Ask your local newspaper or radio or television station to:
  -Do a series on the dangers of volcanic eruptions, ashfalls, floods, etc.
  -Do a story featuring interviews with local officials about land use management in low-lying areas.
  -Highlight the importance of staying informed about local conditions.
  -Run public service ads about how to protect lives in the event of a volcanic eruption.
  -Feature an interview with a representative of the U.S. Geological Survey, talking about how this group determines the likelihood of a volcanic eruption.
  -Do a series on local volcanic hazards and how to recognize the warning signs of a possible volcanic eruption.
  -Publicize emergency evacuation routes.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide the business telephone numbers for the local emergency management office, local American Red Cross chapter, and state geological survey or department of natural resources.

- Work with officials of the local fire, police, and emergency medical services departments; utilities; hospitals; emergency management office; and American Red Cross chapter to prepare and disseminate guidelines for people with mobility impairments about what to do if they have to evacuate.

Facts and Fiction

Fiction: Volcanoes erupt with regularity.
Facts: Volcanoes generally experience a period of closely spaced eruptions followed by long periods of quiet. Most volcanoes show no regularity, and thus on the basis of past history alone cannot be considered "overdue" or "ready to blow."

Fiction: Volcanoes are unpredictable, erupting at any time without warning.
Facts: Volcanoes usually give warning signs that they are going to erupt weeks to months or more in advance. Although we cannot predict when a volcano will start to be restless, once activity begins, scientists can make general forecasts about how soon an eruption will occur. A more difficult challenge for volcanologists is forecasting the size of an impending eruption.

Fiction: Lava flows are the most significant hazards from volcanoes in the United States.
Facts: Although this is true in Hawaii, the hazards differ at the more than 150 volcanoes in other parts of the United States. Principal hazards outside Hawaii include: (1) Volcanic ashfall resulting from explosive-style eruptions. Volcanic ash, the shattered remnants of volcanic rock, rises into the atmosphere, where it is a hazard to aircraft and affects large areas downwind when it falls back to earth. Where it falls in sufficient quantity, it can cause difficulties for vehicles, machinery, and utilities, and can be injurious to human health. (2) Volcanic mudflows (lahars) resulting from the sudden melting of snow and ice
during eruptions. Lahars can inundate river valleys tens of miles distant, destroying bridges, highways, and other types of development, as well as endangering people.

Fiction: Earthquakes cause volcanic eruptions.
Fact: Earthquakes indicate a geologically active landscape, but they are not the cause of volcanic eruptions. In rare cases, large tectonic earthquakes have triggered eruptions of nearby volcanoes that have been poised to erupt anyway. In the case of Mount St. Helens, a flurry of earthquakes under the volcano suggested potential eruptive activity.

Winter Storms

AWARENESS MESSAGES

Why talk about winter storms?

Each year, exposure to cold, vehicle accidents caused by wintry roads, and fires caused by the improper use of heaters injure and kill hundreds of people in the United States. Add these to other winter weather hazards and you have a significant threat to human health and safety.

A major winter storm can last for several days and can include high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. People can become marooned at home without utilities or other services. Heavy snowfall and blizzards can trap motorists in their vehicles and make walking to find help a deadly effort. Storm effects, such as severely cold temperatures, heavy snow, and coastal flooding, can cause hazardous conditions and hidden problems. The aftermath of a winter storm can impact a community or region for days, weeks, or even months.

What are winter storms?

Winter storms can range from a moderate snow over a few hours to a blizzard with blinding, wind-driven snow that lasts for several days. Some winter storms are large enough to affect several states, while others affect only a single community. Many winter storms are accompanied by dangerously low temperatures and sometimes by strong winds, icing, sleet, and freezing rain.

Winter storms are defined differently in various areas of the country, and each area is equipped differently to deal with the challenges and hazards of severe winter weather. A snowstorm that would be unremarkable in Buffalo, N.Y., could bring a city in the southern states to a standstill. Local emergency management offices, National Weather Service (NWS) offices, and American Red Cross chapters can provide definitions specific to each area.

What damages can snow cause, and what are the different kinds of snow?

Heavy snow can immobilize a region and paralyze a city, stranding commuters, closing airports, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Homes and farms may be isolated for days. In rural areas, unprotected livestock can be lost. In urban areas, the cost of snow removal, damage repair, and lost business can have severe economic impacts. In the mountains, heavy snow can lead to an **avalanche**—a mass of tumbling snow. More than 80 percent of midwinter avalanches are triggered by a rapid accumulation of snow, and 90 percent of those occur within 24 hours of snowfall. An avalanche can reach a mass of a million tons and travel at speeds up to 200 miles (322 kilometers) per hour.

Various intensities of snow are defined differently:

- **Blizzard** describes winds of 35 miles (56 kilometers) per hour or more with snow and blowing snow that reduce visibility to less than one-quarter mile (0.4 kilometer) for at least three hours.
- **Blowing snow** describes wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground that is picked up by the wind.
- **Snow squall** describes a brief, intense snow shower accompanied by strong, gusty winds. Accumulation from snow squalls can be significant.
- **Snow shower** describes snow that falls at varying intensities for short durations with little or no accumulation.

What damages can ice cause, and what are the different kinds of ice?
Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt communications and power for days while utility companies repair extensive damage. Even small accumulations of ice can be severely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Ice forms in different ways:

- **Sleet** is rain that freezes into ice pellets before it reaches the ground. Sleet usually bounces when hitting a surface and does not stick to objects; however, it can accumulate like snow and cause roads and walkways to become hazardous.
- **Freezing rain (also known as an ice storm)** is rain that falls onto a surface that has a temperature below freezing. The cold surface causes the rain to freeze so the surfaces—trees, utility wires, vehicles, and roads—become glazed with ice. Even small accumulations of ice can cause significant hazards to people—especially pedestrians and motorists—and property.

What damages can severe cold cause?
What constitutes severe cold varies in different parts of the country. In some northern regions, cold temperatures are not considered severe until they are well below 0° F (−18° C). In most southern regions, near-freezing temperatures (around 32° F, or 0° C) are considered severe cold. Severe cold can cause much harm; for example, it can damage crops and other vegetation and freeze pipes causing them to burst. Unusually cold temperatures are especially dangerous in areas not accustomed to them because residents are generally unprepared and may not realize the dangers severe cold present.

Exposure to cold can cause frostbite and life-threatening hypothermia. **Frostbite** is the freezing of body tissue, and it most frequently affects fingers, toes, earlobes, and the tip of the nose. Frostbite damage ranges from superficial and reversible to deep and permanent. Frostbite can result in tissue loss and even loss of digits and limbs.

Hypothermia begins to occur when a person's body temperature drops to 3° below its normal temperature. On average, a person would begin to suffer hypothermia if his or her temperature dropped to 96° F (35.6° C). Cold temperatures can cause hypothermia in anyone who is not adequately clothed or sheltered in a place with adequate heat. Hypothermia can kill people, and those who survive hypothermia are likely to suffer lasting ill effects. Infants and elderly people are the most susceptible. Elderly people account for the largest percentage of hypothermia victims, many of whom freeze to death in their own homes. Most of these victims are alone and their heating systems are working improperly or not at all. People who are taking certain medications, who have certain medical conditions, or who have been drinking alcohol also are at increased risk for hypothermia.

What is winter flooding?
Winter flooding can result from winter storms or long periods of cold temperatures, and it can cause significant damage and loss of life. The winds of intense winter storms can cause widespread tidal flooding and severe beach erosion along coastal areas. Long cold spells can cause rivers and lakes to freeze so that when a rise in the water level or a thaw breaks the ice into large chunks, the chunks become jammed at man-made and natural obstructions. These ice jams can act as dams, resulting in severe flooding. In addition, the sudden thawing of a heavy snow pack can often lead to flooding.

How can I protect myself in winter storms?
Winter storms are considered deceptive killers because most winter storm deaths are related only indirectly to the storms. Overall, most winter storm deaths result from vehicle or other transportation accidents caused by ice and snow. You should avoid driving when conditions include sleet, freezing rain or drizzle, snow, or dense fog. These are serious conditions that are often underestimated, and they make driving—and even walking outside—very hazardous.

Exhaustion and heart attacks brought on by overexertion are two other common causes of deaths related to winter storms. Cold temperatures compound the strain of physical labor on a person's body. Tasks such as shoveling snow, pushing a vehicle, or even walking in heavy snow can cause a heart attack, particularly in people who are older or not used to high levels of physical activity. Before tackling strenuous tasks in cold temperatures, you should carefully consider your physical condition, the weather factors, and the nature of the task. If you are not sure how much you can safely do, you should avoid all heavy work in cold temperatures**.**

You should also dress to protect yourself from frostbite and hypothermia. When outside in cold temperatures, wear warm, loose-fitting, lightweight clothing in several layers. If you get too warm, you can remove one or more layers and if you get too cold you can add layers, so you can avoid the sweat-chills cycle. Your outer garments should be tightly woven, water repellent, and have a hood. Wear a hat. Half of your body heat can be lost from your head. Mittens, snug at the wrist, are better than gloves. Try to stay dry. If it is extremely cold, cover your mouth to protect your lungs.

If, during severe cold, your home loses power or heat, go to a designated public shelter. For information on designated shelters, contact your local emergency management office or American Red Cross chapter.

Home fires occur more frequently in the winter because people do not take the proper safety precautions when using alternative heating sources. Be sure all heating sources are installed according to local codes and permit requirements. To protect yourself, be sure that you never leave a fire unattended, that you dispose of ashes properly and only after they are completely cold, and that you operate and position space heaters only according to the manufacturer's instructions. Use only space heaters approved by an independent testing laboratory. Fire during winter storms is exceptionally dangerous because conditions may make it difficult for firefighters to get to the fire, and the water needed to fight the fire may be frozen.

In addition, every winter people are killed by carbon monoxide (CO) emitted by fuels they are using to heat their homes. Never operate unvented fuel-burning appliances in any closed room or where people are sleeping. CO poisoning from fuel-burning appliances kills people each year in the United States. Never use gas appliances such as ranges, ovens, or clothes dryers to heat your home. Do not use charcoal grills indoors or in attached garages.

Never use a portable generator in an enclosed or partially enclosed space, including in your home, or in a garage, basement, crawl space, or other partially enclosed area, even with ventilation. Opening doors and windows or using fans will not prevent CO buildup. Locate a portable generator outdoors and away from doors, windows, and vents that could allow CO to come indoors. Portable generators can produce high levels of deadly CO very quickly. In addition to producing toxic engine exhaust, portable generators can cause electric shock or electrocution and fire. (See Appendix: Portable Generators.)

What is the best source of information about winter weather?
Local radio or television stations or NOAA Weather Radio are the best sources of information about winter weather conditions.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information about winter weather and other hazards is issued for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Wind Chill Temperature
The wind chill temperature is how cold people and animals feel when they are outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As wind increases, heat is carried away from the body at a faster rate. This drives down the body temperature. Therefore, the wind makes it feel much colder. The wind chill temperature is not the actual temperature but rather how wind and cold feel on exposed skin.

Outlook, Watch, Warning, Advisory

A **Winter Storm OUTLOOK** means winter storm conditions are possible in the next two to five days. Stay tuned to local media for updates.

A Winter Storm WATCH means winter storm conditions are possible within the next 36 to 48 hours. People in a watch area should review their winter storm plans (Family Disaster Plan, Disaster Supplies Kit) and keep informed about weather conditions.

A **Winter Storm WARNING** means life-threatening, severe winter conditions have begun or will begin within 24 hours. People in a warning area should take precautions **immediately.**

A **Blizzard WARNING** means sustained winds or frequent gusts of 35 miles (56 kilometers) per hour or greater and considerable falling or blowing snow that reduces visibility to less than a quarter mile (0.4 kilometer) are expected to prevail for a period of three hours or longer. People in a warning area should take precautions **immediately.**

A **Winter Weather ADVISORY** means winter weather conditions are expected to cause significant inconveniences and may be hazardous. If you are cautious, these situations should not be life threatening.

Outlooks, watches, warnings, and advisories are issued by the National Weather Service (NWS) and broadcast on NOAA Weather Radio and on local radio and television stations

Is your community StormReady? To help people prepare for the ravages of hazardous weather, the National Weather Service has designed StormReady, a program aimed at arming America's communities with the communication and safety skills necessary to save lives and property. More information is available at www.stormready.noaa.gov/.

Carbon Monoxide Alarm

Every home should have properly installed and maintained carbon monoxide (CO) alarms that meet current safety standards. (See Appendix: Carbon Monoxide Alarms.) CO alarms can help detect CO, a colorless, odorless gas produced by burning any fuel. Exposure to high levels of CO can cause death. The initial symptoms of CO poisoning are similar to the flu and include dizziness, fatigue, headache, nausea, and irregular breathing.

ACTION MESSAGES

Be Prepared for a Winter Storm

Protect Yourself

CORE ACTION MESSAGES

- **Install and maintain smoke and carbon monoxide alarms.**
- **Keep cold-weather clothing, supplies, and equipment ready.**
- **Inspect heating equipment and have it serviced as needed.**

For general preparedness, every household should create and practice a Family Disaster Plan and assemble and maintain a Disaster Supplies Kit. In addition, every household should take specific precautions and make specific plans for cold weather.

If you live in an area where severe winter weather is possible, you should:

Talk with members of your household about what to do if a winter storm watch or warning is issued. Discussing winter storms ahead of time helps reduce fear and helps everyone know how to respond during a winter storm.

- **Install smoke alarms.** For new homes, interconnected smoke alarms are required on every level of the home, outside each sleeping area and inside each bedroom. Although this approach is ideal for all homes, as a minimum, existing homes should have smoke alarms on every level and outside each sleeping area. Test and maintain them according to the manufacturer's instructions. (See Appendix: Smoke Alarms.)
- **Install carbon monoxide (CO) alarms following the manufacturer's instructions. It is especially important to have one near sleeping areas.** Test and maintain them according to the manufacturer's instructions. (See Appendix: Carbon Monoxide Alarms.)
- **Get training.** Take an American Red Cross first aid course to learn how to treat exposure to the cold, frostbite, and hypothermia.
- **Service snow removal equipment before the winter storm season and maintain it in good working order.**
- **Keep your vehicle's gas tank full** so you can leave right away in an emergency and to keep the fuel line from freezing.
- **Keep a supply of non-clumping kitty litter** to make walkways and steps less slippery. Kitty litter temporarily improves traction on an icy surface. Rock salt melts ice on walkways, but it can damage vegetation and concrete. You may find other, less damaging, ice-melting products at building supplies stores.
- **Keep handy** a warm coat, gloves or mittens, hat, water-resistant boots, and extra blankets and warm clothing for each member of the household.
- **Make sure your home heating sources are installed according to local codes and permit requirements and are clean and in working order.** Many home fires are started by poorly maintained furnaces or stoves, cracked or rusted furnace parts, or chimneys with creosote buildup.
- **Be sure all portable and fixed electric space heaters have been certified by an independent testing laboratory.** Keep blankets, clothing, curtains, furniture, and anything that could get hot and catch fire at least three feet away from all heat sources.

Plug heaters directly into the wall socket rather than using an extension cord and unplug them when they are not in use.

- **Use kerosene heaters only if permitted by law in your area.** Refuel kerosene heaters outdoors only after they have cooled. Kerosene has a low flash point. If mistakenly dripped on hot surfaces, it can cause fires. Do not substitute gasoline for kerosene in the heater. Make sure the area is ventilated properly. Follow all of the manufacturer's instructions.
- **Have chimneys and wood stoves inspected annually and cleaned if necessary.** Chimneys and wood stoves build up creosote, which is the residue left behind by burning wood. Creosote is flammable and needs to be professionally removed periodically. Store ashes in a metal container with a tight-fitting lid.
- **Bring your companion animals inside during winter weather.**

Protect Your Property

CORE ACTION MESSAGES
- **Guard against fire and CO poisoning.**
- **Insulate your home and protect the pipes.**

If you live in an area where severe winter weather is possible, you should:

- **Make sure your home is properly insulated.** If necessary, insulate the walls and attic to reduce your home's power demands for heat. Caulk and weather-strip doors and windowsills to keep cold air out.
- **Install storm windows or cover windows with plastic from the inside** to provide an extra layer of insulation to keep cold air out.
- **Protect pipes from freezing by:**
  -Wrapping pipes in insulation or layers of newspaper and then covering them with plastic to keep out moisture.
  -Letting faucets drip a little.
- **Know how to shut off the main water valve and how to shut off and drain outside faucets.** Outside faucets are often controlled by a valve inside the home. Keep a wrench near the valves.
- **Install heat tape on water pipes.** Put the tape on all exterior water pipes and interior pipes located on outside walls or anywhere else that temperatures could go below freezing. Follow carefully the manufacturer's instructions for installation.
- **If the pipes freeze,** remove any insulation or newspaper and wrap the pipes in rags. Completely open all faucets and pour hot water over the pipes, starting where they were most exposed to the cold or where the cold most likely penetrated. A hand-held hair dryer, used with caution to prevent overheating, also works well.
- **Consider buying emergency heating equipment, such as a wood- or coal-burning stove or an electric or kerosene heater.** If you have a stove, be sure it is properly vented and in good working order and that you dispose of ashes safely. Keep a supply of wood or coal on hand. If you have an electric space heater, either portable or fixed, be sure it is certified by an independent testing laboratory. Plug a heater directly into the wall socket rather than using an extension cord and unplug it when it is not in use. Use a kerosene heater only if permitted by law in your area; check with your local fire department. If you have a kerosene heater, use only the correct fuel for your unit. Properly ventilate the area of use. Refuel the unit outdoors only, and only when the unit

is cool. Follow all of the manufacturer's instructions. Keep all heaters at least three feet away from furniture and other flammable objects.

- **When using fireplaces, stoves, and space heaters, ventilate properly and guard against fire.** Using alternative sources of heat such as these greatly increases your risk for fire and carbon monoxide (CO) poisoning.
- **Consider storing sufficient heating fuel.** Regular fuel sources may be cut off. Be cautious of fire hazards when storing any type of fuel.
- **If you have a fireplace, consider keeping a supply of firewood or coal**. Be sure the fireplace is properly vented and in good working order and that you dispose of ashes safely.
- **Install snow fences in rural areas** to reduce drifting snow on roads and paths, which could block access to homes, barns, and animals' feed and water.
- **Create a place where your animals can be comfortable in severe winter weather.** Bring your companion animals indoors. Horses and livestock should have a shelter where they can be protected from wind, snow, ice, and rain. Grazing animals should have access to a protected supply of food and non-frozen water.
- **Be aware of the potential for flooding when snow and ice melt and be sure that your animals have access to high ground that is not impeded by fencing or other barriers.** You may not be able to get to them in time to relocate them in the event of flooding.
- **Ensure that any outbuildings that house or shelter animals can withstand wind and heavy snow and ice.**
- **Consider purchasing flood insurance,** if you live in a flood-prone area, to cover possible flood damage that may occur during the spring thaw. Homeowners' policies do not cover damage from floods. Ask your insurance agent about the National Flood Insurance Program (NFIP) if you are at risk. More information on NFIP is available at www.fema.gov/nfip.

What to Do Before a Winter Storm

CORE ACTION MESSAGES

- **Stay informed.**
- **Know the location of public shelters.**

You should:

- **Keep handy a battery-powered radio or television or NOAA Weather Radio with the Specific Area Message Encoder (SAME) feature.**
- **Contact your local emergency management office or American Red Cross chapter for information on designated public shelters in case you lose power or heat.**
- **Check your Disaster Supplies Kit, and keep it handy.**
- **Be sure you have ample heating fuel.**
- **If you have alternative heating sources, such as fireplaces, wood- or coal-burning stoves, or space heaters, be sure they are installed according to local codes and permit requirements and are clean and in working order.**
- **Check that your fire extinguisher(s) is in good working order, and replace it if necessary.** (See Appendix: Fire Extinguishers.)

- **Bring your companion animals inside and ensure that your horses and livestock have blankets if appropriate and unimpeded access to shelter, food, and non-frozen water.**

What to Do During a Winter Storm Watch

CORE ACTION MESSAGES
- **Stay informed.**
- **Shelter animals.**
- **Stay inside if possible.**

- **Listen to NOAA Weather Radio or a local radio or television station for updated information.**
- **Watch for changing weather conditions.** Severe weather can happen quickly. Temperatures may drop rapidly, winds may increase, or snow may begin to fall at heavier rates. Even local media may not know moment by moment what is happening in your particular area.
- **Move animals to sheltered areas with a supply of non-frozen water.** Most animal deaths in winter storms are caused by dehydration.
- **Ensure that you have supplies for clean-up for your companion animals,** particularly if they are used to eliminating outdoors (large plastic bags, paper towels, and extra cat litter).
- **Avoid unnecessary travel.** The safest place during a winter storm is indoors. About 70 percent of deaths related to ice and snow occur in automobiles.

What to Do During a Winter Storm Warning or a Blizzard Warning

CORE ACTION MESSAGES
- **Stay informed.**
- **Stay inside if possible.**
- **Dress warmly in layers.**
- **Watch for dangers.**

- **Stay indoors and wear warm clothes.** Layers of loose-fitting, lightweight, warm clothing will keep you warmer than a bulky sweater. If you feel too warm, remove layers to avoid sweating; if you feel chilled, add layers.
- **Listen to a local station on battery-powered radio or television or to NOAA Weather Radio for updated emergency information.**
- **Bring your companion animals inside before the storm begins.**
- **Eat regularly.** Food provides the body with energy for producing its own heat.
- **Keep the body replenished with fluids to prevent dehydration.** Drink liquids such as warm broth or juice. Avoid caffeine and alcohol. Caffeine, a stimulant, accelerates the symptoms of hypothermia. Alcohol, such as brandy, is a depressant and hastens the effects of cold on the body. Alcohol also slows circulation and can make you less aware of the effects of cold. Both caffeine and alcohol can cause dehydration.

- **Conserve fuel.** Winter storms can last for several days. Great demand may be placed on electric, gas, and other fuel distribution systems (fuel oil, propane, etc.). Suppliers of propane and fuel oil may not be able to replenish depleted supplies during severe weather. Electric and gas services may be temporarily disrupted when many people demand large amounts at the same time. Lower the thermostat to 65° F (18° C) during the day and to 55° F (13° C) at night. Close off unused rooms, and stuff towels or rags in cracks under the doors. Cover the windows at night.
- **If you must go outside, protect yourself from winter storm hazards:**
  -**Wear layered clothing**, **mittens or gloves, and a hat.** Layered clothing will keep you warmer than a single, heavy coat. Outer garments should be tightly woven and water repellent. Mittens or gloves and a hat will prevent the loss of body heat. Mittens are warmer than gloves because your fingers maintain more warmth when they touch each other. Half of your body-heat loss is from your head.
  -Cover your mouth to protect your lungs from severely cold air. Avoid taking deep breaths; minimize talking.
  -**Watch for signs of hypothermia and frostbite.** (See Appendix: Frostbite and Hypothermia.)
  -Keep dry. Change wet clothing frequently to prevent a loss of body heat. Wet clothing loses much of its insulating value and transmits heat rapidly away from the body.
  -Stretch before you go out. If you go out to shovel snow, do a few stretching exercises to warm up your body. This will reduce your chances of muscle injury.
  -Avoid overexertion, such as shoveling heavy snow, pushing a vehicle, or walking in deep snow. The strain from the cold and the hard labor may cause a heart attack. Sweating could lead to a chill and hypothermia.
- **Walk carefully on snowy, icy sidewalks.** Slips and falls occur frequently in winter weather, resulting in painful and sometimes disabling injuries.
- **If you must go out during a winter storm, use public transportation if possible.** About 70 percent of winter deaths related to ice and snow occur in automobiles.
- **Check on relatives, neighbors, and friends, particularly if they are elderly or if they live alone.**

Driving in Winter Conditions

CORE ACTION MESSAGES

- **Winterize your vehicle and stock it with emergency supplies.**
- **Avoid driving in a winter storm.**
- **If stranded, stay with the vehicle and keep warm.**

You should:

- **Have your vehicle winterized** before the winter storm season. Keeping your vehicle in good condition will decrease your chance of being stranded in cold weather. Have a mechanic check your battery, antifreeze, wipers and windshield washer fluid, ignition system, thermostat, lights, flashing hazard lights, exhaust system, heater, brakes, defroster, and oil level. If necessary, replace existing oil with winter-grade oil. Install good winter tires. Make sure the tires have adequate tread. All-weather radials are usually adequate for most winter conditions. However, some jurisdictions require that vehicles on their roads be equipped with chains or snow tires with studs.

- **Check your vehicle emergency supplies kit and replenish it if necessary.** (See Appendix: Emergency Supplies for Your Vehicle.)
- **If you will be driving in wintry conditions, in addition to the usual emergency supplies you keep in your vehicle, be sure to keep enough of the following for each person:**
  -Blankets or sleeping bags.
  -Rain gear, extra sets of dry clothing, mittens, socks, and wool hats.
  -Newspapers for insulation.
  -Plastic bags for sanitation.
  -Canned fruit, nuts, and high energy "munchies." (Include a non-electric can opener if necessary.)

  Keep in your vehicle:
  -A windshield scraper and small broom for ice and snow removal.
  -A small sack of sand for generating traction under wheels and a set of tire chains or traction mats.
  -Matches in a waterproof container.
  -Cards, games, and puzzles.
  -A brightly colored (preferably red) cloth to tie to the antenna.
- **Keep a cell phone or two-way radio with you when traveling in winter.** Make sure the battery is charged.
- **If you must be on the road during a winter storm, bring warm broth in a thermos and several bottles of water for each person.**
- **Keep your vehicle's gas tank full so you will be ready in case of emergency and to prevent the fuel line from freezing.**
- **Plan to travel during daylight and, if possible, take at least one other person with you.**
- **Let someone know your destination, your route, and when you expect to arrive.** If your vehicle gets stuck along the way, help can be sent along your predetermined route.
- **Before leaving, listen to weather reports for your area and the areas you will be passing through, or call the state highway patrol for the latest road conditions.**
- **Be on the lookout for sleet, freezing rain, freezing drizzle, and dense fog, which can make driving very hazardous.**
- **Avoid traveling during a winter storm.**
- **If you must travel and do become stranded, it is better to stay in the vehicle and wait for help.** Do not leave the vehicle to search for assistance unless help is visible within 100 yards (91 meters). You can quickly become disoriented and confused in blowing snow.
- **If you are stuck in a vehicle:**
  -**Display a trouble sign to indicate you need help.** Hang a brightly colored cloth (preferably red) on the radio antenna and raise the hood after snow stops falling.
  -Run the engine occasionally to keep warm. Carbon monoxide can build up inside a standing vehicle while the engine is running, even if the exhaust pipe is clear. Running the heater for 10 minutes every hour generally is enough to keep the occupants warm. Running the engine for only short periods reduces the risk of carbon monoxide poisoning and conserves fuel. Turn on the engine for about 10 minutes each hour (or five minutes every half hour). Use the heater while the engine is running. Keep the exhaust pipe clear of snow, and slightly open a downwind window for ventilation.
  -Leave the overhead light on when the engine is running so that you can be seen.

-Do light exercises to keep up circulation. Clap your hands and move your arms and legs occasionally. Try not to stay in one position for too long.
-If more than one person is in the vehicle, take turns sleeping. One of the first signs of hypothermia is sleepiness. If you are not awakened periodically to increase body temperature and circulation, you can freeze to death.
-Huddle together for warmth. Use newspapers, maps, and even the removable floor mats for added insulation. Layering items will help trap more body heat.
-Watch for signs of frostbite and hypothermia. Severe cold can cause numbness, making you unaware of possible danger. Keep fingers and toes moving for circulation, and drink warm broth to reduce the risk of further injury.
-Drink fluids to avoid dehydration. Bulky winter clothing can cause you to sweat, but cold dry air will help the sweat evaporate, making you unaware of possible dehydration. When people are dehydrated, they are more susceptible to the ill effects of cold and to heart attacks.
-**Avoid overexertion.** Cold weather puts an added strain on the heart. Unaccustomed exercise, such as shoveling snow or pushing a vehicle, can bring on a heart attack or make other medical conditions worse.

What to Do After a Winter Storm

CORE ACTION MESSAGES
- **Stay informed.**
- **Avoid travel.**
- **Avoid overexertion.**

You should:

- **Keep listening to a local radio or television station or NOAA Weather Radio for updated information and instructions.** Access to some parts of the community may be limited or roads may be blocked.
- **Help people who require special assistance—**infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- **Avoid driving and other travel until conditions have improved.** Roads may be blocked by snow or emergency vehicles.
- **Avoid overexertion.** Heart attacks from shoveling heavy snow are a leading cause of death during the winter.
- **Keep up with local weather forecasts and be prepared when you go outside.** Major winter storms are often followed by even colder conditions.
- **Check on your animals and ensure that their access to food and water is unimpeded by drifted snow, ice, or other obstacles.**

For information on **portable-generator safety** and **carbon monoxide poisoning,** see Appendix: Portable Generators.

Media and Community Education Ideas

- Sponsor a "Winter Weather Awareness Day" a week or so before winter storm season begins. This is a good way to get emergency management officials and local Red Cross representatives involved.
- Ask your local newspaper or radio or television station to:
  -Do a series on the dangers of winter storms and severe cold, with special emphasis on what people should do if they are caught out in the open or in a vehicle.
  -Highlight the importance of staying informed about local weather conditions.
  -Run public service ads about how to protect lives in winter storms and extreme cold.

  Help the reporters to localize the information by providing them with the local emergency telephone number for the fire, police, and emergency medical services departments (usually 9-1-1) and emergency numbers for the local utilities and hospitals. Also provide business telephone numbers for the local emergency management office and American Red Cross chapter.
- Inform your community about the different National Weather Service announcements—winter storm outlook, winter storm watch, winter storm warning, blizzard warning, winter weather advisory.
- In the fall, present information sessions about safe practices for the coming season of cold weather and winter storms. Include information on alternative heat sources and home insulation.
- Interview local physicians about the dangers of hypothermia and other winter health conditions. Include discussions of exhaustion and heart attacks caused by overexertion.
- Advise people of the dangers of winter driving, and warn them that driving in winter storms can be a risk to their lives. Produce a series of announcements on what people should do if they are stuck in a vehicle during a blizzard.

Facts and Fiction

Fiction: If you are stuck in a car in a snowstorm, the best thing to do is to get out and look for help.
Facts: You should stay in your vehicle and wait for rescuers. If you leave your vehicle in wind-driven snow, you could quickly become disoriented. Make the vehicle visible to rescuers (tie a colored cloth to the antenna or door, turn on the dome light when running the engine for heat, raise the hood when the snow stops falling). If you have a cell phone, call a towing company or 9-1-1 or the local emergency number.

Fiction: In severe cold, it is best to stay warm by wearing a very heavy coat.
Facts: You should wear loose, lightweight, warm clothes in layers. Trapped air insulates. Remove layers to avoid perspiration and subsequent chill. Outer garments should be tightly woven, water repellent, and hooded. Wear a hat. Half your body-heat loss can be from the head. Cover your mouth to protect your lungs from extreme cold. Mittens, snug at the wrist, are better than gloves. Try to stay dry.

Page WS-14 blank

Appendix

Smoke Alarms

If you have a fire, smoke alarms can cut nearly in half your risk of dying in a fire. Smoke alarms sense abnormal amounts of smoke or invisible combustion gases in the air. They can detect both smoldering and flaming fires. National Fire Protection Association 72, the National Fire Alarm Code, now requires in new homes hard-wired, interconnected smoke alarms with battery back-up on every level of the home, outside each sleeping area, and inside each bedroom. It also requires that alarms be wired together so that if one sounds, they all sound.

- **If smoke alarms are not already in place, at a minimum install them on every level of the home and outside each sleeping area.** If a fire occurs inside a bedroom, dangerous gases can cause heavier sleep. Smoke alarms inside bedrooms will be more likely to wake you.
- **To prevent nuisance alarms, vacuum cobwebs and dust from your smoke alarms monthly. Never** disable a smoke alarm, even if you experience nuisance alarms while cooking or showering. Clean the smoke alarm following the manufacturer's instructions and, if possible, relocate it away from the kitchen or bathroom. If nuisance alarms are a persistent problem, look for a different type of smoke alarm.
- **Use the test button to test your smoke alarms monthly.** The test feature tests all electronic functions and is safer than testing with a controlled fire (matches, lighters, cigarettes). If the smoke alarm manufacturer's instructions permit the use of an aerosol smoke product for testing the smoke alarm, and you prefer that method, choose one that has been listed (examined and tested to appropriate product safety standards) by a third-party product testing laboratory, and use it in accordance with the product instructions.
- **If you have battery-powered smoke alarms, replace the batteries at least once a year.** (Replace the batteries in your carbon monoxide (CO) alarms at the same time you replace your smoke alarm batteries.) Some agencies recommend that you replace batteries when the time changes from standard to daylight savings each spring and then back again in the fall. "Change your clock, change your batteries." Replacing batteries this often certainly will not hurt; however, data show that fresh batteries will last at least a year, so more frequent replacement is not necessary unless the smoke alarm begins to chirp. Also, Arizona, Hawaii, the eastern portion of Indiana, Puerto Rico, American Samoa, and Guam do not use daylight savings time. Pick an easy-to-remember anniversary, such as your birthday or a national holiday, as the day to change the batteries each year.
- **Replace your smoke alarms every 10 years.** This is the recommendation of the National Fire Protection Association and the U.S. Consumer Product Safety Commission. Smoke alarms become less sensitive over time.
- **Be sure to install smoke alarms in areas where pets are and in other buildings that house animals.**

Carbon Monoxide Alarms

Every home should have properly installed and maintained carbon monoxide (CO) alarms. CO alarms can help detect CO, a colorless, odorless gas produced by burning any fuel. Exposure to high levels of CO can cause death. The initial symptoms of CO poisoning are similar to the flu and include dizziness, fatigue, headache, nausea, and irregular breathing.

- Install battery-operated CO alarms or plug-in CO alarms with battery back-up in your home, according to the manufacturer's installation instructions. CO alarms should be certified to the requirements of the latest safety standards for CO alarms (UL 2034, IAS 6-96, or CSA 6.19.01). It is especially important to have a CO alarm near sleeping areas.

- Test and maintain your CO alarms according to the manufacturer's instructions.

Because of the risk of CO poisoning, never operate unvented fuel-burning appliances in any closed room or where people are sleeping. CO poisoning from fuel-burning appliances kills people in the United States each year.

CO can leak from faulty furnaces or fuel-fired heaters or can be trapped inside a home by a blocked chimney or flue. Burning charcoal inside a home produces CO. Running an automobile engine in an attached garage can cause CO to enter a home and so can running a portable generator if it is near windows, doors, or vents, even if it is outdoors.

Never use gas appliances such as ranges, ovens, or clothes dryers for heating your home. **Never** use a portable generator in an enclosed or partially enclosed space, including in your home or in a garage, basement, crawl space, or other partially enclosed area, even with ventilation. Locate a generator outdoors and away from doors, windows, and vents that could allow CO to come indoors. Generators can produce high levels of deadly CO very quickly. (See Appendix: Portable Generators.)

Fire Extinguishers

- **Consider having one or more working fire extinguishers in your home.** An extinguisher rated "A-B-C" is recommended for home use. Many fire extinguisher models are designed for one-time use and cannot be recharged.
- **Get training from the fire department or a fire extinguisher manufacturer on how to use your fire extinguisher.** Fire extinguishers from various manufacturers operate in different ways. Unless you know how to use your extinguisher, you may not be able to use it effectively, or it could place you in greater danger. There is no time to read directions during an emergency. Only adults should handle and use extinguishers.
- **Install extinguishers high on the wall, near an exit, and away from heat sources.** Extinguishers should be easily accessible to adults trained to use them, and kept away from children's curious hands. Heat may make the contents less effective or cause the extinguisher to lose its charge more quickly.

- **If you try to use a fire extinguisher on a fire and the fire does not immediately die down, drop the extinguisher and get out.** Most portable extinguishers empty in 8 to 10 seconds. After some residential fires, people have been found dead with fire extinguishers near them or in their arms.
- **Look at your fire extinguisher to ensure that it is properly charged.** Fire extinguishers will not work properly if they are not properly charged. Use the gauge or test button to check that there is proper pressure. Follow the manufacturer's instructions for replacing or recharging fire extinguishers. If the unit is low on pressure, damaged, or corroded, replace it or have it professionally serviced.
- **Before you begin to fight a fire with a fire extinguisher, be sure that:**
  -Everyone has left or is leaving the home.
  -The fire department has been called.
  -The fire is small and not spreading.
  -Your back is to an exit you can use quickly.
  -There is not much smoke in the room.

Arc-Fault Circuit Interrupters (AFCIs)

Consider installing AFCIs in your home's electrical panel box. AFCIs (arc-fault circuit interrupters) are new devices now required by the National Electrical Code® for bedrooms in new construction. They detect abnormal arcing in a circuit (which can cause overheating and lead to an electrical fire) and de-energize the circuit when an arc fault is detected. (AFCIs should not be confused with ground-fault circuit interrupters—GFCIs—which address shock, not fire, hazards.)

Home Fire Sprinkler Systems

- **Consider installing an automatic fire sprinkler system in your home.** Although smoke alarms are essential in every household, they are designed to detect, not control, a fire. Home fire sprinklers complement the alarms' work, providing a way to fight flames immediately. In less time than it would take the fire department to arrive on the scene, home fire sprinklers can prevent a fire from spreading and even extinguish a fire. A sprinkler system can decrease the chance that deadly smoke and gases will reach your family. In addition, sprinkler systems can put out fire when you are away from home, and if they are connected to an alarm system, may notify the fire department in your absence.
- **To ensure sprinkler system reliability, be sure to use a qualified installer who adheres to National Fire Protection Association (NFPA) codes and standards and local fire safety regulations.**

Portable Generators

Portable generators are useful when temporary or remote electric power is needed, but they also can be hazardous. The primary hazards to avoid when using a generator are carbon monoxide (CO) poisoning from the toxic engine exhaust, electric shock or electrocution, and fire. Every year, people die in incidents related to portable generator use.

Carbon Monoxide Hazard

Never use a portable generator in an enclosed or partially enclosed space. Portable generators can produce high levels of CO very quickly. When you use a portable generator, remember that you cannot smell or see CO. Even if you cannot smell exhaust fumes, you may still be exposed to CO. If you start to feel sick, dizzy, or weak while using a portable generator, get to fresh air **right away.** Alert others in the home or in the vicinity to get to fresh air. **Do not delay.** The CO from portable generators can rapidly lead to full incapacitation and death.

If you experience serious symptoms, get medical attention immediately. Inform medical staff that CO poisoning is suspected. If you experienced symptoms while indoors, have someone call the fire department to determine when it is safe to reenter the building.

Follow these safety tips to protect against CO poisoning:

- **Never** use a portable generator indoors, including in homes, garages, basements, crawl spaces, and other enclosed or partially enclosed areas, even with ventilation. Opening doors and windows or using fans will not prevent CO buildup.
- Follow the instructions that come with your portable generator. Locate the unit **outdoors** and away from doors, windows, and vents that could allow CO to come indoors.

Electrical Hazards

Follow these tips to protect against electrical hazards:

- Keep the portable generator dry and do not use it where it could get wet by rain or snow. To protect it from moisture, operate it on a dry surface under an open, canopy-like structure. Dry your hands if they are wet before touching the generator.
- Plug appliances directly into the portable generator. Or, use a heavy-duty, outdoor-rated extension cord that is rated (in watts or amps) at least equal to the sum of the connected appliance loads. Check that the entire cord is free of cuts or tears and that the plug has all three prongs, especially a grounding pin.
- **Never** try to power the home wiring by plugging the portable generator into a wall outlet, a practice known as “backfeeding” This is an extremely dangerous practice that presents an electrocution risk to utility workers and neighbors served by the same utility transformer. It also bypasses some of the built-in household circuit protection devices.
- If you must connect a portable generator to the home wiring to power appliances, have a qualified electrician install the appropriate equipment in accordance with local electrical codes. Or, check with your utility company to see if it can install an appropriate power transfer switch.
- For power outages, permanently installed stationary generators are better suited for providing backup power to a home. Even a properly connected portable generator can become overloaded. This may result in overheating or stressing the generator components, possibly leading to a generator failure.

Fire Hazards

Follow these tips to protect against fire hazards:

- Never store fuel for your portable generator in the home. Gasoline, propane, kerosene, and other flammable liquids should be stored outside of living areas in properly labeled, non-glass, safety containers. Do not store them near a fuel-burning appliance, such as a natural gas water heater in a garage. If the fuel is spilled or the container is not sealed properly, invisible vapors from the fuel can travel along the ground and can be ignited by the appliance's pilot light or by arcs from electric switches in the appliance.
- Before refueling a portable generator, turn it off and let it cool down. Gasoline spilled on hot engine parts could ignite.

Tips for Preparing Your Disaster Supplies Kits

Keep items in separate airtight plastic bags. This will help protect them from damage or spoiling.

- **Observe the expiration or "use by" date on stored food and water. If you have prepared you own containers of water, replace them every six months** to ensure freshness.
- **Rethink your kit and family needs at least once a year.** Replace batteries, update medicines, clothes, etc.
- **Ask your physician or pharmacist about storing prescription medications.** You may find that the best solution is to gradually acquire a reserve by refilling prescriptions a little early, but always using those on hand first to avoid having the expiration dates lapse. Be sure they are stored to meet instructions on the label. It may be difficult to obtain prescription medications during a disaster because stores may be closed or supplies may be limited. Keep copies of essential prescriptions with you at all times.
- **Use easy-to-carry containers** for the supplies you would most likely need for an evacuation. Label them clearly. Think about using:
  - -Large trash container with handles and a cover
  - -Camping backpack
  - -Duffel bag
  - -Cargo container that fits on the roof of your vehicle
  - -Insulated cooler that protects stored items in hot climates
- **Store water separately** to prevent damage from leakage.
- **Always keep your cell phone with you**, if you have one. Do not pack it in the kit. Consider getting an extra cell phone battery to keep with your Disaster Supplies Kit.

Emergency Supplies for Your Vehicle

In addition to basic vehicle safety items—properly inflated spare tire, wheel wrench, jack, jumper cables, tool kit, flashlight and extra batteries, reflective triangle, signal flares, duct tape—you should always keep a first aid kit (see Appendix: First Aid Kit) and emergency supplies appropriate to the season in your vehicle. During winter in cold climates, make sure your vehicle has items such as a windshield scraper and snow brush, salt, sand, shovel, tire chains, and warm clothing.

Also recommended for the vehicle that members of the household would use to evacuate are a sleeping bag or blankets for each person, a tube tent, a compass, a shovel, and several rolls of quarters for public telephones and vending machines.

First Aid Kit

Assemble a first aid kit to include in your Disaster Supplies Kit and one for each vehicle. Include:

- First aid manual
- Sterile adhesive bandages in assorted sizes
- Safety pins in assorted sizes
- Cleansing agent/soap
- Antiseptic
- Latex gloves (2 pairs)
- Sunscreen
- 2-inch and 4-inch sterile gauze pads (4 to 6 each)
- Triangular bandages (3)
- 2-inch and 3-inch sterile roll bandages (3 rolls each)
- Scissors
- Tweezers
- Needle
- Moistened towelettes
- Thermometer
- Tongue depressor blades (2)
- Tube of petroleum jelly or other lubricant
- Nonprescription drugs, including aspirin and nonaspirin pain reliever, antidiarrhea medication, antacid, laxative, vitamins

Note: Remember to include prescription drugs in a Disaster Supplies Kit. Because the storage requirements of prescription drugs vary, some may have to be added to the kit at the last minute. You may want to pin or tape a note to the outside of your kit container reminding you to take along prescription drugs if you have to evacuate.

Foods to Stock at Home and in Your Disaster Supplies Kit

Even though it is unlikely that an emergency would cut off your food supply for two weeks, consider maintaining a supply in your home that will last that long. The easiest way to **develop a two-week stockpile** is to increase the amount of basic foods you normally keep on your shelves. Check expiration dates frequently and follow the practice of first-in, first-out.

Pack at least a three-day supply of nonperishable food and water in your Disaster Supplies Kit. You need to have these items packed and ready in case there is no time to gather food from the kitchen when disaster strikes. Include both compact, lightweight items like dehydrated foods, which are easy to carry if you must evacuate, and canned foods like fruit, juices, and vegetables that supply a source of water. Choose foods that require no refrigeration, preparation, or cooking. If you must heat food, pack a can of cooking fuel, such as used for camping. **Do not pack gasoline, kerosene, or propane.**

Familiar foods can lift morale and help people feel secure in time of stress. Try to include foods that everyone will enjoy. Look for foods high in calories, protein, carbohydrates, vitamins, and minerals. Look for canned foods with high liquid content in case water is scarce.

Specifically, consider packing:

- Ready-to-eat canned meats, fruits, and vegetables.
- Canned juice, milk, and soup.
- High-energy foods, such as peanut butter, jelly, salt-free crackers, and energy bars.
- Trail mix (prepackaged or homemade).
- Comfort foods, such as hard candy, sweetened cereals, candy bars, and cookies.
- Instant coffee, tea bags.
- Compressed food bars. They store well, are lightweight, taste good, and are nutritious.
- Dried foods. They can be nutritious and satisfying, but may contain a lot of salt, which promotes thirst. If salt is a problem, used dried fruit, like raisins.
- Freeze-dried foods. They are tasty and lightweight, but will need water for reconstitution.
- Whole-grain cereals (oatmeal, granola, multi-grain).
- Instant meals. Cups of noodles or cups of soup are a good addition, although they need water for reconstitution and may contain a lot of salt.
- Snack-sized canned goods, which generally have pull-top lids or twist-open keys.
- Prepackaged beverages. Those in foil packets and foil-lined boxes are sealed and will keep for a long time if the seal is not broken.
- Foods for infants, elderly persons, or persons on special diets.
- Nonperishable foods for pets and other animals.

When selecting foods, keep in mind that:

- Salty foods are usually not a good choice because they will make you thirsty and drinking water may be in short supply.
- If your water supply is limited, you should avoid eating foods that are high in fat and protein, even if they are part of your emergency supply, because they require more water for the body to metabolize.

- Commercially dehydrated foods often require a lot of water for reconstitution and effort to prepare.
- Food packaged in glass bottles and jars is usually heavy and bulky, and the glass can easily break.
- Meal-sized canned foods are usually heavy and bulky, but they can be useful because they contain water.
- Whole grains, beans, and dried pasta require water and cooking time for preparation that could be difficult in a disaster situation.

If your electricity goes off and you lose refrigeration:

- First, use perishable food from the refrigerator.
- Then, use the food from the freezer. To minimize the number of times you open the freezer door, post a list of freezer contents on it. In a well-filled, well-insulated freezer, foods will usually still have ice crystals in their centers (meaning foods are safe to eat) for at least two days.
- Finally, begin to use nonperishable foods and staples.

(See Appendix: Keeping Refrigerated Food Safe If the Power Goes Out.)

(See Appendix: Food and Water Exposed to Floodwater, Fire, and Chemicals.)

Storing Water

Having an ample supply of clean water is a top priority in an emergency. The following guidelines will help you ensure that members of your household have sufficient water in an emergency situation:

- **Keep at least a three-day supply of water,** that is, a minimum of three gallons per person. It is strongly recommended that you store more if possible. Each person should have one-half gallon per day for drinking and one-half gallon for cooking and sanitation. A normally active person needs to drink at least one-half gallon of water each day. Hot environments and intense physical activity can double that amount. Children, nursing mothers, and ill people will also need more. Be sure to include drinking and clean-up water for your pets. The amount needed will depend on their sizes and the conditions. Remember that pets often drink more water than usual when under stress.
- To prepare the safest and most reliable emergency supply of water, it is recommended that you purchase commercially bottled water**. Keep bottled water in its original container and do not open it until you need to use it.**
- **Store bottled water in the original sealed container and observe the expiration or "use by" date.**
- **If you are preparing your own containers of water,** follow the directions below for selecting, cleaning, and filling the containers with water:
    - It is recommended that you purchase food-grade, water-storage containers from surplus or camping supplies stores to use for water storage.
    - If you chose to use your own storage containers, chose two-liter, plastic soda bottles—not plastic jugs or cardboard containers that have had milk

or fruit juice in them. Milk protein and fruit sugars cannot be adequately removed from these containers and provide an environment for bacterial growth when water is stored in them.

- Do not use glass containers because they can break and are heavy.
- Do not use cardboard containers, because they can leak easily. These containers are not designed for long-term storage of liquids.
- If storing water in plastic soda bottles or food-grade, water-storage containers, follow these steps:
  - Thoroughly clean them with dishwashing soap and water, and rinse them completely so there is no residual soap.
  - Sanitize them and their caps by adding a solution of 1 teaspoon of non-scented liquid household chlorine bleach to a quart of water. Swish the sanitizing solution in the containers and caps so that it touches all interior surfaces. After sanitizing the containers and caps, thoroughly rinse out the sanitizing solution with clean water.
- To fill water containers:
  - Fill them to the top with regular tap water. If the tap water has been commercially treated from a water utility with chlorine, you do not need to add anything else to the water to keep it clean. If the water you are using comes from a well or water source that is not treated with chlorine, add two drops of non-scented liquid household chlorine bleach to the water.
  - Tightly close the containers using the original caps. Be careful not to contaminate the caps by touching the inside of them with your fingers.
  - Place a date on the outside of the containers so that you know when you filled them. Store them in a cool, dark place.
- **Replace the water every six months** if not using commercially bottled water**.**

- **Store your three-day supply in a handy place.** You need to have water packed and ready in case there is no time to fill water bottles when disaster strikes.

Drinking Water Safety

Listen to a local radio or television station for announcements from appropriate authorities about the safety of drinking water. Follow their directions.

- **You can drink water from the community water system unless you have been told or have reason to suspect it has become contaminated.**
- **If the water is contaminated:**
  -Use your emergency supply of water.
  -Purchase bottled water, if necessary, until you are certain that your water supply is safe.
  -Consider all water from wells, cisterns, and other delivery systems in the disaster area to be unsafe until tested.
  -Water from melted ice cubes made before the disaster occurred is generally safe to drink.
  -Water from undamaged hot water tanks and water pipes is generally safe to drink. Turn off the main water valve before draining water from these sources.

-Bottled juices and the liquid from canned fruits and vegetables are another source of water.

- **If you need to find drinking water outside your home**, you can use rainwater; streams, rivers, and other moving bodies of water; ponds and lakes; and natural springs. If you question its purity, be sure to treat the water first. (See below.) Avoid water with floating material, an odor, or a dark color. Use saltwater only if you distill it first. Do NOT drink floodwater.

Treating Water

Treat water for drinking, cooking, and bathing only if it is of questionable quality. There are several ways to treat water—but none is perfect. Often, the best solution is a combination of methods.

- **Boiling is the safest method of treating water.** Strain water through a clean cloth to remove bulk impurities. Bring water to a rolling boil for about one full minute. Let the water cool before drinking. Boiled water will taste better if you put oxygen back into it by pouring the water back and forth between two clean containers. This will also improve the taste of stored water.
- **Household liquid bleach can kill microorganisms in water.** Use chlorine bleach from a freshly opened bottle. Use only regular household liquid bleach that contains approximately 5.25 to 6.0 percent sodium hypochlorite. Do not use scented bleaches, color-safe bleaches, or bleaches with added cleaners. Add 16 drops of fresh, chlorine bleach per gallon of water, stir, and let stand for 30 minutes. If the water has a slight scent of chlorine, you can use it. If it does not, discard it and find another source of water. Other chemicals, such as iodine or water treatment products sold in camping or surplus stores that do not contain 5.25 to 6.0 percent sodium hypochlorite as the only active ingredient, are not recommended and should not be used.
- **Distilling removes salt and other solid impurities from water.** Distillation involves boiling water and then collecting the vapor that condenses back to water. The condensed vapor will not include salt or other solid impurities. A relatively simple, although inefficient, way to distill water in an emergency is to suspend a cup over boiling water. One way to do this is to—

  -Make a cradle for the cup with string. You can start by fastening the middle of the length of string to the cup handle with a knot, then wrapping the string around the cup as if it were a parcel, finishing with a knot in the middle of the mouth of the cup. A longer piece of string, perhaps three feet or so, will make the task easier.

  -With the excess string, tie the cup to the lid handle so the cup will hang rightside up when the lid is upside down.

  -Choose the tallest pot possible and fill it with water to the point just below where the cup will hang, so the cup will not touch the water.

  -Put the lid upside down on the pot so that the cup is suspended by the string above the water. Boil the water. Make sure that the ends of the string are in the pot and not hanging over the side where they could catch on fire. The water that drips from the lid into the cup is distilled. It will take quite a while to collect even a moderate amount of water. Be careful that the pot does not boil dry.

  (See Appendix: Food and Water Exposed to Floodwater, Fire, and Chemicals.)

Keeping Refrigerated Food Safe if the Power Goes Out

The loss of power from high wind, fire, flood, or even a traffic accident can be sudden. Without power to run your refrigerator and freezer, the safety of your food could be a concern. Be prepared for an emergency by keeping on hand items that do not require refrigeration, such as shelf-stable food, boxed or canned milk, and canned goods. (See Appendix: Tips for Preparing Your Disaster Supplies Kits.) Make sure you have pre-prepared baby formula for infants, if needed. Remember to use these items in the order you bought them and replace them from time to time.

Knowing ways for keeping food safe when the power goes out will help reduce the worry about what is safe to eat and minimize the potential loss of food. The following information will help you make the right decisions for keeping your family safe:

- **Always keep your refrigerator at or below 40° F (4° C). Keep your freezer at or below 0° F (-18°C)**. An appliance thermometer can tell you if your refrigerator and freezer are at the proper temperatures.
- **If the power goes out, keep the refrigerator and freezer doors closed as much as possible to maintain the cold temperatures.** An unopened refrigerator will keep food safely cold for about four hours. A full freezer will stay sufficiently cold for about 48 hours (24 hours if it is half full) if it is unopened.
- **If your freezer is not full, keep items close together**—this helps the food stay cold longer.
- **Keep frozen meat and poultry items on the lowest (coldest) shelf of the freezer, and separated from other food** so that thawing meat or poultry juices will not contaminate the other food.
- **Obtain dry or block ice to keep your refrigerator as cold as possible** if the power is going to be out for a prolonged period of time.
- **If you are not sure a particular food is cold enough, take its temperature with the food thermometer.** Discard any perishable foods (such as meat, poultry, fish, eggs, and leftovers) that have been above 40° F (4° C) for two hours or more, and any food that has an unusual odor, color, or texture, or feels warm to the touch.
- **Be sure to discard any fully cooked items in either the freezer or the refrigerator that have come in contact with raw meat juices.**
- **Remember, you cannot rely solely on appearance or odor.** Never taste food to determine its safety. Some foods may look and smell fine, but if they have been at room temperature too long, bacteria that cause food-borne illness can begin to grow very rapidly. Some types of bacteria produce toxins that are not destroyed by cooking.

If previously frozen food is partially or completely thawed when the power comes back on:

- **You can safely refreeze it if it contains ice crystals or is at 40° F (4° C) or below.** You will have to evaluate each item separately.
- **Partially thawed food can be refrozen safely, but refreezing may reduce the quality of some food.**
  - -Raw meats and poultry from the freezer can be refrozen without too much quality loss.
  - -Prepared food, vegetables, and fruits can be refrozen, but there may be some quality loss.

-Fruit juices can be refrozen safely without much quality loss, but frozen fruit will become mushy.

Food from the refrigerator and freezer are not safe outdoors, even in cold weather or snow because:

- **Frozen food can thaw if it is exposed to the sun's rays.**
- **Refrigerated food may become too warm and food-borne bacteria could grow.**
- **The outdoor temperature could vary hour by hour,** and the temperature outdoors would not be satisfactory to protect both refrigerated and frozen foods at the same time. For example, if the outdoor temperature is 25° F (-4° C), it is too cold for refrigerated food and too warm for frozen food.
- **Perishable items would be exposed to unsanitary conditions and to animals** that may be attracted to the food. Animals are not clean and may harbor disease. Never use food that has come in contact with an animal.

I**nstead of putting food outdoors, consider taking advantage of the cold by making ice.** Fill buckets, empty milk cartons, or cans with water and leave them outside to freeze. Then put the homemade ice in your refrigerator and freezer or coolers.

Food and Water Exposed to Floodwater, Fire, and Chemicals

After a flood, you should:

- **Wear gloves, boots, and a long-sleeved shirt and long pants when cleaning up.**
- **Discard all food or drinking water that came in contact with floodwater, including canned goods.** It is impossible to know if containers were damaged and the seal compromised.
- **Discard wooden spoons, plastic utensils, and baby bottle nipples and pacifiers if they have been covered by floodwater.** There is no way to safely clean them.
- **Disinfect metal pans and utensils that have been covered by floodwater by boiling them in clean or properly treated water for 10 minutes.**

Consider what you can do ahead of time to keep your food safe in an emergency. For example, if you live in a location that could be affected by a flood, plan your food storage so that your appliances and food shelves will be safely out of the way of floodwater. And remember to store pet food where it will be safe from possible contamination by floodwater.

After a fire, you should:

- **Throw out food and water exposed to fire** because they may have been damaged by the heat, smoke, and fumes of the fire and by the chemicals used to fight the fire.
- **Throw out food and water in cans or jars even if they appear to be undamaged,** because the heat from a fire can activate spoilage bacteria and make the food and water unsafe.

- **Throw out any raw food or food in permeable packaging**—cardboard, plastic wrap, screw-topped jars and bottles, etc., even if it was stored in the refrigerator.
- **Throw out any food that has an off-flavor or odor when it is prepared.**

Toxic gases released from burning materials are very dangerous. These gases can kill; they can also contaminate food and water. Food and water stored in refrigerators or freezers can also become contaminated by gases. The refrigerator seal is not airtight and gases can get inside.

If food or water has been exposed to toxic chemicals, throw it away. The chemicals cannot be washed off the food. This includes food stored at room temperature, such as fruits and vegetables, as well as food in permeable containers like cardboard and screw-topped jars and bottles, even if it is in the refrigerator. Canned goods are the only foods that can be safely kept after exposure to chemicals and then **only if** the unopened cans are washed with a dishwashing detergent and then immersed in a bleach solution (1 teaspoon of bleach per quart of water).

If cookware and utensils have been exposed to toxic chemicals, wash them with dishwashing detergent and then immerse them in a bleach solution (1 teaspoon of bleach per quart of water).

What to Do if Evacuation Is Necessary Because of a Storm

If you are advised to evacuate or if you think it is appropriate to evacuate, you should:

- **Leave as soon as possible, preferably in daylight.** Avoid flooded roads and watch for washed-out bridges. Evacuation will probably take longer than expected. Give yourself plenty of time.
- **Secure your home by unplugging appliances and turning off the electricity and the main water valve.** This will reduce potential damage to your appliances from power surges and to your home.
- **Tell someone outside the storm area where you are going**—(the out-of-town contact you identified in your Family Disaster Plan). Relatives and friends will be concerned about your safety. Letting someone know your travel plans will help relieve their fear and anxiety.
- **If time permits and you live in an identified surge zone or area prone to flooding, move furniture to a higher floor.** Moving valuable furnishings helps reduce the potential for damage.
- **Bring your Disaster Supplies Kit, including warm protective clothing.** People frequently arrive at shelters or hotels with nothing. Having these items with you will make you more comfortable. While shelters provide a safe place to stay and food, specialty items for infants and individuals on restricted diets may not be available. It may be several days before permission is given by local authorities to reenter an evacuated area.
- **Lock your home and leave.** There may be individuals evacuating after you, or returning before you. Police may be busy with storm-related emergencies and not able to patrol neighborhoods as usual.

What to Do When There Is Flooding

If you are outdoors, you should:

- **Stay out of areas subject to flooding.** Dips, low spots, canyons, washes, etc. can become filled with water.
- **Climb to high ground and stay there.** Move away from dangerous floodwater.
- **If you come upon a flowing stream where water is above your ankles, stop, turn around, and go another way.** Never try to walk, swim, or drive through swift water. Most flood fatalities are caused by people attempting to drive through water, or people playing in high water. If it is moving swiftly, even water six inches (15 centimeters) deep can sweep you off your feet.

If you are driving, you should:

- **Avoid already flooded areas and areas subject to sudden flooding.** Do not attempt to cross flowing streams. Most flood fatalities are caused by people attempting to drive through water or by people playing in high water. The depth of water is not always obvious. The roadbed may be washed out under the water, and you could be stranded or trapped. Also, standing water may be electrically charged from underground or downed power lines. Rapidly rising water may stall the engine, engulf the vehicle and its occupants, and sweep them away. Look out for flooding at highway dips, bridges, and low areas. Two feet (0.6 meters) of water will carry away most vehicles, including SUVs and pickup trucks.
- **Stay away from underpasses.** Underpasses can fill rapidly with water, while the adjacent roadway remains clear. Driving into an underpass can quickly put you in five to six feet (1.5 to 1.8 meters) of water.
- **Turn around and find another route if you come upon rapidly rising water.** Move to higher ground away from rivers, streams, creeks, and storm drains. If your route is blocked by floodwater or barricades, find another route. Barricades are put up by local officials to protect people from unsafe roads. Driving around them can be a serious risk.
- **Abandon your vehicle immediately and climb to higher ground if the vehicle becomes surrounded by water or the engine stalls, and if you can safely get out.** When a vehicle stalls in the water, the water's momentum is transferred to the car. The lateral force of a foot (0.3 meter) of water moving at 10 miles (16 kilometers) per hour is about 500 pounds (227 kilograms) on the average vehicle. The greatest effect is buoyancy—for every foot (0.3 meter) that water rises up the side of a car, it displaces 1,500 pounds (680 kilograms) of the car's weight. So, two feet (0.6 meter) of water moving at 10 miles (16 kilometers) per hour will float virtually any car, SUV, or pickup truck. Use caution when abandoning your vehicle, and look for an opportunity to move away quickly and safely to higher ground.

"Wind Safe" Room

A "wind safe" room is a reinforced area of a home designed to withstand severe windstorms. While basements offer some protection from damaging winds, the level of protection can be increased greatly by building a reinforced shelter area in a basement, or constructing a shelter in an above-ground room such as an interior closet or a small study room.

An effective "wind safe" room must be strong enough to survive extreme wind speeds and the impact of airborne debris, sufficiently affordable to appeal to homeowners, and accessible quickly in the event a severe storm approaches. "Wind safe" rooms are easiest to install when a home is being built; however, they can also be added to many existing homes. A variety of options exists for homes with basements, homes built on a "slab-on-grade" foundation, and homes with a "crawlspace" foundation. Typical costs range from $2,000 for a simple "lean-to" shelter in a new-home basement, to $6,000 or more for an above-ground, steel-sheathing shelter.

Get more information from the Federal Emergency Management Agency (FEMA) about building a "wind safe" room. Also for more information, check out the Institute for Business and Home Safety at www.ibhs.org.

Detailed construction plans and information related to safe rooms can be found at http://www.fema.gov/mit/saferoom/.

How to Shelter-in-Place *(Chemical Incident)*

Shelter-in-place applies to several types of terrorist attacks, but details will vary. For example, you would use duct tape and plastic sheeting to seal an internal room against chemical agents. For sheltering against radiation dispersed by a radiological dispersion device (RDD or "dirty bomb") or radioactive fallout particles after a nuclear explosion, you would normally prefer a basement shelter to a higher floor; duct tape and plastic would help keep radioactive dust out, but primary protection from radioactive particles would be achieved by applying the principles of mass, distance, and time. (See Appendix: Factors for Protection From Radioactive Fallout.)

If officials advise people in a specific area to **shelter-in-place because of a short-term chemical release**, households should have the following in the shelter-in-place room:

- Plastic sheeting pre-cut to fit room openings. (Cut the plastic a minimum of 6 inches wider than each opening. The thickness of the plastic should be 4 to 6 millimeters or greater.)
- Duct tape and scissors. (The thickness of the duct tape should be 10 millimeters or greater.)

A shelter-in-place room should be an interior room, preferably one without windows, that you can seal to block out air that may be contaminated by the short-term release of hazardous chemical agents. The room should be above the ground-level floor. In the case of a chemical threat, an above-ground location is preferable because some agents are heavier than air and may seep into basements even if the windows are closed.

Guidelines for sheltering-in-place are based on the need to shelter for only a few hours—more than sufficient time for a short-term release of airborne agents to dissipate. Ten square feet of floor space per person will provide sufficient air to prevent carbon dioxide build-up for up to five hours, assuming each person is resting and breathing at a normal rate.

During a Chemical Attack

The following are guidelines for what you should do in a chemical attack.

If you are instructed to remain in your home or office building, you should:

- Close and lock all windows and exterior doors.
- Turn off all ventilation, including furnaces, air conditioners, vents, and fans.
- Go to shelter in an internal room and take your Disaster Supplies Kit. Be suer you have a working battery-powered radio.
- Seal the room with duct tape and plastic sheeting. Use duct tape with a minimum thickness of 10 millimeters and pre-cut plastic sheeting with a thickness of 4 to 6 millimeters or greater to seal all cracks around doors, windows, and vents, and all wall plugs, switch plates, and cables.
- If you are told there is danger of explosion, close the window shades, blinds, or curtains.
- Call your emergency contact. Ideally your room will have a hard-wired telephone. Cellular telephone service may be overwhelmed or damaged during an emergency. You will need a working phone if you have to report a life-threatening emergency.
- Keep listening to your radio or television until you are told all is safe or you are told to evacuate. Local officials may call for evacuation in specific areas at greatest risk in your community.

At home:

- Close the fireplace damper.
- Bring your pets with you, and be sure to bring additional food and water for them.

If you are caught in an unprotected area, you should:

- Move away immediately.
- Get upwind of the contaminated area.
- Find shelter as quickly as possible.

Using HEPA Filters
HEPA filters may be useful in **biological attacks.** If you have a central heating and cooling system in your home with a HEPA filter, leave it on if it is running or turn the fan on if it is not running. Moving the air in the home through the filter will help remove the agents from the air. If you have a portable HEPA filter, take it with you to the internal room where you are taking shelter and turn it on.

If you are in an apartment or office building that has a modern central heating and cooling system, the system's filtration should provide a relatively safe level of protection from outside biological contaminants.

HEPA filters will not filter chemical agents.

(See chapter on "Terrorism.")

Factors for Protection From Radioactive Fallout

The three factors for protecting oneself from radioactive fallout are **distance, shielding, and time.**

- **Distance**—the more distance between you and the fallout particles, the better. An underground area, such as a home or office building basement, offers more protection than the first floor of a building. A floor near the middle of a high-rise may be better, depending on what is nearby at that level on which significant fallout particles would collect. Flat roofs collect fallout particles, so the top floor is not a good choice, nor is a floor adjacent to a neighboring flat roof.
- **Shielding**—the heavier and denser the shielding materials—thick walls, concrete, bricks, books, and earth—between you and the fallout particles, the better.
- **Time**—fallout radiation loses its intensity fairly rapidly. In time, you will be able to leave the fallout shelter. Radioactive fallout poses the greatest threat to people during the first two weeks, after which time it has declined to only about one percent of its initial radiation level.

Remember that any protection, however temporary, is better than none at all; and the more shielding, distance, and time you can take advantage of, the better.

Taking Protective Measures

Before a Nuclear Explosion

To prepare for a nuclear explosion, you should:

- Modify your Disaster Supplies Kit so it is adequate for up to two weeks.
- Find out from officials if any public buildings in your community have been designated as fallout shelters. If none have been designated, make your own list of potential fallout shelters near your home, workplace, and school. These places would include basements or the windowless center area of middle floors in high-rise buildings, as well as subways and tunnels.
- If you live in an apartment building or high-rise, talk to the manager about the safest place in the building for sheltering and about providing for building occupants until it is safe to go out.

Taking shelter before a nuclear explosion is absolutely necessary. There are two kinds of shelters—blast and fallout.

- **Blast shelters** are specifically constructed to offer some protection against blast pressure, initial radiation, heat, and fire; but even a blast shelter could not withstand a direct hit from a nuclear explosion.
- **Fallout shelters** do not need to be specially constructed for protecting against fallout. They can be any protected space, provided that the walls and roof are thick and dense enough to absorb the radiation given off by fallout particles.

(See chapter on “Terrorism.”)

Emergency Sanitation

In many shelters during an emergency, people will need to use improvised, emergency toilets if the water supply has been cut off. These kinds of toilets consist of any watertight container with a snug-fitting cover.

- Use a garbage container, pail, or bucket.
- If the container is small, keep a large container (also with a cover) available for waste disposal.
- If possible, line both containers with plastic bags.
- Every time the emergency toilet is used, pour or sprinkle a small amount of regular household disinfectant, such as creosol or chlorine bleach, into the container to reduce odors and germs.
- After each use, replace the lid.

How to Recognize and Treat Heat Exhaustion and Heatstroke

Heatstroke

The signs of heatstroke in a person are hot, red skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. A person experiencing heatstroke can have a very high body temperature—sometimes as high as 105°F (41° C). If the person was sweating from heavy work or exercise, the skin may be wet; otherwise, it will feel dry.

Heatstroke is a life-threatening situation. If you suspect someone is suffering from heatstroke, call 9-1-1 or your local emergency number immediately. Move the person to a cooler place. Quickly cool the person's body— immerse it in a cool bath or wrap it in wet sheets and fan it. Watch for signs of breathing problems. Keep the person lying down and continue to cool the body any way you can. If the person refuses water, is vomiting, or exhibits changes in the level of consciousness, do not give him or her anything to eat or drink.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Heat Exhaustion

The signs of heat exhaustion in a person are cool, moist, pale, or flushed skin; heavy sweating; headache; nausea or vomiting; dizziness; and exhaustion. A person experiencing heat exhaustion may have a normal body temperature, or it is likely to be rising.

If you suspect someone is suffering from heat exhaustion, move the person to a cooler place. Remove or loosen tight clothing and apply cool, wet cloths, such as towels or sheets dipped in water. If the person is conscious, give him or her cool water to drink. Make sure the person drinks slowly. Give a half glass of cool water every 15 minutes. Let the person rest in a comfortable position, and watch carefully for changes in his or her condition.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Heat Cramps

Heat cramps are muscle spasms that are caused by excessive sweating that results in a deficiency of salt. Although not as serious as heat exhaustion or heatstroke, heat cramps sometimes precede them. **If someone is suffering from heat cramps, move the person to a cooler place** and have him or her rest in a comfortable position. Lightly stretch the affected muscle and replenish fluids. Give a half glass of cool water every 15 minutes.

Do not give liquids that contain alcohol or caffeine because they can cause further dehydration, making conditions worse.

Frostbite and Hypothermia

Frostbite is a severe reaction to exposure to cold that can cause permanent harm to people. Symptoms of frostbite are a loss of feeling and a white or pale appearance in fingers, toes, nose, or earlobes.

Hypothermia is a condition brought on when a person's body temperature drops to 3° below its normal temperature. On average, a person would begin to suffer hypothermia if his or her temperature dropped to 96° F (35.6° C). Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion. Hypothermia is not always fatal, but those who survive it are likely to suffer lasting kidney, liver, and pancreas problems.

If frostbite or hypothermia is suspected, begin warming the person slowly and get immediate medical assistance. Warm the person's trunk first. You can hug the person to use your own body heat to help warm him or her. Arms and legs should be warmed last because stimulation of the limbs can drive cold blood toward the heart and lead to cardiac arrest. Put the person in dry clothing and wrap his or her entire body in a blanket. Never give anything with alcohol or caffeine in it to a person who is suffering from frostbite or hypothermia. Caffeine, a stimulant, can cause the heart to beat faster and hasten the effect the cold has on the body. Alcohol, a depressant, can slow the heart and also hasten the ill effects of the cold.

First Aid Kit for Pets

A fully equipped household first aid kit contains almost all of the supplies you may need for your pets. A simple first aid kit for your pets should include these additional items in a waterproof container:

- Latex (or hypoallergenic material) gloves
- Gauze sponges (a variety of sizes)
- Gauze roll, 2-inch width
- Material to make a splint
- Adhesive tape, hypoallergenic
- Non-adherent sterile pads
- Small scissors
- Grooming clippers or safety razor
- Nylon leash
- Towel
- Muzzle
- Compact emergency "blanket" (available in the camping department of many stores)
- Water-based sterile lubricant

- Hydrogen peroxide (3 percent)
- Rubbing alcohol;
- Topical antibiotic ointment
- Epsom salts
- Baby-dose syringe or eye dropper
- Sterile eye lubricant
- Sterile saline wash
- Diphenhydramine, if approved by your veterinarian
- Glucose paste or syrup
- Styptic powder or pencil
- Plastic card (such as old credit card) to scrape away stingers
- List of emergency phone numbers including those for your pet's veterinarian, an after-hours emergency veterinary hospital, and the National Animal Poison Control Center (1-888-426-4435)
- Petroleum jelly
- Penlight
- Clean cloth
- Needle-nose pliers

For a complete list of items for your pet first aid kit and detailed information on how to provide first aid for your pets, consult *Pet First Aid* by Barbara Mammato, DVM, MPH, a handbook sponsored by the American Red Cross and The Humane Society of the United States.

Page AP-22 blank

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

V

W

Page Index-12 blank

(Inside back cover blank)

A4461M
Rev. August 2004