

Flash Flood Guidance System with Global Coverage

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Flash Flood Guidance System – Global Coverage

Introduction

- Discuss a **GLOBAL** initiative by the Hydrologic Research Center (HRC), USA – an initiative that would be implemented and operated under the auspices of the WMO and coordinated with NOAA-National Weather Service and USAID/OFDA
- An initiative that addresses the global need to access the appropriate data at the appropriate temporal and spatial scales to provide **early warnings for flash floods**
- Intent is to fund the initiative primarily through philanthropy with some public sector funding

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The Need Behind the Initiative

- Flash floods (short duration events) are among the worst natural disasters – WMO disaster prevention and mitigation survey indicated that flash floods were among the top two most important hazards
- With short time scales and infrequent occurrence for any particular location - most NMHSs and response agencies **do not have tools** or are not trained to anticipate and plan effective response actions
- Very few in-situ systems (ALERT) are available to provide early warnings – and these systems can be costly (\$ and logistics) and may not provide full coverage
- Vast flash flood prone areas remain without any surveillance with unmitigated threat for millions worldwide – **especially in the Third World and Developing countries**

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Response to the Problem

- HRC applied advances in remote sensing, global digital spatial databases, internet and satellite communications, and distributed hydrologic modeling to develop a high spatial resolution, rapid-response system that can be used as a **tool** for flash flood warnings
- System can provide forecasters with information on the likelihood of flooding of small streams over large regions by using bias-corrected remotely-sensed precipitation estimates and real time soil moisture estimates to produce **flash flood guidance** and **flash flood threat**
- Forecasters can apply additional local information along with system outputs
- Continuation of CAFFG program – funded by USAID/OFDA

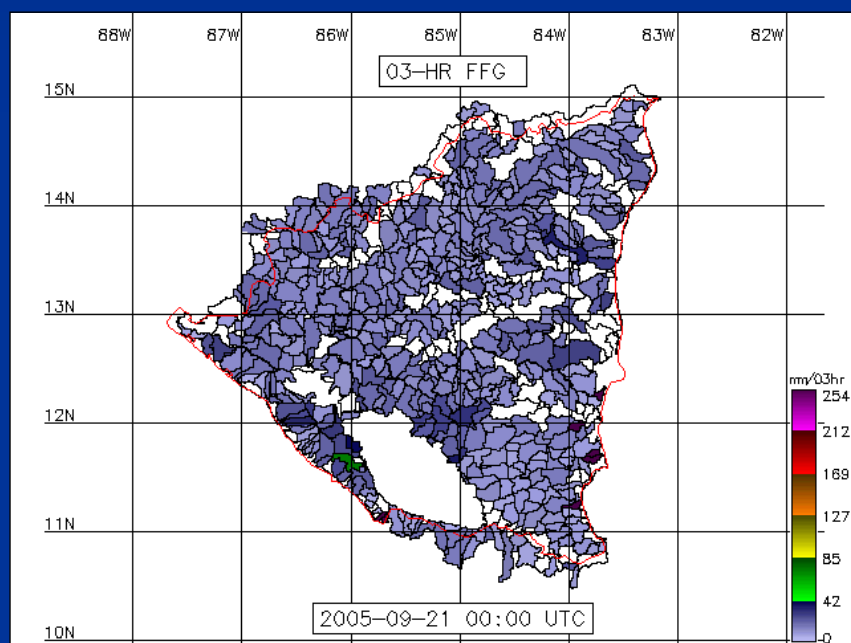
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Vision – implement an end-to-end global flash flood warning system to improve response by federal, state, and local governments, international organizations, NGOs, the private sector, and the public to occurrences of flash floods.

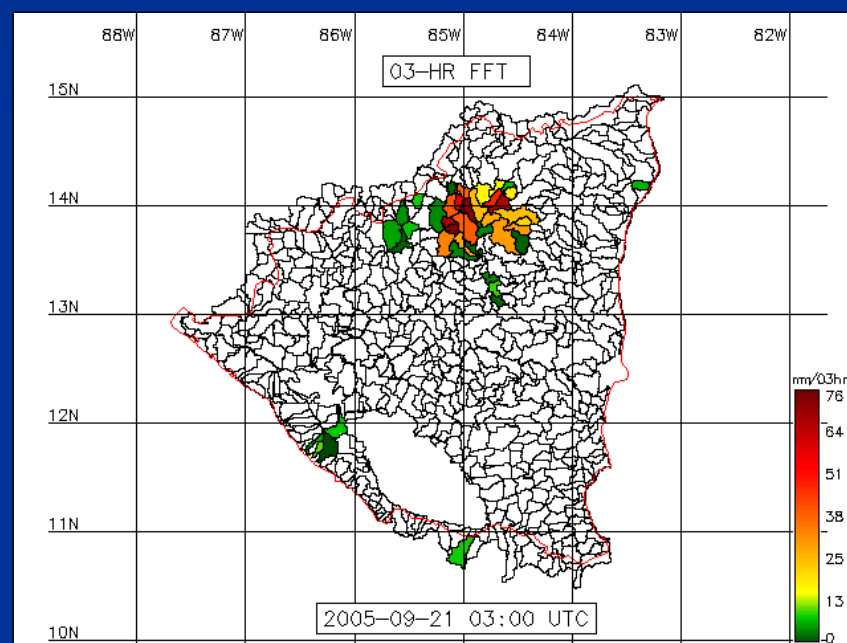


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IMAGINE – FOR THE GLOBE



FLASH FLOOD GUIDANCE



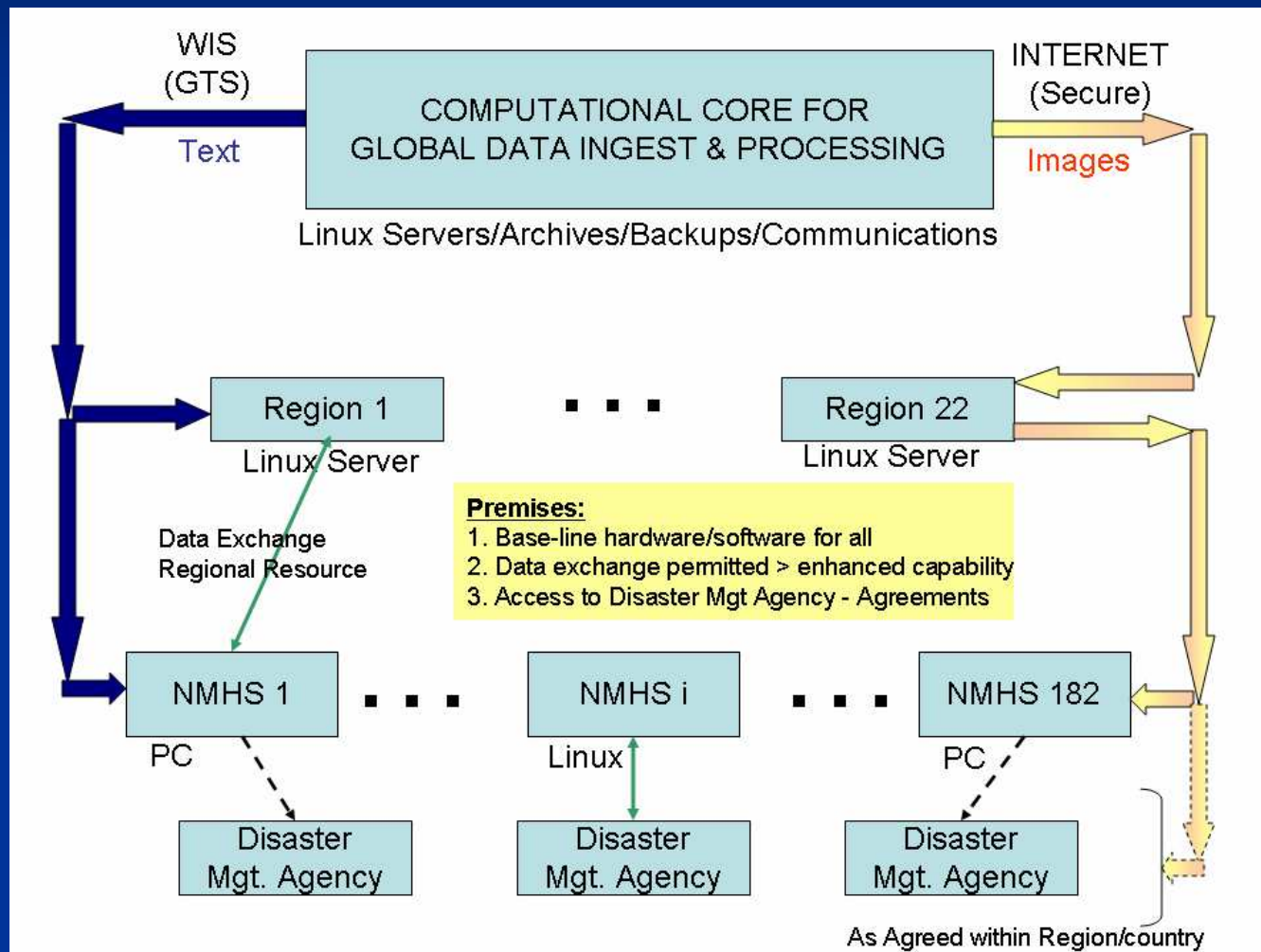
FLASH FLOOD THREAT

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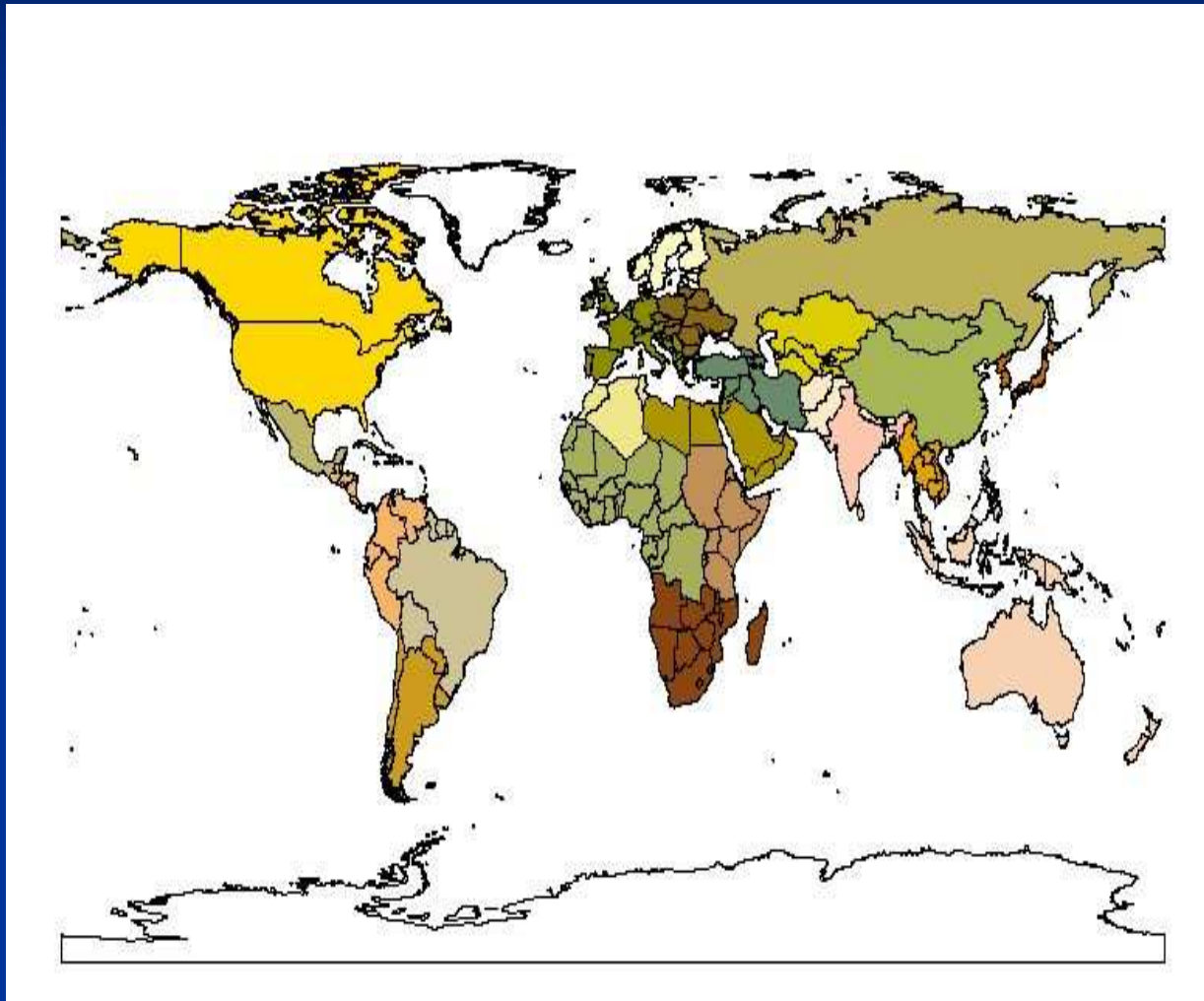
USER
HARDWARE
REQUIREMENTS
ARE MINIMAL

DETECT
AND
ASSESS

DISSEMINATE
AND
RESPOND



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Focusing on Disaster Risk Reduction

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Benefits of the System

- Early awareness of impending local flash flood threats for all potentially vulnerable areas
 - Provide rapid assessments of the potential of flash floods allowing world-wide improvement of the early warnings for the **occurrence** of a flash flood
 - Allow for the more rapid mobilization of response agencies (rather than a system that provides detailed forecasts of the magnitude – which add uncertainty and complexity to warning development)

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Benefits of the System

- Responsible national agencies will be establishing criteria for issuing watches and warnings based on flash-flood guidance and flash flood threat
 - This requires understanding of the capabilities of the population to take effective action and will encourage the national agencies to interact with local communities
 - The responsible agencies will need to design awareness campaigns for both municipal agencies and the public for interpretation of flash flood warnings and effective action strategies

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Benefits of the System

- Enhancement of regional and global collaboration of NMHSs (meteorologists and hydrologists) and disaster mitigation and response agencies – **identify needs and requirements**
- Improvement of community awareness of flash flood disaster threat and mitigation
- Network of regional centers provide an **infrastructure** which may also host other global products pertaining to disaster mitigation and response
- Development of products useful for delineating high risk areas globally to effectively plan future development

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Implementation

- Partnerships will be sought to develop a joint strategy and concrete action plans for implementation of the FFGS in a particular region with agencies such as:
 - International Federation of Red Cross and Red Crescent Societies, and its regional offices
 - United Nations Office for the Coordination of Humanitarian Affairs (UN/OCHA) and its regional offices
 - Regional inter-governmental agencies with membership represented by disaster risk management authorities and ministries
- Objective is to bring partners representing the technical aspects of the system implementation and operation together with agencies in disaster risk reduction to enable implementation of the system – **Very Important Collaborations**

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Implementation

- Activities such as joint training programs and public outreach and awareness programs
 - Opportunity for enhancement of regional and global collaboration of disaster risk management agencies and improvement of community awareness of flash flood disaster threat and mitigation
 - Training programs will be designed to **include NMHSs and the disaster management agencies**
 - Protocol development for flash flood warnings – dissemination, appropriate wording, lead times
 - Involvement in **system validation** programs which will require determinations of where flooding did or did not occur

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Implementation

- Goal – develop a capacity building program that will use the FFGS system data and products to train NMHS and response agency staff on effective mitigation and response to flash flood threats world wide – **need total involvement**



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Example Disaster Risk Reduction Program

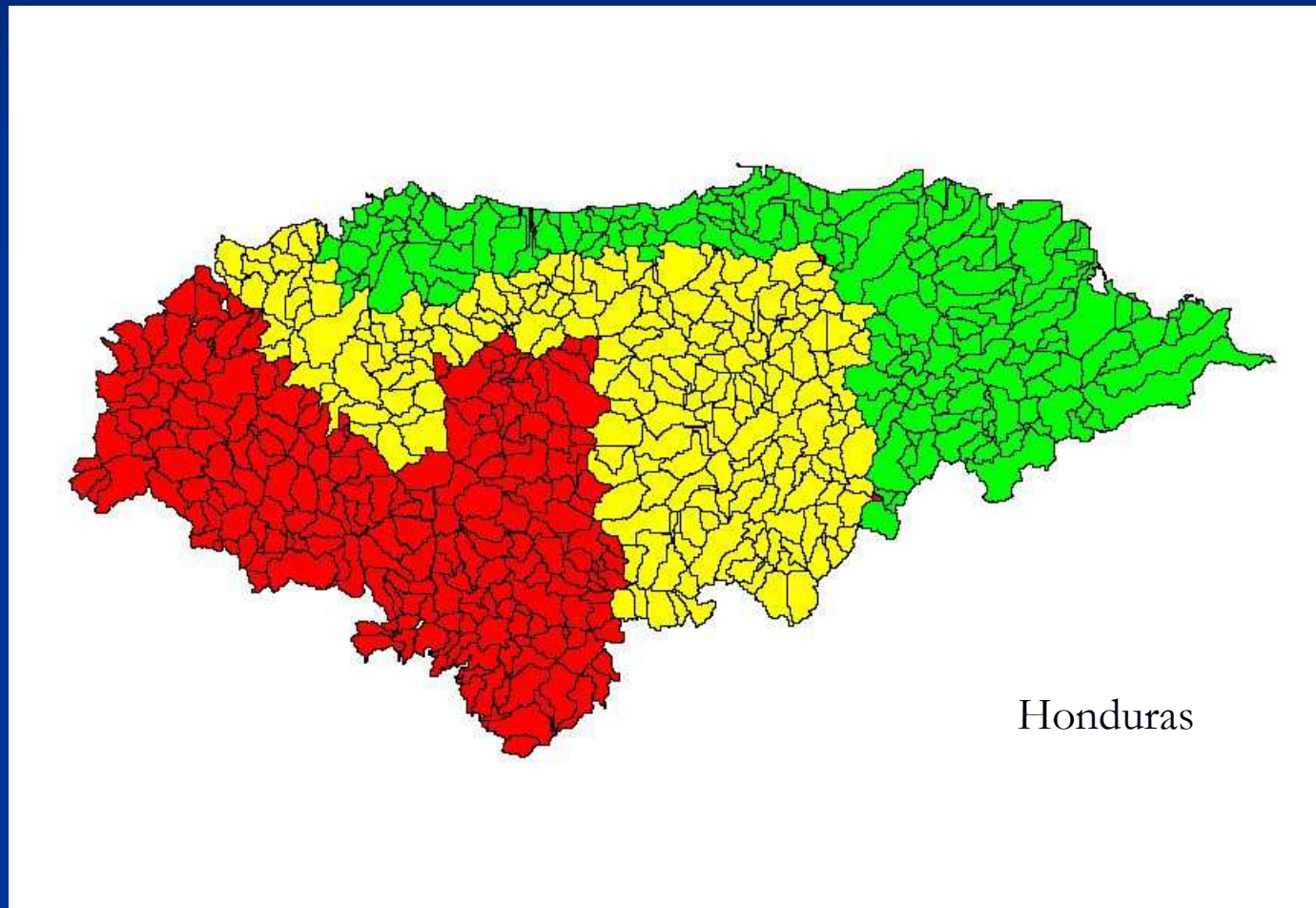
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CAFFG

- Pilot study with World Food Program regional office
 - Explore the possibility to use daily CAFFG products to identify in advance flood areas where at risk populations may need emergency food supplies
 - The idea was to provide WFP several hours lead time to coordinate with the Caribbean Regional Office for shipping supplies – opportunity to distribute resources in the areas more difficult to access

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Developed Risk Maps



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Results

- Short study showed that application of the system in this way on a regional scale was not effective
- Outputs too generalized to differentiate delineated risk areas from locations actually in flooding or having a potential to flood
- There is a need to understand the application of flash flood guidance and flash flood threat for warnings
- There is a need to understand local conditions and work closely with local/regional disaster agencies to better determine true risk for any given event
- Shows the need for collaborations and joint training programs

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CAFFG System Validation

- Rigorous validation during first rainy season
 - 65% when system indicated flooding, flooding was reported at the time and location indicated
 - 35% when system indicated flooding, flooding was not reported
- System does well, we need to work on the application and collaboration

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Program with WMO, NOAA/NWS, USAID/OFDA

- Development in phases – Phase I, that would start in the second half of 2007, would have a three-years duration and would consist of the following components:
 - Strengthening of the CAFFG System, including its extension to at least 2 more countries apart from the 7 already included
 - Implementation in South East Asia with focus on the Mekong Basin – started with USAID/OFDA funding
 - Development in Southern Africa – started with RSA
 - Development in Central Asia - Middle East

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THANK YOU