



Swedish Civil
Contingencies
Agency

Implementing the EU Floods Directive in Sweden, intentions and reflections

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Swedish Civil Contingencies Agency (MSB)

From 1st of January 2009

New Agency, 3 merged into one:

- Swedish Rescue Services Agency
- Swedish Emergency Management Agency
- National Board of Psychological Defence

Mandate

The MSB is responsible for matters related to protection of the population from emergencies of all types, emergency management, and civil defence.

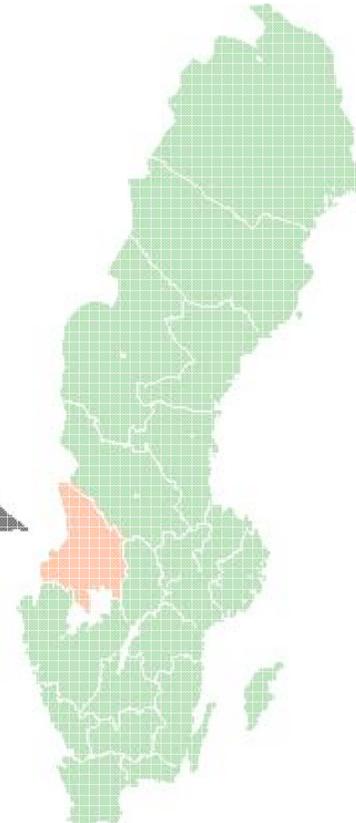
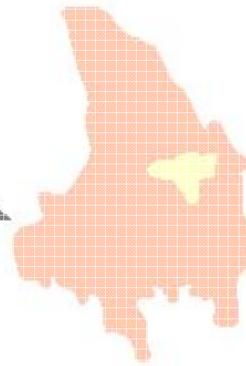
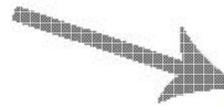
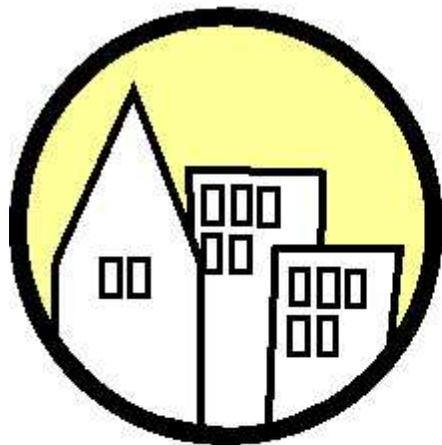
This responsibility applies to measures taken before, during, and after the occurrence of emergencies, crises and disasters.

The MSB's mandate spans the entire spectrum of threats and risks, from everyday accidents up to major disasters.



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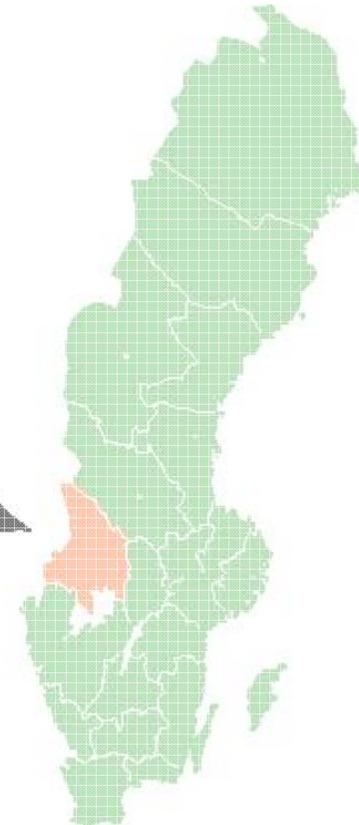
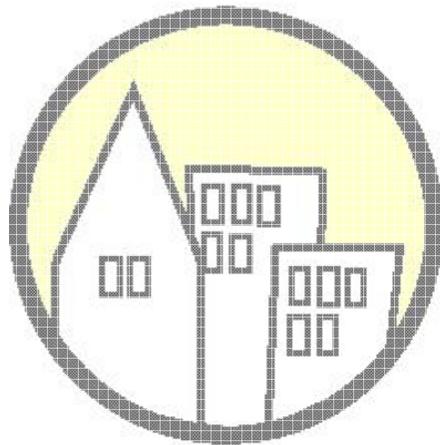
Municipal Level – Risk management Landuse planning Action programs, Civil Protection Act





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Regional Level
Supervision, e.g. Civil Protection Act
Environmental Act etc
Referral for consideration for Land use
planning





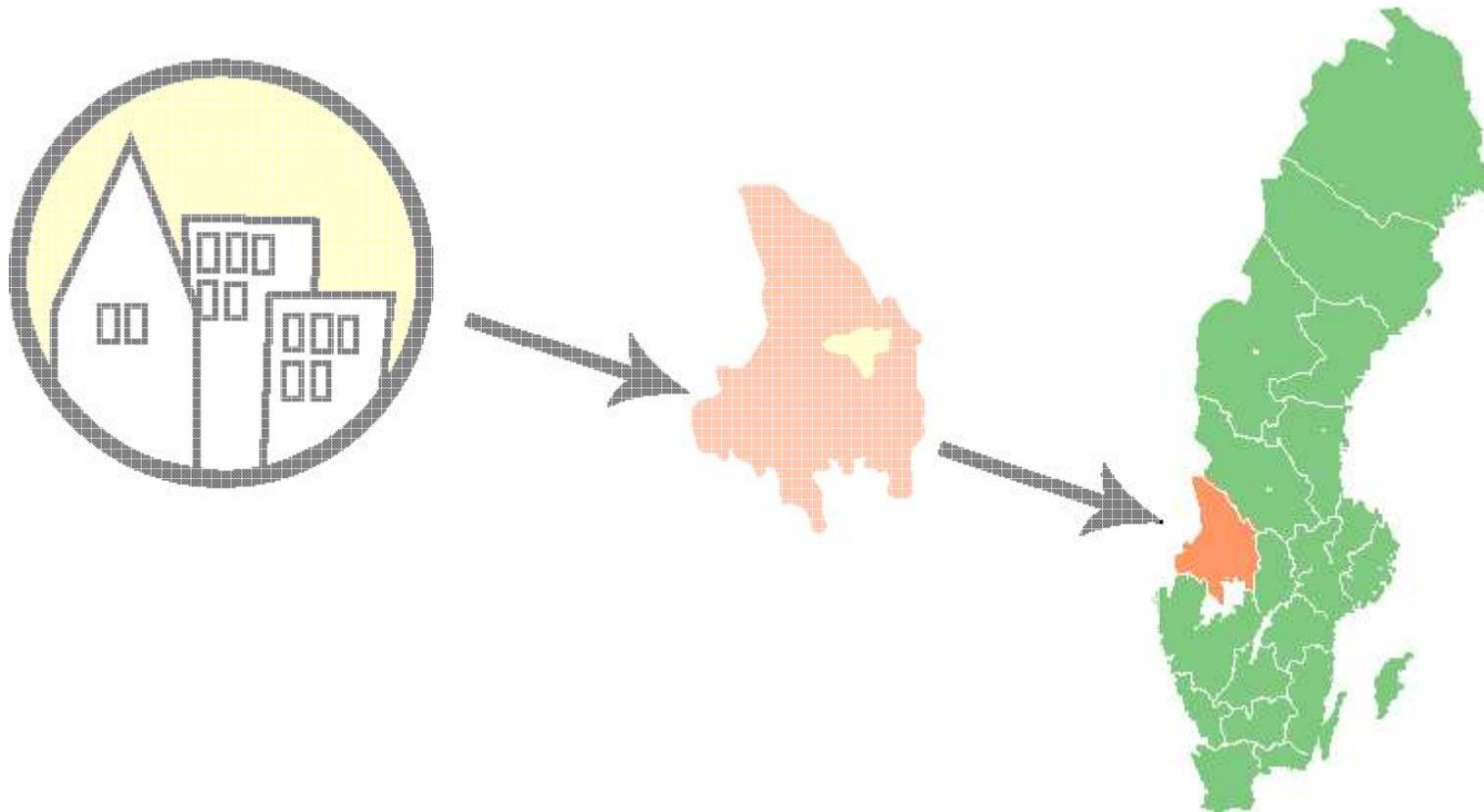
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National Level

Supervision Civil Protection Act

Supervision Environmental Act

Supervision Planning and Building Act



Natural Hazards and Disaster Events – in Sweden today

Windstorms – heavy winter storms - hurricanes

- Gudrun 2005 and Per 2007

Flash floods and inundations

- Fulufjäll 1997, Hagfors 2004 and Ånn 2006
- Arvika and Lake Vänern 2000-2001, Lagan 2004, Västra Götaland 2006-2007

Landslides

- Göta älv/Tuve 1977
- Road E6 Munkedal 2006

Forest fires

- Boden 2006
- Härjedalen 2008

Snowstorms

- Gävle 1998





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MSB's Preventive work towards Natural Disasters

- **General Stability Maps**
- **General Flood Inundation Maps**
- **Governmental Subsidies for preventive measures towards landslides and floodings**
- **Research and development**
- **Information, Education and Training**
- **River Coordination groups**
- **Database Natural Disasters – Lessons Learned**
- **National Platform, established september 13th 2007**
- **Materiel support for the Fire & Rescue Services, including depots with demountable barriers**
- **Forest fire prognosis system**
- **Flood prognosis system, calculation of water levels during a flood**
- **Cooperation – on national and international level, EU and UN**



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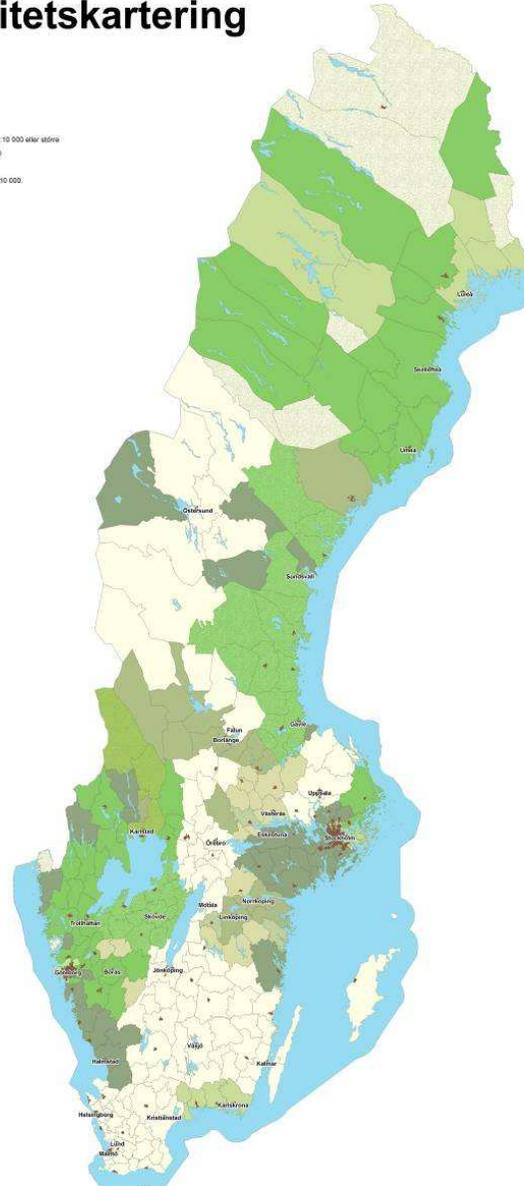
General Stability Maps, within build up areas

Översiktlig stabilitetskartering

Karterade kommuner

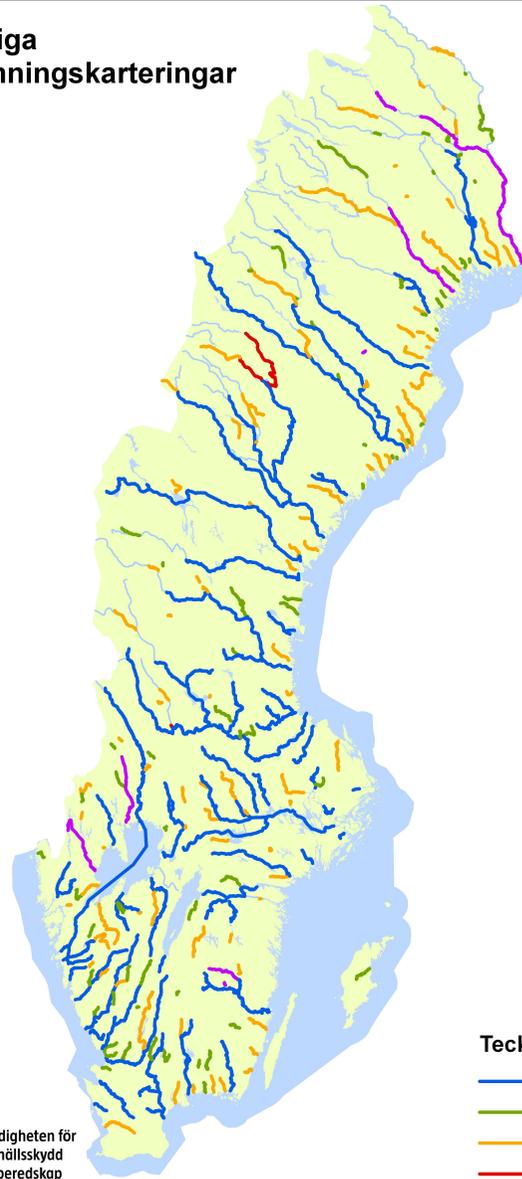
Karteringsklasser

- 1 Förstudie och huvudstudie utförd över hela kommunen efter 1997. Karta 1A och 1B i skala 1:10 000 eller äldre
- 2 Förstudie och huvudstudie utförd över hela kommunen 1992-1999. Karta 1A i skala 1:10 000
- 2,3 Karteringsklass 2 kompletterad med karteringsklass 3
- 3 Huvudstudie utförd i vissa delar av kommunen, tillstäm utgifter vattendrag. Karta 1A i skala 1:10 000
- 3,4 Karteringsklass 3 kompletterad med karteringsklass 4
- 3,7 Karteringsklass 3 kompletterad med karteringsklass 7
- 4 Huvudstudie utförd över hela kommunen. Karta med i skala 1:50 000
- 5 Förstudie utförd, ännu ingen huvudstudie
- 6 Ingen förstudie eller huvudstudie utförd
- 7 Förstudie utförd, ingen huvudstudie nödvändig
- 8 Uppgradering till karteringsklass 1 pågår
- 9 Skredriskkartering utförd utmed delar av Göta älv



- Governmental commission for SRSA/MSB since 1986
- Areas at risk for landslides, 3 zones with subzonation
- Covering Sweden, build up areas
- Basic data for municipality risk assessment

Översiktliga
översvämningsskarteringar
2009



MSB Myndigheten för
samhällsskydd
och beredskap

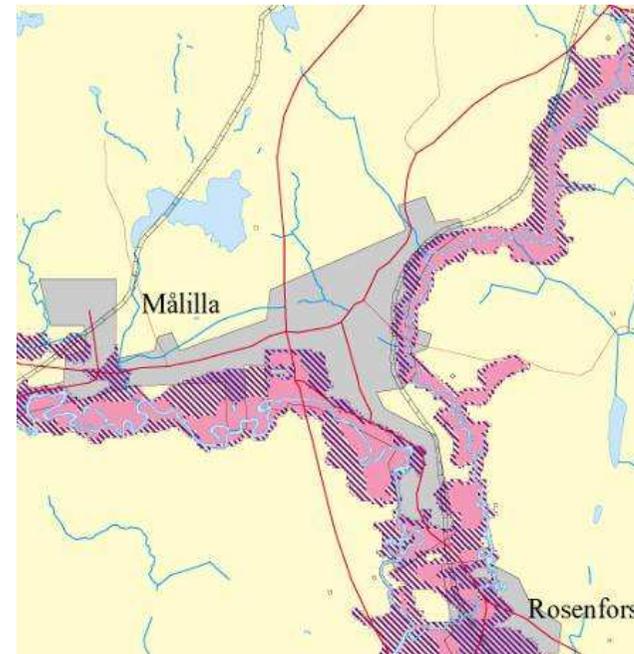
Bakgrundskarta Copyright Lantmäterverket

Teckenförklaring

- Karterade
- Prio 3 att kartera
- Prio 2 att kartera
- Prio 1 att kartera
- Pågående kartering

General Flood Inundation Map

- 61 major rivers mapped
- 5 mapping ongoing
- Torne river, in collaboration with Finland
- 6 new for official purchase





General Flood Inundation Maps

- Areas at threath of floods are mapped along rivers
- Governmental commission for SRSA/MSB since 1998
- Approx 10% of Swedens rivers will be mapped, priority for 10 000 km, based on identified risks and passed events
- Two discharges are calculated
 - 100 year flood and
 - Highest estimated flood according to the guidelines of Swedish Flood Committe, approx 10 000-year flood
- Hydraulic model
- Report and GIS-data
- "Flood prognosis system", water levels

River Coordination Groups

- SRSA/MSB commissioned to initiate establishment of river coordination groups within Sweden
- Watershed based
- County Administrative Board task to convene, chair of the group
- Meetings, Seminars and Workshops
- Spring Flood
- MSB called in when required
- Members; F&R services, Landuse planners, Environmental sector, National Road Administration, National Railroad Administration, Water Regulation Enterprises, SMHI, etc





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Governmental Subsidies



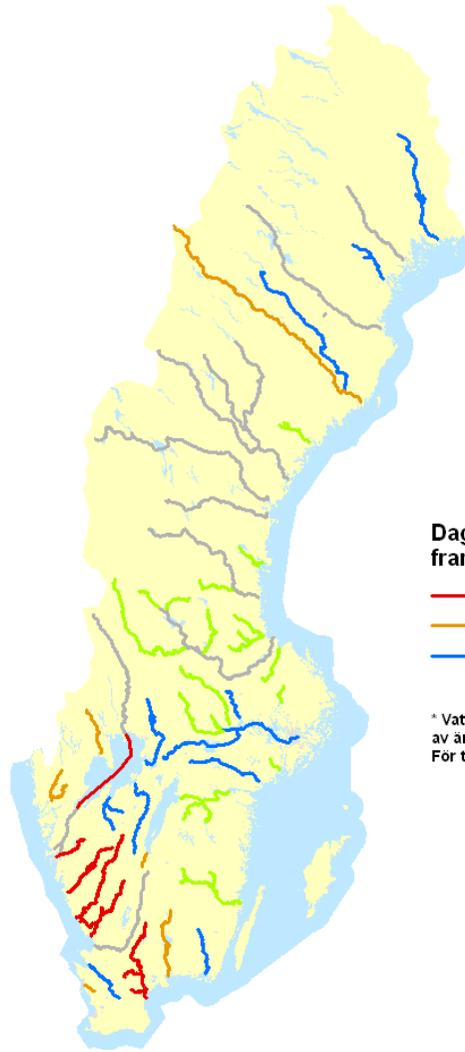
- Municipalities can apply for permanent measures
- 40 MSEK/year, ~4 M Euro or ~5,7 M \$
- approx 25 municipalities applies/year, applications exceeds many times available amount of money
- Commission for MSB in cooperation with national expert authorities

Sweden facing climate change - threats and opportunities



- **Governmental Committee on "Climate Change and Vulnerability" 2005-2007**
- **Final report October 2007**
 - Downscaling Global to Regional Climate Change scenarios
 - translated into English "Sweden facing climate change – threats and opportunities"
- **The report is the Swedish guidance document for action**

Climate Change - Governmental Committee, 2005-2007



Dagens 100-årsflöde väntas i ett
framtida klimat att inträffa:

- Mycket oftare
- Oftare
- Ungefär lika ofta
- Mindre ofta
- Ej beräknade vattendrag *

* Vattendrag som är allt för reglerade för beräkning
av ändring i återkomsttid. Se kap. 4 samt tabell 4.2 och 4.3.
För tillrinning se Översvämningshot, SOU 2006:94.

**Changes in return
period of 100-year
flood, 2071-2100.
Applied on rivers
covered with
General Flood
Inundation maps**

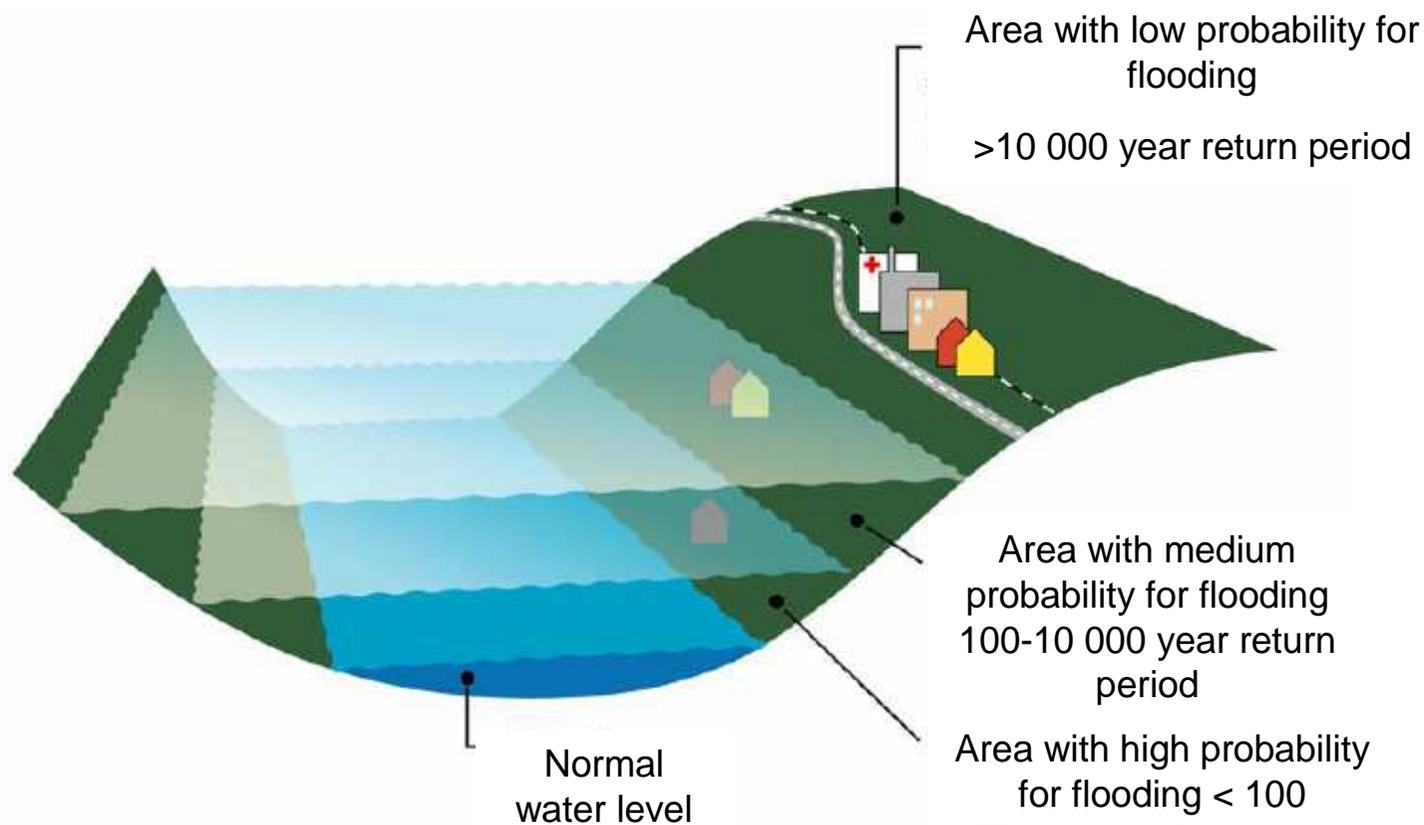
Förändring av dagens 100-års flöde om 100 år, perioden 2070-2100.
Beräknat för vattendrag som är oreglerade eller har låg regleringsgrad,
ingående i Räddningsverkets rapportserie "Översiktlig
översvämningskartering"

Källmaterial:
Översiktlig översvämningskartering Räddningsverket
Beräkning av förändrat 100-års flöde Rosaby Centre, SMHI



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Recommended land use planning - restrictions along rivers and lakes

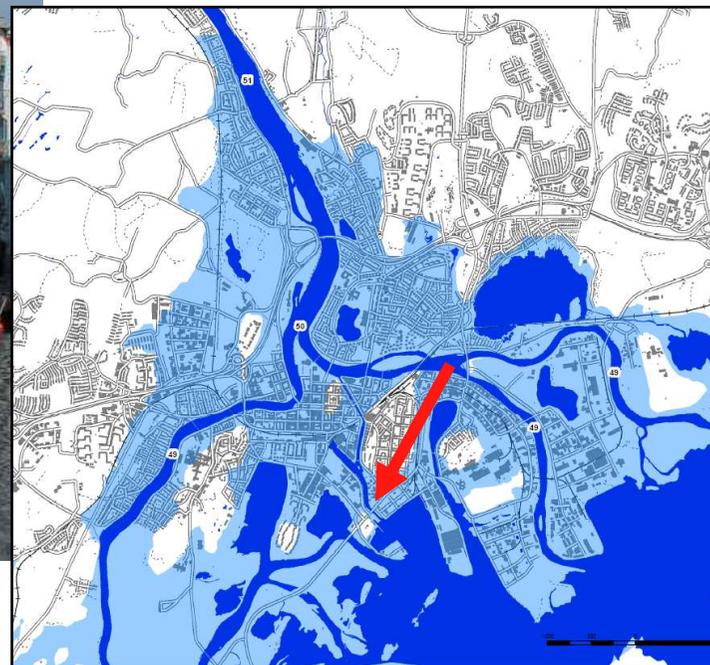




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New establishments, just at the shore

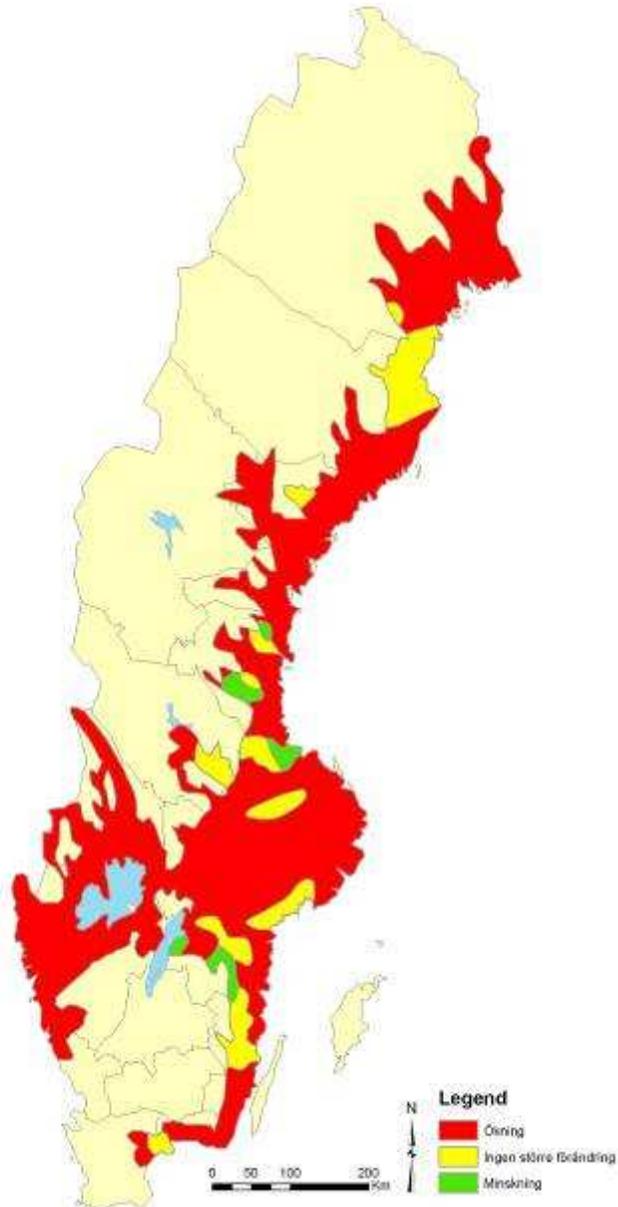
**Worst case
scenario
2071-2100**





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Change in soil stability period 2071-2100



Increased risk

No change

Decreased risk



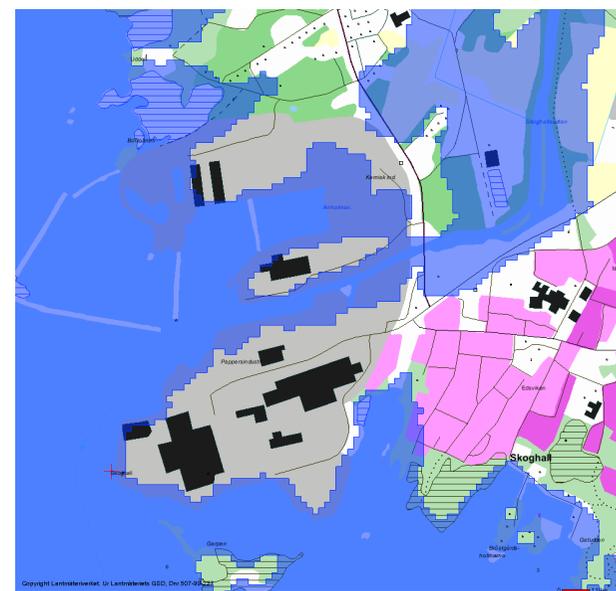
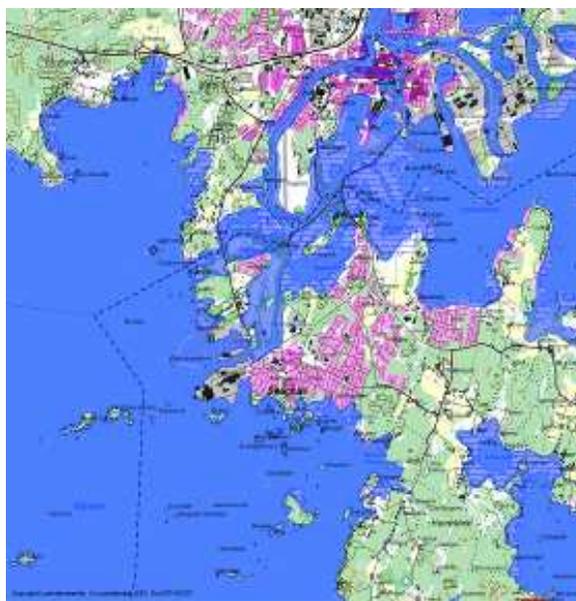
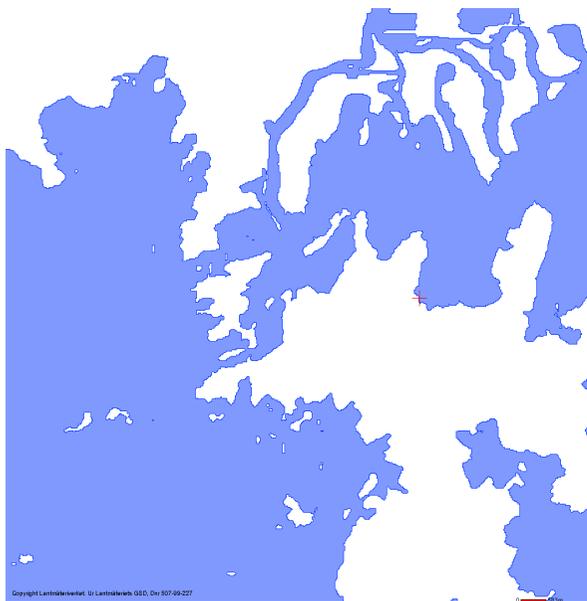
Source: SMHI, SGI, SGU, SRSA/MSB

General Flood Inundation map and a Seveso plant

Polygon for flood inundation area +

GSD-Topographic map

Seveso plant at risk of flooding



Implementing the EU Floods Directive



- Came into force 26/11 2007
- Implemented in swedish legislation at the latest 26/11 2009
- Step 1 – preliminary flood risk assessment (2011)
- Step 2 – two types of maps (2013)
 - flood hazard maps
 - flood risk maps
- Step 3 – flood risk management plans (2015)



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SRSA proposal for the implementation

- Flood-regulation
- MSB ”competent authority”
- MSB mandate to write the regulations
- MSB responsible for the PFRA (step 1) and flood hazard maps (step 2 a)
- County Administrative Boards responsible for flood risk maps (step 2 b) and the flood risk management plans (step 3). With information from the municipalities and River coordination groups as a basis.
- MSB responsible for reporting



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Floods directive in swedish legislation

- A flood-regulation
- Corresponds to the e.g. Civil Protection Act, Environmental Act, Planning and Building Act, Water Framework Directive etc
- The Government will come to a decision in october – nothing yet decided