

The Swedish adaptation strategy

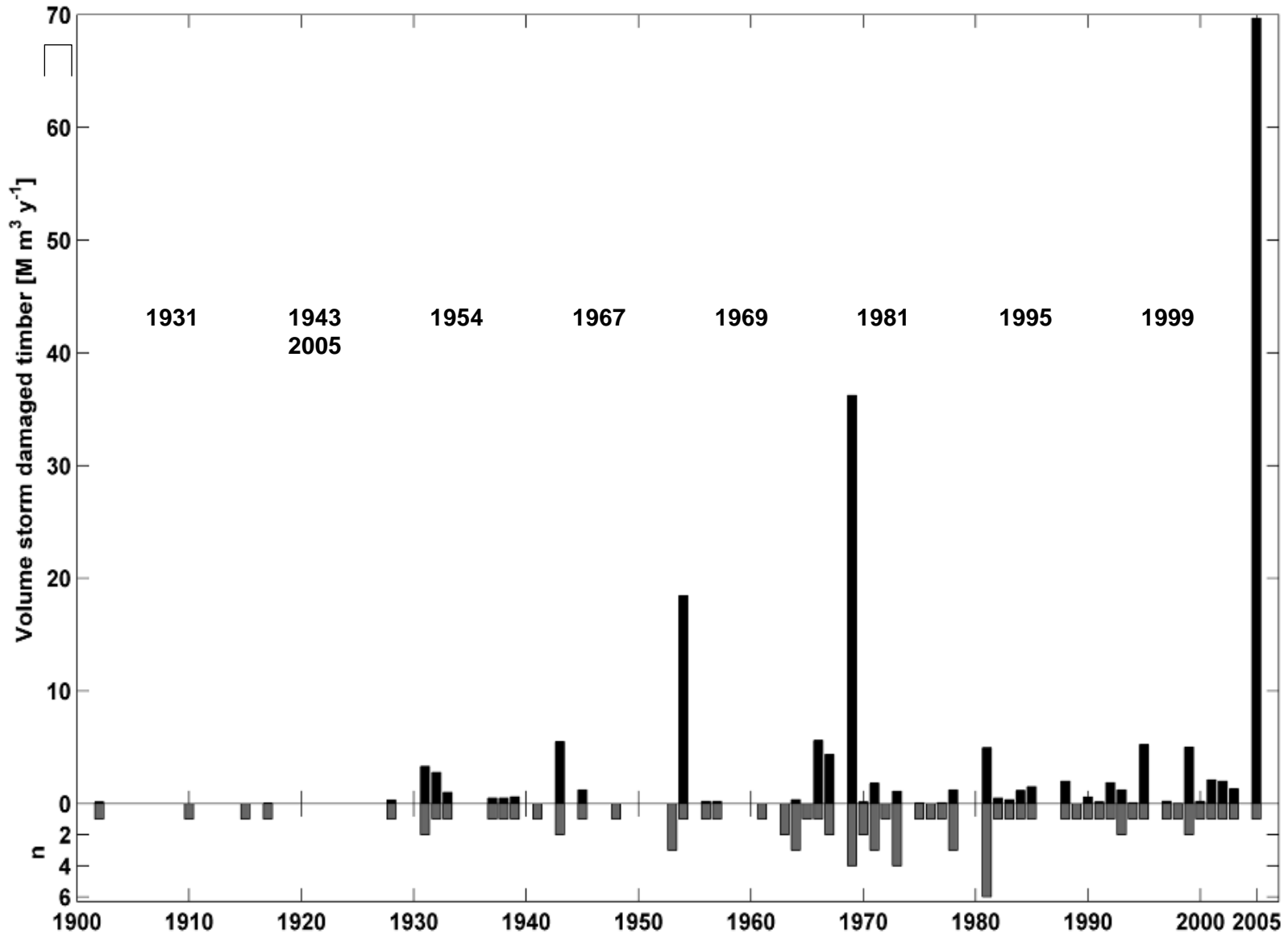
Sten Bergström

The Swedish Meteorological and Hydrological Institute



**The most famous recent storm in Sweden,
Gudrun of January 8, 2005**

Losses of timber by storms during over 105 years



Swedish Commission on Climate Change & Vulnerability 2005-2007

Sverige inför
klimatförändringarna
– hot och möjligheter



SLUTBETÄNKANDE AV
KLIMAT- OCH SÄNNBARHETSUTREDNINGEN


STATENS OFFENTLIGA
UTREDNINGAR
SOU 2007:60

Sweden facing
climate change
– threats and opportunities



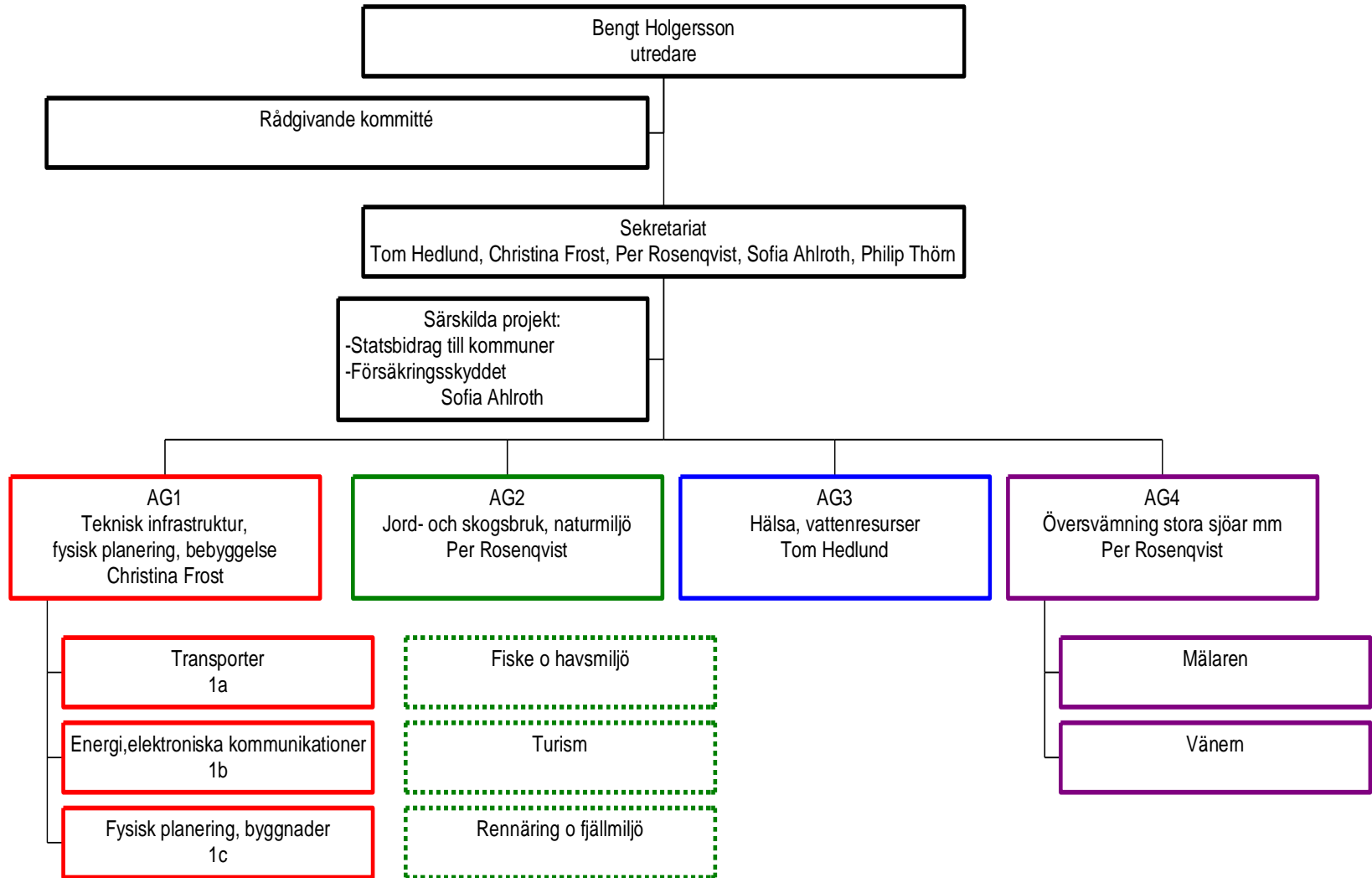
FINAL REPORT FROM
THE COMMISSION ON CLIMATE AND VULNERABILITY


STATENS OFFENTLIGA
UTREDNINGAR
SOU 2007:60

Bengt Holgersson chaired the investigation



Klimat- och sårbarhetsutredningen

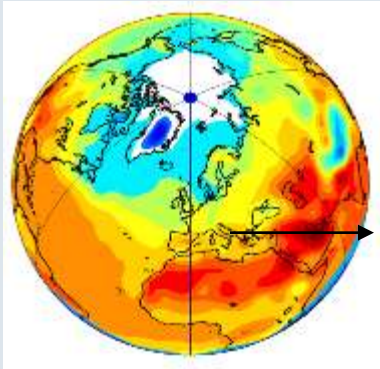


There were 34 special reports mainly on:

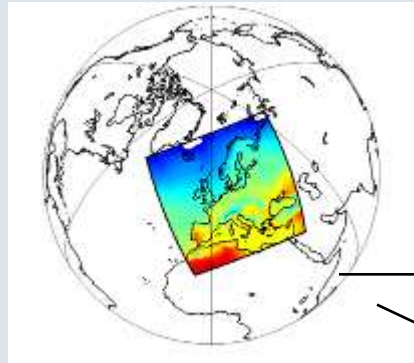
- **Roads, railways, shipping and aviation**
- **Telecom, radio, TV, power supply**
- **Floods, land slides and and dam safety**
- **Heating and cooling of buildings**
- **Water quality, water supply and waste water**
- **Forestry, agriculture and fishery**
- **Fire risks**
- **Tourism**
- **Biodiversity**
- **The Baltic Sea**
- **Health**

Climate modelling chain

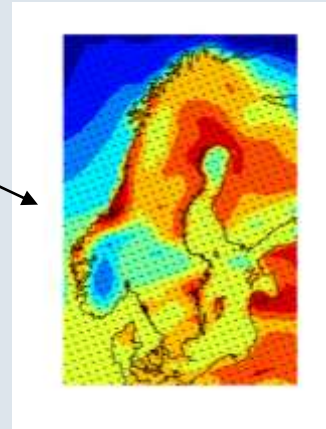
Global modelling



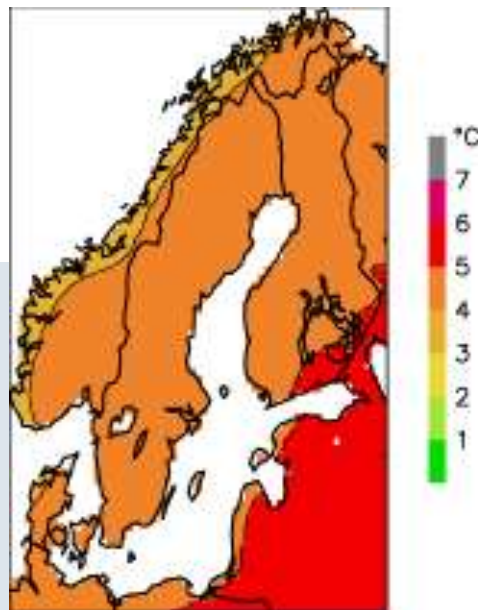
Regional modelling



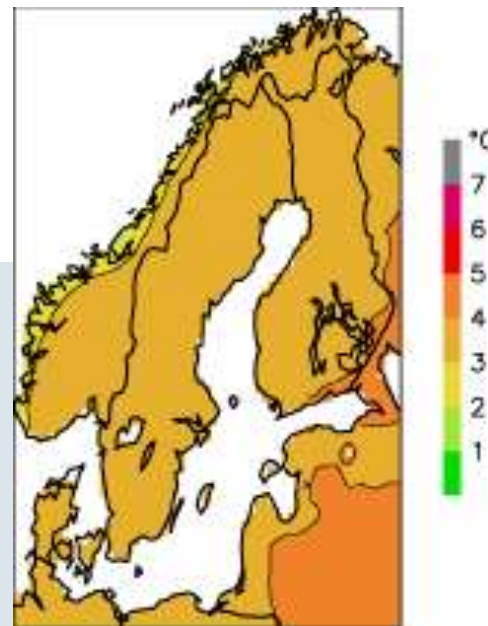
Local-regional studies



Temperature change in 2071-2100

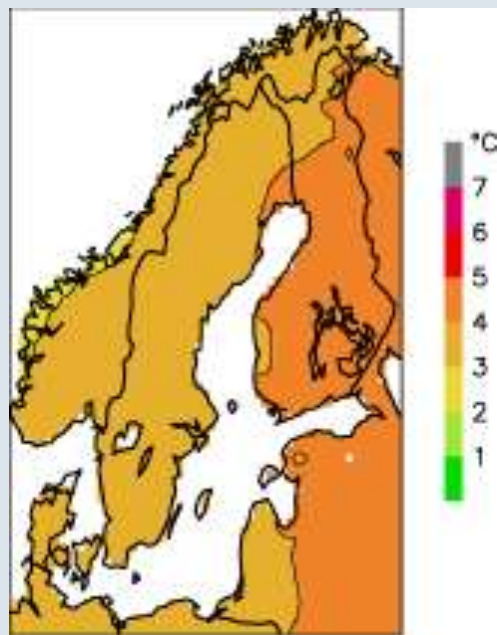


B2



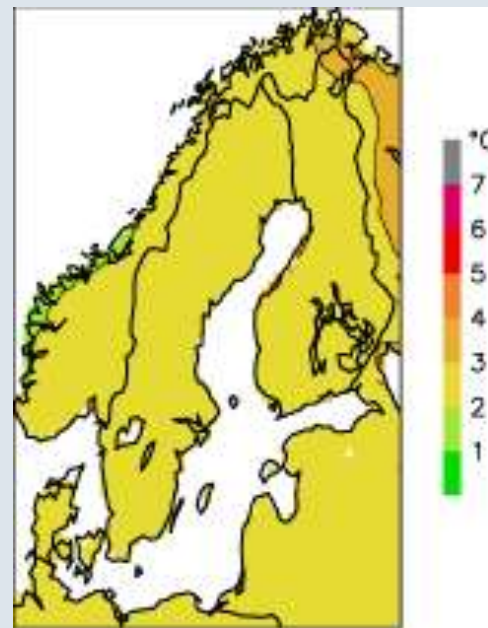
ECHAM4/OPYC3

A2



HadAM3H

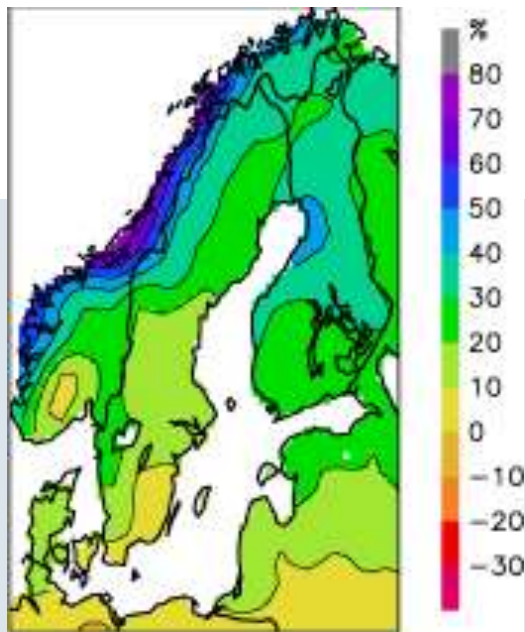
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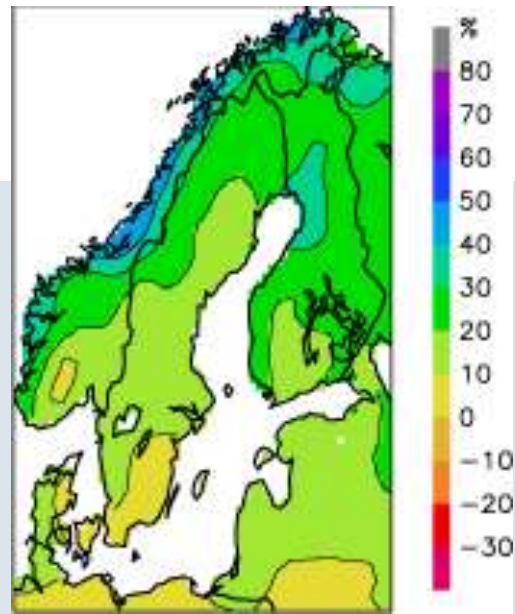
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Precipitation change according to:

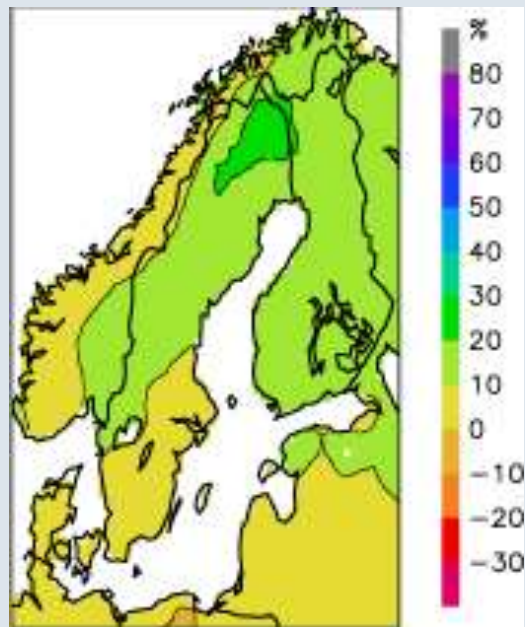
ECHAM4/OPYC3
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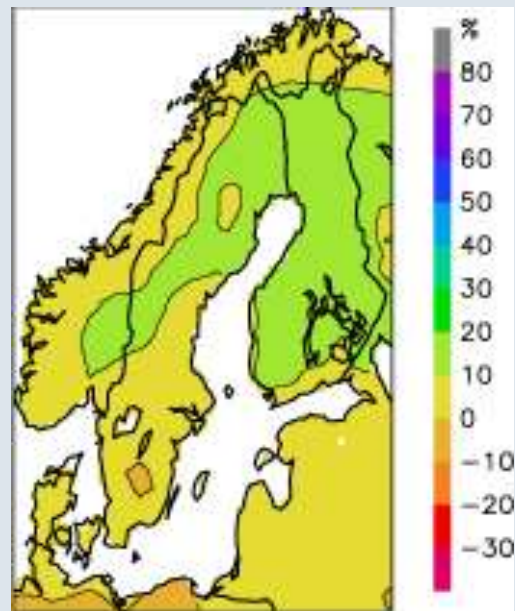
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HadAM3H
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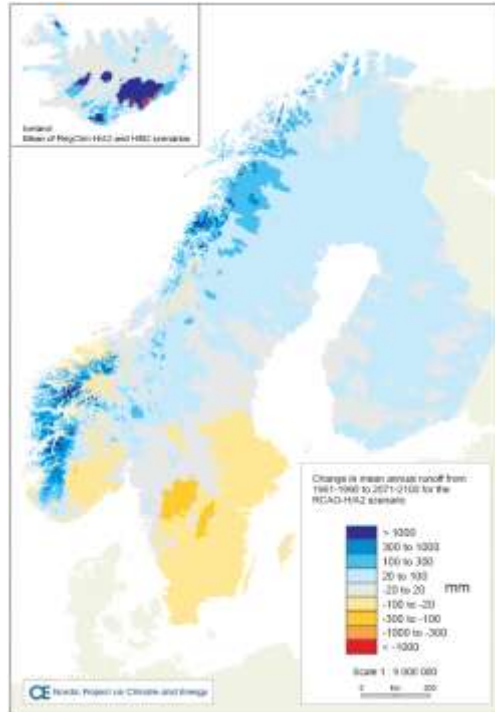
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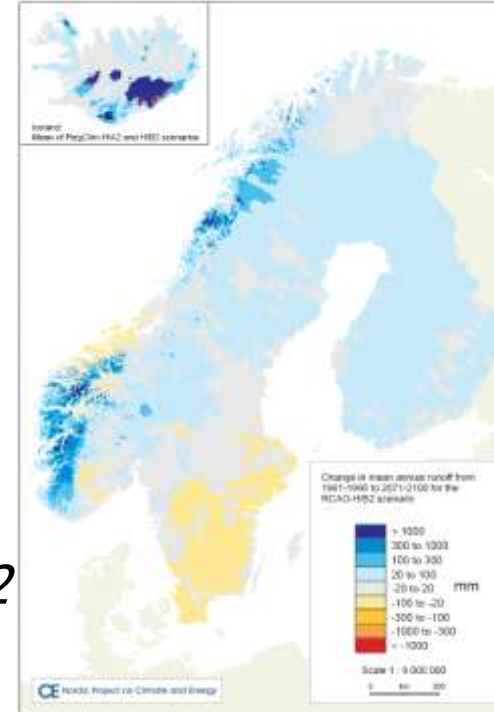
Annual runoff change (mm)

Hadley/A2



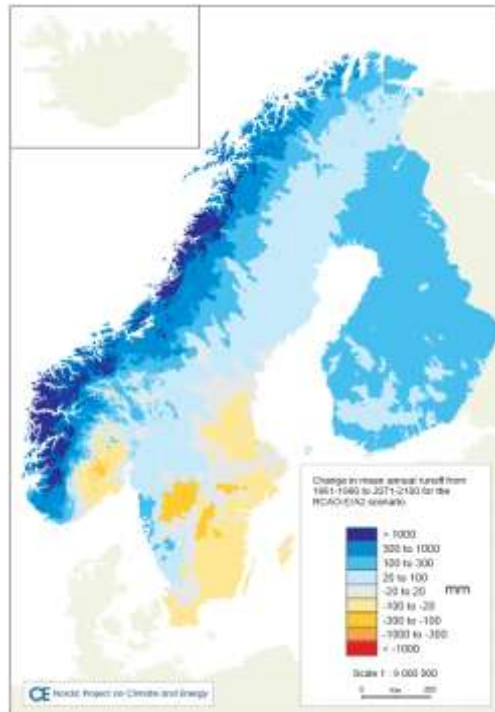
Annual runoff change (mm)

Hadley/B2



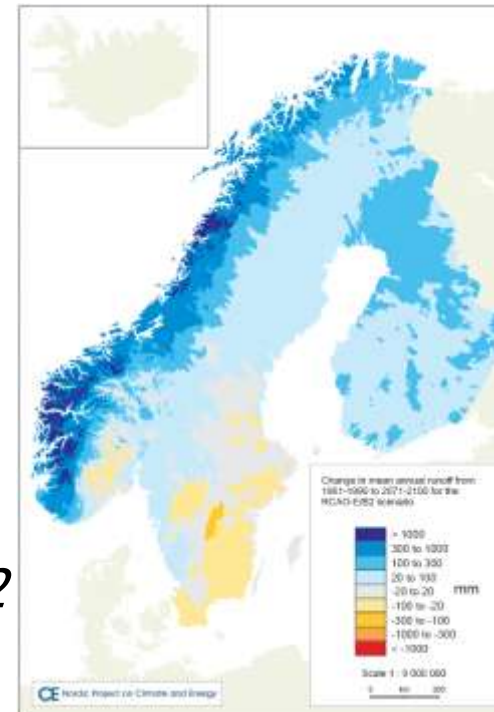
Annual runoff change (mm)

Echam/A2



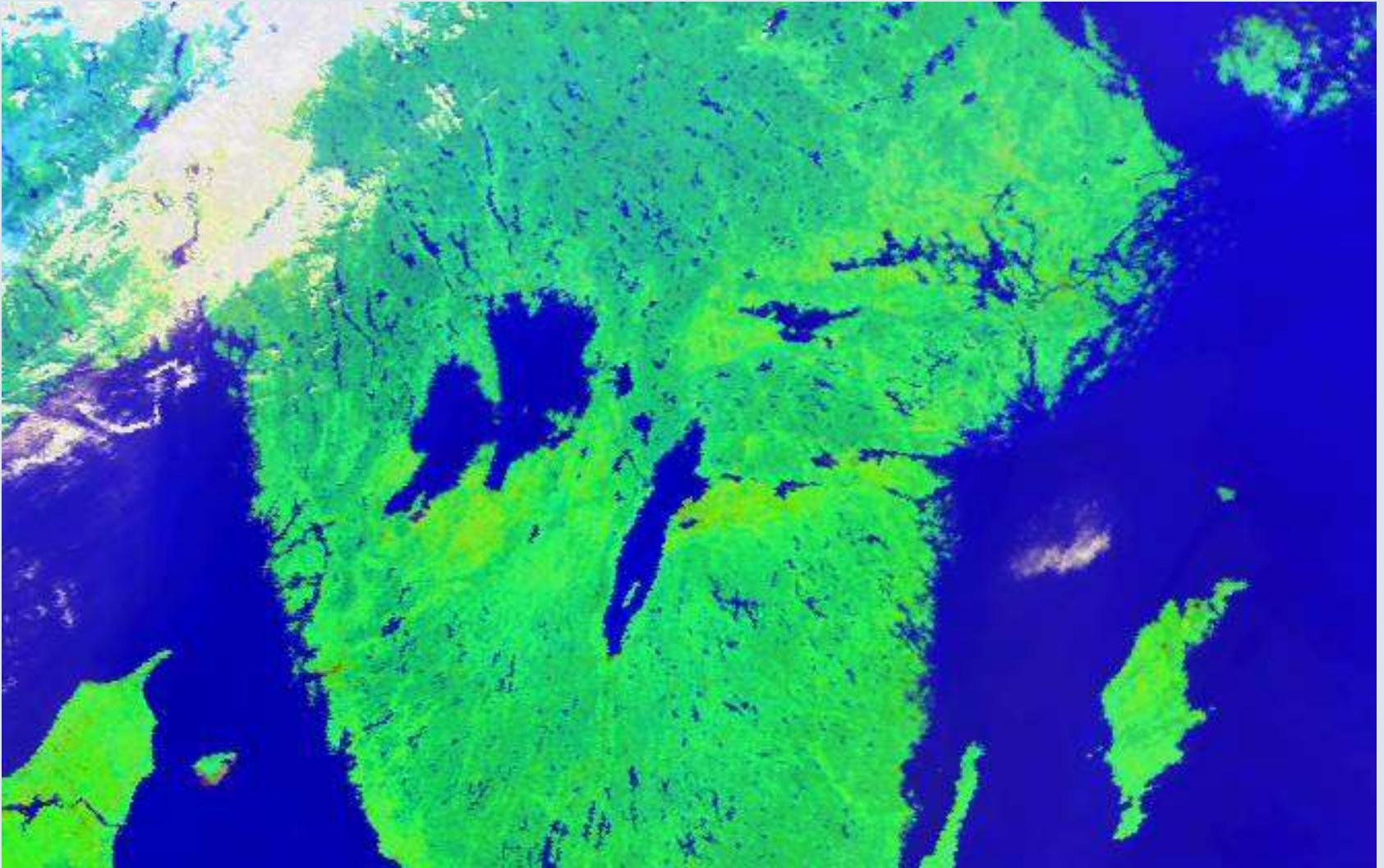
Annual runoff change (mm)

Echam/B2

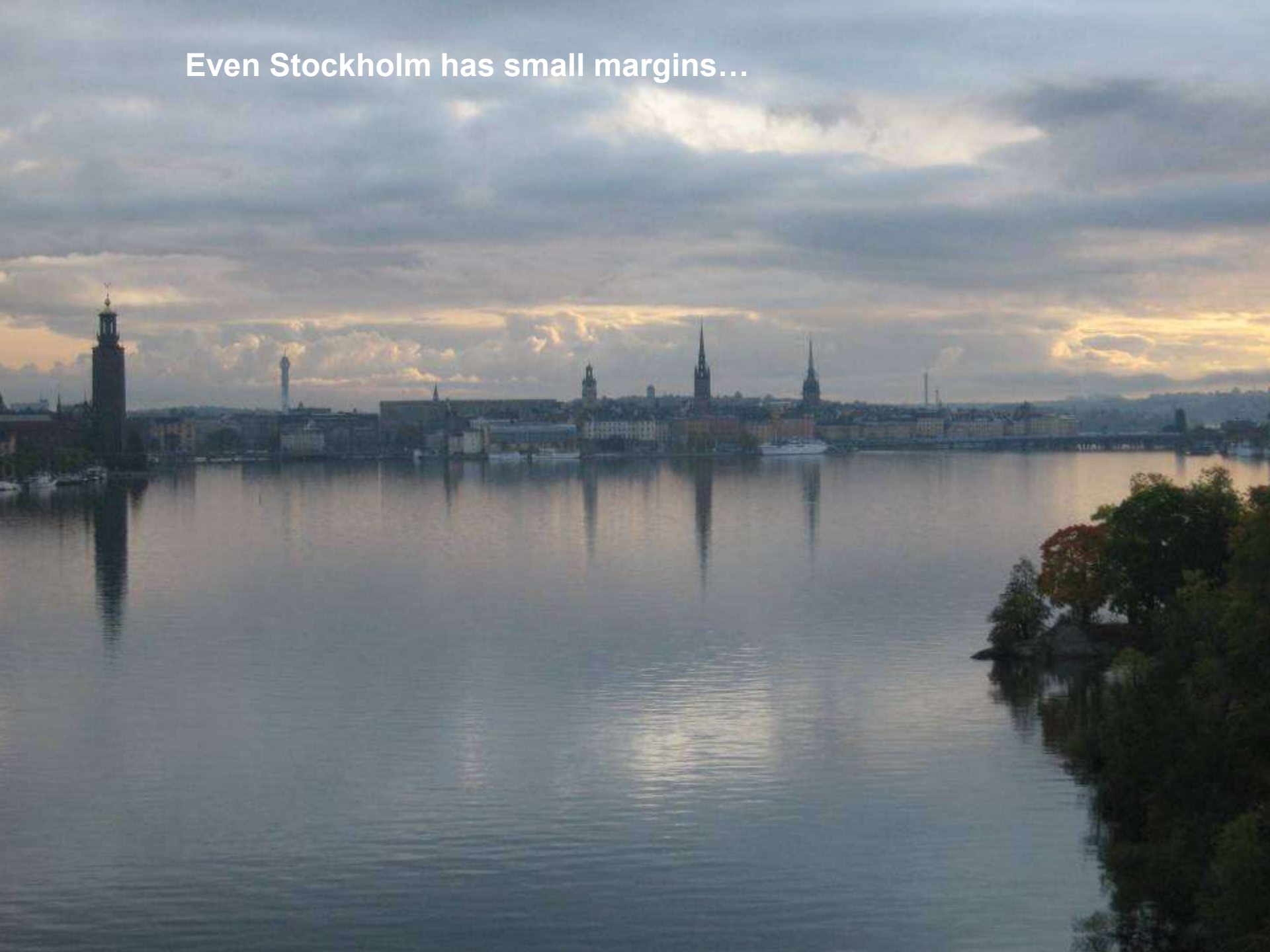


Special studies

The Swedish Commission on Climate and Vulnerability studied the big lakes



Even Stockholm has small margins...



A flood in Stockholm in 1924



Stockholm today



Foto: Sten Bergström, SMHI

Vänern och Göta älv





Göteborgs Stad
Stadsbyggnadskontoret



2008-12-11

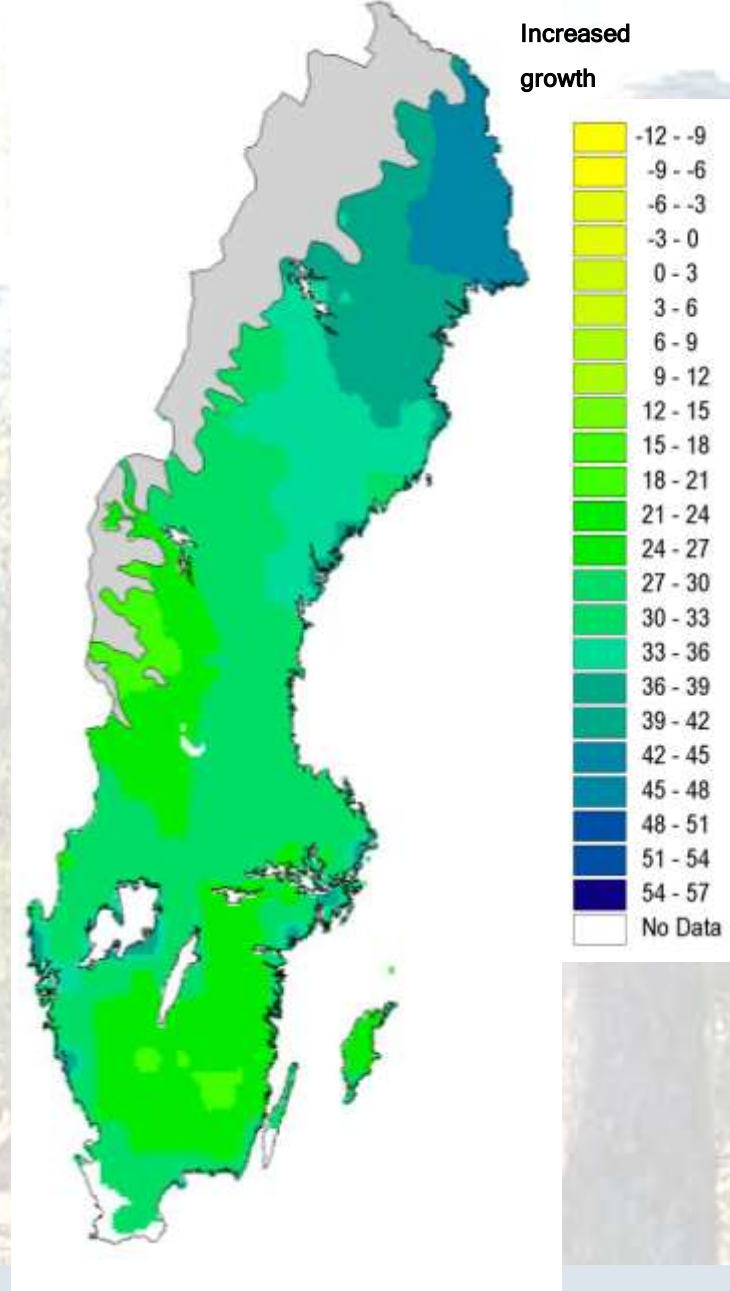
Forestry in Sweden, a winner?

Longer growing season

More damage from insects and fungi?

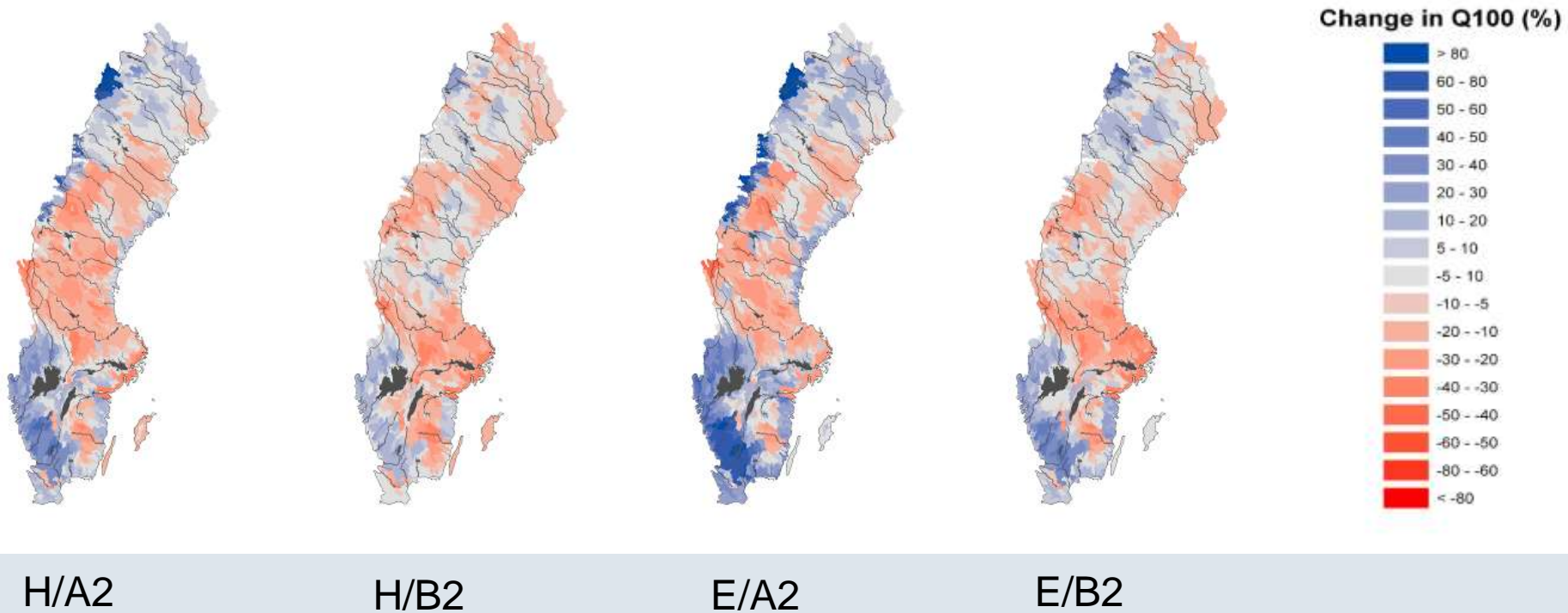
Storms?

Fires?



Source: the Swedish Commission on Climate and Vulnerability, 2007

Change in the 100-years flood according to four climate scenarios from 1961-1990 to 2071-2100



Landslides, Tuve in 1977



Ånn in July 2006, close to a disaster



Hydropower-
a part of the solution?



Nordic hydropower in % of total electricity production

Norway	100%	123 TWh
Sweden	45%	66 TWh
Finland	12%	8 TWh

(approximate figures)

Conclusions from the CE-project

- Hydropower production is expected to increase in the Nordic area (But this is not the case for the rest of Europe!)
- The annual rhythm in river flow will be more favourable for production
- Impact on dam safety is not self-evident and has to be analysed carefully
- The development of the future European energy market will have strong impact on the Nordic hydropower industry

Nordic and Baltic conference on “Future Climate and Renewable Energy – Impacts, Risks and Adaptation”, Oslo, Norway, 31 May - 2 June 2010

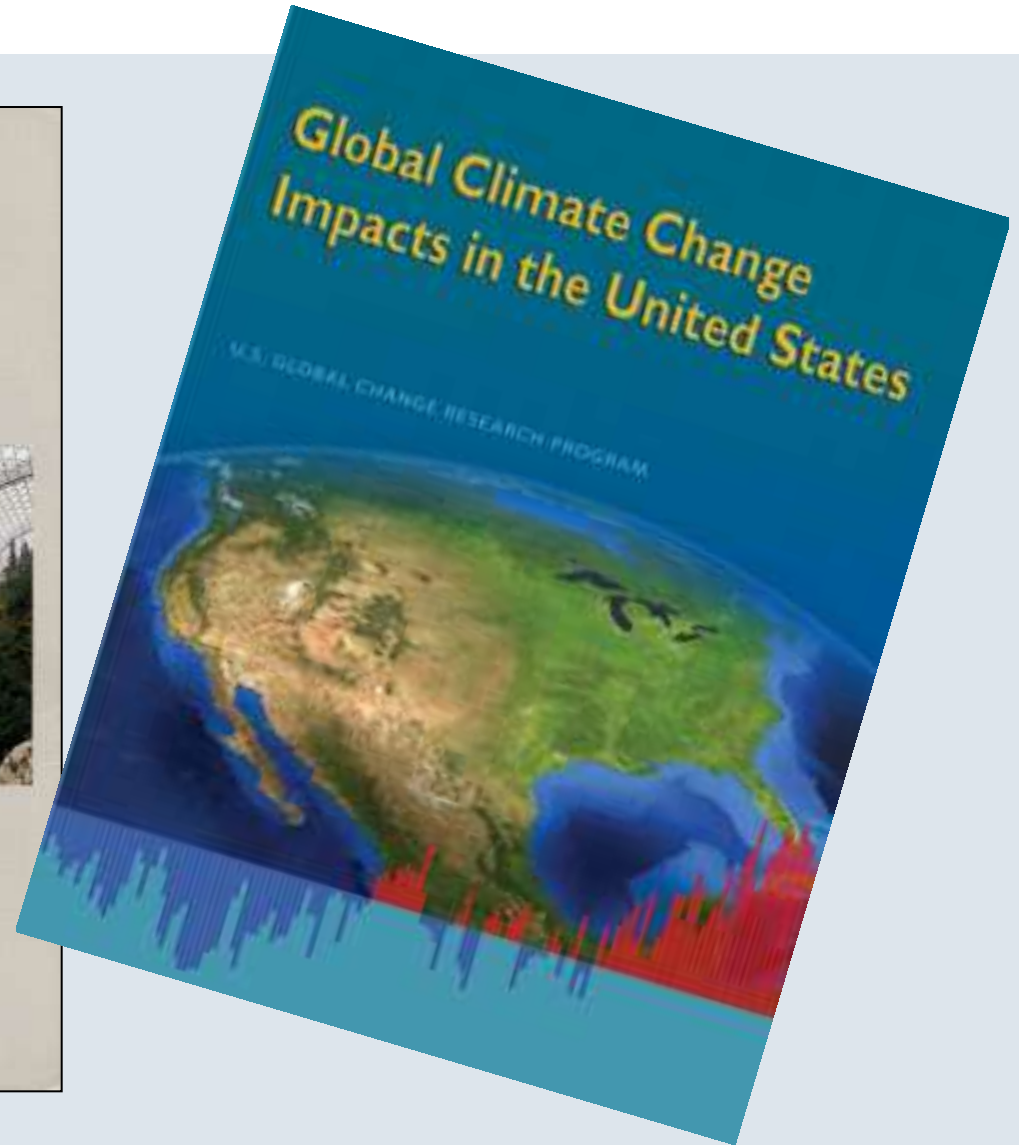
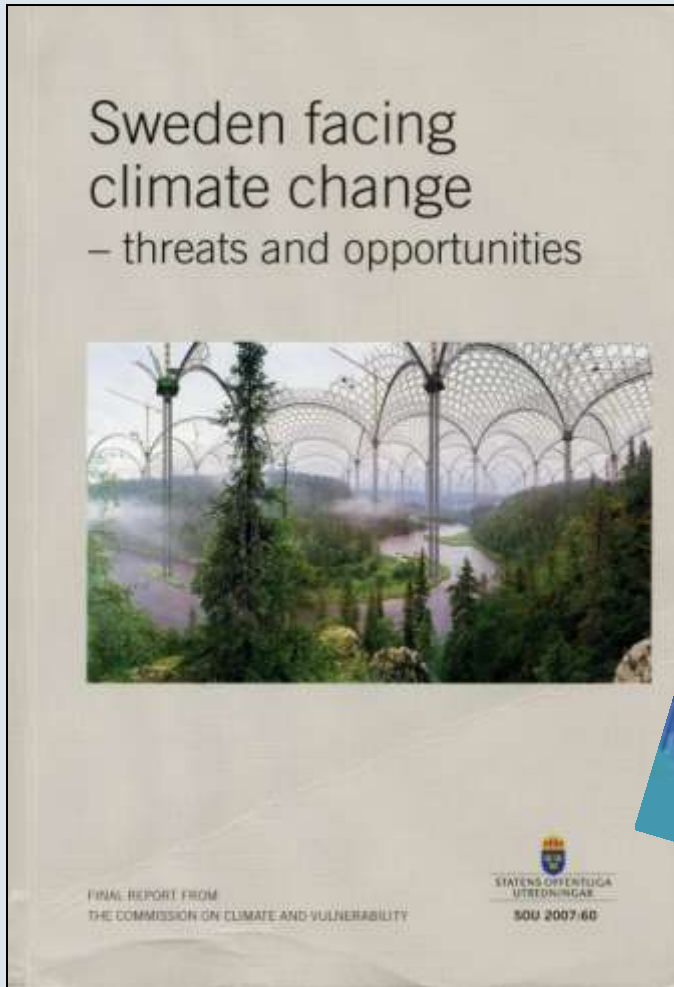
- past and present changes in climate and hydrology.
- climate and hydrological projections for the near future (2020-2050).
- effects of a changing climate and hydrology on renewable energy.
- risks and opportunities for renewable energy caused by climate change.
- adaptation strategies.

• **www.nve.no/ces2010**

A new strategy in summary, examples:

- **The county administration boards have been given a key role as coordinators in adaptation work**
- **All governmental sector agencies have been given responsibilities for adaptation to a changing climate in their own areas of responsibility**
- **A new digital terrain model is being developed to assist in flood risk mapping**
- **Special geological stability studies are carried out along the River Göta älv**
- **Restrictions are suggested for some flood prone areas**
- **SMHI has obtained resources for climate modelling and information**

The message has now reached more decision makers...



And adaptation discussions have started

Recent adaptation projects



Thank you for your attention...

