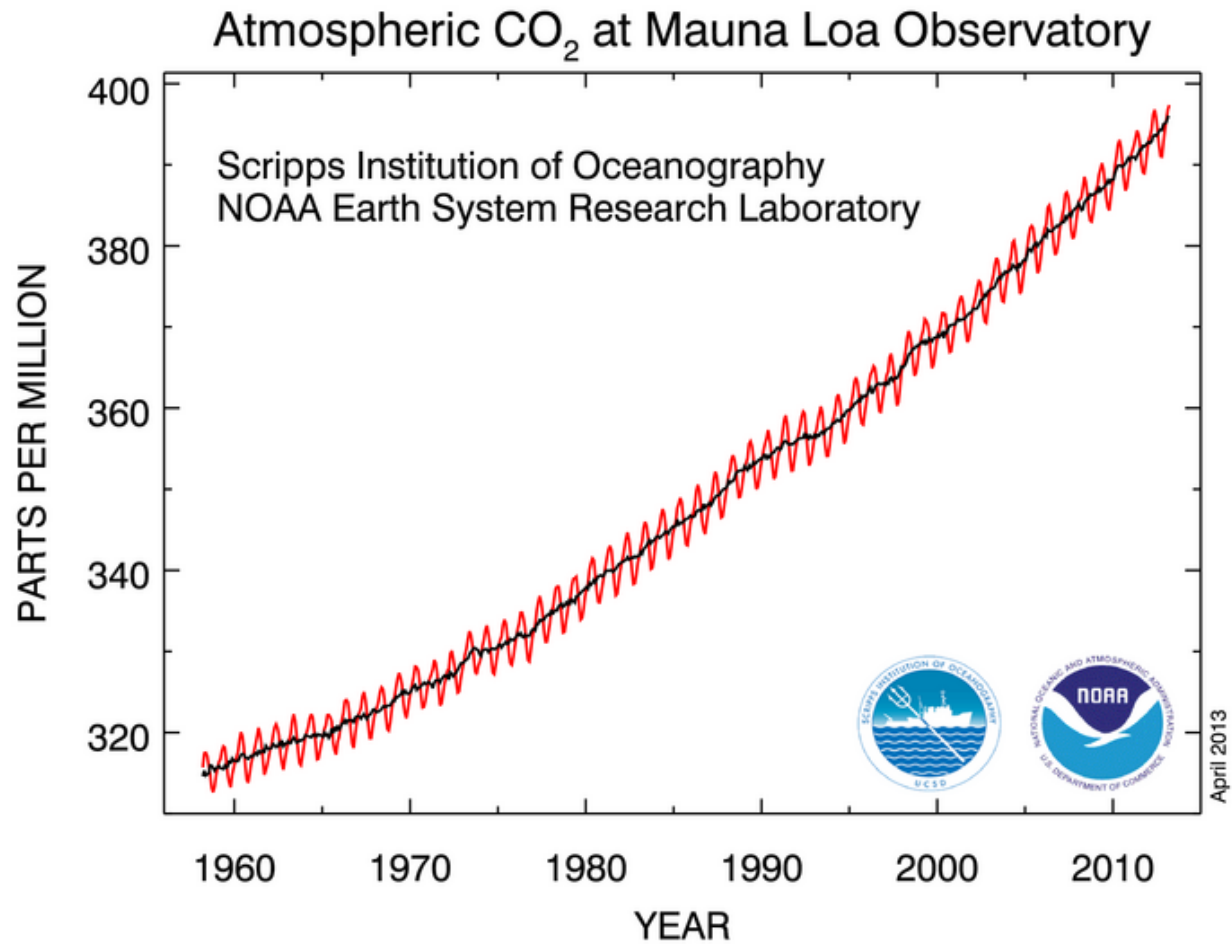


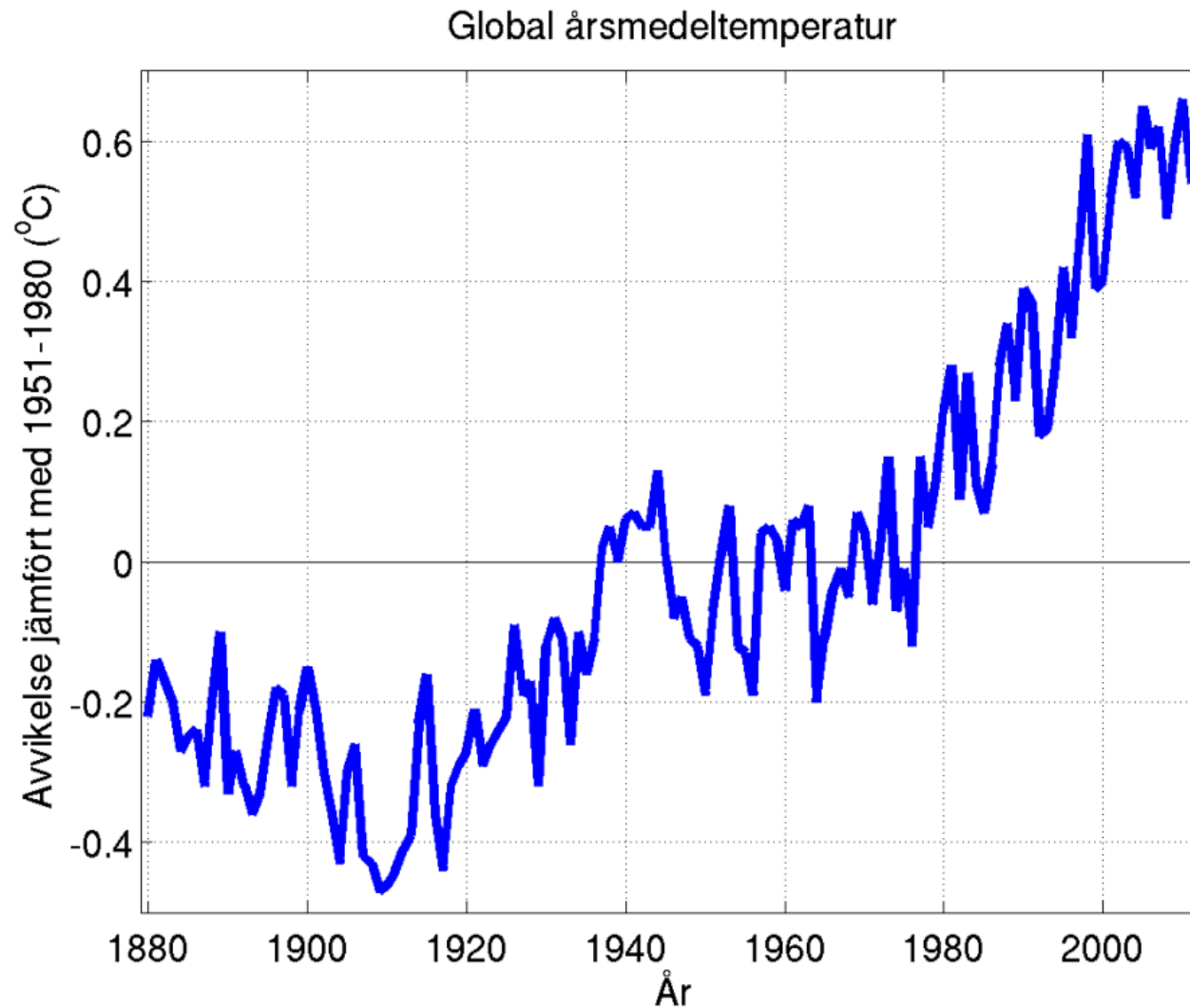
# **Climate change effects in the Baltic Sea Region – what do we know?**

**Sten Bergström**



<http://www.esrl.noaa.gov/gmd/ccgg/trends/>

Global surface mean annual air temperature 1880-2012 (data from NASA)

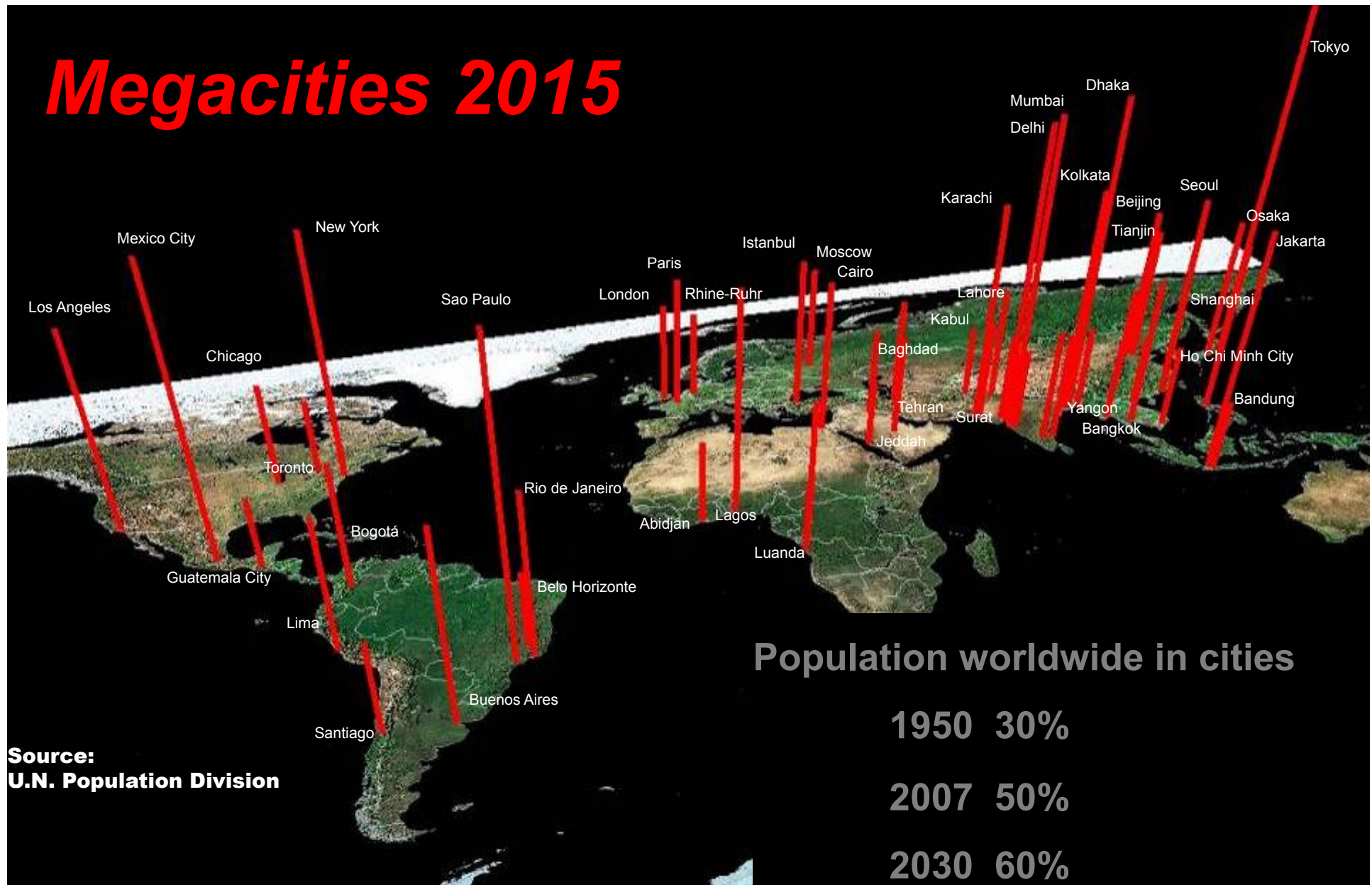


# *Megacities 1950*



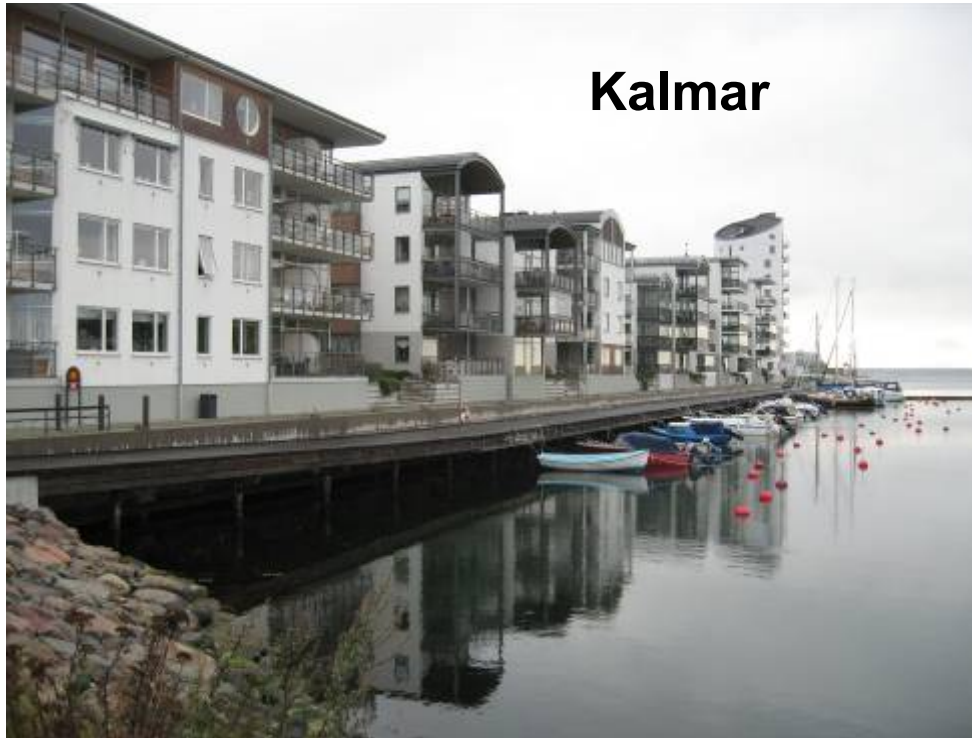
**Source: U.N. Population Division**

# Megacities 2015



Source:  
U.N. Population Division

**Kalmar**



**Färjestaden**



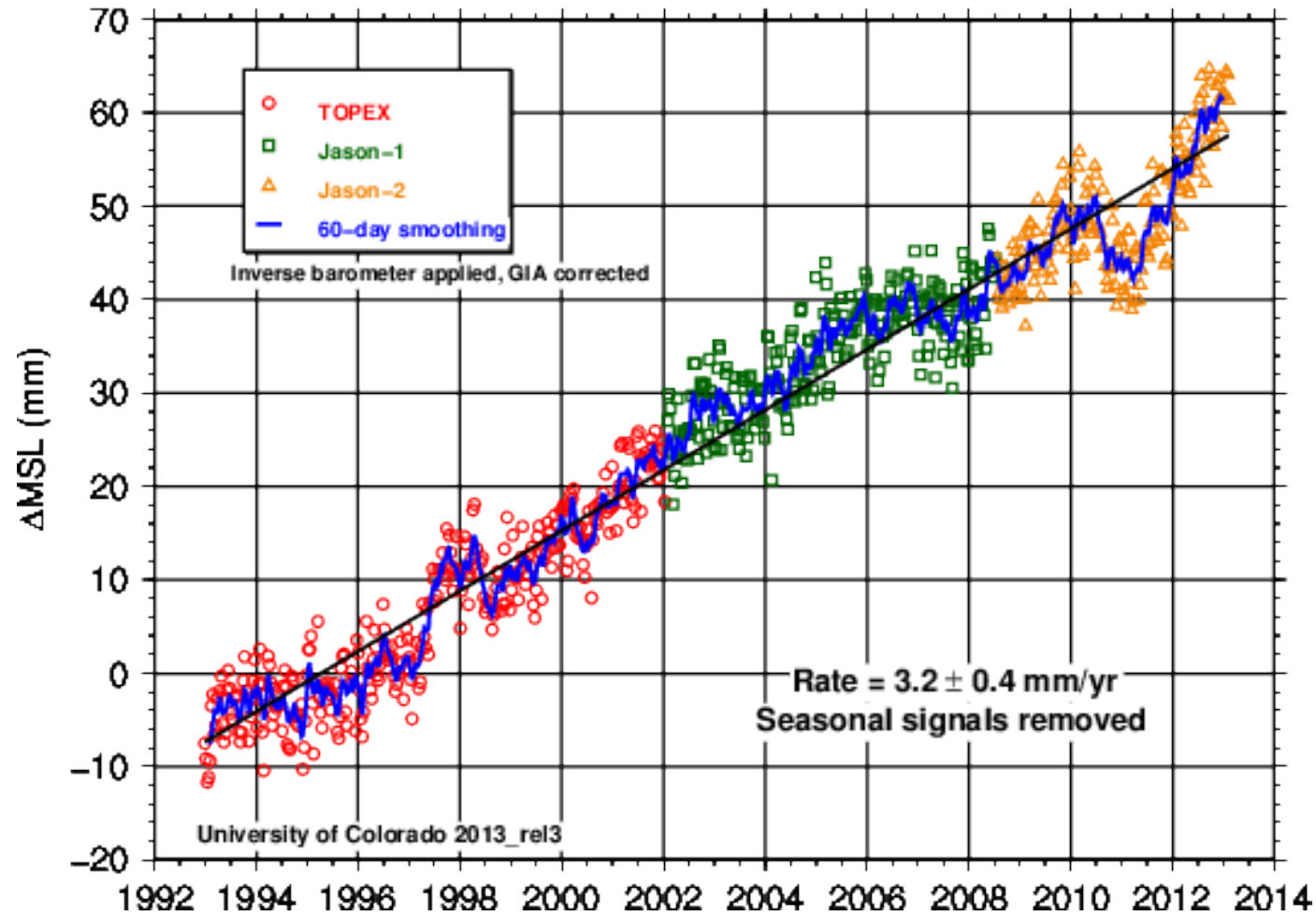
**Stockholm**



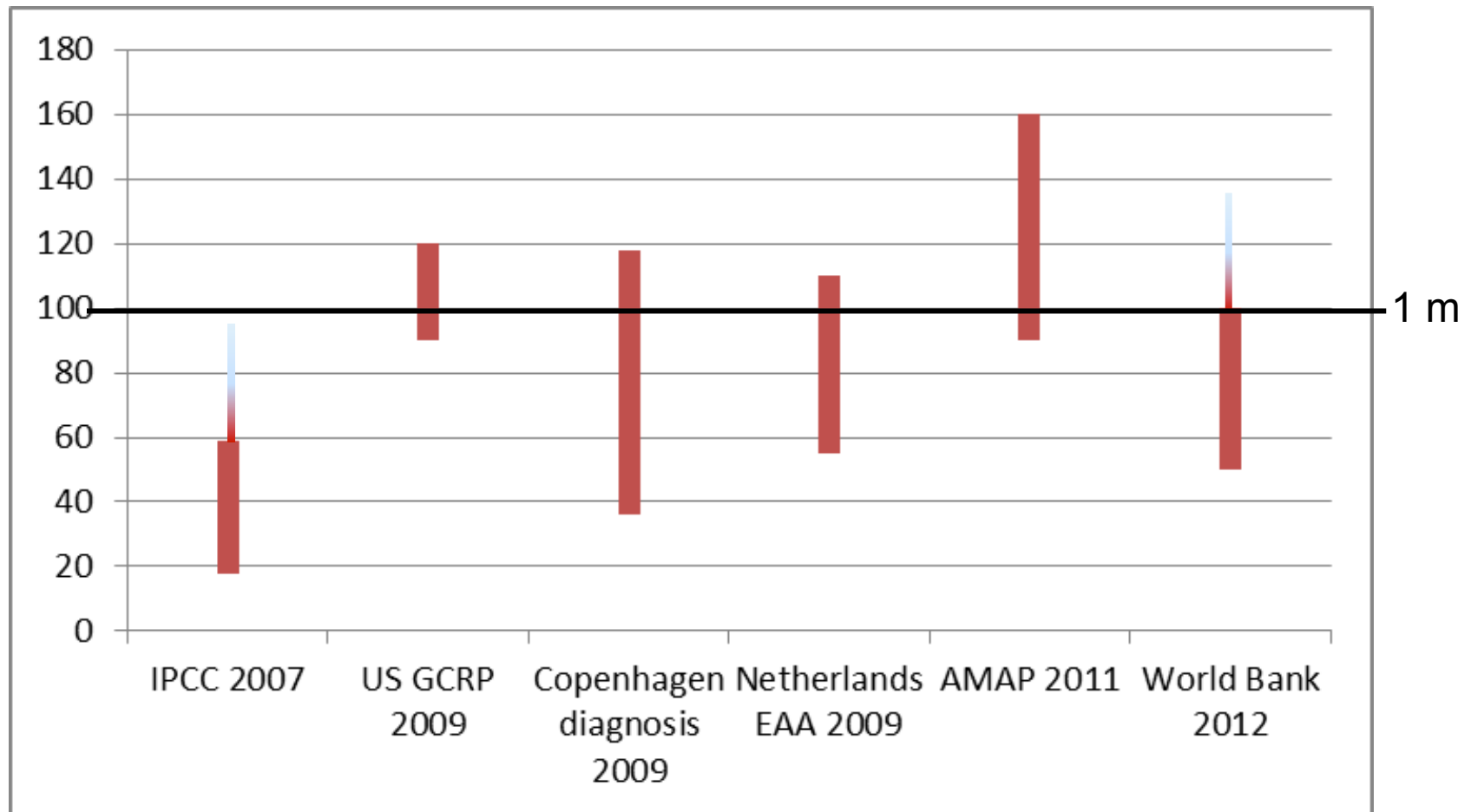
**Västervik**



# Sea levels up to 2013-04-20

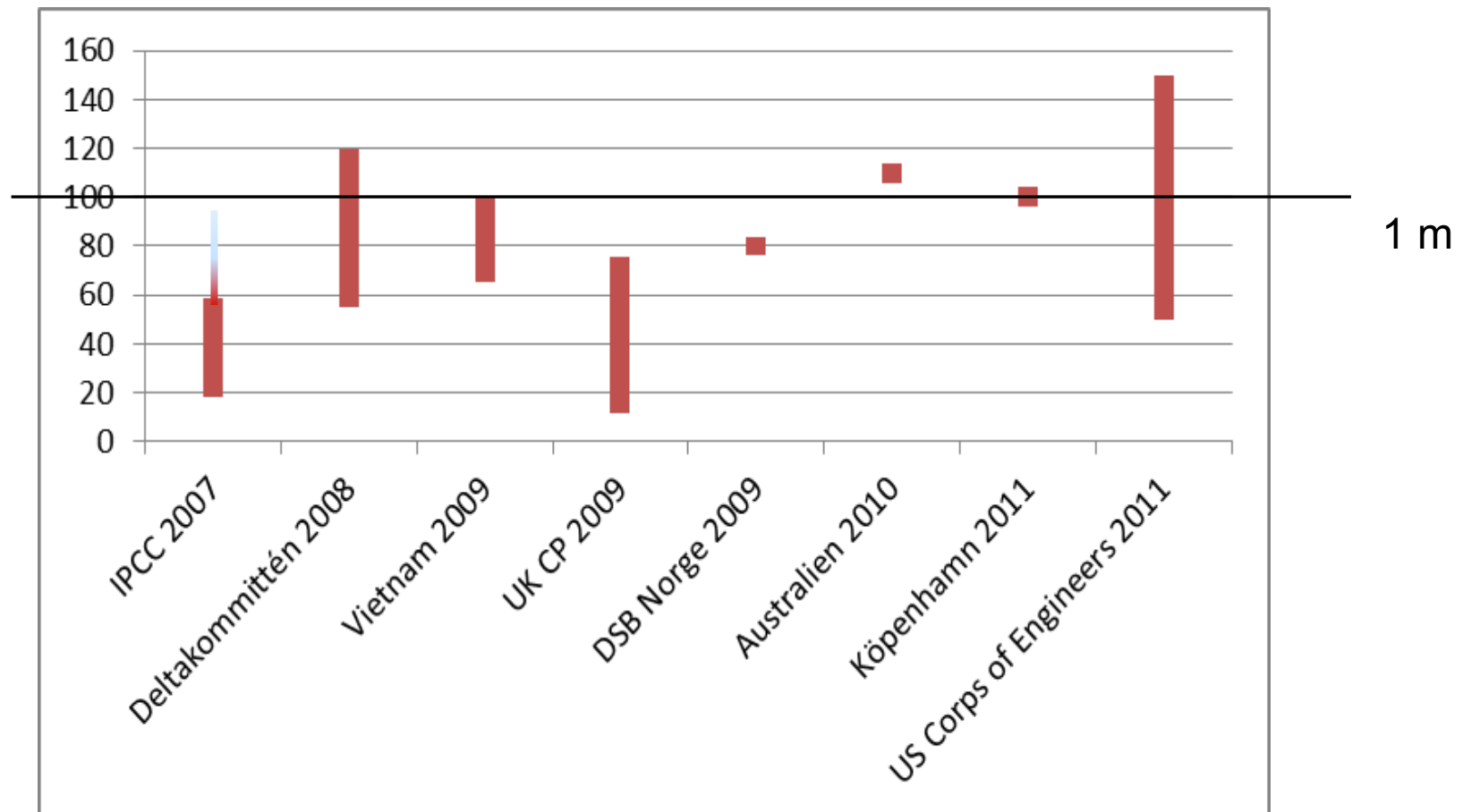


## Some recent scientific assessments of Sea Level Rise until 2100

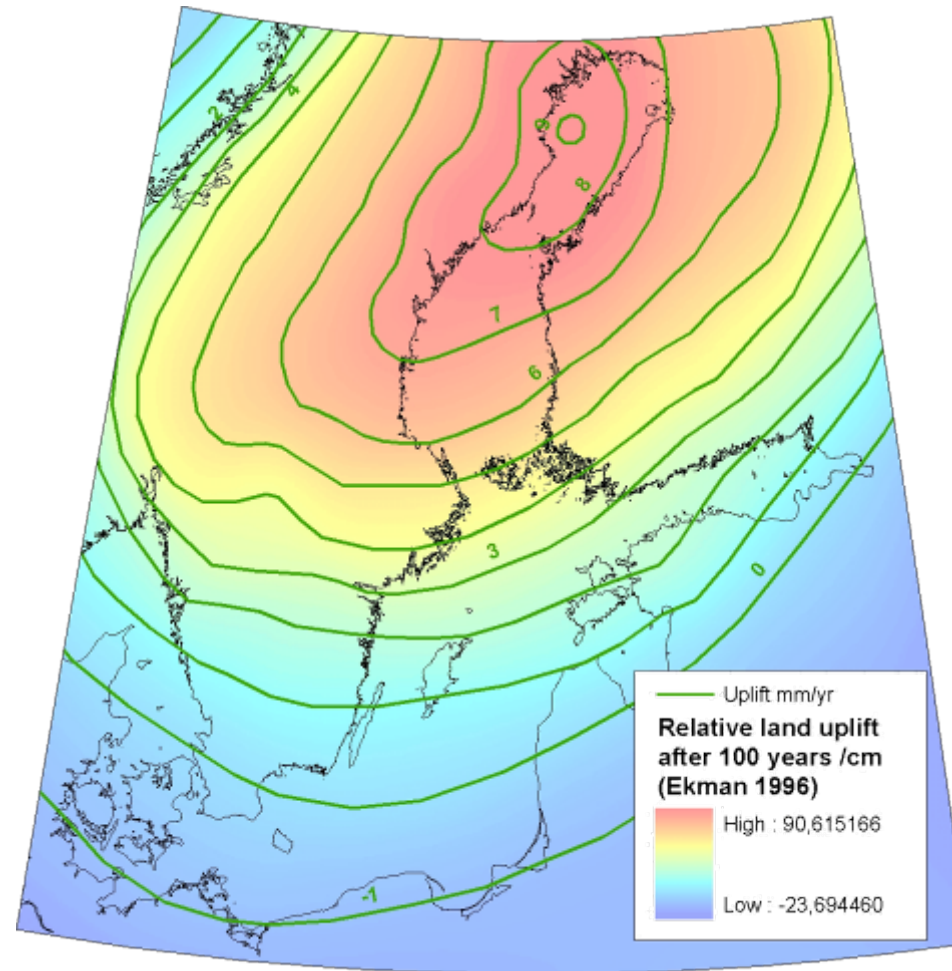


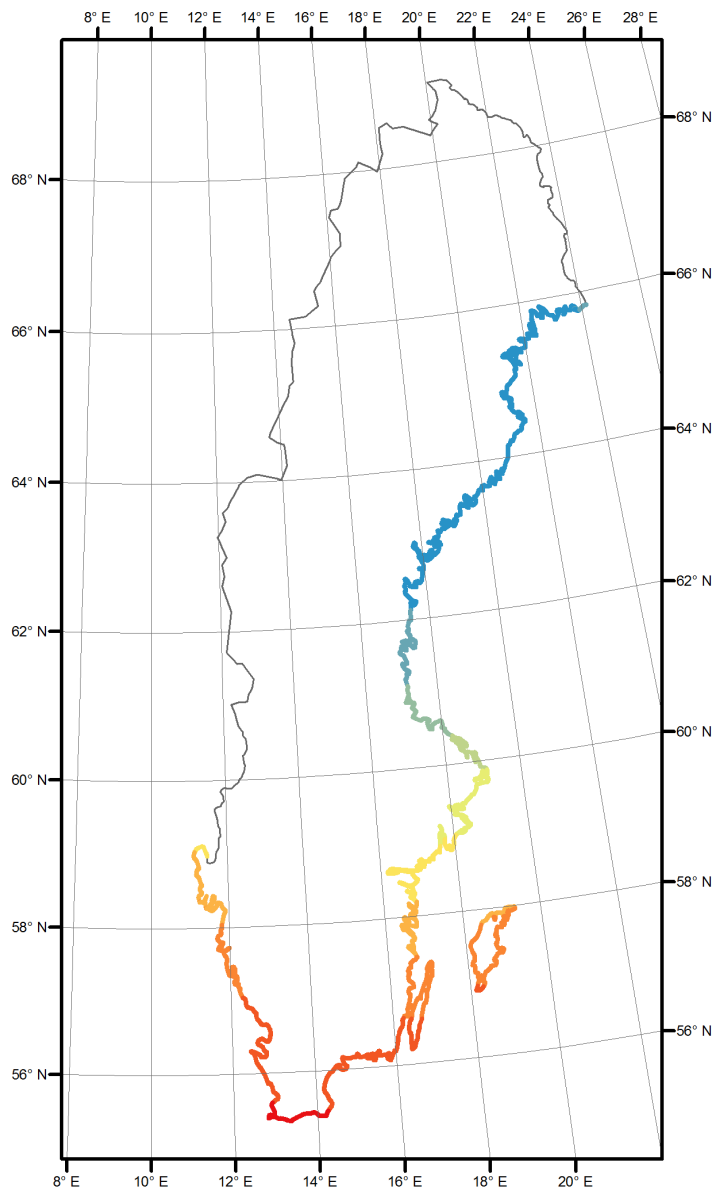


## Some recent national interpretations for adaptation to Sea Level Rise until 2100



## Uplift of land in Sweden relative to sea levels





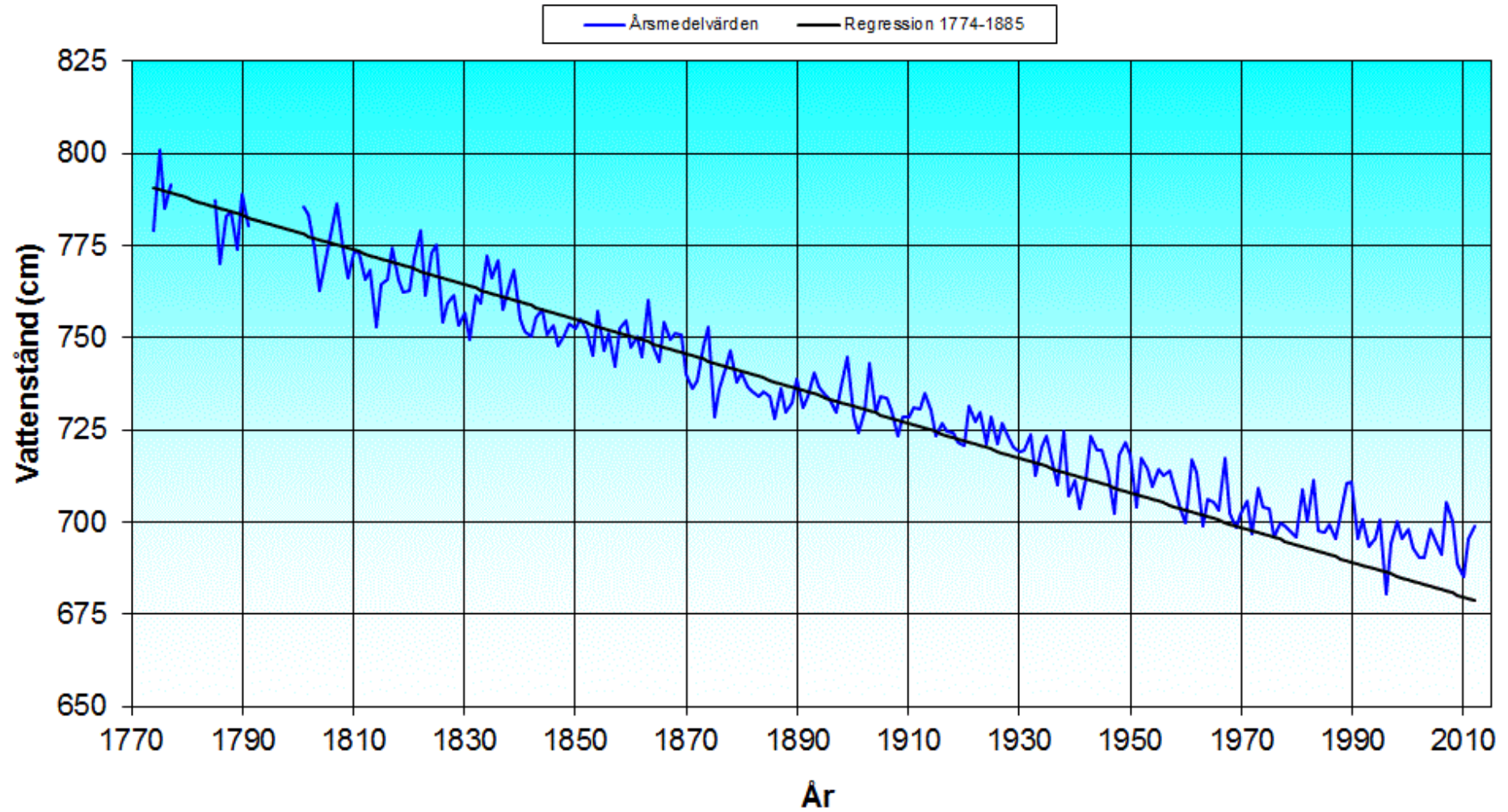
Nettoeffekten av havsnivåhöjning minus landhöjning i Sverige under förutsättning av en global havsnivåhöjning på 1 meter under 100 år. Beräkningen av landhöjningen är baserad på Lantmäteriets landhöjningsmodell NKG2005LU (Ågren och Svensson, 2007).

Förändrad havsnivå år 2100 (m)

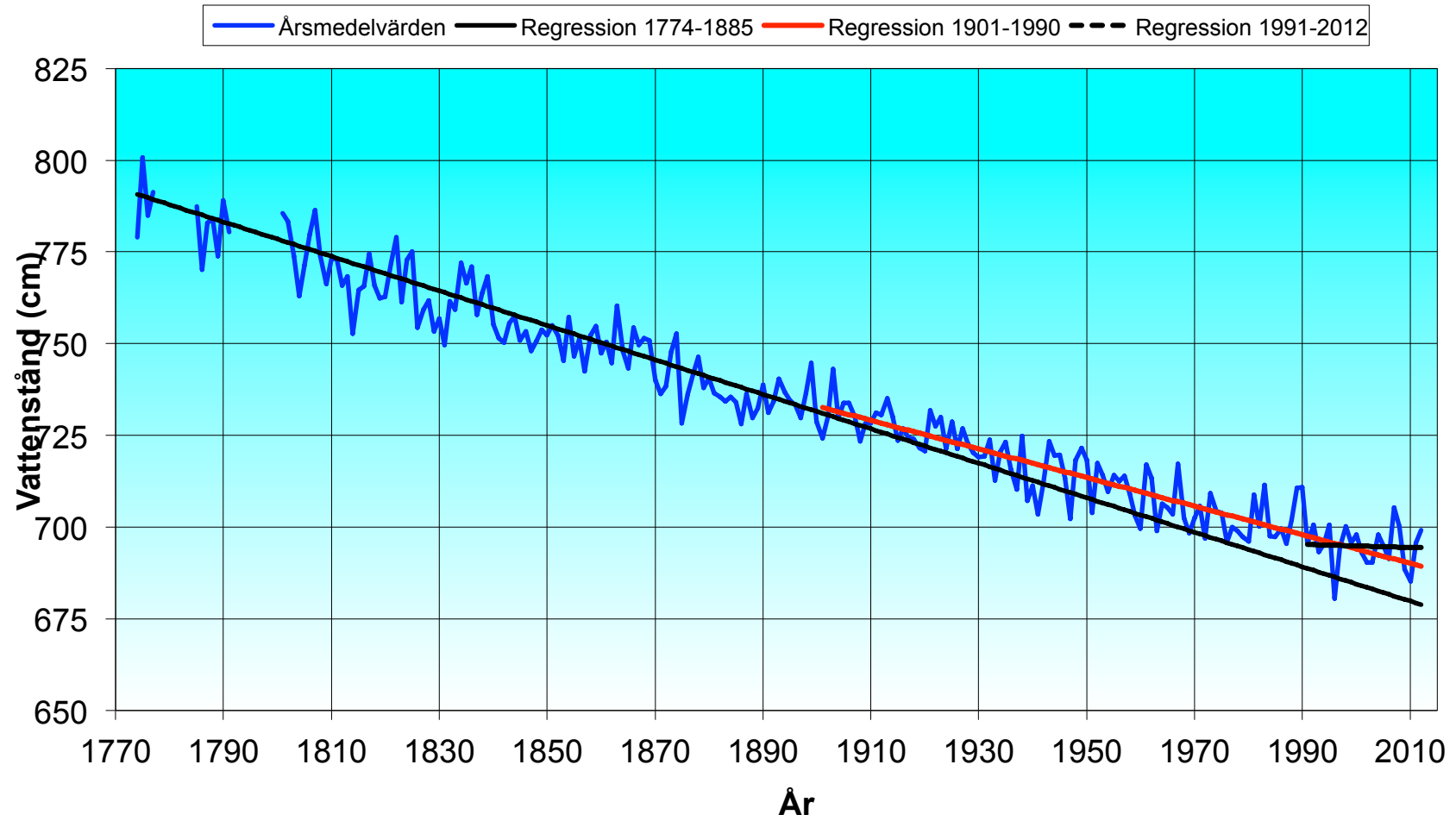
- 0,9 - 1,0
- 0,8 - 0,9
- 0,7 - 0,8
- 0,6 - 0,7
- 0,5 - 0,6
- 0,4 - 0,5
- 0,3 - 0,4
- 0,2 - 0,3
- 0,1 - 0,2
- < 0,1

# Sea levels i Stockholm

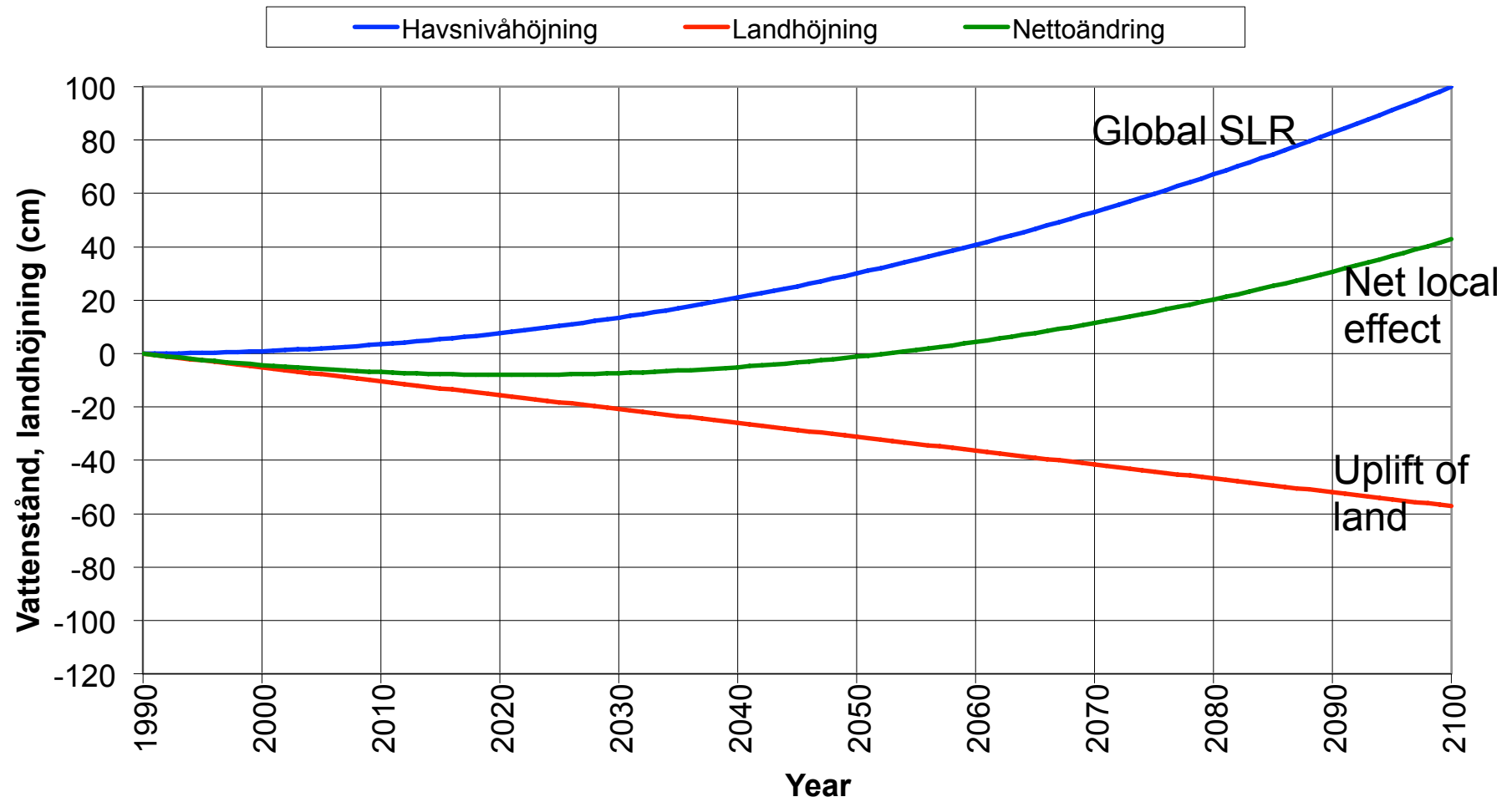
## Havsvattenstånd Stockholm 1774 - 2012



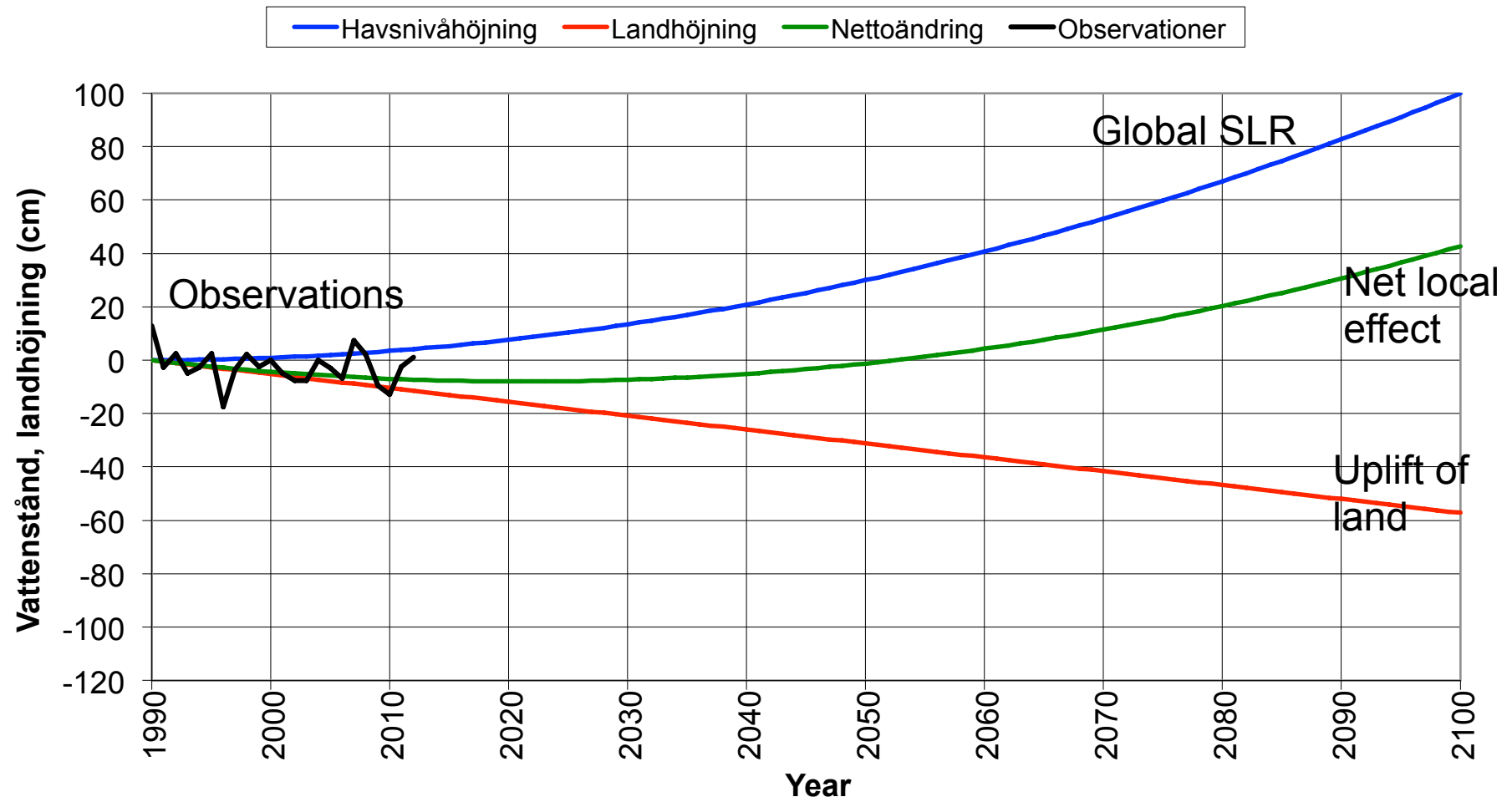
### Havsvattenstånd Stockholm 1774 - 2012



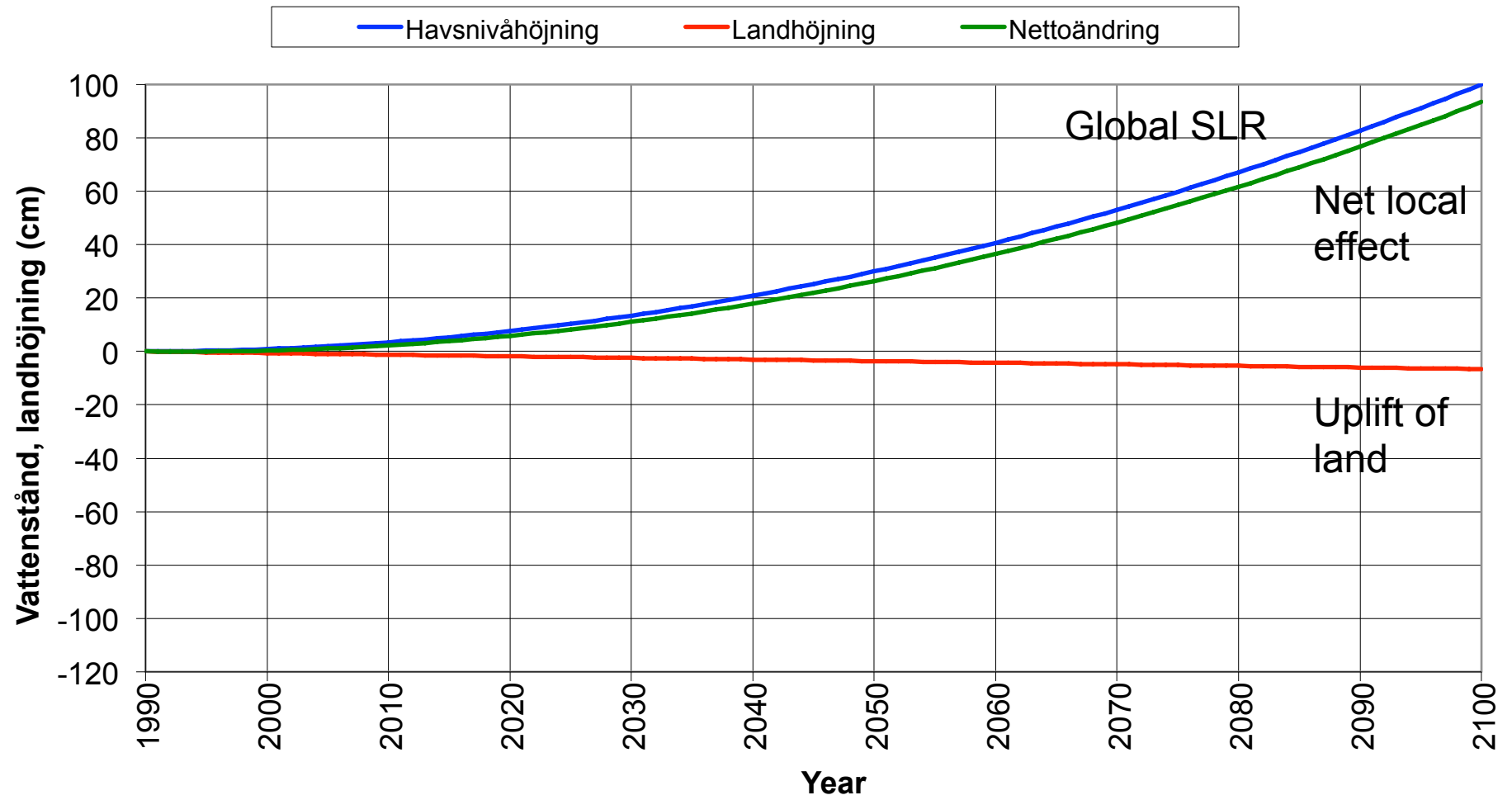
**Stockholm 1990 - 2100**



**Stockholm 1990 - 2100**

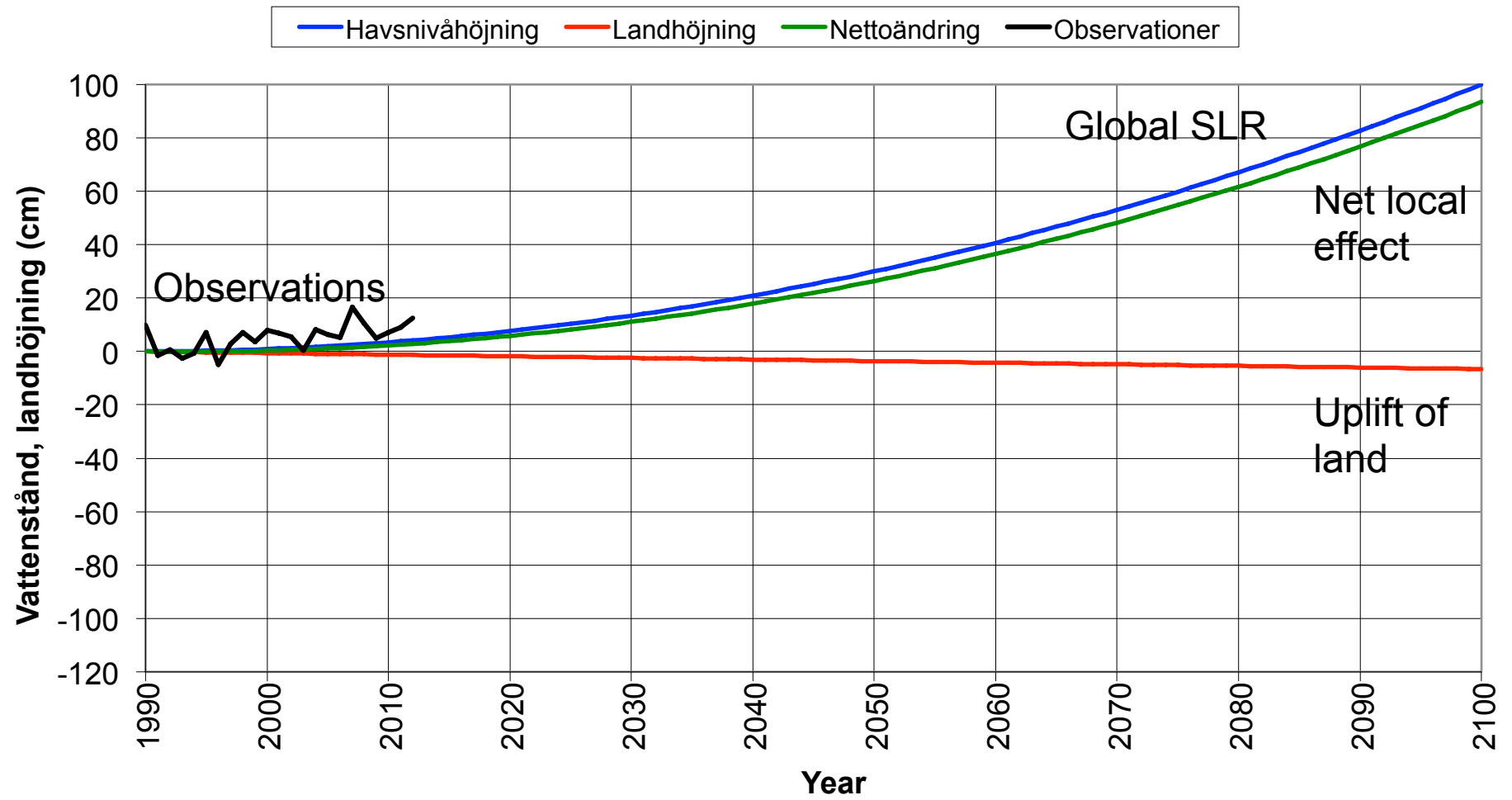


**Skanör 1990 - 2100**





**Skanör 1990 - 2100**



Copenhagen July 2, 2011



# July 2011 - damages

- More 150 mm rain within 2 hours
- Close to 1 billion euros in insurance claims
- Damage to critical infrastructure
- Hospitals minutes from evacuation
- Emergency services threatened



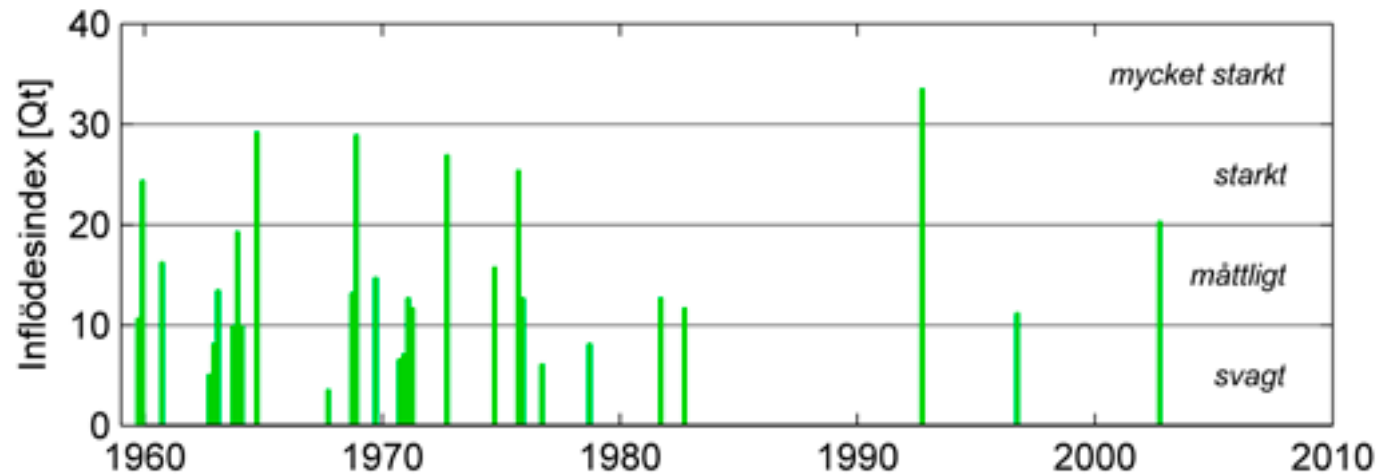
Global Challenges  
**COPENHAGEN  
SOLUTIONS**



## Oxygen free bottoms in the Baltic Sea (autumn 2011)

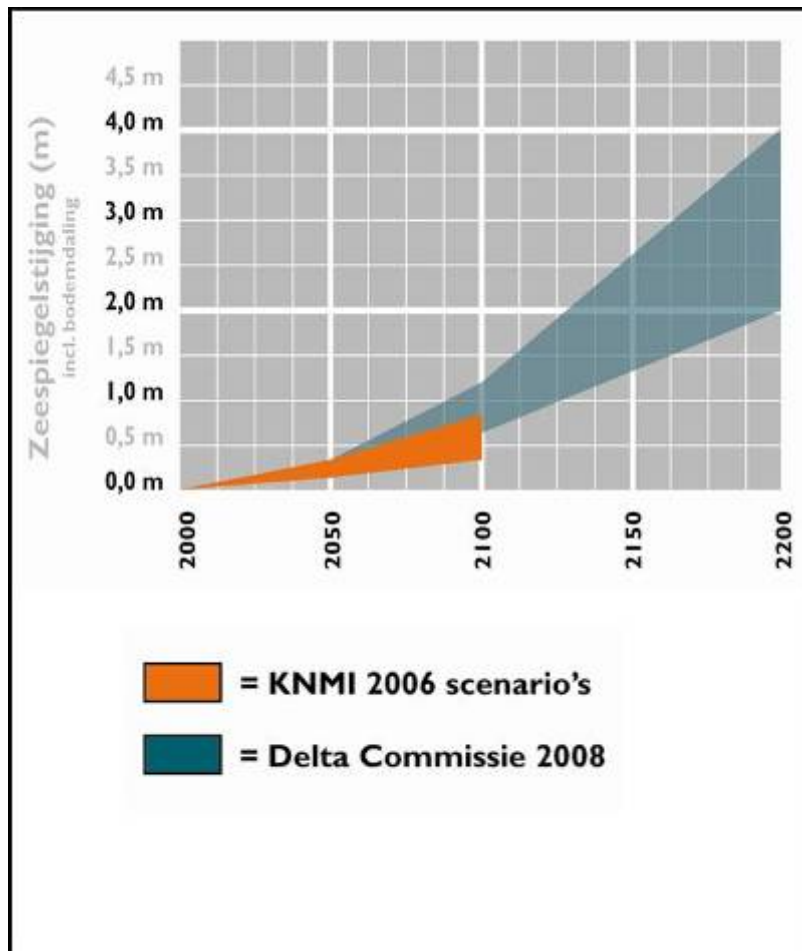


Why are there so few massive inflows these days?



What about the next 200 years?

## Sea level rise by the Dutch Deltacommittee



2100: + 0.55 - 1.20 m

2200: + 2 - 4 m