Adapting to a Changing Climate: County of Stockholm

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Länsstyrelsen Stockholm

Outline

- Our role
- Climate change in Stockholm
- Challanges in Stockholm
- Lake Mälaren
- Measures and tools

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The role of the County Administrative Board

- Coordinate climate adaptation work in the region
- Reviewer of plans (city, area)
- Contingency work

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How we work

- Cooperation and networking
  - Municipalities, other counties, authoroties, researchers, private companies
- Knowledge building
  - Seminars, reports
- Pilot projects
  - E.g. the Cloudburst project
- Planning tools
  - GIS layers, maps, guidelines

Action Plan – Climate adaptation County of Stockholm 2014

County of Stockholm

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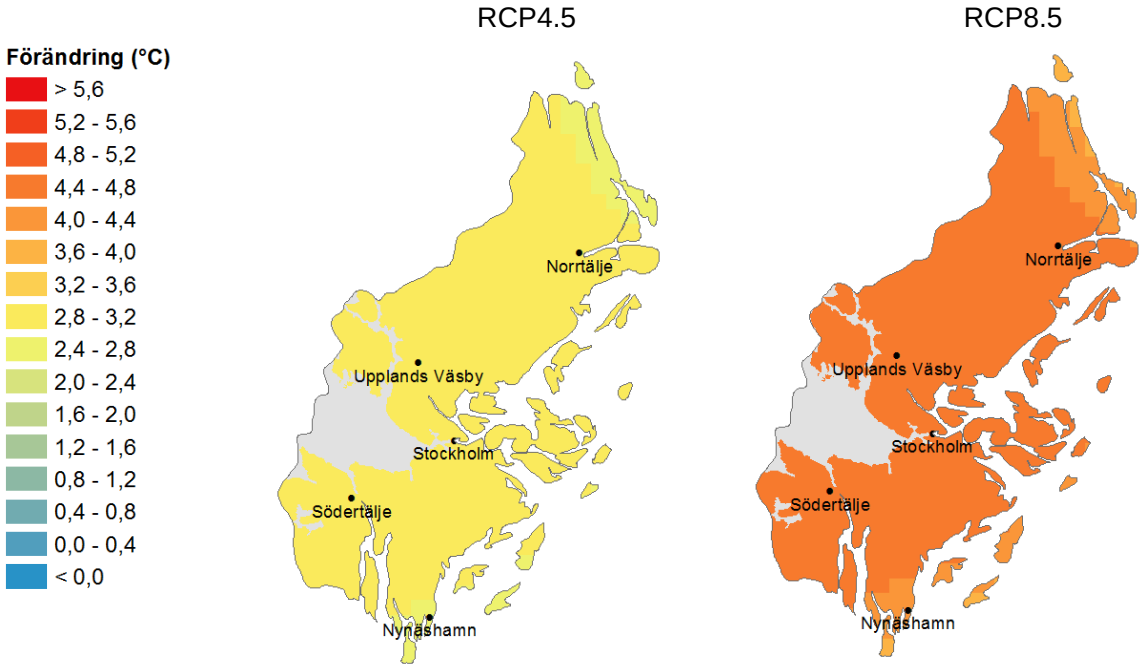
Future climate of Stockholm
- according to RCP scenarios



Change in mean annual temperature,
2069-2098 vs 1961-1990

- SMHI report (2015) describing todays and future climate (2100) in Stockholm County based on observations and climate modelling.
- Regional modelled RCP4.5 and RCP8.5 scenarios have been further downscaled to 4×4 km^2 resolution.

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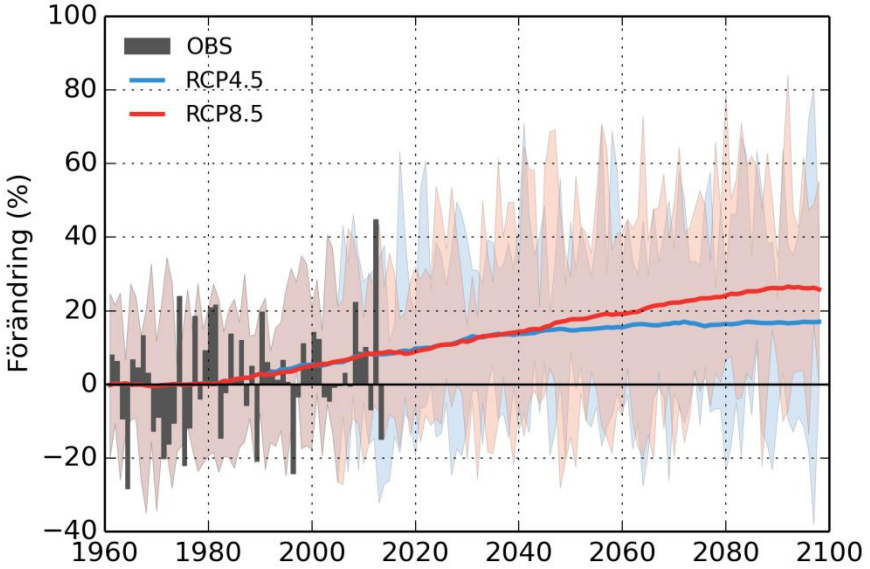
Precipitation

- Annual rainfall can increase up to 20 % by the end of the century.
- The largest increase during winter and spring.
- The extreme precipitation will also increase by around 20%, 1-hour rainfall can increase by up to 30%.



Change in mean annual precipitation compared to 1961-90.

SMHI 2015

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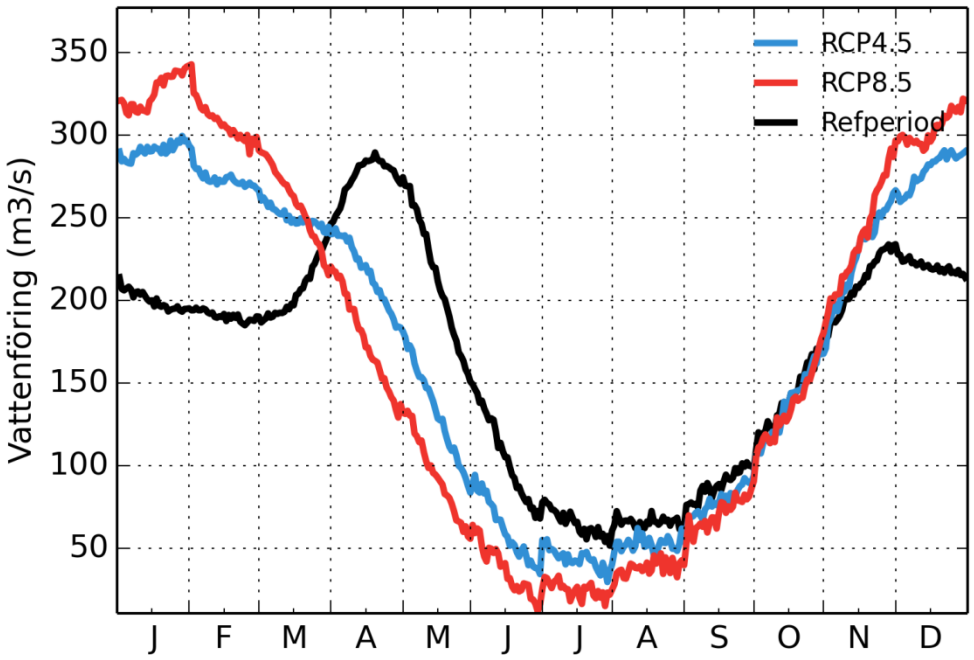
Discharge



Discharge to the mouth of Lake Mälaren at the end of the century compared to 1961-90.

- The flow increase in winter and decrease during summer.
- The spring flow peak dissapears.
- The period of low flow in summer is extended
- The number of days with low soil moisture increase.

SMHI 2015

Consequences of climate change

- More favorable climate for **ticks, mosquitoes, bacteria and mold growth**
- **Local flooding** due to cloudburst and extreme precipitation
- **Flooding** due to higher sea level
- Risk of poor **water quality**
- **Increased risk of landslides and erosion**

Main challanges of climate change
Stockholm connected to water

Lake Mälaren as a supplier of drinking water

- 95 % drinking water in the county
- Raised sea level can lead to salt water intrusion
- Change in runoff can lead to increased inflow of humus and microorganisms

Urban challenges + densification

- Storm water – heavy rainfall
- Flood risks due to higher sea level
- Adaptation of existing built environment

Floods

Drinking water

Storm water

Measures - floods

- Established **recommendations** for lowest-level foundation for building near Lake Mälaren, the sea and watercourses.
- Start a collaborative project managing existing buildings in flood hazard areas where also the question of **responsibility** is investigated.
- Work to **increase the long term water storage capacity** of the landscape in order to reduce flood risks.

Measures – Stormwater

The subway station Medborgarplatsen
July 2014, 31- year rain.

- Knowledge building activities for sustainable stormwater management
- Include stormwater and sewage issues early in the planning process.
- Produce low-level/ cloudburst maps to identify areas in risk of beeing flooded.

Lake Mälaren and the Baltic 2100

- Global sea level rise: 1 m by 2100
- To drain Mälaren we need a hight difference of 50 cm (today 70 cm) to the Baltic
- Land uplift: 0.52 cm a year

70 cm + 52 cm − 100 cm = 22 cm

Hight diff. today + Uplift − Uplift = Hight diff. 2100

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Lake Mälaren

- High flood risk today
- Higher drainage capacity can handle some rise in sea level
- Lake Mälaren to more than 2 Million people
- Several alternatives how to tackle the problems in a longer time perspective
- Regional water supply programme

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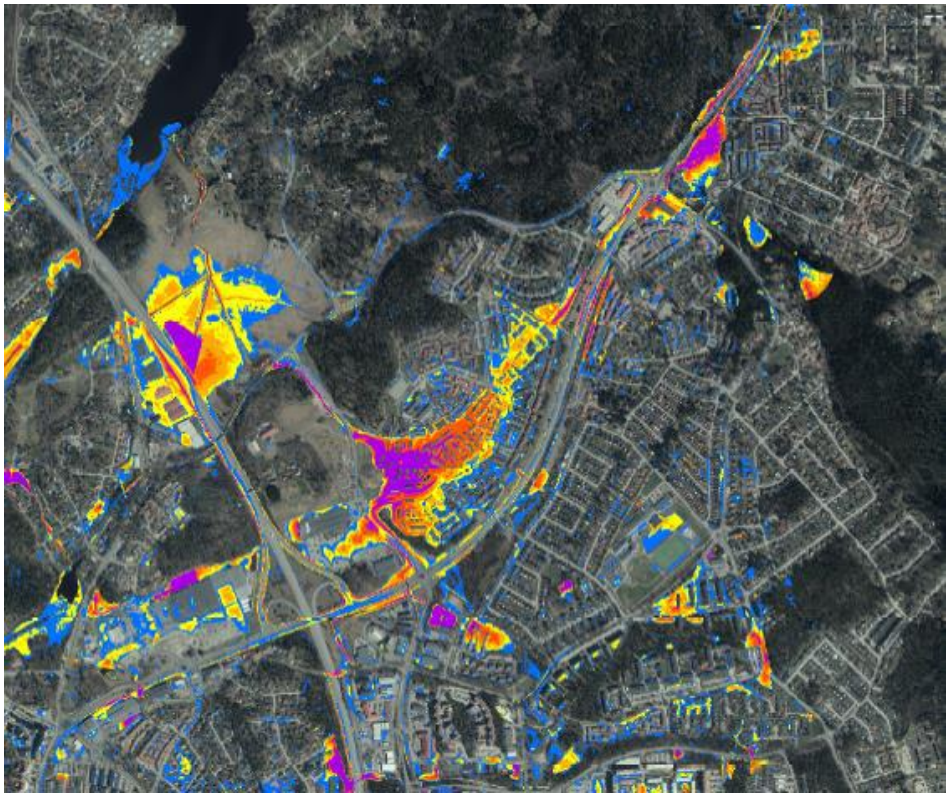
Current projects

- Cloudburst project
  - Seminars
  - Low level and cloudburst maps
  - Guidelines
- Building recomendations near water
  - Mälaren
  - Baltic
  - Water courses
- Checklist – physical planning
  - Legal support for planners
- Innovations
  - Openlab
  - Network within the building industy



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Thank you!

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