

“Climate in Norway 2100”: a national climate assessment

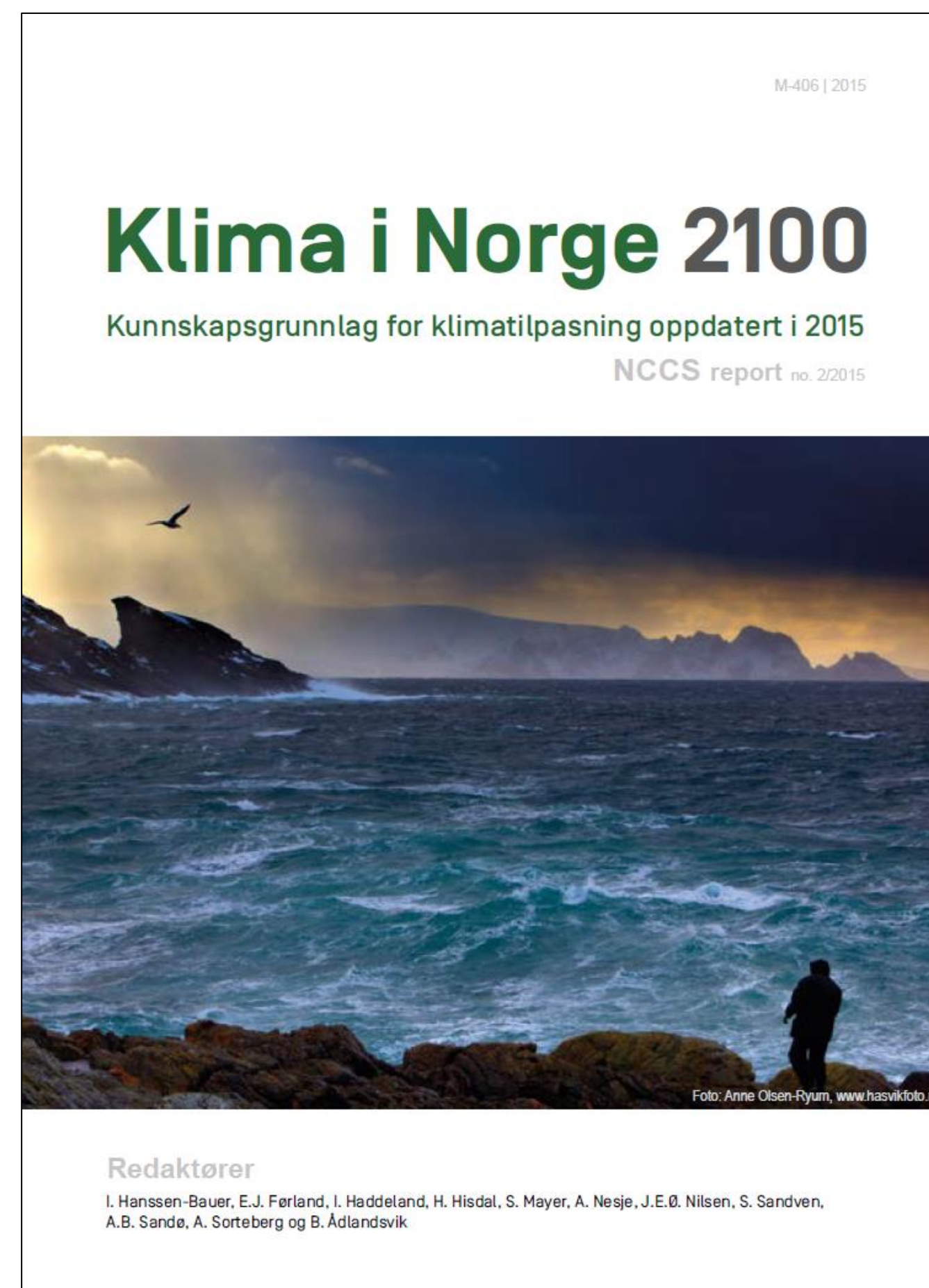
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Introduction

The Norwegian Centre for Climate Services (NCCS), launched a national report about the past, present and projected future climate in Norway, "Klima i Norge 2100" ("Climate in Norway 2100").

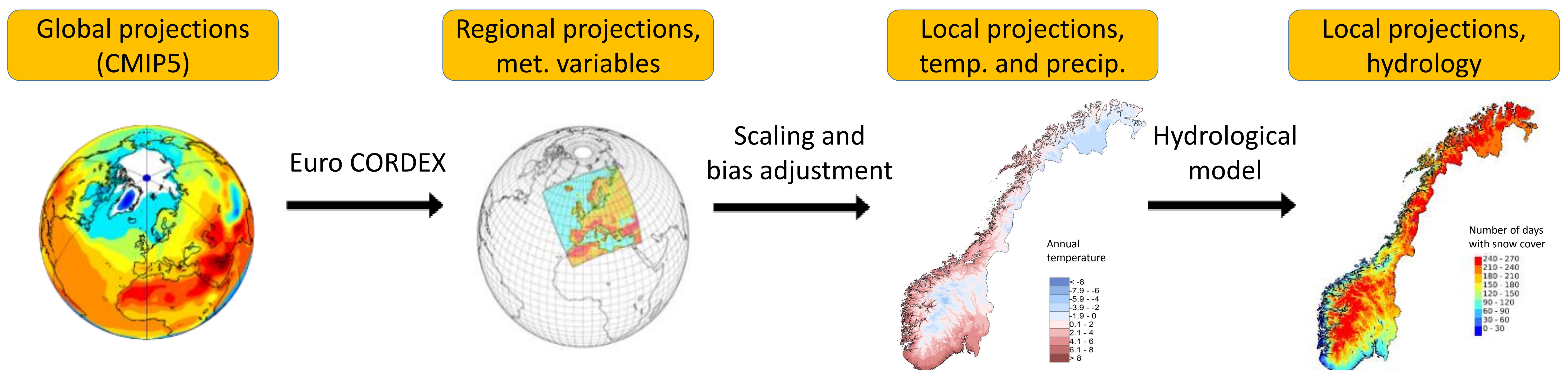
The report was commissioned by the Norwegian Environment Agency to form a common basis for climate change adaptation. Thirty-seven authors from seven institutions have contributed to the report, which includes results for temperature, precipitation, wind, runoff and floods, snow and glacier conditions, avalanches, landslides, sea-level and some results for the marine environment. This poster focuses on the projected future climate change.



Methods

- All results were based on the global models in CMIP5, <http://cmip-pcmdi.llnl.gov/cmip5/>.
- Projections for meteorological variables were based on high-resolution (0.11° x 0.11°) RCM results from Euro-CORDEX (Jacob D. et al., 2014) for emission scenarios RCP4.5 and RCP8.5.
- For air temperature, statistical downscaling (Benestad R. et al., 2008) was also applied directly from global models. Large ensembles were produced for RCP2.6, RCP4.5 and RCP8.5.
- Projections of hydrological variables were calculated from bias adjusted Euro-CORDEX results. The bias adjustment was carried out on daily values of temperature and precipitation, using observationally based 1x1 km gridded values (see Figure 1).
- Projections of sea level were based on results from global models, but adjusted for regional and local effects including land rise (Simpson et al. 2015).

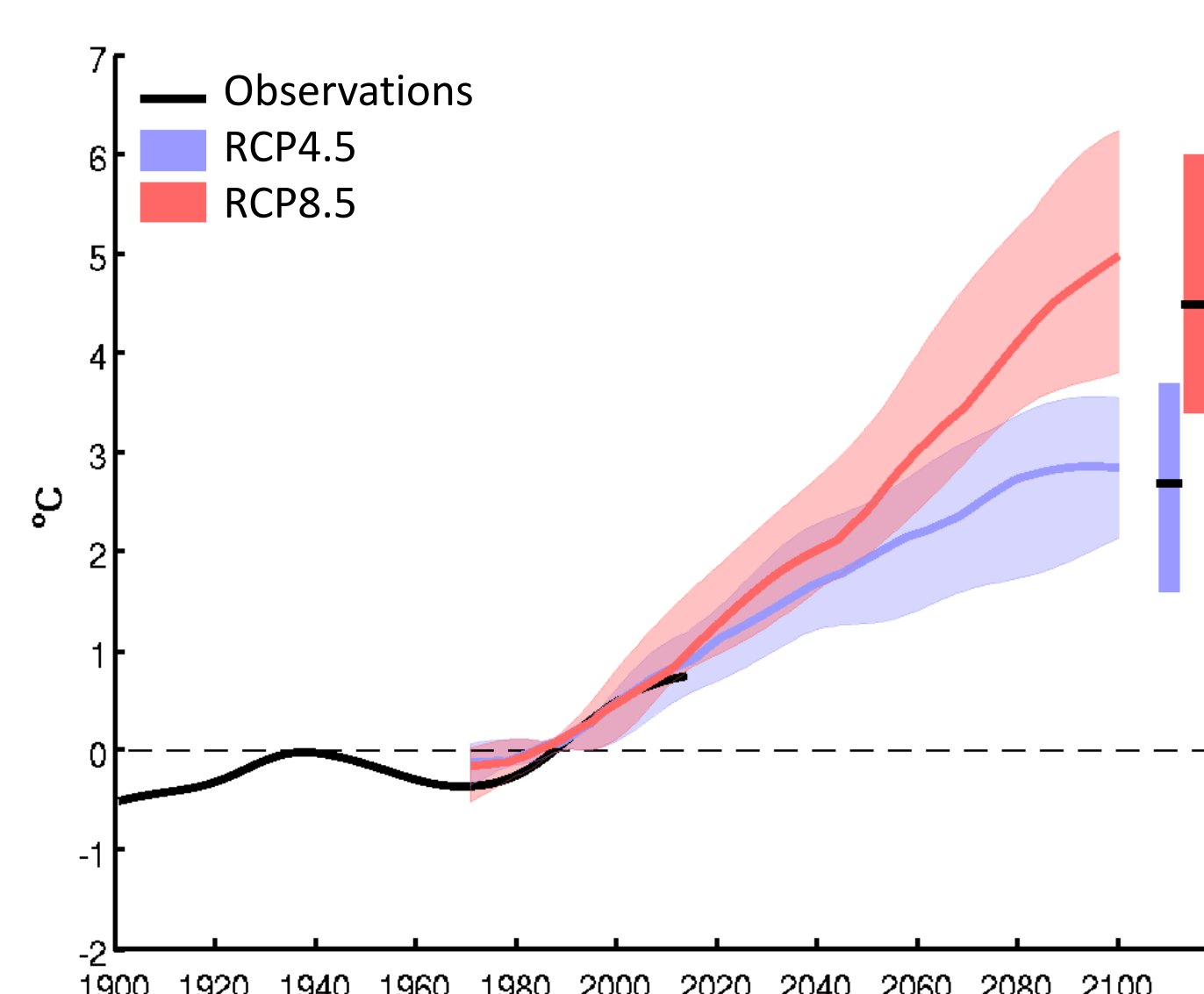
Figure 1 : Model chain from global to local projections



Presentation of results

- Projected changes were calculated from the control period 1971-2000 to 2031-2060 and to 2071-2100.
- The results were given on annual and seasonal basis.
- They were given for Norway as well as for sub-regions.
- For meteorological and hydrological variables, the median and the 10th and 90th percentiles were given for each scenario, to indicate “best guess” and model spread.
- For sea level, the 5th and 95th percentiles were used to indicate uncertainty.

Figure 2: Temperature projections, Norway



Some main results

With continued rapidly increasing greenhouse gas emissions (RCP8.5), the following climate changes are projected for Norway towards the end of this century:

- Annual mean temperature median change: + 4.5 °C (model spread: +3.3 to +6.4 °C)
- Annual rainfall median change: + 18% (model spread: +7 to +23%)
- Heavy rain episodes will become more intense and occur more frequent. The increase in heavy rainfall (in %) will probably be larger than the average precipitation increase.
- Rain floods are projected to increase
- Snowmelt floods are projected to decrease
- The snow season will decrease
- The average winter maximum snow water equivalent will decrease in the lowlands along the coast, but may increase in some high mountains areas
- There will be fewer glaciers and the remaining glacier will have decreased
- Average sea level increase by between 15 and 55 cm are calculated, differences are mainly due to differences in land rise.

Reduced greenhouse gas emissions will lead to significantly less climate change.

References

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