

Climate and Energy Systems, 2007-2010

The Climate modelling and scenarios group

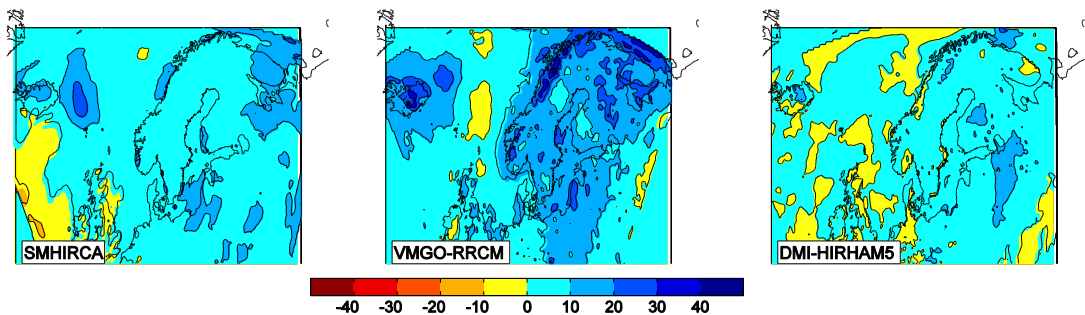
<http://www.os.is/ces>

Focus of the Climate modelling and scenarios group in CES

Focus in the CES project is on conditions for production of renewable energy in the Nordic area and how they might change due to global warming during the next decades. This relates both to potential production and future safety of the production systems. A special focus is on uncertainties. The principal aims of the climate modelling and scenarios group are to:

- provide climate scenario data for the CES groups on Renewable Energy Package for use in applications.
- provide a coherent and consistent analysis of ranges and conditional probabilities, for changes in mean climate and climate variability, for the period of 2010-2050.
- analyse regional climate scenarios in terms of impact-relevant indices defined in co-operation with the Statistical Analysis Package.

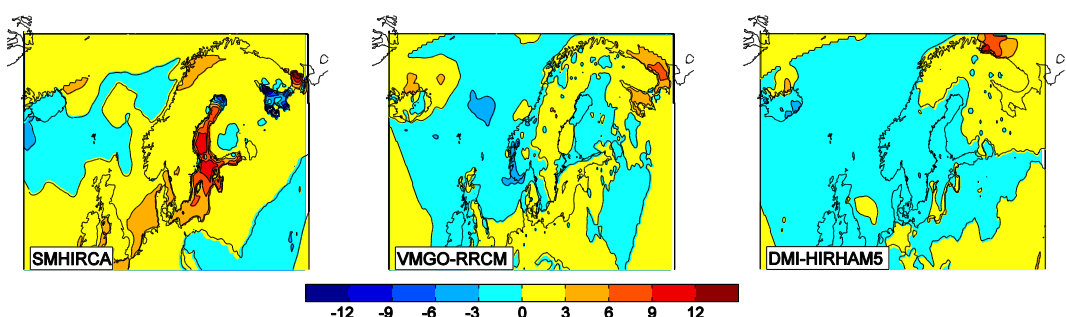
Activities and results

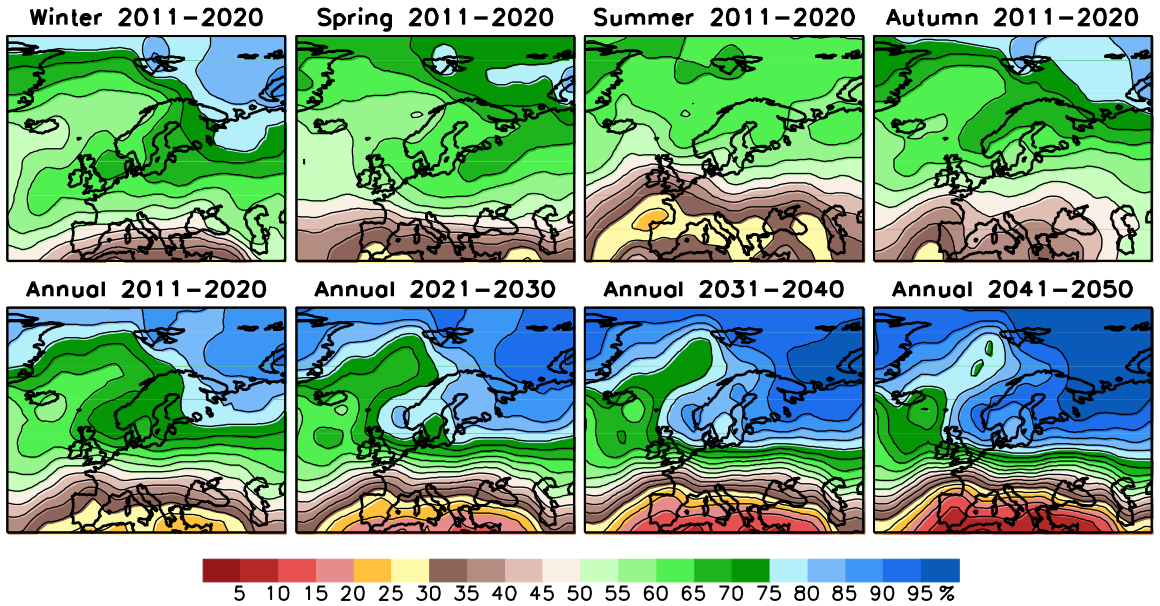


1) Regional climate models are used to produce climate change scenarios at 25 km resolution. The work is done in parallel to the European fp6 project ENSEMBLES. In total more than 30 simulations with different combinations of global and regional models all under the IPCC1B emission scenario (right) have been accomplished, see <http://ensemblesrt3.dmi.dk>

Global model Regional inst.	METO-HC Standard	METO-HC Low sens.	METO-HC Hi sens.	MPIMET Standard	MPIMET Ens.m. 1	MPIMET Ens.m. 2	IPSL	CNRM	NERSC	MIROC	CGCM3	Total number
METO-HC	2100	2100*	2100*	2100 (06/2009)								4
MPIMET				2100			2050* (06/2009)					2
CNRM								2050				1
DMI				2100*				2100	2100* (06/2009)			3
ETH	2100											1
KNMI				2100* 2100	2100*	2100*				2100*		1+4
ICTP				2100								1
SMHI		2100*		2100* 2100*					2100			3+1
UCLM	2050											1
C4I				2050 (A2)*								2
GKSS							2050* (?)					1
METNO	2050*							2050*				1
CHMI								2050* (?)				1
OURANOS**											2050*	1
VMGO**	2050*											1
Total (1951- 2050)	5	2	2	7+2	0+1	0+1	2	3	3	0+1	1	25+5

Relative changes comparing 2021-2050 to 1961-1990 in three of the CES RCMs are shown for annual mean precipitation (above) and 10m-wind speed (below). Units: %.

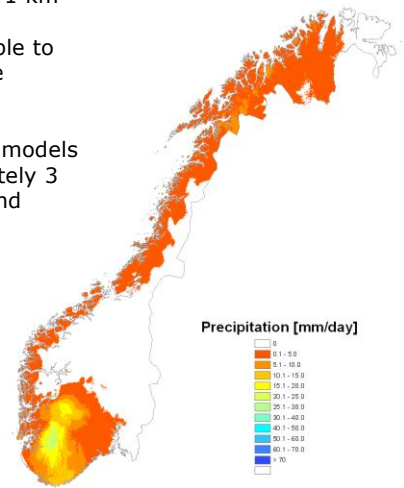
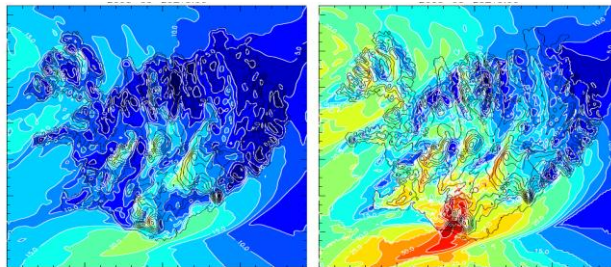




2) Probabilistic climate change scenarios building on the CMIP3 AOGCMs and the ENSEMBLES/CES RCMs are developed within the CES project. The example above shows the probability (%) that decadal mean precipitation will exceed the mean for 1971-2000 based on CMIP3 AOGCMs.

3) Interpretation of regional climate scenarios, to approximately 1 km resolution is done by means of statistical downscaling and other combinations of observed and modelled climate data. The example to the right shows precipitation in Norway on a 1x1-km grid for one particular day.

Dynamic downscaling by means of very-high resolution regional models will be conducted for a few selected regions, down to approximately 3 km resolution. Shown below are examples of wind speed and wind gustiness for Iceland in one simulation.



4) Customized regional climate scenarios for risks analyses are developed in close dialogue with stakeholders in the CES project. This work includes work also on extremes such as return periods for rare events.

Partners

The work in the Climate modelling and scenarios group is carried out by a network of scientists from the national institutes and other institutes and universities:

- the Swedish Meteorological and Hydrological Institute (Sweden)
- the Danish Meteorological Institute (Denmark)
- Met.no (Norway)
- the Finnish Meteorological Institute (Finland)
- University of Helsinki (Finland)
- Institute for Meteorological Research (Iceland)
- the Voeikov Main Geophysical Observatory in St Petersburg (Russia)

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