

# Rosby Centre Newsletter

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The Rosby Centre is the regional climate modelling research unit of the Swedish Meteorological and Hydrological Institute, SMHI. This Newsletter aims to provide useful information to stakeholders on climate change research and results of the Rosby Centre. This newsletter is published 2-4 times a year.

The following topics are covered in this Newsletter:

1. **Coordinating DAMOCLES and SEARCH**
2. **Climate conditions in Sweden in a 100,000 year time perspective**
3. **End of phase one of the PUNGWE project**
4. **EC-EARTH**
5. **The Rosby Centre Day 2006**
6. **Support to the Committee of inquiry on Climate and Vulnerability**
7. **Basics of the Rosby Centre**
8. **Subscriptions and cancellations of subscriptions**

## 1. Coordinating DAMOCLES and SEARCH

The EU-funded Specific Support Action SEARCH for DAMOCLES (S4D) started on 1 October, 2006. S4D aims at a coordination of major European (DAMOCLES) and US (SEARCH) Arctic research activities during the upcoming International Polar Year (2007-2008). Rosby Centre is in charge of the climate modelling work in DAMOCLES as well as in S4D, and contributes to the management of both projects. S4D objectives relevant for Rosby Centre are:

- the coordination of the scientific effort to improve forecasting of the Arctic marine and atmospheric environment, as well as climate projections

- to consolidate long-term observations required for documentation and modelling of climate change, and in particular of extreme climate events.

A possible practical benefit for Rosby Centre is anticipated in US partner's contributions to sensibility and predictability assessments of the Arctic coupled system.

## 2. Climate conditions in Sweden in a 100,000 year time perspective

The Rosby Centre leads a new project that intends to identify the climatic extremes within which the climate in Scandinavia may vary over a 100,000 year time span. The project is commissioned by the Swedish Nuclear Fuel and Waste Management Company and is undertaken in collaboration with Stockholm University. Based on forcing conditions which have yielded extreme conditions during the last glacial-interglacial cycle climate models will be applied to reproduce climate variables in those climatic extremes. The specific time periods involved are; the MIS3 interstadial representing a cold period with a relatively small ice sheet covering the Scandinavian region and the Last Glacial Maximum with an extensive ice sheet

covering northern Europe. As an example of a warm climate a future time period with a strong forcing from additional greenhouse gases in the atmosphere and with a complete loss of the Greenland ice sheet will be investigated.

The climate modelling effort involves a global model for producing boundary conditions that will be used by a regional climate model. The regional model in turn will produce detailed information on key climate variables like the near-surface air temperature and precipitation with an emphasis on Scandinavia. The regional climate model data will be compared to available paleodata over Northern Europe.

## 3. End of phase one of the PUNGWE project

During the last year SMHI has been involved in a water resource project connected to the Pungwe river basin in Zimbabwe and Mozambique. In view of changing climate SMHI has made scenarios for future water availability in the region by means of the Rosby Centre regional climate model RCA and the hydrological HBV model. In general

the results show a gradual reduction in runoff and an increase in potential evaporation for a continued global warming.

A final report on the results is now being prepared. The report will include an assessment on vulnerability for sectors such as agriculture and water supply. The

assessment is performed in cooperation with African project partners. This report marks the end of phase one of the PUNGWE project. The project partners all see the importance to continue the project in a second phase in

which needed adaptations and actions will be identified. The PUNGWE project has been coordinated by UNDP with financial support also from SIDA. At the moment, financial support for the second phase is being secured.

#### 4. EC-EARTH

EC-EARTH is a new initiative for developing a state-of-the-art Earth System Model starting from the ECMWF's Integrated Forecast System (IFS) today in use in medium-range weather forecasting and seasonal forecasting. The EC-EARTH partners comprise of KNMI in the Netherlands, the Rossby Centre at SMHI, and a few other European weather services

and institutes. Recently a workshop at the ECMWF brought together the interested parties. Two working groups were formed that will prepare the first science and implementation plans for EC-EARTH. The first phase of research and development around EC-EARTH is planned to last for four years.

ECMWF= European Centre for Medium-Range Weather Forecasts, se [www.ecmwf.int](http://www.ecmwf.int)

#### 5. The Rossby Centre Day 2006

This year's Rossby Centre Day focused on the IPCC working process. Professor and former chairman of the IPCC Bert Bolin gave a thorough presentation of the development of IPCC from the very start. Marianne Lilliesköld, the Swedish focal point for the IPCC, gave a Swedish perspective on the process. Thereafter followed presentations by Martin Parry (current Co-Chair of WG2), Jens Hesselbjerg Christensen (a WG1 lead author) and Rik Leemans with experiences from both the IPCC and the MEA assessment processes. The day was completed with a few short news bulletins from the Rossby Centre. More than 60 persons participated during the day.



*Martin Parry in action at the Rossby Centre Day.*

The programme as well as the presentations can be found at: [www.smhi.se/sgn0106/if/rc/RCday.htm](http://www.smhi.se/sgn0106/if/rc/RCday.htm)

#### 6. Support to the Committee of inquiry on Climate and Vulnerability

Rosby Centre has delivered a vast amount of material to the Committee of inquiry on Climate and Vulnerability (Klimat- och Sårbarhetsutredningen). The material, mainly consisting of climate index maps, describes some projected changes in climate on the European and Scandinavian scale. At a workshop on 22 August at SMHI, the Research Department at SMHI gave presentations on the material and its background and representatives for the Committee made presentations.

The presentations are found at: [www.smhi.se/sgn0106/leveranser/info3.htm](http://www.smhi.se/sgn0106/leveranser/info3.htm)

#### 7. New reports

**RMK 108:** A new report presents an overview of the regional climate model RCA3 with focus on model improvements since the earlier version, RCA2. The report also documents how the model reproduces the observed climate in model evaluation experiments. Finally, the report presents results from a few transient regional climate change scenarios. The report can be downloaded:

[www.smhi.se/sgn0106/if/biblioteket/rapporter\\_pdf/RMK108.pdf](http://www.smhi.se/sgn0106/if/biblioteket/rapporter_pdf/RMK108.pdf)

Kjellström, E., Bärring, L., Gollvik, S., Hansson, U., Jones, C., Samuelsson, P., Rummukainen, M., Ullerstig, A., Willén U. and Wyser, K., 2005. A 140-year simulation of European climate with the new version of the Rossby Centre regional atmospheric climate model (RCA3). *Reports Meteorology and Climatology 108*, SMHI, SE-60176 Norrköping, Sweden, 54 pp.

**RMK 109.** Another new report is from the Seareg project. The report can be downloaded: [www.smhi.se/sgn0106/ff/biblioteket/rapporter\\_pdf/RMK109.pdf](http://www.smhi.se/sgn0106/ff/biblioteket/rapporter_pdf/RMK109.pdf)

Meier, H. E. M., Andréasson, J., Broman, B., Graham, L. P., Kjellström, E., Persson, G. and Vierhauser, M. 2006. Climate change scenario simulations of wind, sea level, and river discharge in the Baltic Sea and Lake Mälaren region - a dynamical downscaling approach from global to local scales. *Reports Meteorology and Climatology 109*, Swedish Meteorological and Hydrological Institute, SE-601 76 Norrköping, Sweden, 52 pp.

**RMK 110:** The regionalized stabilisation scenario study, described already in earlier RC newsletters, is now finalized and a report is available. The report can be downloaded: [www.smhi.se/sgn0106/ff/rc/pdf/rmk110.pdf](http://www.smhi.se/sgn0106/ff/rc/pdf/rmk110.pdf)

Wyser, K., Rummukainen, M. and Strandberg, G. 2006. Nordic regionalisation of a greenhouse-gas stabilisation scenario. *Reports Meteorology and Climatology 110*, Swedish Meteorological and Hydrological Institute, SE-601 76 Norrköping, Sweden, 36 pp.



## 8. Basics of the Rossby Centre

The Rossby Centre works on regional climate model development and evaluation as well as model applications on process studies, climate system studies, climate change research and impact studies. The Rossby Centre is also involved in a number of EU-funded and other projects on climate modelling and other aspects of climate and climate change research.

Rossby Centre homepages are mainly in English and are found via [www.smhi.se](http://www.smhi.se) (Click on "Forskning"/"Research" at the top of the page and thereafter at the Rossby Centre link in the left panel.)

## 9. Subscription and cancellation of subscription

The Rossby Centre newsletter is sent as an email blind copy to those who wish to receive a text version. The full version is reached via the Rossby Centre homepages (see item 9) under Newsletter".

Comments and suggestions as to the scope, content and forms of the newsletter are welcome. Feedback can be provided via [rossby.data@smhi.se](mailto:rossby.data@smhi.se).