

# 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. The newsletter is published 2-4 times a year. The following topics are covered in this Newsletter:

1. **Rosby Centre Day 2007**
2. **ENSEMBLES Regional Scenario Web Portal**
3. **Evaluation of RCA using satellite data**
4. **CLARIS La Plata Basin**
5. **FreshNor workshop**
6. **Paleo-environment workshop**
7. **Rosby Centre Staff news**
8. **New report**

## 1. Rosby Centre Day 2007

The topic of this year's Rosby Centre Day was "Towards higher resolution". We have identified an increasing demand for knowledge on the climate variability at high spatial and temporal resolution. At the same time the rapid development of computers allows longer simulations with higher resolution. Climate modelling has certainly not reached the end of this evolution; however, the Rosby Centre's current model family needs an update to fulfil

the increasing amount of requests from our users.

During the Rosby Centre Day presentations from keynote speakers focused on the demand from users for better climate data, and on statistical and dynamical downscaling techniques that could help to meet the demands. A stimulating discussion rounded off the day.

Presentations are found at: <http://www.smhi.se/cmp/jsp/polopoly.jsp?d=6903&a=30362&l=en>

## 2. ENSEMBLES Regional Scenario Web Portal

The ENSEMBLES project aims to develop an ensemble prediction system for climate change to produce an objective probabilistic estimate of uncertainty in future climate at seasonal to decadal and longer timescales. The web portal provides briefing material for developers and users of regional climate information, together with links to relevant datasets and tools,

including the ENSEMBLES web-based statistical downscaling service. ENSEMBLES is funded by the European Commission and coordinated by the Hadley Centre for Climate Prediction and Research at the UK Met Office and uses the collective expertise of 66 institutes. Rosby Centre provides datasets and contributes scientifically in the project.

The Scenario web Portal is found at: <http://www.cru.uea.ac.uk/projects/ensembles/ScenariosPortal>

The ENSEMBLES project web: <http://www.ensembles-eu.org/>

## 3. Evaluation of clouds and radiation in RCA using satellite data

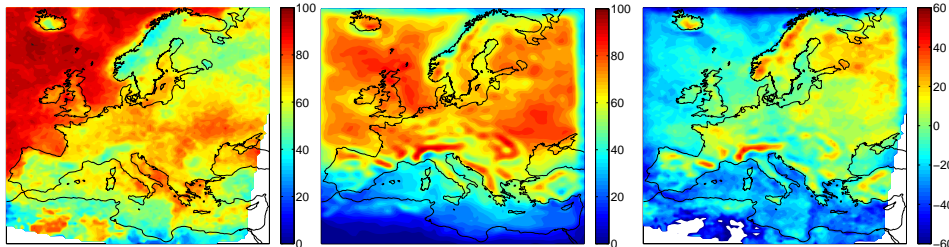
Newly available satellite data have been used to evaluate clouds and radiation simulated by the Rosby Centre regional climate model (RCA) over Europe from 2005 onwards. The data are from the EUMETSAT\* Satellite Application Facility on Climate Monitoring

project (CM-SAF, <http://www.cmsaf.dwd.se>). Some of the purposes of CM-SAF are to provide input for climate models to study processes in the climate system on a European and global scale and for climate prediction and validation of climate models.

This initial study has revealed both model and satellite problems. For example the RCA model tends to overestimate the amount of cloud fraction over snowy and mountainous regions compared to CM-SAF data. The satellites are known to overestimate the

amount of cloud over sea as can be seen in the sharp gradient between land and sea in the left figure. This study will help further development of the RCA model and give feedback to the CM-SAF group suggesting improvements for the satellite data processing.

\* EUMETSAT, the European Organisation for the Exploitation of Meteorological Satellites



*The Cloud fraction in percentage from CM-SAF to the left, RCA in the middle and the difference between RCA and CM-SAF to the right for March 2006.*

#### 4. CLARIS La Plata Basin

SMHI participates in a new, recently approved, EC-project under the 7<sup>th</sup> Framework. The project aims at predicting the regional climate change impacts on La Plata Basin (LPB) in South America. Adaptation strategies will be designed for land-use, agriculture, rural development, hydropower production, river transportation, water resources and ecological

systems in wetlands. Rosby Centre and University of Buenos Aires will run RCA over South America for climate sensitivity studies and projections. The hydrological group at the Research Department of SMHI will thereafter use the climate projections to assess climate impact on water resources in the La Plata Basin.

#### 5. FreshNor workshop



Freshwater has recently become a recognized field in connection with the expected increased melting rates of the Greenland ice sheet and changed river runoff into the Arctic Ocean. The object of FreshNor is to identify the most important research components and possible Nordic collaborations in the field. Several research activities are considered important: Improved model representations of processes determining Arctic oceanic freshwater export, such as freshwater distribution and air circulation. Concerning the Greenland ice sheet, geothermal heating, ice flow characteristics and calving in interaction with

ocean water properties is considered important to quantify ice losses. The FreshNor project is funded by the Nordic Council of Ministers' Arctic Co-operation Programme. The projects duration is 2007-2009.

The first **FreshNor** workshop on the freshwater budget of the Nordic Seas is held November 18-19 2007 at SMHI in Norrköping (<http://freshnor.dmi.dk/meetings.html>).

A report from the workshop will be presented to the project funders.

FreshNor website: <http://freshnor.dmi.dk/index.html>

## 6. Workshop on paleo-environment

The Swedish Nuclear Waste Management Company (SKB) organized a workshop on "Fennoscandian paleo-environment and ice sheet dynamics during Marine Isotope Stage 3 (MIS 3\*)" in Stockholm September 20-21. The workshop was initiated by the 100,000 year project, intended to identify the climatic extremes within which the climate in Scandinavia may vary over this long time span. The project is lead by the Rosaby Centre (see RC Newsletter 3 2006). The goal of the workshop was to discuss the possibility to obtain a consistent picture of ice extent, sea

level, topography, permafrost and vegetation during MIS 3, based on paleo data, to use as input for climate model simulations. Also, there were discussions on how simulated climates in global circulation models correspond to the paleo-environmental and paleo-geographic picture. About 20 researchers from Sweden, Norway, Denmark and Finland participated in the workshop. Abstracts and summaries of the discussions will be published in a SKB report.

\* MIS 3 is the period during the last glacial cycle that preceded the Last Glacial Maximum.

## 7. Rosaby Centre staff news

**Colin Jones** has been appointed Head of the Rosaby Centre. Colin is Professor at the University of Quebec at Montreal, Department of Earth and Atmospheric Sciences. He acts as Programme Leader of the Canadian regional climate modelling and diagnostics network. As a former Rosaby Centre colleague Colin is familiar with SMHI. Until summer 2008 he will share his time between SMHI and the University of Quebec.

**Markku Rummukainen**, former Head of the Rosaby Centre, is since July 1 appointed climate expert at SMHI.

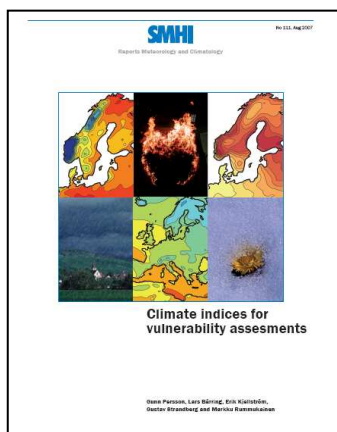
**Grigory Nikulin** works with model output analyses at Rosaby Centre since September 1. Grigory arrived from his post doc at the Laboratory of Dynamical Meteorology in Paris. He fulfilled his doctoral thesis at the Swedish Institute of Space Physics in Kiruna (Umeå University). The name of his thesis is "Impact of Rosaby waves on ozone distribution and dynamics of the stratosphere and troposphere".



**Petter Lind** presented his M Sc Thesis Work at the Department of Meteorology, Stockholm University, in August. The name of the publication is "Investigation of the water and energy budgets in the BALTEX area, as simulated in a regional climate model". He has continued working with scenario analyses at Rosaby Centre during the autumn.

**Göran Broström**, oceanographer, currently works 20% time at SMHI and leaves us for other duties from January 1.

## 8. New report



Persson, G., Bärring, L., Kjellström, E., Strandberg, G. and Rummukainen, M. 2007. Climate indices for vulnerability assessments. *SMHI Reports Meteorology and Climatology RMK No 111*. Swedish Meteorological and Hydrological Institute, SE-601 76 Norrköping, Sweden, 64 pp.

The report presents climate indices on the European and Scandinavian scale based on results from the Rosaby Centre regional climate models. It can be downloaded from [http://www.smhi.se/sgn0106/ef/biblioteket/rapporter\\_pdf/RMK111.pdf](http://www.smhi.se/sgn0106/ef/biblioteket/rapporter_pdf/RMK111.pdf)

A vast amount of climate scenario maps are available on a complementary DVD. The report, including the DVD, is available upon request ([anneli.arkler@smhi.se](mailto:anneli.arkler@smhi.se)).

### **General information**

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.

The Rossby Centre newsletter is sent as an email blind copy to those who wish so. 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).