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Project acronym: ENSEMBLES

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Instrument: Integrated Project

Thematic Priority: Global Change and Ecosystems

**MM8.2 and M8.6 Assessment of progress and quality of published material from Ensembles, implementation of suggested modifications**

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<b>Dissemination Level</b>		
<b>PU</b>	Public	✓
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the Consortium (including the Commission Services)	

During the third year of the project, members of ENSEMBLES have produced almost 70 papers published in or in press with ISI indexed, peer-reviewed journals, which means that the number of published material has more than doubled as compared to the second or increased by a factor of nine as compared to the first year. A list of ENSEMBLES papers is provided in the Annex at the end of this document. Three of the papers reproduced in the list have been assessed by Michel Verstraete and Gilles Sommeria. Their comments are given below:

### **Assessment of published material by Reviewer # 1 (Michel Verstraete)**

Review of articles:

Martin Beniston (2006): August 2005 intense rainfall event in Switzerland: Not necessarily an analog for strong convective events in a greenhouse climate. *Geophysical Research Letters* 33, L5701.

Markus Stoffel and Martin Beniston (2006): On the incidence of debris flows in the Swiss Alps since the early Little Ice Age and in a future climate. *Geophysical Research Letters* 33, L16404.

by Michel M. Verstraete (Institute for Environment and Sustainability, EC Joint Research Centre)

“The ENSEMBLES project is a large 6-year (2004-2009) Integrated Project supported by the European Commission's 6th Framework Programme under the Thematic Sub-Priority 'Global Change and Ecosystems'. The content and overall objectives of this large Integrated Project can be found at the following address:

<http://ensembles-eu.metoffice.com/>

This project is itself structured along 8 principal research themes, and this assessment only covers some of the activities of RT8, whose objective is to provide an efficient means of disseminating the results emerging from the ENSEMBLES research community at different levels. More details on this project component can be found at

<http://www.unige.ch/ia/climat/rt8/index.html>

The following two papers are part of the deliverables of RT8. The first one, entitled 'August 2005 intense rainfall event in Switzerland: Not necessarily an analog for strong convective events in a greenhouse climate', by Martin Beniston, puts a particular extreme weather event in the larger perspective of climatic expectations for that geographical area. The high natural variability of weather and hydrological variables in mountainous regions does not permit one to conclude positively on a direct relation between global climate change and such local to regional events, at

least at this time. Nevertheless, the size, intensity and impact of such events are sufficient to suggest close monitoring and more detailed studies.

The second paper, entitled 'On the incidence of debris flows from the early Little Ice Age to a future greenhouse climate: A case study from the Swiss Alps', by Markus Stoffel and Martin Beniston, takes advantage of the long dendroclimatological records available in this region to reconstruct debris-flow occurrences in historical times. If the paleo records indicate a general decrease in such events in recent years, materials continue to accumulate in the natural channels and pose a serious risk in the future. Predictions derived from runs of a regional climate model suggest a decrease in precipitations in this region, but the paper points out that extreme weather events could be even more devastating as a result.

Both papers were published in a very reputable international peer-reviewed journal, and contribute to the literature on the subject of climate change and impact assessments. They do help place meteorological events in the broader perspective of climate change, and should prove helpful for policy makers.”

## Assessment of published material by Reviewer # 2 (Gilles Sommeria)

Review of article:

Martin Beniston and Stéphane Goyette (2007): Changes in variability and persistence of climate in Switzerland: exploring 20<sup>th</sup> Century observations and 21<sup>st</sup> century simulations. *Global and Planetary Change* **57 (1-2)**, 1-15

by Gilles Sommeria (WMO Geneva)

“The question of the probability of occurrence and intensity of extreme events for the present and future climate is a particularly delicate and important subject in climate science. It requires high quality and high frequency data, and is difficult to tackle with climate models, which generally don’t have a sufficiently high resolution. It is only recently that it has been addressed by the Intergovernmental Panel on Climate Change (IPCC), and the uncertainties and needs for research in this domain are highlighted in the Assessment Report No 4 released this year. This subject is also particularly important for climate change impact studies, as extreme events are those which matter most for economic impacts and disaster reduction efforts. It is also highlighted under the title “climate risks and extreme events” in the new Work Programme established in Nairobi in November 2006 by the United Nations Framework Convention on Climate Change on “impacts, vulnerability and adaptation to climate change”.

This paper investigates more precisely how the probability distribution of minimum and maximum daily temperatures evolves under conditions of mean climate warming. For past and present climate, it is based on observational data from Swiss stations since 1900 at low and high elevation. The good quality of those measurements is an asset for the study. For future climate, the authors use results from regional climate model simulations, as part of the “Ensembles” project. Those results are first calibrated and validated, and then applied to a warming scenario for the 21<sup>st</sup> century.

The results from 20<sup>th</sup> century climate observations indicate a decrease on inter-annual and decadal variability of both maximum and minimum daily temperatures, whereas it is generally admitted that this variability may increase with climate warming. The study is carried out with good quality data and sound statistical tools. A reasonable explanation is given for this result, by looking at the evolution of the occurrence of weather patterns, a step further compared to what is usually done in rough estimates on the variability of statistics on extremes. It is hard to say up to which extent these results can be generalized, but this work is relevant to present concerns on the evolution of climate variability, and can serve as an example for similar studies in other regions of the world.

The model results from the “Ensembles” project are first validated against recent data to assess their validity, and then used to estimate potential changes of the distribution of extremes in Switzerland during the 21<sup>st</sup> century. The validation is useful by itself, and it is an exercise which needs in any case to be carried in various parts of the world. The conclusions for the evolution of the occurrence of extremes indicate an increase in the variability of maximum temperatures, but also a greater persistence

above some thresholds, along with a diminution of persistence of cold events with respect to minimum temperatures.

Overall this article use sound techniques and is well written. It provides useful information in a domain of importance for a society, as the forecasts on the evolution of the occurrence of extreme events may have repercussion on health and economic issues. It is in several respects (from the scientific and application points of view) an example of good use of results from a European research project, the “Ensembles “project. Furthermore, it provides a good basis for climatologists who would like to carry out similar studies, certainly useful for other regions of the world.”

## ANNEX: Scientific publications of ENSEMBLES members

### Year 1:

- Collins, M., B.B.B. Booth, G.R. Harris, J.M. Murphy, D.M.H. Sexton, and M.J. Webb, 2005: Towards Quantifying Uncertainty in Transient Climate Change. *Climate Dynamics*, Submitted.
- Dufresne J.-L., J. Quaas, O. Boucher, S. Denvil, L. Fairhead, 2005: Contrasts in the effects on climate of anthropogenic sulfate aerosols between the 20th and the 21st century, accepted in *Geophys. Res. Lett.*.
- Frame, D.J., B.B.B. Booth, J.A. Kettleborough, D.A. Stainforth, J.M. Gregory, M. Collins, and M.R. Allen, 2005: Constraining climate forecasts: The role of prior assumptions. *Geophysical Research Letters*, **32**, L09702, doi:10.1029/2004GL022241.
- Fronzek et al. 2005. Potential impact of climate change on the distribution of palusa mires in subarctic Fennoscandia. Submitted to *Climate Research*.
- Giannakopoulos et al. 2005. Report on the impacts of a 2C global rise in the Mediterranean. A Report for WWF, 67 pp. [http://www.panda.org/downloads/climate\\_change/medreportfinal8july05.pdf](http://www.panda.org/downloads/climate_change/medreportfinal8july05.pdf)
- Harris, G. R., D. M. H. Sexton, B. B. B. Booth, M. Collins, J. M. Murphy and M. J. Webb: Frequency distributions of transient regional climate change from perturbed physics ensembles of general circulation models. *Climate Dynamics*, Submitted.
- Hewitt, C.D. and Griggs, D., 2004: Ensembles-based Predictions of Climate Changes and their Impacts. *Eos*, **85**, p566.
- Kundzewicz, Z W., Radziejewski, M., Pinskiwar, 2005: Too much – too little: precipitation extremes in the changing climate of Europe. Submitted to *Climate Research*.
- Leckebusch, G.C., B. Koffi, U. Ulbrich, J. Pinto, T. Spanghel, S. Zacharias, 2005: Analysis of frequency and intensity of winter storm events in Europe on synoptic and regional scales from a multi-model perspective. *Climate Research*, accepted for publication.
- Vajda and Venäläinen, 2005. Feedback processes between climate, surface and vegetation at the northern climatological tree-line (Finnish Lapland). *Boreal Environment Research*, in press.

### Year 2:

- Arzel O., Fichefet T., Goussé H.; (2006): Sea ice evolution over the 20th and 21st centuries as simulated by current AOGCMs. *Ocean Modelling*, **12**, 412-427.
- Bengtsson L., Hodges K.I., Roeckner E.; (2006): Storm tracks and climate change, *J. Climate* (in press)
- Brasseur G.P., Roeckner E.; (2005): Impact of improved air quality on the future evolution of climate. *Geophys. Res. Lett.*, Vol. 32, L23704, doi:10.1029/2005GL023902
- Douville H.; (2006): Detection-attribution of global warming at the regional scale: How to deal with precipitation variability? *Geophys. Res. Lett.*, **33**, L02701, DOI:10.1029/2005GL024967
- Douville H., Salas-Méla D., Tyteca S.; (2006) : On the tropical origin of uncertainties in the global land precipitation response to global warming. *Climate Dyn.* **26**(4):367-385 ( DOI 10.1007/s00282-005-0088-2)
- Dufresne J-L, J. Quaas, O. Boucher, S. Denvil and L. Fairhead (2005): Contrasts in the effects on climate of anthropogenic sulfate aerosols between the 20th and the 21st century, *Geophys. Res. Lett.*, **32**, doi: 10.1029/2005GL023619
- Good P. and J.A. Lowe (2006): Emergent behaviour and uncertainty in multi-model climate projections of precipitation trends at small spatial scales. *J. of Climate* (in press)
- Huebener H., Cubasch U., Langematz U., Spanghel T., Niehoerster F., Fast I., Kunze M.;(2006): Ensemble climate simulations using a fully coupled ocean-troposphere-stratosphere GCM; Submitted to *Phil.Trans. Royal Society Series A*, 06.07.2006
- 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.
- Leckebusch, G.C., B. Koffi, U. Ulbrich, J.G. Pinto, T. Spanghel and S. Zacharias, 2006: European winter storms and their modification under climate change from a multi-model perspective. Geophysical Research Abstracts, Vol. 8, 01945, 2006, SRef-ID: 1607-7962/gra/EGU06-A-01945. <http://www.cosis.net/abstracts/EGU06/01945/EGU06-J-01945.pdf>
- Le Sager, P., C. Giannakopoulos, A. Vajda and A. Venalainen, 2006: Estimating forest fire risk in North and South Europe: a comparative study using two different fire indices. Geophysical Research Abstracts, Vol. 8, 04030, 2006, SRef-ID: 1607-7962/gra/EGU06-A-04030 <http://www.cosis.net/abstracts/EGU06/04030/EGU06-J-04030.pdf>
- Müller W.A., Roeckner E.; (2006): ENSO impact on mid-latitude circulation patterns in future climate change projections, Geophys. Res. Lett., 33, L05711, doi:10.1029/2005GL025032
- Roeckner E., Stier P., Feichter J., Kloster S., Esch M., Fischer-Bruns I.; (2006): Impact of carbonaceous aerosol emissions on regional climate change, Climate Dynamics, doi:10.1007/s00382-006-0147-3
- Salas y Mélia D., Chauvin F., Déqué M., Douville H., Guérémy J.F., Marquet P., Planton S., Royer J.F., Tyteca S. ; (2005) : Description and validation of CNRM-CM3 global coupled climate model, Note de Centre du GMGEC N°103, décembre 2005. Submitted to Climate Dynamics. (available from: [http://www.cnrm.meteo.fr/scenario2004/paper\\_cm3.pdf](http://www.cnrm.meteo.fr/scenario2004/paper_cm3.pdf) )
- Seneviratne, S. I., Lüthi, D., Litschi, M. and Schär, C. 2006. Land-atmosphere interactions and climate change in Europe. Nature, in press. doi:10.1038/nature05095.
- Sorteberg A., Katsov V., Walsh J., Palova T.; (2006): The Arctic surface energy budget as simulated with the IPCC AR4 AOGCMs, *Clim. Dynamics*, accepted
- Stott P. A., Jones G. S., Lowe J. A., Thorne P. W., Durman C. F., Johns T. C., Thelen J.-C.; (2006) Transient simulations with the HadGEM1 climate model: causes of past warming and future climate change. *J. Climate*, Vol. 19, No. 12, pages 2763-2782.
- Ulbrich, U., G.C. Leckebusch, T. Spanghel, J.G. Pinto and M. Reyers, 2006: Northern hemisphere storm tracks in an ensemble of IPCC climate change simulations. Geophysical Research Abstracts, Vol. 8, 10717, 2006, SRef-ID: 1607-7962/gra/EGU06-A-107177 <http://www.cosis.net/abstracts/EGU06/10717/EGU06-J-10717-1.pdf>
- Van den Hurk, B., A. Klein Tank, G. Lenderink, A. van Ulden, G. J. van Oldenborgh, C. Katsman, H. van den Brink, F. Keller, J. Bessembinder, G. Burgers, G. Komen, W. Hazeleger and S. Drijfhout (2006): KNMI climate Change scenarios 2006 for the Netherlands; KNMI WR2006-01, 82 pp (available from [www.knmi.nl/climatescenarios](http://www.knmi.nl/climatescenarios))
- Zacharias, S., Fink, A., Leckebusch, G.C., Pinto, J.G. and Ulbrich, U., 2006: Influence of the North Atlantic Oscillation on the development of extreme cyclones over Europe. Geophysical Research Abstracts, Vol. 8, 07183, 2006, SRef-ID: 1607-7962/gra/EGU06-A-07183 <http://www.cosis.net/abstracts/EGU06/07183/EGU06-J-07183.pdf>
- Busuioc, A., F. Giorgi, X. Bi and M. Ionita, 2006: Comparison of regional climate model and statistical downscaling simulations of different winter precipitation change scenarios over Romania. *Theoretical and Applied Climatology*, **86**,101-120
- Busuioc, A., R. Tomozeiu and C. Cacciamani: Statistical downscaling model for winter extreme precipitation events in the Emilia-Romagna region", *International Journal of Climatology*, (waiting for editor decision).
- Kundzewicz, Z. W., Radziejewski M. & Pińskwar, I. (2006) Precipitation extremes in the changing climate of Europe. *Climate Research*, **31**, 51-58.
- Kundzewicz, Z. W. & Radziejewski, M. (2006) Methodologies for trend detection. In: *Climate Variability and Change—Hydrological Impacts*, IAHS Publ. 308, 2006 (in press).
- Pińskwar, I., Kundzewicz, Z. W. & Radziejewski M. (2006) Too much – too little: precipitation extremes in the changing climate of Europe. In: Kundzewicz, Z. W. & Hattermann, F. F. (eds) *Natural Systems and Global Change* (in press).

- Graczyk, D., Szwed, M. & Kundzewicz, Z. W. (2006) Thermal seasons in Poland – observations and projections. In: Kundzewicz, Z. W. & Hattermann, F. F. (eds) *Natural Systems and Global Change* (in press).
- Kundzewicz, Z. W. (200?) Intense precipitation and high flows – observations and projections. In: Kropp, J. (ed.) *Extremes, Trends and Scaling in Hydrometeorology*, Springer (submitted).
- Radziejewski, M. (200?) Trend detection in river flow extremes. In: Kropp, J. (ed.) *Extremes, Trends and Scaling in Hydrometeorology*, Springer (submitted).
- Kostopoulou, E., C. Giannakopoulos, C. Anagnostopoulou, K. Tolika, P., Maheras, M. Vafiadis, D. Founda. (2006) “Simulating maximum and minimum temperature over Greece: a comparison of three downscaling techniques” *Theoretical and Applied Climatology*, in press

### Year 3:

#### RT1

- Collins, M. Ensembles and probabilities: a new era in the prediction of climate change. *Phil. Trans. R. Soc. A* **365**. (doi:10.1098/rsta.2007.2068)
- Frame, D.J., Faull, N.E., Joshi, M.M. and Allen, M.R. 2007. Probabilistic climate forecasts and inductive problems. *Phil. Trans. R. Soc. A*, **365**, 1971-1992.
- Huebener, H., Cubasch, U., Langematz, U., Spangehl, T., Nierhorster, F., Fast, I. and Kunze, M. Ensemble climate simulations using a fully coupled ocean-troposphere-stratosphere General Circulation Model (GCM). *Phil. Trans. R. Soc. A* **365**. (doi:10.1098/rsta.2007.2078)
- McLaren, A.J., H. T. Banks, C. F. Durman, J. M. Gregory, T. C. Johns, A.B. Keen, J. K. Ridley, M. J. Roberts, W. H. Lipscomb, W. M. Connolley, and S. W. Laxon, 2006. Evaluation of the sea ice simulation in a new coupled atmosphere-ocean climate model (HadGEM1). *Journal of Geophysical Research*, **111**, C12014, doi:10.1029/2005JC003033.
- Murphy, J. M., Booth, B. B. B., Collins, M., Harris, G. R., Sexton, D. and Webb, M. 2007. A methodology for probabilistic predictions of regional climate change from perturbed physics ensembles. *Phil. Trans. R. Soc. A*, **365**, 1993-2028. (doi:10.1098/rsta.2007.2077)
- Smith, D. M. and J. M. Murphy, 2007: An objective ocean temperature and salinity analysis using covariances from a global climate model. *J. Geophys. Res.*, **112**, C02022, doi:10.1029/2005JC003172
- Smith, D.M., Cusack, S., Colman, A.W., Folland, C.K. and J.M. Murphy, 2007: Improved surface temperature for the coming decade from a global climate model. *Science*, **317**, 796-799.
- Stainforth, D.A., Allen, M.R., Tredger, E.R., and Smith, L.A. 2007. Confidence, uncertainty and decision-support relevance in climate prediction. *Phil. Trans. R. Soc. A*, **365**, 2145-2161.
- Troccoli, A. and Palmer, T. N. Ensemble decadal prediction from analysed initial conditions. *Phil. Trans. R. Soc. A* **365**. (doi:10.1098/rsta.2007.2079)

#### RT2A

- Chauvin F., S. Denvil : Changes in severe indices as simulated by two French coupled global climate models. *Global and Planetary Change* **57**, 96-117
- Good P. and J.A. Lowe (2006): Emergent behaviour and uncertainty in multi-model climate projections of precipitation trends at small spatial scales. *Journal of Climate*, Vol. 19, No. 21, pages 5554-5569.
- Guemas and Salas-Mélia (2007): Simulation of the Atlantic Meridional Overturning Circulation in an Atmosphere-Ocean Global Coupled Model: Part II: Weakening in a climate change experiment: a feedback mechanism, submitted to *Climate Dynamics*.

- Ingleby, B. and M. Huddleston (2007): Quality control of ocean temperature and salinity profiles: historical and real-time data. *Journal of Marine Systems*, 65, 158-175.
- McLaren, A.J., H.T. Banks, C.F. Durman, J.M. Gregory, T.C. Johns, A.B. Keen, J.K. Ridley, M.J. Roberts, W. H. Lipscomb, W. M. Connolley, and S. W. Laxon, 2006. Evaluation of the sea ice simulation in a new coupled atmosphere-ocean climate model (HadGEM1) - *Journal of Geophysical Research*, 111, C12014, doi:10.1029/2005JC003033
- Müller, W. and E. Roeckner (2007): ENSO teleconnections in projections of future climate in ECHAM5/MPI-OM. *Climate Dynamics* (submitted)
- Sillmann, J. and E. Roeckner (2007): Indices for extreme events in projections of anthropogenic climate change. *Climatic Change* (in press)
- Weisheimer, A., F. Doblas-Reyes, P. Rogel, N. Keenlyside, M. Balmaseda, J. Murphy, D. Smith, M. Collins, B. Bhaskaran, and T. Palmer (2007). Initialisation strategies for decadal hindcasts for the 1960-2005 period within the ENSEMBLES project. ECMWF Tech. Memo., 521.

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- Busuioc, A, Giorgi, F, Bi, X and Ionita, M., 2006: Comparison of regional climate model and statistical downscaling simulations of different winter precipitation change scenarios over Romania. *Theoretical and Applied Climatology* **86**, 101-123, DOI 10.1007/S00704-005-0210-8.
- Busuioc, A., Tomozeiu, R. and Cacciamani, C., 2007: Statistical downscaling model for winter extreme precipitation events in Emilia-Romagna region. *International Journal of Climatology*, in press.
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- Leckebusch, G. C., U. Ulbrich, L. Fröhlich, and J. G. Pinto, 2007, Property loss potentials for European midlatitude storms in a changing climate, *Geophys. Res. Lett.*, **34**, L05703, doi:10.1029/2006GL027663.
- Leckebusch, G.C., B. Koffi, U. Ulbrich, J. Pinto, T. Spanghel, S. Zacharias, 2006: Analysis of frequency and intensity of winter storm events in Europe on synoptic and regional scales from a multi-model perspective. *Climate Research*, **31**, 59-74
- Pinto, J.G., E.L. Fröhlich, G.C. Leckebusch, and U. Ulbrich, 2007: Changing European storm loss potentials under modified climate conditions according to ensemble simulations of the ECHAM5/MPI-OM1 GCM. *Nat. Hazards Earth Syst. Sci.*, **7**, 165–175, 2007.
- Pinto, J.G., U. Ulbrich, G.C. Leckebusch, T. Spanghel, M. Reyers, S. Zacharias, 2007: Changes in storm track and cyclone activity in three SRES ensemble experiments with the ECHAM5/MPI-OM1 GCM. *Climate Dynamics*, DOI 10.1007/s00382-007-0230-4.
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- Hewitt, CD, Goodess, CM and Betts, RA, 2007: Probabilistic scenarios of climate change for municipal engineering. Submitted to *Municipal Engineer*.
- Somot S. , Sevault F., Déqué M., Crépon M. (2007) 21st century climate change scenario for the Mediterranean using a coupled Atmosphere-Ocean Regional Climate Model. *Global and Planetary Change* (accepted)
- Pavan V, Tomozeiu R., Cacciamani C., and M. Di Lorenzo Daily precipitation observations over Emilia-Romagna: mean values and extremes (2007) Submitted to *Int.J. Climatol*.
- Stephenson, D., Pavan, V., Collins, M., Junge, M., Quadrelli, R. North Atlantic Oscillation response to transient greenhouse gas forcing and impact on European winter climate: a CMIP2, multi-model assessment. *Climate Dyn.*, 2006, **27**,401-420
- Pińskwar, I., Kundzewicz, Z. W. & Radziejewski, M. (2006) Too much water – too little water: precipitation extremes in the changing climate of Europe. In: *Natural Systems and Global Change*. Eds. Z. W. Kundzewicz & F. F. Hattermann, Research Center for Agricultural and Forest Environment of the Polish Academy of Sciences, Poznań:18-27.

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- Z.W. Kundzewicz (2007) Climate change impacts on water management and adaptation needs in Europe. In: *Climate Change Impacts on Water Cycle, Resources and Quality*, Publications of European Communities, Luxembourg.
- Kundzewicz, Z. W. & Radziejewski, M. (2006) [Methodologies for trend detection](#). In: *Climate Variability and Change – Hydrological Impacts* (edited by Demuth, S., Gustard, A., Planos, E., Scatena, F. & Servat, E.). IAHS Publication 308, IAHS Press, Wallingford, Oxfordshire, UK, 538-550.
- Kundzewicz, Z. W. (2007) River floods and their impacts in the changing climate – integrated view. IPCC TGICA Expert Meeting “Integrating Analysis of Regional Climate change and Response Options”, Nadi, Fiji, 20-22 June 2007, Meeting Materials and Extended Abstracts and Papers, 105-111.

#### RT3

- Lenderink, G., van Ulden, A., van den Hurk, B., Keller, F. 2007. A study on combining global and regional climate model results for generating climate scenarios of temperature and precipitation for the Netherlands, *Clim. Dyn.*, doi:10.1007/s00382-007-0227-z. (Vol 29: 2-3, pp. 157-176.)
- Rummukainen, M., C. Hewitt and D. Jacob, 2007. The ENSEMBLES and the BALTEX projects. In: H.-J. Isemer (ed): Fifth Study Conference on BALTEX, Kuressaare, Saaremaa, Estonia, 4-8 June 2007. Conference Proceedings. *International BALTEX Secretariat Publication No. 38*, 50-51.

#### RT4

- Alessandri A., S. Gualdi, J. Polcher, and A. Navarra, 2007: Effects of Land-Surface-Vegetation on the boreal summer surface climate of a GCM. *J. Climate*, **20**, 255-278.
- Arzel, O., T. Fichefet, H. Goosse and J-L. Dufresne (2007): Causes and impacts of changes in the Arctic freshwater budget during the 20<sup>th</sup> and 21st centuries in an AOGCM, *Climate Dynamics*, published online, doi:10.1007/s00382-007-0258-5.
- Bellucci A., S. Gualdi, E. Scoccimarro and A. Navarra, 2007: NAO-Ocean Circulation Interactions in a Coupled General Circulation Model. *Clim. Dyn.*, submitted.
- Beniston, M., 2007: Entering into the "greenhouse century": recent record temperatures in Switzerland are comparable to the upper temperature quantiles in a greenhouse climate. *Geophysical Research Letters*, in press.
- Beniston, M., and Goyette, S., 2007: Changes in variability and persistence of climate in Switzerland; exploring 20th century observations and 21st century simulations. *Global and Planetary Change*, **57**, 1-20.
- Bengtsson, L., K. I. Hodges, M. Esch, N. Keenlyside, L. Kornblueh, J.-J. Luo and T. Yamagata (2007): How may Tropical Cyclones Change in a Warmer Climate? *Tellus*, **59A**, 539-561
- Carril A., S. Gualdi, A. Cherchi and A. Navarra, 2007: Heatwaves in Europe: Areas of homogeneous variability and links with the regional to large-scale atmospheric and SSTs anomalies. *Clim. Dyn.*, DOI 10.1007/s00382-007-0274-5
- Cherchi A. and A Navarra, 2007: Sensitivity of the Asian summer monsoon to the horizontal resolution: differences between AMIP-type and coupled model experiments. *Clim. Dyn.*, **28**, 273-290.
- Coelho, C. A. S., Ferro, C. A. T., Stephenson, D. B. and Steinskog, D. J.: 2007, Exploratory tools for the analysis of extreme climate and weather events in gridded datasets, *Journal of Climate*, *In revision*.

- Conil S., H. Douville, S. Tyteca (2007a) The relative roles of soil moisture and SST in climate variability explored within ensembles of AMIP-type simulations. *Climate Dyn.*, **28**, 125-145.
- Conil S., H. Douville, S. Tyteca (2007b) What is the contribution of realistic soil moisture initial conditions to the boreal summer hindcast skill? to be submitted.
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