

Workshop on understanding, modeling and predicting weather and climate extremes

Oslo Science Park, Oslo, Norway
October 5 - 7, 2015



Venue

The workshop will take place in Oslo Science Park, in Ciens toppsenter. Oslo Science Park is situated close to Blindern, University of Oslo. For directions, click the link below:

<http://www.oslotech.no/forskningsparken/how-to-find-us/>

Local Organizers: Jana Sillmann (CICERO), Thordis Thorarinsdottir (NR), Noel Keenlyside (U Bergen)
Co-organizers: Sonia Seneviratne (ETH Zurich), Gabriele Hegerl (U Edinburgh), Xuebin Zhang (EC)



Summary

Understanding, modeling and predicting weather and climate extremes is one of the key challenges in climate research and thus has been selected as one of the World Climate Research Program (WCRP) Grand Challenges.

This workshop will bring together national and international experts and early career scientists from weather, climate and statistical sciences with the goal to discuss some of the scientific challenges as emphasized in the WCRP Grand Challenges on Weather and Climate Extremes white paper (<http://www.wcrp-climate.org/index.php/gc-extreme-events>). In particular, the workshop will address:

- dynamical and physical processes (e.g., large-scale modes of variability, atmospheric blocking, land-atmosphere and snow feedbacks) that affect the occurrence and amplitude of weather and climate extremes
- the representation of these processes in models and their usefulness and potential for prediction of extremes
- the development of statistical methods and tools to incorporate this information into model performance metrics.

The workshop participants will have ample opportunity to present and discuss their latest research related to these challenges. Substantial time will be spent to evaluate current state of knowledge, to identify opportunities for cross-community collaborations to address the challenges (e.g., modeling experiments, data needs, storylines for model evaluation, scale issues) and to coordinate future research and communication of results.

Size: ca. 30 experts and early career scientists (invite only)

Programme

Monday, October 5

08:30 - 09:00	Registration and coffee
09:00 - 09:40	Opening
09:00 - 09:10	Jana Sillmann (CICERO, Norway) Welcome, organizational matters
09:10 - 09:20	Solrun Figenschau Skjellum (Norwegian Environment Agency) Opening remarks
09:20 - 09:25	Boram Lee (WCRP, Switzerland) The World Climate Research Programme (WCRP)
09:25 - 09:30	Sonia Seneviratne (ETH Zurich, Switzerland) The WCRP Grand Challenges on Climate Extremes
09:30 - 09:40	Brian Golding (UK Met Office) High Impact Weather Project (HIWeather)
09:40 - 12:45	Session A-I: Large-scale circulation Chair: Jana Sillmann, Rapporteur: Nathalie Schaller
09:40 - 10:25	Tim Palmer (University of Oxford, UK) Circulation extremes and climate change
10:25 - 10:40	Friederike Otto (University of Oxford, UK) Thermodynamics vs. dynamics: the importance of attributing circulation changes
10:40 - 11:05	Coffee break
11:05 - 11:20	Pascal Yiou (LSCE-IPSL, France) Analogues of atmospheric circulation to probe rare and extreme events

Monday, October 5, continues

- 11:20 - 11:35 Stephan Pfahl (ETH Zurich, Switzerland)
The importance of atmospheric blocking for European temperature extremes
- 11:35 - 11:50 Dim Coumou (PIK, Germany)
Weakened flow, persistent circulation and prolonged heat waves in boreal summer
- 11:50 - 12:00 Pandora Hope (Australian Bureau of Meteorology, Australia)
Why was it so hot? Australia's record heat in late spring 2014
- 12:00 - 12:45 **Discussions**

12:45 - 14:30 Lunch and poster session

Introduction of posters (3min intro per poster presenter)

- Lukas Gudmundsson (ETH Zürich, Switzerland)
North Atlantic and human influence on European drought risk
- Nathalie Schaller (University of Oxford, UK)
Predictability of the NAO in seasonal hindcasts from 1900-2009
- Tim Cowen (University of Edinburgh, UK)
Synoptic and oceanic conditions during heat wave events: a case study for southern Australia
- Noelia Otero Felipe (Institute for Advanced Sustainability Studies (IASS), Germany)
Decadal prediction of Sahel rainfall using dynamics-based indices
- Tobias Erhardt (Technische Universität München, Germany)
Standardized drought indices: A novel uni- and multivariate approach
- Hoffman Cheung (Guy Carpenter Asia-Pacific Climate Impact Centre, School of Energy and Environment, City University of Hong Kong, Hong Kong, China)
Observed and Future Changes of Ural blocking and East Asian Winter Climate
- Fumiaki Ogawa (Bjerknes Centre for Climate Research, Norway)
Impacts of sea ice / SST changes for the observed climate change - GREENICE project

14:30 - 18:00 Session A-II: Land/snow feedback

Chair: Sonia Seneviratne, Rapporteur: Lukas Gudmundsson

- 14:30 - 15:15 Robert Vautard (LSCE-IPSL, France)
Changes in dynamical and physical processes in explaining recent extreme events
- 15:15 - 15:30 Herve Douville (National Centre for Meteorological Research, France)
Land surface contributions to model uncertainties in heat wave and drought projections
- 15:30 - 15:45 Elisabeth Kendon (UK Met Office)
The changing character of rainfall at convection permitting scales
- 15:45 - 16:00 Diego Miralles (Ghent University, Belgium)
Evidence of the effect of soil desiccation during the escalation of temperatures in mega-heatwaves

16:00 - 16:30 Coffee break

- 16:30 - 16:45 Yvan Orsolini (Norwegian Institute for Air Research)
Impact of snow cover and sea ice on subseasonal-to-seasonal forecasts
- 16:45 - 17:00 Wim Thiery (ETH Zürich, Switzerland)
Hazardous thunderstorms over Lake Victoria under present and future climate conditions
- 17:00 - 18:00 **Discussions**

19:00 Dinner (Festningen)

Tuesday, October 6

09:00 - 12:30 Session B: Prediction

Chair: Noel Keenlyside, Rapporteur: Erik Kolstad

- 09:00 - 09:45 Francisco Doblas-Reyes (Catalan Institute of Climate Sciences, Spain)
Predicting climate extreme events in a user-driven context
- 09:45 - 10:00 Geert Jan van Oldenborgh (Royal Netherlands Meteorological Institute)
Seasonal prediction of extreme weather: lesson from attribution

Tuesday October 6, continues

10:00 - 10:15 Javier Garcia Serano (Barcelona Supercomputing Center, Spain)
Predictability of the Euro-Atlantic climate from Arctic sea ice variability

10:15 - 10:40 Coffee break

10:40 - 11:00 Antje Weisheimer (University of Oxford, UK)
Prediction of extreme climate events on seasonal and sub-seasonal timescales

11:00 - 11:15 Erik Kolstad (Uni Research, Norway)
Intraseasonal persistence of European surface temperatures

11:15 - 11:30 Noel Keenlyside (Geophysical Institute and Bjerknes Centre, University of Bergen, Norway)
The North Atlantic Ocean role in shaping regional climate change

11:30 - 12:30 ***Discussions***

12:30 - 14:00 Posters and lunch

14:00 - 17:30 Session C: Model performance
Chair: Thordis Thorarinsdottir, Rapporteur: Tobias Erhardt

14:00 - 14:45 Chris Ferro (University of Exeter, UK)
Statistical evaluation of forecasts

14:45 - 15:00 Marion Mittermaier (UK Met Office)
Feature-based diagnostic evaluation of global NWP forecasts

15:00 - 15:15 Gabi Hegerl (University of Edinburgh, UK)
Evaluating mechanisms of temperature extremes

15:15 - 15:30 Erich Fischer (ETH Zürich, Switzerland)
A plethora of noise - The challenge of evaluating models and constraining projections given abundant internal variability

15:30 - 16:00 Coffee break

16:00 - 16:15 Francis Zwiers (PCIC Canada)
Evaluation of dynamical or dynamically influenced phenomena in RCMs

16:15 - 16:30 Peter Guttorp (University of Washington, USA and Norwegian Computing Center, Norway)
Projecting local sea level rise

16:30 - 17:30 ***Discussions***

19:00 Tapas, drinks and socializing (The Mini Bottle Museum)

Wednesday, October 7

09:00 - 12:30 Breakout sessions

09:00 - 09:30 Jana Sillmann, Sonia Seneviratne, Noel Keenlyside and Thordis Thorarinsdottir
Introduction of the breakout sessions

09:30 - 12:30 ***Breakout group discussions***

12:30 - 13:30 Lunch

13:30 - 15:00 Summary and conclusions

13:30 - 14:00 ***Summaries of breakout sessions***

14:00 - 15:00 ***Final discussion and wrap-up***

15:00 End of workshop and safe trip home