

# WCRP Summer Schools on Grand Challenges

- **2014: Extreme Climate Events: *Trieste, Italy***
- **2015: Regional Climate Information: *Dakar, Senegal***
- **2016: Clouds, Circulation and Climate Sensitivity: *Les Houches, France (?)***
- **2017: sea-level?**
- ....

## WCRP-ICTP Summer School on Attribution and Prediction of Extreme Events

21 July – 1 August 2014, ICTP Trieste ITALY

<http://www.wcrp-climate.org/index.php/ictp2014-about>

### Organized by:



### Sponsored by:



The International Union of Geodesy and Geophysics



## Introduction

**Francis ZWIERS** (Pacific Climate Impacts Consortium, Canada)  
**Sonia SENEVIRATNE** (ETH Zurich, Switzerland)

## Extreme event prediction at seasonal and shorter lead times

**Francisco DOBLAS-REYES** (IC3, Spain)  
**Arun KUMAR** (NOAA/CPC, USA)

## Statistical theory

**Lisa ALEXANDER** (UNSW, Australia)  
**Eric GILLELAND** (NCAR, USA)  
**David KAROLY** (University of Melbourne, Australia)  
**Philippe NAVEAU** (LSCE-IPSL, France)

## Detection and attribution

**Francis ZWIERS** (Pacific Climate Impacts Consortium, Canada)

## Event attribution:

**Friederike OTTO** (University of Oxford, UK)  
**Peter STOTT** (Met Office, UK)

## Event attribution: Physical process assessment approach

**David KAROLY** (University of Melbourne, Australia)  
**Sonia SENEVIRATNE** (ETH Zurich, Switzerland)

## Teaching Assistants

**Han Quizi WEN** (Environment Canada)  
**Rene ORTH** (ETHZ, Switzerland)  
**Daniel MITCHEL** (University of Oxford, UK)  
**Fraser LOTT** (UK Met Office, UK)  
**Andrew CIAVARELLA** (UK Met Office, UK)  
**Markus DONAT** (ARC Centre of Excellence for Climate System Science, Australia)  
**Chloé Prodhomme** (IC3, Spain)

## Organizers

**Anna PIRANI** (CLIVAR-ICTP)  
**Adrian TOMPKINS** (ICTP)  
**Roberta BOSCOLO** (WCRP)  
**Catherine MICHAUT** (WCRP-IPSL)  
**Petra KRIZMANCIC** (ICTP)

	Monday	Tuesday	Wednesday	Thursday	Friday
9h-9h45	What is an extreme event? <b>D. Karoly</b>	Extreme Value Theory (multi-variate) <b>P. Naveau</b>	Detection and Attribution (General introduction) <b>F. Zwiers</b>	Physical mechanisms (Large-scale circulation): <b>D. Karoly</b>	Prediction - seasonal prediction systems <b>A. Kumar</b>
9h45-10h30	How do extremes changes in the context of climate change? <b>S. Seneviratne</b>	Extreme Value Theory (non-stationarity) <b>P. Naveau</b>	Detection and Attribution (Optimized & Non-optimized methods) <b>F. Zwiers</b>	Physical mechanisms (Large-scale circulation): <b>D. Karoly</b>	Prediction - Predictability, and extremes <b>F. Doblas-Reyes</b>
Coffee break					
11h-12h30	Statistical Theory <b>E. Gilleland</b>	Introduction to R & NCAR extreme package <b>E. Gilleland</b>	Practical exercise with R: Optimal fingerprinting <b>F. Zwiers/Q. Wan</b>	Climate extremes: Data issues <b>L. Alexander</b>	Practical exercise on prediction <b>A. Kumar, F. Doblas-Reyes, C. Prudhomme</b>
Lunch					
14h-15h30	Statistical Theory <b>E. Gilleland</b>	Introductory exercises with NCAR extreme package <b>E. Gilleland</b>	Group projects	Group projects	Group projects
Coffee break					
16h-17h30	Presentation of potential projects and first group discussions	Group projects	Group projects	Group projects	Project progress reports (15 min each)
After dinner	Welcome reception	Statistical Theory – Advanced talk <b>P. Naveau</b>		Dinner Outing	

	Monday	Tuesday	Wednesday	Thursday	Friday
9h-9h45	Detection and attribution (Extreme values) <b>F. Zwiers</b>	Physical mechanisms (Land-climate feedbacks) <b>S. Seneviratne</b>	Event attribution: Theory <b>P. Stott</b>	Event attribution: Theory <b>F. Otto</b>	9h-9:45 Disaster Risk Management for Sustainable Development <b>K. Koshi</b>
9h45-10h30	Detection and attribution (Extreme values) <b>F. Zwiers</b>	Physical mechanisms (Local vs large-scale drivers) <b>S. Seneviratne</b>	Event attribution: Theory <b>P. Stott</b>	Event attribution: Theory <b>F. Otto</b>	Final Project wrap up and ongoing collaboration planning
Coffee break					
11h-12h30	Practical exercise with R: D&A Extreme values <b>F. Zwiers/Q. Wan</b>	Practical exercise - land-climate interactions and soil moisture memory <b>R. Orth / S. Seneviratne</b>	Practical exercise with climateprediction.net data <b>F. Otto</b>	Practical exercise with climateprediction.net data <b>F. Otto</b>	Project presentations (30-minutes each)
Lunch					
14h-15h30	Group projects	Group projects	Group projects	Group projects	Project presentations (30-minutes each)
Coffee break					
16h-17h30	Group projects	Group projects	Group projects	Group projects	
After dinner		Guest Lecture		End of School Dinner	



- **Data Set Development** (*L. Alexander, M. Donat*)
- **Dimension Reduction for Extremes** (*P. Naveau*)
- **Detecting Human Influence in ETCCDI Temperature Indices** (*F. Zwiers, X. Zhang*)
- **Event Prediction** (*F. Doblas-Reyes, A. Kumar, C. Prodhomme*)
- **To what extent is it possible to reliably calculate any changed risk of unusually warm or cold or dry or wet seasons in regions of the world attributable to anthropogenic influence on climate?**
  - **Assessment of CMIP5** (*P. Stott*)
  - **Assessment of climatepredict.net simulations** (*F. Otto, M. Allen*)
- **Land surface drivers of droughts: The role of soil moisture persistence** (*S. Seneviratne and R. Orth*)

# 2<sup>nd</sup> WCRP-ICTP Summer School on Climate System Prediction and the Delivery of Actionable Regional Climate Information

April 2015, Dakar, Senegal

## Hosted by:

National Civil Aviation and Meteorological Agency (ANACIM)



## Organized by:



## Potential Partners:

- WMO West Africa Climate Outlook Forum (PRESAO)
- ACMAD
- AGRHYMET
- GFCS
- ClimDev
- Regional NHMs

## Potential Lecturers

**Adrian Tompkins** ICTP, Italy  
**Benjamin Kirtman** U. Miami, USA  
**Jin Huang** NOAA, USA  
**Francisco Doblas Reyes** IC3, Spain  
**Benjamin Lamptey** ACMAD, Niger  
**Andre Kamga** ACMAD, Niger  
**Ousmane Ndiaye** ANACIM, Senegal  
**Richard Graham** UK Met Office, UK  
**Andrew Robertson** IRI, USA  
**Alessandra Giannini** IRI, USA  
**Doug Parker** U. Leeds, UK

## Organizers

**Anna PIRANI** (CLIVAR-ICTP)  
**Adrian TOMPKINS** (ICTP)  
**Roberta BOSCOLO** (WCRP)  
**Ousmane NDIAYE** (ANACIM)



## WCRP Summer Schools on Grand Challenges

- **2016: Clouds, Circulation and Climate Sensitivity: *S. Bony & B. Stevens***
- **2017: Sea-Level Rise???**
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