

**Interpreting Climate Change Simulations:
Capacity Building for Developing Nations
Training Seminar
Trieste, Italy
November 26-30, 2007
(Updated 19/11/2007)**

I. Overview

Recognizing that response to climate change requires the capability to assess and properly interpret research findings and to apply them to national planning initiatives, the WCRP and the ICTP wish to support capacity building in developing and least developed countries. The following training seminar will focus on analyzing and interpreting the international ensemble of climate simulations for the 20th and 21st centuries completed as part of the WCRP's Coupled Model Intercomparison Project: Phase 3 (CMIP3) and containing simulations undertaken in support of the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4).

By improving the understanding of the confidence (or its complement – the uncertainty) of the research findings and the implications of climate projection results from the IPCC model simulations, we can better inform future possible assessments by using common methodologies. This workshop will set the stage for invaluable capacity building that will allow scientists from developing countries to provide increasingly strong contributions to the global change debate.

II. Objectives

The training seminar has the following two primary objectives:

1. To explain the analysis and interpretation of the WCRP CMIP3 archive of IPCC AR4 greenhouse simulations to professionals not previously acquainted with this climate change resource; and
2. To assist participants in developing a project that utilizes the WCRP CMIP3 archive in a way that is relevant and helpful to their home nation or organisation.

III. Lecturers

The following team of experts will serve as lecturers at the training seminar: Each lecturer will give two talks and some addition 'chats' in the following broad areas / topics during the programme (see below).

Lecturer	Area of Expertise
Dr F. Giorgi (Local Host) ICTP	Regional climate change, Climate change uncertainties
Professor A. Henderson-Sellers (Co-Host) WCRP	International climate research programmes and future research into climate change

Professor C. Covey PCMDI	Climate model archives and their analysis, ocean-atmosphere interactions
Professor K. McGuffie UTS	Climate model structure and history, tropical cyclone simulations
Professor J. Raisanen University of Helsinki	Climate model uncertainties, climate change analysis and diagnostics
Dr V. Ramaswamy GFDL/NOAA	Atmospheric radiation observations and simulations (IPCC AR4 CLA)
Professor Reto Knutti Swiss Federal Institute of Technology	Approaches to probabilistic prediction of climate change
Dr Claudio Piani ICTP	End-users and climate predictions: the climateprediction.net dataset

IV. Pre-Workshop Requirements for Students

Each student is invited to complete the following prior to the workshop:

1. Think of a relevant project (e.g. identify 'x' for my country 'y') to carry out during and after the workshop. Project topics and regional teams (if necessary) will be finalized at the end of Day 1.
2. Visit and review the CMIP3 website at http://www-pcmdi.llnl.gov/ipcc/about_ipcc.php. Students will access data in the CMIP3 Archive during lab sessions at ICTP. While there is no pre-requirement to have accessed data prior to the seminar, we hope that some students will have gained some familiarity with the CMIP3 data.
3. Read some of the papers available on the CMIP3 website at http://www-pcmdi.llnl.gov/ipcc/diagnostic_subprojects.php and, if possible, "A Climate Modelling Primer" (3rd edition, John Wiley and Sons, 2005) by K. McGuffie and A. Henderson-Sellers which is also recommended by PCMDI for CMIP3 archive users.

V. Agenda

MONDAY NOVEMBER 26, 2007

1. Registration (8:30-9:00)
2. Introduction (9:00-9:45)
 - 2.1. Welcome (F. Giorgi and A. Henderson-Sellers)
 - 2.2. Introductions: Lecturers
 - 2.3. Introductions: Participants
 - 2.4. Local arrangements (F. Giorgi)
3. The WCRP CMIP3 Archive (9.45-11.00)
 - 3.1. Introduction (C. Covey)

Tea/Coffee Break (11.00-11:15)

4. Climate Modelling (11.15-12.30)
 - 4.1. History of climate modelling (K. McGuffie)

Lunch Break (12:30-13:30)

5. Lab Session: CMIP3 Archive (13:30-17:00)
 - 5.1. Selecting a project (A. Henderson-Sellers and F. Giorgi)
 - 5.2. Creating regional teams

- 5.3. Accessing the CMIP3 Data
- 5.4. Identifying data fields

Evening Activity: Being an IPCC Lead Author: a “behind the scenes” glimpse (V. Ramaswamy)

TUESDAY NOVEMBER 27, 2007

- 6. Review (8:45-9:15)
- 7. Climate Change Modelling (9:15-11:30)
 - 7.1. Radiative forcing agents of climate change (V. Ramaswamy)
 - 7.2. Uncertainties in global climate models (J. Raisanen)

Tea/Coffee Break (11:30-11:45)

- 7.3. IPCC WGI AR4: Main messages (V. Ramaswamy)

Lunch Break (12:45-13:30)

- 8. Lab Session: CMIP3 Archive (13:30-17:00)
 - 8.1. Review (C. Covey)
 - 8.2. Exercise 1
 - 8.3. Exercise 2

Evening Activity: What can be researched with CMIP3: example on tropical cyclones (K. McGuffie)

WEDNESDAY NOVEMBER 28, 2007

- 9. Review (8:45-9:15)
- 10. Climate Change Simulation (9:15-11:30)
 - 10.1. Uncertainties in climate change prediction (F. Giorgi)
 - 10.2. Ocean-atmosphere interactions (C. Covey)

Tea/Coffee Break (11:30-11:45)

- 10.3. Probabilistic prediction of climate change (R. Knutti)

Lunch Break (12:45-13:30)

- 11. Lab Session: CMIP3 Archive (13:30-17:00)
 - 11.1. Review (R. Knutti)
 - 11.2. Exercise 1
 - 11.3. Exercise 2

Evening Activity: Interactive session “Using the CMIP3 Archive and publishing results: ‘How to’ guide” (R. Knutti)

THURSDAY NOVEMBER 29, 2007

- 12. Review (9:00-9:30)

Climate Change Prediction (9:30-10:30)

- 12.1. Changes in variability and extremes from the CMIP3 ensemble (J. Raisanen)

Tea/Coffee Break (10:30-11:00)

- 12.2. Regional patterns of climate change from the CMIP3 ensemble (F. Giorgi)
- 12.3. Question and answer session with students on applications of climate change predictions

Lunch Break (12:30-13:30)

13. Lab Session: CMIP3 Archive (13:30-17:00)

- 13.1. Review (C. Covey)
- 13.2. Exercise 1
- 13.3. Exercise 2

Evening Activity: Round Table on regional predictions (A. Henderson-Sellers)

FRIDAY NOVEMBER 30, 2007

14. Review (9:00-9:30)

15. Climate Change Prediction cont. (9:30-10:30)

- 15.1. Climate prediction end-user groups: the *climateprediction.net* example (C. Piani)

Tea/Coffee Break (10:45-11:00)

16. Future Climate Change Research

- 16.1. World Climate Research Programme (WCRP) Future (A. Henderson-Sellers)

Lunch Break (12:30-13:30)

17. Student Presentations (13:30-16:30)

- 17.1. Africa
- 17.2. Eastern Europe
- 17.3. Asia
- 17.4. Central and South America
- 17.5. New topics/areas

18. Conclusion (16:30-17:00)

- 18.1. Final Remarks (F. Giorgi and A. Henderson-Sellers)
- 18.2. Seminar Closing

Evening: Dinner and Wrap Up

VI. Deliverables

The following deliverables are expected out of this training seminar by students and lecturers:

1. Training Resources
 - a. Students and lecturers: compile lectures, exercises, and final projects to be incorporated into a manual for use at other training seminars.
 - b. Lectures will be captured on video and playable over the web 'on demand'.
2. Network Platform

- a. Students and lecturers: To develop a ‘network’ platform for scientists from developing nations in order for them to continue to collaborate and for others to join (discussion forum, data exchange, etc.).
 - b. ICTP: Main data to be held at ICTP but might be mirror-hosted at the APCC (C-K. Park) and/or JAMSTEC (H. Kondo).
3. Journal Articles/Papers:
- a. Lecturers: write a seminar wrap up paper for a journal (e.g. BAMS) on the purpose of the training session.
 - b. Students: During the seminar, participants identify good projects, with the aim of continuing them after the training session (hopefully as regional teams) and we deliver enough papers/projects to have a special journal issue.

VII. List of participants/students

Name	Country
CENTRAL AND SOUTH AMERICA	
Rojas Corradi Maisa	Chile
Profirio da Rocha Rosmeri	Brazil
Tannecia Stephenson	Jamaica
Terra Rafael	Uruguay
Yamina Silva	Peru
Silvina Solmon de Knees	Argentina
ASIA	
Gao Xuejie	China
Syed Faisal	Pakistan
Armelle Reca C. Remedio	Philippines
EASTERN EUROPE	
Srnec Lidija	Croatia
Torma Csaba	Hungary
Bojariu Roxana	Romania
AFRICA	
Engelbrecht Francois	South Africa
Sarr Abdoulaye	Senegal
Abiodun Babatunde	Nigeria
Hansingo Kabumbue	Zambia
Huntsman-Mapila P.	Botswana
Manhique Atanasio	Mozambique
Umer Mohammed	Ethiopia