

The World Climate Research Programme (WCRP) and Anthropogenic Climate Change Research

Description

Growing observational and modelling evidence is clearly indicating that climate change due to increasing concentrations of anthropogenic greenhouse gases has the potential of having major consequences on human societies and natural ecosystems. In 2007, the IPCC Fourth Assessment Report (AR4) was published, marking a crucial year for major developments in anthropogenic climate change.



The current phase of the WCRP Anthropogenic Climate Change (ACC) initiative is centred on modelling activities (mainly WCRP Working Group on Coupled Modelling), with the defined goal being to deliver products for the successive state-of-the-science assessments on climate change (e.g., a potential IPCC AR5). WCRP/ACC is a pan-WCRP initiative drawing on the expertise of all WCRP core projects, task forces, working groups and panels, and seeking interactions with the International Geosphere-Biosphere Programme, the International Human Dimensions Programme, the Earth System Science Partnership (ESSP) and other agencies and institutions on the national and international levels. While the current focus is on process-level and modelling investigations, and projections of human-induced climate change, the long-term vision is that, over time, WCRP/ACC will expand in scope. The WCRP Anthropogenic Climate Change initiative builds on the clear evidence that climate change is caused by anthropogenic greenhouse gas emissions. Photographer: Gerla Brakkee.

Added Value

WCRP is a significant contributor to IPCC AR4: Modelling activities organised and coordinated by the WCRP have been the basis for the 2007 published IPCC AR4. In addition, over 90% of the Working Group 1 coordinating authors are WCRP-associated scientists, and some 70% of the reviewers. WCRP scientists and projects contributed significantly to the collection and assembly of climate observations, model development and understanding of the climate system necessary for the detection and attribution of past climate change, and the provision of climate information, including projections of future change based on various emission scenarios. As a direct result of these activities: 15 modelling groups from 11 countries which participated in these experiments with 23 models have contributed their simulations to the WCRP-CMIP3 (Coupled Model Intercomparison Project: <http://www-pcmdi.llnl.gov/projects/cmip/index.php>) archive at the Program for Climate Model Diagnosis and Intercomparison (PCMDI); more than 200 papers from scientists around the world have been submitted to peer-review journals with results from multi-model analyses (100 of these have been published); and 900 analysis projects have been registered at the PCMDI (<http://www-pcmdi.llnl.gov/>).

WCRP delivers direct input to the Subsidiary Body for Scientific and Technological Advice (SBSTA) on research gaps and needs for the United Nations Framework Convention on Climate Change (UNFCCC):

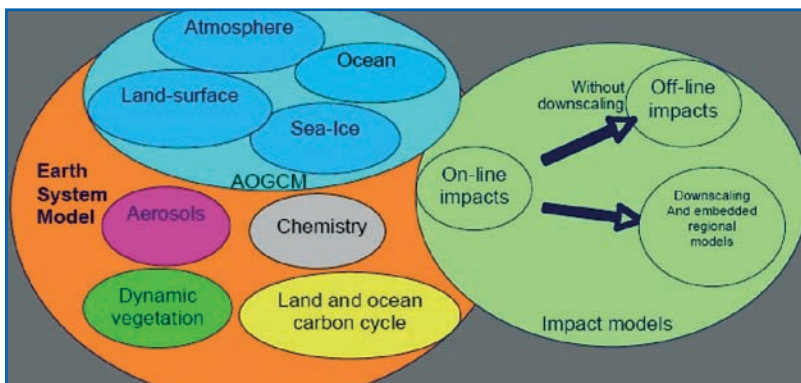
The UNFCCC and the SBSTA have become increasingly aware of and engaged with research requirements for climate change. As a result and at the request of SBSTA, WCRP

- prepared a statement on research gaps for SBSTA 24 (May 2006);
- participated in the “official” side event on research gaps at SBSTA 24 held in Bonn, Germany, May 2006;
- held an additional side event at SBSTA 24 on WCRP research to identify research needs and climate change research challenges; a DVD summarizes the highlights of this event (view DVD at: http://wcrp.wmo.int/PG_CDsDVDs.html);
- submitted a document on research needs for SBSTA 25 with its partners in the ESSP (September 2006);

- participated in an informal discussion at SBSTA 26 (Bonn, May 2007) to enable a more effective dialogue between Parties and regional and international climate change research programmes and organizations;
- organized together with its ESSP partners a side event at SBSTA 26 on Connecting Earth System Science Research to Climate Change Policy.

WCRP reached significant consensus at workshop on next generation Earth System Models (ESM) and emissions scenario requirements:

The WCRP Working Group on Coupled Modelling (WGCM) and the IGBP Analysis, Integration and Modelling of the Earth System (AIMES) project convened a joint workshop in Aspen, Colorado, USA (July 2006) to construct a unified position of the modelling community with respect to the possible scenarios to be used in the future IPCC Fifth Assessment Report (AR5). This meeting represented a very significant breakthrough in the understanding of model forcings. The resulting joint report, approved by WCRP and IGBP in September 2006, has been communicated to the Chairman of the IPCC in response to his invitation for input in preparation for a future IPCC assessment. A White Paper is available for download at http://wcrp.wmo.int/documents/Aspen_WhitePaper_1final.pdf (WCRP Informal Report No. 3/2007).



Schematic diagram of an Atmosphere-Ocean General Circulation Model (AOGCM) as an integrated part of the Earth System Model (orange oval), and various types of impact models (right).

WCRP with some of its key partners will hold the following major events during 2007 as part of its capacity building remit to help improve the science, better connect research to policy:

- Future Climate Change Research and Observation: *GCOS, WCRP and IGBP Learning from the IPCC Fourth Assessment Report, Workshop*, 4-6 October 2007, Sydney, Australia. The main goal of the workshop will be to consider the implications from the IPCC AR4 on future climate research challenges and climate observing strategies with a primary focus on the lessons learned from Working Groups I and II. It is intended that the workshop provide a major input into the evolution of the Global Climate Observing System (GCOS) and the research agenda for WCRP.
- Interpreting Climate Change Simulations: *Capacity Building for Developing Nations*, ICTP and WCRP Training Seminar, 26-30 November 2007, Trieste, Italy. Recognizing that response to climate change requires the capability to appreciate and properly interpret research findings and to apply them to national planning initiatives, the WCRP and the International Centre for Theoretical Physics (ICTP) wish to support capacity building in developing and least developed countries. WCRP together with the ICTP can help 'transfer knowledge' with respect to the science used to make input to and described in the IPCC assessment reports. By improving knowledge pertaining to climate change research can have a significant regional and global impact.

Relevance to GEO

Task CL-07-01. Coordinator: WCRP.