



Scientists discuss Causes and Impact of Climate Change and Extreme Events

Priorities for Climate Observations, Research and Predictions High on Agenda

GENEVA / DENVER (19 October 2011) – The latest findings about the relationship between climate change and extreme events such as heatwaves, droughts, floods and their impact on Earth's population and ecosystems will be discussed next week at a conference with more than 1,700 leading scientists from 84 countries. Progress and prospects in forecasting the weather and climate months, seasons and even decades ahead, as well as the challenges facing surface and space based observation networks, are among the other topics.

The World Climate Research Programme's Open Science Conference takes place in Denver, Colorado 24-28 October. It aims to improve our understanding and prediction of - and ability to cope with - naturally-occurring climate variation and human-influenced change from seasons to centuries, and from narrow regions to the entire globe.

Discussions will include the effect of rising global temperatures on polar regions, melting glaciers and ice caps, sea level variability and change, and thawing permafrost which has the potential of becoming a net source of greenhouse gases.

The conference will bring together experts from across a large number of disciplines from physical sciences (atmospheric, oceanic, polar regions, ecosystems) as well as social and information sciences. It also aims to nurture the next generation of scientists, with workshops for early career professionals and students.

The outcomes of the conference will be published and benefit the Intergovernmental Panel on Climate Change (IPCC) and other forthcoming assessments of freshwater resources, ecosystems, biodiversity and ozone.

"The main theme is climate science in service to society and we are committed to providing the best available scientific knowledge as a solid foundation for sustainable development," said Ghassem Asrar, World Climate Research Programme Director. "The conference will facilitate understanding of Earth's climate system and interactions among its components such as the oceans, continents, polar regions and the life, thereby helping us to improve our ability to predict its future evolution and reducing our vulnerability to climate variability and climate change."

Highlights:

Extreme weather: Floods wreaked devastation earlier this year in Australia and Sri Lanka, and most recently in Pakistan, Southeast Asia and Central America, whilst drought has gripped parts of the Horn of Africa and Texas. There is often concern and confusion about whether these extreme events are linked to natural climate variability or to human-influenced climate change.

In its Fourth Assessment Report in 2007, the IPCC anticipated that the magnitude, frequency and duration of extreme events are likely to be altered as the Earth's atmosphere warms. The findings of the Open Science Conference will be a major contribution to the IPCC's Fifth Assessment Report, due in 2014.

Specifically, the conference will discuss the development of a regular service that would respond in a timely manner to provide warnings for the onset, duration and extent of an extreme event with reliable information on the factors contributing to the event and the extent to which human influence has altered the odds of its occurrence. Research is under way, coordinated as a part of the international Attribution of Climate-related Events (ACE) initiative, to develop the science needed to underpin such a service. Case studies include the 2000 floods in the United Kingdom and the 2003 heatwave in Europe.

There will be a special focus on detecting, understanding and predicting extreme climate events, with presentations on Atlantic hurricanes, extra-tropical cyclones, tornado activity, extreme precipitation trends and heat extremes.

Observing systems: As the climate changes, it is becoming increasingly important to observe the details of these changes, distinguish between the human contribution and natural variability, and provide reliable projections for the expected changes in the future. Observing systems are also vital for understanding and evaluating the seasonal to decadal climate predictions.

However, several U.S. satellites that monitor weather and climate are nearing the end of their useful lives, and some replacements have been delayed by funding shortfalls. This has increased the risk that critical observations of Earth's atmosphere, oceans and land surfaces will be lost and guidance on weather and climate for decision makers and the public will be compromised.

The oceans comprise the largest active planetary reservoir for heat, water and carbon, and are home to a vast array of species and as a result they play a crucial role in Earth's climate, and supporting life on Earth. Obtaining the necessary ocean observations to understand and predict their conditions remains a tough technological and resource challenge, but there has been great progress in the last decade. The experts attending the conference will highlight the challenges and opportunities in oceans observations and monitoring, especially the deeper part of oceans, in the next decades.

Predictions and Forecasts: There has also been much progress in weather and climate forecasts during the past few decades. Global numerical weather forecasts, which are based on rapidly changing atmospheric conditions, have improved by about one day per decade. The ten-day weather forecasts of today are as good as the three-day forecasts of the 1970s. This is a remarkable success due to technological and scientific progress in observations, understanding and use of super-computers to simulate weather phenomena.

Scientific advances have boosted the availability and reliability of monthly and seasonal climate predictions, especially at a national and regional level. The main source of seasonal to inter-annual predictions is the so-called El Niño Southern Oscillation (ENSO) phenomenon – the coupling of sea-surface temperatures and atmospheric conditions which have a major impact on climate conditions in many parts of the world.

The conference will hear how other factors apart from ENSO – including upper ocean heat content, soil moisture, snow cover and polar sea ice – also provide potentially very important clues that could be used to improve the seasonal to decadal climate predictions.

Seasonal to decadal predictions will be a highly important tool for a wide range of stakeholders in the agriculture, health, tourism and construction industries, to name but a few, to guide longer-term planning on decisions ranging from the time of planting and harvesting crops; coastal development and defenses, and providing warnings for the onset of diseases or their eradication campaigns.

Scientists will also focus on progress to “downscale” the global observations and model projections to the specific regions to make them useful and relevant for decision makers and practitioners. Particular effort is being devoted to Africa – a region which is especially vulnerable to climate change and variability. For example, seasonal forecasts last year accurately predicted that there would be lower than normal rainfall in Somalia and neighboring regions in the Greater Horn of Africa. The intent is to make available routinely this type of information similar to daily weather forecasts as a part of climate services in the future.

Water: By the year 2050, managers of drinking water and wastewater/stormwater systems in the United States will need to spend up to \$2 trillion to keep their systems working properly and respond to the effects of climate change, according to studies by the U.S. Environmental Protection Agency and industry associations. The conference will address the need for researchers and decision makers to work together as society begins to adapt to the effects of climate variability and change, and to minimize the impacts of fluctuations in fresh water cycle on humans and other natural ecosystems.

The conference will also discuss the global hydrological cycle and the complex interactions with climate, energy and nutrient flows, and the dynamics of ecosystems and socio-economic development. Greater understanding of the fundamental science of the hydrological cycle is necessary in order to understand how humans are influencing and being affected by it.

Policy: Recent research has shown that reducing certain short-lived gases and particles can have positive and effective short-term climate influences, whereas long-lived agents, especially carbon dioxide, will be responsible for at least a millennium of altered climate. These vastly differing characteristics imply that a single basket for trading among gases and particles is incompatible with current scientific understanding, and thus require additional careful consideration based on sound climate science.

Business Opportunities: Private sector and non-governmental organizations are major providers and/or users of climate information. A special session will be devoted to the presentations and discussion by some key business leaders to identify the climate information needs and opportunities that need urgent attention of climate scientists. Experts from energy, insurance and re-insurance, weather and climate services, information and space technologies will participate in this session to share their perspectives with the researchers on the challenges and opportunities they envision as providers and users of climate information.

The conference places a heavy emphasis on the scientific leaders of tomorrow. About a third of participants are either graduate and post-doctoral students or early career scientists who completed their advanced degree and professional development during the past five years.

Notes to Editors:

Full details about the Open Science Conference are at: <http://www.wcrp-climate.org/conference2011/index.html>

WCRP is sponsored by the World Meteorological Organization, the International Council for Science, and the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). These organizations serve more than 180 countries worldwide and are committed to providing the best available scientific knowledge as a solid foundation for sustainable development.

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