

Melting Ice: Regional Dramas, Global Wake-Up Call
Tromsø, 28 April 2009
Co-Chair's Summary

Background

Nobel Peace Prize laureate Al Gore, foreign ministers and climate change scientists met on 28 April 2009 in Tromsø, Norway to discuss the impacts of melting ice in the Polar and mountain areas worldwide. The conference - *Melting Ice: Regional Dramas, Global Wake-Up Call* - took place the day before the Arctic Council's annual ministerial meeting. A number of foreign ministers from states affected by melting ice and snow attended. The event was co-hosted by Mr. Al Gore and Mr. Jonas Gahr Støre, Norway's Minister of Foreign Affairs. Discussions were moderated by Dr. Robert W. Corell (Director, John Heinz III Center, USA).

Key scientific messages delivered on the melting of the cryosphere*

Research shows that the phenomenon of ice melting is a global challenge, affecting the Arctic, the Antarctic and high altitude areas such as the Himalayas and the Andes.

At the conference, representatives of the world's foremost scientific expertise on the topics of climate change and ice melting gave presentations, providing updated information on research and knowledge about melting of ice and snow in the Arctic region as well as globally.

The Arctic Climate Impact Assessment (ACIA) report of the Arctic Council in 2004 was the first comprehensive assessment of climate change in the Arctic. It delivered dramatic messages to the world on the changes in the Arctic climate and the critical role of this region for the future development of the global climate. These messages were confirmed in the fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC) in 2007.

The critical observation that can now be made is that many of the ACIA scientific findings underestimated the accelerating changes that are manifesting themselves just five years after the ACIA report was completed. Data presented at the conference show that climate change has occurred at an even more rapid speed than indicated by the most pessimistic scenarios in the ACIA report and the IPCC in several areas.

The ACIA report indicated that we might experience events of an ice free polar basin in the summer time by year 2050. The observation of withdrawal of sea ice and the expected dynamics of future changes presented at the conference indicate that such events might occur already within a decade. Yearly variations in sea ice extent may be significant, but the downward trend is clear.

Large-scale melting of the Greenland ice sheet will lead to a rise in sea levels, threatening coastal and low-lying areas around the world. New information was presented from the Arctic Monitoring and Assessment Programme (AMAP) showing that most of the significant glaciers of the Greenland ice sheet have retreated and thinned, and calving of ice has

* The **cryosphere**, derived from the Greek word *kryo* for "cold", is the term which collectively describes the portions of the Earth's surface where water is in solid form, including sea ice, lake ice, river ice, snow cover, glaciers, ice caps and ice sheets, and frozen ground (which includes permafrost).

accelerated. This increased melt and ice discharge is leading to enlarged loss of ice from Greenland. According to new assessments, present sea level rise is greater than earlier estimates presented by the IPCC, and recent projections indicate that global sea level may rise as much as 1 meter by 2100, all factors included.

Whereas for a while Antarctica seemed impervious to the warming seen by the rest of the globe, recent measurements indicate that temperatures have risen on parts of that continent as well over the past 50 years: Some studies show almost three degrees Celsius on the Antarctic Peninsula, making it the most rapidly warming region in the Southern Hemisphere. Events, such as recent break-ups on ice shelves, highlight the effect that climate change is having on the region.

The present knowledge base on ice melting in the Himalayas and Tibetan Plateau (the “Third Pole”) as a whole is comparatively smaller than is the case for instance for the Arctic. However, information was presented showing examples of large glacial retreat in marginal areas and glacial retreat accelerating in the past 10 years. Similar information was presented for the Andean glaciers. Many of the world’s main rivers depend on melt water from the mountains for part of the year. Scientists predict that ice and snow in the mountains that feed these rivers could melt away because of global warming. One of the concerns is that heavily populated regions during the next decades could be threatened by increased risks of drought, flash floods and seasonal shortages of water.

Policy options and practical measures to respond to melting ice

These dramatic developments represent serious challenges both for countries that are directly affected by them, and for countries that would be indirectly affected. No place on Earth would be unaffected by global ice melting. Participants at the conference discussed policy options and practical measures to respond to the phenomenon of melting ice globally. In order to be effective, policy responses to melting ice and snow would be required both at global, regional and local level. Some of the responses to global ice melting discussed at the conference:

- The scientific findings on melting ice and snow globally underlines the urgent need for strengthened action to curb global emissions of greenhouse gases. Reductions in CO₂ and other greenhouse gases need to serve as the backbone of any meaningful effort to reduce warming in the polar regions and globally. It underscores the need for an ambitious, robust and comprehensive global agreement at the UN Climate Change Conference in Copenhagen in December 2009.
- There is also a need to consider actions that will make an impact on ice melting in the near future, in particular measures to effectively address short-lived climate pollutants, such as black carbon, methane and tropospheric ozone. Since they have such short lifetimes – from a few days for black carbon, to a decade for methane -- reductions in these pollutants would show an early climate response. It might give regions of ice and snow a chance to survive long enough for greenhouse gas reductions to have an impact. In addition, some of these pollutants cause great harm to human health, for instance indoor pollution leading to respiratory illnesses, warranting responses for these reasons alone.

- The information provided at the conference also underlines the imperative of adaptation to the impacts of manifest and unavoidable climate change and consequences of melting ice. In the Arctic, this means supporting indigenous peoples in order to preserve their unique traditions in a changing environment; preserving infrastructure such as roads and buildings due to permafrost melt; and putting into place new and responsive regulations or legal instruments so that increased economic activity does not further damage already fragile Arctic ecosystems. Around the Himalayas and the Andes, the situation will prove even more critical. There is a need to begin to address the increased risks of drought, flash floods and seasonal shortages of water. The people who live in these regions cannot face these challenges alone. Industrialised nations must assist by becoming part of the solution.
- Finally, it is crucially important to understand the phenomenon of melting ice and snow and its consequences as a backdrop for proper policy responses. While we know enough to act now, continued monitoring and research is core to ensure that future policy assessments will be effective and adapted to particular regional challenges. Research in this area will to a large degree benefit from international cooperation.

Establishment of a task force charged with producing a state-of-the-art report on melting ice globally

The Co-Chairs established a task force charged with producing a state-of-the-art report on the status of and future scenarios for the melting of ice in affected areas worldwide. The following persons made presentations at the conference and will be included in the task force: Dr. Robert W. Corell, Director, John Heinz III Center, USA; Dr. Richard Armstrong, National Snow and Ice Data Center, University of Colorado, Boulder; Dr. Dorthe Dahl Jensen, Niels Bohr Institute, Denmark; Dr. Yao Tandong, Lanzhou Institute of Glaciology and Geocryology, China; Dr Andrés Rivera, Centro de Estudios Científicos, Chile; Kenrick R. Leslie, Caribbean Community Climate Change Centre; and Dr. Jan-Gunnar Winther, Director, Norwegian Polar Research Institute, Tromsø. The task force will be extended, as appropriate, with additional expertise needed to fulfill the mandate of the group.

The work of the task force will be supported and amplified by an international Norway/UNEP expert conference (*Conference on High Mountain Glaciers and Challenges Caused by Climate Change*) in Tromsø in mid June, hosted by the Norwegian Minister of Environment. The Government of Norway offers to fund the work of the high-level task force, host the expert meeting and prepare a Copenhagen side event, in close cooperation with the task force itself. The report should be of limited length and highly analytical but non-technical, and make extensive use of visual materials and graphics. The work should draw on UNEP's Global Outlook for Snow and Ice (2007), tap into relevant cutting-edge international research activities, including those within, but not confined to, the framework of the Arctic Council, taking into account the – the project *Snow, Water, Ice and Permafrost in the Arctic* (SWIPA)

The report is to be presented to policymakers at a high level event during the UN Climate Change Conference in Copenhagen under the responsibility of the two Co-Chairs.

