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Terry Callaghan, Abisko

Climate change issues: a new focus for the Arctic and Mountain scientific community?

Recent major assessments of environmental change and its impacts in arctic and sub arctic regions (ACIA, Millennium Assessment of Ecosystems, IPCC Fourth Assessment) have shown that change is occurring in the Arctic faster than elsewhere and that arctic landscapes and ecosystems are particularly vulnerable to change. Changes in climate and their impacts on the physical environment and ecological systems have major implications for the Indigenous Peoples and other residents of the North and also for the wider global community through the connectivity of the North with the other areas. This connectivity is particularly important in terms of feedbacks from the Arctic to the climate system and the success of migratory species such as many birds.

These recent assessments of climate change in the Arctic and its impacts have been very successful in raising global awareness of the importance of the issues and the world's political leaders are now well informed of the situation (COP meetings, Stern Report, Informal Ministerial Meeting of 27 Ministers of the Environment, Riksgränsen 2007 and many other instruments such as Al Gore' Film "An Inconvenient Truth" and activities, the ACIA film "A Warming Arctic" and the award of the Nobel Peace Prize for 2007 to Al Gore and IPCC). ***The role for researchers now needs to change emphasis.*** Public and political awareness that mitigation is required at a global level and that adaptation is required at local levels, urgently requires the development of knowledge and tools to assist the development of mitigation and adaptation strategies. As the Arctic, and particularly its mountain regions, contributes little to the global emission of carbon, the residents of the North have a minor role to play in global mitigation. However, because of the amplification of global warming in the Arctic, ***the residents of the north need to urgently develop appropriate adaptation strategies.*** Such strategies must be developed at a local scale to reflect geographical and other specific conditions of various localities. Unfortunately, our information on climate change and its impacts at local levels is severely challenged: at best our predictions of climate change are regional in nature, and our understanding of impacts is at either plot (m²) or regional (1000's of km²) scales.

It is necessary to solve scaling issues in predicting climate change and its multiple interacting impacts and to develop tools that can be used by local, regional and national planning authorities to develop local adaptation strategies to improve the quality of life for northern and mountain residents. Stakeholders at all levels need to be consulted at an early stage in the development of these tools and the monitoring community needs to re-appraise its activities by considering monitoring aimed at identifying the success of mitigation and adaptation strategies. Of course research and monitoring concerned with identifying and predicting climate change and its impacts should proceed as earlier, but with a greater emphasis on reducing specific uncertainties (for example the balance over time between multiple biospheric feedbacks to climate) and trying to avoid surprises (such as the un-predicted accelerated rate of loss of sea ice).

The Abisko Station has been successful in gaining an award from the Swedish Science Research Councils for a multidisciplinary project to assess climate change and its impacts at the local scale and to develop adaptation strategies. Within AMAP (Arctic Monitoring and Assessment Programme), a climate downscaling initiative will co-ordinate and encourage similar projects throughout the North. Details of the Abisko Project and the web address for the AMAP programme can be found in the SCANNET Newsletter 12, March 2008 where this article was first published (www.SCANNET.nu).