Polar biogeochemistry and ecosystem feedback mechanisms in a changing environment

The following ten papers are based on presentations made in the sessions on *Terrestrial systems and feedbacks on climate change* (session 3) and *Biogeochemical cycles in the Arctic and Antarctic* (session 6). The issues addressed in these sessions all dealt with research questions identified as of highest priority in several programmes under the International Geosphere-Biosphere Programme (IGBP) such as GCTE, BAHC, IGAC, WOCE and JGOFS.

Session 3 was organized in close conjunction with the IASC-GCTE FATE Working Group which is promoting the implementation of the research priorities laid out in the IASC priority research plan on Feedbacks from Arctic Terrestrial Ecosystems (FATE). The IASC-FATE plan was developed following a series of recommendations coming out of several international meetings, including a major conference on Global Change and Arctic Terrestrial Ecosystems held in Oppdal, Norway, in 1993. For the IASC-FATE research community session 3 at the 1998 Polar Aspects of Global Change symposium therefore constituted a nice chance to meet and review progress since Oppdal.

Session 6 welcomed oral presentations on CO_2 and CH_4 exchanges between the atmosphere and the Arctic tundra and the polar seas, on the functioning of the biological pump of CO_2 and on the silica cycle from present to past; effects of climatic variations on the carbon flux in the Barents and Greenland seas were also demonstrated. Poster presentations dealt with case studies on the impacts of climatic changes on the geochemistry, the biogeochemistry and the biology of terrestrial and aquatic ecosystems.

Significant advances have been made during the past decade in our understanding of Arctic and Antarctic biogeochemical processes in relation to feedback mechanisms on global change, although many important uncertainties remain. It is our opinion that the following set of papers is a clear reflection of this progress in the last years of the 20th century, as well as a signpost indicating major gaps in our understanding of crucial polar ecosystem and biogeochemical processes as we enter a new millennium.

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