

# Editorial: Change at the Poles - A Paleoscience Perspective

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The transfer of heat between tropical and polar regions is fundamental to balancing longitudinal climate gradients in the Earth System. Paleoclimate records demonstrate, however, that this atmospheric and oceanic meridional "dance" is actually never quite in balance. Rather, external orbital (Milankovitch) forcing and system feedbacks combine to produce complex sets of spatial and temporal cycles that are recorded at regional and hemispheric scales through various geological proxies. Characterizing this natural variability is important, particularly in the face of observations that our planet is undergoing rapid change, largely caused by human practices.

Some of the most iconic images of contemporary change include the truly remarkable loss of Arctic summer sea ice and the disintegration of gigantic sections of ice shelves around the Antarctic Peninsula. One primary scientific theme of the International Polar Year (2007-2009; [www.ipy.org/](http://www.ipy.org/)) is to advance the frontiers of polar science and expand our understanding of the magnitude and rates of processes and feedbacks, not only through trans-global linkages between polar regions but also through interactions of the poles with the rest of the world.

Because many readers of *PAGES News* may be unaware of the broad dimensions of polar paleoclimate science, this issue serves to highlight the spectrum of ongoing studies contributing to interna-

tional initiatives that are establishing new benchmarks in polar research. The papers represent a wide range of efforts, covering a variety of proxy records, using numerous types of field operations, laboratory techniques, and data analyses. These studies require scientists to deal with extreme climatic and logistical challenges. International funding agencies are recognizing the need to support the development of sophisticated equipment to be used to overcome these practical challenges. Much of this has been achieved through difficult but innovative national and international collaborations, which create an advanced and sophisticated polar geoscience knowledge base for use in solving globally relevant questions, especially through global models that fully incorporate polar processes.

With this issue we would like to recognize the contributions of individual scientists resourcefully pushing to obtain the funding for innovative scientific programs. Many of the studies highlighted here represent significant contributions to quantifying how past change is measured in a variety of polar systems. Furthermore, exciting new initiatives advancing polar science continue to be developed and have the potential to produce future results relevant to both the PAGES and general scientific communities. Significant value will be added after the IPY in the form of workshops and conferences aimed at synthesizing these remarkable records.


Additionally, we need to acknowledge the technicians and engineers who have been creatively overcoming logistical and operational challenges to develop the equipment/instrumentation technology necessary for allowing polar science to make these amazing advances.

The IPY science umbrella has generated a number of topical and integrative initiatives that require open input from the science community at large. These include Bipolar Climate Machinery (BIPOMAC) (*PAGES news*, 2008, 16(1)), aimed at integrating records from both the northern and southern hemisphere, APEX (Arctic Paleoclimate Extremes), aimed at the Arctic paleoclimate "extremes" versus the "normal" conditions of the climate system, and ACE (Antarctic Climate Evolution), aimed at the study of the climate and glacial history of Antarctica through paleoclimate and ice sheet modeling investigations, resolved to integrate terrestrial and marine geological and geophysical evidence for past change. As plans for synthesis workshops unfold, we invite the science community to become involved in contributing to these benchmark efforts. Additionally, in early 2008, PAGES launched a new Working Group on Arctic climate of the last 2 millennia (Arctic2k), which generates and synthesizes high-resolution paleoclimate data to assess the timing and variability of Arctic climate change during this period ([www.pages-igbp.org/science/arctic2k/](http://www.pages-igbp.org/science/arctic2k/)).




## PAGES Calendar 2009

25 Apr 2009 - Vienna, Austria

 Data-Assimilation Techniques for Paleoclimate Data


[www.pages-igbp.org/calendar/](http://www.pages-igbp.org/calendar/)

18 - 20 May 2009 - Vihula, Estonia

 Peatland Archives of Holocene Climate Variability

[www.pages-igbp.org/calendar/](http://www.pages-igbp.org/calendar/)

20 - 25 May 2009 - Addis Ababa, Ethiopia

 2<sup>nd</sup> Eastern African Quaternary Association Workshop

[www.pages-igbp.org/calendar/](http://www.pages-igbp.org/calendar/)

06 - 11 Jun 2009 - Obergurgl, Austria

Mechanisms of Quaternary Climate Change: Stability of Warm Phases in the Past and Future


[www.esf.org/index.php?id=5310](http://www.esf.org/index.php?id=5310)

23 - 26 Jun 2009 - Guadalajara, Mexico

11<sup>th</sup> International Paleolimnology Symposium


[www.geofisica.unam.mx/paleolimnologia/](http://www.geofisica.unam.mx/paleolimnologia/)

06 - 07 Jul 2009 - Corvallis, USA

 PAGES 1<sup>st</sup> Young Scientists Meeting: Retrospective Views on Our Planet's Future

[www.pages-osm.org/ysm/](http://www.pages-osm.org/ysm/)

08 - 11 Jul 2009 - Corvallis, USA

 PAGES 3<sup>rd</sup> Open Science Meeting: Retrospective Views on Our Planet's Future

[www.pages-osm.org/osm/](http://www.pages-osm.org/osm/)