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## Study Merges Decade of Arctic Data as Ice Collapses Into the Sea

22.09.2008

&gt; nächste Meldung &gt;

**Last month, immense ice shelves collapsed into the Arctic Ocean. Polar bears are losing vital hunting grounds and countries are now staking claims to potential oil reserves under the pole. To better gauge the climate changes, Ohio researchers will "reanalyze" a decade of atmospheric, sea, ice and land surface data merged into a single computer model.**

Anzeige



The Markham Ice Shelf, a massive 19-square-mile platform of ice, broke away from Ellesmere Island in early August and is adrift in the Arctic Ocean. More than half of the nearby Serson Ice Shelf – about 47 square miles – also recently broke away into the sea.

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The accelerating sea-ice melt that last summer opened the Northwest Passage through the Canadian Arctic for the first time since satellite records began in 1978 may signal a significant climatic shift that has serious economic and ecological implications for wildlife, natural resources and world politics.

"The summer ice melting has been advancing much faster than any of the climate models predicted," said David H. Bromwich, Ph.D., a senior research scientist with the Polar Meteorology Group of the Byrd Polar Research Center and a professor with the department of geography at The Ohio State University. "The Arctic region is a very heterogeneous environment, and it's extremely important that we better understand what's happening there in order to predict the future more accurately."

To better understand the evolving northern polar

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a decade of detailed atmospheric, sea, ice and land surface measurements into a single computer model-based synthesis. The coupling of these immense data sets will produce complex and instructive descriptions of the changes occurring across the normally frigid, remote region.

An interdisciplinary collaboration of scientists, led by Dr. Bromwich, will "reanalyze" Arctic data from the past decade at three-hour intervals, 15-kilometer distances and 70 layers from the surface of the Earth to the top of the atmosphere. The study area encompasses the Arctic Ocean, the surrounding landmasses and the rivers that drain into the ocean – an enormous area of nearly 29 million square miles.

"We used to think of places like the Arctic as 'data sparse;' they are remote, largely unpopulated with limited measurements of temperatures, winds, etc., and have challenging environments," said Dr. Bromwich, who as a member of the Intergovernmental Panel of Climate Change shared a Nobel Peace Prize with former Vice President Al Gore in 2007.

"With the introduction of space-borne measurements over the last few decades, researchers have been inundated with vast amounts of information. Today, the trick is to figure out how to effectively use all the diverse information sources."

To make sense of the numbers, Dr. Bromwich and his team turned to the Ohio Supercomputer Center for help with the four-year project. The scientists will fill about 350 terabytes of OSC storage space and employ 1,000 cores of the Center's IBM 1350 Opteron cluster over several months to create detailed visualizations.

"OSC is providing the project with resources that will allow us to complete our work in a limited time frame," Dr. Bromwich said. "Other computation centers likely could not have provided the CPU cycles or stored such vast amounts of data."

The National Science Foundation, as part of the International Polar Year observance, funds the Arctic System Reanalysis project, the first comprehensive environmental reanalysis project led by the academic community. IPY is a large scientific program focusing on the Arctic and the Antarctic from March 2007 to March 2009.

This observance comes "amidst abundant evidence of changes in snow and ice: reductions in extent and mass of glaciers and ice sheets, reductions in area, timing, and duration of snow cover, and reductions in extent and thickness of sea ice," according to IPY. "Changes in snow cover and sea ice have immediate local consequences for terrestrial and marine ecosystems."

Each summer, polar bears are being forced from their seal-hunting grounds on the melting sea ice, endangering their limited populations. Hundreds of thousands of acres of peat moss may decompose and begin to release higher amounts of methane and carbon dioxide, potentially accelerating the accumulation of greenhouse gases in the atmosphere, according to Dr. Bromwich.

Arctic countries are already jostling for political control of one of Earth's last remaining frontiers, he said. Russia, Denmark and Canada have claimed the Arctic sea floor in hopes of securing valuable oil, gas and mineral rights. Canada also is claiming political control over shipping lanes that pass by that country's northern islands, and Russia may follow suit, as passages near its shores are nearly clear of ice.

Images of Dr. Bromwich and his climate models are available.

Celebrating 20 years of service, the Ohio Supercomputer Center (OSC) and OARnet are catalytic partners of Ohio universities and industries that provide a reliable high performance computing and high performance networking infrastructure for a diverse statewide/regional community including education, academic research, industry, and state government. Funded by the Ohio Board of Regents, OSC and OARnet promote and stimulate computational research and education in order to act as a key enabler for the state's aspirations in advanced technology, information systems, and advanced industries. For additional information, visit <http://www.osc.edu>.



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Named in honor of one of America's most famous explorers, the Byrd Polar Research Center of The Ohio State University is recognized internationally as a leader in polar and alpine research. The Center's research programs are conducted throughout the world. Research at the Center focuses on the role of cold regions in the global climate system, with major themes focused on: climatic reconstruction of glacial and post-glacial times; polar ice-sheets: dynamics, history and ice-atmosphere interactions; high-latitude landform evolution, soils and hydrology; geologic evolution of Antarctica; investigations of ocean dynamics and environmental-chemical processes; and the history of polar exploration.

Jamie Abel | Quelle: Newswise Science News


Weitere Informationen: [www.osc.edu](http://www.osc.edu)

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