

The Antarctic is a region where the climate records from observations are both short and sparsely distributed. To address this limitation, the ice sheet and ocean floor will continue to be probed for information about past climate, by drilling ice cores and ocean sediment cores. Antarctic ice core records are providing new information on climate changes on the continent, the surrounding sea ice and Southern Ocean, and even Southern Australia.

FURTHER READING:

Barrie Pittock. *Climate Change: Turning up the heat*. CSIRO Publishing, 2005.
Spencer Weart. *The Discovery of Global Warming*. Harvard University Press, 2003.
Also online at <<http://www.aip.org/history/climate/>>
RealClimate Website: <<http://www.realclimate.org/>>

Given this concentrated, multi-faceted effort and the clear imperative for understanding the climate changes we face in the future, Australian Antarctic science is set to continue its record of major contributions to international climate research.

—TAS van OMMEN
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A new international programme for Antarctic climate research

A new scientific programme called 'Antarctica and the Global Climate System' (AGCS), will focus research attention on the Antarctic climate and its interaction with the global climate.

The programme is one of five flagship activities of the Scientific Committee on Antarctic Research, and 12 nations, including Australia, have submitted plans to address issues covering four main themes.

The first theme will look at climatic change across Antarctica and the Southern Ocean and try to better describe and understand climate variability over decadal time spans. The work will largely rely on observational data and computer modelling. Research will investigate, for example: changes in the El Niño Southern Oscillation that might relate to Antarctica and the Southern Ocean; shifts seen in many post-1970s climate indicators; and recent trends in atmospheric pressure and winds around Antarctica (connected with a phenomenon known as the Southern Annular Mode).

The second theme aims to use ice cores to better reconstruct the climate since the peak of the last ice age, and particularly over the last 10 000 years (the Holocene Period).

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A key activity, and one in which Australia has played a significant role, is the calibration and understanding of the relationships between typical climate parameters (such as temperature) and the dozens of properties that are measured from ice cores.

The third AGCS theme aims to separate the Antarctic climate response to natural and human influences. To do this, researchers will develop climate models and run simulations to evaluate Antarctic and Southern Ocean climate responses under different scenarios of natural variation and human activities.

Australian researchers will focus on the response of the ice sheet to warming and its consequent impact on sea level. This work will involve enhancing climate models, by adding interactions between the ocean and ice shelves, which are currently not included.

The fourth theme of the programme looks at how Antarctic climate processes influence the global climate. We know, for example, that the formation of deep, salty, cold ocean water around Antarctica has a global impact. Computer model simulations and direct oceanographic observations will help us study these processes.

The AGCS programme runs from 2005-2010. It will include a number of international activities throughout the International Polar Year (2007-2009) and will provide a valuable forum for the development of Antarctic climate science into the future.

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