

ICECAP Completes First Field Season

February 18 — Scientists have become increasingly concerned about the potential impacts of climate change on the East Antarctic Ice Sheet, the largest remaining body of ice on Earth. They warn that ice filled basins within the ice sheet could melt in a warmer world and release large volumes of water into the sea, raising global sea levels.



The ICECAP team

has successfully completed the first of three field seasons in East Antarctica using an upgraded World War II-era DC-3. Photo: Jack Holt. [See more photos.](#)

Researchers with the ICECAP (Investigating the Cryospheric Evolution of the Central Antarctic Plate) project are flying an upgraded World War II-era DC-3 aircraft with a suite of geophysical instruments to map the thickness of the ice sheet and measure the texture, composition, density and topography of rocks below the ice. The data will help them model East Antarctic ice stability, forecast how the ice might react to climate change, and show its potential impact on global sea level. They also hope to discover the oldest deposits of ice, which would indicate the best sites for drilling ice cores and reconstructing past climate.

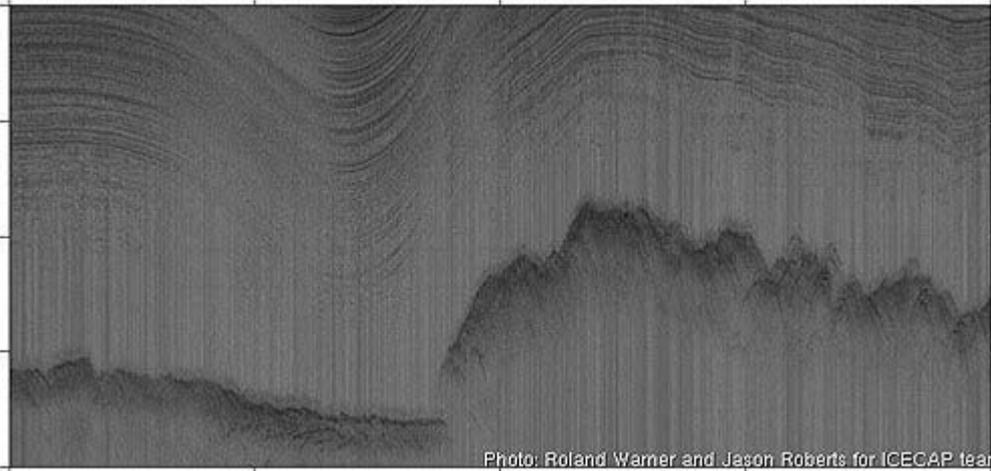


Photo: Roland Warner and Jason Roberts for ICECAP team. Preliminary

processing of radar signals. This 60 kilometer long snippet from one flight line, shows the lower half of the ice sheet. The strong bedrock reflection is seen through about 4 kilometers of ice, and internal layers in the ice can be seen sweeping over an 800 meter change in bedrock height. Image: Roland Warner and Jason Roberts.

The ICECAP team—consisting of researchers primarily from the University of Texas at Austin’s Jackson School of Geosciences, the University of Edinburgh, the University of Tasmania, and the Australian Antarctic Division—has just successfully completed the first of three field seasons in East Antarctica. During three weeks in January and February, the team flew over 30,000 kilometers of aerogeophysical survey lines out of Australia’s Casey Station. They made 14 flights and gathered over a terabyte (one thousand gigabytes) of data. Preliminary data processing has already revealed that the Aurora Subglacial Basin region contains a wide variety of landscapes beneath the ice, from smoothly rolling plains to large mountain ranges cut by deep valleys, and new lakes beneath the ice.

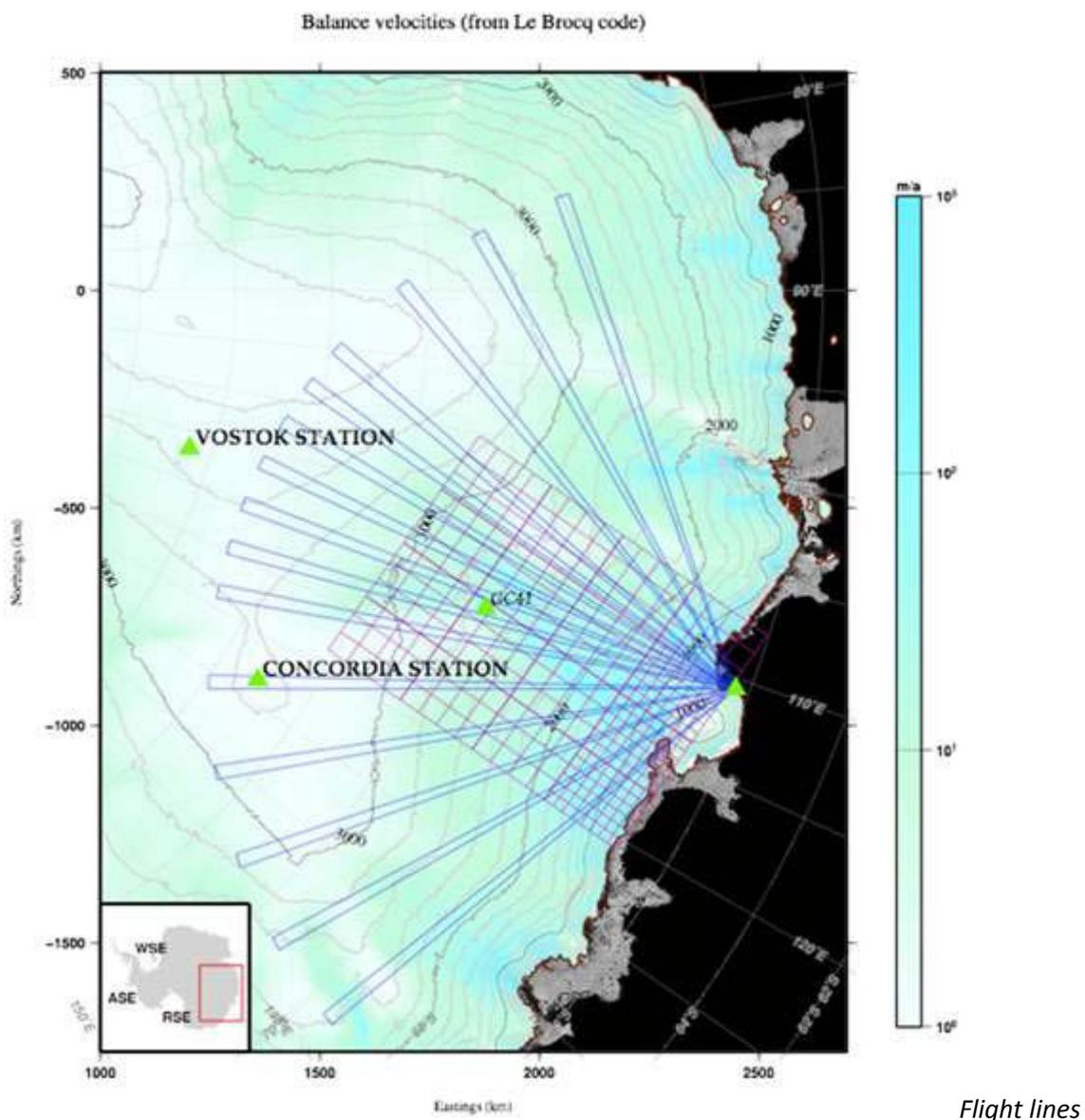


Part of the

ICECAP team with the DC-3 aircraft at McMurdo Station, Antarctica. Photo: Jack Holt. [See more photos.](#)

Casey Station is a permanent base situated on the coast of Antarctica 3,880 kilometers due south of Perth, Australia. Before now, very little was known about the ice sheet south and west of Casey, apart from a few ground traverses by Australian researchers in the 1970s and 1980s. At more than two thousand kilometers per trip, each ICECAP flight covered in a few hours what previously took entire seasons on the ground. Flights, which fanned out in radial lines from the station, were mostly carried out at night to minimize solar magnetic noise.

In the past, scientists surveying the Antarctic ice sheets from the air relied either on heavy cargo planes with poor fuel efficiency but long range, or lighter planes with better fuel efficiency but short range. To fly lighter planes far into the interior of the continent, support planes had to fly in additional fuel from a coastal port, multiplying fuel costs several times.



radiate from Casey Station on the Antarctic coast (right) where the ICECAP team collected radar data

over part of the East Antarctic Ice Sheet, including the Aurora Subglacial Basin, the Astrolabe Basin and the edge of Totten Glacier. Grids indicate flights planned for the second field season in 2009/10.

With the upgraded DC-3, the ICECAP team gets a combination of efficiency and range, minimizing the project's carbon footprint at a time when high oil prices have caused federal funding agencies to scale back scientific studies in the polar regions.

"We're getting much more science done with less oil using this old airframe with modern engines," said Don Blankenship, research scientist at the Jackson School's Institute for Geophysics and a principal investigator for ICECAP. The University of Texas contingent also includes Jack Holt, Duncan Young, Scott Kempf, Gonzo Echeverry, Dustin Schroeder, Jamin Greenbaum, and Isaac Smith.

Martin Siegert, head of the school of Geosciences at the University of Edinburgh, leads the ICECAP team's U.K. contingent. Tas van Ommen, principal research scientist at the Australian Antarctic Division, leads the Australian contingent. The field team included scientists Andy Wright (Edinburgh), Roland Warner (AAD) and Jason Roberts (AAD). Other institutions with major involvement include the University of Bristol (U.K.), the University of Cambridge (U.K.) and the University of Melbourne (Australia)."

In the second field season, the team plans to fly radial survey lines from McMurdo Station, the main U.S. base in Antarctica, to probe the ice in the Wilkes Subglacial Basin. They will also return to Casey to collect data on the Aurora Subglacial Basin, Law Dome and Totten Glacier, this time flying a grid pattern.

Funding for ICECAP is provided by the U.K. Natural Environment Research Council, the Australian Antarctic Division, the U.S. National Science Foundation and the Jackson School of Geosciences.

ICECAP is part of the International Polar Year, an international scientific research program focused on polar regions, 50 years after the 1957-59 International Geophysical Year. Learn more at <http://www.ipy.org/>

Multimedia:

Video: [Jack Holt's interview with the Exploratorium](#)

<http://icestories.exploratorium.edu/dispatches/mapping-east-antarcticas-uncharted-territory/>

ICECAP Photo gallery

<http://www.ig.utexas.edu/research/projects/icecap/gallery.html>

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On February 25th 2009, the IPY Joint Committee will release a report on 'The State of Polar Research'. In the lead-up to this event, major IPY research projects are releasing information for the press, and making themselves available for media enquiries. A wide range of projects will be profiled reflecting the diversity of IPY. For more information, please visit http://www.ipy.org/index.php?ipy/detail/feb09_projects/