

# Post-IPY: Arctic Mapping Continues

Just as the 1957–1958 International Polar Year (IPY) marked the beginning of a decades<sup>™</sup> long effort to map and understand the Arctic Ocean, the present IPY, which ended on 1 March 2009, is being followed by a surge of activity. I am honoured to play a small part in this.

*National Geographic's 'Arctic Landgrab' article (May 2009, vol. 205, no. 5, pp. 104-121) recently showed the areas north of Alaska surveyed by scientists from the University of New Hampshire's Center for Coastal and Ocean Mapping (CCOM, 1) in support of a future US submission to the UNCLOS. I have been fortunate to have participated in three of four of these multi-beam surveys by the American icebreaker USCGC Healy, in 2003, 2004 and 2008.*

While the USA and Canada study the area of my 1960's doctoral work from drifting Ice Station T-3 (Fletcher's Ice Island), Prof. Yngve Kristoffersen and I have been busy on the other side of the Arctic Ocean. Our research hovercraft, the R/H *Sabvabaa* (2), is now in its second summer of deployments onto the permanent pack from Longyearbyen, Svalbard. To date, eight week-long trips have taken pairs of young Norwegian high-school students, interested in a career in polar science, up to the ice over the Yermak Plateau north of Svalbard. These are a small part of Norway's IPY contribution, entitled

'IPY Classroom on the Ice'. During these forays, students have used the hovercraft as a platform for glaciological, oceanographic, and geological and geophysical measurements, testing out the specialised equipment developed for the hovercraft. Thus far, the learning curve totals well over 5,000nmi of travel north of the Arctic Circle.

For deep sampling, we have a lightweight, 170kg, hydraulically powered winch with capstan, adjacent to the hovercraft in a closed tent, handling 3,000m of Kevlar rope with a breaking strength of over 2 tons. Cores 2 metres long can be taken with a hydrostatically powered corer, and a stainless steel dredge can break off rocks from steep submarine slopes. For oceanography, a lightweight hydraulic CTD winch with 500m of single-conductor cable allows rapid casts with a SBE 19plus v2 SeaCat, as well as an Aagaard Doppler current meter. Our Geonics EM-31 ice-thickness probe has been remounted, and has acquired hundreds of kilometres of valuable ice thicknesses. And our Knudsen

12/200kHz echosounder is being remounted under-wing, with a hydraulic lift to allow sounding while hovering at speed. Tests are also ongoing on the various components of our autonomous drifting seismic and echosounding buoys (see the Insider's View, May and December 2008).

The stage is now set for collaboration with Arctic stakeholders willing to trade logistical support (food, fuel, and other resupply) for seismic, geological and oceanographic data from the most inaccessible parts of the Arctic, north of Greenland and Ellesmere (3).