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AUV science in extreme environments, into the next decade

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The Autosub Under Ice (www.noc.soton.ac.uk/aui) programme developed new technology to address scientific questions concerning sea ice and ice shelves in the Antarctic and Arctic. The successor programme, CASEE (Collaborative Autosub Science in Extreme Environments) aims to share the hard won AUI expertise and forge further international collaborations. In March 2006 a Masterclass in AUV Technology for Polar Science addressed the engineering and technical issues (www.noc.soton.ac.uk/CASEE).

This paper will summarise the findings from a workshop (11-13th April, Scott Polar Research Institute, Cambridge UK) concentrating on the science which has been undertaken in polar and other extreme environments using AUVs, then look forward into the next decade to explore what could be achieved with current technologies and what further developments are required. Topics covered will include: Ice sheet and ice shelf studies, validation of satellite data e.g. Cryosat, requirements of the climate/ocean modellers, flows and mixing under ice and in deep trenches, deploying moorings below ice, pp-up ice melting packages, sub-glacial lakes, water sampling, chemical sensor packages, going deep – Autosub 6000 plans, side scan and sub-bottom profiling, mid ocean ridge studies, hydrothermal vents (oceanic and under Antarctic ice), survey scale - ship, AUV and ROV integration, AUV sizes, prop-driven, gliders and floats, lessons from the sea mammal oceanographic monitoring studies