

## Ice Shelf Access Drilling - ANDRILL's Recent Experience at Coulman High

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The ANDRILL Coulman High (CH) Project Site Surveys, which were conducted from November 2010 through January 2011 using the ANDRILL hot water drill system, achieved all primary and secondary objectives. We demonstrated a safe traverse route from McMurdo Station across the Ross Ice Shelf to CH and established safe operating areas using ground-penetrating radar supplemented by airborne radar. A series of combined US-NZ field camps on the RIS were occupied, and the ANDRILL hot water drill (HWD) system was used to melt numerous holes through 250-275 meters of ice shelf.

Oceanographic inductive moorings were deployed through the RIS at two sites and were recovered to the ice surface after two months. We acquired video camera observations of the interior and basal surface of the ice shelf, and these observations were integrated with conductivity-temperature-depth (CTD) measurements through the ice shelf to the seafloor at each site. The Submersible Capable of under-Ice Navigation and Imaging (SCINI) underwater remotely operated vehicle (ROV) was deployed through 260 meters of ice to explore the underside of the ice shelf while conducting operational testing. Lateral and vertical ice motions were monitored by GPS stations installed at four sites to provide data that will contribute to the development of a tidal model that will be used to evaluate the potential impacts on the drill riser for planned geological drilling. The ANDRILL hot-water drill system operated well throughout the field season and allowed all of the science and operational goals of the project to be met.

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