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The PicoR-Ice System - Personal GPR for Measuring Ice and Snow Thickness

Chris Hill

Chief Operating Officer
Canatec Environmental Limited
Calgary, AB, Canada

ABSTRACT

PicoR-Ice allows continuous, real-time, non-invasive calculation of ice thickness along an ice road, across a frozen stream, on an outdoor skating rink, on a frozen lake surface. PicoR-Ice is Ground Penetrating Radar (GPR) technology that is extremely compact and lightweight to the point of being a "personal GPR." The sensing unit generates a 1700 MHz pulse downward to the underfoot subsurface. The selected frequency maximizes resolution in the first three metres underfoot at the expense of deeper pulse penetration. A selection of software algorithms processes reflected data and calculates the substrate thickness according to user-defined parameters. Use of PicoR-Ice in Russia is primarily as a vehicle mounted sensor used to survey ice-road thickness. The system is being introduced on Canada as a hand-held tool for limited area ice and snow thickness measurement. The presentation will feature a fully functional PicoR-Ice unit and some local measurement samples.

SPEAKER'S BIOGRAPHY

Following graduation from the University of Calgary's physical geography program, **Chris Hill** worked nine years in Dome Petroleum's Beaufort Sea Project. He gained practical sea-ice reconnaissance and analysis experience, including management of satellite image acquisitions and analysis of airborne synthetic aperture radar imagery for all-weather ice reconnaissance. His areas of expertise include regional sea-ice regimes; satellite image data acquisition planning; sea-ice interpretation from satellite and airborne imagery; management of field ice information installations; and operational ice forecasting. He has been involved in companies named Canatec since 1988 and has been active in providing ice consulting services to offshore operators and regulators in the Canadian Arctic, Chukchi Sea, Sea of Okhotsk, and Caspian Sea. His present ventures are Canatec Environmental Limited and Canatec-Eurasia LLP, a Kazakhstan-based company which distributes PicoR-Ice.