beadedstream

ARCTIC SEA ICE MASS BALANCE MONITORING

CASE STUDY

*At the forefront of Arctic environmental monitoring, the University of Manitoba's Center for Earth Observation Science (CEOS) focuses on deciphering the dynamics of ice growth and melt by studying the heat exchange between the ocean, ice, and atmosphere. This challenging endeavor is further compounded by the remote and harsh conditions of the Arctic, demanding specialized solutions for accurate data collection. To address these challenges, CEOS integrated the innovative **beaded**stream Digital Temperature Cables into their sea ice mass balance buoys, providing a reliable and high-resolution solution for monitoring temperature dynamics in this unique environment.*

University of Manitoba

Manitoba, Canada

Application

In the realm of Arctic environmental monitoring, CEOS faces the formidable challenge of obtaining reliable data sets. The research involves investigating the intricate interplay of heat exchange within the Arctic environment, particularly in locations critical to global climate studies such as the Beaufort Sea, Daneborg, Greenland, and Station Nord, Greenland. Existing buoys, strategically installed in these locations, seek to provide insights into the complex dynamics of ice growth and melt. However, the harsh and remote conditions of the Arctic make data collection both expensive and difficult.

*CEOS station with **beaded**stream Digital Temperature Cables integrated into sea ice mass balance buoys,*

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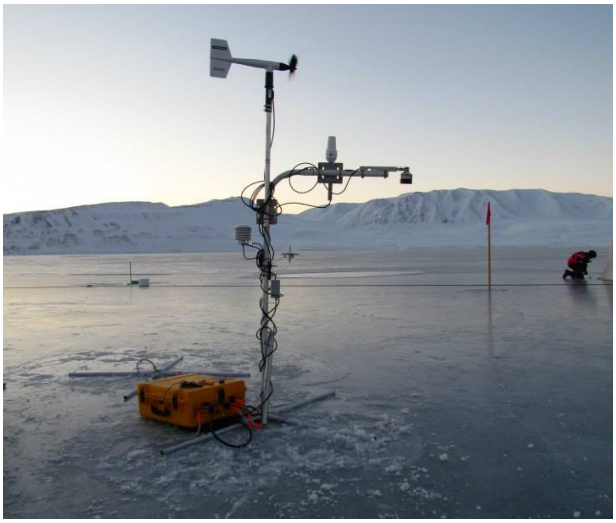
beadedstream Solution

To overcome the challenges of Arctic environmental monitoring, CEOS integrated **beaded**stream Digital Temperature Cables as crucial components of sea ice mass balance buoys. These crucial components boast instrumented lengths ranging from 20 to 197 feet, hosting 45-71 sensors per cable. The sensor spacing, starting at 10cm near the ice surface and expanding to 500cm towards the water bottom, ensures high resolution. Strategically deployed at each buoy installation, these cables traverse through sea ice into near-surface waters. For added sea protection, the thermistor cables are wrapped in white shrink wrap and connected to existing Campbell Scientific data loggers. This flexible and compatible solution effectively addresses the unique challenges presented by the harsh Arctic conditions, providing a reliable means to collect high-resolution temperature data and enhance our understanding of ice growth and melt dynamics.



*Deployment of the CEOS station, integrating **beaded**stream's advanced temperature monitoring cables into the Arctic sea ice.*

A staff member secures a Campbell Scientific data logger underground, ensuring precise temperature monitoring for CEOS at the Arctic station.

beadedstream Solution Benefits

Researchers at CEOS selected **beaded**stream's digital thermistor cables for their ability to monitor a large number of sensors per cable, aligning seamlessly with the demands of digital technology. The cables' compatibility with third-party loggers ensures easy integration into existing buoy installations, offering a practical advantage in the challenging Arctic environment. The successful deployment of **beaded**stream's technology not only enhances the efficiency of modeling ice growth and melt but also underscores its suitability for advancing scientific understanding in complex Arctic ecosystems.