

SmartICE I Canada

Summary

Warmer temperatures have been exponentially affecting our planet's ecosystems. Some of the most severely affected are the polar regions -the Arctic and Antarctica. However, SmartICE (Sea-ice Monitoring and Real-Time Information for Coastal Environments) has developed an integrated, near real-time monitoring and dissemination system to help Inuit people adapt to rapidly changing sea-ice conditions in Arctic Canada. This ICT tool was developed by a university-community-government-industry partnership, led by Memorial University of Newfoundland. A network of stationary and mobile sensors that measure sea-ice thickness, together with ice hazard maps generated from satellite imagery help Inuit make decisions on sea-ice travel by providing information that reduces risks and allows for the planning of safe routes. Through technological innovation, SmartICE strives to integrate and augment Inuit knowledge about local sea-ice conditions - not replace it - while involving Inuit in all aspects of its operation and decision-making.

Key Facts

- SmartICE is established in two pilot Arctic communities and expanding to five others in 2017/18;
- Since 2013, SmartICE has secured support valued at CA\$3.5 million to develop its Information and Communications Technology in pilot communities;
- In 2016 SmartICE shared the Arctic Inspiration Prize for its knowledge-to-action plan to establish a northern social enterprise for expansion of its services across the Arctic.

The Problem

Due to climate change and warmer winters, the ice around Arctic coastal communities is becoming thinner and shortening the "safe" ice season. For example, thinner ice is making it more difficult for people to hunt and fish safely, activities that provide important source of nutritious food in the region. But sea ice is not only a hunting platform and travel highway, it defines Inuit culture and identity. Increased risk or fear of travelling on the ice has therefore severe repercussions for cultural practice and community wellbeing. Changing climate also has the potential to negatively affect community-based economies, such as tourism and fisheries, for which sustainability depends on safe and predictable sea-ice. Climate change presents significant risks to industries where travel safety is paramount for market confidence and growth and predictable ice conditions are essential for smooth operation and profitability. For Inuit a key barrier to climate change adaptation is the availability of suitable sea-ice information at the right time, and in a format that is both comprehensible and accessible.

The Solution

In full partnership with Inuit, SmartICE partners have developed a monitoring and information system to take advantage of communications technology that is now appearing in Arctic communities. SmartICE technology allows trained Inuit operators to acquire and disseminate information on sea-ice thickness and surface characteristics, in near real-time, to support safe travel decision-making under unpredictable and dangerous conditions. SmartICE is a climate change adaptation tool that integrates technology, remote sensing, and indigenous knowledge to produce information on sea-ice status according to user needs. SmartICE generates sea-ice hazard maps at the community scale every 7-10 days, more often during more dynamic ice freeze-up and break-up periods. At least once a week SmartICE operators travel along community trails towing a mobile ice-thickness sensor on sleds (SmartQAMUTIK). A SmartICE app provides the latest sea-ice information, records real-time observations by travellers, and is co-designed and operated by Inuit.

Helping the Planet

This project stresses the importance of climate change adaptation that incorporates local knowledge. Research and monitoring results from SmartICE provide critical information to aid understanding of rapidly changing ice conditions and support culturally appropriate adaptation actions. Although primarily designed to support ice-travel safety, SmartICE observations also inform winter harvesting programs, search-and-rescue operations, ecosystem monitoring, and sea-ice technology validation. For instance, SmartICE is working with the winter tourism industry, inshore winter fisheries and emergency management offices to support proactive adaptive actions to help mitigate potential negative effects of climate change on these ice-based operations.

Helping People

The SmartICE information system directly benefits public safety, food security, and health and wellbeing in Arctic communities. In addition, SmartICE enables and supports sustainable resource development for communities and industries alike. Their operational model commits to maximizing social impact and creating positive community change, while applying an entrepreneurial approach to the delivery of sea-ice information services across the Arctic. Through their operations, SmartICE harnesses the vast potential of Inuit youth and inspires a new generation to embrace knowledge and research as a vehicle for economic development in their communities.

Spillover Effect

SmartICE is responding to this greater demand for information in two ways. In order to expand from current pilot programs, SmartICE is operationalizing its services and creating an implementation plan for expansion. Services of this new social enterprise, *SmartICE Sea ice Monitoring & Information Inc.*, will be operated by trained community members and informed by Inuit knowledge and values. SmartICE is establishing its operational hub in the Arctic that will create a model for replicating community-based, Inuit operated sea-ice information services in northern communities.

More information

Digital assets are available for download at: <http://unfccc.thirdlight.com/a.tlx?l=9ffm9Iji>

Contact:

Affiliation add Memorial University of Newfoundland

Trevor Bell - University Research Professor

tbell@mun.ca | +1-709-864-2525 (office) + 1-709-693-6723 (mobile)

preferred company/organization webpage (url): <https://www.smartice.org/>

Twitter handle: @tbellnl

Facebook page

UN Climate Change secretariat

Sarah Marchildon | smarchildon@unfccc.int | +49 228 815 1065

momentum4change.org