TERRITOIRES

A successful marriage between technology and traditional knowledge

SmartICE sensors have recently appeared in the community of Tuktoyaktuk. Combining traditional knowledge and modern technologies, these instruments are of great use in obtaining reliable values on ice thickness.

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For several decades, the community of Tuktoyaktuk has been strongly affected by global warming. Sea ice is melting there at an alarming rate, which causes hazardous travel conditions for its inhabitants and complicates the harvest of traditional food.

Thanks to the recent installation of SmartICE sensors, it has recently been possible to consult real-time data concerning the thickness of the ice in the territory. The SmartICE tool, which translates to “sea ice monitoring and real-time information for coastal environments”, relies on the effectiveness of combining traditional knowledge and advanced technologies. Local employees are thus solicited to make their contribution to carry out data collections which will also be used for research on global warming.

There are several reasons why Tuktoyaktuk now finds itself with this technology: “SmartICE was approached by the Tuktoyaktuk Community Society at the end of 2018 because it was starting a three-year climate monitoring project in Tuktoyaktuk and ice thickness monitoring was going to be an important part of this project. They wanted SmartICE to provide equipment and training for their climate monitors, ”said Dr. Trevor Bell, founding director of SmartICE Sea Ice Monitoring and Information Inc.

During the same period, Dr. Bell was called to make the presentation of SmartICE within the framework of the operation NANOOK-NUNALIVUT 19, which took place in Resolute Bay as well as in Tuktoyaktuk: “I trained the Rangers of the first group of Canadian Ranger Patrol (Patrouille Tuktoyaktuk) to use our SmartQAMUTIK for ice thickness surveys, ”he adds.

Using technology to collect valuable data ...

Different instruments are used to collect data. “SmartICE has several tools for adapting to climate change: a stationary SmartBUOY sensor and a mobile SmartQAMUTIK sensor. We also provide our operators with a Castaway CTD (Conductivity, Temperature and Depth Sensor) ”, explains Zack Coombs, Operations Manager for SmartICE.

SmartBUOY sensors are stationary and are fitted with 60 thermistors fulfilling a role similar to that of a thermometer. Thermistors are located in water, snow or ambient air and calculate the thickness of snow and ice from the data collected which is transmitted once a day via satellite.

The SmartQAMUTIK, on the other hand, is a mobile sensor towed behind a snowmobile. As the vehicle drives along the ice, this sensor simultaneously measures the thickness of the snow and ice. When returning from his shipment, the operator only has to connect to the Internet and download the data collected in order to make them available on SIKU. “SIKU is an indigenous knowledge social network where community members can post weather information, hunting stories, view SmartICE data, and more. », Clarifies Mr. Coombs. In addition to being available on the Internet and on the SIKU application, the information can be found on social media as well as in printed documents.

Over the years, this data will prove useful in research on global warming. “It gives us a digital library to compare year after year with all the data on ice, air temperature and water, so it's all available to us with just the click of a mouse. We can compare the daily records and so on, ”says Tyrone Raddi, SmartICE project coordinator for the Tuktoyaktuk Community Society.

... by leveraging the traditional knowledge of the community

All this technology would be of little use without the essential contribution of the Tuktoyaktuk inhabitants, who have the necessary knowledge to ensure the proper functioning of these instruments. “What we are doing would not be possible without the support of communities and their traditional knowledge. SmartICE trains Inuit who are experienced hunters and sea ice travelers to operate our equipment. This technology is designed to be used in conjunction with community members who are familiar with sea ice conditions in their areas, ”says Zack Coombs.

The involvement of as many people as possible is essential to ensure the success of the project. "We are collaborating with Elders, Hunters and Trappers, Community Members, Community Councils through a series of public meetings to learn how and where to integrate and deploy technology in their area and in their community.” , he adds.

So local employees were hired to do this work: “We have eight people doing rotating shifts with two people at a time going and patrolling various locations in our harvest areas. Young people are always sent with an experienced person who is familiar with the places to which they travel ”, specifies Tyone Raddi.

A promising future

Building on its success, the company SmartICE received in 2016 its first distinction with the Arctic Inspiration Prize, which pays tribute to concepts of influence aiming to change things in different fields such as education, health, life. sociocultural, environment and economy in northern Canada.

Other SmartICE activities are planned in Kugluktuk, Grise Fiord, Iqaluit, Inuvik, Taloyoak and Gjoa Haven: “We are constantly communicating with new communities and discussing other expansion plans,” concludes Zack Coombs.

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Photo
Credit: Captain Soomin (Sam) Kim
Caption
Left to Right: Trevor Bell (SmartICE), Sgt Jackie Jacobson (Tuktoyaktuk Ranger Patrol) and John Woods (US National Ice Center)