



LOOKNorth

To Identify Sector Needs, Validate Technology

by Andrew Safer

Solving the technological challenges involved in developing natural resources in Canada's North is the focus of a new Center of Excellence that has received funding commitments of \$11.6m.

Based in St. John's, Newfoundland, Leading Observations and Knowledge for the North (LOOKNorth) will receive \$7.1 million from the Government of Canada from the 2010 Centers of Excellence for Commercialization and Research program over five years. The Government of Newfoundland and Labrador is providing \$2 million from the Department of Innovation, Trade and Rural Development and the Research and Development Corporation, and industry partners have committed \$2.5 million to date.

LOOKNorth is an initiative of C-CORE of St. John's, a research and development corporation with core expertise in radar and vision systems, ice engineering and geotechnical engineering. C-CORE provides applied R&D engineering related to regulatory, security, operational and market challenges, particularly in the natural resource and energy sectors.

The objective of LOOKNorth is to respond to information gaps by validating existing technologies in Canada's North to assist the natural resource sector in developing oil and gas, hydro and mining in the sub-Arctic and Arctic. The initial focus will be on the

use of Earth observation satellite technology to monitor conditions to provide the information industry needs to assess resource opportunities and initiate exploration and development.

To achieve this, LOOKNorth will link the needs of industry, remote sensing technologies that have proven themselves in non-northern environments, and the Canadian small businesses that have expertise in this area. That includes getting the technology through the last stages of development, if necessary, and facilitating the validation process in an operating environment. "These will be technical solutions that provide the best available information to support informed decisions on project designs for safer, more cost-effective, or environmentally responsible operations," said LOOKNorth Executive Director Paul Adlakha.

LOOKNorth will also scan the status of R&D initiatives in government, university and private-sector labs to identify relevant technologies and support them, as required, through the final stages of development. One area of interest is to gather high-resolution information on the concentration, location, and strength of mobile sea ice and icebergs to assist resource companies in planning cargo supply vessel operations. "Climate change is opening up the shipping season in the North," Adlakha said, "extending the open-water season to a time of year when there has tradition-



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ally been little marine transport. This extended season can dramatically change the economic model of a Northern project. Current guidelines regarding allowable transit areas are based on historical weather and ice risks. Since there's a greater amount of variability in conditions, additional information is required to support environmentally responsible transportation." He adds that regulations may allow operations provided they are equipped with the appropriate monitoring technologies and the approved ice-class vessel. Since shipping lanes in the North are not well charted, he adds, another priority will be to identify and validate technologies that can collect the necessary bathymetric data the resource sector requires. Sonar, AUV's and other alternatives to satellite technology could be used to collect this information subsea.

Another potential LOOKNorth project is to identify and validate technologies to collect the measurements needed to design the parameters for determining an acceptable level of reclamation for a mine site after it's been shut down. Adlakha notes that the parameters would have to be accepted by the Northern people, the regulatory bodies, and the company. "How do you bring to bear the appropriate information metrics that can be accepted by everybody?" he asked. "Satellite technology has a very strong potential to do that as it has done in southern environments, but a different type of satellite measurement may be required."

Since the freezing and break-up of ice roads in the North doesn't occur uniformly, he added that developing the capability to monitor them over several hundred or several thousand kilometers will be key. This will allow industry to determine their integrity as early as possible when frozen, know when they are starting to break up or melt, and detect when it's feasible to transport cargo by truck. Otherwise supplies have to be airlifted or sealifted into the operations at much higher cost. The ability to measure the stability of sea ice is a potential LOOKNorth project, Adlakha said, that would serve the interests of the oil and gas industry, as the operation of some offshore production platforms requires stable ice in the surrounding area.

Radar satellite technology will provide the principal platform for LOOKNorth's initiatives. This technology is ideally suited to the North, Adlakha said, because it acquires images of the Earth day and night (there are long periods of darkness in the North), and in all weather conditions including cloud cover and fog. Because it monitors from space, he added, this technology doesn't require a

land-based power source, and its operations aren't affected by the extreme temperatures of the North. Much of LOOKNorth's focus will leverage the investments made by the Government of Canada in RADARSAT 1 and 2, and also use additional radar satellites such as ENVISAT, TerraSAR-X, and COSMO-SkyMed.

At the LOOKNorth funding announcement in late January in St. John's, C-CORE President Charles Randell noted that the organization's experience leading the Polar View project for the European Space Agency "was an important consideration in C-CORE being named the Centre of Excellence for this initiative." Launched in 2003, Polar View is an 80-partner international project that offers integrated monitoring and forecasting services in the Polar Regions, as well as mid-latitude areas affected by ice and snow. The information is provided via satellite to a range of public user groups such as Inuit hunters and the coast guard. C-CORE is the program manager for Polar View. Initial LOOKNorth technology validation projects will be identified this summer and the first call for proposals is targeted before Christmas. Adlakha noted that the technologies that are proven in Canada's North will be transferrable to other polar regions.