

**IMPROVING GOVERNMENT SERVICES WITH RADARSAT-2**


### MARINE SURVEILLANCE

With the ability to switch quickly between imaging modes, RADARSAT-2 can cover regions with concurrent activities—for example, ice and pollution monitoring. It can also provide:

- ▶ high-resolution surface wind information for coastal waterways
- ▶ improved characterization of ocean features, such as currents and fronts
- ▶ more precise tracking and path prediction of hurricanes

The high spatial detail provided by the satellite's high-resolution will benefit applications involving coastlines, tidal and near-shore terrestrial areas, and near-shore bathymetry.



*"We are extremely pleased with the timely, accurate imagery and analyses. RADARSAT is an operational tool for marine environmental emergency response that we can count on. It's a deterrent to polluters, too."*

*ROGER PERCY, Manager Environmental Emergencies Environment Canada, Atlantic Region*

### ICE

Canada is a world leader in the operational use of space radar for sea and land ice monitoring.

With multiple polarization options, RADARSAT-2 will greatly improve ice edge detection, identification of ice types, and ice topography and structure information.



*"RADARSAT-1 has long provided ice information to the Canadian Ice Service. Environment Canada began delivering operational oil spill monitoring services in 2006, and has since demonstrated applications for marine wind and ship detection. With RADARSAT 2, we anticipate applications to identify ocean features and improve marine weather forecasts."*

*DOUG BANCROFT, Director, Canadian Ice Service, Environment Canada*

### HYDROLOGY

RADARSAT-2 is well suited for distinguishing between water and land features.

The polarimetry capabilities of RADARSAT-2 enhance the measurement of surface moisture for flood and agricultural forecasting, as well as snow monitoring and analysis. Polarimetric analyses are used for mapping land surfaces and soil conditions to support groundwater studies.

There is great potential for wetland mapping and discrimination. Permafrost and glaciers are indicators of climatic changes. They can be tracked over the long term with radar data.



*"There is a need to evolve a strategy to provide more comprehensive information on our freshwater resources and RADARSAT-2 is seen as part of the solution."*

*MIKE DEMUTH, Glaciology Research Scientist, Natural Resources Canada*

### GEOLOGY

Canadian radar data is used for onshore and offshore exploration and mapping and to monitor and detect oil seeps, reducing the risk and cost of drilling.

It is also used to derive geophysical terrain information, such as surface roughness, which is useful for understanding processes such as bedrock weathering and the sorting of surface materials.

RADARSAT-2, with its enhanced resolution and wider range of polarization modes, provides detailed mapping of terrain features or geological structures, better identification of structural elements and improved discrimination of geologic units than its predecessor RADARSAT-1.



*"Radar monitoring of subsidence and landslides is crucial for Canada's strategic transportation and energy corridors. RADARSAT-2 interferometry supports the operational monitoring of areas at risk."*

*VERN SINGHROY Senior Scientist, Canada Centre for Remote Sensing, Natural Resources Canada*

### FORESTRY

Over 40% of Canada's total land area is forest or wooded land. So it is no small feat to assess and monitor forest resources. Satellite imagery is the most efficient method for synoptic coverage of forested areas and parameters, especially northern and remote areas, or where optical data is unavailable.

RADARSAT-2 can help in providing complementary information for land-cover classification, and specialty projects involving wetland and agricultural area analysis.



*"We need timely information for our National Forest Inventory. RADARSAT-2 can help us assess forest resources in northern regions where the abundance of wetlands and clouds limits the efficiency of standard optical data."*

*ANDRÉ BEAUDOIN, Research Scientist, Canadian Forest Service*

### EMERGENCY MANAGEMENT

RADARSAT data has been used to support humanitarian, rescue and relief efforts for communities affected by earthquakes, tsunamis, floods, landslides, forest fires, and other natural and human-caused disasters throughout the world. RADARSAT-2 can deliver data in near-real time—a significant advantage where lives, communities, and ecosystems are at stake.

In Canada, radar information is compiled to provide marine and ice condition information. The forecasts are essential for safe navigation and community activities.



*"The demand for spring ice floe rescues has decreased since the Floe Edge Service became available to us."*

*BRIAN KOONOO, Sirmilik Park Warden, Parks Canada*

### CARTOGRAPHY

RADARSAT-2 can provide data for

- ▶ the creation of Digital Elevation Models (DEMs)
- ▶ the detection and mapping of centimetre-scale movements at the Earth's surface (InSAR)
- ▶ the extraction and identification of features to support environmental management and security



*"Space-based imagery can help us fulfill our mapping goals. Given the sheer size of our country, satellite remote sensing is fast and cost effective. It can't be done with aircraft alone!"*

*ROBERT HÉLIE, Habitat Conservation Science Coordinator, Canadian Wildlife Service*

### AGRICULTURE

Soil dynamics fluctuate throughout the growing season. Satellite imagery is an efficient method for mapping crop characteristics over large spatial areas and tracking temporal changes in soil and crop conditions.

Multiple polarization modes on RADARSAT-2 can provide so much valuable information that a single image may be sufficient to extract the desired information.



*"The time staff spends in the field is expensive. Satellite data provides cost savings to program delivery, helping us target which areas need to be verified."*

*JOHN FITZMAURICE, Senior Soil Resource Specialist, Prairie Farm Rehabilitation Administration, Agriculture and Agri-Food Canada*