



SURVEILLANCE AND INTELLIGENCE

# MDA ICEVIEW™

**MDA IceView™ is a powerful suite of historical and near-real time ice monitoring and forecasting products that improve safety, and enable the cost-effective operation of offshore platforms and vessels in environmentally challenging, ice-infested regions of the world.**

The RADARSAT-1 and -2 synthetic aperture radar (SAR) satellite missions were designed to be fully integrated for ice imaging, to support Arctic operations for Canadian government and industry users. This requirement directly influenced satellite tasking, frequency of coverage, imaging capability at northern latitudes, beam modes, ground station locations, information flow, and processing techniques.

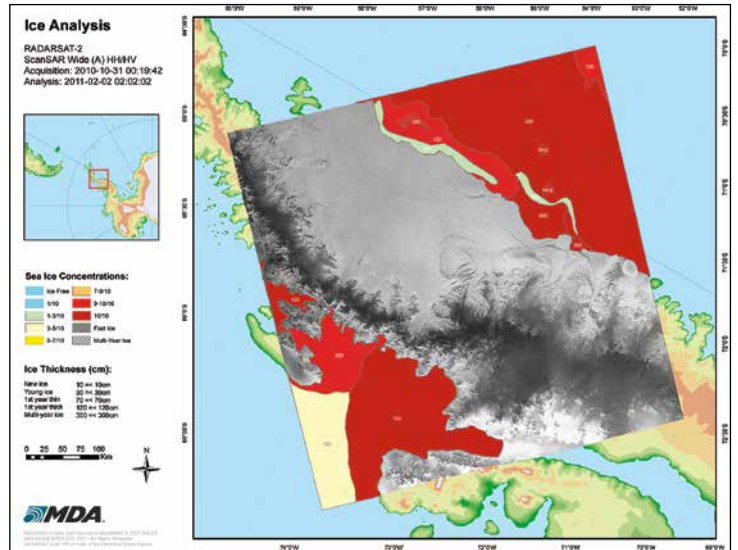


*RADARSAT-2 provides superior coverage over polar regions.*

**SYSTEMS AND SERVICES TO SUPPORT ICE MONITORING**

RADARSAT-2 is the sensor of choice for high-latitude maritime navigation and operations. RADARSAT-2 delivers multi-polarization imaging options that dramatically improve ice-edge detection, ice-type discrimination, and ice topography and structure information.

RADARSAT-2 collects high-resolution images through cloud cover and darkness, and has a high revisit cycle over polar regions. MDA is a world leader in satellite ground stations and image processing and analysis to support environmental monitoring.



*Classified MDA IceView™ products can be securely delivered to clients on land, offshore platforms, or ships within hours of a satellite pass to ensure the most accurate, up-to-date sea ice information available. Understanding ever-changing ice conditions in remote locations can save lives, vessels, fuel, the environment, and time.*

**THE MDA ICEVIEW™ ADVANTAGE FOR POLAR OPERATIONS**

MDA IceView™ is a powerful service that ingests, processes, and analyzes sea ice conditions, generating classified products that can be used to support analysis of ice conditions for navigation and operations in extreme environments where sea ice presents a risk to human life, shipping, resource extraction, and the environment.

The C-Band SAR carried on RADARSAT-2 provides the best available ice discrimination and feature classification. With image swath options of up to 500 kilometres wide and resolutions ranging from one to one hundred metres, it is capable of addressing both broad area and point locations.

RADARSAT-2 is in a polar orbit, passing close to the North and South poles, traversing the Arctic, a region roughly the size of continental Europe, 15 times per day.

RADARSAT-2 offers imaging flexibility with an expanding range of imaging modes, swath widths, ground resolutions, and single and multi-polarized imaging modes to serve the demanding and growing customer requirements for current, detailed information. RADARSAT-2 acquires images independently of weather and solar illumination, making it an ideal information source for regions that are under cloud and darkness much of the year.

## Northern Ground Segment

RADARSAT northern ground stations enable rapid data reception for electronic delivery to image processing and analysis facilities, enabling fast, dependable, repeat imaging of ice conditions at high latitudes.

## Personnel for Ice Services

Skilled analysts and advanced tools produce accurate and rapid ice charts and analysis products. MDA's investment in new tools and techniques ensures that clients receive the latest updates in ice monitoring products and services.

## ICE MAPPING AND MONITORING SERVICES

Understanding ice thickness and drift are central to ice management engineering for offshore Arctic operations. Access to near-real time (NRT) and historical RADARSAT ice imagery enable a clear understanding of ice movement, allowing icebreakers upstream of the operation to navigate a range of tight ice breaking paths through ice floes.

This approach breaks ice into small pieces that move with prevailing currents past the drilling operation, well within ice load levels. Thick multi-year floes typically cannot be broken by icebreakers. MDA IceView™ ensures that drift and positional information on those floes are monitored and movement that may threaten an operation is detected well before presenting a direct risk to life, infrastructure, and the environment.

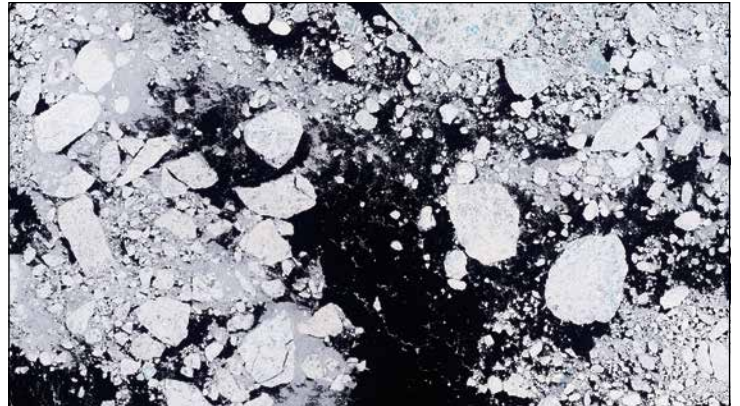
MDA has more than 40 years of international experience in remote monitoring systems and services to support high latitude land and maritime operations. Based on this experience, the company provides two unique, but complementary, ice reporting services:

### Historical Ice Condition Analysis and Reports

Advanced proprietary multi-satellite analysis delivers detailed, accurate historical records of ice conditions and trends. MDA performs custom searches of these data catalogues to identify and use optimal datasets for superior information.

The high frequency of RADARSAT-1 and -2 coverage, with their 24-hour imaging capability over the poles, has created a massive archive of valuable SAR ice imagery since 1996. Other SAR and optical imagery spanning decades of high-latitude imaging, including ERS, ENVISAT, and SSM/1, AVHRR, LANDSAT, and MODIS, complement the archive.

Ice regimes, features, dynamics, and consultation to define end user requirements drive imagery age and type selection for analysis. Skilled analysts, using advanced software tools, extract required information



© Landsat

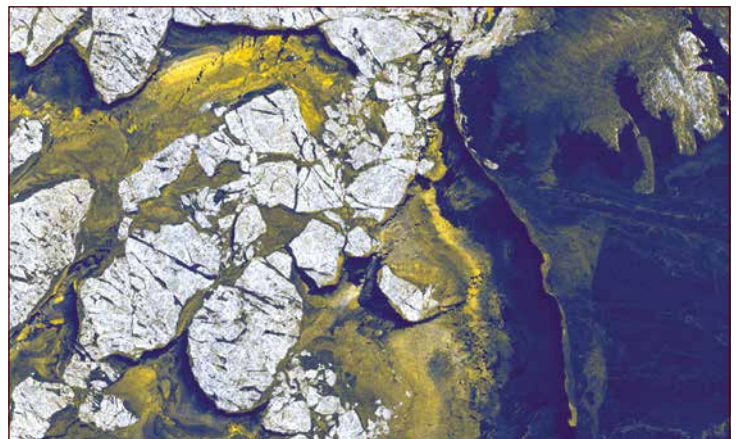
*Historical imagery, such as this Landsat 7 image from 2001, is used to track changes in sea ice patterns over time.*

such as ice types and features for direct ingested to end user geographic information systems and the delivery of source data is an option that some customers use to enhance their own analyses.

### Ice Monitoring and Operational Support Products

MDA provides ice monitoring and near real-time electronic delivery of ice conditions to fixed and mobile operations anywhere in the world. Most monitoring is conducted by a program of scheduled acquisitions, however in emergencies RADARSAT-2 can be programmed to image an area of interest less than four hours before a pass, with image data availability approximately 30 minutes after acquisition.

MDA delivers custom projects that range from source data to ice maps and products, and ice navigation alerts for any location in the world where sea ice is a threat to operations and navigation.



*RADARSAT-2's multi-polarization imaging options enable better discrimination and improved classification of sea ice types. This image is of Banks Island, NWT, Canada.*



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*MDA IceView™ image showing sea ice extent off the southwest coast of Greenland. Green vectors identify the coastline, purple and light blue vectors identify offshore ice formations by type.*

The majority of MDA customers depend on RADARSAT-2 derived ice products for regular programmed monitoring at offshore drill site locations and navigation choke points to understand and mitigate risks associated with operations and maritime navigation. In addition to emergency programming, imagery from other satellites can supplement report products for highly accurate daily situation assessments.

Ice features, movement, and forecasts combine to provide alert services. MDA delivers all its ice products electronically to both remote operational sites and onshore support offices for rapid incorporation into customer GIS and other ice management decision support software.

## OPERATIONAL ADVANTAGES

### Superior Ice Information

Accurate, timely ice classification in all weather to support decision making for operations, navigation, and environmental protection.

### Operational Effectiveness

Personnel, assets, and the environment are protected with information from historical ice condition reports, augmented by routine and emergency global imaging.

### Dependable Supply

MDA's operational experience and its complete control of the supply chain ensure that information is dependable and reliably delivered when and where it is needed.

### Risk Mitigation

Timely and accurate information enables effective decision making to identify and manage risks.

## Learn about MDA IceView™ at: [www.mdacorporation.com](http://www.mdacorporation.com)

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