

**Solutions Spotlight: Homeland Security and Disaster Management**

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# Fighting Marine Pollution from Space

Oceans regularly fall victim to pollution caused by oil slicks, dumping and other illegal activities such as violating ballast water exchange regulations. The Marpol 73/78 International Convention for the Prevention of Pollution from Shipping is one of the most important international marine environmental conventions, as it prevents pollution from ships by prohibiting discharges and requires ships to carry detailed record books outlining activities sur-

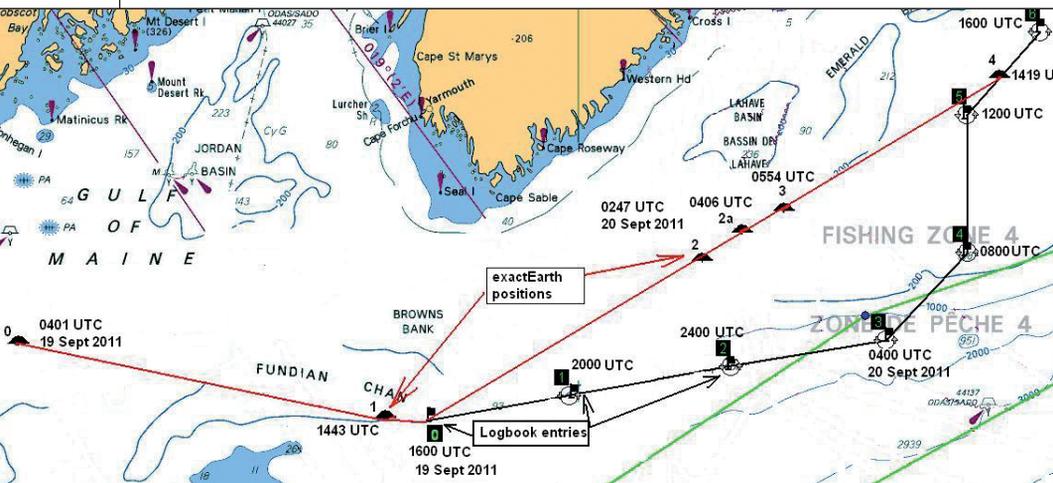
## Real-World Examples

Satellite AIS (S-AIS) provides vessel tracks to help governments determine violations of existing regulations surrounding prohibited discharges. Then authorities are able to validate positions recorded in the on-board logbooks to identify any discrepancies. Data also can be used to show ships that have deviated from a predefined route, indicating they may be trying to avoid detection of prohibited discharge.

The following are two real-world examples where S-AIS has been used

As a result, national governments will impose strict limits from their shorelines in which ballast water may not be discharged and exchanged. For example, for the Canada/United States Great Lakes area, federal regulations call for vessels to conduct mid-ocean ballast water exchange during ballast-laden voyages outside a 200 nautical miles (nm) limit from any shore prior to arrival in port.

As shown in the image at left, S-AIS data were used by Transport Canada marine safety inspectors to prove that a ship's log had been falsified in an attempt to avoid voyaging out beyond the set limit for ballast exchange. The S-AIS data provide unequivocal proof of the ship's real track.



S-AIS data of a vessel was compared to its reported track to show the vessel didn't make a required course change to exchange its ballast water.

rounding these discharges. However, one of the challenges facing the maritime industry is actually tracking ships and monitoring their behaviour once they "disappear" over the horizon.

During the last few years satellites have been launched that can "listen in" to existing Automatic Identification System (AIS) technology installed on the world's shipping fleet under the International Convention for the Safety of Life at Sea. Growing constellations of advanced satellites from companies such as exactEarth in Canada allow for global ship tracking in near-real time, reaching beyond the coastal range and into the most remote ocean areas. This relatively new technology is increasingly being used in the fight against marine pollution.

successfully in the fight against marine pollution.

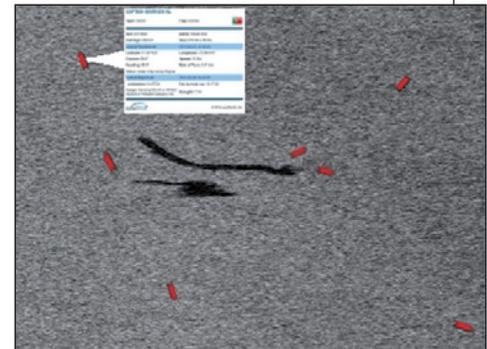
## Illegal Ballast Water Exchange

Since the introduction of steel-hulled vessels around 120 years ago, water has been used as ballast to stabilize ships at sea. This ballast water is pumped into the hull to reduce stress, provide stability, improve propulsion and maneuverability, and compensate for weight lost due to fuel and water consumption.

However, this practice poses serious ecological, economic and health risks due to the multitude of marine species carried in ships' ballast water. The transferred species may survive to establish a reproductive population in the host environment, becoming invasive, outcompeting native species and multiplying into pest proportions.

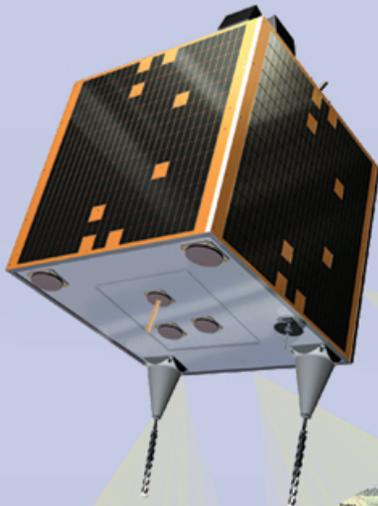
## Oil Spill Identification

Radar imagery—both from airborne and satellite sources—is used extensively in maritime surveillance for identifying surface vessels and locating other ocean surface features, such as oil slicks. Unfortunately, radar

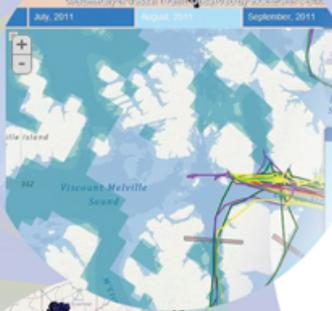


Oil spills are clearly visible on a radar image of an ocean's surface. By overlaying the ship position and track information collected by S-AIS, operators are able to identify vessels in the vicinity for further investigation.

imagery is only an unattributed picture and doesn't identify detected surface objects. As shown in the image above, combining radar imagery with S-AIS identifies surface pollution as well as ships in the vicinity, providing an immediate short list of potential offenders.



### Canadian Arctic Monitoring



### THE VANCOUVER SUN

#### Shake hands with Russia over the Northwest Passage, says Arctic expert



An increasingly ice-free Arctic is making the case for Canada to establish a joint position with its polar neighbor, Russia, over control of the Northwest Passage, says Michael Byres, author of the 2009 book *Viva Viva The Arctic!*

A leading Canadian expert on polar politics is urging the Russian and Canadian governments to establish and promote a joint position on the status of the Northwest Passage and Northern Sea Route — the

### The Gazeur

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#### China's navy engaging in unprecedented co-ordination with India, Japan on anti-piracy patrols



In this Dec. 19, 2009 file photo, Chinese missile frigate Zoukuan is welcomed by a group of people at the Stonecutters Island base in Hong Kong after completing escort duties in the Indian Ocean to protect vessels from pirate attacks. China began close cooperation with the U.S. and India in anti-piracy patrols off the coast of Somalia, a sign of increased work with other nations in safeguarding global trade despite mixed sentiments toward the country's two main Asian rivals. (AP Photo/Vincent Yu, File)

**CP24 TORONTO'S BREAKING NEWS**  
NEWS WEATHER TRAFFIC VIDEO CP24 BR  
**One dead, 125 rescued after boat capsizes**



The June 27, 2012 photo released by Australian Maritime Safety Authority shows a boat carrying asylum seekers 200 kilometers (120 miles) north of Christmas Island in the Indian Ocean hours before capsizing Wednesday, June 27, 2012, six months on from the Australian Maritime Safety Authority.

### nzherald.co.nz

Thursday July 5, 2012 1:40 AM NZT

#### Rena lawsuit could be NZ's biggest environmental claim

By Carly Gibbs of the Bay of Plenty Times  
3:36 PM Wednesday Jun 27, 2012

Two legal firms are preparing a class action lawsuit that could end up being the country's biggest environmental claim.



Tenders are being called for the removal of the Rena wreck from the Astrolabe Reef. Photo / Maritime NZ

North South Environmental Law in Auckland, assisted by Holland Beckett Lawyers in Tauranga, has identified 150 claimants affected by the Rena grounding – and expects to add more in coming weeks.

The claimants, all business owners, will become part of a joint lawsuit to bring proceedings against Greece-based Rena owner Daina Shipping Co.

Individual claims from Bay businesses currently range between \$20,000 and \$100,000.

The lawsuit is understood to be the biggest negligence-based class action in New Zealand, only outdone in size by the

# We see a lot more than just ships