

# ICE BREAKER

LIFE ON GREENLAND WOULD BE UNBEARABLE WITHOUT THE WORK OF ROYAL ARCTIC LINE SHIPS. **GEOFF SAWYER** EXPLAINS HOW FREE EO IMAGERY MAKES IT POSSIBLE FOR RAL TO CONTINUE SAILING

Everything about Greenland is affected by ice. As the largest, non-continental island, most communities and settlements are in themselves islands in an inhospitable climate. There are no roads linking these settlements, so most transport is by sea.

Furthermore, virtually all imports and exports are carried by shipping company Royal Arctic Line (RAL), which describes itself as a "piece of infrastructure" and has a sole concession for cargo transport between Denmark and Greenland. Without RAL, life on Greenland would be very basic for its 56,000 inhabitants.

For the Greenlanders, ice is a constant feature of their lives and the Greenland landscape. The temperatures mean that the seas freeze over in winter while in summer, icebergs calve from the active glaciers all around the Greenland coast. Generally, these drift down the east coast and up the west coast posing a real threat to shipping.

Navigating through the ice is therefore a part of everyday life in Greenland. RAL is required to provide all Greenlandic settlements with cargo no matter the size of the population. Based on experience and word of mouth, navigators know the

ice conditions in certain areas and which routes are open, nevertheless the ice conditions change very quickly especially with strong winds and at times this knowledge is not enough to follow the best routes. These circumstances have led to an ice-service provided by the Danish Meteorological Institute (DMI) located in Copenhagen, which has evolved over the years and is now making use of the earth observation (EO) imagery coming from the Copernicus Sentinel satellites.

Based on the EO data, DMI has developed a number of services that are disseminated to all relevant stakeholders in Greenland. Using Sentinel-1 and other satellite data, DMI's ice service provides up-to-date ice charts and ice maps, which are used by the captains of RAL's ships as well as many other Greenlanders. A Facebook group which is used by DMI to disseminate images has 3,000 followers and evokes regular exchange between them. Local fishermen, ferry captains, charter boats, or individuals simply going from one settlement to the next all consult the images before traveling. Local fishing companies such as Royal Greenland dominating the Greenlandic economy use them as does of course RAL.

One of the greatest benefits of having and using the ice-products is navigating more safely around the ice and thus saving lives. But they also help navigators save time in moving about more efficiently. Without RAL, life on Greenland, if possible, would be very basic. Without the images, RAL operations would be less efficient and more dangerous; facts which extend to every facet of life on the island.

Furthermore, economic benefits are felt beyond the direct users of the ice maps and ice charts such as the fishermen and navigators. For instance, safe passage means that local businesses and the local economy can operate more efficiently, stimulating economic growth as the local population can be sure imports will arrive on time. Additionally, citizens and the general public can be certain that supermarkets and other important shops will be stocked whilst jobs are assured through reliable navigation thus increasing living standards. All in all, economic benefits to the Greenland economy, thanks to the use of Copernicus Sentinel data, are calculated to be between €8.6m and €12.5m annually.

The use of Copernicus Sentinel data in Greenland is just another great example of how comprehensive information could be gathered in an inexpensive way thanks to the free and open data policy of the EU to benefit a wide range of Greenlandic stakeholders and contribute to economic growth.

**Geoff Sawyer is secretary general of EARSC ([www.earsc.org](http://www.earsc.org))**

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