KYSTVERKET

PNT Advisory Board Oct 2008

Arve Dimmen
Director Maritime Safety
Norwegian Coastal Administration

Content

- e-navigation moving forward
- SCAT-I certified airports
- Polar routes update

e-navigation

- *“e-navigation is the harmonised collection, integration, exchange, presentation and analysis of maritime information onboard and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and protection of the marine environment”*

- *International Maritime Organisation, IMO*

- *Draft time schedule proposed – implementation phase to start in 2012*

Core objectives of e-nav

(as expressed by IMO's NAV53)

- facilitate safe and secure navigation of vessels having regard to hydrographic, meteorological and navigational information and risks;
- facilitate vessel traffic observation and management from shore/coastal facilities, where appropriate;
- facilitate communications, including data exchange, among ship to ship, ship to shore, shore to ship, shore to shore and other users;
- provide opportunities for improving the efficiency of transport and logistics;
- support the effective operation of contingency response, and search and rescue services;
- demonstrate defined levels of accuracy, integrity and continuity appropriate to a safety critical system;

Core objectives of e-nav

(as expressed by IMO's NAV53)

- integrate and present information on board and ashore through a human interface which maximizes navigational safety benefits and minimizes any risks of confusion or misinterpretation on the part of the user;

- integrate and present information onboard and ashore to manage the workload of the users, while also motivating and engaging the user and supporting decision making in corporate training and familiarization requirements for the users throughout the development and implementation process;

- facilitate global coverage, consistent standards and arrangements, and mutual compatibility and interoperability of equipment, systems, symbology and operational procedures, so as to avoid potential conflicts between users; and

- be scalable, to facilitate use by all potential maritime users

Some e-nav core elements

- Electronic Chart Display and Information Systems (ECDIS)
- PNT systems
- Communication

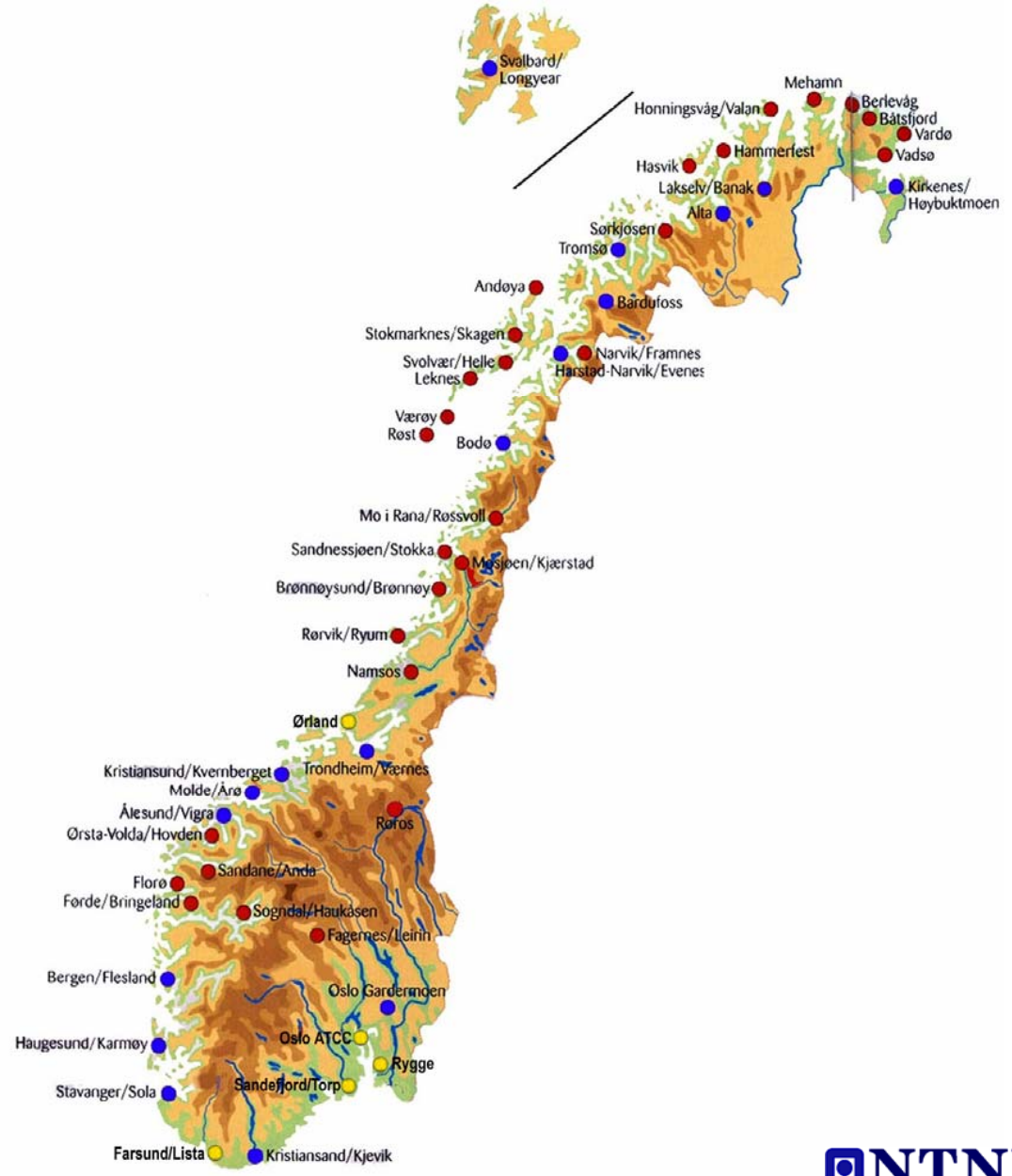
- ECDIS: Breakthrough in carriage requirements
  - IMO's subcommittee on Safety of Navigation agreed on regulations for mandatory carriage requirements of ECDIS in it's NAV54 meeting
  - Draft regulations submitted to IMO's Maritime Safety Committee for approval in MSC85 in Nov-Dec 2008
    - Proposed timetable: 2012-2018

SPECIAL CATEGORY-I in Norway: THE SYSTEM AND ITS CERTIFICATION

Börje Forssell, ***Norwegian Univ. of Science & Techn., Trondheim.***
Gunn Marit Hernes, ***Civil Aviation Authority, Bodø.***
Linda Lavik, Park Air Systems, Oslo

Airports in Norway

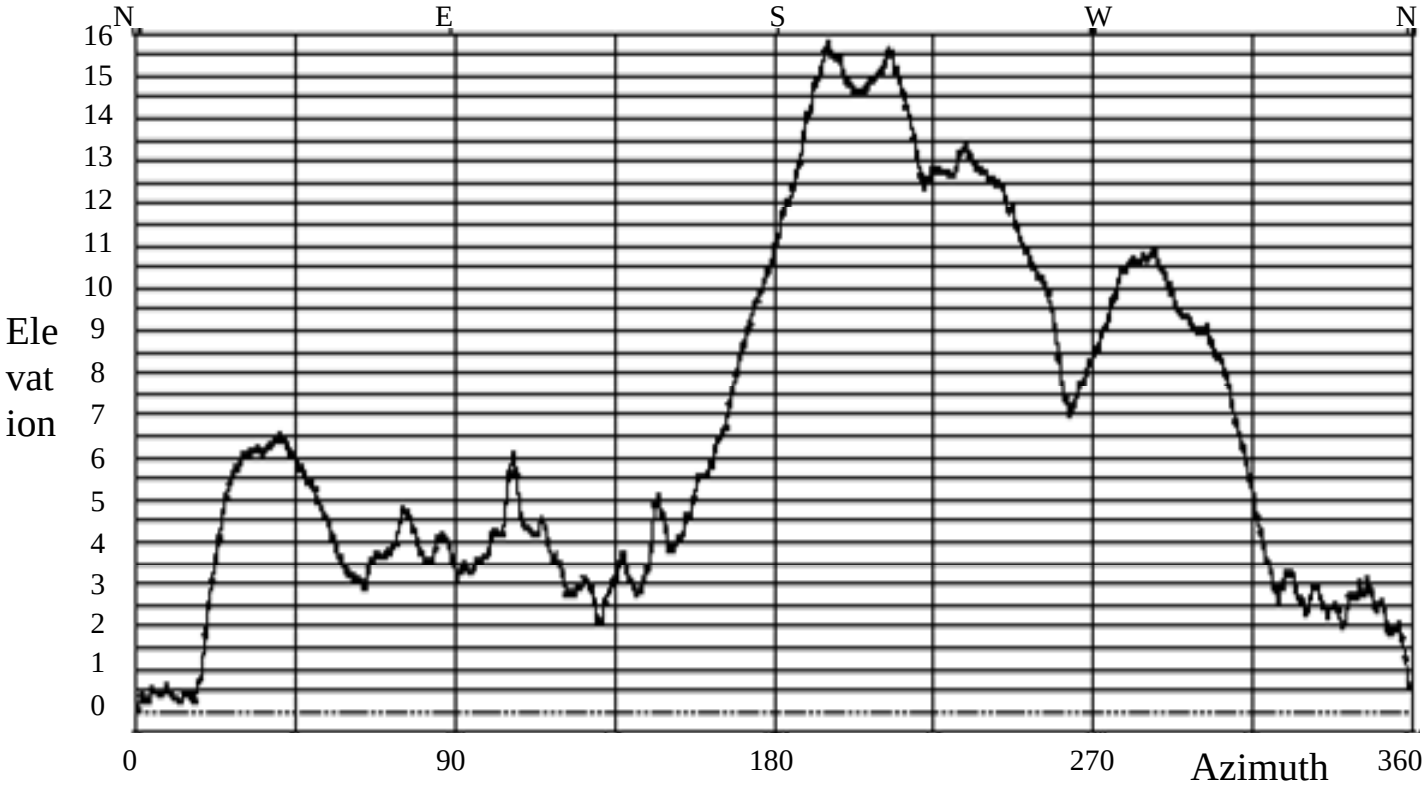
- 9 International
- 9 medium sized
- 28 regional
  - 800 - 1200 m runways
  - LLZ/DME or VOR/DME
- + military & private



NTNU

One of the difficult airports

Horizon diagram of Sørkjosen community airport in northern Norway (ENSR). The approach to runway 15 lies along a fjord from the north.



Position 69.79°N, 20.96°E. Sample angle 1°

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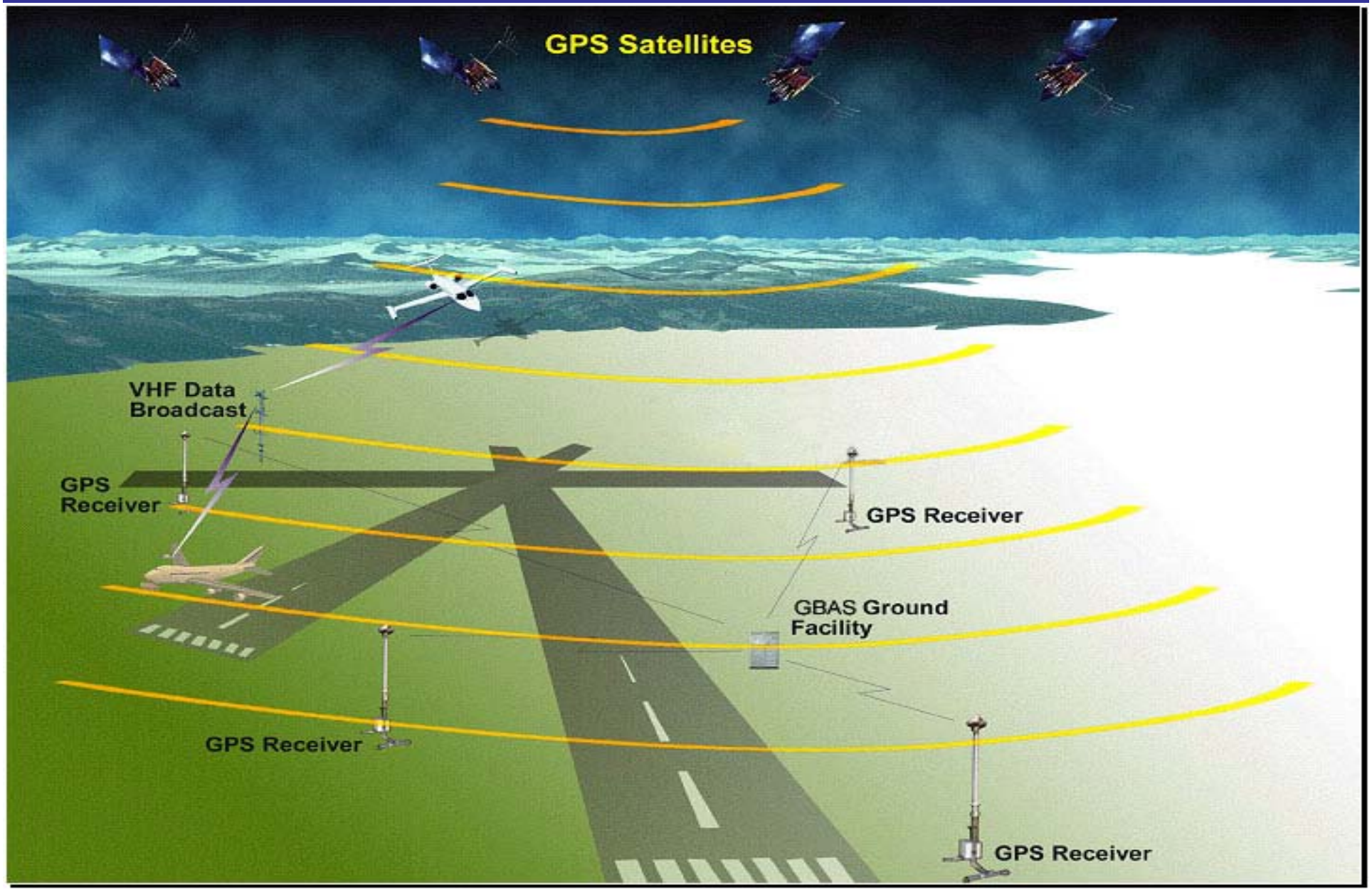
SCAT-I


GPS Satellites
VHF Data Broadcast
GPS Receiver
GPS Receiver
GBAS Ground Facility
GPS Receiver
GPS Receiver

NTNU

Significant parameters transferred by the data link

- Integrity information;
- Satellite identity;
- Pseudorange corrections (PRC);
- Range-rate corrections (RRC);
- Issue of data (IOD), Z-count, etc;
- PRC standard deviation;
- Difference between corrections derived from two independent GPS receivers and antennas;
- Approach path (final approach segment);

The Norwegian SCAT-I project

Project leader: *Avinor*, the state-owned airport owner and operator.

Ground system development: *Park Air Systems (previously Navia), Oslo*.

Airborne avionics: *Universal Avionics Systems Corporation, Tucson, Arizona, USA.*

Airline to use SCAT-I in its Bombardier DASH-8 (DHC) aircraft: *Widerøe*.

Approval of the airborne avionics: *The US Federal Aviation Administration, the Los Angeles Air Certification Office*.

Approval of the ground equipment, each individual SCAT-I Ground installation and its approach procedures, and validation of aircraft installation approval: *The Norwegian Civil Aviation Authority*, *Bodø*.

Developing the regulations, policies and services for transportation in Canada (incl. installations in the DASH-8): *Transport Canada*, *Ottawa*.

Installation of avionics in the DASH-8: *Field Aviation*, *Toronto*.

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SCAT-I Inauguration
Brønnøysund 29 October 2007

Park Air Systems was awarded Jane's ATC Industry Global Award, March 2008!

NTNU

Status

- **Decision made in 1996 to implement SCAT-I**

- **Two airports certified by august 2008**
- **26 more to be certified over the next three years**

- **The full story can be heard in Tokyo, November 2008 (International symposium on GPS/GNSS):**

  ”The World’s Only Certified GPS-based Precision Approach System.”

  – *Prof. Börje Forssell, Norwegian University of Science and Technology, Trondheim, Norway*
  – *Steinar Hamar, Avinor, Oslo, Norway*

Polar routes?

NEWS

Trailblazer Beluga

A German player is planning to send a ship through the Northeast Passage — without assistance.

Geoff Garfield London

Germany's Beluga Shipping plans to deploy a ship through the Northern Sea Route (NSR) for the first time next summer as climate change melts the Arctic ice cap.

The route around Russia, otherwise known as the Northeast Passage, can cut thousands of miles off normal sailing via the Suez Canal.

Recent satellite pictures from Nasa show that both it and the Northwest Passage skirting the Arctic coast of Canada are now both open to navigation.

Niels Stolberg's Bremen-based Beluga says it would have used the NSR this summer if it had been able to obtain in time the necessary permission from the Russian authorities.

"We shall now try to use this economically attractive seaway in mid-2009," Stolberg told TradeWinds.

The route linking the Atlantic and Pacific Oceans passes the Russian island of Novaya Zemlya to the Bering Strait dividing Russia from Alaska.

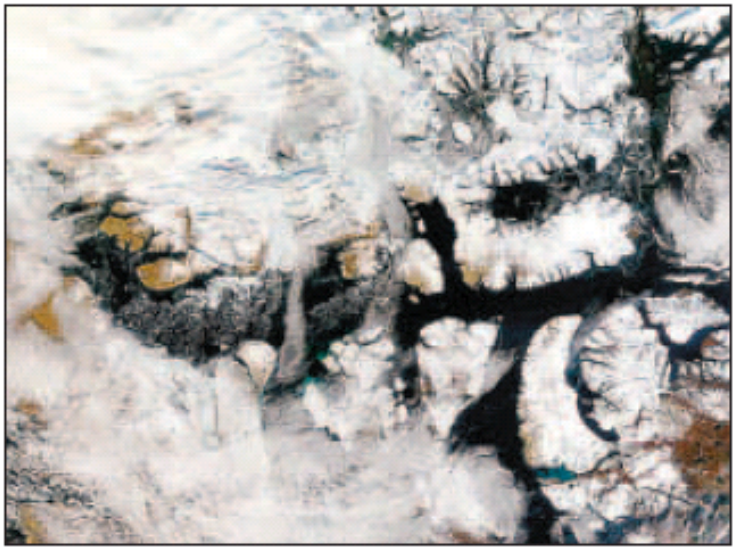
On a journey from Bremen to Shanghai, for example, Beluga says the NSR offers a potential savings of 3,200 nautical miles. From Bremen to Masan, South Korea, a journey of 11,000 nautical miles can be cut to 7,360.

Beluga operates a fleet of 57 multipurpose heavylift/project-cargo vessels, many of which are suitable for the summer Arctic operation, says Stolberg.

That fleet will grow to more than 70 ships in 2009 with delivery of the P-series of 20,000-dwt vessels, built to German ice class E3 — equivalent to the Finnish-Swedish 1A — with a combined 1,400-tonne-maximum crane capacity.

He says they will not require icebreakers or other assistance, the cost of which would wipe out any benefits. Voyage times have still to be determined.

But Beluga is moving "one step" at a time, beginning with just a single voyage before extending. Much will depend on cargo volumes between Europe and Asia. The route will only be accessible for between six and 10 weeks.



ICE FREE: The Northwest Passage as seen by a Nasa satellite. The Northeast Passage (Northern Sea Route) is now open as well. Photo: Nasa

Cargoes it expects to carry are typical for Beluga's fleet — harbour cranes, generators, LNG cold boxes, refinery equipment and wind-power generating plants. Probable port destinations in Asia include Shanghai and Zhangzhou in China as well as Masan.

Stolberg says Beluga, which is pioneering the use of SkySails's wind-assisted kite system, has been studying the potential of the Arctic seaway for a long time. The necessary logistics are being set up with personnel in "close contact" with the Russian authorities on preconditions and rules of procedure.

A Beluga meteorologist is studying weather conditions while working closely with the company's chartering department.

Stolberg says Asian economic growth is expected to continue for many years and this is why he pressed ahead with Beluga's new-building series of 20,000-tonners. The NSR offers big potential for trade and greater efficiency, he says.

The Beluga chief executive cautions, however, that the passage must be at least 90% free of ice because of the dangers posed by drifts. He believes Beluga will be the first shipping company from Western Europe to attempt the route without assistance.

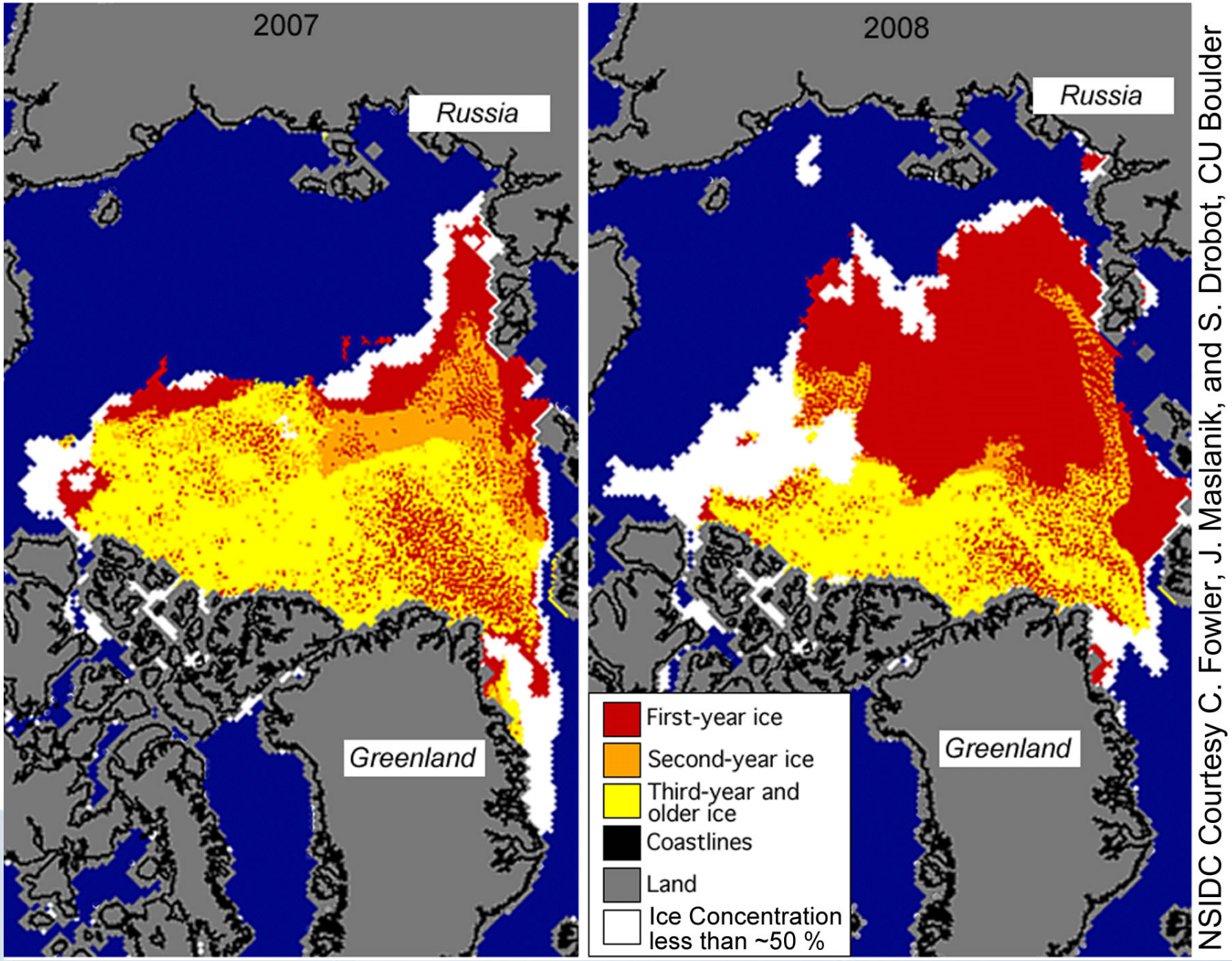
In 2005, the NSR opened while the Northwest Passage remained closed. Last year, the situation reversed.

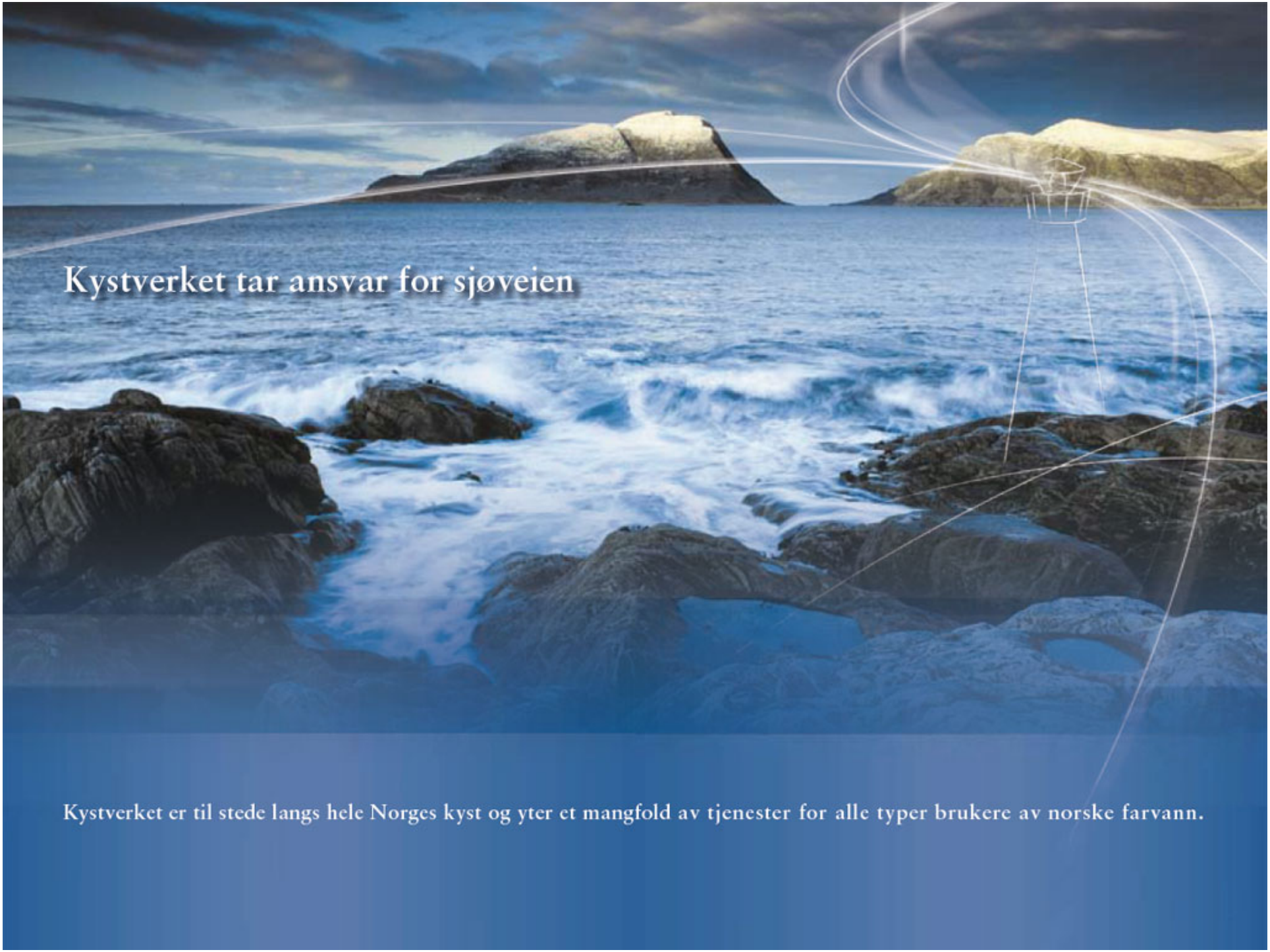
Aker Arctic Technology president Mikko Niinni says the company is carrying out an NSR feasibility study for a commercial client, a "screening" of what type of ship should be used and viability of the passage.

He warns that too many "open issues" surround the subject and this explains why other established operators are instead concentrating on slow steaming and improving vessels' fuel efficiency.

Said Ninni: "The main obstacle [to using the NSR] remains psychological. You are in the internal waters of Russia and if you are stuck in ice what is the reliability and cost of the Russian icebreaker service? It is the same that has been around since the early 1990s when the route was formally opened."

Arctic sea ice age, September 2007 and 2008




Kystverket tar ansvar for sjøveien
Kystverket er til stede langs hele Norges kyst og yter et mangfold av tjenester for alle typer brukere av norske farvann.