

Service and Infrastructure - needs in the Arctic

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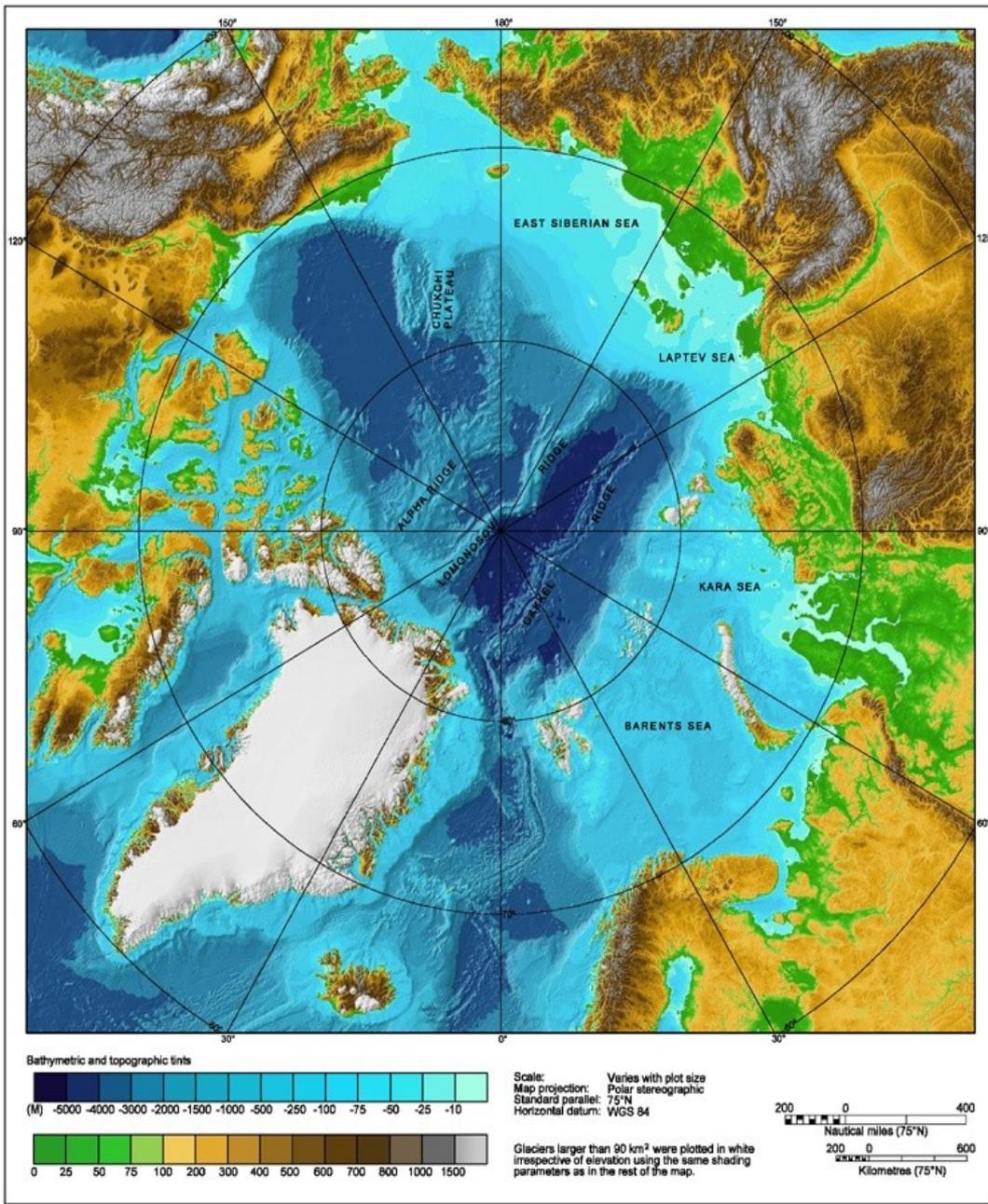
Head of Division

Danish Maritime Safety Administration



FARVANDSVÆSENET

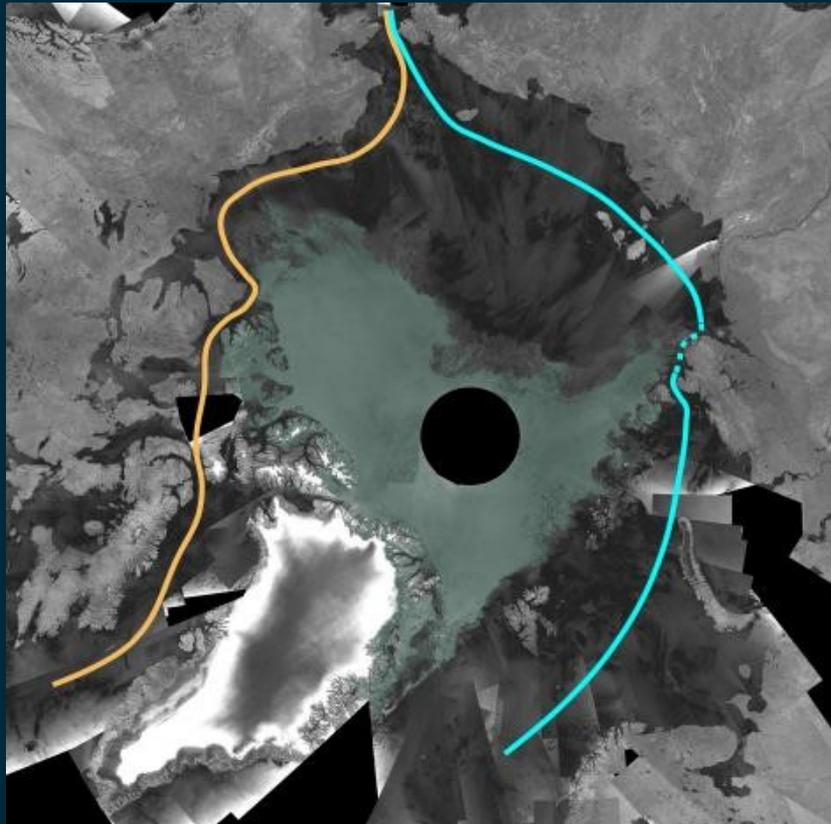
Danish Maritime Safety Administration



Climate Change

- Temperatures in the Arctic have risen twice as much as the global average
- The ice and permafrost are disappearing faster than forecast earlier
- Important to monitor the environmental changes in the Arctic
- Exploit the opportunities for new and safe routes between the Atlantic and the Pacific

Polar routes





Increasing traffic - Implications

- Maritime operations – safety of navigation
- Plants and Animals
- Ecosystems
- Industry - oil, gas, transport
- Infrastructure needed



Requirements for safe navigation

- Monitoring and warning capacity for ice conditions
 - Icebreaker capacity
- Hydrographic surveys – bathymetric data and charts
- Monitoring ship traffic - collection and use of AIS information
- Definition of routes and need for aids to navigation – buoys
- Need for radio navigation systems
- NAVTEX availability and capacity

Requirements...

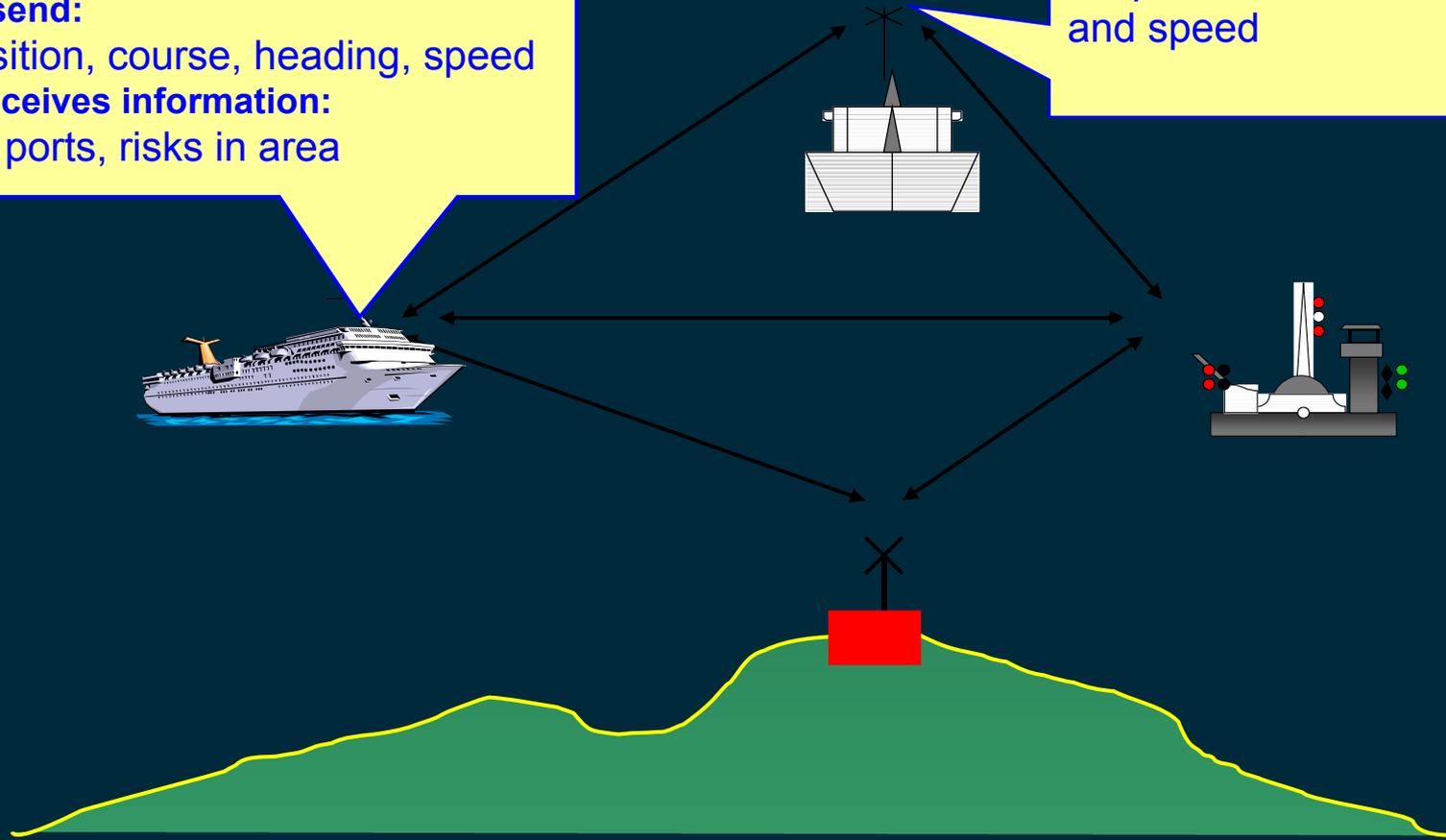
- Navigational warnings – maritime safety information
- Notice to Mariners
- Collection and dissemination of METOC information (data and forecasts for wind, waves, currents, water levels, land- and sea temperatures, salinity, tides)
- Search and Rescue capacity
- Environmental protection and prevention capacity: oil spill and so forth
- Communications and positioning: satellites GPS, GLONASS, GALILEO



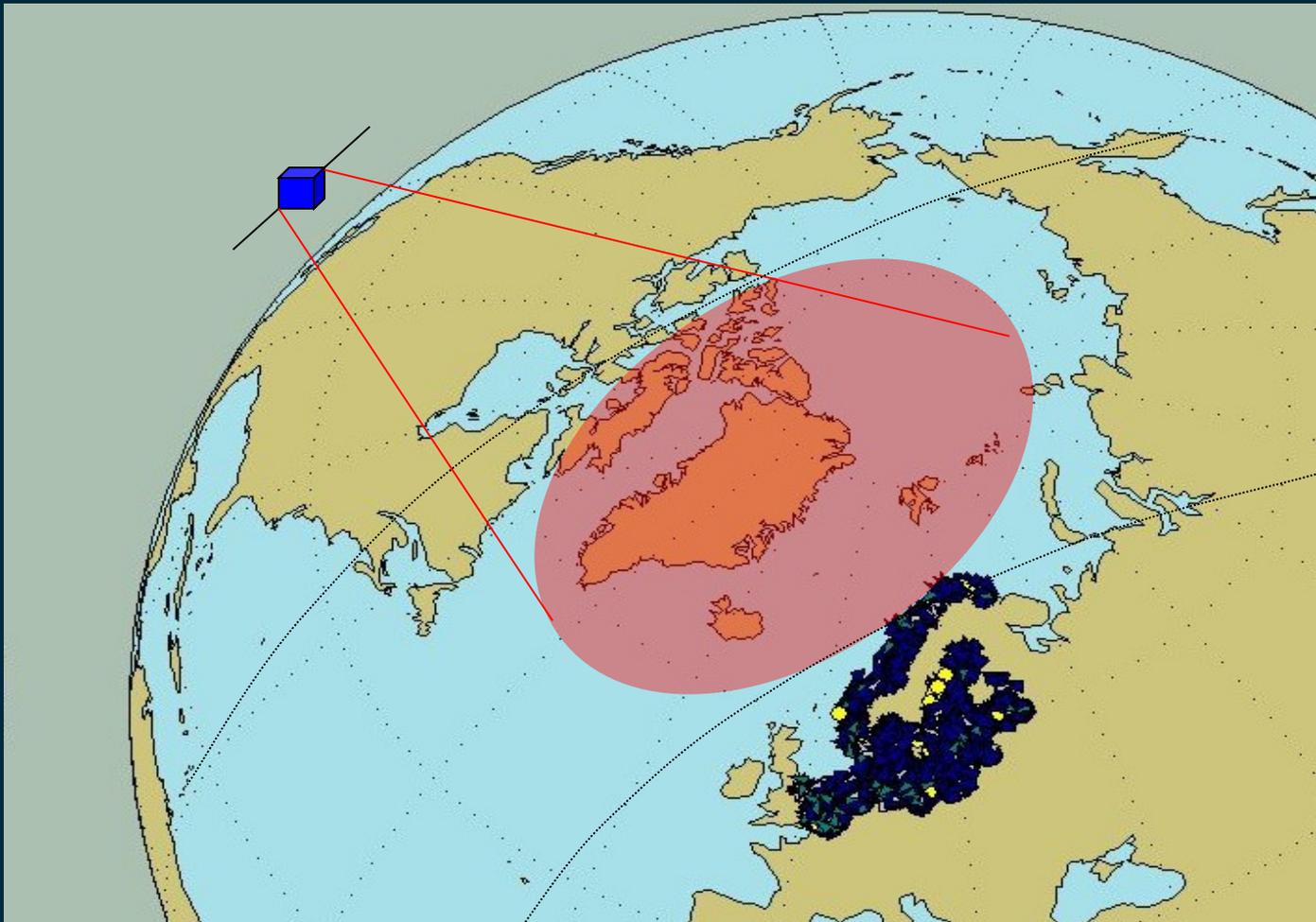
AIS principle

Ships send:
ID, position, course, heading, speed
Ship receives information:
Ships, ports, risks in area

Ships send and receive:
ID, position, course, heading
and speed



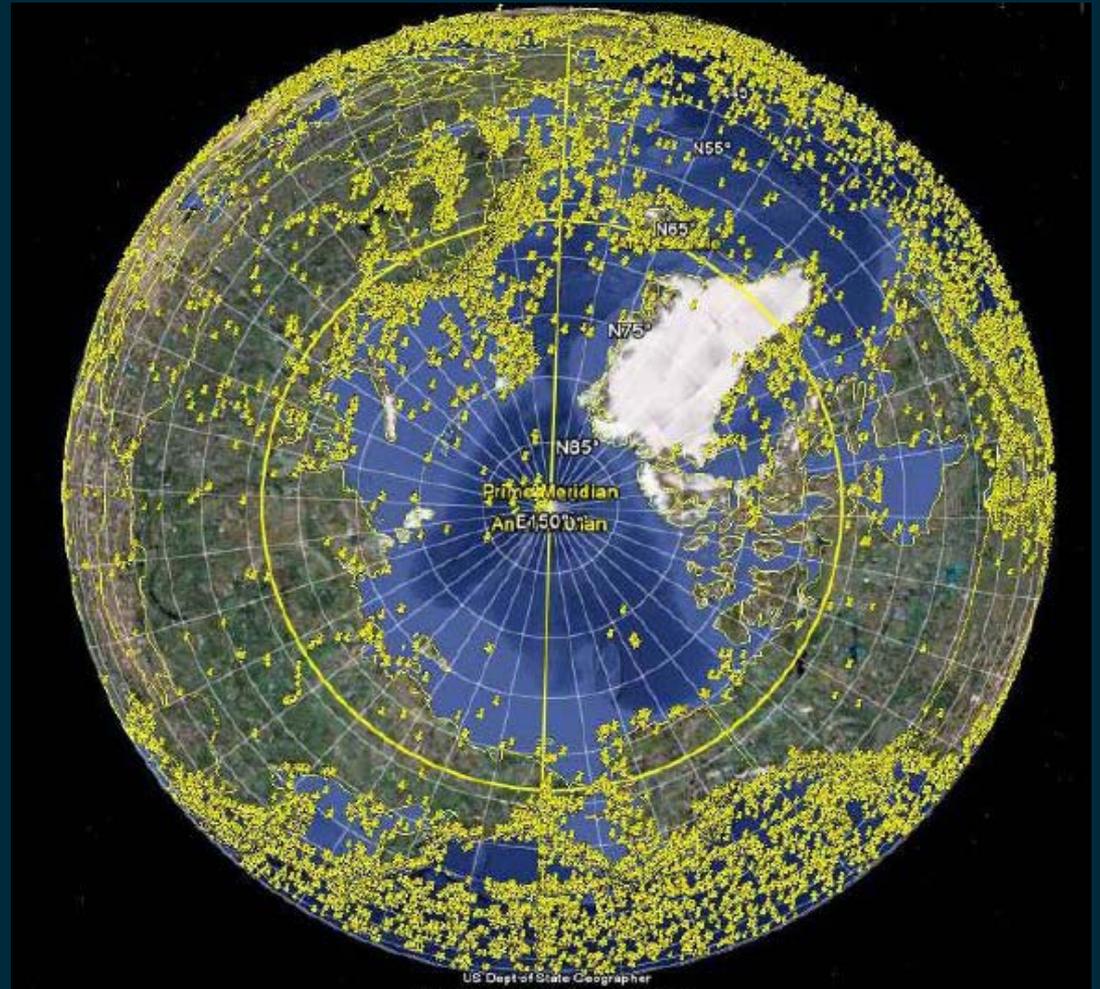
AIS by satellite



AIS

Automatic Identification System

Information from satellites



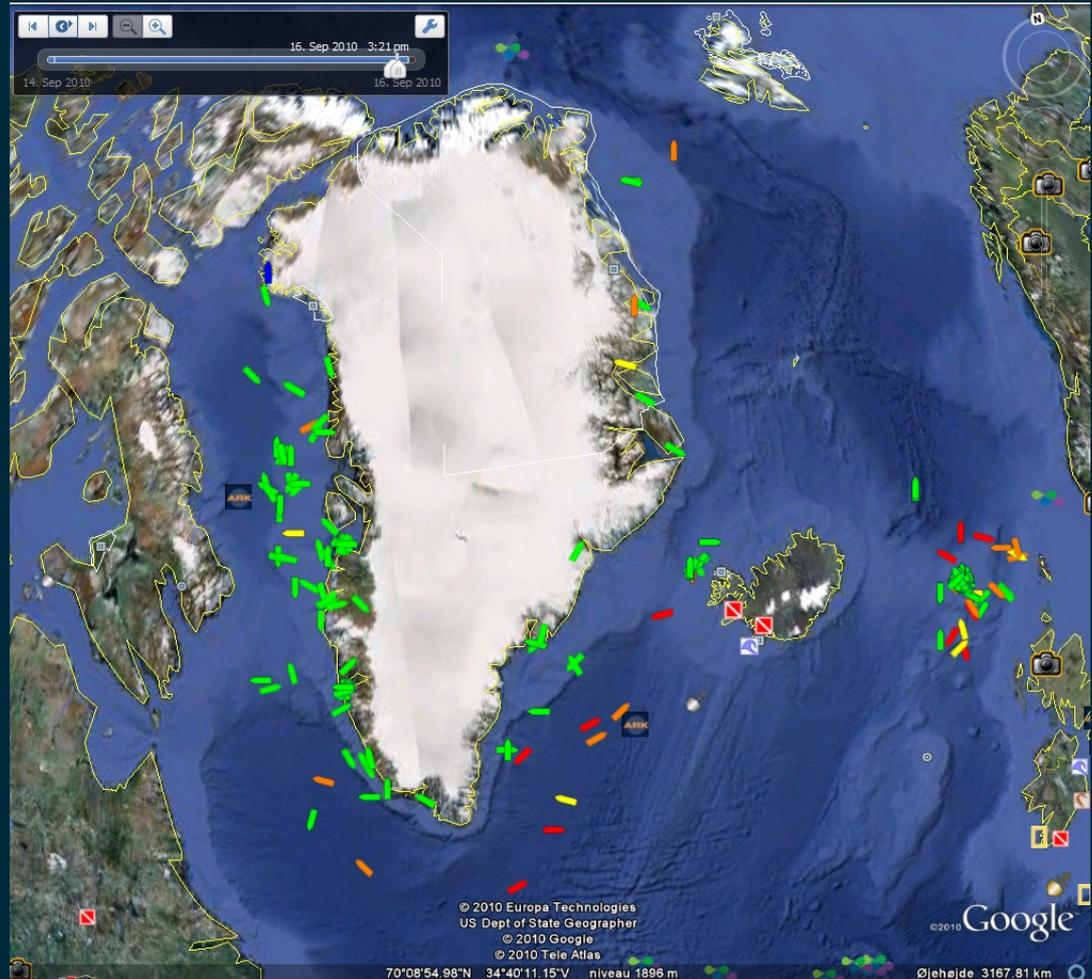
Uses for AIS

Transport Authorities
analyses
Vessel Trafficing Services

Search and Rescue (SAR)

Environmental aspects

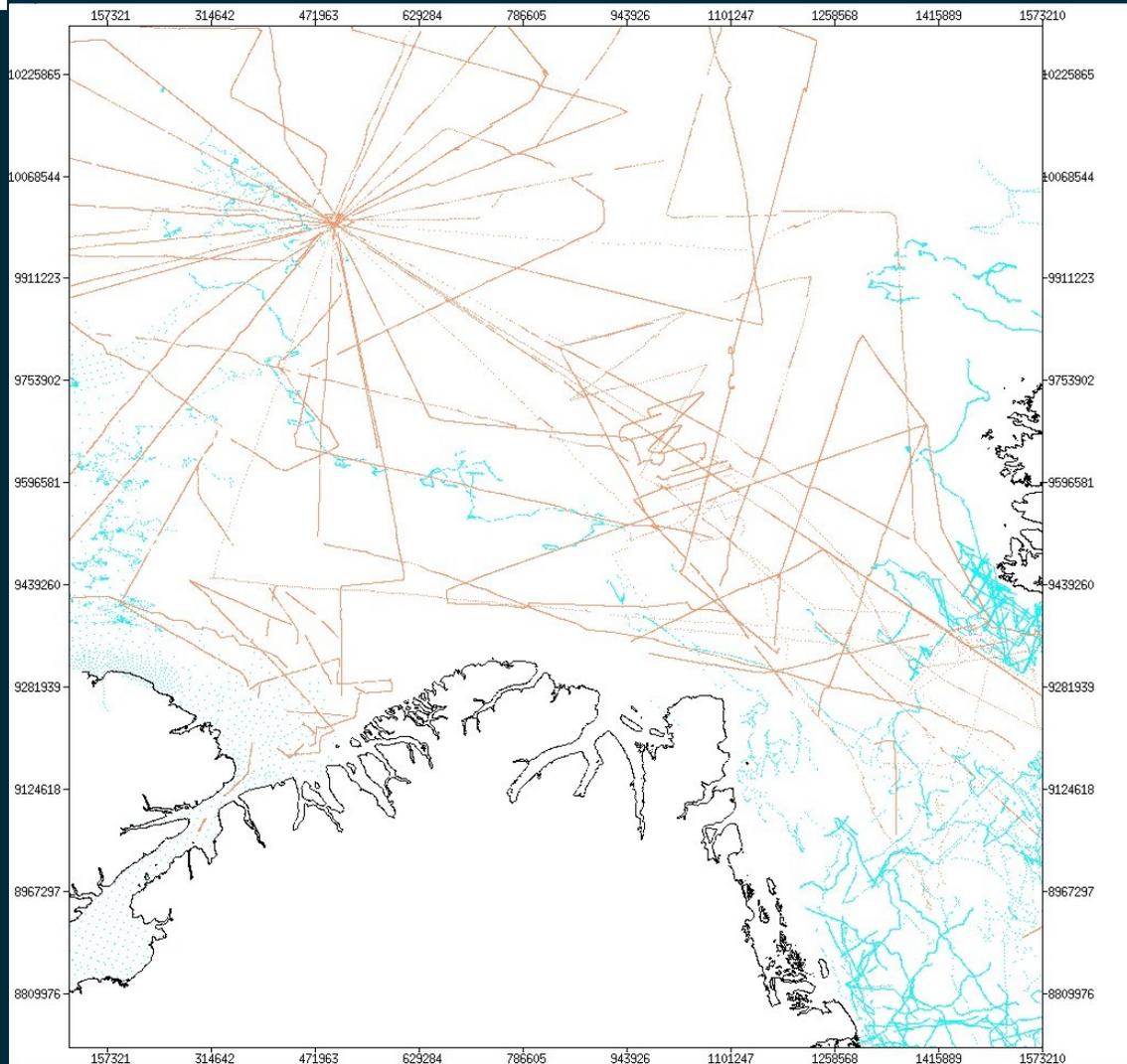
Traffic
hydrographic surveys



Hydrographic Surveys

- Collection and quality control of bathymetric data
- Only 3% of the Greenlandic Waters are to date surveyed to modern standards (multi-beam echo soundings). This is the part of the surveyed area within the 200m curve in navigable waters/seas.
- There are 2.2 mio. km² seas in the Greenlandic Waters alone
- The task demands considerable resources
- Increased use of green laser/ortho photos from satellites to plan hydrographic surveys
- Ice surveillance

Continental Shelf: available bathymetric data





Greenland and the Arctic – new challenges



Recommendations – satellite based

- AIS coverage in the Arctic
- Cooperation on telecommunications for METOC information, aids to navigation, maritime safety information, navigation, NAVTEX and environmental surveillance

