The Role of Satellite Technology in Arctic governence

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Kongsberg Satellite Services

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Hammerfest

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1890 – early adopters of new technology

Narvik: a node in the global transport network

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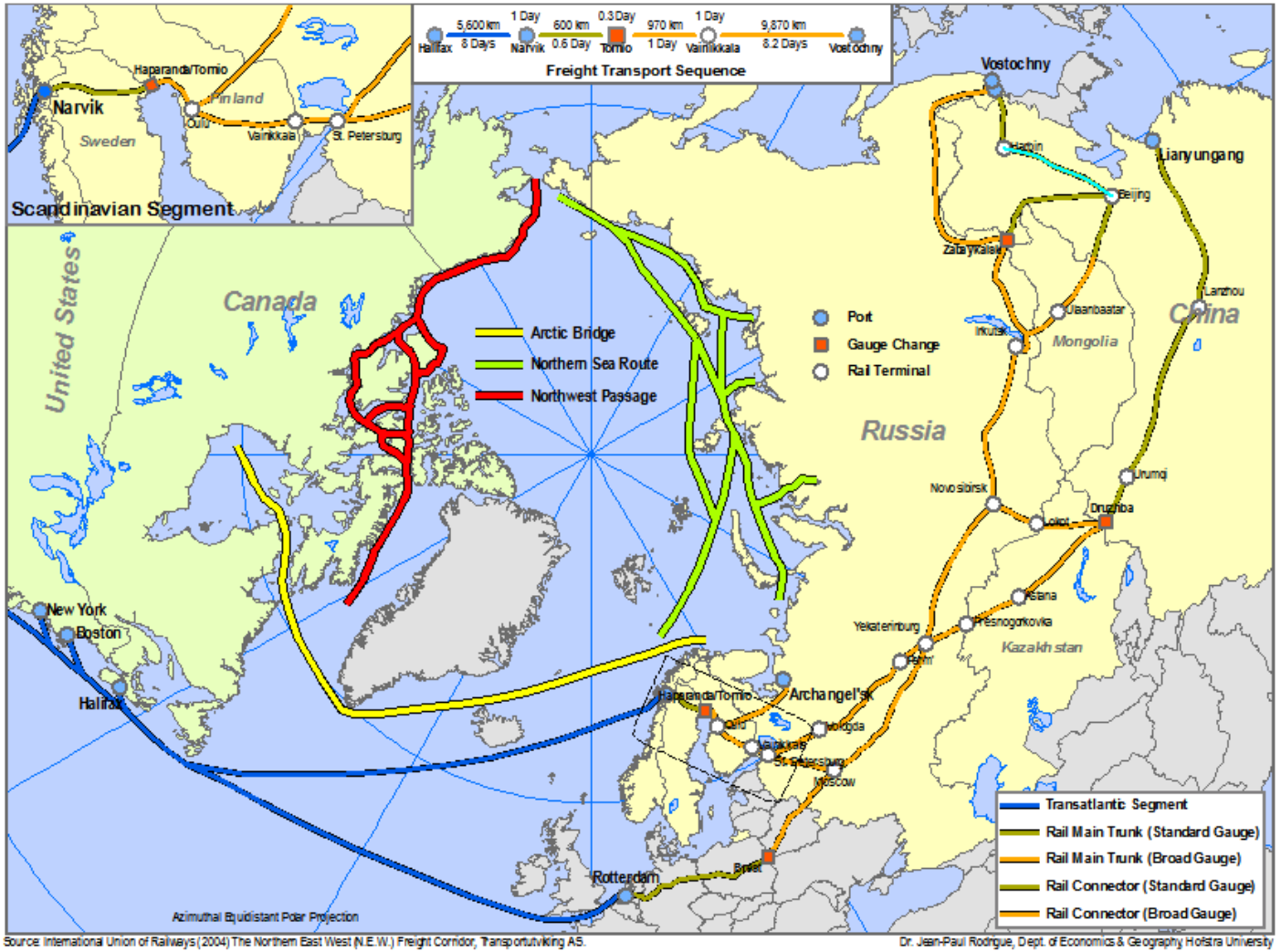

KSAT in the polar regions

Svalsat 78° North

Trollsat 72° South

Tromsø 69° North

Satellite Technology

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- Imaging
  - Synthetic Aperture Radar
  - Optical
- GNSS (Global Navigation Satellite Systems)
  - Tracking animals, people and assets
    - GPS (United States)
    - Galileo (European)
- Communications
  - Iridium
- Future
  - Molinya orbits
    - Pseudo-geostationary satellite series
      - Meteorolgical observations (eg. Better information about power lows)
      - Telecommunications
  - Satellite-based AIS (Automatic Identification of Ships)

Optimal Route

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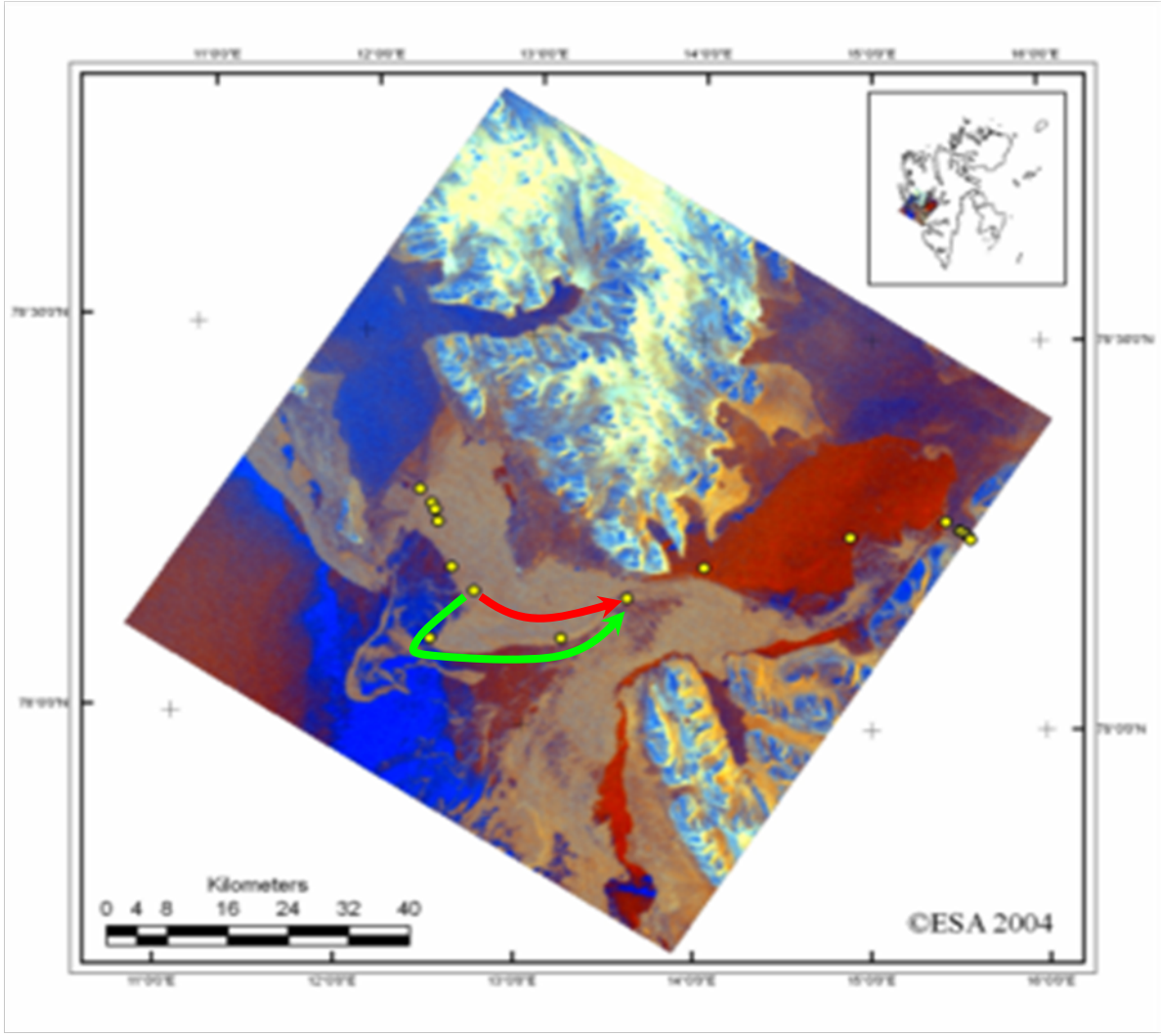

Planned direct route
through the ice

6 hours

Actual route
around the ice

3 hours

The view from above
- halved the journey time

Envisat AP pseudo-colour image and IceCam ground truth data

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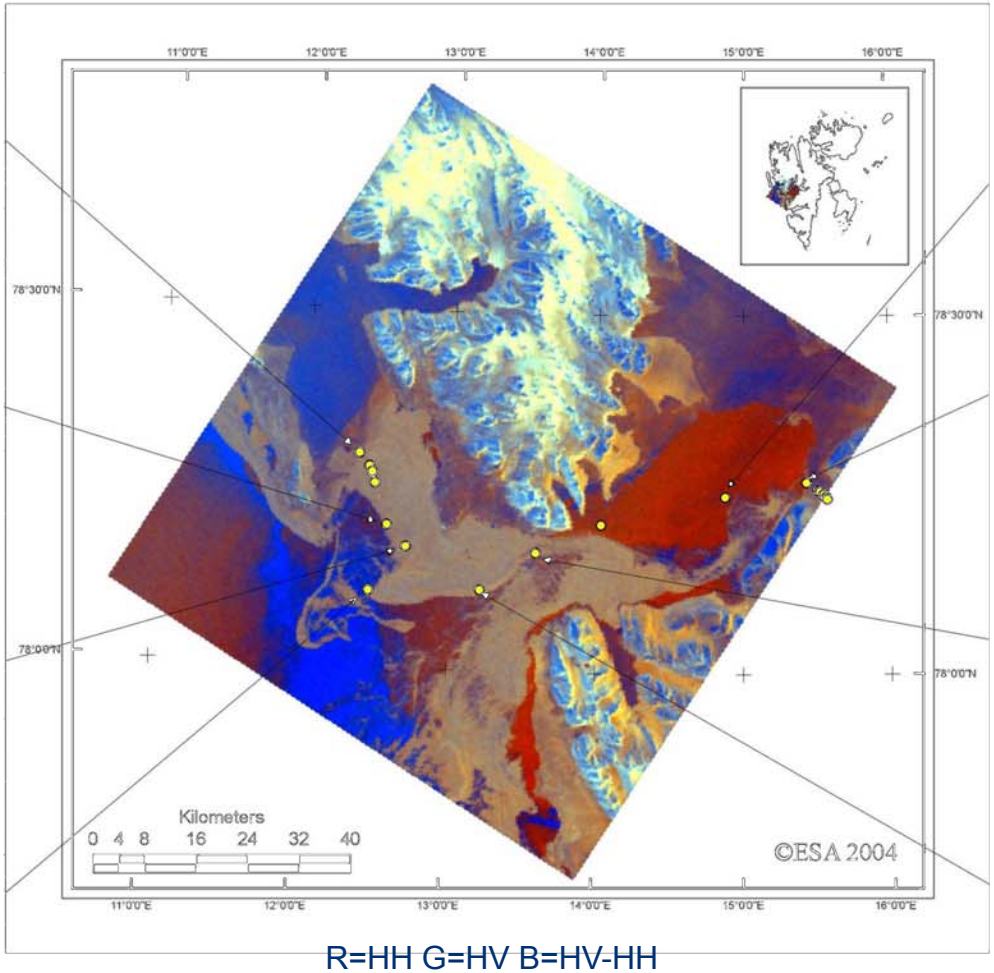
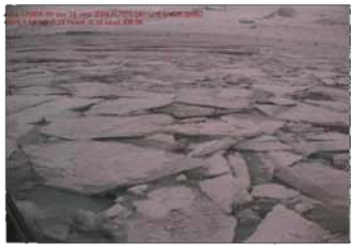


R=HH G=HV B=HV-HH



The open Northern Sea Route
6th September 2008

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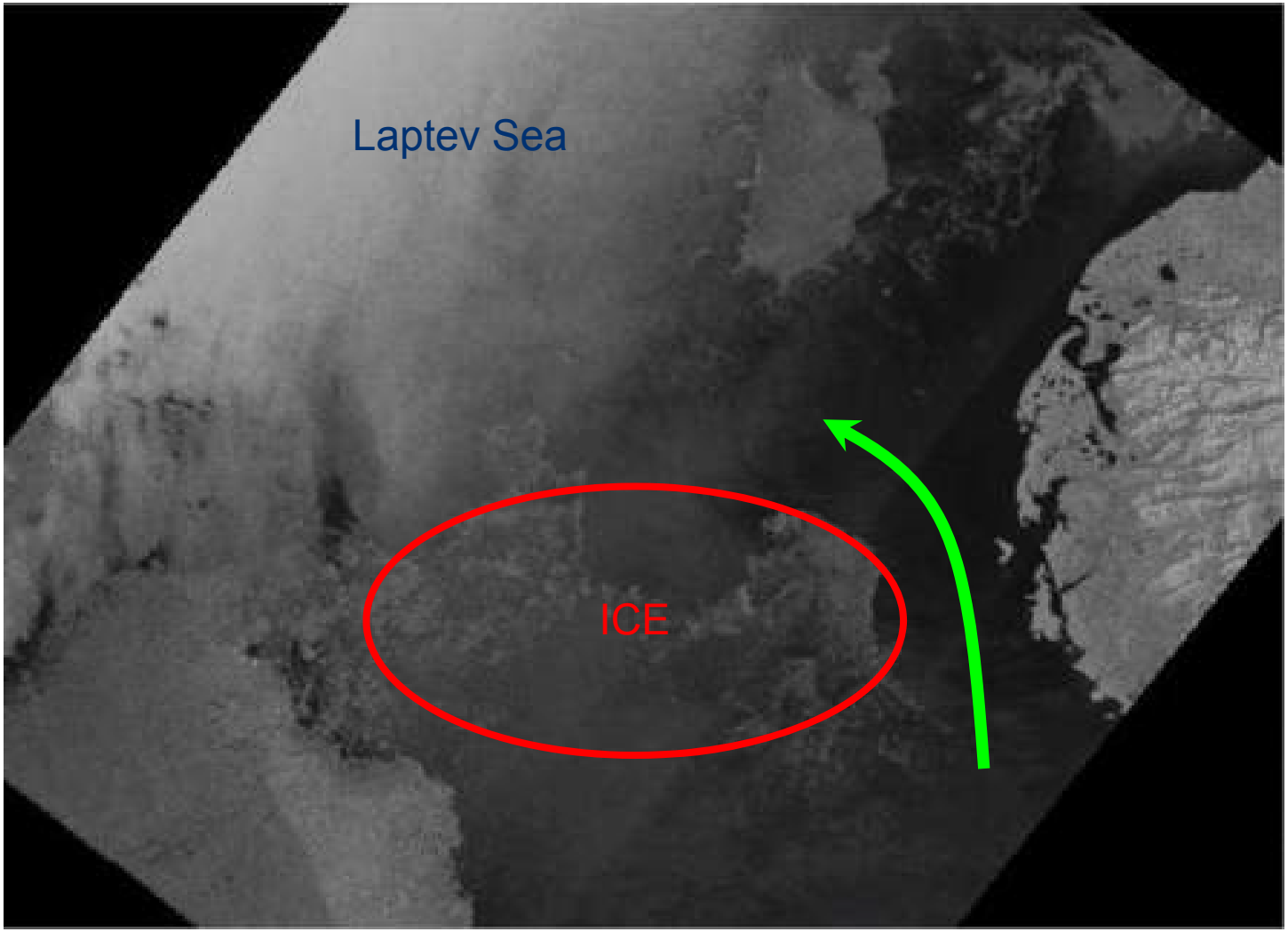

Open water ≠ ice-free

M/V Explorer

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Antarctic Peninsula 22nd November 2007

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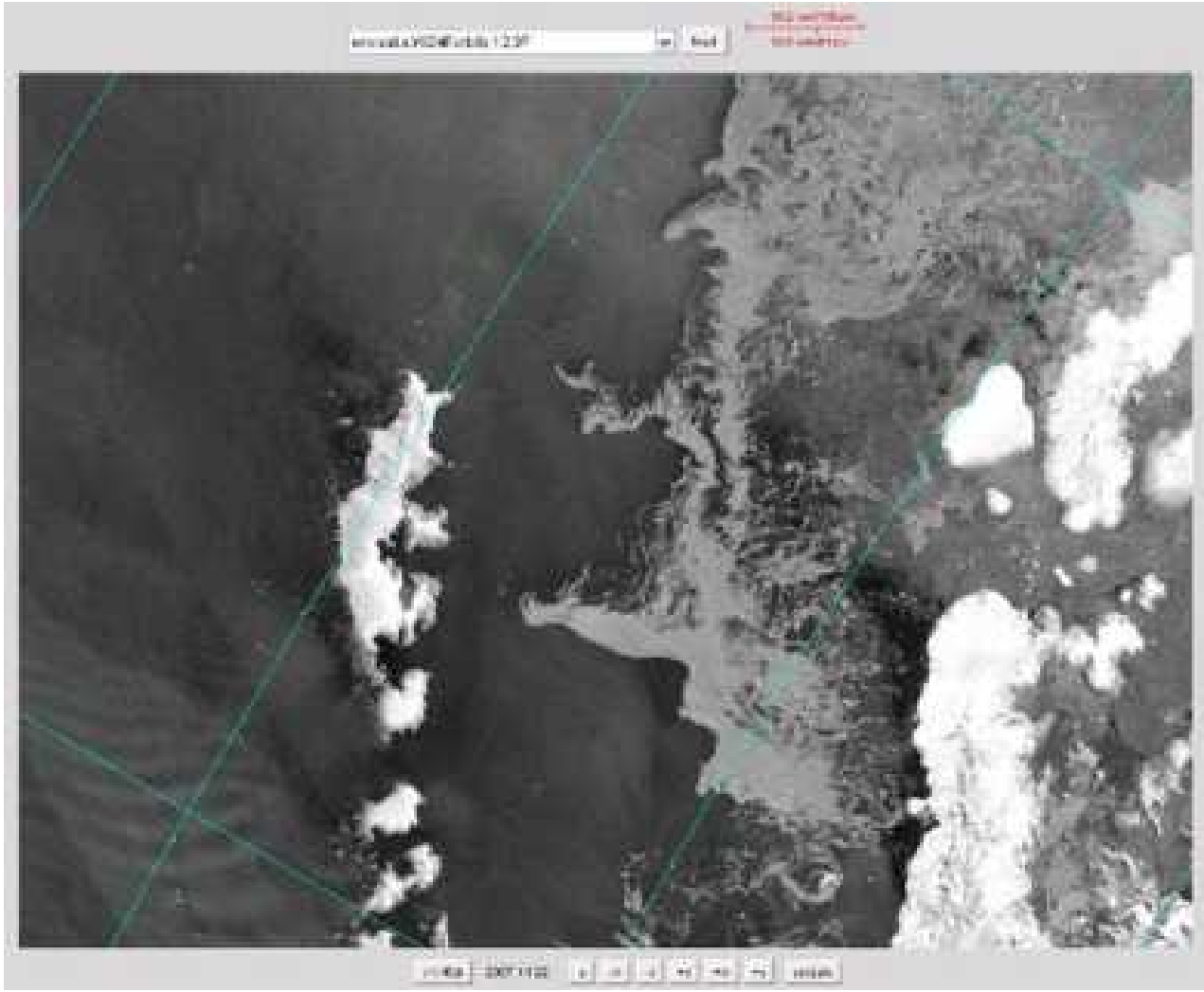

Image Anywhere - Access in the field

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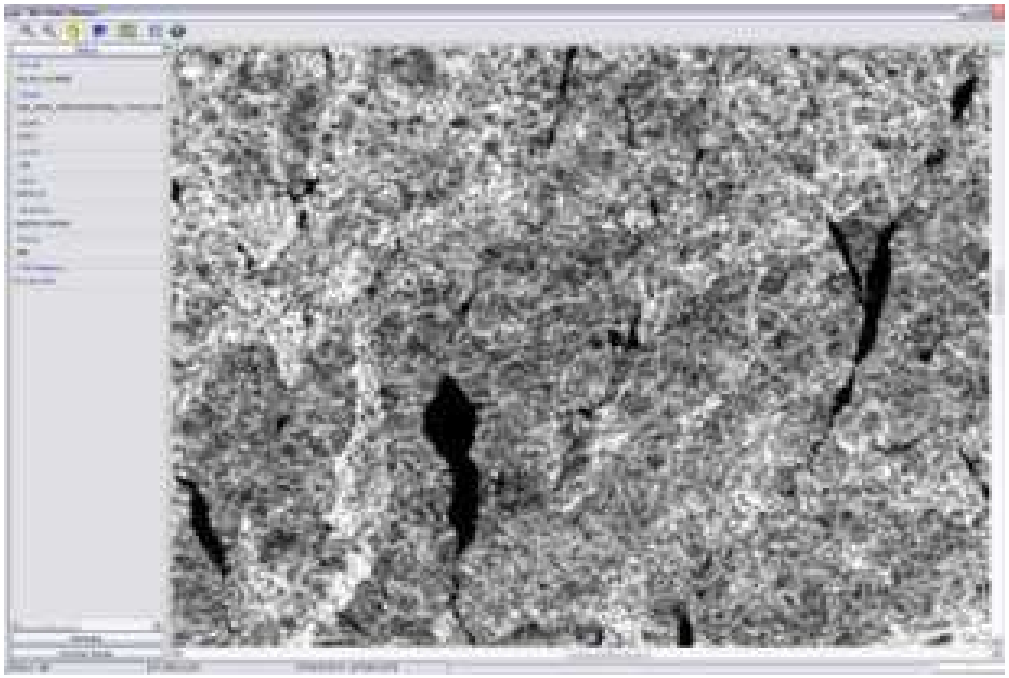
- High resolution images can be viewed anywhere in the world.
- Technology can operate regardless of communication capacity
  - e.g. iridium phone
- Allows tactical decisions to be made with best available information



Opening Image

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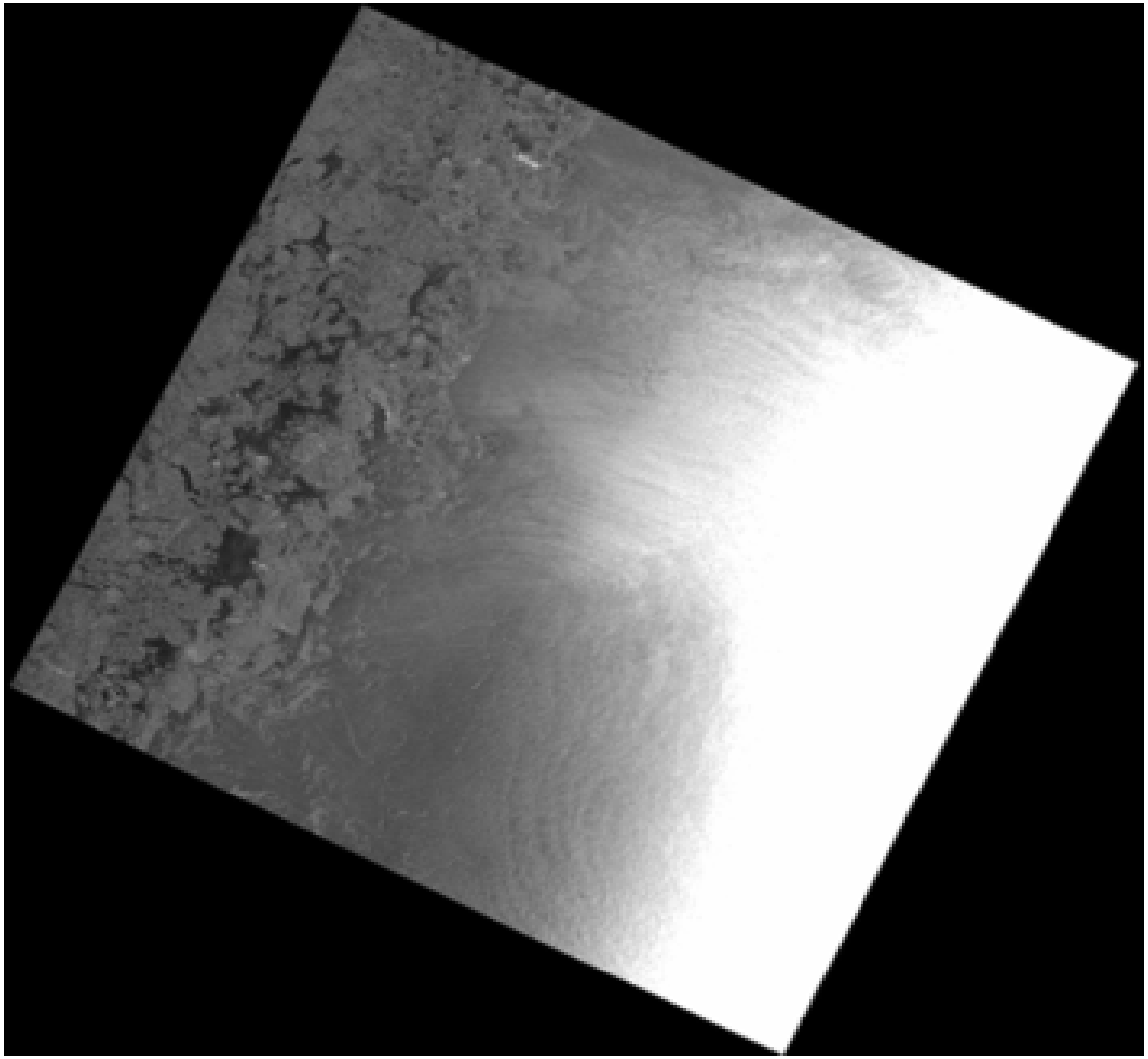
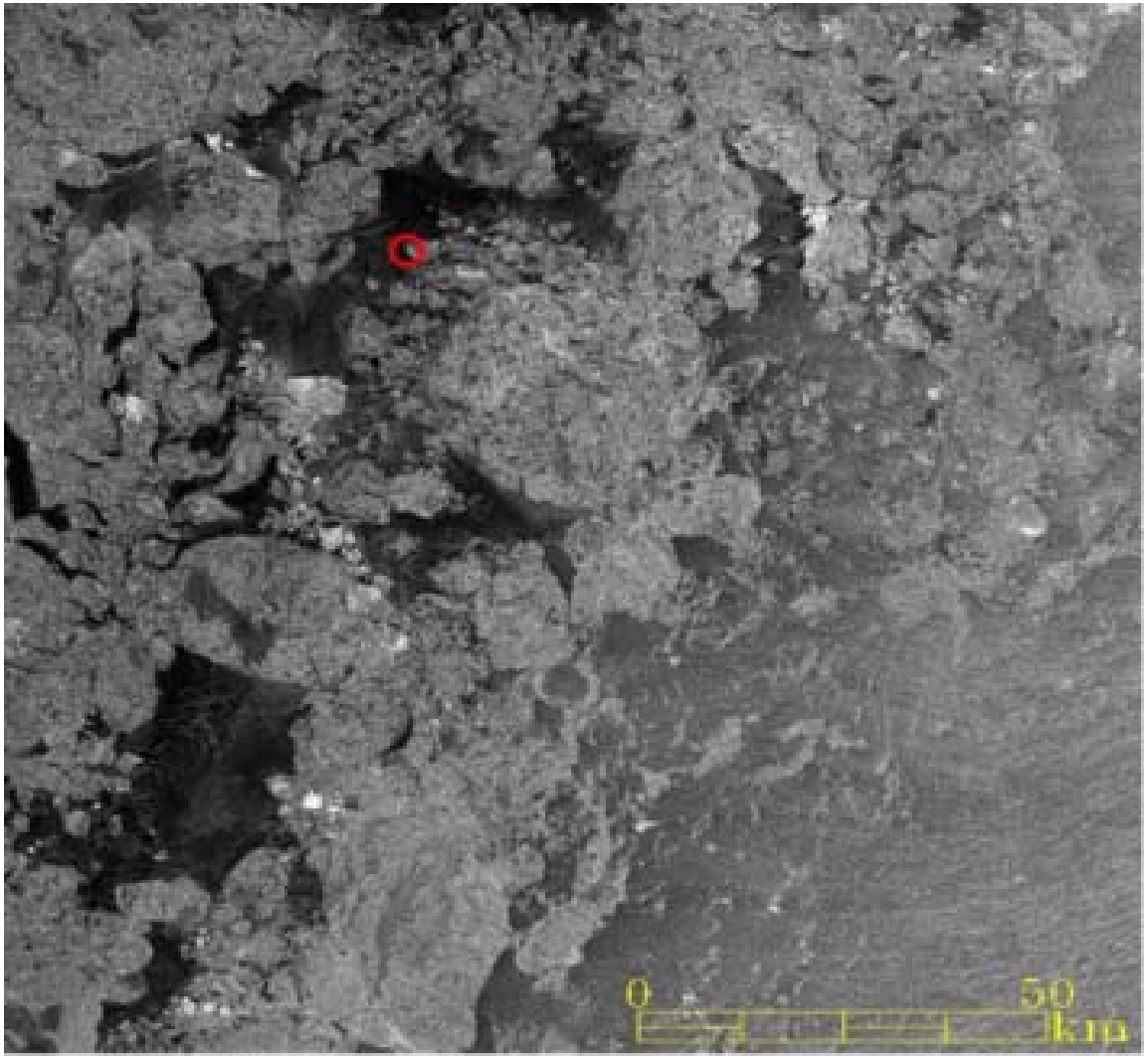
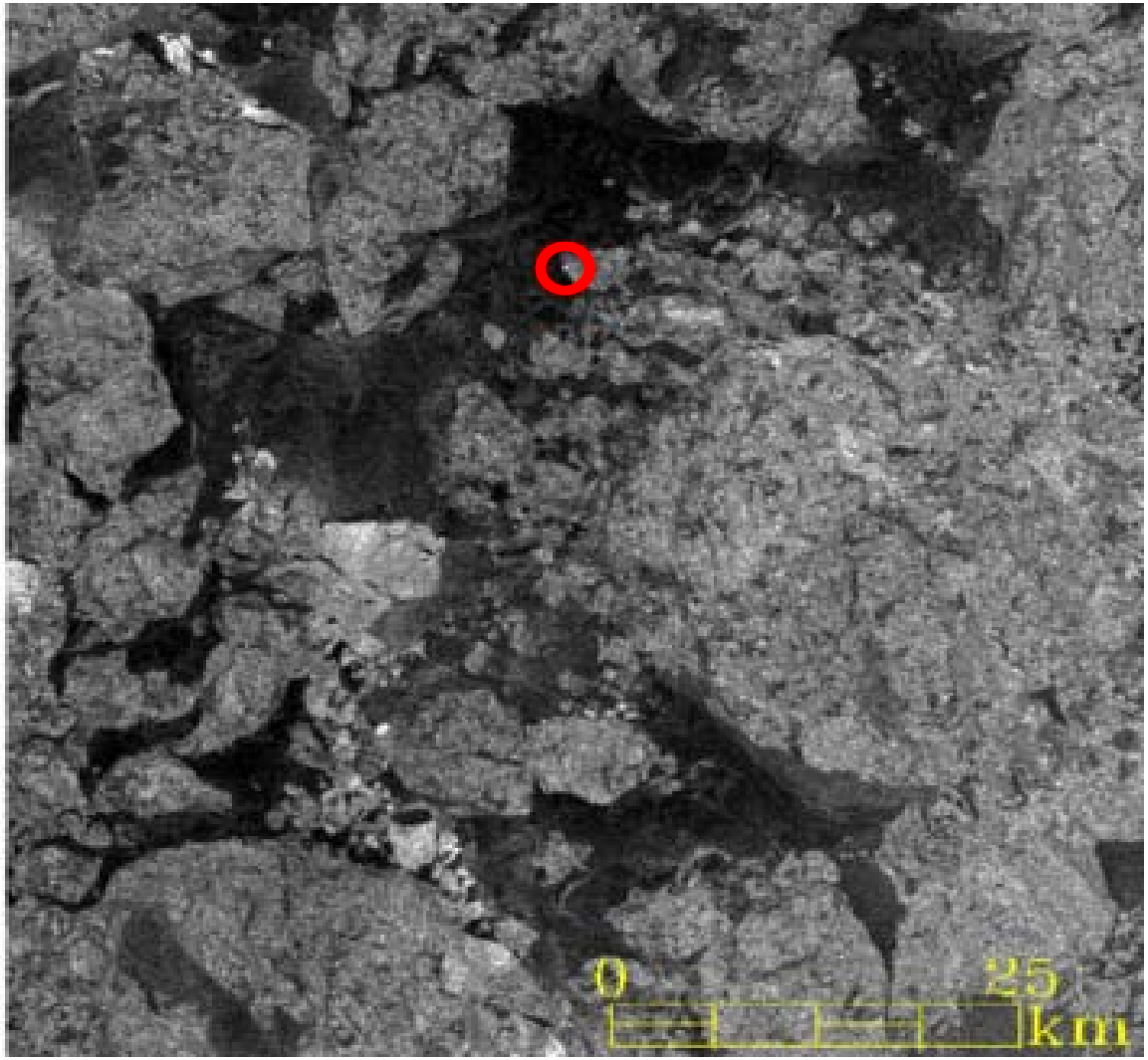


First zoom




0
25
km

The Detail

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Image Anywhere: Kara Gate, 8th April 17:25 GMT

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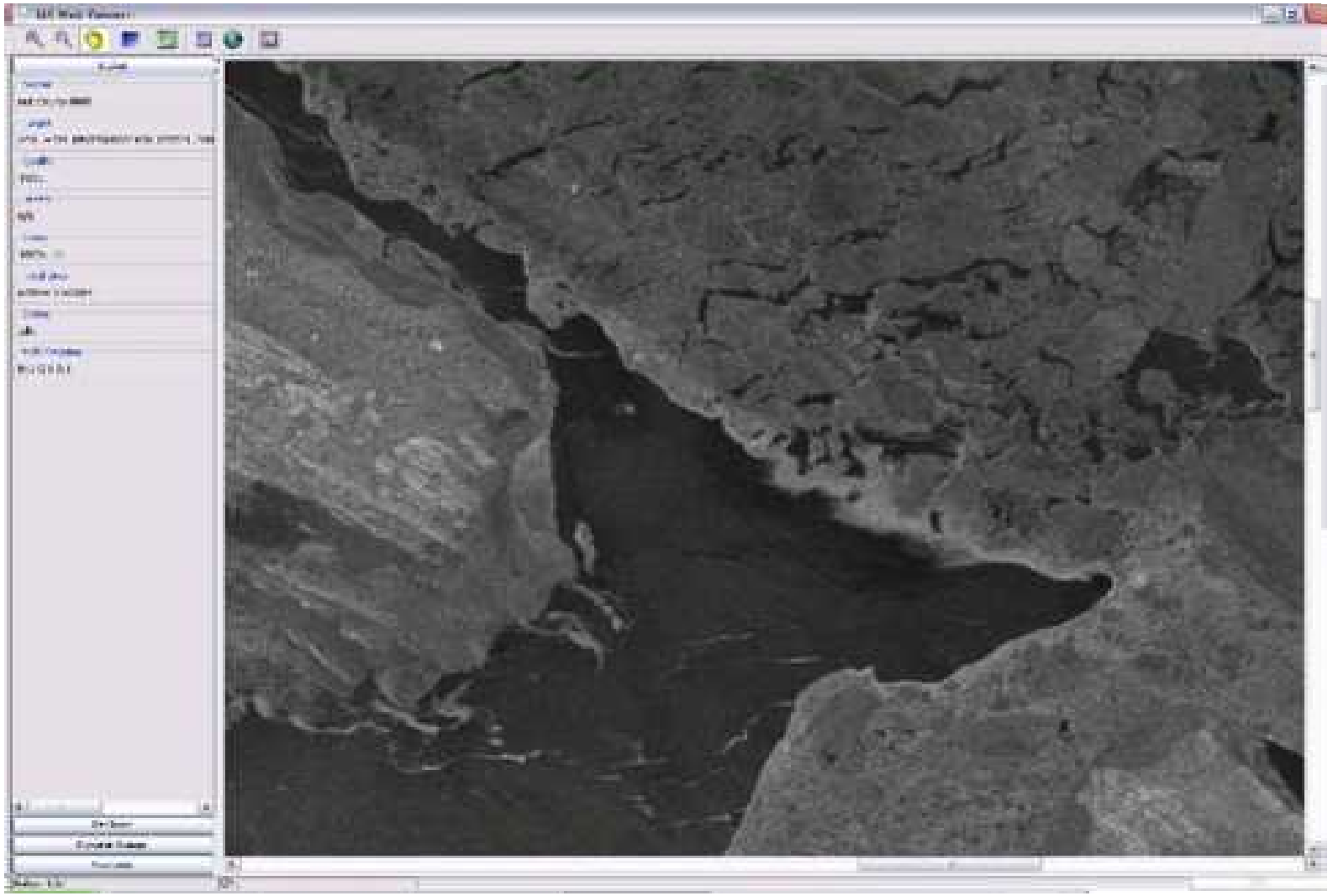

Radarsat-2 data

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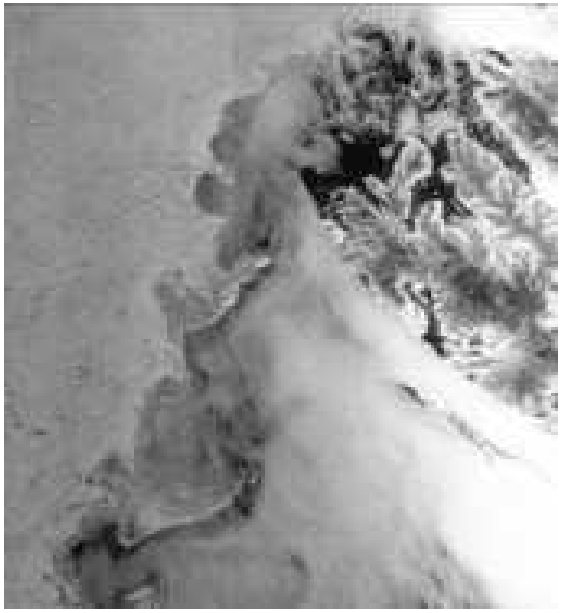
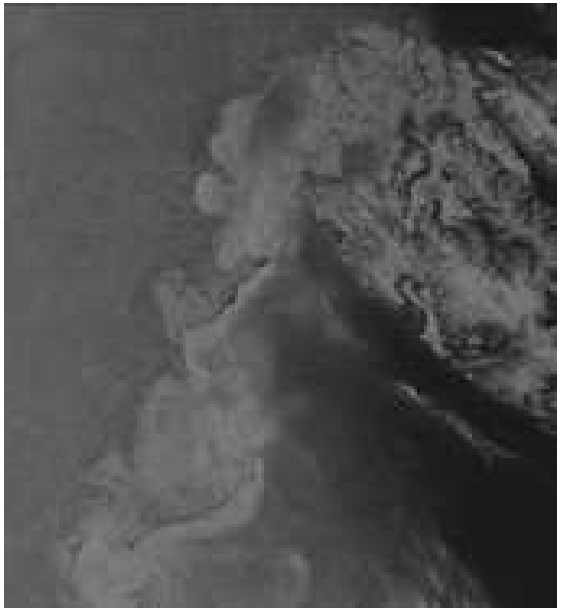


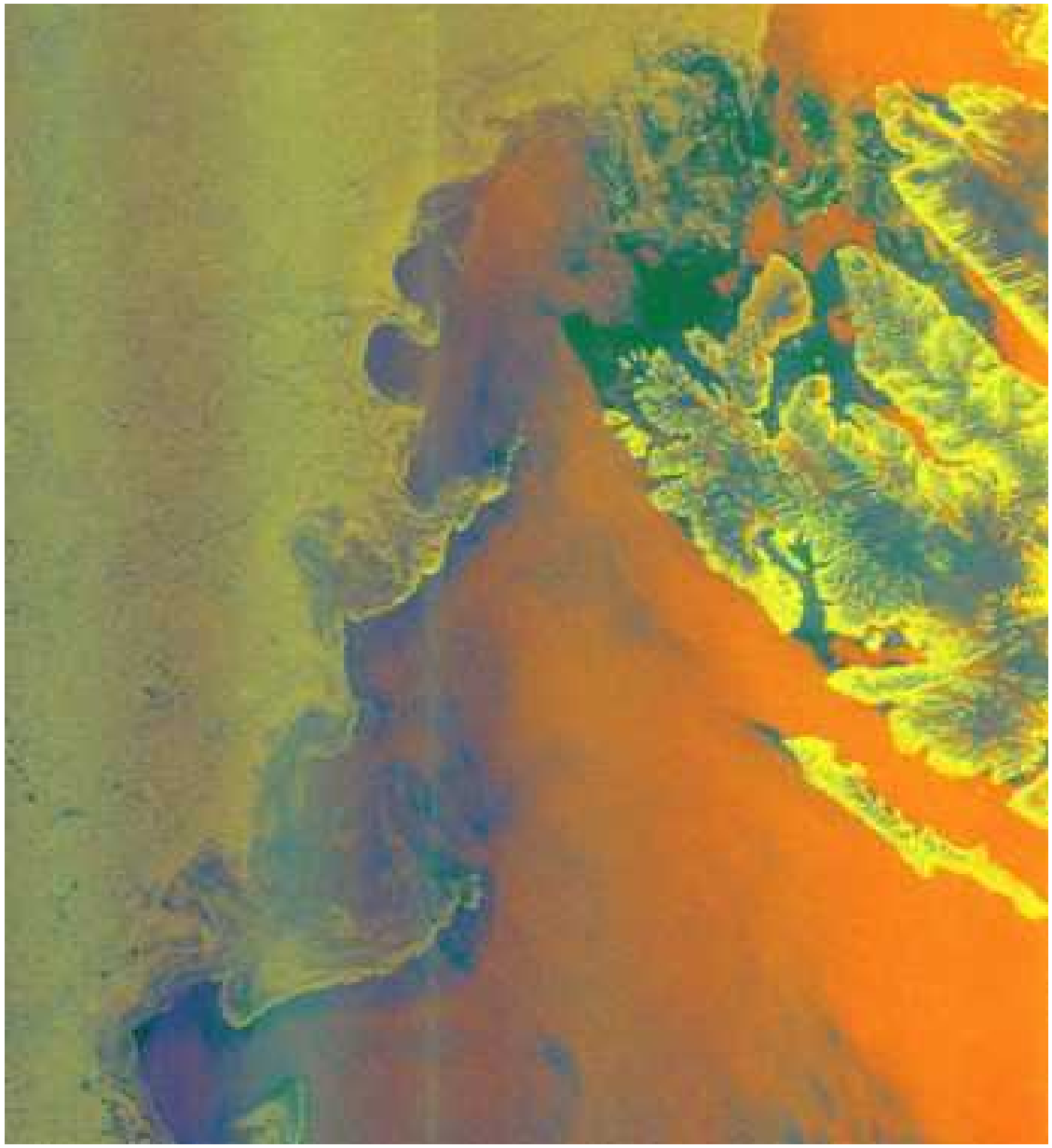
HH

HV



HV-HH

Dual polarization ScanSAR-B 21st July 2008



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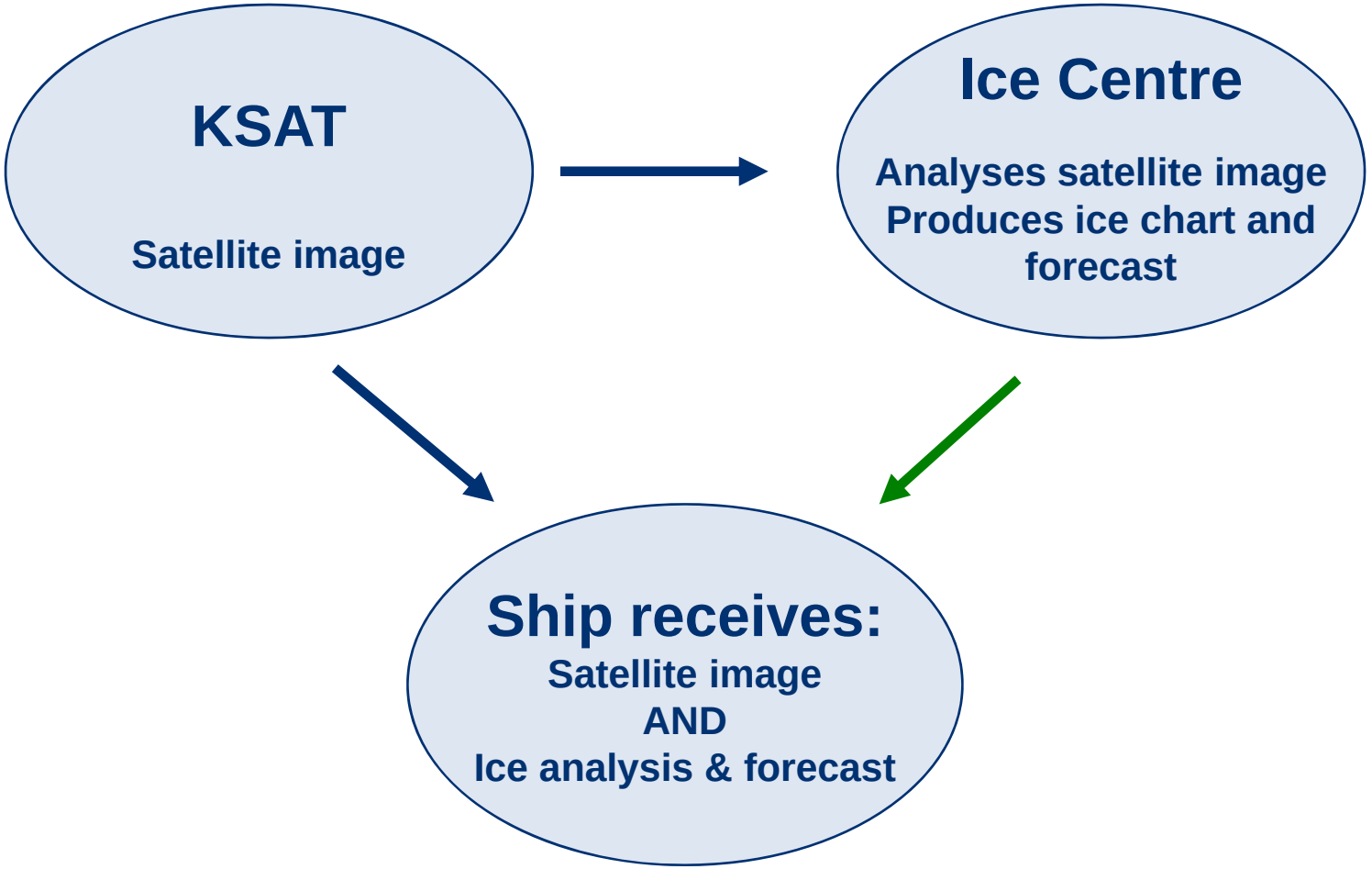
R=HH

G=HV

B=HV-HH

Processed by KSAT 2008

Ideal Information Distribution



Real time access to high resolution satellite data

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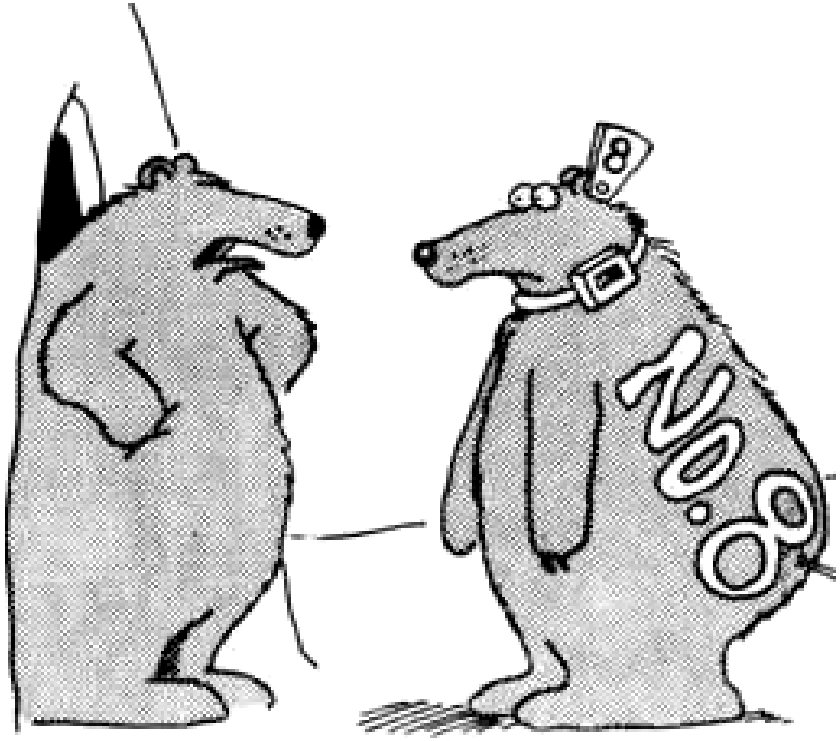
Benefits

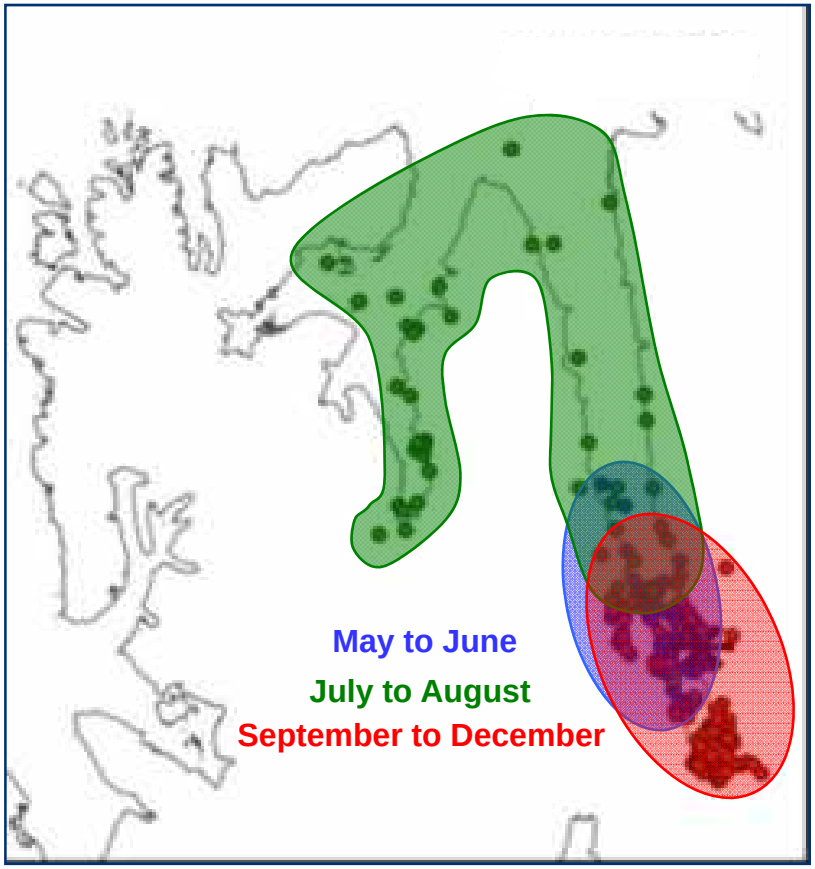
- Saves time
  - Easiest, simplest route can be identified
  - Navigate around obstacles
- Saves money
  - Less fuel consumed
  - Less hull maintenance
  - Less time in dry-dock and therefore potential increase in number of operating days per year.

  Validations during winter 2005 in the Baltic indicated a time saving potential of 20% when sailing in ice with the aid of satellite data.

GNSS data



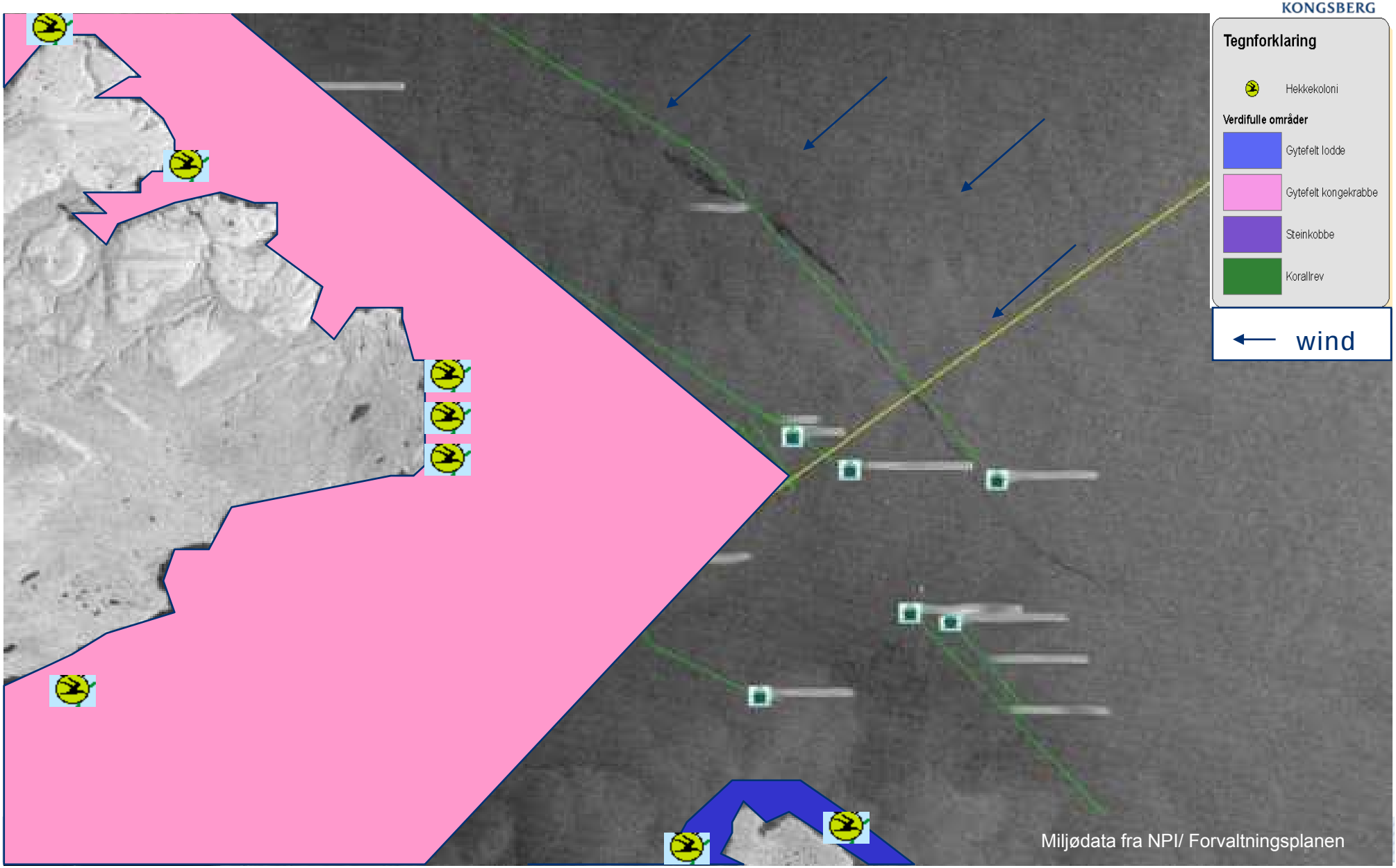
Have you been playing with the scientists again?

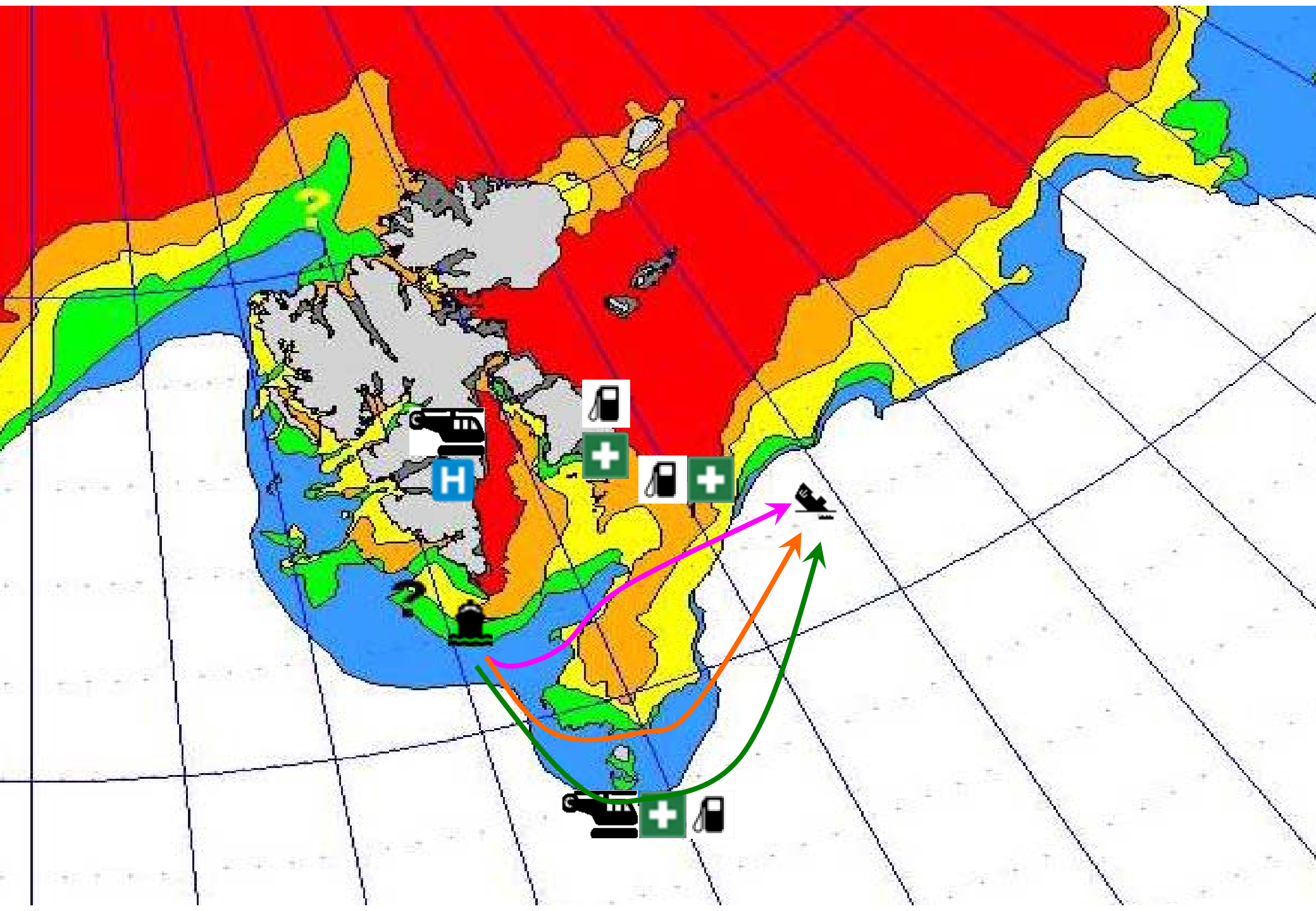


For Illustration purposes only

GPs data: ©Norwegian Polar Institute

Integration of environmental information





Summary: satellite technology and governance

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- Self-governance is of equal importance
  - You are responsible for your actions
  - help could be too far away.

- Information obtained from satellites can be used to allow humans to exploit the Arctic responsibly.
  - Real-time images
  - Real-time tracking

- It can be used to monitor activities that are detrimental to the Arctic.
  - Pollution
  - Illegal fishing

- Tracking people:
  - Good - faster rescue?
  - Bad - invasion of privacy?

The challenge: satellite technology and governance

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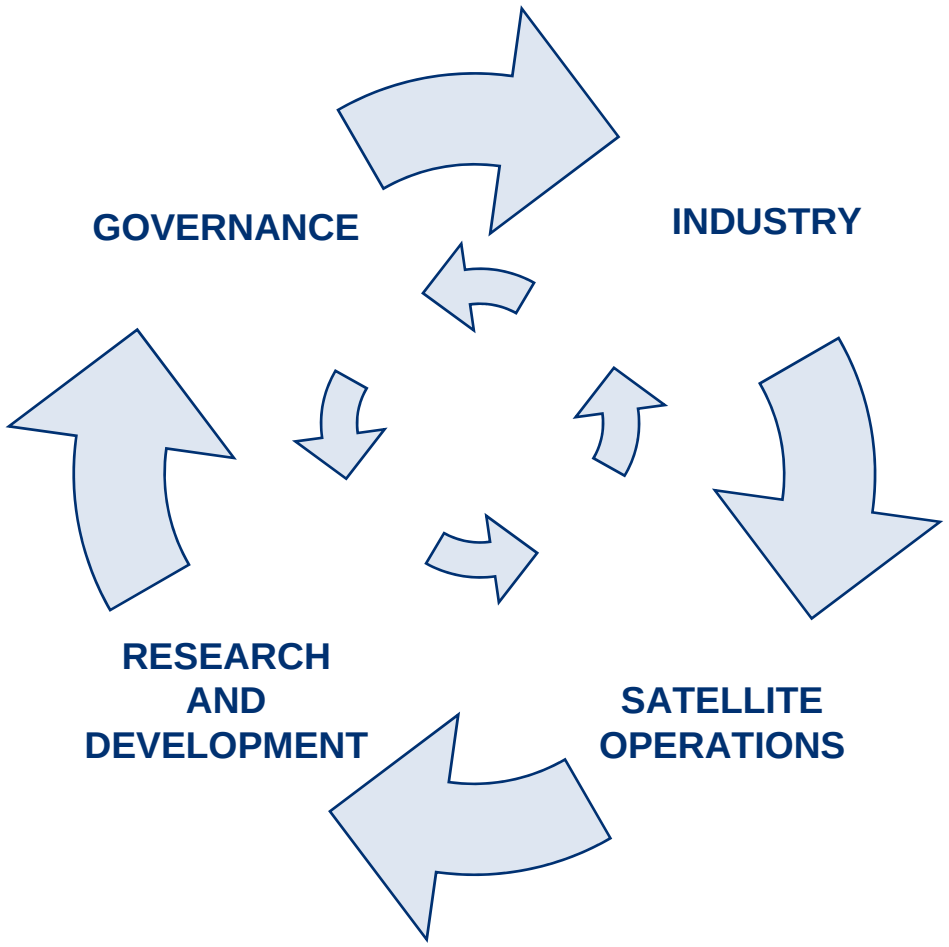

COMMUNICATE

Each sector needs to know

What is required

What is possible

Thank you for your attention

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