

Norsat-2

AIS + VDES

February 2017

NewSpace



Incumbent Space:
Time of development: Years
Price: Hundreds of millions \$
Size and weight: A mini-bus
Resolution: - 30cm - 1m
Revisit: once a day
Data Price: > \$50/Km²

Vs.

NewSpace:
Time of development: Months
Price: Hundreds of thousands \$
Size and weight: A mini-bar
Resolution: - 1m - 2.5m
Revisit: Many times a day
Data Price: < \$0.25/Km²



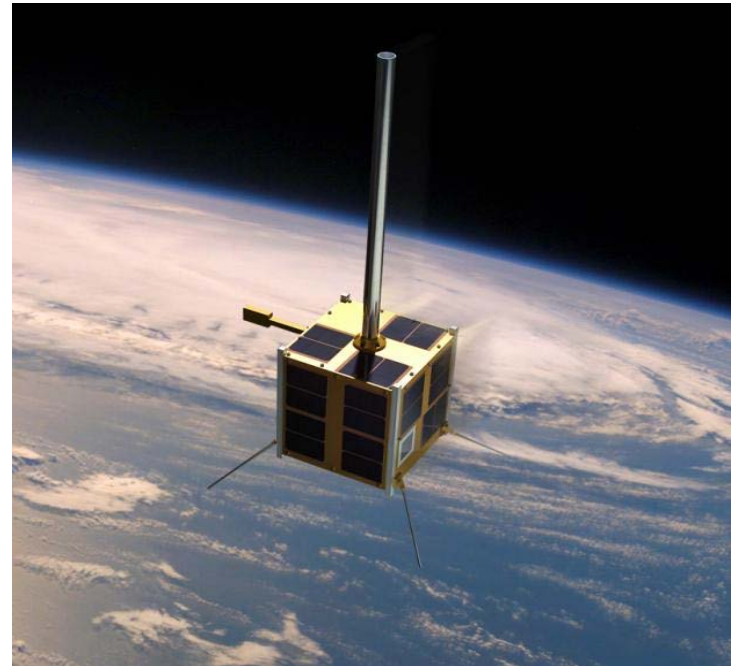
Catapult Ltd 2015

Planet launch

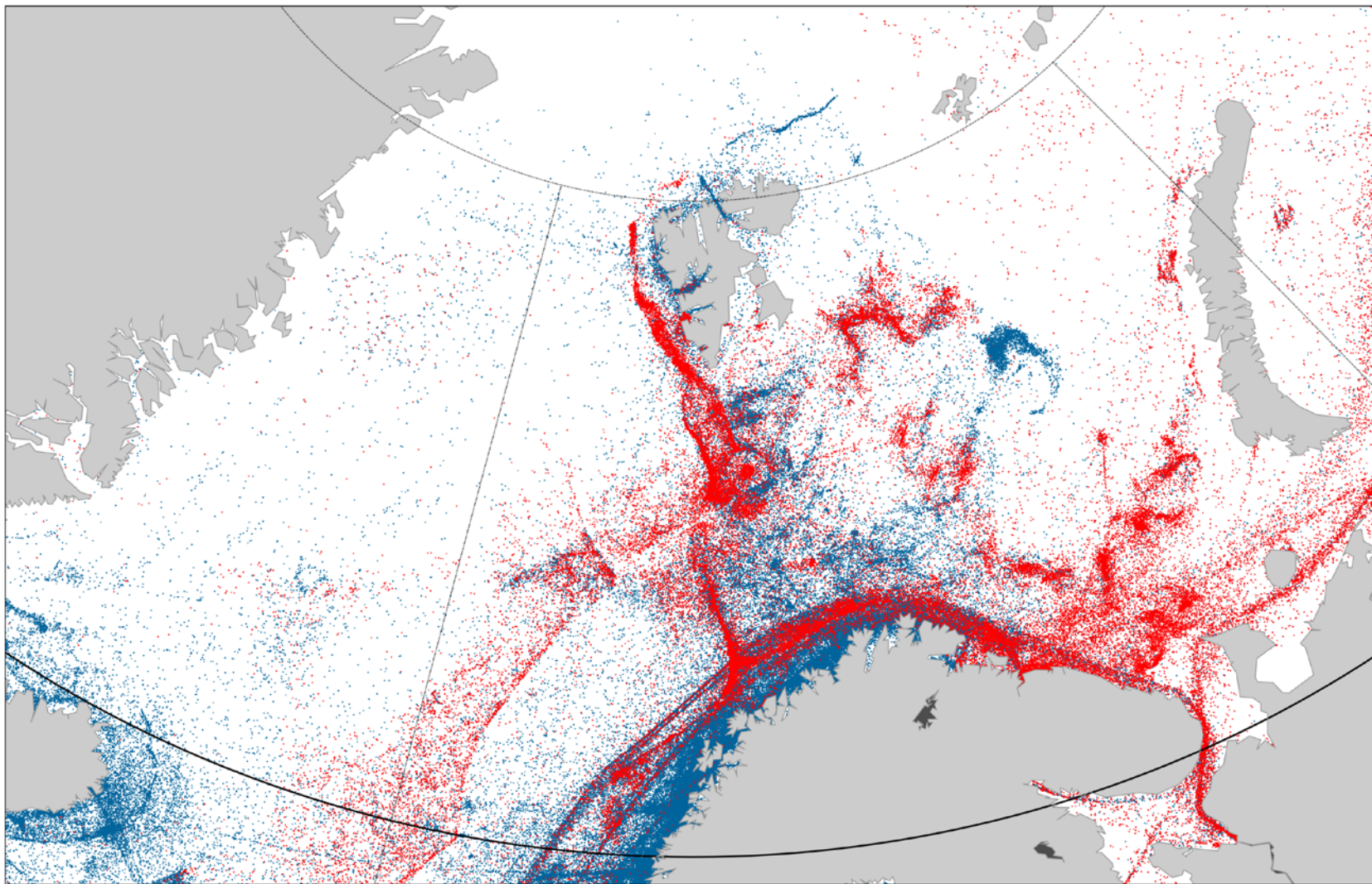


AISSat 1,2 (3)

- AISSat-1 : 12 July 2010
 - Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota
 - PSLV-C15 rocket
 - CARTOSAT-2B
- AISSat-2 : 8 July 2014
 - Baikonour Cosmodrone
 - Soyuz 2-1B rocket
 - Meteor-M 2 satellite
- AISSat 3 : 3Q 2017
 - Baikonour Cosmodrone
 - Soyuz 2-1B rocket



AISSat-1 og 2

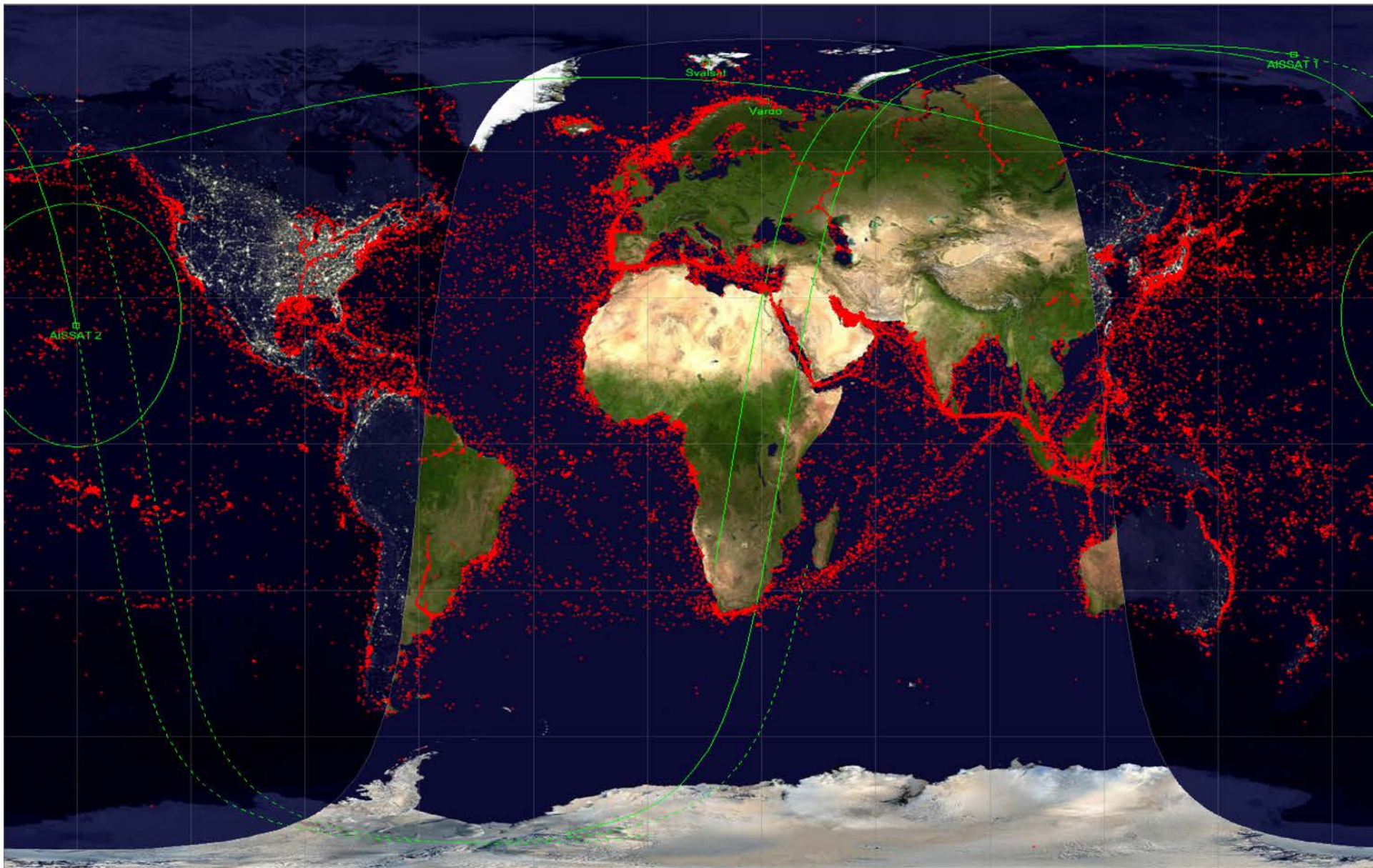


Brukere : de som har operativt ansvar til sjøs

- Kystverket
- Hovedredningssentralen
- Forsvaret
- Politiet
- Tollvesenet
- Fiskeridirektoratet
- Sjøfartsdirektoratet

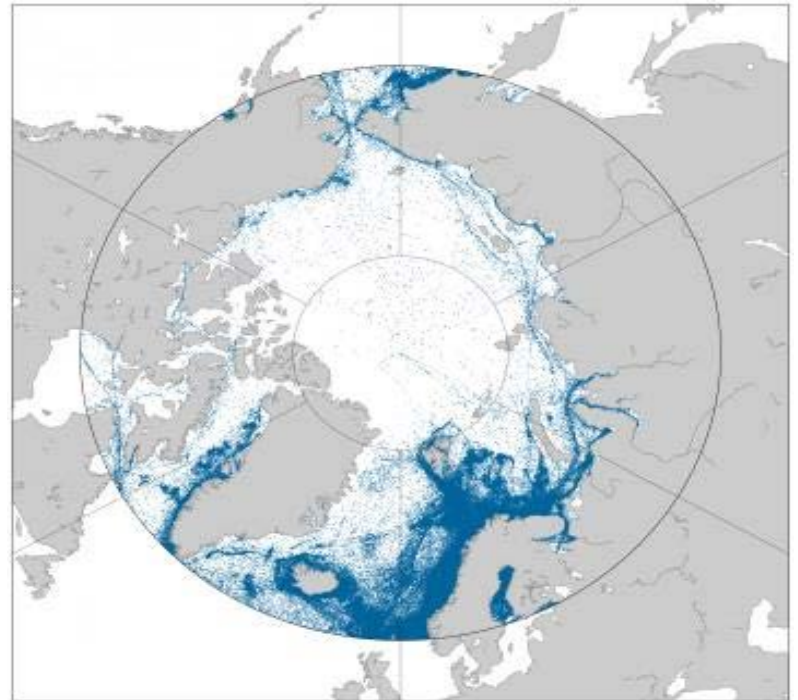


AISSat gir global dekning



...som gjør Norge til en attraktiv samarbeidspartner

- EU
- USA
- Canada
- Japan

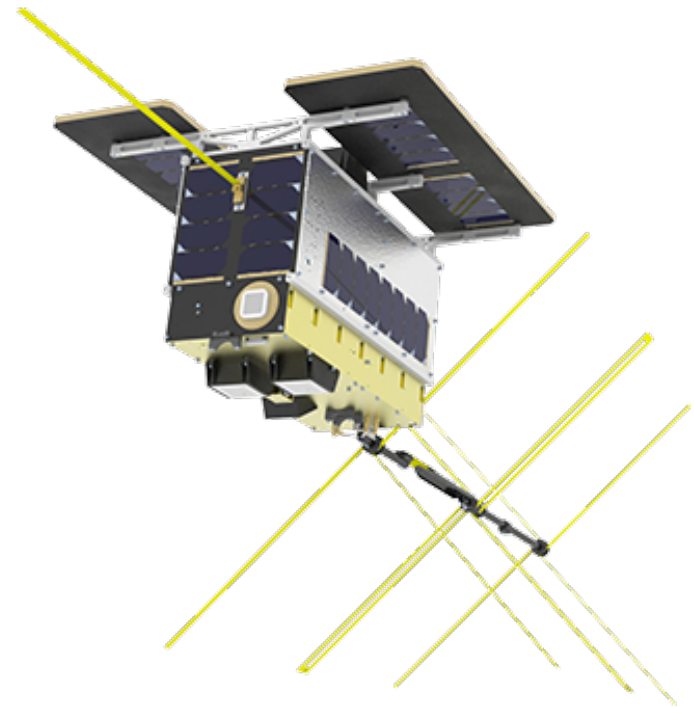
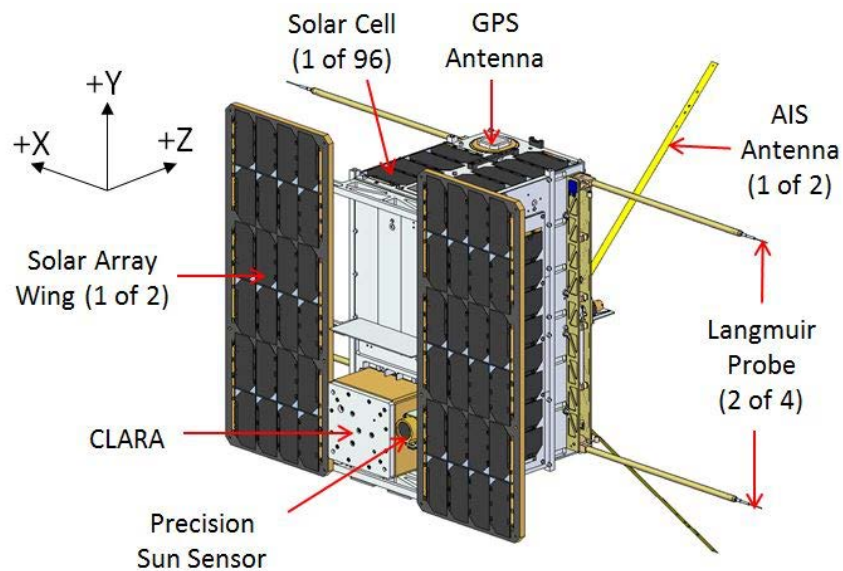


Regjeringens maritime strategi

- myndighetsutøvelse og suverenitet, og en effektiv beredskap.
- **Betydelig forbedret oversikt** over skipstrafikken i de norske arktiske havområdene.
- **Nasjonal transportplan**



NorSat-1og 2



Oppskyting

- 1Q 2017
- Baikonour Cosmodrom
- SOYUZ-2.1A/Fregat
- Kanopus-V-IK



Bakkesegment



Stort havområde uten nødradio: – Situasjonen er prekær

Flere fiskere befinner seg nå uten kystradio eller nødberedskap på et av de mest værharde havområdene etter fiberkabelbrudd. – Dette er alvorlig, sier dekningsdirektør i Telenor.



Flere fiskere kan ikke melde ifra om nødssituasjoner etter at kystradioen er nede i et stort område i Barentshavet, FOTO: KNUT-SVERRE HORN / NRK



André Bendixen

Journalist



Rune Berg

@RuneBerg71

Journalist

● MER OM [KABELBRUDD](#)

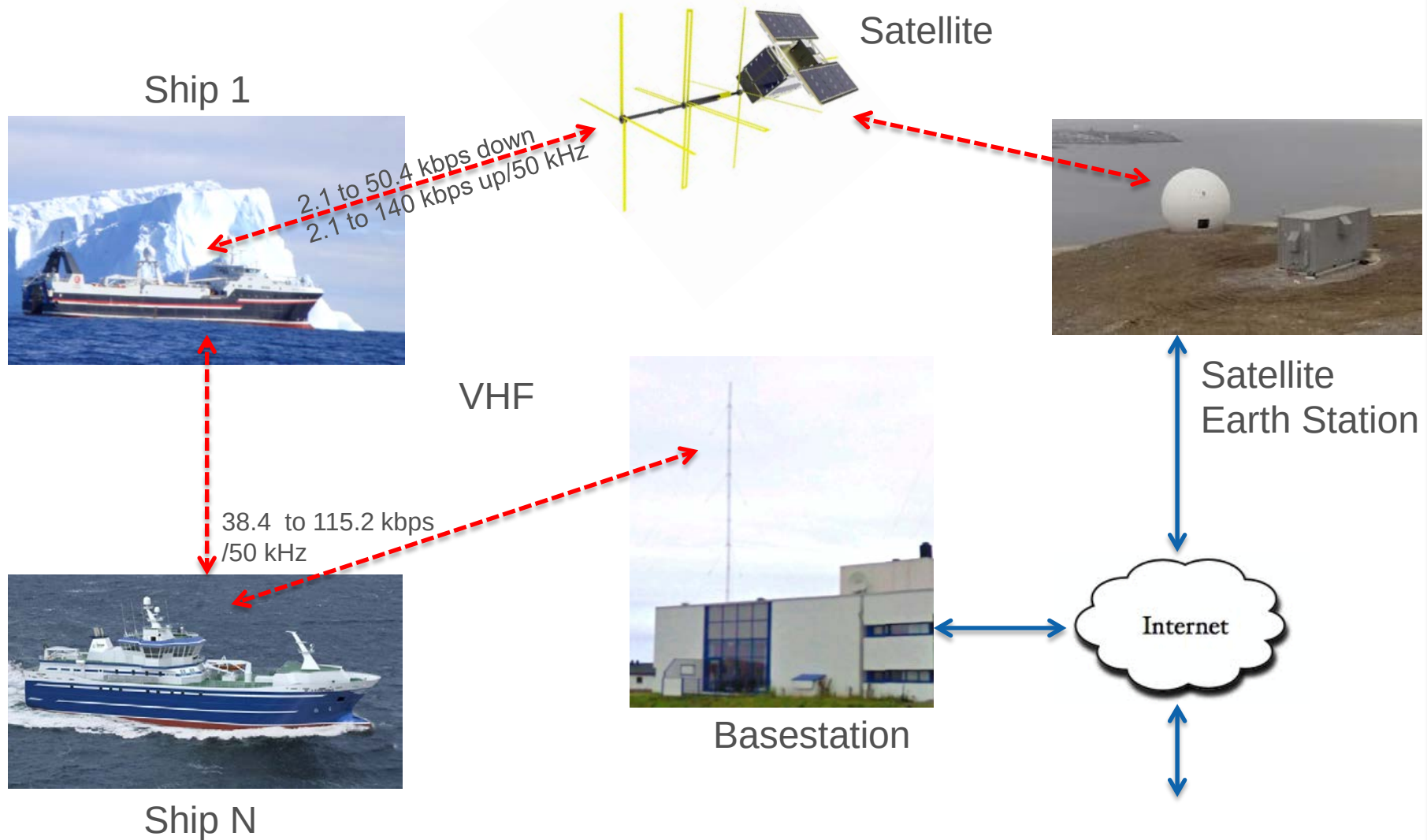
● MER OM [FINNMARK](#)

● MER OM [FISKERI I FINNMARK](#)

○ Oppdatert 11.01.2017, kl. 14:40

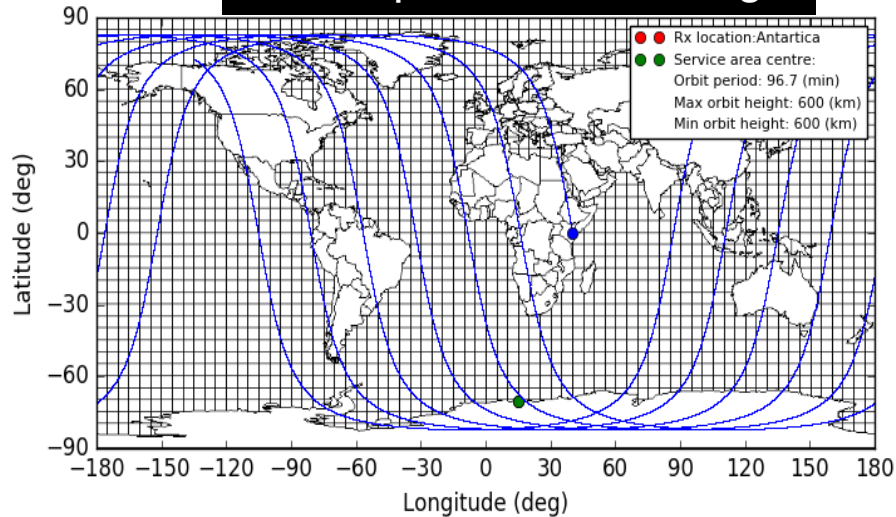
VHF Data Exchange System Elements

**SPACE
NORWAY**

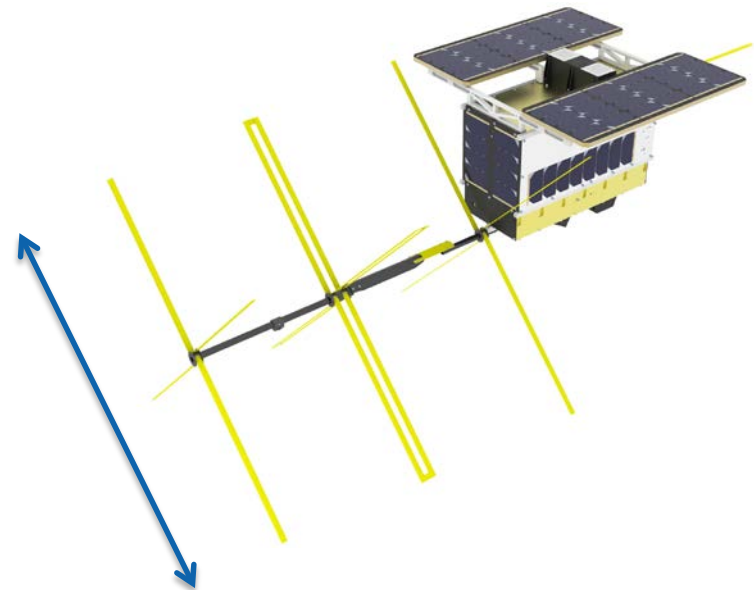
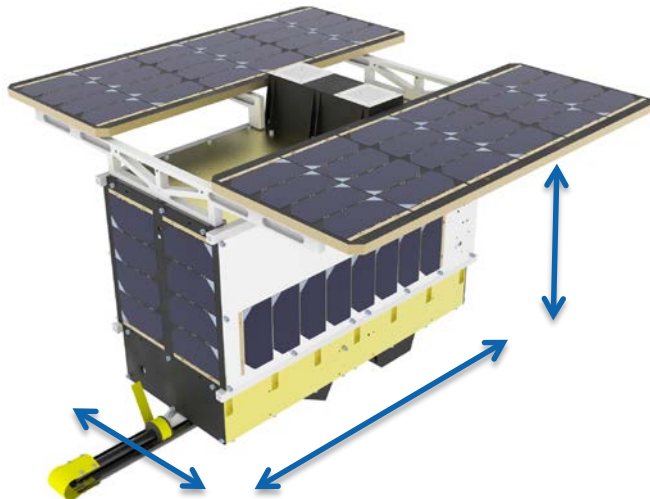
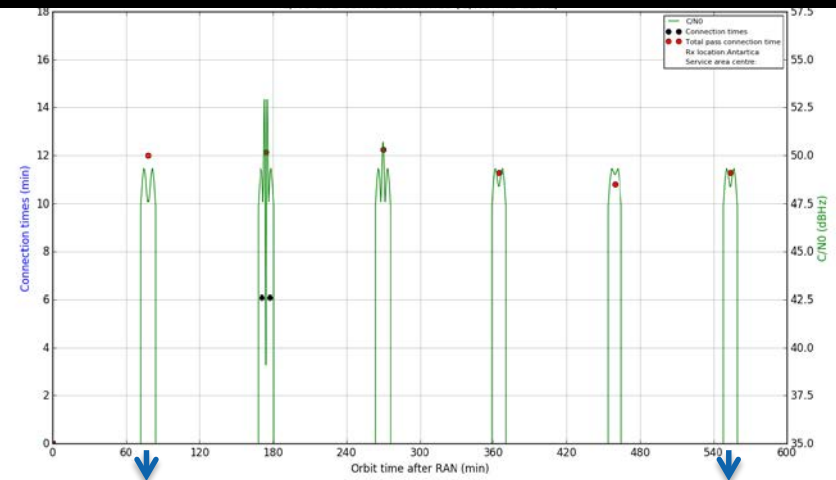


Norsat-2 LEO satellite

Global part time coverage



Link available 11 min every 97 minutes @70



Mission: AIS reception and two way VHF Data Exchange System to **SPACE NORWAY**

Primary coverage area:

Norwegian Arctic regions

Launch:

Soyuz 2.1 Q2 2017

Bus manufacturer:

UTIAS SFL

Antenna manufacturer:

UTIAS SFL

AIS payload manufacturer:

Kongsberg Seatex

VDES payload manufacturer:

Kongsberg Seatex

Satellite owner:

Norwegian Space Centre

AIS payload user:

Norwegian Coastal Authority

VDES payload owner:

Space Norway

Key technical parameters:

Polar orbit:

600 km SSO

Attitude control:

3 axis stabilized

Solar power generation:

56 W peak

Mass:

16.7 kg

Satellite body size:

200 x 300 x 440 mm

AIS payload weight:

1.3 kg

VDES payload weight :

1.5 kg

Antenna weight:

0.3 kg

VDES transmit duty cycle:

10% of orbit, adjustable

VDES receive band:

157.1875-157.3375 MHz

VDES transmit RF power:

1 W linear (28 dB C/I₃)

VDES transmit duty cycle:

10% of orbit, adjustable

VDES transmit band:

161.7875-161.9375 MHz

Feeder link:

S-band, 1 Mbps in both directions

Payload technology:

Software Defined Radio (initial software is Arbitrary Waveform

Generator)

Yagi antenna size:

800 x 975 mm

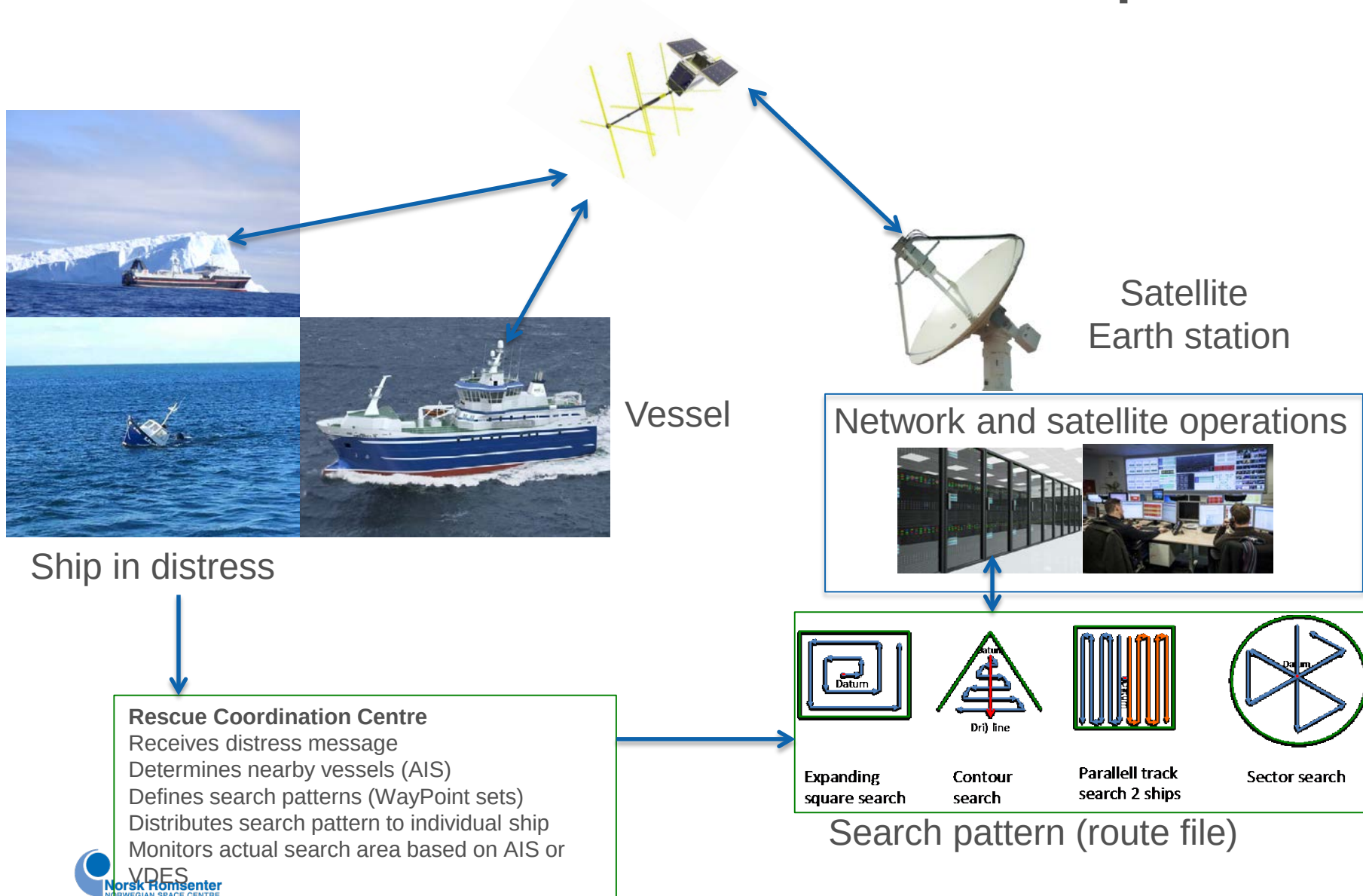
Peak antenna gain:

8.0 dBi



Example: Satellite based SAR coordination concept

SPACE
NORWAY



Maritime Service Portfolio (MSP)

1. VTS Information Service (IS)
2. Navigational Assistance Service (NAS)
3. Traffic Organization Service (TOS)
4. Local Port Service (LPS)
5. Maritime Safety Information Service (MSI)
6. Pilotage Service
7. Tugs Service
8. Vessel Shore Reporting
9. Telemedical Assistance Service (TMAS)
10. Maritime Assistance Service (MAS)
11. Nautical Chart Service
12. Nautical Publications Service
13. Ice Navigational Service
14. Meteorological Information Service
15. Real-time Hydrographic and Environmental Information Service
16. Search

VDES aktiviteter i Norge

- 1) VDES nedlink målinger i Arktis med Norsat-2: SPN, KSX og FFI
- 2) VDES Testbed og system simulator: SPN, KSX og FFI
- 3) VDES for GNSS bruk i Arktis: KSX, SPN og GLA (UK)
- 4) Utvikling av design og spesifikasjoner for VDES i IALA
- 5) ITU regulatorisk arbeid sammen med NKOM for WRC-19

Konklusjon

- NorSat-2 skal skytes opp i mai 2017
- VDES skal testes ut i perioden 2017-2018
- Ta kontakt med Space Norway for ev samarbeid
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