



KYSTVERKET

NORWEGIAN COASTAL ADMINISTRATION

CAATEX 2019 Scientific Cruise

AIS rebroadcasting by VDES (VHF data exchange)

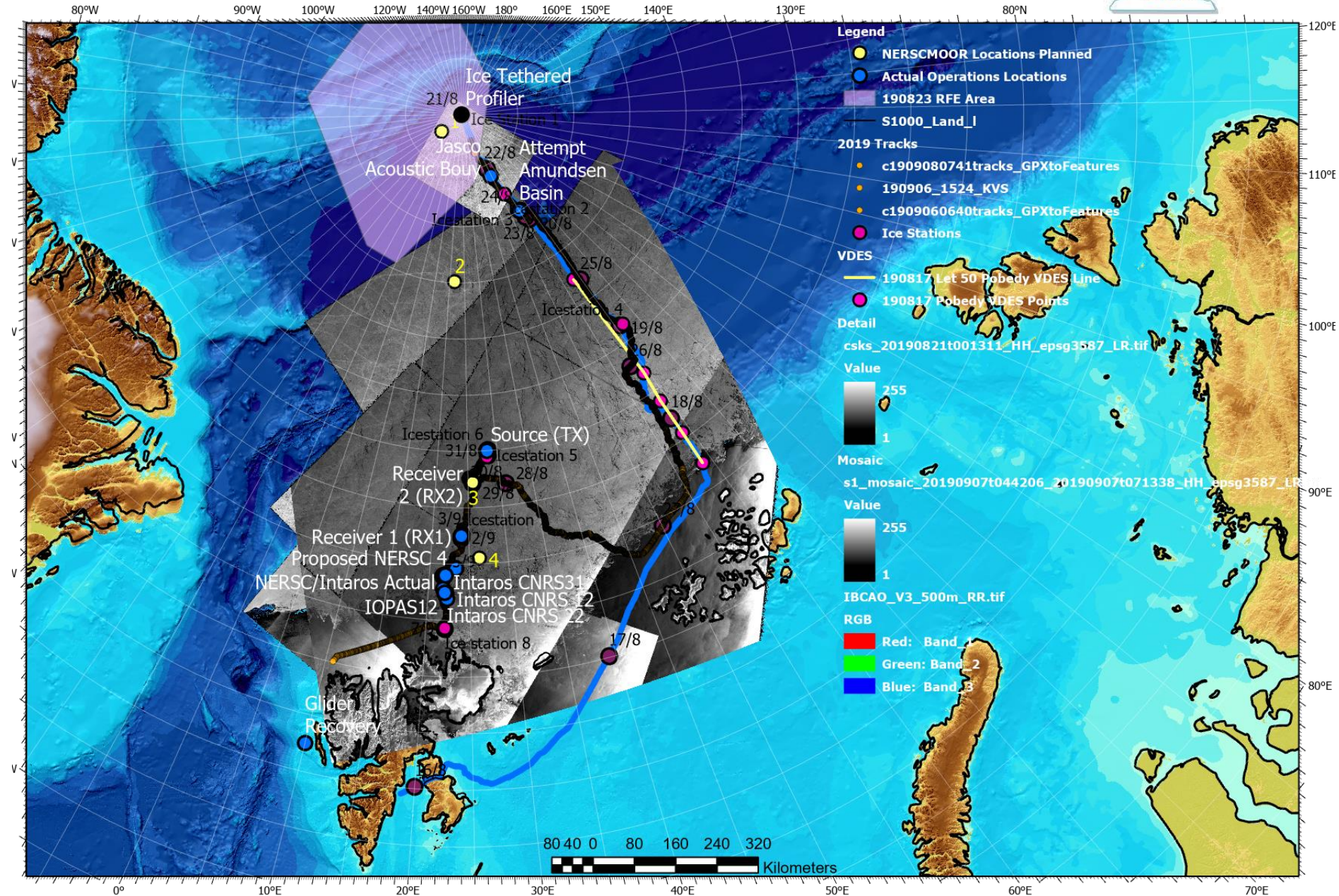
Andreas Kjøl, Senior Advisor
Arctic Ocean, 190908

2019 CAATEX Scientific Cruise Expedition



Main Objectives/ Achievements:

- Deploy 4 scientific moorings in Eurasian Basin
- Understand temperature development in Arctic Ocean and other oceanographic data sampling
- On Ice Research stations underway
- Dep Longyearbyen 14 Aug
- Arrival North Pole 21 Aug
- Ret Longyearbyen 9 Sept
- Distance in ice 2185 nm

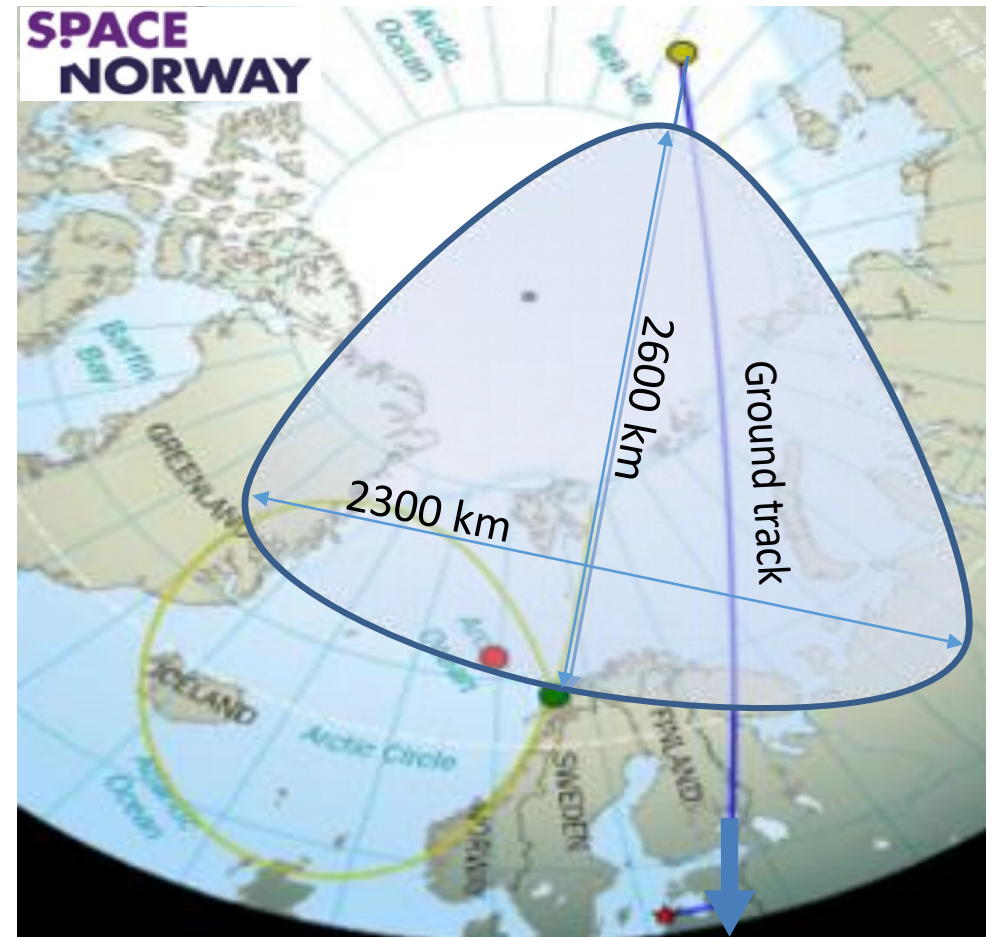


VDES over satellite to support ice-navigation and safety



Norwegian Coastal
Administration

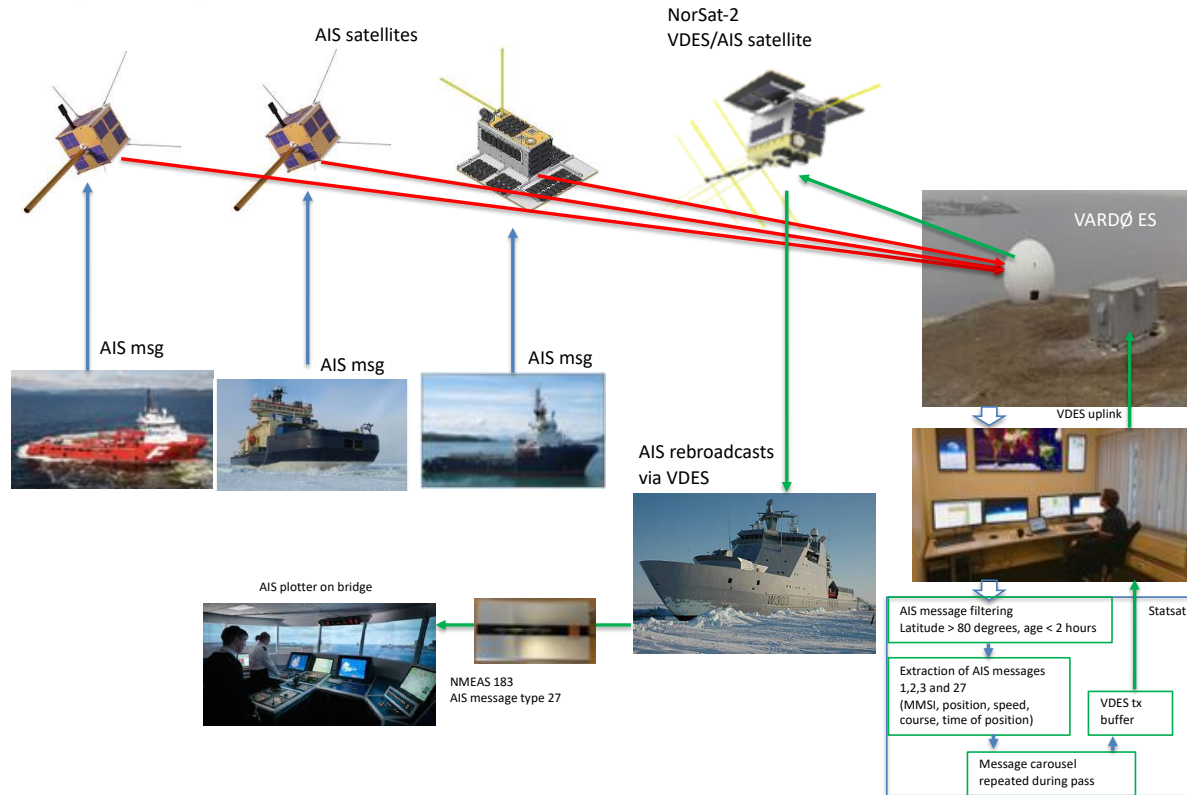
- Progress of vessels through ice may be used to determine safest route
- Few vessel within AIS terrestrial range in the Arctic
- VDES over satellite covers large areas at low cost, but with limited capacity
- Rebroadcasted location of all vessels beyond 75N via VDES
- Theoretical VDES capacity is 1500 AIS msg 27 reports/pass



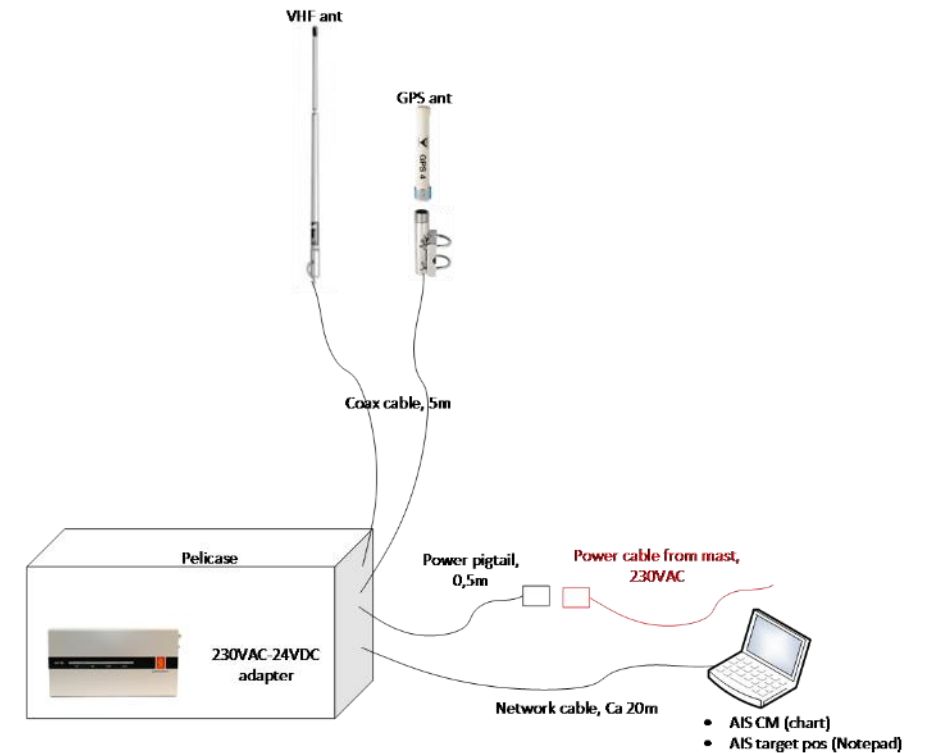
NCA Work Package 1, Nor Sat 2 Test of VDES

**SPACE
NORWAY**

Arctic AIS rebroadcasting service via VDES step 1

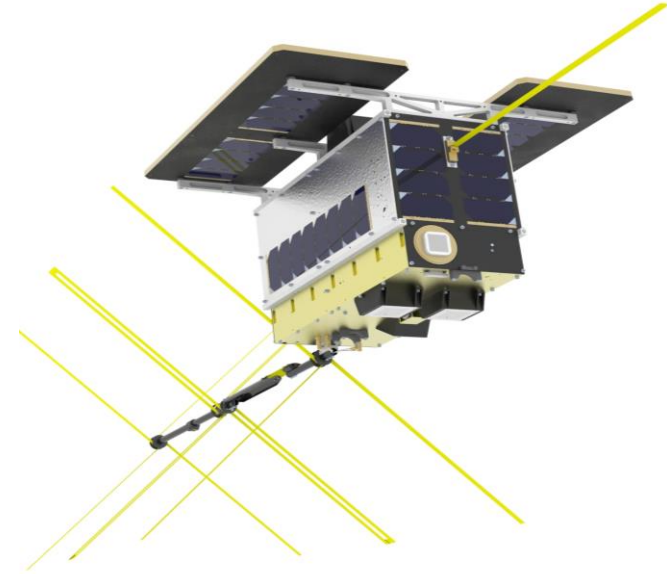
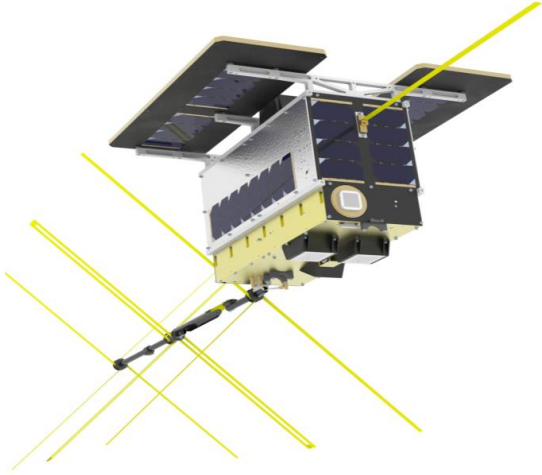


Onboard Installation

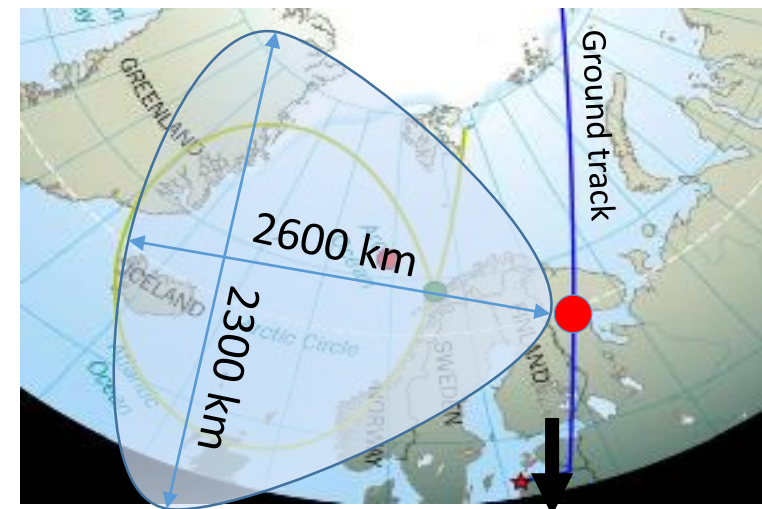


Goal to Receive/plot all targets N of 75 and use for situation awareness and decision support

NorSat-2 VDES space infrastructure



- Procured by Norwegian Space Agency for NCA
- AIS primary mission
- Space Norway procured VDES payload
- Payload manufactured by Kongsberg Seatex
- Typical 10 minute pass time/98 minutes/satellite
- 5 satellites will ensure < 15 min latency from 70N



Vessel to be used, «KV Svalbard» (Norwegian Coastguard Icebreaker)

Main Particulars

MMSI 259 040 000

IMO 8640387

LOA 103,7 m

Beam 19,1m

Draught 6,5m

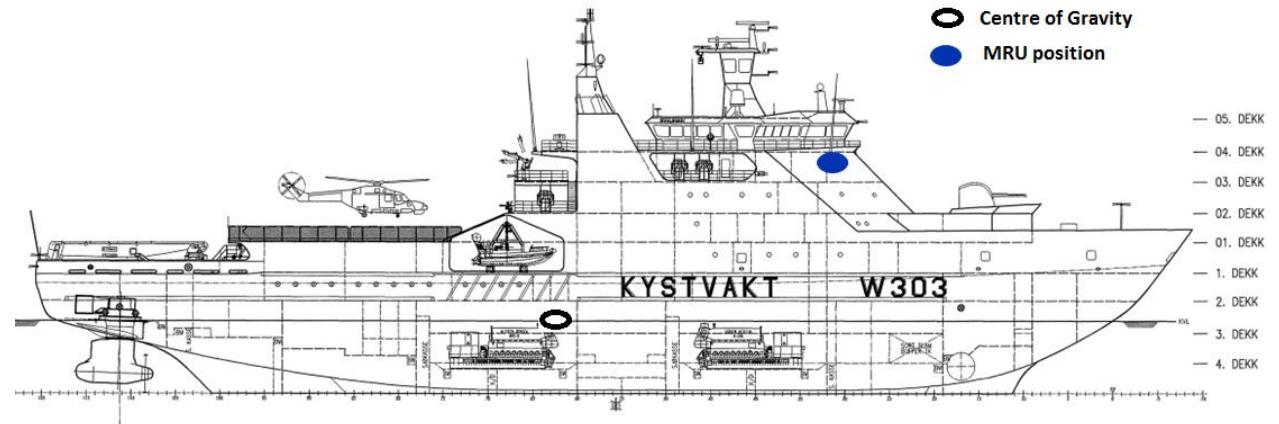
Displacement 6500 T

Total Power 19 MW

Propulsion Power 10 MW

Ice Class DNVGL Icebreaker Polar 10

Crew 55, Scientists and researchers 20

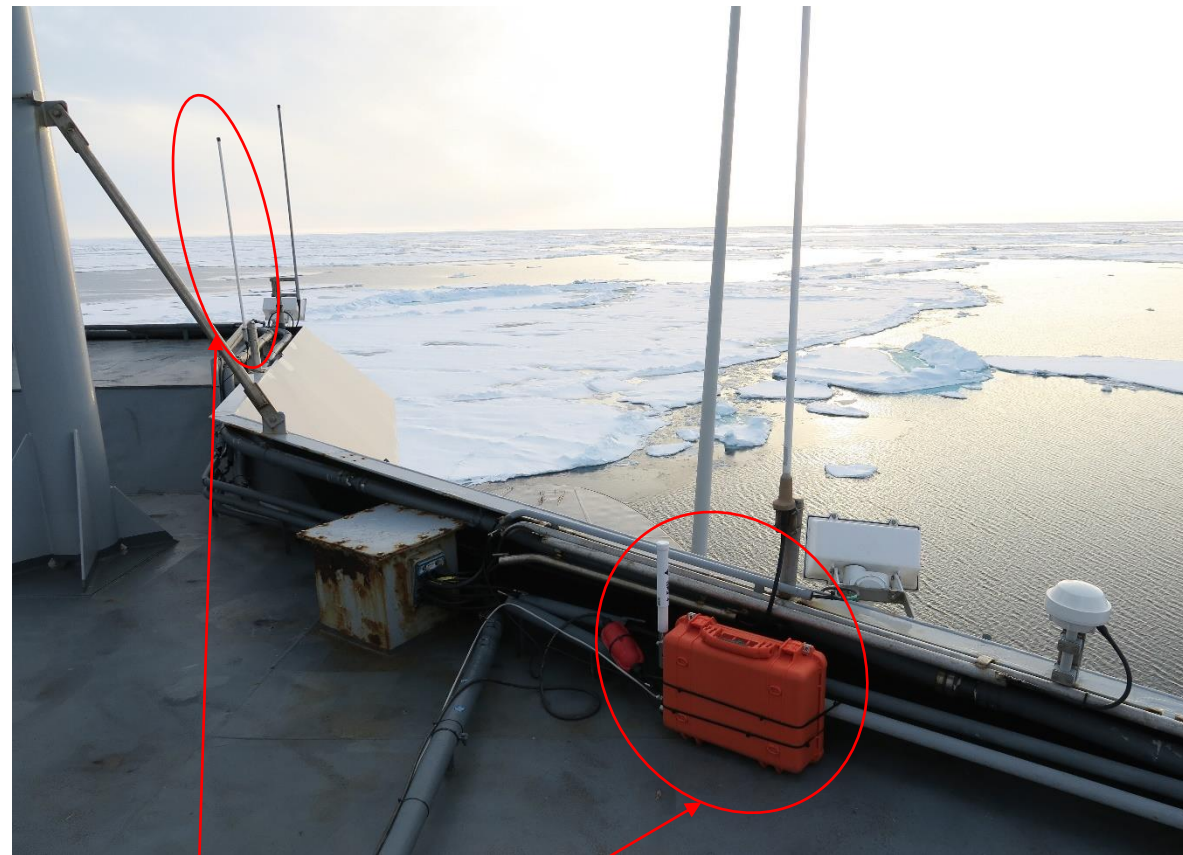


Onboard Installation

NCA Workstations on Bridge



VDES receiver on wheelhouse roof



VDES Equipment

Software/GUI used onboard

AIS CM 2019-08-16 06:04:13 Nemoo-PC/Nemoo

Map (55 vessels, 0 PSSes, 0 AtoNs in view)

Time	MsgId	RepeatIndicator	MMSI	Accuracy	RAIM	NavStat	Lon	Lat	SOG	COG	PosStat
16.08.2019 01:17	27	0	273316240	Low	Low	UnderWayUsingEngine	58,7116667	82,4633333	19	358	NotCurrent
16.08.2019 01:24	27	0	273316240	Low	Low	UnderWayUsingEngine	58,7116667	82,4633333	19	358	NotCurrent
16.08.2019 02:52:51	27	0	273316240	Low	Low	UnderWayUsingEngine	58,8016667	83,1116667	17	339	NotCurrent
16.08.2019 06:03	27	0	273316240	Low	Low	UnderWayUsingEngine	58,815	83,795	17	1	NotCurrent
16.08.2019 06:10	27	0	273316240	Low	Low	UnderWayUsingEngine	58,815	83,795	17	1	NotCurrent
16.08.2019 09:14	27	0	273316240	Low	Low	UnderWayUsingEngine	59,2766667	84,3666667	16	48	NotCurrent
16.08.2019 09:16	27	0	273316240	Low	Low	UnderWayUsingEngine	59,2766667	84,3666667	16	48	NotCurrent
16.08.2019 17:29	27	0	273316240	Low	Low	UnderWayUsingEngine	58,1883333	86,445	16	6	NotCurrent

Comma separated file established in AIS CM daily for each MMSI (Vessel)

Vessels (63 targets in list)

MMSI	Name	Call Sign	Latitude	Longitude	Head
211202460			E 075°13.400	E 004°30.100	
258244000			E 078°13.900	E 014°56.200	
257806000			E 076°31.900	E 031°13.800	
258157000			E 078°35.600	E 016°24.700	
273425330			E 077°03.100	E 045°02.400	
246573000			E 078°09.500	E 012°10.900	
273891000			E 076°00.500	E 022°14.900	
273332880			E 075°57.500	E 022°29.800	
231053000			E 077°02.800	E 044°53.600	
259707000			E 076°43.200	E 029°09.400	
273326830			E 075°57.900	E 022°31.400	
231763000			E 077°02.700	E 016°28.500	
740339000			E 078°15.600	E 181°00.000	
224298000			E 076°58.700	E 029°42.500	
273352280			E 077°16.800	E 044°50.200	
273316240			E 083°47.700	E 058°48.900	

Vessel details

Vessel Interrogation Messages

Vessel

Name:

MMSI:

Call sign:

IMO Number:

Cargo and ship:

Class:

Navigation

Latitude:

Longitude:

HDG: SOG: kts

COG: ROT: deg/min

Dimensions

Antenna reference p

A = m

B = m

C = m

D = m

Length:

Width:

Draught:

Positioning Device:

N 81°59.6955' E 046°25.6387' 226°, 141.96 nm from 273316240 1:16 000 000

AIS Net

Legend

- Northpole
- NERSCMOOR Locations Planned
- Actual Operations Locations
- 190823 RFE Area
- S1000_Land_I

2019 Tracks

- c1909080741tracks_GPXtoFeatures
- 190906_1524_KVS
- c1909060640tracks_GPXtoFeatures

Ice Stations

- Ice Station 1 21/8
- Ice Tethered Profiler
- Jasco
- Acoustic 22/8
- Bouy
- Ice station 2 29/8
- Ice station 3 23/8
- Ice station 4 19/8
- Ice station 5 30/8
- Ice station 6 31/8
- Ice station 7 28/8
- Ice station 8 29/8
- Ice station 9 3/9

VDES

- 190817 Let 50 Pobedy VDES Line
- 190817 Pobedy VDES Points

2019 Tracks


- 170817 50 Let Pobedy Point1 VIS NOR

Other Labels:

- Attempt Amundsen Basin
- Source (TX)
- Receiver 2 (RX2)
- Receiver 1 (RX1)

Scale: 40 20 0 40 80 120 160 Kilometers

Positions plotted in GIS
overlayed on earth
observation data (SAR Scenes)



Thanks to:

Space Norway
Kongsberg Seatex
Statsat

Norwegian Coastguard
Norwegian Space Agency
European Space Agency

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