National Oceanography Centre

Ocean Surface Current Airborne Radar (OSCAR) Demonstrator & SEASTARex campaign

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For more info: admartin@noc.ac.uk

esa

METASENSING Radar Solutions

Radarmetrics Seeing through.

ICM Institut de Ciències del Mar

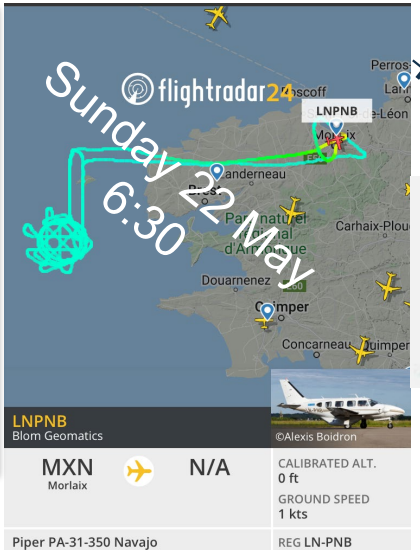
Ifremer

FRANCE ENERGIES MARINES

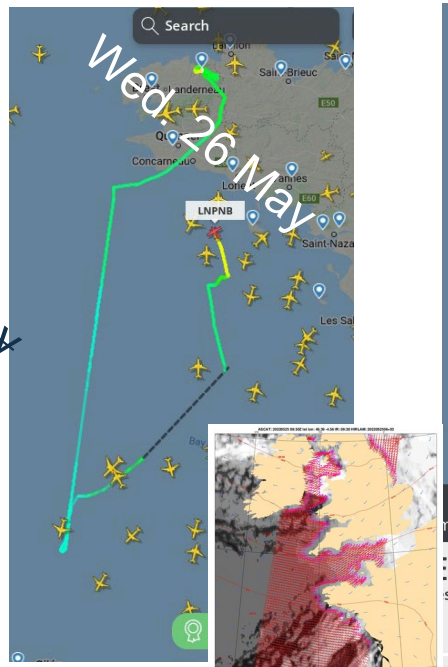
Helmholtz-Zentrum hereon

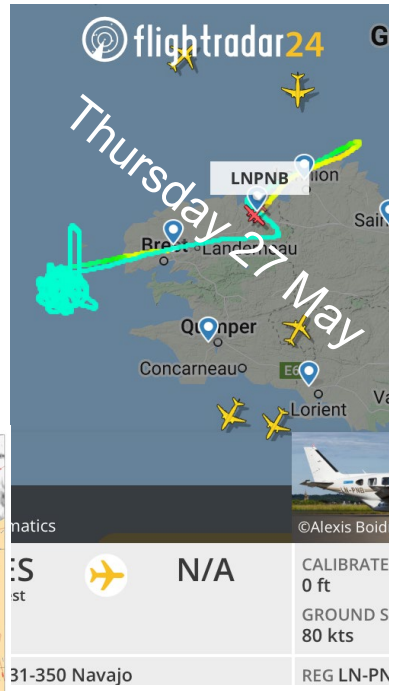
ESA LPS22 Bonn


Tuesday 17 May

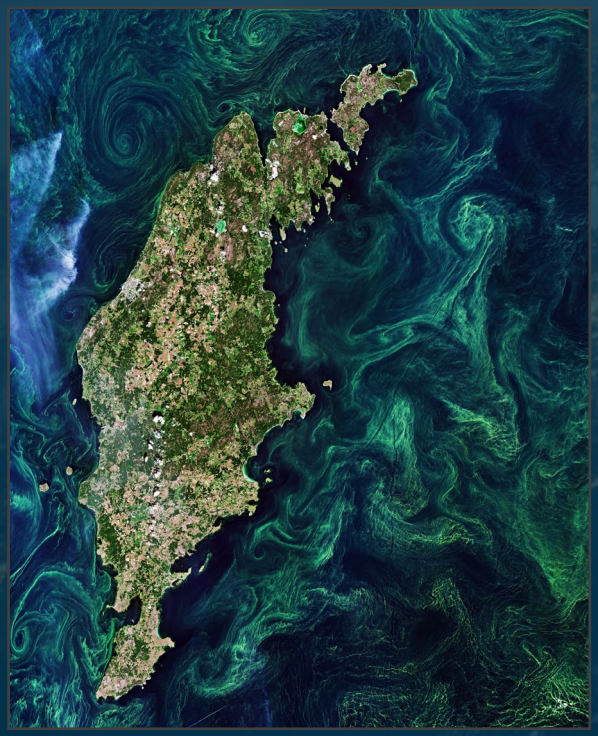

Sunday 22 May
6:30
flightradar24
LNPNB
LNPNB
Blom Geomatics
©Alexis Boidron
MXN
Morlaix
N/A
CALIBRATED ALT.
0 ft
GROUND SPEED
1 kts
Piper PA-31-350 Navajo
REG LN-PNB


Tuesday 24 May


Search
Wed. 26 May
LNPNB

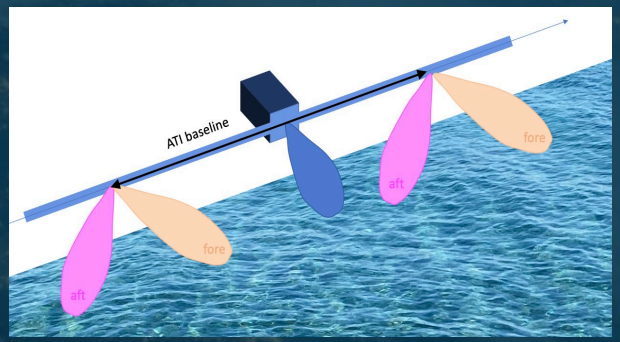

flightradar24
Thursday 27 May
LNPNB
Concarneau
Lorient
©Alexis Boid
N/A
CALIBRATE
0 ft
GROUND S
80 kts
31-350 Navajo
REG LN-PN

SEASTAR Summary



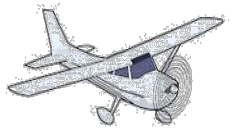
SEASTAR is a dedicated ocean mission to address well articulated scientific needs for new synoptic imaging of ocean current and wind vectors at 1km resolution.

It focus on key interfaces of the Earth system makes SEASTAR relevant to a large and growing community of ocean, atmosphere, cryosphere, coastal and climate scientists and operators.

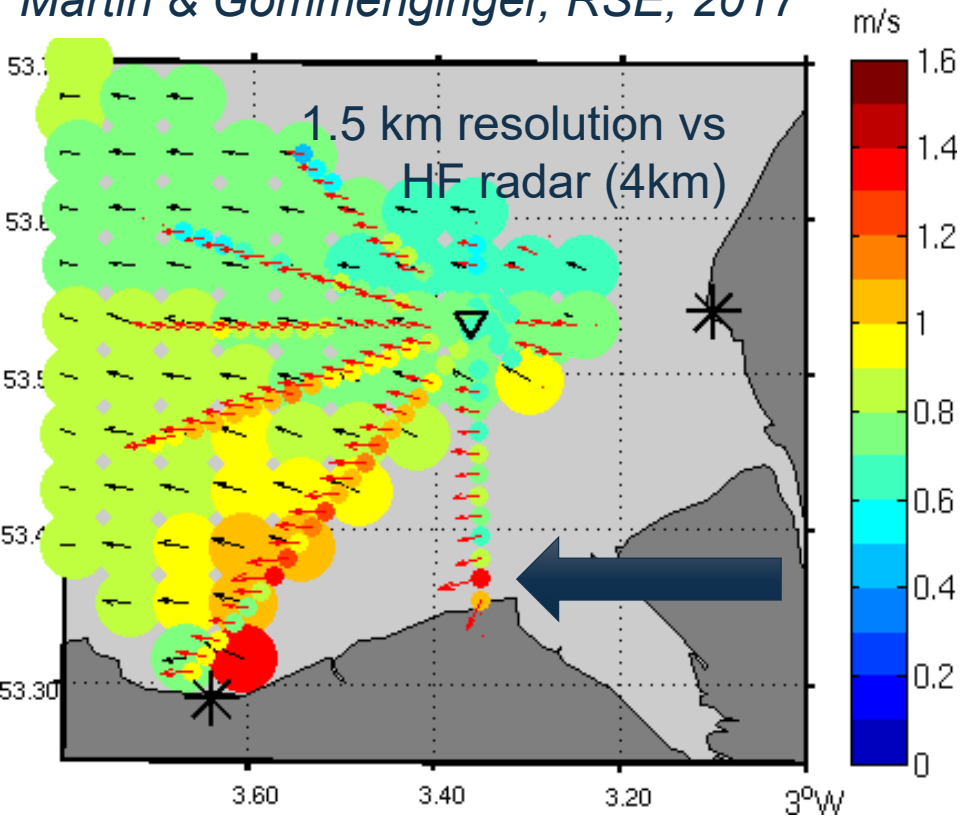


projects.noc.ac.uk/seastar/

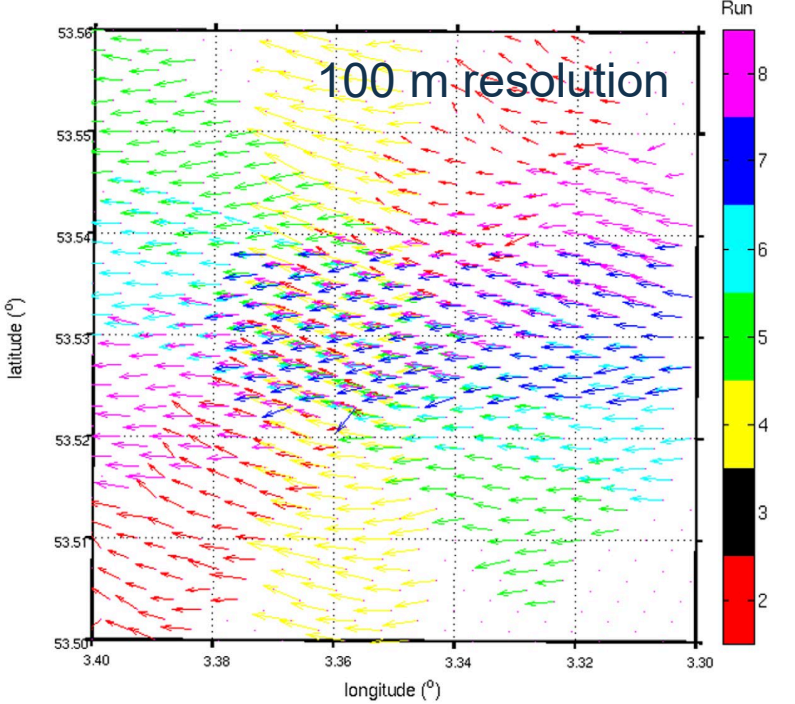
Wavemill Airborne measurements
Irish Sea 2011

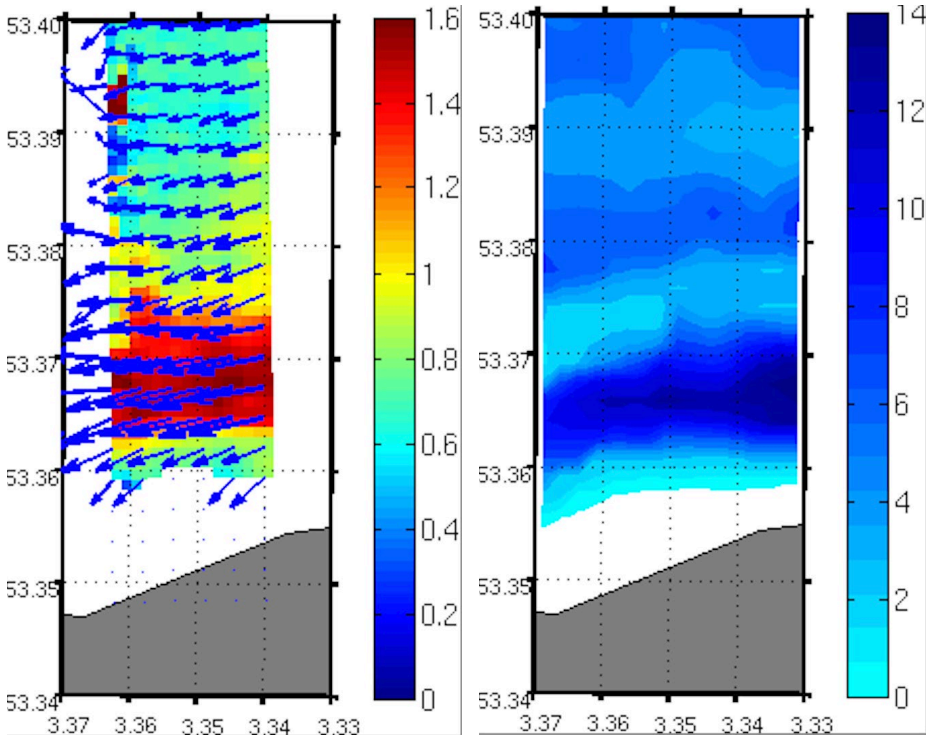


Martin & Gommenginger, RSE, 2017

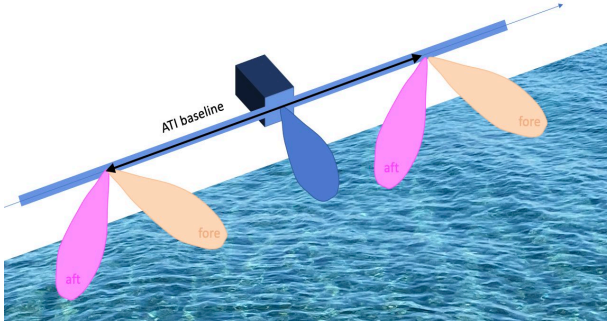


Better than 10cm/s @1.5km versus HF radar

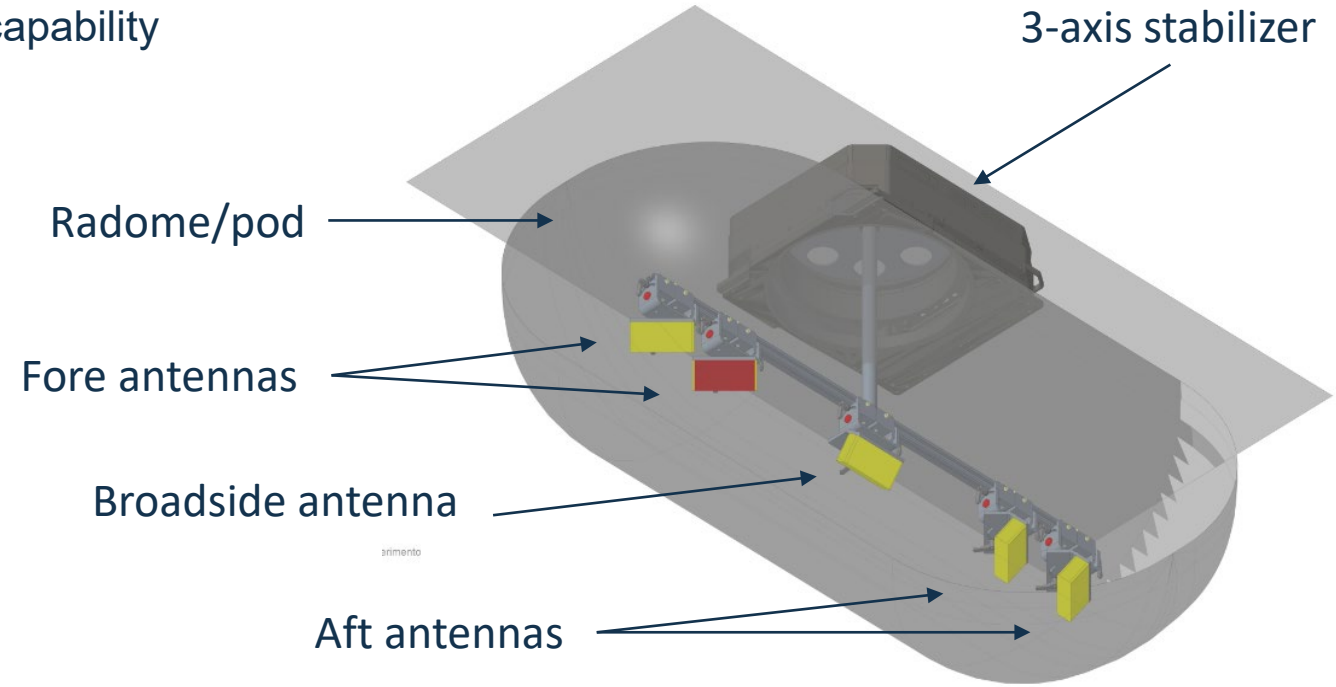




OSCAR key features

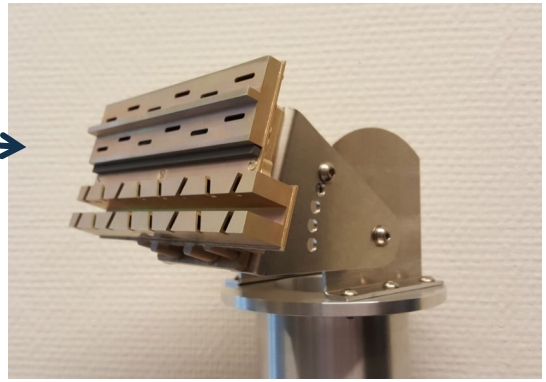


- Ku-band SAR at 13.5 GHz, up to 150 MHz bandwidth, 30W average power
- 2 + 2 along-track interferometric beams (fore and aft), squinted by +/- 45°
- 1 broad-side antenna to “complete” Scatterometer
- full-polarimetric capability
- 3-axis stabilized

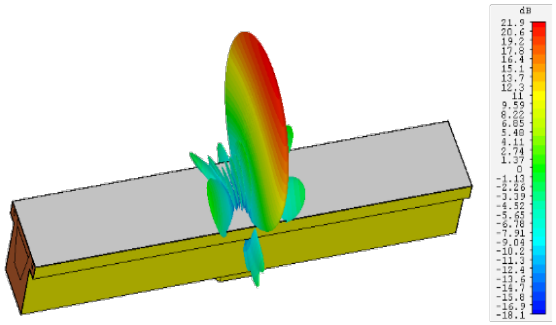


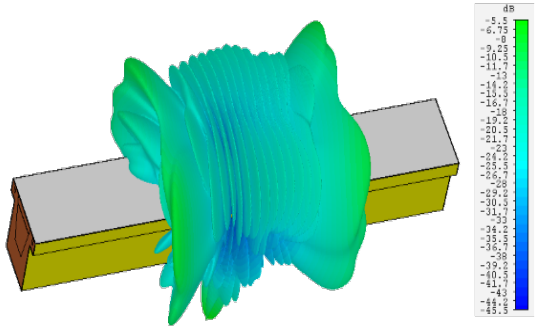
Instrument technology

- dual-polarimetric antenna
- slotted waveguide antenna



- very high accuracy 3-axis stabilizing unit
- very high accuracy Navigation Unit, IMU rigidly mounted onto the antenna frame





Antennas + instrument

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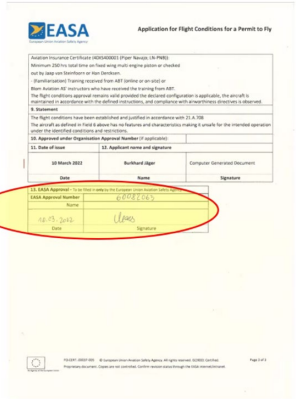
Radar Solutions

Long story short – start in 2016

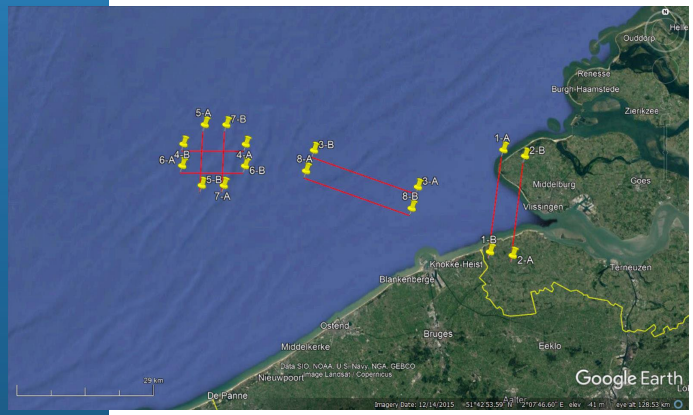

EASA

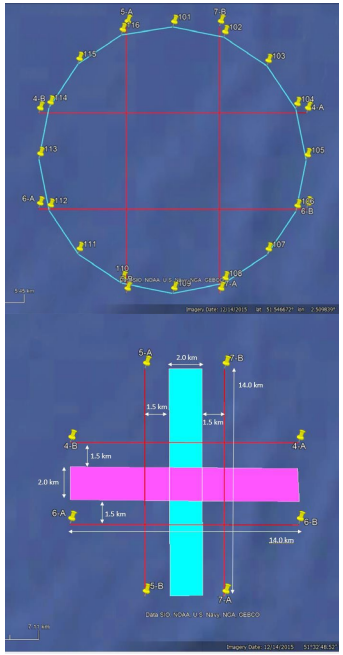
Application for Flight Conditions for a Permit to Fly

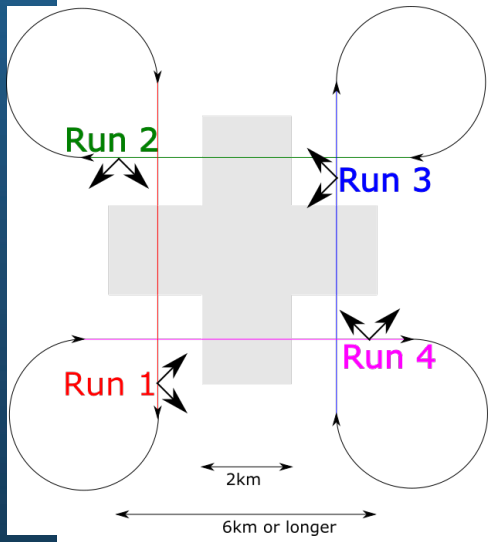
Date	Name	Signature
10 March 2022	Burkhard Jäger	Computer Generated Document

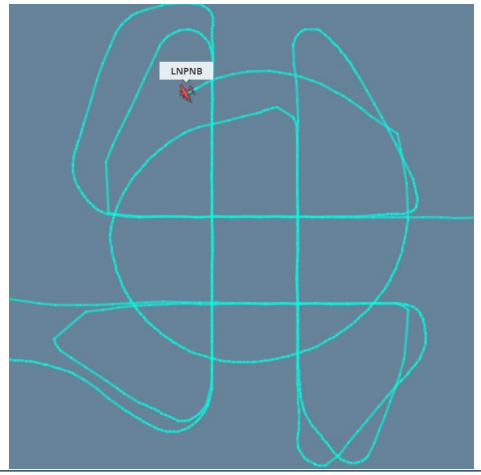
Aircraft certification
Feb 2022

Netherlands functional test flight – 11 April 2022

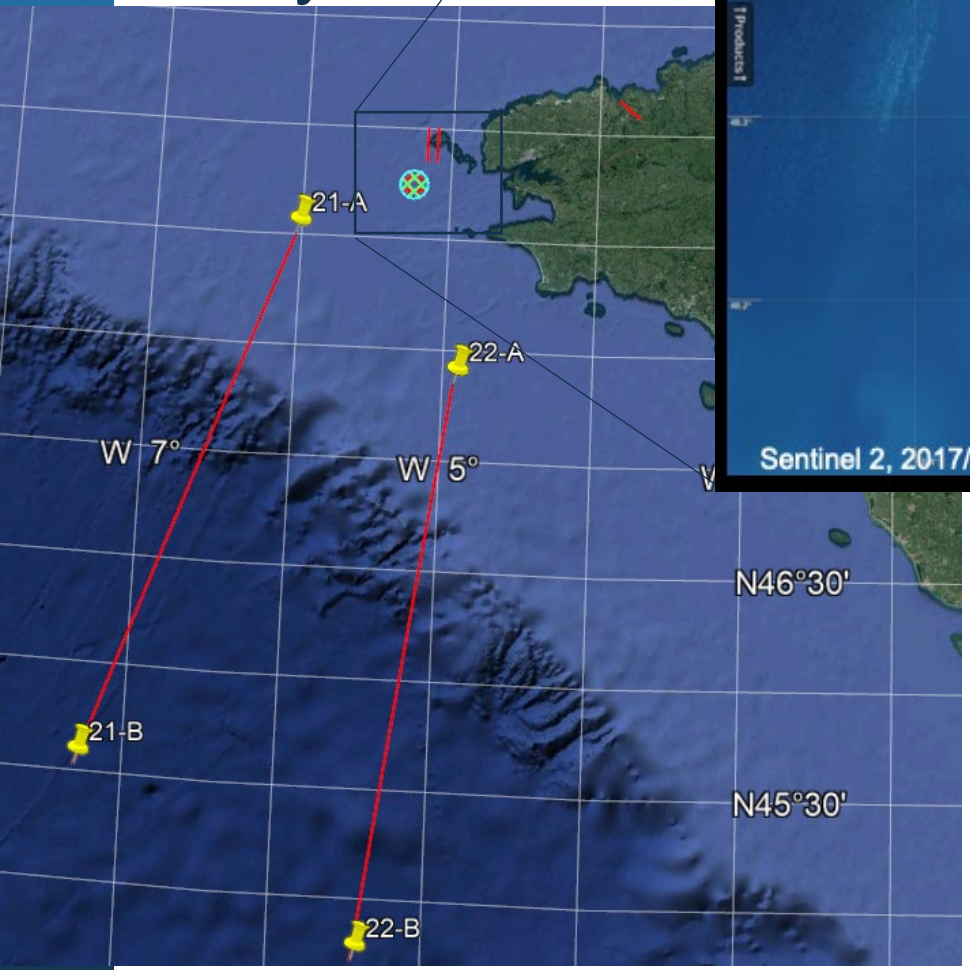


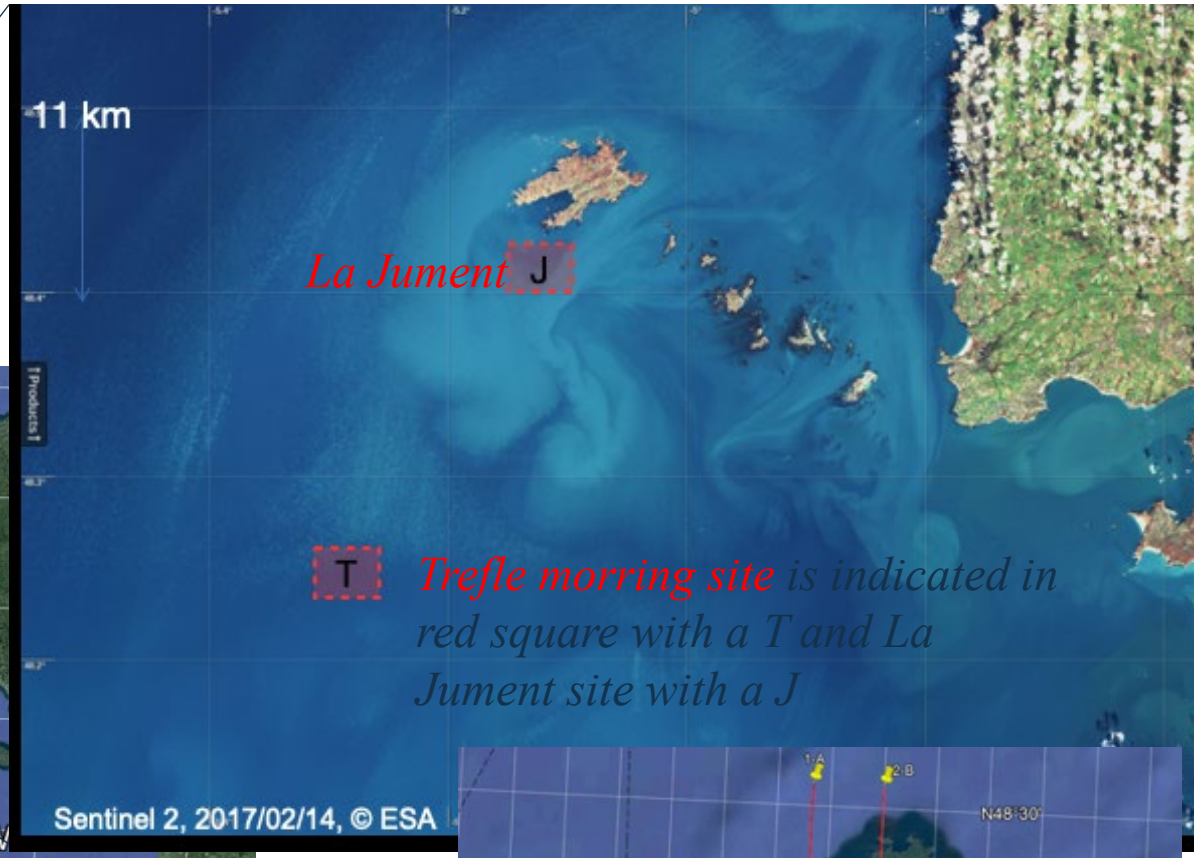




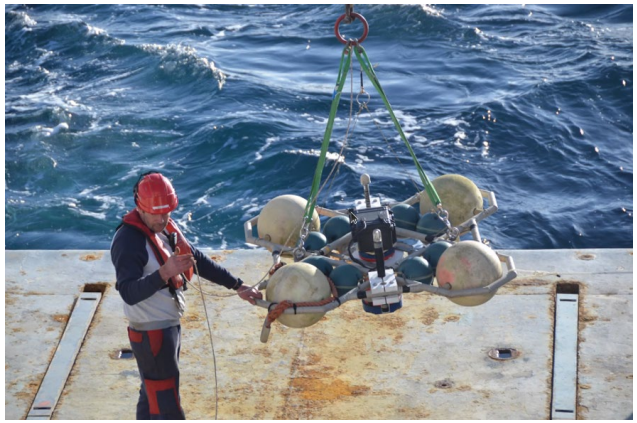


SEASTARex campaign Iroise Sea May 2022



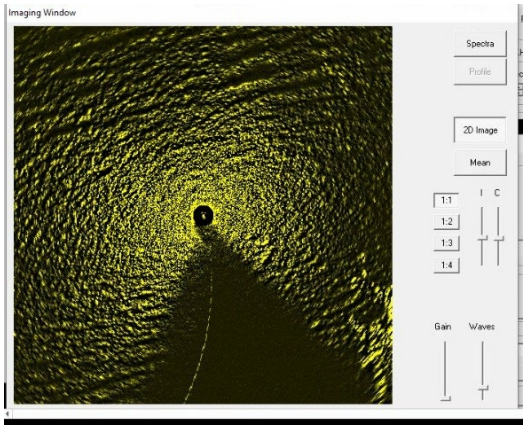


SEASTARex campaign - ground truth measurements

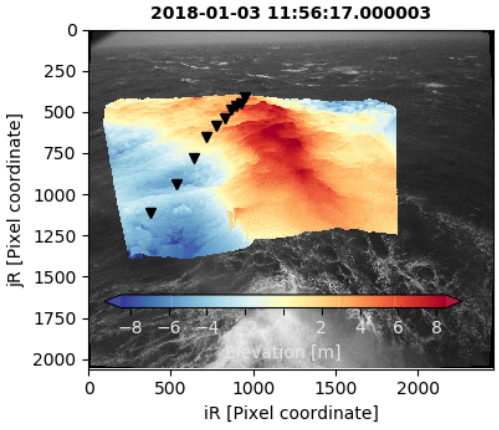


TREFLE buoy carrying a down looking ADCP and an IMU. It provides measurements of the vertical profile of surface current and directional wave spectrum

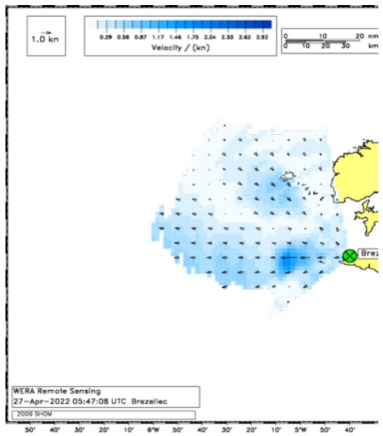
Dual sonic anemometer, high speed gaz analyser instrument and an IMU to correct buoy motion. It also carries a meteorological package measurement slow (1Hz) fluctuations of wind, air temperature, humidity and pressure at the height of 2m above sea level.



La Jument lighthouse X-band marine radar

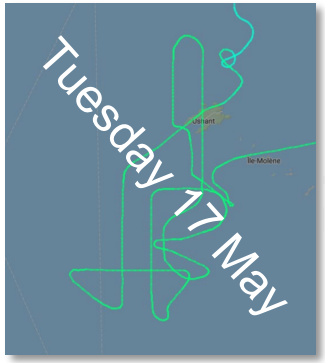


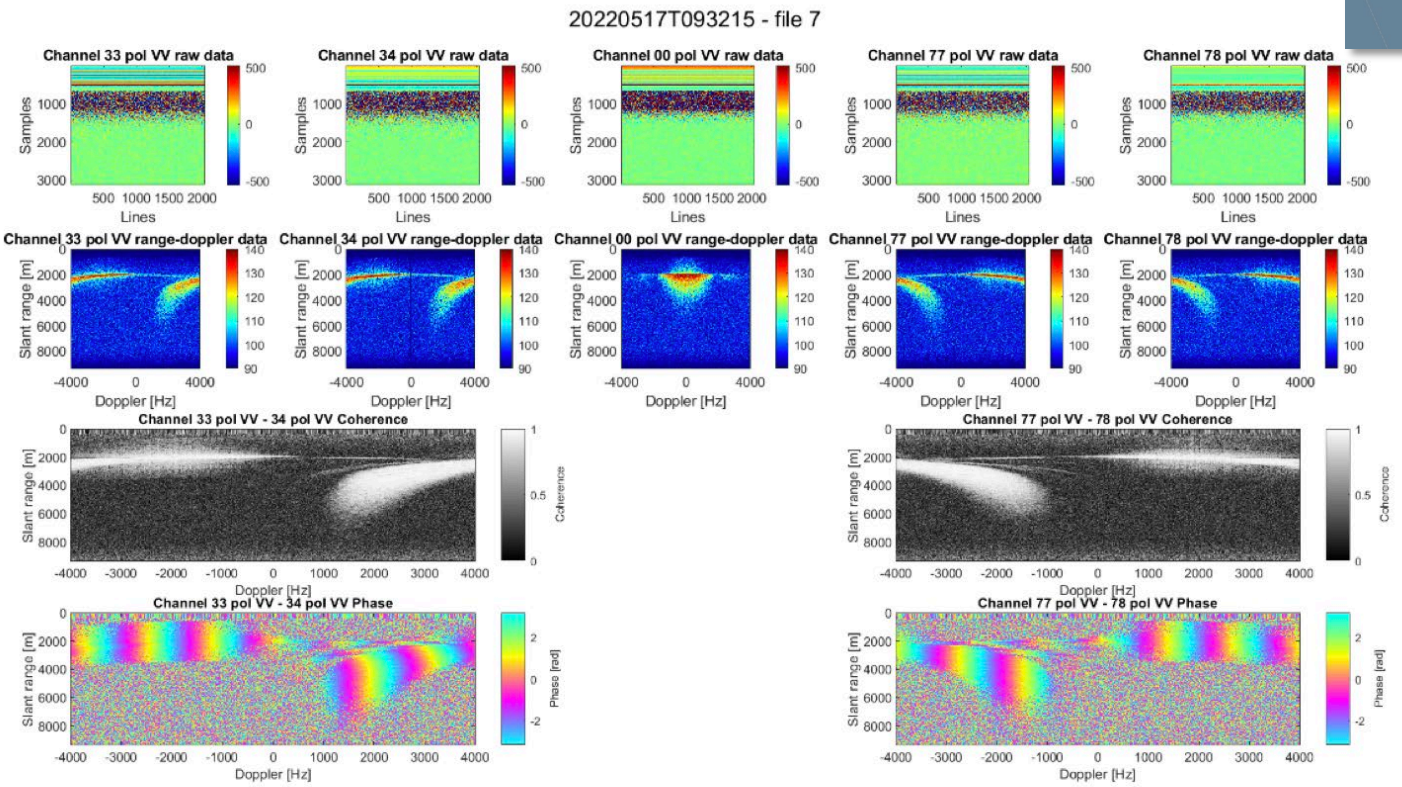
La Jument lighthouse Stereo-Video



HF Radar

Over strong gradient area (Ouessant)





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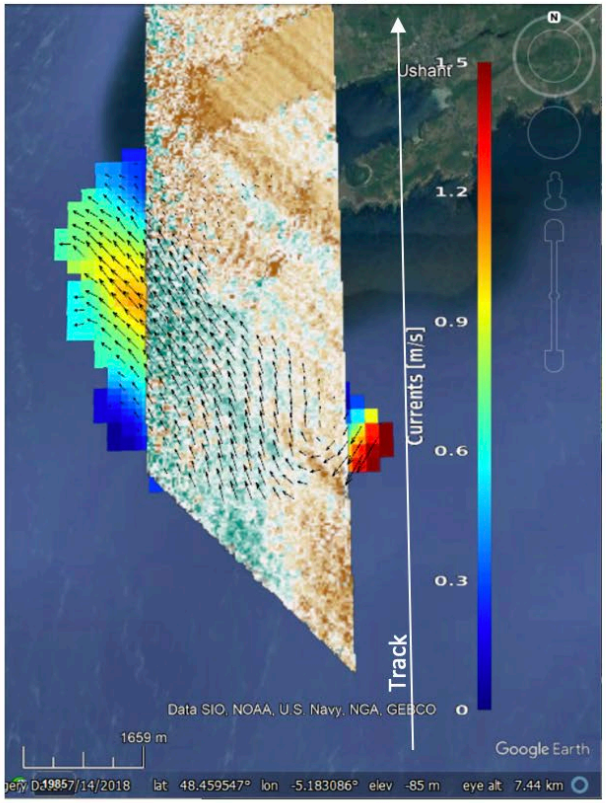
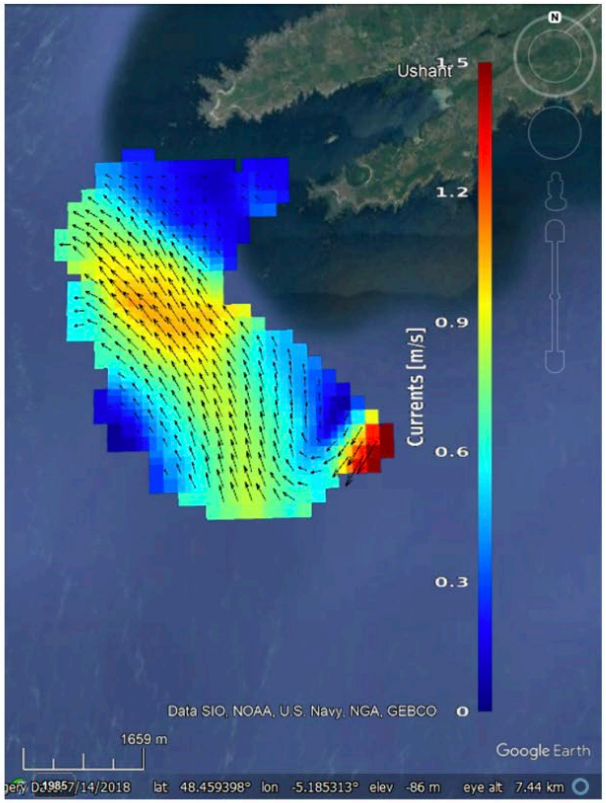
OSCAR Track South-North (course 0°N)

OSCAR SAR processing is still work in progress, with some residuals still to be removed, but the physical features are visible

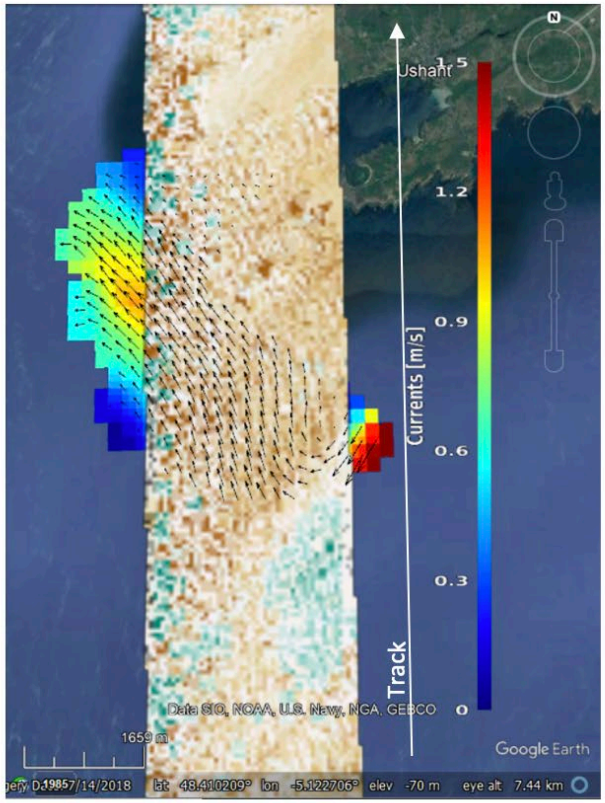
OSCAR 45° squint fore



X-band ground-based marine radar



OSCAR 45° squint aft



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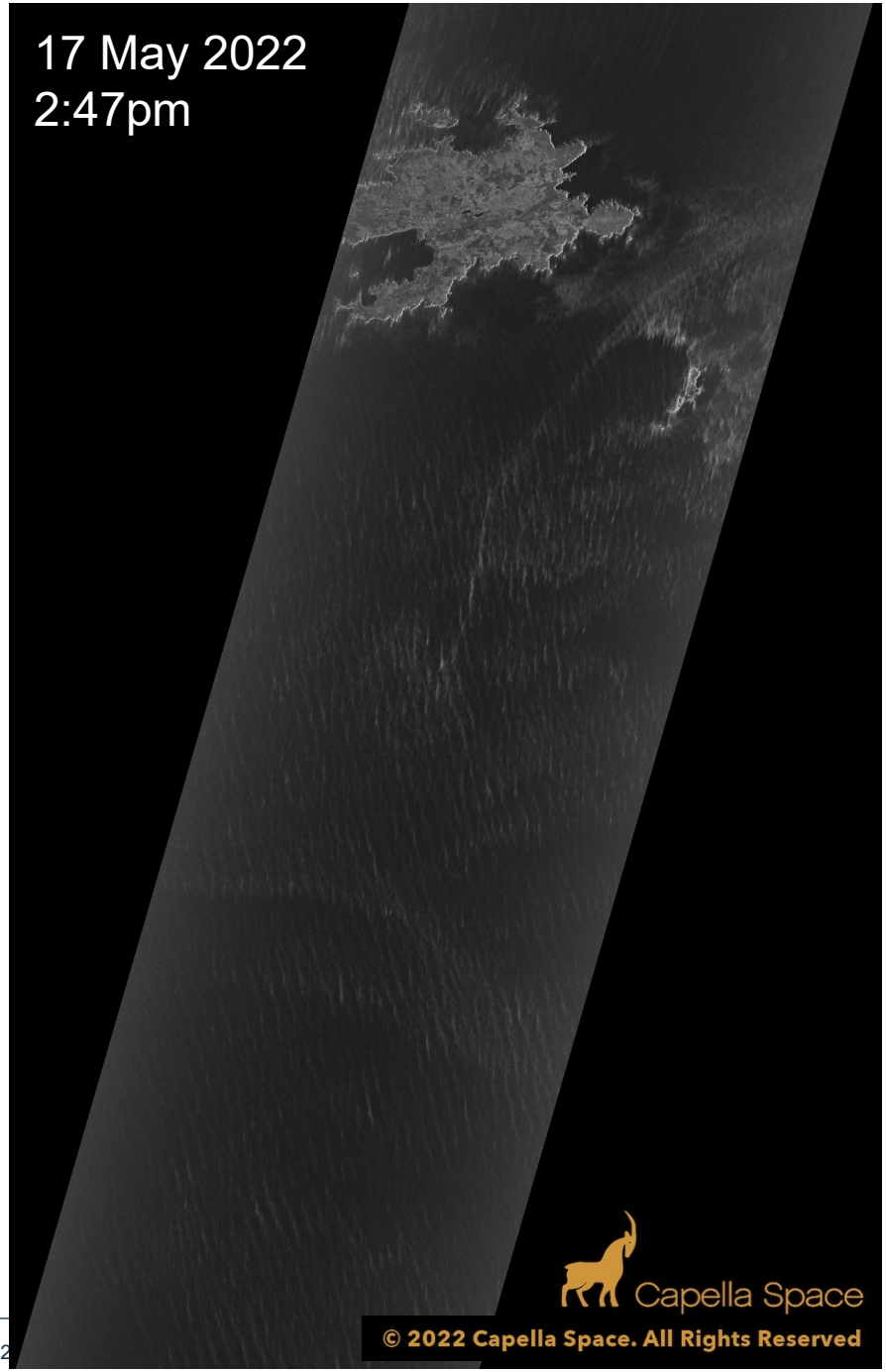
Satellite SAR acquisition

- Sentinel-1, Sentinel-2, Sentinel-3
- ESA Third Party Mission
  - Radarsat-2
  - TerraSAR-X
  - PAZ
  - COSMO-Skymed
- Others
  - NovaSAR
  - Capella

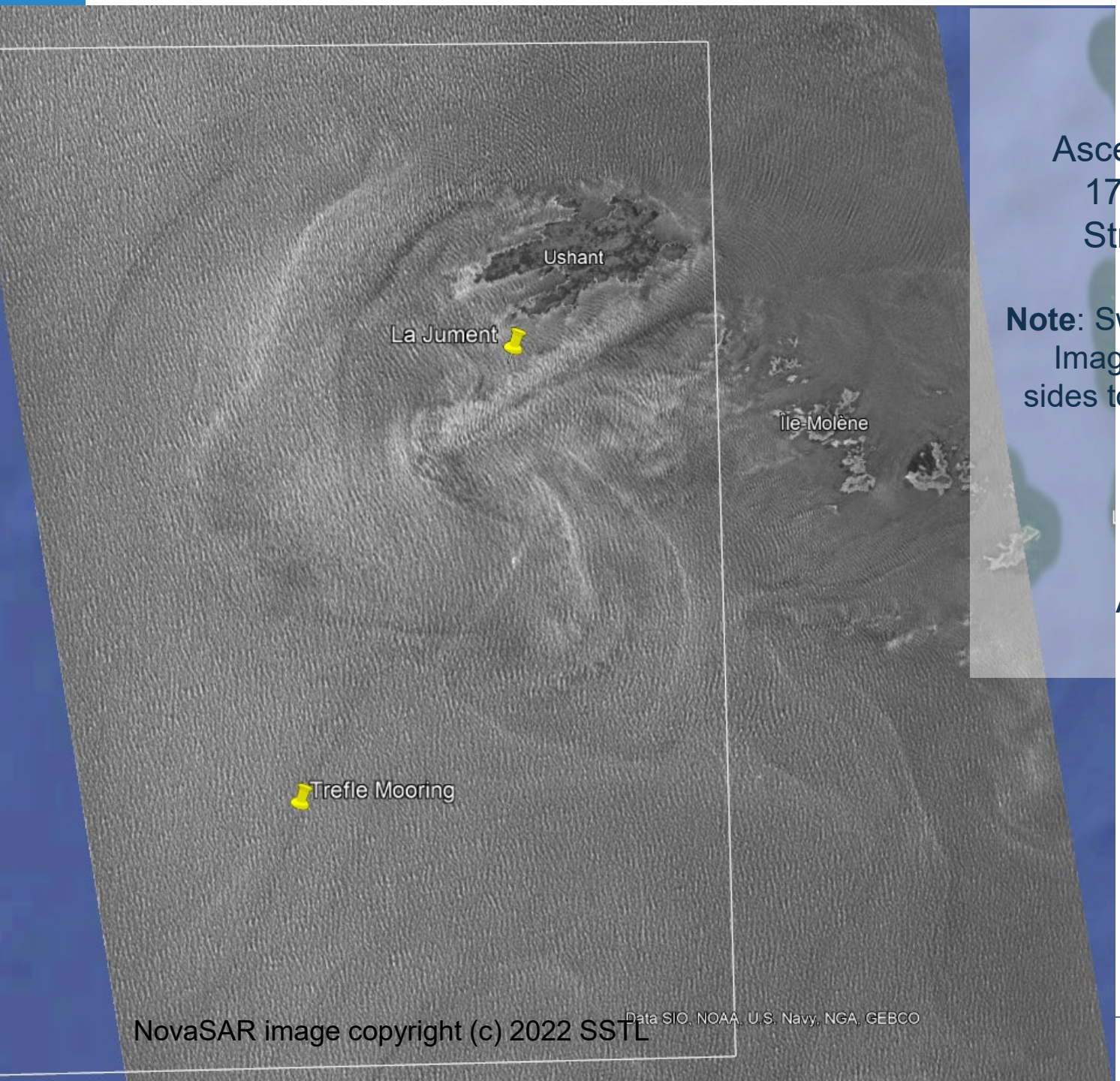


NovaSAR-1

Acquisition 33889
Ascending, Right-sided
17th May at 10:30 am
Stripmap VV, 6m res.

Note: Swath extended during Image processing on both sides to give a wider view of the trials area

Courtesy:
Martin Cohen,
Airbus, Portsmouth



National Oceanography Centre

Making Sense of Changing Seas

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Off-shore flight