NIVA TRIOS transects

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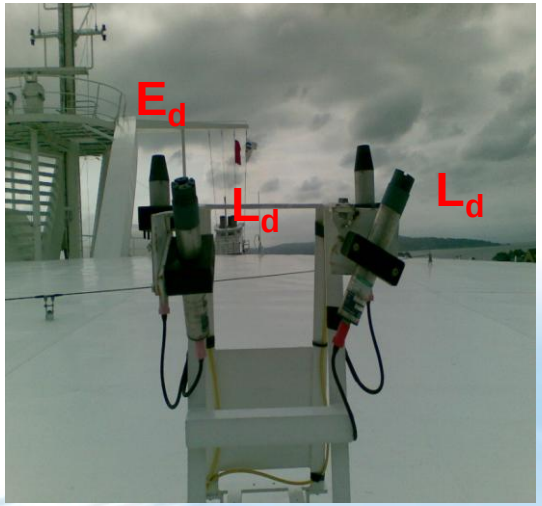
Platforms

- Speed/Course
- Tilts (heading, pitch, roll)
- Not dedicated for hosting instrumentation
- Ship dependent installations
- Avoid effects from ship



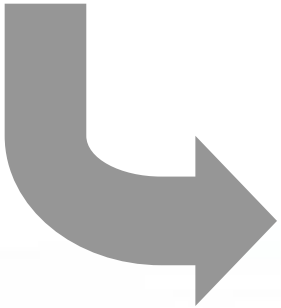
Measurements

- TRIOS
  - Irradiance (1 Ed)
  - Radiance (2 Ld + 2 Lu)
- Installation angles
  - Device Zenith Angle (DZA)
  - Device Azimuth Angle (DAA)
- Values at 194 sensor specific wavelengths
- MSDA Software (TRIOS)
- Acquisition interval: 30s

- Computer time
- *FERRYBOX*
  - *Position*
- *Wind*
- *Heading*

Objectives

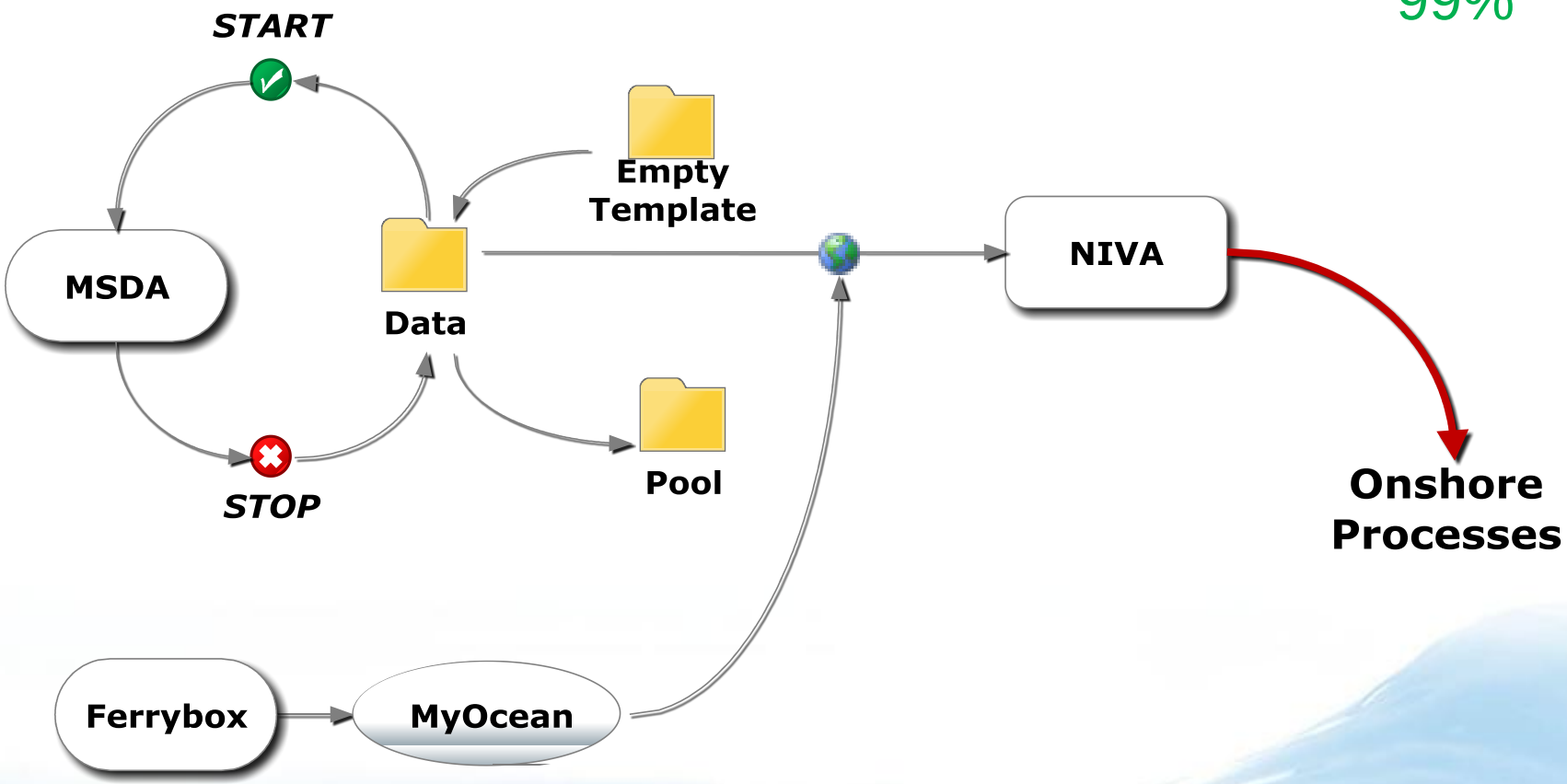
- Continuous 24/7
- ~200MB per day, per ship
- ~500GB historical data since 2006
- Self documenting file format



- Organized file structure and file content
- Automatization
- Delivery for Mermaid, …

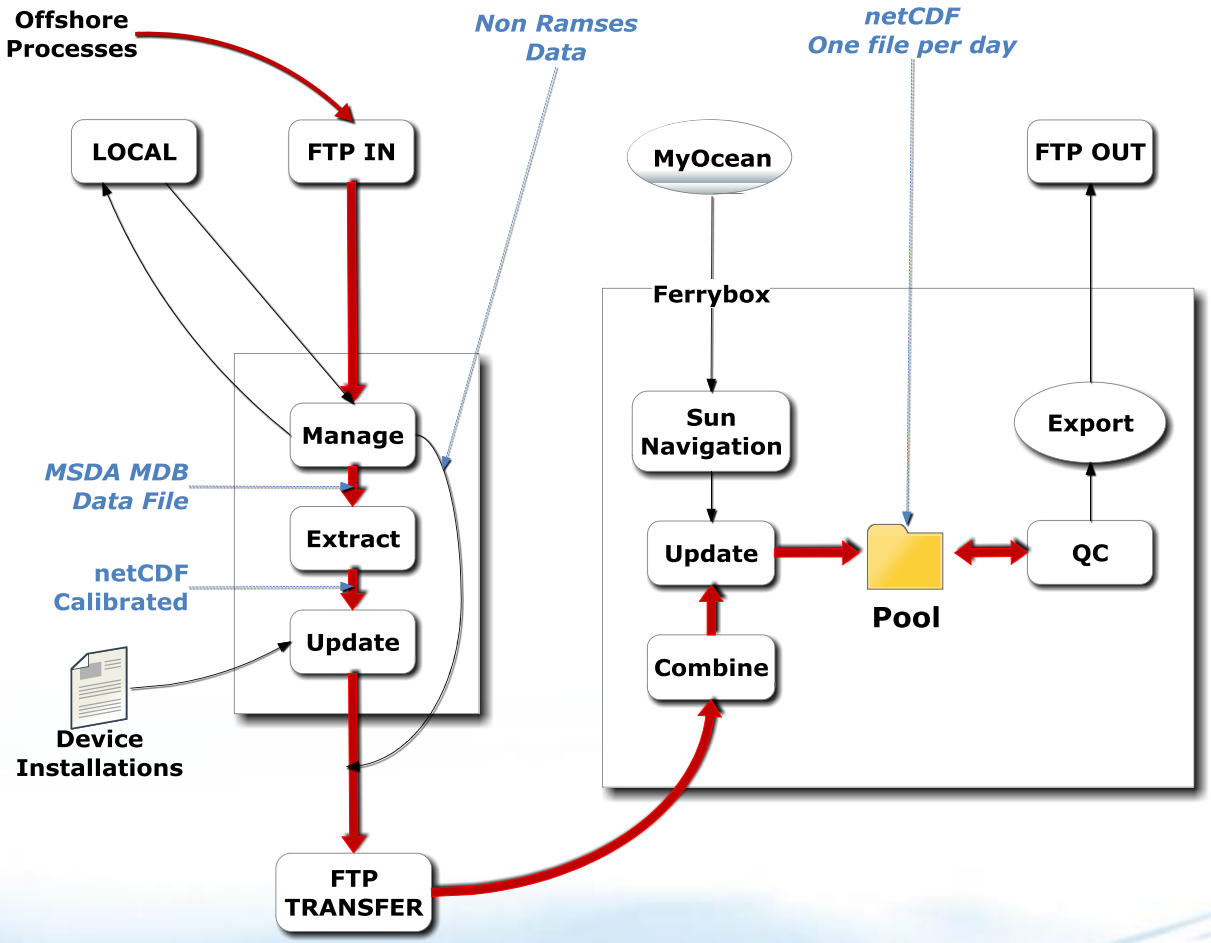
Offshore Processes

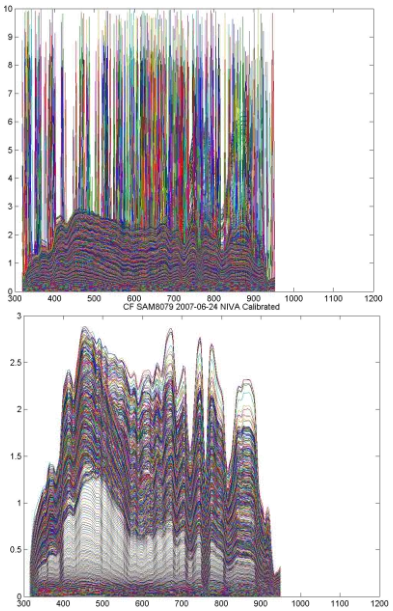
99%



Onshore Processes

99%



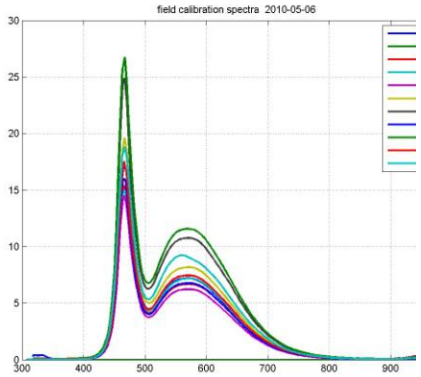


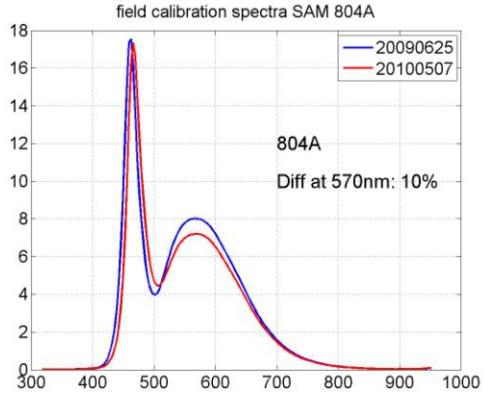
$$\lambda(N) = P(N+1)$$

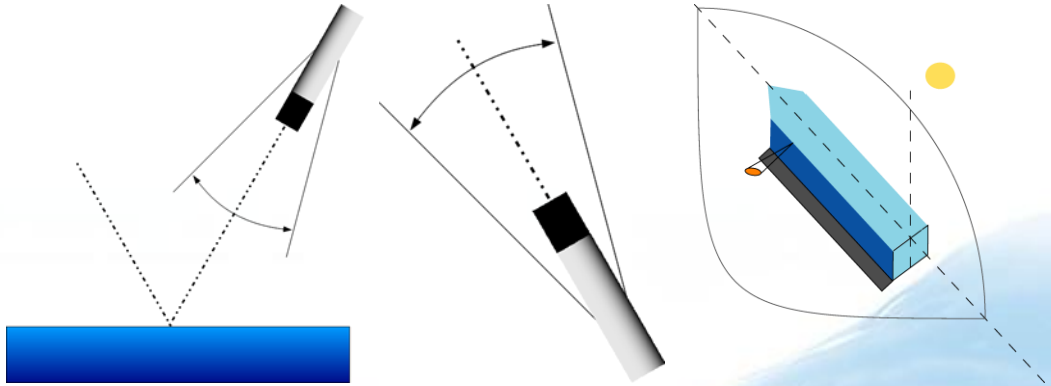
QC Processing

90%

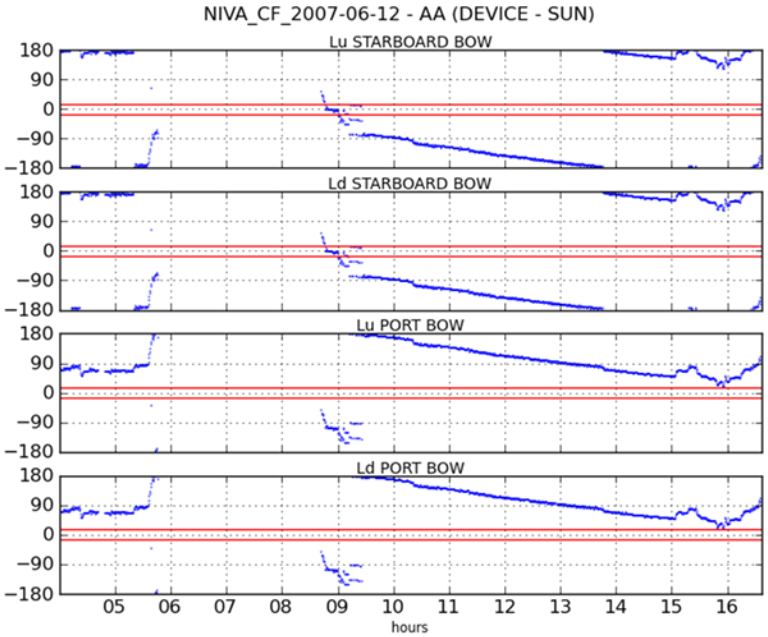
Time gaps	*300 s*
Speed range	*2.5 .. 15 m/s*
Ship shadow	
Sun zenith	*< 75°*
Sun glint	*> 30°*
Field control events	

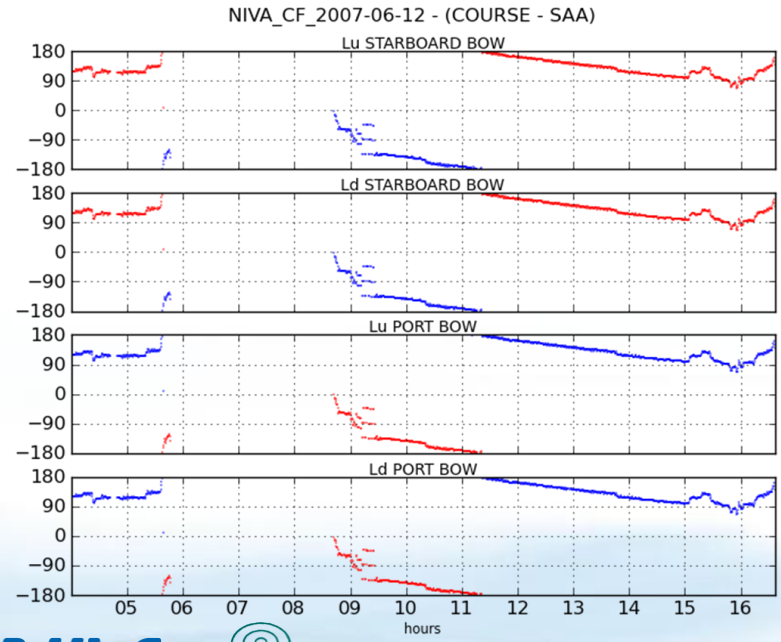


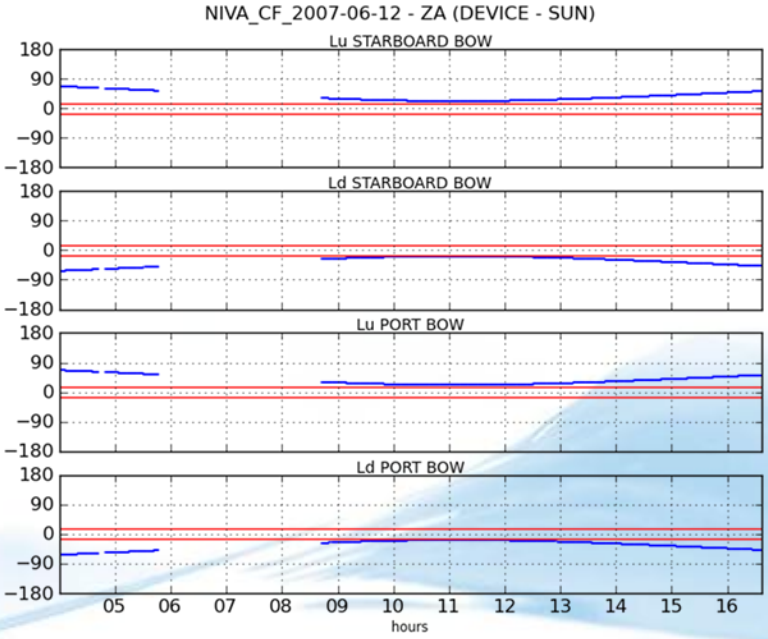




Sun Glint
Ship Shadow





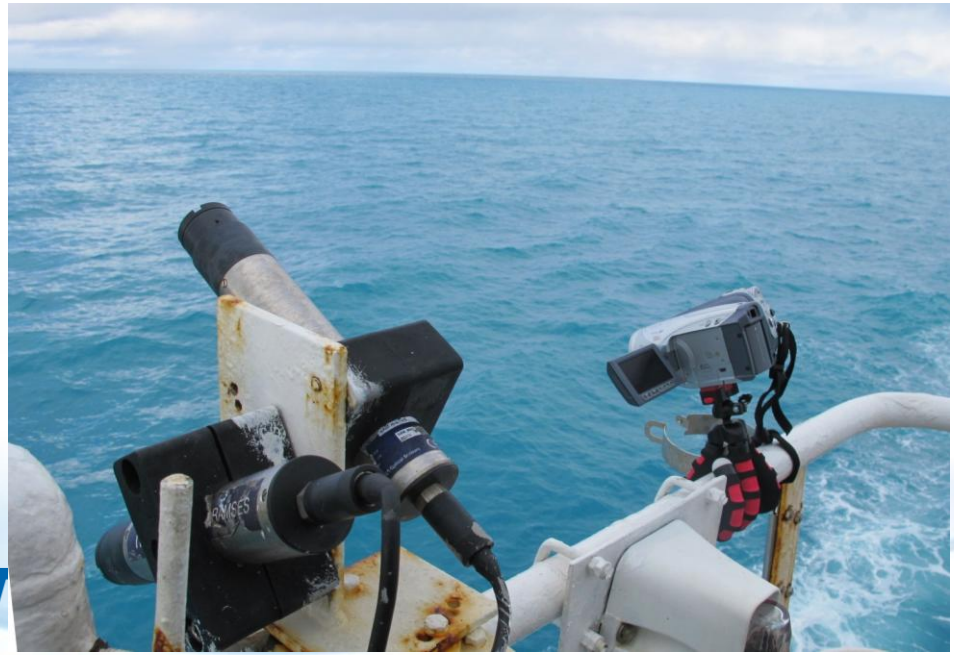


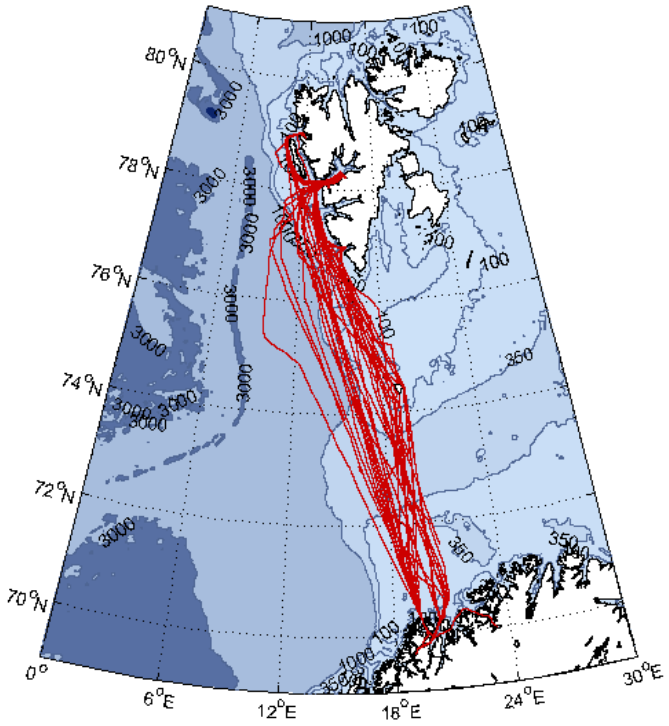
Todo

- netCDF3 export for ARGANS
- Install offshore processes
- Field lamp control management
- Consolidate Measurement Protocol

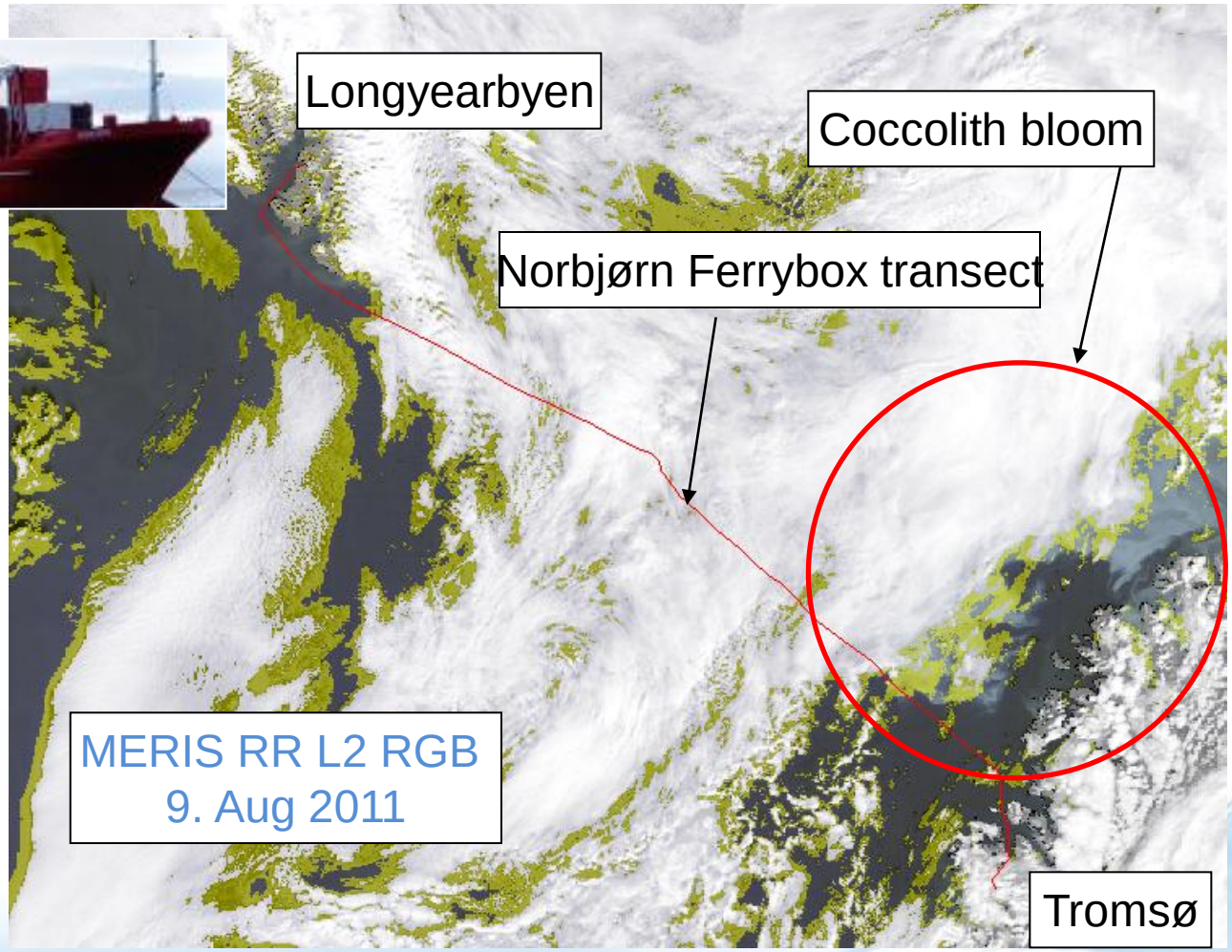
An example of MERIS validation from transect data in the Arctic

- Ferrybox on Tromsø-Longyearbyen line since 2008
- Equipped with NIVA's core system
  - T, S, O_2, Chl-a, turbidity sensors
  - water sampler
- Since August 2011:
  - TriOS Ramses sensors: Lu, Ld, Ed → water-leaving reflectance





Validation results from August 2011



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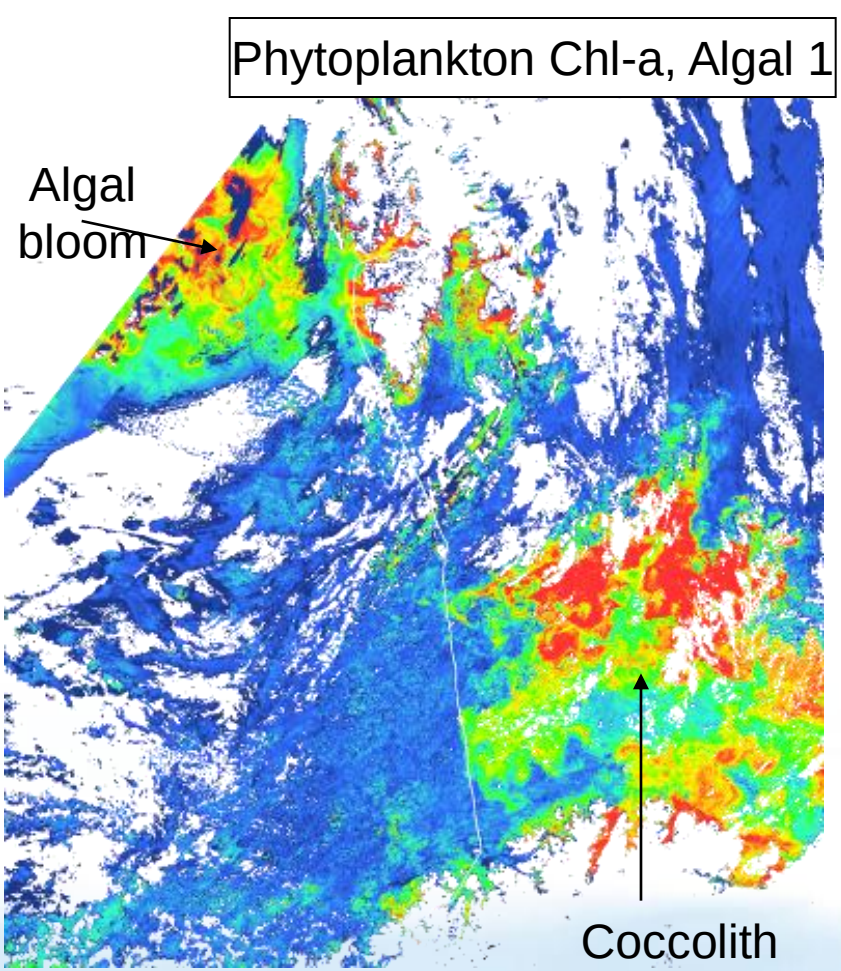
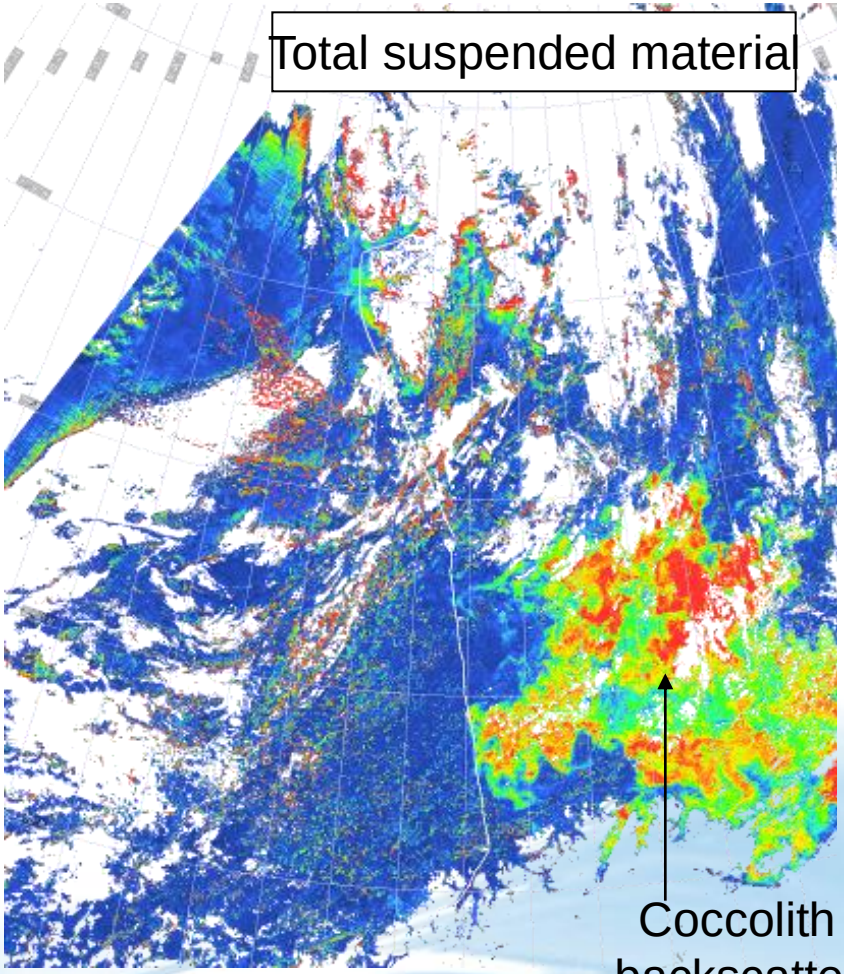
MERIS mosaic 9-12 Aug. 2011.





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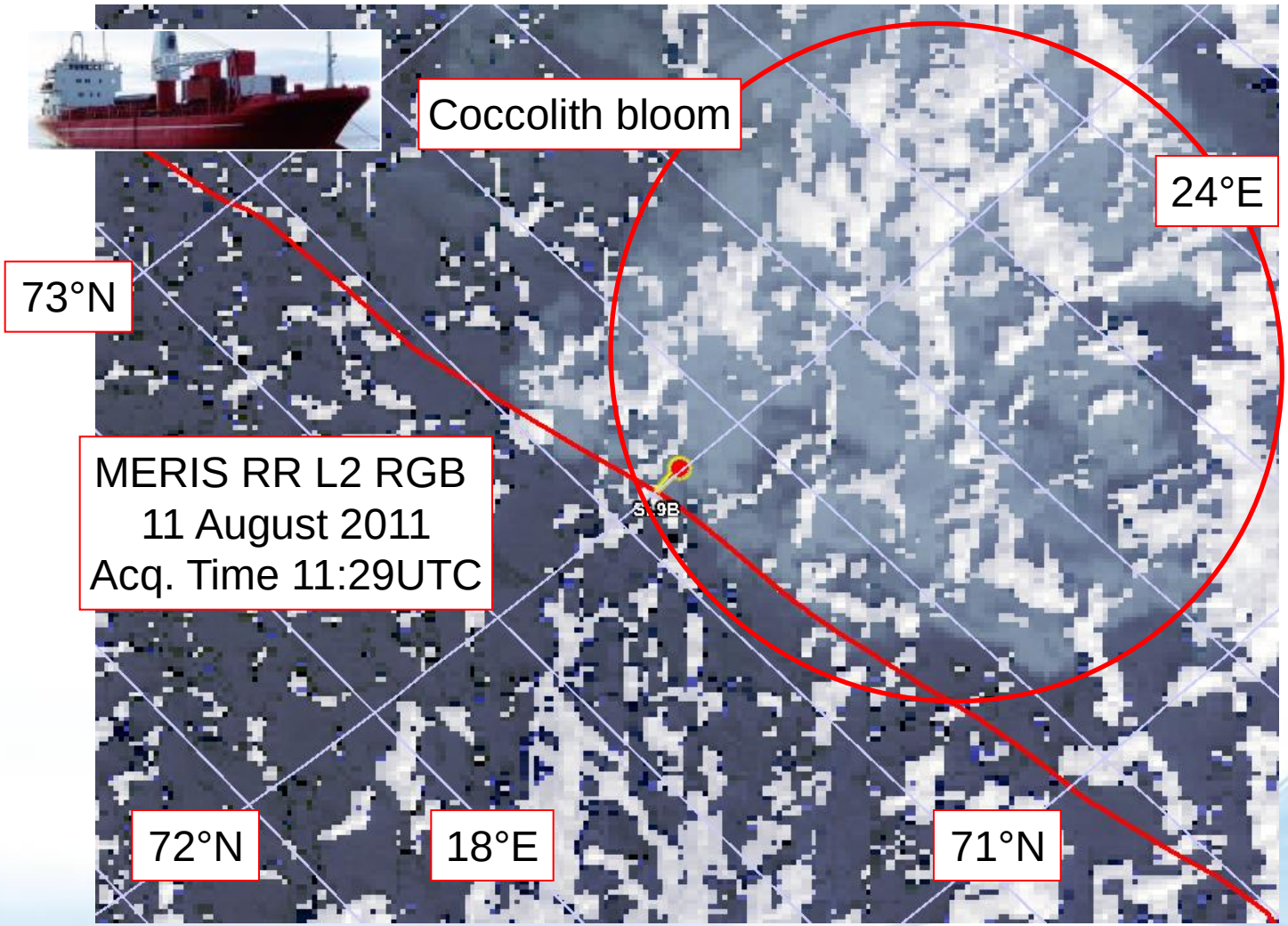
MERIS validation in the open Barents Sea



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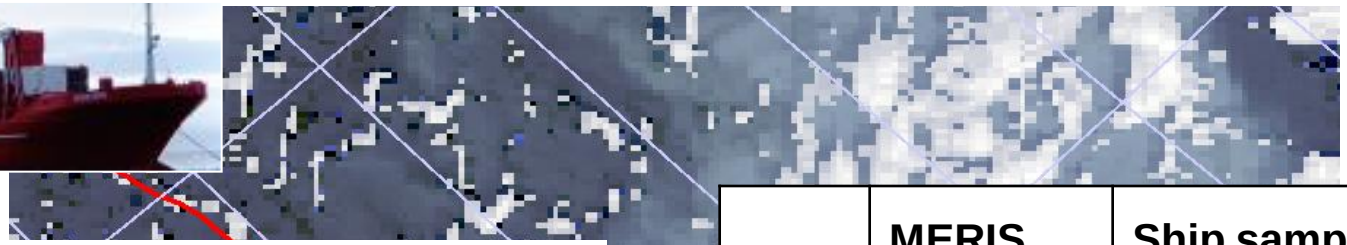
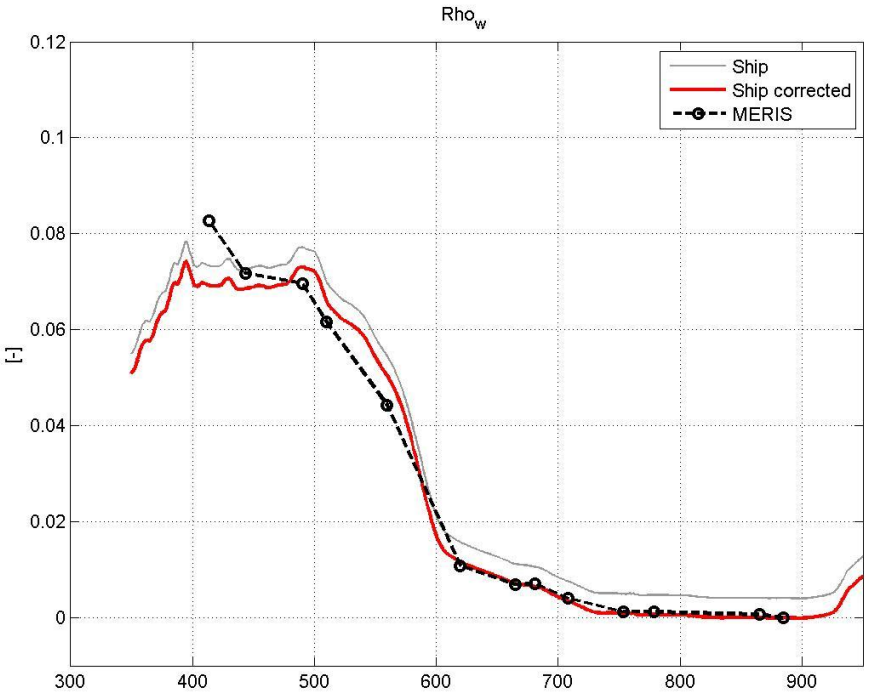
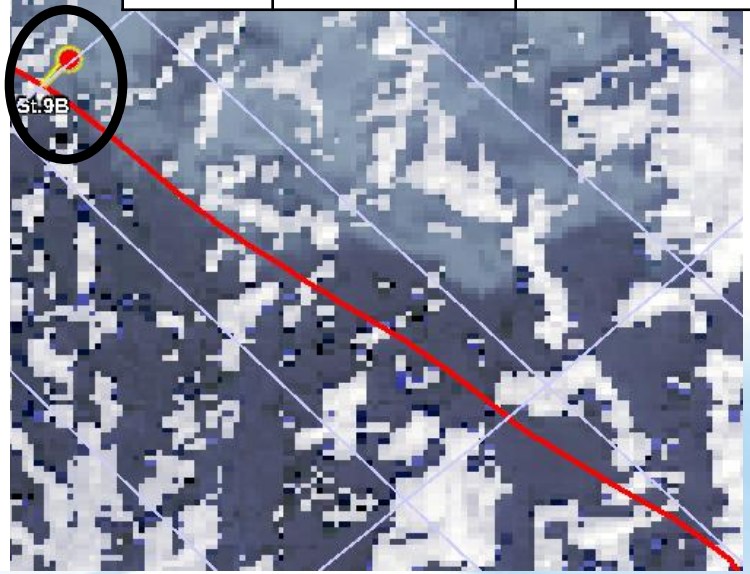
Ship measurements close to time of MERIS overpass (dt<20min)

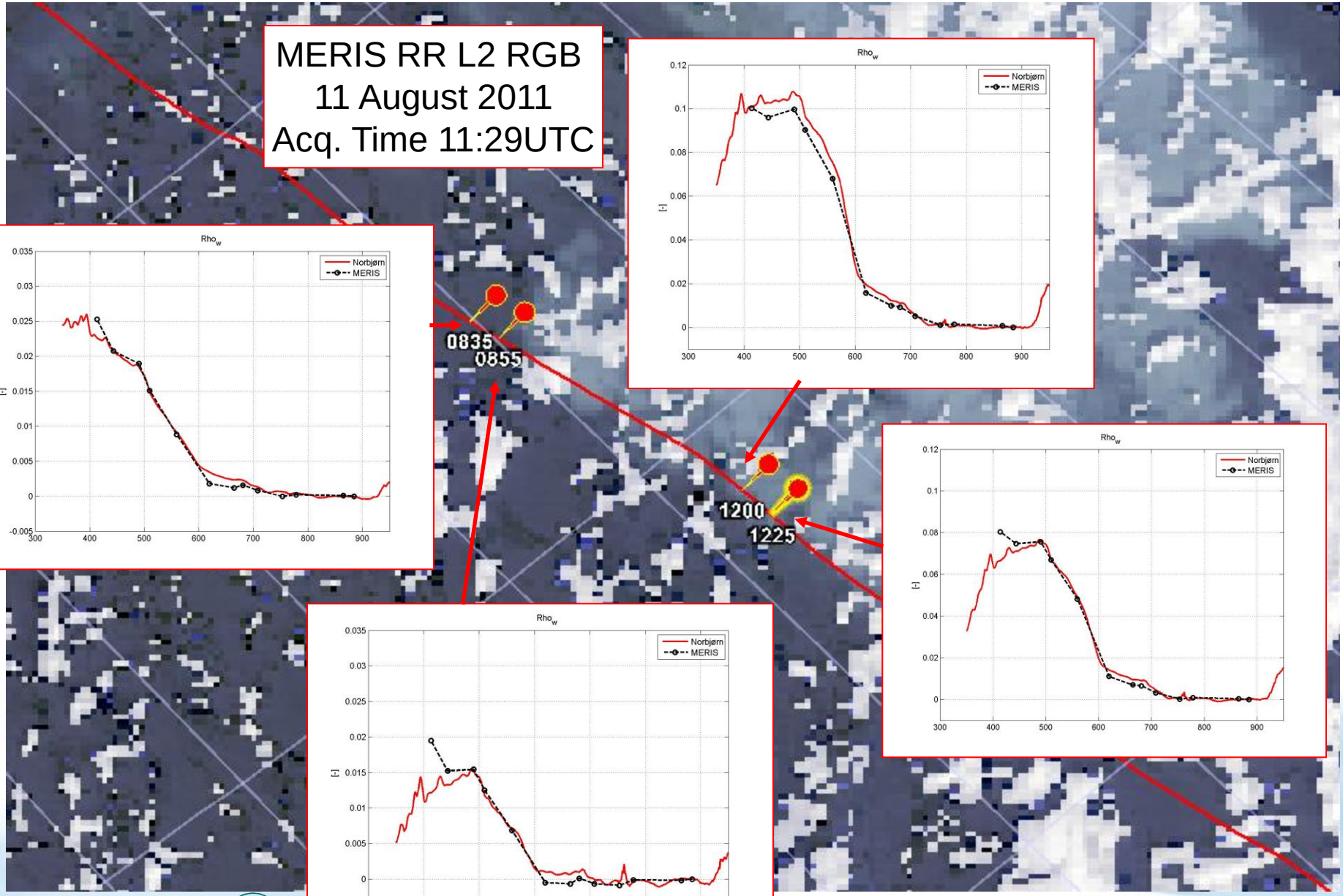




	MERIS	Ship sample
Chl-a	0.72	0.68
TSM	2.22	1.02



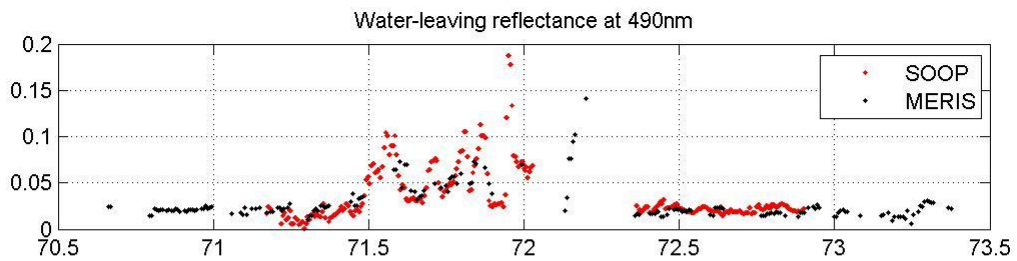
Satellite and ship measured reflectance

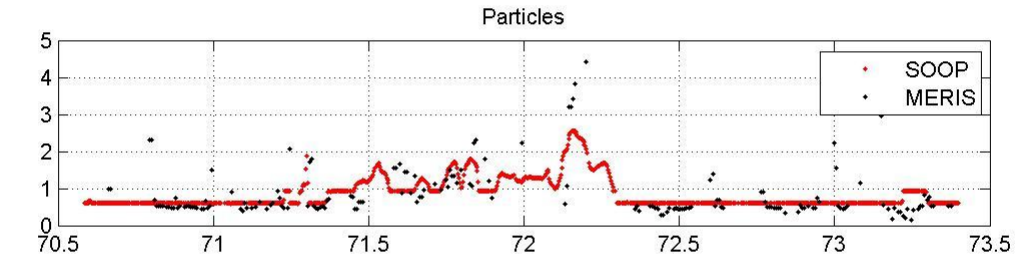


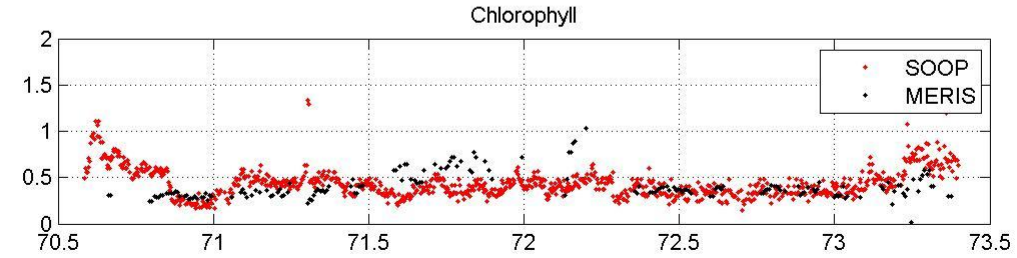
Satellite and ship measured particles and chlorophyll

24°E

73°N







72°N

18°E

71°N

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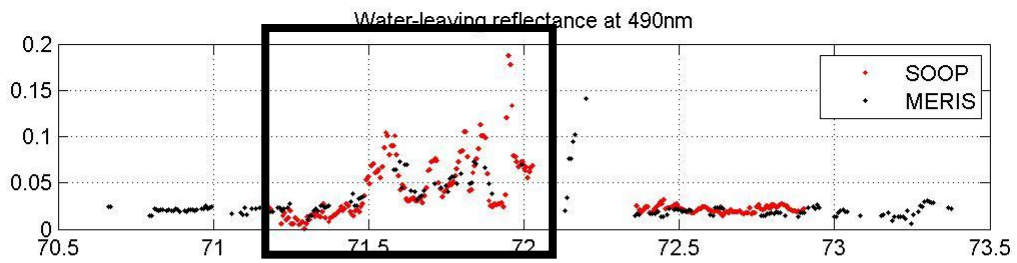
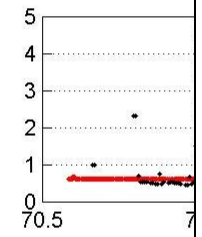
Satellite and ship measured particles and chlorophyll

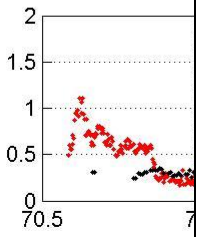
24°E

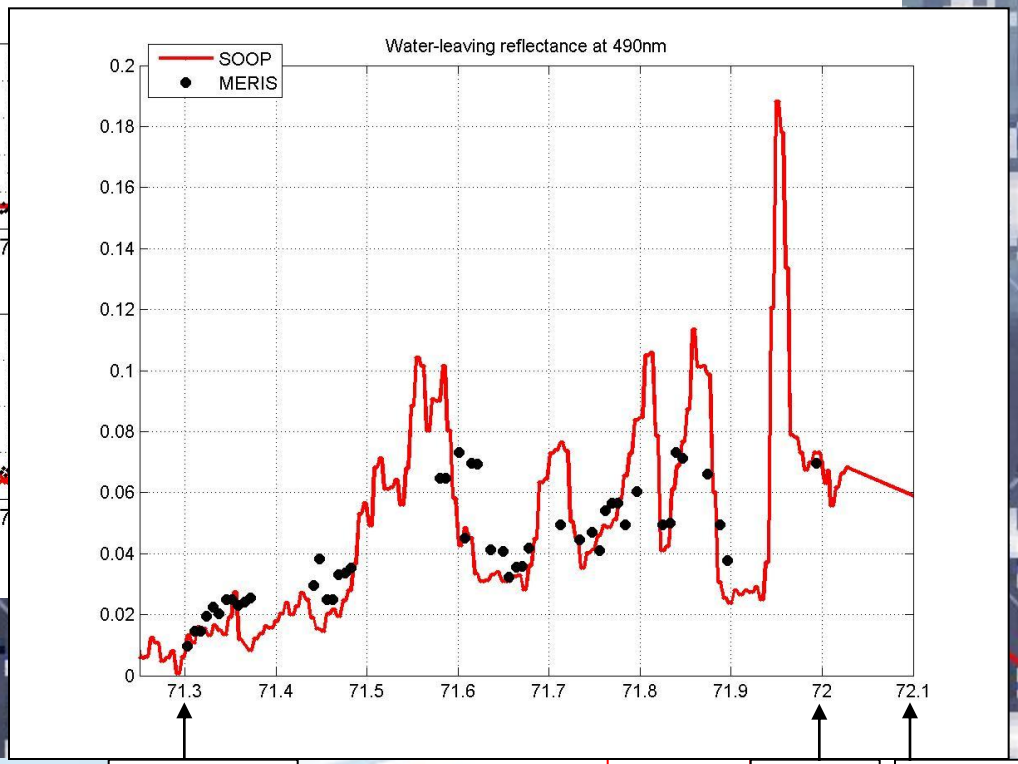
73°N

72°N









dt=3.5h

dt=0

dt=1h

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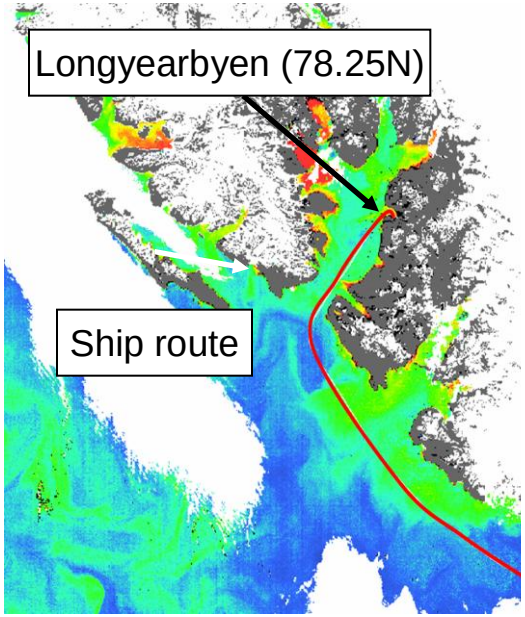
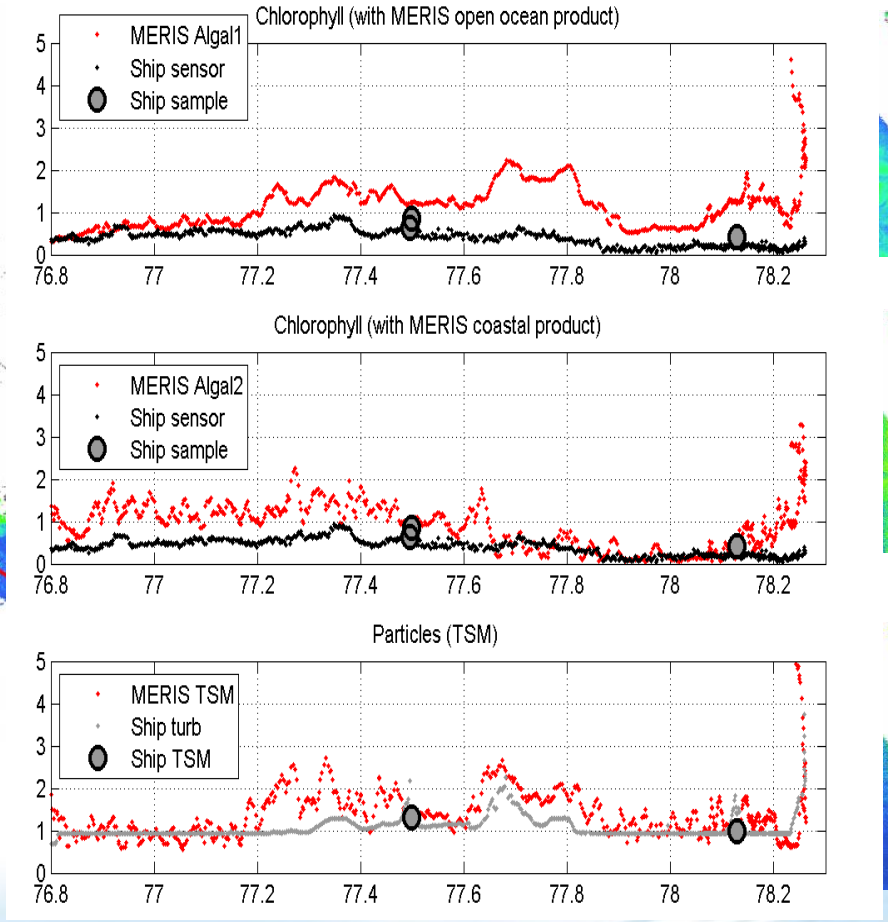
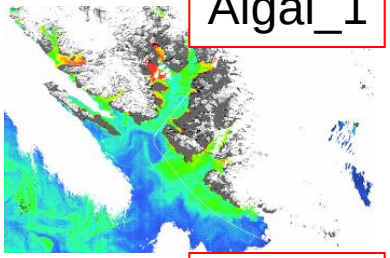
Validation in Arctic coastal waters

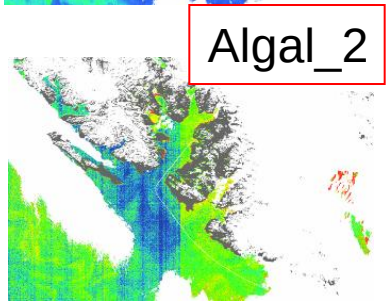
Satellite and ship data along ship track

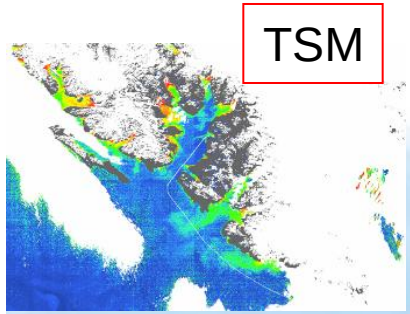


MERIS FR
09Aug2011
1058h









Ship: 09Aug. 1400h-10Aug. 0100h

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Summary

- Barents Sea (open ocean)
  - Ramses sensors applied on SOOP in this area for the first time
  - Very good agreement between MERIS and SOOP reflectance spectra during a coccolith bloom
  - MERIS TSM product not so good agreement with Ferrybox sensor and water sample data within bloom area, i.e. conversion factors need to be locally tuned
- Spitzbergen coastal waters:
  - Algal_2 and TSM product reproduces well the Ferrybox observations (sensor and water sample data)
  - Algal_1 overestimates the Chl-a concentration as observed from Ferrybox data