

Status on the Ferrybox network in Norwegian waters

(www.ferrybox.no, www.oceanbox.no)

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Contribution from Bengt Karlson,
SMHI

Outline

- The Ferrybox-network
- The sensor systems
- The status of the lines
- Applications
 - monitoring
 - satellite validation
- Data presentations (web portals)
- Future plans

Ferrybox network in Norwegian Waters

(NIVA and partners; IMR, GKSS, MarLab, Akvaplan-niva)



Norbjørn, NIVA/
Akvaplan-niva



Trollfjord,
NIVA/Akvaplan-niva



Vesterålen, IMR



Norønna, MARlab/NIVA



Bergensfjord, NIVA



Color Fantasy, NIVA



Lysbris, GKSS

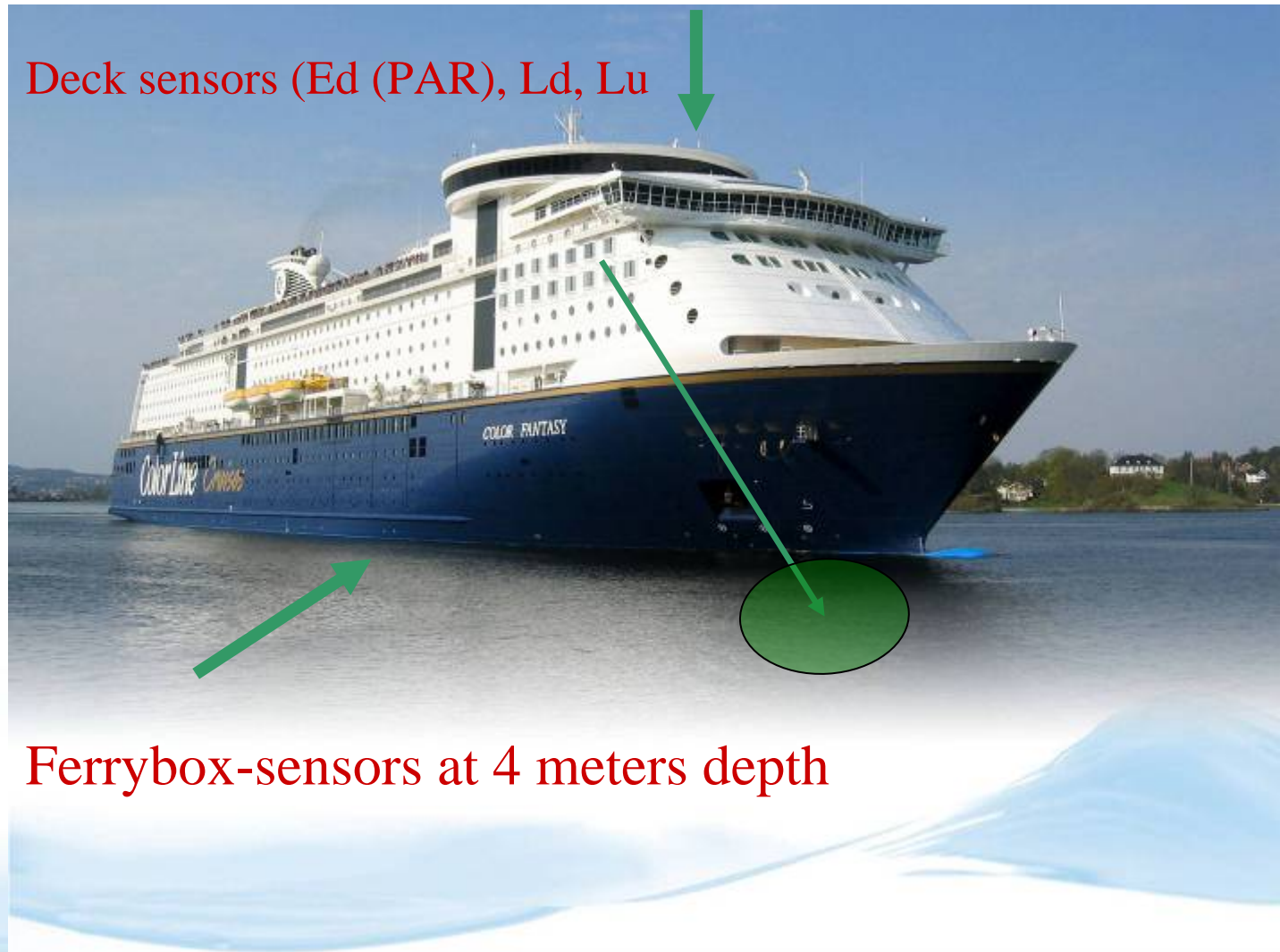


Status on NIVA lines



- Tromsø-Longyearbyen: Oct 2008---
 - 37 transects per year,
 - Sensors T,S,O₂, Chl-a-FI,Turb
 - Water sampler
- Bergen –Kirkenes: Jul 2004---
 - 35 transect per year (11 days trip)
 - Sensor: ; T,S,O₂, Chl-a-FI,Turb, radiance)
 - Water sampler
- Bergen-Hirtshals / (Hantsholm): 2005---
 - 2-3 transect per week
 - Sensors T,S,O₂, Chl-a-FI,Turb
 - Water sampler
- Oslo-Kiel: Jun 2008-- (Oslo-Hirtshals 2001-2008)
 - 3 transects per week
 - Sensor: ; T,S,O₂, Chl-a-FI,Turb, radiance)
 - CDOM and pycocyanin
 - Water sampler

The Ferrybox systems on Color Fantasy between Oslo and Kiel (Flaggship)



The Ferrybox installation



Ferrybox on Oslo-Kiel

Cyano-
bacteria

CDOM

Algae

Particles

Temperature
Salinity

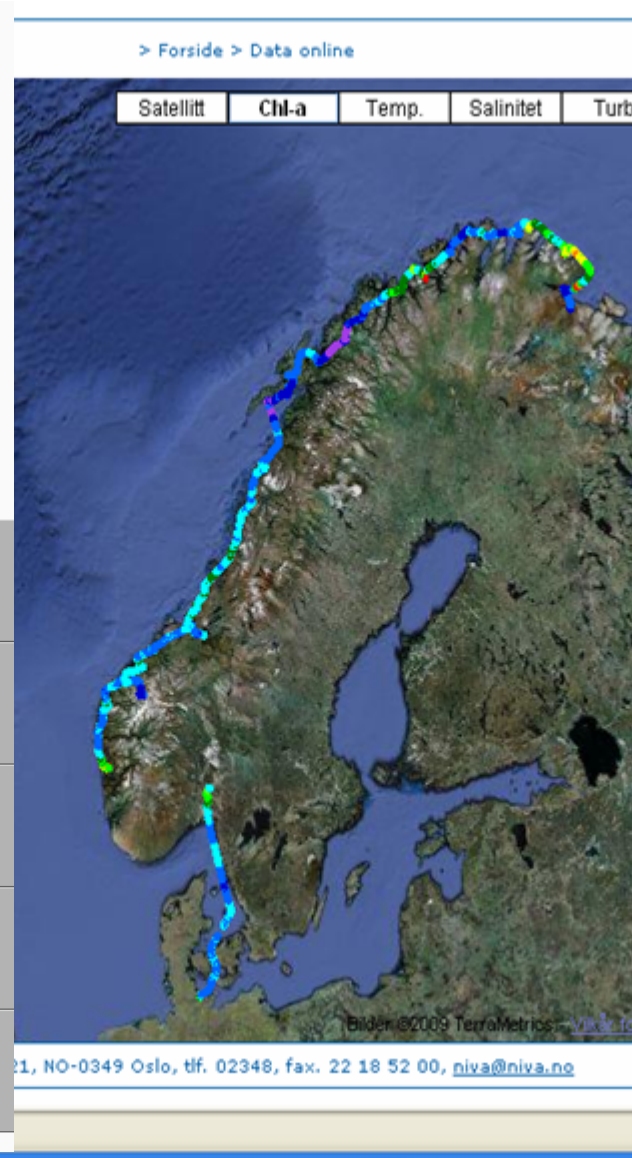
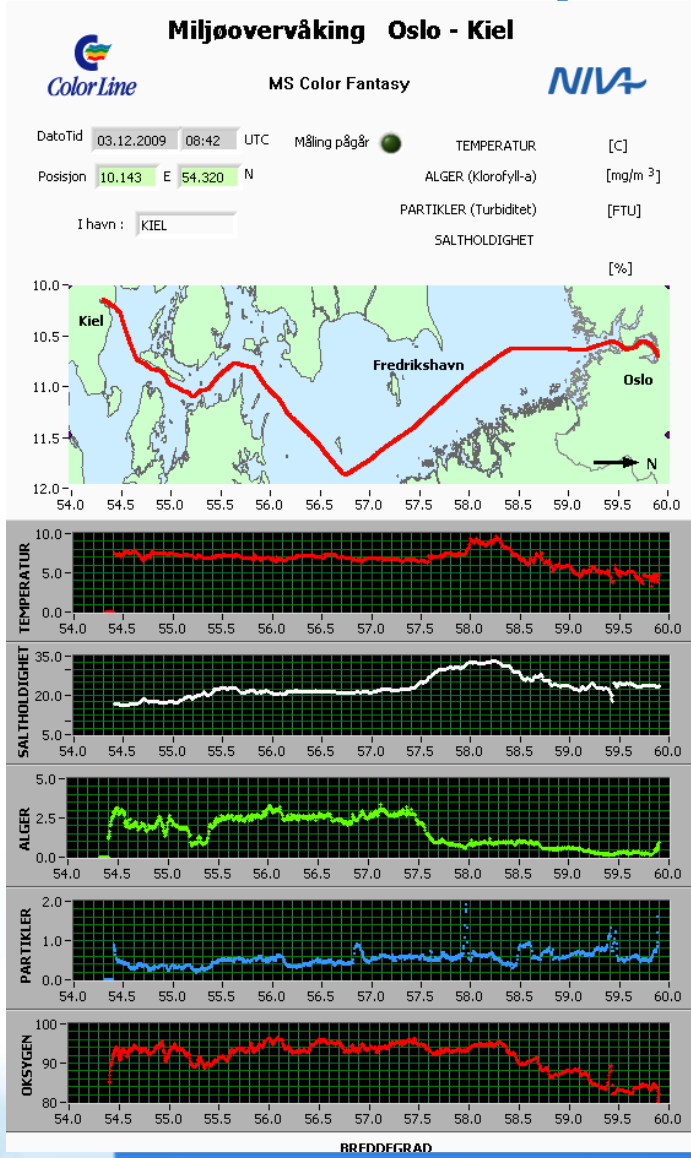
pH (opt)

Oxygen

Water sampler



Ferrybox-Presentation



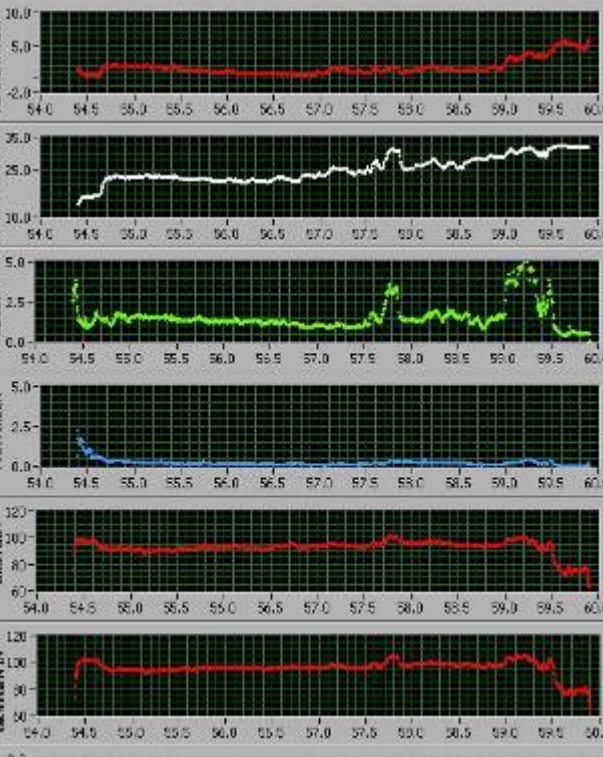


Miljøovervåking Oslo - Kiel

MS Color Fantasy

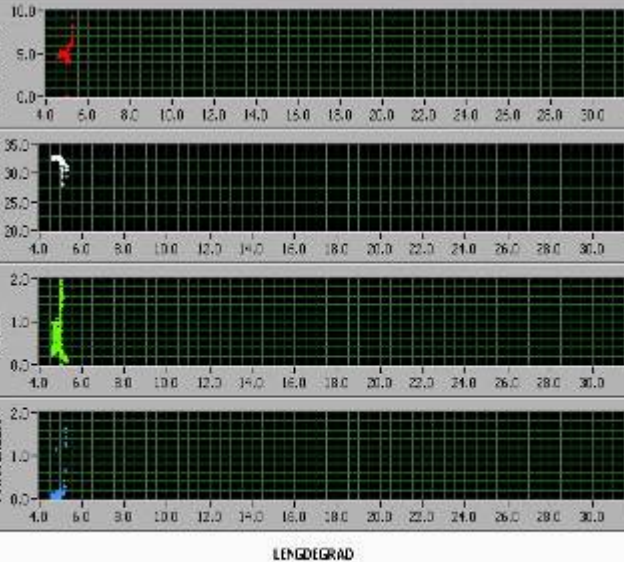
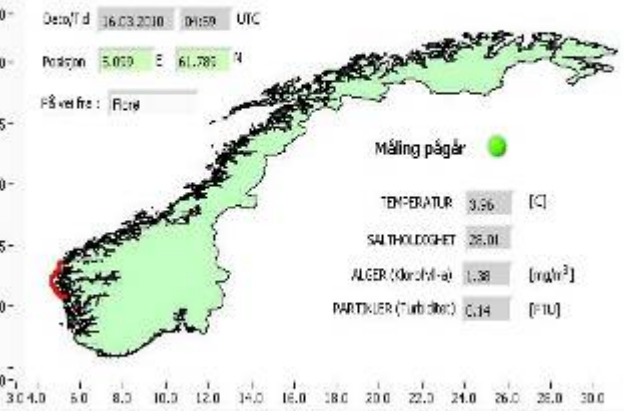


Dato/Tid: 16.03.2010 09:59 UTC Måling pågår ● TEMPERATUR [C]
 Posisjon: 10.709 E 59.909 N ALGER (Oksyfyke) [mg/l³]
 Partikler (Turbiditet) [FTU]
 Saltholdighet [PSU]



Miljøovervåking Bergen - Kirkenes

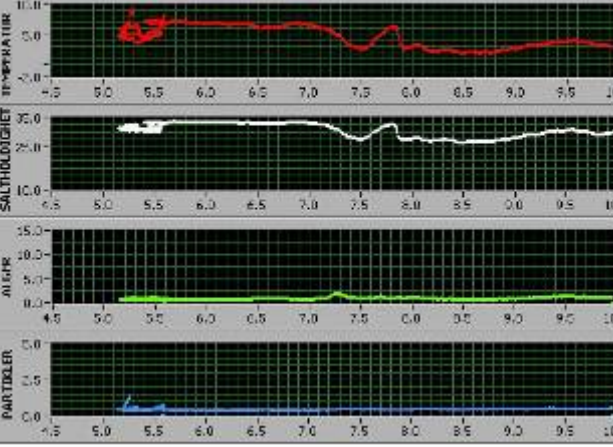
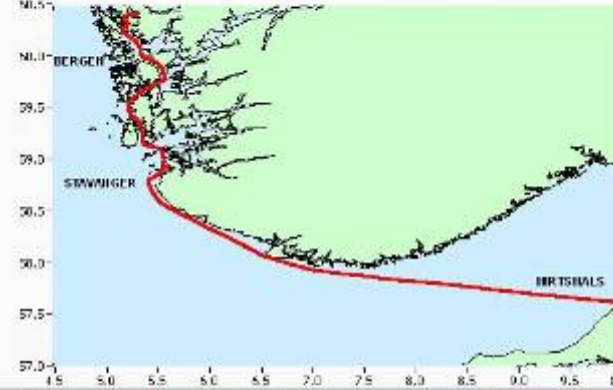
Hurtigruten MS Trollfjord



Miljøovervåking Bergen - Hirtshals

MS Bergenstjord

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 Posisjon: 9.524 E 57.524 N ALGER (Oksyfyke) [mg/l³]
 Partikler (Turbiditet) [FTU]
 Saltholdighet [PSU]



www.tellybox.no, www.oceanbox.no

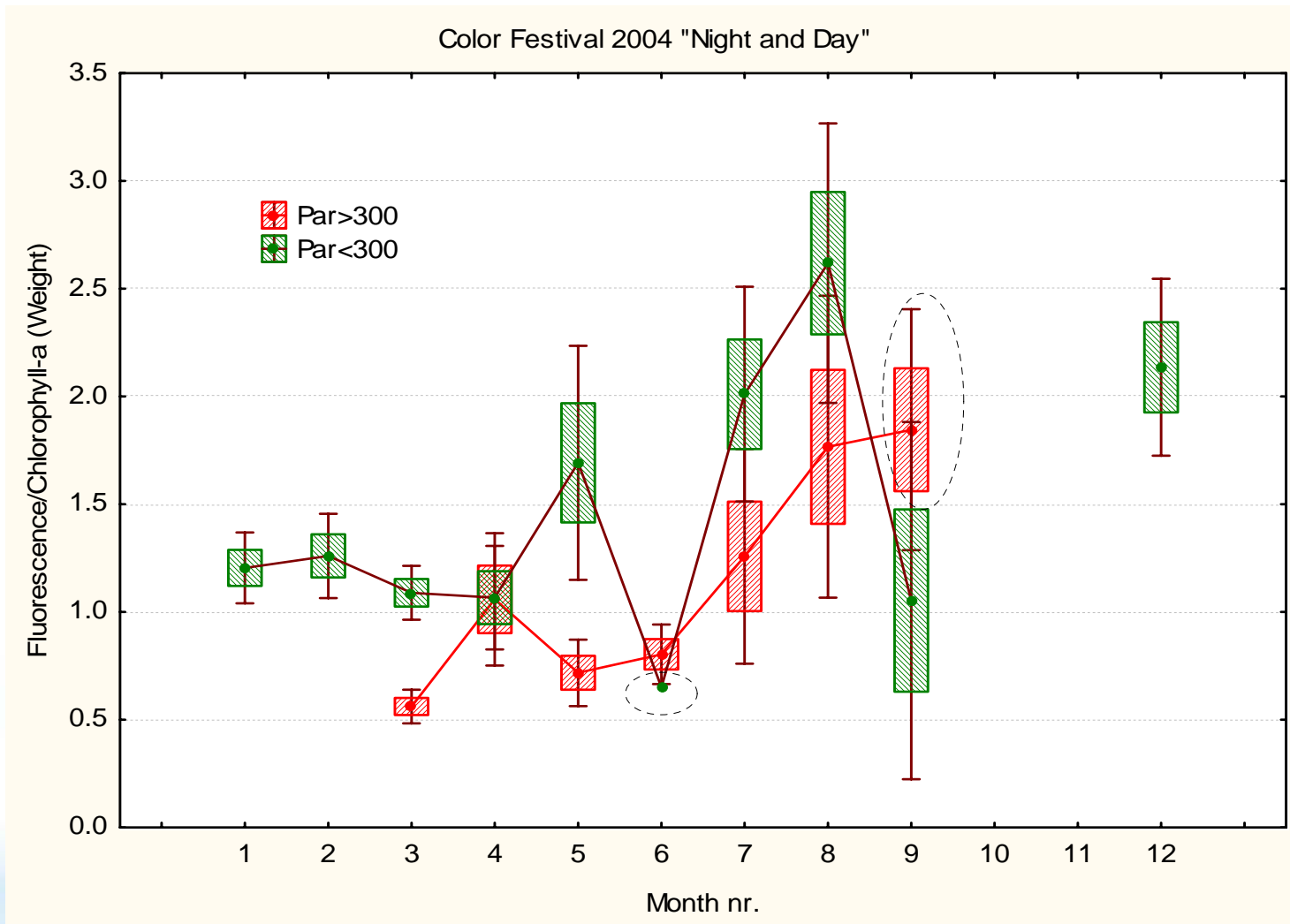


kai.sorensen@niva.no

21. mars 2010

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Chl-a_Fluorescence/Chl-a ratio 2004- ("night" and "day" using PAR < or > 300)

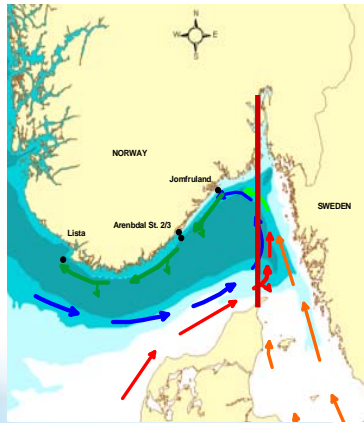
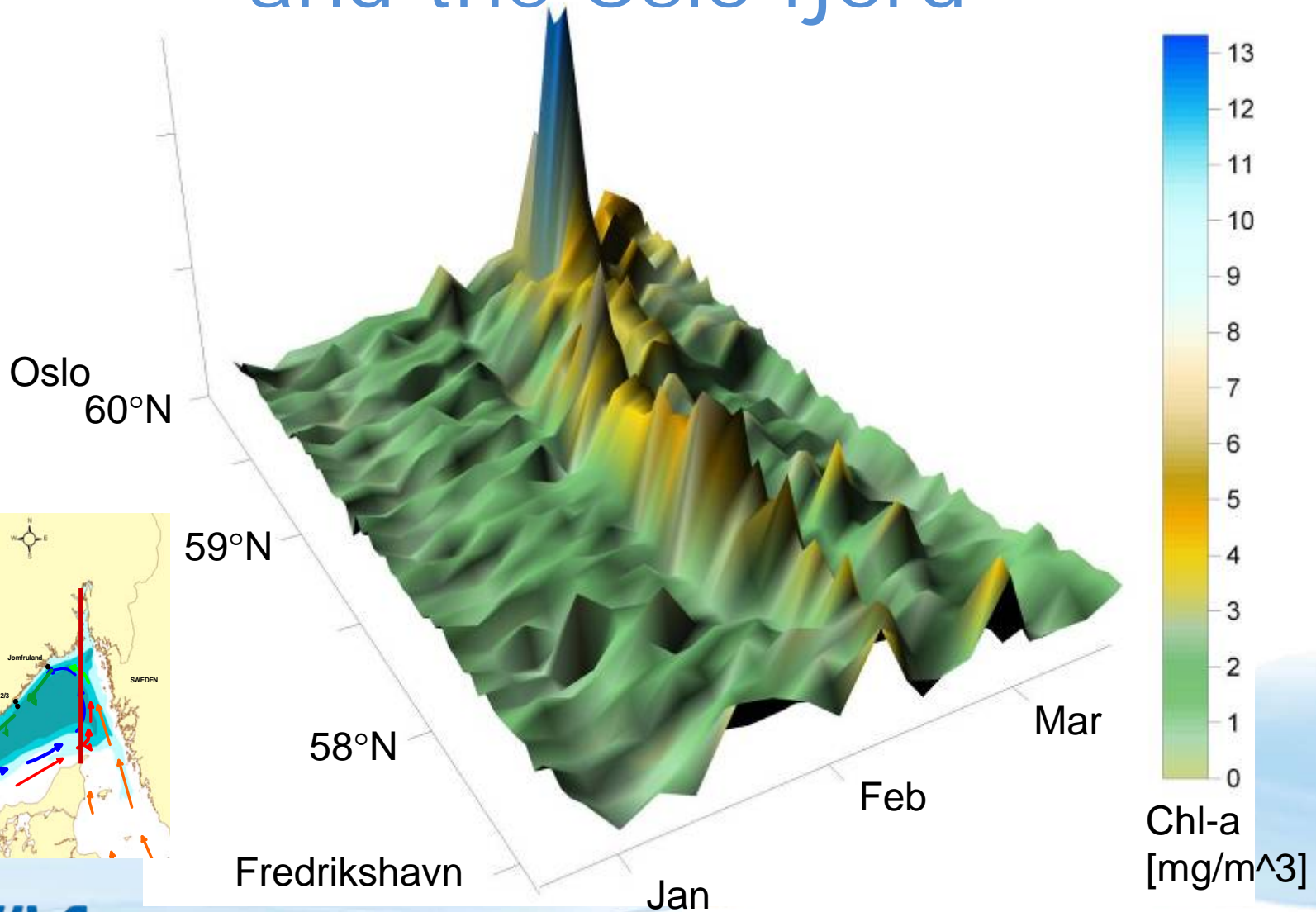


Applications - end user projects

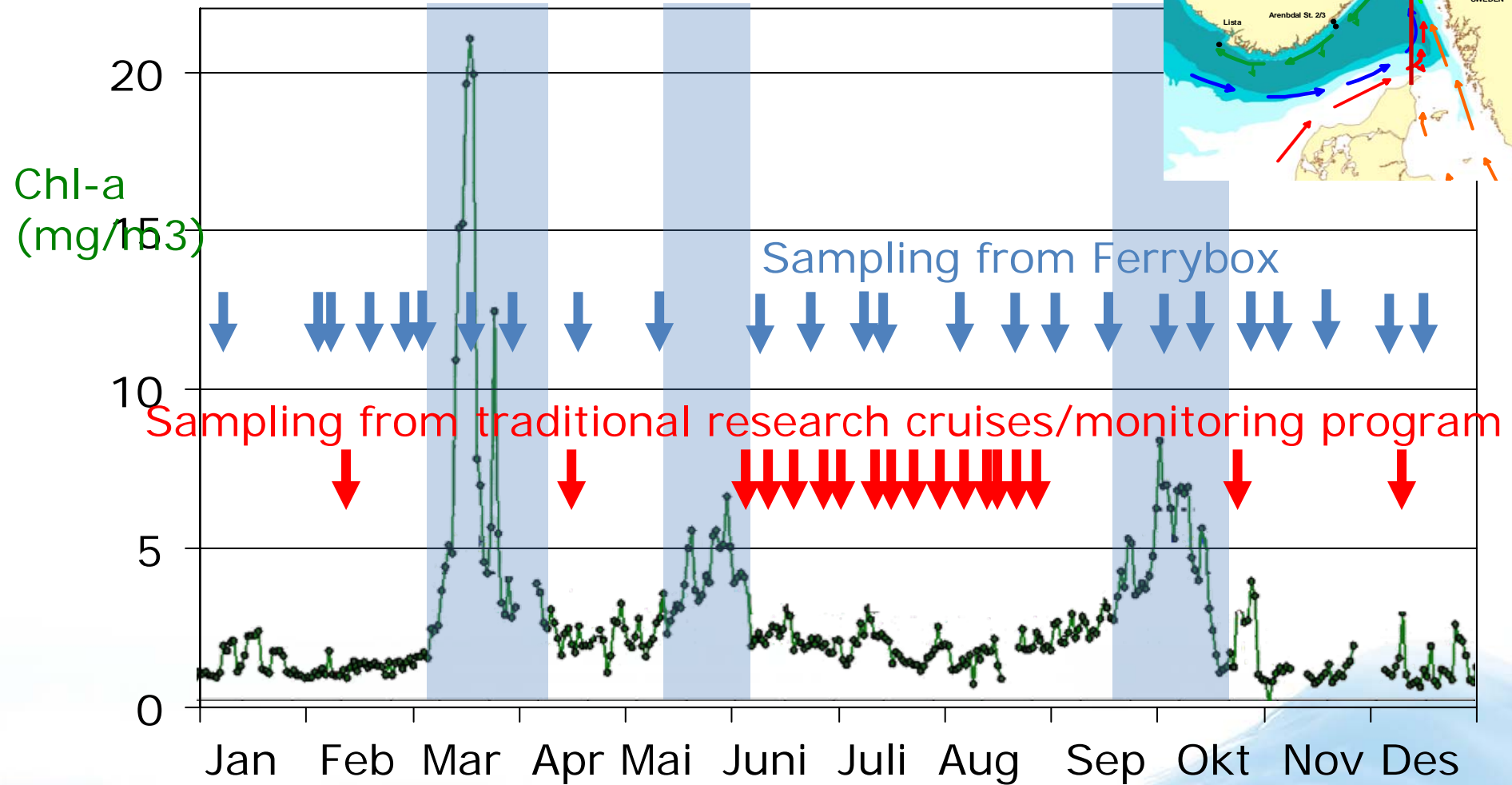
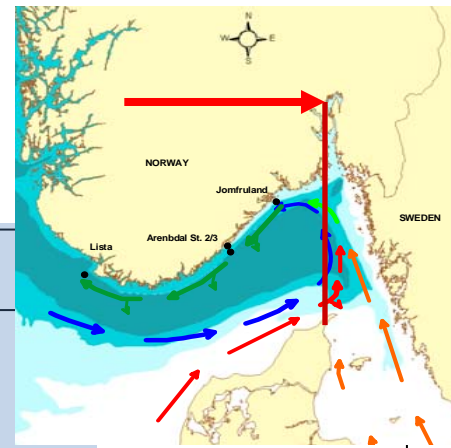
- **Oslo-Kiel route**
 - 3 monitoring stations, 22 x per year, state program
 - 4 monitoring stations, 7 x per year, local programs
 - 2 stations - toxic algal monitoring program
 - 2-6 stations for satellite product validation
- **Hirsthals-Bergen route**
 - 2 monitoring stations, 22 x per year
 - 2-4 stations – toxic algal monitoring
- **Bergen-Kirkenes route**
 - 1 monitoring station
 - Satellite product validation
 - WFD (plan for several stations)
- **Tromsø-Longyearbyen**
 - Monitoring (ocean acidification)
 - Satellite product validation



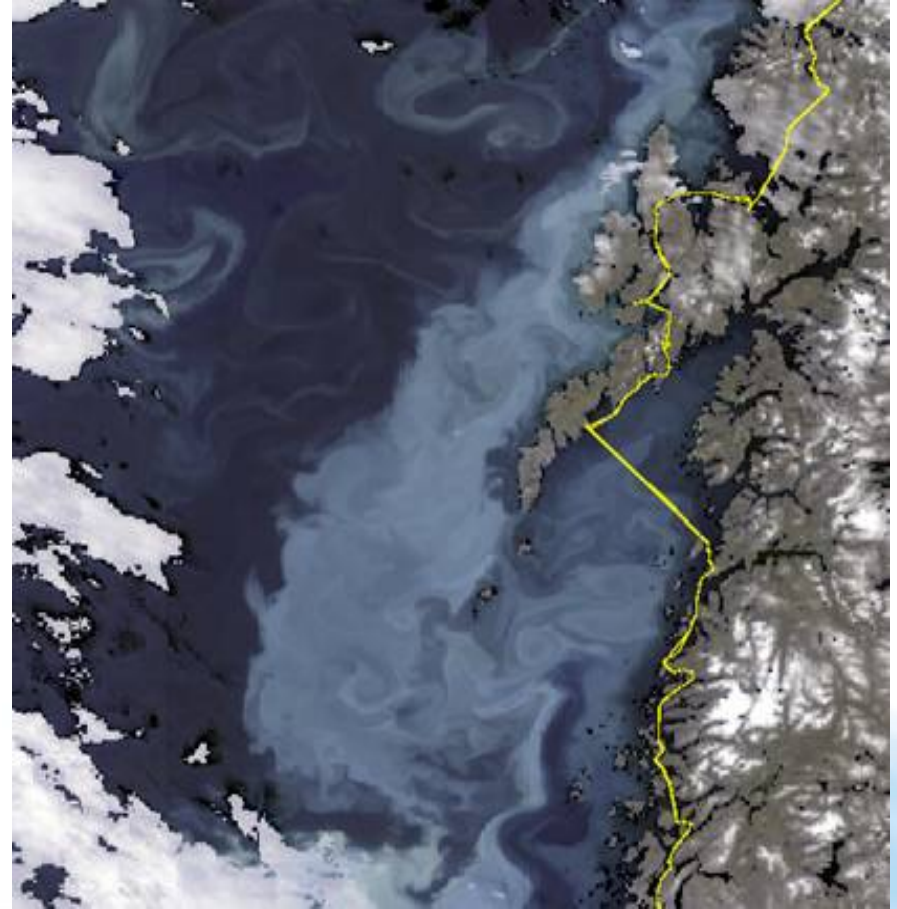
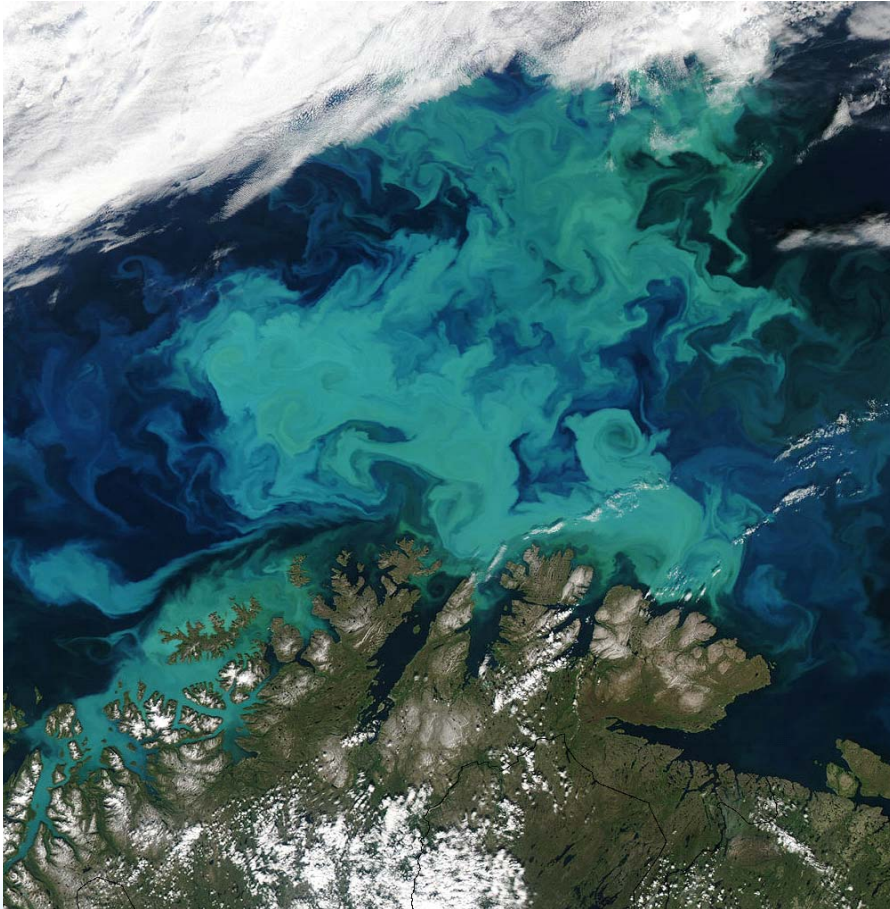
Spring bloom in Skagerrak and the Oslo fjord



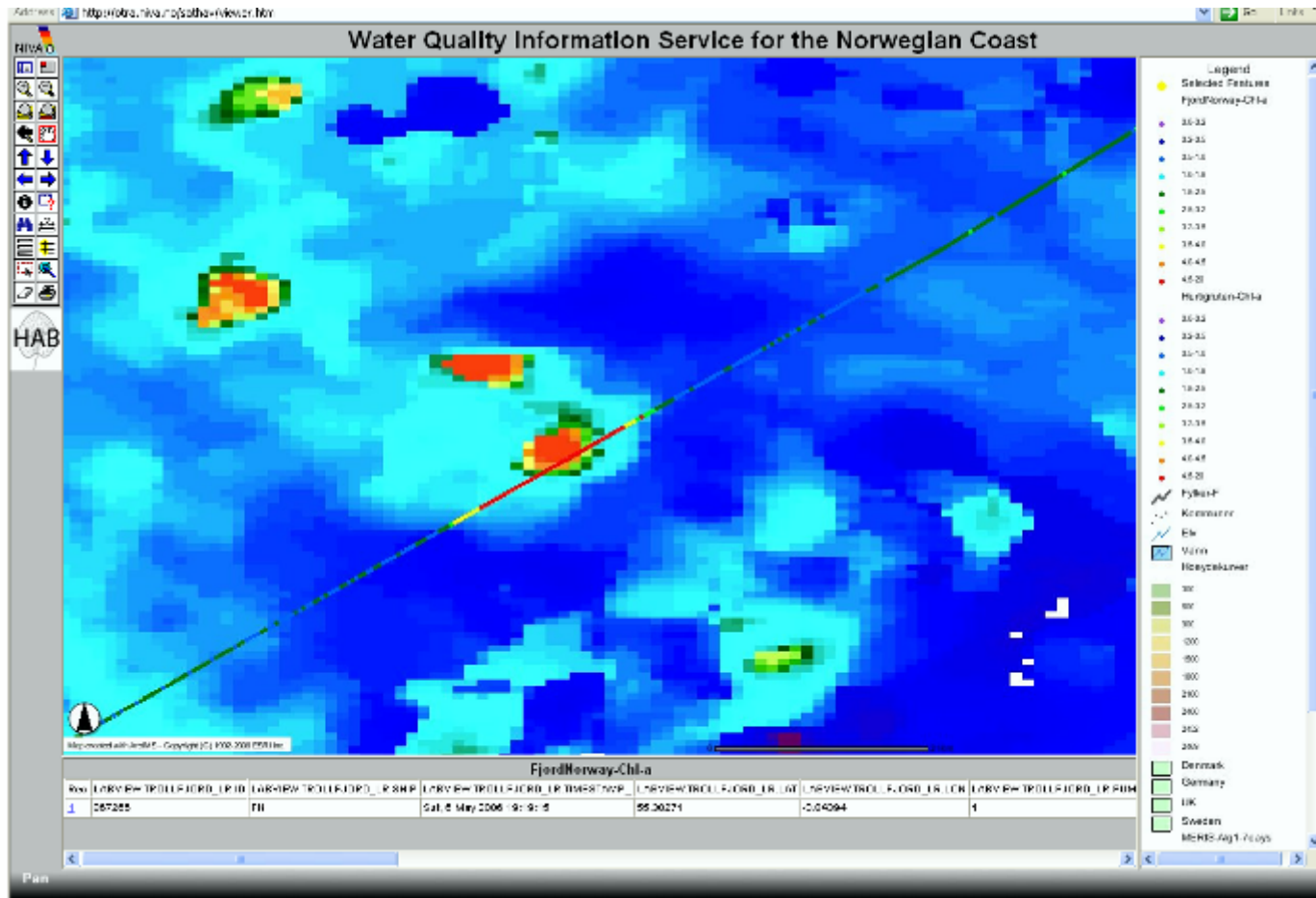
High frequency measurements compared to routine sampling



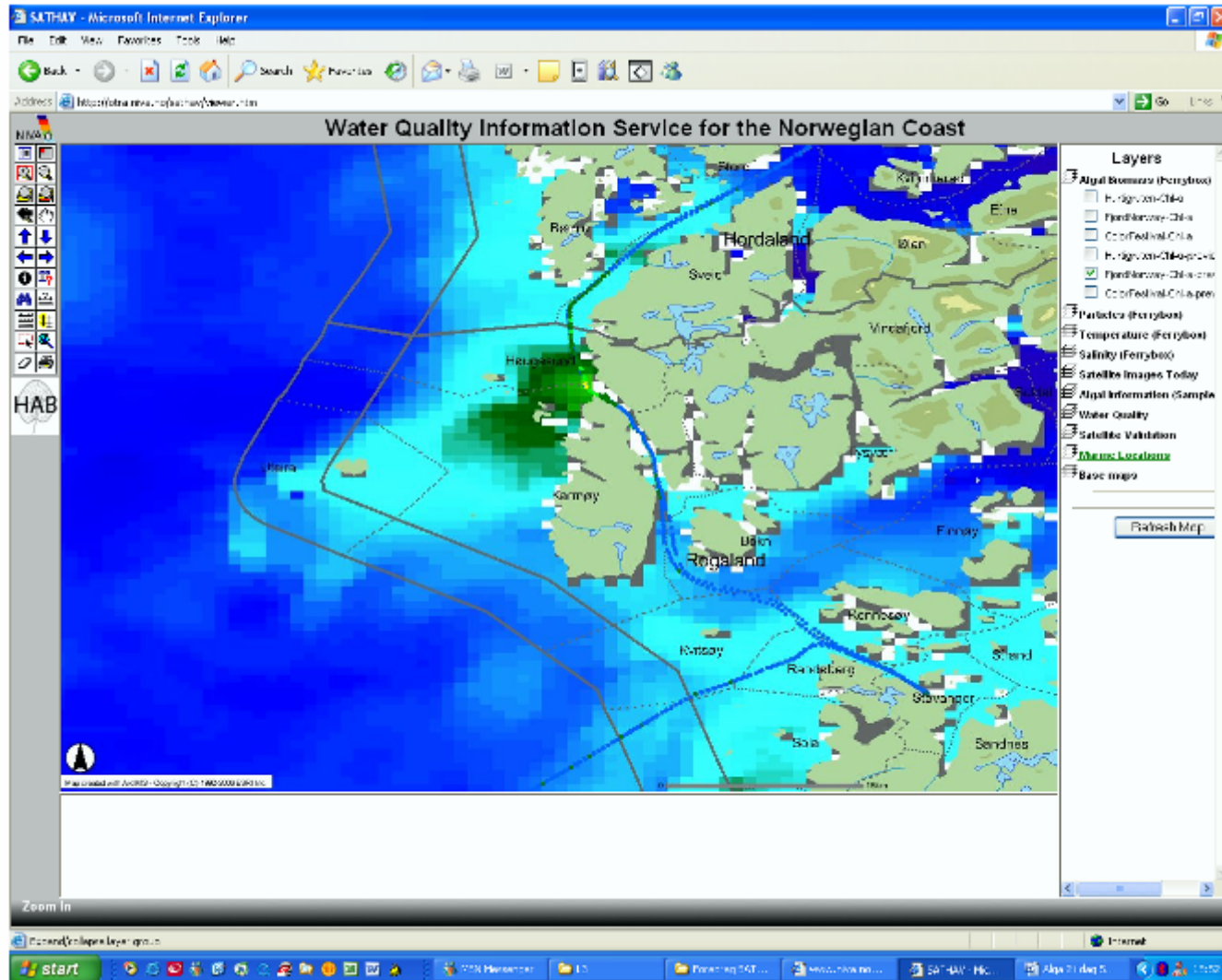
Algal bloom products from satellites needs verification



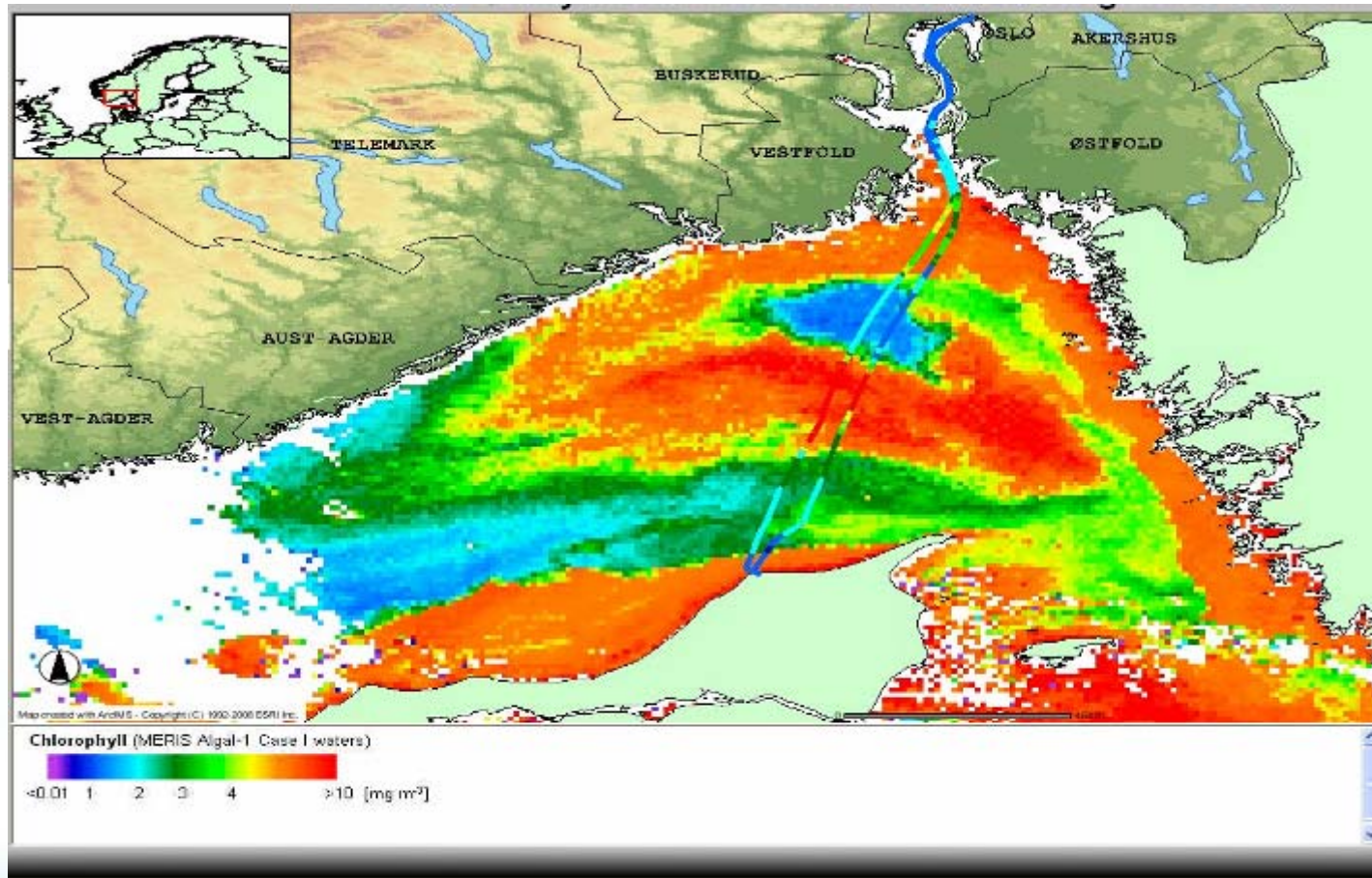
Algal bloom seen by satellite in the open sea verified with ship



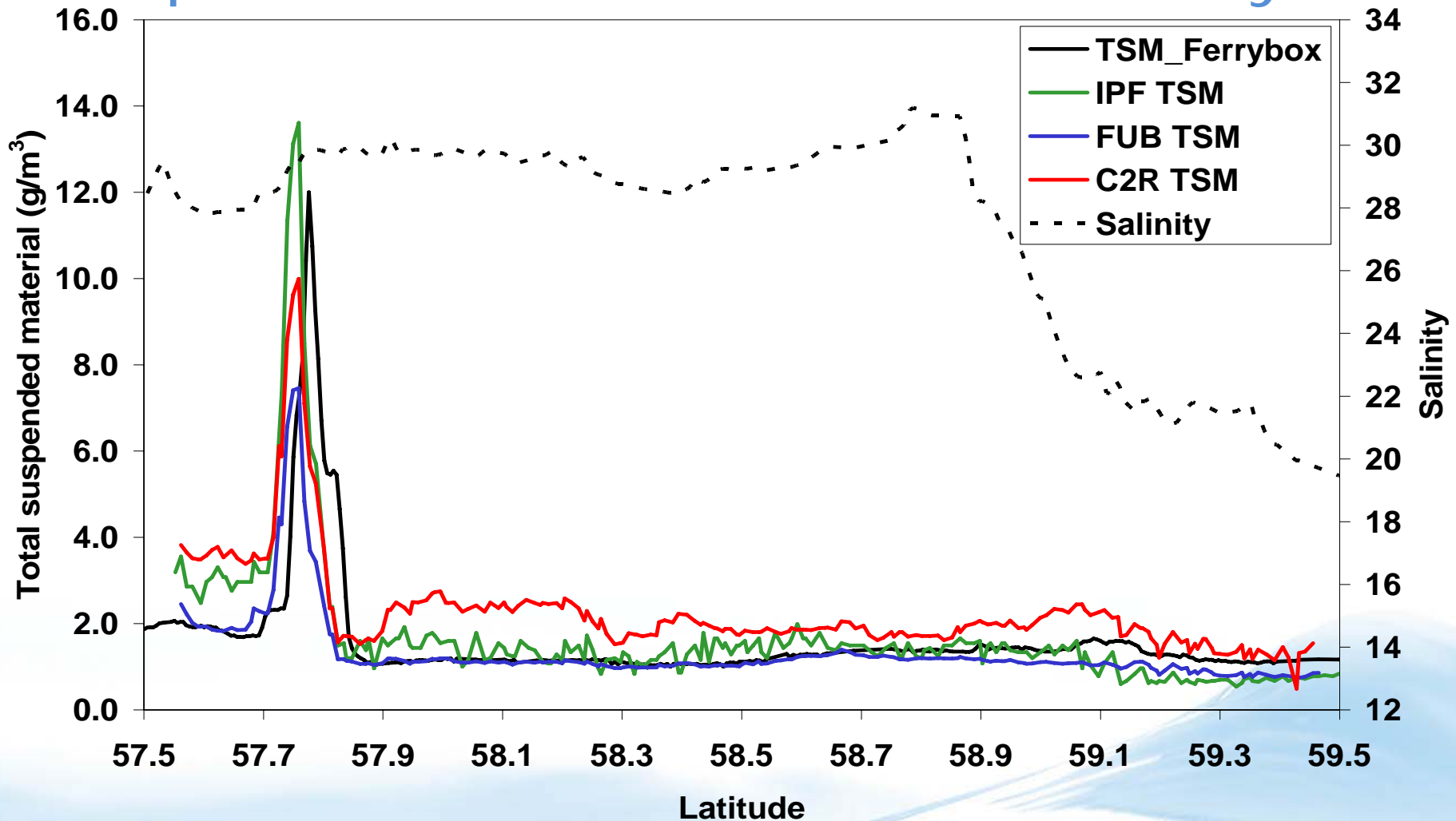
Combination of the data confirming the algal bloom



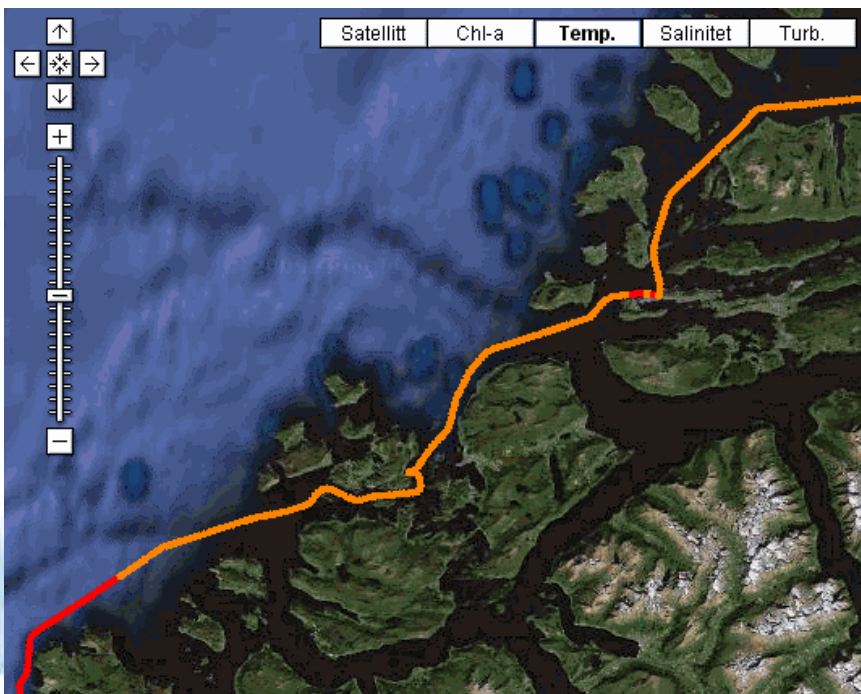
Combination of satellite data of algae and Ferrybox data give overview of a algalbloom



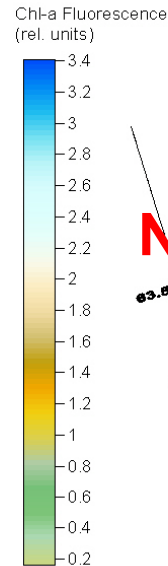
MERIS TSM with different processors compared to TSM derived from Ferrybox



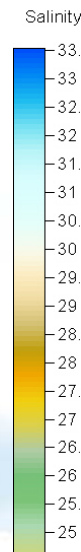
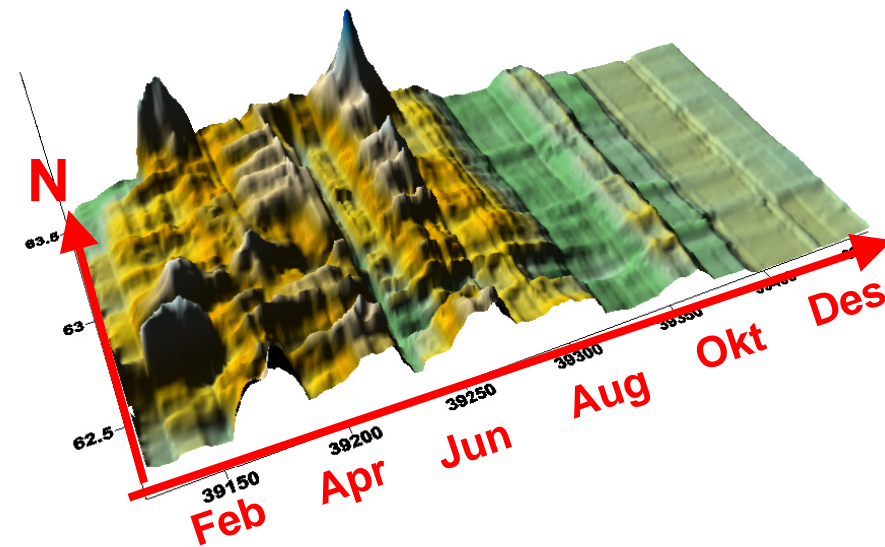
Data example from the west coast of Norway



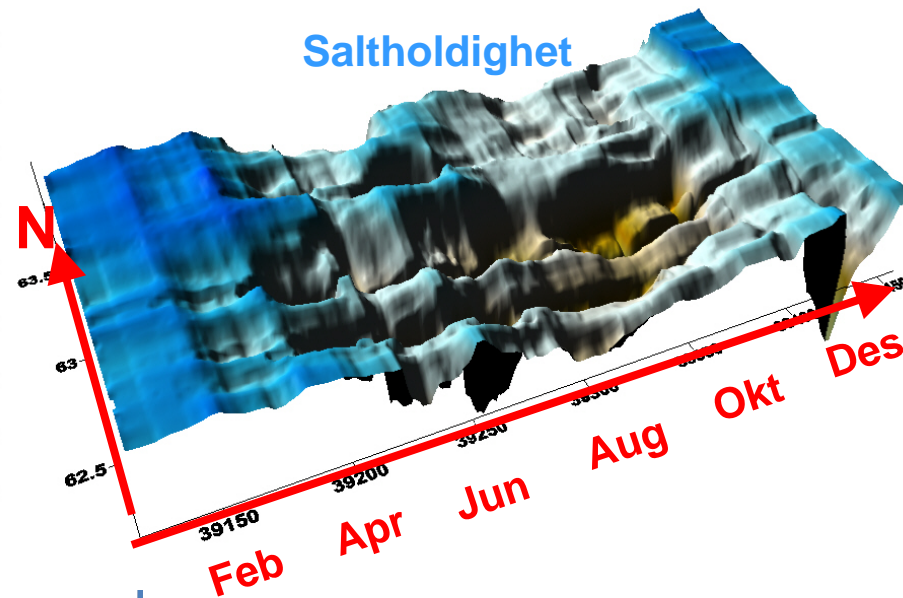
FERRYBOX TROLLFJORD
Jan - Dec 2007
Stad - Tromdheimsfjordens munning



Algemengde



Saltholdighet



Water framework directive and the use of the Ferrybox platform

Water types

Not classified



Open, exposed coast



Moderate exposed



Coast/fjord/archipelago



Protected coast/fjord



Oxygen poor fjord



Narrow strait

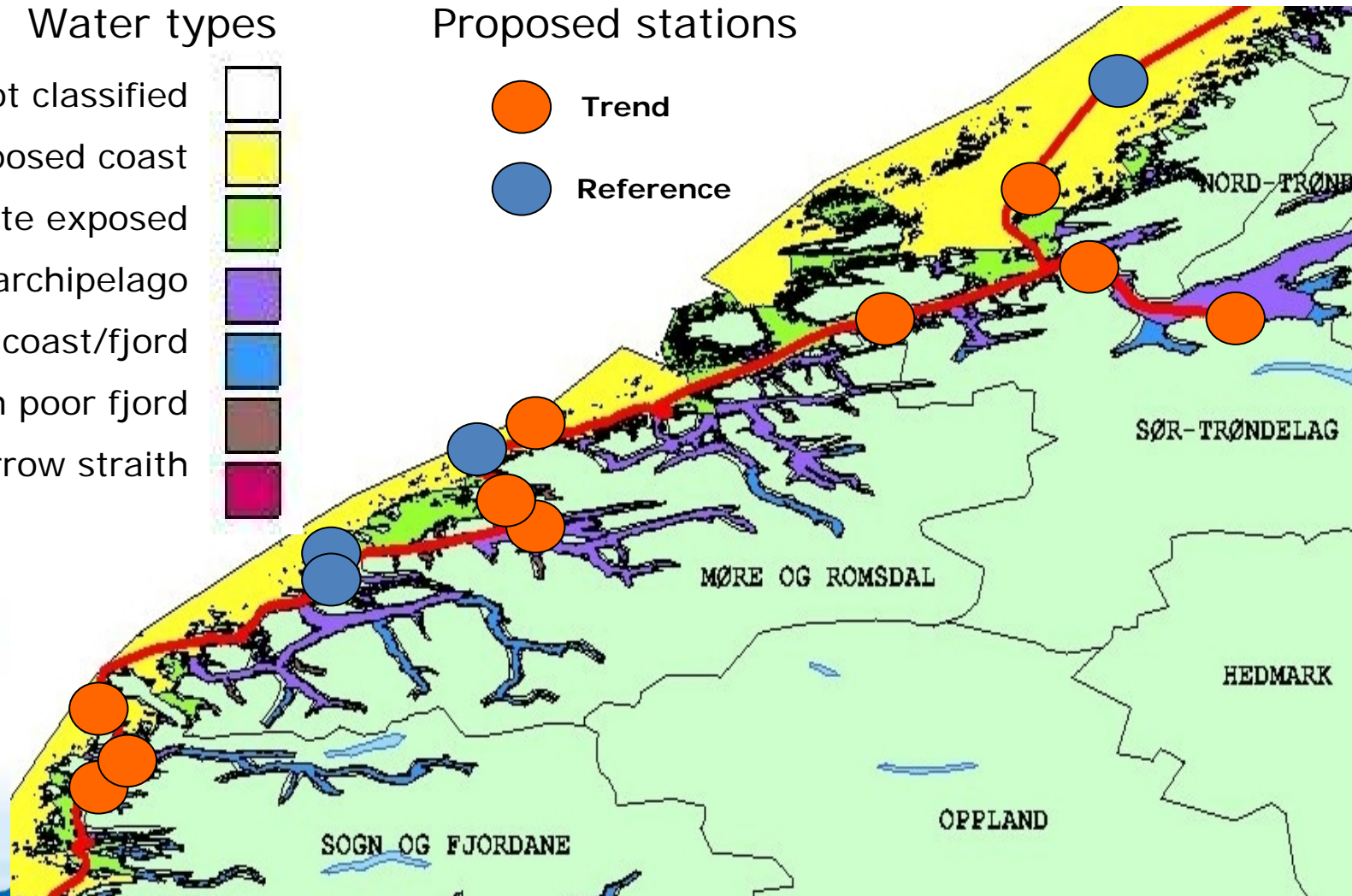


Proposed stations

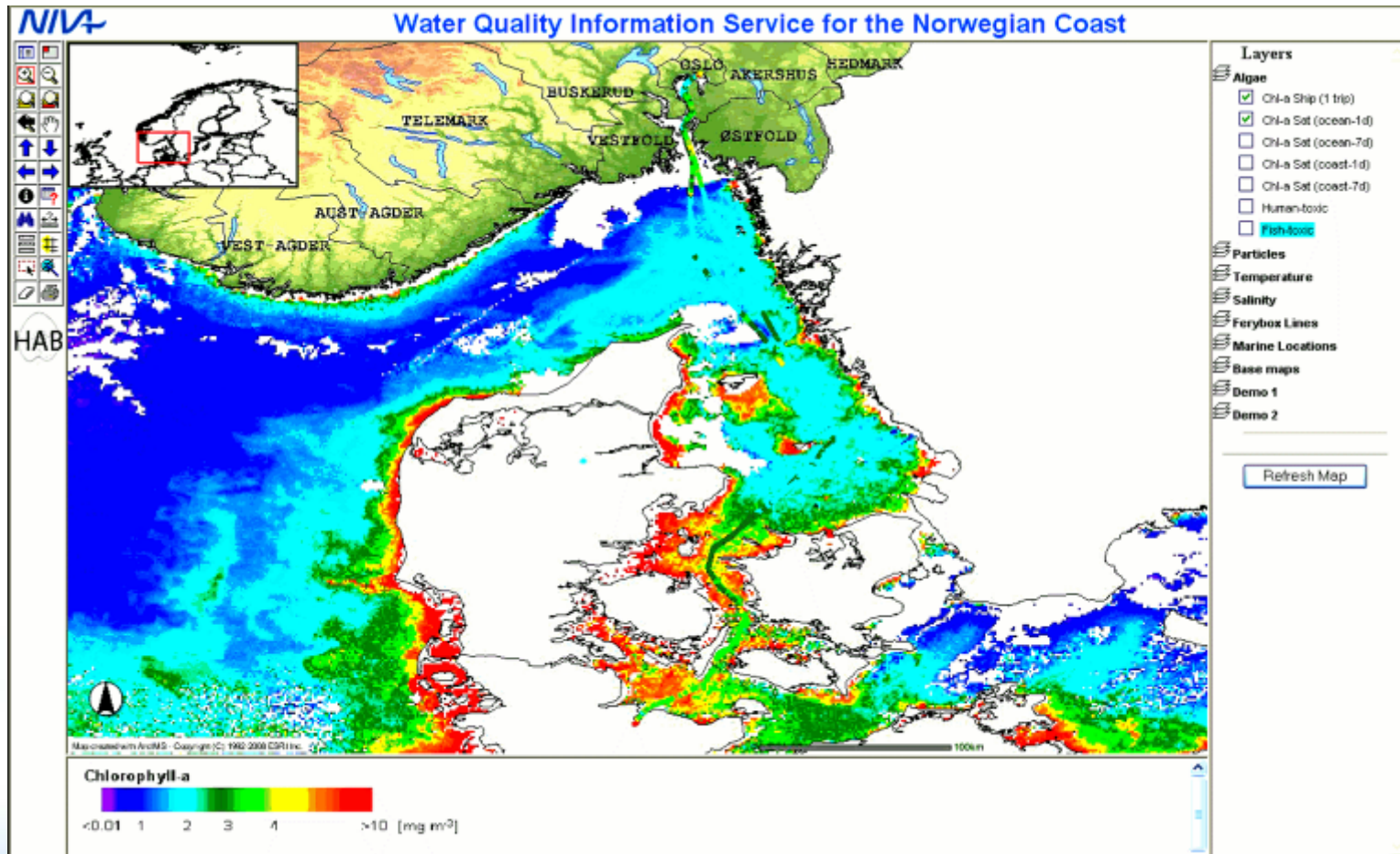
Trend



Reference

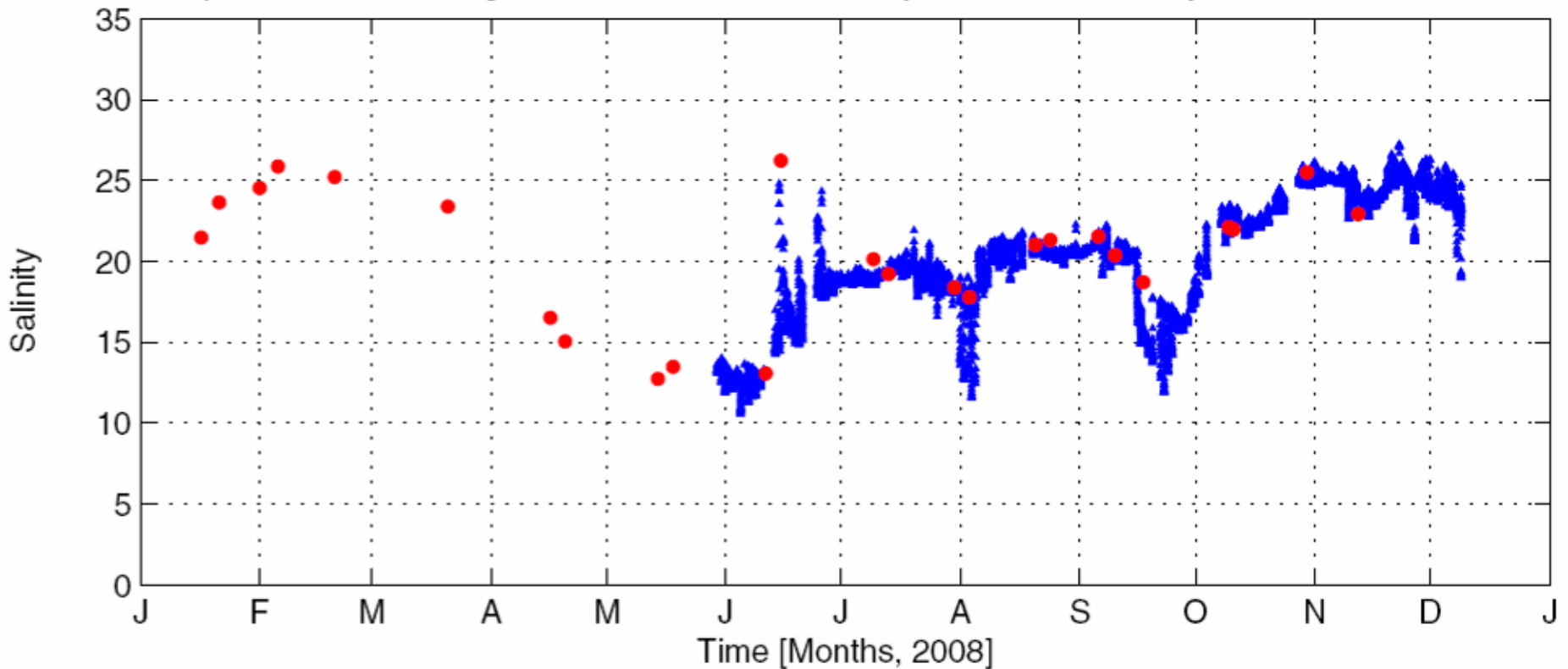


SatOcean NIVA web portal



Comparison of Ferrybox and Argos salinity at Anholt E 2008

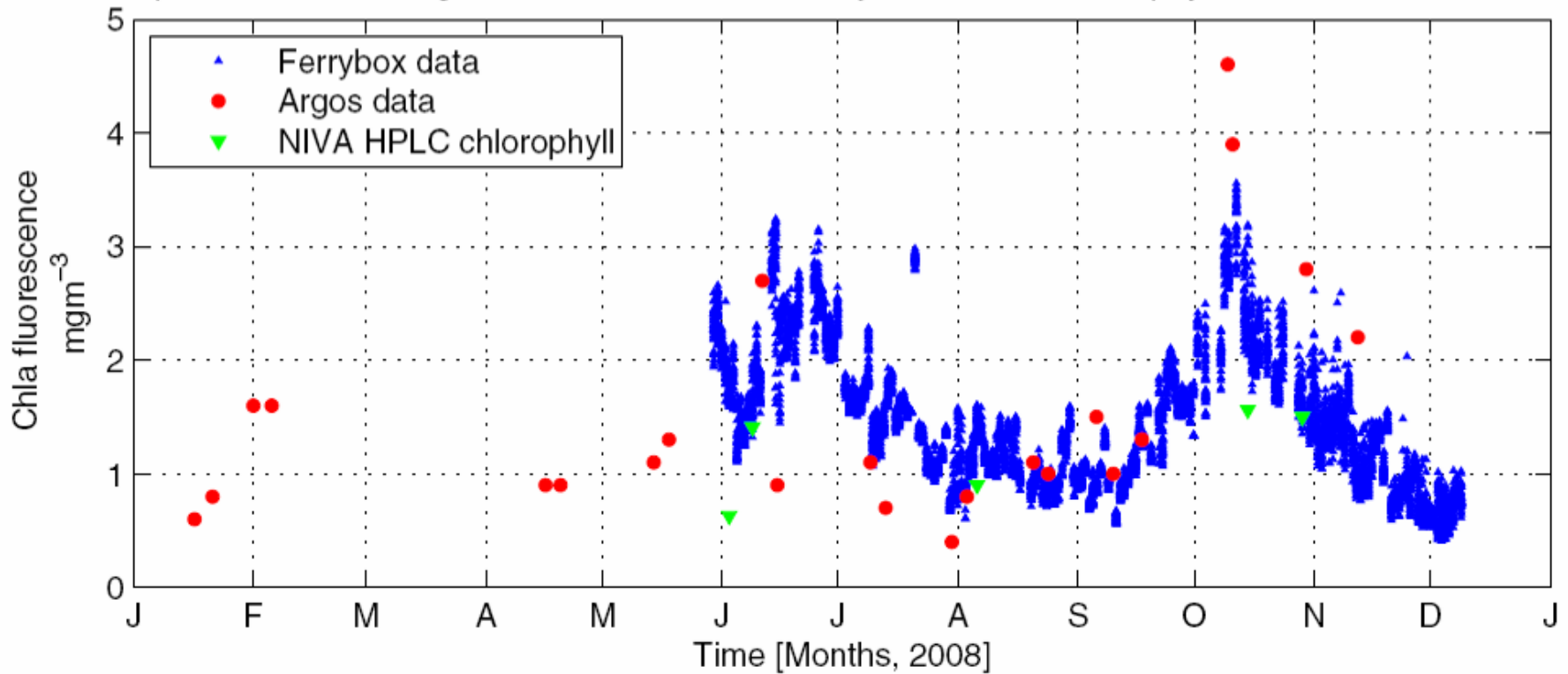
Comparison between Argos bottle data and NIVA ferrybox data for Salinity within 50 km of Anholt E



Data from SMHI. Report Karlson et.al 2009

Comparison Ferrybox and Argos samples at Anholt 2008

Comparison between Argos bottle data and NIVA ferrybox data for Chlorophyll a within 50 km of Anholt E



Data from SMHI. Report Karlson et.al 2009

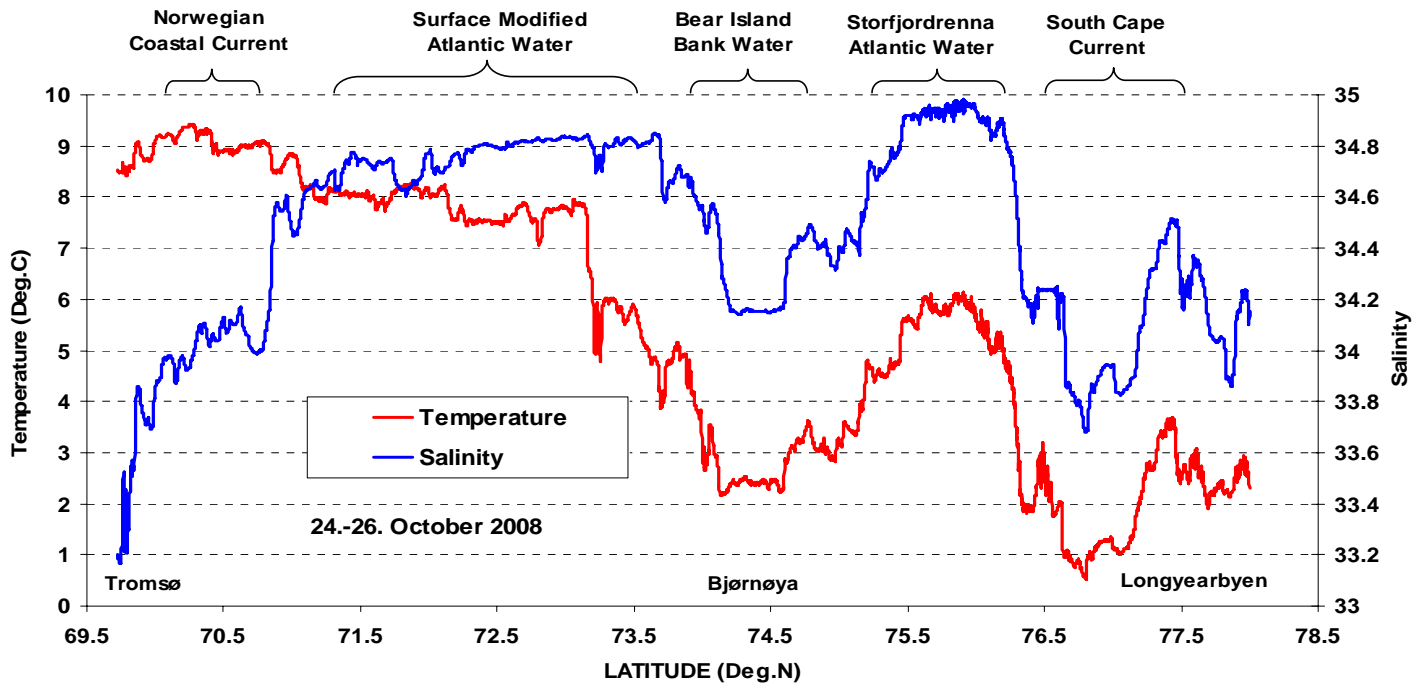
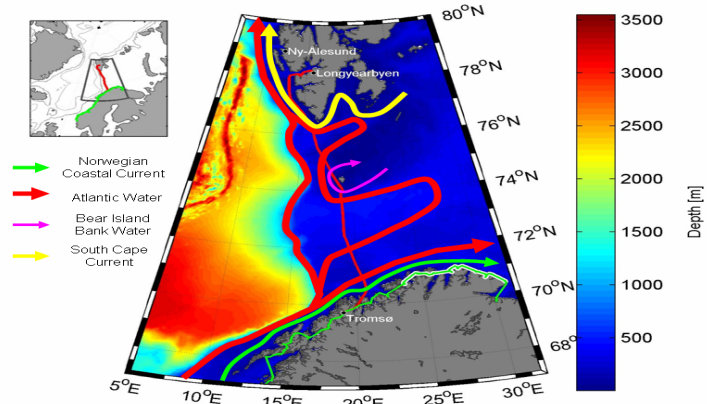
Ferrybox and Argos data 2009

ANHOLT E 2009
Ferrybox (Color Fantasy) and R/V Argos observations



Data from Bengt Karlson (SMHI)

The Svalbard transect



Future plans

- Marine acidification
 - Spectrofotometric pH (m-cresol-purple)
 - pCO₂ system
 - Automatic sampling for TIC, Alk
- Nutrients analysers
- PSICAM sensor for Chl-a absorption
- Oil-fluorescence sensors
- Radiometric measurements
 - Tromsø-Longeyearbyen (tbd)