

FerryBox

Bruk av sensorer på skip i faste ruter langs kysten

Louise Valestrand mfl. 13.11.2023



NorSOOP: Norwegian Ships of Opportunity Program for marine and atmospheric research

Partners: NIVA (lead), Institute for Marine Research, Akvaplan-niva, Met.no,

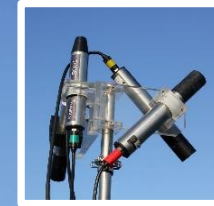
Remote sensing validation



Satellite communication
(for data transfer and remote control)



Meteorological station



Light and reflectance sensors

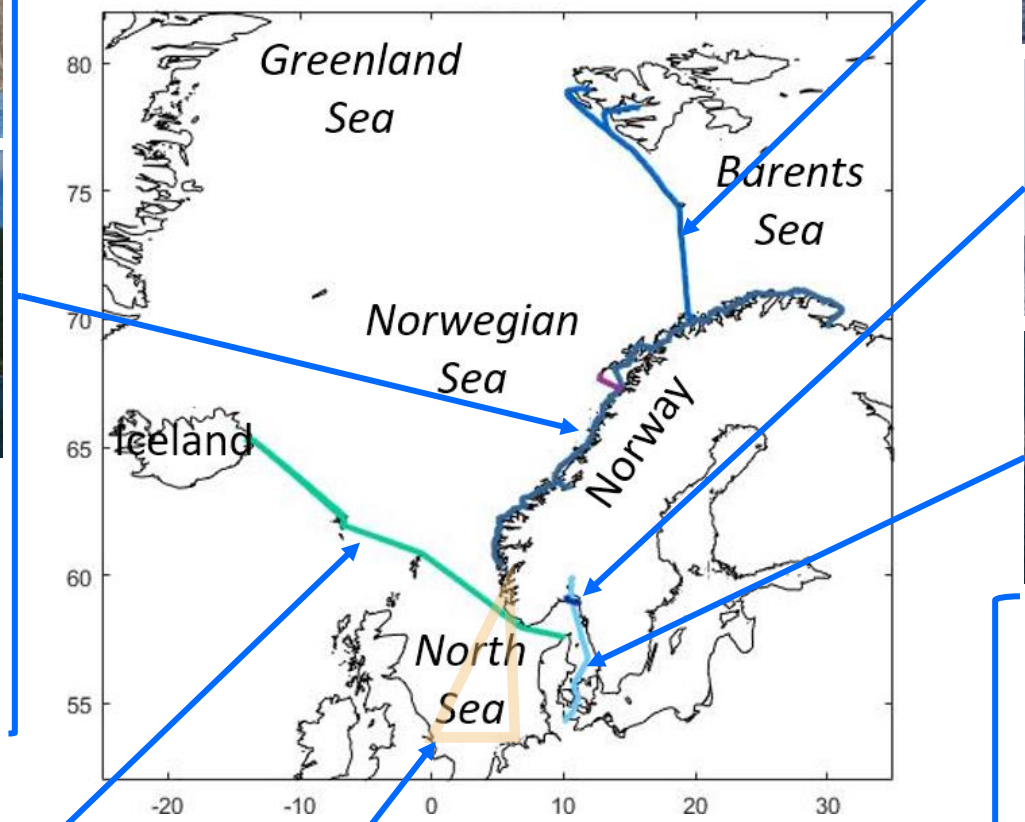


Downward-looking sensors (sea surface skin temp, LIDAR, etc.)



FerryBox (essential ocean variables + others)

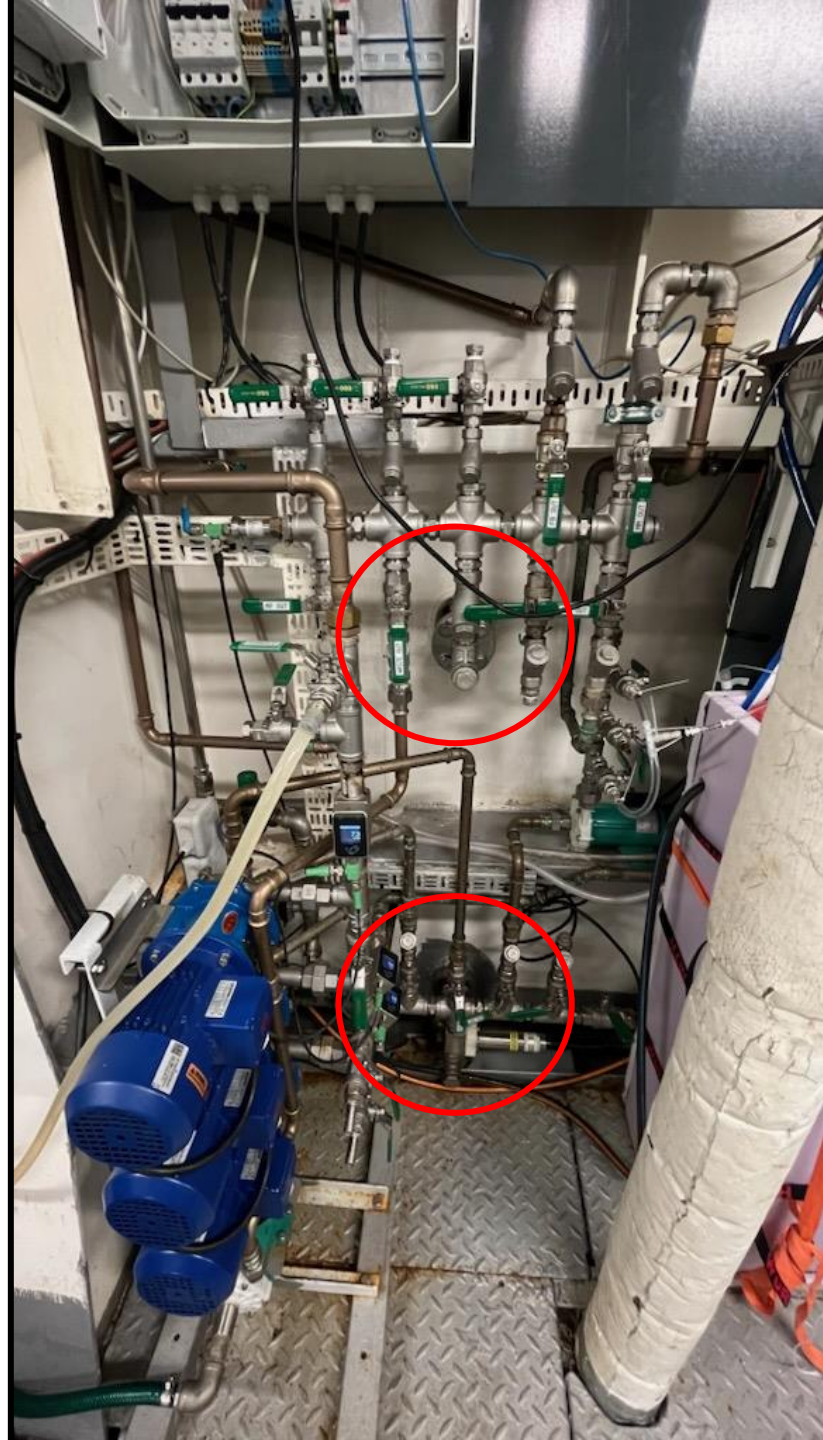
NorSOOP ships and routes



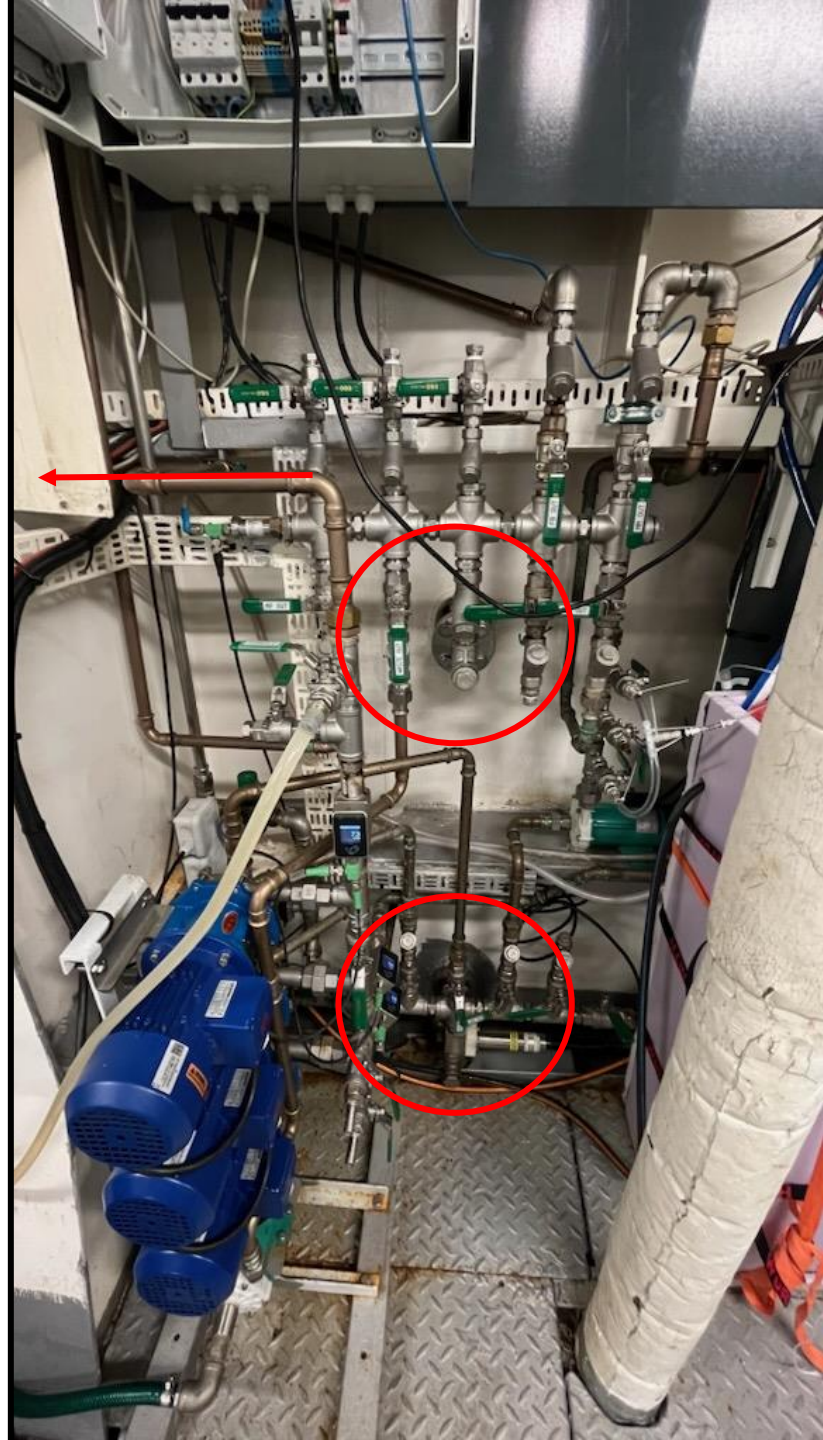
Antarktis,
Arktis &
Great Lakes

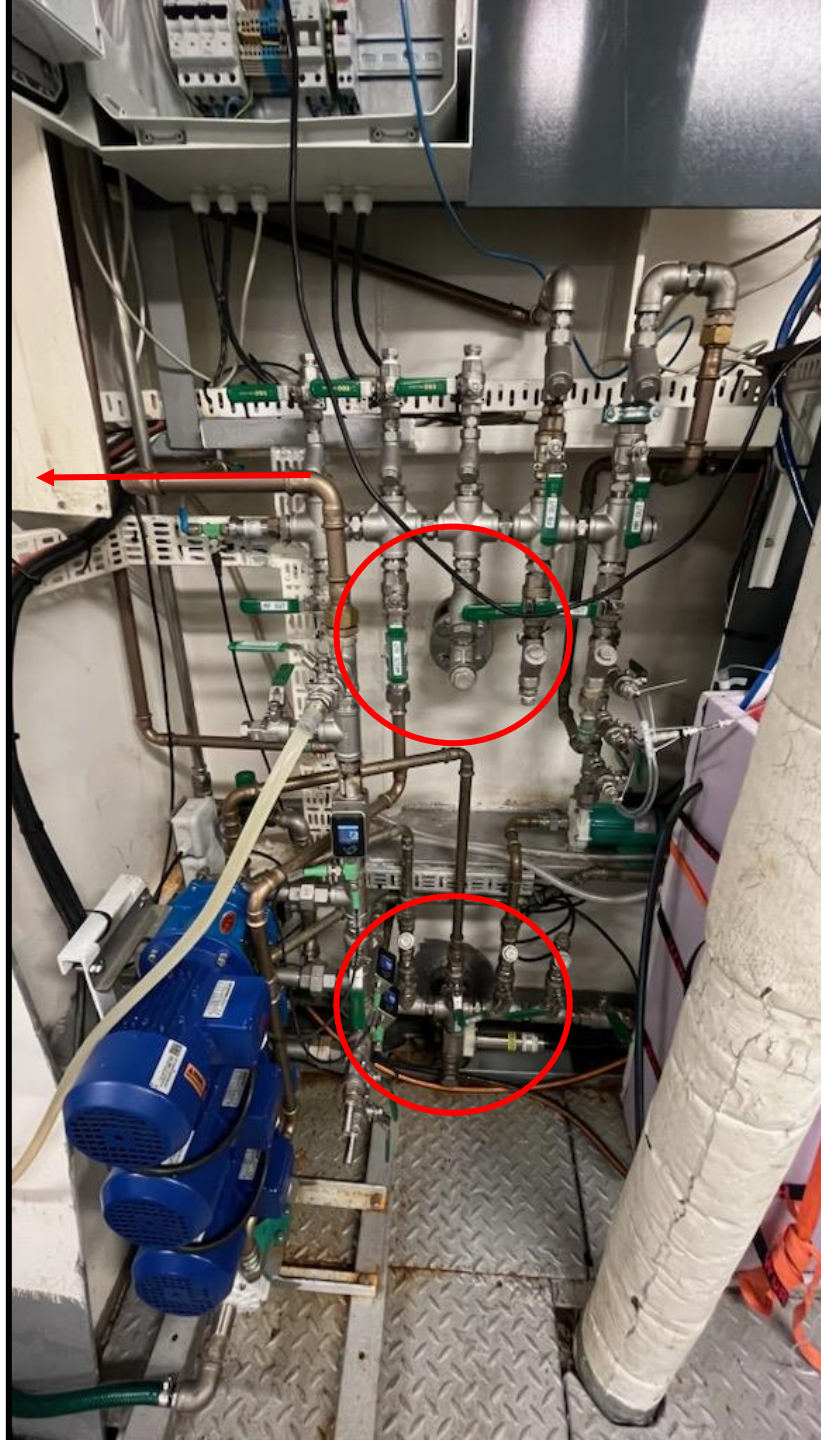


- Hoved vanninntak på ca 4 m dyp
 - Temperatursensor
- Tre pumper
 - En til våtskap med sensorer
 - Salinitet, temperature og oksygen
 - Klorofyll-a fluorescence, cDOM fluoresensce og turbiditet
 - En til pH og pCO2
 - En til mikroplast-innsamler



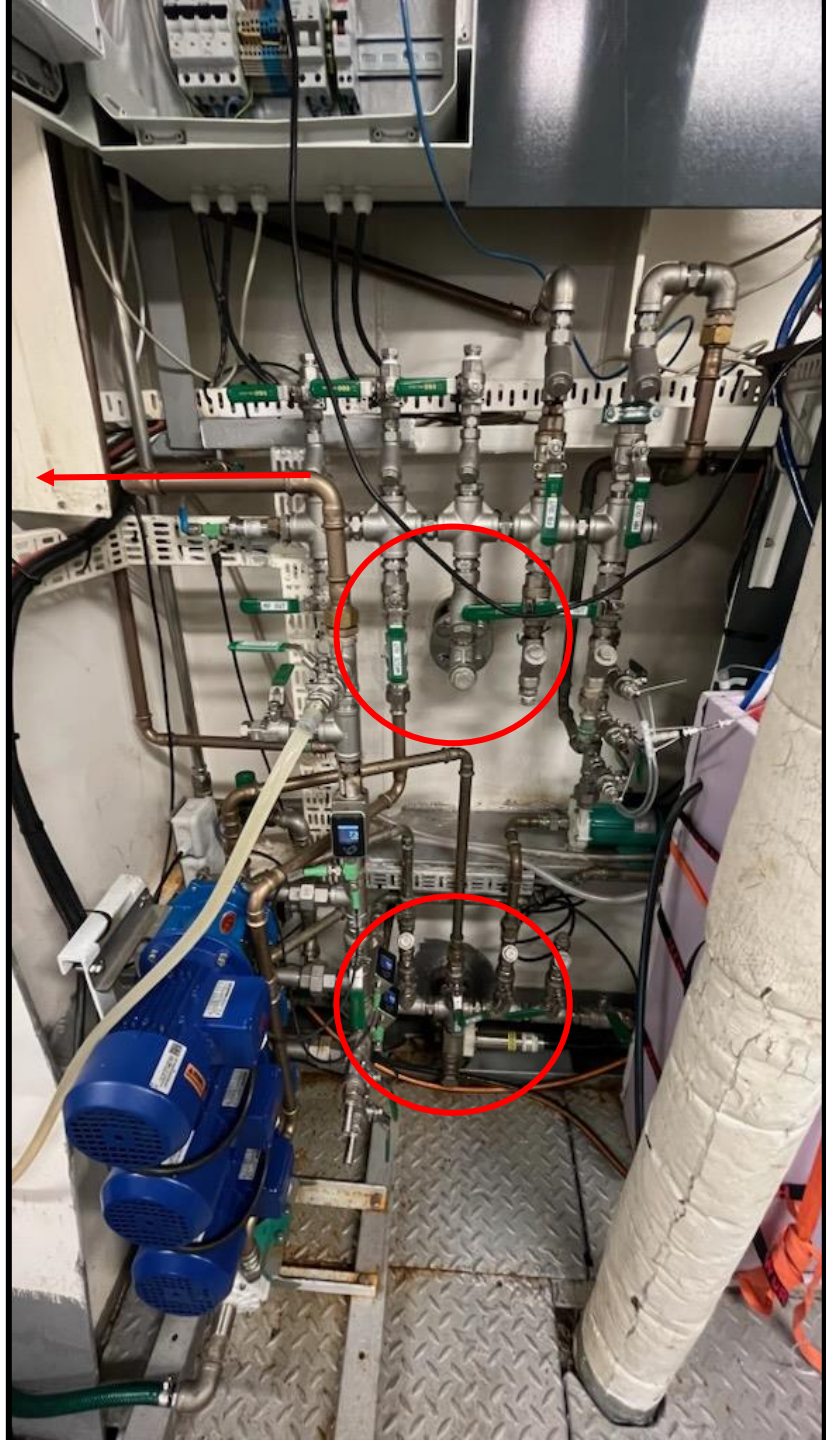
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NIVA

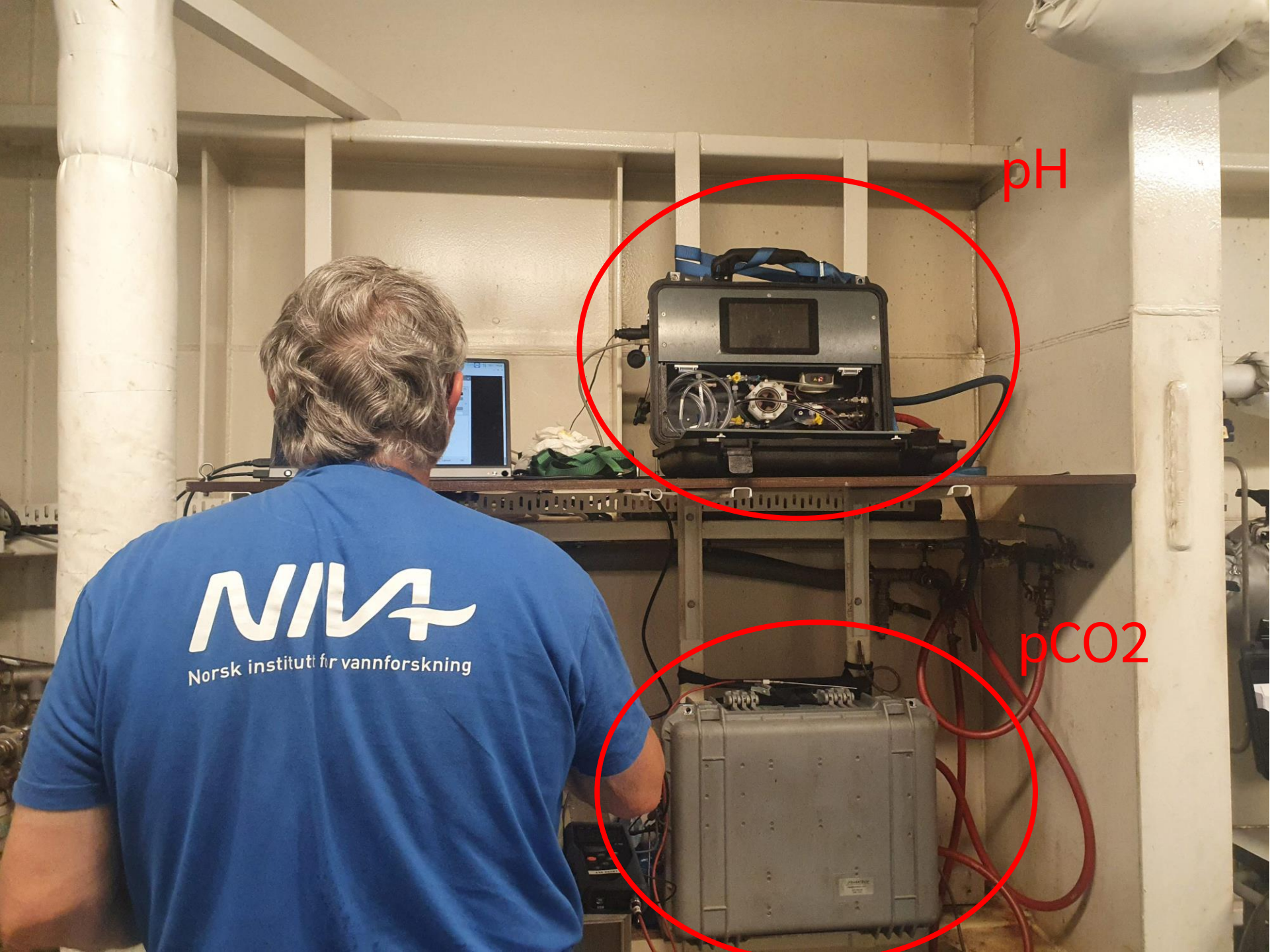




ISCO vanninnsamler

- 1 L flasker i en rosett
- Fylles ved å få et signal
 - Signalene bestemmes ved koordinater
- Fjernstyres
- Vann til lab for videre analyse
 - Næringsalter
 - Planteplankton
 - mm

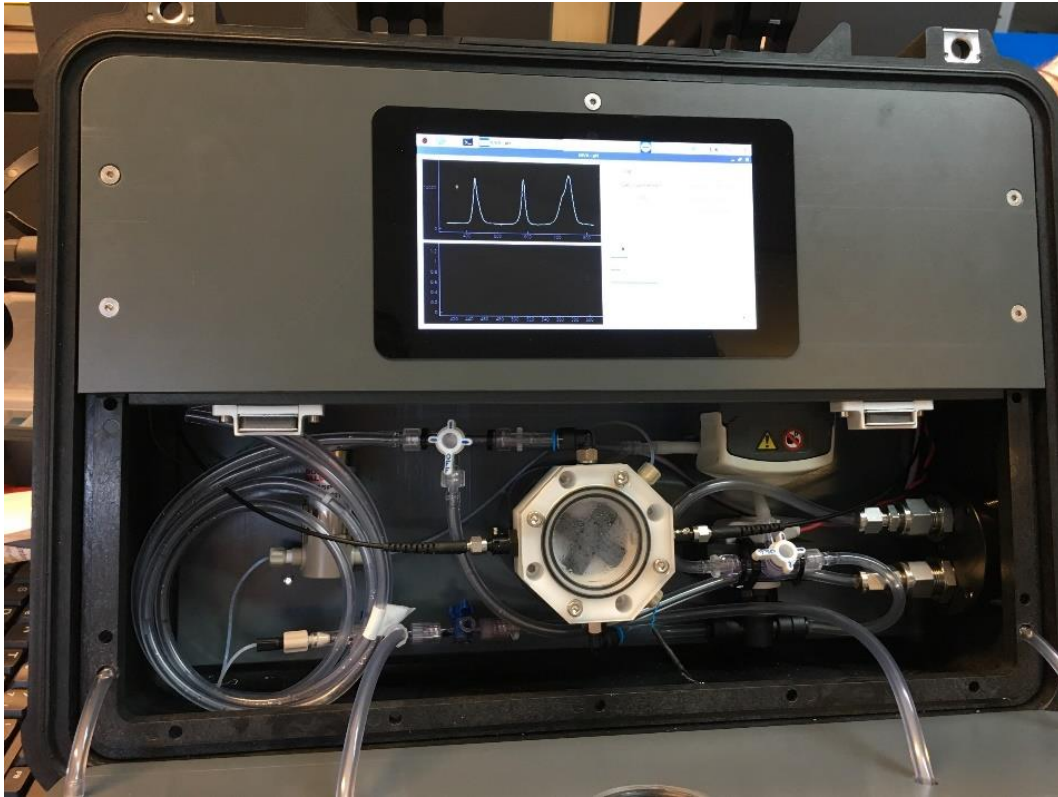




pH

pCO2

NIVA
Norsk institutt for vannforskning



NIVA spektrofotometrisk pH sensor
med m-cresol farge målt ved insitu temperatur



Franatech-NIVA pCO2 sensor
med membran og NIR detektor

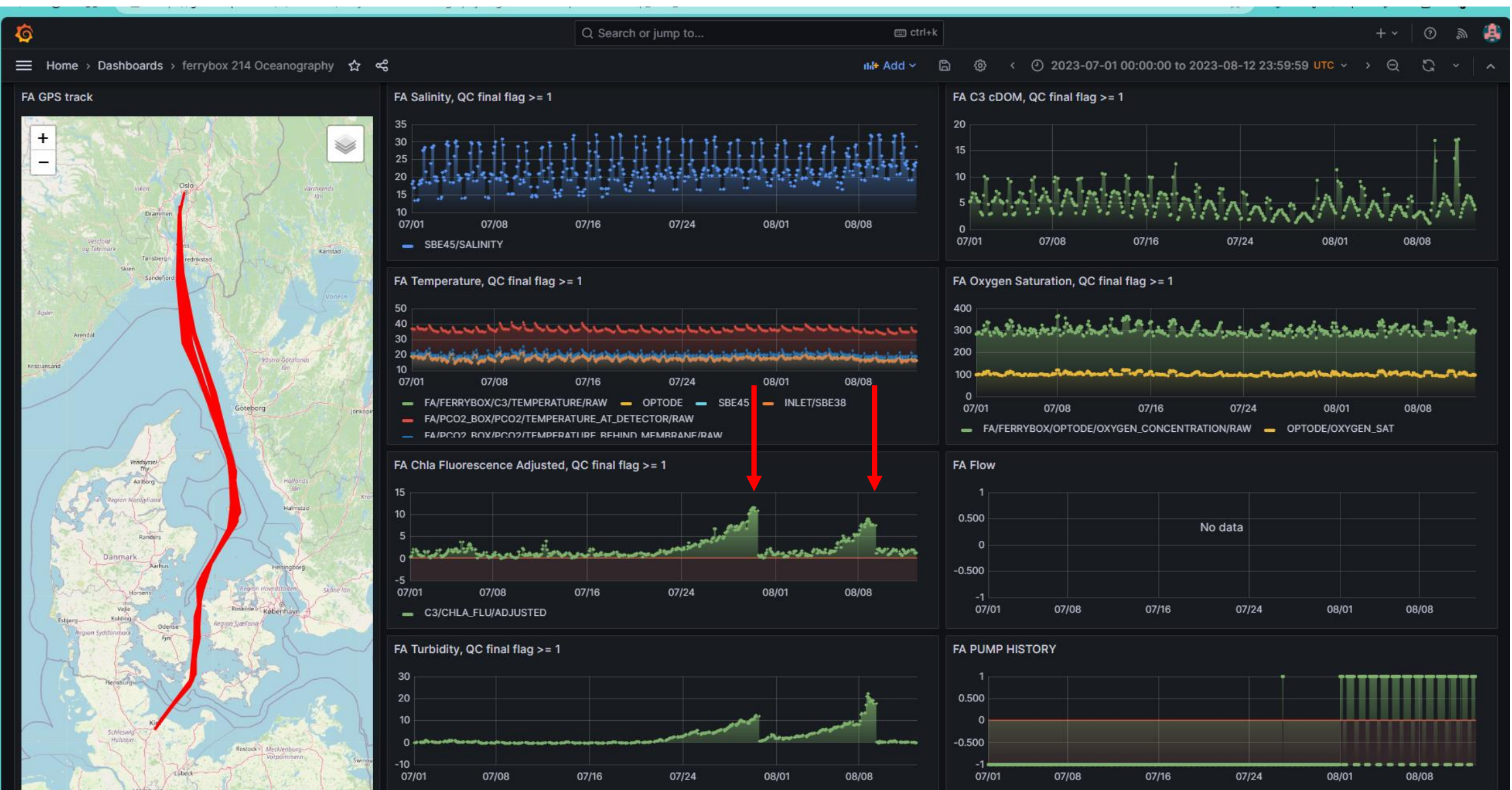
Automatisk næringssaltanalyse Systea



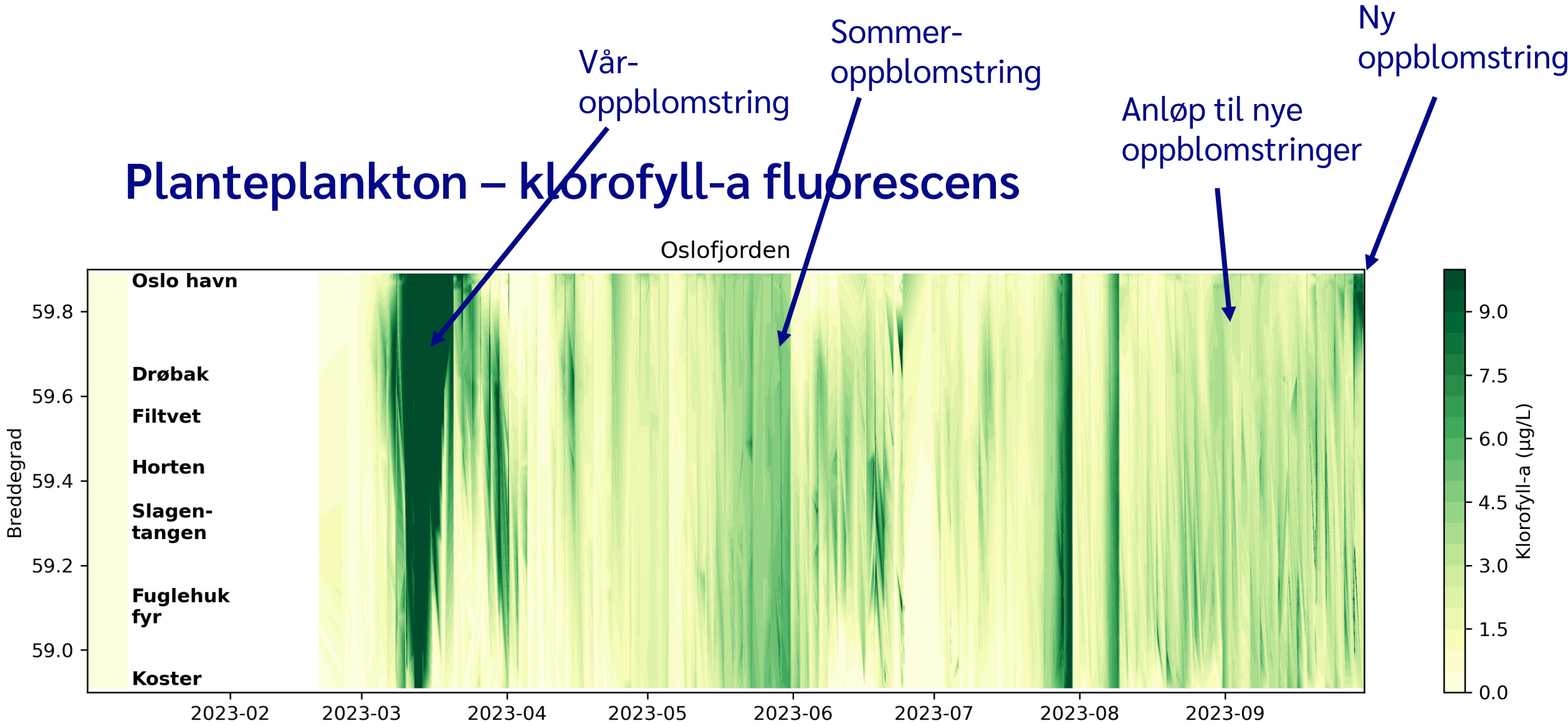
Imaging FlowCytobot McLane

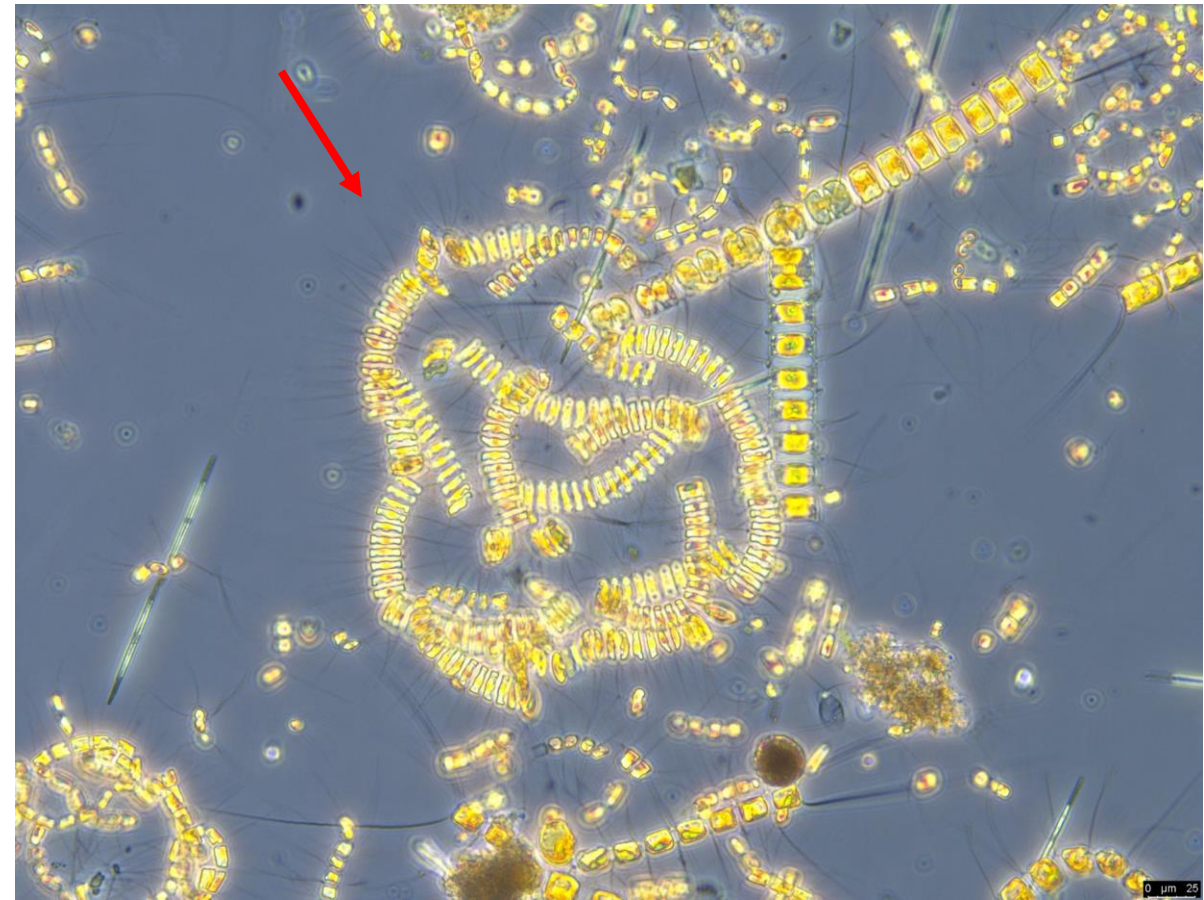
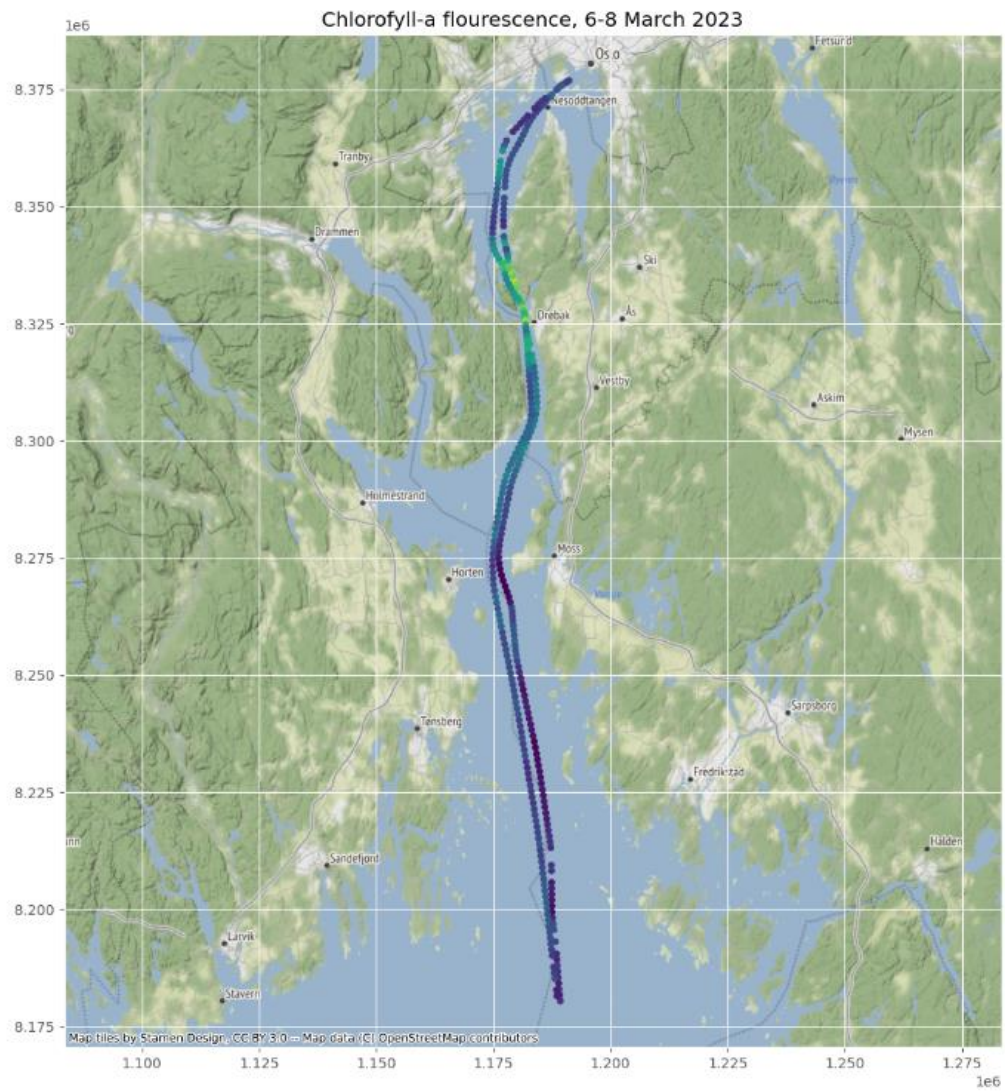




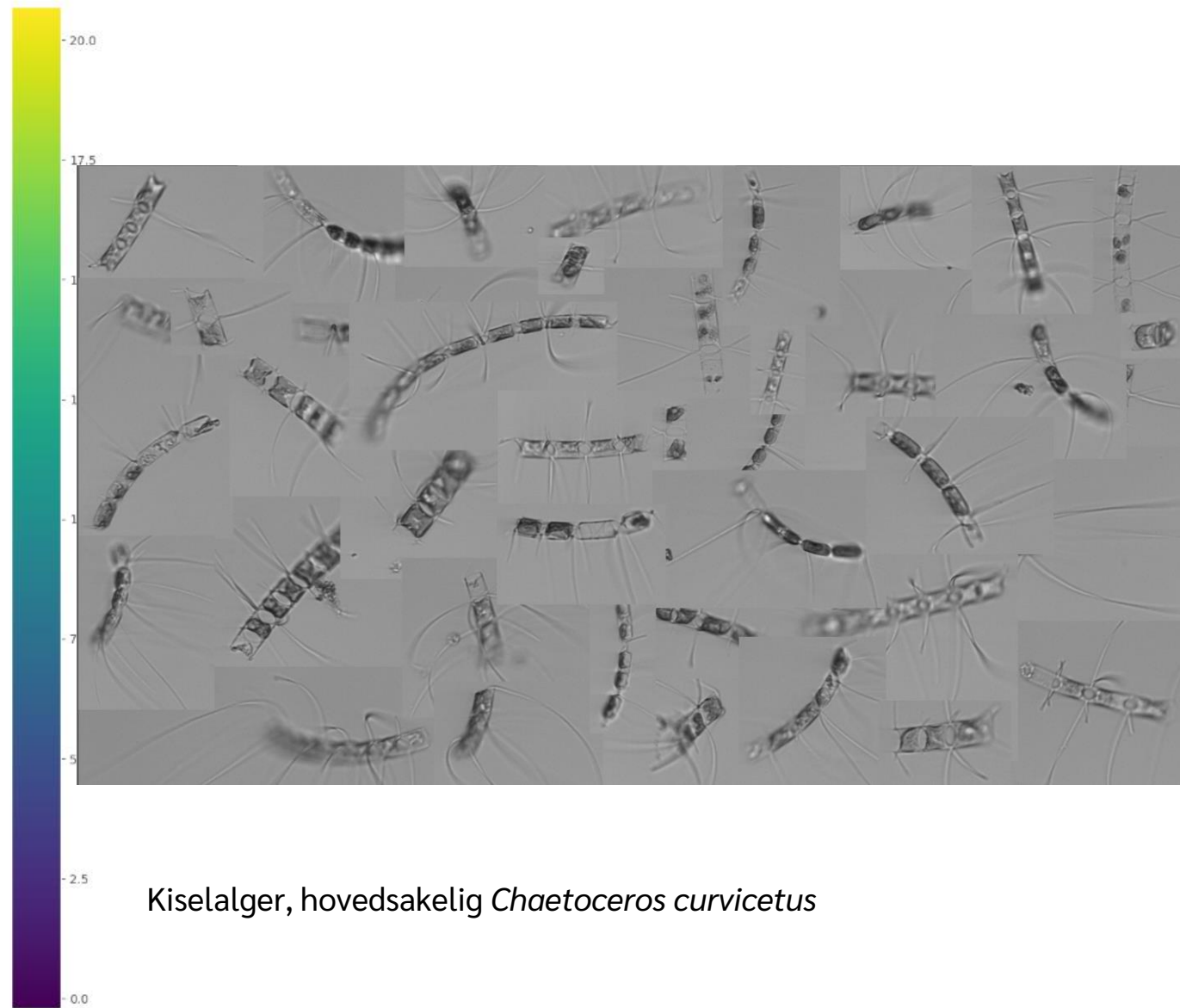
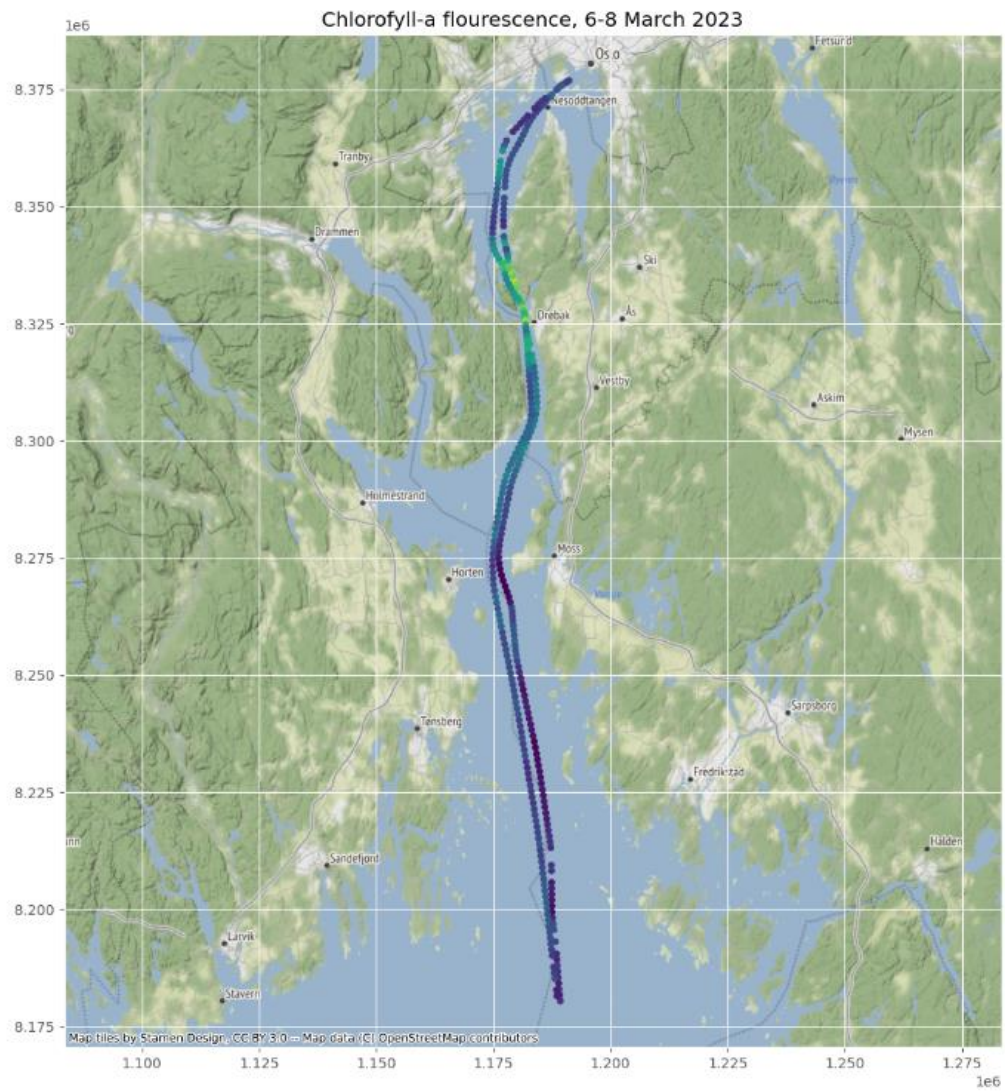


Planteplankton – klorofyll-a fluorescens





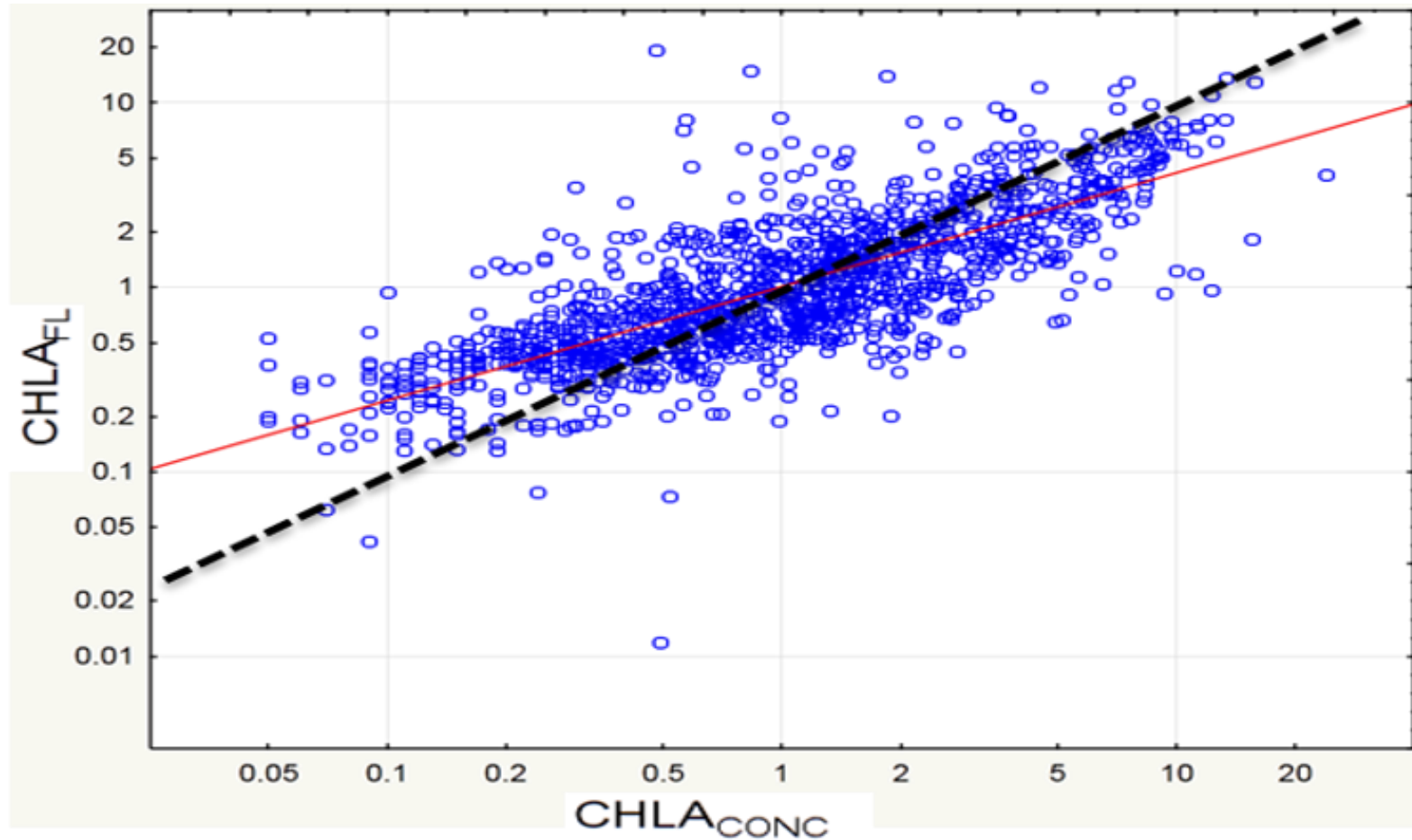
Kiselalger, hovedsakelig *Chaetoceros curvicetus*



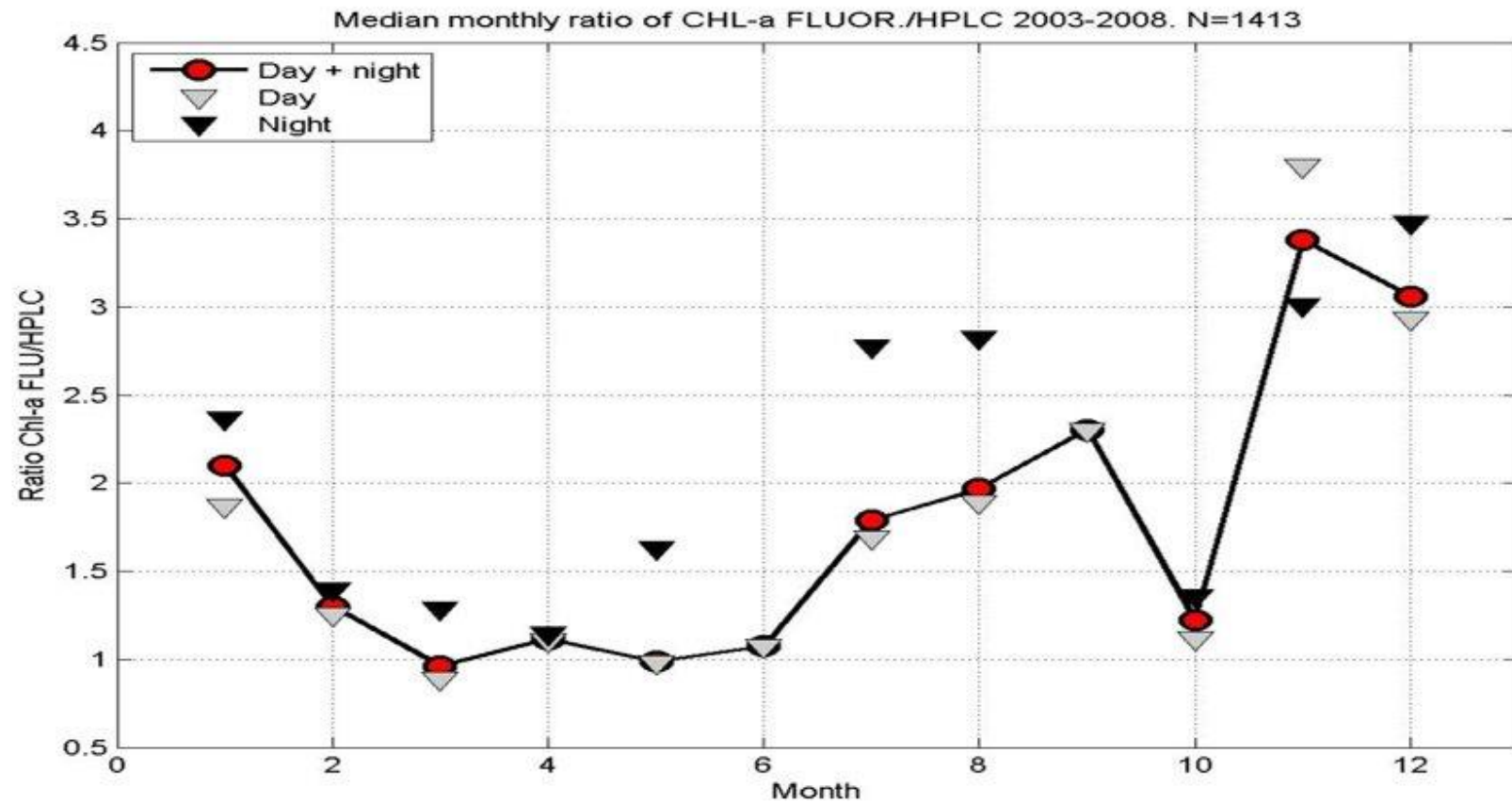
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Sensor vs vannprøve

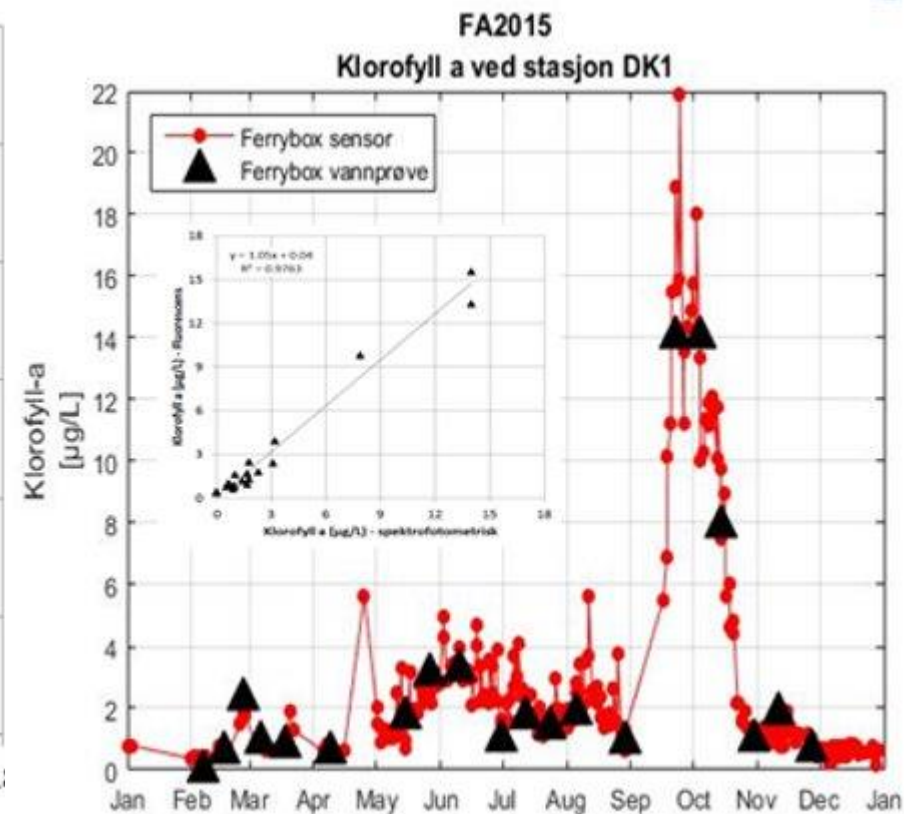
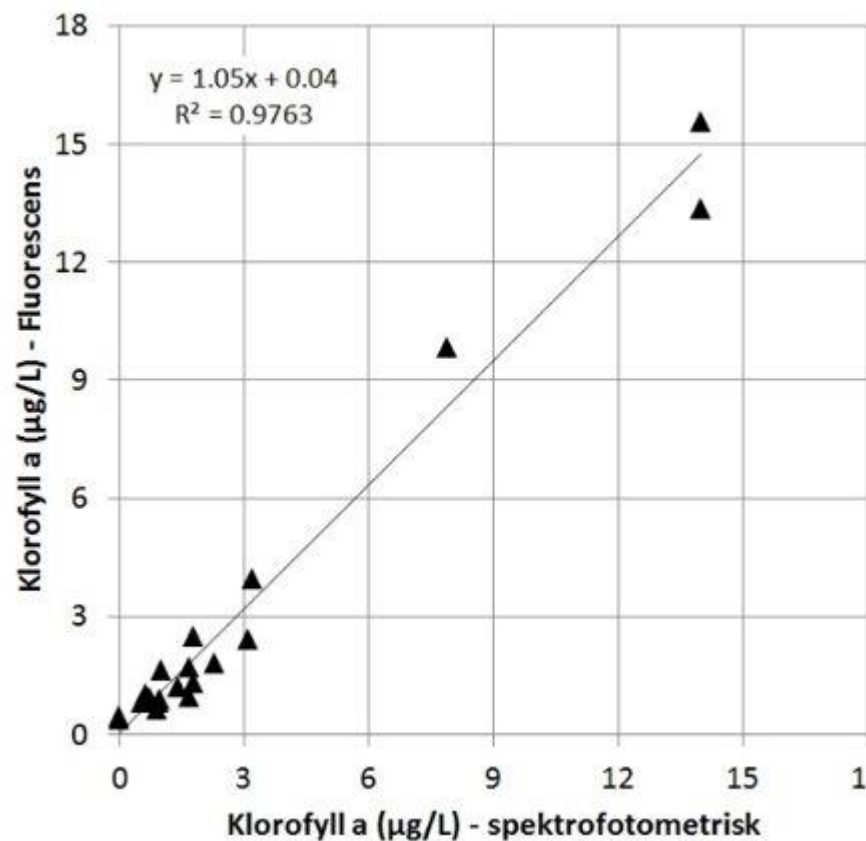
- 1400 datasett fra Skagerrak over 6 år
- Natt- og dagdata
- Svart linje er 1:1



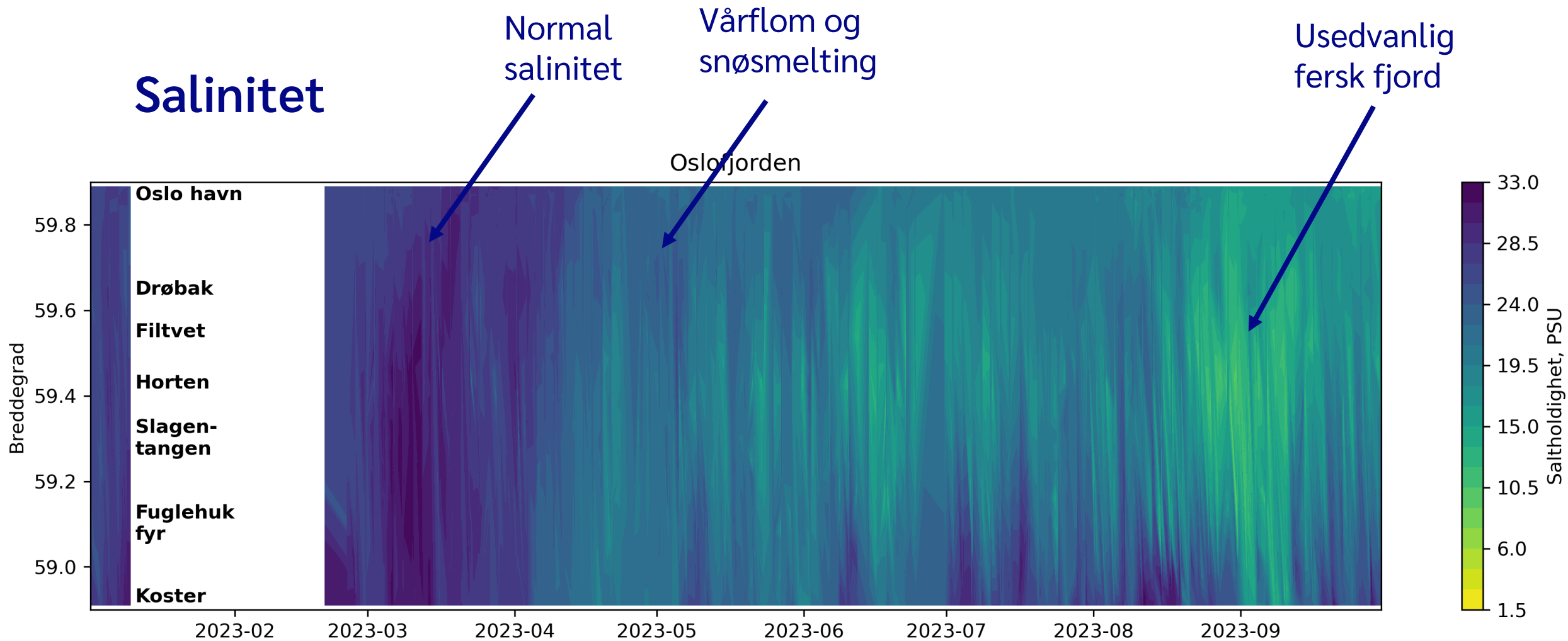
- Stor døgnvariasjon
 - Mer fluorescens ila natt



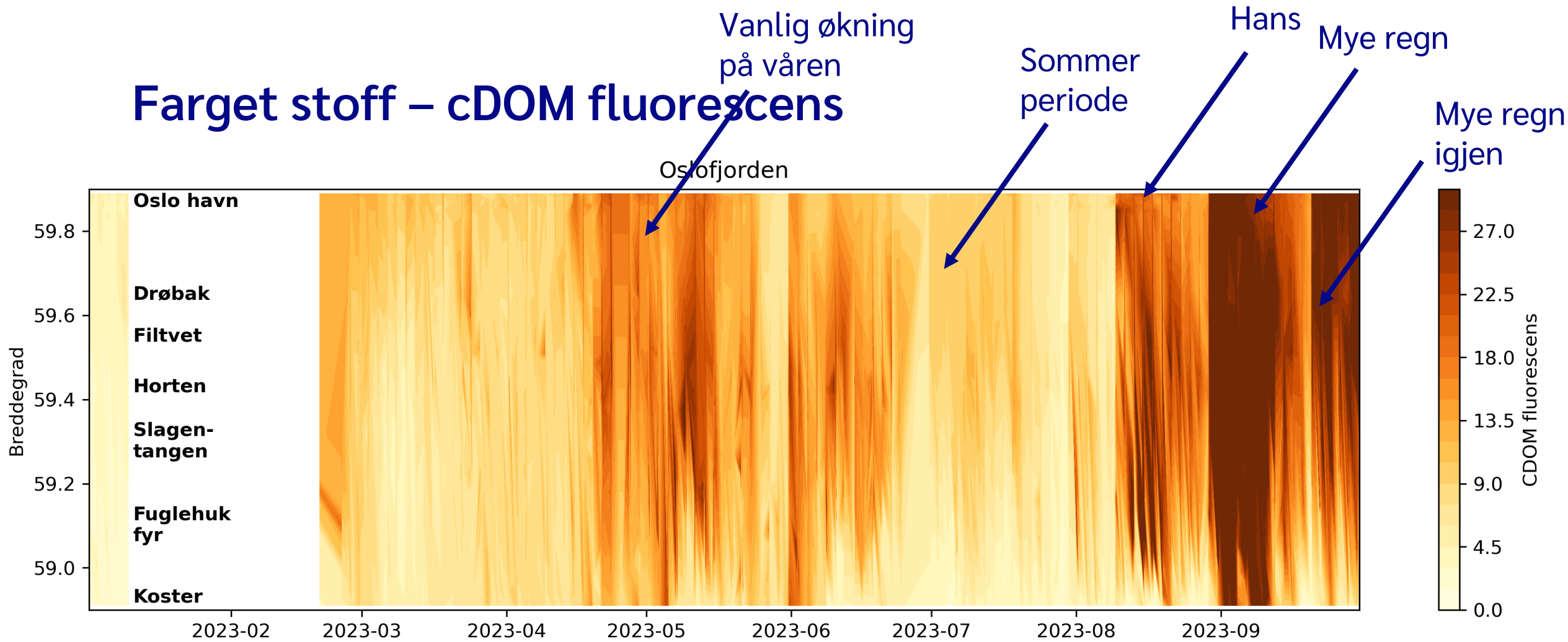
Etterkalibrering av
sensordata med
klorofyll a vannprøver



Salinitet



Farget stoff – cDOM fluorescens



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- [Ferrybox | NIVA](#)
- [News & Events | NorSOOP](#)



Fagrådet for vann- og avløpsteknisk samarbeid i indre Oslofjord



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