Norwegian Institute for Water Research (NIVA)
Activities 2016 / Plans 2017

ArcticROOS 22.-23. nov. 2016 (Longyearbyen) - Dag Hjermann

NIVA activities in 2016 (and planned for 2017)

1. INTAROS (H2020)
2. Jerico-NEXT (FP7)
3. AtlantOS (H2020)
4. Copernicus CMEMS
5. Northern land-ocean infrastructure
6. Other plans:
   - CPR/SAHFOS (Ian – passive samplers on the CPR)
   - Microplastic sampler on Norbjørn

Norwegian Institute for Water Research (NIVA) activities in Horizon 2020 INTAROS

NIVA team for INTAROS


Andrew King


Kai Sørensen


Wenche Eikrem


Bert van Bavel


Richard Bellerby


Marit Norli


Dag Hjermann

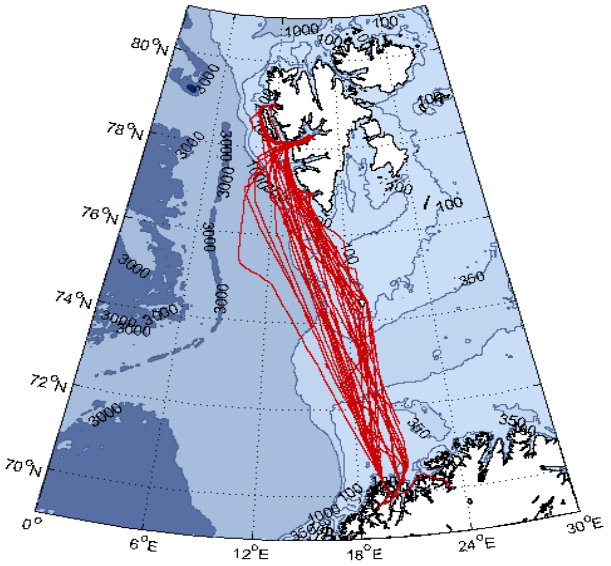

Pierre Jaccard


Phil Wallhead


Luca Nizzetto


Anna Birgitta Ledang

M/S Norbjørn FerryBox observations



30-35 roundtrips/year
between Norway and Svalbard

NIVA activities in INTAROS

-Continued operation of M/S Norbjørn in the Barents Sea opening that includes:

- -FerryBox system
- -pH/pCO_2 sensors
- -new integrated cavity absorption meter (PSICAM) for phytoplankton composition
- -new microplastics sampler

-Seasonal and regional downscaling of existing chlorophyll, nutrient, and carbonate chemistry datasets

-Deployment of passive contaminant samplers on the Svalbard moorings

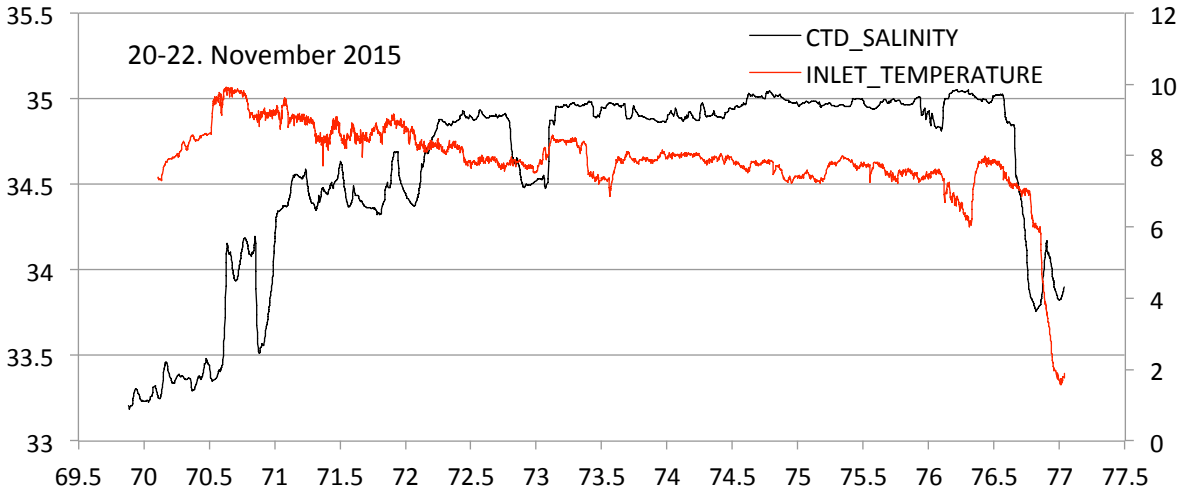
-Use of carbonate system chemistry with other partners to examine C fluxes in the Arctic Ocean and coastal regions

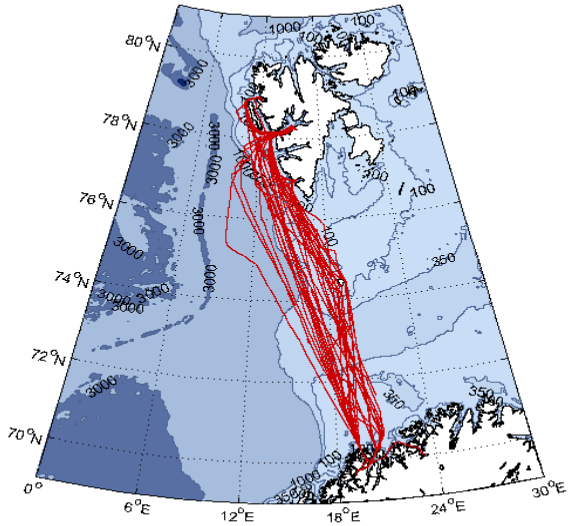
M/S Norbjørn FerryBox system with autonomous sensors for measuring biology and chemisty

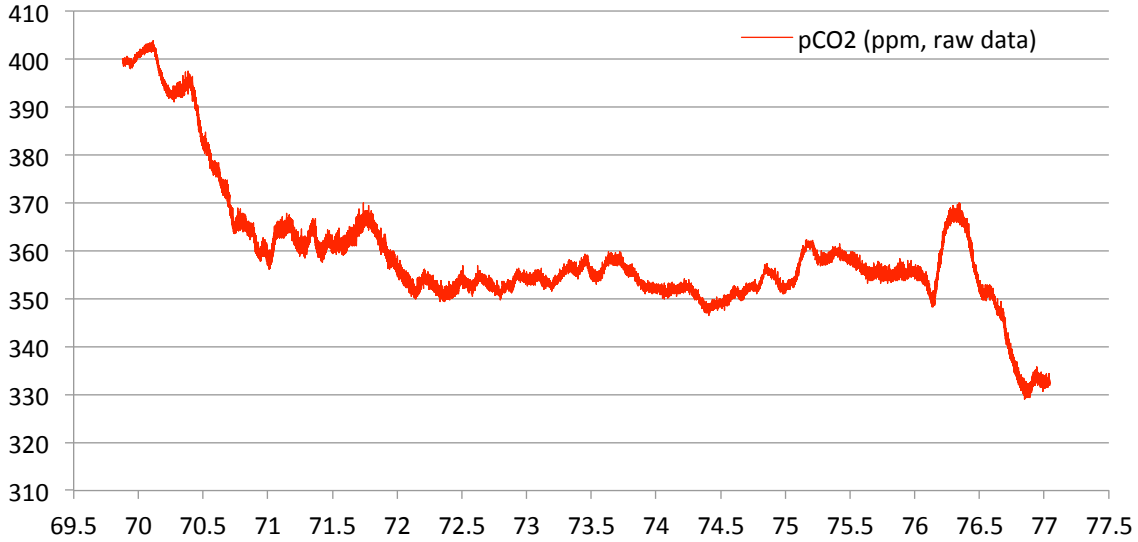
pCO_2 (top) and pH (bottom) sensors

Debubbler (left) and CTD, chl a, and turbidity sensors (right)

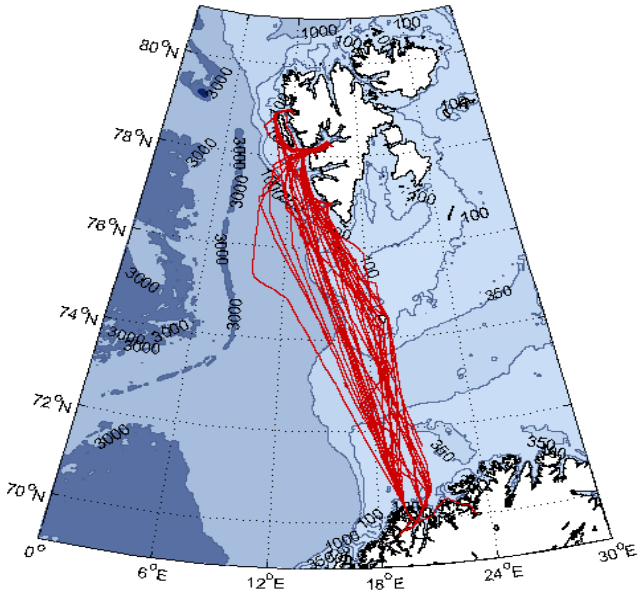
November 2015 crossing: salinity, temperature, and pCO_2

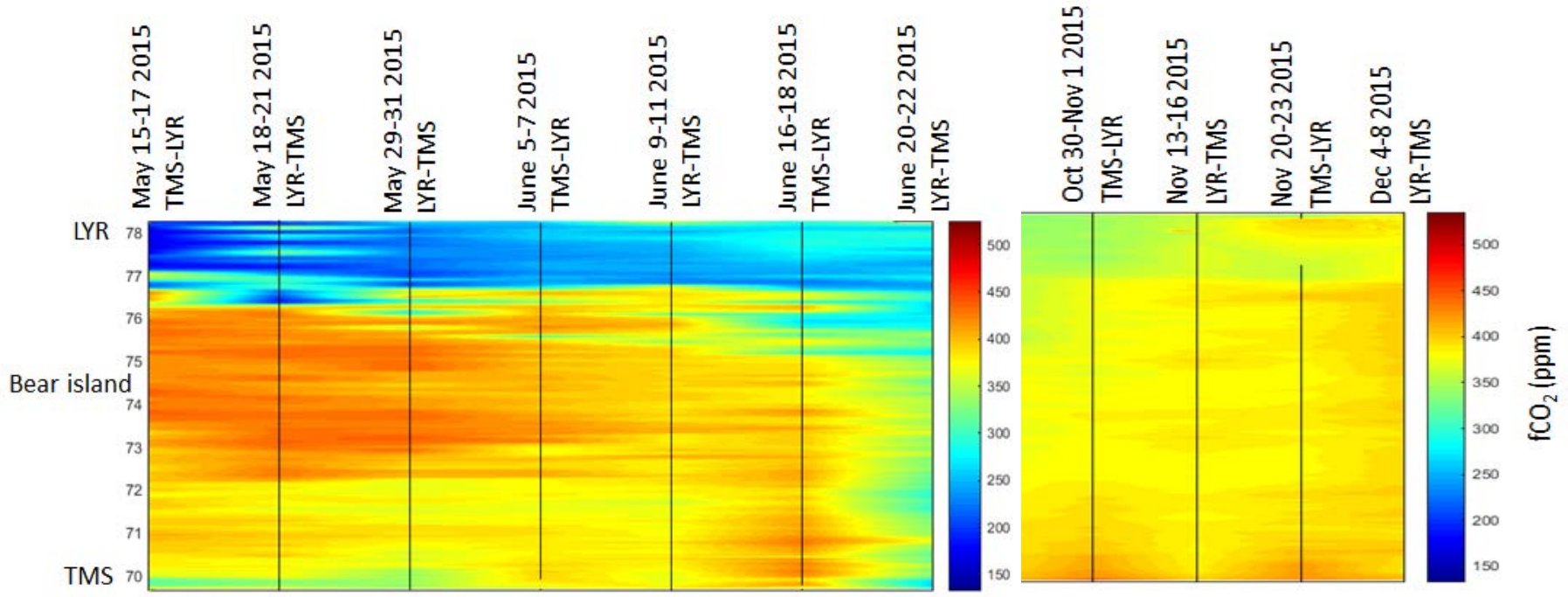


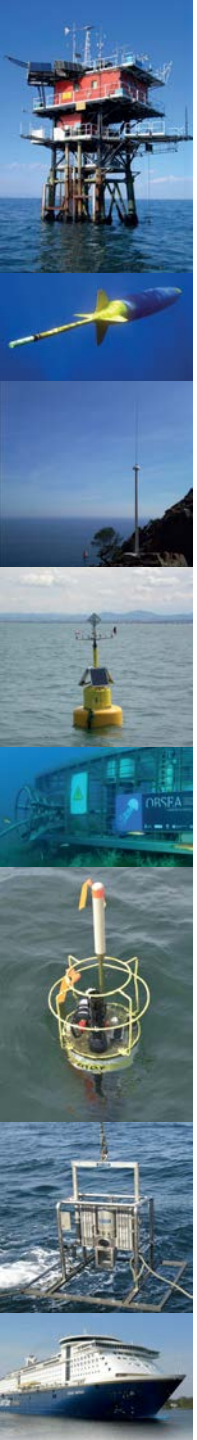




Underway pCO_2 data from May-Dec 2015 in the Barents Sea opening







NIVA leads two tasks:

Task 3.5: Combined sensors for carbonate systems
(Andrew King)

Task 4.3: Occurrence of chemical contaminants in coastal waters and biological responses
(Luca Nizzetto)

Task 3.5: Main objectives

1) Combined spectrophotometric pH and CO3 determination

2) Combined spectrophotometric pH and alkalinity determination

3) Combined electrode and spectrophotometric technology for high-accuracy, high-resolution pH determination

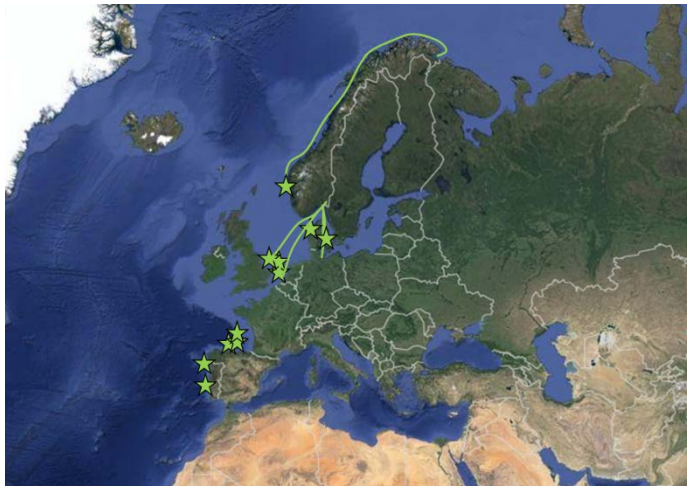
Closely coupled with FP-7 NEXOS

Task 4.3: Main objectives

1) To identify new contaminants in coastal waters
2) To describe spatial distribution of chemical contaminants
3) Exploring the drivers controlling spatial distribution
4) Exploring co-linearities between contaminant concentrations and biological responses

Secondary objectives

1) To deliver technical protocols and best practices for the monitoring of chemical pollutants
2) To optimize existing chemical sensor technology for use CI
3) To provide guidelines for the implementation of contaminant monitoring strategies using JERICO infrastructures



State of the work (November 2016)

Activity 1. 40% of the sampling activity from Ferry Boxes accomplished (Sampled area so far: North Atlantic, Barents sea)

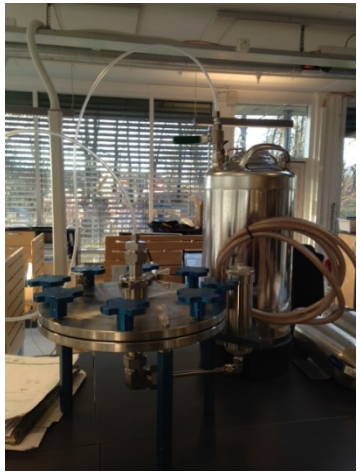
Activity 2: Sampling from fixed platforms ongoing in most of the stations. Re-collection will occur between now and March.

Activity 3: High resolution campaign combining contaminants and biomarker analysis will take place duriong the first half of December in the OsloFjord, Kattegat Skagerrak, Baltic outflow area).

Accomplished Ancillary activity

Developed a new design and handling protocol for passive sampler deployment on mooring.

Upgraded active sampling unit for high flowthrough extraction of contaminants from seawater to be used during activity 3 of JRAP3.



Task 4.3 Work in 2017

Collection of passive samplers (By March 2017)

Chemical analysis of all samples (March-June 2017)

Data analysis

DIssemination

AtlantOS

NIVA participates in two tasks in WP 8. Societal benefits:

Task 8.1 Harmful algal blooms
Task 8.5 Offshore aquaculture siting

AtlantOS task 8.1 Harmful algal blooms

Near-real-time and forecast information on Harmful algal blooms (HAB)

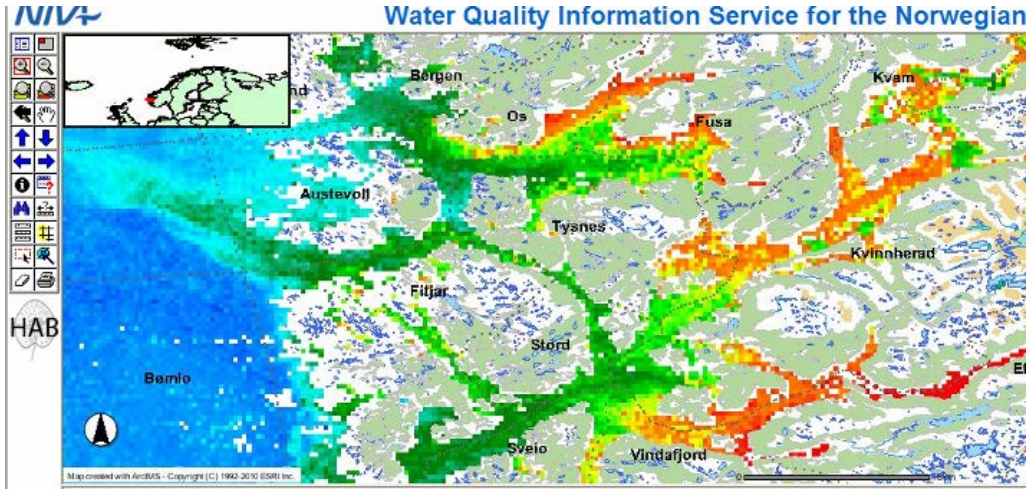
- Decision support system for the industry
- Hydrographic and biogeochemical data -> biophysical models

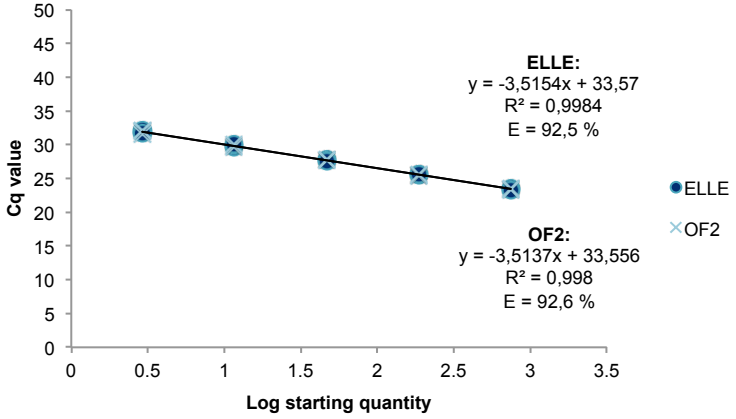
Remote sensing data

- MERIS -> Sentinel 3 (and 2?)

qPCR

- species-specific probes that recognizes/quantifies HAB using DNA





AtlantOS task 8.1 Offshore aquaculture siting

Essential ocean variables:

- Bathymetry
- Temperature
- Salinity
- Wave height
  - Max for dimentioning of structures, moorrings etc
  - Frequency of periods with wave height over a certain level where farm operations are difficult
- Current velocity
  - For dimentioning of structures, morrings etc
  - For animal welfare
- Wind
- Chl a
- Turbidity
- HABs (see task 1)

Ocean Farming er et steg videre i byggingen av offshore havmerden. Foto: Salmar Ocean Farming

Prislappen på denne giganten vil bære mellom 600-700 millioner per skip. Nordlaks har søkt om å få bygge tre stykker.
FOTO: NSK SHIP DESIGN

AtlantOS task 8.5 Offshore aquaculture siting

Objective: In order to establish possible future sites for offshore aquaculture production we intend to gather relevant wave, current velocity and water column structure measurements from the coasts of Ireland, Norway and Spain and use these data to validate site assessment models of potential new offshore aquaculture sites This will result in a generic tool based on in-situ observations and model output over a hindcast period, coupled to existing site decision tools

D8.2 Aquaculture site selection Report**:** Report on potential, selected sites for offshore aquaculture along the Spanish, Norwegian and Irish Atlantic coasts. **PM24**

Objective: We will develop a weather window tool to give developers real-time access to observations and model forecasts of seas state to plan day to day operations

D8.8 Aquaculture operation Bulletin**:** Weather window nowcast/forecast Bulletin tool for offshore aquaculture operators. **PM36**

Objective: The AtlantOS fitness for purpose for the aquaculture economy will be assessed

D8.13 Report on AtlantOS fitness for aquaculture economy**:** Assessment of the observing system fitness for purpose for aquaculture. **PM45**

Copernicus INSTAC WP 3.2

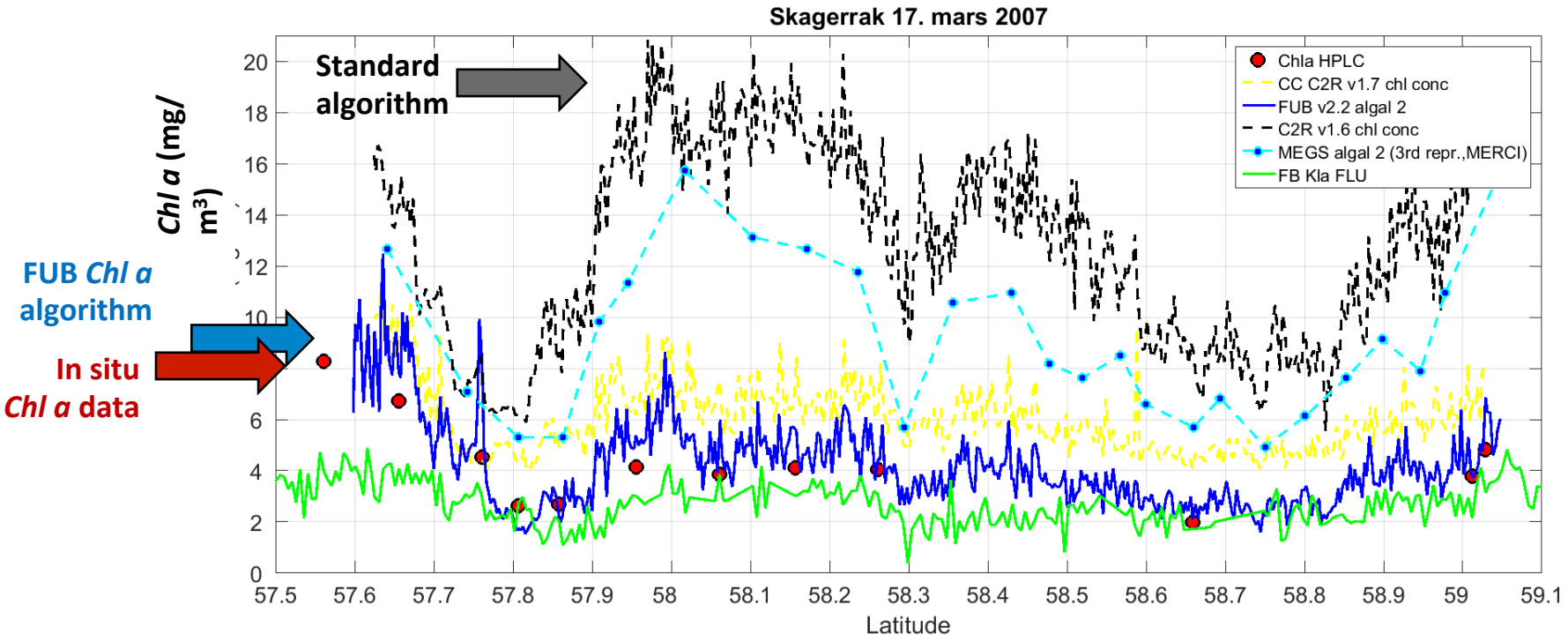
- NIVA (Pierre Jaccard, Dag Hjermann, Anna Birgitta Ledang)
- SYKE (Seppo Kaitala)
- ACRI (Antoine Mangin)

- Focus on biogeochemical (BGC) data: **Chl a**, oxygen, turbidity
    - Review existing historical BGC-data (e.g., codes
    - Cooperation with OCTAC (Ocean Colour TAC), i.e. Antoine
    - Outline delayed mode QC-method

- No geographic limitations

Copernicus INSTAC WP 3.2

Match-ups between remote sensing estimates (using different algorithms) and in-situ data



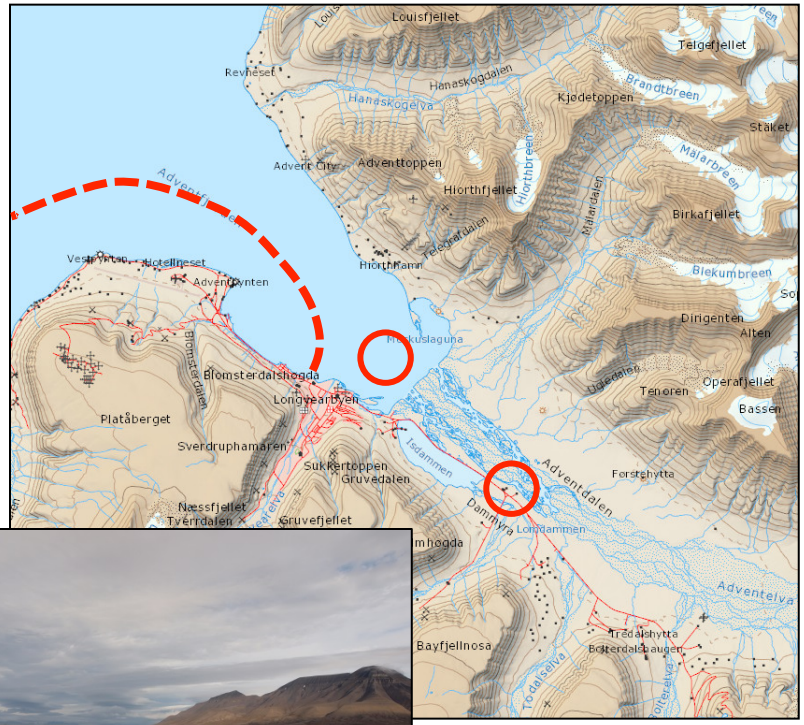
Development of match-up tool as part of
http://seasiderendezvous.fr/

InfraNord

Infrastructure to study land-ocean interactions in northern ecosystems

- sensors in river + buoy in fjord + existing Ferrybox installations
- Temp, condictivity , turbidity, CDOM, pH

Adventselv - Adventsfjord



Målselv - Malangen