

Project information

Project title

Establishing the Current status of ocean acidification in the Norwegian Arctic - OA-state

Year

2013/2014

Project leader

Agneta Fransson, NPI

Participants

Project leaders:

- Agneta Fransson (NPI) and Richard Bellerby (NIVA)

Participants:

- Melissa Chierici (IMR), Knut Yngve Børsheim (IMR)
- Mats Granskog (NPI), Paul Dodd (NPI), Arild Sundfjord (NPI),
- Vladimir Pavlov (NPI)
- Evgeniy Yakushev (NIVA) and Kai Sørensen (NIVA)
- Marit Norli (NIVA) and Emanuele Reggiani (NIVA)

Flagship

Ocean acidification, Theme: Understanding the physical and chemical mechanisms controlling ocean acidification in Arctic waters - past, present and future

Funding Source

Fram Centre, MFCA

For the Management

Large and successful sampling campaign in several parts of the Arctic, resulting in a unique data set covering ocean acidification data and tracers for studies on the effect of freshwater on OA state. Third year of time series in Arctic for OA studies in the water column during Fram Strait annual cruises, MOSJ cruises and along A-TWAIN mooring section continued. Two years of carbonate system data in the Fram Strait shows variability

in pH and CaCO₃ (aragonite) saturation between the two years with more river runoff and Pacific water of the Arctic outflow (to the west) and less sea-ice melt in 2012 than in 2011. Higher content of inorganic carbon in the inflow of Atlantic water in 2012. These studies direct to large interannual variability which motivates further field sampling to establish and continue the first OA time series in the Arctic.

The clear seasonal changes in the seawater carbonate chemistry from the Tromsø-Svalbard transect emphasizes the need for long time-series in order to separate a climate trend from the seasonal variation.

Investigations of OA state in Svalbard fjords in winter and summer and the relation to abundance and shell structure of the aragonite forming pteropod *L. helicina* motivate further investigations.

Communicated Results

- Lead author for AMAP AOA (Richard Bellerby) and contributing authors (Agneta Fransson, Melissa Chierici) for the AMAP report for Arctic Ocean Acidification (www.amap.no).

Workshops

- 2nd International workshop to develop a Global Network for Ocean Acidification Observations – GOA-ON. St. Andrews, Scotland, UK, 23-26 July 2013, (M. Chierici, and A. Fransson invited for expertise). http://www.pmel.noaa.gov/co2/GOA_ON/2013/
- OA Flagship 1st science workshop on scientific results from OA Flagship, effects on organisms and socioeconomic impact, Fram Centre, Tromsø, 21-22 October, 2013, Fram Centre
- 9th International CO₂ Conference (ICDC9), Beijing, China, 3-7th June, 2013. <http://icdc9.lasg.ac.cn/dct/page/1>
- ICES-OSPAR Study Group of Ocean Acidification (M.Chierici), 7to 10th Oct, 2013, Copenhagen
- M. Chierici. 4x45 minute Lectures on "Ocean Acidification and Climate change" in the course "Arctic Marine Pollution" the University of Tromsø- the Arctic university.

Public presentations

- Participated in Polar Foundation, Arctic Futures Symposium, Brussels, Belgium 16-18 October 2013, A. Fransson oral presentation.
- Chierici, M., APECS webinar series January 2013
- Børsheim, K.Y and M. Chierici, "Skjellene dør på USAs vestkyst", BT?, datum?, Chronicle in Bergens Tidende

Data base

- Provide data for the data bases SOCAT, GLODAP and MOSJ, NMDC

Budget in accordance to results

The project funding has been fundamental to implement this project. It supports the hiring of A. Fransson (project post doc and PI), and supports the high costs associated with Arctic field work and extensive sample analysis required in the work. It has also supported to acquire state-of-the-art instrument that are needed for measurements outside the time in the field. However, the funds have to be supplemented by significant external and in-kind contributions (IMR, NPI, NIVA) for successfulness.

Fram Centre funding boosted joint effort to continue the 1st Arctic time serie sections north of Svalbard with other Flagship and between institutes/universities.

Fram Centre funds have supported:

Salary to A. Fransson (Project post doc – 6 months)

Field work and travel

Chemical analyses

Field equipment (partly)

Supported attendance to conference and workshops and advisory committees.