

Project information

Project title

COPOL II - Importance of primary and secondary sources for POP-concentrations in Kongsfjorden

Year

2012/2013

Project leader

Anita Evenset, ApN

Participants

Project leader:

- Anita Evenset, Akvaplan-niva, Geir Wing Gabrielsen, NP

Fram Centre partners:

- Eldbjørg Heimstad, Nickolas Warner, Dorte Herzke, Sabine Eckhard, Knut Breivik, NILU
- Katrine Borgå, Anders Ruus, Jostein Starrfelt, NIVA
- Guttorm Christensen, Akvaplan-niva

International Partners:

- Aaron Fisk, Ken G. Drouillard, University of Waterloo, Canada
- Jon Arnot, University of Toronto, Scarborough, Canada
- Alexei Konoplev, Typhoon, Russia

Flagship

Hazardous substances, Theme: Animal health and ecosystem

Funding Source

Fram Centre

Summary of Results

As international regulations reduce emissions from primary POP-sources, secondary sources are expected to become more important in the years to come, especially in the Arctic region. Increase in temperature would promote greater volatilization of POPs from soil and surface water. However, increased temperatures will also promote melting of snow and ice, which have been shown to be storage mediums for POPs and increase contaminant loading in surface water through melt water introduction. Through the COPOL-project an extensive database on levels of conventional Persistent Organic Pollutants (POPs) in sediment and biota from Kongsfjorden has been established. However, the project has also identified some gaps of knowledge and some processes that should be studied more thoroughly. The balance between deposition from primary POP-sources and reemission from secondary sources in one subject that deserves further attention. Thus, the main goal of the project described here is to determine the relative importance of primary and secondary sources for POPs in Kongsfjorden.

The funding from the Fram Centre was used to obtain samples that can be used to assess the importance of secondary POP sources to Kongsfjorden.

Methods

: In order to investigate the importance of secondary sources more data concerning concentrations of POPs in seawater and runoff (from glaciers, rivers and land) was needed. Therefore passive samplers (low density polyethylene (LPDE)) were deployed on 4 marine stations in Kongsfjorden in June 2012. These were deployed in areas that are affected by runoff from glaciers or only by snow-melt. In addition, passive samplers were installed in air in the same region as the water samplers. At the same time as the passive samplers were deployed large volume water samples were collected at the marine stations and in 4 rivers entering Kongsfjorden (Figure 1). In one of the rivers a passive sampler was deployed. All passive samples were retrieved in mid September. Both passive samplers and high volume water samples will be analysed for POPs (2013). The next step will be to use these data in source modelling.



Figure 1. High volume water sampling in a river entering Kongsfjorden.

Published Results/Planned Publications

No publications are ready yet, but the results will be published in international peer reviewed journals (e.g. Environmental Science & Technology, Environmental Pollution).

Abstract submitted to Setac Europe, Berlin 20 – 24. May 2012. Influence of climate change on contaminant distribution and effects in Arctic marine food webs - Summary of the IPY protocol COPOL.

Communicated Results

Oral presentation at Setac Europe, Berlin (see above).

Interdisciplinary Cooperation

For a successful result the project depends on good collaboration between ecologists, ecotoxicologists, chemists and modellers. Researchers within all these disciplines are involved in the project.

Budget in accordance to results

The funding from the Fram Centre was used to collect samples in Kongsfjorden. This has been a very good start for a project that look at the relative importance of primary and secondary POP-sources. We have also submitted a proposal for a large project to the NRC.

Could results from the project be subject for any commercial utilization

No

Conclusions

The project is a follow-up of research themes that has been identified as highly relevant through the IPY-project COPOL. Thus, the funding from the Fram Centre has allowed us to continue our research and to apply for external funding for the coming years.