

Climate effects on planktonic food quality and trophic transfer in the Arctic marginal ice zone

CLEOPATRA II is a continuation of the IPY-project CLEOPATRA (2007-2010) where we studied the role of light for timing, quantity and quality of primary and secondary production in the Arctic under decreasing sea ice cover

About the project:

In CLEOPATRA II we study Arctic zooplankton and their capability to adapt their life history strategies and physiology to a changing Arctic. We focus on *Calanus glacialis*, the key herbivore in Arctic shelf seas, and combine field and laboratory investigations with model development to ultimately arrive at an improved understanding of key Arctic zooplankton adaptations to a warmer climate with less sea ice. We particularly focus on winter and early spring ecology which at present is poorly known.



Objective:

To obtain a better knowledge of Arctic zooplankton physiology and life history strategies to predict the degree of match/mismatch of key biological processes at the base of the Arctic marine food web in a changing Arctic

CLEOPATRA II consists of 3 parts:

- Field investigations** to document the full annual cycle of *Calanus glacialis* and to obtain data that allow testing of predictions on diapause duration, critical size of lipid storage, and reproductive success and population abundance.
- Laboratory studies** to obtain fundamental measurements of metabolism and diapause-flexibility of *C. glacialis*, including testing of predictions on the temperature- and food-dependence of these traits.
- Modelling work** to model the life history of *C. glacialis* in order to predict optimal strategies for specified environments and thereby predict how *C. glacialis* and similar species may respond to climate change in the Arctic.



We sample frequently throughout the year to document the full annual cycle and metabolism of *C. glacialis* in different seasons and climate regimes (ice vs. ice free environments).

CLEOPATRA II is led by UNIS (PI Janne E. Søreide)

in close co-operation with the Norwegian Polar Institute (NPI) and the Alfred Wegener Institute (AWI). Other associated partners are Akvaplan-niva (APN), the University of Tromsø (UoT), Polish Academy of Sciences (IOPAS), the Scottish Association for Marine Science (SAMS), Laboratoire des Sciences de l'Environnement Marin (LEMAR) and the University of Alaska (UAF).

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