# Advancing past environment reconstruction for the last 8,000 years using planktic fossils in the Arctic and Subarctic region

The Arctic is experiencing a greater-than-average response to human-induced climate change. Arctic marine ecosystems react quickly to a changing environment and this ongoing climate change will likely affect the Arctic marine carbon cycle, which acts as a $CO_2$-sink and -supplier and which is controlled by marine bioproductivity. Predicting future changes in marine $CO_2$-in- and -output is important for our society. A possible approach to predict these changes is by investigating past changes in bioproductivity and its causes like temperature, salinity and sea-ice cover.

For the reconstruction of past environments, sediment cores are often the choice of study. Unfortunately, studying individual components of past environments is difficult since most signals like e.g. temperature and sea-ice cover overlay each other.

In my study I make use of the observation that the composition of Dinoflagellate (Fig.1) communities reflects the environment under which they grew and that this information is transferred into the sediment by their fossil cysts. My aim is to advance environmental reconstructions for the Arctic and Subarctic Baffin Bay region using Dinoflagellates. By using different mathemathical algorithms and their rigorous statistical analysis I show which environmental conditions can significantly be reconstructed in this region for the last 8,000 years.

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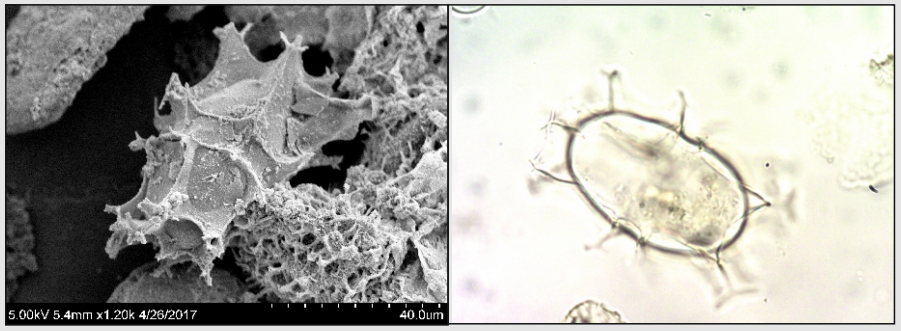


Fig.1: A scanning electron microscope picture and an inverted light microscope picture of the organic-walled Dinoflagellate cyst *Spiniferites elongatus* from a sediment core in north-east Baffin Bay (left-to-right). A Dinoflagellate is a unicellular planktic microorganism which counts as primary producer.