

Title: Green Edge

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The culture, health and economic capacity of northern communities are closely linked to marine resources supported by the phytoplankton spring bloom (PSB). Furthermore, timing, duration and magnitude of the PSB are strongly related to ice cover conditions. The warming climate has induced substantial changes to the sea ice cover in recent decades, including decreases in ice extent and thickness, and an earlier melt. Through control on the under-ice light environment, these changes will likely increase phytoplankton production under the ice cover, extending the period and thus, magnitude of production. Already, the decrease in the summer ice extent has lead to a 20% increase in pan-Arctic phytoplankton production. This project aims to improve our understanding of the processes that control the Arctic PSB as it expands northward and to determine its fate in the food web by investigating its related carbon fluxes.

Our plan is to conduct scientific research near Qikiqtarjuaq, this spring (2015) and next spring (2016). In 2014, Eric Brossier moored his sailing ship, Vagabond, close by Qikiqtarjuaq and lived there with his family during the winter and spring. He developed good relationships with the community and explored the surrounding region for the ice related work we plan to undertake with our project. Our team gathers researchers specialized in the study of sea ice and seawater ecosystems. Our goal is to undertake research in a site just over 20 km from Qikiqtarjuaq (see map below), for a period of four months (mid-March to mid-July). During this time, we hope to set-up one to two heated tents at a temporary on-ice sampling station to support our data collection. Sampling will involve installing automated electronic sensors on the ice that will monitor the weather and ocean properties and currents. Regular on ice sampling will involve the use of ice corers, augers, and ocean samplers. While at the camp, we will operate one to two generators for power supply and drip diesel furnaces for heating. The plan is to live in Qikiqtarjuaq and conduct laboratory work in a tent set up in the community. Our team will consist of two to four people from mid-March until mid-May, and ten to twelve people from mid-May until Mid-July. We will travel by snowmobile to the sampling site every 2-3 days. We will follow the same route to our on-ice site each sampling day and will avoid all hunting and fishing areas identified by Qikiqtarjuaq community members and the Hunters and Trappers Organization (HTO).

The Green Edge project will contribute to the major societal challenge of efficient resource management and adaptation to climate change, through a better understanding and anticipation of environmental change. It will address significant knowledge gaps in Arctic marine biogeochemical cycles and the food web, and their linkages with local human populations. The results/findings will be communicated to the Qikiqtarjuaq council, HTO, the Inuksuit School and interested community members. These organizations/groups will be asked what is the preferred form of communication (e.g., in-person seminar, document, poster). It is also planned to produce publications in peer-reviewed scientific journals.



Sea ice concentration : July 1st 2014



Sea ice concentration : June 12th 2014



Sea ice concentration : May 1st 2014

