

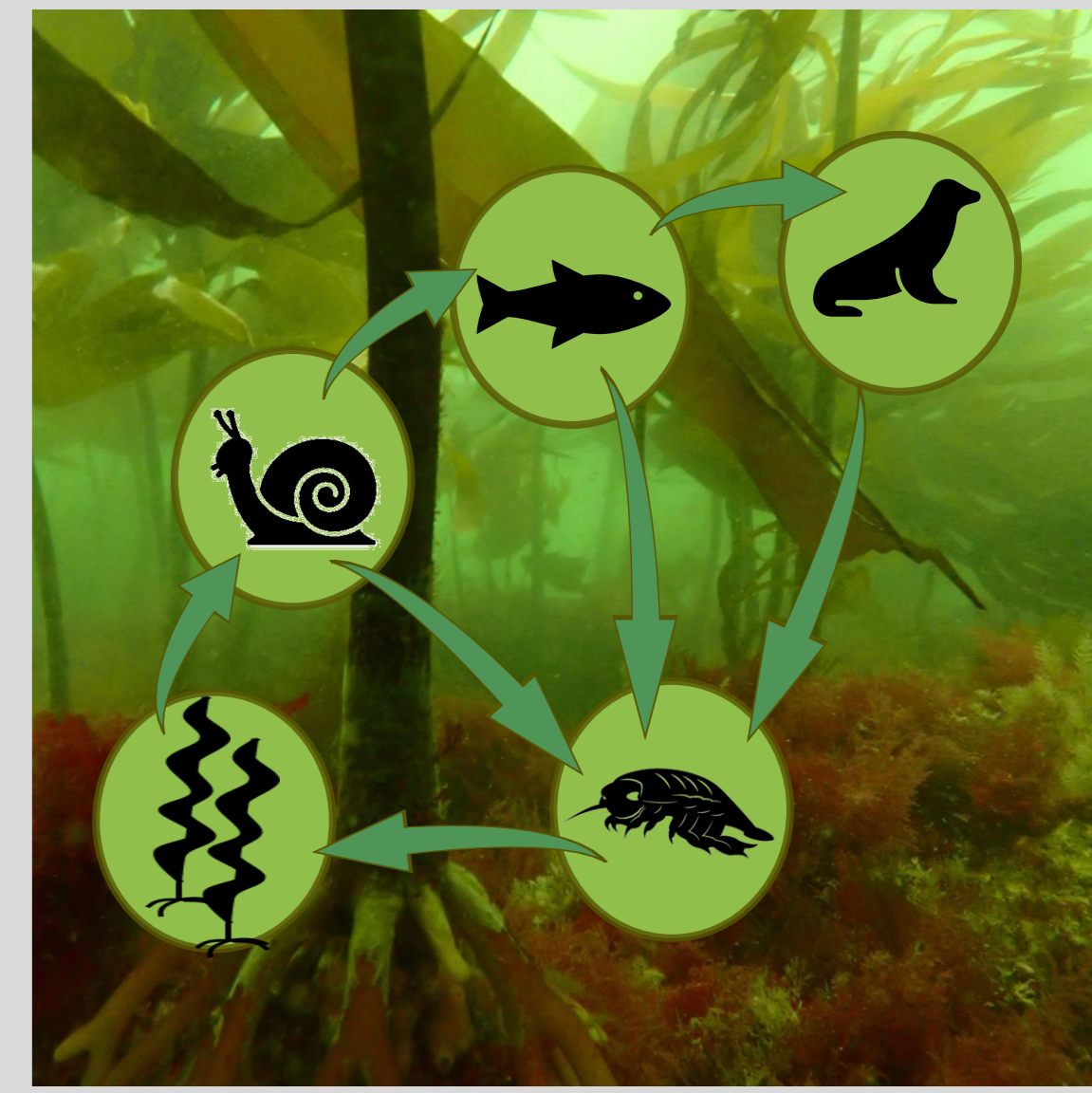
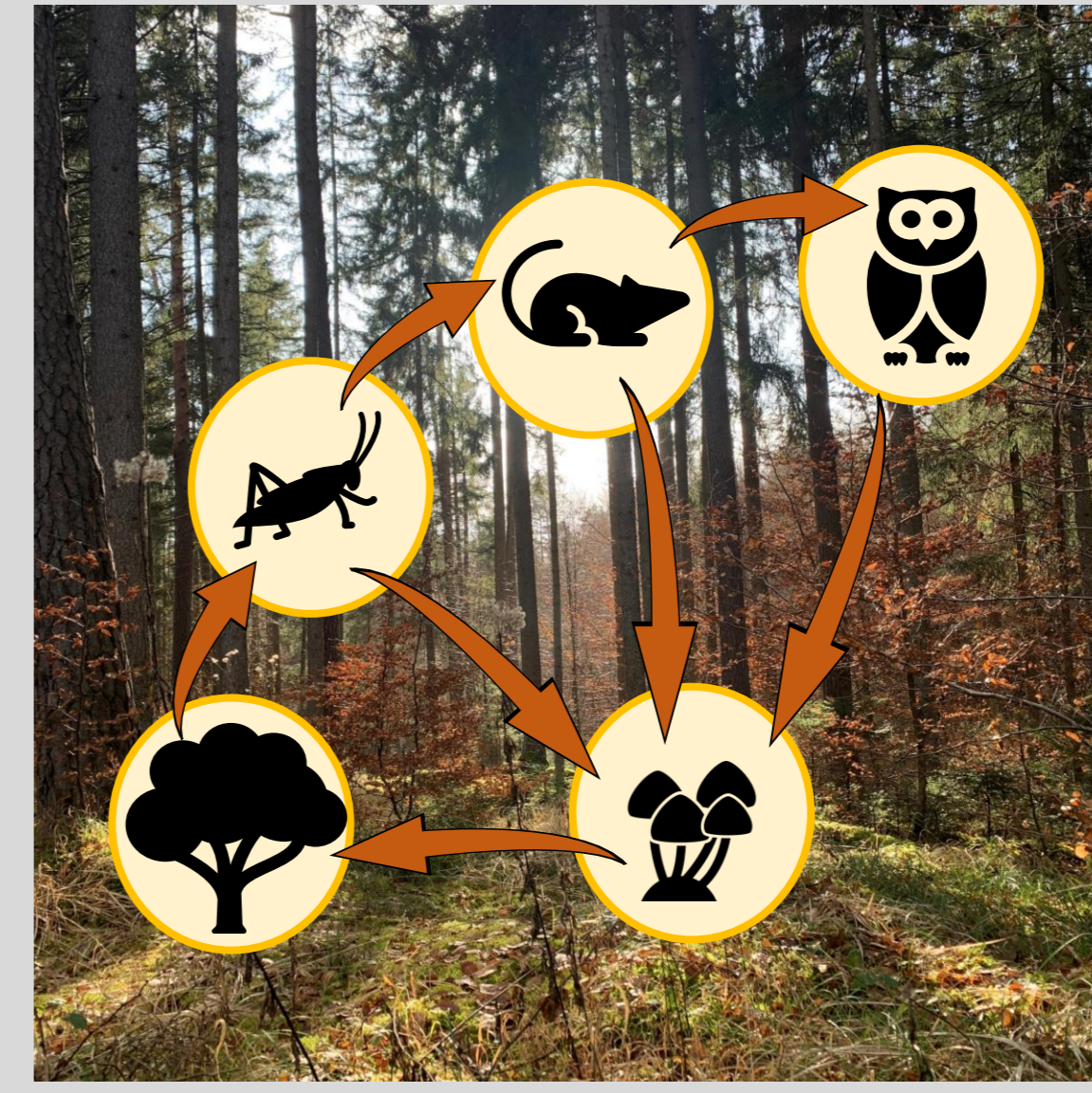
Glacial run-off opposes Arctic kelp expansion

Sarina Niedzwiedz, Kai Bischof

Marine Botany & MARUM, University of Bremen, Germany

sarina@uni-bremen.de

Kelps are brown macroalgae, forming vast submarine forests from temperate to polar regions. Their role in the ecosystem can be compared to trees, as kelps are providing habitat, food and nursery ground for many species. While the water temperature is determining their geographical distribution, light for photosynthesis is determining their depth distribution. Both temperature and light in the Arctic are changing due to climate change, which will likely have effects on kelp forests.



Present

Currently, in the Arctic low temperatures and short light periods prevail.

Method:

Temperature experiment:

- Two kelp species
- Three temperatures (3°C, 7°C, 11°C)

Background:

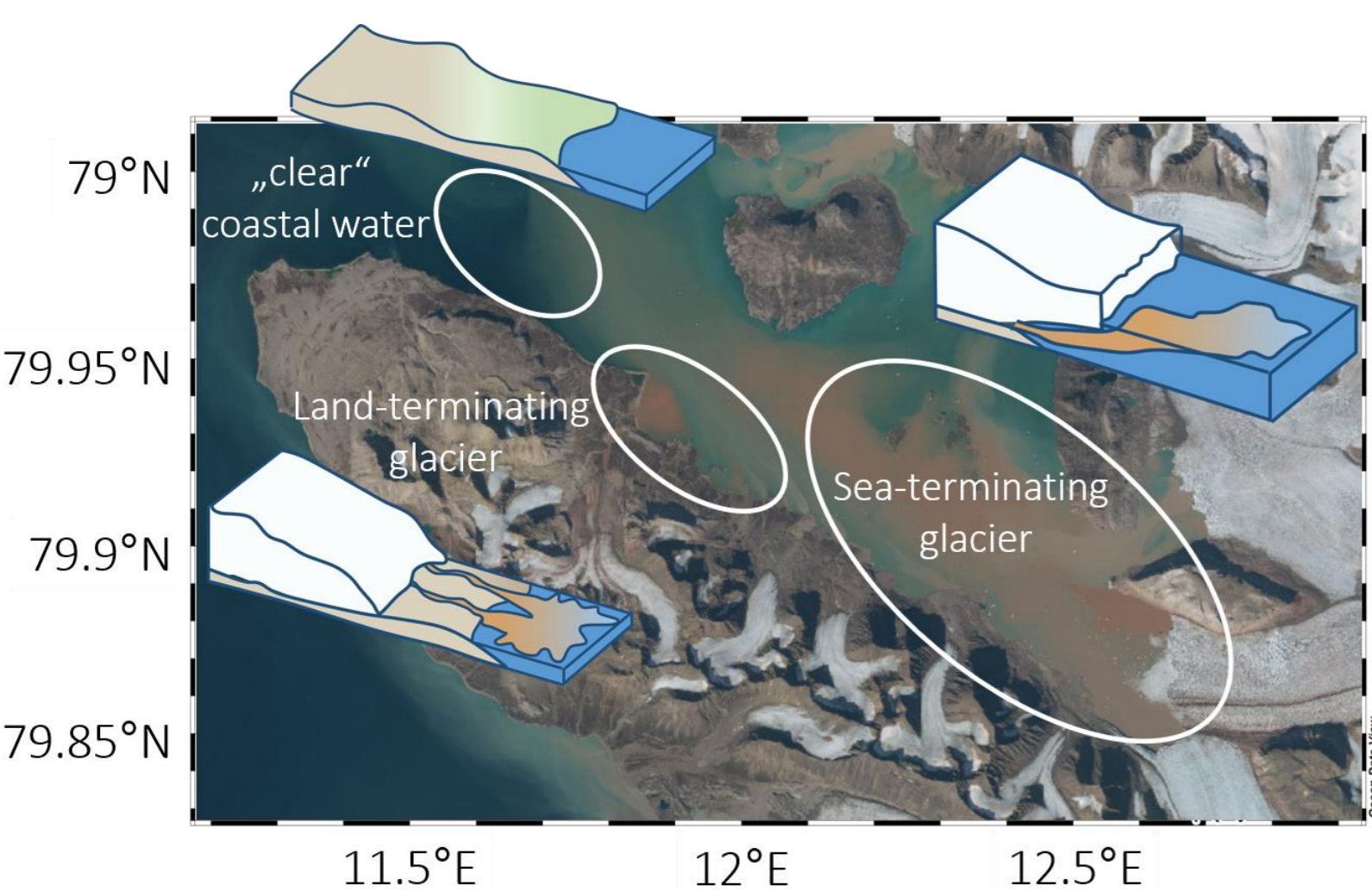
Due to climate change, temperatures in the Arctic are rising drastically.

Background:

Glacial meltwater leads to high sediment concentrations in the fjords.

Method:

Light intensity and quality measured in sediment plumes of Kongsfjorden, Svalbard.



Sediment plumes of Kongsfjorden, Svalbard.

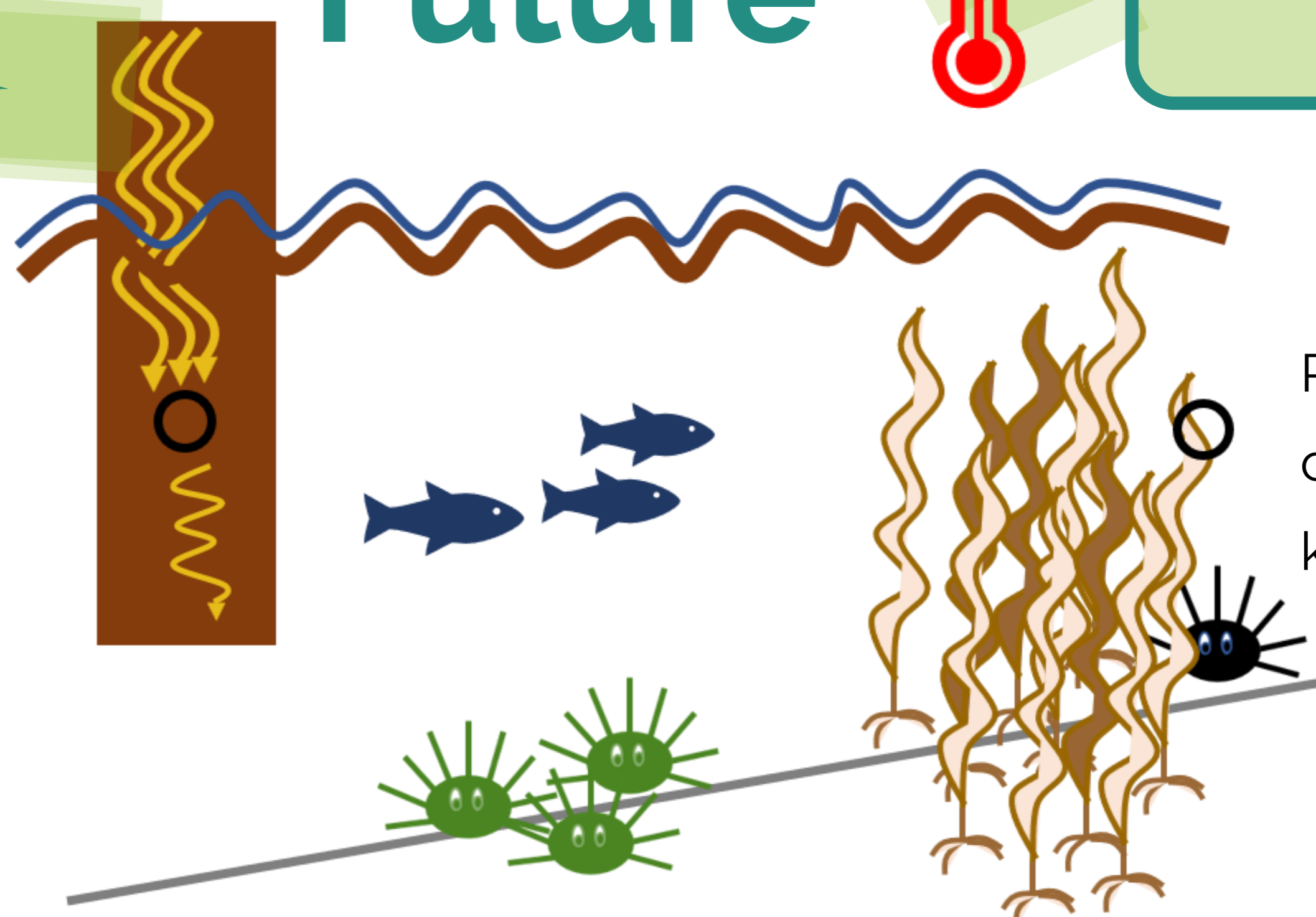
Reduction of kelp depth limit

Drastically reduced light intensity and quality in sediment plumes.

Future

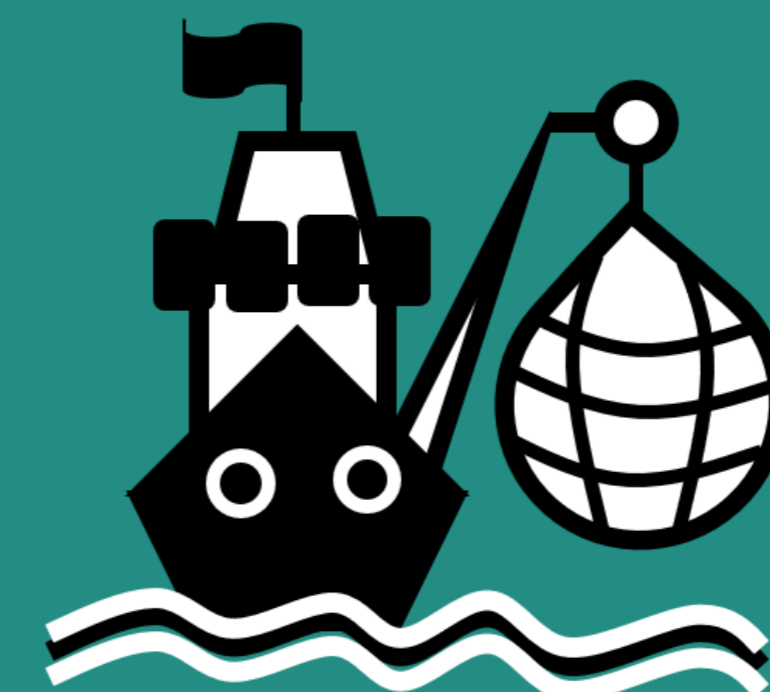
Changed kelp species composition

Polar kelps are constricted; temperate kelps are benefitting.



How are kelp forests changing in the future Arctic?

A changed species composition and reduced depth distribution will have cascading effects on Arctic ecosystems, being also of socio-economic importance.



Get Niedzwiedz & Bischof 2023