

Ecology and Importance of west Greenland *Calanus* populations



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Little - Giants

Best Western Plus Airport Hotel Copenhagen – May 15, 2024

Disko bay



- Southern border of Sea Ice, with impacted by the change in ice cover
- Ca. 30 % of the Greenlandic population lives in the Bay area
- Important fishing and hunting area

Disko Bay June 2017



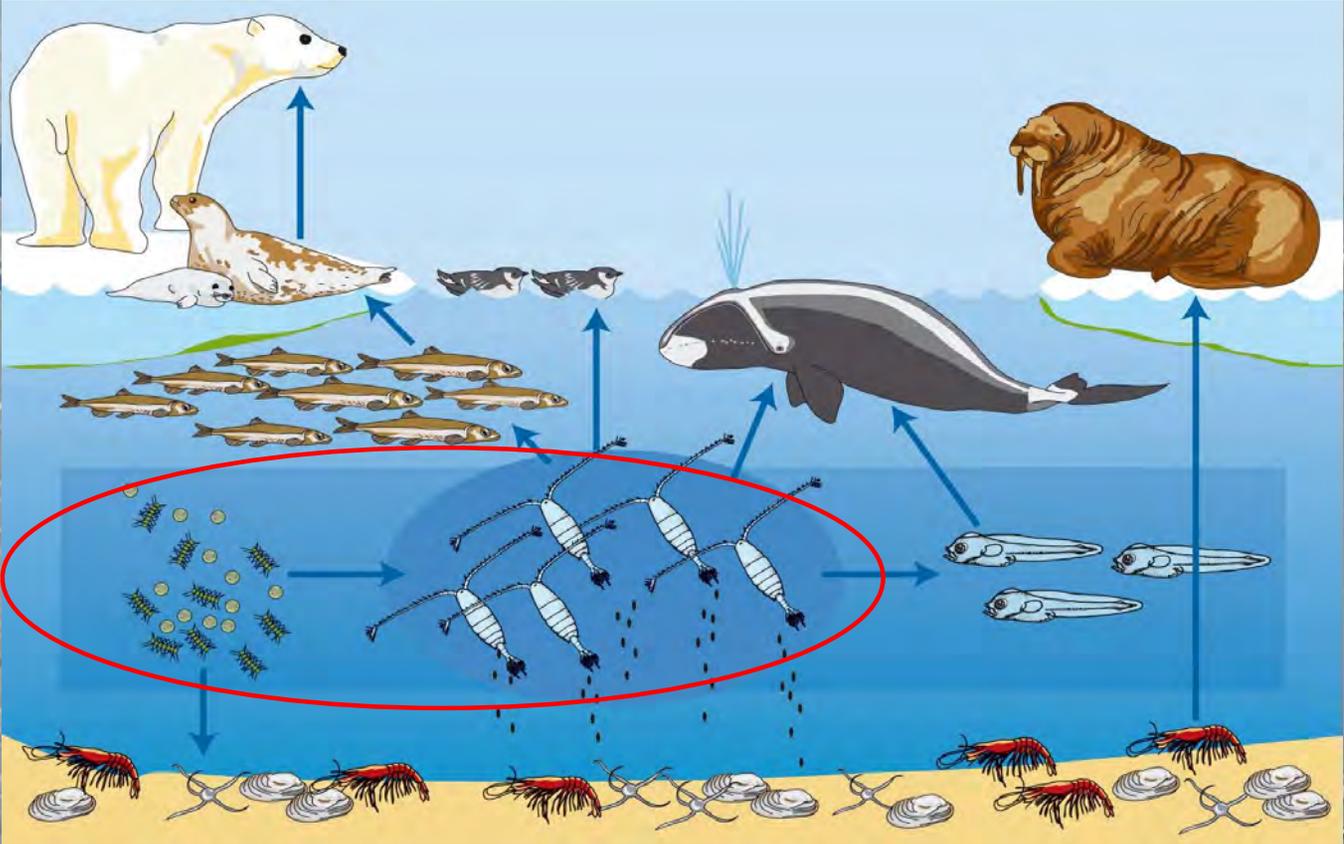
Feeding ground for 1500 Bowheads



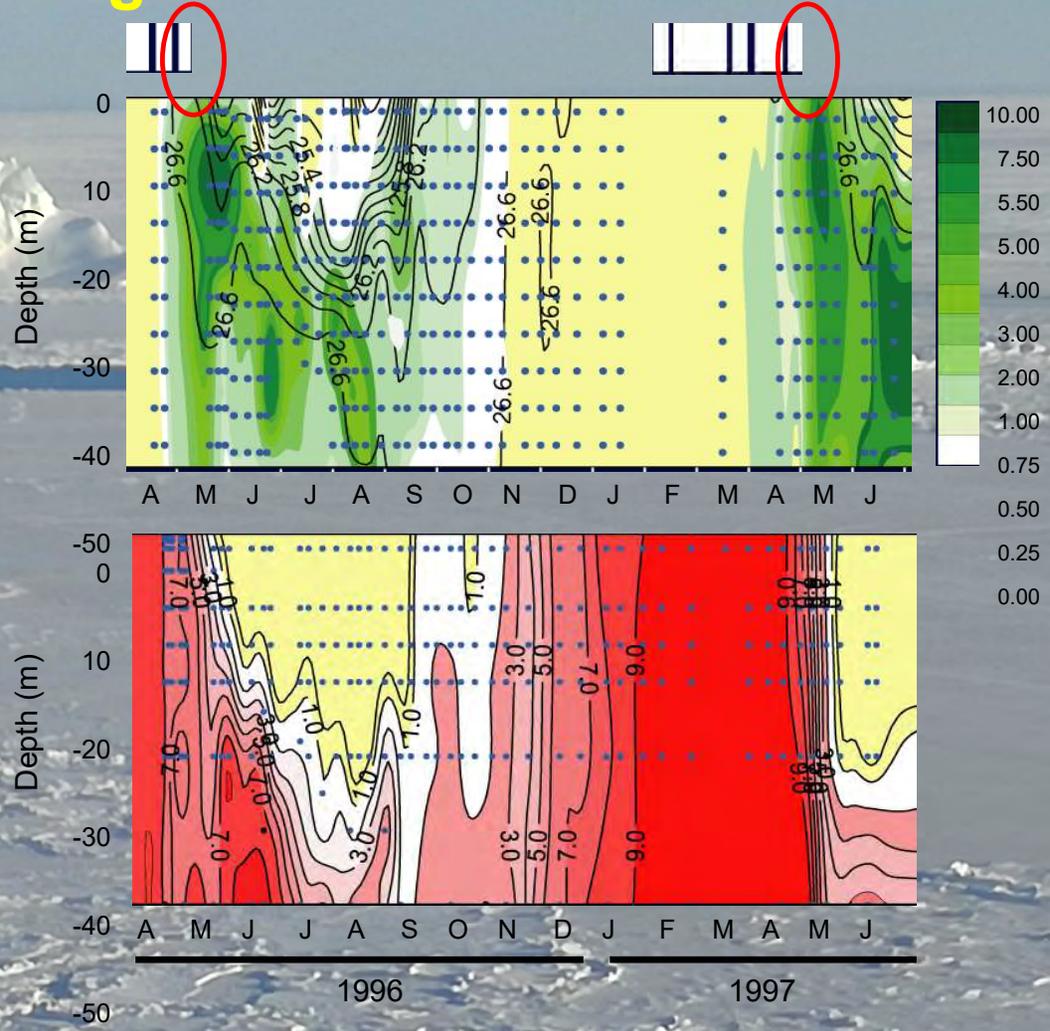
Calanus



The arctic marine food web



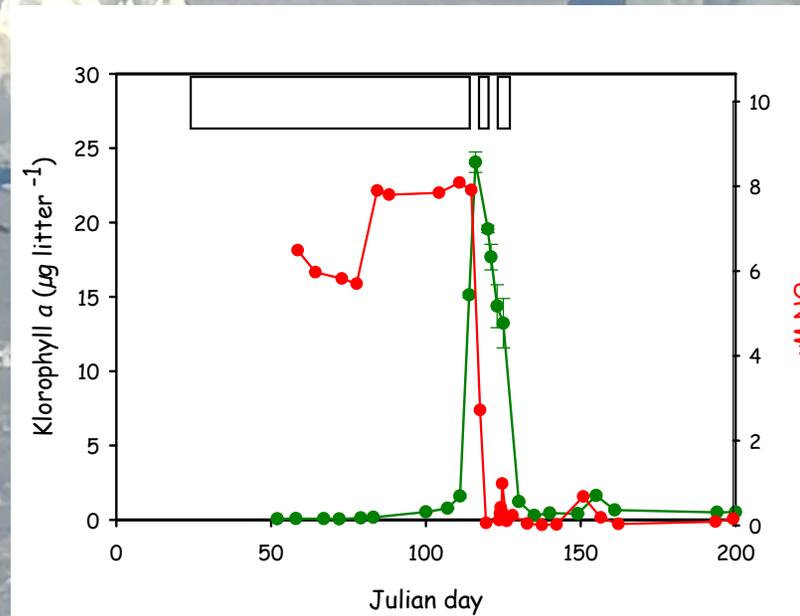
Chlorophyll og nitrat



"On the spot research"



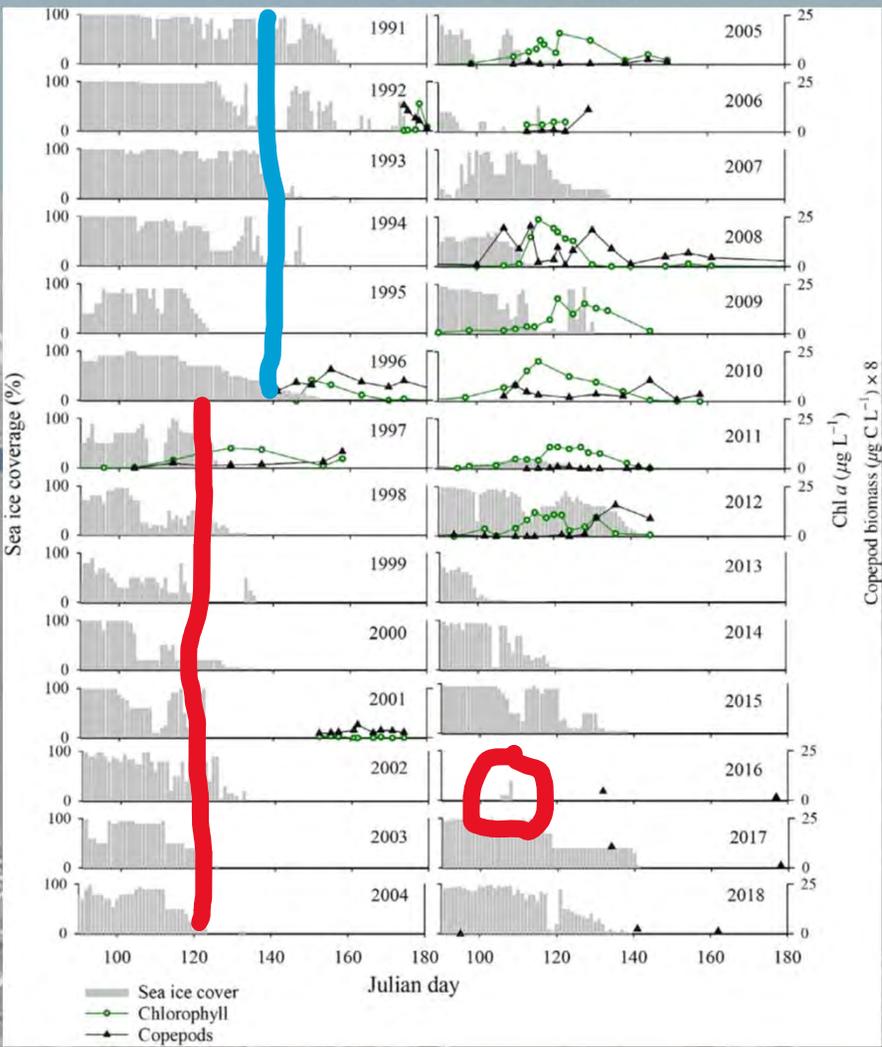
Spring 2008



Dünweber et al. 2010



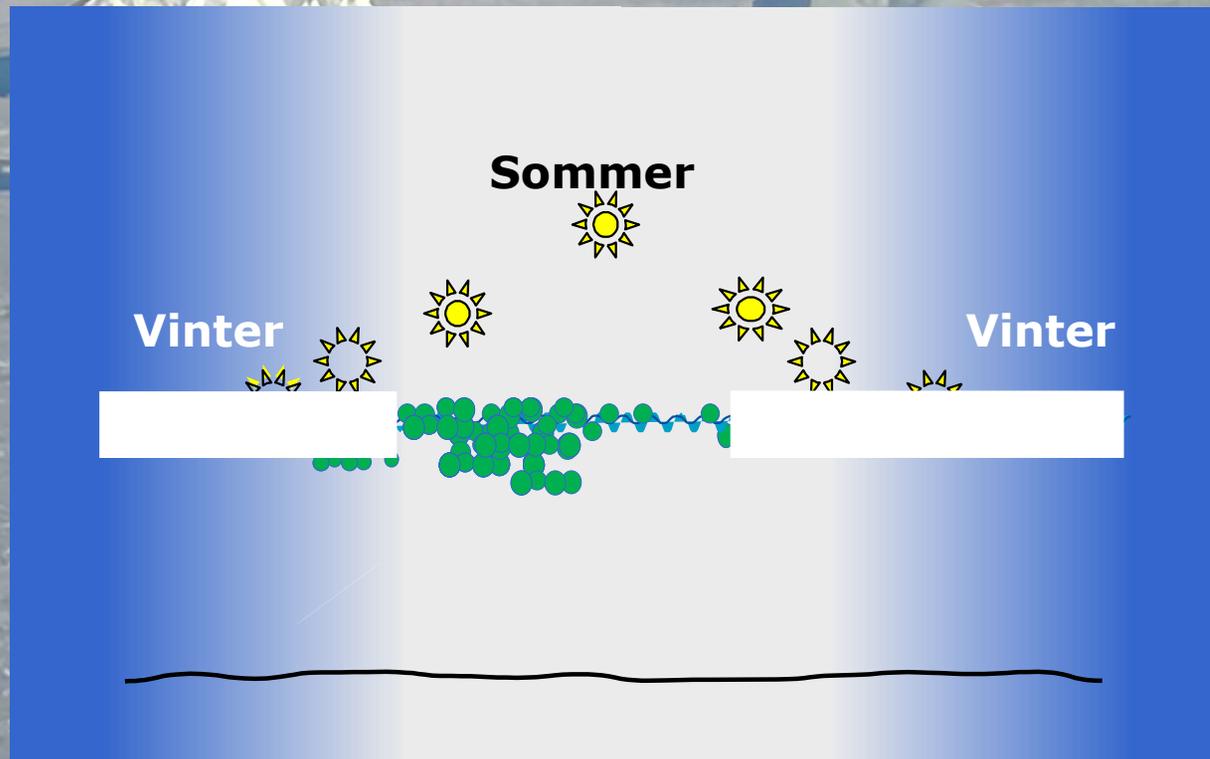
Sea ice cover,
Disko Bay



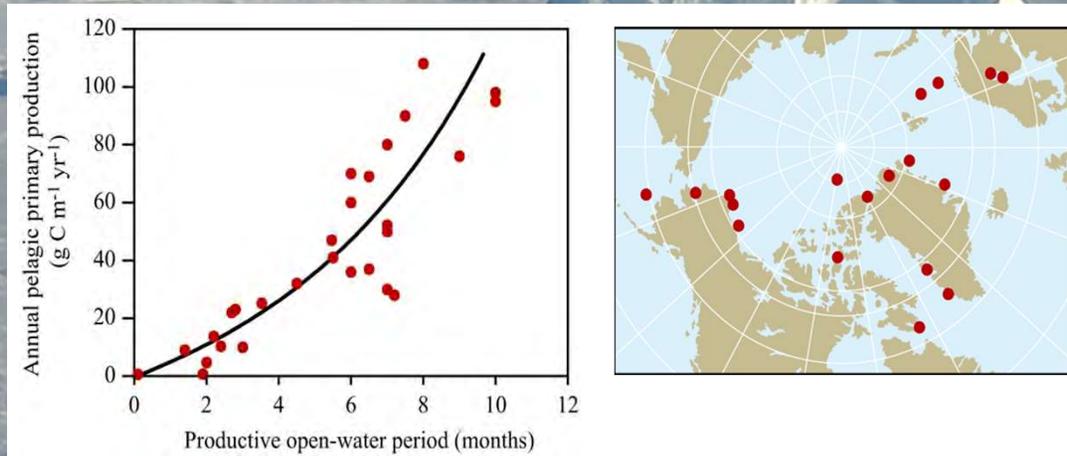
On the ice february 2016



Climate change and primary production



Sea ice and Primary production

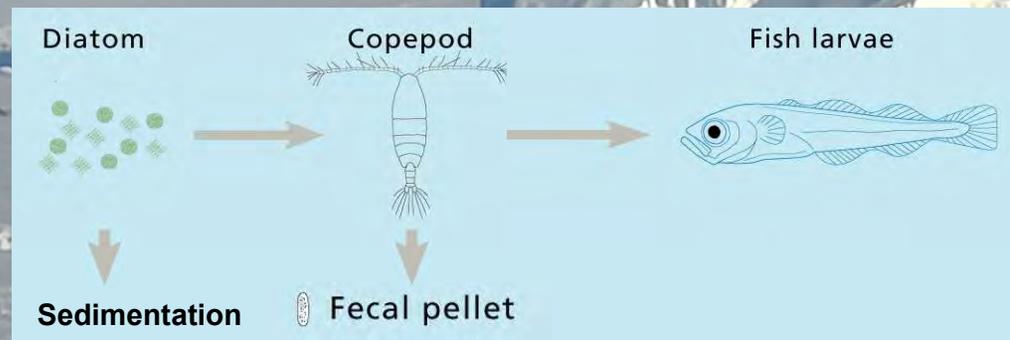


Rysgaard et al. 1999

Primary production

- The initiation of the spring bloom will be initiated by the light rather than the ice break up.
- The productive season will be longer
- The total primary production will increase.

The fate of the Primary production ?



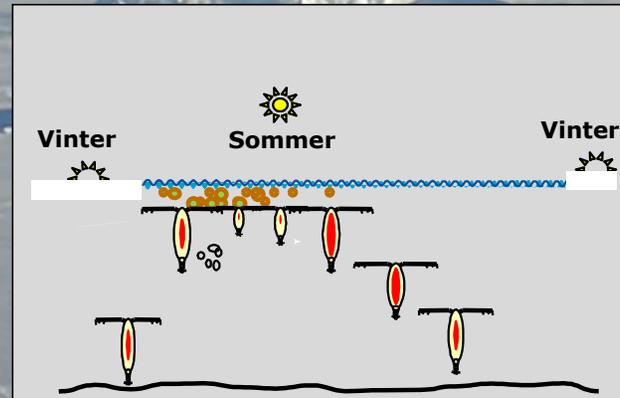


<http://www.ru.nl/biologie/onderzoek/onderzoekgroepen/oe/pictures/12diatoms.jpg>

Overwinter bottomn near

Migrates to surface and exploite spring bloom

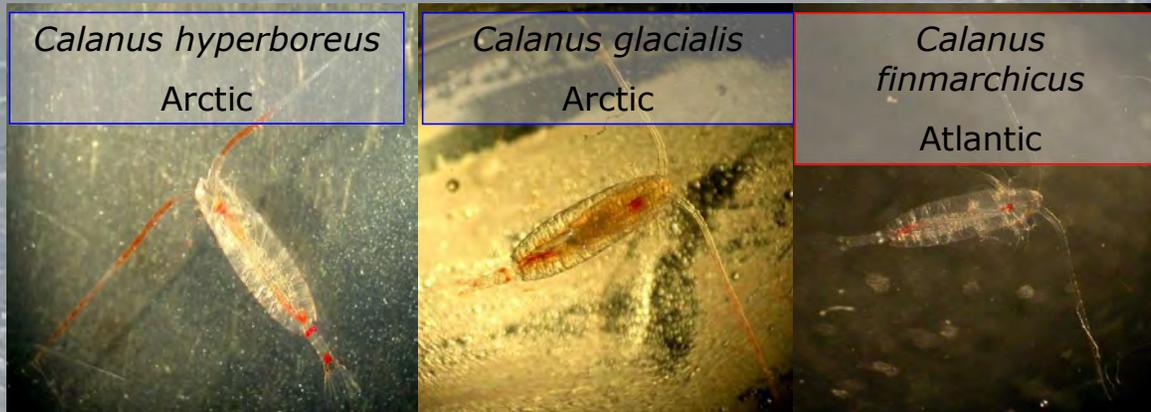
After spawning and refuling down again



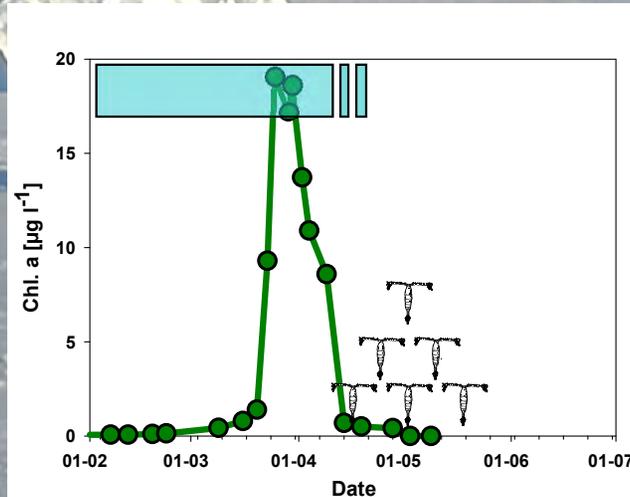
The timing of the migration to the surface **not flexible**

Calanus is a key actor in the arctic pelagic food web

Through the first steps in the food web the lipid content increases from 10-20% in phytoplankton to 50-70 % in *Calanus*



“Match - mismatch”



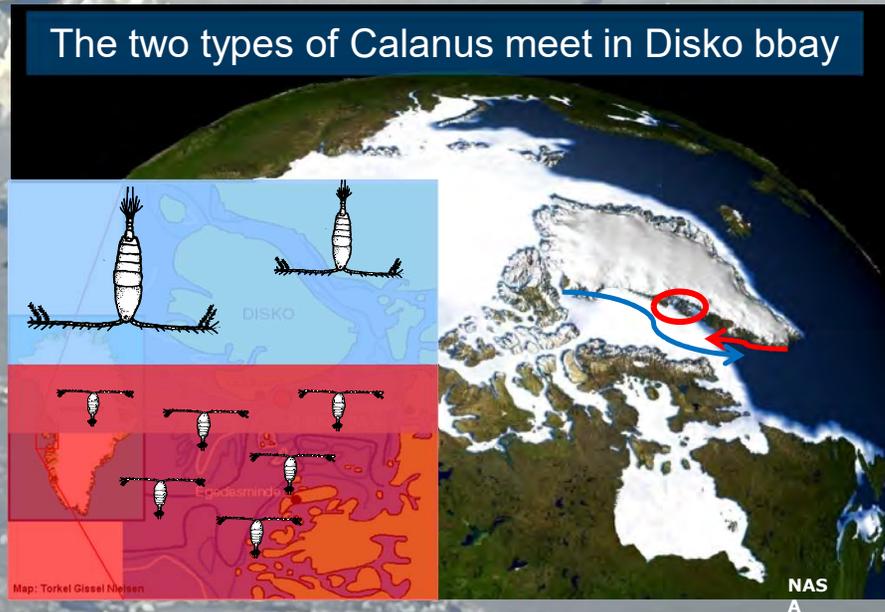
Short and intense bloom

Migration have to match the bloom

In a warmer future, the spring bloom will follow the light rather than the ice

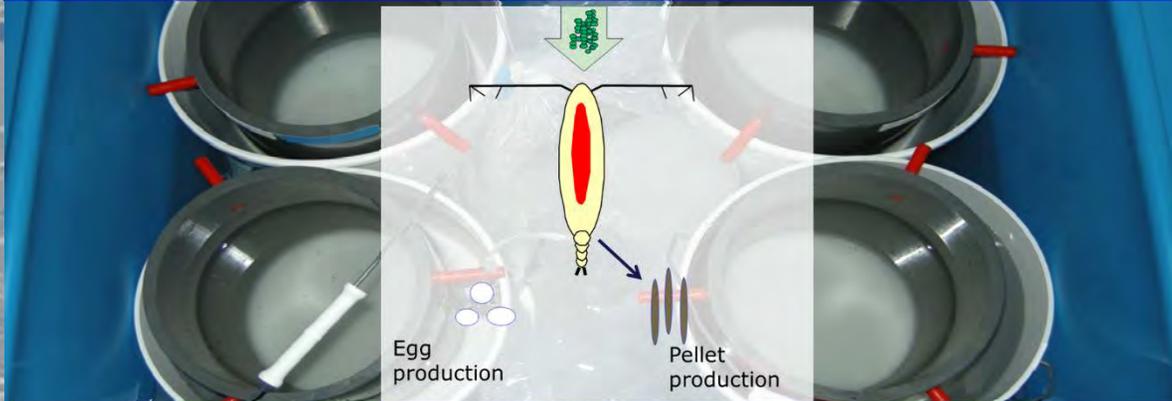
A “mismatch” will have large ecological consequences since less lipid will be transferred trough the food web

The two types of Calanus meet in Disko bbay



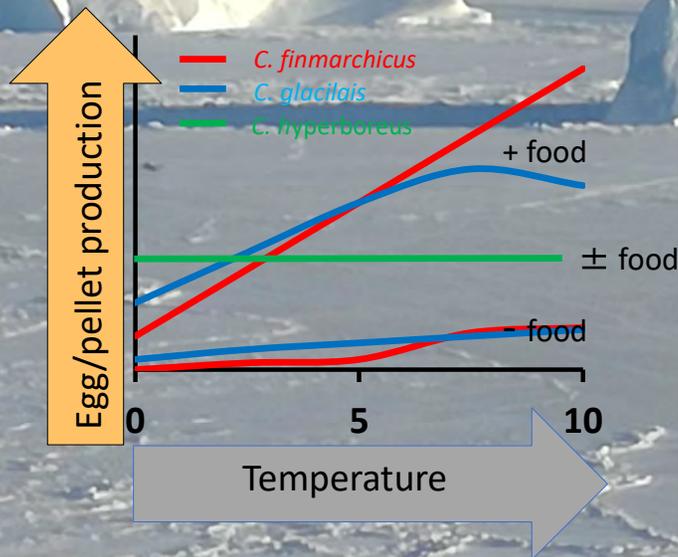


5 temperatures 0°C, 2.5°C, 5°C, 7.5°C and 10°C with and without food.



Measured the daily egg and pellet production

Summary



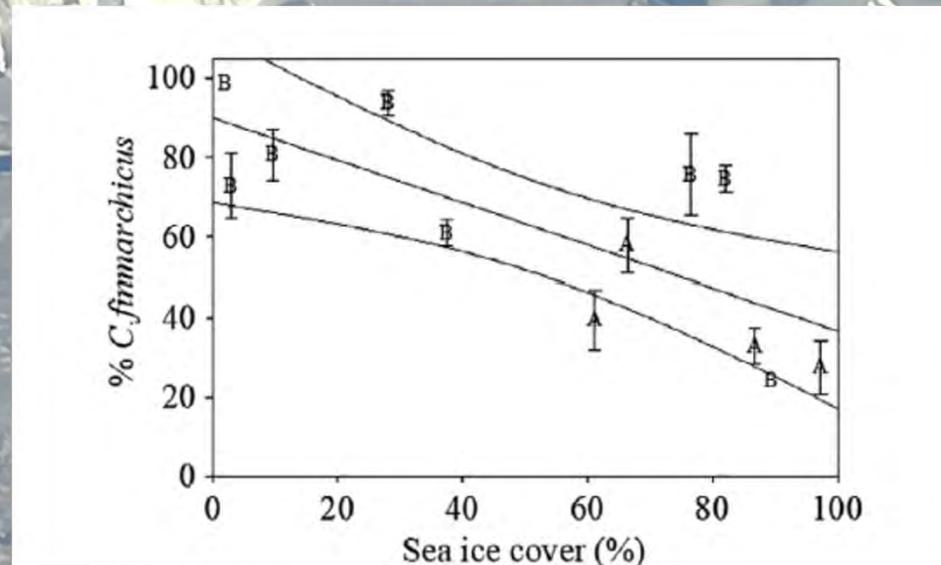
› *C.f.* og *C.g* : positiv effect of food and temperature

› *C.g* : perform best at low temperature and *C.f* at high temperatures

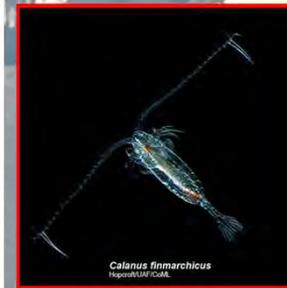
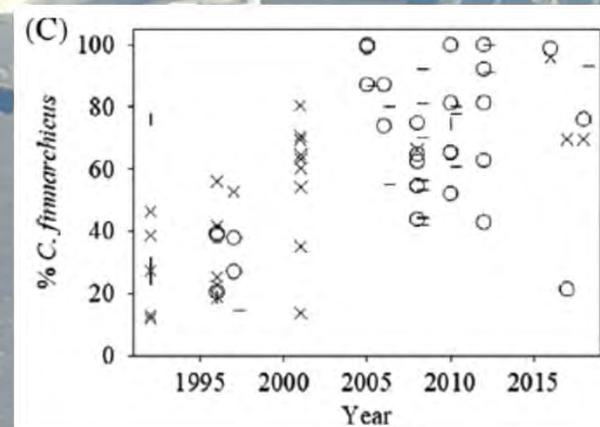
› New: *C.f.* can produce eggs before the bloom if the temperature increase!

› *C.h* : No effect of food or temperature

Open "warm water" more *C. finmarchicus*



How is the *Calanus* community today then ?



Møller & Nielsen 2019





Tak for opmærksomheden