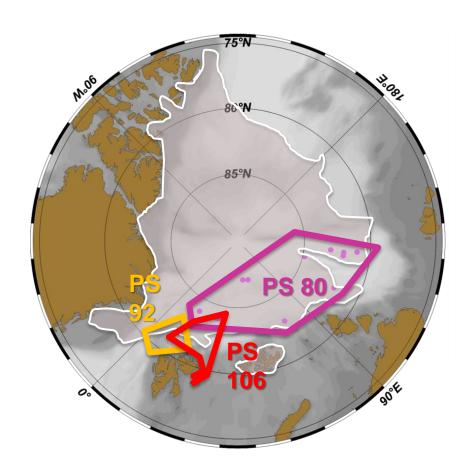


### Polarstern Surveys



- PS80 (2012)
  - Under-ice nets
- PS 92 (2015)
- PS 106 (2017)
  - Under-ice nets
  - Pelagic nets (RMT)
  - Acoustic surveys (EK60)
  - Drift station (PS 106.1)



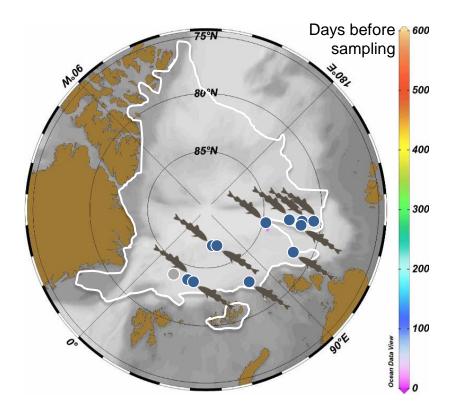


### Polar cod



#### **Hypothesis:**

Sea ice provides high-energy food for young polar cod to succesfully cross the CAO

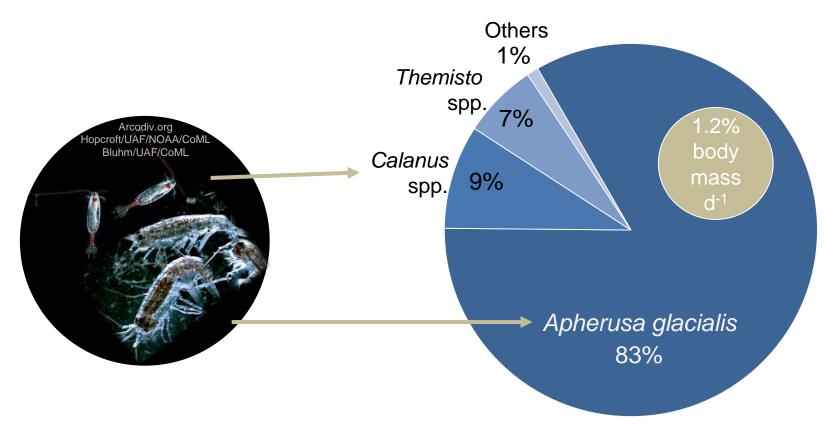


David et al. (2016) Polar Biol



### Polar cod diet



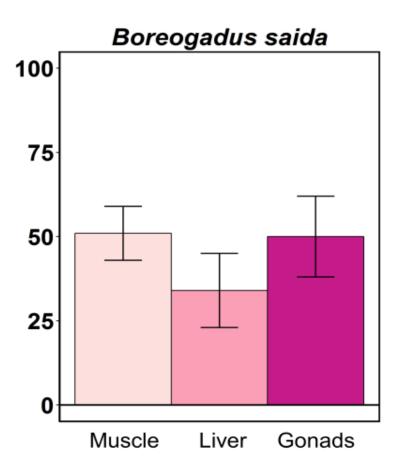


Proportional diet composition by mass (%)



#### Polar cod diet





- Sea ice provides sufficient highenergy food for young polar cod to grow
- Critical dependency on ice algaeproduced carbon
- Young polar cod particularly vulnerable to changes in sea ice habitat structure
- Impacts of sea ice change on higher predators likely

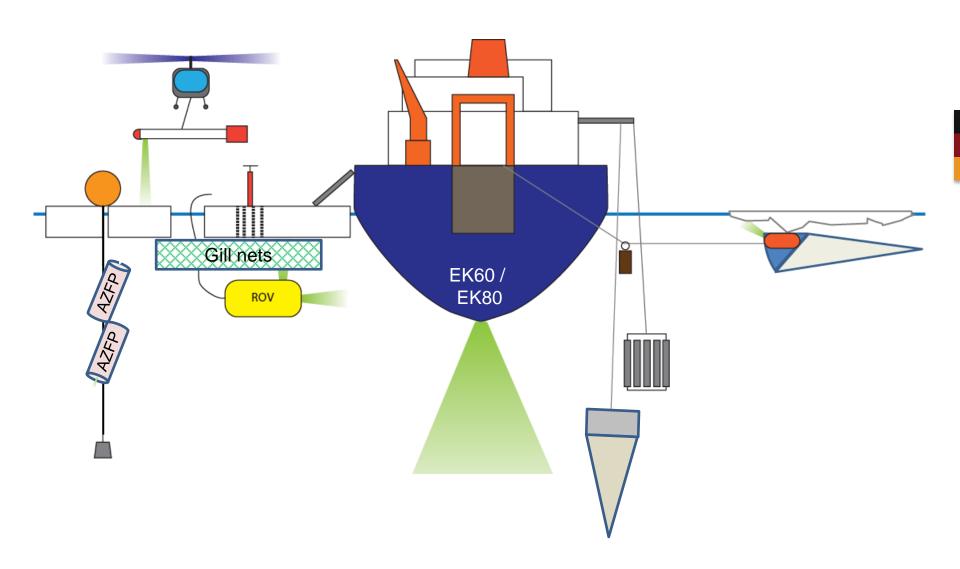
**Kohlbach**, Schaafsma, ..., Flores et al. *Prog in Oceanogr* Doi: 10.1016/j.pocean.2017.02.003





## MOSAiC observatory







# Challenges

- There is at least one (polar cod) fish population at the North Pole
- The CAO suffers from lack of information at all trophic levels, e.g. mesopelagic / benthic fish unknown
- The ecosystem faces critical changes drastic and unprecedented
- Very difficult to predict how the future Arctic ecosystem will function

#### **Conclusions:**

- Binding regulations are necessary (also for the shelf seas)
- THE CAO needs an international EPA, ICES, BONUS, etc.
- Example: CCAMLR
- The best thing would be to make the Arctic High Seas one big MPA
- The international political processes are far too slow

