



COMPARATIVE STUDIES AMONGST SUB-ARCTIC SEAS

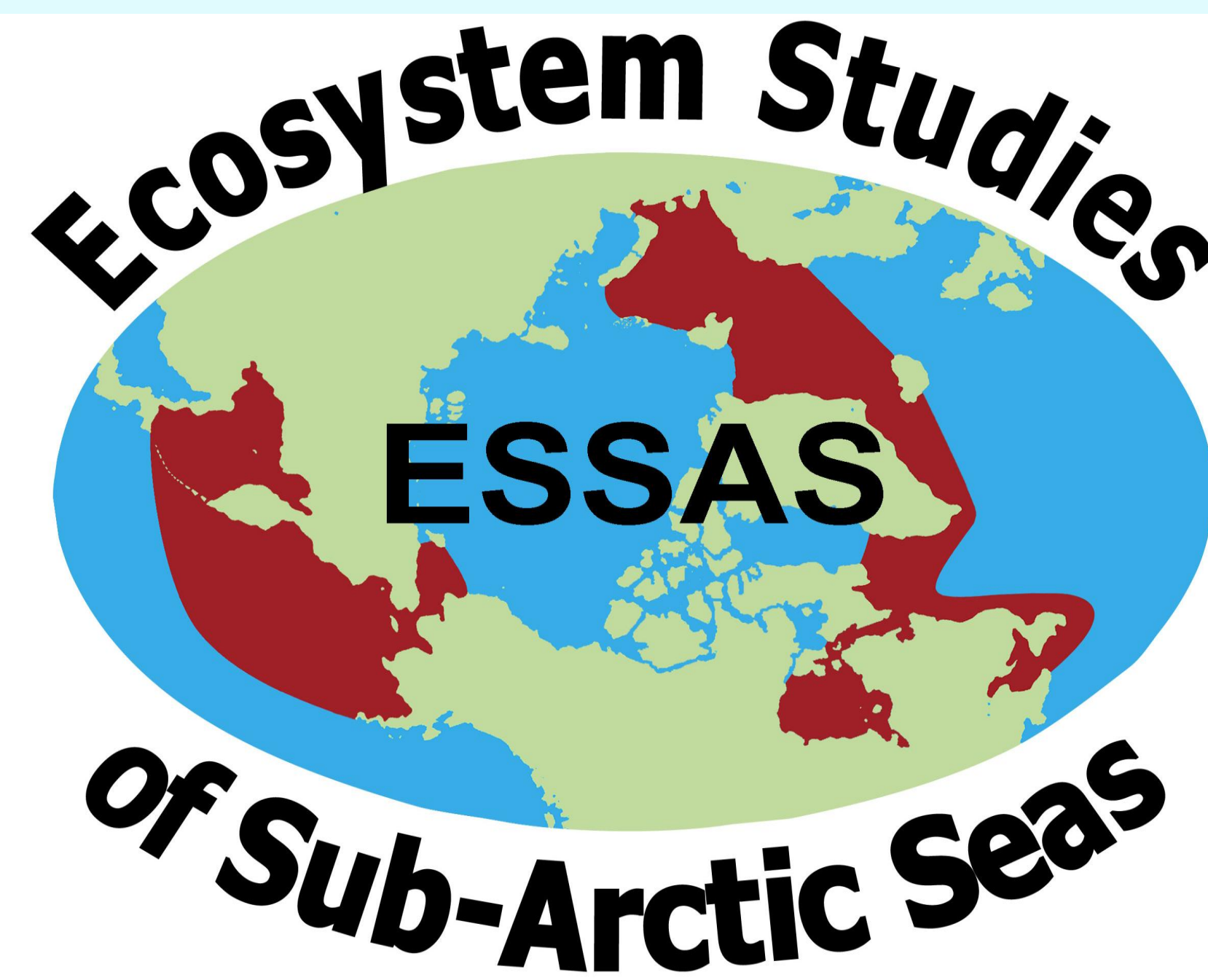
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ESSAS

ESSAS is an IMBER regional program whose aim is *to compare, quantify and predict the impact of climate variability on the productivity and sustainability of Sub-Arctic marine ecosystems.*

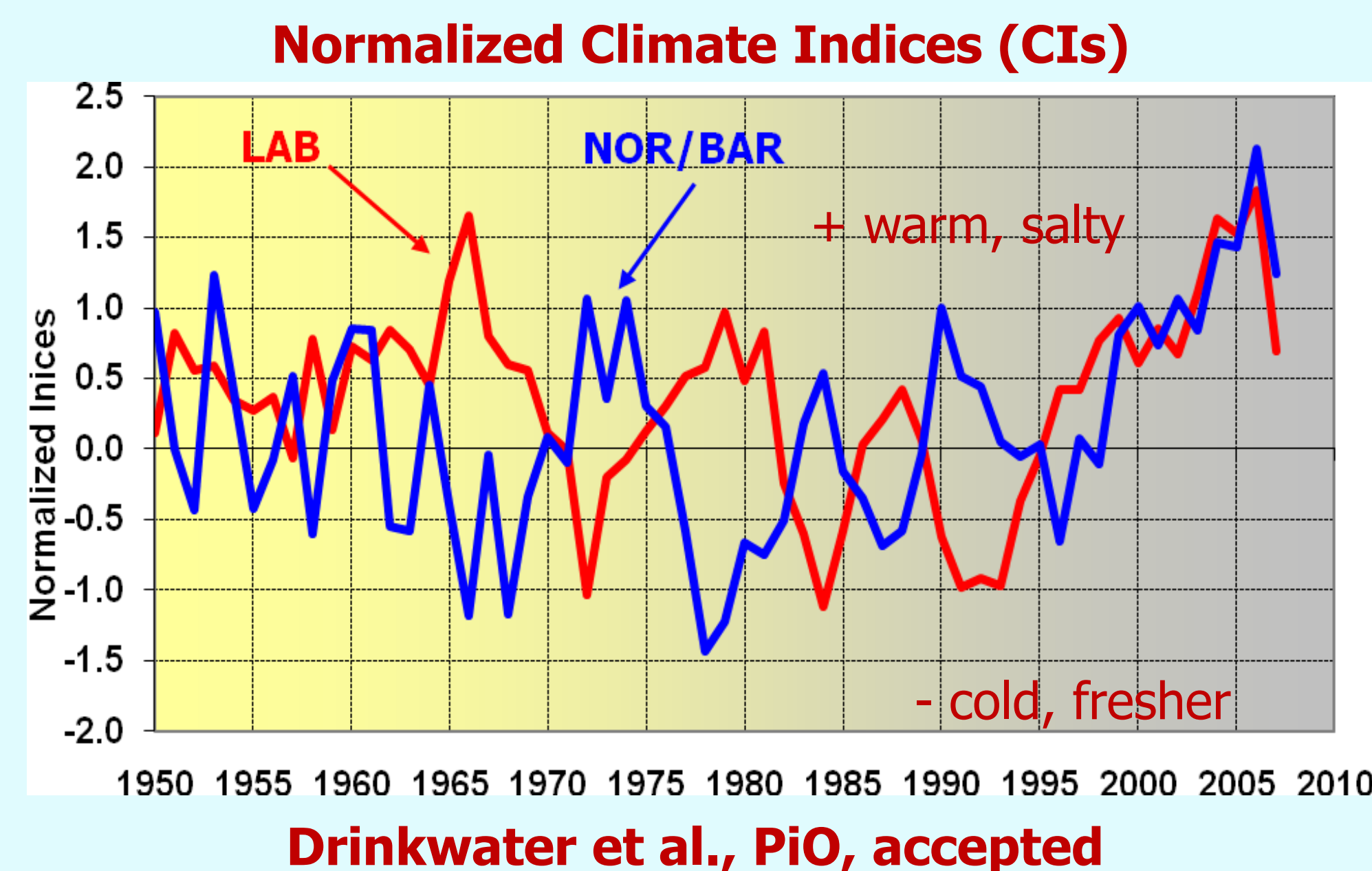


ESSAS undertakes comparative studies between different sub-arctic seas:

- to gain scientific insights
- to determine what processes are fundamental to sub-Arctic seas and which are unique to particular seas
- to share methodologies.

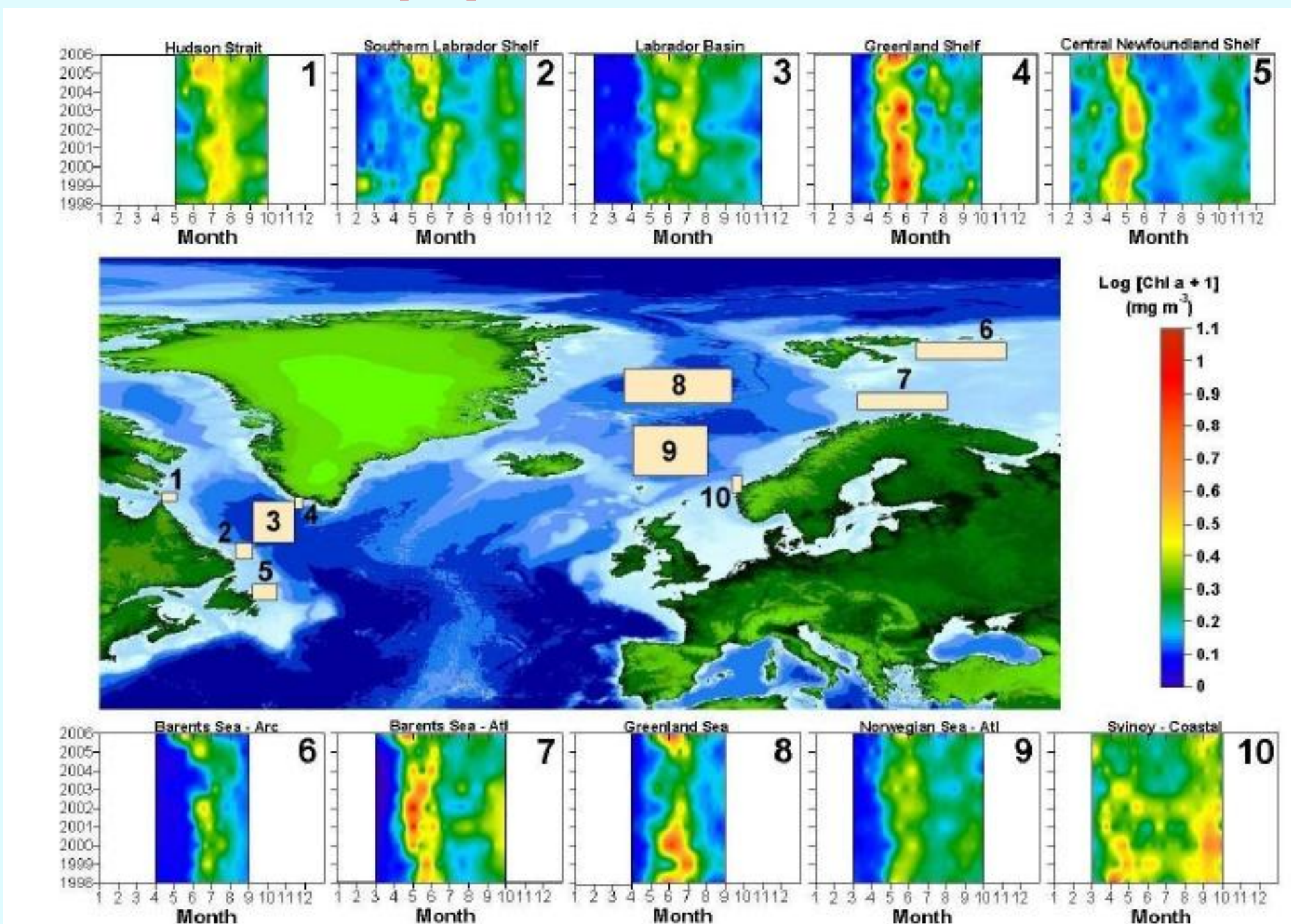
NORCAN (NORway-CANada Comparison of Marine Ecosystems)

This project has been comparing different ecosystem components between the Labrador Sea and the Norwegian/Barents seas.



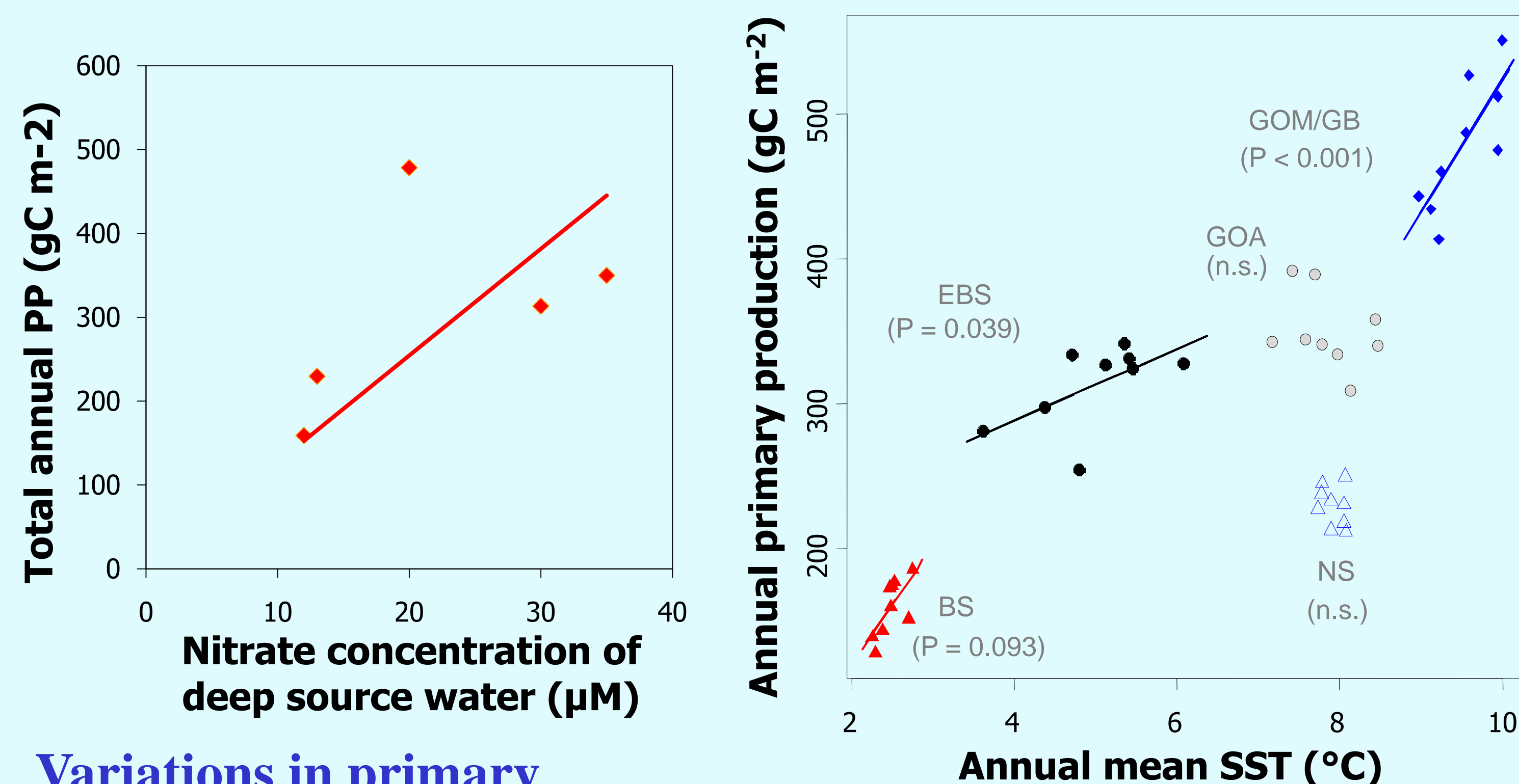
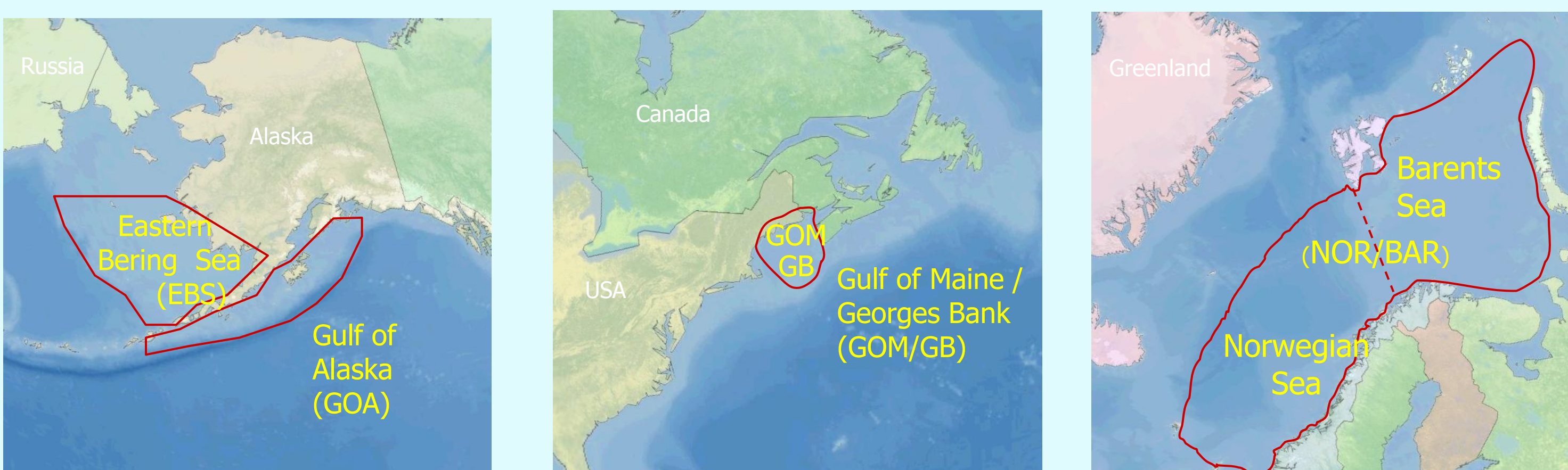
Change from out of phase to in phase CIs between the two regions in the late 1990s caused by shifts in atmospheric pressure systems (weakening of NAO).

Surface Chlorophyll Concentrations from SeaWiifs



Timing of the spring bloom and peak seasonal productivity are occurring progressively earlier in the year, particularly at high latitudes.

MENU (Comparison of Marine Ecosystems of Norway and the United States)



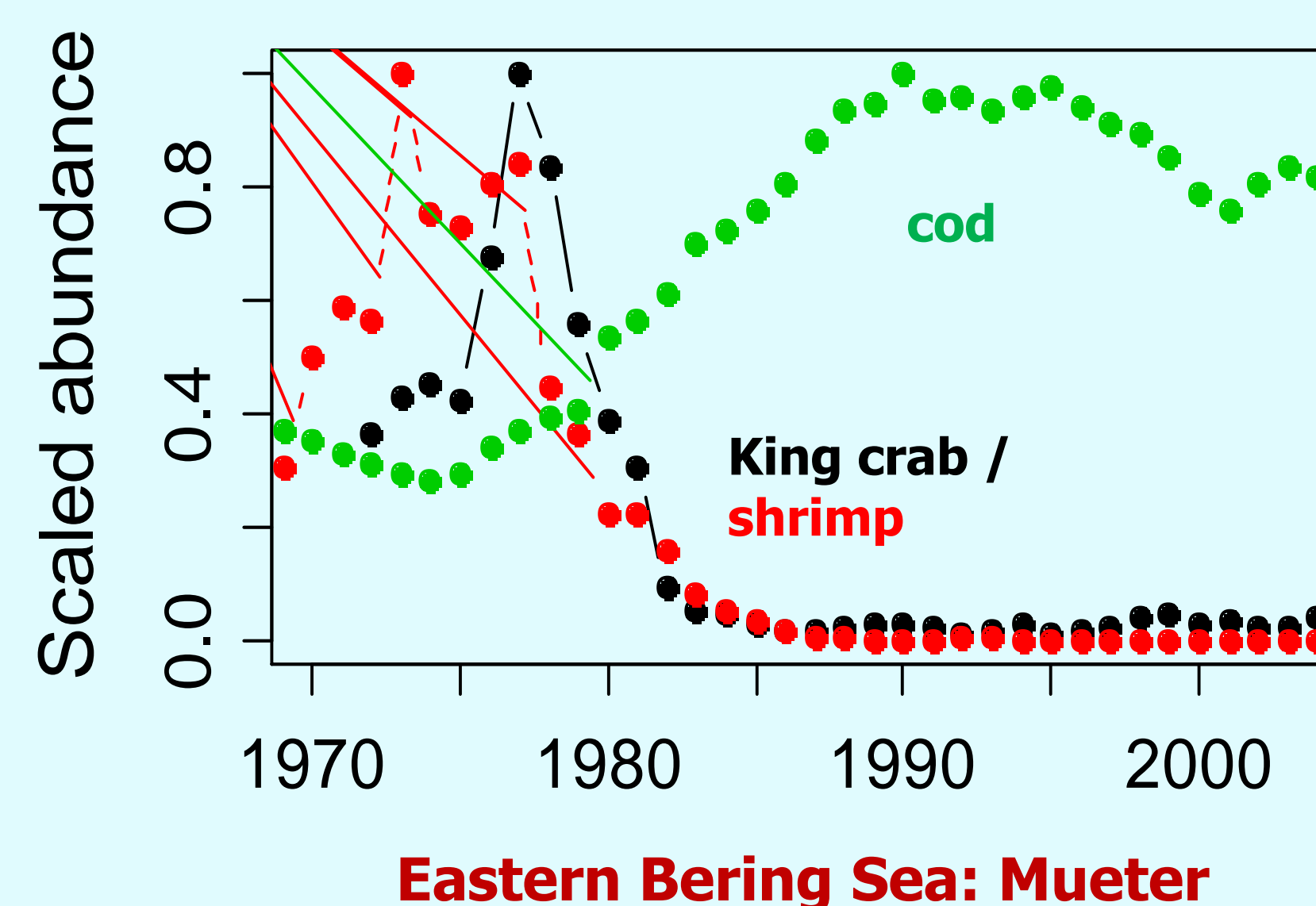
Variations in primary production depends on deep water nitrate concentrations.

Drinkwater et al., PiO, 2009;
Mueter et al., PiO, 2009

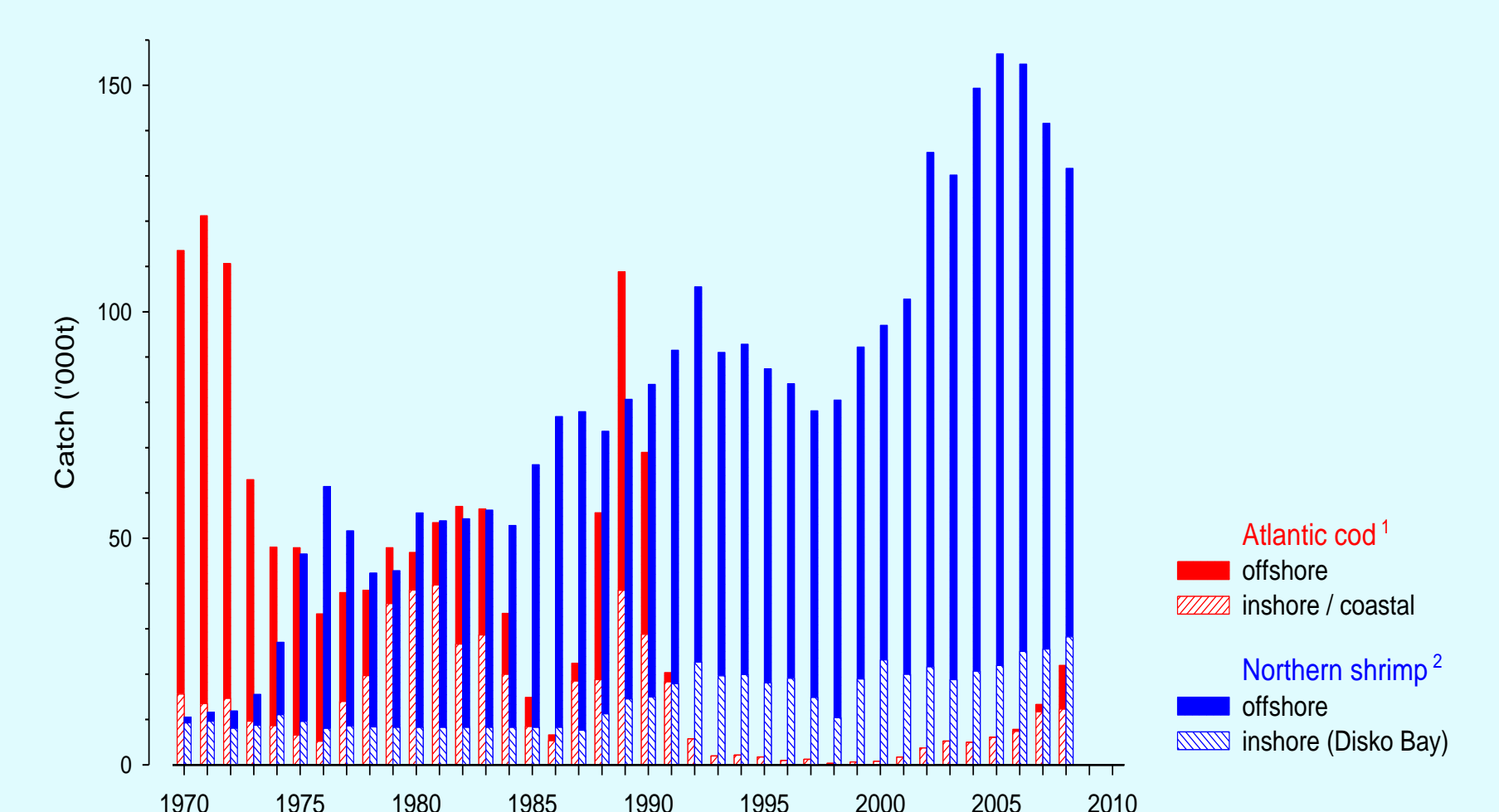
Primary production increased with warming from 1998-2006 in 3 of 5 ecosystems.

Investigating Invertebrate-Gadoid Interactions

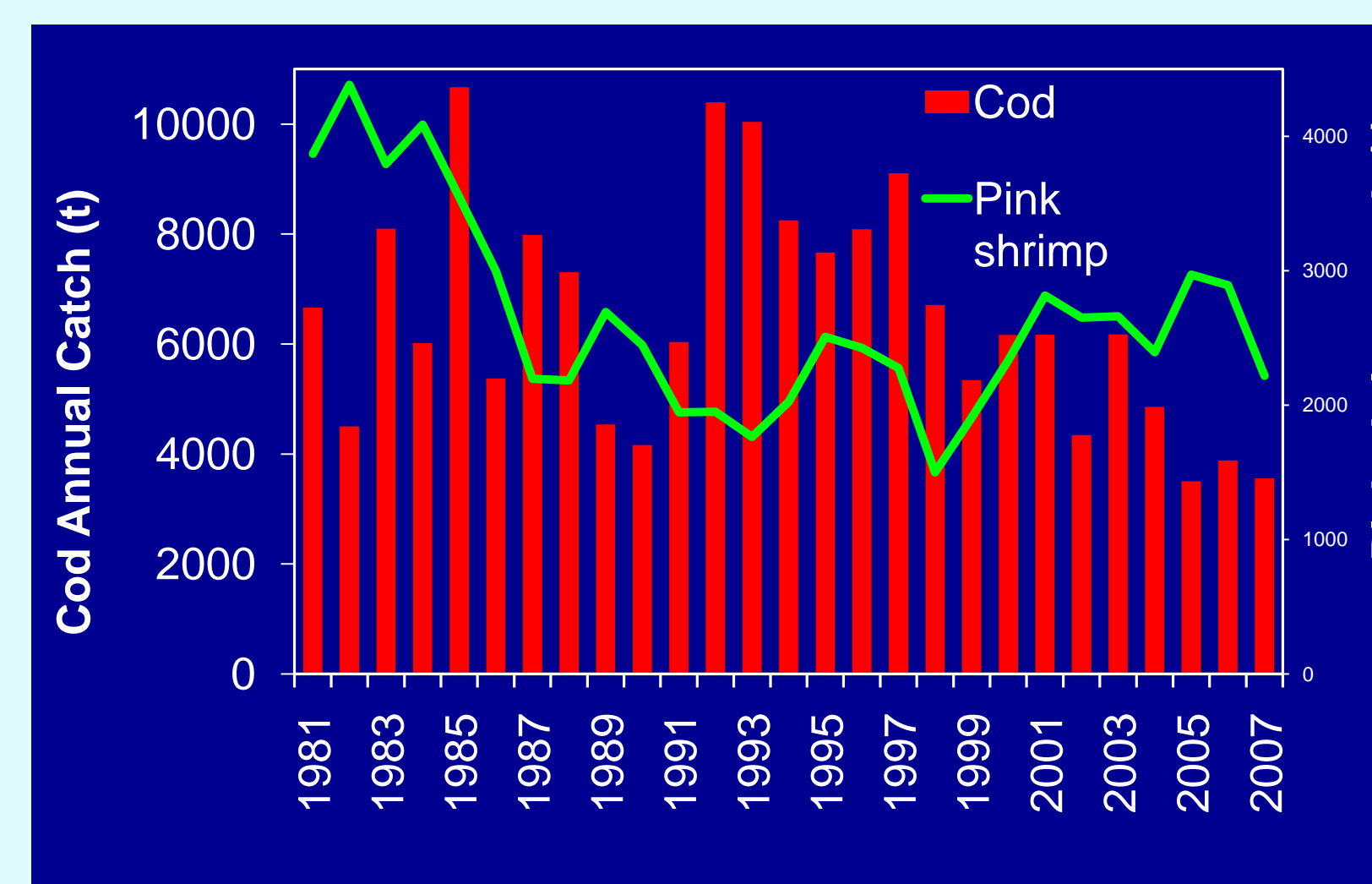
An ESSAS comparative study between different Sub-Arctic Ecosystems is testing the hypothesis that gadoids control invertebrate abundance through predation.



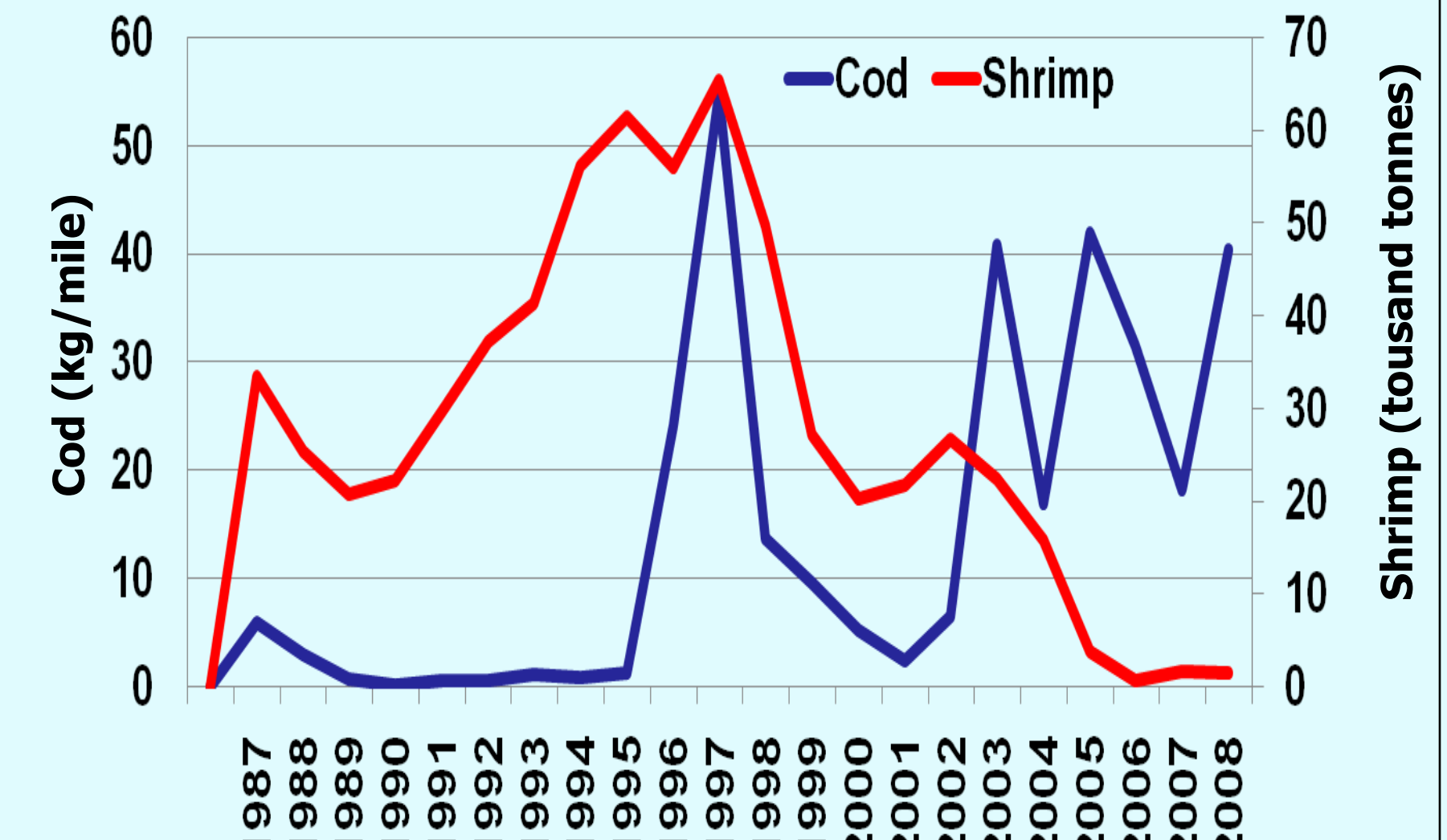
Eastern Bering Sea: Mueter



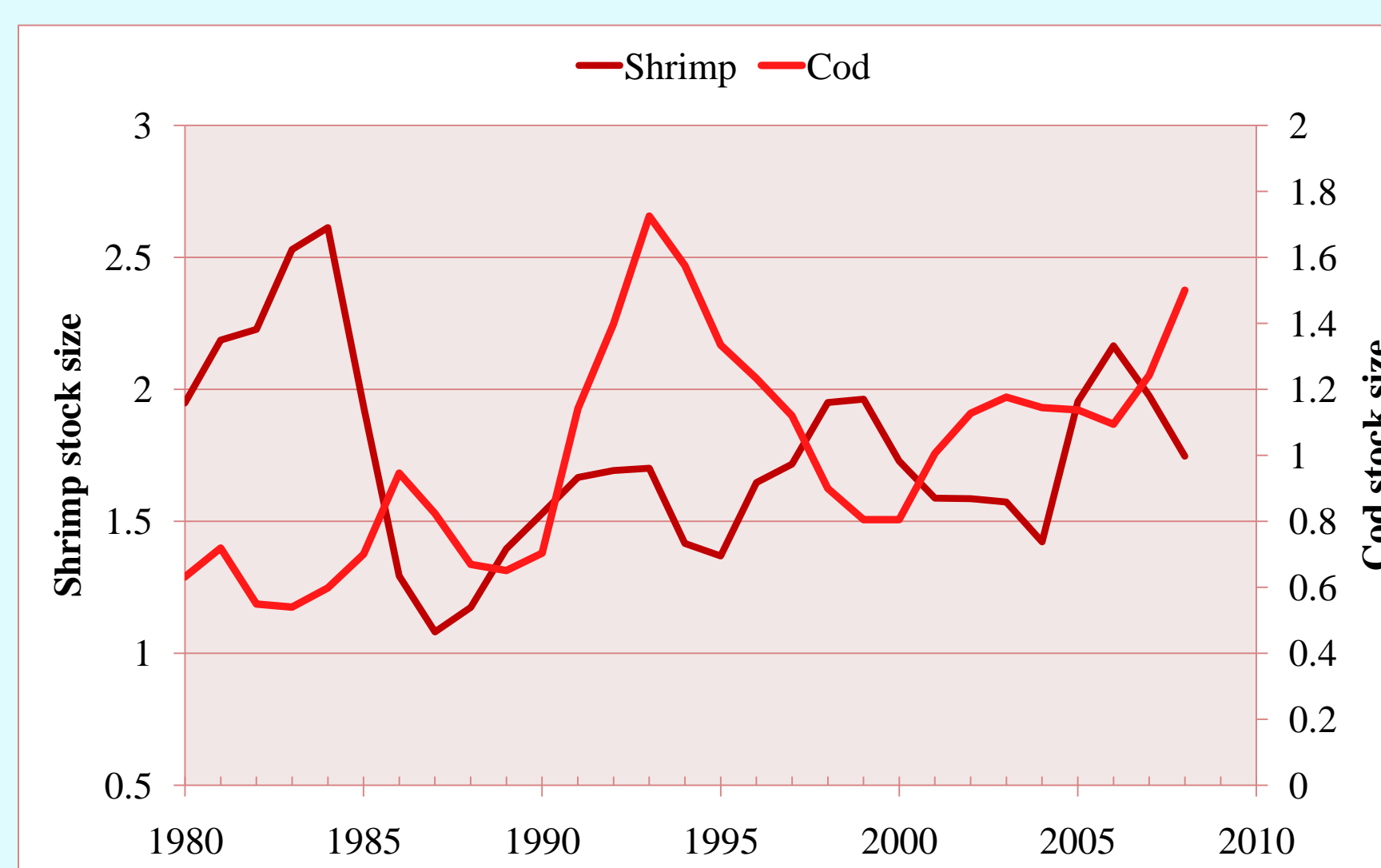
Northern Iceland: Astthorsson



Japanese Waters: Yamamura and Sakurai



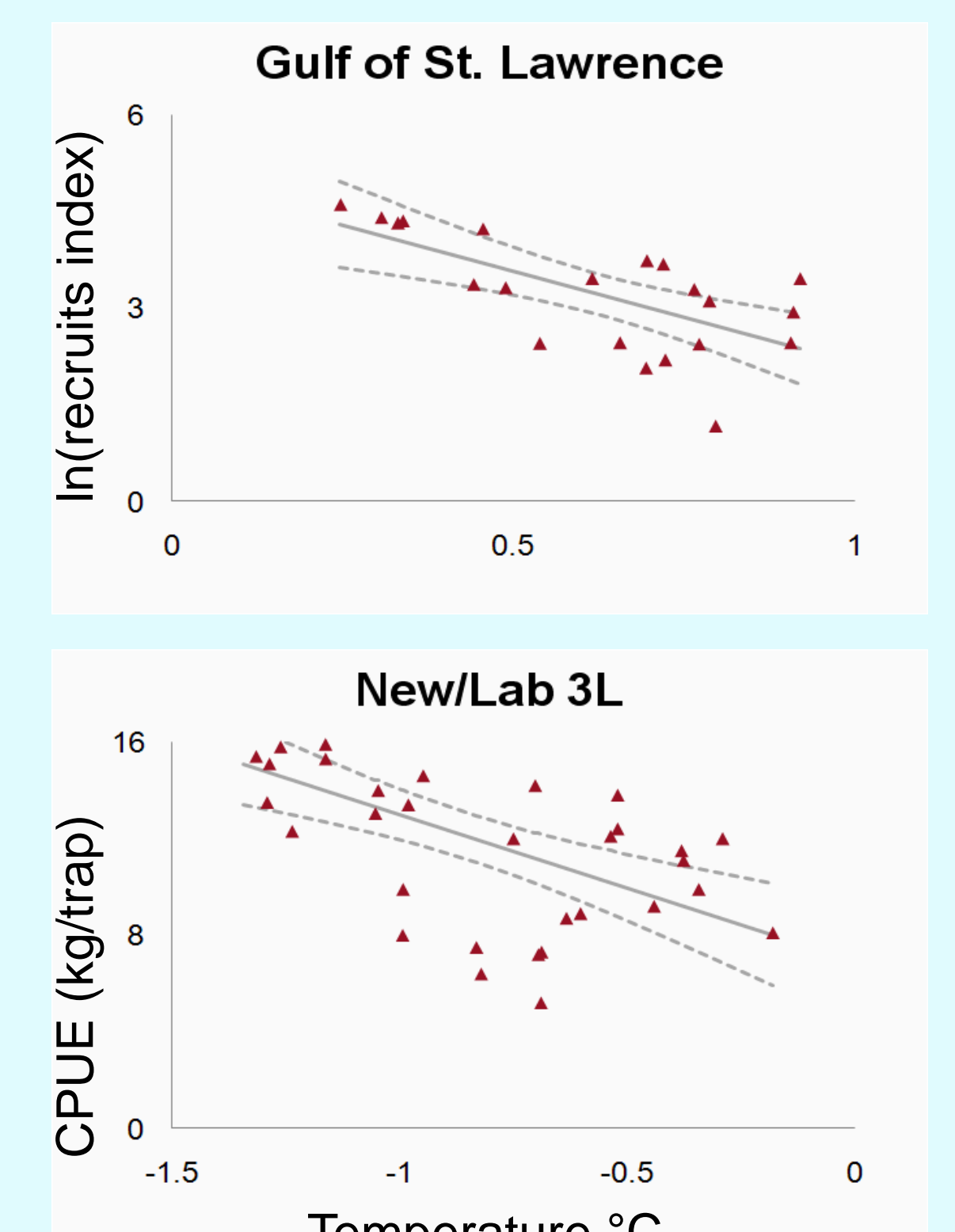
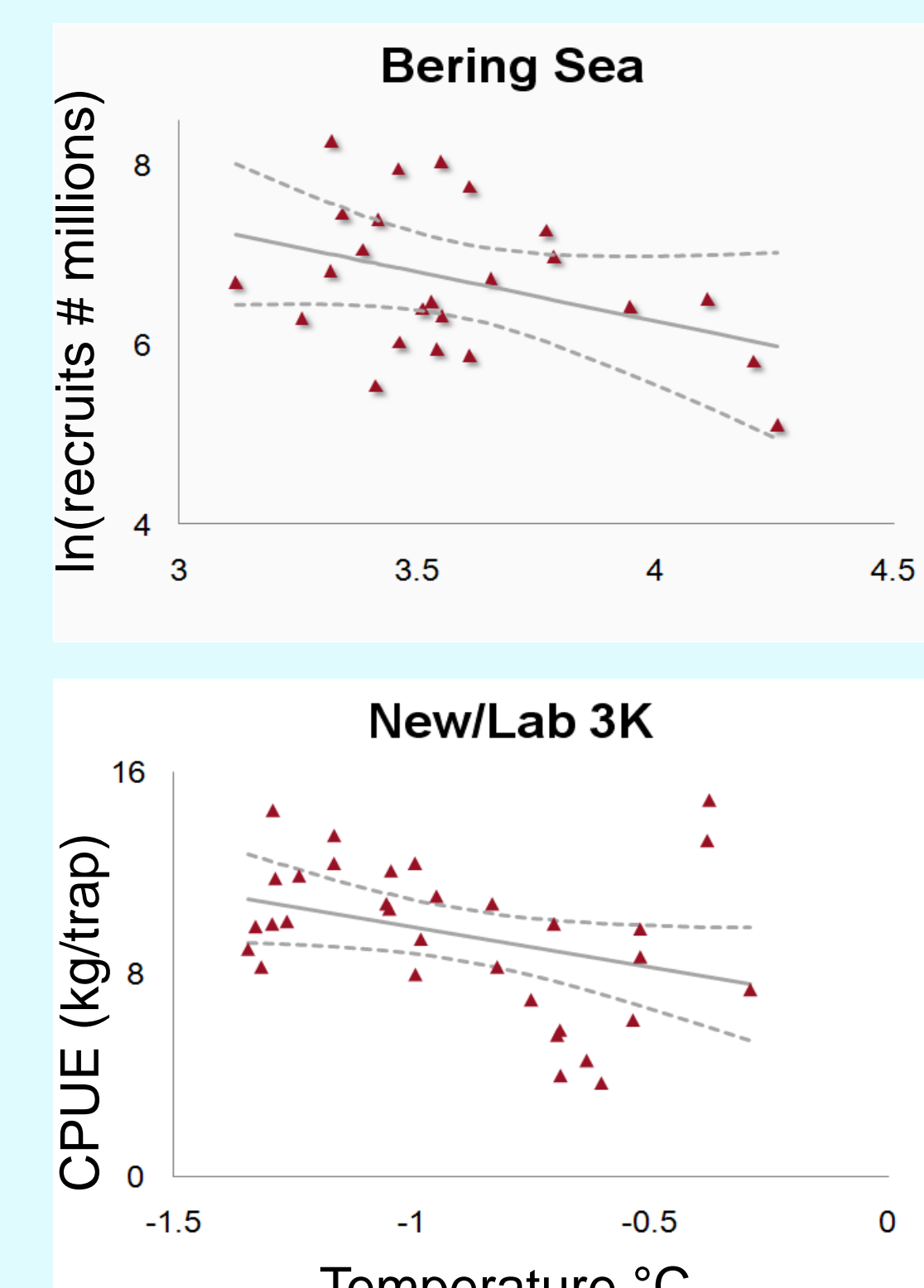
West Greenland: Wieland et al.



Barents Sea: Hvingel

Analyses indicate no consistent relationship between shrimp abundances with gadoids, nor with physical variables in the different regions. Further studies are ongoing.

Analyses of snow crab show no relationship with gadoid abundance but do show a negative relationship with temperature for all regions investigated.



Marcello et al.

ESSAS is continuing to undertake further comparative studies using both observations and models. This poster is based on the work of many ESSAS scientists whom I gratefully acknowledge and thank.