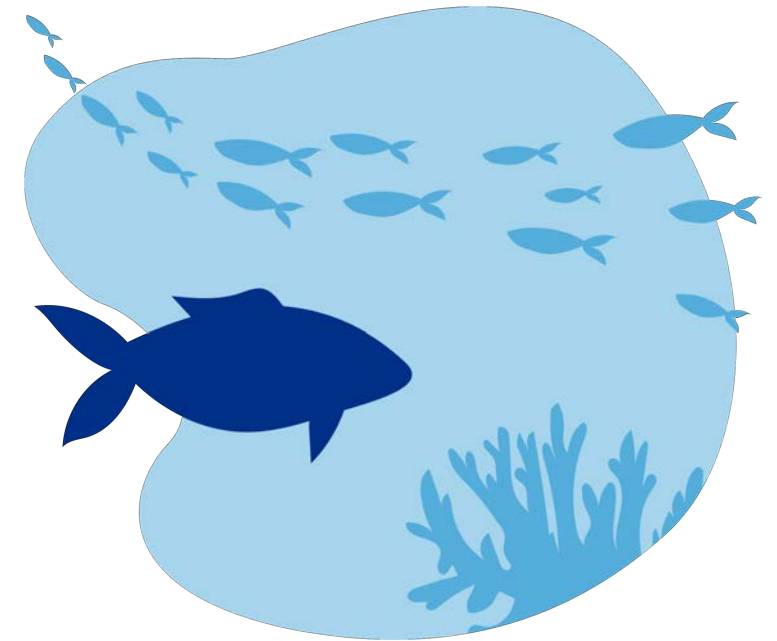


Ocean predictions at the applications interface



Kelly Kearney^{1,2}, Albert Hermann^{1,3}, Wei Cheng^{1,3}

¹University of Washington, CICOES

²NOAA Alaska Fisheries Science Center, ³NOAA Pacific Marine Environmental Laboratory

US CLIVAR Summit
July 31-Aug 2, 2023
Seattle, WA



MAPP
Modeling, Analysis,
Predictions, and Projections



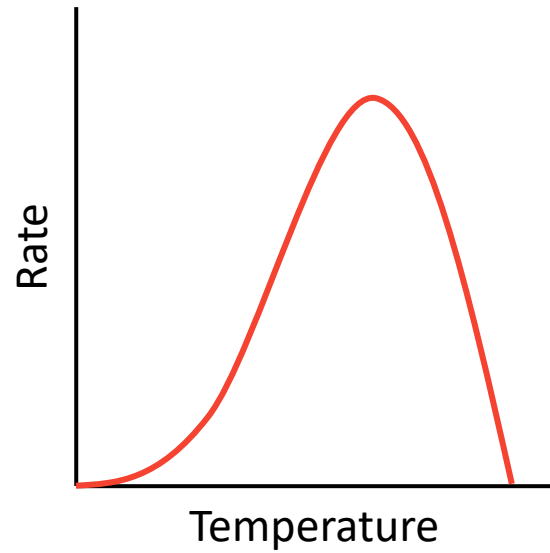
NOAA
FISHERIES



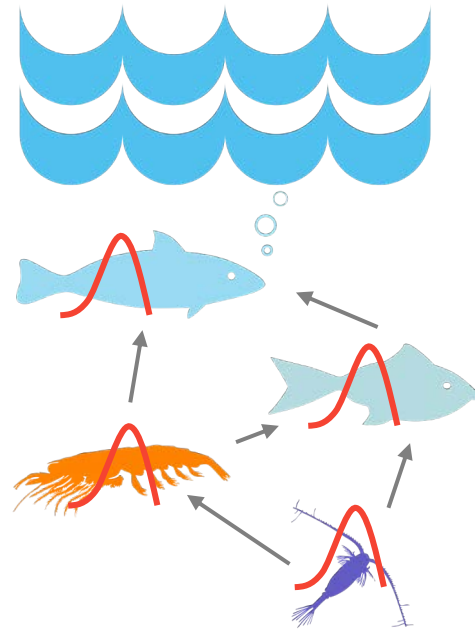
Cooperative Institute for
CLIMATE, OCEAN &
ECOSYSTEM STUDIES

How does temperature impact living marine resources?

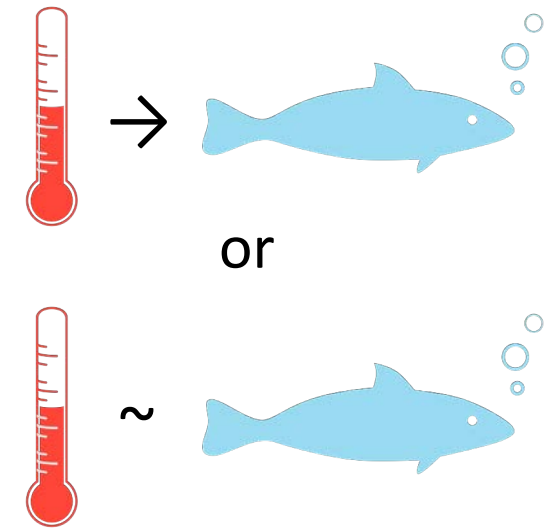
Direct



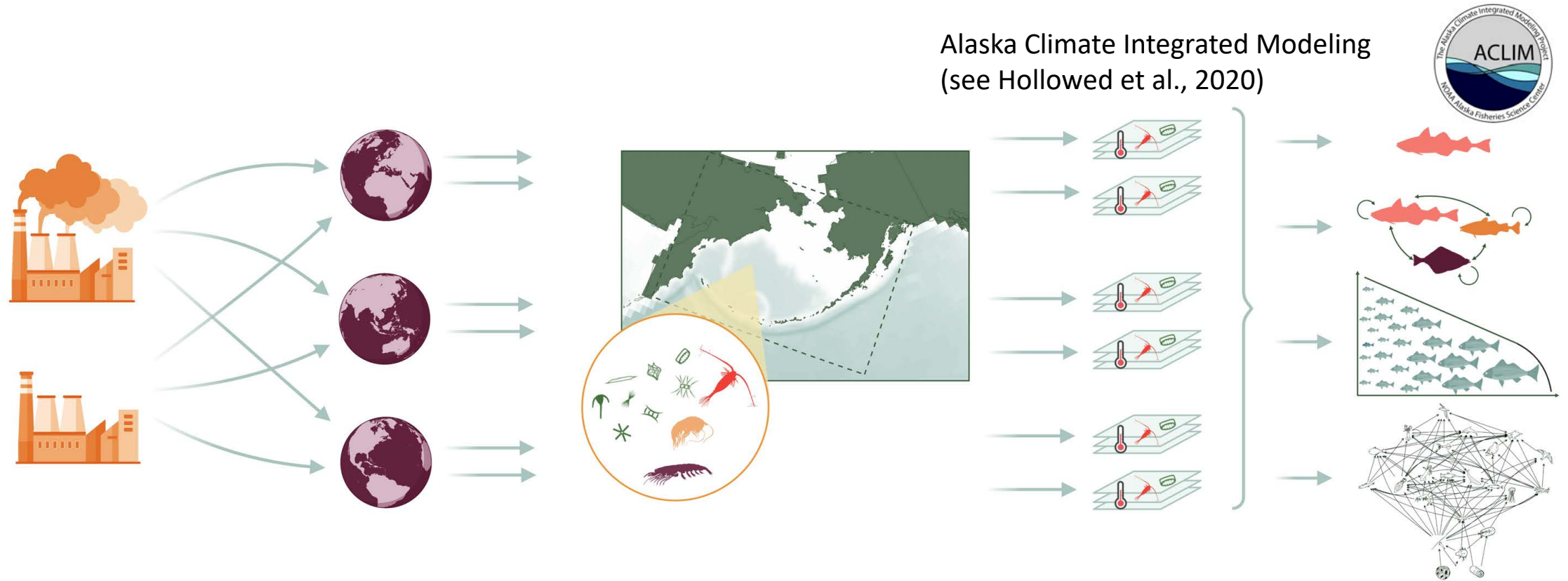
Indirect



Coincidence



Regional ocean models in a fisheries context



Socioeconomic pathways drive...

...global earth system models that...

...are dynamically downscaled by a regional ocean model.

Indices from the regional model drive...

... upper trophic level models.

Regional ocean models in a fisheries context

Ecosystem Status Report 2022 EASTERN BERING SEA



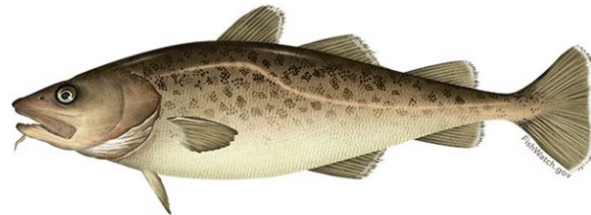
Edited by:
Elizabeth Siddon
Alaska Bay Laboratories, Alaska Fisheries Science Center, NOAA

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Appendix 2.2 Ecosystem and Socioeconomic Profile of the Pacific cod stock in the Eastern Bering Sea - Report Card

S. Kalei Shotwell, Steve J. Barbeaux, Tom Hurst, Ben Laurel, Lauren Rogers, and Elizabeth Siddon
November 2022

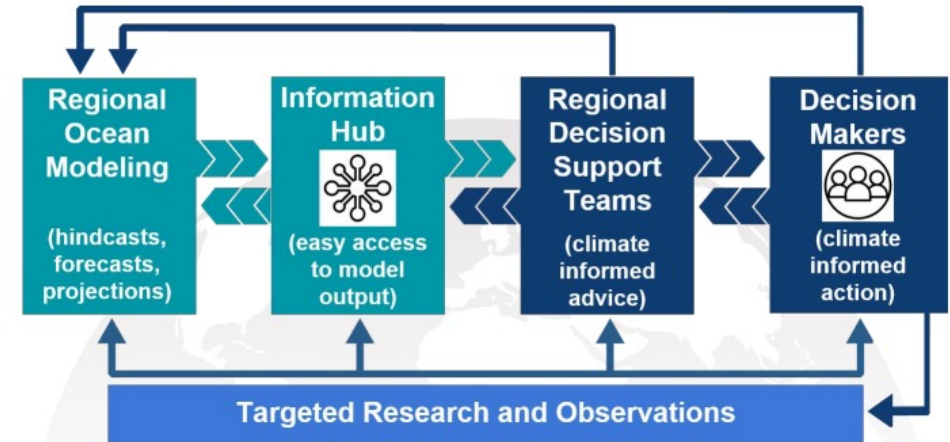


With Contributions from:

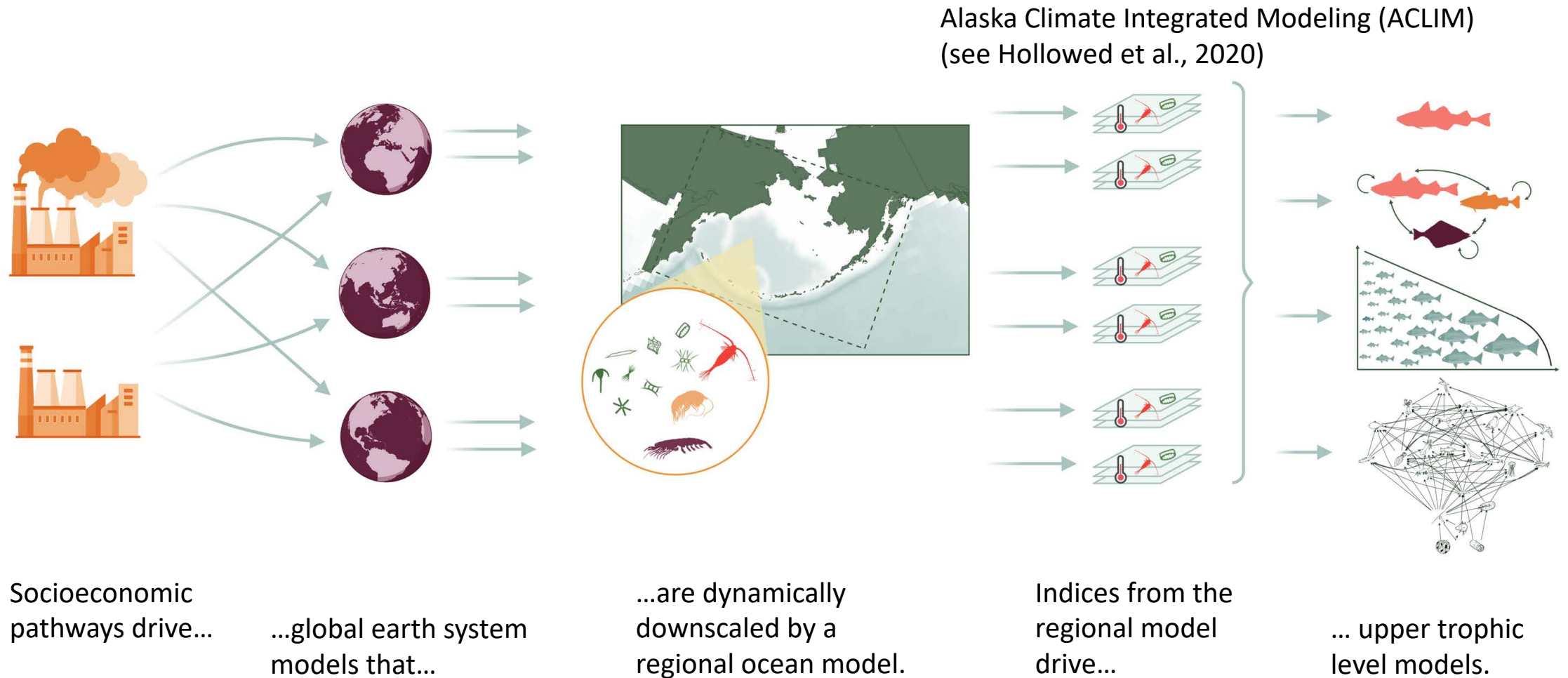
Kerim Aydin, Matt Callahan, Curry Cunningham, Lukas DeFilippo, Bridget Ferriss, Ben Fissel, Grant G. Thompson, Kirstin Holsman, Kelly Kearney, Jean Lee, Beth Matta, Sandi Neidetcher, Jens Nielsen, Krista Oke, Patrick Ressler, Heather Renner, Sean Rohan, Ingrid Spies, Katie Sweeney, Abigail Tyrell, Muyin Wang, Jordan Watson, Sarah Wise, Stephani Zador

National Marine Fisheries Service | NOAA CLIMATE, ECOSYSTEMS, AND FISHERIES INITIATIVE

CEFI Integrated Modeling and Decision Support System

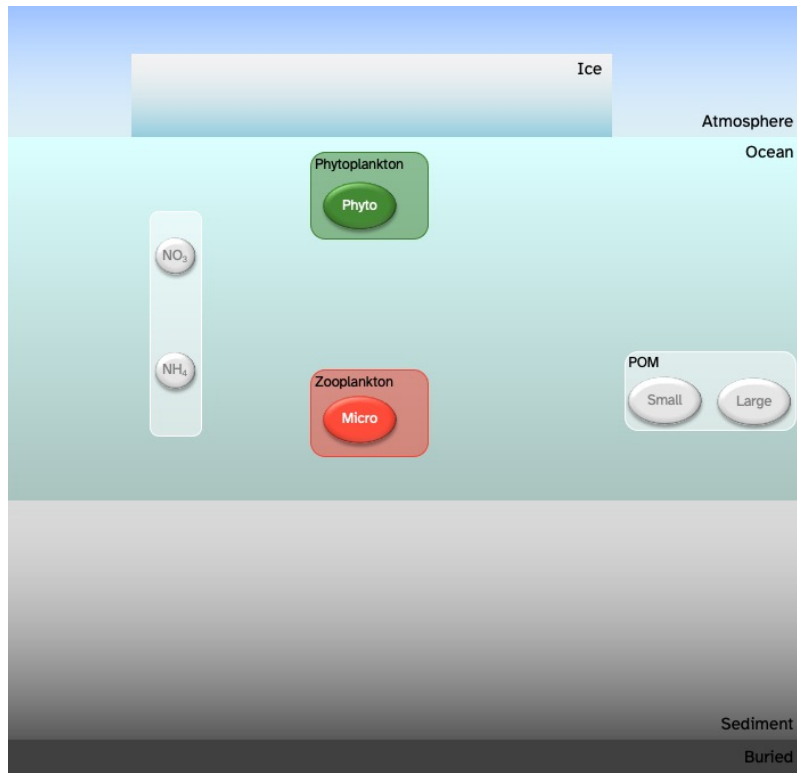


Regional ocean models in a fisheries context

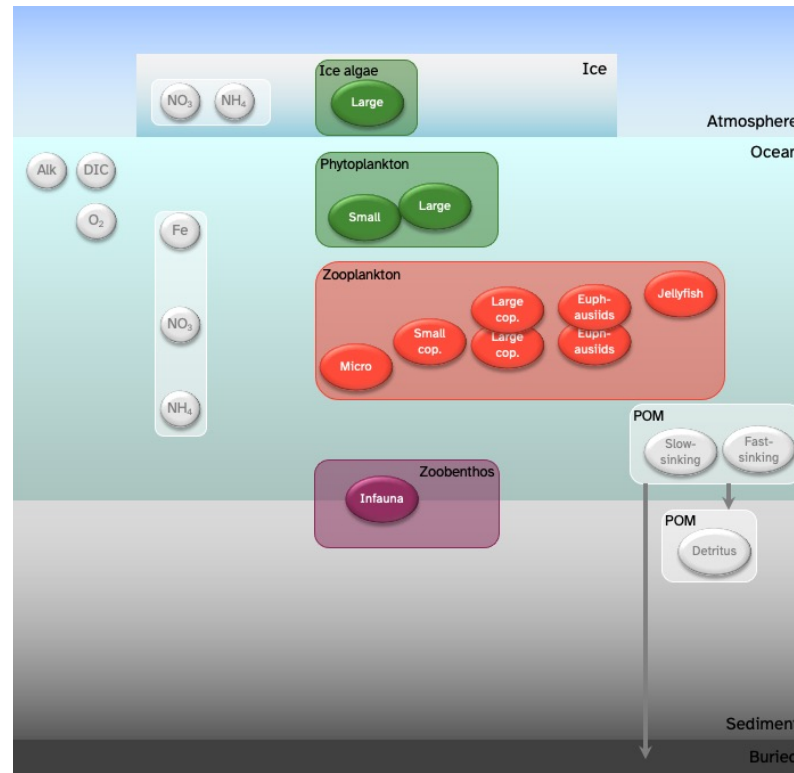


The experiment: Compare LMR metrics across a variety of models

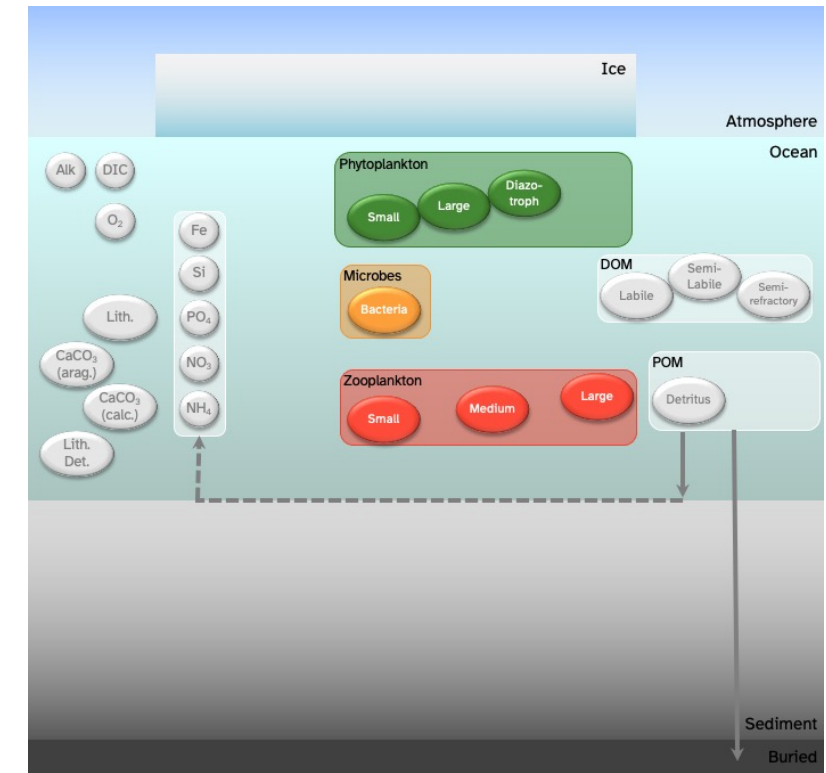
Banas et al., 2009



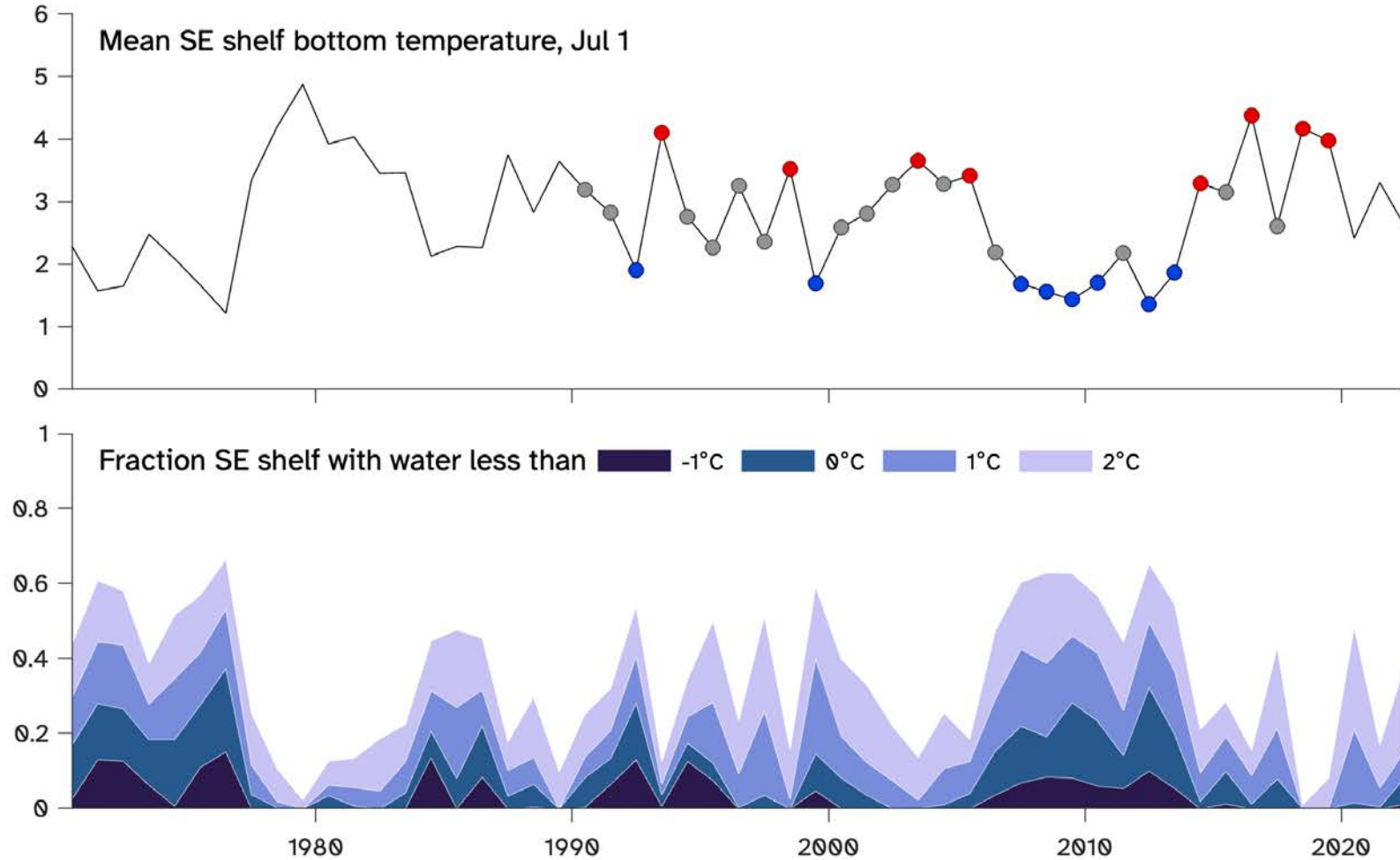
BEST_NPZ



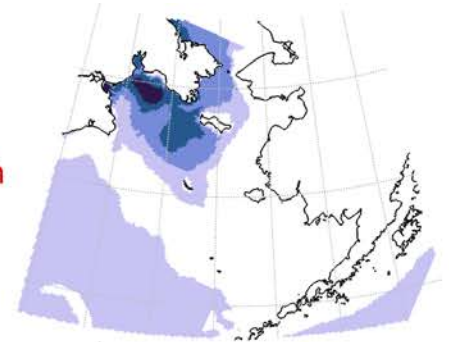
COBALT



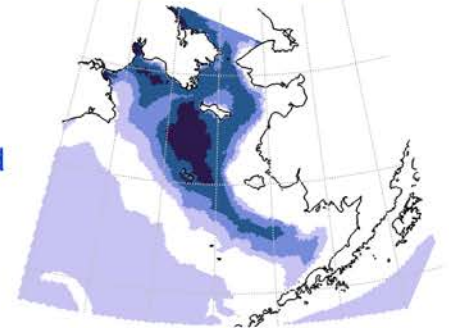
Bering Sea shelf temperature variability



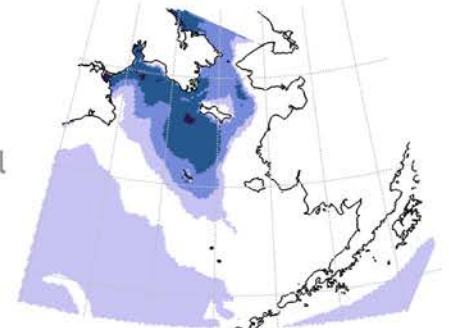
Warm



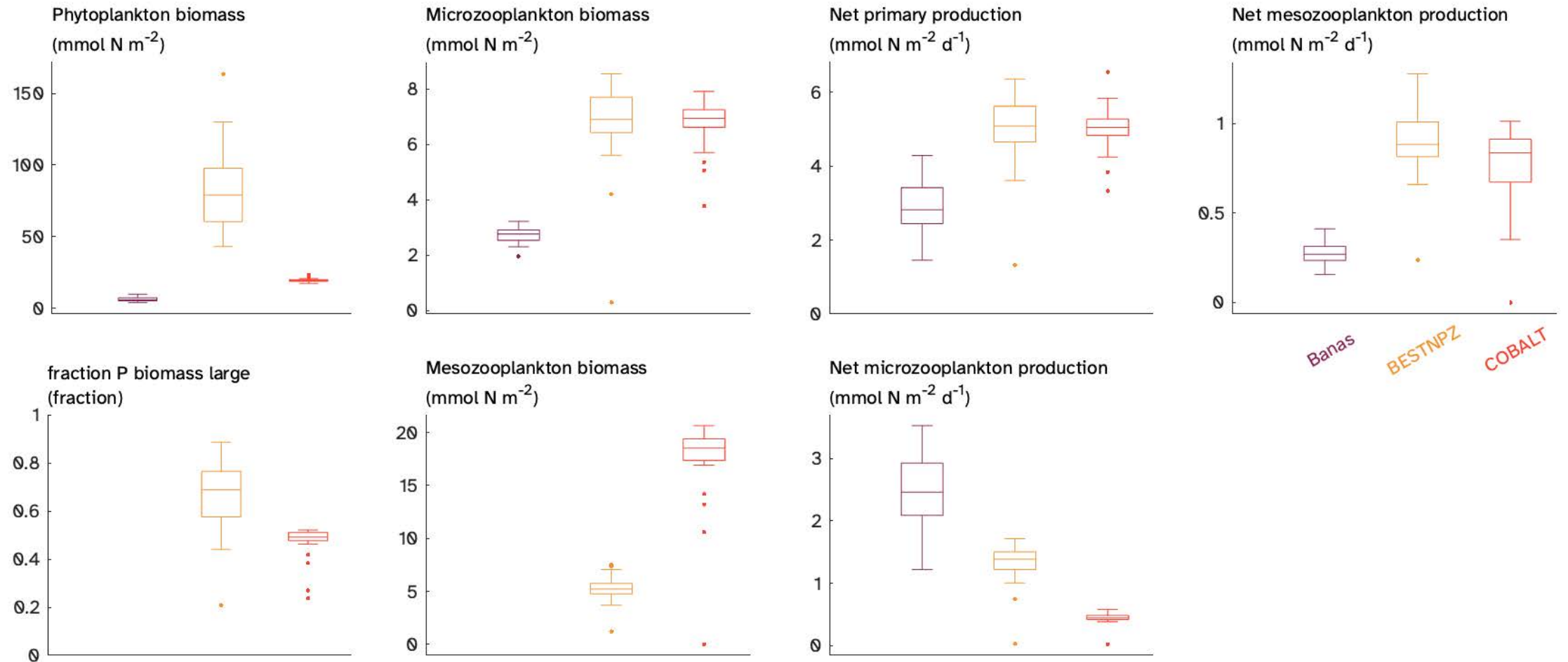
Cold



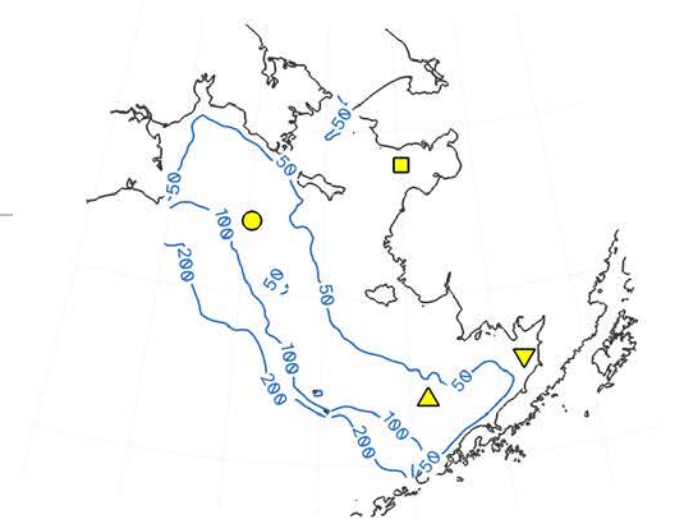
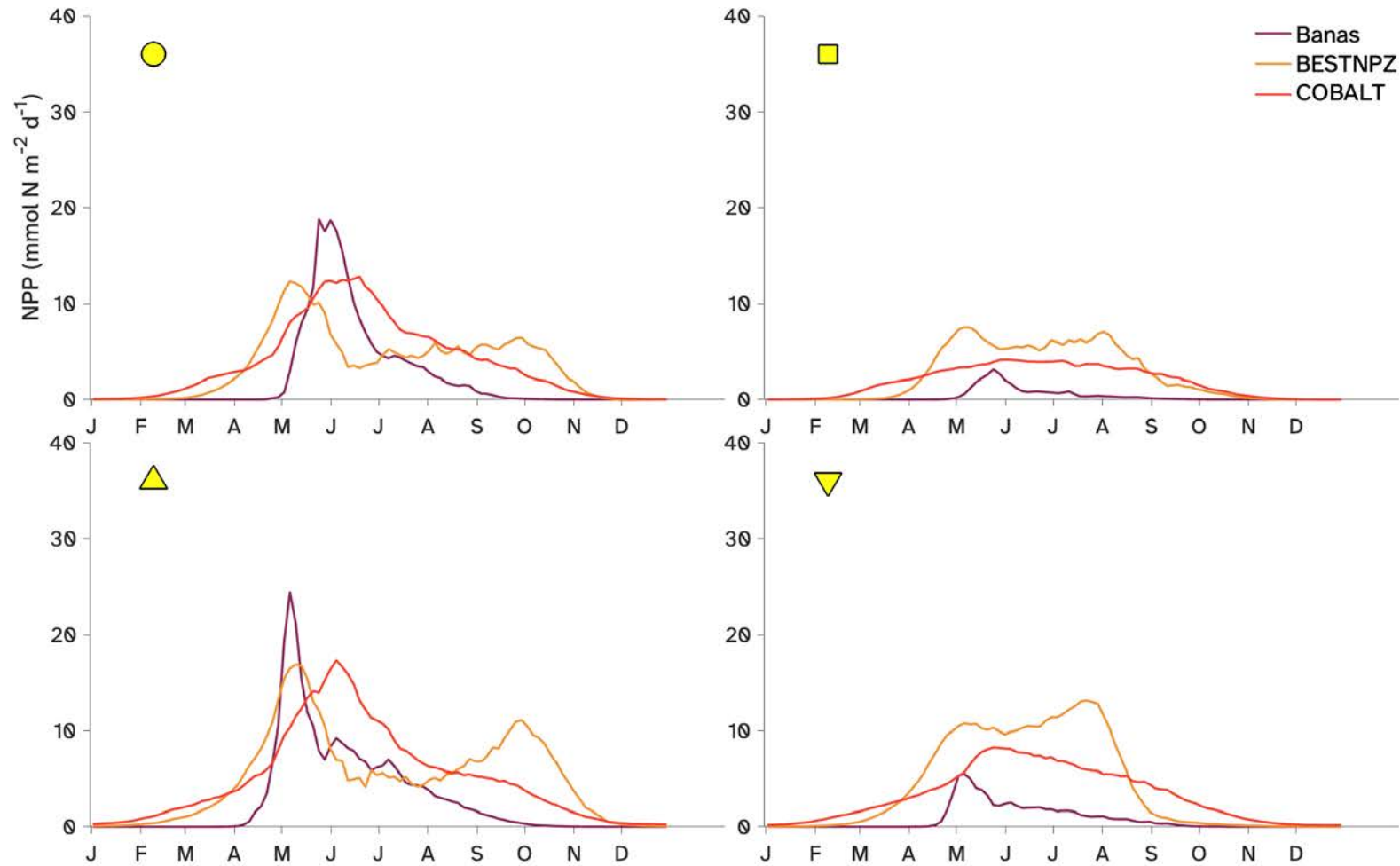
Neutral



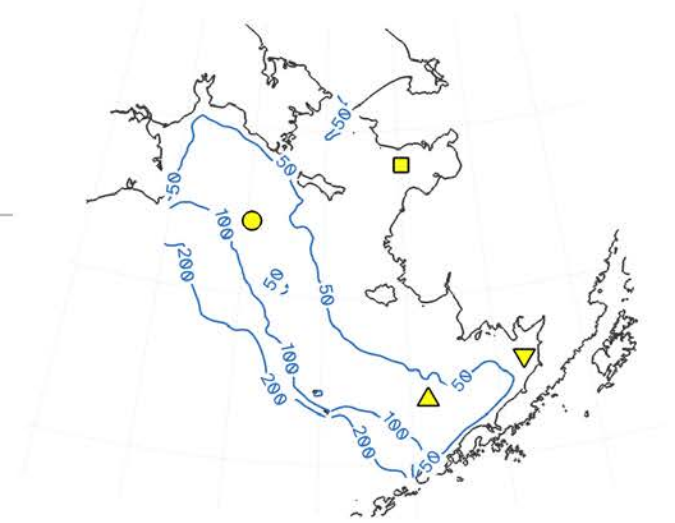
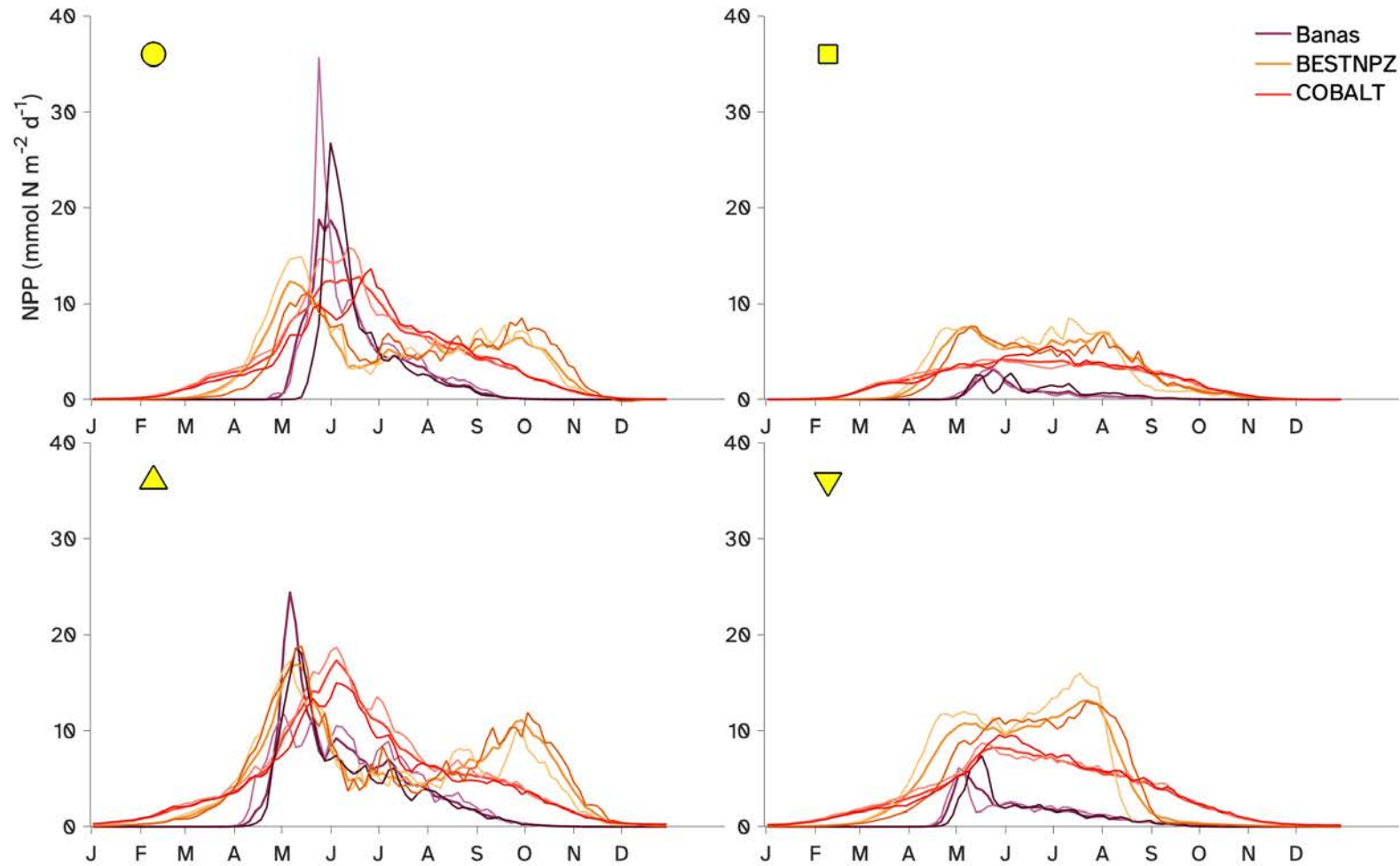
Model uncertainty vs internal variability



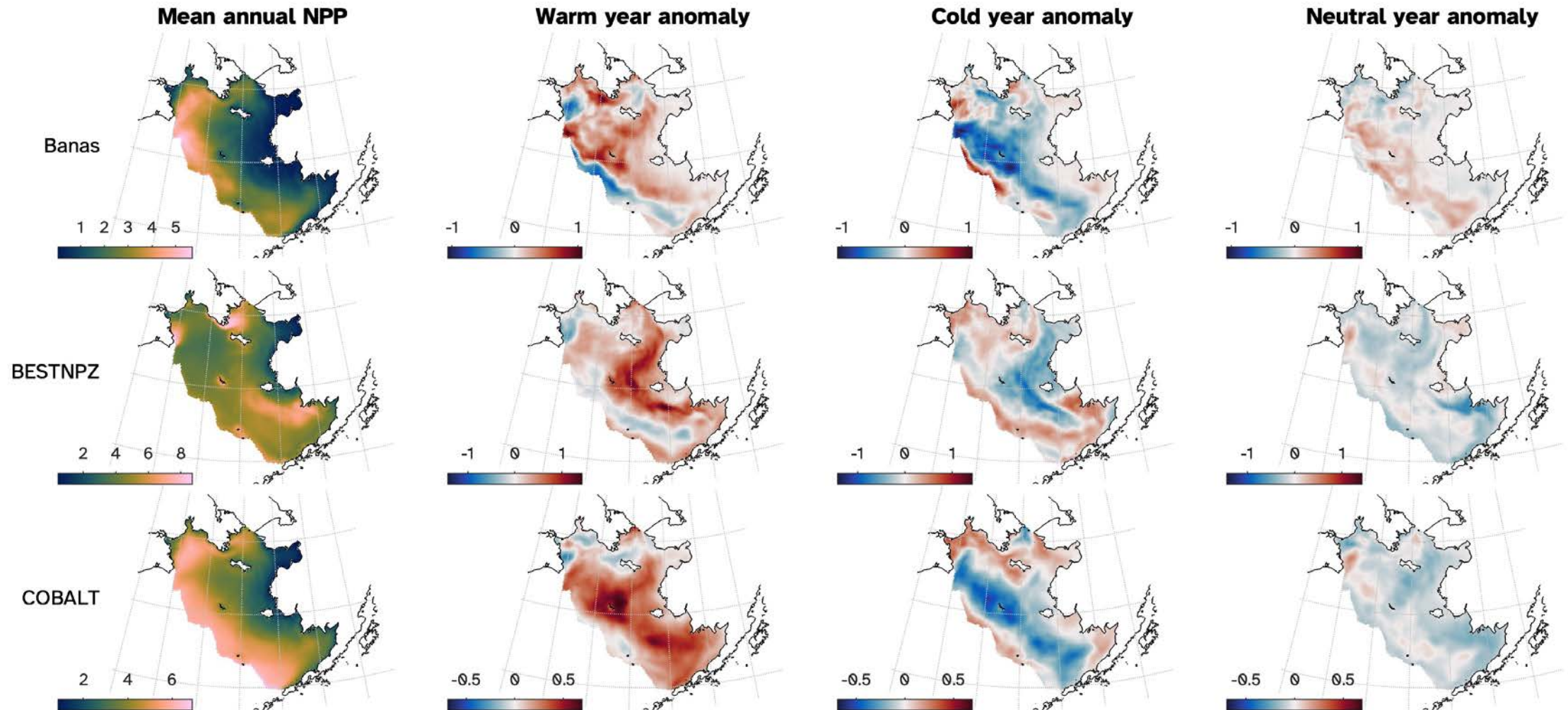
How does NPP respond to temperature?



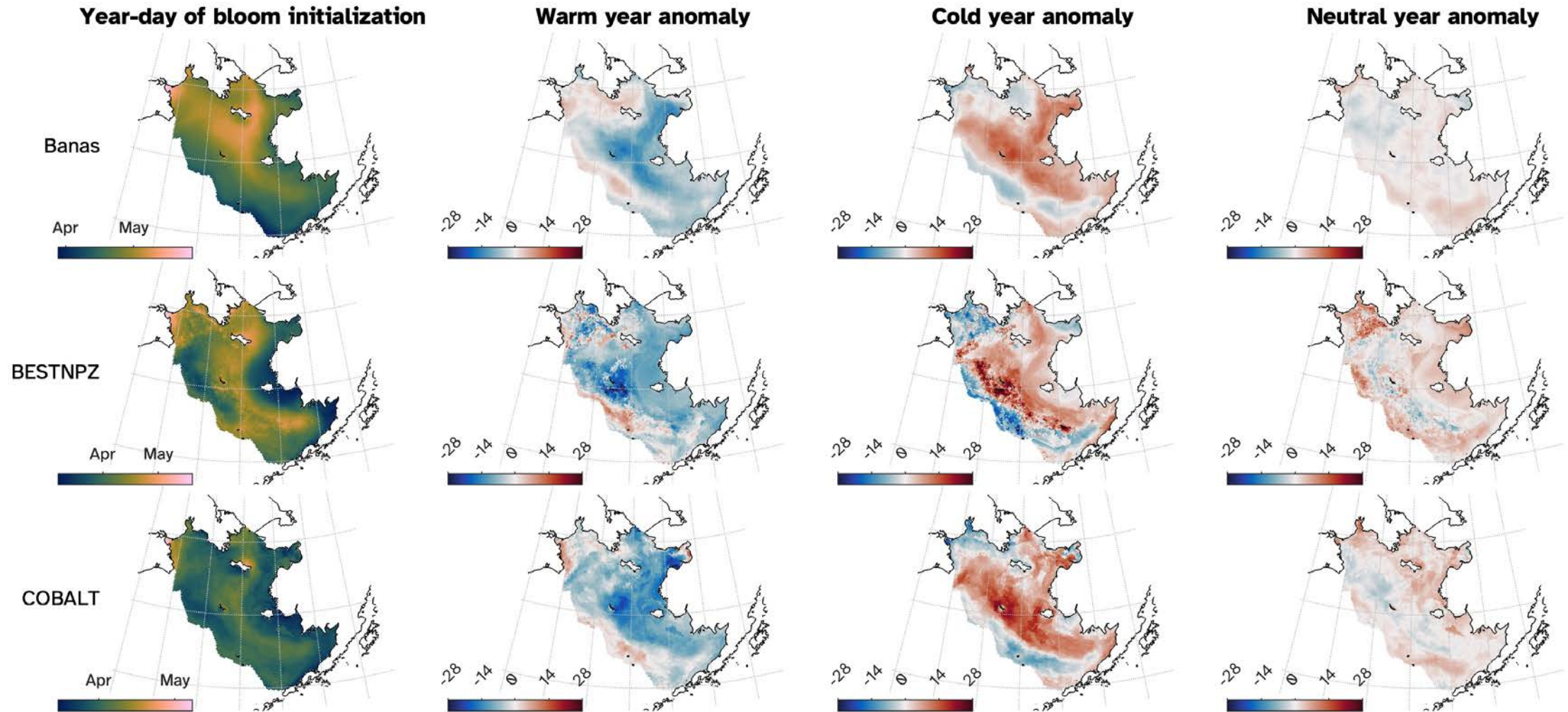
How does NPP respond to temperature?



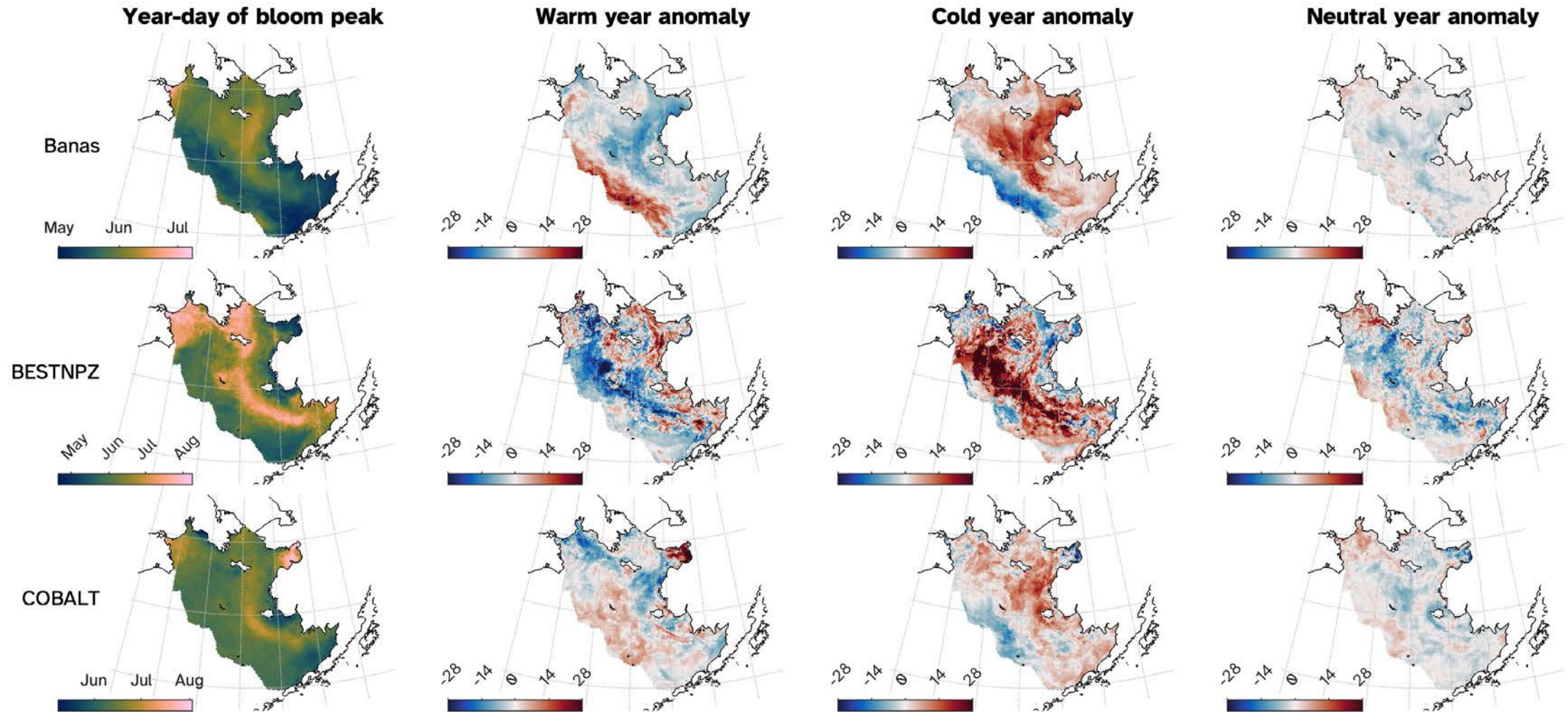
How does NPP respond to temperature?



How does NPP respond to temperature?

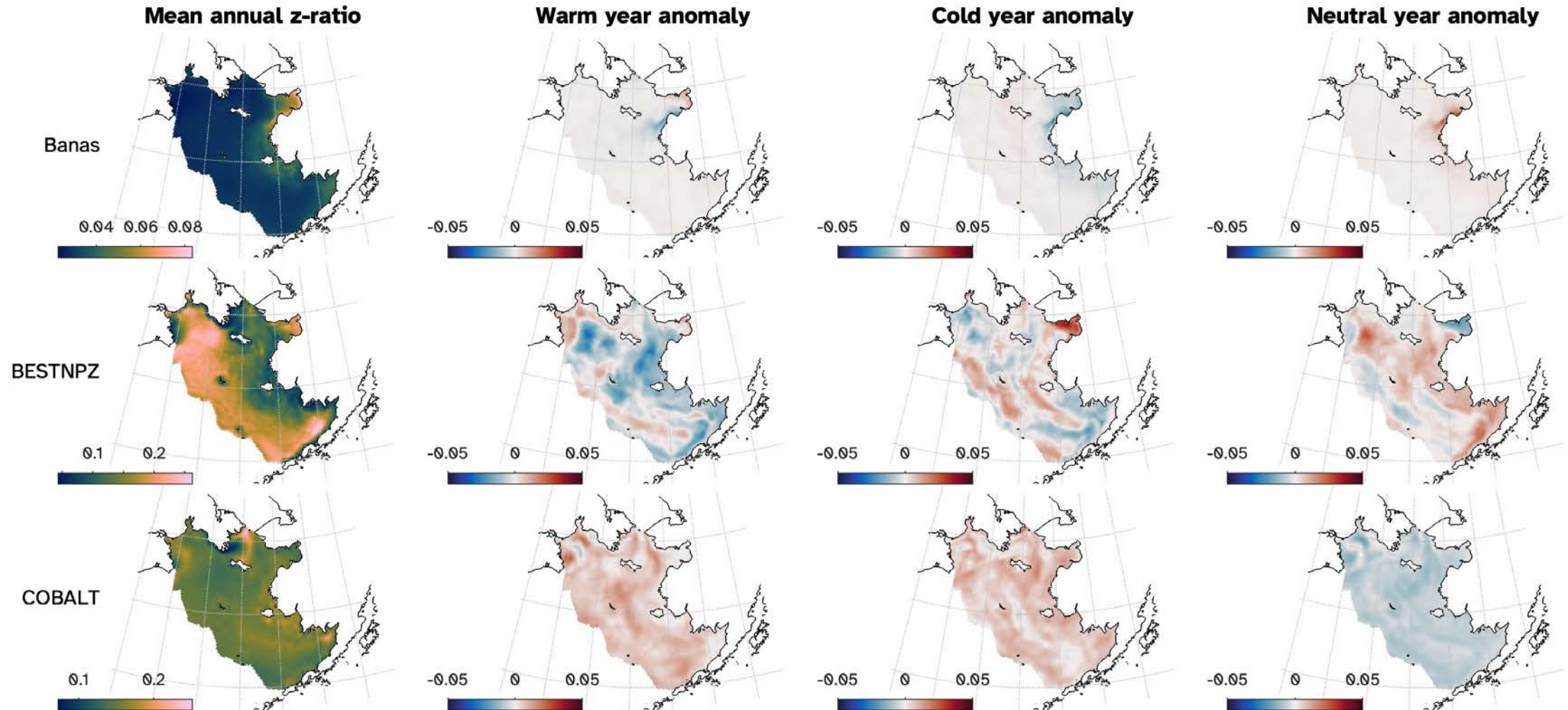


How does NPP respond to temperature?

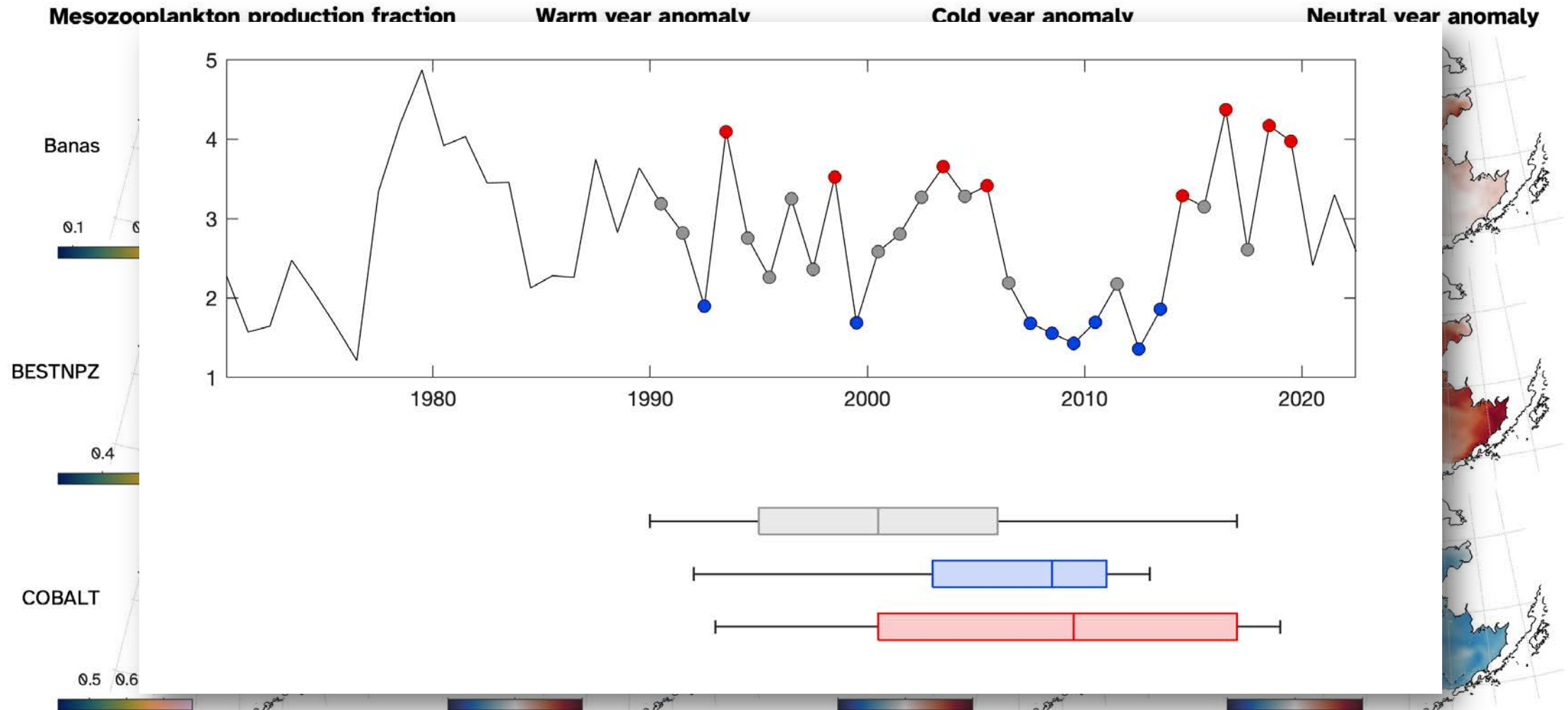


How do zooplankton respond?

z-ratio = mesozoo prod/NPP
(Stock et al., 2014)

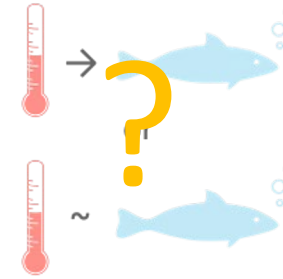
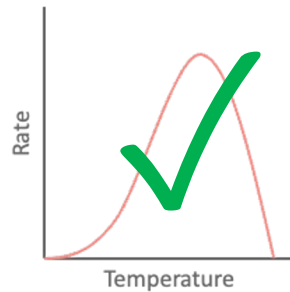


How do zooplankton respond?



What challenges do we face bringing environmental forecasts into the decision-making process?

1



2

Mismatch between model design priorities and current desired use (research focus vs use across spatiotemporal scales and with novel conditions)

3

Efforts like the CEFI are necessary to bring research-oriented models into an operational space