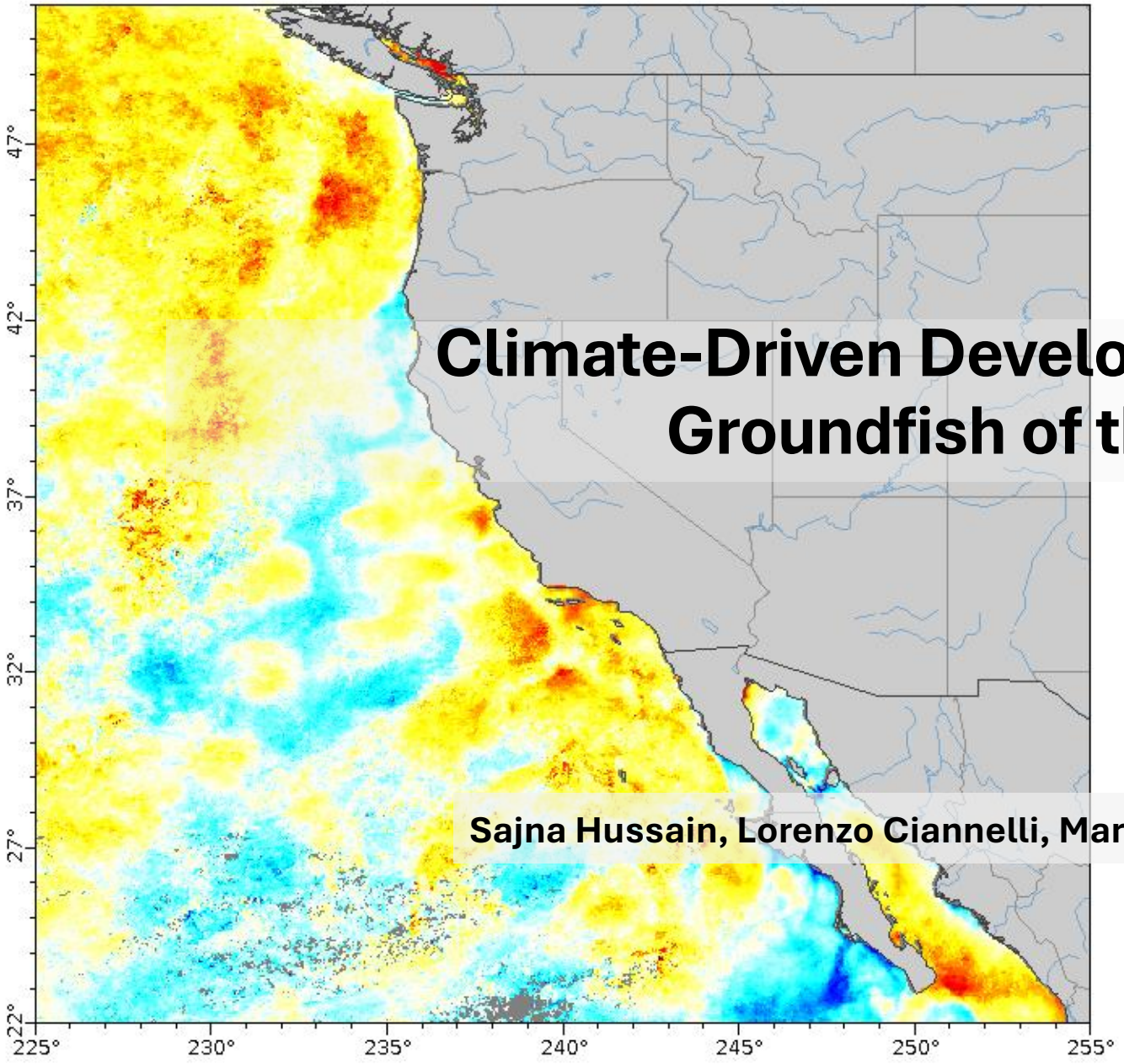


Climate-Driven Developmental and Ecological Shifts in Groundfish of the California Current Ecosystem

Sajna Hussain, Lorenzo Ciannelli, Mary Hunsicker, Eric Ward, Owen Lui and Jameal Samhouri

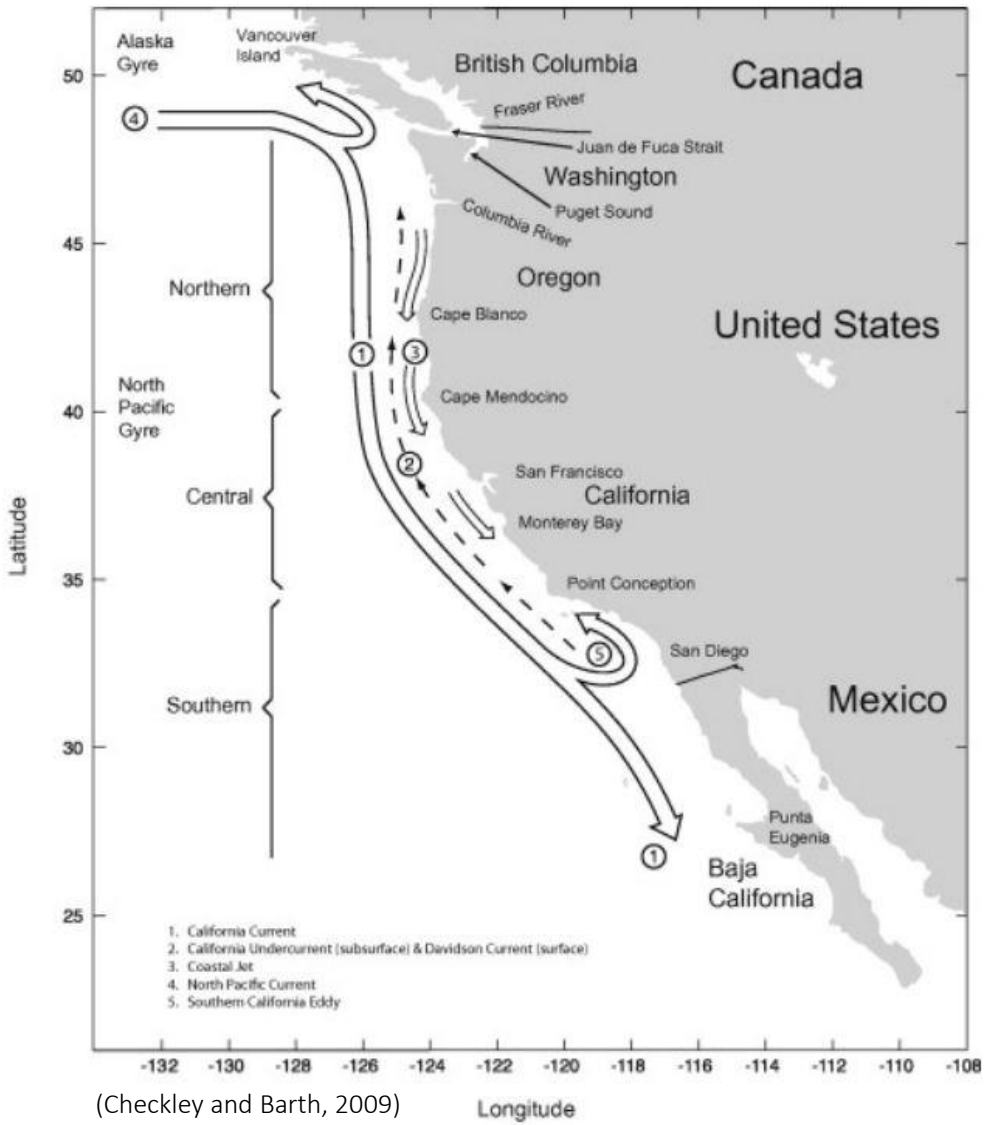
Cooperative Institute for CLIMATE, OCEAN & ECOSYSTEM STUDIES

Oregon State University

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

CICOES Virtual All Hands Meeting

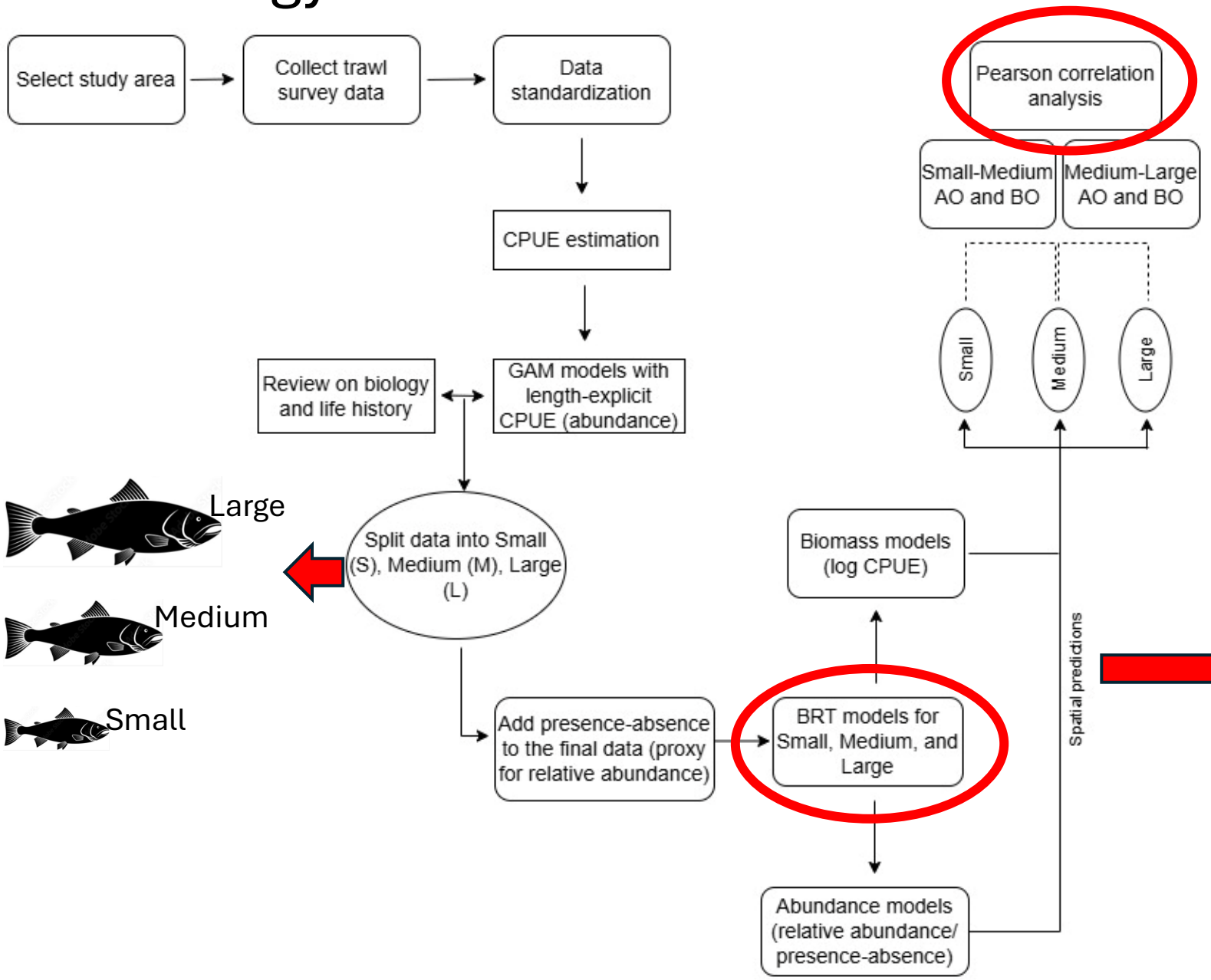
Research Questions



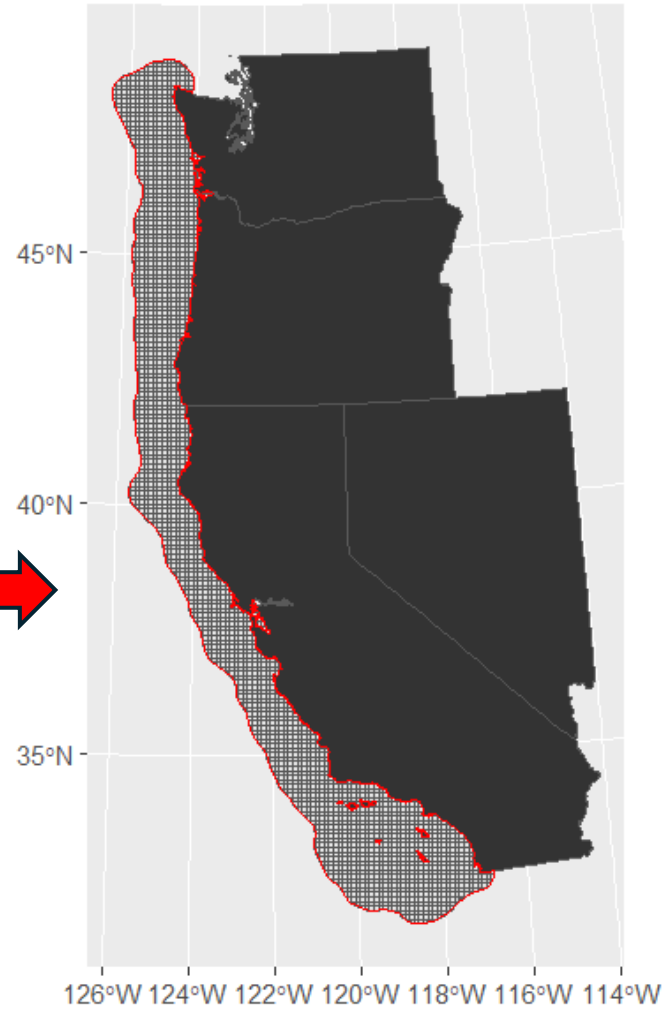
(Checkley and Barth, 2009)

- How Climate Change affects the ontogenetic distributional shifts of selected ground fish species of Northern and Central California Current Ecosystem?
- Are there changes in spatial overlap among life history stages over years?
- What are the potential distributional shifts in the future under different SSP scenarios?

Methodology

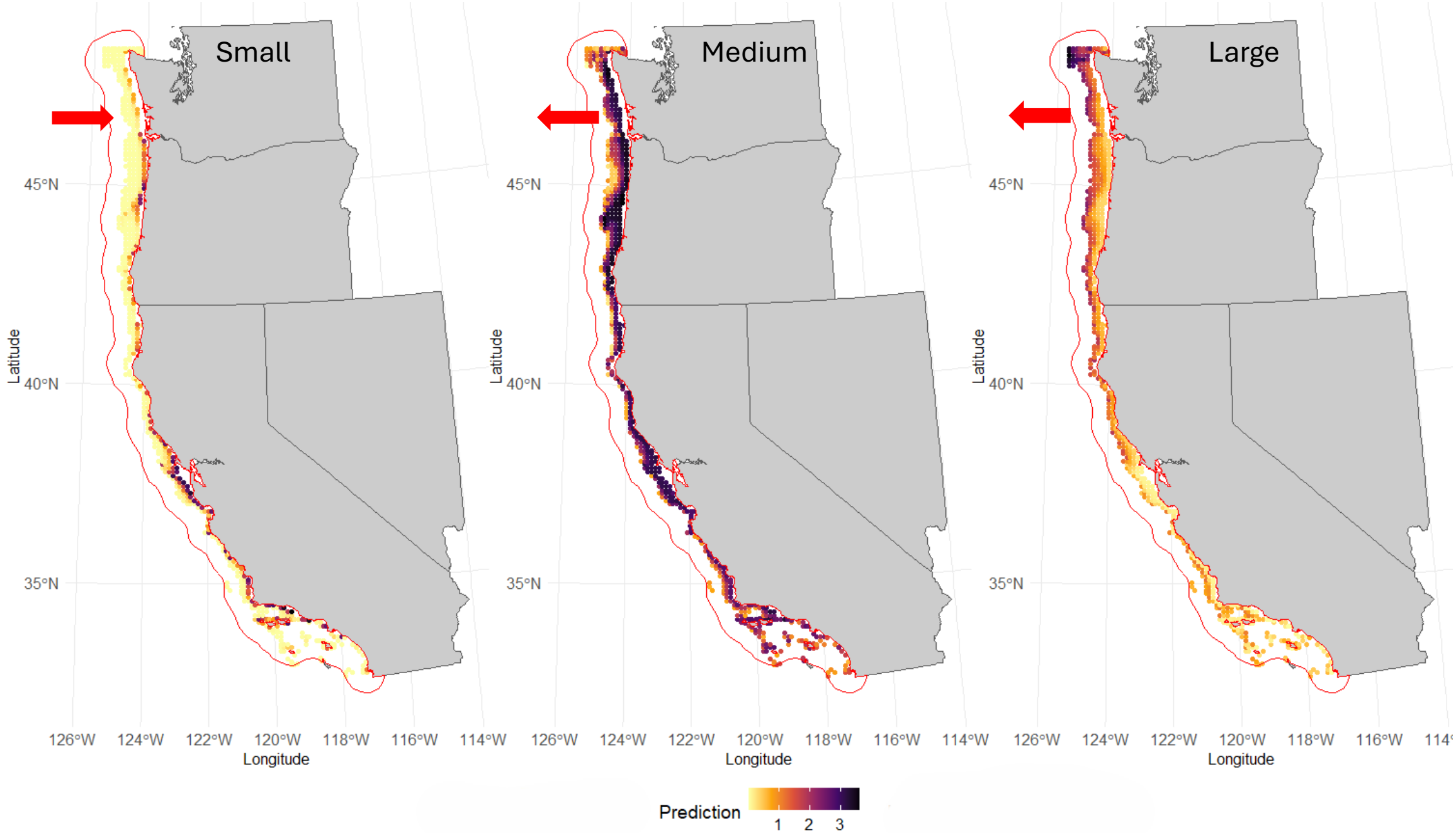


Prediction Grid



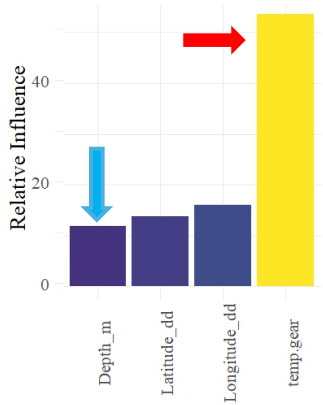
Results

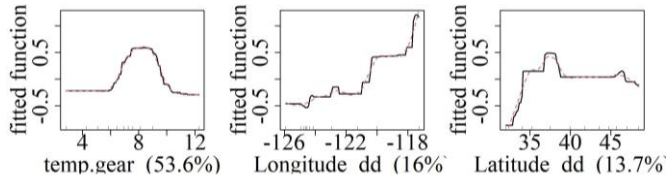
English Sole



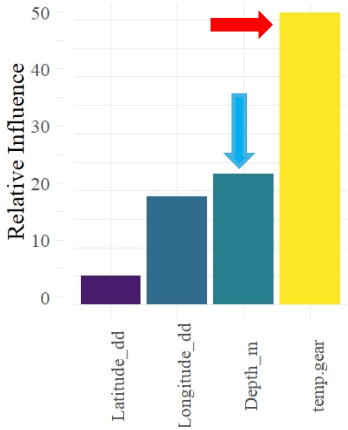
Small

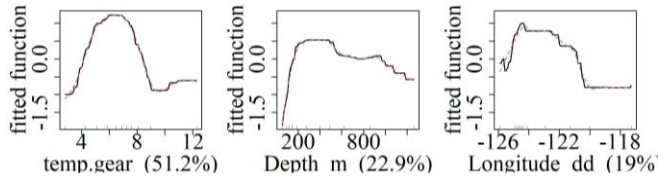
Dover sole



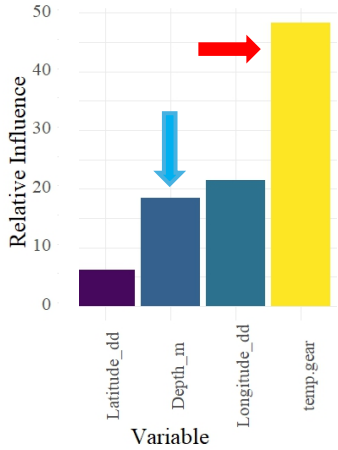


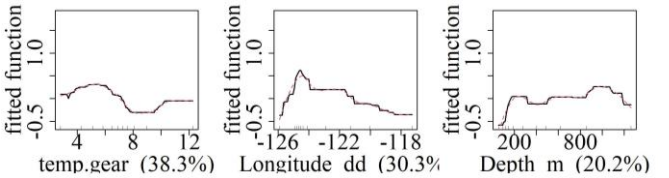
Medium





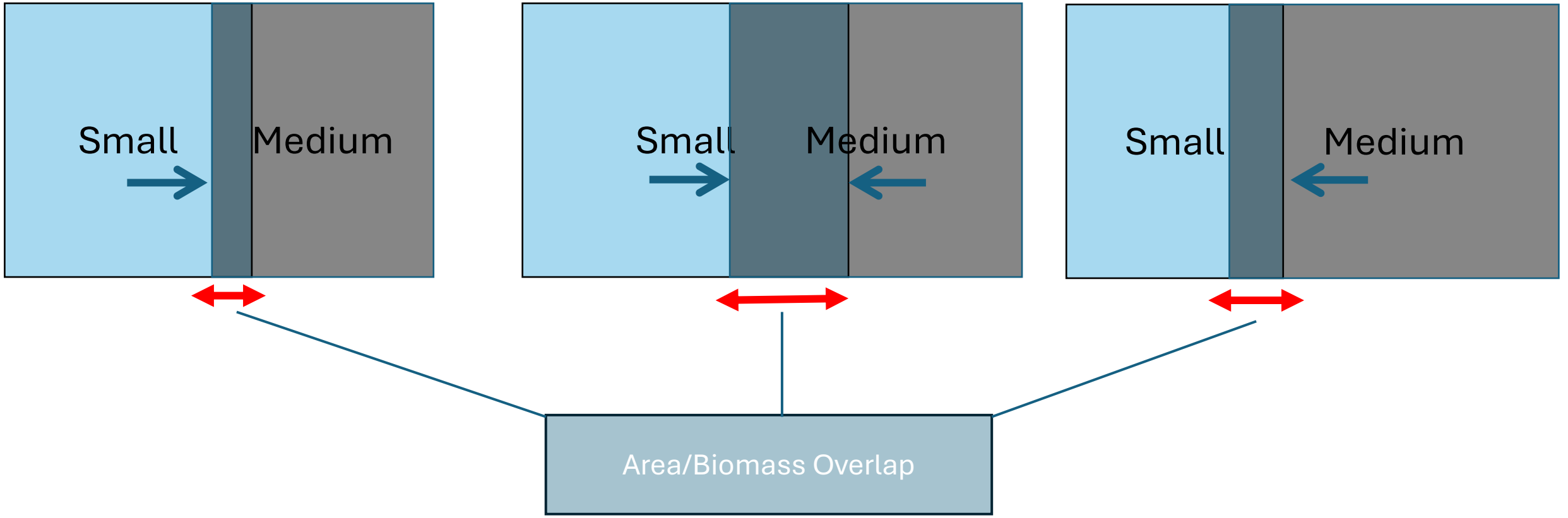
Large





temp.gear - Temperature

Ecological significance – spatial distributional shifts



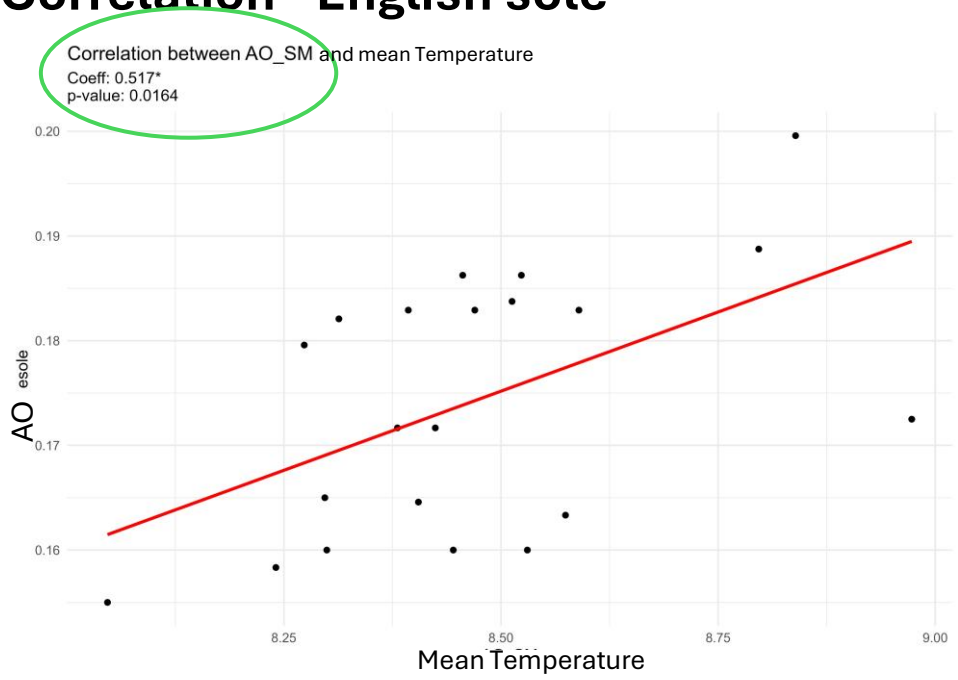
- **Area overlap** - Proportion of all sampled locations across a predefined area where the species co-occur.
- **Biomass overlap** - Amount of Medium biomass interacting with small or the other way.

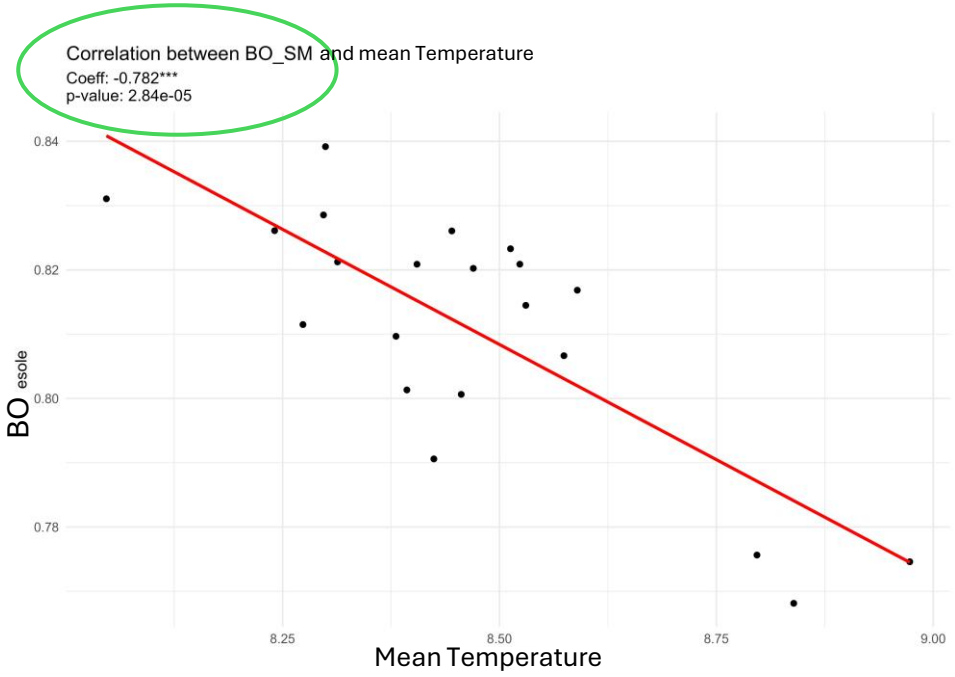
Ecological metrics

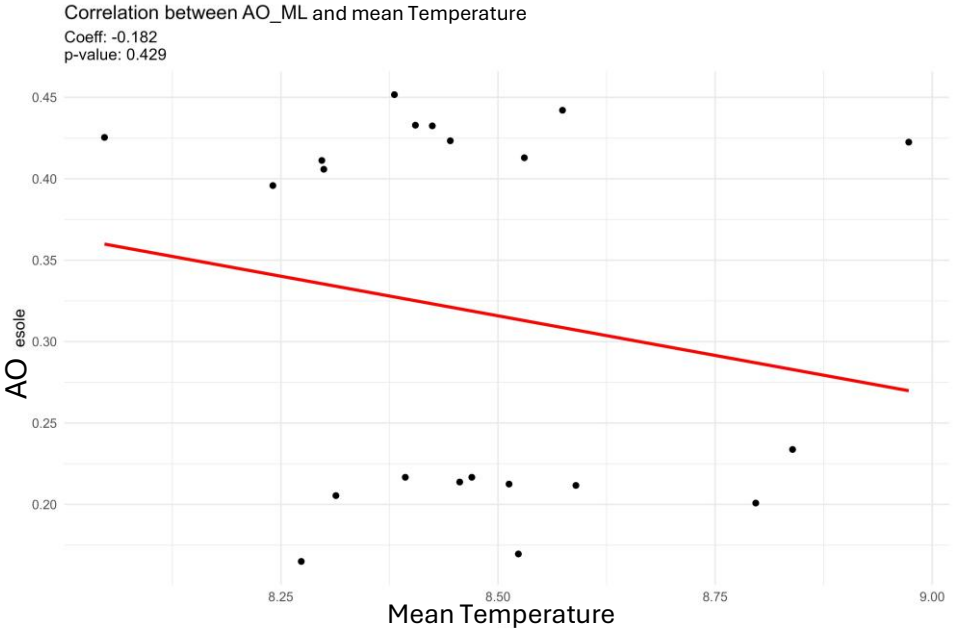
Area and Biomass overlaps (AO and BO) were estimated for Small-Medium (SM) and Medium-Large (ML) length group distributions.

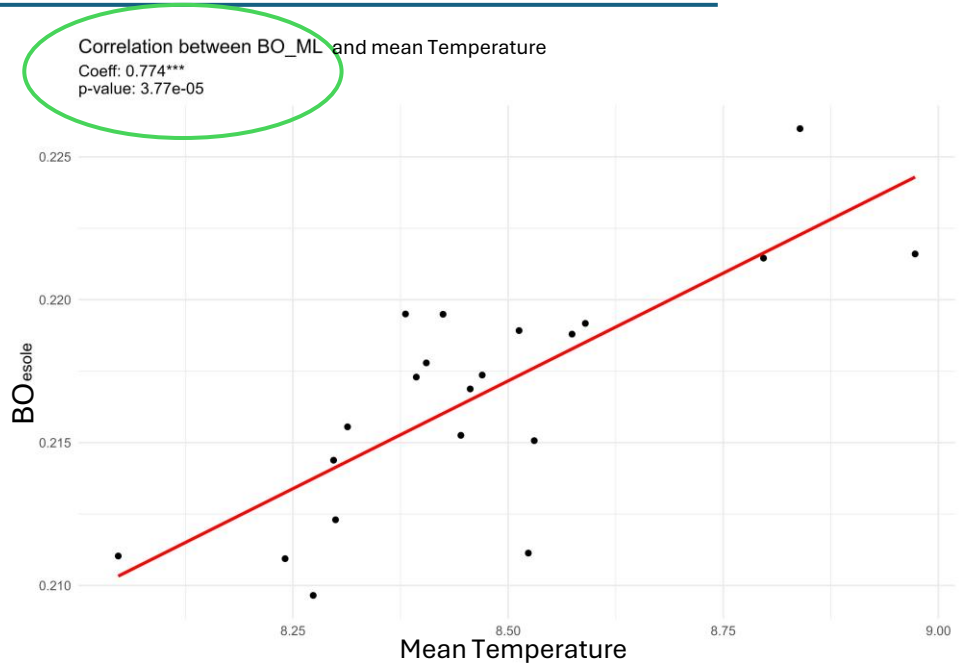
	Small	Medium	Large
Area Overlap	SM_AO	ML_AO	
Biomass Overlap	SM_BO	ML_BO	

Pearson Correlation - English sole



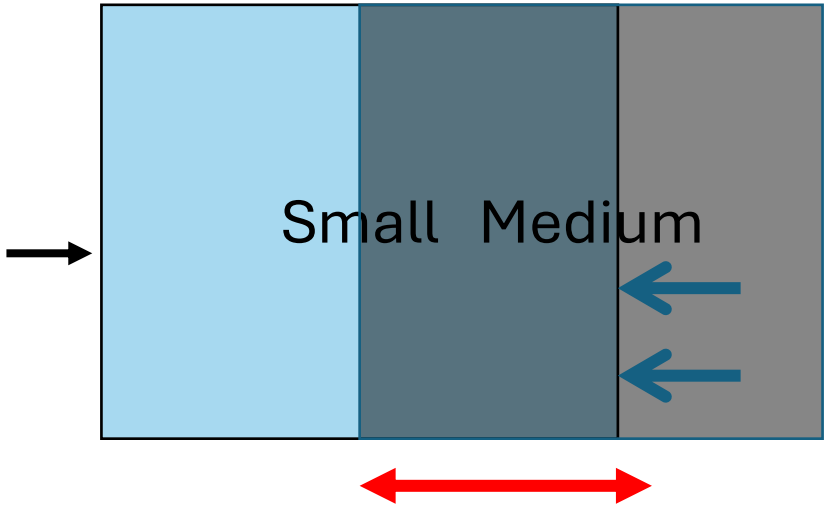






Summary of correlations

	SM_AO	SM_BO	ML_AO	ML_BO
Dover sole	-	-	-	-
English sole	+0.5 * ↑	-0.8*** ↓	-	+0.7*** ↑
Petrale sole	-	-0.3* ↓	-	-
Sable fish	-	-0.3* ↓	-	+0.5* ↑
Shortspine thorny head	-	-0.5* ↓	-	+0.4* ↑
Longspine thorny head	-	-	-	-



Matrix indicates change in spatial distribution of English sole in relation to Temperature.

Decrease in BO between Small and Medium length groups.

Increase in BO between Medium and Large length groups.

Looking into other factors affecting the spatial distributional shifts of rest of the fish species which needs to be considered.

Key Findings

- Each species exhibits an optimal window of temperature and depth for distribution.
- Response varies between length class , species, and environmental factors.
- Manuscript is in progress.

Work ongoing!

- Expanding the model to search for additional climatic factors affecting fish distributional shifts.
- Regional downscaling of climate models and predicting future distributions under SSP scenarios.

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Oregon State University

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Thank you!