

Introduction

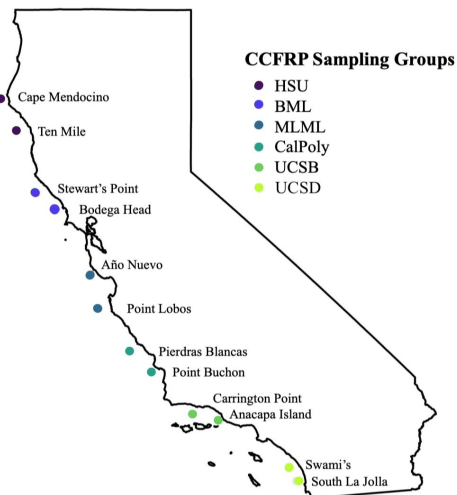
- Bergmann's rule¹ states that individuals of a species will have smaller body sizes in warm conditions and larger body sizes in areas with colder temperatures
- We used four years of data from the California Collaborative Fisheries Research Program (CCFRP) to determine if the patterns described by this axiom would be consistent for species with different life history strategies
- We compared the mean lengths of 11 of the most frequently caught rockfish species from 12 MPAs and corresponding reference sites along the California coast
- For life history strategies, we looked at the maximum age of all 11 species, as well as the water column use of 6 species

Research Questions:

1. Do the mean lengths of rockfishes vary along the California coast?
2. Do the mean lengths also vary with different life history strategies?

Methods

- All fish were caught in depths <50 m in nearshore rock and kelp habitats using standardized hook and line fishing techniques and were measured to the nearest cm
- Fish were collected from 12 MPAs and reference sites by 6 CCFRP groups during 2017–2020
- We analyzed 11 rockfish species with a variety of life history strategies
- We used fish that were greater than the length at 50% maturity² (L_{50}) for our analyses



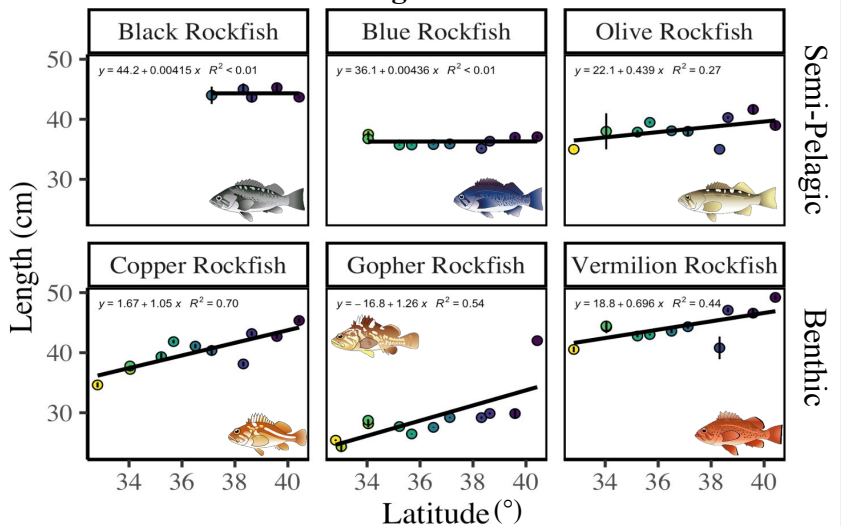
<https://mlml.sjsu.edu/ccfrp/>

References

1. Bergmann, C. (1847). *Ueber die Verhältnisse der Wärmeökonomie der Thiere zu ihrer Grösse*. Göttinger Studien 1: 595–708.
2. Love, M. S., Yoklavich, M., Thorsteinson, L. K., & Butler, J. (2002). *The rockfishes of the Northeast Pacific*. University of California Press.

Results

Mean Length vs. Latitude



Max Age < 40 years

Rockfish Species	Max Age (years)	Mean Length vs. Latitude Slope	P-value
Rosy Rockfish	14	positive	0.005*
Kelp Rockfish	25	positive	0.023*
Olive Rockfish	30	positive	0.126
Gopher Rockfish	30	positive	0.006*
Brown Rockfish	34	positive	0.108

Max Age > 40 years

Rockfish Species	Max Age (years)	Mean Length vs. Latitude Slope	P-value
Deacon Rockfish	44	positive	0.035*
Blue Rockfish	44	~ 0	0.971
Black Rockfish	50	~ 0	0.991
Olive Rockfish	50	positive	0.126
Vermilion Rockfish	60	positive	0.027*
China Rockfish	79	positive	0.005*

Takeaways

- The mean lengths of 3 benthic species, Vermilion, Copper, and Gopher Rockfish, vary significantly from south to north, whereas there is little variation in the mean lengths of the semi-pelagic species
- Positive latitudinal variations in mean length are seen in most species, despite differences in maximum age
- The standardization of CCFRP's sampling techniques enabled this type of geographic analysis

Acknowledgements

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* Co-Authors



Molly Alvino
molly.alvino@sjsu.edu



Konnor Payne
konnor.payne@sjsu.edu