

thesis meeting 9/21/20

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Goals for today's meeting

1. Updates to project questions and goals
2. Updates about ISI search results and terms
3. Next steps for implementing methods

Project updates

Last week we discussed how the second question listed below would be a better thematic guide to approaching this review but less able to address a quantitative question. I spent some time reading through the papers that Mary sent as well as looking through Web of Science for any inspiration. I have centered on the following directions for a quantitative project that is a more detailed version of the question I posed last week:

Does environmental variation affect how rates scale across levels of biological organization?

Overarching goal:

Conduct a meta-analysis on some subsection of the ecological literature with respect to environmental variation across different levels of organizations

Option 1. Look exclusively at temperature manipulations across all levels of organization

Driving question: + How does the magnitude of temperature response connect across different levels of organization when exposed to different types of temperature variation (diurnal, stochastic, autocorrelated etc.) + Potential response variables: + Individual: metabolic rate, TPC + Population: population growth rate, population density, carrying capacity + Community: biomass?, NPP? Other rate based metrics? + Potential outcomes: a more nuanced understanding how the type of variation manipulation can influence differential responses across different levels of organization

Option 2: Look exclusively at diurnal fluctuations of 3 different environmental variables (temp, pH, salinity) across all levels of organization

Driving question(s):

- Is there a differential response at different levels of organization to variation in each of these variables
- How do non-linear and linear response variables respond to stochastic vs. predictable variation?
 - look at a couple different environmental variables and how different manipulations of those variables coincides with either linear or non-linear response variables
- Potential response variables:

- Individual: metabolic rate, growth rate, respiration rate (MMR)?
 - Population: population growth rate, population density, carrying capacity
 - Community: biomass?, NPP? Other rate based metrics?
 - Potential outcomes: a better understanding of these metrics that covary may not necessarily covary in their responses to variation across different levels of organization?
3. Looking at the trade-off between spatial and temporal variation in temperature in marine and aquatic systems
 4. Does environmental variation affect how rates scale across levels of biological organization?
 5. How is environmental variation (temperature, pH, nutrient composition) systematically studied and manipulated (duration and periodicity) across organismal, population, and community ecology and how does study design influence conclusions about environmental variation compare across these bodies of literature?