Oceanography Seminar

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"Multiple simultaneous stressors in marine environments"

Ocean systems are increasingly experiencing the effects of multiple simultaneous stressors. Previous work on single stressors, both in laboratory experiments as well as ecosystem modelling efforts, have highlighted how these may impact food webs. However, the presence of more than one stressor often leads to non-additive effects. Factors, including species-specific responses, ontogenetic-specific responses, stressor combinations, etc. can all influence how stressors interact and impact an organism. This, in combination with understudied species groups and geographical areas, means that there is uncertainty around the magnitude and direction of interaction effects, with consequences for our understanding of ecosystem-wide impacts. While several ecosystem models have incorporated interactions between stressors in their work, these efforts did not isolate the interaction effect, hampering their ability to explore the interplay between species, stressors, and multiple stressor interactions. A new modelling framework presented here aims to address this gap. Two model application examples are presented, one based on the California Current and one on the Chukchi Sea, to demonstrate effects between stressor strength, stressor variability and changes in interactions between multiple stressors and may result in changes in relative biomass.

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