UCONN

UNIVERSITY OF CONNECTICUT

Department of Marine Sciences
Presents a Seminar by

Samantha Siedlecki

UConn Marine Sciences

Predicting future coastal ocean biogeochemistry - how coastal processes modify projections and forecasts of ocean health measures

The upward trend in atmospheric carbon dioxide is accompanied by a trend in the carbonate system of the global ocean referred to as ocean acidification (OA). In coastal environments, local processes can modulate or exacerbate these trends. These processes occur on spatial scales that are not well represented in global climate models (GCMs), but the importance of these processes to modification on climate timescales for coastal carbon or oxygen trends remains understudied. Using downscaled simulations to project future (~2100) carbonate system conditions off the west and east coast of the U.S under RCP 8.5, spatial and temporal patterns in OA trends in these environments are compared to 1 degree CMIP5 simulated patterns in these same regions. Modification is quantified on the west coast simulations using a five member ensemble. When the mean and ensemble spread from the downscaled projections to the 1 degree model projected changes fall outside of the annual average results from the global models, the change is found to be modified. On the west coast, the carbonate variables are modified by coastal processes and correlations with other variables suggest that the benthic pelagic coupling and sedimentary impacts on the total alkalinity dynamics on the simulated shelf in the downscaled simulations drives the modification. A suite of forecasts have been in development for the Pacific Northwest coast including a short-term forecast (LiveOcean, 72 hour) and a seasonal forecast system called J-SCOPE which can be used in the interim to explore using model tools to inform decisions facing coastal communities regarding ocean health. On the east coast, a suite of downscaled models all project more severe than or similar change to the global CMIP5 models used to drive them with the most dramatic differences subsurface. The results suggest projections that resolve coastal processes are necessary for adequate representation of the magnitude of projected change in carbon stressors in the both of these systems. Our results will shed light on the extent and timing of the risks to local ecosystems and provide critical guidance to those concerned with mitigation of and adaptation to the threat of ocean acidification and deoxygenation.

Host: Craig Tobias
Time & Date: 11:00 am, Friday, September 23, 2022
Place: Lowell Weicker Building, Seminar Room 103 (or WebEx)

Please visit this page to request seminar information:
https://marinesciences.uconn.edu/seminar/seminarform/

If you are an individual with a disability and need accommodations, please contact 860-405-9152 or email marinesciencesseminars@uconn.edu.
For cancellations and additional seminar information see: https://marinesciences.uconn.edu/seminar/seminar1228/.