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# Department of Marine Sciences Presents a Seminar by


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## Carbonate dynamics in different ecosystems- from Texas to the Arctic


Atmospheric carbon dioxide ($CO_2$) has increased from the preindustrial period of 180 ppm to today's ~416 ppm. Throughout this history of human emissions, the oceans have performed an essential service by absorbing 1/3 of all $CO_2$ emissions since the Industrial Revolution. However, the continuous uptake of $CO_2$ by seawater causes a cascade of chemical reactions that allow acid to build up, a process known as ocean acidification (OA, increased seawater $CO_2$, decreased pH). Ocean acidification (OA) is well known for its deleterious consequences for ecosystem structure and function, resulting in the collapse of commercially important shellfish and severe economic losses. OA is mainly regulated by 1) accumulation of anthropogenic $CO_2$, 2) biological metabolism (i.e., photosynthesis and respiration), 3) the buffer capacity changes related to freshwater discharge or sea-ice melting. Unlike the uniform OA trends in open-ocean acidification driven by increased atmospheric $CO_2$, the coastal ecosystems display a much broader range of carbonate chemistry trends, sometimes even basification. I will take a few case studies from the Gulf of Mexico, California upwelling system and Gulf of Stream impacted area, Bering Sea, and the Chukchi Sea to show the tale of long-term carbonate dynamics and dominated process(es) in different ecosystems. At the end of my talk, I will also present to you one of my most recent works about the simulated impact of ocean alkalinity enhancement on atmospheric $CO_2$ removal in the Bering Sea.


**Host**: Samantha Siedlecki
**Time & Date**: 11:00 am, Friday, February 4, 2022

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