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Department of Marine Sciences  
Presents a Seminar by

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## **Inverse model constraints on the ocean iron cycle**

Iron (Fe) is a critical micronutrient that limits marine phytoplankton growth and carbon storage by the ocean's biological carbon pump. Changes in the Fe supply to the ocean have been invoked to explain dramatic climate shifts in Earth's history, and may drive climate feedbacks in response to future warming. However, even the most fundamental aspects of the marine Fe cycle remain poorly understood – global estimates of iron inputs from dust, sediments, and hydrothermal vents vary by orders of magnitude, and the “lifetime” of Fe in the ocean is similarly unconstrained. Here we develop a new model of ocean Fe cycling that assimilates observations from the ongoing GEOTRACES campaign, to quantify the various sources and trace the Fe they supply through the biogeochemical cycle. We show that although dust is the smallest global source of Fe, it has an outsized role in fueling primary production and carbon export, whereas sediments are the largest source but only impact phytoplankton growth locally in anoxic upwelling margins. Our findings suggest that future changes in land use that modulate the dust supply to the ocean have the greatest potential to impact marine productivity and ocean carbon storage.

**Host:** Julie Granger

**Time & Date:** 11:00 am, Friday, March 19, 2021

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