

UC SANTA BARBARA
Department of Earth Science

Earth Science Colloquium

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Oceanic emissions of nitrous oxide:
from global patterns
to regional processes

Daniele Bianchi

Atmospheric and Oceanic Sciences
UCLA

Assessment of the global budget of nitrous oxide (N_2O) is limited by poor knowledge of the oceanic N_2O flux to the atmosphere, the magnitude, variability, and drivers of which are still uncertain. In the first part of the talk, I discuss a new, data-based reconstruction of oceanic N_2O emissions that captures coastal hotspots and reveals a vigorous, globally synchronous seasonal cycle. In the second part of the talk, I discuss results from a high-resolution model of the Eastern Tropical South Pacific that resolves N_2O cycling in oxygen-deficient waters. I show that denitrification is a dominant source of N_2O , and that “eddy reaction” terms at the boundary of oxygen minimum zones enhance the rate of N_2O production and reshape the anaerobic nitrogen cycle.