



Department of Atmospheric &
Oceanic Sciences (ATOC)
University of Colorado Boulder



ATOC Distinguished Lecture Series

Wednesday, October 2nd 2019, 3:00 PM
SEEC S228 (Sievers room)
CU Boulder East Campus

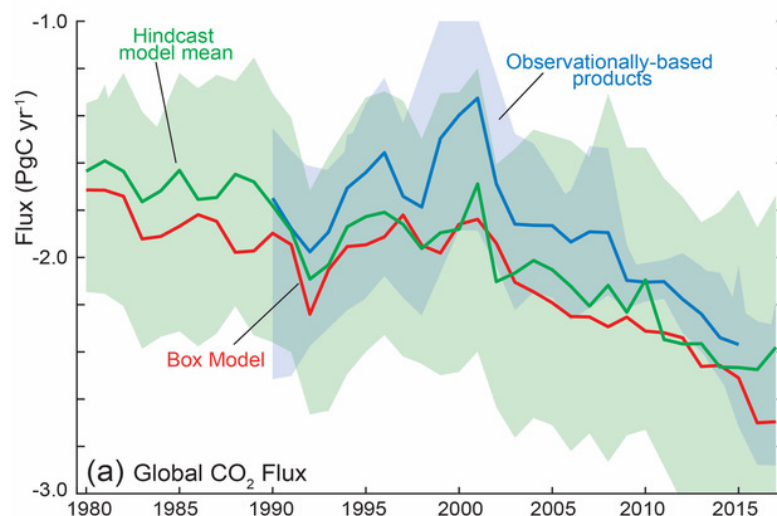
Free parking available for non-CU attendees

Prof. Galen A. McKinley

Lamont Doherty Earth Observatory /
Columbia University

Understanding recent decadal variability of the global ocean carbon sink

The ocean has absorbed approximately 40% of industrial-age fossil carbon emissions, and thus has substantially damped climate change. Better understanding of decadal variability in the ocean carbon sink is crucial for accurate diagnosis of the global carbon cycle, and will improve confidence in future predictions. Ensembles of hindcast ocean models and ensembles of observation-based products indicate globally-coherent changes in the sink since the 1990s. There was a sharp increase in the ocean sink in the early 1990s. Next, there was a decline to a sink minimum in 2001, and then the sink recovered. An upper ocean diagnostic box model allows for attribution of this pattern to two external forcings: the variable growth rate of atmospheric $p\text{CO}_2$, and the 1991 eruption of Mt. Pinatubo. To assess differences in magnitude between models and observation-based products, a large ensemble testbed analysis is developed to test the interpolation methodologies used to create the products. The leading product performs well north of 30S, but significantly overestimates decadal flux variability in the sparsely-sampled Southern Ocean. Reduced Southern Ocean flux variability increases consistency with ocean hindcast models.



For more information, visit www.colorado.edu/atoc/events