



Environmental Engineering & Sciences

Department of Civil and Environmental Engineering
Spring '24: CEE 595AG Seminar

Friday, February 2, 2024 | 10:00 – 10:50 a.m. CST | VIRTUAL

A puzzle in atmospheric oxidation: what is the methane lifetime, and why is it so difficult to constrain? (Virtual Lecture)

Join Zoom Meeting

<https://illinois.zoom.us/j/88653828268?pwd=cUtOUdQxZTZNSFJGTGI5WXo1VEEyQT09>

Meeting ID: 886 5382 8268

Password: 817814



Abstract

The “detergent of the atmosphere,” the hydroxyl radical (OH), oxidizes and removes numerous trace gases, including pollutants like CO and greenhouse gases like CH₄. However, the reactive nature and short lifetime of OH make it highly variable in time and space, difficult to measure on broad scales, and notoriously difficult to constrain across air quality and climate models. I will walk through the progression of research aimed at understanding why OH and the resulting methane lifetime differ among models and how current satellite measurements can be utilized to begin to design an indirect OH observing system. I'll describe a variety of techniques employed to date ranging from 0-D box modeling to machine learning-based evaluation of global models, and across scales ranging from point-by-point comparisons of aircraft data to global satellite observations spanning decades.

Dr. Julie M. Nicely
Assistant Research Scientist
NASA Goddard Space Flight Center



Biography

Julie Nicely is an Assistant Research Scientist with the University of Maryland Earth System Science Interdisciplinary Center and the Atmospheric Chemistry and Dynamics Laboratory at NASA Goddard Space Flight Center. Her research focuses on using observations and models to improve our understanding of the chemistry that takes place in Earth's atmosphere. Specifically, she is interested in tropospheric chemistry and how it influences climate and composition.