



ATOC COLLOQUIUM

Welcome!

Please join us for the next ATOC Colloquium on **Friday, April 12** from **11:00 AM–12:00 PM**, which will be held in **SEEC S372A/B and simulcast over Zoom**. This week's colloquium features postdoctoral research associates, **Laura Sunberg and Arianna Varuolo-Clarke**.

Laura Sunberg ▶ Impact of Biofouling on the Regional-Scale Transport of Microplastics

Microplastics are a growing and pervasive problem in the world's oceans. As such, it is important to understand their transport in ocean flows. Their transport is complicated by biofouling, i.e., the growth of organisms that adhere to the microplastic particles. Biofouling increases the size and density of microplastics, changing their settling velocity and thereby their transport. Biofouling is also dependent on transport, as more fouling will occur when microplastics are in regions where organism growth is more biologically favorable. In this talk, I will share our methods for and preliminary results from modeling the regional-scale impact of biofouling on microplastic transport in the northern Gulf of Mexico. Our results show that biofouling can significantly impact distributions of microplastics and the degree to which they are deposited on the seabed, retained in nearshore/beach areas, and/or exported from the study domain. We also identify areas where further experimental and observational work would be most useful through a sensitivity analysis. These results highlight the importance of accounting for changing microplastic properties in response to varying environmental conditions to understand their transport.



Arianna Varuolo-Clarke ▶ Exploring Drivers of Modeled Mid-Latitude Precipitation Change

As we continue to pump CO₂ and other greenhouse gases (GHGs) into the atmosphere, global average temperatures continue to rise and hydroclimate patterns, including precipitation, are shifting. Systematically quantifying precipitation changes, however, is challenging because the physical constraints of precipitation are not as well understood as those of temperature. Additionally, there is a large amount of internal variability associated with precipitation that adds to the challenge of quantifying precipitation trends. Constraining precipitation projections are further complicated by the need to parameterize processes related to precipitation, like cloud formation and atmospheric convection, in state-of-the-art climate models. The goal of this study is to understand the drivers of mid-latitude precipitation change. To do this, we employ the CESM2 Large Ensemble and quantify the thermodynamic vs. dynamic contributions to precipitation change across the Northern and Southern Hemisphere midlatitudes (~30°-60°) based on a large-scale moisture budget. Using daily precipitation and daily 500 hPa vertical velocity, we quantify the precipitation changes attributable to changes in the vertical velocity, considered the dynamic change, and changes related to the atmospheric moisture content (the thermodynamic change).



Zoom: <https://cuboulder.zoom.us/j/93794324385>

Passcode: ATOC

About the ATOC Colloquium

The Department of Atmospheric and Oceanic Sciences (ATOC) Colloquium is typically held **every other Friday** from **11:00 AM–12:00 PM**. Colloquia alternate between the following formats: (A) Full-length talk by a faculty member or invited speaker, (B) Three conference-length talks by graduate students or postdocs. If you would like to nominate a speaker (including self), please email the ATOC Colloquium Committee Chair, Prof. Andrew Winters (andrew.c.winters@colorado.edu). Please visit www.colorado.edu/atoc/colloquium for further details.