



# ATOC COLLOQUIUM

## Welcome!

Please join us for the next ATOC Colloquium on **Friday, November 11** from **11:00 AM–12:00 PM**, which will be held in **SEEC S228 and simulcast over Zoom**. This week's colloquium features ATOC graduate students, **Tim Higgins and Erin Guderian**, as well as **NCAR ASP Postdoctoral Scholar, Monica Morrison**. Please join us for coffee beginning at 10:45 AM and stay for lunch from Illegal Pete's afterwards.

### **Tim Higgins ▶ An Improved Understanding of the Impacts of Anthropogenic Forcing on Extreme Atmospheric Rivers on the US West Coast**

Uncertainty regarding the impacts of climate change on extreme atmospheric river and precipitation activity on the US west coast continues to exist. In this work, we identify the main contributors to the changes in extreme precipitation and atmospheric river activity over the US west coast in addition to quantifying the trends in future AR events using a unique high-resolution climate model run at unprecedented ensemble size. Data computed from the Weather@Home regional climate modeling project will be analyzed. Weather@Home is unique because it uses computing power from volunteers' computers to run regional climate simulations. This will be the first Weather@Home project to examine eastern Pacific ARs and precipitation. This analysis will include boreal winter AR events with historical forcings from the early 21st century as well as future forcing relevant to 1.5°C and 2° warming using output from HadAM4.

### **Erin Guderian ▶ Investigating the relative forcing of tropical ocean SST on Asian monsoon precipitation using LIM**

The Asian monsoon provides essential precipitation to one of the most densely populated regions in the world. While the influence from ENSO and other modes of climate variability on Asian monsoon precipitation have been thoroughly investigated, the individual contributions from basin-wide sea surface temperature (SST) anomalies has not been fully addressed. In this study, a linear inverse model (LIM) is applied to the leading principal components of tropical Pacific and Indian Ocean SST and precipitation anomalies over Southern Asia in order to isolate the effects of SST forcing on the interannual variability of the Asian monsoon. Specifically, we will investigate how the direct forcing from the Pacific Ocean, the direct forcing from the Indian Ocean, and the Indo-Pacific interactions contribute to the leading modes of precipitation variability over India.

### **Monica Morrison ▶ The Logic of Actionable Science: Earth System Model Inadequacies and Epistemic Risk**

Scientific models, including Global Climate models (GCMs) and Earth System models (ESMs), are constructed with particular purposes in mind. As a consequence, the decisions made about what features to represent within the target system, and how to represent these features, are a function of these purposes. When a model is repurposed, there is a risk that the representational decisions made through the course of construction are inadequate for these new purposes. In the context of actionable science—the generation of scientific knowledge for use in societal decision making, e.g., how to adapt and develop resilience to climate change—the risk of inadequacies in the representational content of models carries with it the possibility of harm—e.g. maladaptation to climate change or the misuse of limited resources. Evaluations of a model's data output is not enough to reliably assess these risks, as there are many cases in which models get good answers for bad reasons. Therefore, we need to rethink our standard practices for evaluating models and how we communicate their usefulness as GCMs/ESMs are increasingly purposed to answer actionable science questions.

**Zoom:** <https://cuboulder.zoom.us/j/97845417945>

**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](mailto:andrew.c.winters@colorado.edu)). Please visit [www.colorado.edu/atoc/colloquium](http://www.colorado.edu/atoc/colloquium) for further details.