



# ATOC COLLOQUIUM

## Welcome!

Please join us for the next ATOC Colloquium on **Friday, February 18** from **11:00 AM–12:00 PM**, which will be held in **SEEC S228 and simulcast over Zoom**. This week's colloquium features **Dr. Melissa Breeden (CIRES/NOAA PSD/NOAA CSD)**. Please join us for coffee beginning at 10:45 AM and stay for lunch from Illegal Pete's afterwards. **In CU Buildings, please wear a mask if not actively eating/drinking.**

## Exploring Seasonal Changes in 2-meter Temperature Forecasts of Opportunity over North America

Skillful subseasonal (weeks 3-8 lead times) 2-meter temperature forecasts over North America are highly desirable, but at present forecasts have generally low skill in operational dynamical models. Given the chaotic nature of the atmosphere, at subseasonal lead times only a subset of forecasts is expected to be skillful, motivating the search for so-called 'forecasts of opportunity'. Forecasts of opportunity are often related to tropical phenomena, such as the El Niño-Southern Oscillation and Madden-Julian Oscillation, that can impart teleconnections to the extratropics. The character of these teleconnections also depends on the mean state of the tropopause-level jet. Given seasonal variations in both the jet and tropical heating, it is likely that the nature of forecasts of opportunity differs between seasons, though this has not been extensively investigated.

Prior research has demonstrated that during boreal winter, an empirical-dynamical model, namely a linear inverse model (LIM), produces north Pacific 500-hPa geopotential height forecasts comparable to the ECMWF IFS and NCEP CFSv2 forecast models. Moreover, the LIM could use signal-to-noise ratio to identify forecasts of opportunity in its own forecasts and in the other models. In this study, we use LIMs including tropical outgoing longwave radiation (OLR) and Northern Hemisphere streamfunction from the Japanese 55-year Reanalysis dataset to examine subseasonal North American 2-meter temperature forecasts of opportunity. We consider how LIM skill evolves during the three phases of the spring transition of the north Pacific jet (late winter, spring, and early summer), revealing clear differences in each phase and a distinct skill minimum in spring. While LIM temperature skill is somewhat low on average (as in operational dynamical models), we are able to identify, in all three phases, a subset of forecasts that are highly skillful. However, skill improvements are only significant during winter and summer, again reflecting the spring subseasonal skill minimum. Finally, skill during forecasts of opportunity indicates a strong contribution from tropical OLR, consistent with prior studies pointing to tropical heating as a source of extratropical subseasonal skill.



**Location:** SEEC S228 & Zoom

**Zoom:**

<https://cuboulder.zoom.us/j/95719896617>

**Password:** ATOC

## About the ATOC Colloquium

The Department of Atmospheric and Oceanic Sciences (ATOC) Colloquium is typically held **every other Friday** from **11:00 AM–Noon**. 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. If you would like to nominate a speaker (including self), please email the ATOC Colloquium Committee Chair, Prof. Jan Lenaerts ([jan.lenaerts@colorado.edu](mailto:jan.lenaerts@colorado.edu)). Please visit [www.colorado.edu/atoc/colloquium](http://www.colorado.edu/atoc/colloquium) for further details.