Part 2: Effect of climate change on the general circulation

A student leads the discussion each week. They will first give a 5-10 minute overview. Then we will all discuss the paper(s), including things we didn't understand, good and bad points of the method used, and interesting implications.

Students answer short online questions on the reading prior to the class. Those taking the class for credit should write a summary on their topic (~3 pages).

Topics and schedule

1. Energy transport and the meridional temperature gradient (Oct 29) Mathieu

Caballero & Langen, "The dynamic range of poleward energy transport in an atmospheric general circulation model", GRL, 2005

2. Meridional shifts in the zonal-mean circulation (Nov 5) Kasturi and Jonathan

a. Chen & Held, "Phase speed spectra and the recent poleward shift of Southern Hemisphere surface westerlies", GRL, 2005
b. Shaw & Tan, "Testing latitudinally dependent explanations of the circulation response to increased CO2 using aquaplanet models", GRL, 2018

3. Does arctic amplification affect the midlatitudes? (Nov 12) Alexandre

Blackport et al, "Minimal influence of reduced Arctic sea ice on coincident cold winters in mid-latitudes", N. Clim Change, 2019

4. Intensity of the extratropical storm tracks (Nov 19) Rohini

a. Lorenz, "Available potential energy and the maintenance of the general circulation", Tellus, 1955
b. O'Gorman, "Understanding the varied response of the extratropical storm tracks to climate change", PNAS, 2010

5. Tropical circulation and static stability change (Nov 26) Martin

Sohn et al, "The role of the dry static stability for the recent change in the Pacific Walker Circulation", J. Climate, 2016

6. Hydrological cycle (Dec 3) Kasia

Durack et al, "Ocean salinities reveal strong global water cycle intensification during 1950 to 2000", Science, 2012

OR

Simpson et al, "Causes of change in Northern Hemisphere winter meridional winds and regional hydroclimate", N. Climate Change, 2015