**Reading guidelines for Lecture 17: Monsoons in a warming world**

**Part 1: CMIP5 model projection**

1. The global monsoon in terms of precipitation characteristics is the dominant mode of the annual variation of the tropical circulation.
2. What are the RCP (representative concentration pathway) scenarios? See reference of Taylor et al. 2012.
3. How to define a monsoon domain?
4. How to define the monsoon onset date, retreat date, and duration?
5. The consensus of 29 CMIP5 models show the increased trends of global monsoon area (GMA), global monsoon intensity (GMI), and global monsoon total precipitation (GMP) in the RCP4.5 scenario, and more so in the RCP8.5 at the end of 21st century. See Figs. 2, 3.
6. The observed global monsoon precipitation over land experienced a slight increasing trend from 1900 through the early 1940s, then an overall decreasing trend from the 1940s to the 1980s, followed by a recovering trend until the present. CMIP5 model are not able to reproduce the mid-20th century maximum. See Fig. 4.
7. Future projected increases are larger in the NH than in the SH, and are larger in RCP8.5 than in RCP4.5 for both hemispheres, though the difference is larger in the NH. See Fig. 4.
8. Under RCP8.5 scenario, the CMIP5 models show Pav increases (decreases) in the tropics (subtropics). Patterns of SDII and R5d are generally consistent with that in Pav. CDD is projected to increase over most tropical and subtropical regions, except for the equatorial Pacific.
9. The sensitivity of Asian monsoon to global warming is stronger than that of other monsoons. In East Asia, most models project an increase in Pav, SDII, and R5d. Meanwhile, many models show an increase in CDD.
10. The monsoon onset dates are generally projected to come earlier or not change much, and monsoon retreat dates are projected to be delayed, resulting in a general lengthening of the monsoon season.
11. What is the wet-get-wetter or warmer-get wetter paradigm?
12. Why the circulation tends to be weakened over the Indian summer monsoon region in a warming world?