

Organization of Monsoon Precipitation

H. Annamalai¹, J. Hafner¹, J.P. McCreary and Bunmei Taguchi²

(email: hanna@hawaii.edu)

1. IPRC, University of Hawaii
2. JAMSTEC, Japan

Anchored by the north-south migration of the warm pool (regions where sea surface temperature $> 28^{\circ}\text{C}$), the annual cycle of the Asian monsoon can be viewed as a seasonal displacement of the Intertropical Convergence Zone (ITCZ). The seasonal mean rainfall, both in summer and winter, largely dictates the socio-economic conditions of millions of small-scale farmers. Yet, skill in monsoon prediction (days to seasons) by dynamical models remains low, partly due to our lack of understanding and inability to model the interactive processes that shape the monsoon. Fig. 1 shows the difference in boreal summer precipitation climatologies (mm/day) between CMIP3/5 multi-model mean (MMM) and GPCP observations. The errors are nearly identical in the two panels, indicating that there has been little or no improvement in simulating monsoon rainfall from CMIP3 to CMIP5, that is, large systematic errors persist. This raises an important question: in observations, what are the dominant thermodynamical processes that control monsoon precipitation climatology? Are these processes faithfully represented in CFES? The present talk will address these questions.

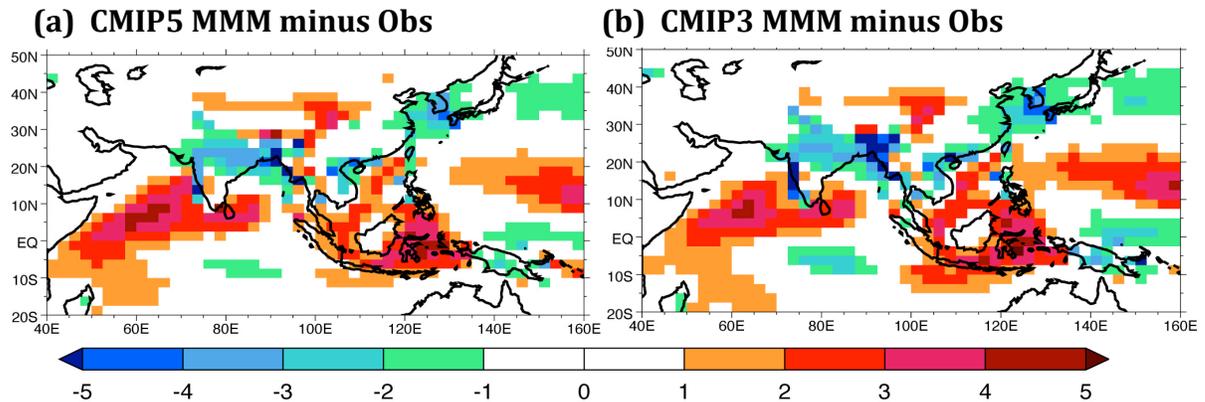


Figure 1: Boreal summer (June-September) rainfall climatology patterns: (a) CMIP5 multi-model mean minus observations; (b) same as (a) but from CMIP3 (from Sperber et al.