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# Expected Future Shifts in the Seasonal Mean and Sub-seasonal Characteristics of Indian Summer Monsoon under a WarmerWorld

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The Indian Monsoon is the most important climate phenomenon that affects the lives and well being of over a billion people living in the sub-continent. Though monsoon as a phenomenon is quite regular in its arrival, the year-to-year fluctuations in its quantum and time distribution can occasionally lead to reduced foodgrain production and severe stress to the regional economies. Therefore, understanding and assessing the expected future changes in the mean and other important sub-seasonal scale features of monsoon under different warming scenarios are of prime interest and consequence to the people living in the region. Our work presents such an assessment based on simulations from a large suite of CMIP5 models and draws comparisons, where needed, with the assessments made earlier using CMIP3 suite of models. While a systematic evaluation of improvements, if any, in simulating various features of monsoon from CMIP3 to CMIP5 will be a focus, the future shifts in the seasonal mean and subseasonal characteristic like the onset, duration, withdrawal, intra-seasonal oscillations, extremes in precipitation and temperature under different greenhouse gas emission scenarios will be examined. Attempts will be made to link any changes that are identified in these features of monsoon to expected future changes in various climate modes that are known to play a role in monsoon variability on different spatial and temporal scales. Relative roles of circulation and thermodynamic changes on the expected future monsoon will also be assessed.