



## **Future of West African Monsoon in A Warming Climate**

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West Africa is the home of more than 300 million people whose agriculture based economy highly relies on West African Monsoon (WAM), which produces a mean annual rainfall of 150 - 2,500 mm and variability and change of which have devastating impact on the local population. The observed widespread drought in West Africa during the 1970s and 1980s was the most significant drought at regional scale during the twentieth century. In this study, a high resolution AGCM, High Resolution Atmospheric Model (HiRAM), is used to study the effects of anthropogenic greenhouse warming on WAM. HiRAM is developed at GFDL based on AM2 and employs a cubed-sphere finite volume dynamical core and uses shallow convective scheme (for moist convection and stratiform cloudiness) instead of deep convective parameterization. Future projections are done using two representative concentration pathways, RCP 4.5 and RCP 8.5 from 2007 to 2050 at C360 (~25 km) resolution. Both RCP 4.5 and RCP 8.5 scenarios predict warming over West Africa during boreal summer, especially over Western Sahara. Also, both scenarios predict southward shift in WAM rainfall pattern and drying over Southern Sahara, while RCP 8.5 predicts enhanced rainfall over Gulf of Guinea. The intensification of rainfall over tropical latitudes is caused by increased low level winds due to warm SST over Gulf of Guinea.