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Year of Tropical Convection (YOTC): Status and research agenda

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The realistic representation of tropical convection in global models is a long-standing challenge for numerical weather prediction and an emerging grand challenge for climate prediction. Insufficient knowledge and practical capabilities in this area disadvantage the modeling and prediction of prominent multiscale phenomena such as the ITCZ, ENSO, monsoons and their active/break periods, the MJO, subtropical stratus decks, near-surface ocean properties, and tropical cyclones. Science issues include the diurnal cycle, multiscale convective organization, the global energy and water cycles, and interaction between the tropics and extra-tropics on timescales of weeks-to-months, e.g., intersection of weather and climate. To address such challenges, the WCRP and WWRP/THORPEX are conducting a joint international research project, the Year of Tropical Convection (YOTC), a coordinated observing, modeling and forecasting project. The focus-year and integrated framework exploits the vast observational datasets, the modern high-resolution modeling frameworks, and theoretical insights. The over-arching objective is to advance the characterization, diagnosis, modeling, parameterization and prediction of multiscale tropical phenomena and their interaction with the global circulation. The "Year" (May 2008 - April 2010) is intended to leverage recent major investments in Earth Science infrastructure and overlapping observational activities. The research agenda involves phenomena and scale-interactions that are problematic for prediction models and have important socio-economic implications: MJO and convectively coupled equatorial waves; easterly waves and tropical cyclones; the monsoons including their intraseasonal variability; the diurnal cycle; and two-way tropical-extratropical interaction. This talk will summarize the status of the above.