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Seasonal Tropical Cyclone Forecasts for the Middle America

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Tropical Cyclones (TCs) from the Eastern Pacific (EP) and North Atlantic (NA) Ocean commonly make landfall in the continental landmass of Middle America. These meteorological phenomena not only can cause floods and socioeconomic impacts, but they can also transport such heavy amounts of water that one event refill lakes, rivers, aquifers, and dams up to 100% during periods of prolonged droughts in arid and semiarid regions. This water resource can be used for agricultural and livestock activities, which are essential for Mexico and Central America's countries. That is why local decision-makers are interested in having seasonal forecasts of tropical cyclone activity for the region. Current seasonal forecasts of tropical cyclone activity only focus on providing a number of TCs for the whole basin. However, local decision makers need information about possible affected regions at least 2 months in advance of the TC season peak (July-August-September for EP and August-September-October for the NA). This work is aimed at exploring a statistical-dynamical method for creating a seasonal forecast of TCs for Middle America. We track TC-like vortices in five Coupled Global Models: ECMWF, Météo-France, UKMO, DWD and CMCC during the 1993-2015 period (climatology period) and using two initial conditions: 1st July and 1st August for a three-month forecast. Our preliminary results show that three of the five models have the skill to adequately forecast the standardized track density anomaly and the TC activity per tercile (above-normal, normal, and below-normal) over the EP and NA basins. However, most of the models overestimate the activity. as indicated by the Brier Score (BS) and the Ranked Probability Skill Score (RPSS). Additionally, we present a statistical analysis of the type of tracks that are more important for the region and discuss how these types of tracks can be predicted depending on ENSO phase. We conclude that some models are useful to predict the TC activity 3 months in advance (dynamical approach), which can be combined with a statistical approach to provide more information about the type of TC track and possible affected regions.