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Oral
Results are presented that address subseasonal prediction of North American precipitation and Western Hemisphere tropical cyclones. First, we present results that use machine learning (ML) to predict errors in subseasonal North American precipitation forecasts in UFS hindcasts. Specifically, by looking at when/where there are errors in the UFS, neural networks can be used to understand what atmospheric conditions helped produce these errors via explainability methods. We identify phase 4 of the Madden-Julian oscillation (MJO) and phases 1 and 2 of the BSISO as significant factors in aiding UFS error prediction across different regions and seasons.

Several prototypes of the UFS also produce common subseasonal prediction errors over the tropical east Pacific and Atlantic, affecting the conditions that modulate tropical cyclones in these basins. In particular, when the UFS is initiated in MJO phases with a strong dipole of convection across the Maritime Continent, prominent subseasonal UFS forecast errors result in the Western Hemisphere. The UFS maintains an MJO that propagates eastward too slowly, and maintains its strength too long after
initialization. An analysis of tropical cyclone genesis potential suggests that substantial errors in prediction of TC genesis result from these forecast biases. Logistic regression (LR) and neural network (NN) models utilizing ENSO and MJO indices and other local environmental information are also used to predict east Pacific and Atlantic cyclogenesis. Overall, the NN model shows superior performance to the LR model, retaining skill out to three weeks for the east Pacific, and out to four weeks for the Atlantic basin.
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