STREAMFLOW FORECASTING IN WEST-CENTRAL FLORIDA USING CLIMATE DRIVERS

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Streamflow forecasts help make efficient environmental and economic decisions, such as water supply management and planning for flood/drought hazards. Large-scale climate pattern can provide information for streamflow forecasts due to the associations between streamflow and sea surface temperatures in the Pacific Ocean associated with the El Niño–Southern Oscillation (ENSO). The goal of this study was to evaluate the ability of machine learning models to forecast streamflow in West-Central Florida using ENSO.

Four Niño indices along with the preceding streamflow were used as covariates in a suite of machine learning models to predict streamflow. As opposed to point forecasts, this work aims at estimating the entire predictive distribution of the future streamflow that may be directly embedded in the probability-of-exceedance analyses and decision tools. We compared the forecast performance in the dry season to investigate the relative predictive skill as a function of ML model, the location, and the month of the year. The results showed that using four Niño indices improved the streamflow forecast in West-Central Florida. The forecasts provided by multiple linear models, general addictive model, and tree-based models were found to be skillful over the baseline of the climatology forecast with lower bias and lower uncertainty.

PRESENTER BIO: Jia-Yi Ling is a Ph.D. student specialized in hydrological forecasting through statistical and machine learning models. Her research mission is to fabricate or apply statistical models to monitor or forecast hydrological and environmental changes and assess the risks and impacts of such changes.