

ASSESSMENT OF TRENDS IN SOUTH FLORIDA SUB-DAILY RAINFAL

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The frequency and magnitude of local and regional flooding hold significant implications for the resilience of communities grappling with the challenges posed by climate variability, climate change, and urban growth. In coastal areas, these flooding events are particularly complex, driven by a confluence of factors, including the intensification of extreme rainfall events, rising sea levels, and elevated groundwater levels. To comprehensively understand the evolution of both past and future conditions, it is imperative to assess the significance of observed and projected trends in these contributing factors to flooding. While there have been numerous studies focusing on assessing trends in climatic drivers at daily and longer timescales, there is a conspicuous gap when it comes to sub-daily events. This study, a collaboration of the United States Geological Survey, the South Florida Water Management District (SFWMD), and Florida International University, narrows its focus to explore trends in extreme rainfall magnitude and frequency at sub-daily timesteps. This effort will expand SFWMD's Water and Climate Metric development effort which is assessing spatiotemporal trends in rainfall across south Florida.

While assessing trends in extreme rainfall events, we observed a scarcity of publicly available datasets suitable for trend assessment at sub-daily timesteps. However, we have gathered available data from a variety of sources, including rainfall gage data and radar data from the SFWMD, the Florida Automated Weather Network, NOAA, and a variety of other sources. Our analysis utilizes a combination of parametric and nonparametric methods to evaluate changes in extreme sub-daily rainfall events and average event characteristics including event frequency, duration, and maximum intensity. In summary, this study will bridge a critical knowledge gap by examining trends in rainfall extremes at sub-daily timesteps.

PRESENTER BIO: Dr. Jayantha Obeysekera is a Research Professor and the Director of the Sea Level Solutions Center in the Institute of Environment at the Florida International University with over 30 years of experience in the field of Stochastic Hydrology with recent emphasis on climate change and sea level rise.