The Urban Flood Pulse Concept: Quantifying Water Source Contributions to Coastal Urban Flooding

Matt Smith, Florida International University
Research Mentor: John Kominoski

Goals

- Determine influence of wet-dry seasonal hydrology and episodic tidal flooding on dissolved organic carbon (DOC) concentration and composition
- Quantify relative contributions of precipitation, groundwater, and marine water contributions to coastal urban canals

Research Methodology

- Monitor fluctuations in water level and baseline conditions of temperature, dissolved oxygen (DO), salinity, and DOC concentration
- Measure DOC fluorescence, δ2H and δ18O stable isotopes, and chloride (Cl−) during (1) monthly baseflow events, (2) high v. low tide, and (3) wet v. dry season
- Develop endmember mixing model (EMMA) to differentiate between three water sources (precipitation, groundwater, marine water) in mixed canal water

Results

- Shifts in rain and marine water contributions during baseflow reflect variation in local precipitation and tidal amplitude
- Increased groundwater contributions are expected during the wet season, particularly during seasonal high tide events

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