

WATER LEVEL TRENDS AT SOUTH FLORIDA COASTAL STRUCTURES AND IMPLICATIONS TO WATER MANAGEMENT

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The South Florida Water Management District (District), serving about 9 million people, is responsible for operating the south Florida regional water management system infrastructure that comprises of approximately 2,100 miles of canals and 2,000 miles of levees/berms, more than 600 water control structures and 625 project culverts and over 70 pump stations. The District operates this complex system for flood control, water supply, water quality treatment and ecosystem restoration. The region is characterized by low relief, flat topography, hydrology driven by a delicate balance between rainfall and evapotranspiration, high surface-water and groundwater interaction. At the outskirts of this water management system, the coastal gravity structures play a great role in disposing inland water to tide while preventing salt-water intrusion. The effectiveness of these coastal gravity structures highly depends on the available head across them in comparison to their design heads. As a result of this, sea water level increase will adversely impact the discharge capacity of coastal gravity structures in effectively disposing inland water to tide. Therefore, to understand and summarize long term water level conditions at coastal gravity structures, trend analysis on water level timeseries was conducted.

The trend analysis on water level data at coastal structures and NOAA tidal gages in South Florida is part of resiliency metrics development that was embarked by the District. The trend analysis metric characterizes sea level trend based on observed long-term historical water level data at coastal structures as well as water level data at NOAA tidal stations. This effort also includes quantifying coastal structure water level trend associated with sea level rise, change in rainfall and other factors. The results of this analysis will assist planners and water managers in designing or retrofitting adaptive water management infrastructure as well as operational protocols.

PRESENTER BIO: Dr. Tibebe Dessalegne is a Section Leader within Hydrology and Hydraulics Bureau at the South Florida Water Management District. He holds a professional Engineering license from state of Florida. In addition, he is a registered Professional Hydrologist and is a Diplomate Water Resources Engineer with over 20 years of experience.