EVAPOTRANSPIRATION TREND IN SOUTH FLORIDA

Yibing Kevin Zhu
South Florida Water Management District, West Palm Beach, FL, USA

Studies have been reporting global climate changes in the past decades. The increased level of greenhouse gases and the subsequent warming have altered the hydrological cycle to different extents at locations around the Earth (IPCC 2021). To address the challenge, the SFWMD is implementing several water and climate resiliency metrics to identify the regional trends, using the District managed data. Along with rainfall and surface flow, evapotranspiration (ET) plays a critical role to the sustainable development of our infrastructure, e.g. in agriculture and water supply. A recent look at the observation data shows that South Florida has been experiencing an upward trend of ET over the past 30 to 60 years, with an averaged change ratio of +5 mm/year. The data come from different sources as manually measured pan evaporation, and calculated potential ET with input of insolation that was retrieved from satellite images of cloudage. These data of independent sources draw the same conclusion that was statistically testified with high confidence ($p < 0.05$). The trends of four influential variables were also examined, in which the increasing solar radiation and declining relative humidity contribute to the upward ET trend most, then the air temperature, while the wind speed shows a downward trend. In addition, evaporation and transpiration roughly share a 50/50 composition in the ET of South Florida, and they both have an upward trend. Due to the wet climate, actual ET shares the same trend with potential ET in South Florida, especially in wetlands or during the wet season.

PRESENTER BIO: Mr. Zhu is a professional engineer with more than 25 years of experience in design and construction of hydraulic structures, Hydraulic &Hydrological modeling, and environmental assessment for restoration. Most recently, he also got extensive experience with hydrological data QA/QC and investigation of monitoring issues.