

EVERGLADES STORMWATER TREATMENT AREAS: MANAGING FLOWS TO ACHIEVE PERFORMANCE GOALS

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The Everglades stormwater treatment areas (STAs) are wetlands designed to remove phosphorus (P) from stormwater runoff before sending the water to the ecologically sensitive Everglades. After 2025, the South Florida Water Management District (SFWMD) must achieve the water quality-based effluent limit (WQBEL) of 13 µg P/L annual average from the Everglades STAs. Managing the flow quantity and timing is a key variable for achieving low P concentration. High flows and stages can stress emergent vegetation resulting in die-off, development of “short circuits” (preferential flow paths), tussock formation, and loss of P removal performance. Conversely, low/no flows can lead to dry-out, submerged aquatic vegetation (SAV) community loss, and TP resuspension in the water column upon rehydration.

SFWMD water managers and scientists set weekly STA inflow priorities based on weather forecasts, treatment cell stages, and vegetation condition within each treatment cell. Phosphorus loading rates are also monitored and factored into the inflow priority assessment. In addition, the SFWMD has built flow equalization basins (FEBs) upstream of the STAs to assist in moderating high flows to the STAs during the wet season and providing inflows in the dry season to maintain minimum stages. Flow attenuation helps to reduce the duration that STA treatment cells are above target stage, reducing vegetation stress and improving P removal performance. The FEBs may provide some water quality improvement as well, reducing P loading to the STAs. With the monitoring and management of flows through the STAs, P removal performance can be maximized and help achieve the WQBEL.

PRESENTER BIO: Tracey Piccone is a licensed Civil Engineer with over 30 years of experience in water resources engineering. As Chief Consulting Engineer, she is a key participant in investigating factors that influence phosphorus reduction in the STAs and management approaches to ensure the STAs achieve the mandated discharge phosphorus concentrations.