# TIDAL AND SUBTIDAL NUTRIENT FLUX FORCED BY LAKE OKEECHOBEE DRAWDOWN

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This study presents a novel method to estimate seasonal nutrient flux to the Indian River Lagoon, forced by tide and Lake Okeechobee drawdown. The US Army Corps of Engineers release water from Lake Okeechobee to draw the lake surface down and protect communities near the lake from dangerous floods that may occur during hurricane season. However, nutrients in Lake Okeechobee may cause harmful algal blooms in downstream estuaries. Complex interactions between tide and canal flow govern the partitioning of nutrient mass flux to the lagoon and ocean. Applied Technology and Management presents a method to measure nutrient flux to the lagoon and ocean forced by tide and seasonal canal flow, thereby accurately quantifying parts of nutrient flux to the lagoon from parts to the ocean.

A vessel-mounted Acoustic Doppler Current Profiler measures vertical velocity profiles along a transect during a tidal cycle. Vertical nutrient profiles are concurrently measured with Sondes along the transect. Nutrient flux during a tidal cycle is the product of velocity and nutrient concentration. Least-squares analysis quantifies residual nutrient flux, which describes both tidal and subtidal nutrient mass flux to the lagoon and to the ocean. Residual nutrient flux quantifies the spatial distribution of nutrient flux to the lagoon or the ocean during a tidal cycle. Measurements during episodic release events, or during wet and dry seasons allow for differentiation between seasonal fluxes. Long-term measurements may permit the prediction of nutrient flux to the lagoon and ocean as a function of selected nutrient concentrations in the lake.

Long-term monitoring of nutrient flux is important in characterizing water quality in the lagoon and ocean. The dynamics of nutrient flux are critical in protecting and preserving estuarine and coastal ecosystems.

**PRESENTER BIO**: Dr. So is a Professional at Applied Technology and Management, a Geosyntec company. He received master's and PhD degrees in Civil and Coastal Engineering from University of Florida. He specializes in statistical and time-series analyses; field data collection; and storm surge, sediment transport, and water quality modeling.