

## **SPATIAL STABILITY OF WATER QUALITY IN THE LAKE OKEECHOBEE WATERSHED**

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Improving surface water quality in large watersheds is complicated by high spatiotemporal variability. Establishing high-density monitoring sites and conducting high-frequency sampling within the watershed may capture sources and pathways of pollutants, however, it can be a costly endeavor. Lake Okeechobee is the largest freshwater lake in the southeastern United States and the heart of the greater Everglades ecosystem services. Although great restoration efforts have been made to reduce phosphorus (P) loads to the lake, it has still been plagued by frequent algae blooms for years. We examined the spatiotemporal water quality variability in the watershed to help identify hot spots and hot moments, with an emphasis of the stability of the patterns. We chose three groups of water quality parameters reflecting geogenic, biogenic, and anthropogenic sources within the upstream region of Lake Okeechobee watershed. We quantified the spatial stability of stream water quality across the monitoring stations using Spearman's rank correlations between the concentrations rank of individual sampling date and the water quality matrix spanning two decades. Our results showed that spatial stability of the stream water quality in the Lake Okeechobee watershed can be attributed to a higher spatial coefficient variation (CV) than temporal CV, and temporal synchrony of the time series. The spatial stability highlights how infrequent synoptic sampling may be sufficient to accurately represent the spatial patterns of water quality over the past two decades. This information demonstrates that for the Lake Okeechobee watershed, frequent sampling during the wet season is more efficient for quantifying solute loads, but infrequent sampling at additional sites can help locate the sources, determine the water restoration locations, evaluate the efficacy of water quality monitoring regime.

PRESENTER BIO: Dr. Dai is a postdoc at the University of Florida. She has experience in water quality analysis, lake eutrophication and nutrient load control.