

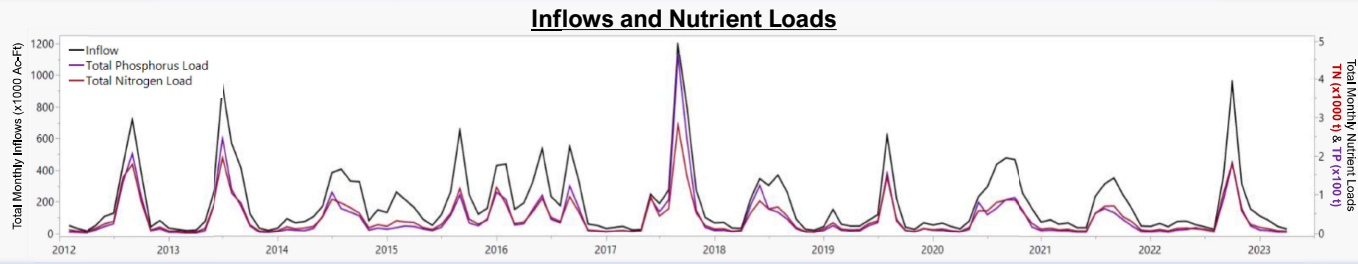
# Chapter 8B: Lake Okeechobee Watershed Protection Plan Annual Progress Report

## Lake Okeechobee Hydrology, Water Quality and the Ecological Envelope

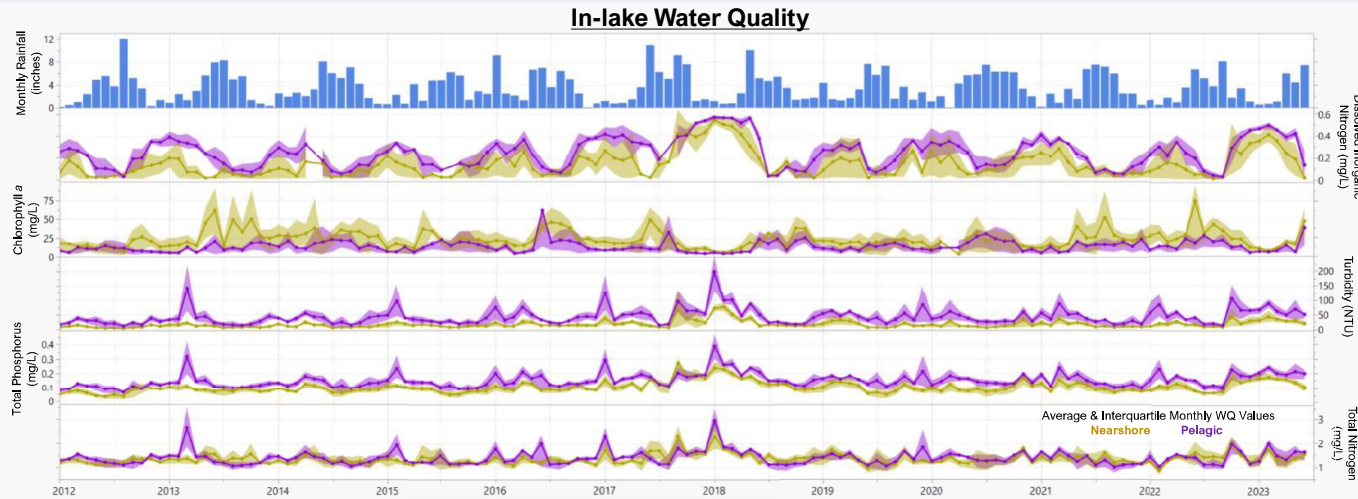
Paul Jones, Ph.D., Lake and River Ecosystem Section, Applied Sciences Bureau



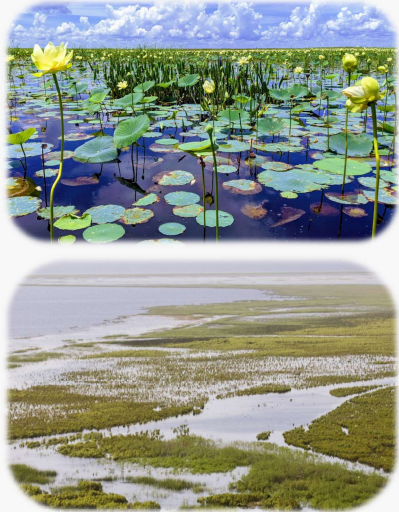
- Nutrient loads to Lake Okeechobee are determined primarily by surface water inflow volumes.
- Elevated inflows are the main driver of rapid rises in lake stage.
- H. Ian (2022) caused the highest inflows since H. Irma (2017), but TP loads were considerably lower.



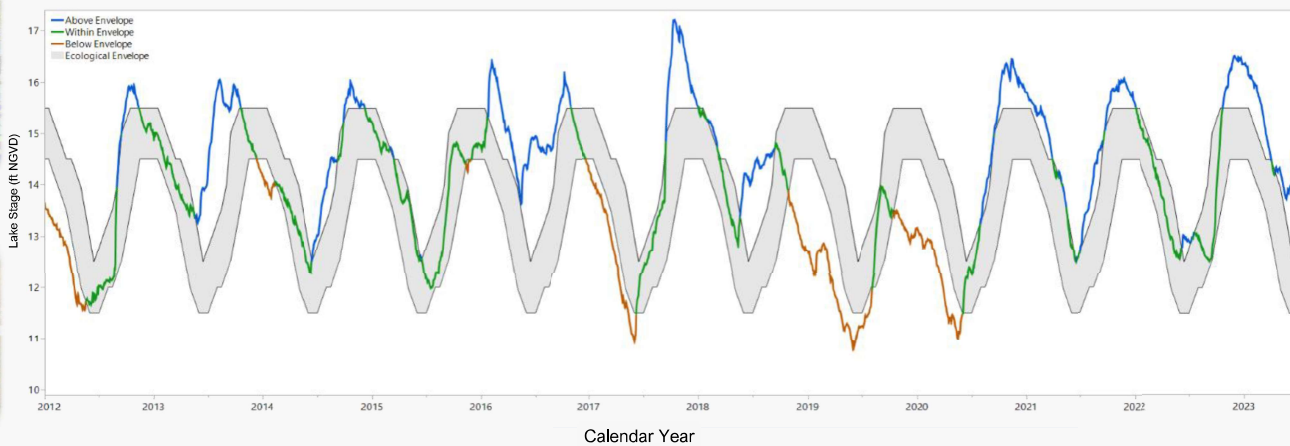
- TN and TP levels in the Pelagic (central) region follow a similar pattern to turbidity, suggesting they are associated with particulates.
- With large surface area and shallow water, particulate levels are highly influenced by strong winds.



- Changes in concentrations of dissolved inorganic nitrogen (DIN) and chlorophyll a are indicators of biological activity.
- High inflows often increase DIN, which is rapidly consumed by algae and cyanobacteria and intensifies the risk of phytoplankton blooms (higher chlorophyll a).
- Poor water clarity after strong storms, such as H. Irma in Sept 2017, may cause prolonged periods of low light and elevated DIN, until conditions for biological uptake improve.

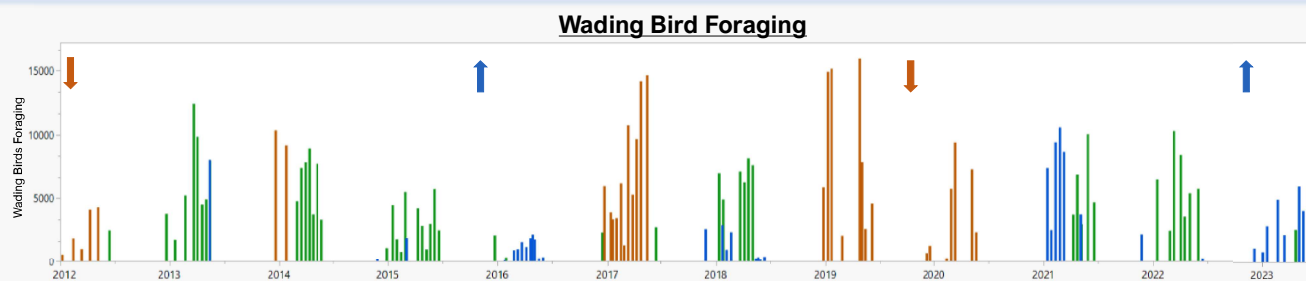


### Lake Stage Ecological Envelope

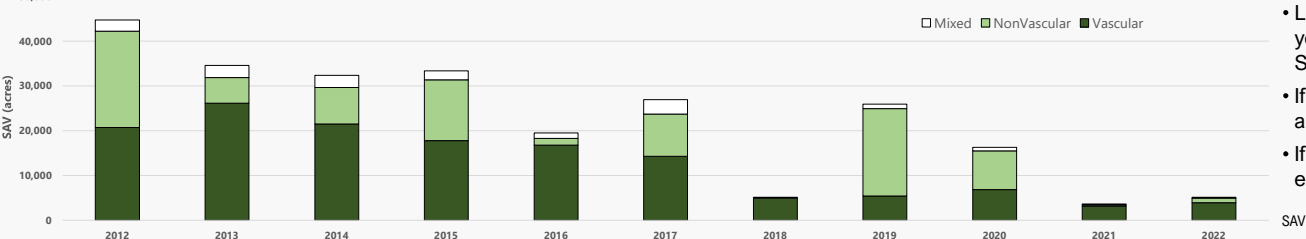


- Lake Okeechobee stages (line) fluctuate in response to changes in inflows, outflows, rainfall, and evaporation.
- Ecological envelope (gray band) defines the range of water levels that represent a compromise of optimal conditions across seasons, habitats, flora, and fauna.
- Short periods above or below the envelope are not necessarily ecologically harmful, but slow rates of change are desirable.
- Rapid and extreme variations in water levels are unnatural and a function of the highly channelized watershed.

- Higher wet season lake levels promote prey production in the upper marshes.
- As lake levels recede and marshes dry, prey becomes concentrated and easier to catch.
- If lake is too low prior to nesting season (e.g. ↓), or too high during it (e.g. ↑), foraging is usually lower.

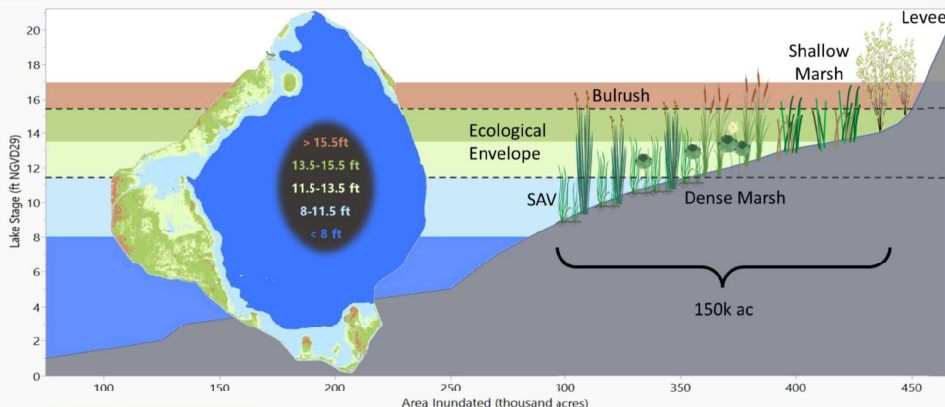


### Submerged Aquatic Vegetation

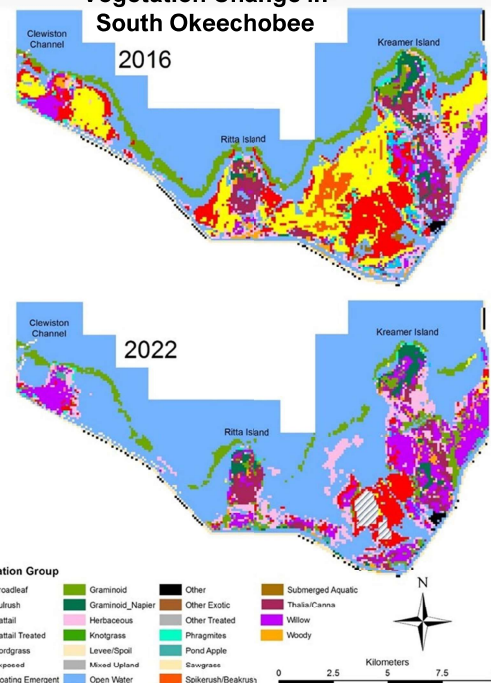


- Lower lake stages increase the light reaching young/seedling submerged aquatic vegetation SAV and promote growth.
- If stages stay too low, SAV beds may dry out and become dominated by emergent plants.
- If lake stages stay too high, even tall and well established SAV can die out.

SAV sampled in Aug, prior to H. Ian (Sept. 2022) and H. Nicole (Nov. 2022)



### Vegetation Change in Emergent Aquatic Vegetation



For more information: SCAN ME