

MICROALGAE AND ENTEROCOCCI IN THE LAKE OKEECHOBEE, ST. LUCIE, AND LOXAHATCHEE WATERSHEDS



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INTRODUCTION

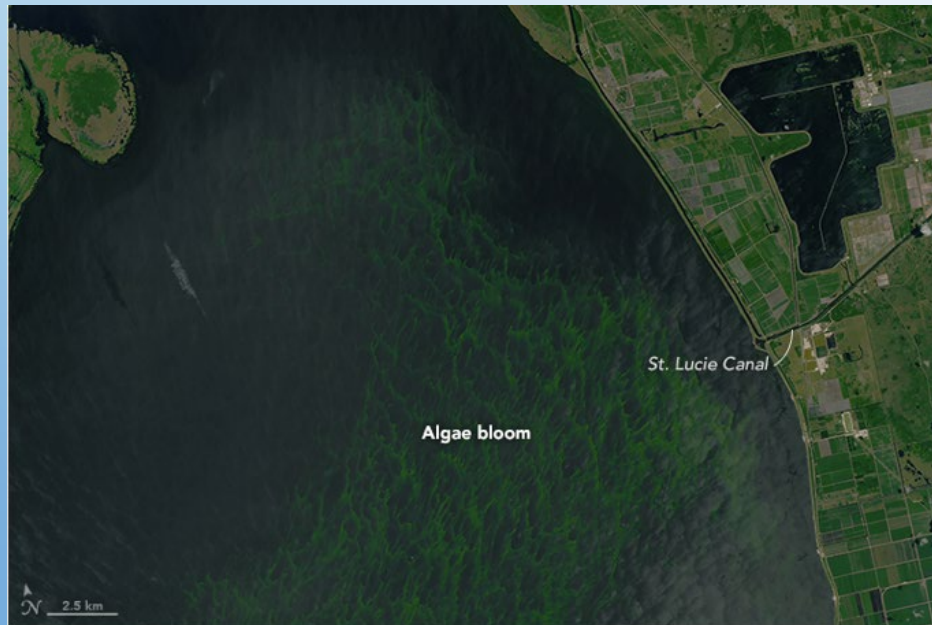
RECREATIONAL WATER QUALITY IS IMPORTANT TO THE STATE OF FLORIDA

- ECONOMY, PUBLIC HEALTH, AND QUALITY OF LIFE DEPEND UPON HEALTHY BEACHES AND WATERSHEDS
- WATER QUALITY HAS BECOME A MAJOR TOPIC OF CONCERN
- SCIENTIFIC UNDERSTANDING SOUGHT BY RESEARCHERS, AGENCIES, AND THE PUBLIC



ADVISORIES AND EXCEEDANCES

- STATE OF EMERGENCY DECLARED IN SEVEN FLORIDA COUNTIES IN SUMMER 2018 DUE TO BLUE-GREEN ALGAE (CYANOBACTERIA)
- BACTERIAL EXCEEDANCES (ENTEROCOCCI) REPORTED AT RECREATIONAL BEACHES IN THESE COUNTIES AND OTHERS THROUGHOUT THE STATE



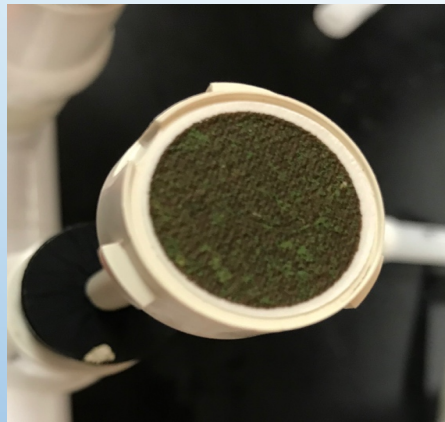
STUDY OBJECTIVE

UNDERSTAND THE RELATIONSHIP BETWEEN MICROALGAE AND ENTEROCOCCI
AT THREE STUDY SITES

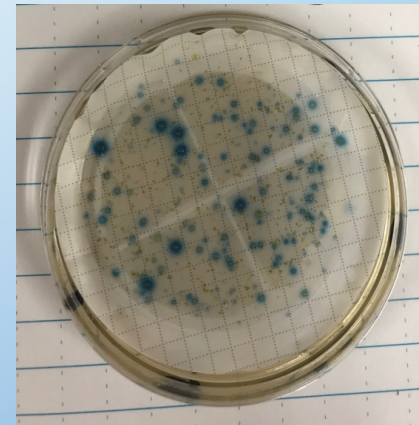
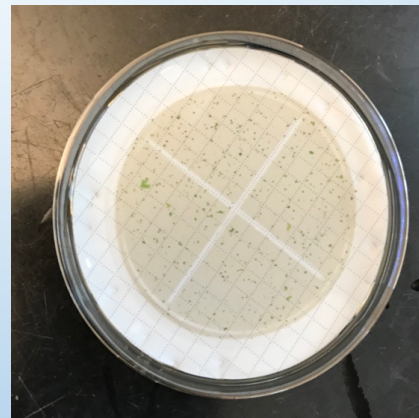


MEASURING CHLOROPHYLL AND ENTEROCOCCI

MICROALGAE MEASURED THROUGH CHLOROPHYLL ($\mu\text{G/L}$)

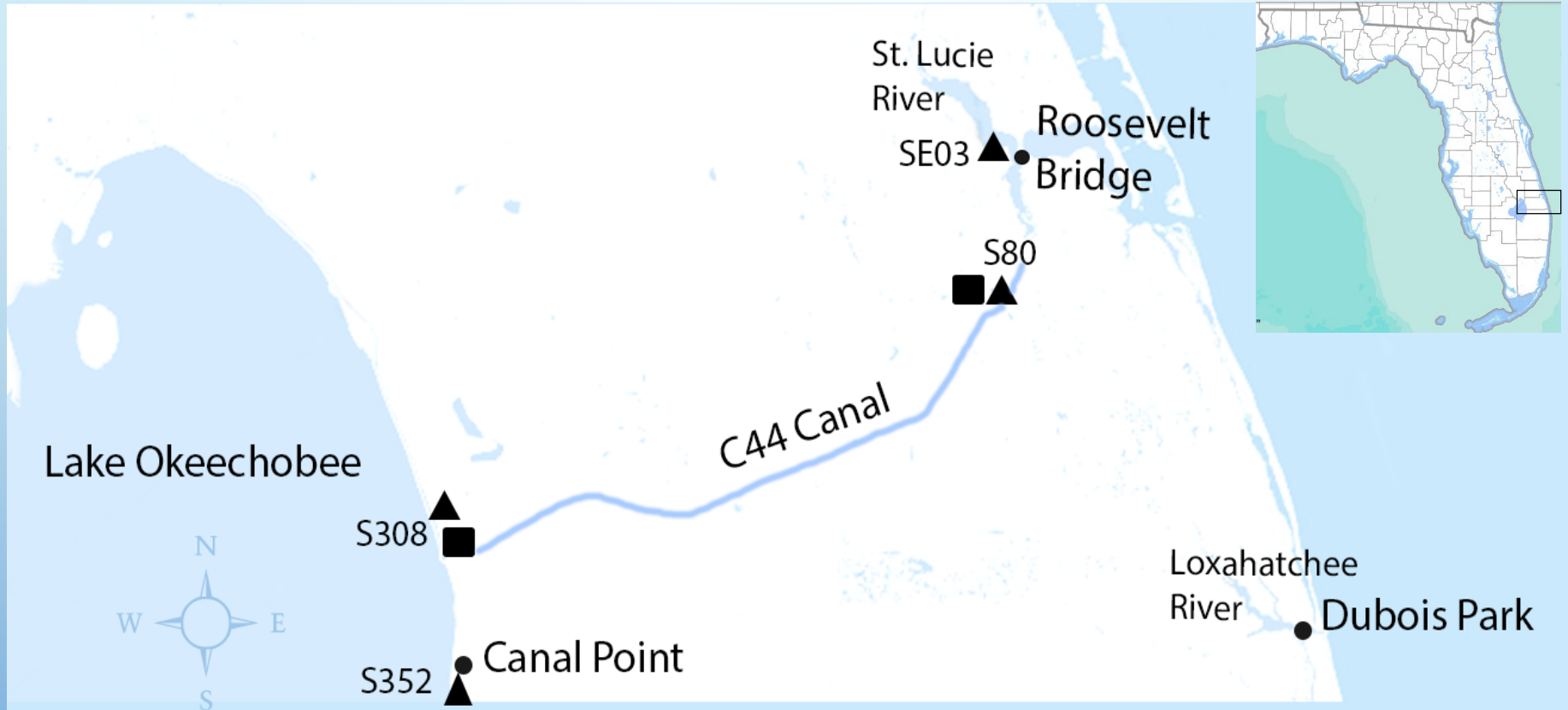


BACTERIA MEASURED IS ENTEROCOCCI (CFU)



METHODS

STUDY SITES



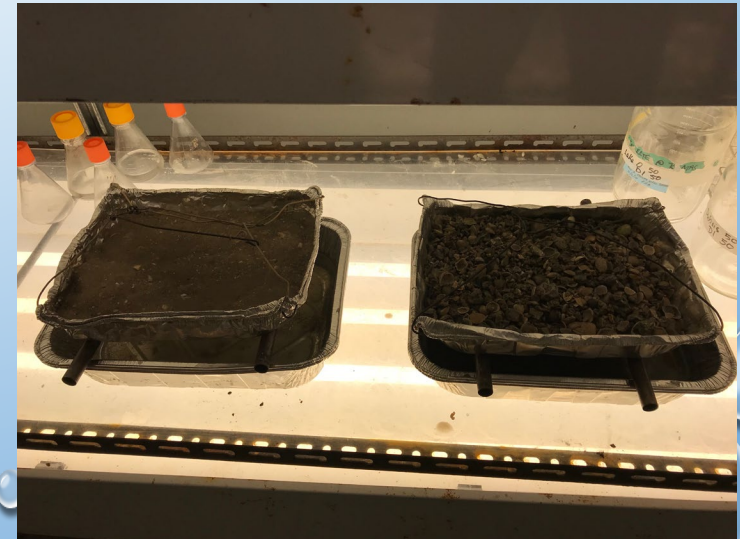
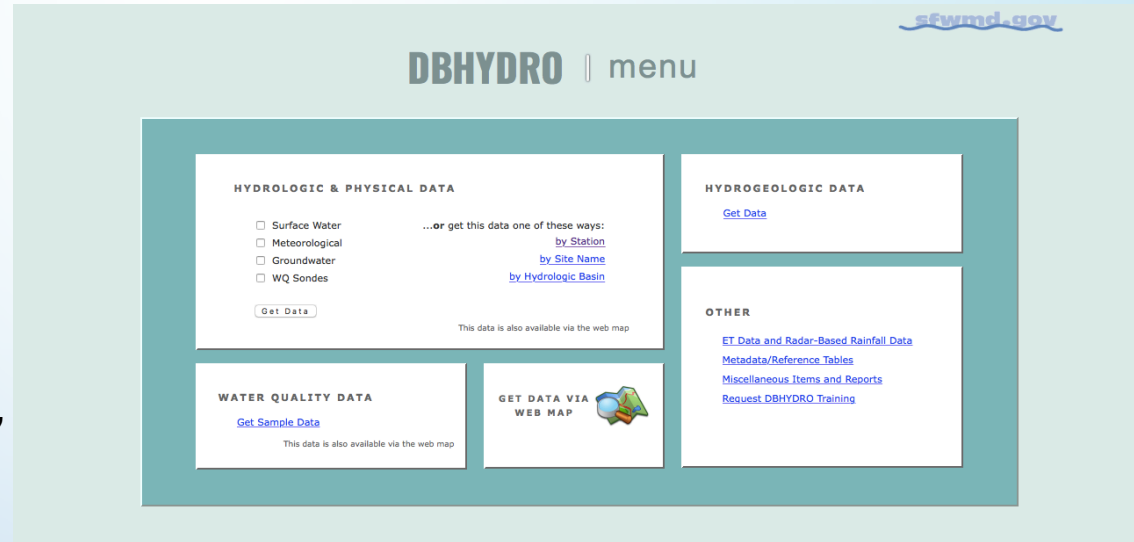
=NUTRIENT SITES



=HYDROLOGY SITES

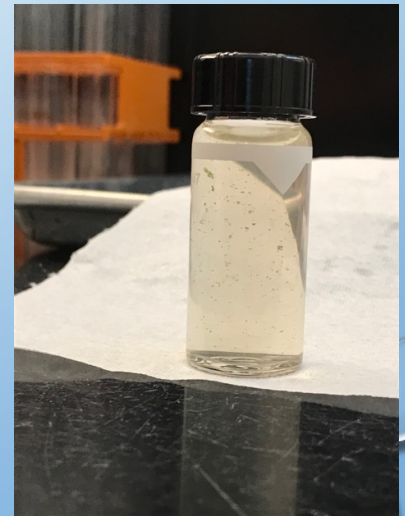
THREE SECTIONS OF STUDY

- LONG-TERM STUDY (2000-2018)
- YEAR-LONG STUDY (SEPTEMBER 2017 – AUGUST 2018)
- MICROCOSM STUDY (4 CONDUCTED DURING YEAR-LONG STUDY)



ANALYSIS

- LONG –TERM DATA
 - MULTIPLE REGRESSION (DBHYDRO AND DOH) - PHYSICAL-CHEMICAL AND HYDROLOGICAL DATA
 - LINEAR REGRESSION AND ANOVA DOH METEOROLOGICAL DATA
- YEAR-LONG FIELD STUDY
 - MULTIPLE REGRESSION PHYSICAL-CHEMICAL AND HYDROLOGICAL DATA
 - TIME-SERIES
 - LINEAR REGRESSION NCEI METEOROLOGICAL DATA
- MICROCOSMS
 - TIME-SERIES

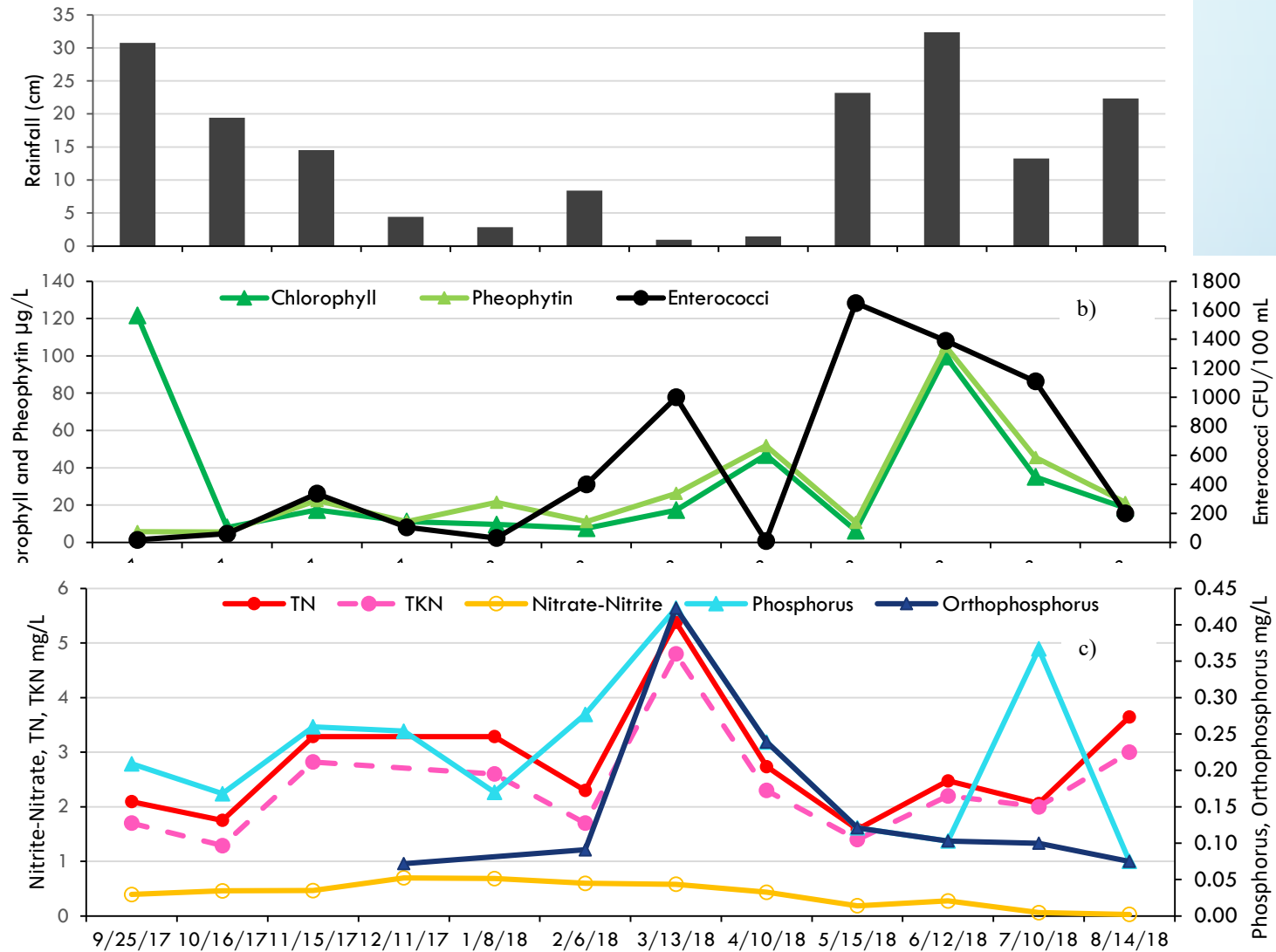


RESULTS

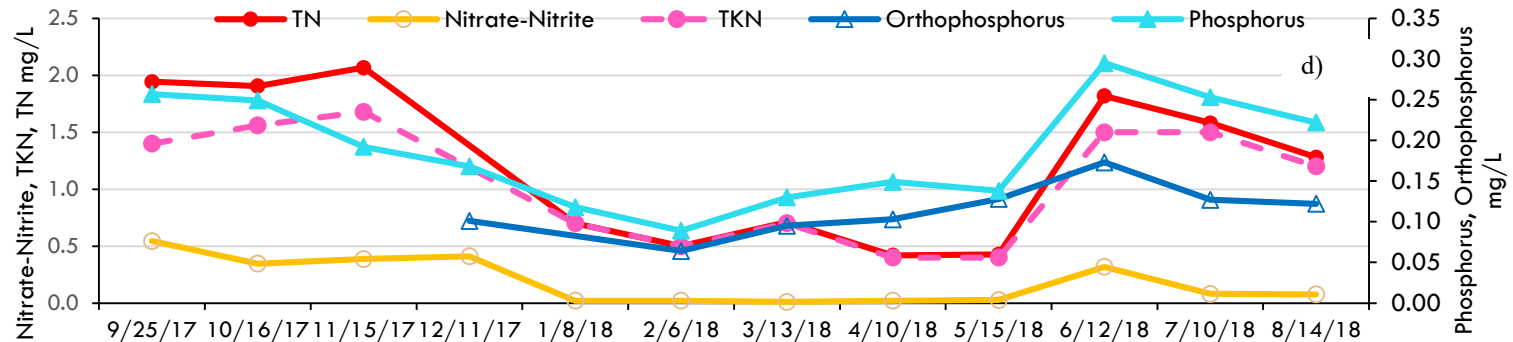
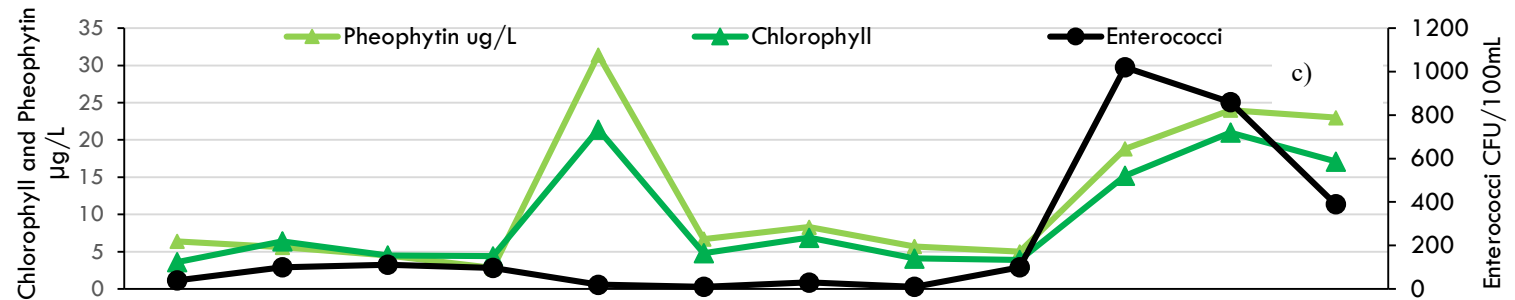
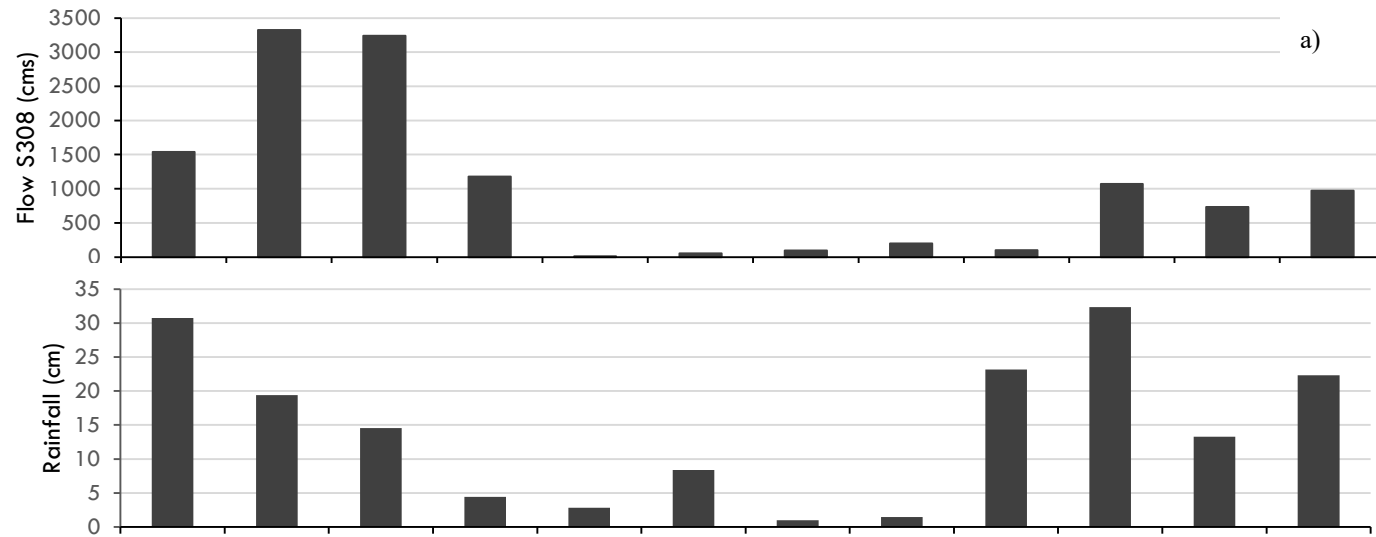
The background is a light blue gradient. In the top-left corner, there are several water droplets of varying sizes, some overlapping. In the top-right corner, there are a few more droplets. In the bottom-right corner, there is a cluster of droplets, including a large one and several smaller ones. In the bottom-left corner, there are a few small droplets.

YEAR-LONG FIELD STUDY

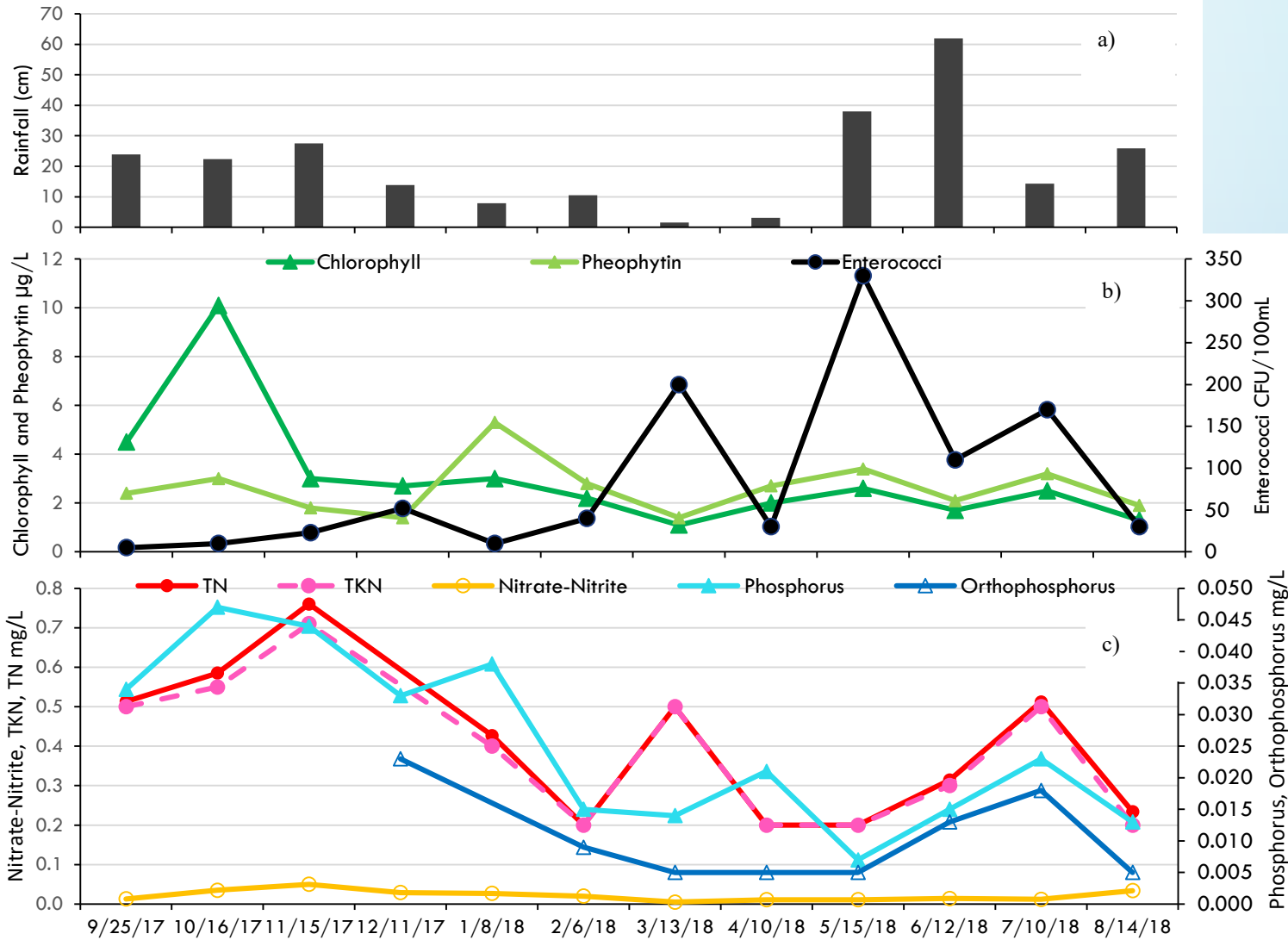
CANAL POINT



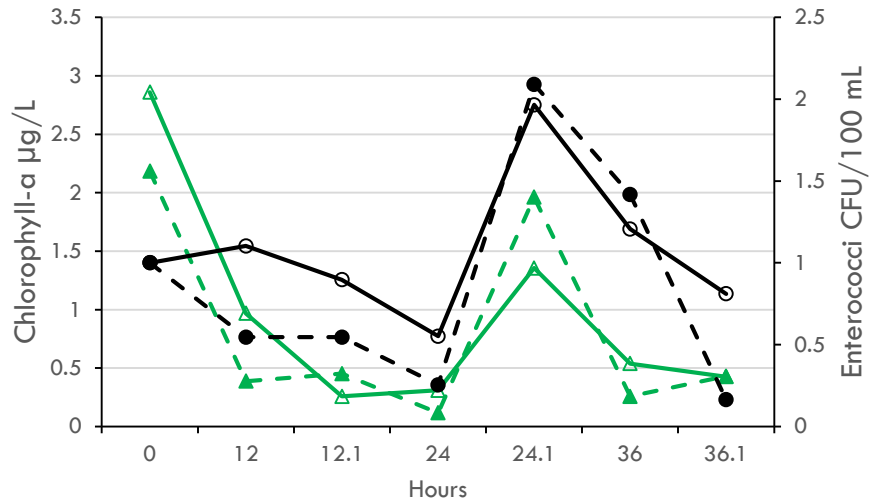
ROOSEVELT BRIDGE



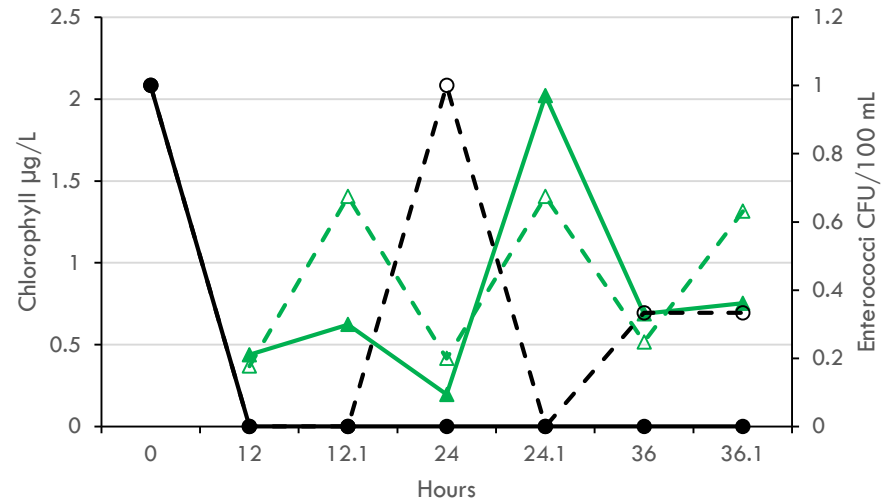
DUBOIS PARK



MICROCOSMS



MICROCOSM EXPERIMENT 3: WATER AND SEDIMENT FROM LAKE OKEECHOBEE, CHLOROPHYLL-A AND ENTEROCOCCI MEASURED EVERY 12 HOURS.



MICROCOSM EXPERIMENT 4: WATER AND SEDIMENT FROM LAKE OKEECHOBEE AND SEDIMENT FROM DUBOIS PARK, CHLOROPHYLL-A AND ENTEROCOCCI MEASURED EVERY 12 HOURS.

SEDIMENT INFLUENCE, WAVE ACTION, CYCLING?

CONCLUSIONS



CONCLUSIONS

- DATABASES ARE IMPORTANT
- IN SOME ENVIRONMENTS, MICROALGAE AND ENTEROCOCCI RESPOND TO THE SAME NUTRIENTS
- NUTRIENTS WERE DIFFERENT SPECIES OF NITROGEN OR PHOSPHORUS
- SEDIMENT MAY HAVE AN IMPACT ON WATER QUALITY
- DATA COLLECTION FOR YEAR-LONG STUDY STARTED ONE WEEK AFTER HURRICANE IRMA – ANOMALY?



THANK YOU

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- SOUTH FLORIDA WATER MANAGEMENT DISTRICT



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National Oceanic & Atmospheric Administration