



**FLAGLER
COLLEGE**

***An Investigation of Water Quality Parameters
in the San Sebastian River***

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and Trinity DeWitt***

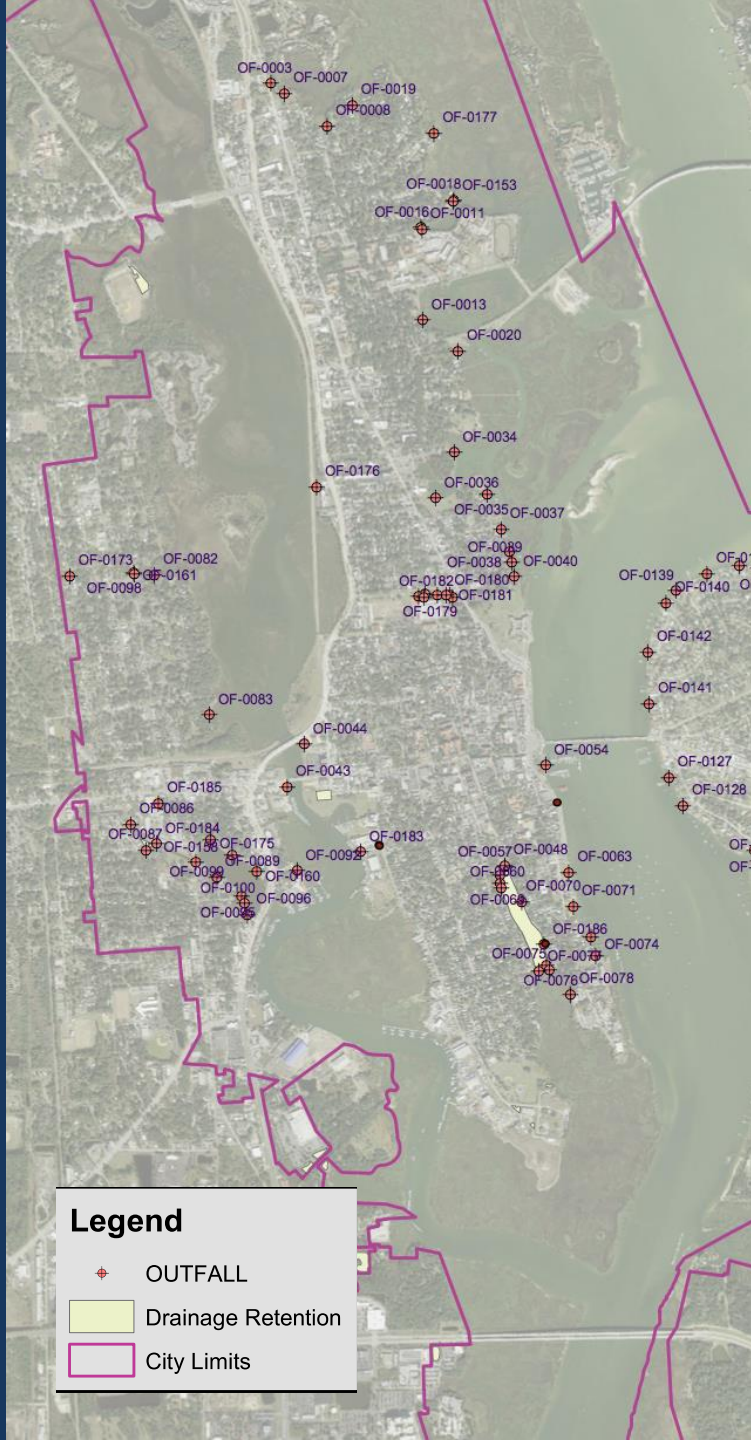
A satellite image showing the San Sebastian River estuary. The river flows from the top left towards the bottom right, where it meets the ocean. The river is surrounded by a dense urban area with buildings, roads, and parking lots. The river's path is somewhat irregular, with several bends and a large loop in the middle. The ocean is visible on the right side of the image, with a sandy beach area between the river and the water. The sky is blue with a few clouds.

San Sebastian River

~ 5 miles from
Matanzas River
confluence to
wetlands north
of State Road 16

--only monitoring
done is by GTMNERR
at one location

--river is under pressure
from urban runoff,
marinas and marine
construction, and
development



City of Saint Augustine Stormwater Outfalls

Credit: Glabra Skipp and
Jessica Beach

Legend

- OUTFALL
- Drainage Retention
- City Limits







Site 5



Site 4



Site 3



Site 2



Site 1

Monthly water quality monitoring at 5 sites since May 2019

--temperature

--salinity

--dissolved oxygen

--turbidity

--total suspended solids

--chlorophyll-A

--major nutrients

ammonium, nitrate/nitrite,

phosphate

--fecal coliform bacteria

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2020 TerraMetrics

359 m

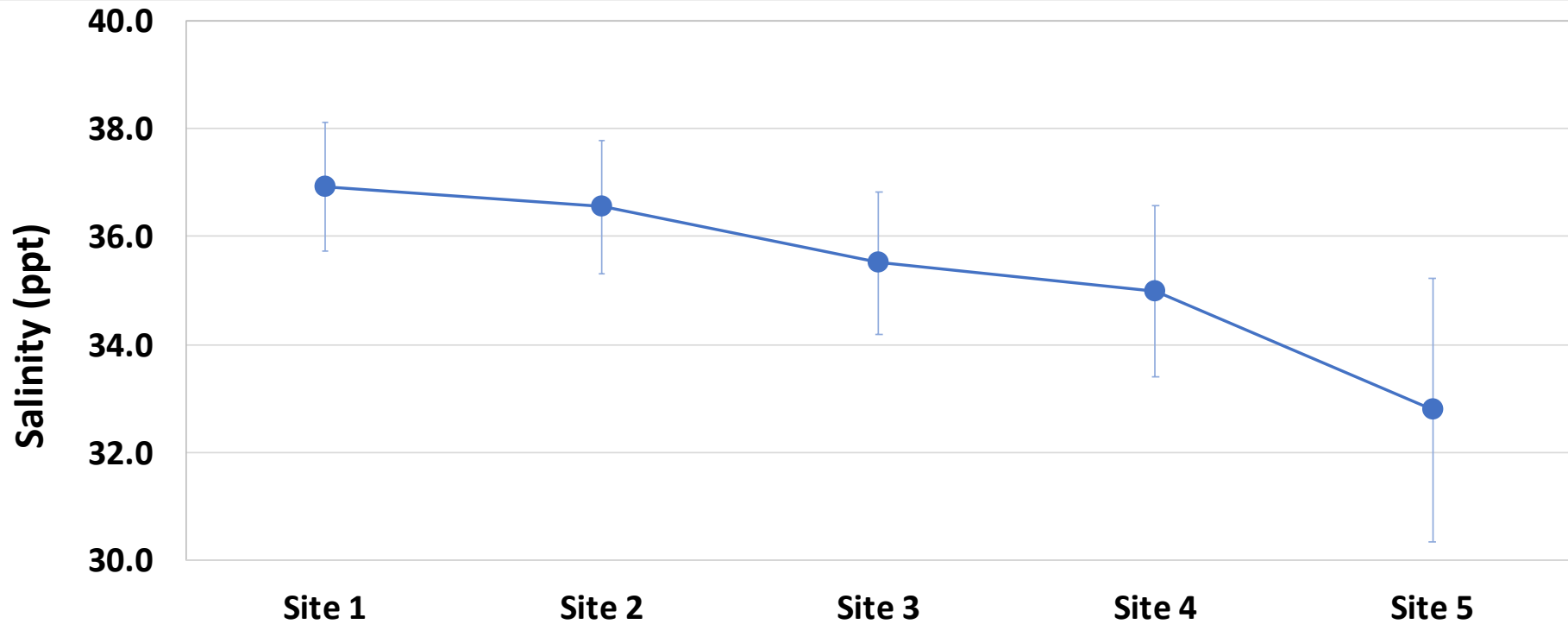
Google earth



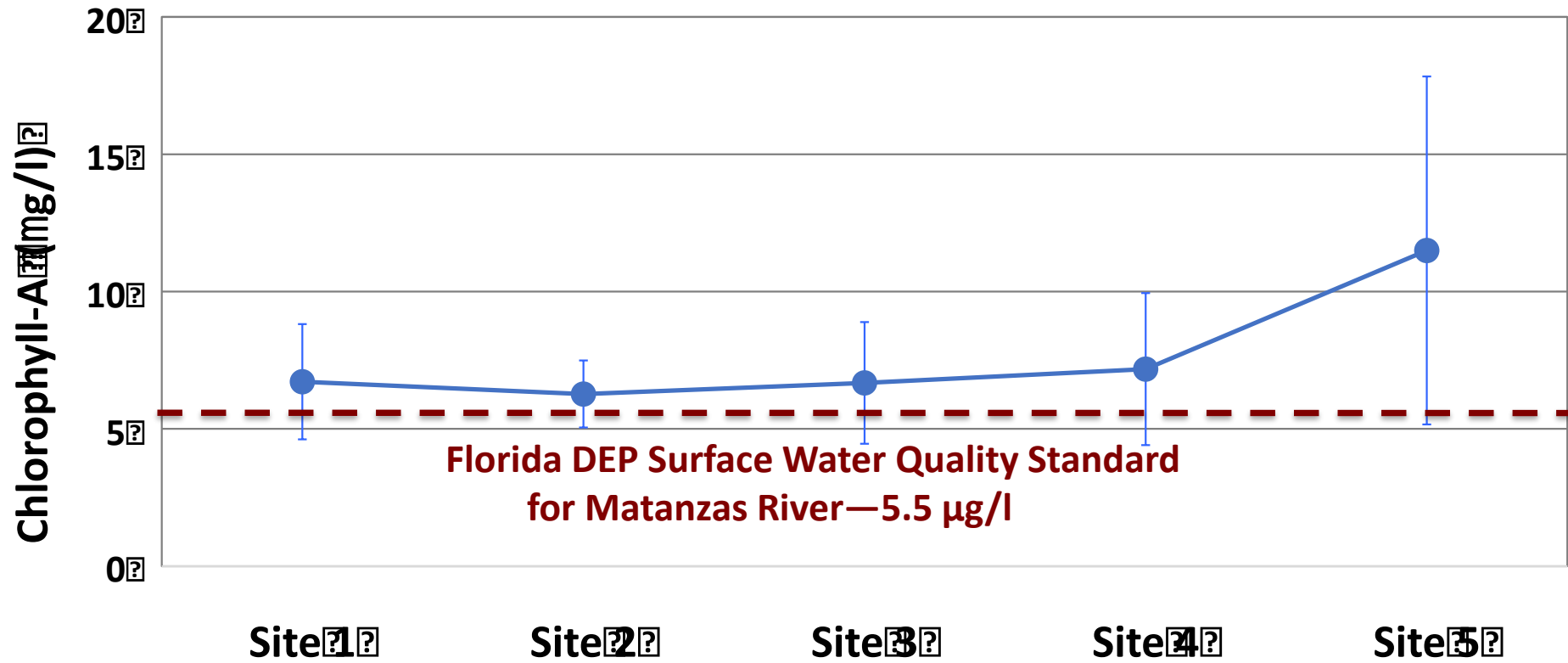
Study Objective: to investigate spatial and temporal trends in water quality parameters in the San Sebastian River

Secondary Objective: provide undergraduate research opportunities at Flagler College

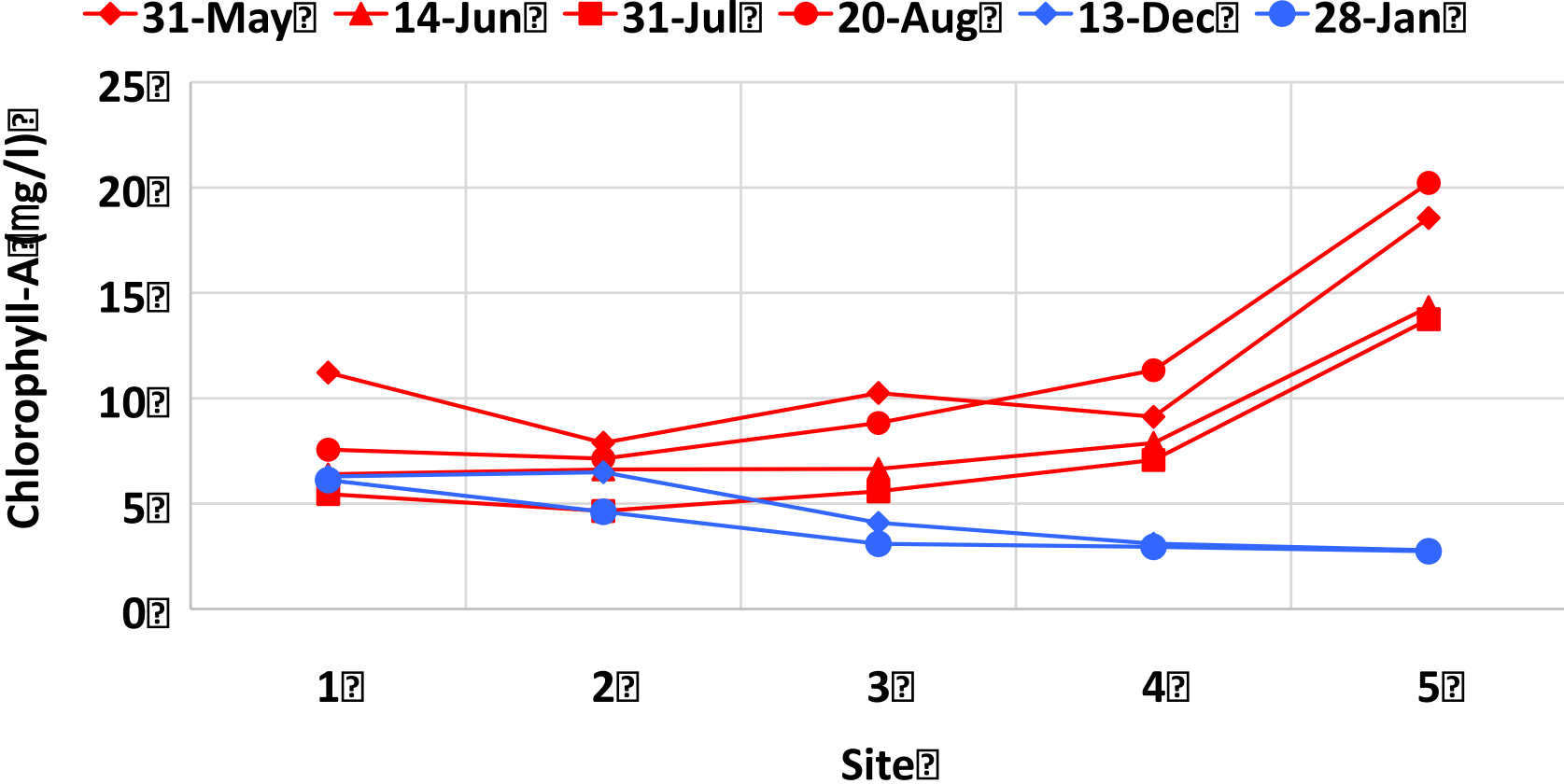
Salinity—slightly fresher water moving up the San Sebastian River



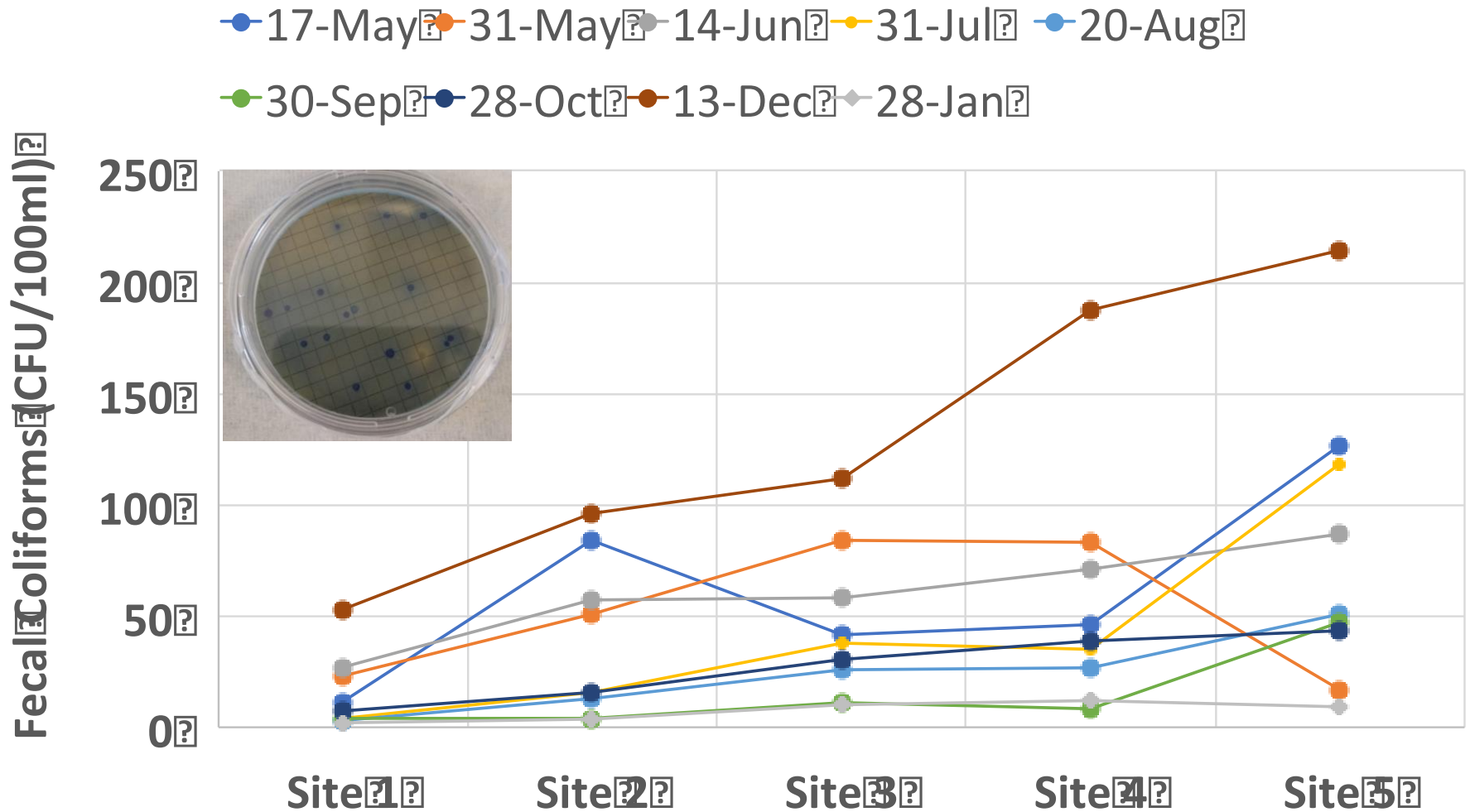
Chlorophyll-A: estimate of phytoplankton biomass in the water column

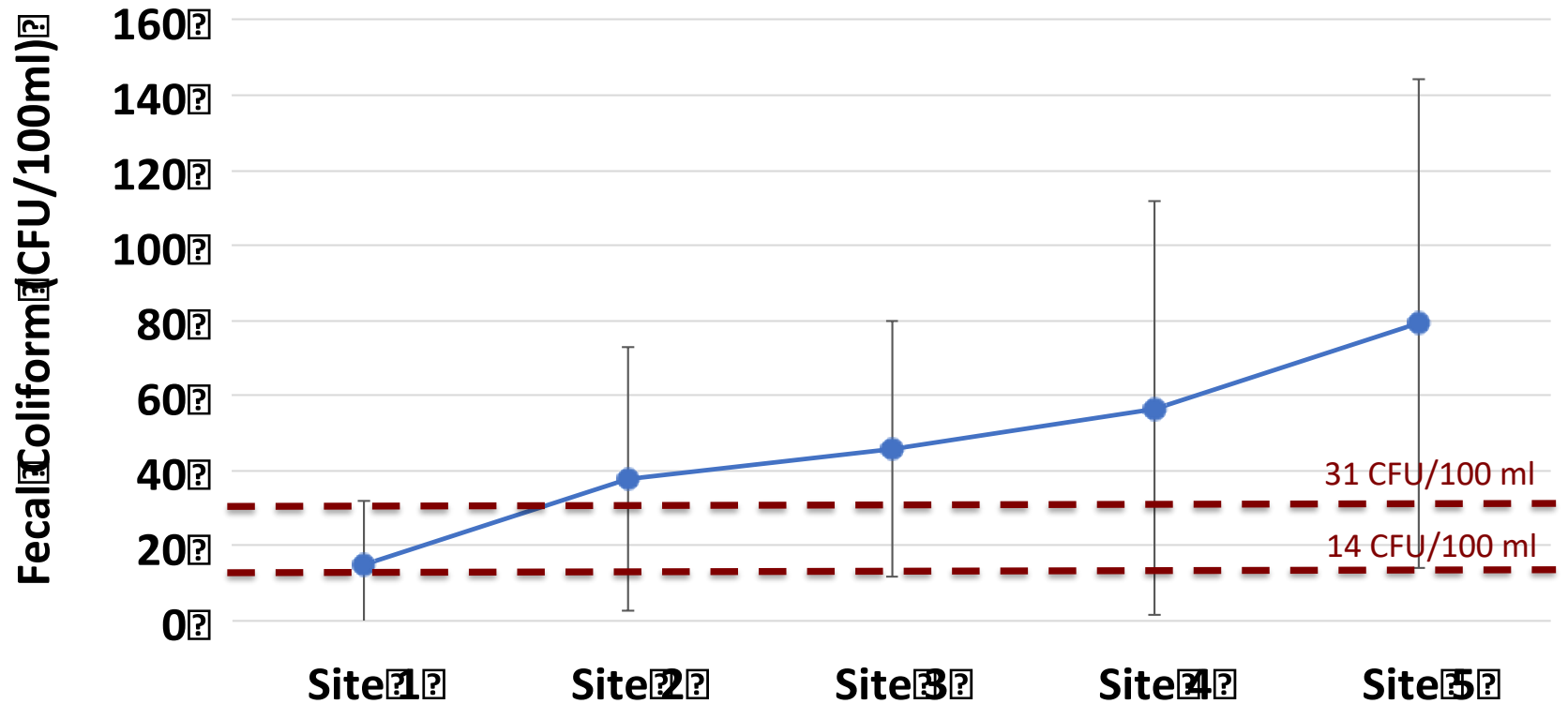


Chlorophyll-A: apparent seasonal differences in phytoplankton biomass moving up San Sebastian



Fecal Coliforms—bacteria present in the gut and feces of warm-blooded animals and humans; can be indicative of presence of pathogenic bacteria

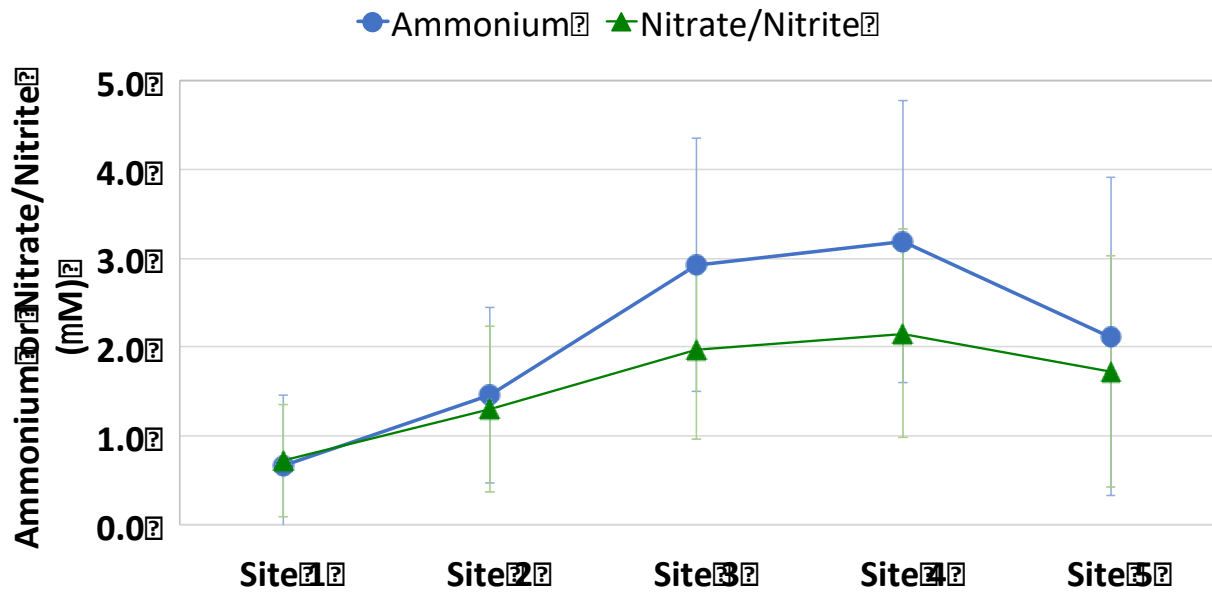




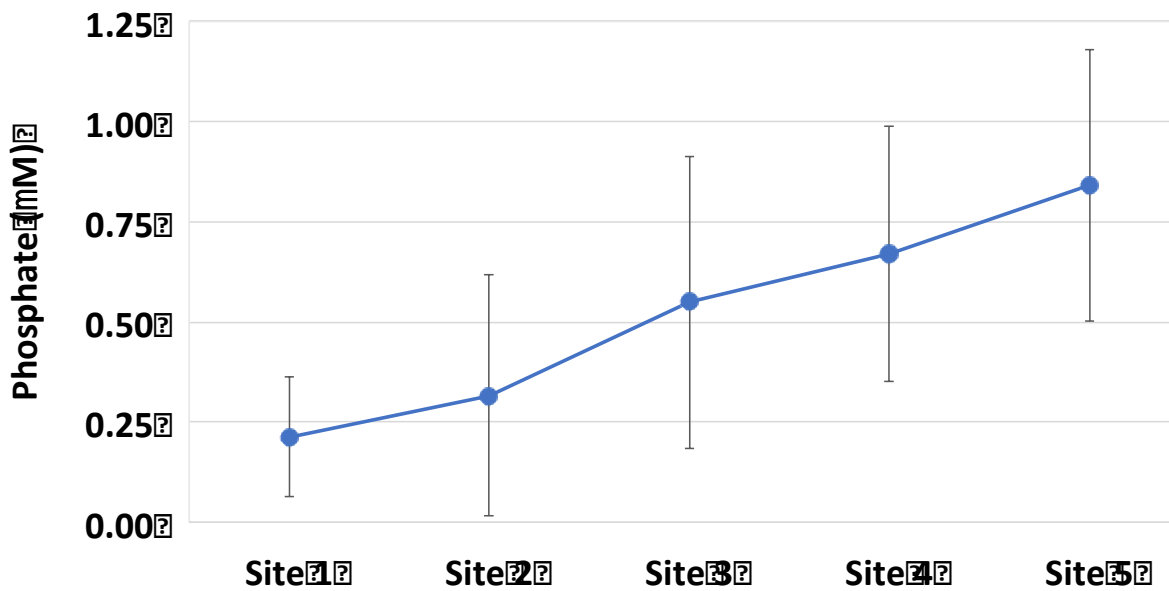
San Sebastian River fails to meet Florida DEP Class II Water Body (Shellfish Harvesting) water quality standard of “14/31 rule”

Potential Source of Fecal Coliforms.....





Nitrogen species show maximum near Site 3 and Site 4



Phosphate shows a fairly linear increase up the San Sebastian River

Conclusions:

Differences in phytoplankton biomass between summer and winter most pronounced in northern San Sebastian

Both nutrients and fecal coliform bacteria are elevated in San Sebastian river relative to surrounding estuary waters

Undergraduate Research Effort toward this project nearly ~ 150 hours

