



Florida Department of Environmental Protection

Reference Stream Sampling Status Report

Aquatic Ecology and Quality Assurance

May 17, 2017





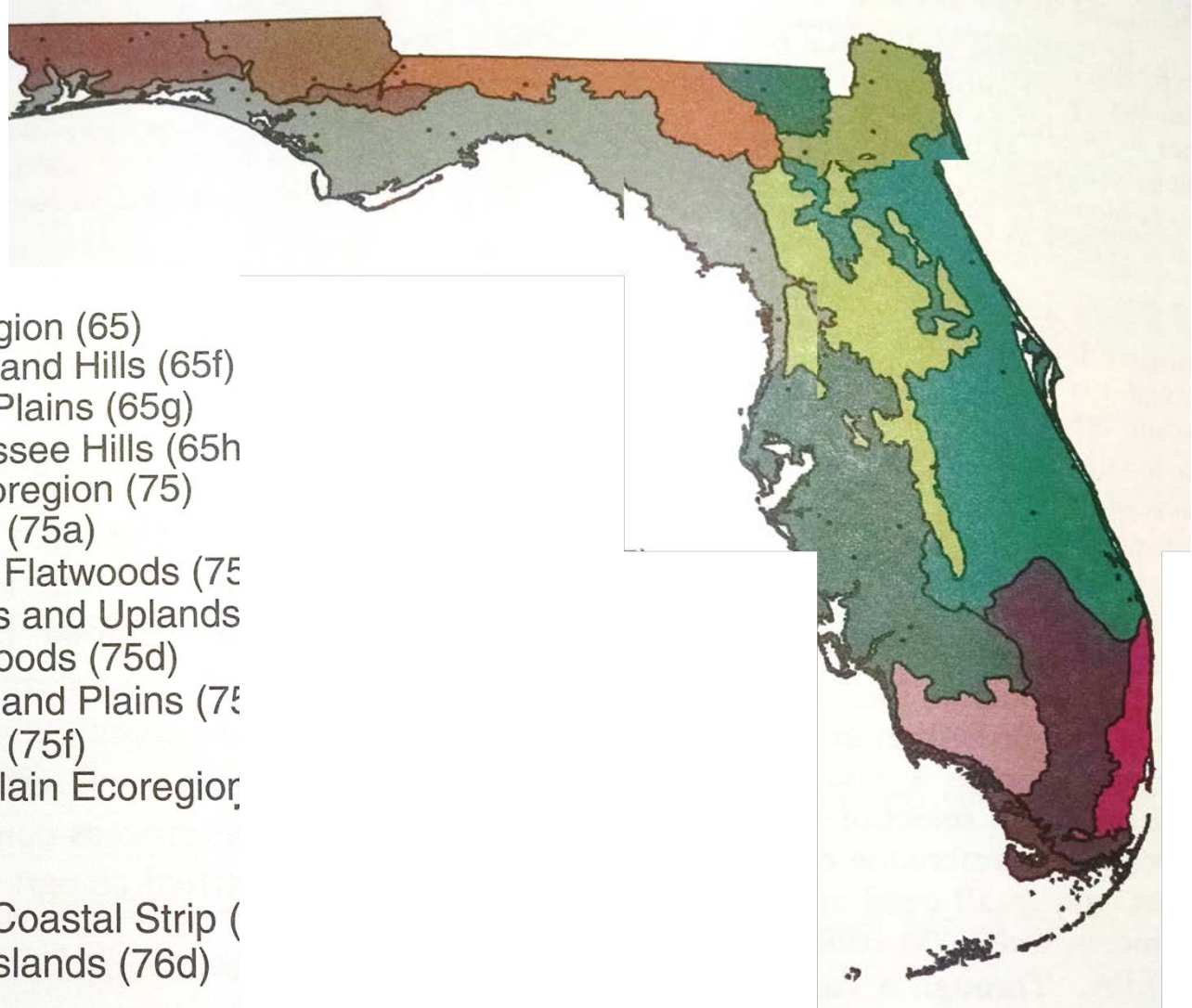
Background

- Reference stream sampling began in 1992.
- Sites were chosen to represent the least impaired streams throughout Florida.
- Sites had relatively small watersheds wholly contained within a given subcoregion.
- Eighty-five sites were on the original reference list.

District	Reference Sites
NW	31
NE	20
SW	15
CD	12
SO	4
SE	3



Location of Original Sites



- Reference Site
- Southeastern Plains Ecoregion (65)
 - Southern Pine Plains and Hills (65f)
 - Dougherty/Marianna Plains (65g)
 - Tifton Upland/Tallahassee Hills (65h)
- Southern Coastal Plain Ecoregion (75)
 - Gulf Coast Flatwoods (75a)
 - Southwestern Florida Flatwoods (75b)
 - Central Florida Ridges and Uplands (75c)
 - Eastern Florida Flatwoods (75d)
 - Okefenokee Swamps and Plains (75e)
 - Sea Island Flatwoods (75f)
- Southern Florida Coastal Plain Ecoregion (76)
 - Everglades (76a)
 - Big Cypress (76b)
 - Miami Ridge/Atlantic Coastal Strip (76c)
 - Southern Coast and Islands (76d)



Objectives

- Re-evaluate historic reference streams.
- Establish a revised list of reference streams.
- Document changes in the conditions over time.



List of Analytes

- Stream Condition Index
- Rapid Periphyton Survey
 - Algal ID sample, if periphyton is abundant.
- Linear Vegetation Survey
- Habitat Assessment
- Hydrologic Modification Characterization (per SOP FT3101)
- Chlorophyll-a
- Turbidity
- Alkalinity
- Color
- Ammonia
- Nitrate+nitrite
- Total Phosphorus
- Total Kjeldahl Nitrogen
- qPCR – HF183
- Calcium
- Sulfate
- Chloride
- Sodium
- Potassium
- Carbonate
- Magnesium
- Bromide
- Sucralose
- Acetaminophen
- Total Organic Carbon
- Total Dissolved Solids
- Total Suspended Solids
- Fecal coliforms & e. coli



LIMS and SBIO Project

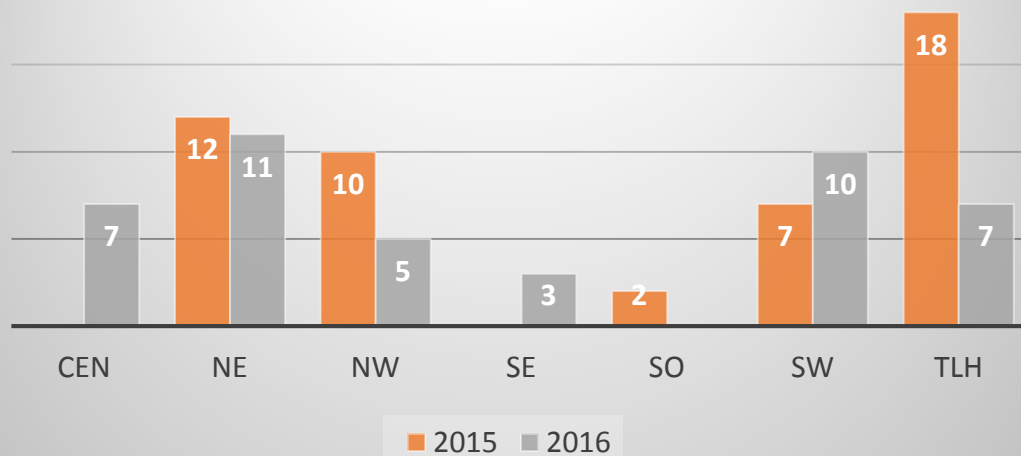
- The following data were retrieved from LIMS under “SCIREF” and “EcoRegional Reference Stream” in SBIO.
- If samples were scheduled/entered under another project (e.g. SMP) they are not included.
- In the future, if reference stream samples are collected for multiple purposes, use the projects listed above. SMP lists are generated from the IWR database and include all standard projects.



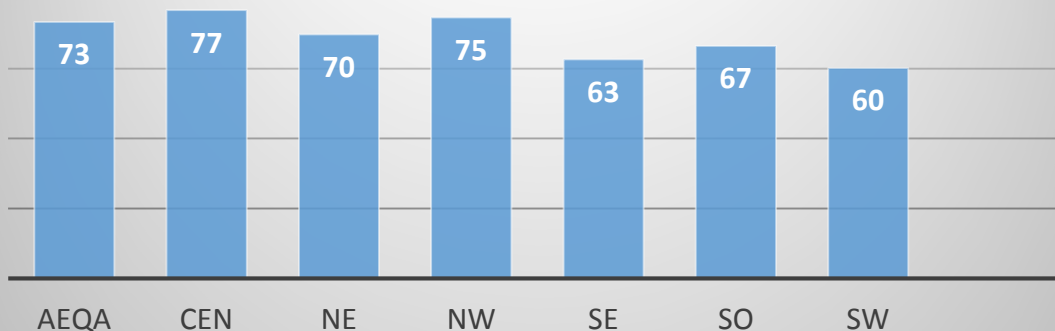
SCI Summary by Sampling Group 2015 – 2016

Graphs include only samples marked complete as of 4-27-17.

SCIs Completed by Sampling Group



Average SCI Score

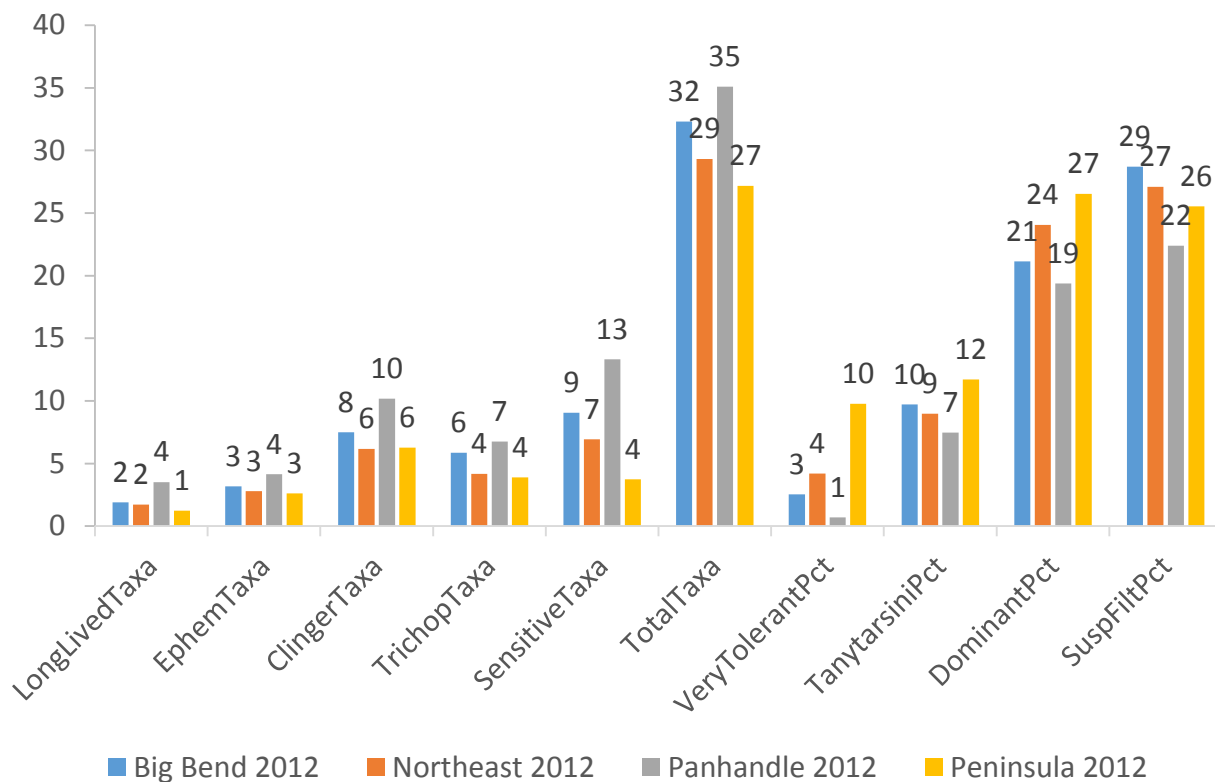




SCI & SCI Metrics by BioRegion

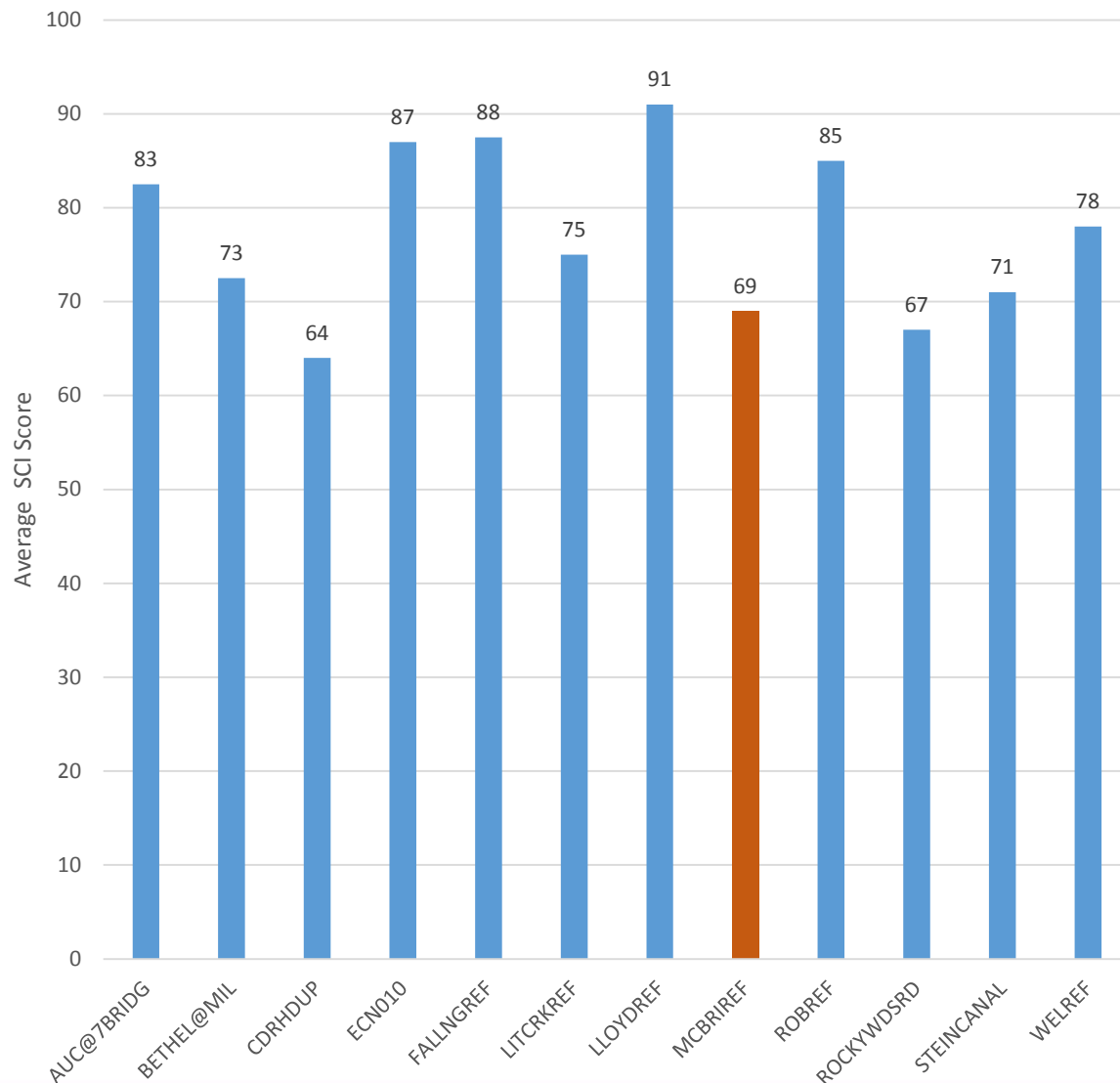
	Big Bend	Northeast	Panhandle	Peninsula
Average	79	64	72	66
Minimum	64	37	52	19
Maximum	92	81	88	92
St. Dev	9.9	13.2	10.6	15.2

SCI Metrics - BioRegion

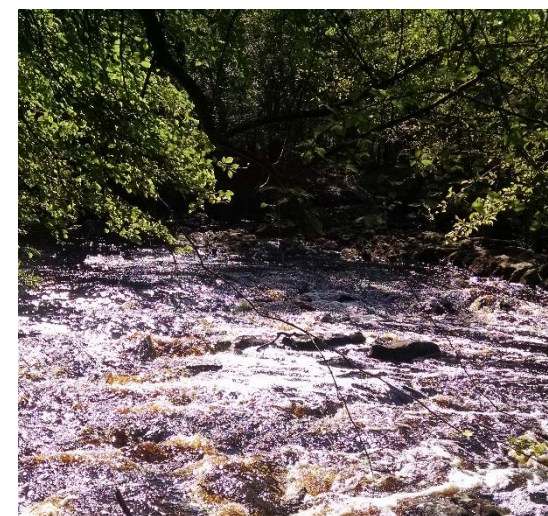




Big Bend – SCI Results



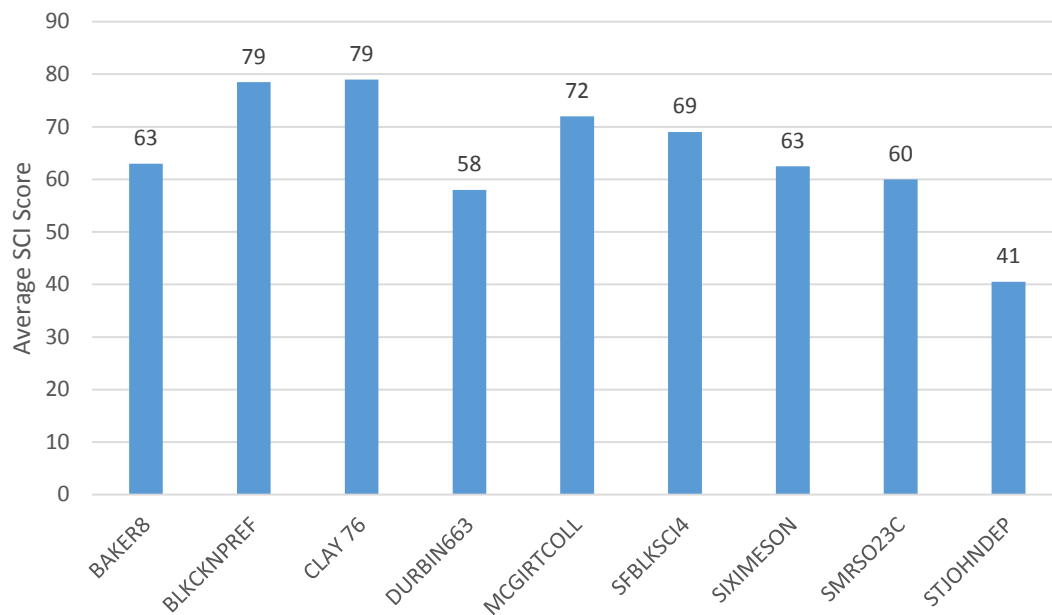
McBride Slough - Sept 3, 2015



Steinhatchee River – May 2, 2017



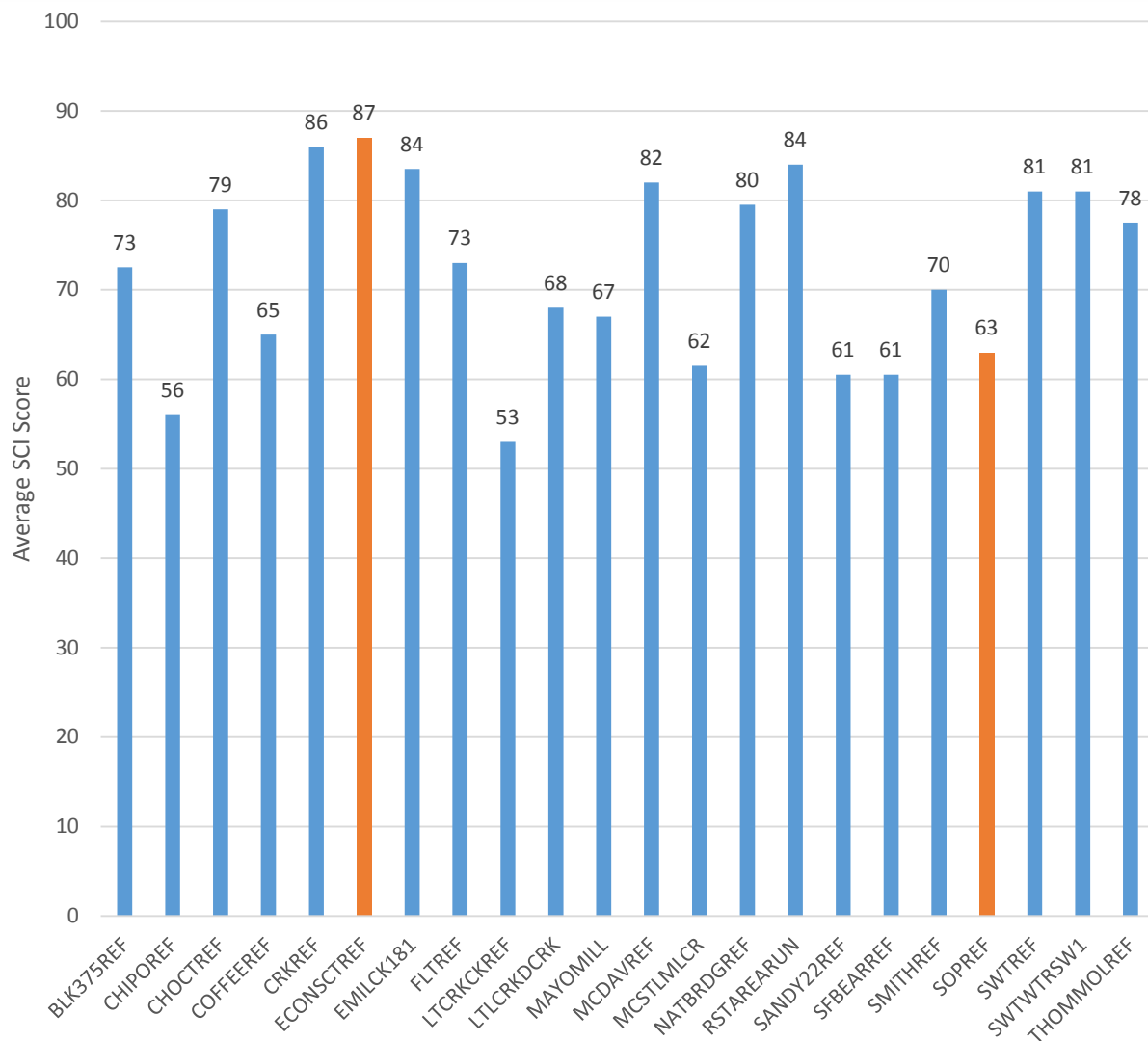
NE – SCI Results



*STJOHNDEP – Deep Bottom Creek



Panhandle – SCI Results



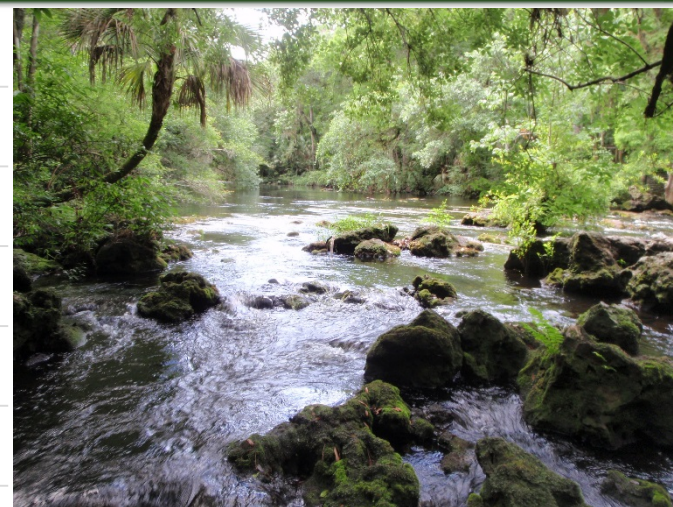
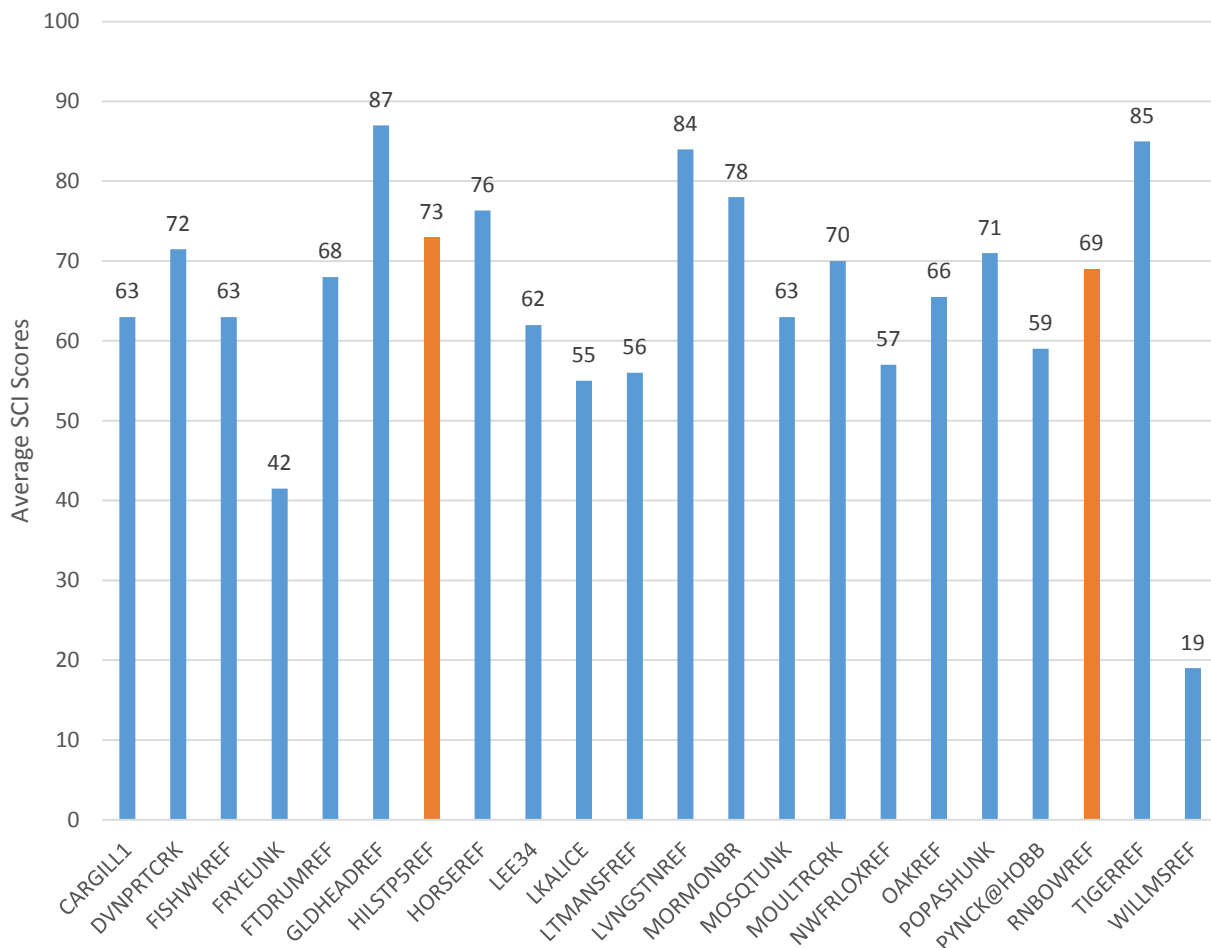
Sopchoppy River - September 3, 2015



Econfina Creek – February 9, 2017



Peninsula – SCI Results



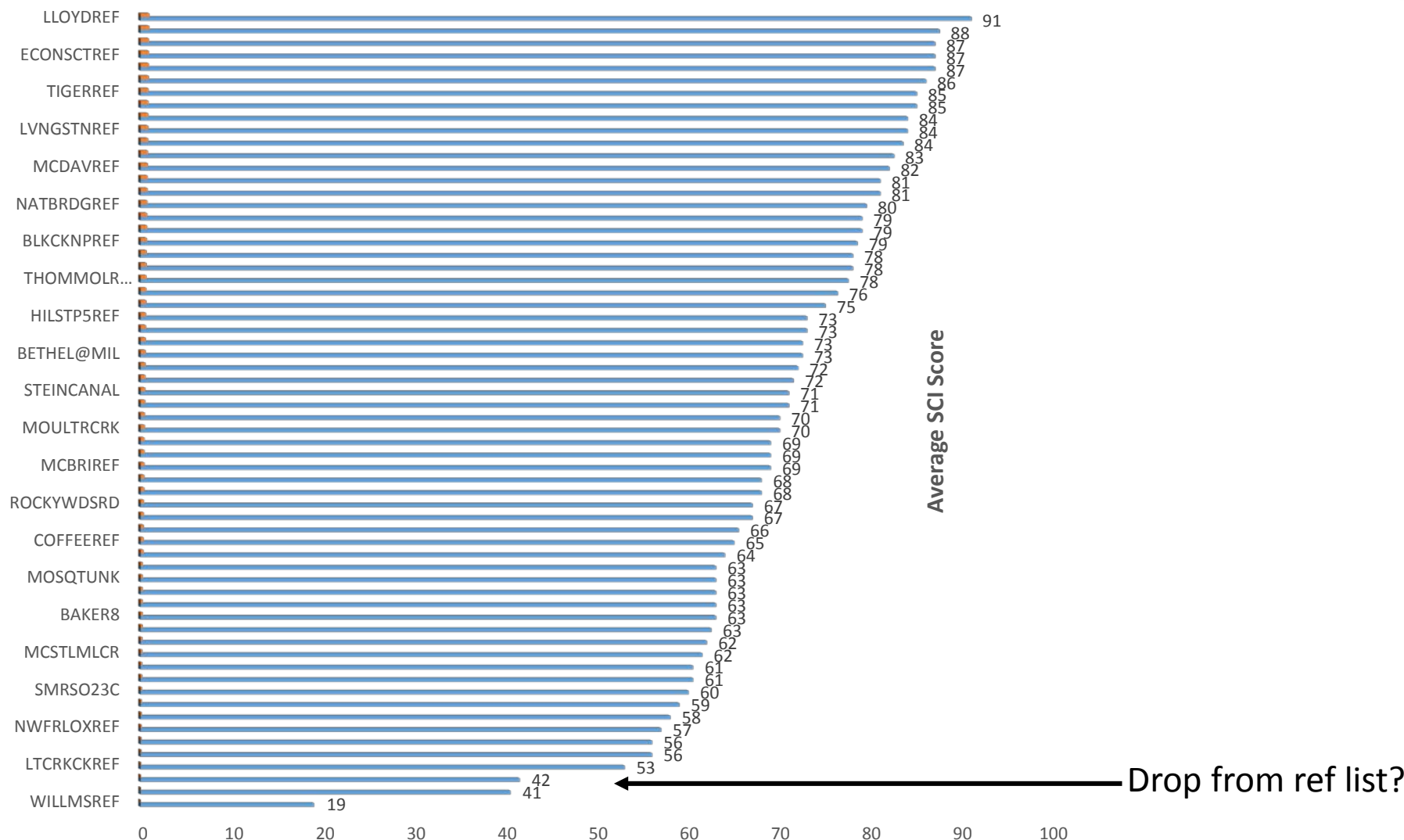
Hillsborough River - April 21, 2015
(photo provided by J. Ashton)



Rainbow River - December 4, 2016
(photo provided by M. Linger)



SCI Score Percentile Ranks





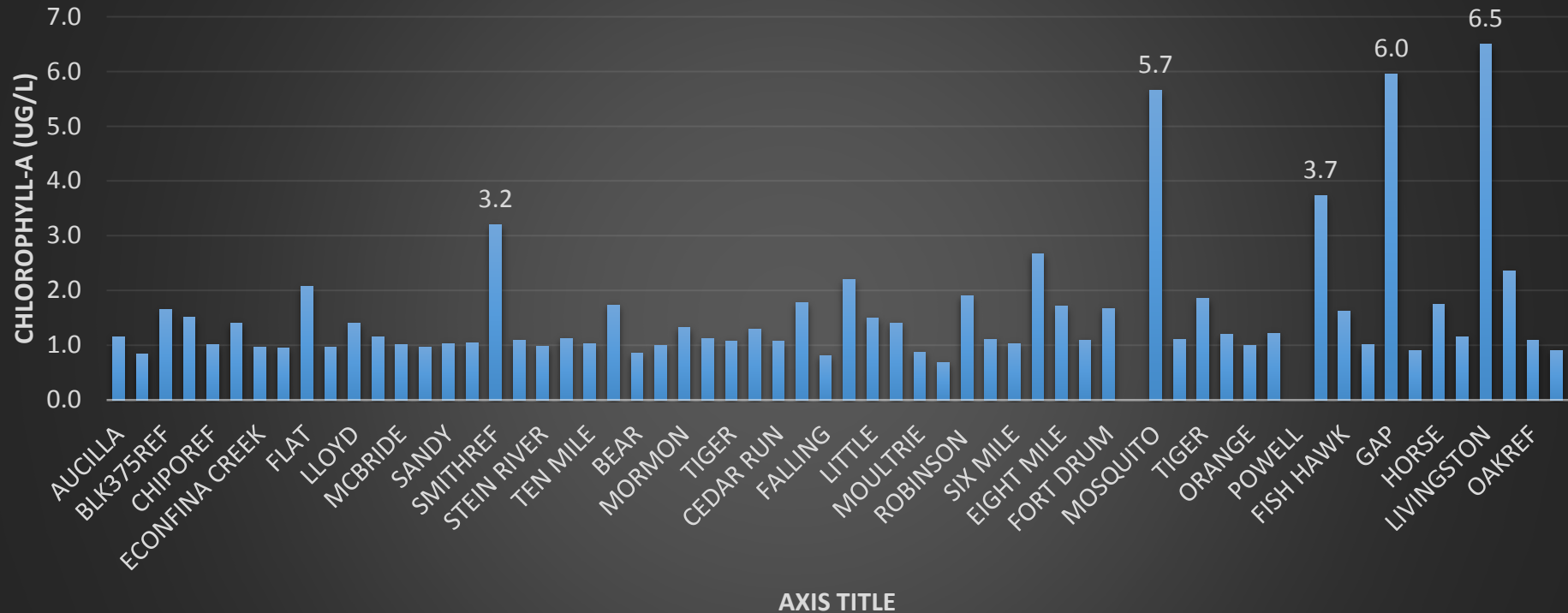
Nutrients – Descriptive Statistics

Analyte	N*	Mean	Std Dev	Median	Min	Median	75%
CHL-A	62	1.592	1.176	1.14	0.69	1.14	1.696
NO2NO3	62	0.268	0.376	0.049	0.004	0.13	0.344
TKN	62	0.655	0.589	0.0761	0.125	0.492	0.845
TN	62	0.888	0.641	0.0814	0.181	0.79	1.06
TP	62	0.152	0.223	0.0284	0.005	0.0715	0.18

*Note: Twenty-two (22) samples were removed for fatal qualifier codes.



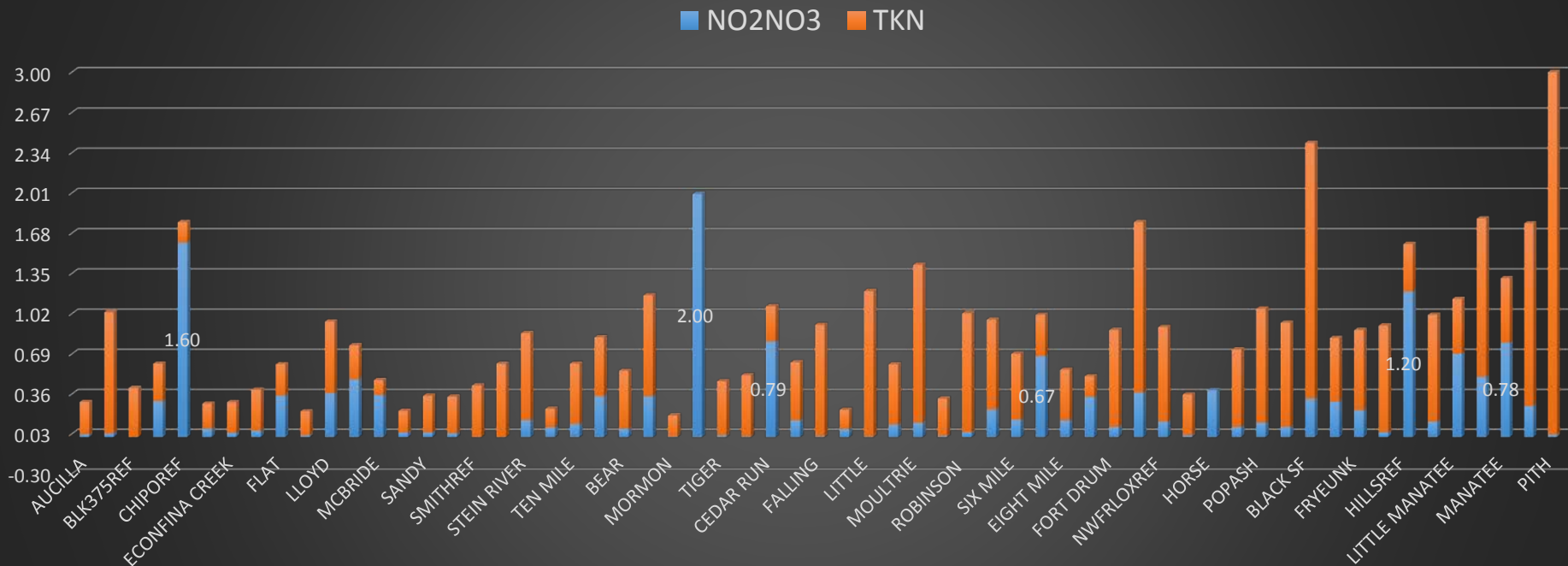
Average Chlorophyll-a



Five sites had elevated chlorophyll-a levels: Smith, Mosquito, South Fork Black, Gap, and Livingston Creeks



TOTAL NITROGEN NO_x + TKN

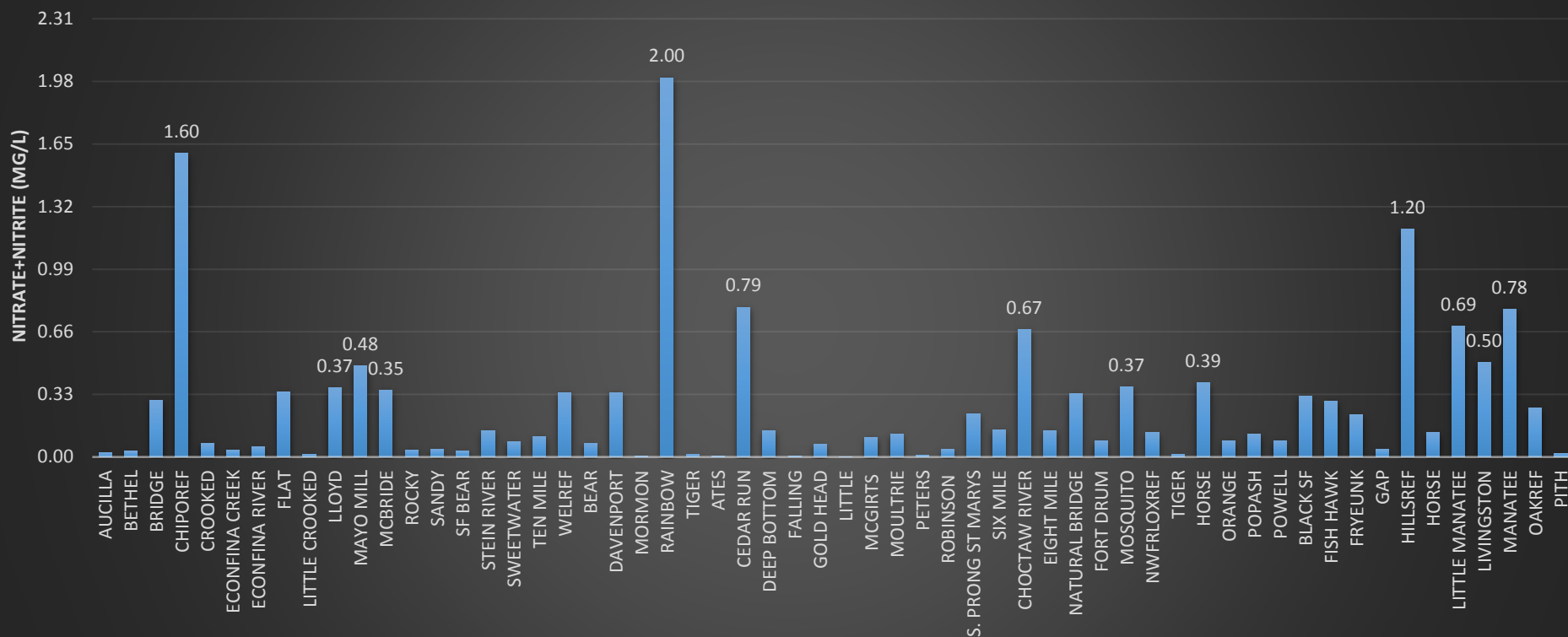


TKN accounted for a large fraction of TN at most sites.

Notable exceptions were the Chipola, Flat, Lloyd, Mayo Mill, McBride, Rainbow, Cedar Run, Choctawhatchee, Hillsborough, Little Manatee, and Manatee Rivers where NO_x made up half or more.



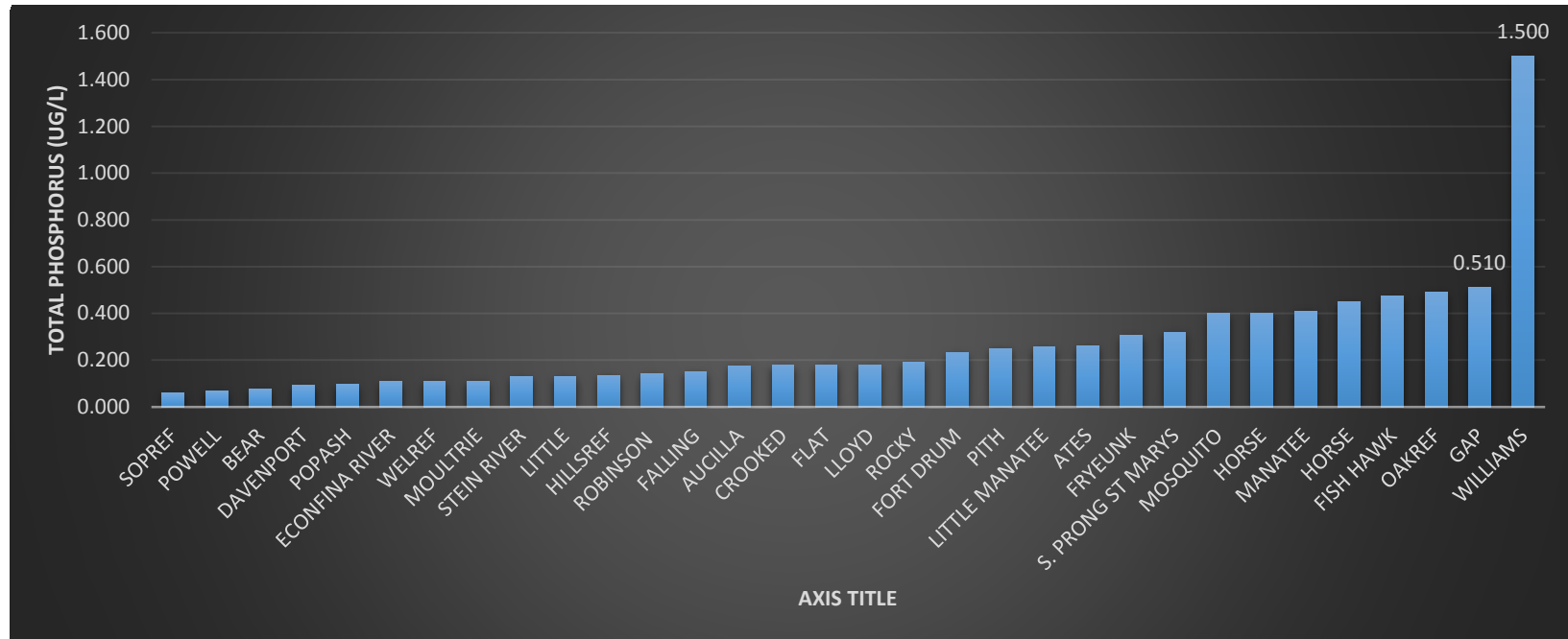
NO₂+NO₃



Thirteen sites had ≥ 0.35 mg/L nitrate: Chipola, Flat, Lloyd, Mayo Mill, McBride, Rainbow, Cedar Run, Choctawhatchee, Mosquito, Horse, Hillsborough, Livingston, and Little Manatee, Livingston, and Manatee



TOTAL PHOSPHORUS



Williams Creek was an order of magnitude higher than most sites.

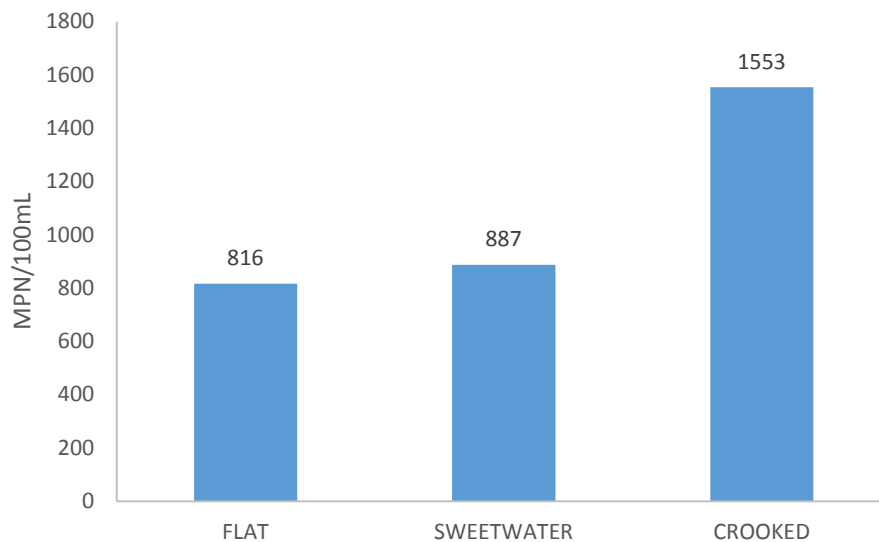
Williams is also the site that had a 19 and 37 for SCl scores. We suggest removing it from the pool of reference sites.



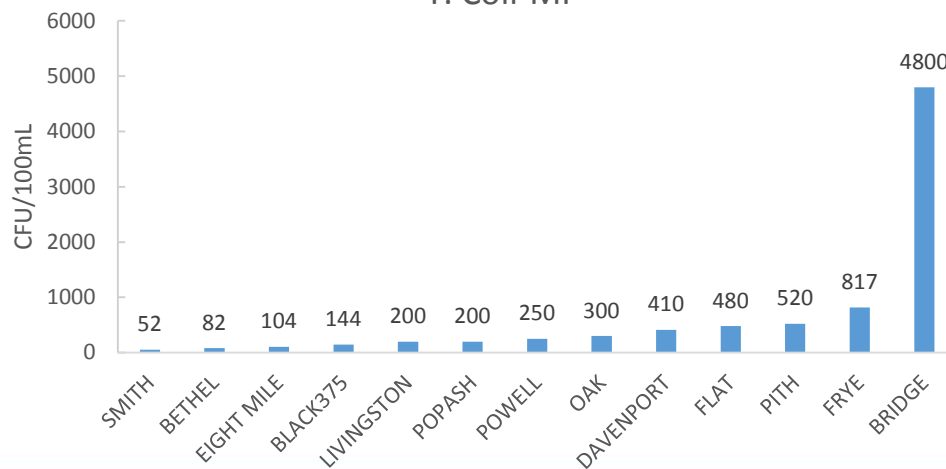
Bacteria

E. Coli-QT

(samples that exceed TPTV ≤ 410 CFU/100mL)



F. Coli-MF

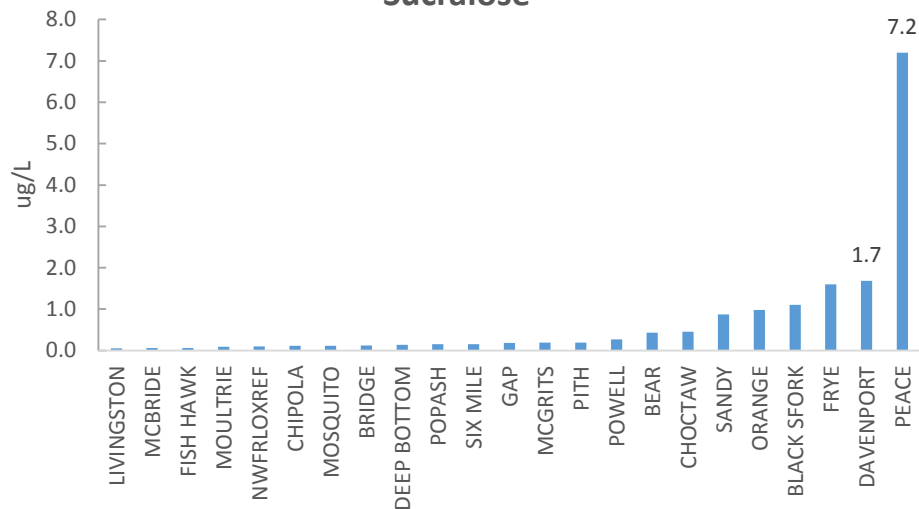




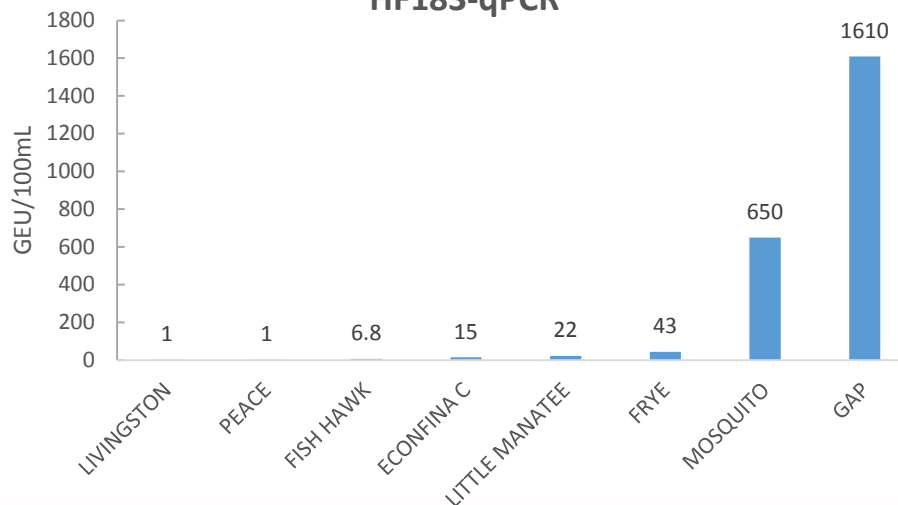
Bacterial Indicators

Very few acetaminophen samples were collected. Check scheduling templates to make sure it is included.

Sucralose



HF183-qPCR





Cell-fie



Cell-fie



Cell-fie