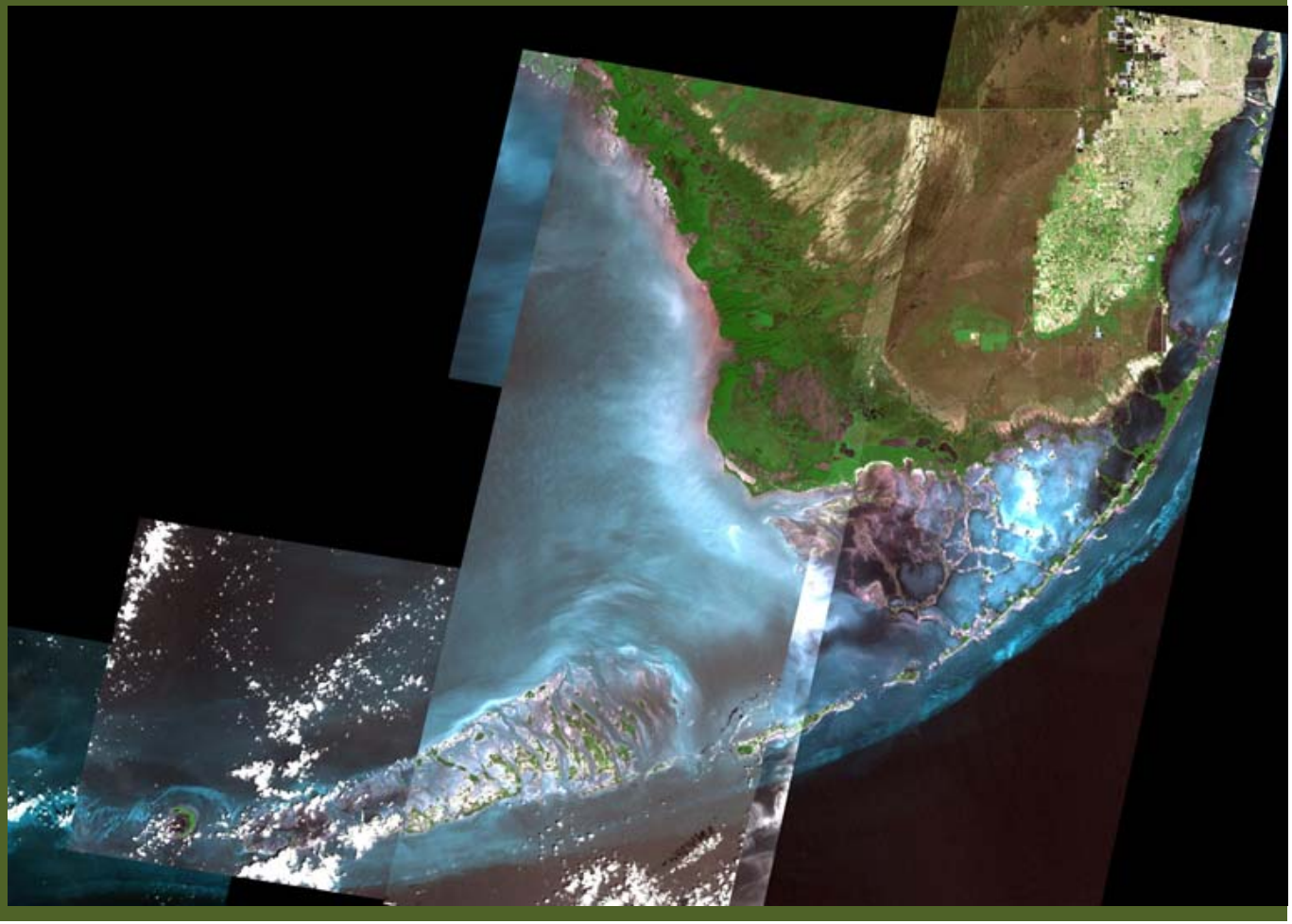
GEER 2015

Biscayne Bay Part II: Coastal Restoration and Management of Biscayne Bay

NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS RESPONSES IN SOUTH FLORIDA COASTAL AND ESTUARINE WATERS

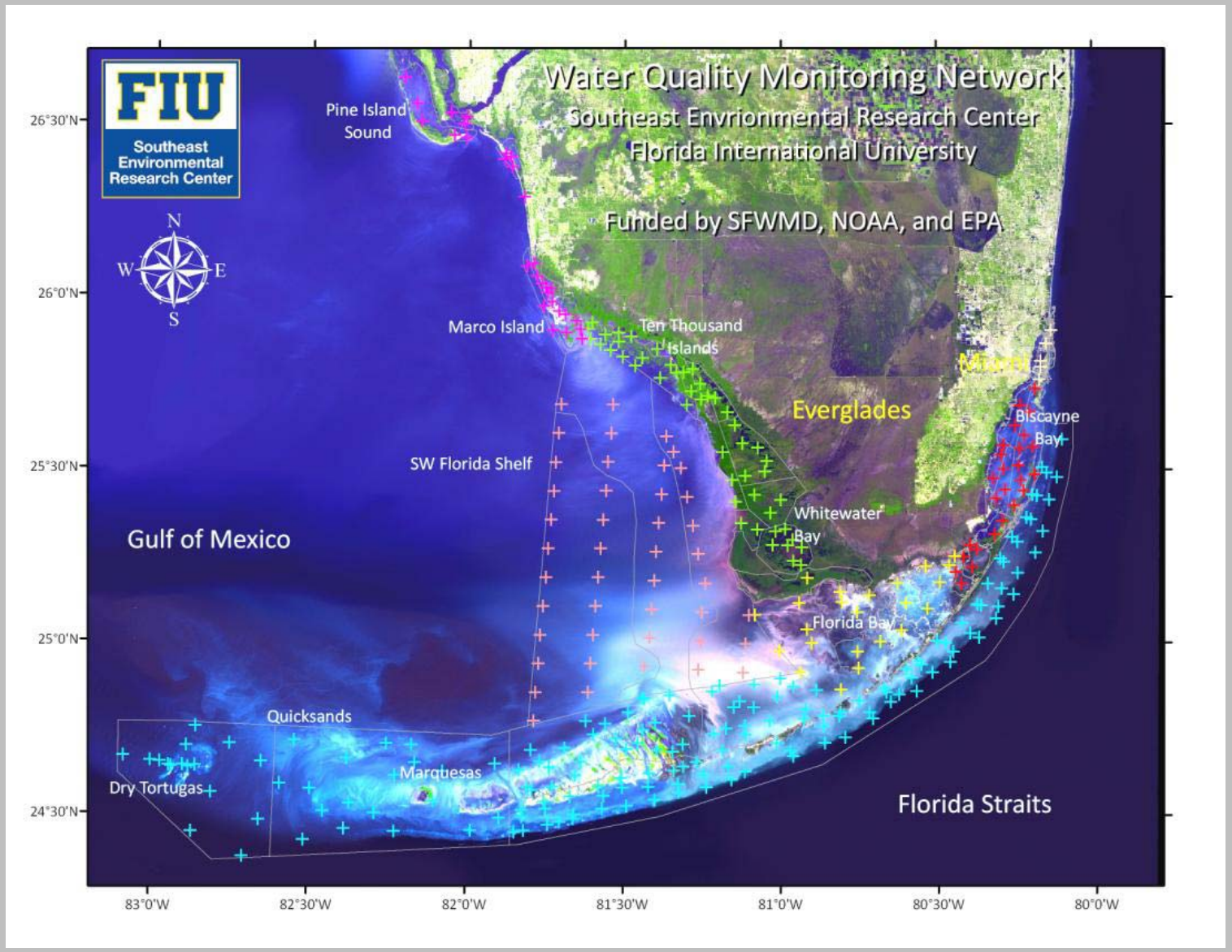


Henry O. Briceño
Florida International University

Joseph N. Boyer
Plymouth State University

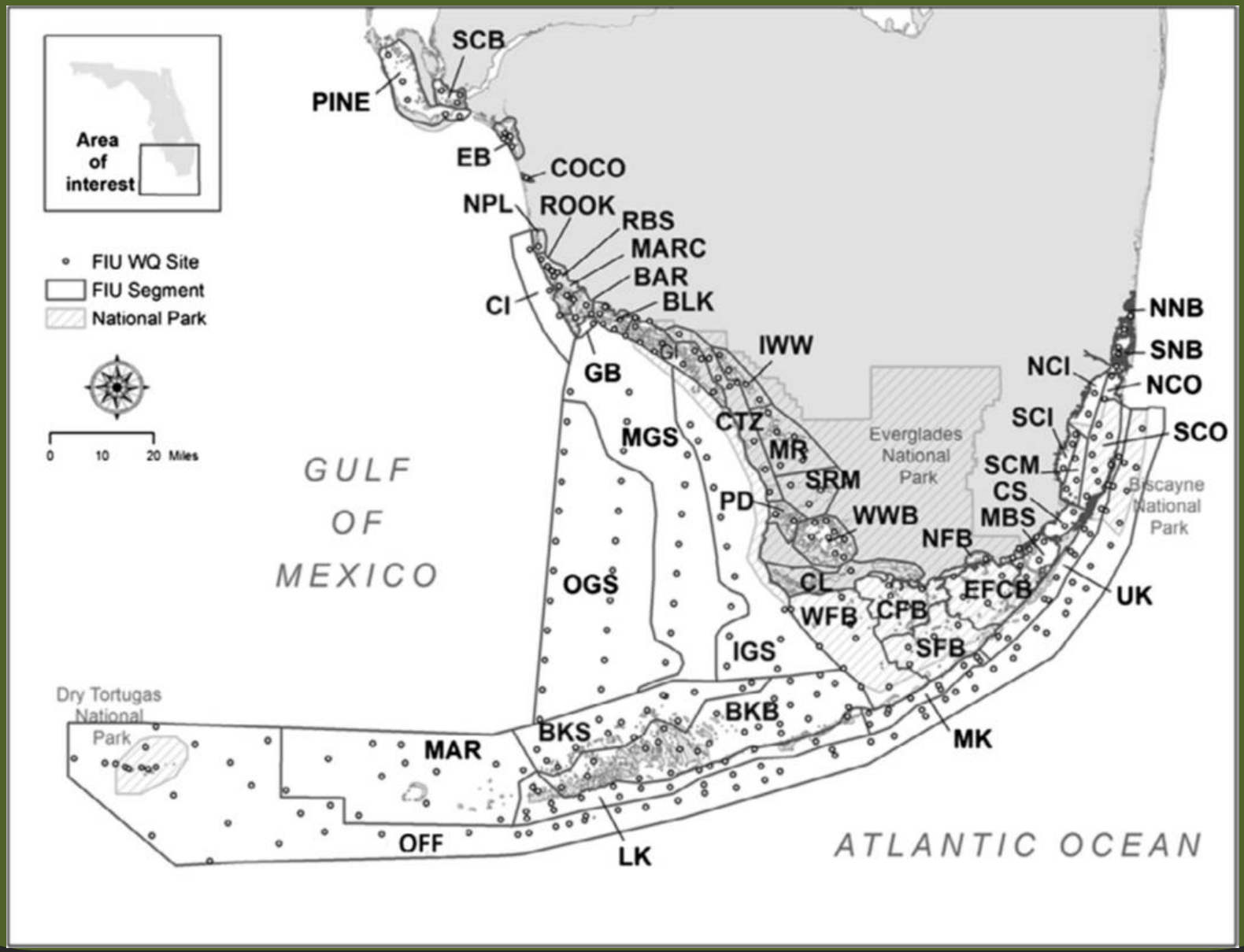
NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

Water Quality Monitoring Network



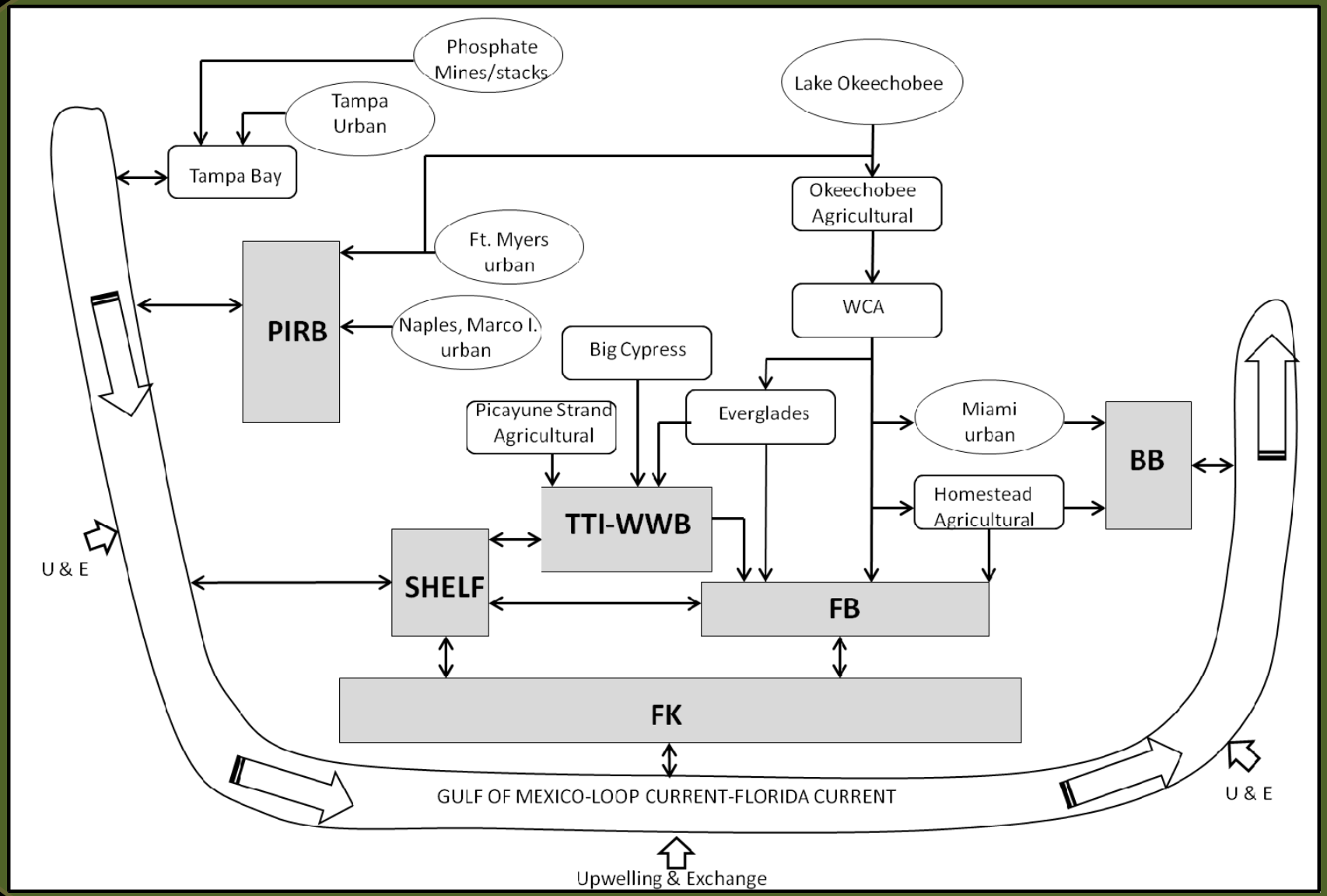
NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

Geographic setting



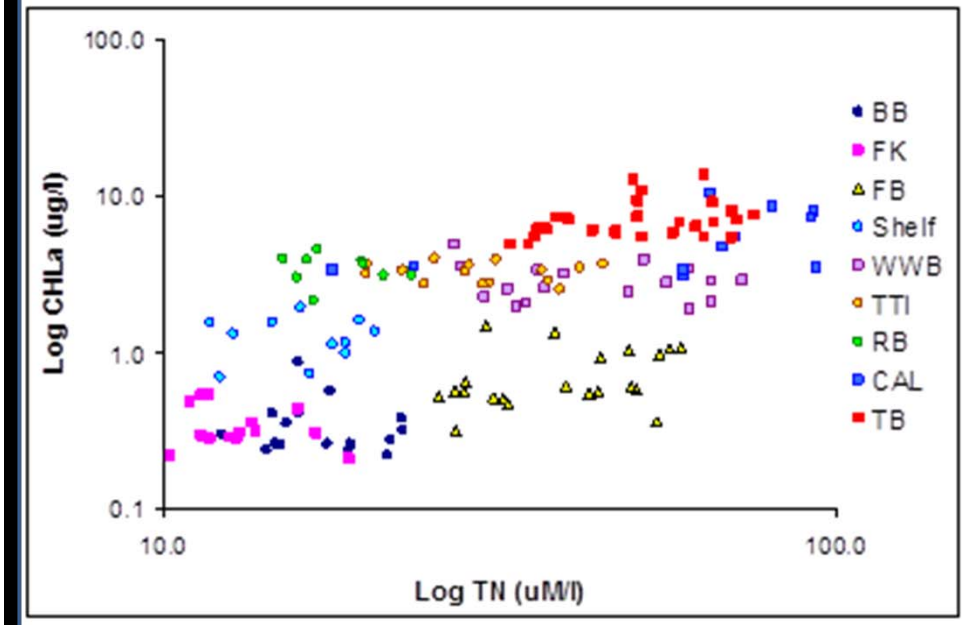
NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

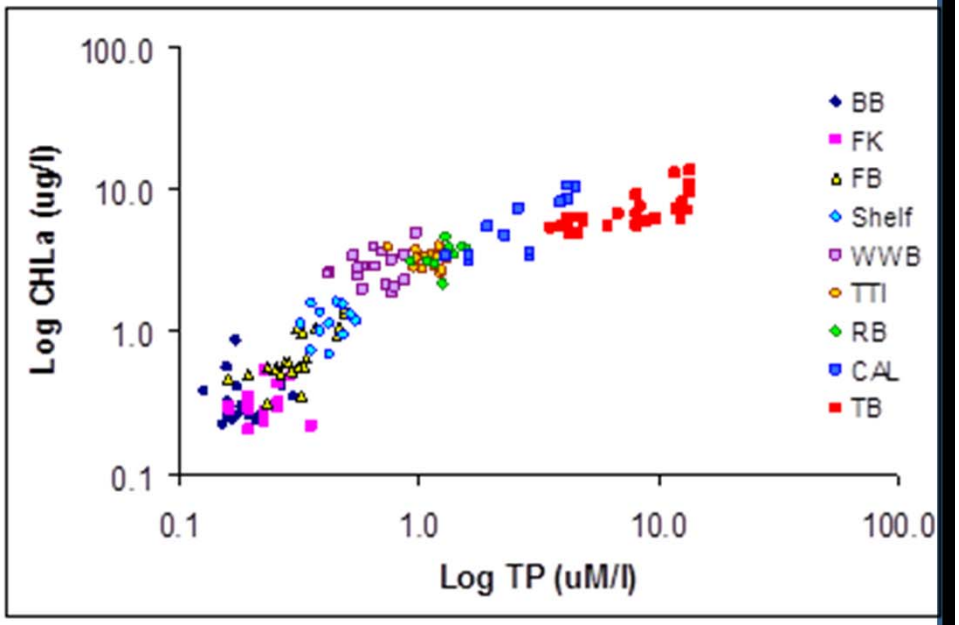
Conceptual Model



NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

Chlorophyll-a Drivers





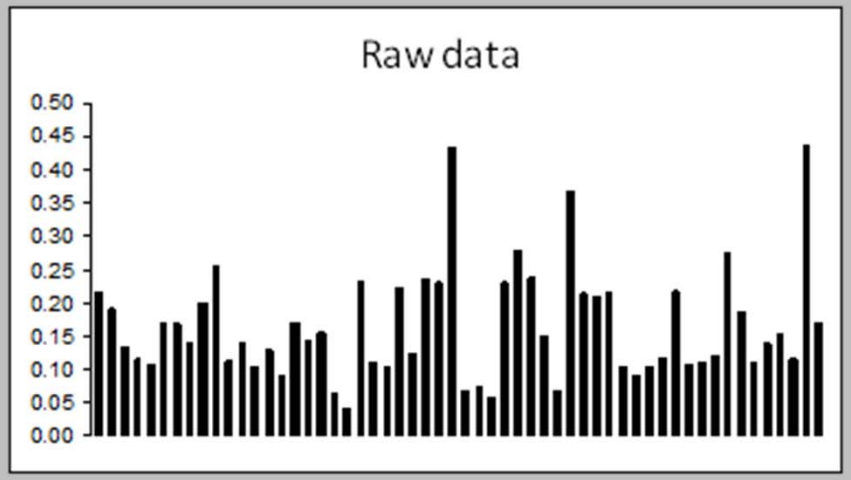
Method for Calculating Nutrient Thresholds

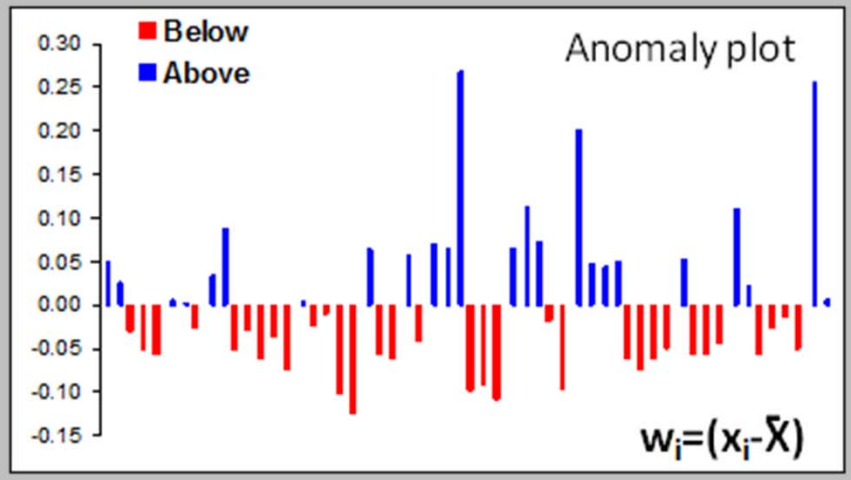
Threshold:

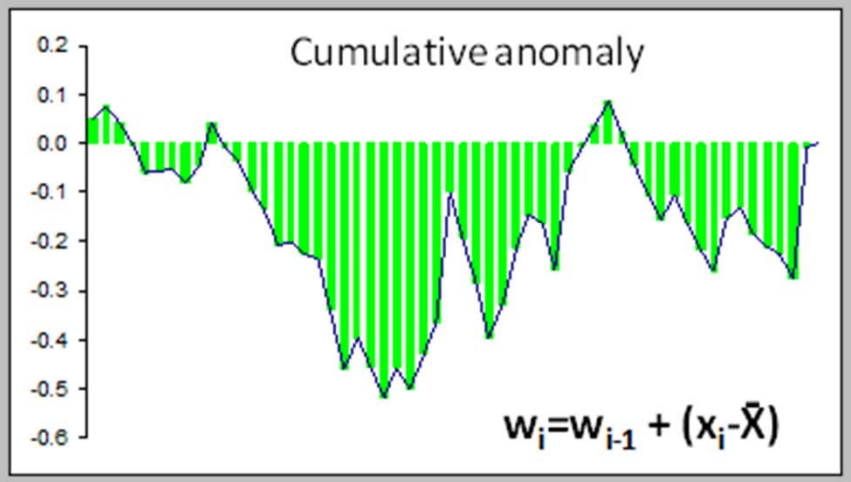
…"is the critical values of an environmental driver for which small changes can produce an abrupt shift in ecosystem conditions, where core ecosystem functions, structures and processes are essentially changed between alternative states".

NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

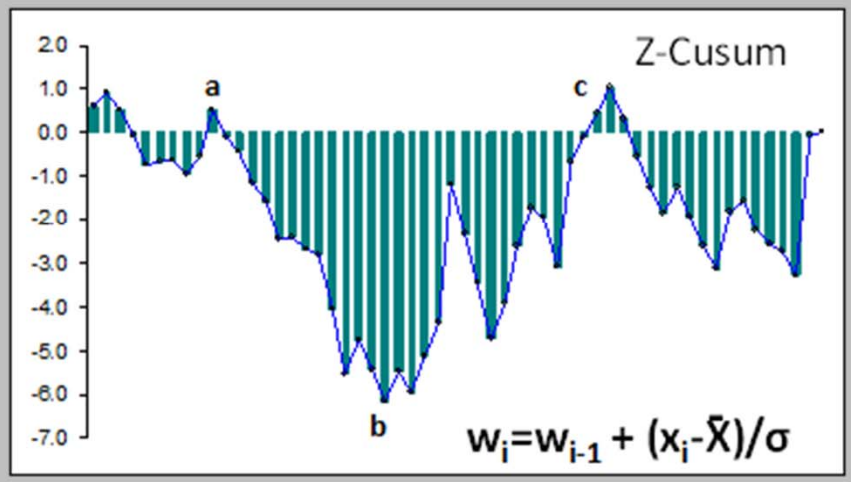
Method







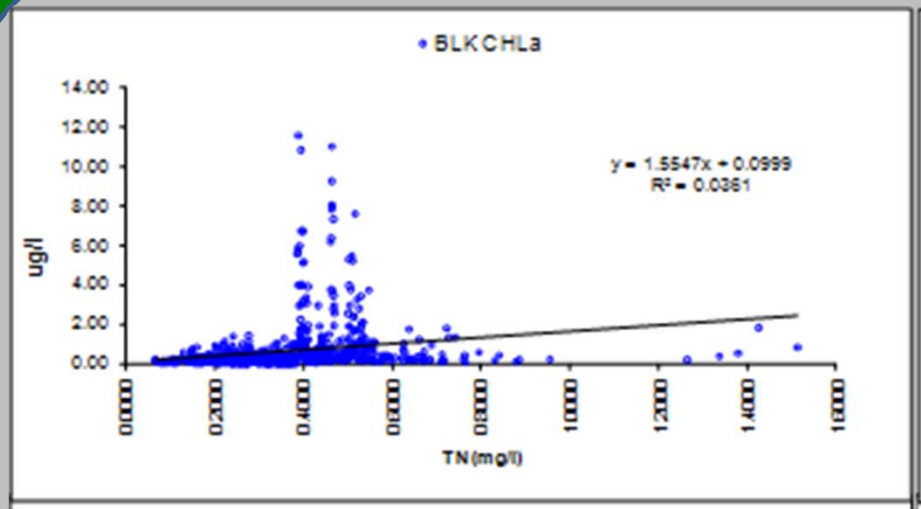
Running sum of anomaly data
(deviation expressed in original units)

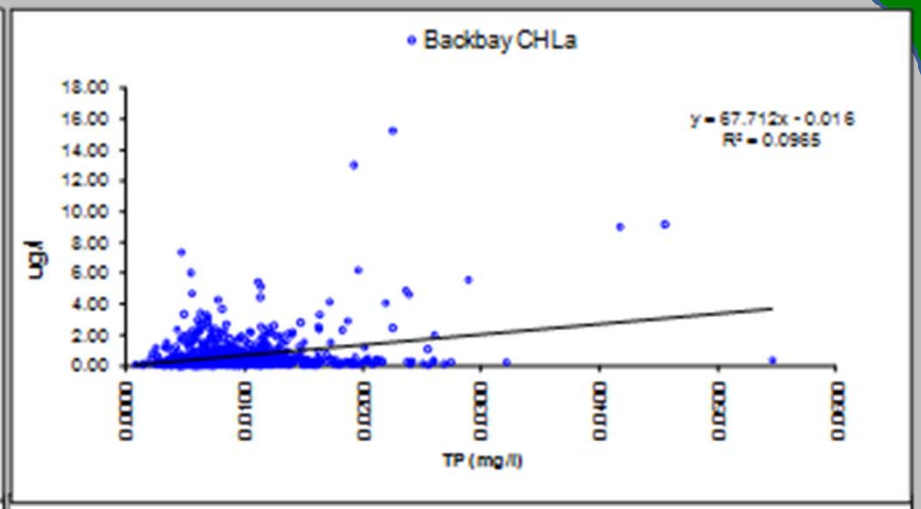


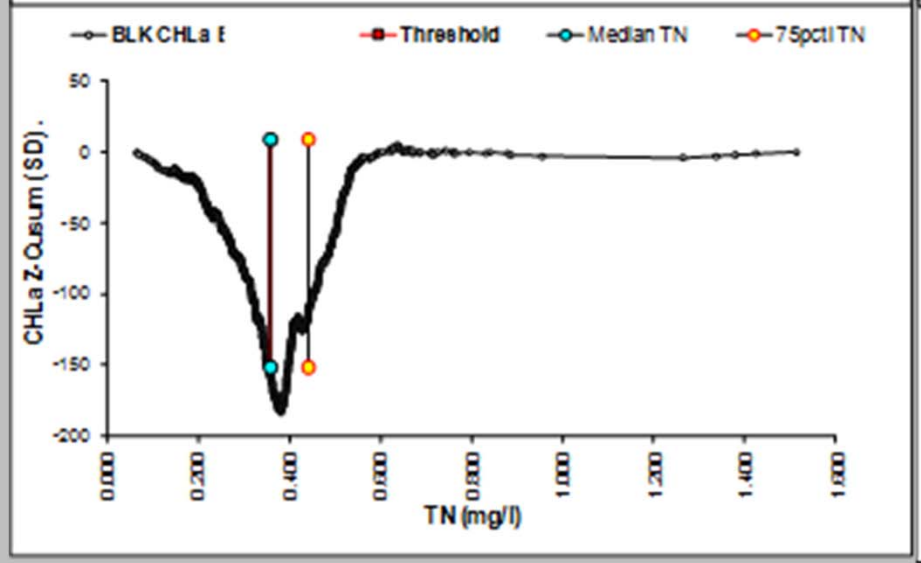
Running sum of z-scored data
(deviation expressed as multiples of σ)

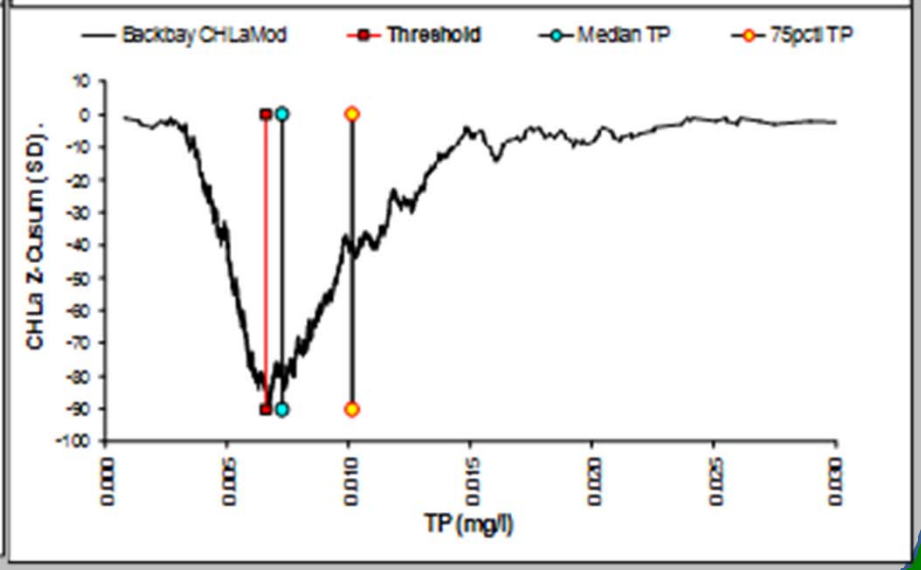
NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS

Method

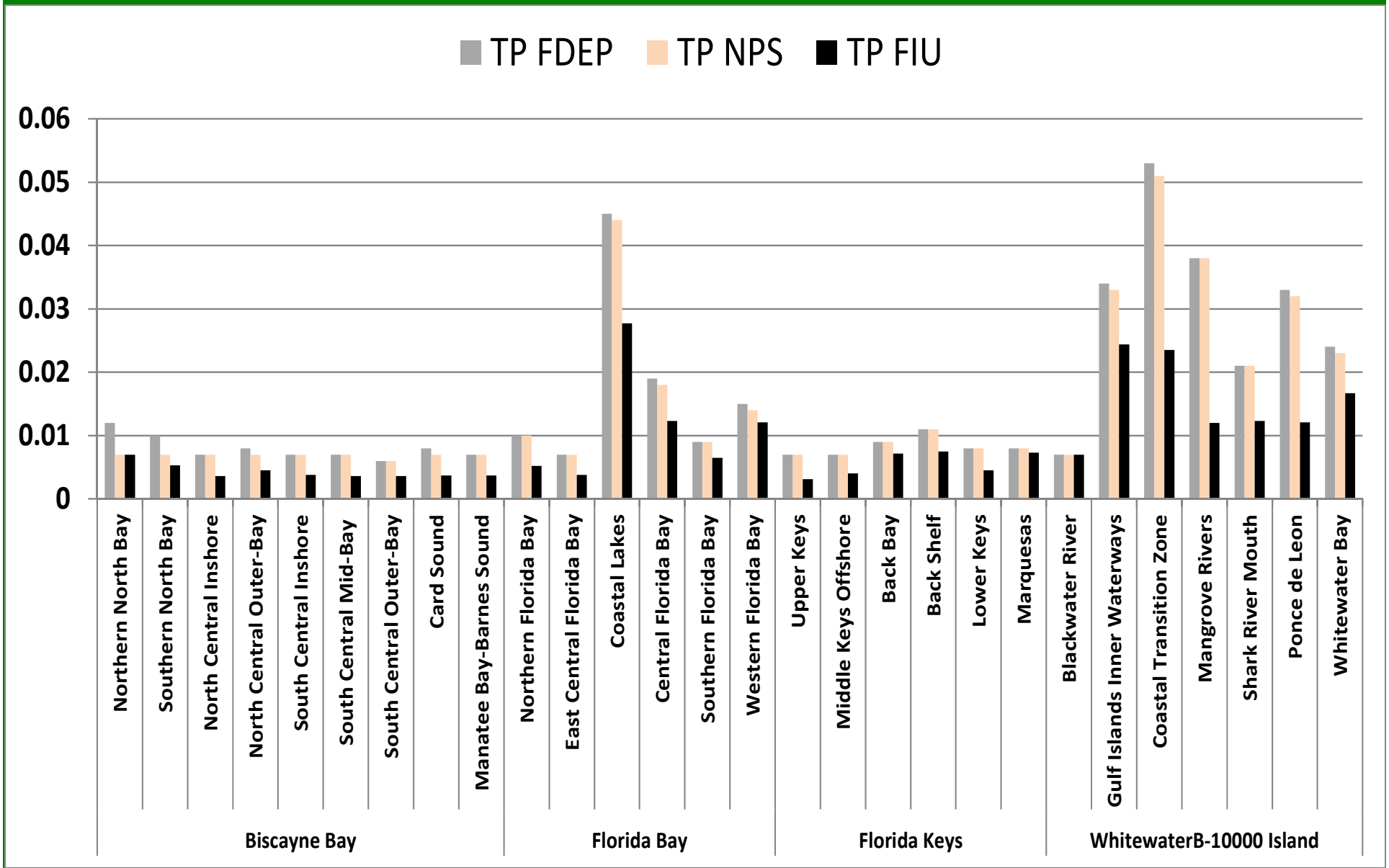




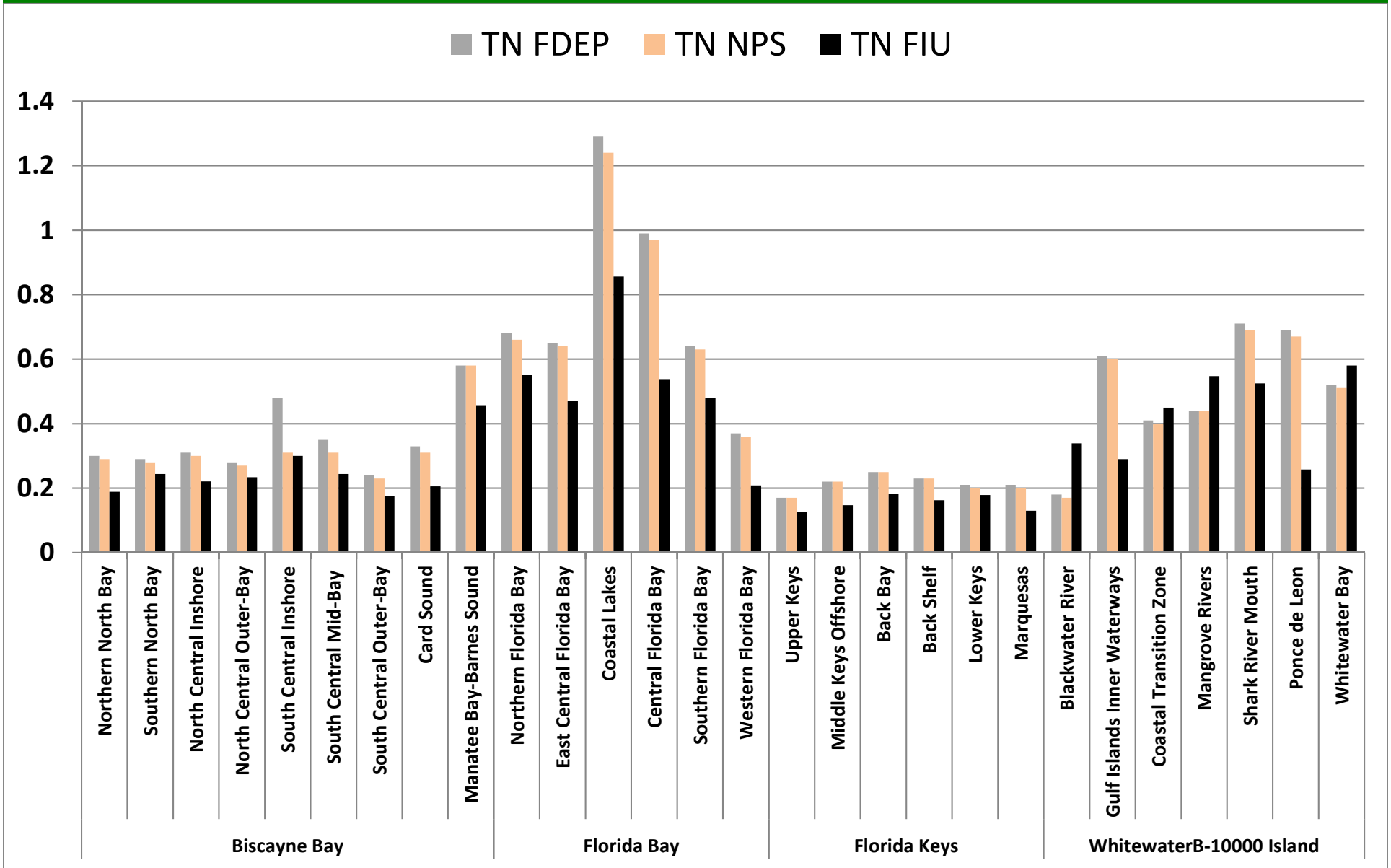




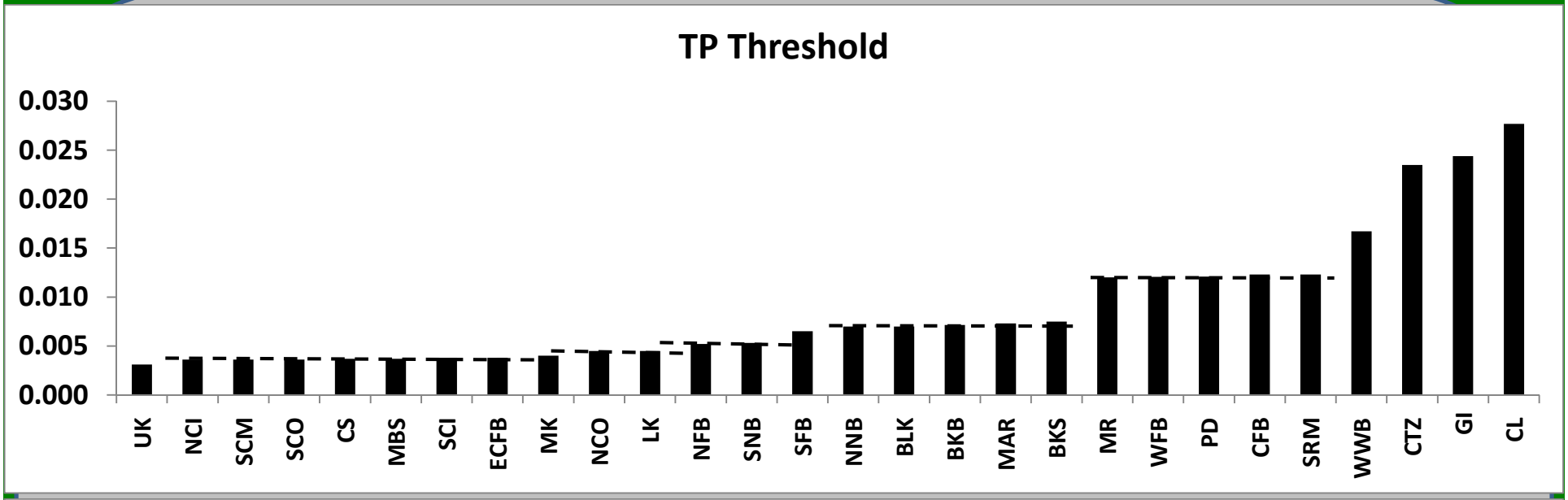
NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS
Comparing results to NPS suggested values and FDEP criteria

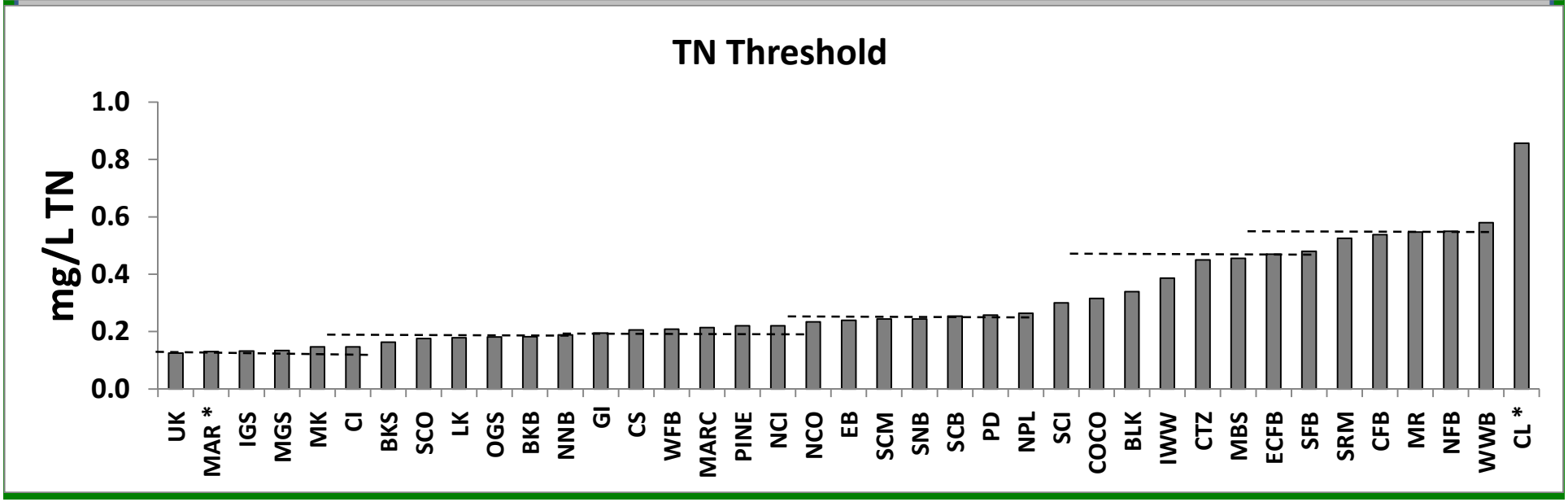


NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS
Comparing results to NPS suggested values and FDEP criteria



NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS





NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS CONCLUSIONS

Although cause-and-effect relationships between nutrient enrichment and ecosystem responses have not been experimentally established (i.e. no nutrient-dose experiments), monitoring data may be used to assess such relationships.

CHLa concentrations in South Florida waters s driven more by phosphorous than by nitrogen concentration

There are driver concentration thresholds whose small changes can produce an abrupt shift in ecosystem conditions and response leading to significant changes.

There are common threshold levels which transcend salinity regimes and ecosystem structures, from the most oligotrophic systems (Florida Keys) to the eutrophic end members (Pine Island-Rookery Bay, Whitewater Bay-Ten Thousand Islands).

GEER 2015

Biscayne Bay Part II: Coastal Restoration and Management of Biscayne Bay

NUTRIENT THRESHOLDS DRIVE PHYTOPLANKTON BIOMASS RESPONSES IN SOUTH FLORIDA COASTAL AND ESTUARINE WATERS

Henry O. Briceño
Florida International University

Joseph N. Boyer
Plymouth State University