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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
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Geographic setting
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Conceptual Model
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Chlorophyll-α 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”.

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Method

Raw data

Anomaly plot

Cumulative anomaly

Z-Cusum

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

Running sum of z-scored data (deviation expressed as multiples of σ)
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Method
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Comparing results to NPS suggested values and FDEP criteria

![Graph comparing nutrient thresholds across different areas in Florida. The x-axis represents various locations such as Biscayne Bay, Florida Bay, Florida Keys, and WhitewaterB-10000 Island. The y-axis represents TP concentrations ranging from 0 to 0.06. The graph shows the comparison of TP concentrations across FDEP, NPS, and FIU criteria.]
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Comparing results to NPS suggested values and FDEP criteria
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TP Threshold

TN Threshold

mg/L TN

UK  NCI  SCM  SCO  CS  MBS  SCI  ECFB  MK  NCO  LK  NFB  SNB  SFB  NNB  BLK  BKB  MAR  BKS  MR  WFB  PD  CFB  SRM  WWB  CTZ  GI  CL

UK  NCI  SCM  SCO  CS  MBS  SCI  ECFB  MK  NCO  LK  NFB  SNB  SFB  NNB  BLK  BKB  MAR  BKS  MR  WFB  PD  CFB  SRM  WWB  CTZ  GI  CL
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 are 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).
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Thanks!!!

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