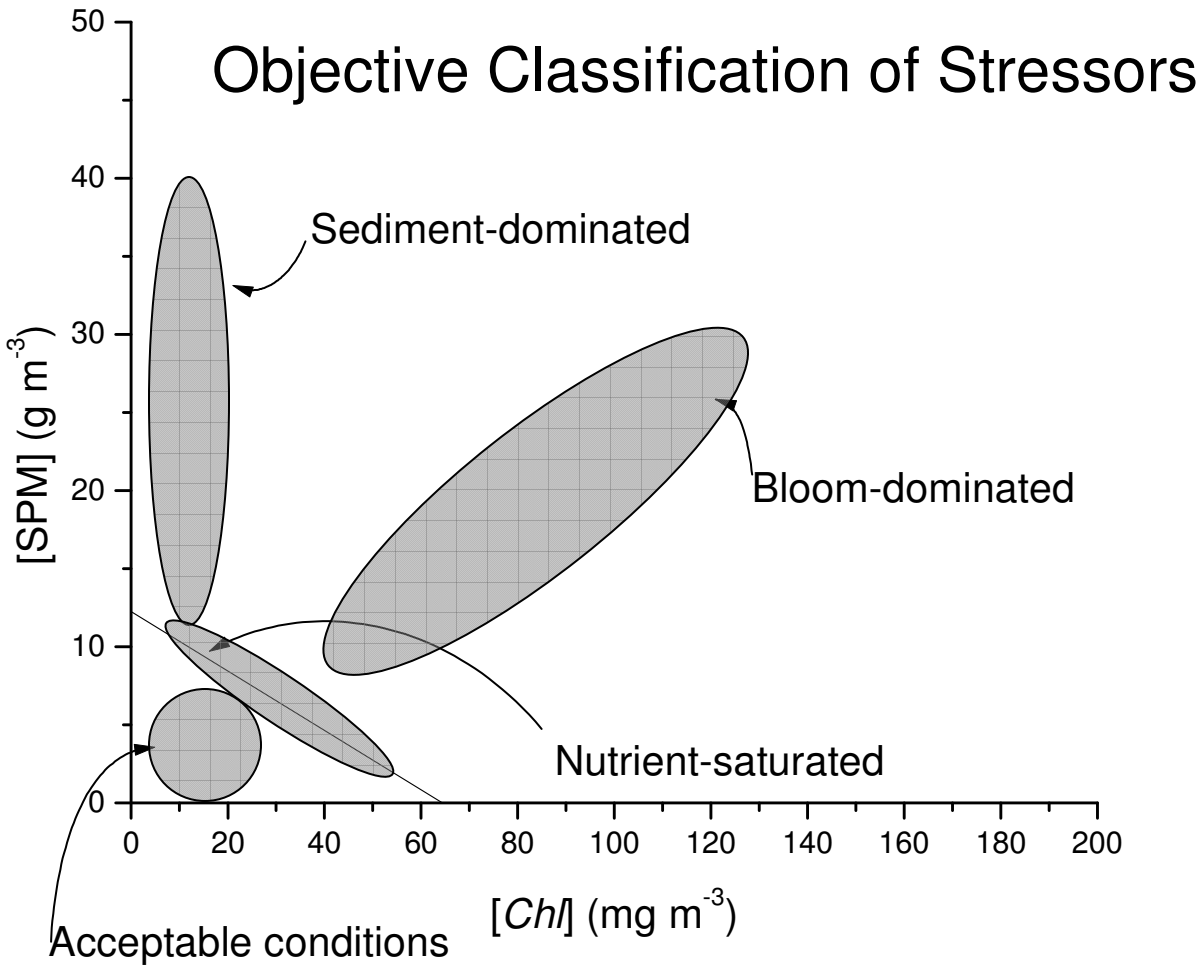
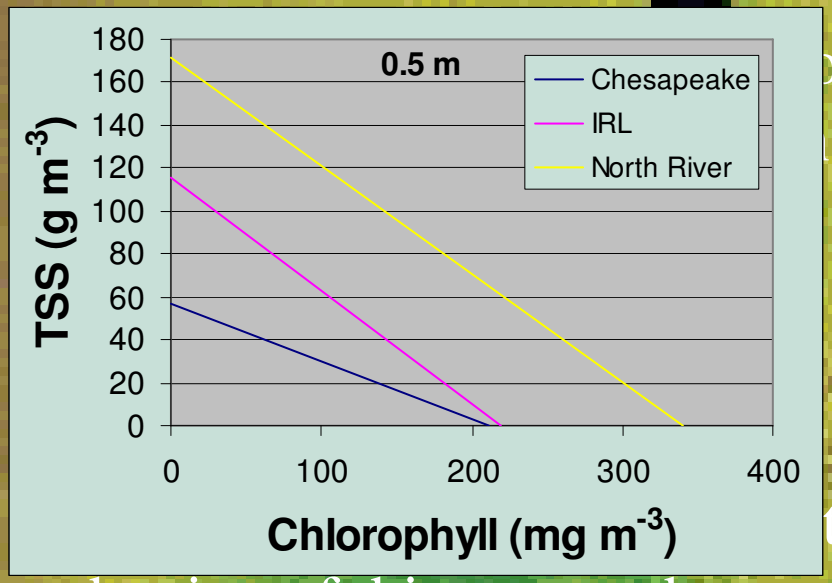
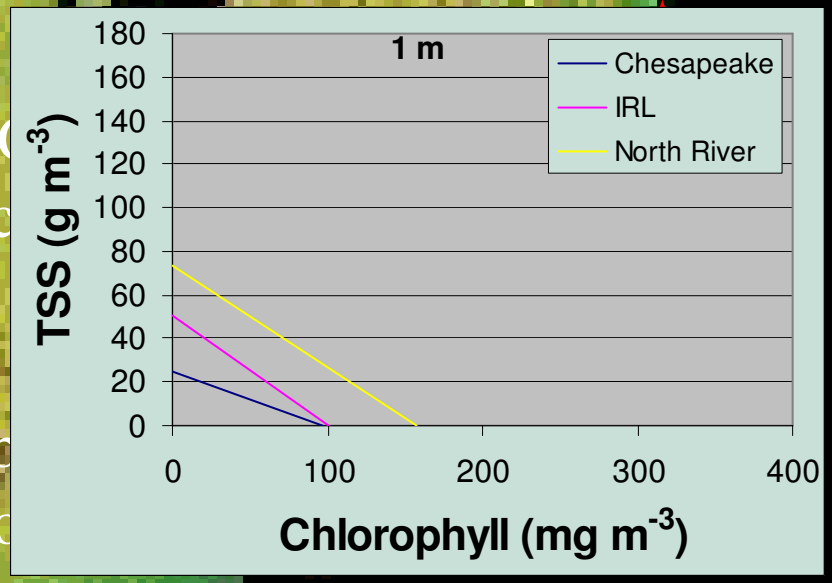
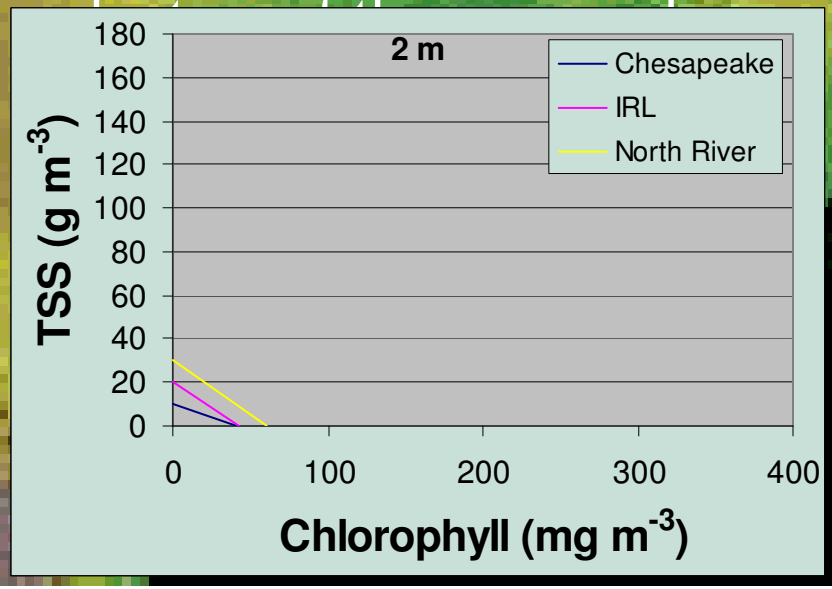
Development of Indicator Based on Quantification of Characteristic Modes of Variation



Indicator Status

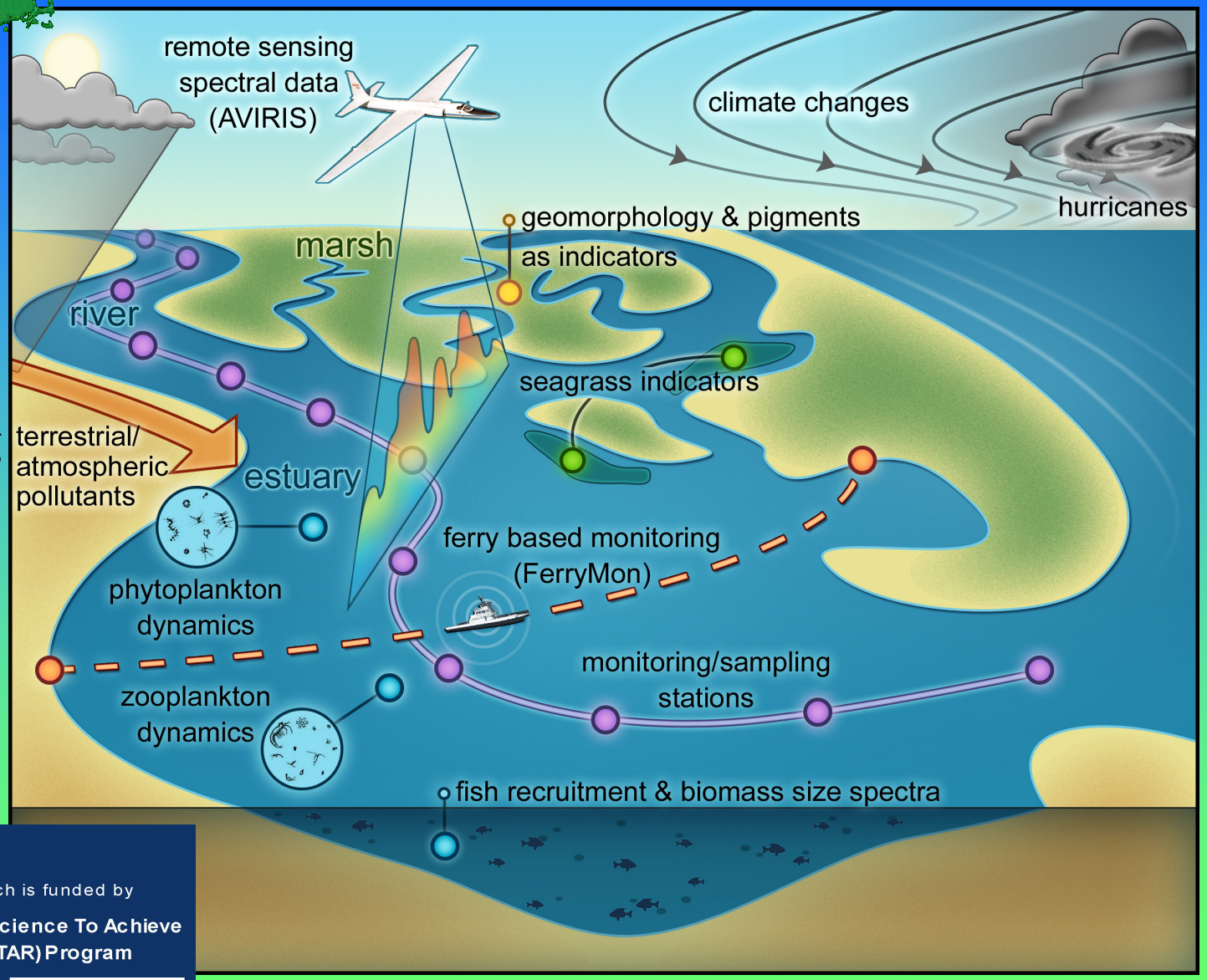






Coastal Indicators as Management Tools

www.aceinc.org



Thanks to

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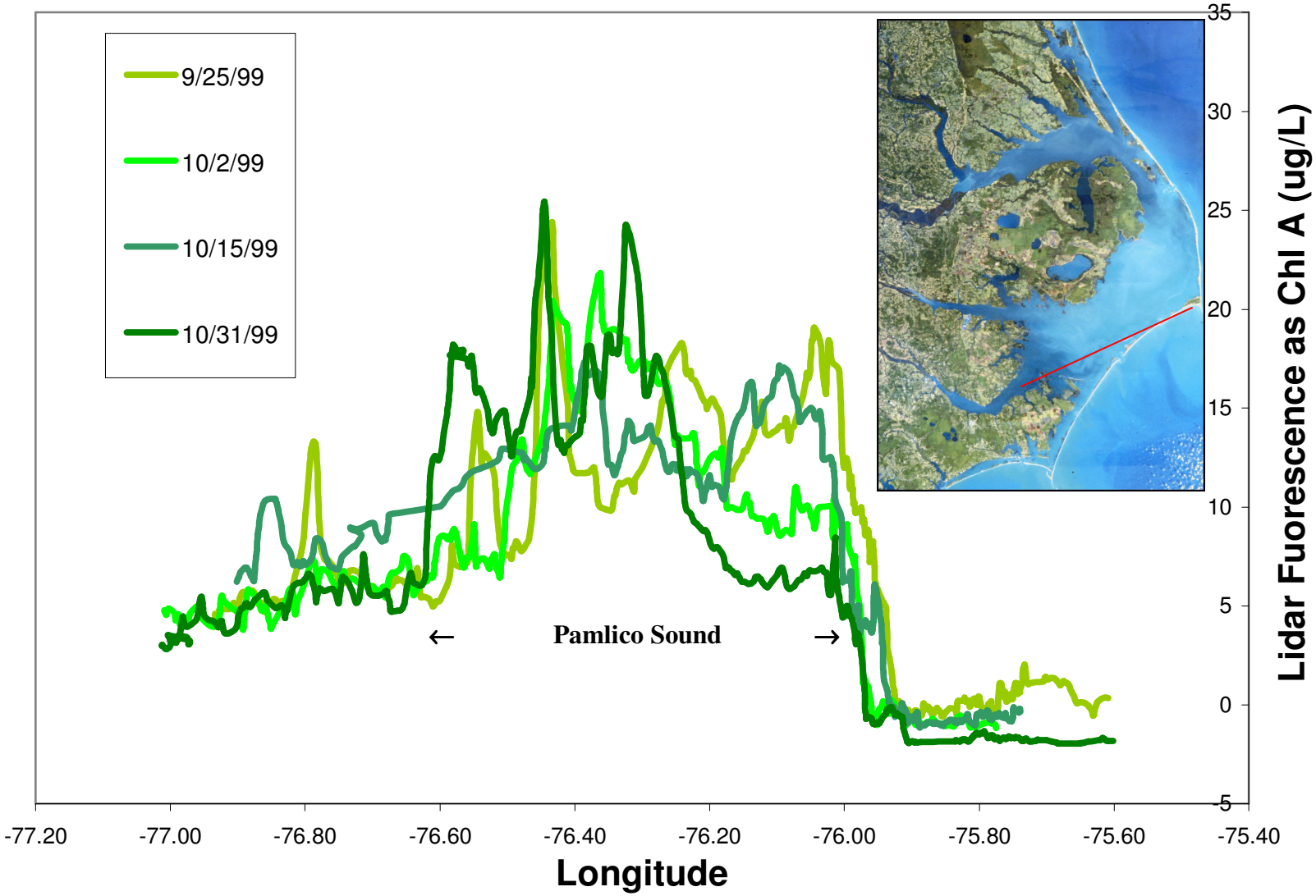
U.S. EPA - Science To Achieve Results (STAR) Program
Grant # 82667701

NOAA-ECOHAB, NSF, NC Sea Grant, USDA

Using FerryMon to calibrate remotely-sensed photopigments

Overflight Data from Line 5, Neuse River into the Pamlico Sound and out Ocracoke Inlet onto the shelf



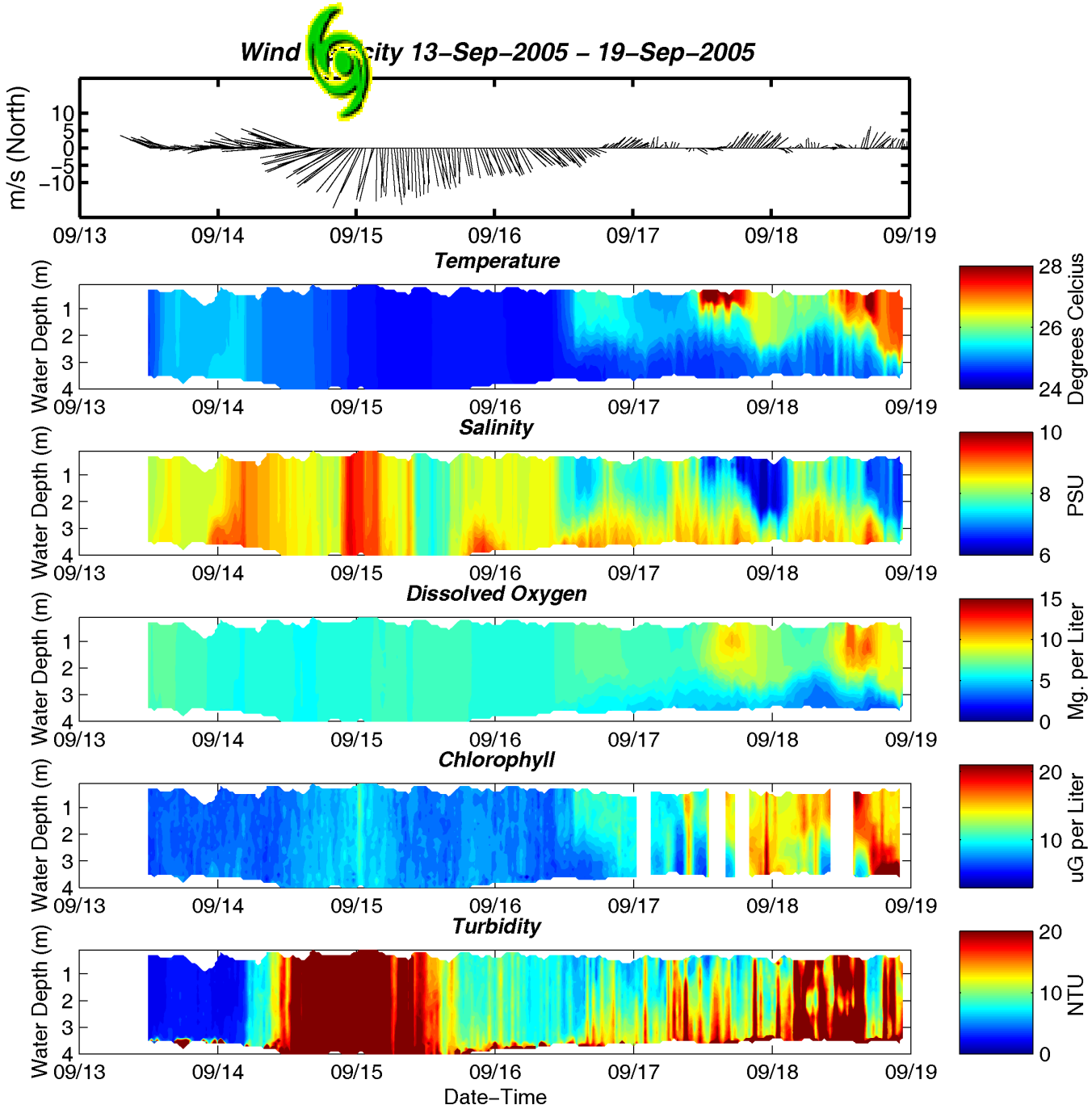
Examining & expanding the vertical scale: Autonomous Vertical Profiling System

Computer controlled winch mechanism controls depth of instruments

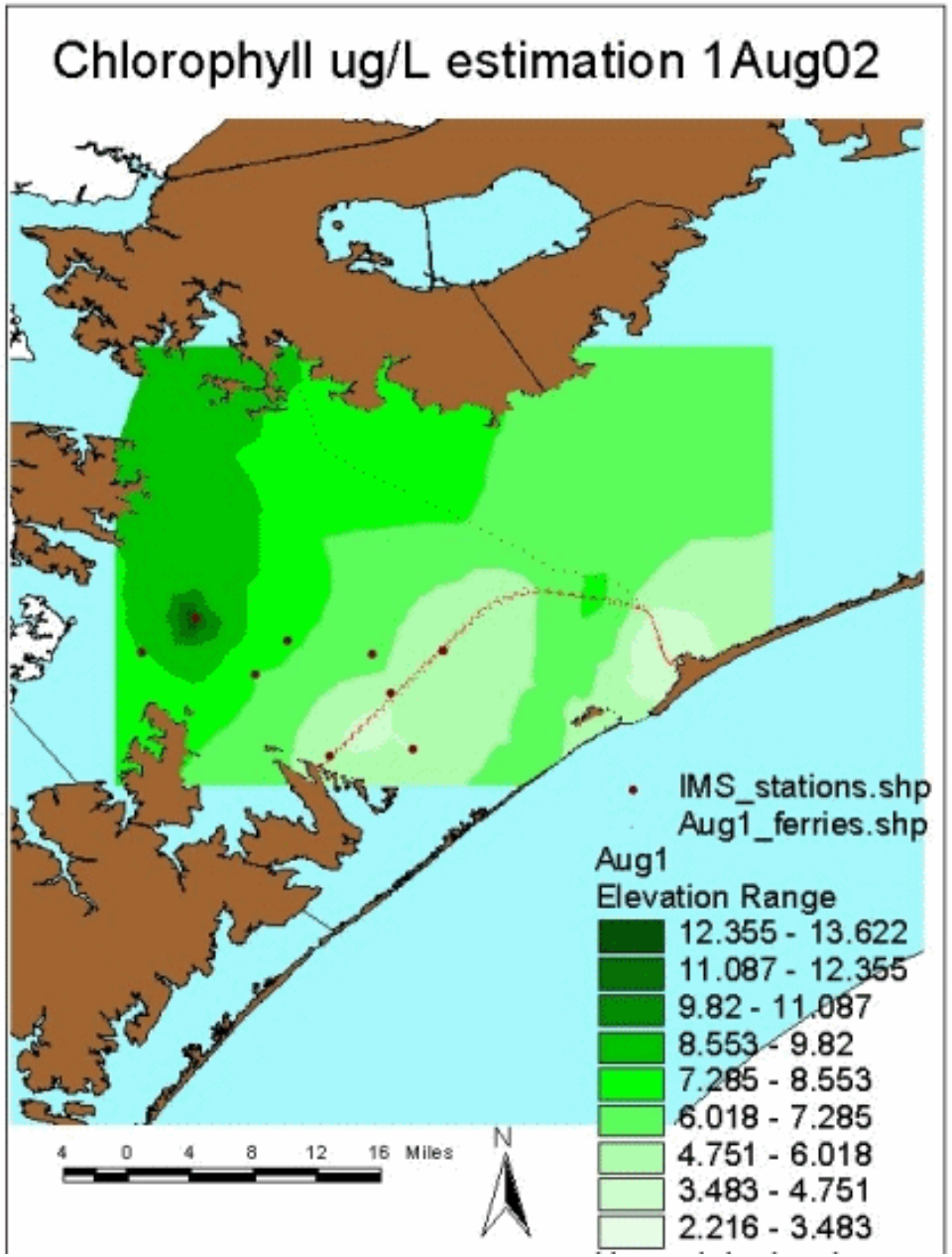
1 cast every 30 min.

10 or 25 cm depth resolution

Collects temperature, salinity, DO, pH, turbidity and *in vivo* fluorescence data using a YSI 6600 multi-parameter water quality instrument .


Wind Velocity 13–Sep–2005 – 19–Sep–2005
m/s (North)
10
5
0
−5
−10
09/13
09/14
09/15
09/16
09/17
09/18
09/19
Temperature
Water Depth (m)
1
2
3
4
28
26
24
Degrees Celcius
Salinity
10
8
6
PSU
Dissolved Oxygen
15
10
5
0
Mg. per Liter
Chlorophyll
20
10
uG per Liter
Turbidity
20
10
0
NTU
Date–Time

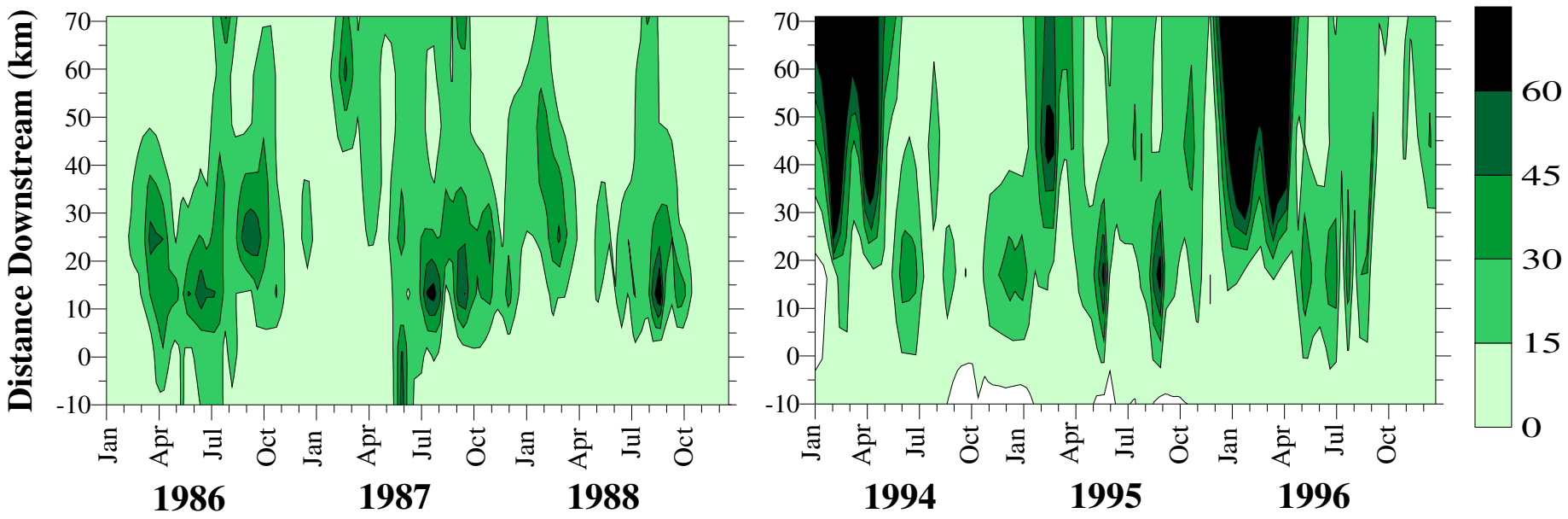
Using FerryMon for Modeling WQ responses on large scales

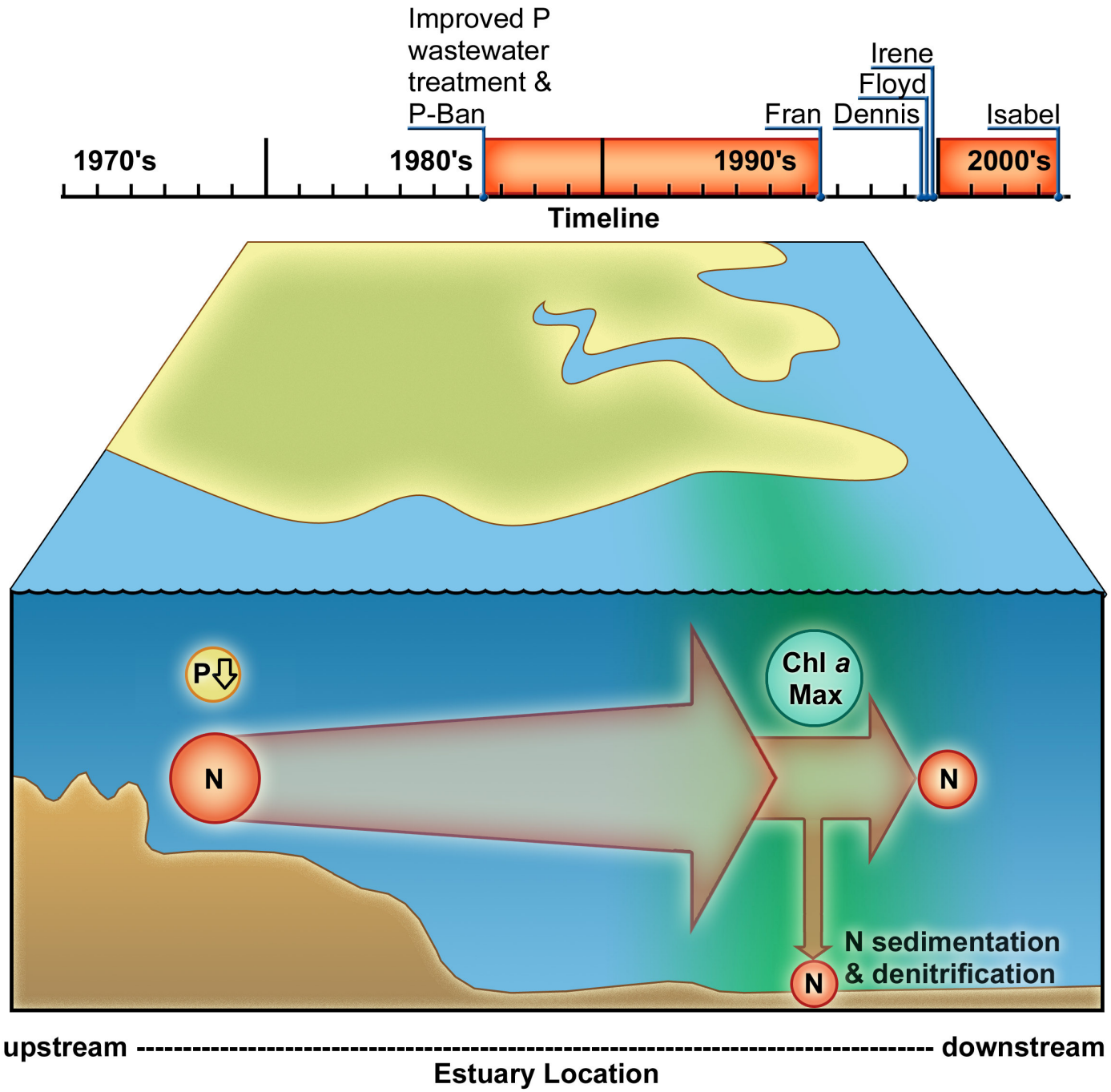


Has Freshwater P Reduction w/o Parallel N Reduction Exacerbated Estuarine Eutrophication?

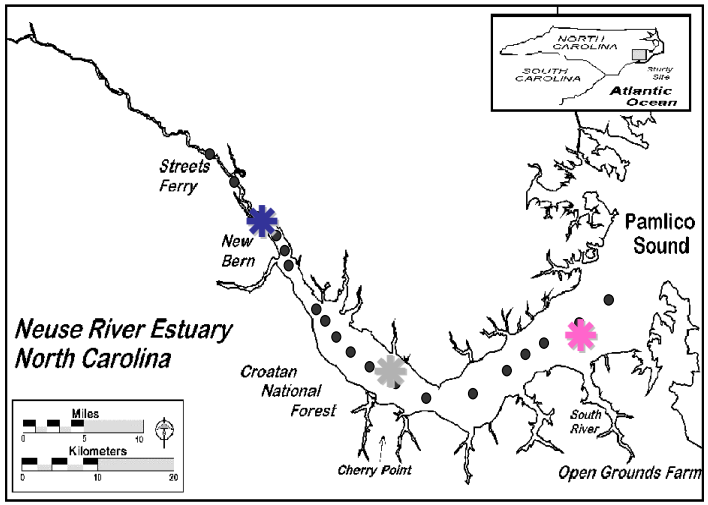
Chlorophyll *a*

Neuse River Estuary

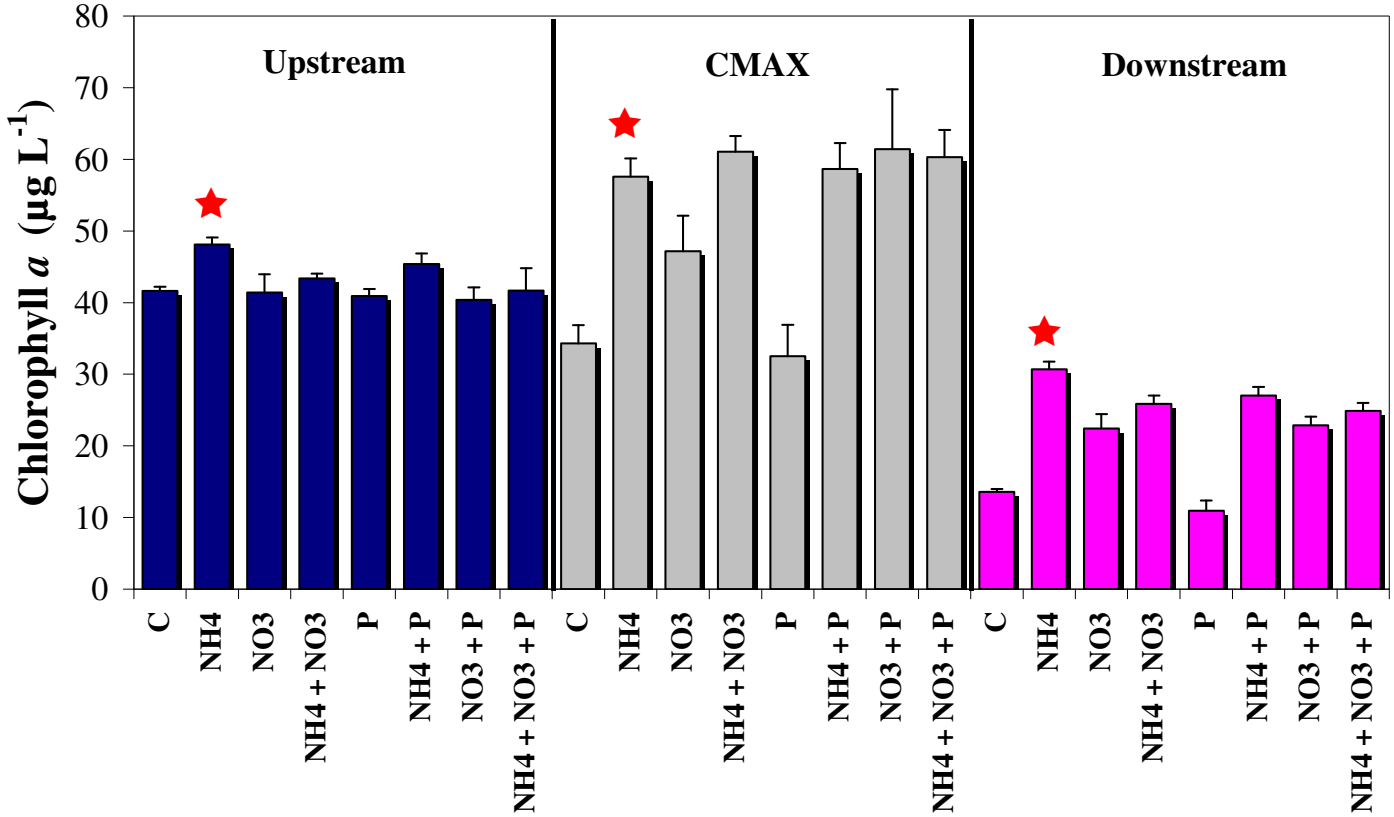



Improved P wastewater treatment & P-Ban
Irene
Floyd
Fran
Dennis
Isabel
1970's
1980's
1990's
2000's
Timeline
P
N
Chl a Max
N
N
N sedimentation & denitrification
upstream
downstream
Estuary Location

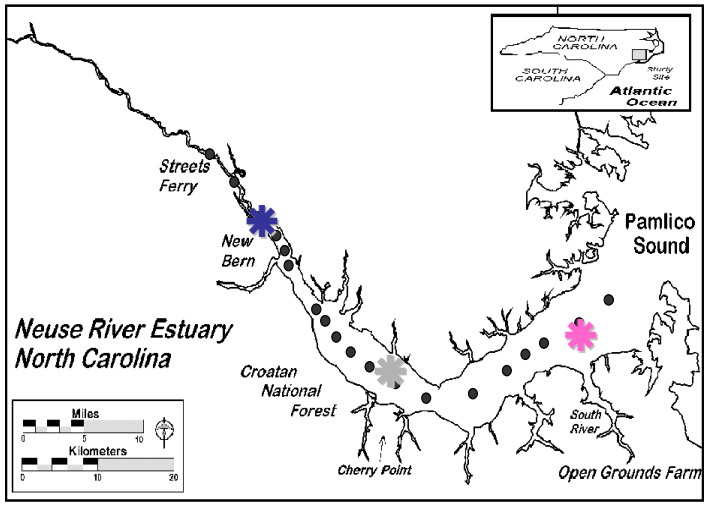
Ammonium is a Preferred N source: Effects on Phyto Community Structure



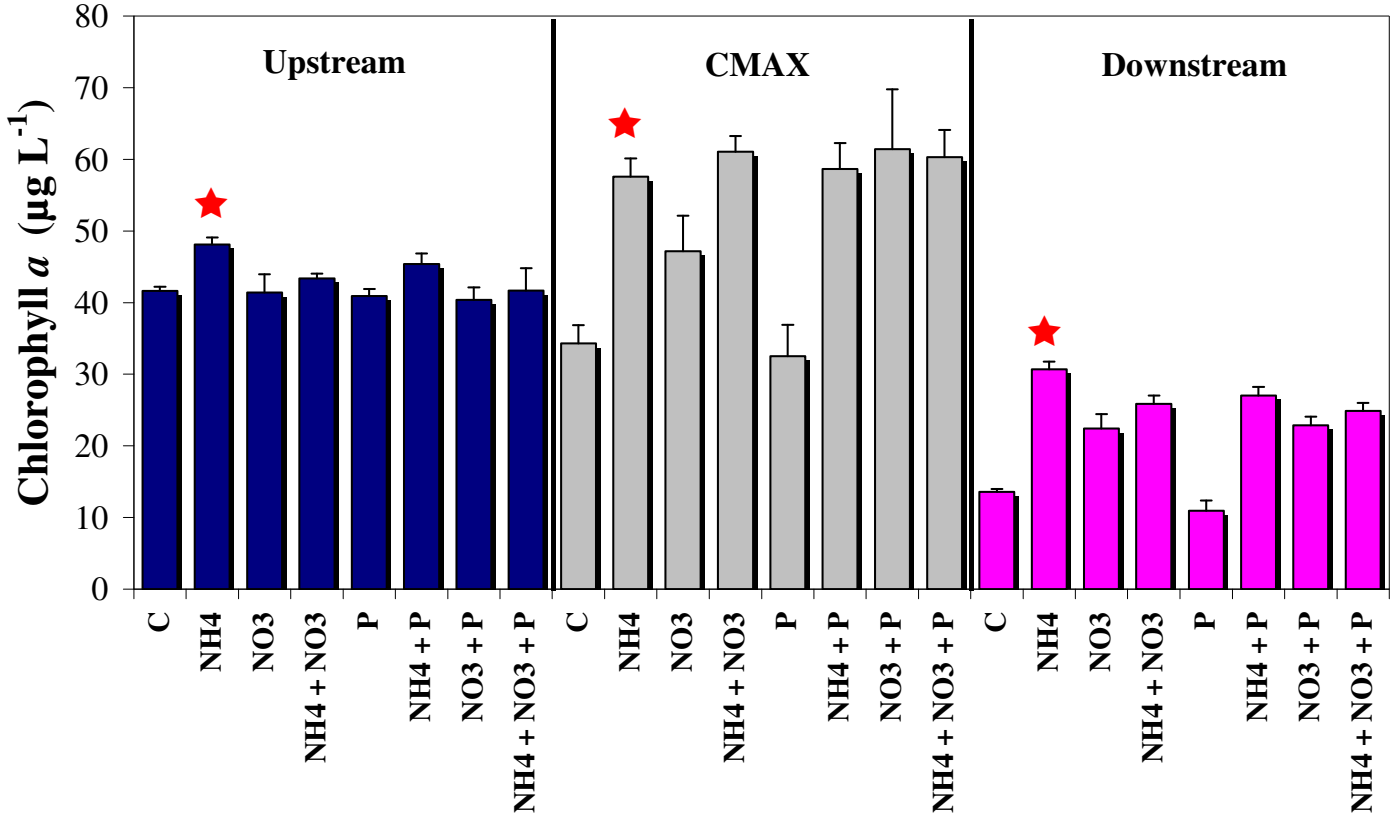
Nutrient Addition Bioassay Experiment, T1
Neuse River, July 2003



Ammonium is a Preferred N source: Effects on Phyto Community Structure

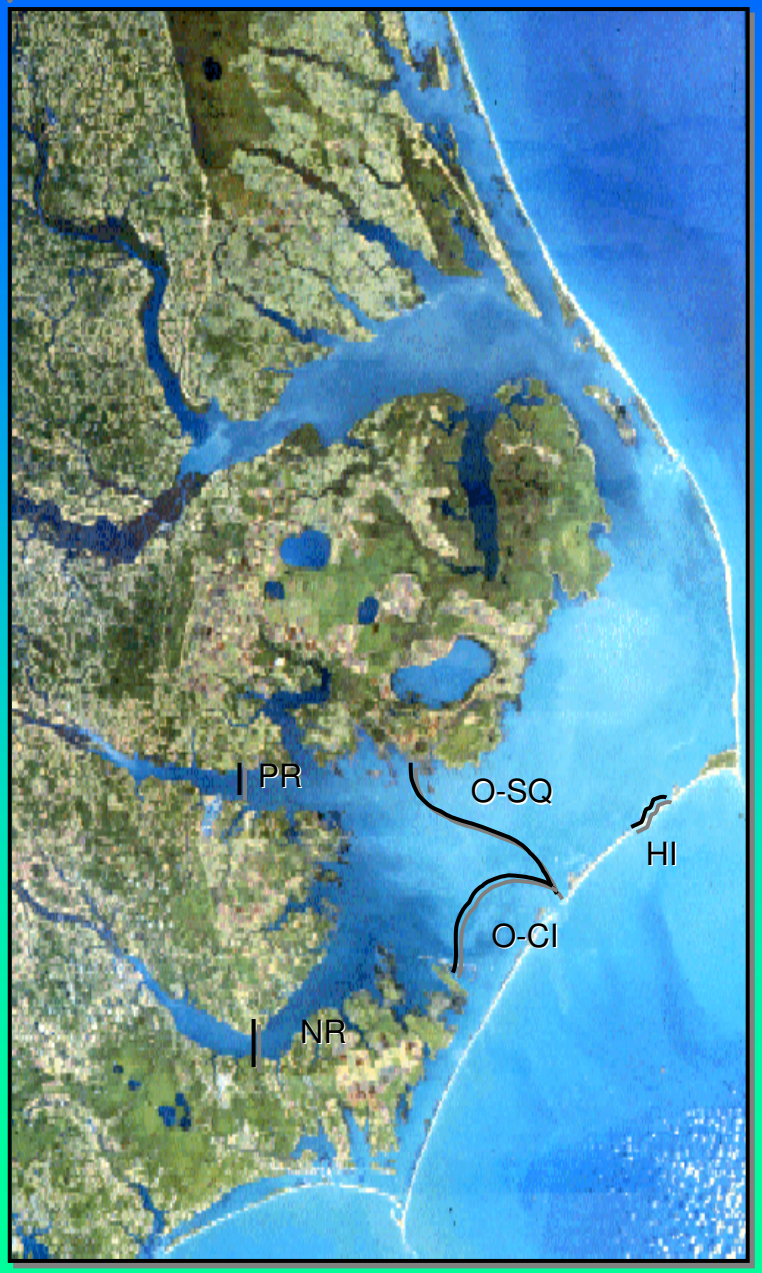


Nutrient Addition Bioassay Experiment, T1
Neuse River, July 2003

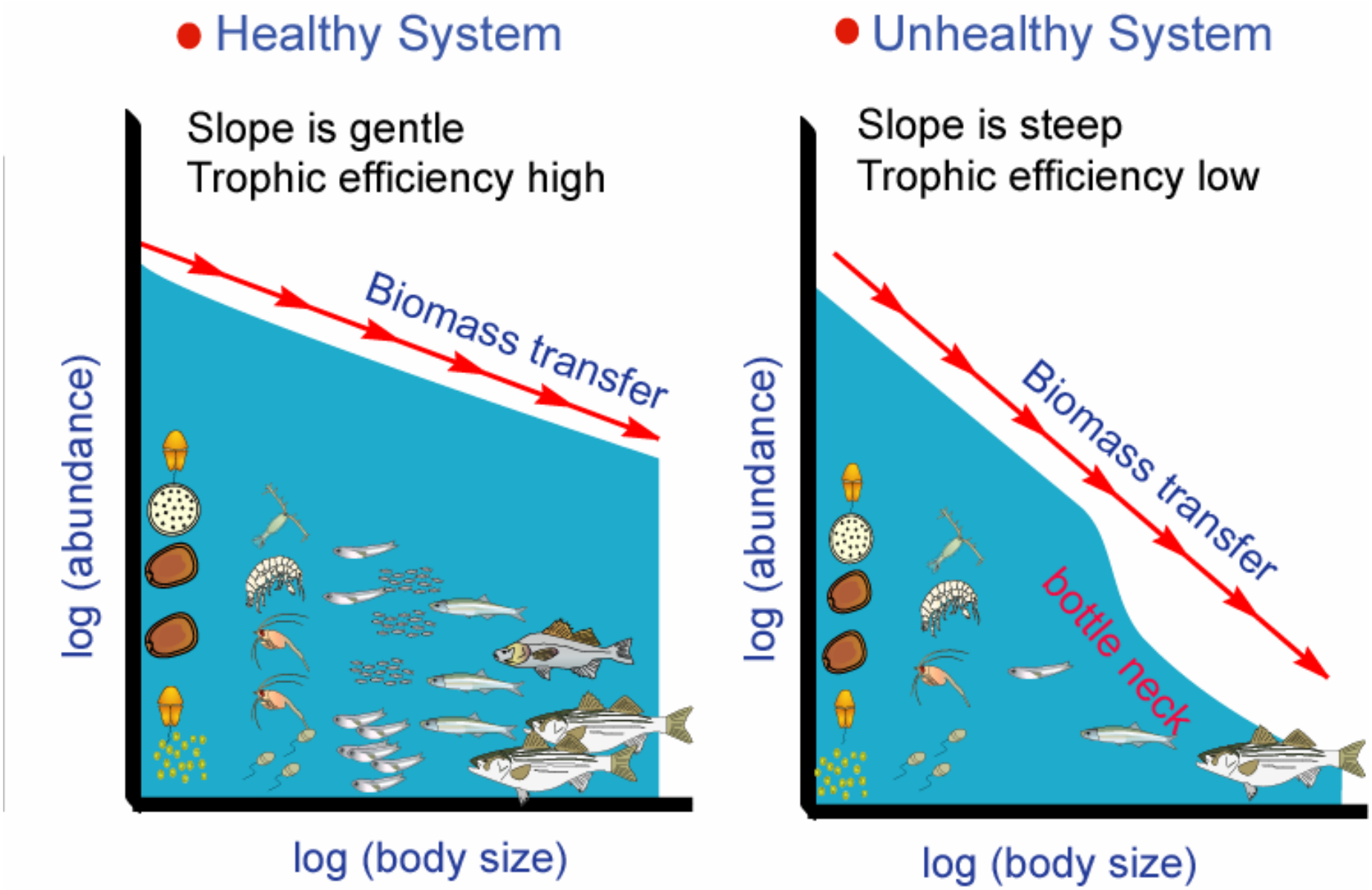


The Need to Scaling up for the Pamlico Sound: FerryMon

www.ferrymon.org



Salinity, Temp., dissolved O_2, turbidity, pH, diagnostic pigments, nutrients


Healthy System
Slope is gentle
Trophic efficiency high
Biomass transfer
log (abundance)
log (body size)
Unhealthy System
Slope is steep
Trophic efficiency low
Biomass transfer
bottle neck
log (abundance)
log (body size)