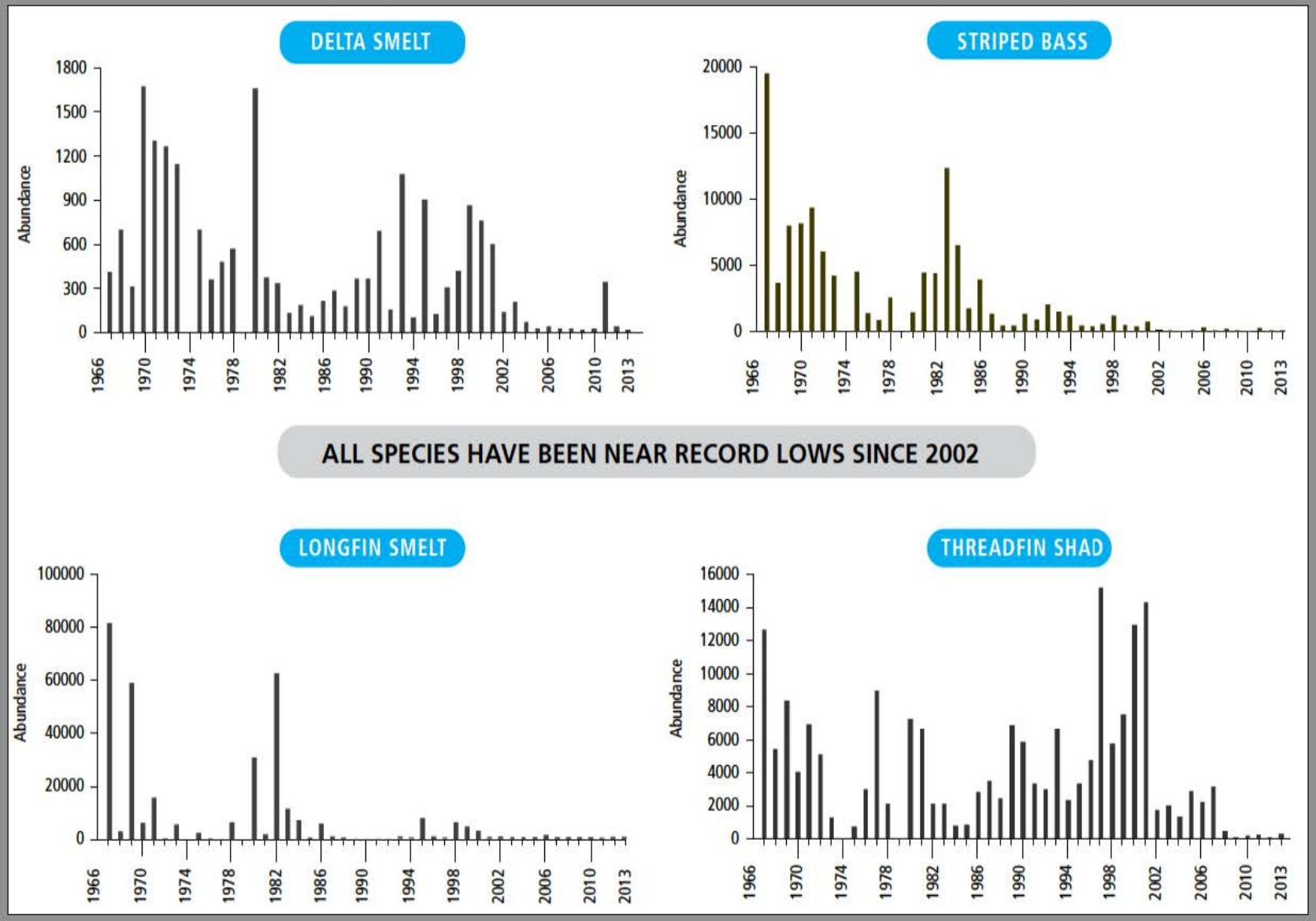
This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.

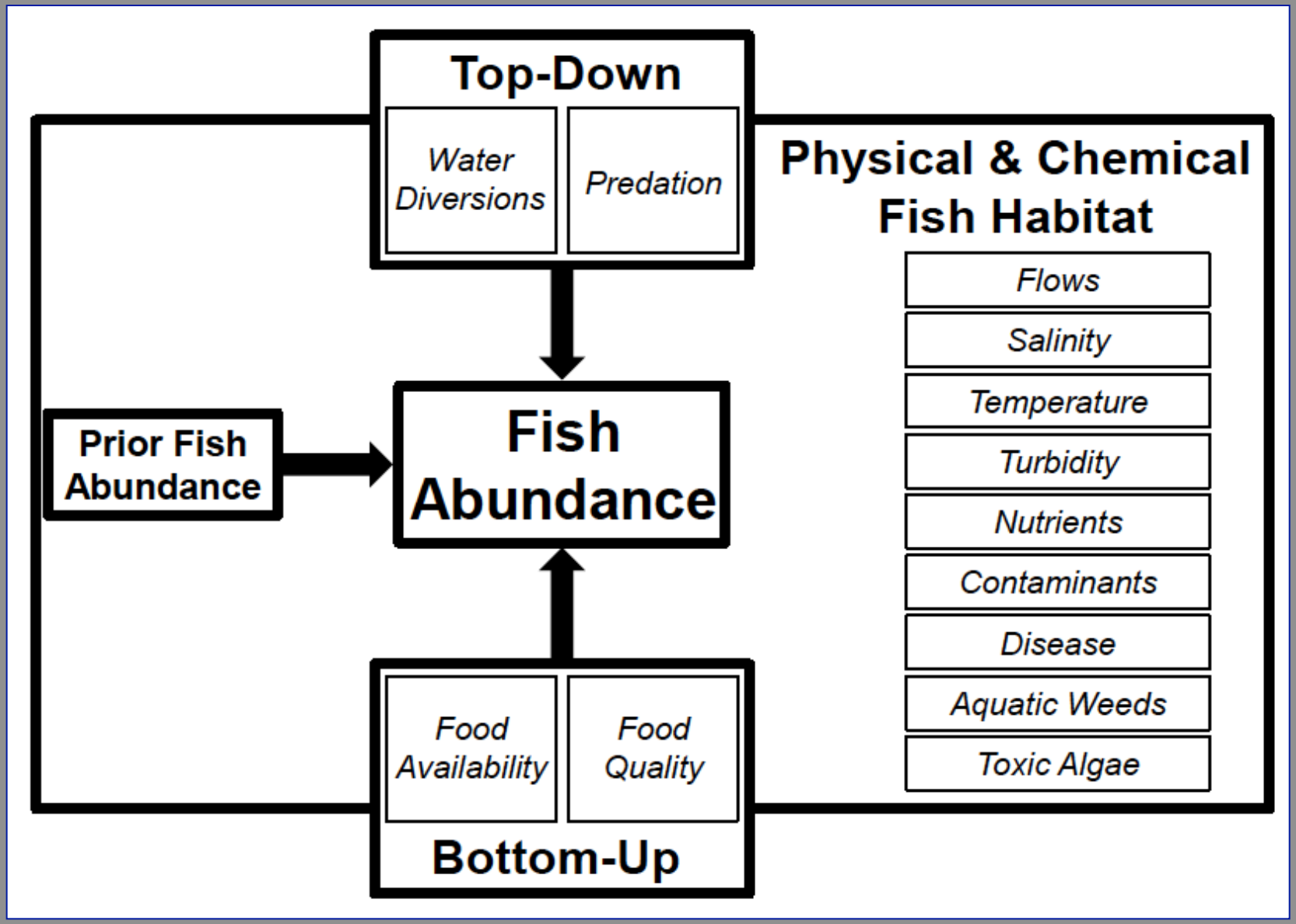


Preliminary

PRELIMINARY

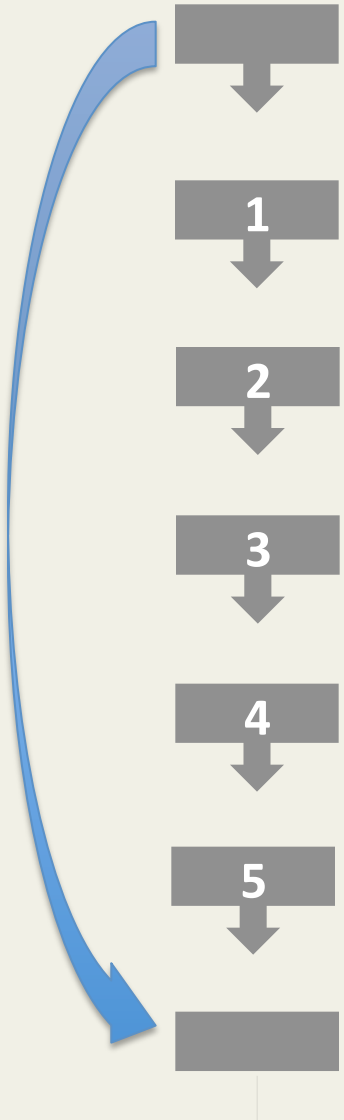
2014 RMP Update; CADFW data

Why?



PRELIMINARY

ALTERNATIVE EXPLANATION RELATED TO NUTRIENTS



↑ NH_4 loading

↑ NH_4 concentration and N:P

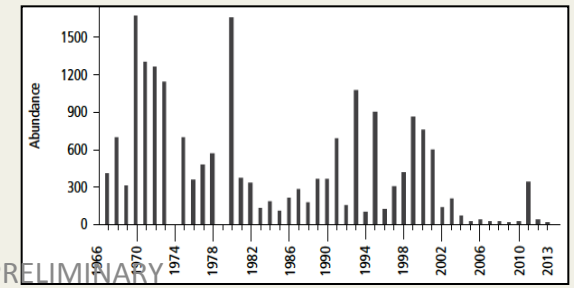
↓ Diatoms

↑ Non-diatoms

↓ Phytoplankton Biomass & PPR

↓ Food Quality

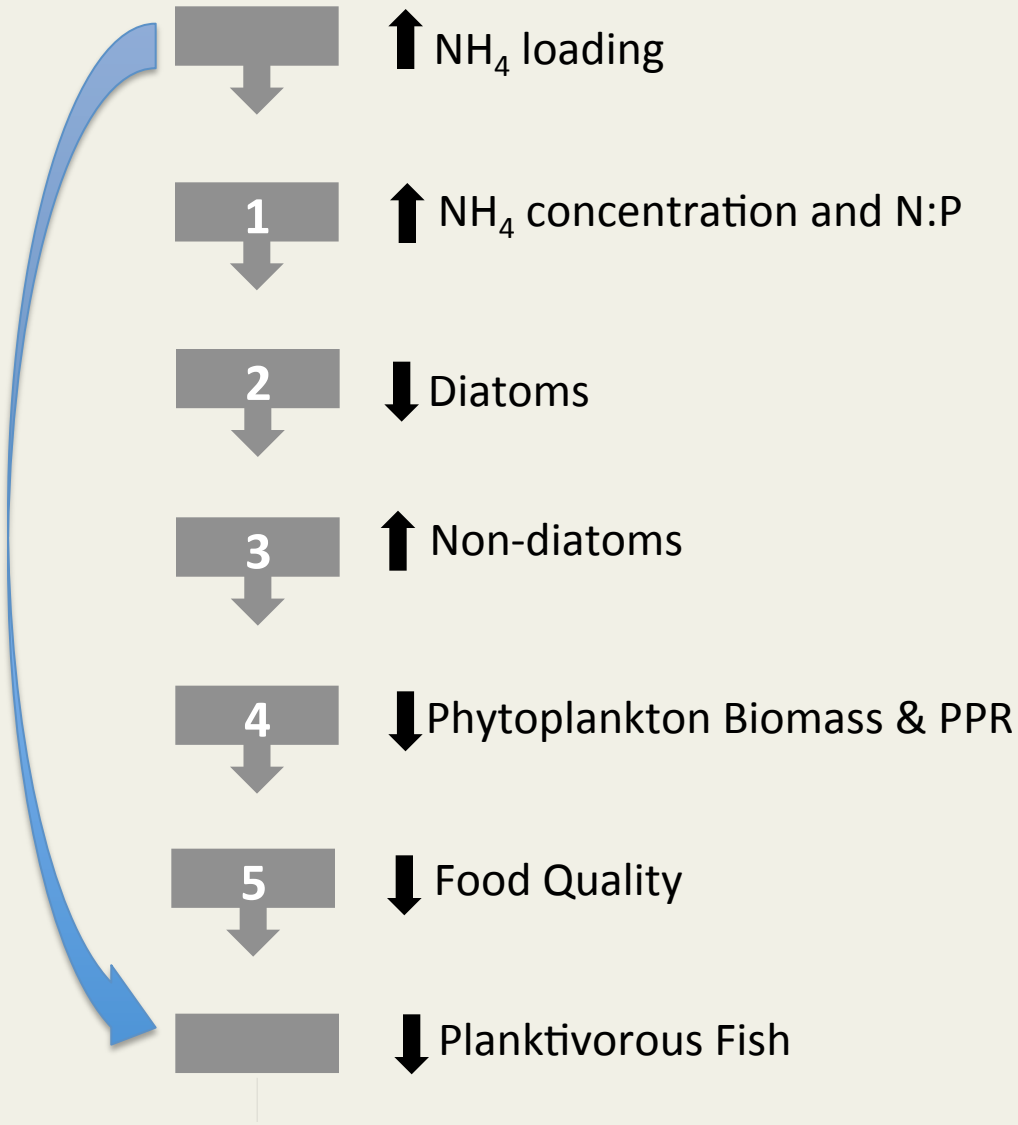
↓ Planktivorous Fish



PRELIMINARY

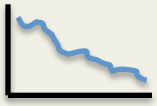
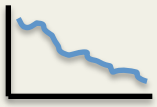
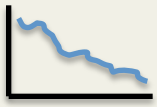
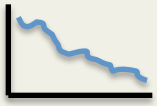
Preliminary

HYPOTHESIS



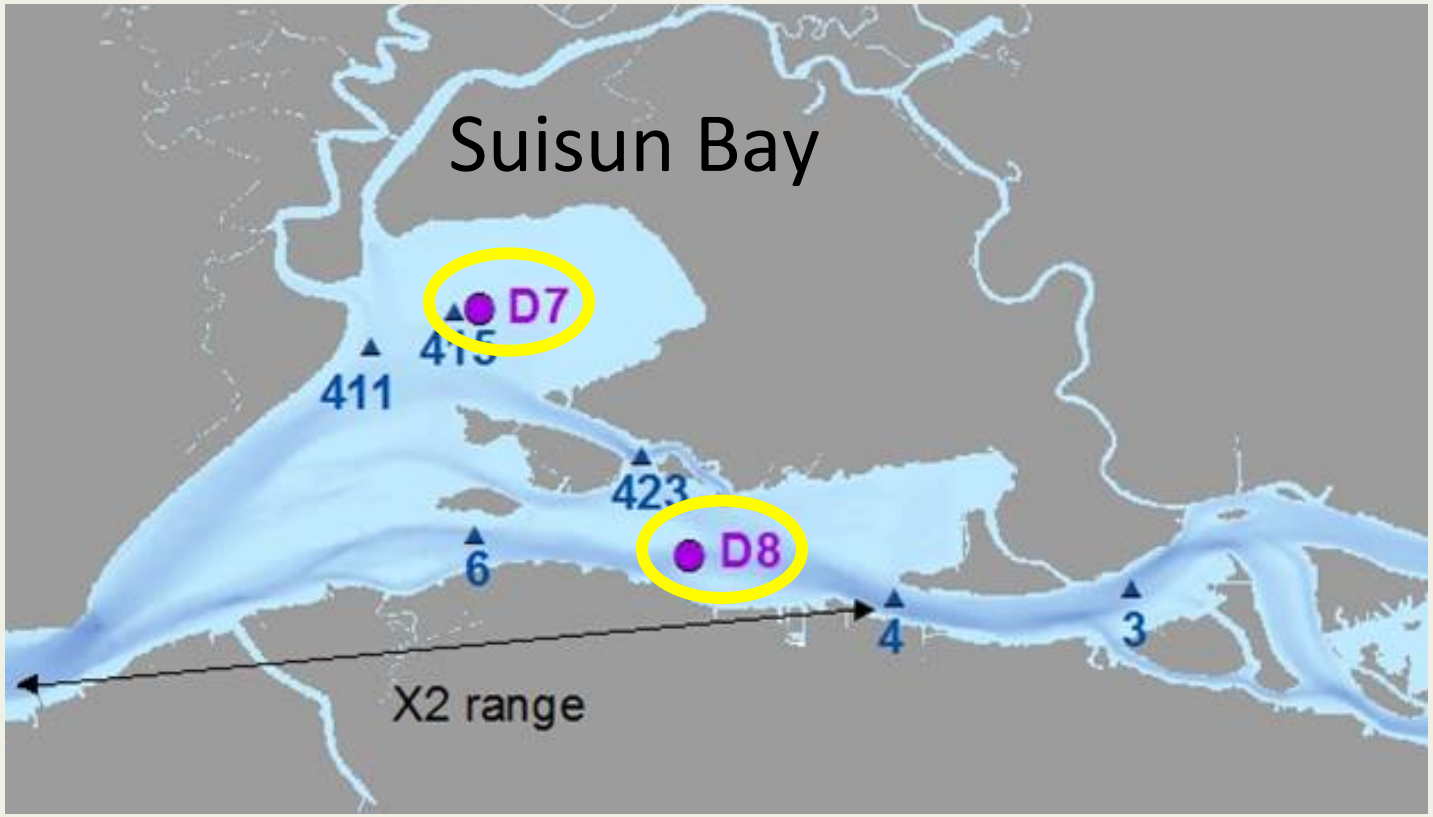
PRELIMINARY

Preliminary

	HYPOTHESIS	EXPECTED	OBSERVED
	↑ NH_4 loading		?
1	↑ NH_4 concentration and N:P		?
2	↓ Diatoms		?
3	↑ Non-diatoms		?
4	↓ Phytoplankton Biomass & PPR		?
5	↓ Food Quality		?
	↓ Planktivorous Fish		?

PRELIMINARY

Preliminary



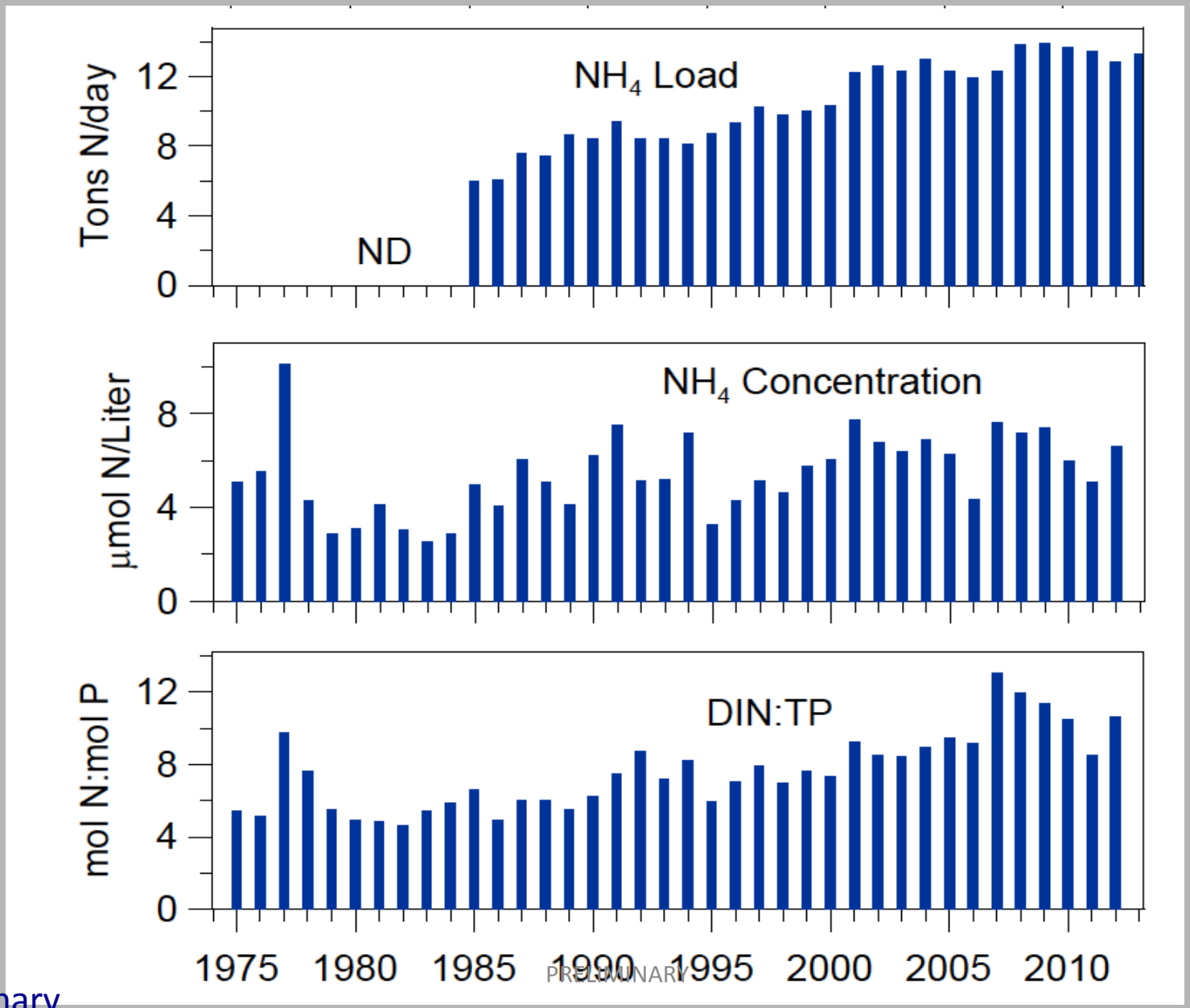
Annual means at IEP-EMP stations D7 and D8

Data sources: IEP-EMP; USGS; Tim Mussen, Sacramento Regional County Sanitation District

PRELIMINARY

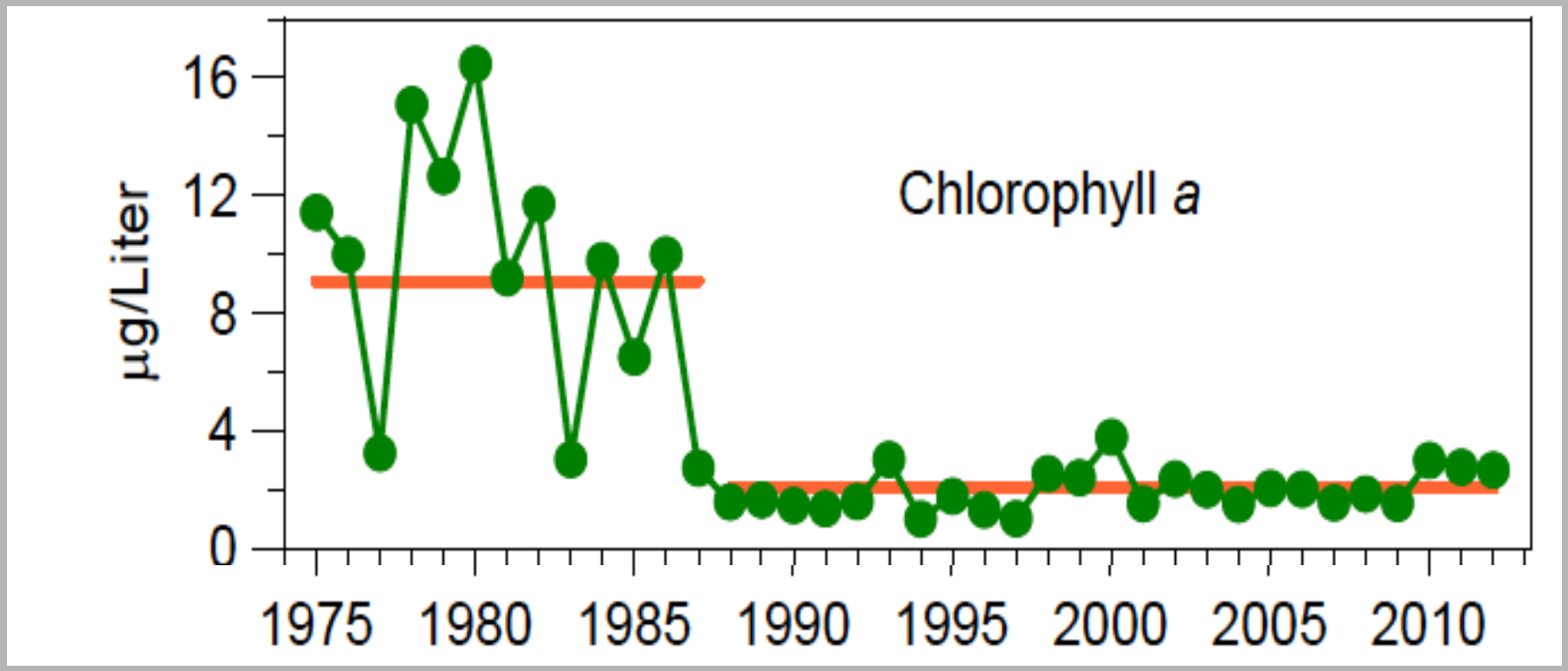
↑ NH_4 loading

↑ NH_4 concentration and N:P



Preliminary

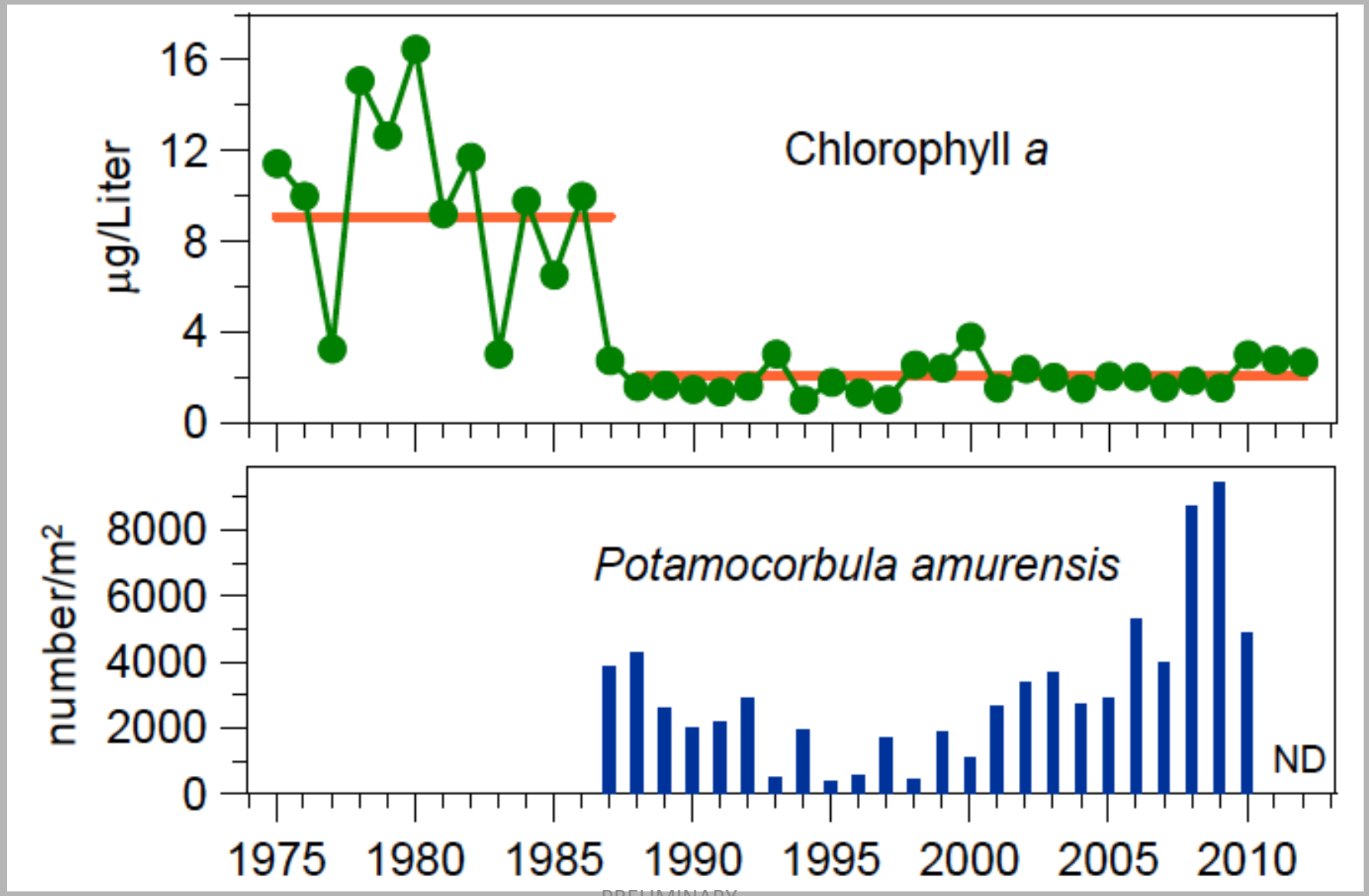
Phytoplankton Biomass



Preliminary

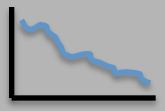
PRELIMINARY

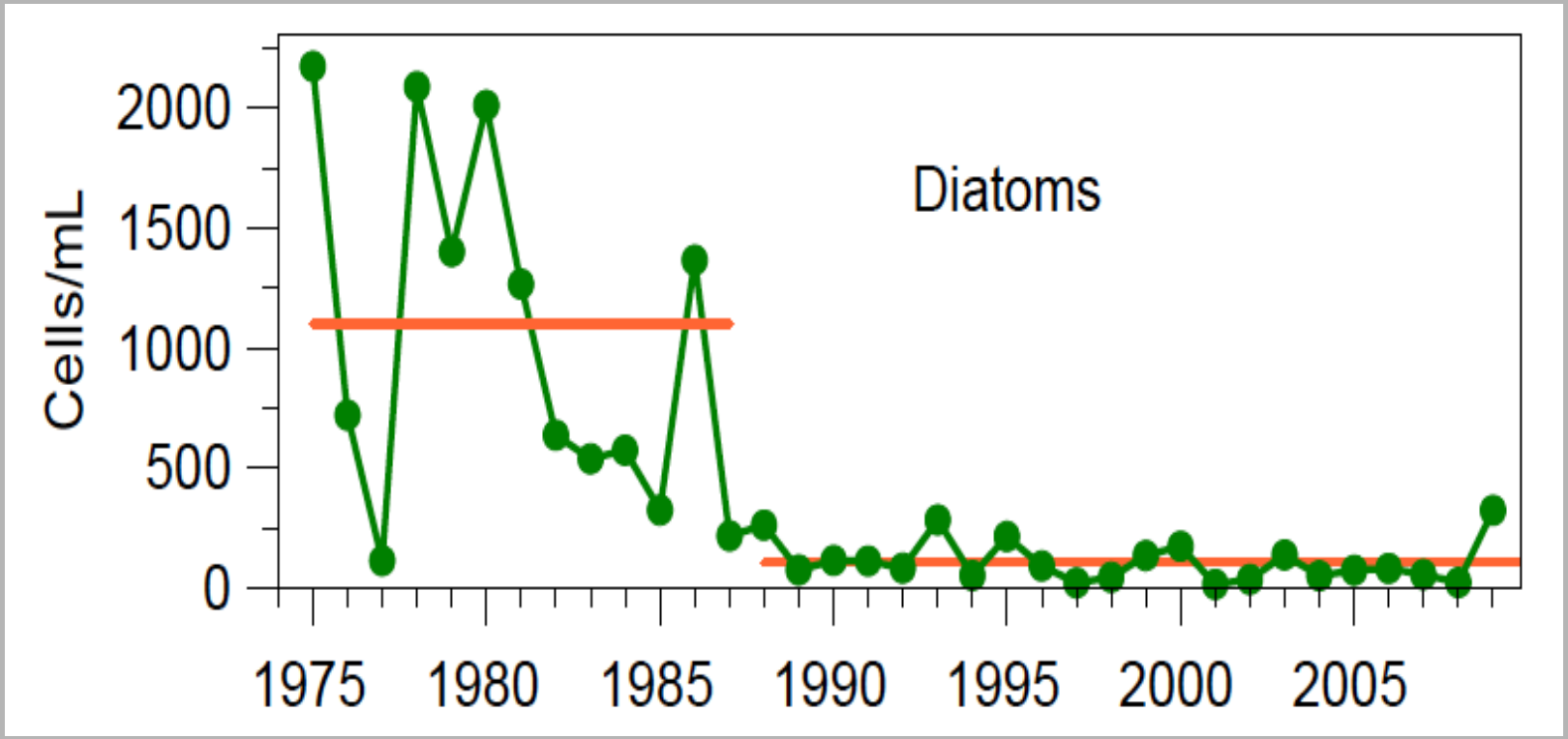
Phytoplankton Biomass



PRELIMINARY

Preliminary

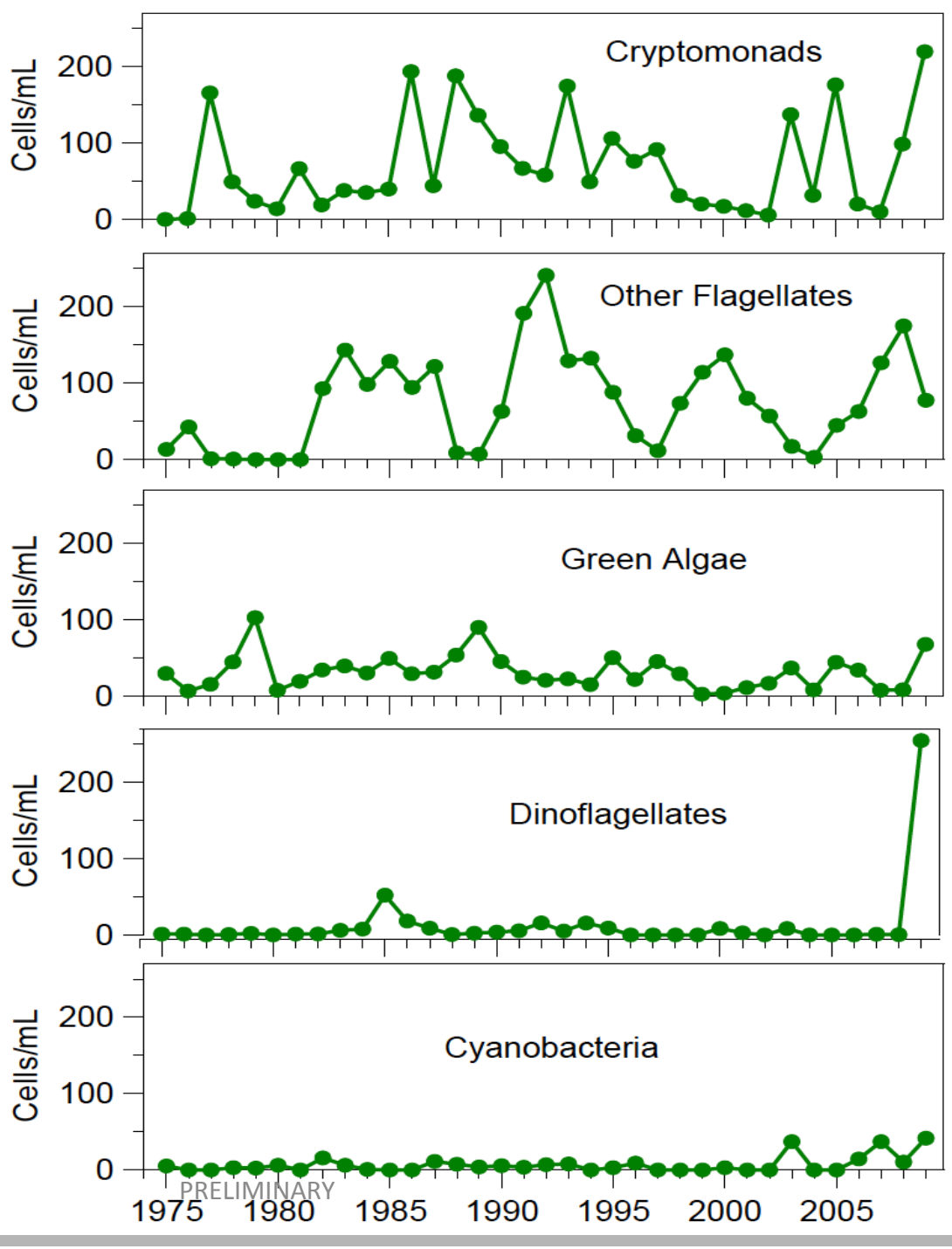
⬇ Diatoms 



PRELIMINARY

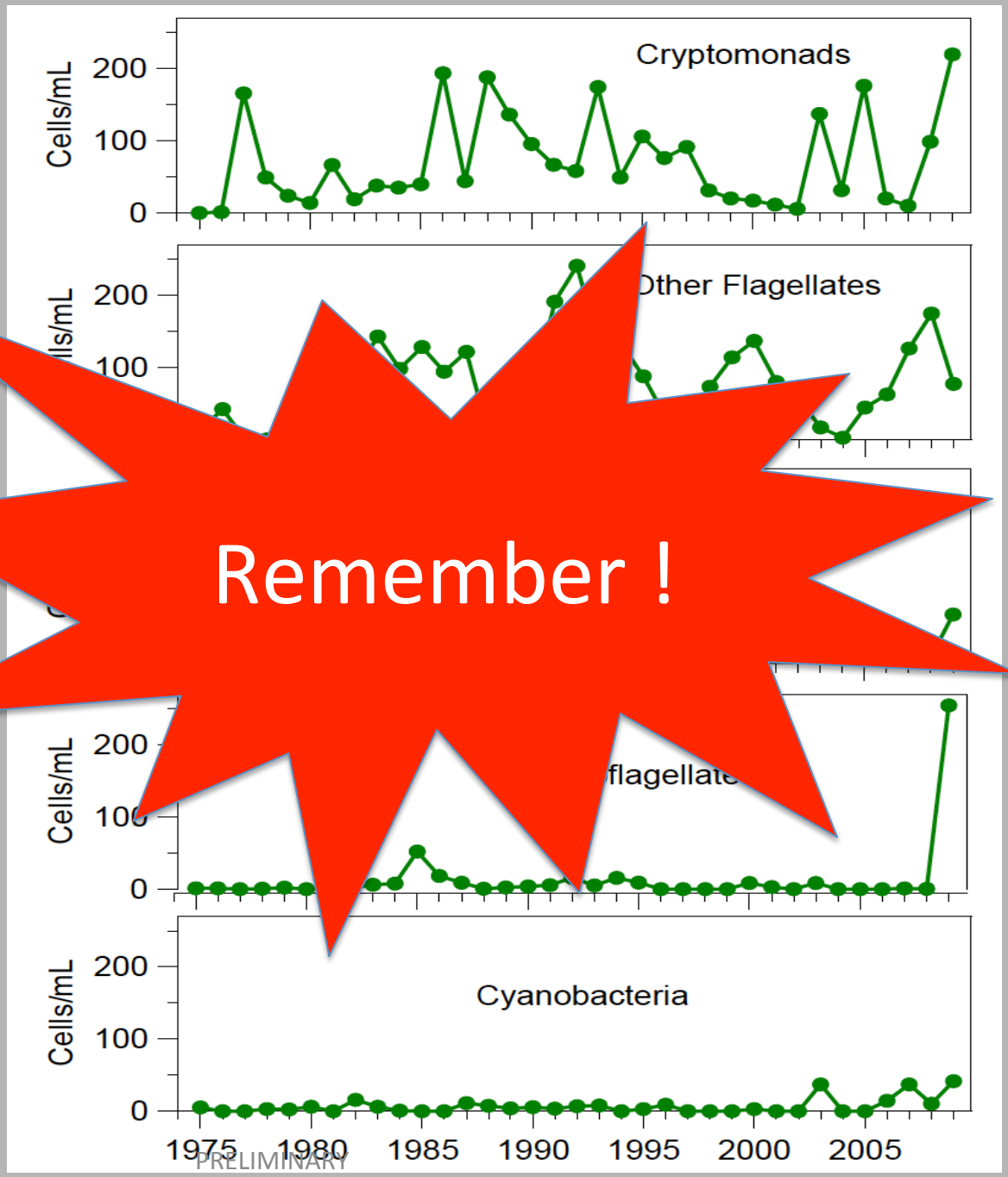
Preliminary

Non-diatoms



Preliminary

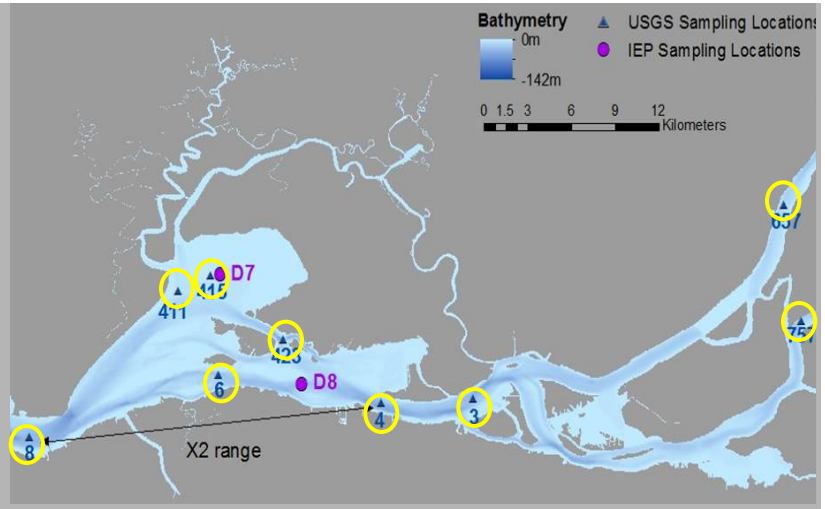
Non-diatoms



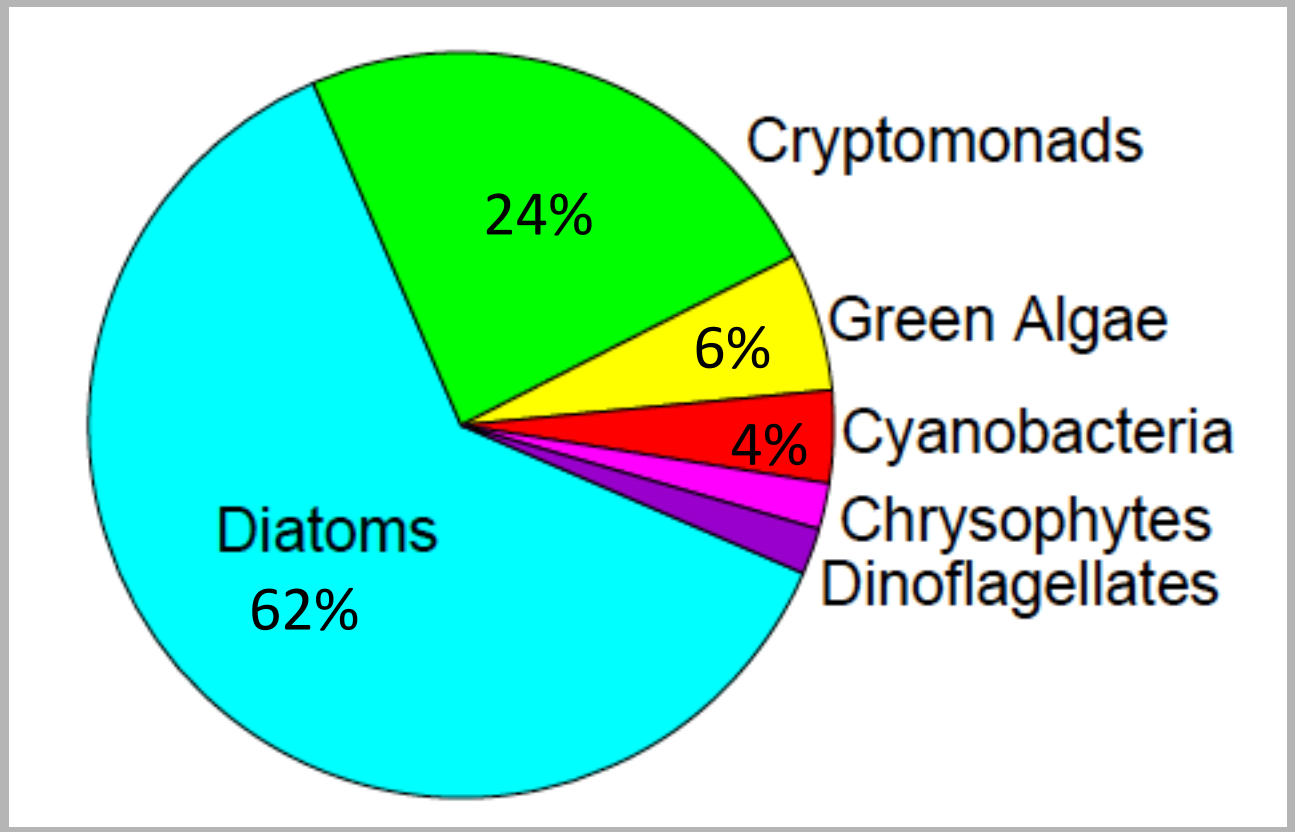
Remember !

Preliminary

Food Quality



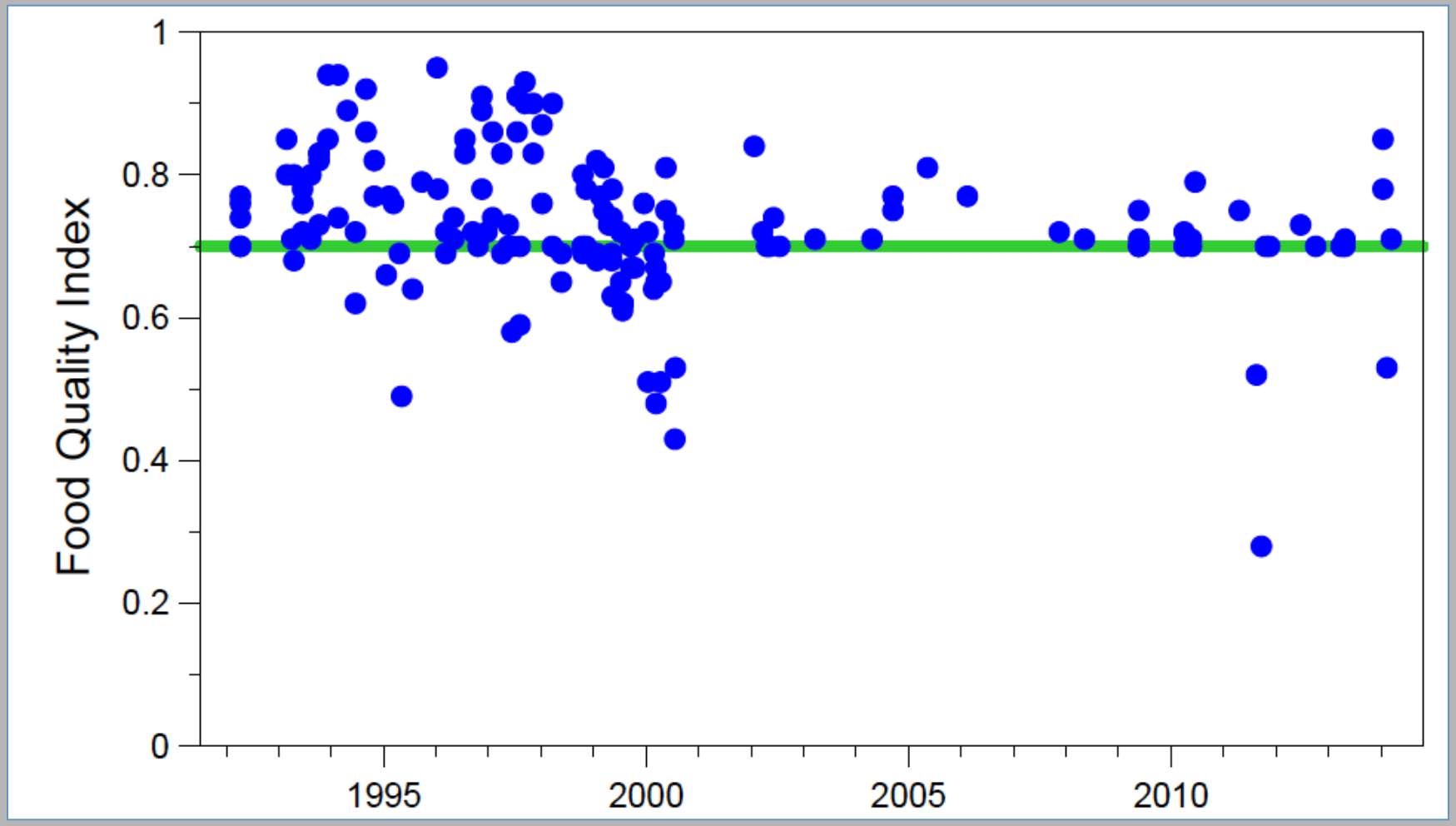
152 USGS Samples 1992-2013



PRELIMINARY

Preliminary

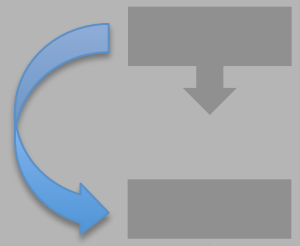
Food Quality



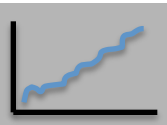
Food Quality Index = $0.2*P_{cy} + 0.525*P_{gr} + 0.7*P_{di} + 0.95*P_{cr}$ (Park et al., 2013)

PRELIMINARY

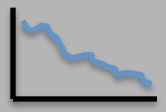
Preliminary

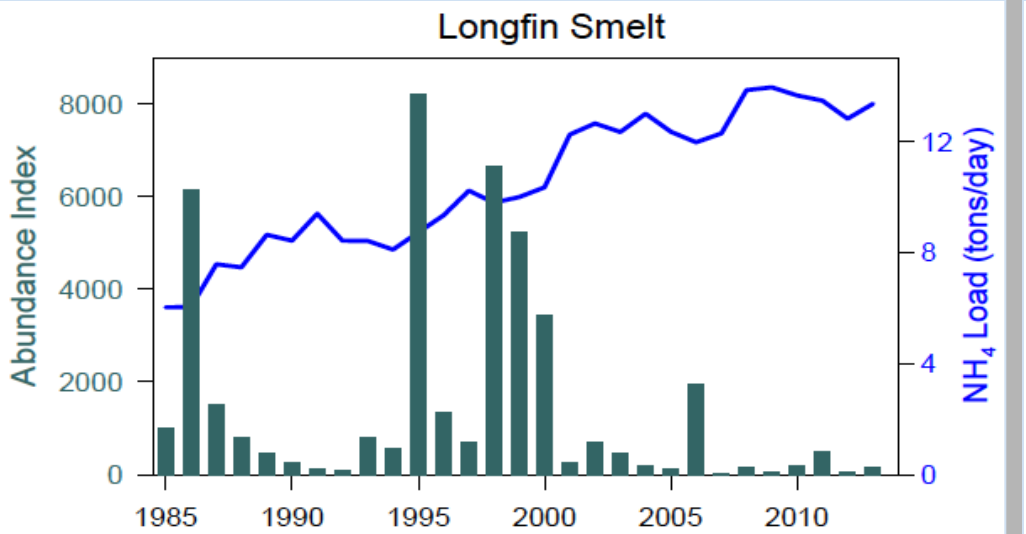


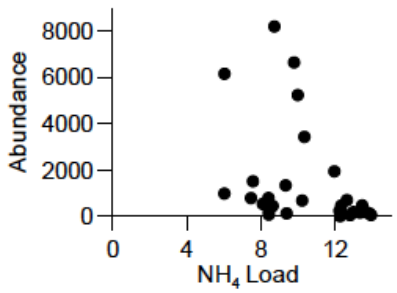
↑ NH_4 loading

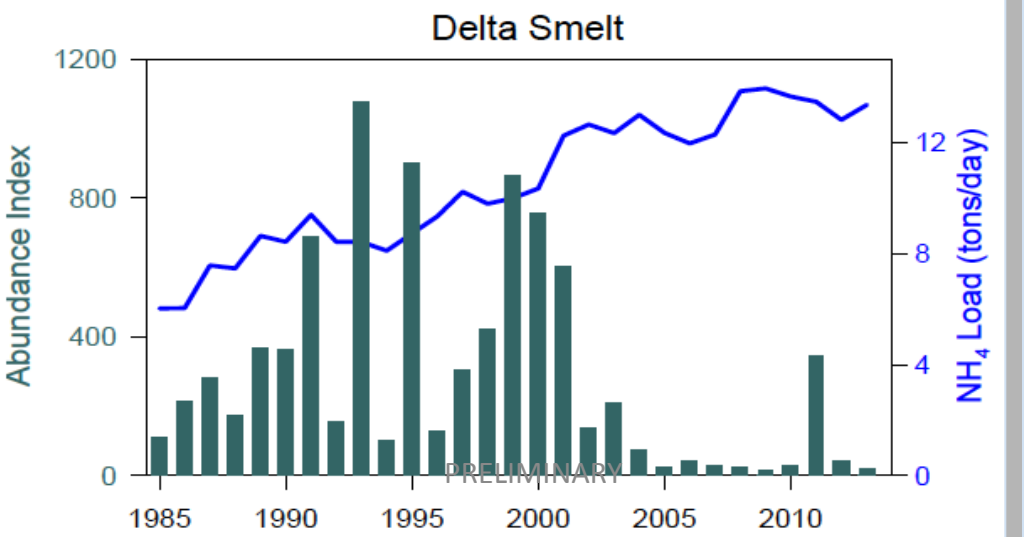


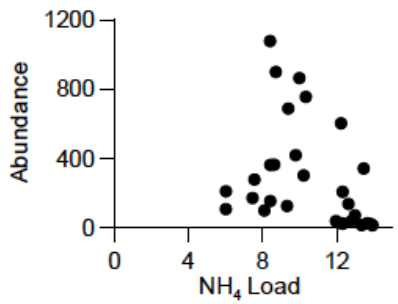
↓ Planktivorous Fish



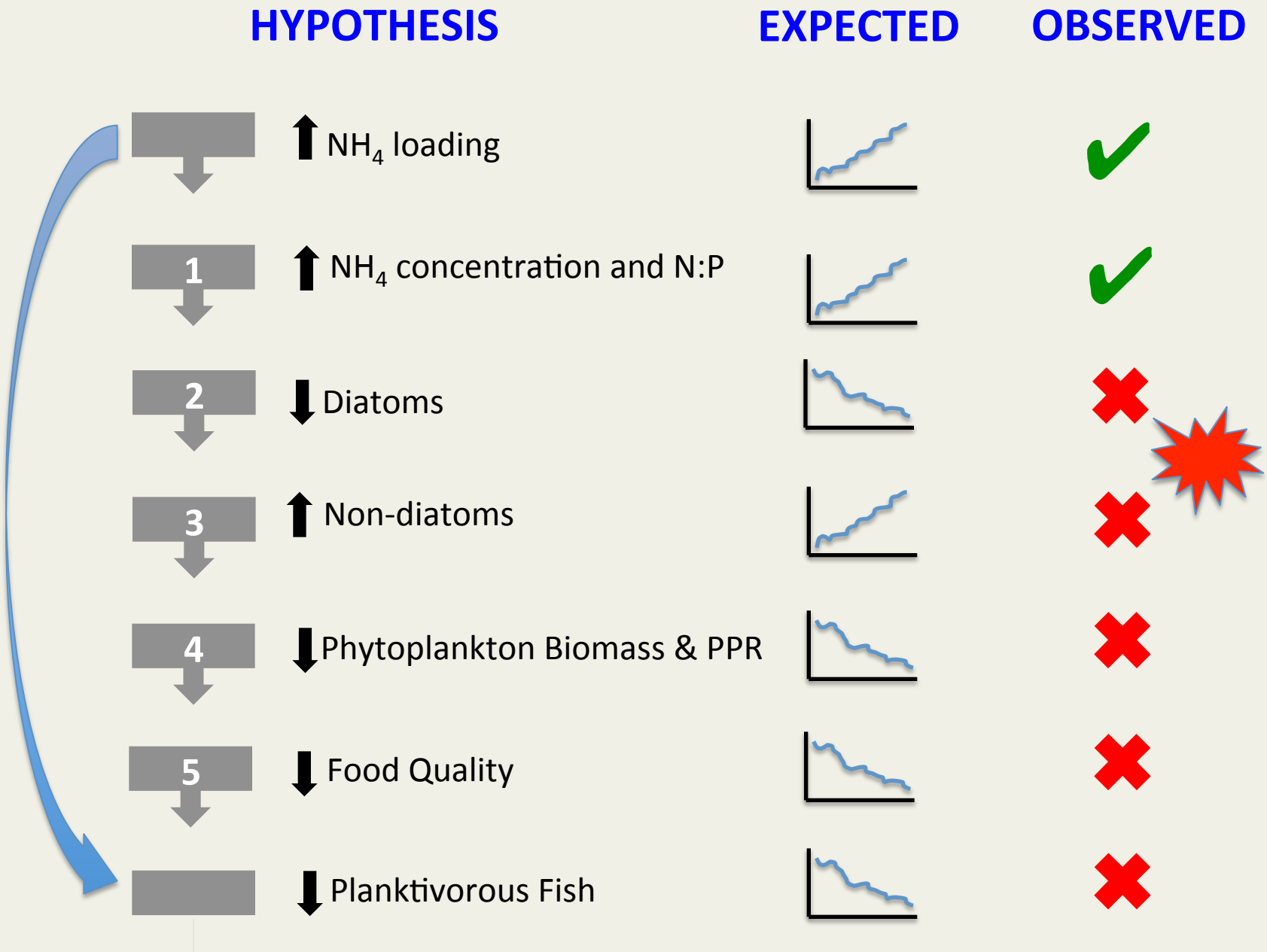








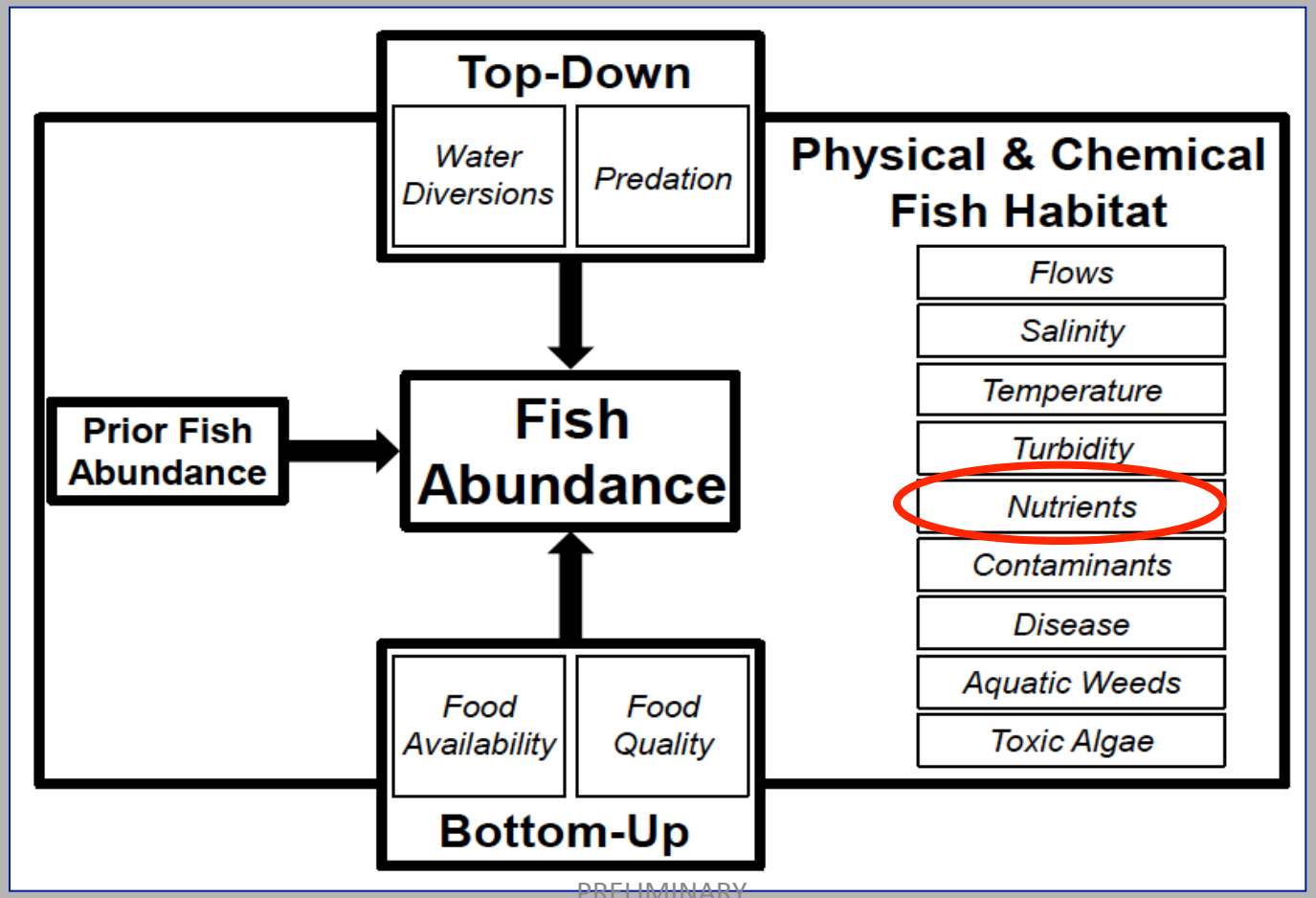
Preliminary



PRELIMINARY

"efforts to eliminate any one stressor are unlikely to reverse declines in the listed species"

(NRC 2012)



PRELIMINARY