A Preliminary Biogeochemical Assessment of the Niantic River Estuary

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***And* Nature's Fingerprint® / MIT LLC**
Niantic, CT

Niantic River Data from Dr. Jamie Vaudrey and Prof. James Kremer
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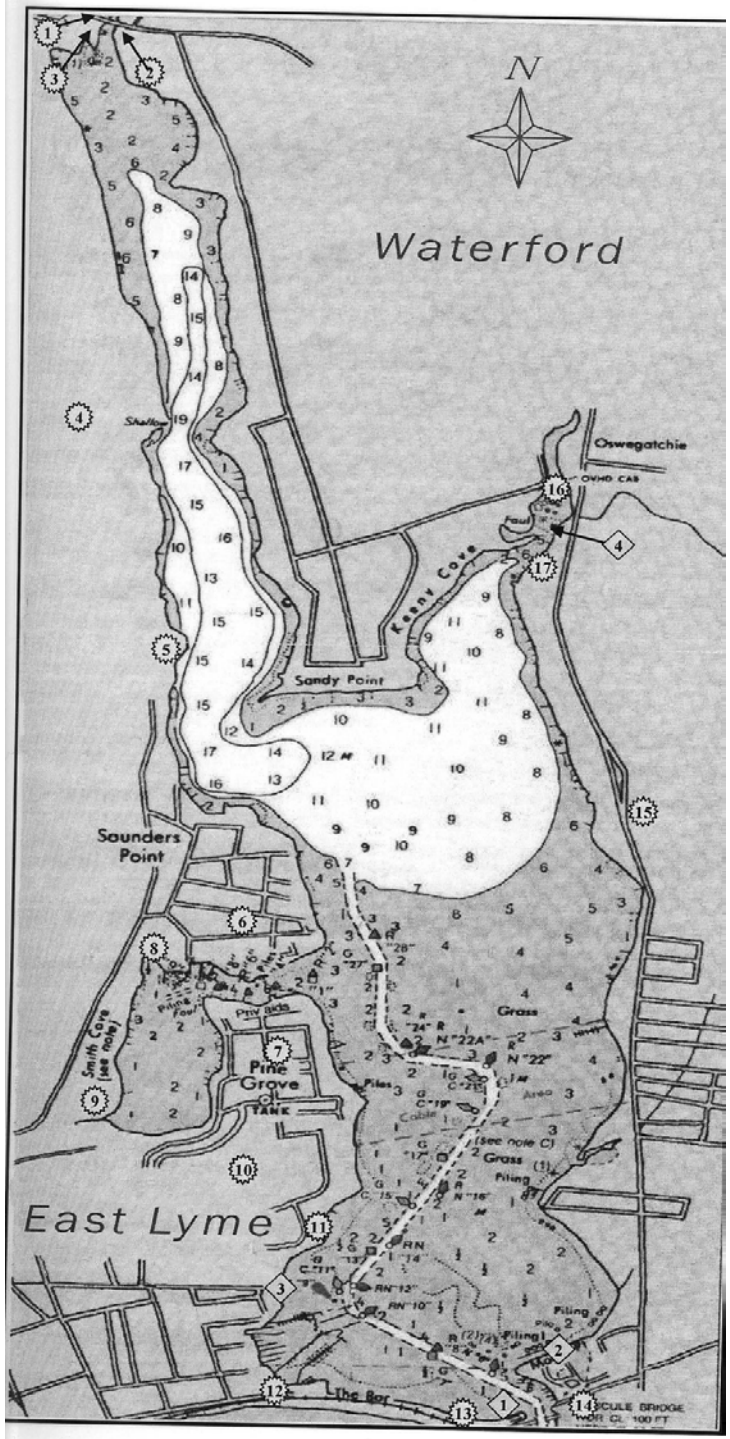
Latimer Brook

Deeper water
(~8-20 feet)

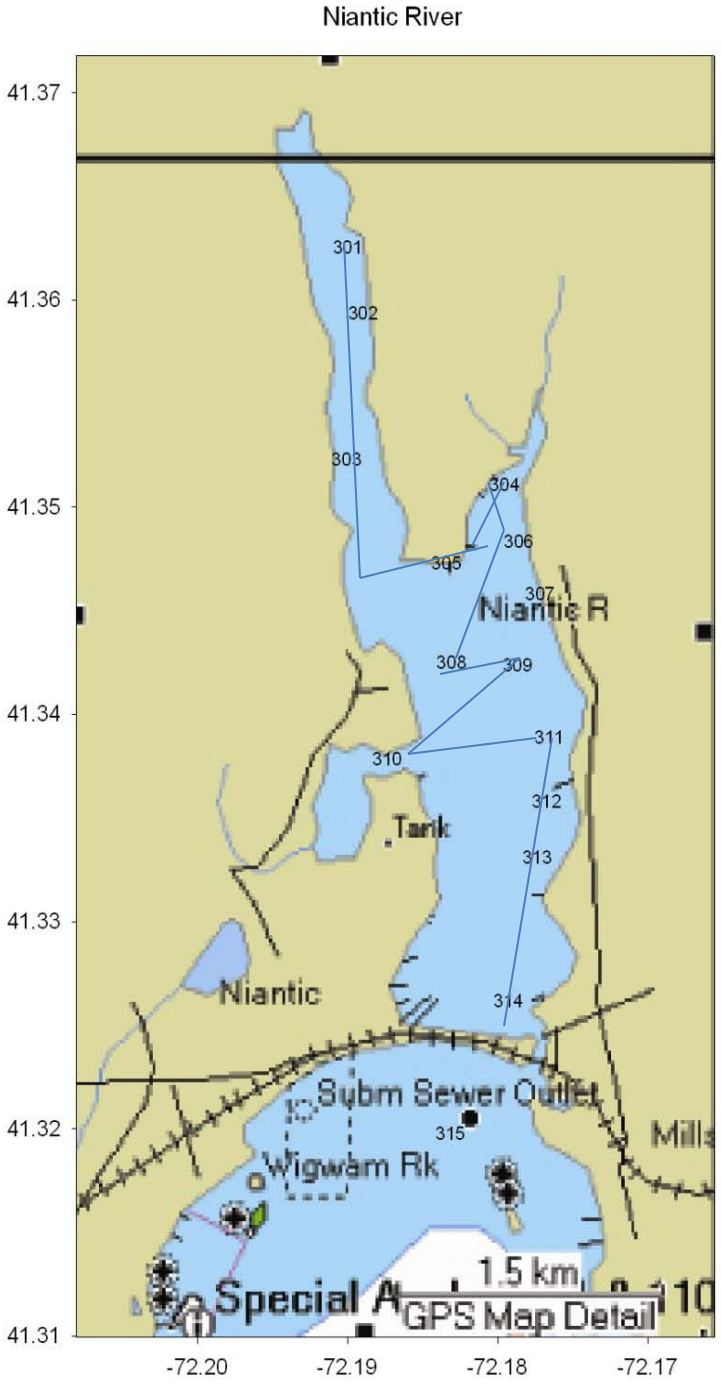
Seagrass Beds,
Shallower water
(~1-3 feet)

Long Island Sound



The Niantic River Estuary

Southeastern Connecticut



Sampling Stations on the Niantic River

Estuarine Circulation and the Nutrient Trap

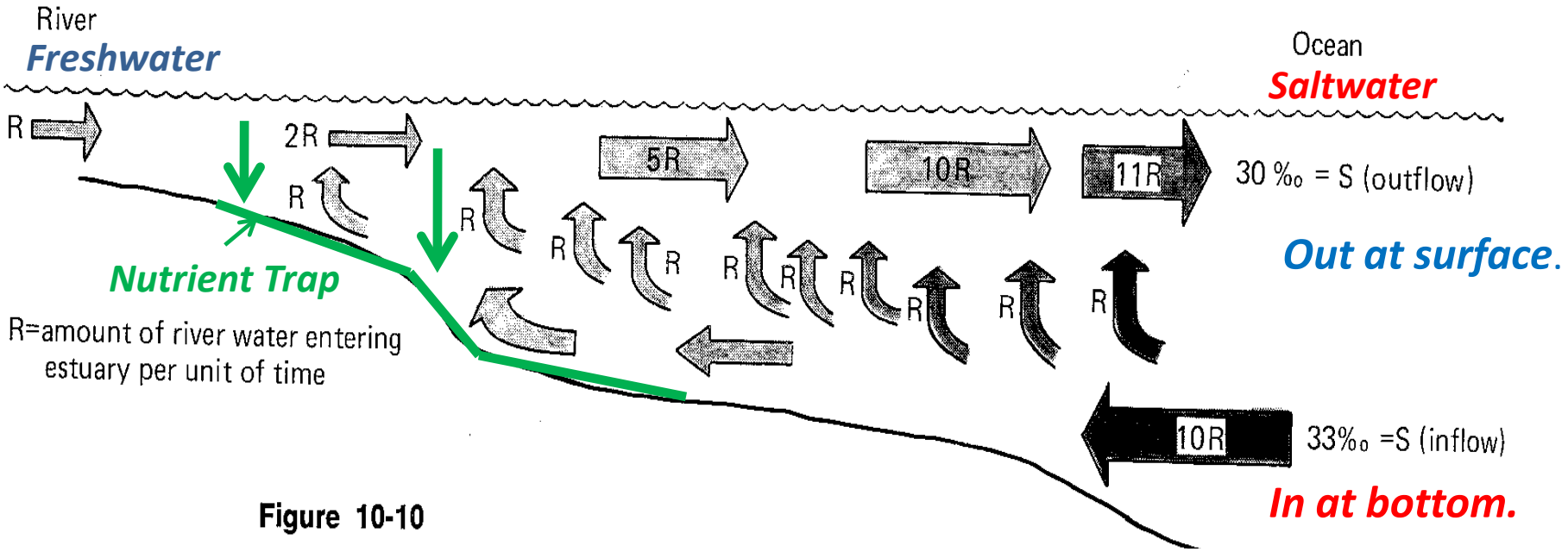
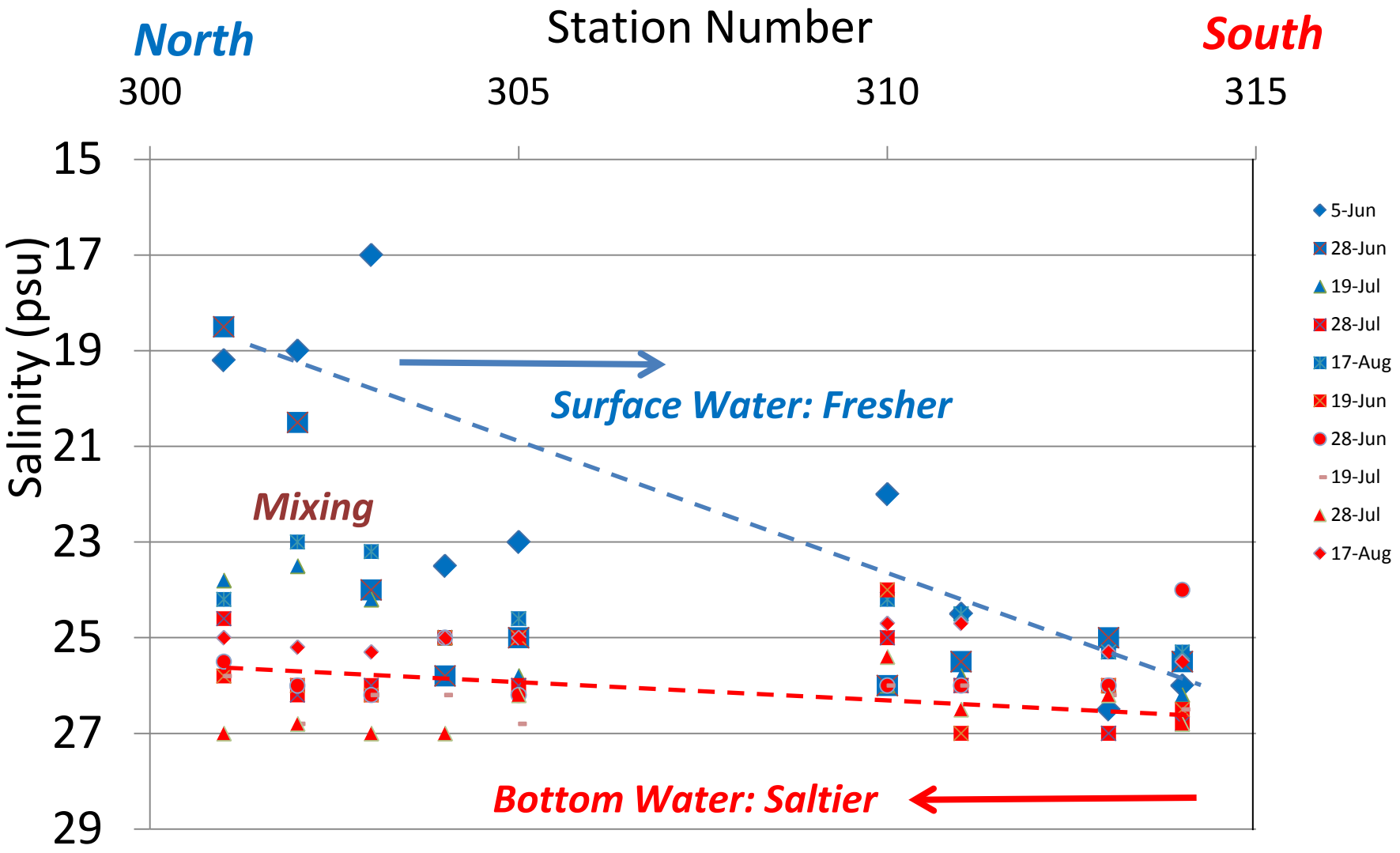


Figure 10-10

Examples of Estuarine Circulation:

1. Riverine estuaries.
2. Coastal upwelling zones.
3. Global ocean.

Niantic River: Salinity vs. Station: Summer, 2000



Estuarine Chemistry and Mixing: PO4 vs Salinity:

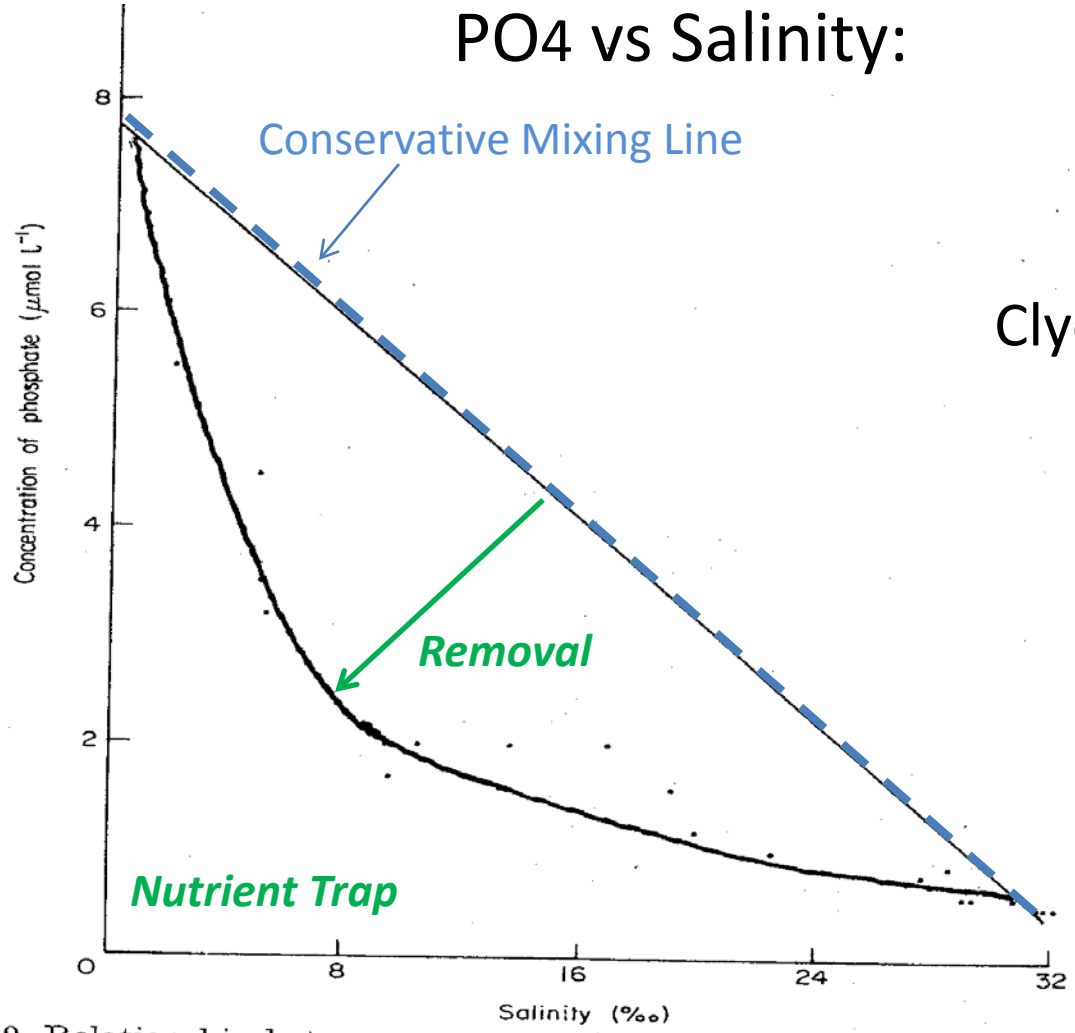


Fig. 9. Relationship between concentration of phosphate and salinity; survey of 12th April, 1973. The theoretical dilution line is shown.

Clyde Estuary, Scotland

(Mackay & Leatherland, 1976)

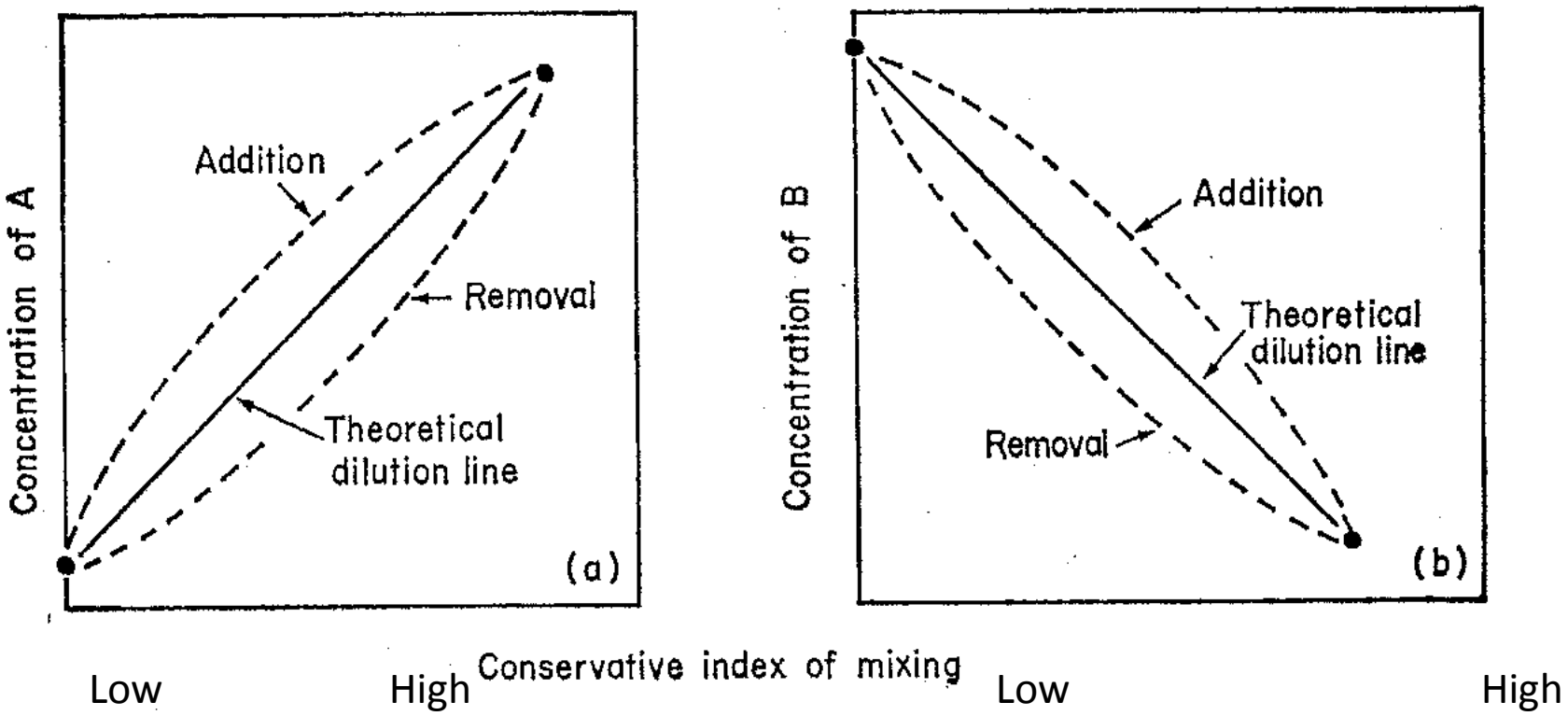
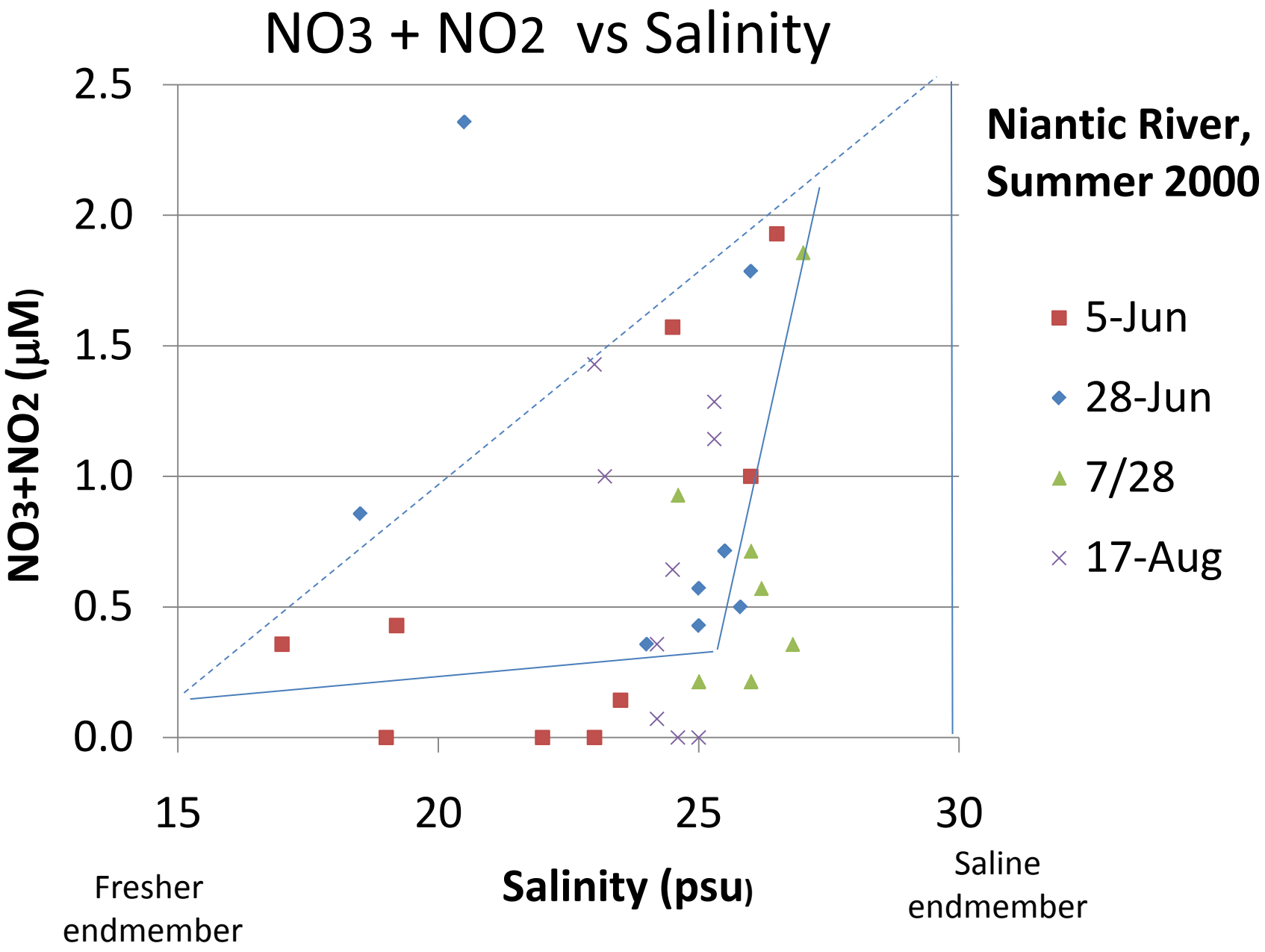
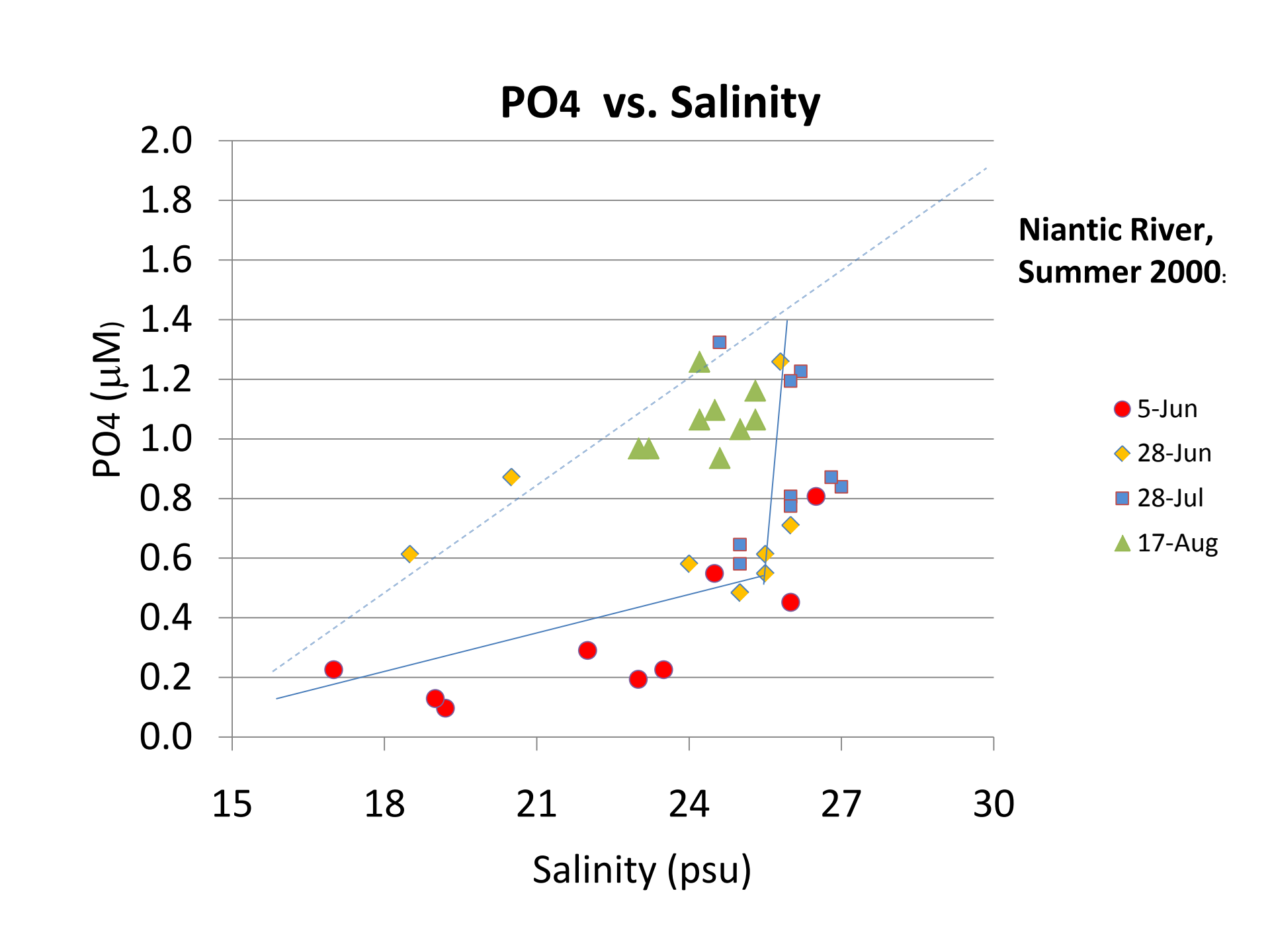
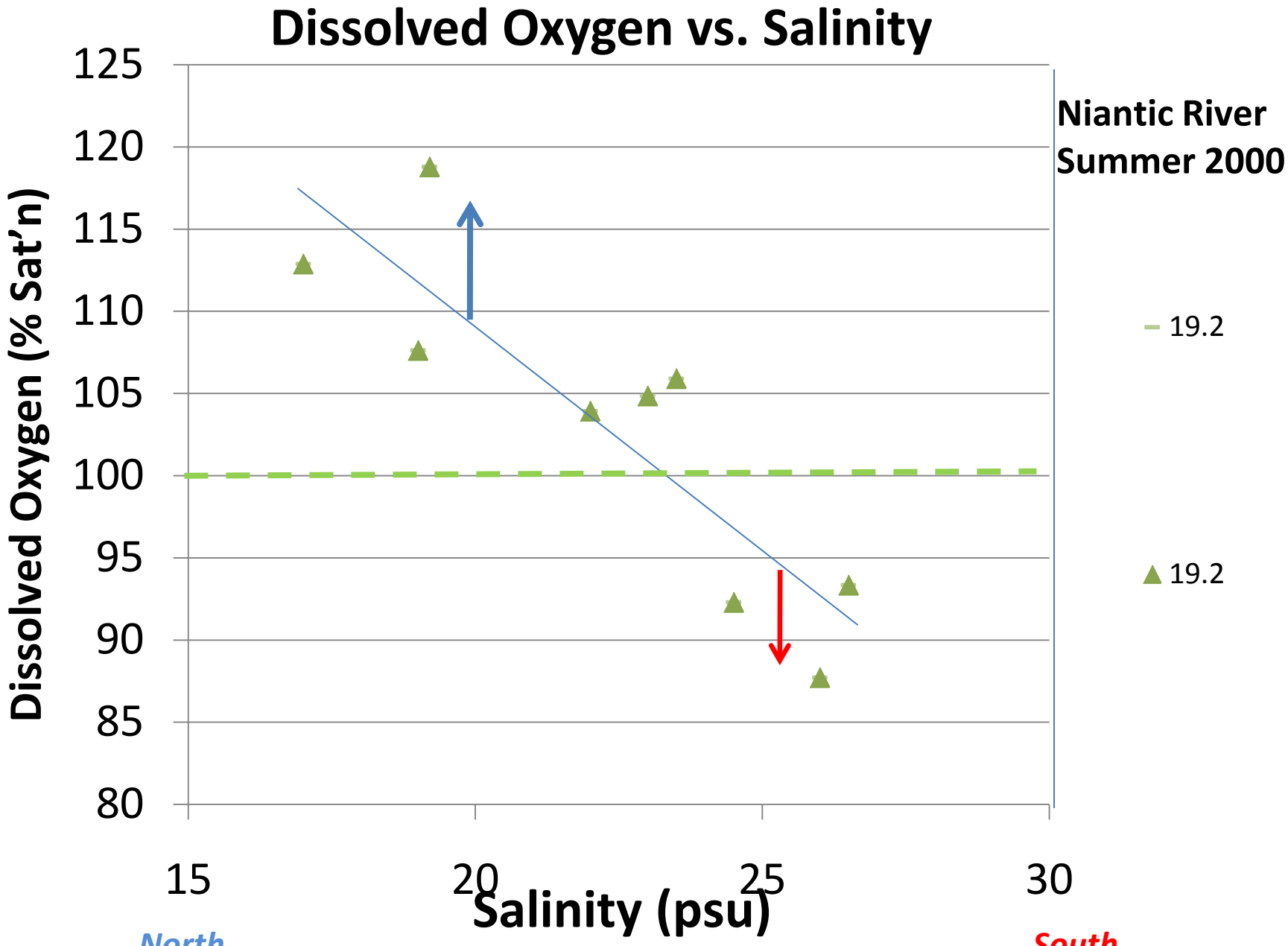


Fig. 1. Idealized representation of the relationship between concentration of a dissolved component and a conservative index of mixing, for an estuary in which there are single sources of river and sea water: (a) for a component (A) whose concentration is greater in sea water than in river water and (b) for a component (B) whose concentration is greater in river water than in sea water.

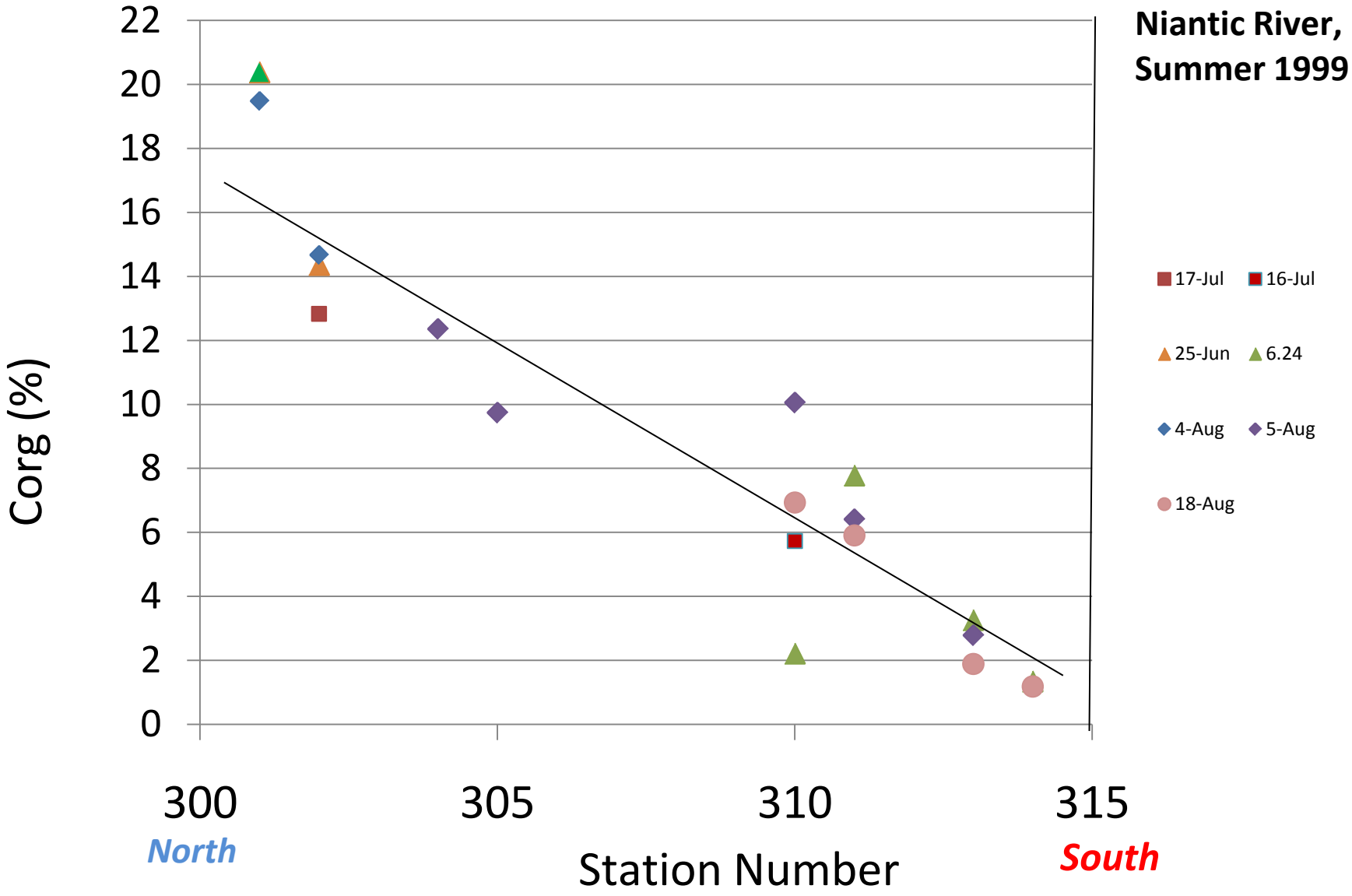
(Liss, 1976; Estuarine Chemistry)


NO3 + NO2 vs Salinity
2.5
2.0
1.5
1.0
0.5
0.0
NO3+NO2 (µM)
15
20
25
30
Salinity (psu)
Fresher endmember
Saline endmember
Niantic River, Summer 2000
5-Jun
28-Jun
7/28
17-Aug

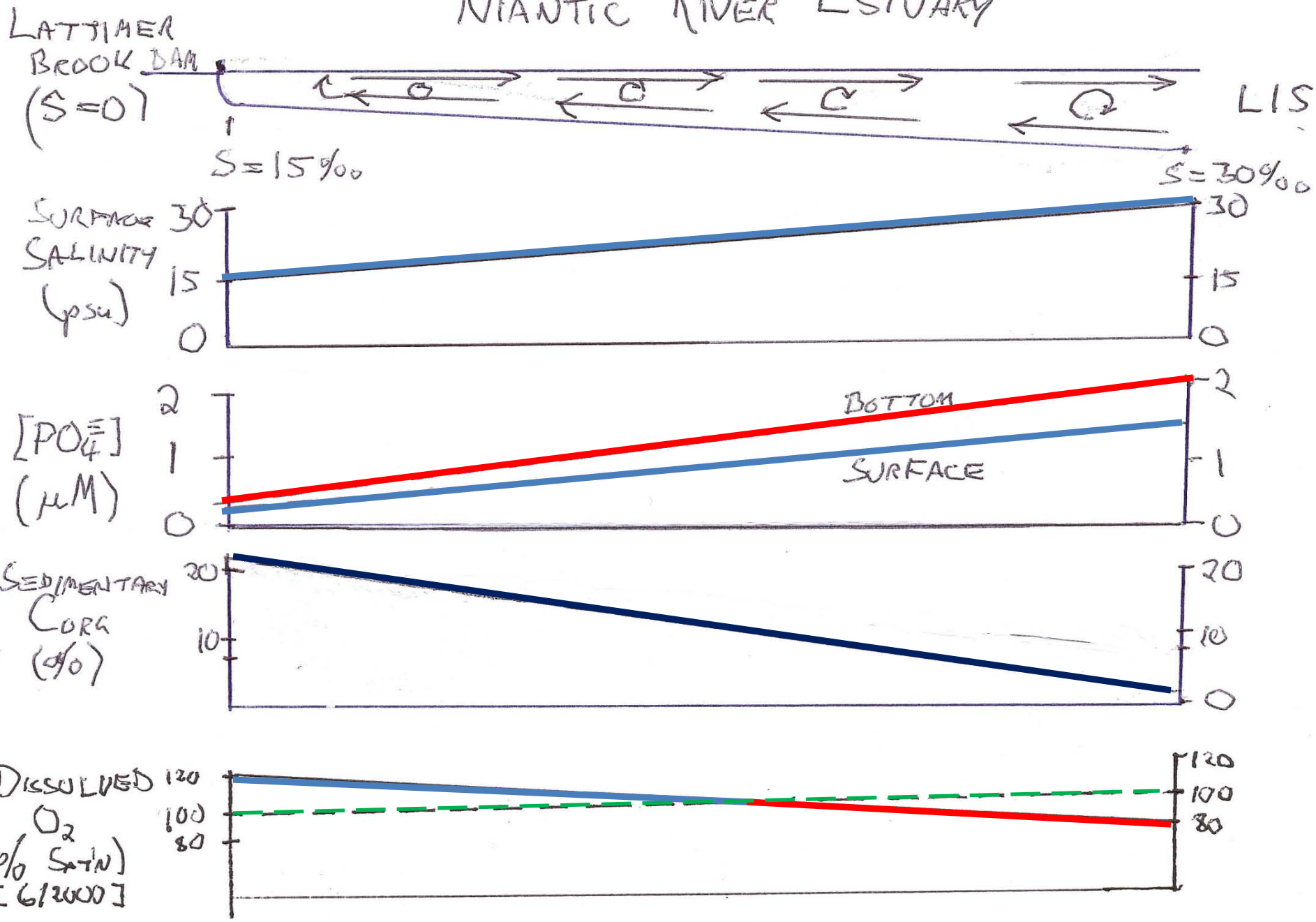

PO4 vs. Salinity
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
PO4 (µM)
15
18
21
24
27
30
Salinity (psu)
Niantic River,
Summer 2000:
5-Jun
28-Jun
28-Jul
17-Aug


Dissolved Oxygen vs. Salinity
Dissolved Oxygen (% Sat'n)
125
120
115
110
105
100
95
90
85
80
15
20
25
30
Salinity (psu)
North
South
Niantic River
Summer 2000
19.2
19.2

Sedimentary Organic Carbon vs. Station



NIANTIC RIVER ESTUARY



Summary

1. A preliminary assessment of the Niantic River estuary indicates that:
   A. There is a typical salinity gradient of ~30 psu to ~15 psu.
   B. Nutrients (PO4, NOx) decrease from high levels at the *LIS high-salinity end member* to low levels at the low-salinity end member.
   C. Sedimentary Corg increases from 2% levels at the LIS high-salinity end member toward ~20% Corg the low-salinity end member.
   D. One DO gradient shows subsaturation in the high-salinity end member. and supersaturation in the low salinity end member.

2. These observations are consistent with the high-salinity portion (15-30 psu) of the Niantic River acting a sink for LIS nutrients.

3. It will be important to examine the low-salinity realm (0-15 psu) as a sink for terrigenously-derived nutrients.

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