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Some background info...



Photo courtesy of NASA

CFR system is largest watershed in NC, and drains many large urban areas

Lots of anthropogenic inputs go into river system

CFR flows directly into Long Bay

Direct connection between terrestrial human activities and nearshore water quality

Data collected from Jan. 2000 – Oct. 2005

Monthly CORMP cruises
on CFR plume

64 μm zooplankton
collection net and pump
filtered 2 100L samples
per station

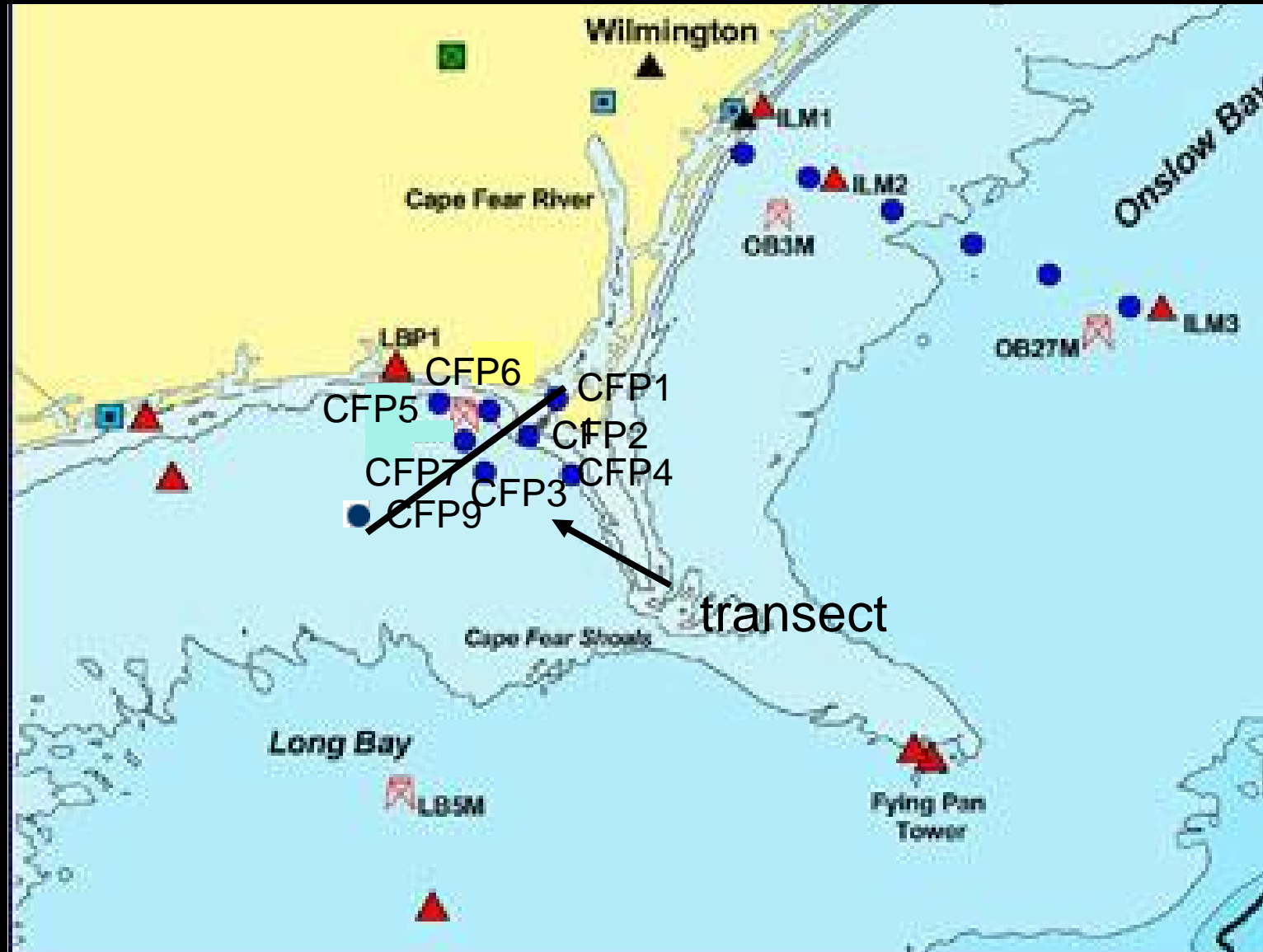
Dry weight and ash
weight analysis performed

Statistical analysis
performed via SAS

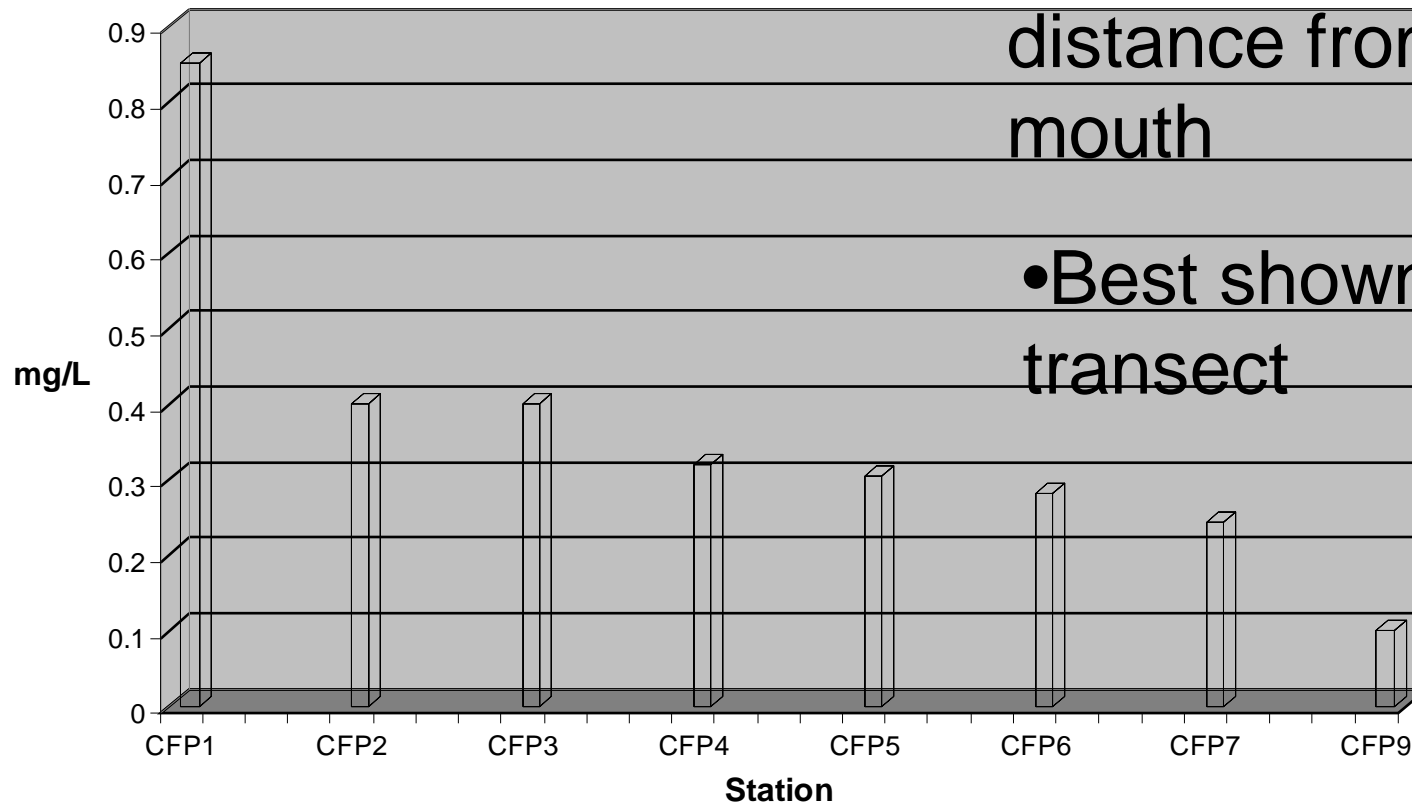


R/V Seahawk photo courtesy UNCW-CMS

MAP VIEW OF STUDY AREA



2000-2005 Mean Total Seston



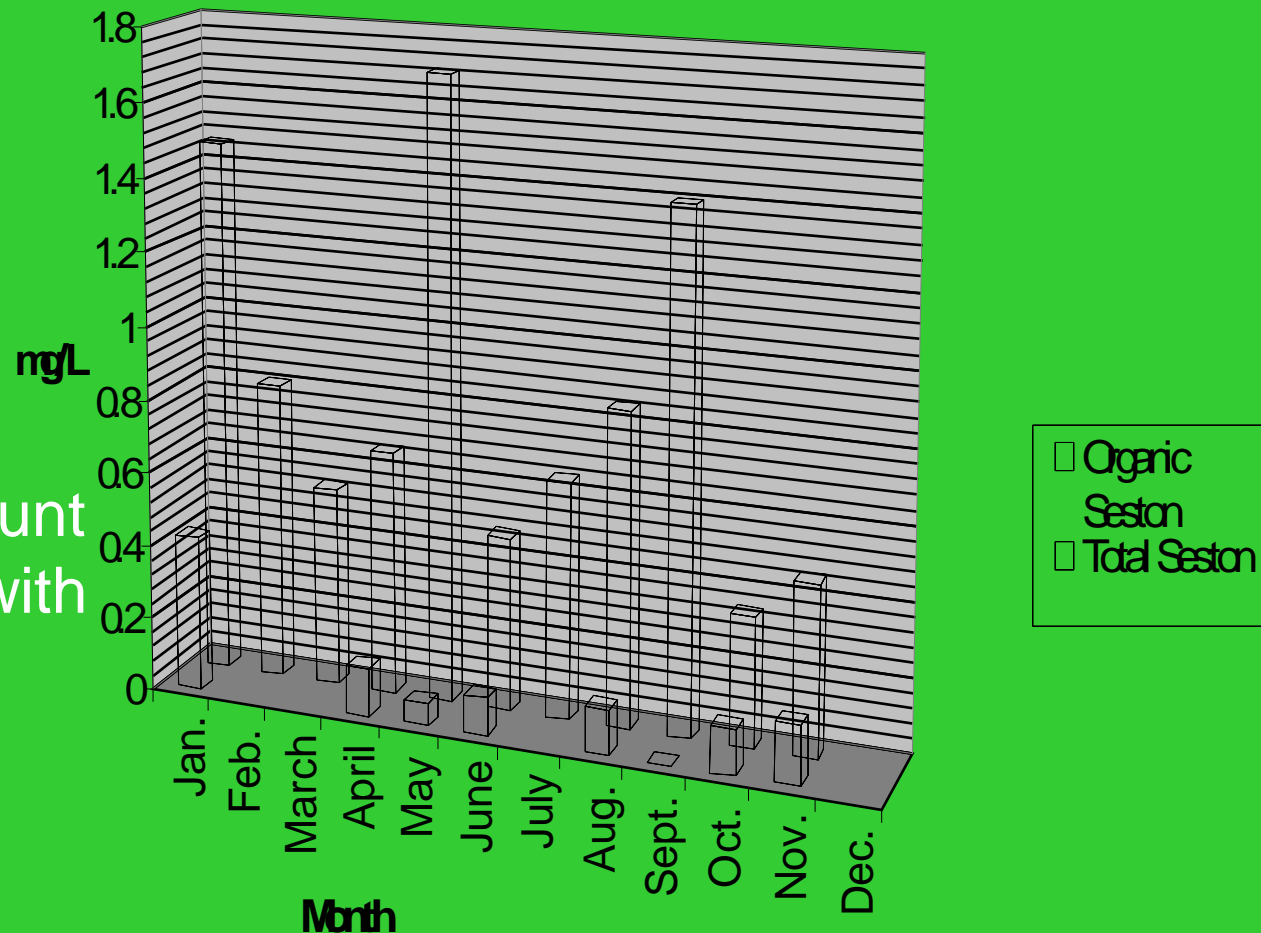
- Settling of seston increases spatially with distance from river mouth

- Best shown along a transect

CFP1- Lower estuary

- Strong positive correlations between turbidity and all macronutrients ($p < 0.03$)
- No correlations with chl a
- suggests high amount of inorganic seston with small organic component

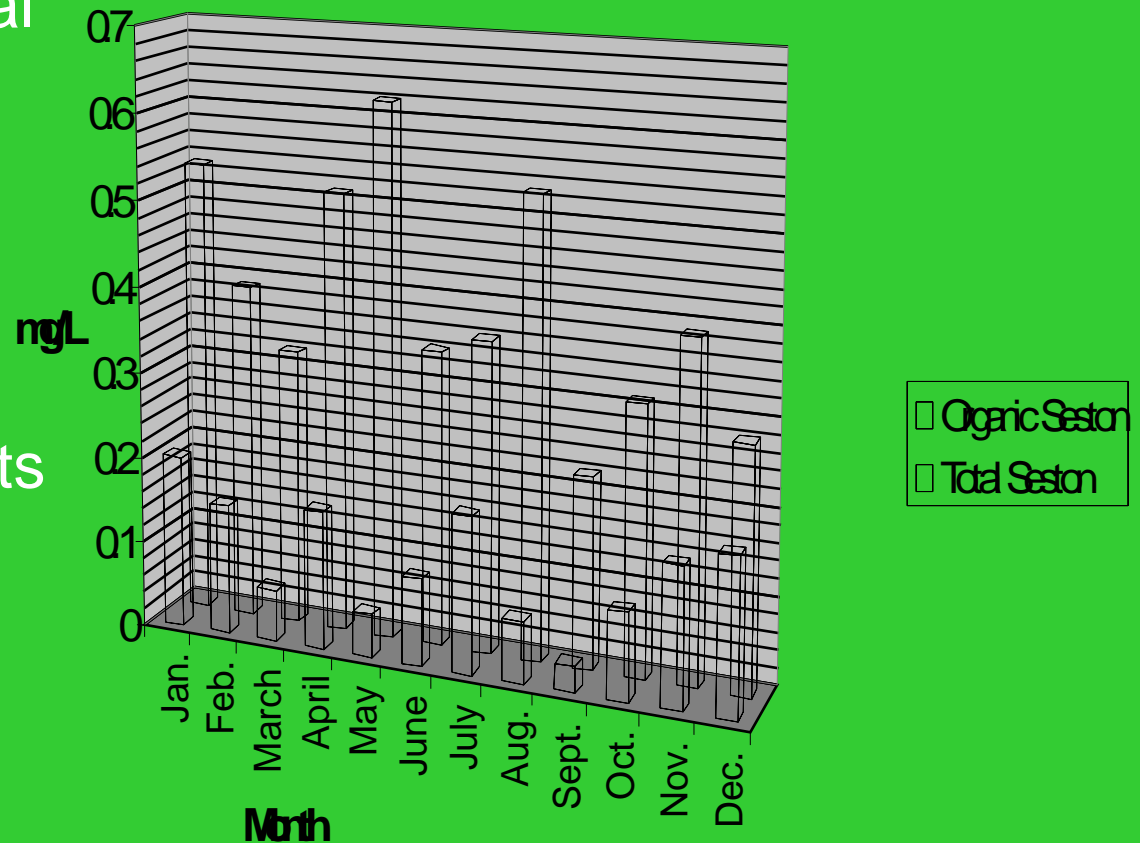
Comparison of Annual Means 2000-2005
Total Seston and Organic Seston
Station 1



CFP2- Just outside of estuary

- Strong positive correlation between total ash weight (org. seston) and total dry weight (total seston) ($p < 0.005$)
- Chl a and total P positively correlated ($p < 0.012$)
- Turbidity, macronutrients and total dry weight positively correlated ($p < 0.01$)
- Suggests increase in organic component in plume

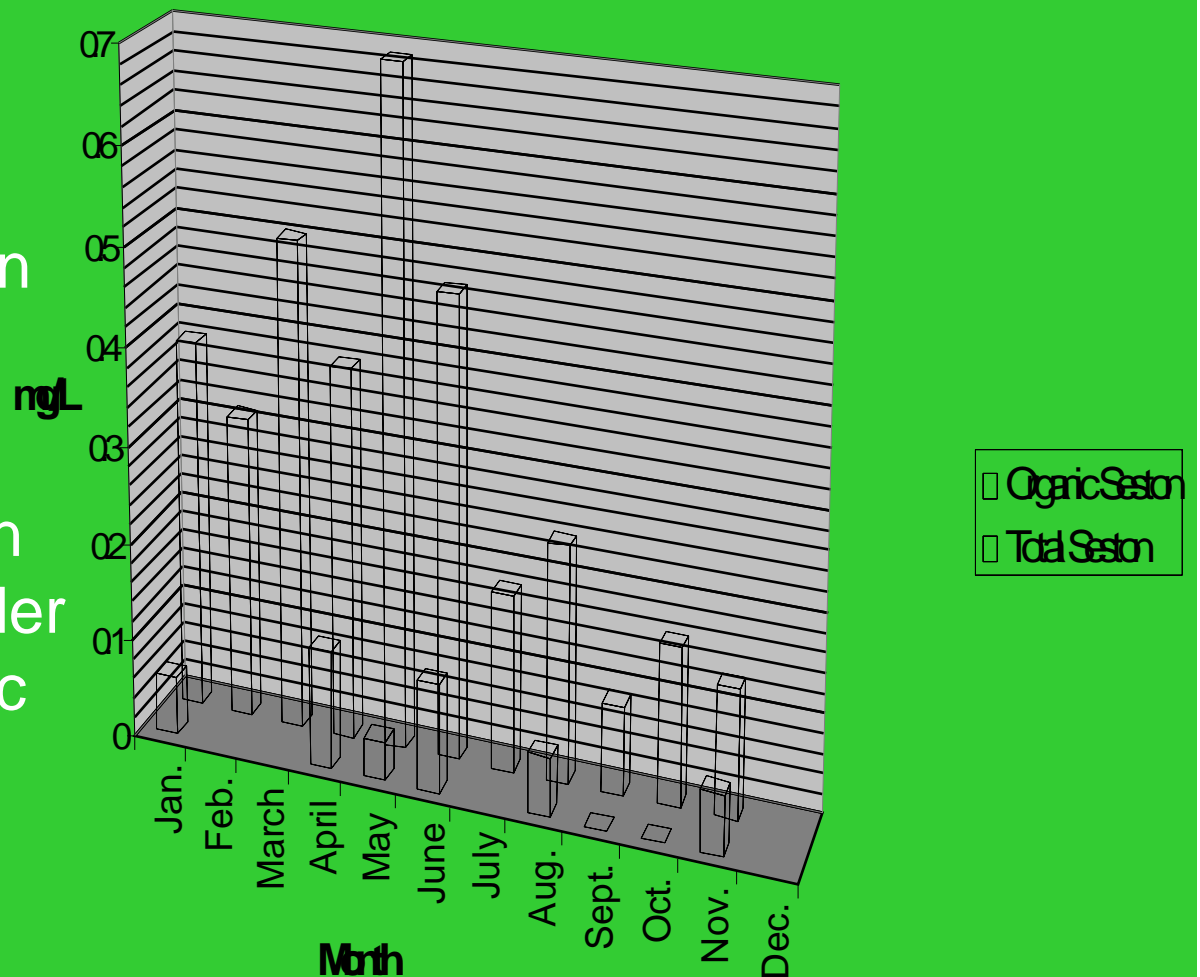
Comparison of Annual Means 2000-2005
Total Seston and Organic Seston
Station 2



CFP3- Away from plume over shoals

- Neg. correlation between total dry weight and % organic component ($p < -0.05$)
- Neg. correlation between turbidity and temp. ($p < -0.004$)
- Suggests more seston in water column during colder months and small organic % of seston

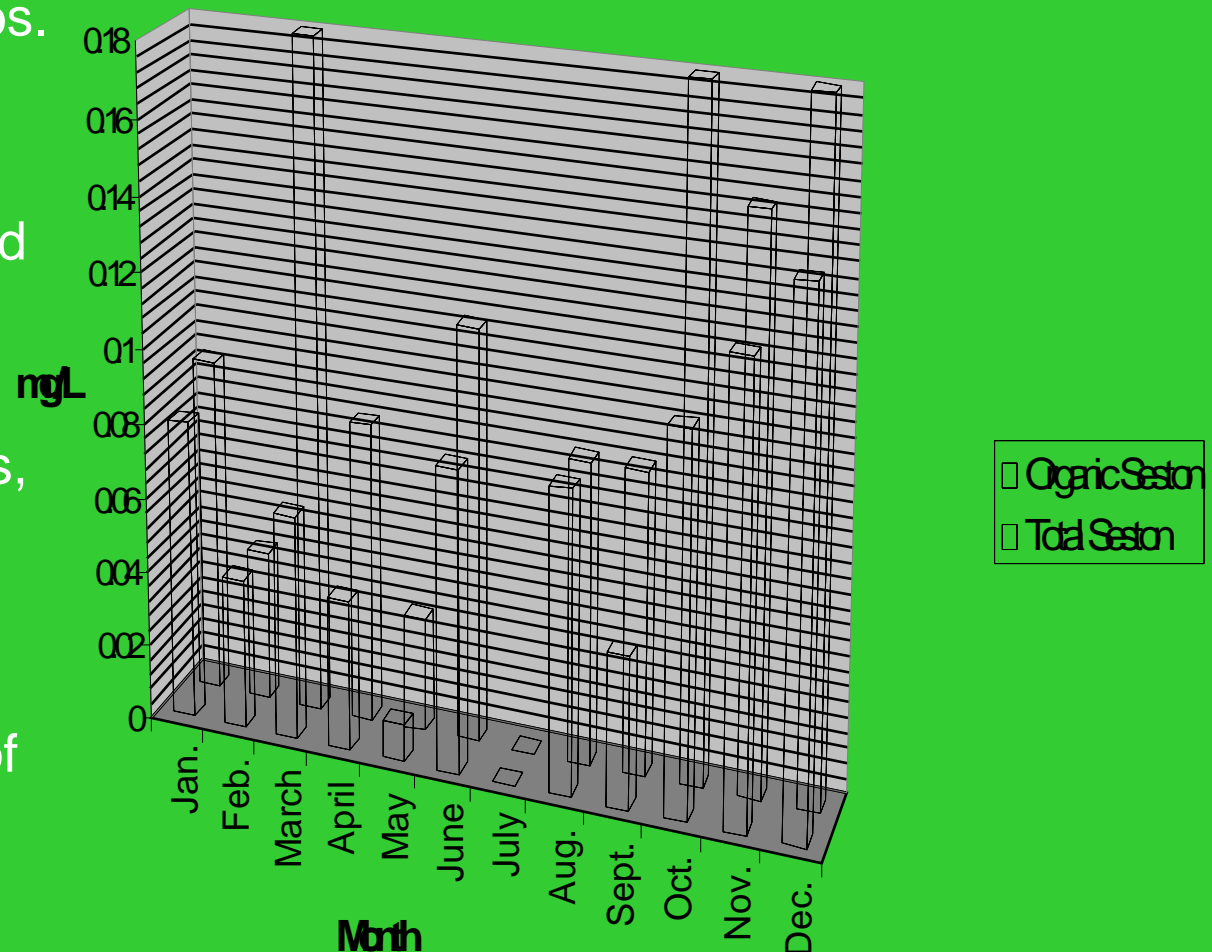
Comparison of Annual Means 2000-2005
Total Seston and Organic Seston
Station 4

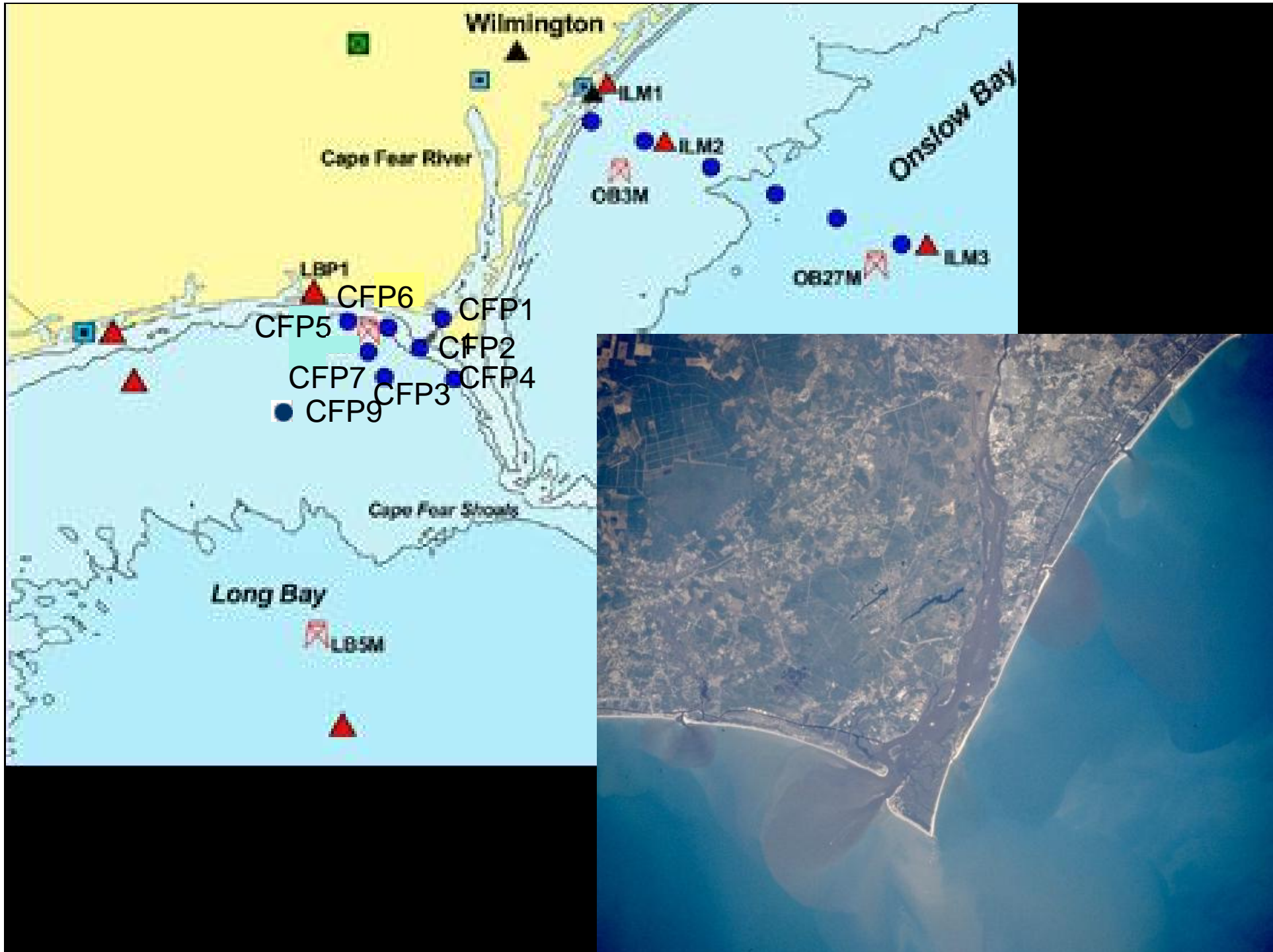


CFP9 – Outside of plume (3 mi.)

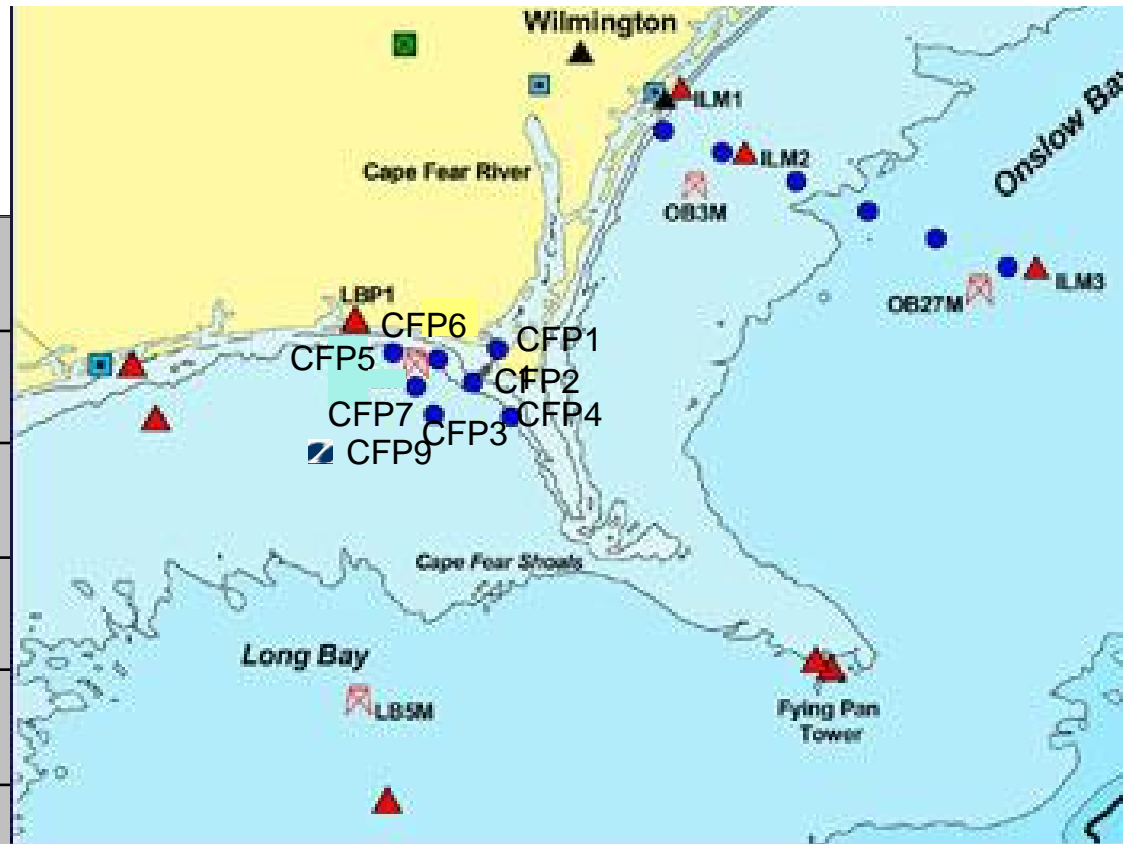
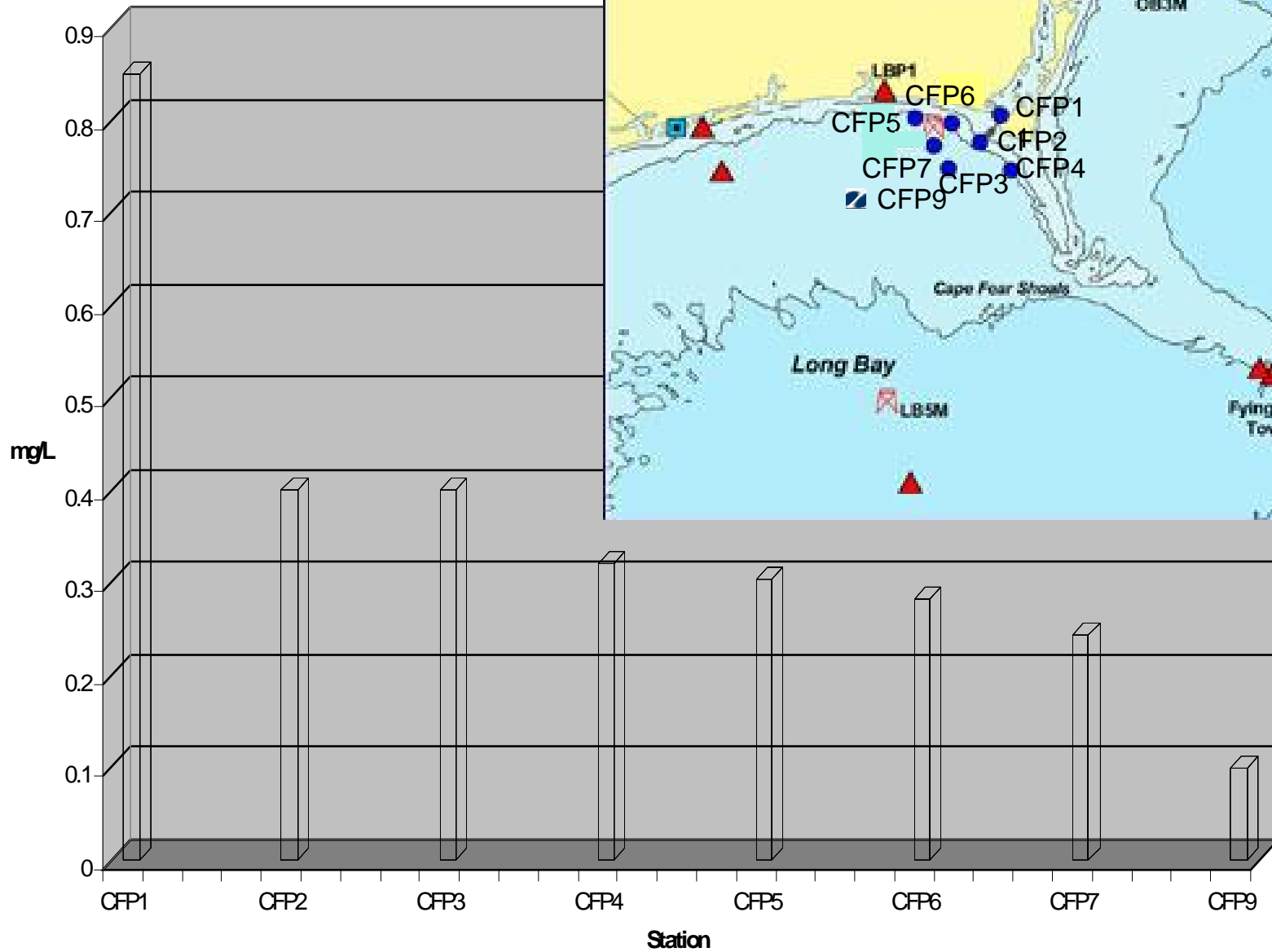
- Neg. correlation between turbidity and organic component of seston ($p < 0.05$)
- Chl a and macronutrients pos. correlated ($p < 0.04$)
- Total seston pos. correlated with Chl a, % org. seston, and Si. ($p < 0.03$)
- Suggests presence of macronutrients AND biomass, with highest % of organic component
- Zooplankton and phytoplankton independent of river inputs
- Si due to diatoms?

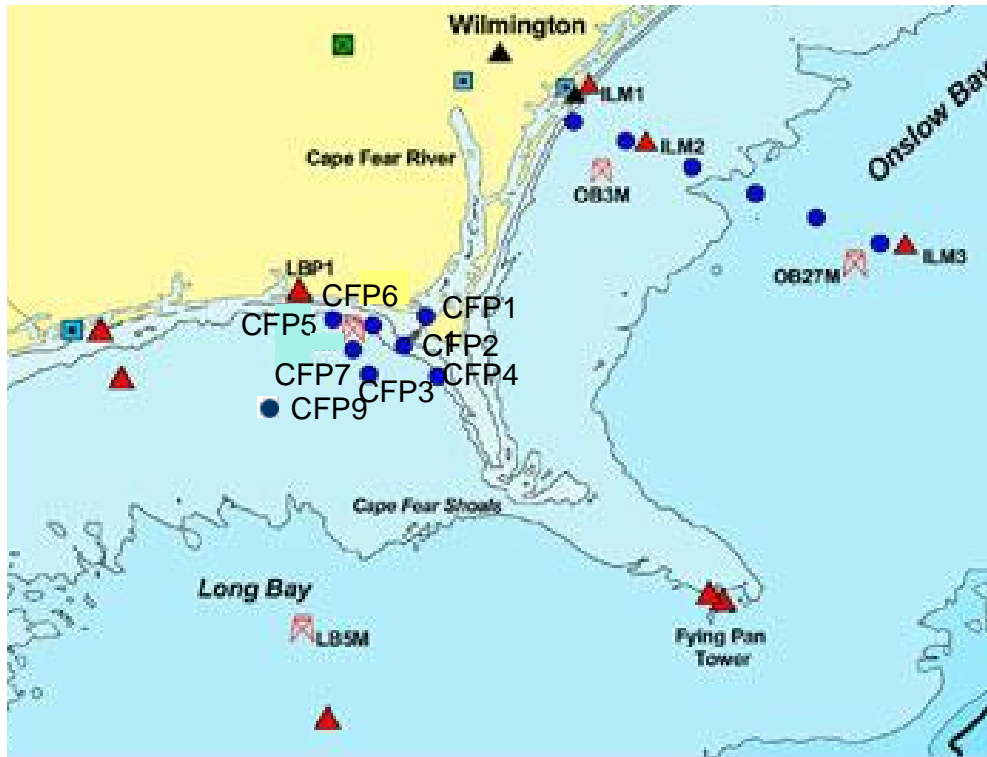
Comparison of Annual Means 2000-2005
Total Seston and Organic Seston
Station 9



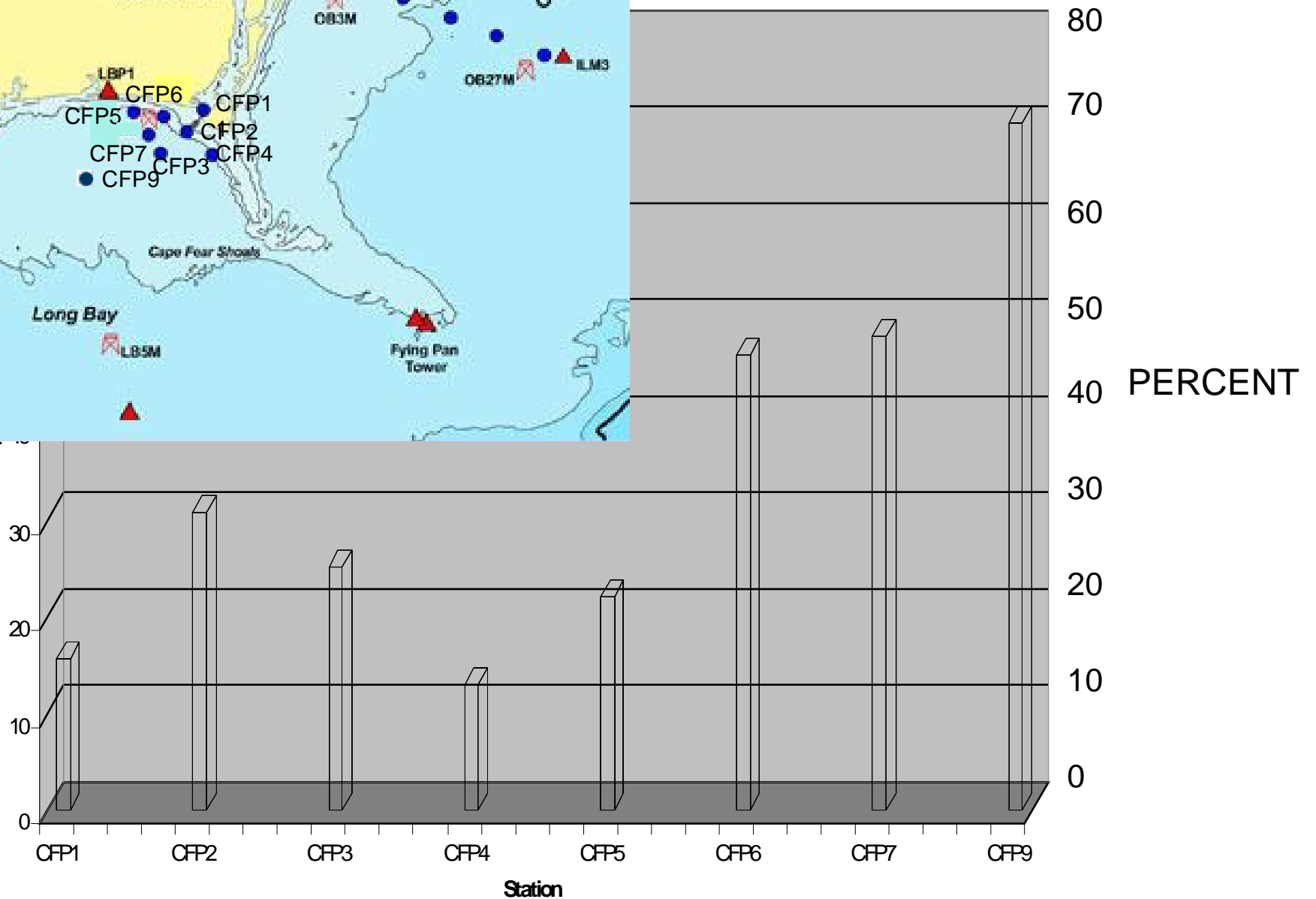


2000-2005 Mean Total Seston

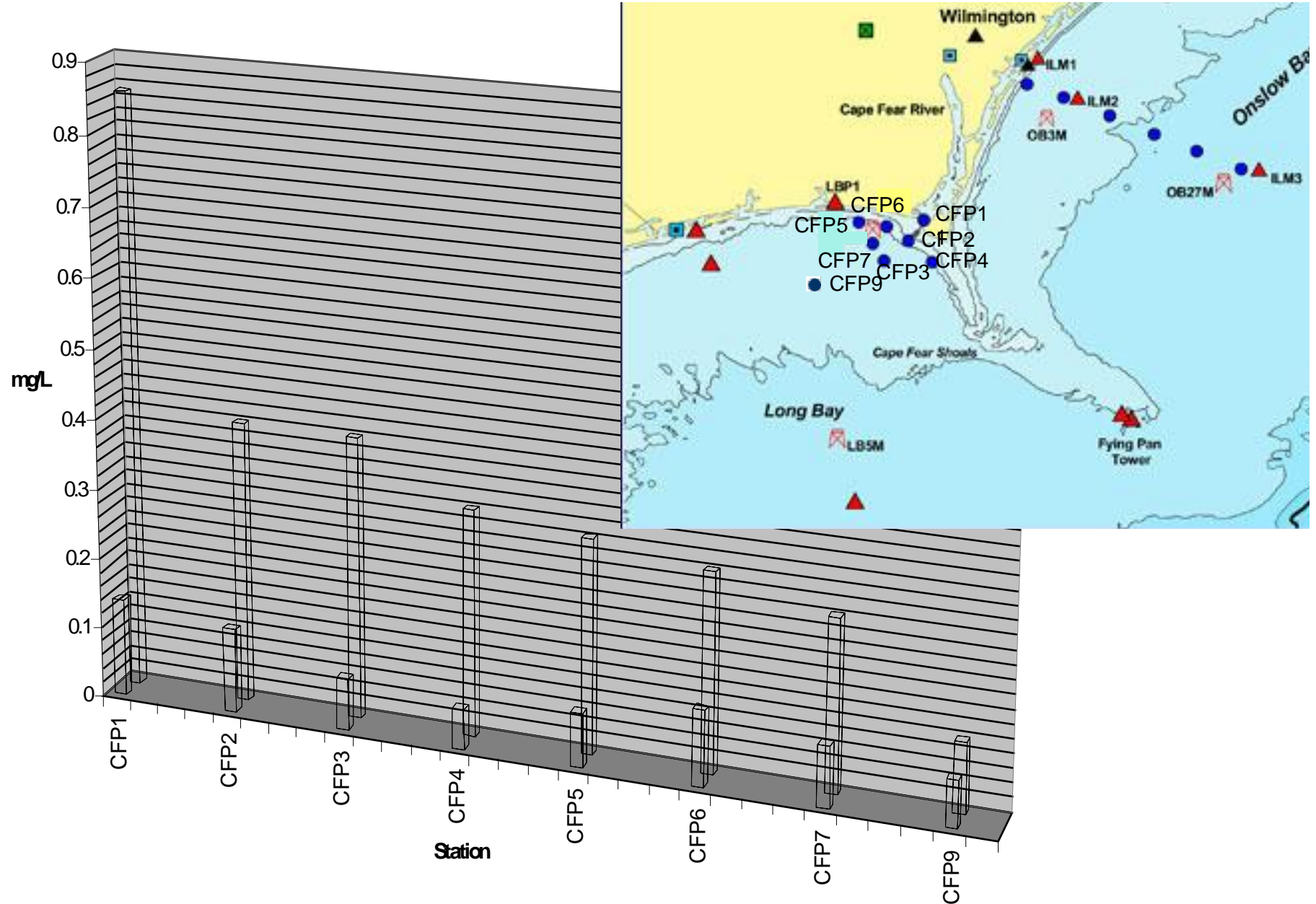




2002-2005 Mean Percentage of Organic Seston



2000-2005 Mean Total Seston Vs. Mean Organic Seston



CONCLUSIONS

- Total seston decreases spatially along a transect with distance from shore
- Organic percentage of seston follows an opposite trend, as inorganic particles settle out of the water column
- Surface currents constrained by Cape Fear most likely influence southerly flow of seston to CFP5, 6 and 7 and away from CFP4
- CFP9 most likely influenced more by other oceanic processes outside of plume
- Shows CFR plume delivers loads containing inorganic and organic components which may be amplified by anthropogenic activities (nutrient loads from point and non-point sources in the watershed)
- Increase in N, P and Si due to anthropogenic inputs helps stimulate phytoplankton, therefore zooplankton as well

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Virginia Johnson

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