



Cost Effective Regional Phosphorus Concentration Mapping of Open Water

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Corps of Engineers



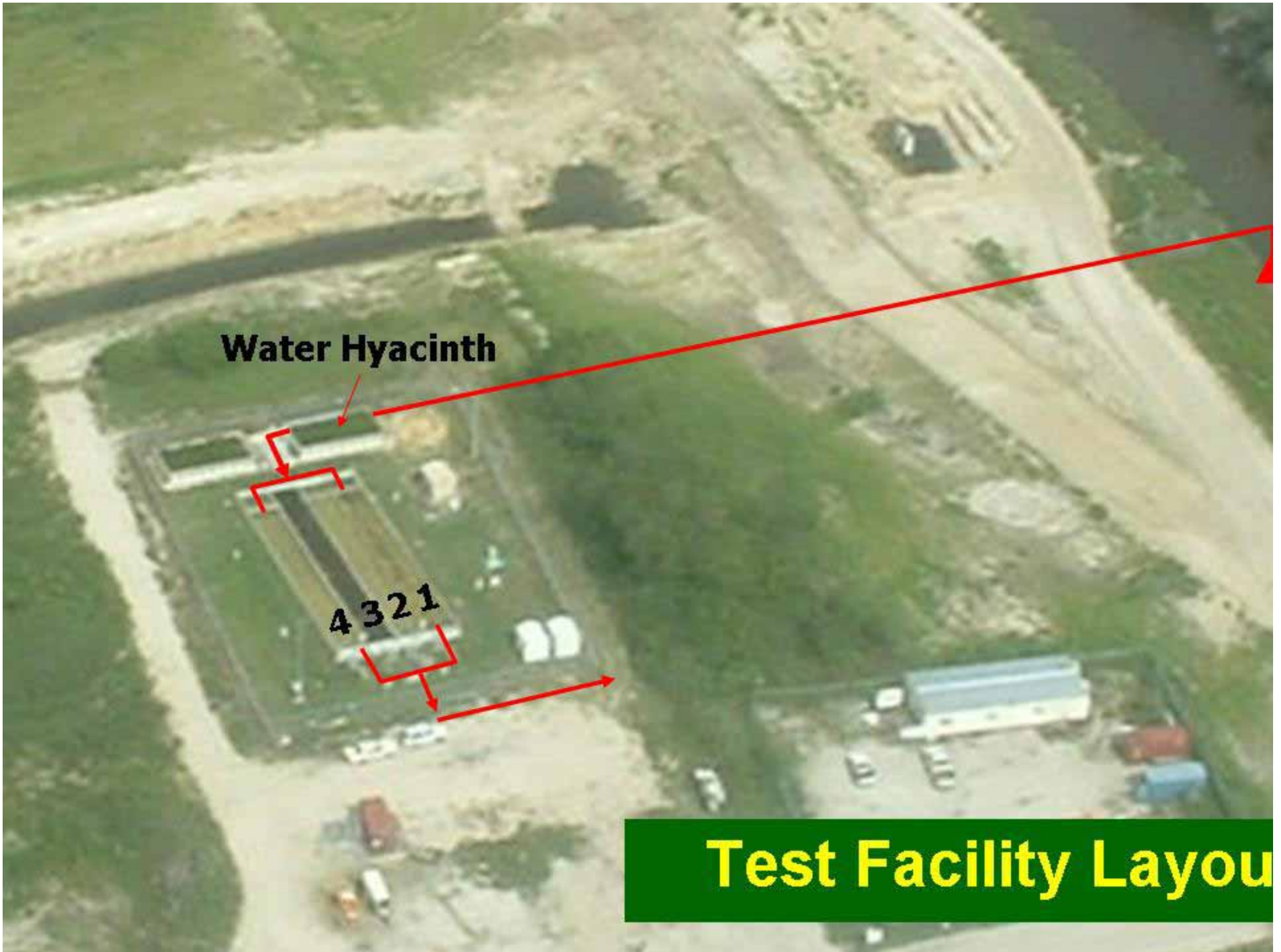
Naval Research Laboratory

Strategy for Regional Phosphorus Mapping using Remote Sensing

- **Background**
- **Theory**
- **Results Showing Relationships**
- **Conclusions**

Water Parameters (~70% Accurate) Successfully Estimated by Remote Sensing

- Chlorophyll
- Suspended Sediment/Turbidity
- Dissolved Organic Matter
- Temperature
- Salinity
- Potential for Phosphorous ?



Water Hyacinth

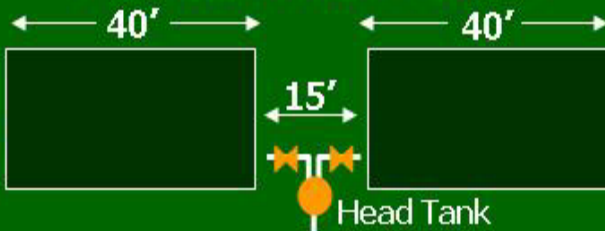
4 3 2 1

Test Facility Layout

PSTA

PRE-TREATMENT POOLS

Water Hyacinth



C-51

~ 100 – 1000 ppb P



Periphyton mat



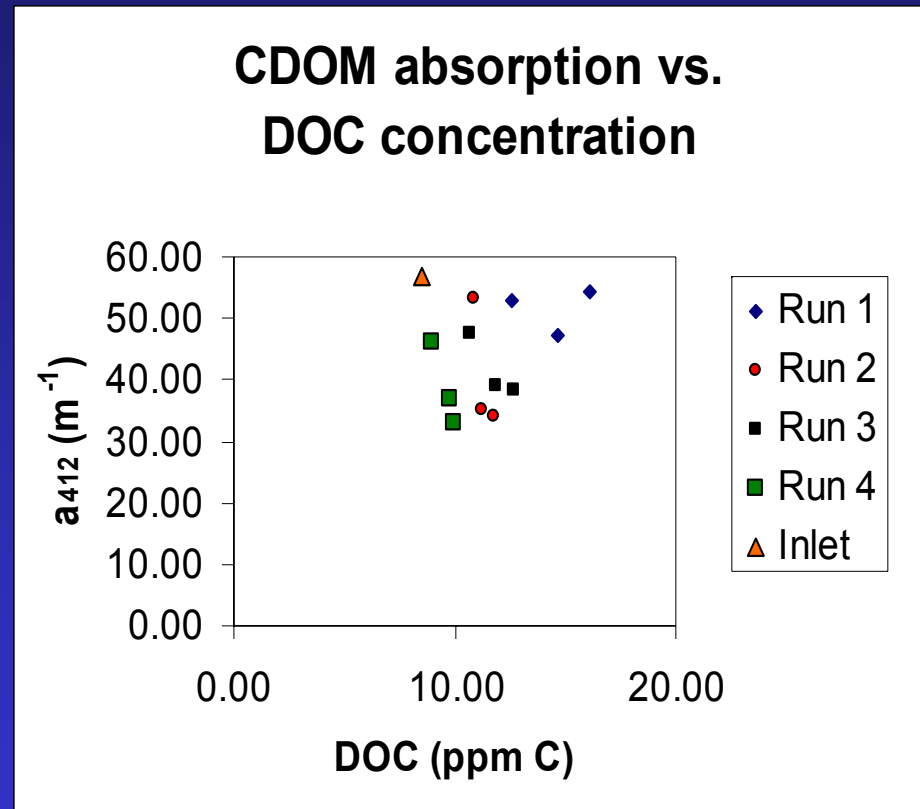
Calcareous Periphyton Mat (Cells 4 & 2)



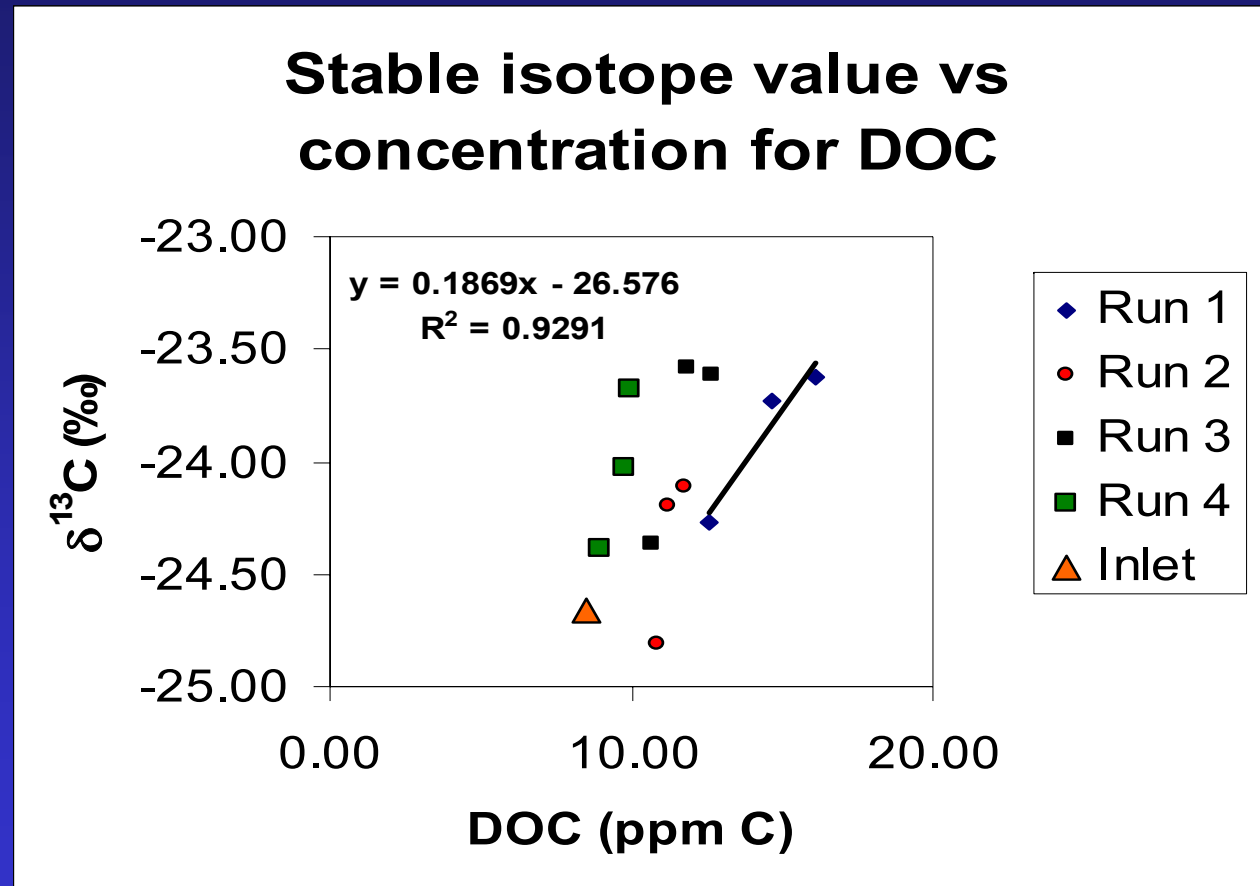
Agricultural Ditch



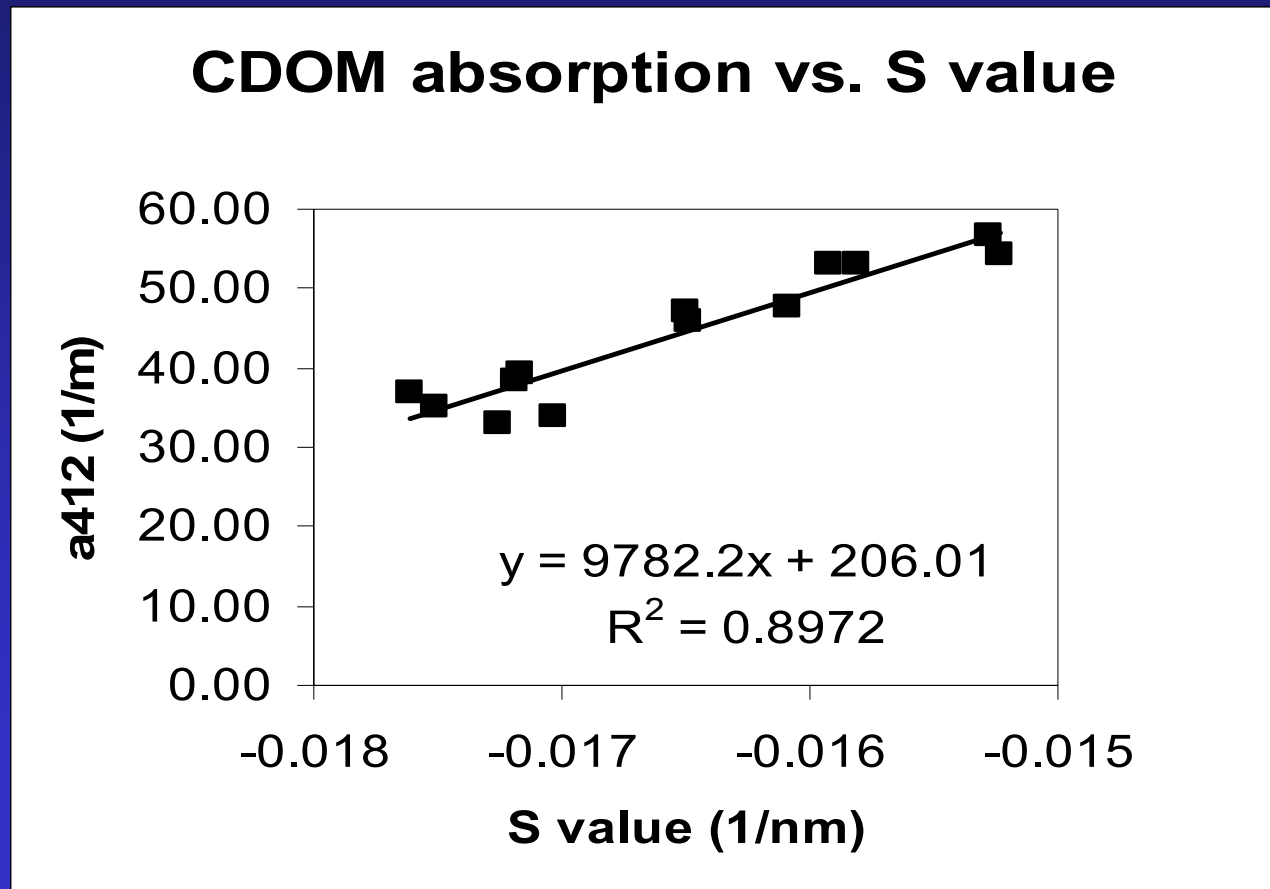
CDOM Absorption vs DOC Concentration at 412 nm



Stable Isotope value vs DOC Concentration

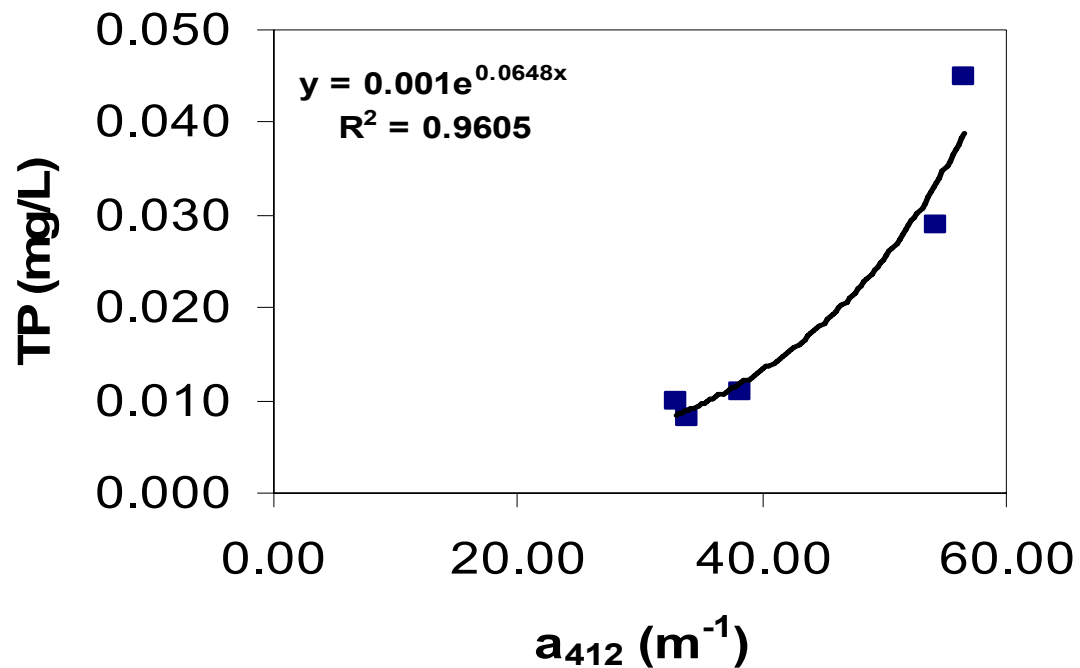


CDOM Absorption vs S value

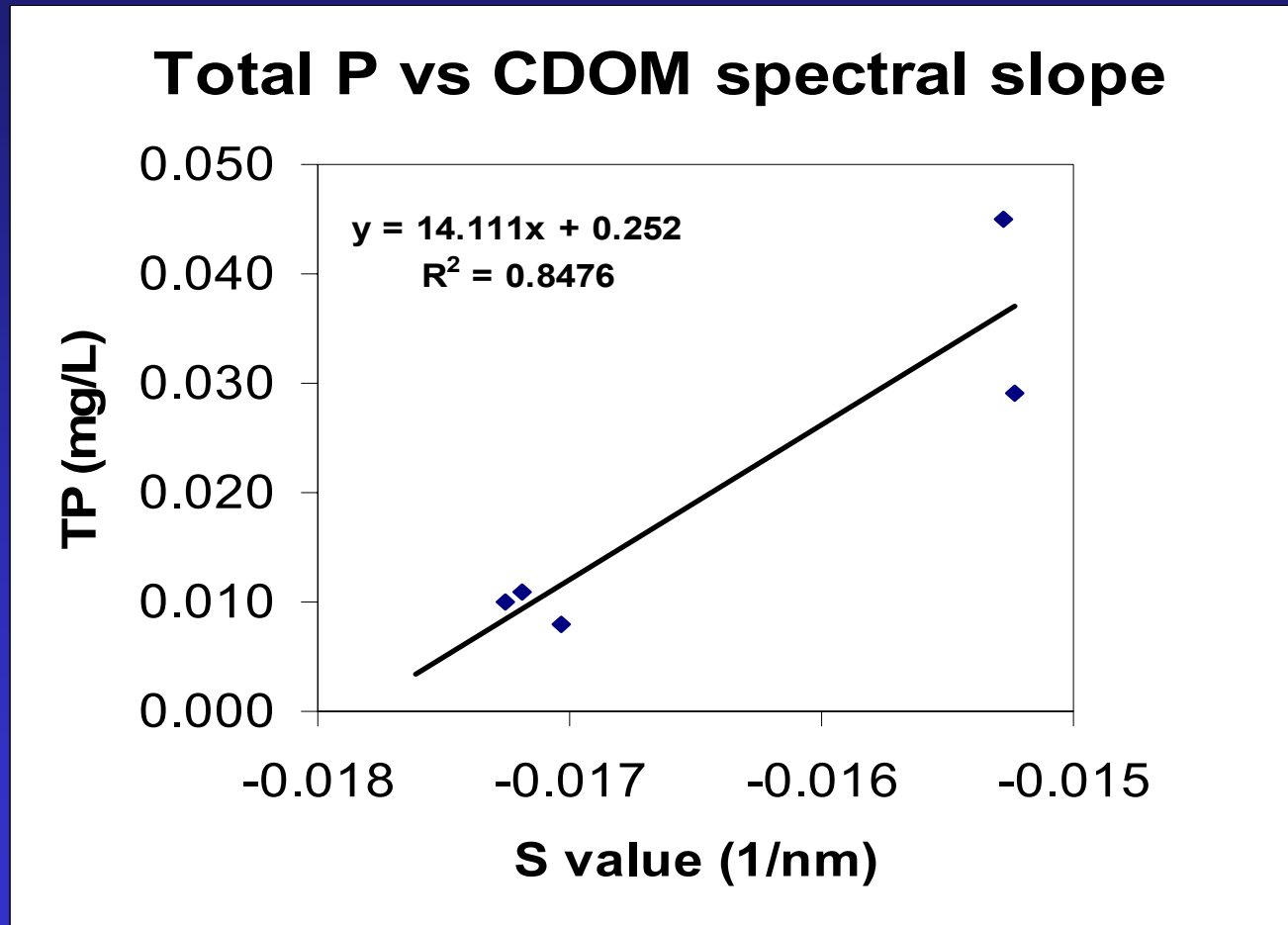


Total P vs CDOM Absorption

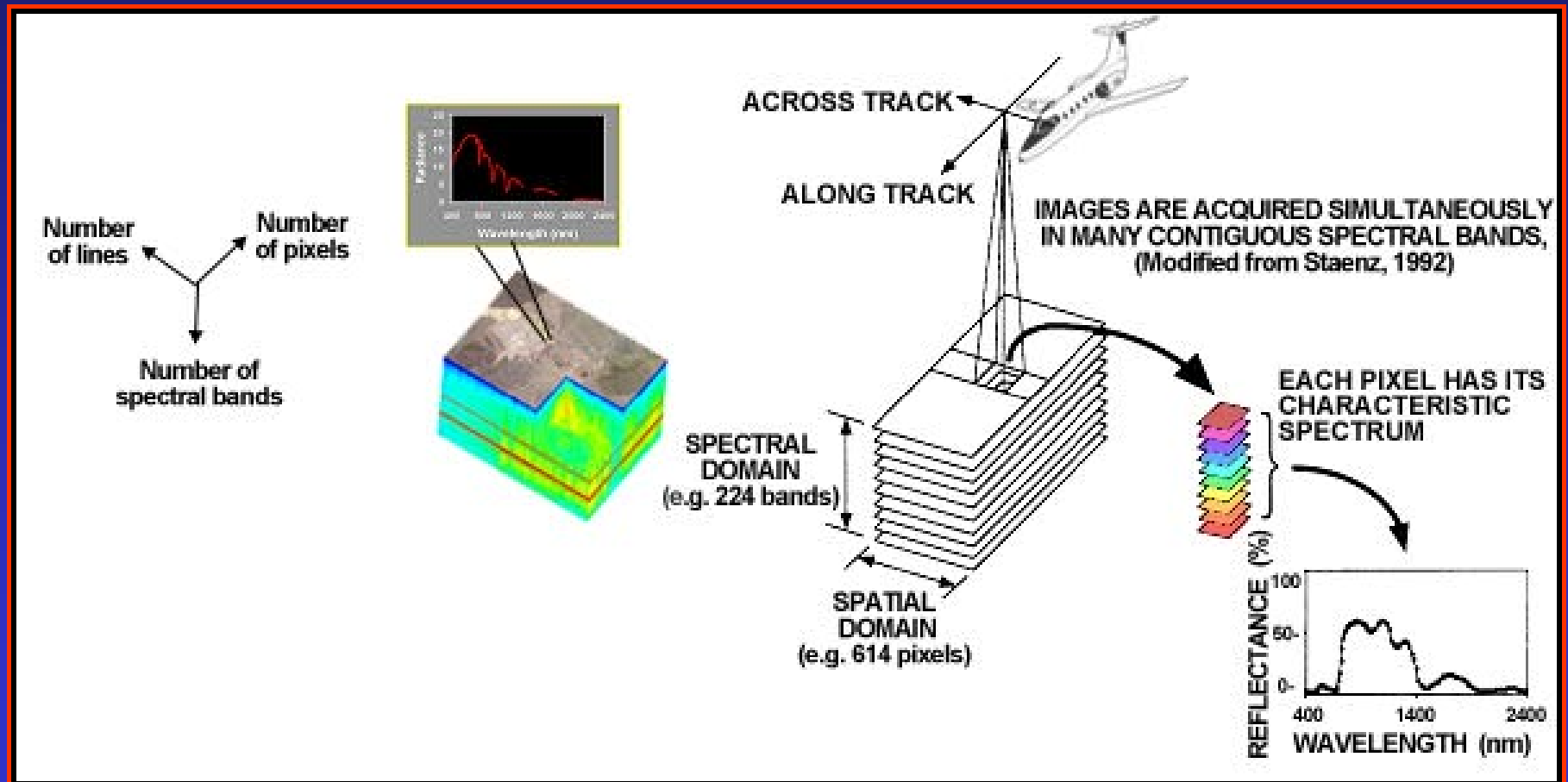
Total P vs CDOM absorption



Total P vs CDOM Spectral Slope



TP Monitoring Algorithm Certification



Conclusions

- S value, a₄₁₂, CDOM, TP show strong correlation.
- This observation calibrates application of CDOM hyperspectral surveys for prediction of TP transport.
- This finding justifies development of algorithms in over flight and satellite imaging for monitoring TP.