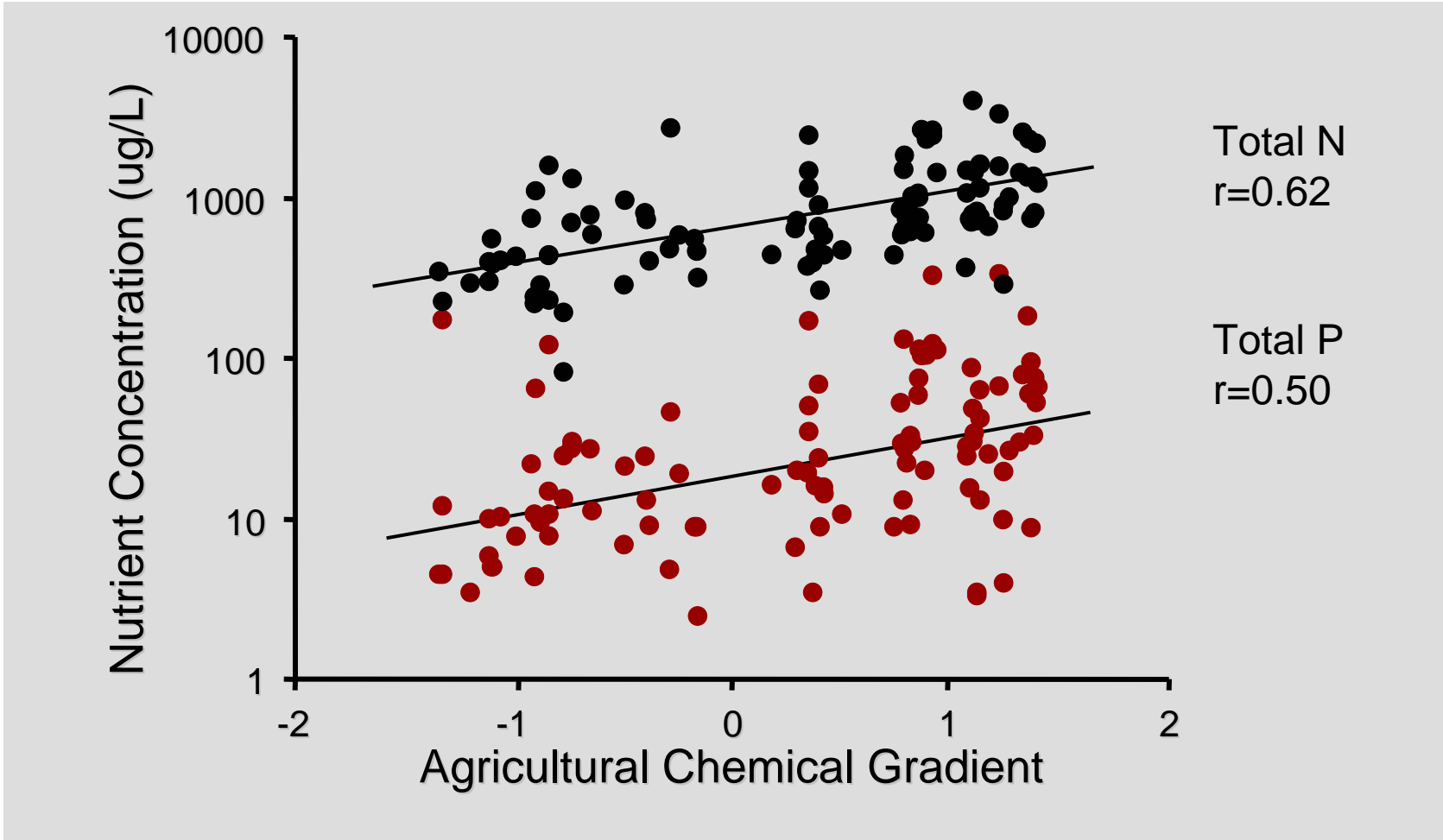


Nonpoint Water Quality Effects on Great Lakes Coastal Wetlands

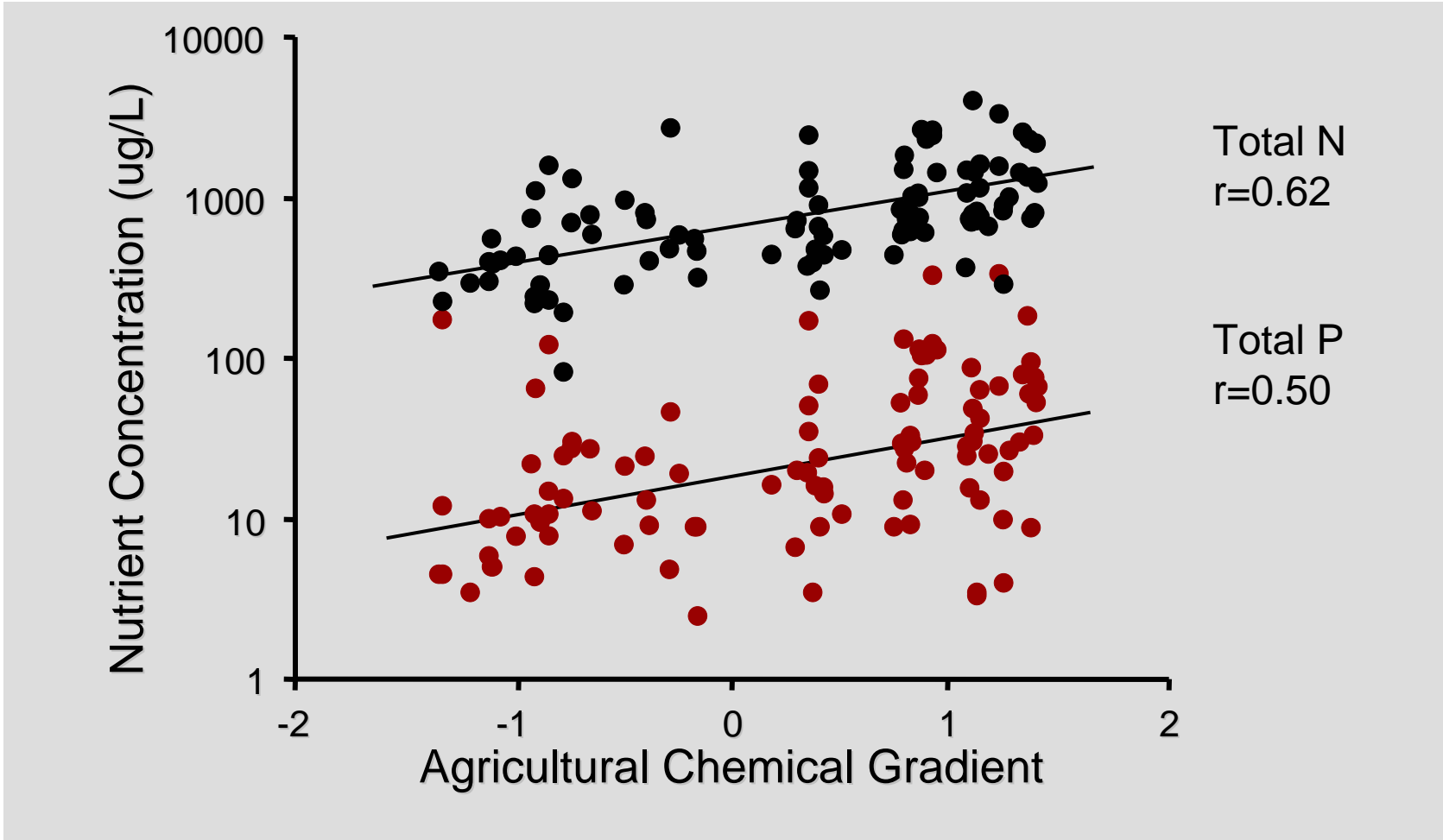


John Morrice
Nick Danz
Jack Kelly
Anett Trebitz
Gerald Niemi
Tom Hollenhorst
Anne Cotter
Greg Peterson
Euan Reavie
Ron Regal
Richard Axler

Water Quality is a Good Indicator of Connections Between Coastal Wetlands and Land-based Ecosystems.

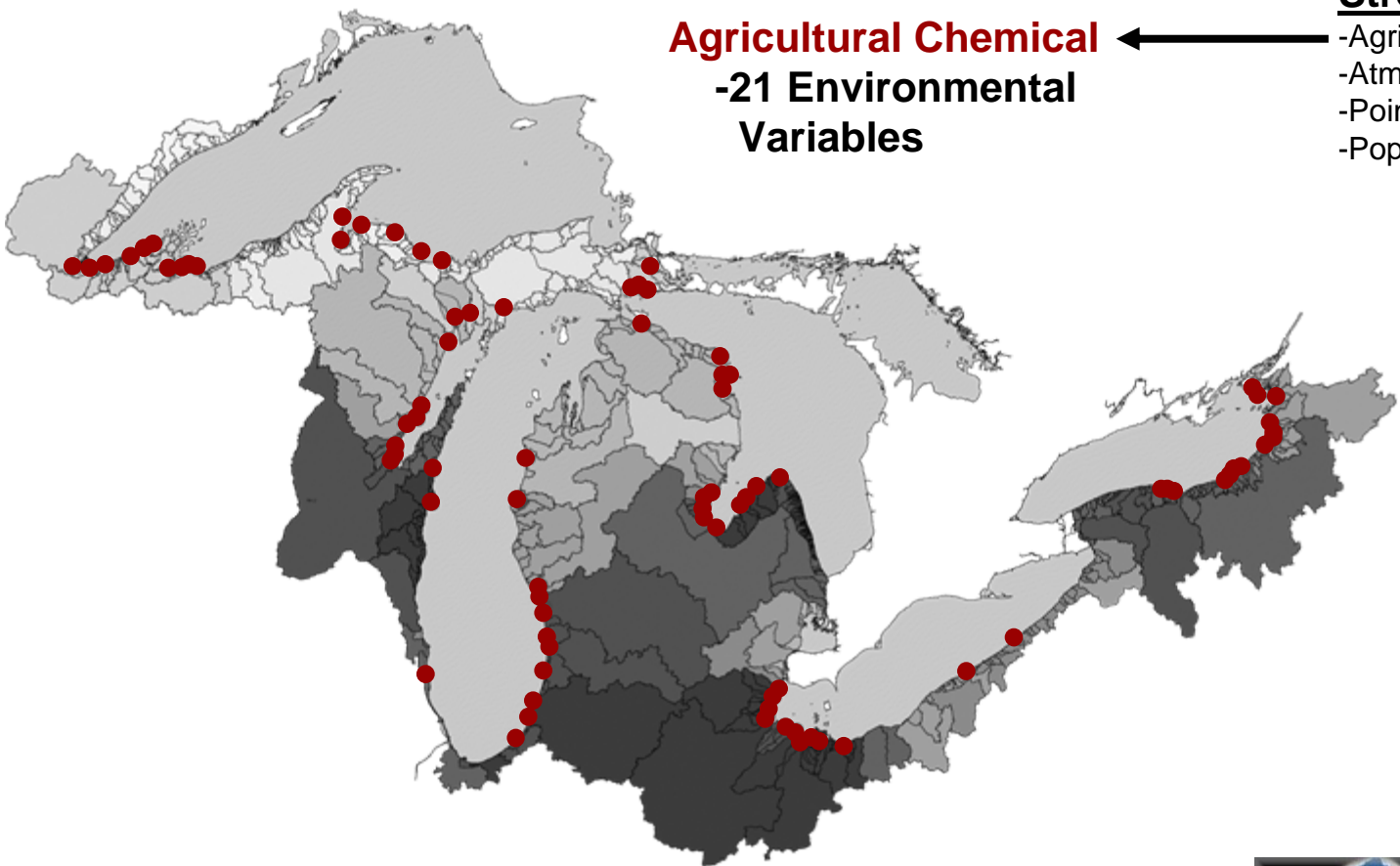
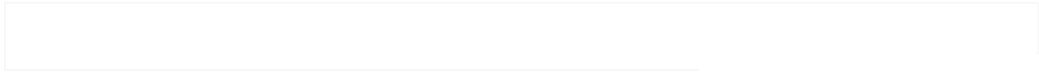


Water Quality is a Good Indicator of Connections Between Coastal Wetlands and Land-based Ecosystems.



- What Types (and what metrics) of Land-based Stressors Influence Coastal Wetland Water Quality?
- What is the Role of Hydrology in Determining the Nature of Connections Between Coastal Wetlands and Land-based Ecosystems?

Landscape-Scale Stressor Metrics



Agricultural Chemical
-21 Environmental
Variables



Stressor Categories

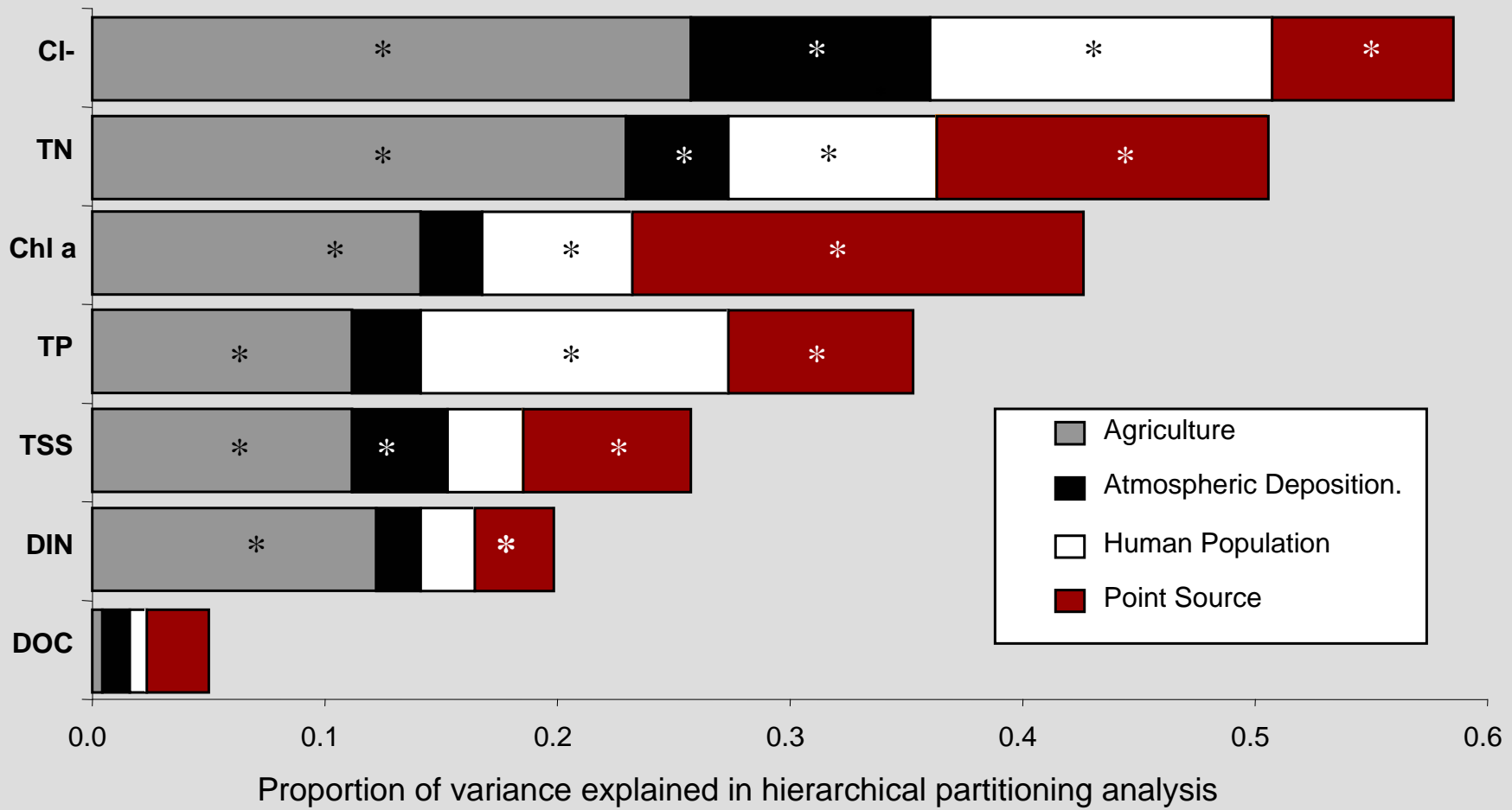
- Agriculture and Ag. Chemical
- Atmospheric Deposition
- Point Sources
- Population and Development



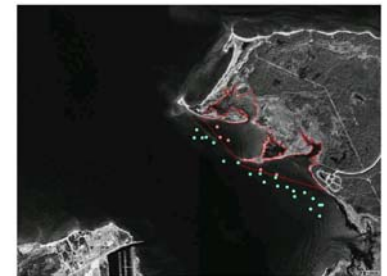
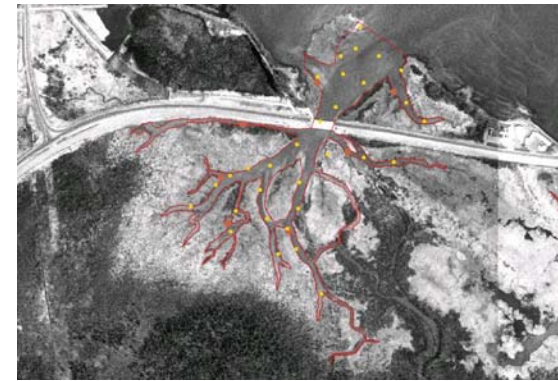
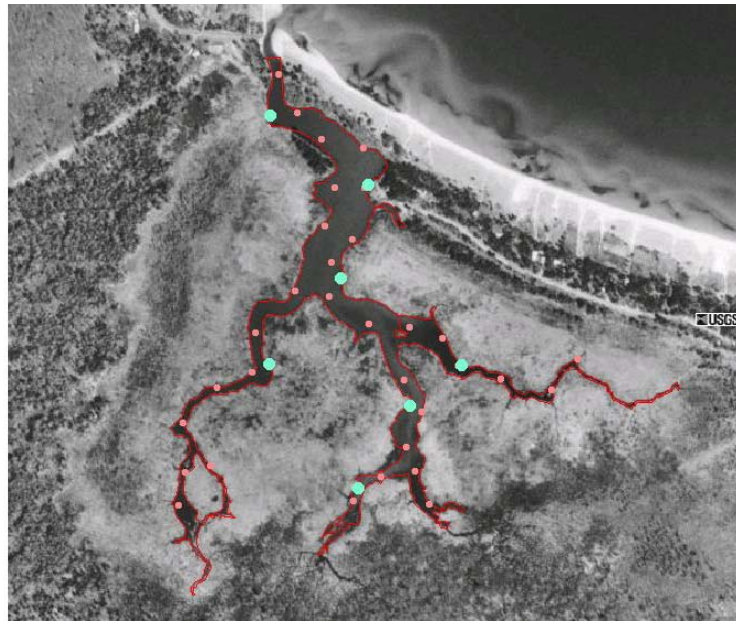
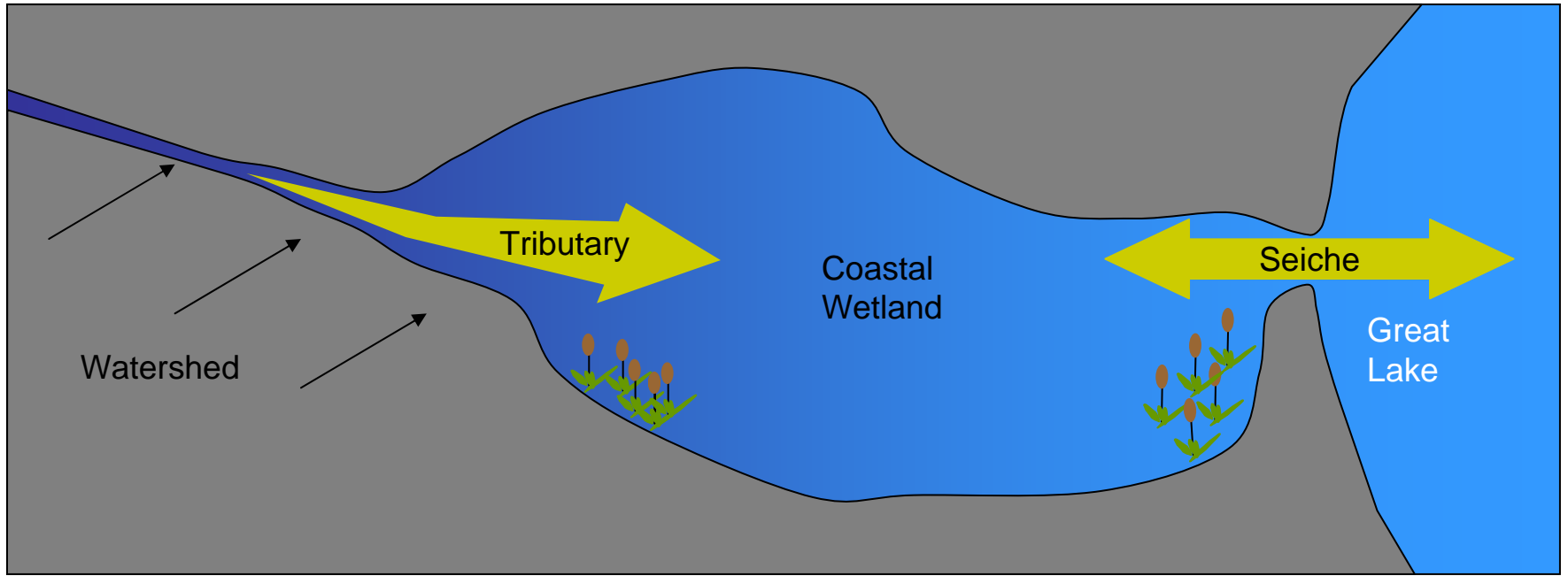
Great Lakes Environmental Indicators Project
<http://glei.nrri.umn.edu>

Danz et al. (2007)
Environmental Management

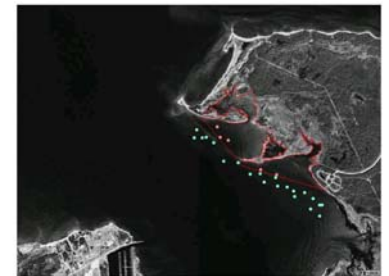
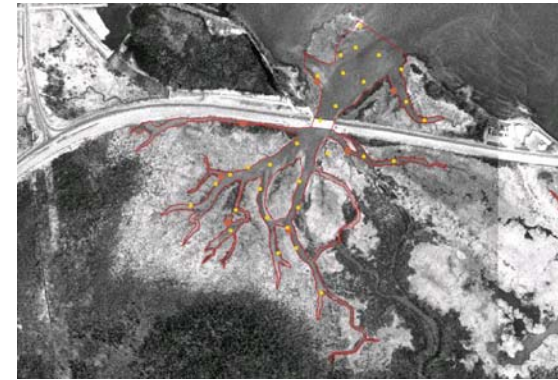
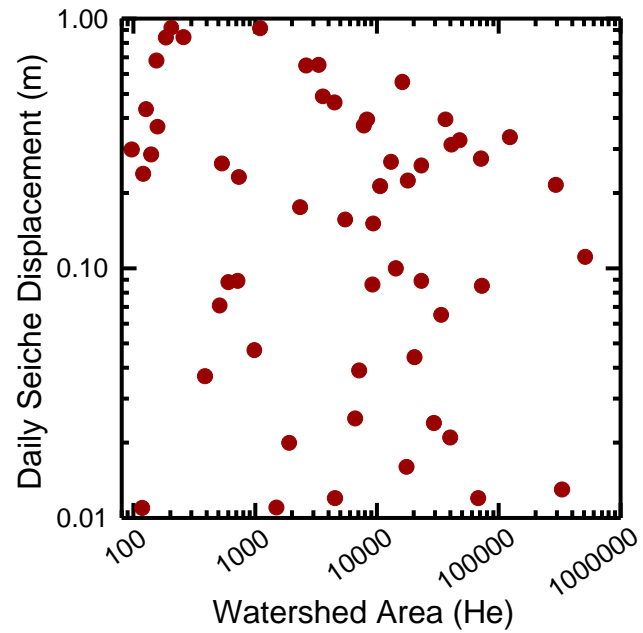
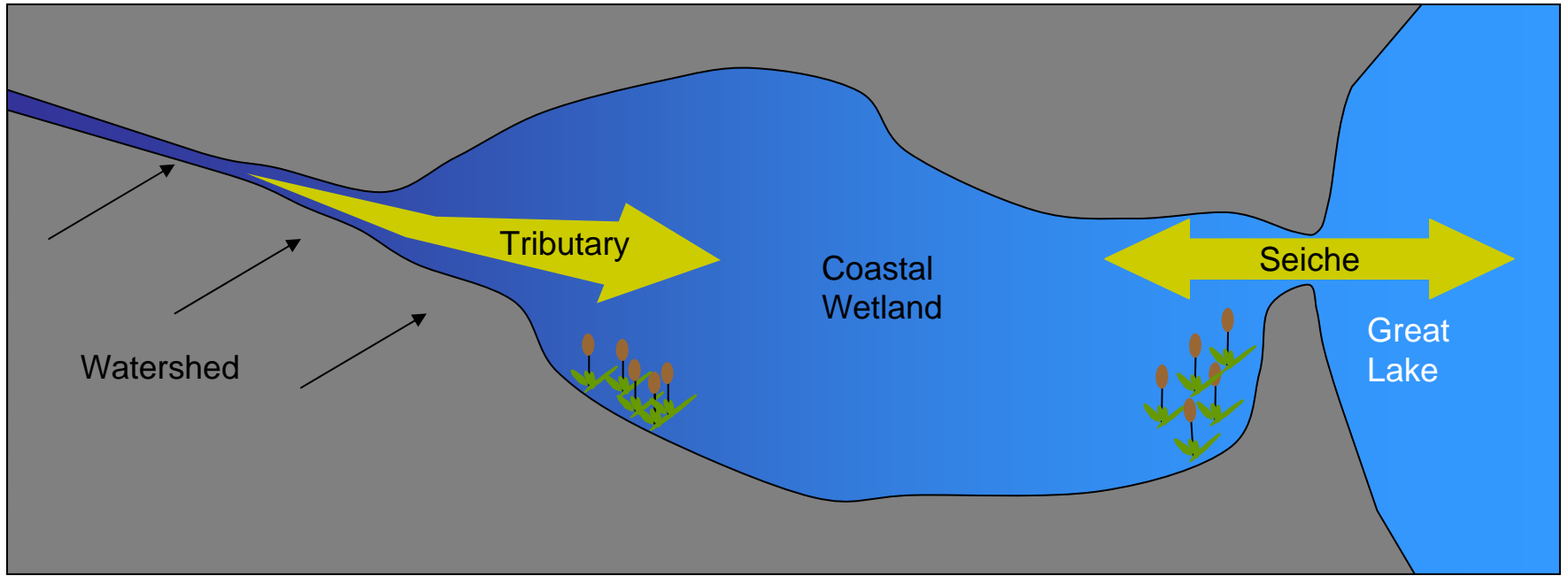
Wetland Water Quality is Influenced by Multiple Classes of Land-based Stressors



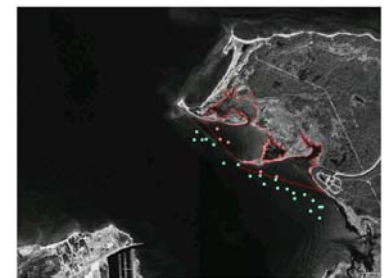
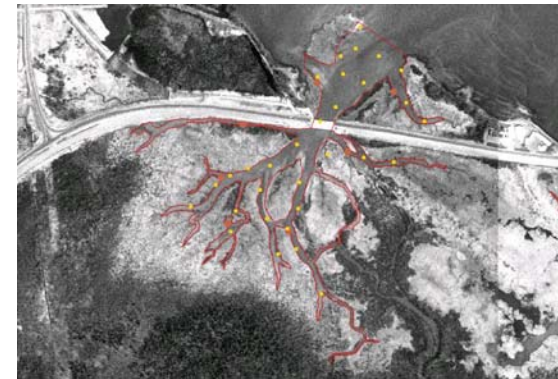
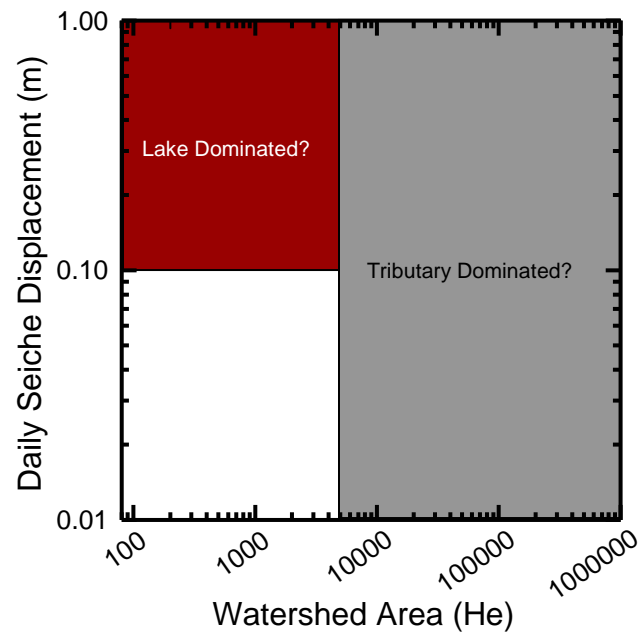
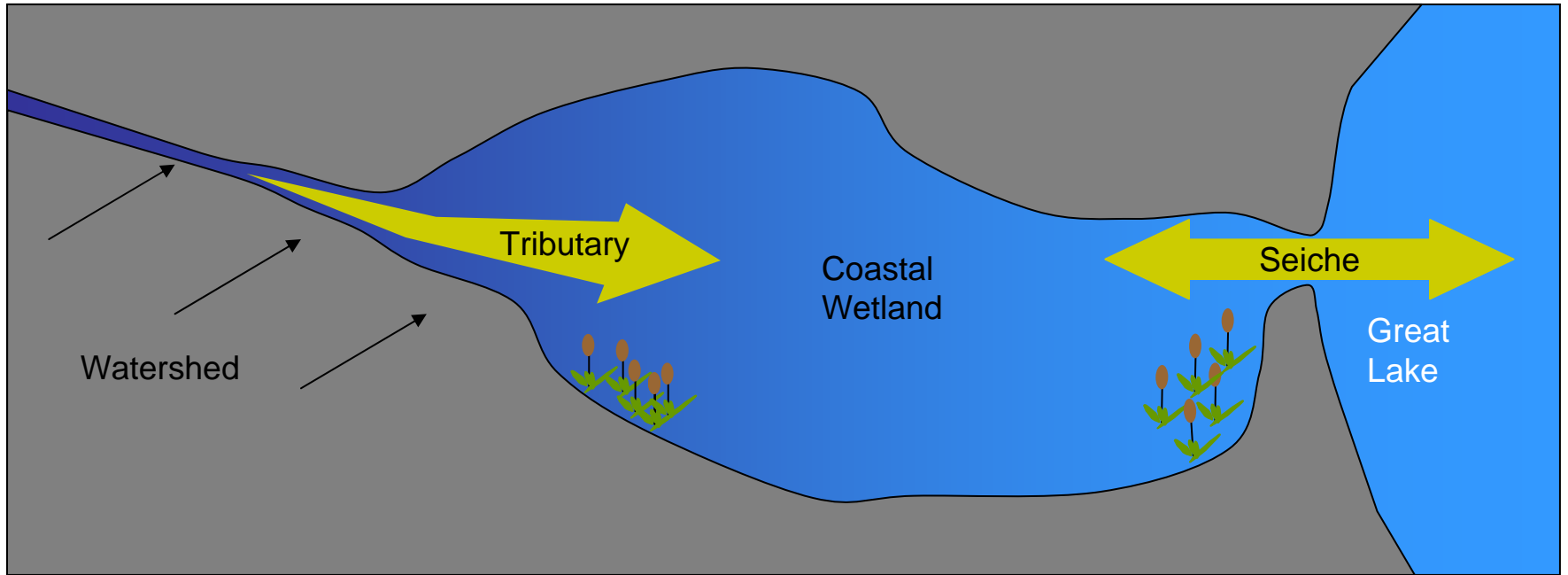
Hydrology and the Coastal Wetland-Landscape Connection

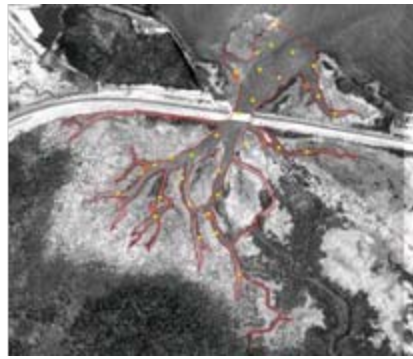
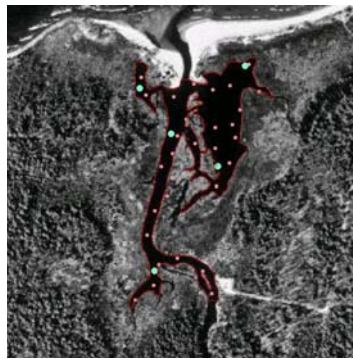
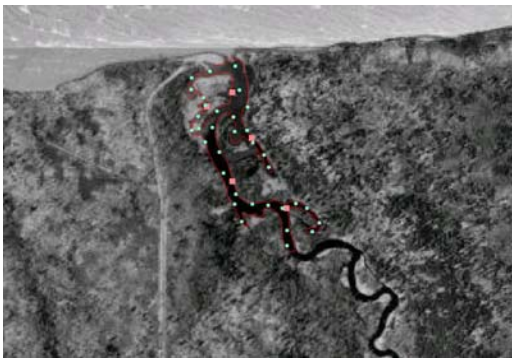


Hydrology and the Coastal Wetland-Landscape Connection

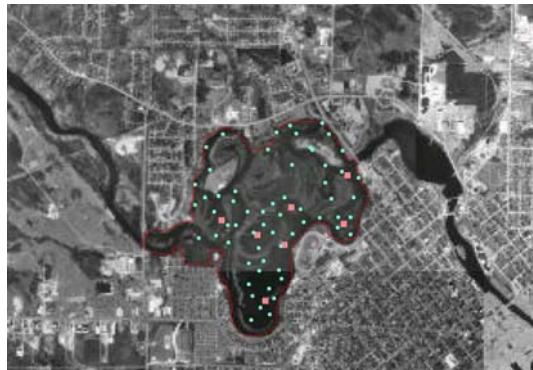
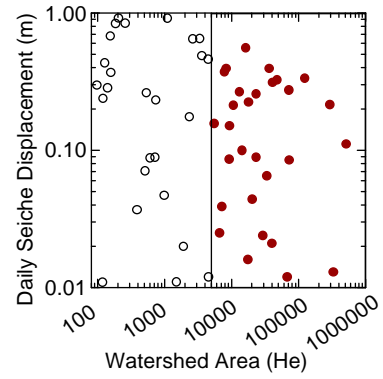


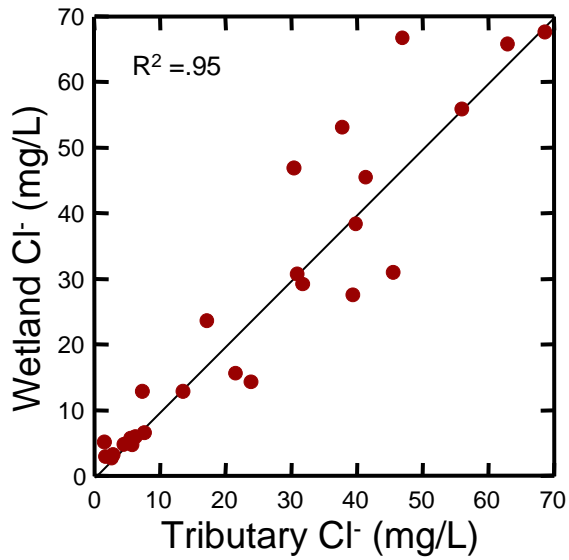
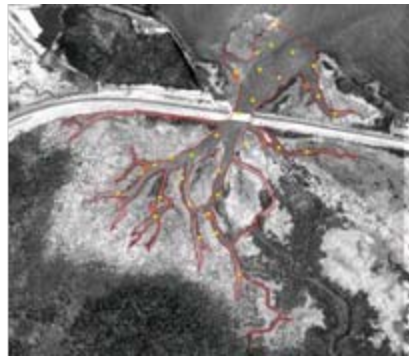
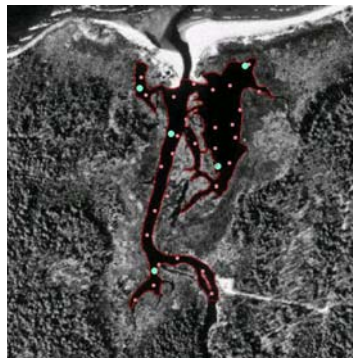
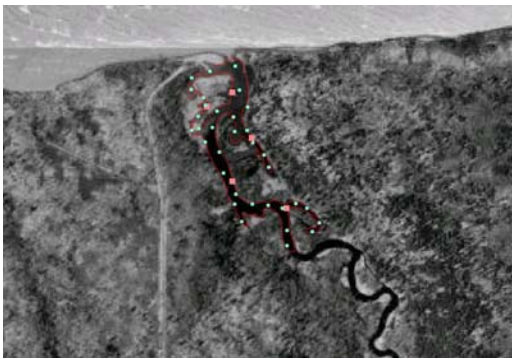
Hydrology and the Coastal Wetland-Landscape Connection



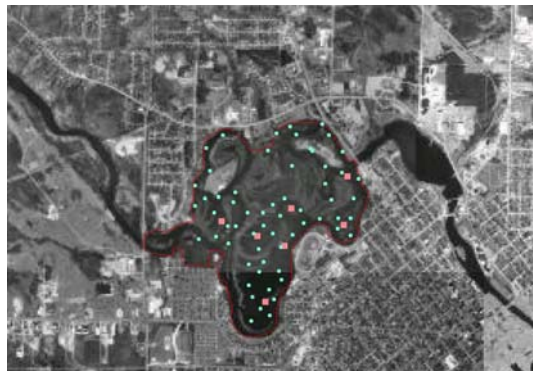
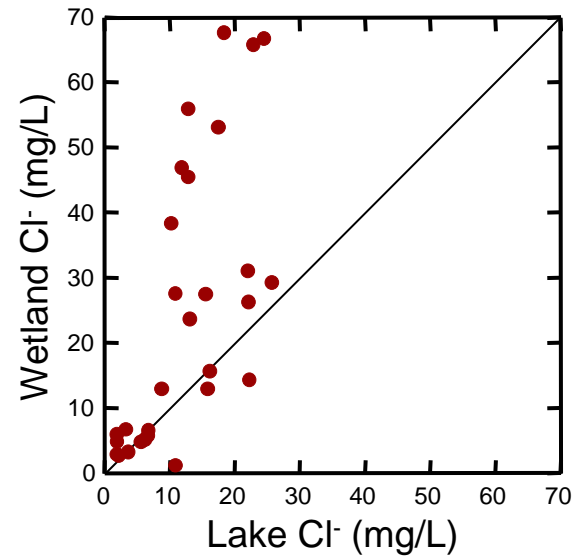
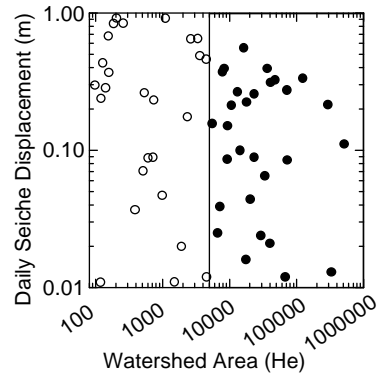


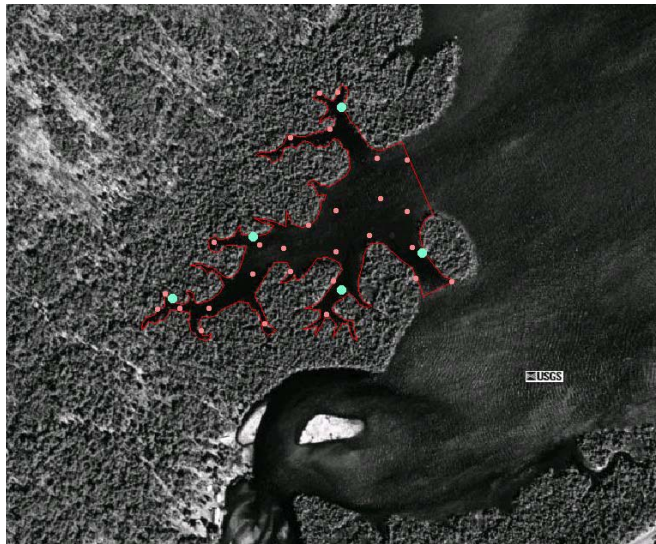
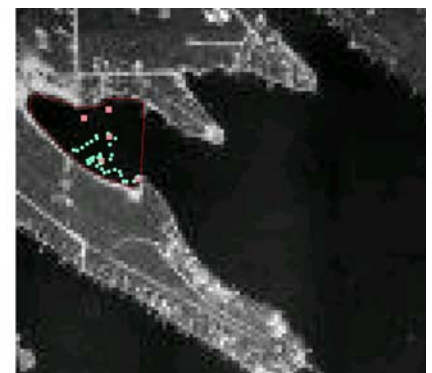
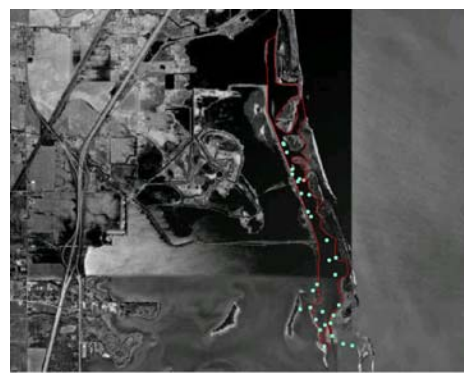
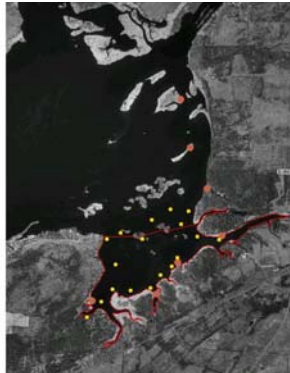
Wetlands with large watersheds (>4000 He)



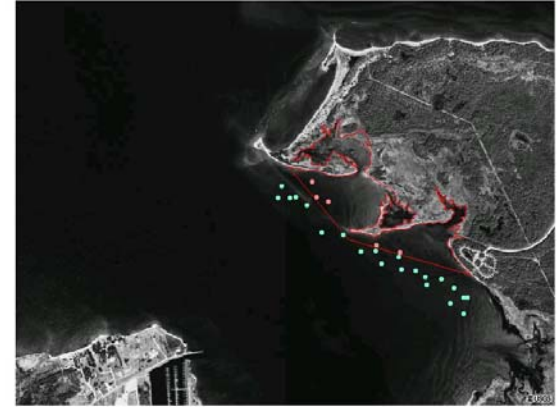
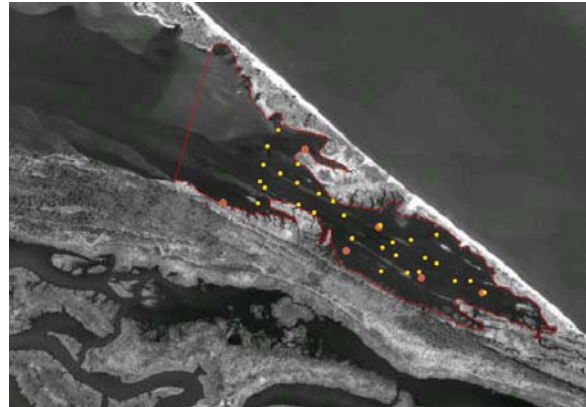
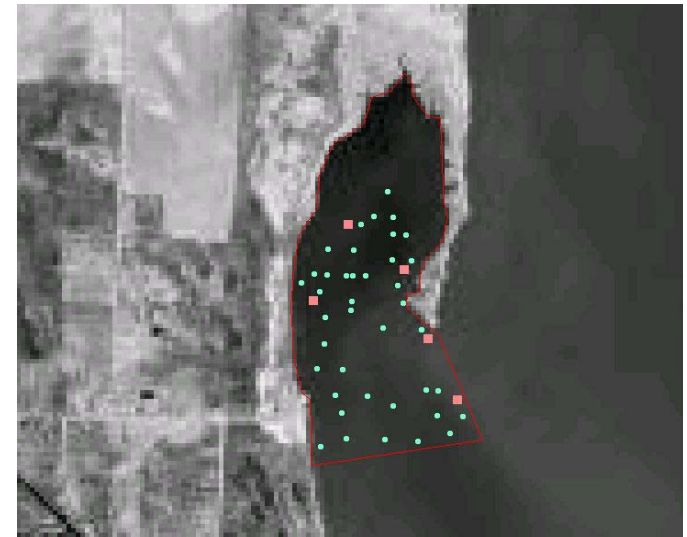
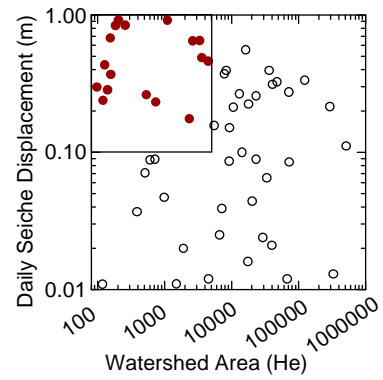


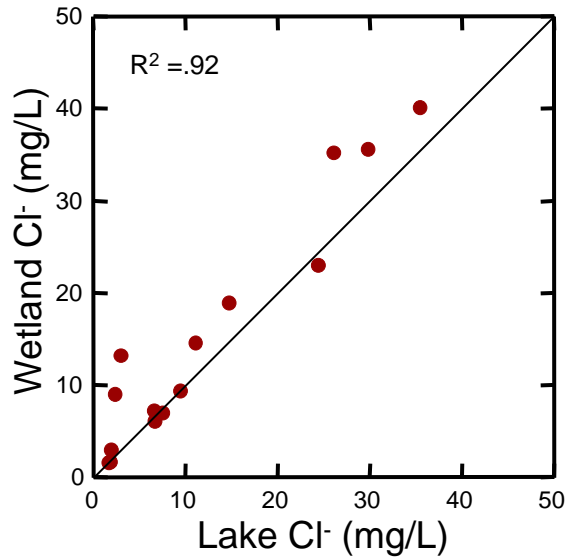
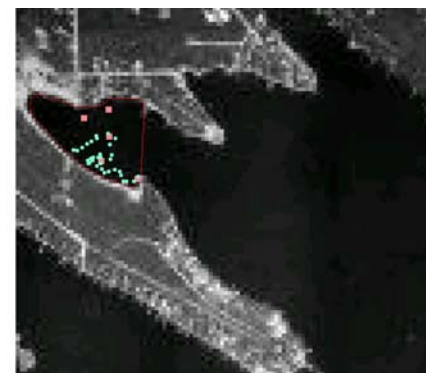
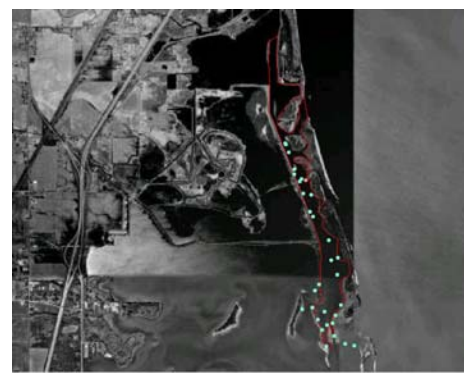
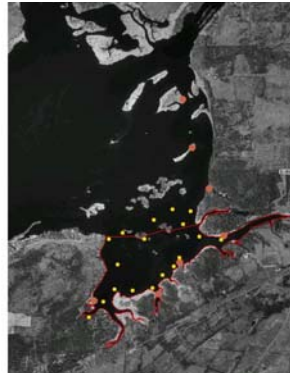
Wetlands with large watersheds (>4000 He)



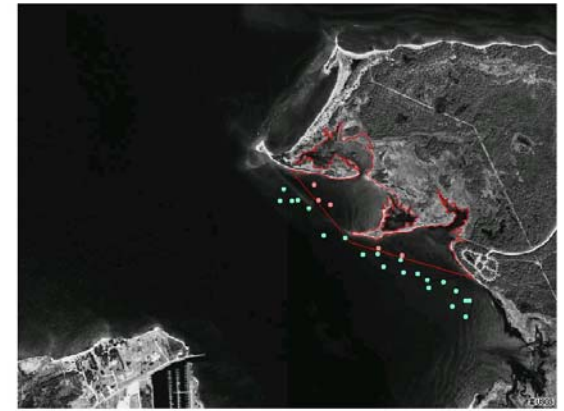
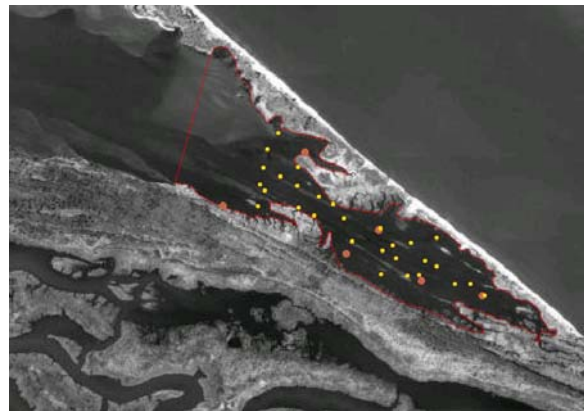
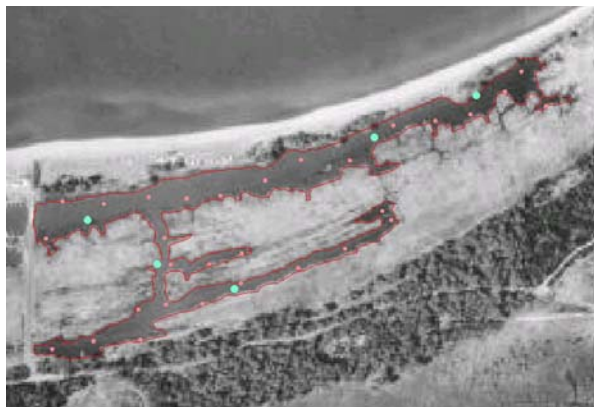
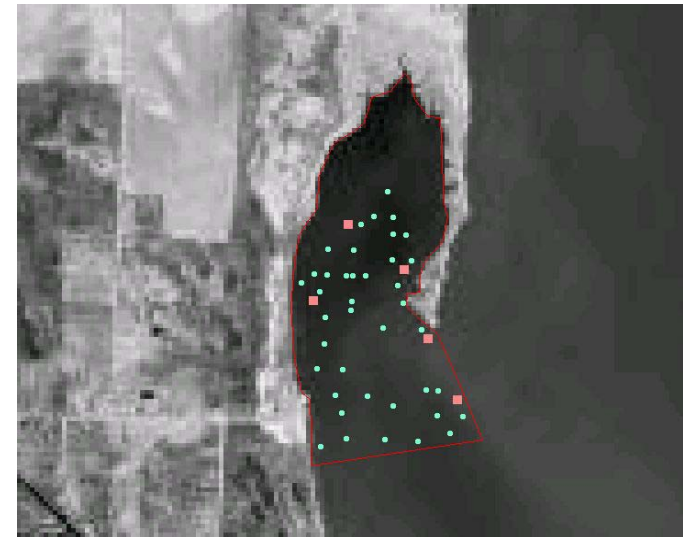
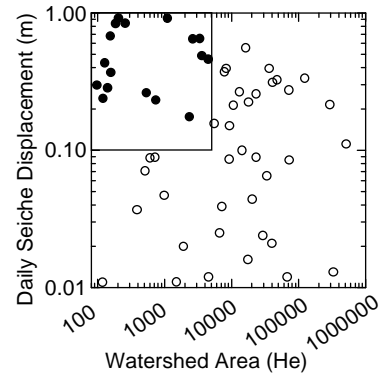


Wetlands with small watersheds (<4000 He) and large seiche





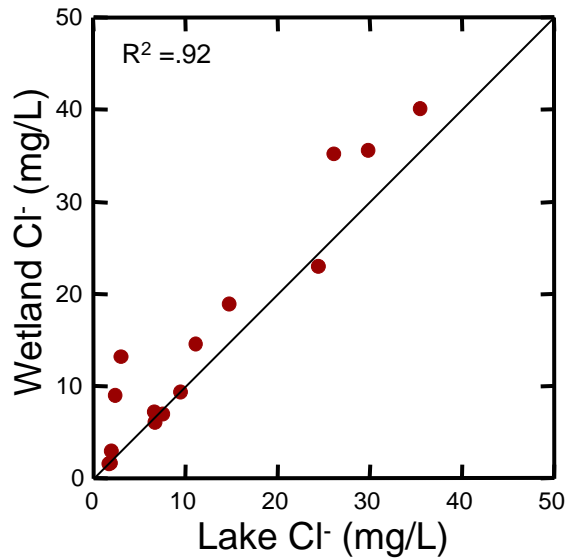
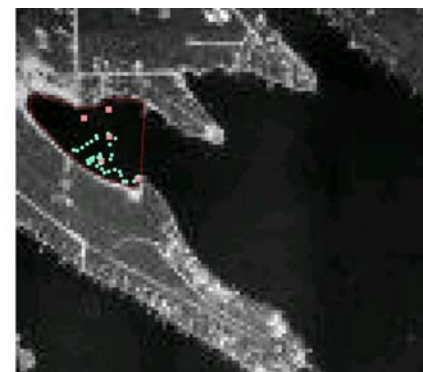
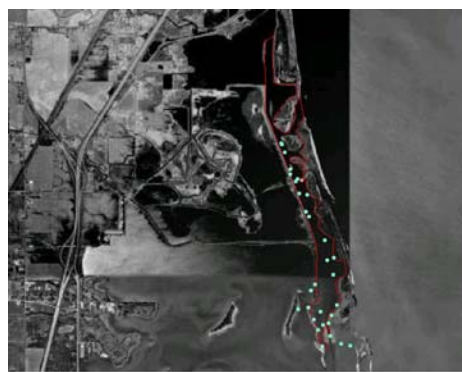
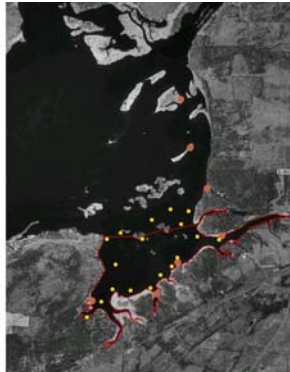
Wetlands with small watersheds (<4000 He) and large seiche



Summary

- Water quality indicates strong connections between coastal wetlands and land-based ecosystems.
- Water quality varies in response to multiple classes of anthropogenic stressors.
- Hydrology determines the nature of linkage (strength and spatial scale) of coastal wetlands to land-based ecosystems.





Wetlands with small watersheds (<4000 He) and large seiche

