

A photograph of a pond with water lilies and reeds. The water is dark and still, reflecting the sky. Several green water lily leaves are visible, some floating on the surface and others submerged. Tall, thin reeds or grasses are scattered throughout the pond, some standing upright and others leaning over. The overall scene is a natural, somewhat overgrown aquatic environment.

Aquatic Macrophytes as Trophic Indicators

**Jeremy Williamson
Polk County Land & Water
Resources Department**





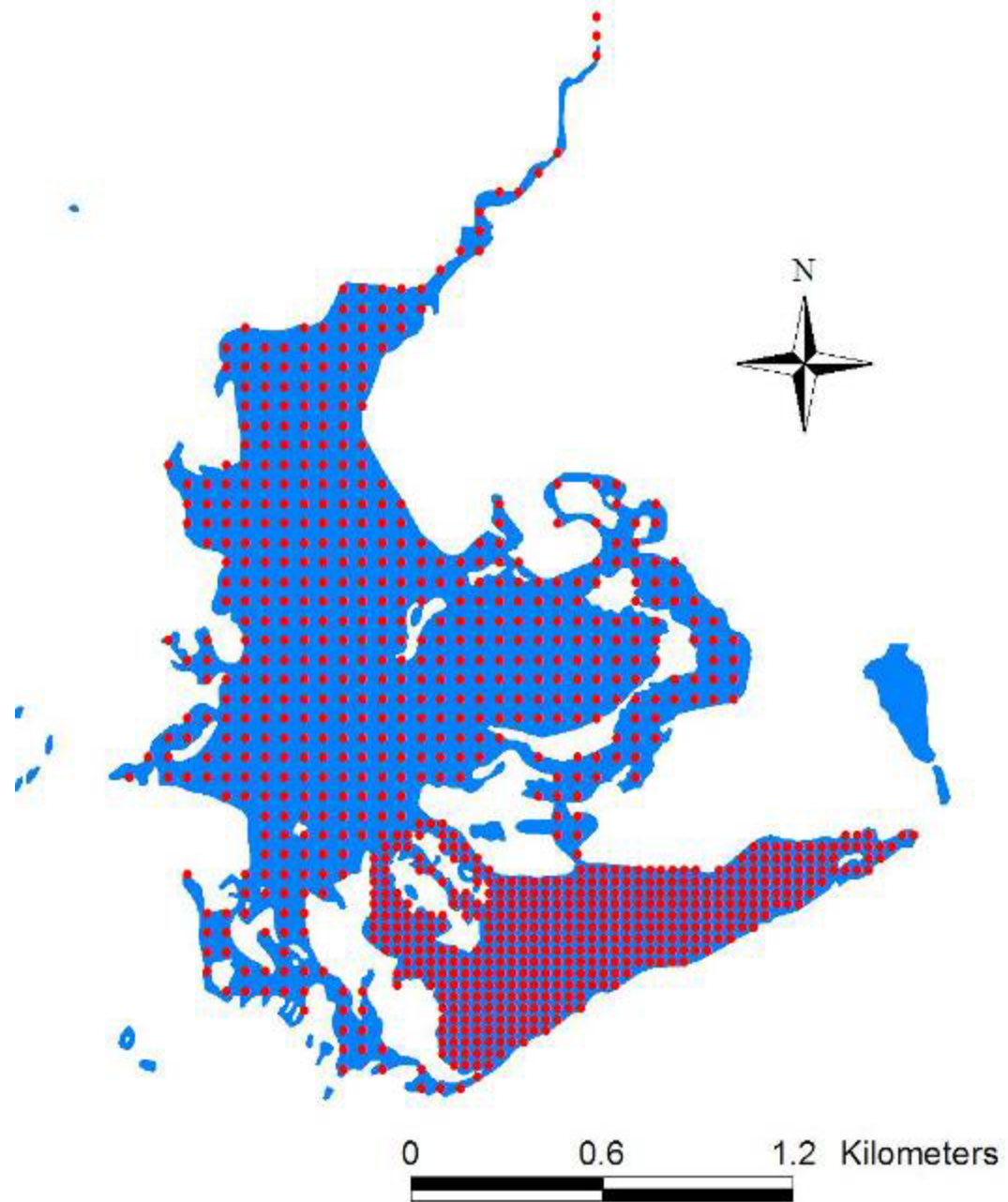
(Wetland Plants of Wisconsin, Gary Fewless, UWGB)



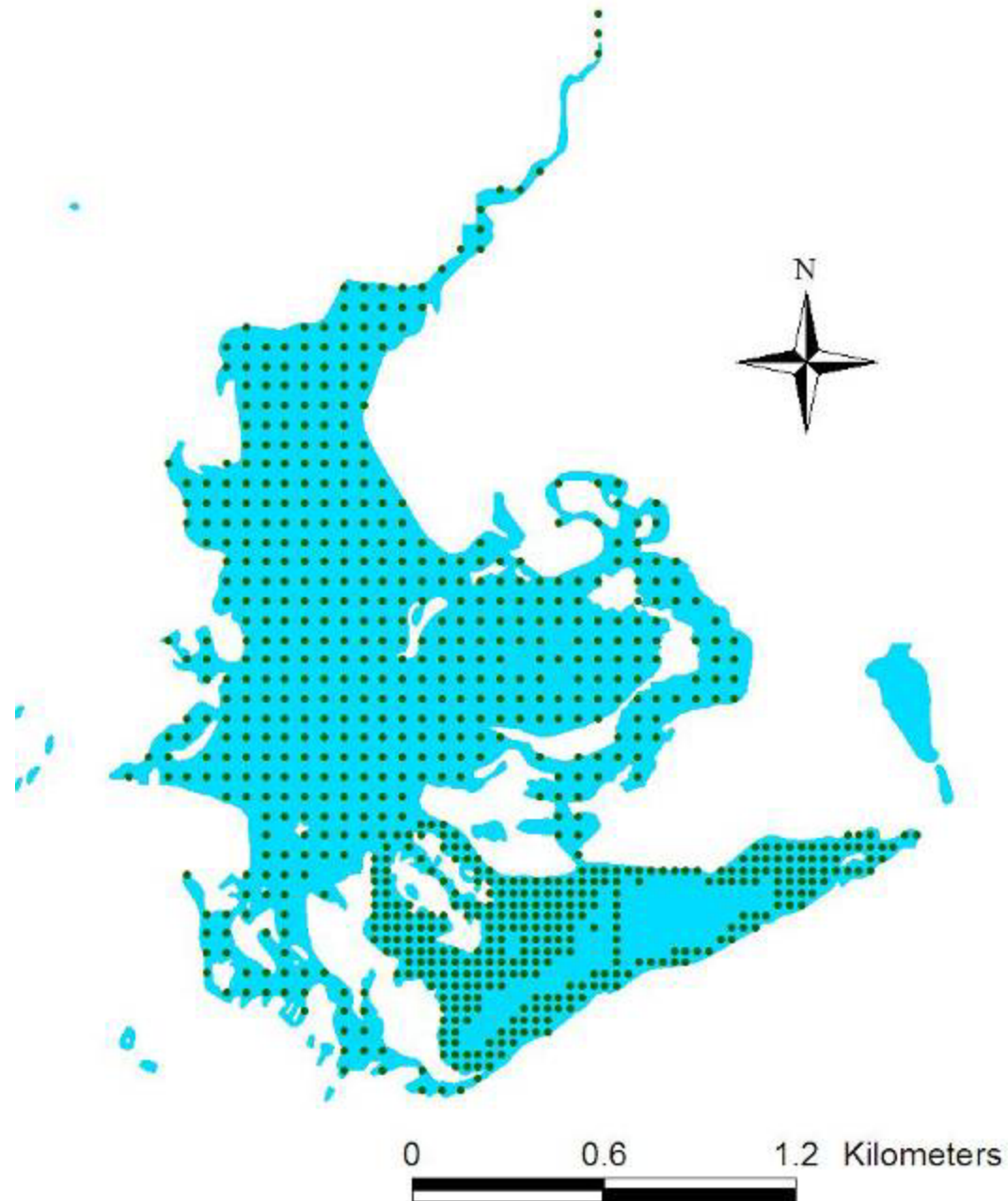




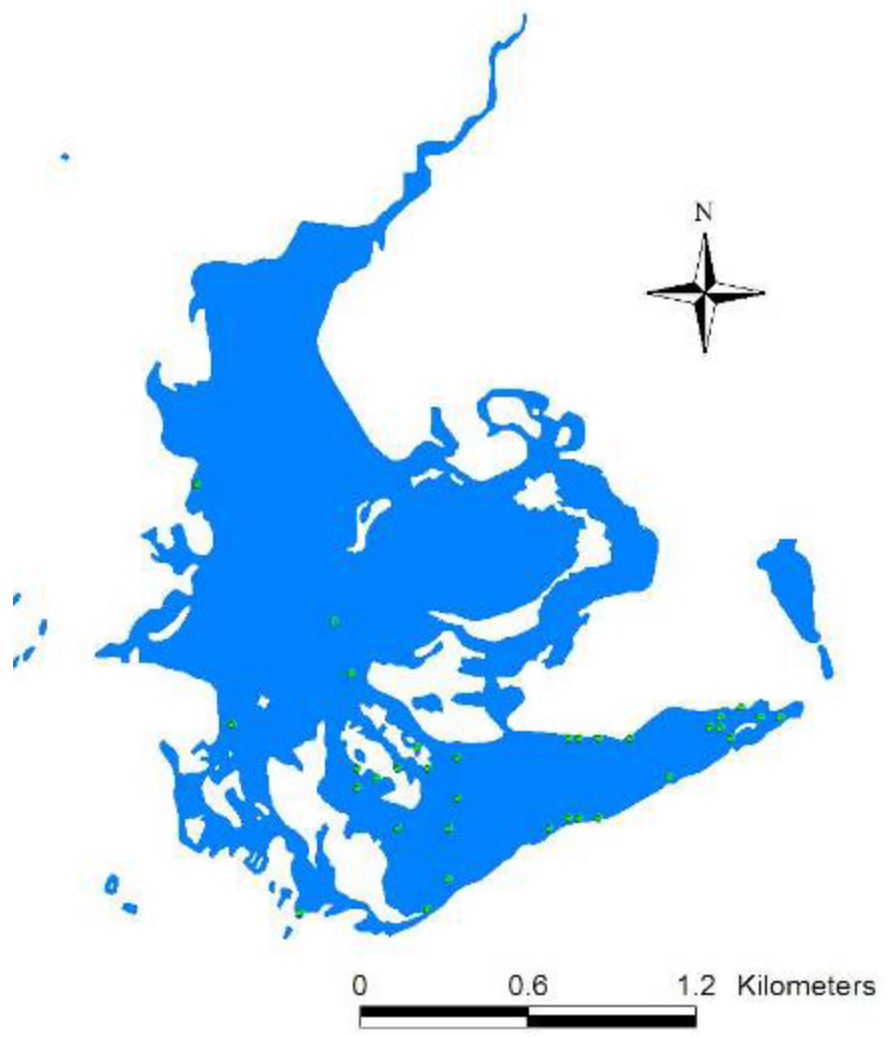
Mud & Callahan Sampling Points



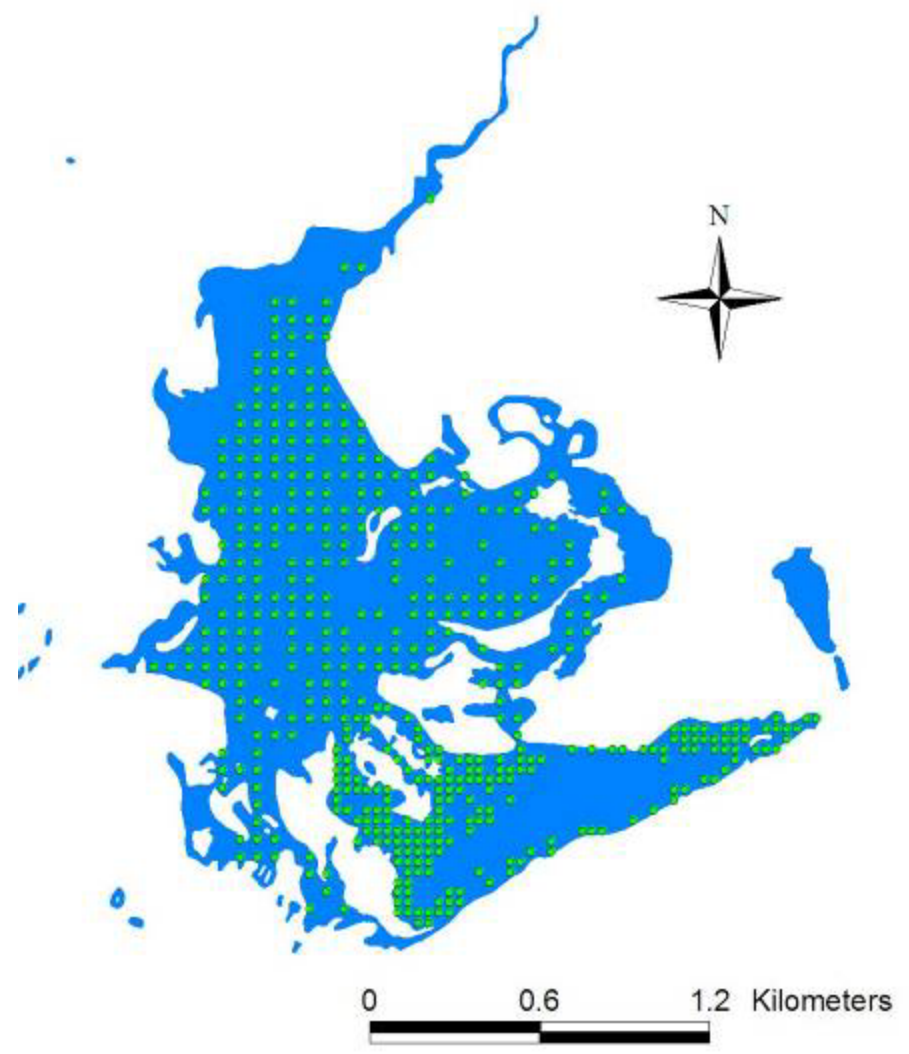
Areas in which aquatic vegetation is present



Potamogeton gramineus



Potamogeton robbinsii

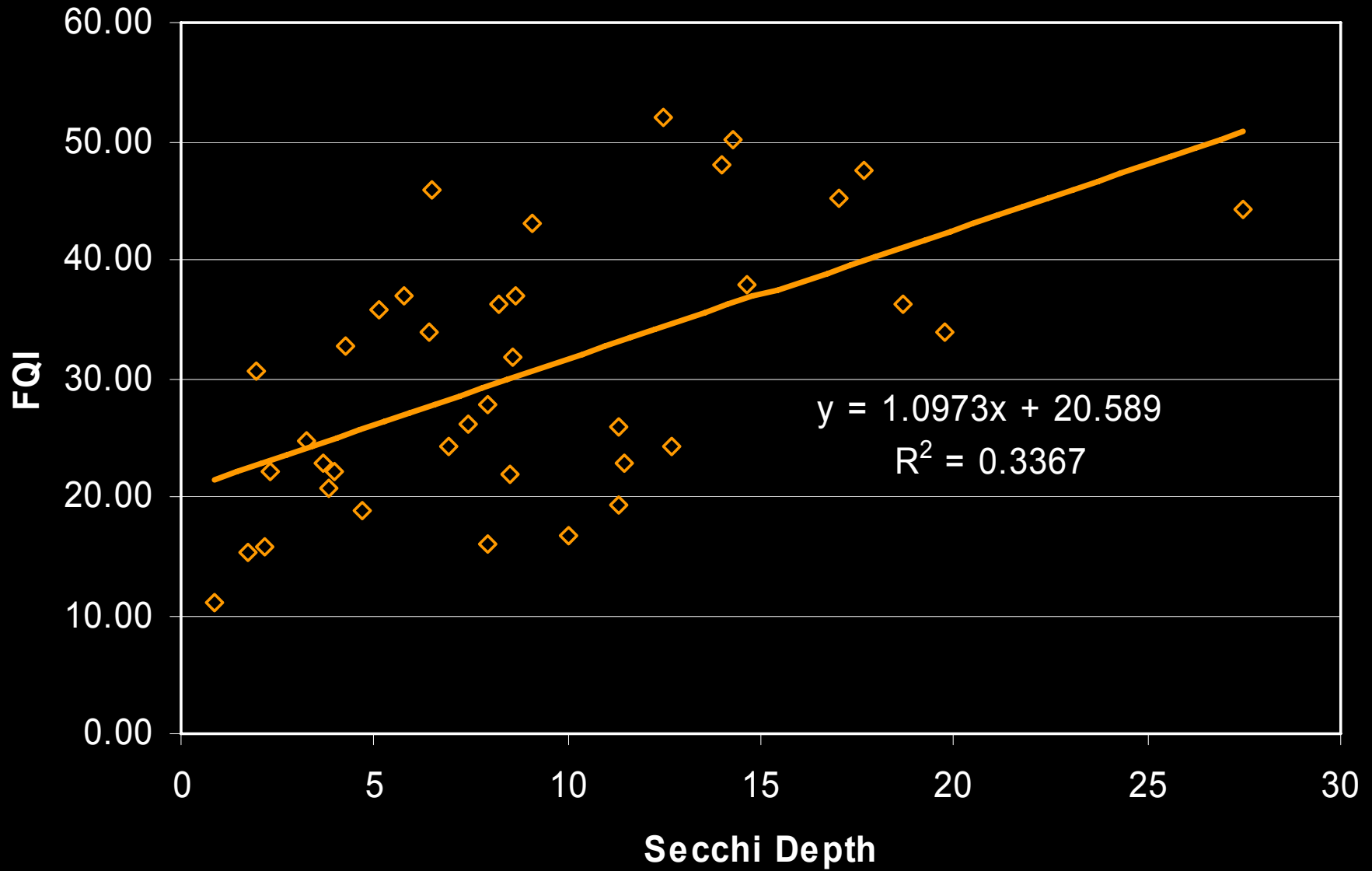


Floristic Quality Index

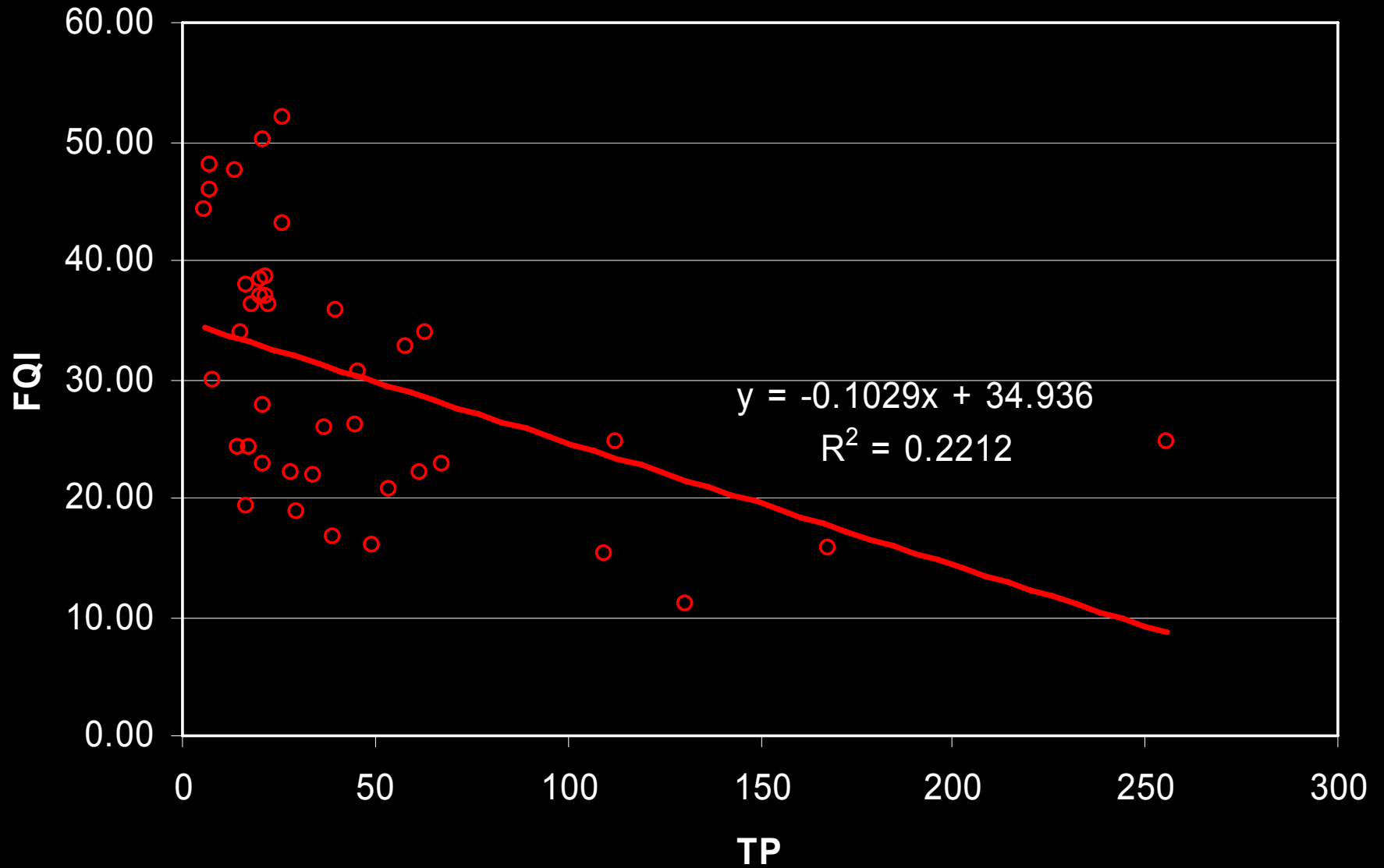
$$I = \overline{C} \sqrt{N}$$

(Nichols, 1999)

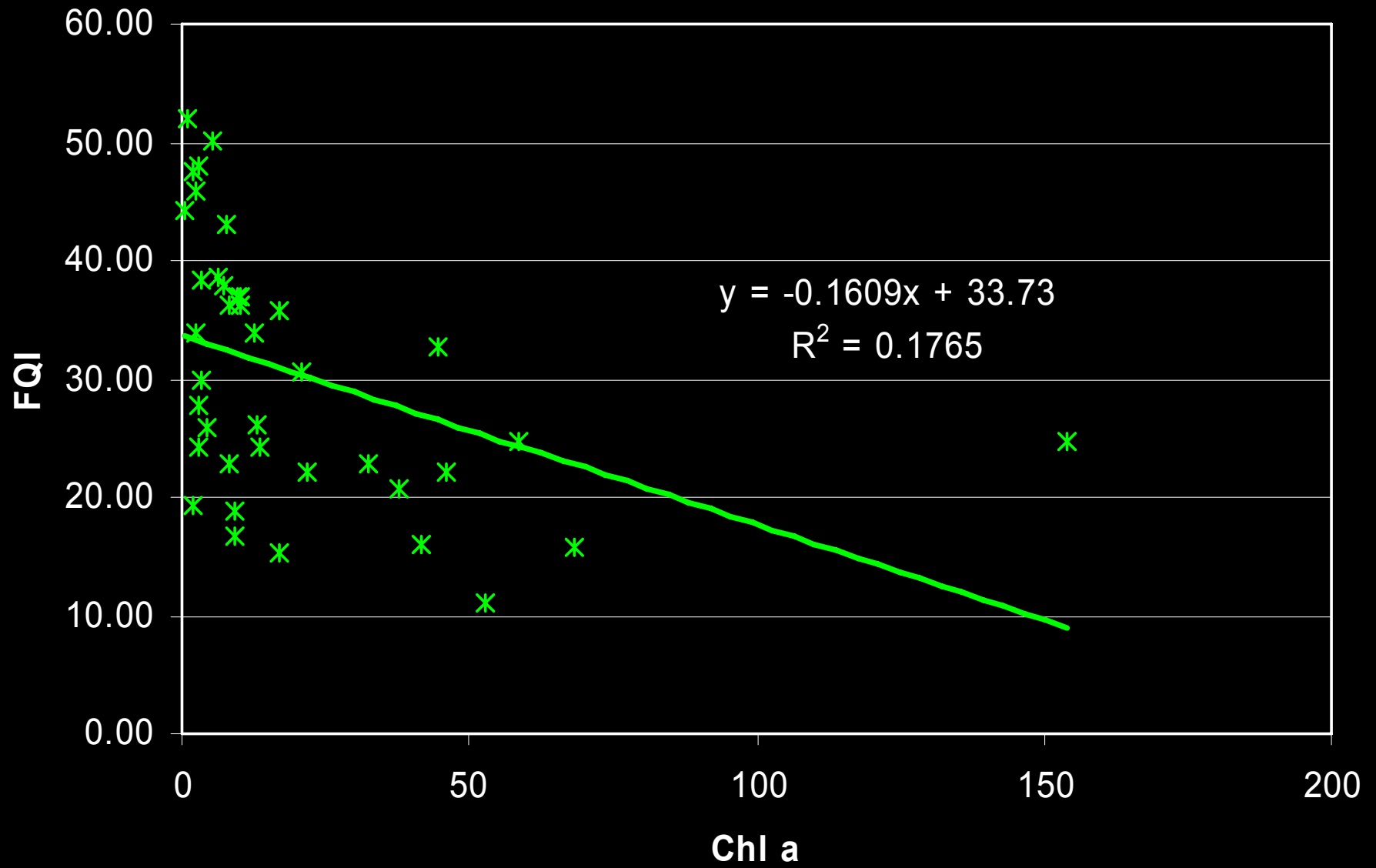
Floristic Quality Index v Secchi Depth



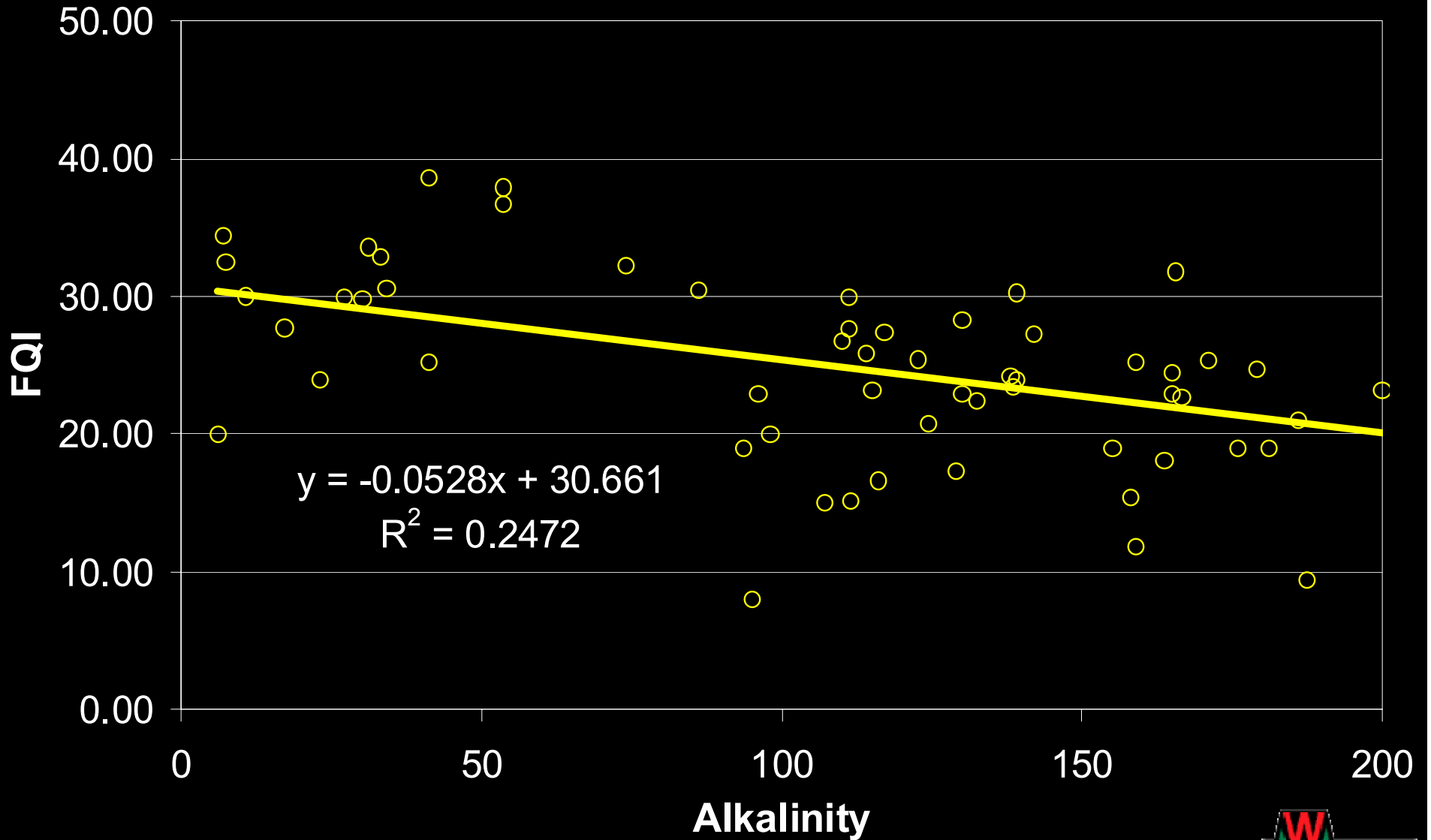
Floristic Quality Index v TP



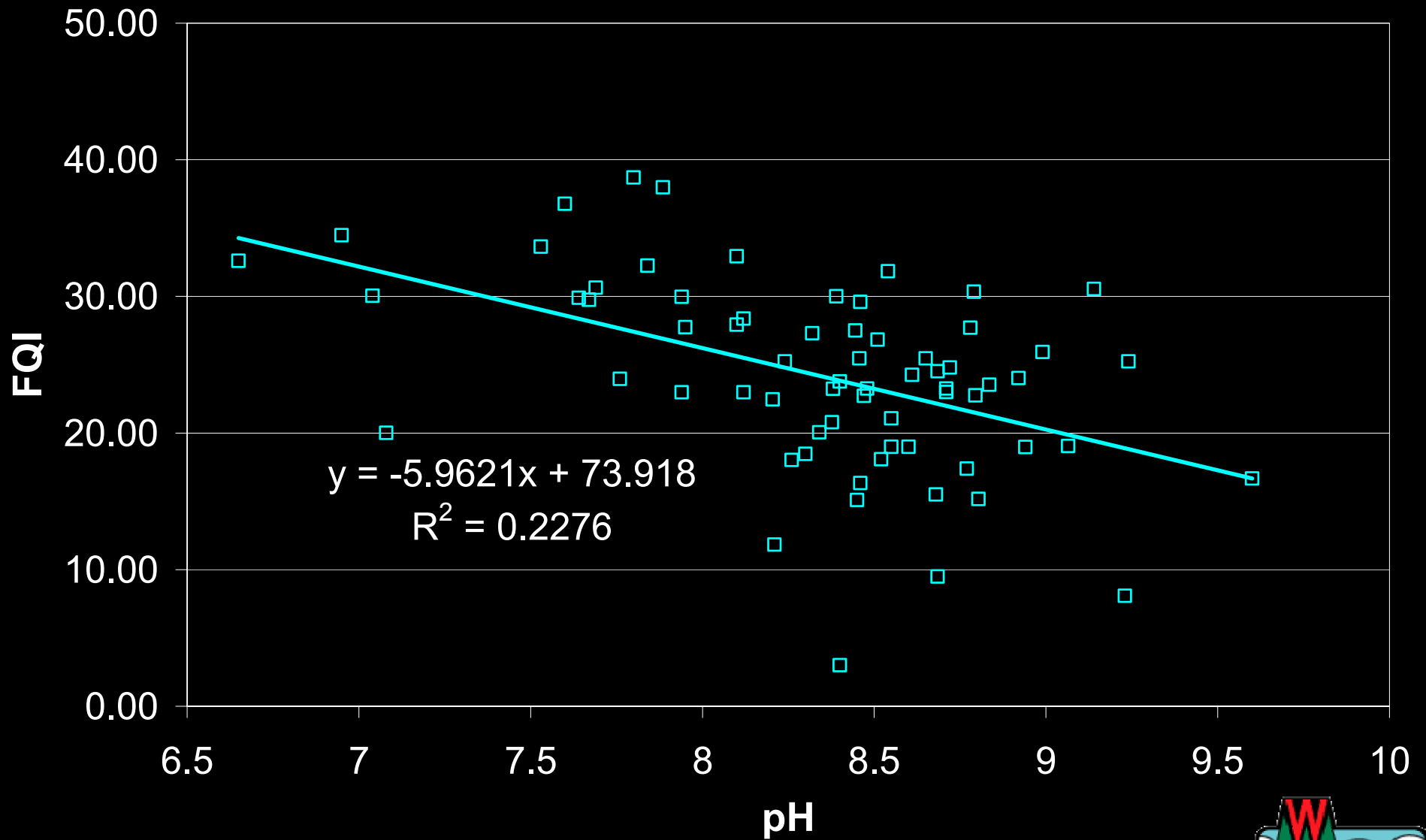
Floristic Quality Index v Chl a



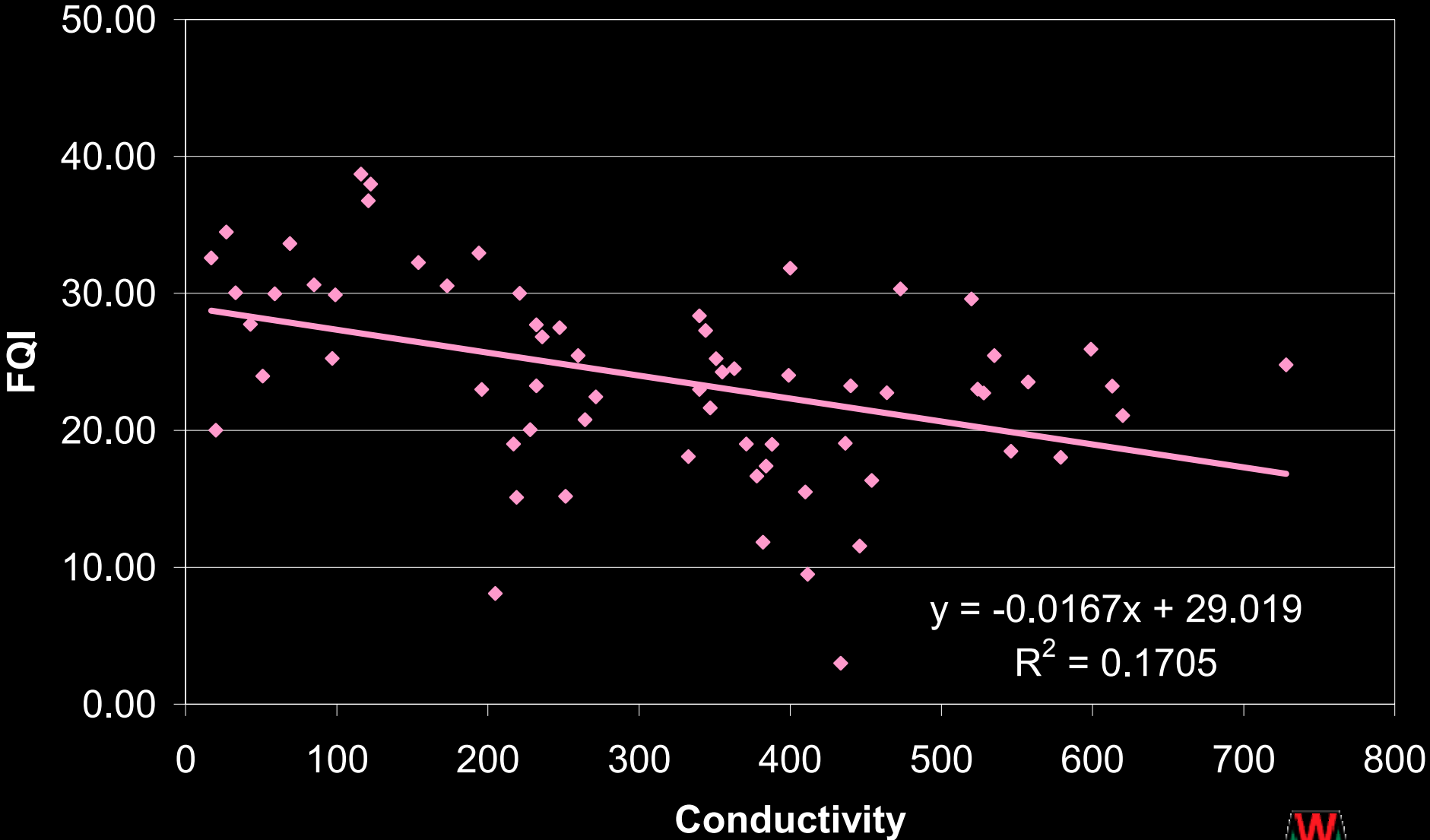
Floristic Quality v Alkalinity



Floristic Quality v pH



Floristic Quality v Conductivity



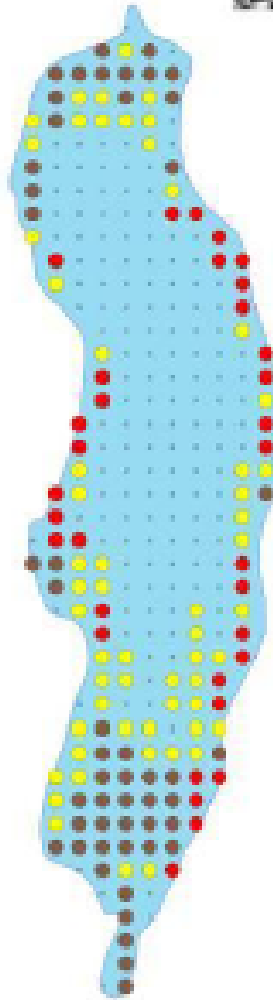
Lake Sediment

North Pipe Lake
Polk County, WI
August 3, 2007



Bottom Sediment Type

- No Sample
- Muck
- Rock
- Sand



0 0.125 0.25 0.5 Miles

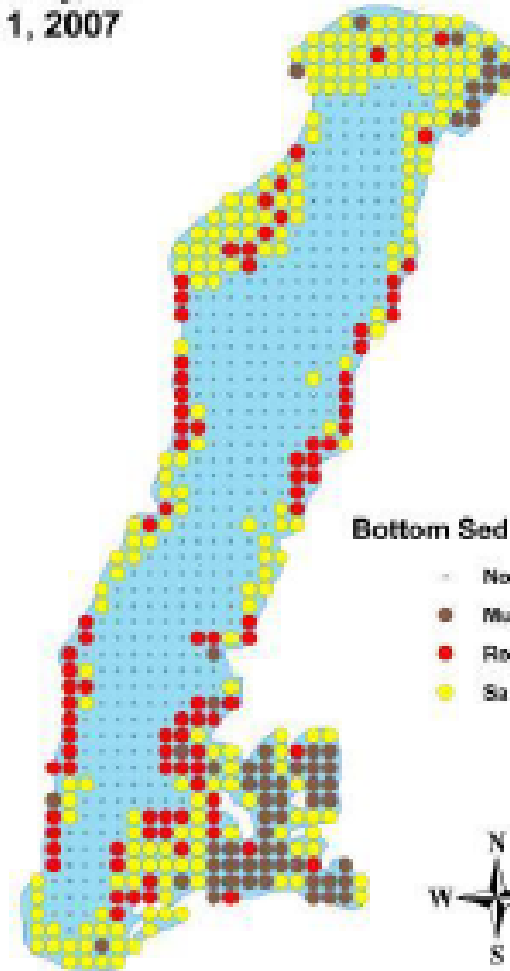
Lake Sediment

Pipe Lake
Polk County, WI
August 1, 2007



Bottom Sediment Type

- No Sample
- Muck
- Rock
- Sand



0 0.25 0.5 1 Miles

Figures courtesy of Endangered Resource Services

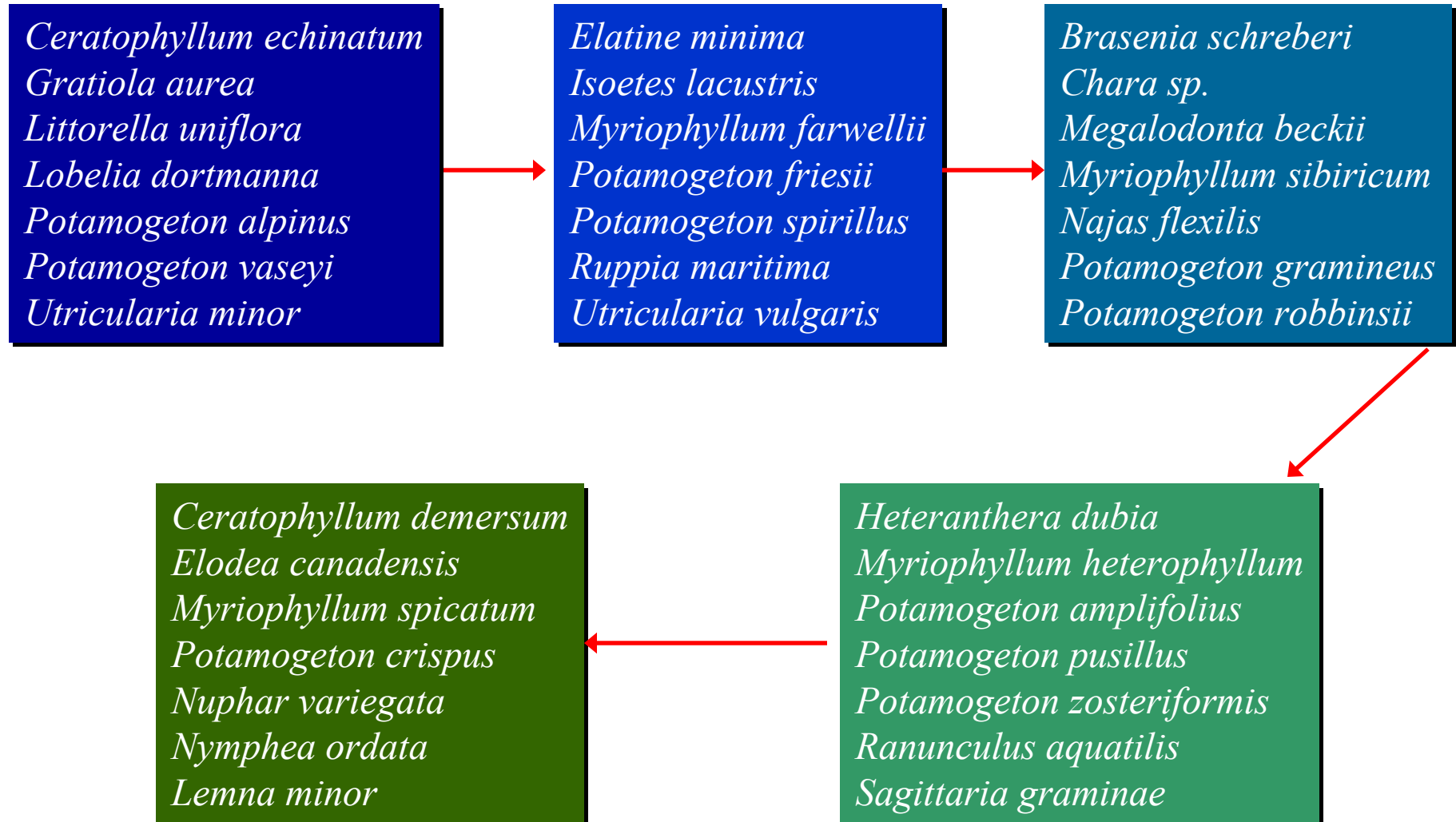


Exotics!

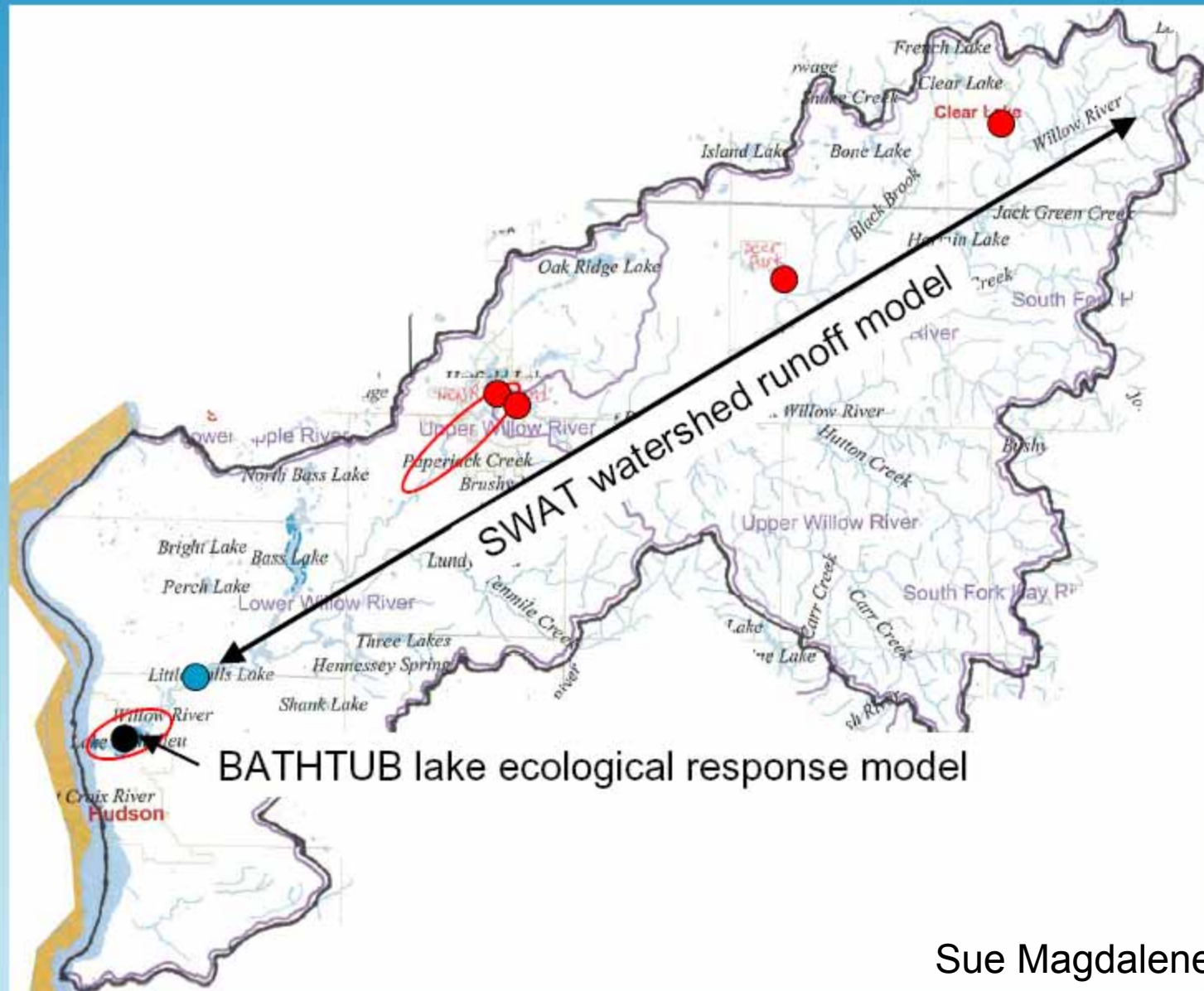


Potamogeton crispus
curly pondweed growing in
Bone Lake, Wisconsin
Photo by Frank Koshere

Trophic “Cascade”

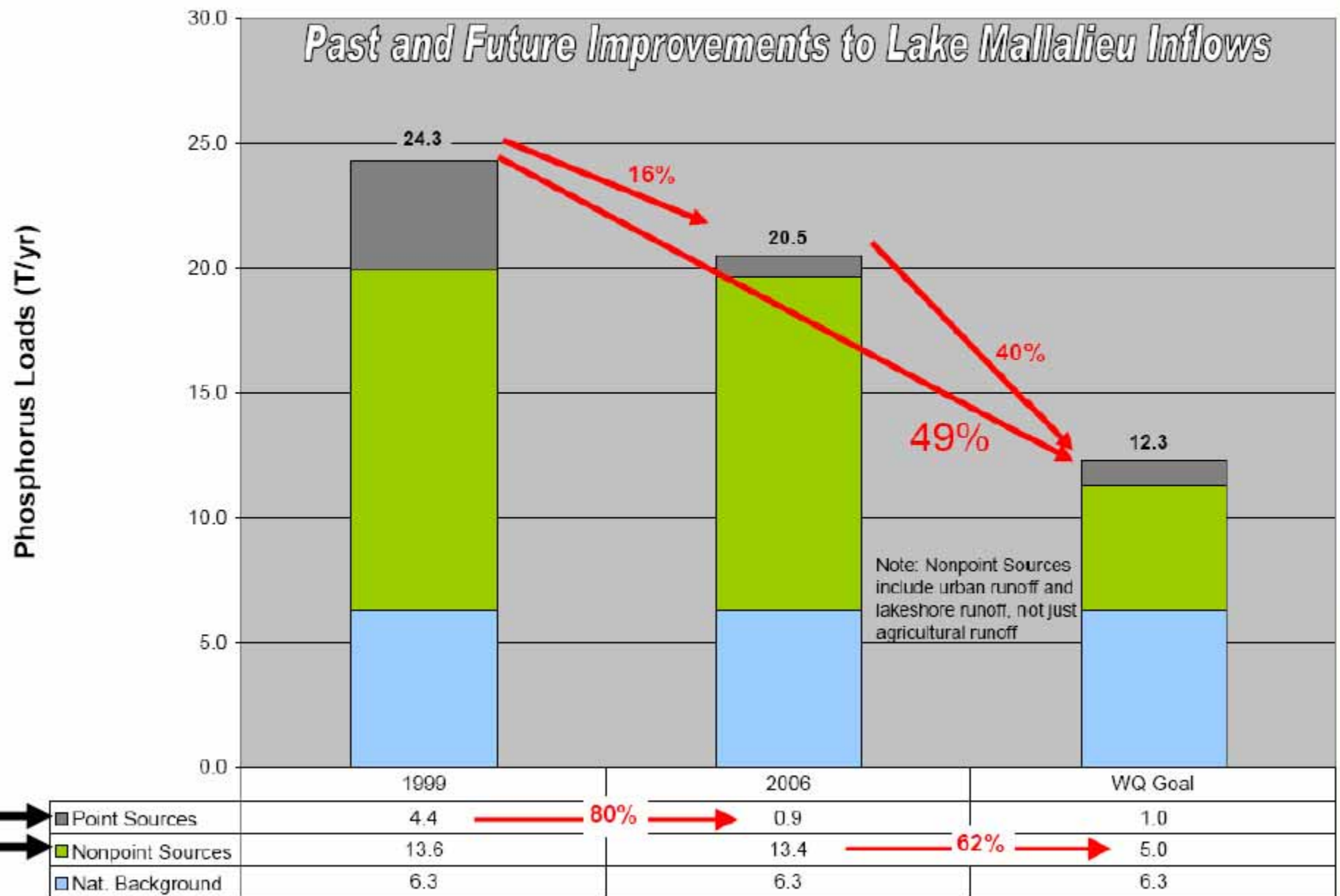


Willow River Watershed



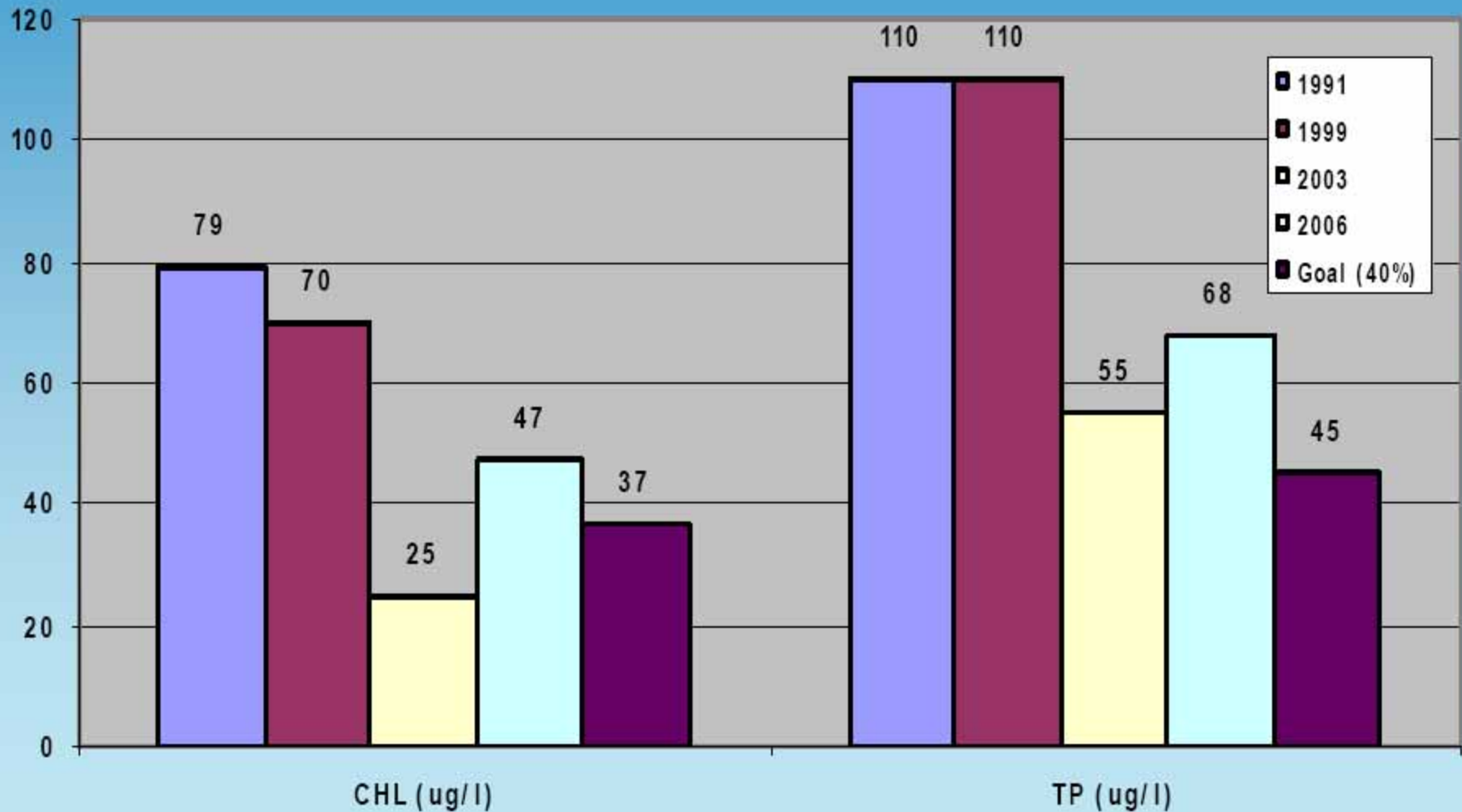
Sue Magdalene, SCWRS

Proposed Lake Mallalieu TMDL WQ Goal



Lake Mallalieu Water Quality

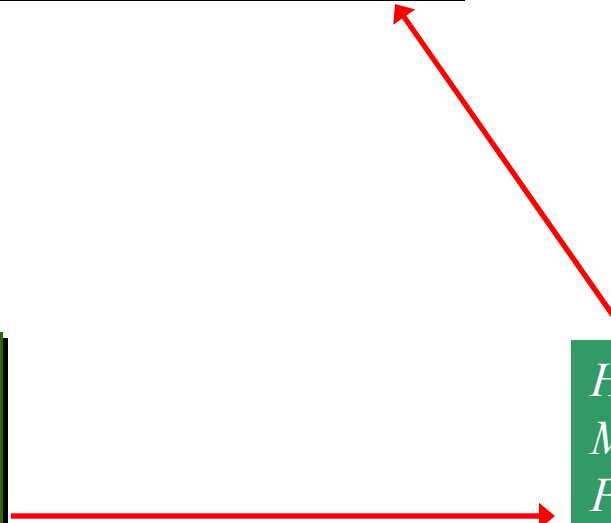
Comparison of Monitoring Results and Goal



Brasenia schreberi
Chara sp.
Megalodonta beckii
Myriophyllum sibiricum
Najas flexilis
Potamogeton gramineus
Potamogeton robbinsii

Ceratophyllum demersum
Elodea canadensis
Myriophyllum spicatum
Potamogeton crispus
Nuphar variegatum
Nymphaea ordata
Lemna minor

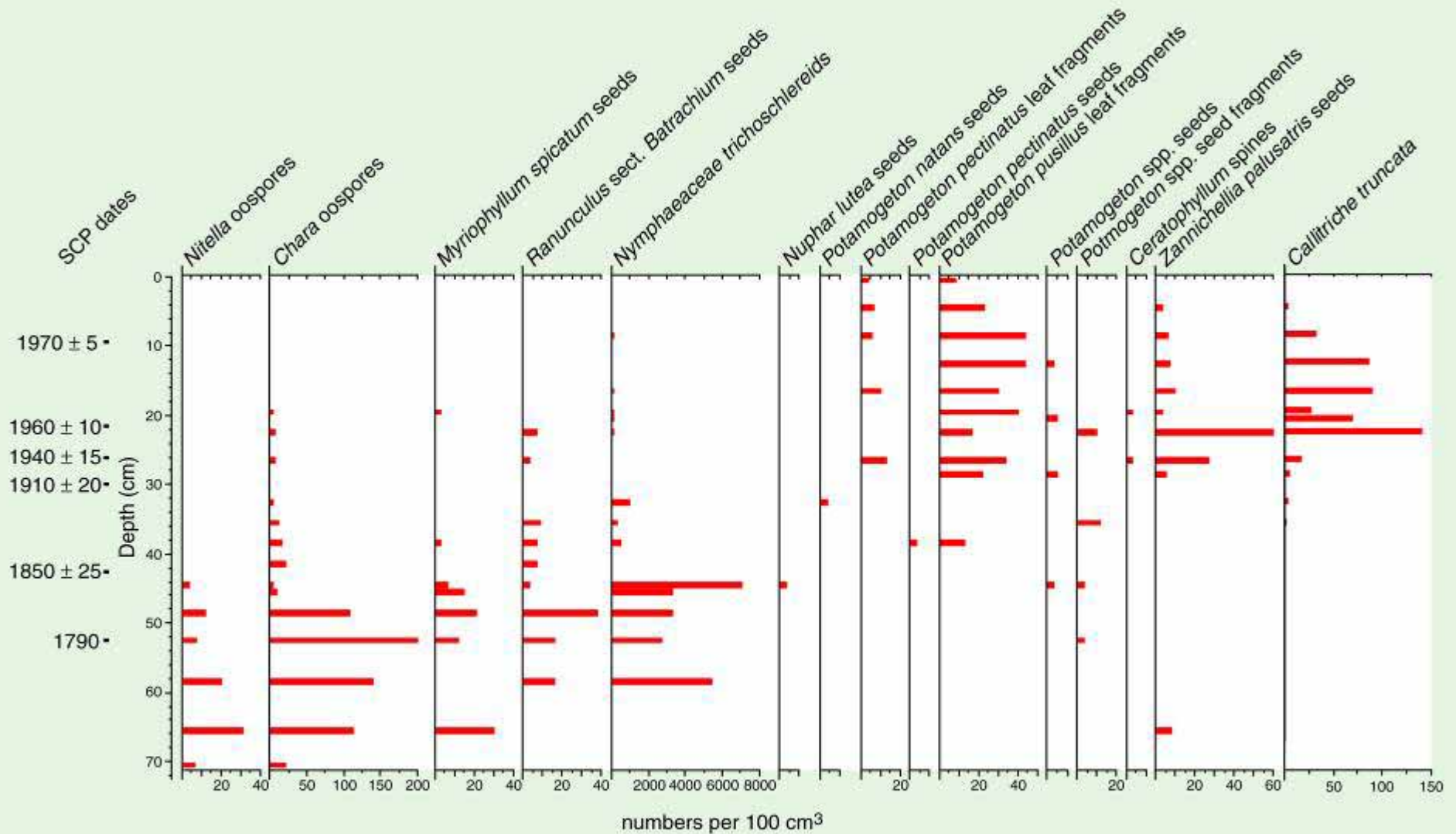
Heteranthera dubia
Myriophyllum heterophyllum
Potamogeton amplifolius
Potamogeton pusillus
Potamogeton zosteriformis
Ranunculus aquatilis
Sagittaria graminea



Use in Paleolimnology

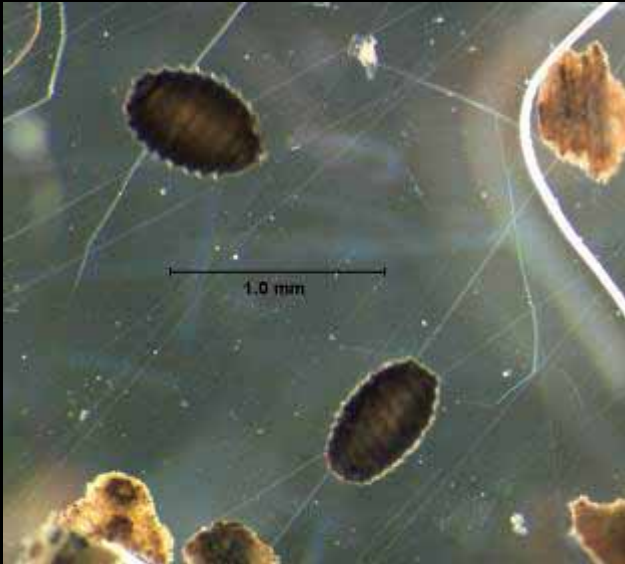


Reconstructing aquatic macrophytes: microfossils



Macrofossils: diverse bits and pieces preserved

Courtesy John Anderson, Department of Geography, Loughborough University



Chara Oocyte
C = 7



Potamogeton pusillus
seed
C = 7

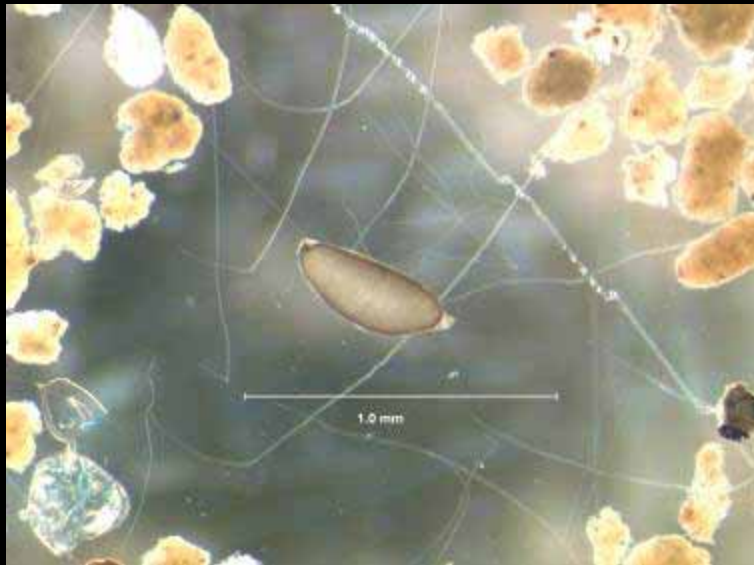


Myriophyllum sp.
flowering structure
C = 7-10

Horse Lake ~1840



Ceratophyllum demersum
leaf tip
C = 3



Najas flexilis seed
C = 6

Horse Lake ~2000-present

Acknowledgements

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Sue Magdalene, SCWRS

Questions?

