

A Comparison of Adjacent Ridge and Slough Vegetative Communities

Hydrologic Restoration Requirements of Aquatic Slough Vegetation
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Michael Kline, Michael S. Ross**, Leonard J. Scinto**, and Jennifer H. Richards*

*Principal Investigator
Dept. of Biological Sciences
Florida International University

** Co-Principle Investigator
Southeast Environmental Research Center
Florida International University



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Ridge and Slough Landscape

Original Landscape:

- One of the most expansive Everglades landscapes
- Present for at least 2000 years
- 40 miles from East to West, 70 miles from North to South
- Relatively dry ridges, and continuously inundated sloughs.

Ridges:

- elongated, slightly elevated, oriented North to South
- underlying peat substrate
- frequent dry down periods during dry season
- sawgrass (*Cladium jamaicense*) is primary vegetative component

Sloughs:

- low lying, relatively deep channels
- usually are inundated throughout the wet and dry seasons
- species most associated: *Nymphoides aquatica*, *Nymphaea odorata*, *Utricularia* spp.

Hydrologic Restoration Requirements of Aquatic Slough Vegetation:

- 1. Field experiment to look at restoration trajectories of artificially created ridges and sloughs.**
- 2. Mesocosm experiment to examine effects of water depth and hydroperiod on three signature slough plant species.**
- 3. Field experiment to characterize ridge and slough habitat, both outside and inside Everglades National Park.**

Objective:

Compare adjacent ridge and slough environments, including comparisons of hydrology, vegetation composition, structure, and nutrient content, and soil biogeochemistry.

HYDROPERIOD



PHYSICAL CHARACTERISTICS:

SOIL DEPTH
WATER DEPTH
NUTRIENT AVAILABILITY

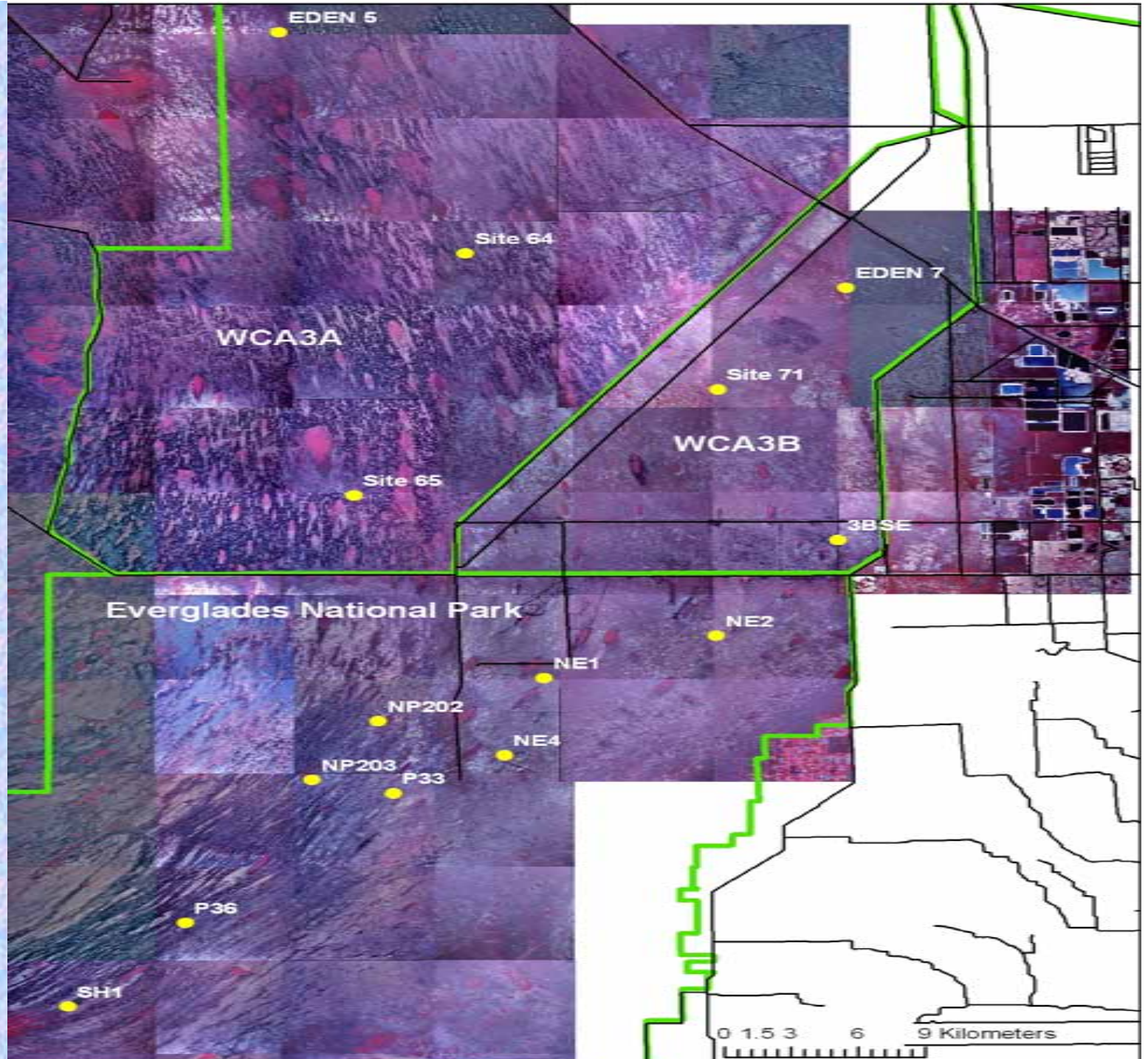


VEGETATION STRUCTURE, COMPOSITION, AND NUTRIENT CONTENT:

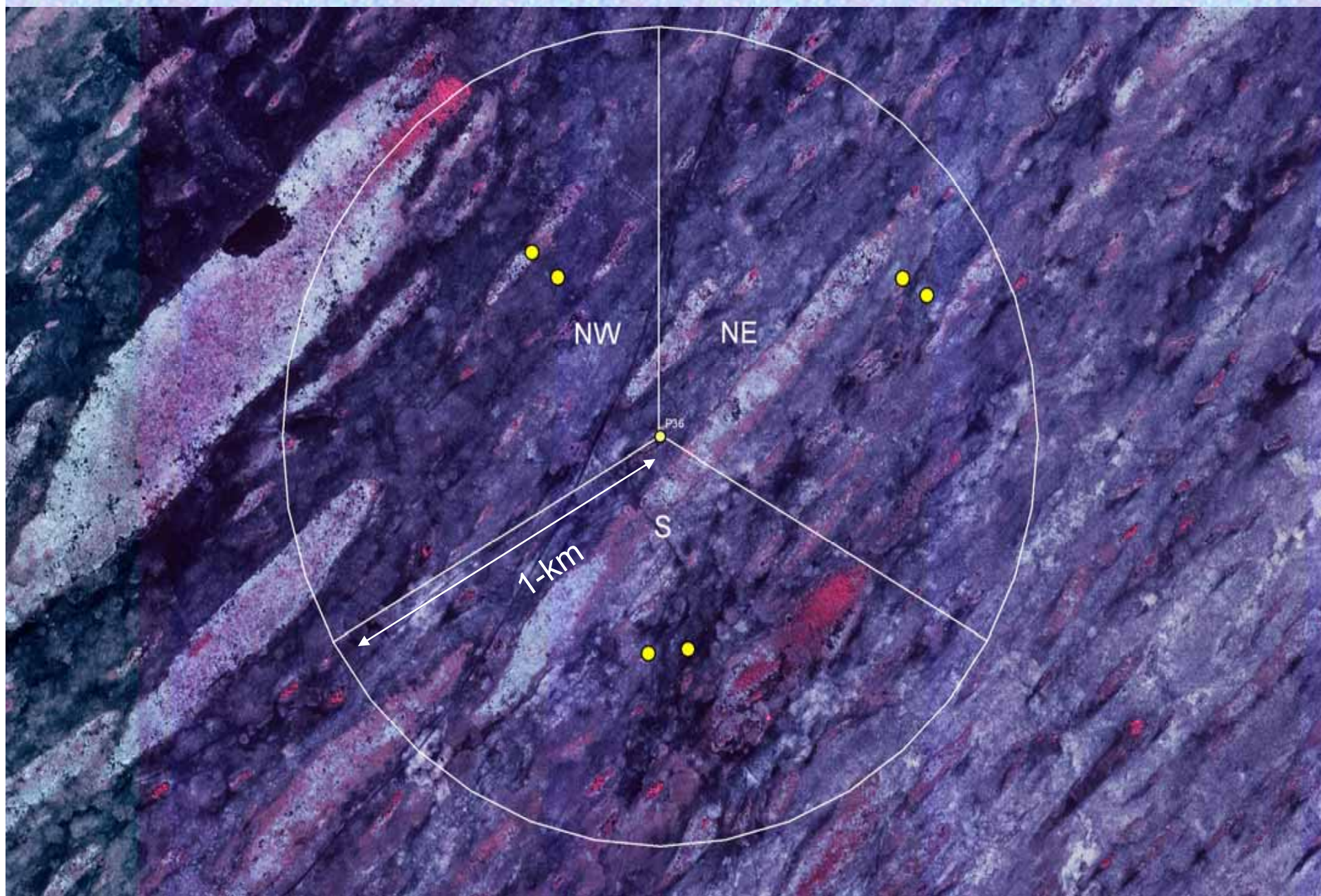
SPECIES DENSITY
VEGETATION COVER
CANOPY HEIGHT
BIOMASS

TOTAL CARBON CONTENT
TOTAL NITROGEN CONTENT
TOTAL PHOSPHORUS CONTENT
MOLAR N:P RATIO

Sampling Sites are 14 long-term water level recorders in ENP, WCA3A, and WCA3B



Sampling Design



Sampling Methods

5 1-m² Quadrats

-Structure and composition of all herb species

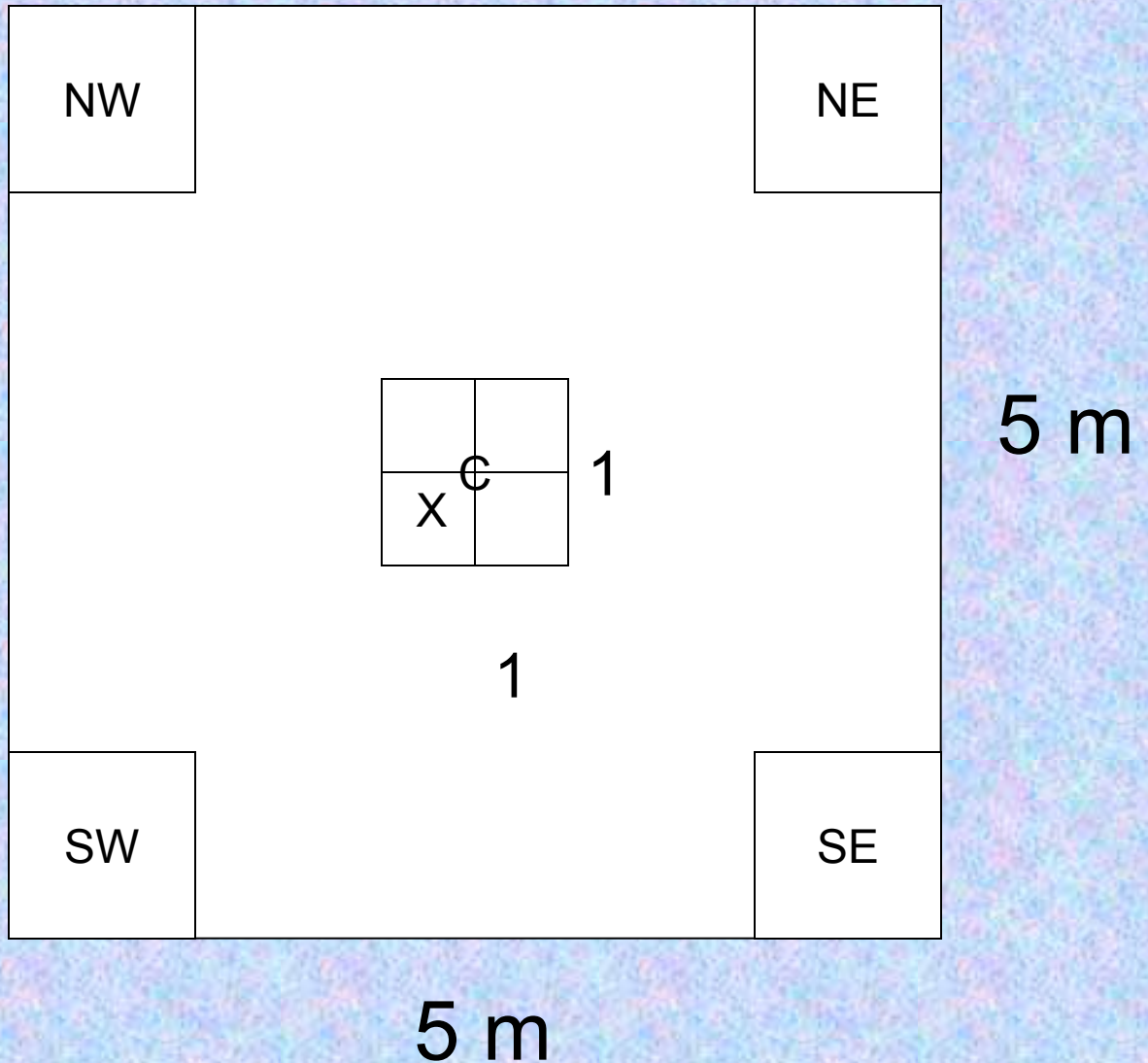
-Soil and Water depths in quadrat centers

-Rooted vegetation harvested in one of four sub-quadrats (X)

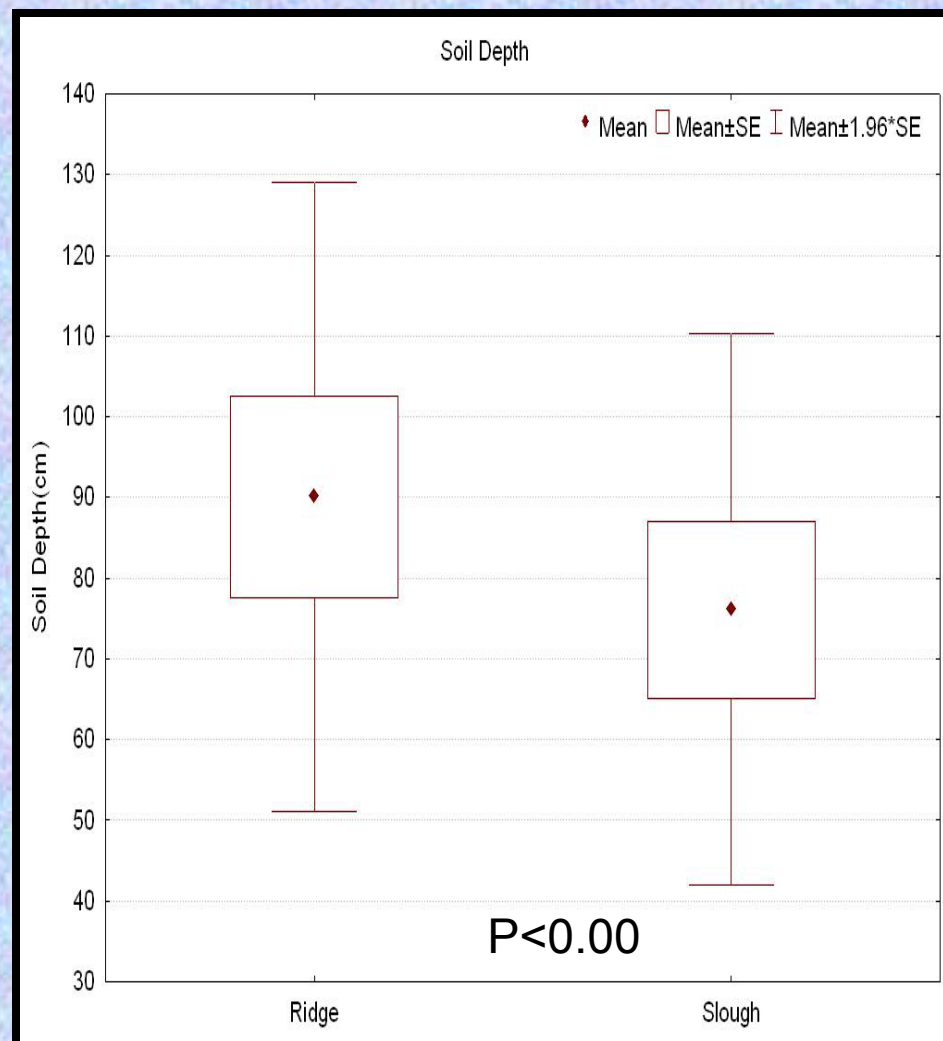
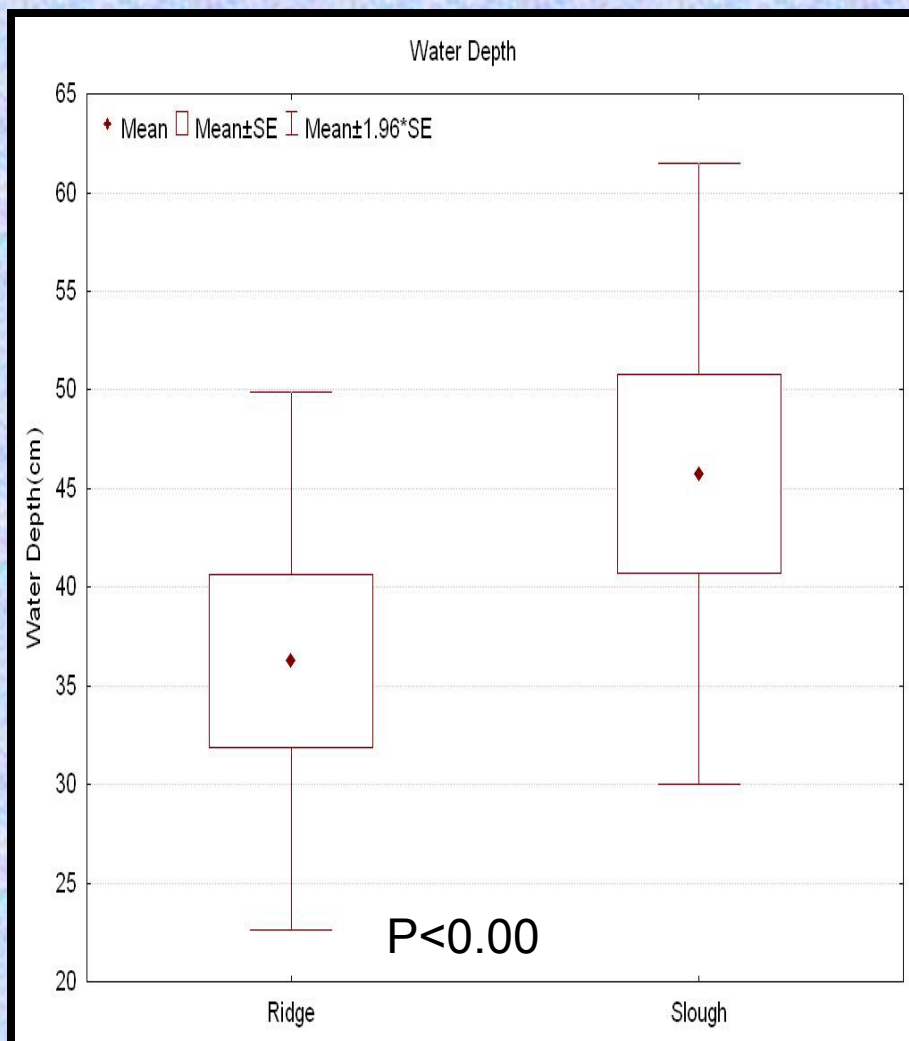
5-m² shrub and vine plot

-Total cover of shrubs and vines

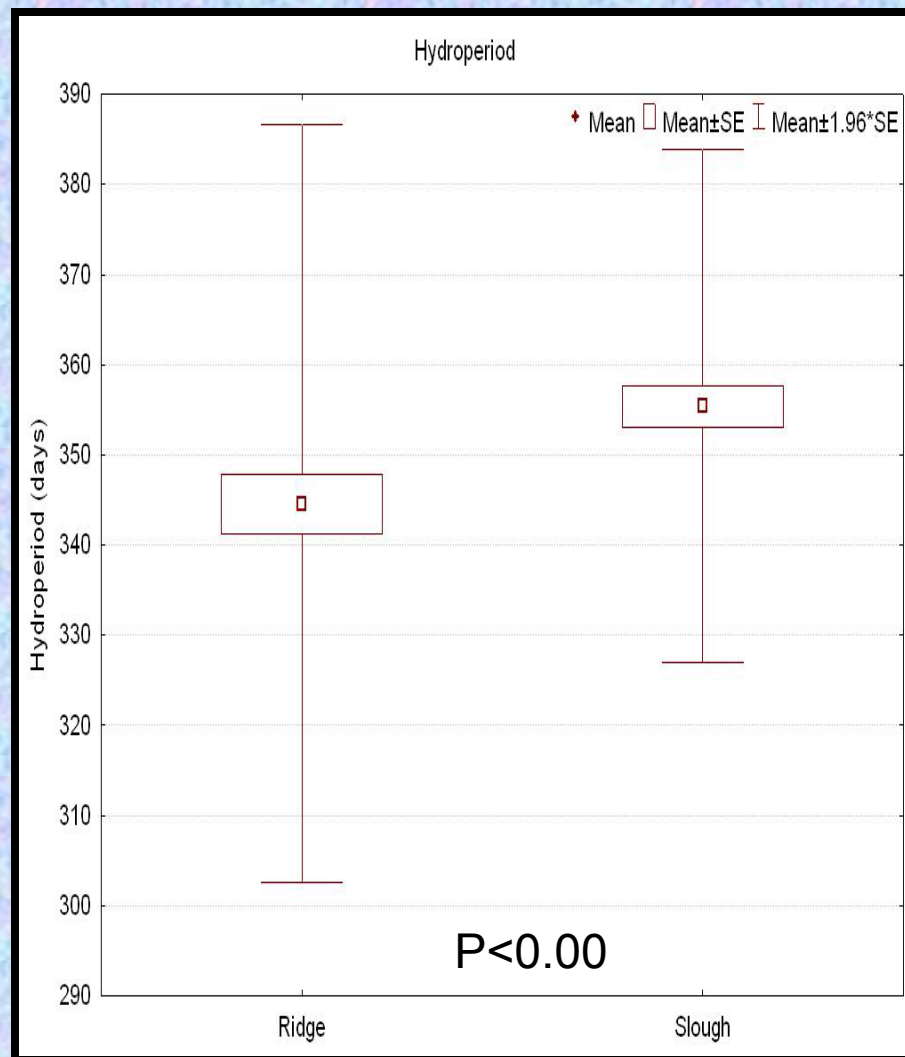
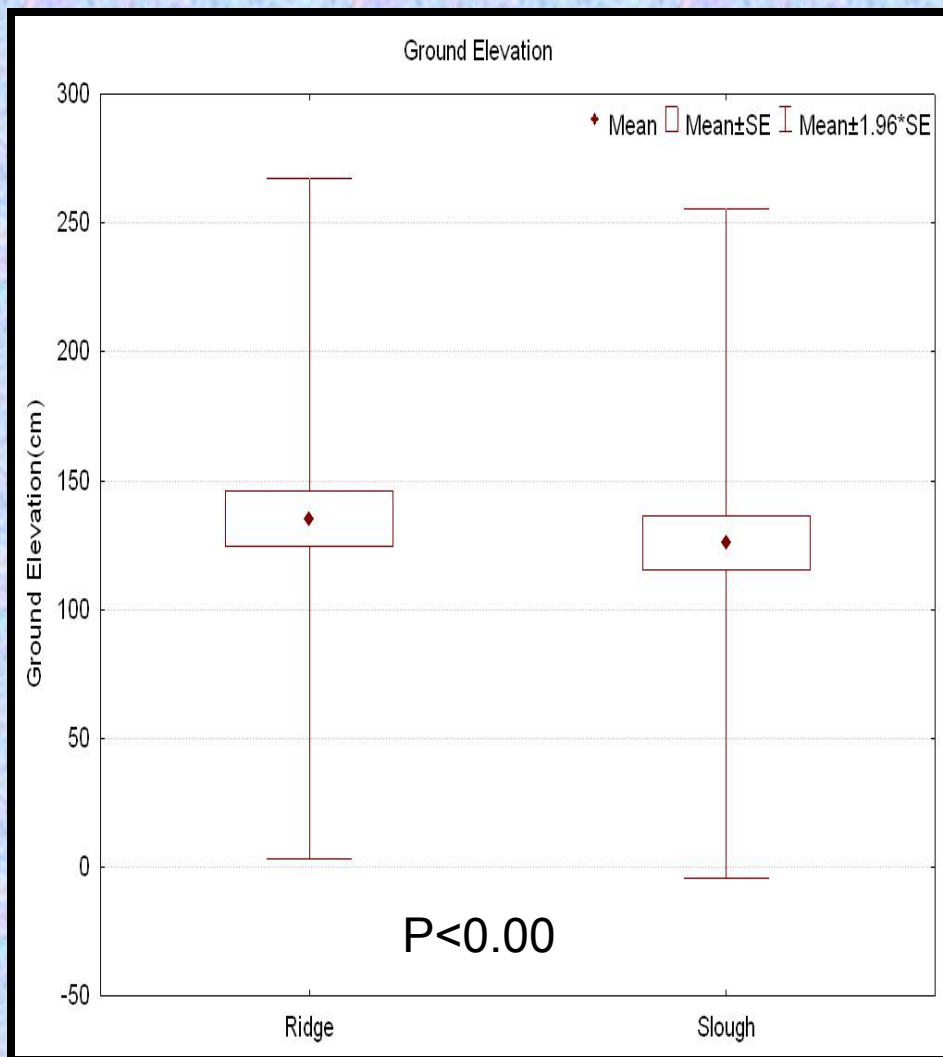
-Survey of trace species not found in quadrats



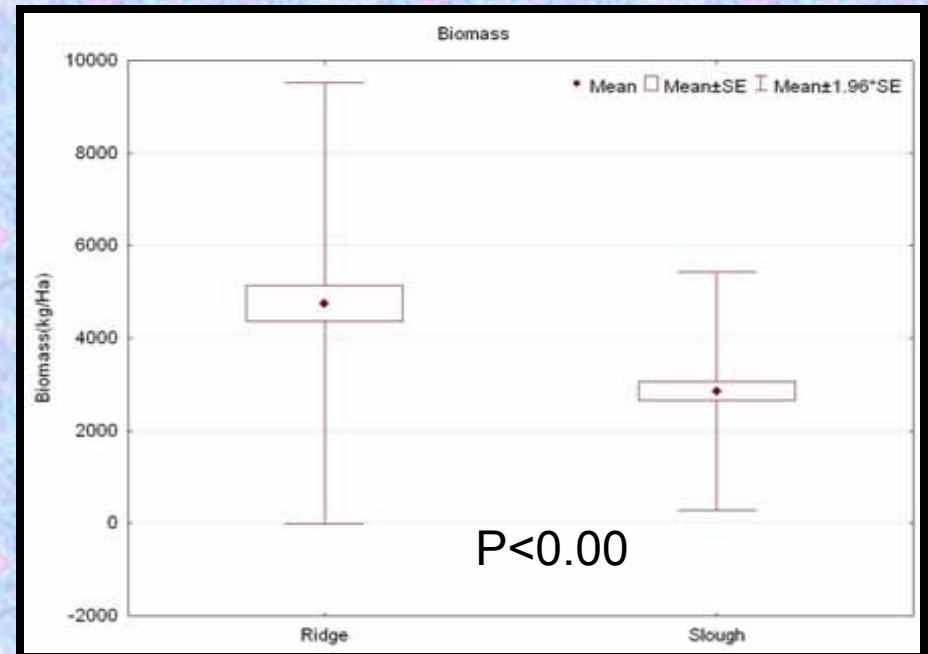
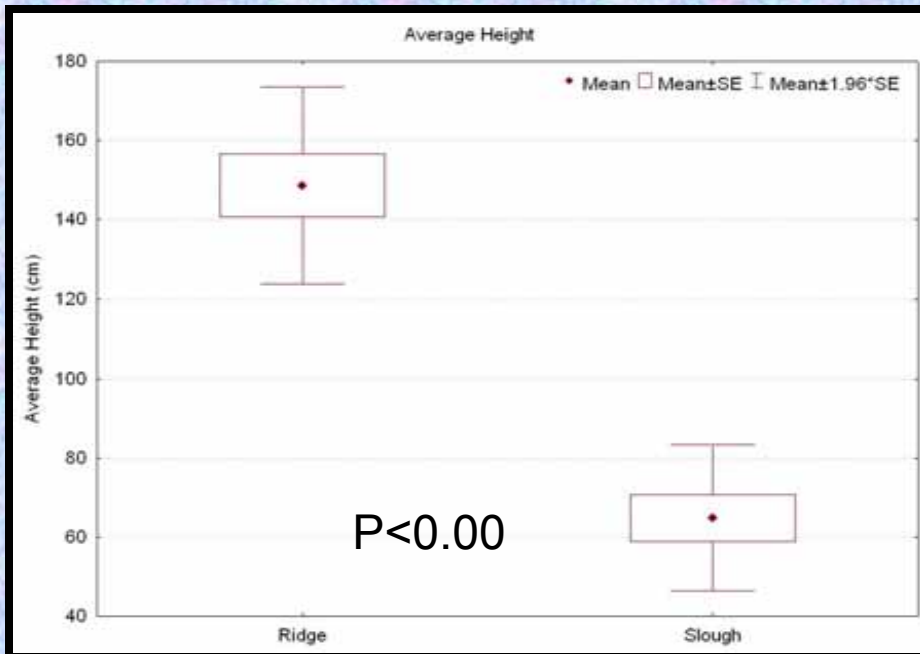
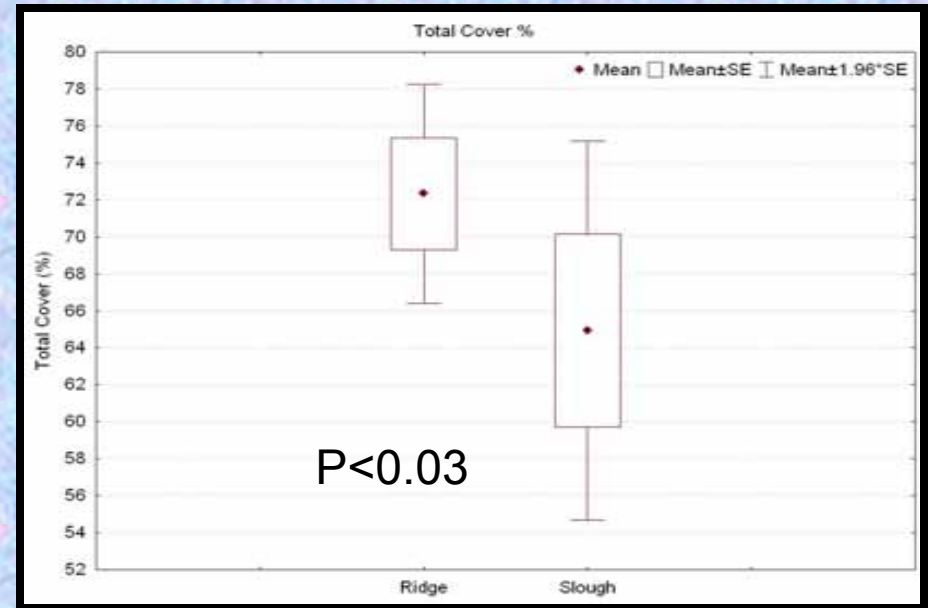
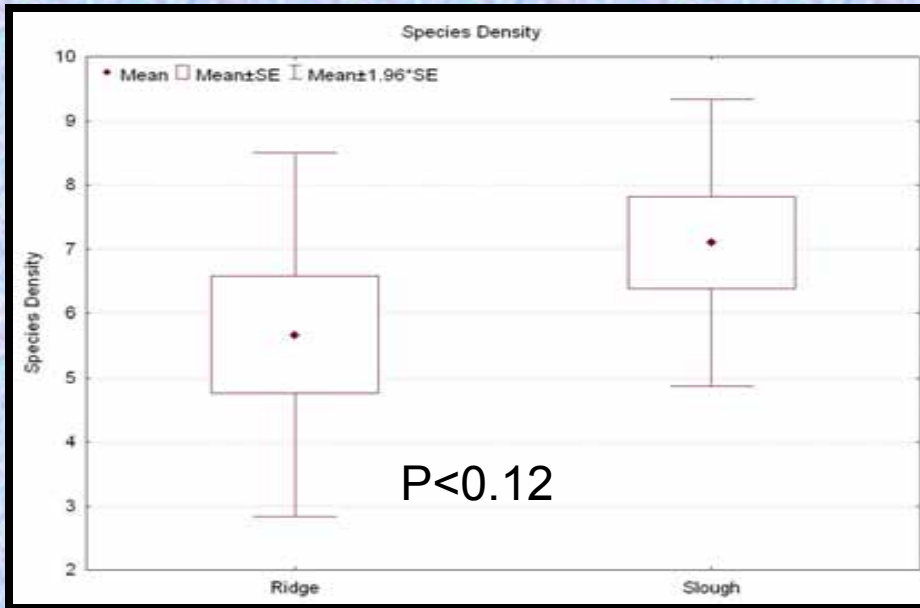
Physical Characteristics of Ridges and Sloughs



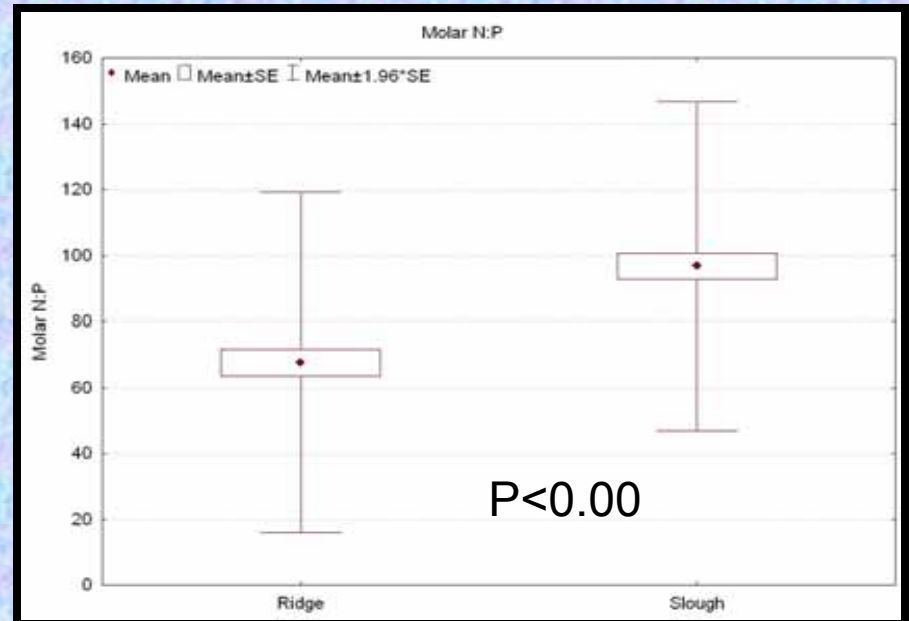
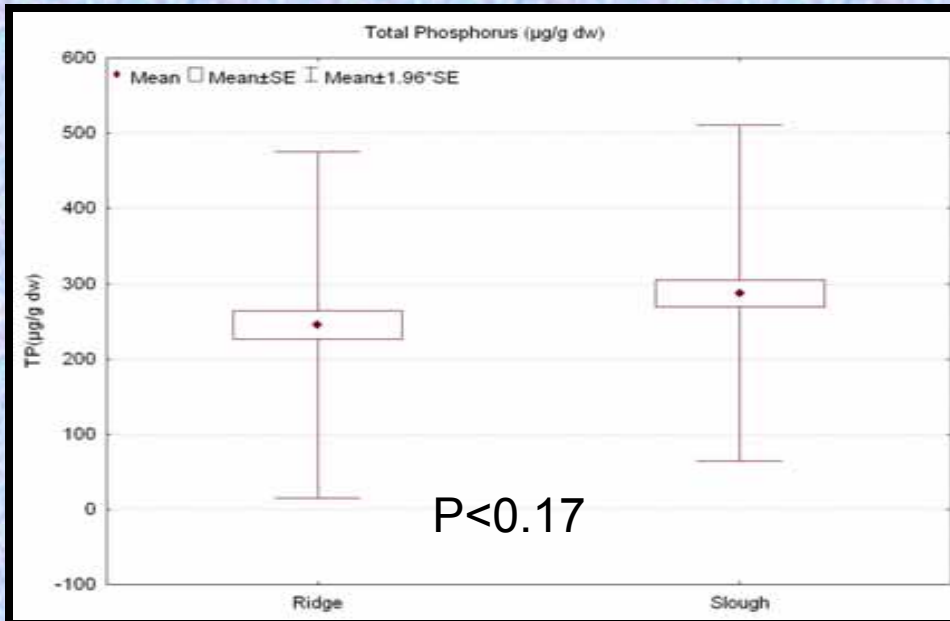
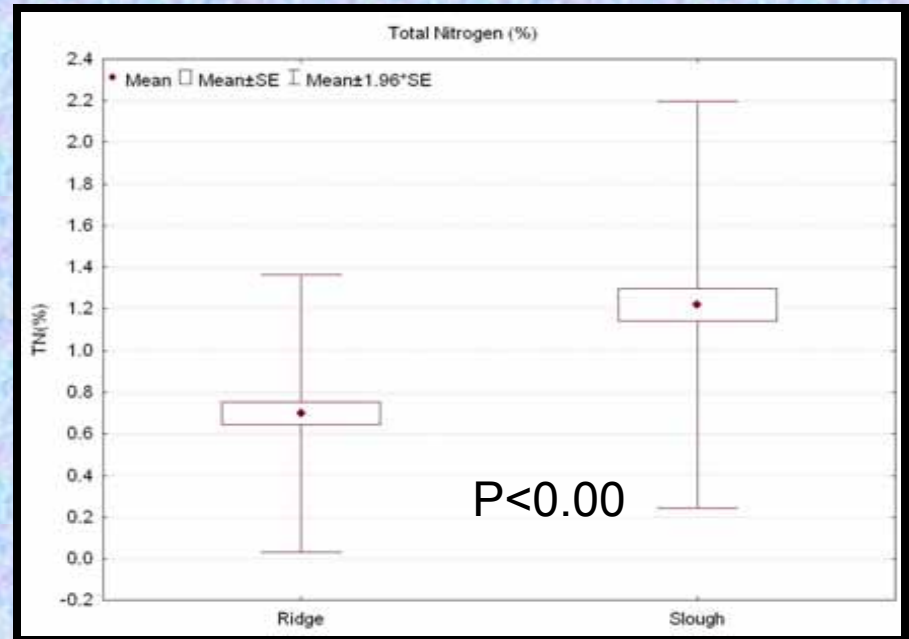
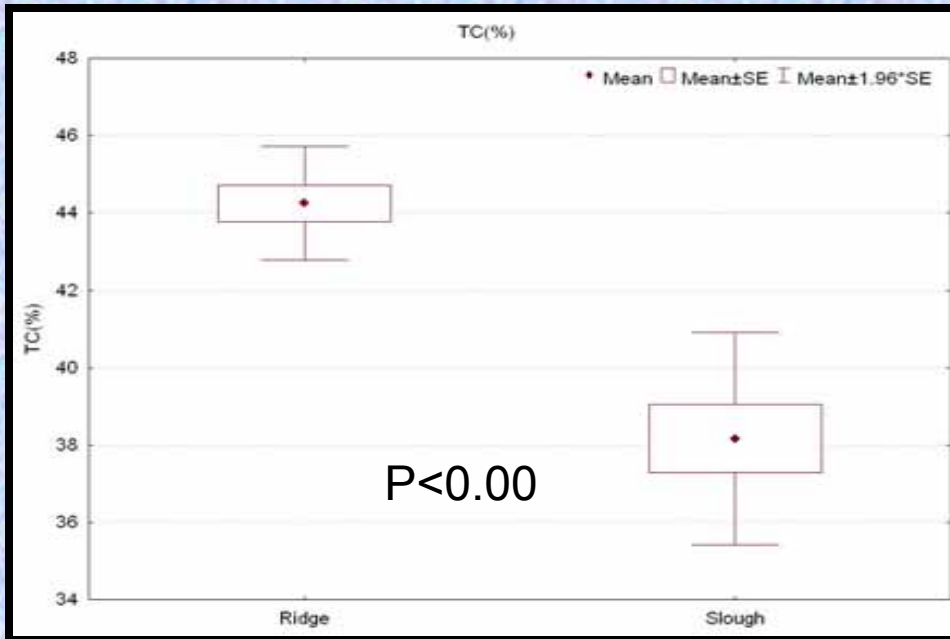
Inferred Physical Characteristics of Ridges and Sloughs



Vegetation composition and structure of Ridges and Sloughs

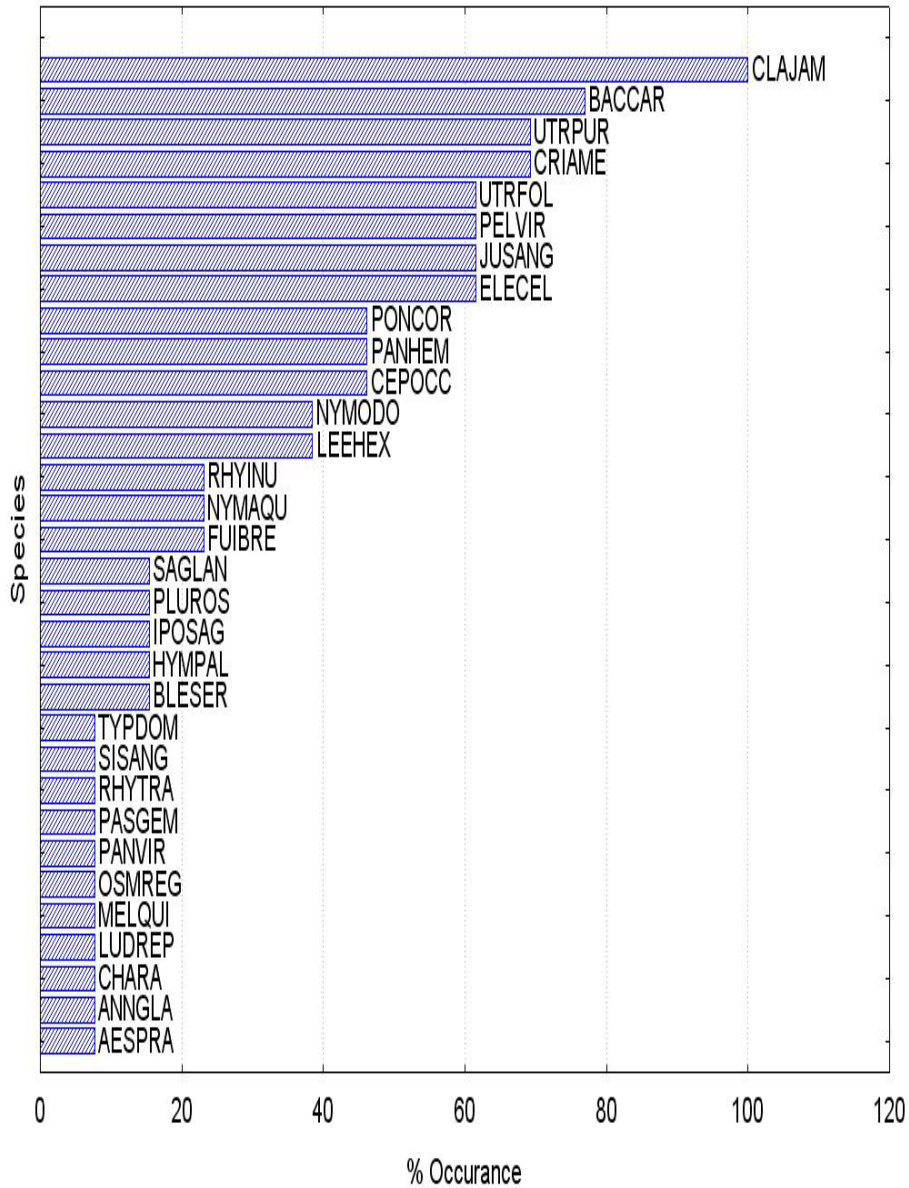


Vegetation Nutrient Content of Ridges and Sloughs

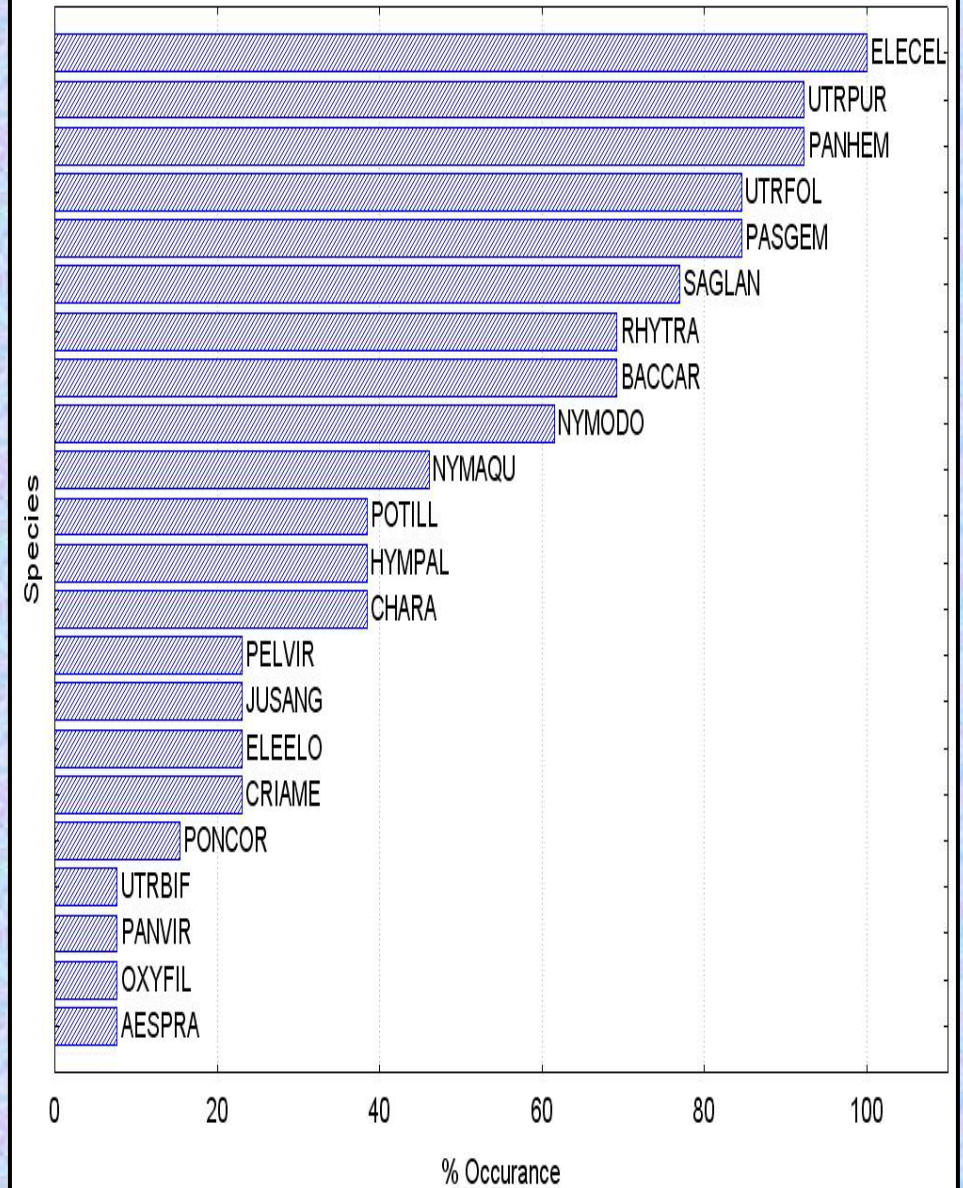


Species Compositions of Ridges and Sloughs

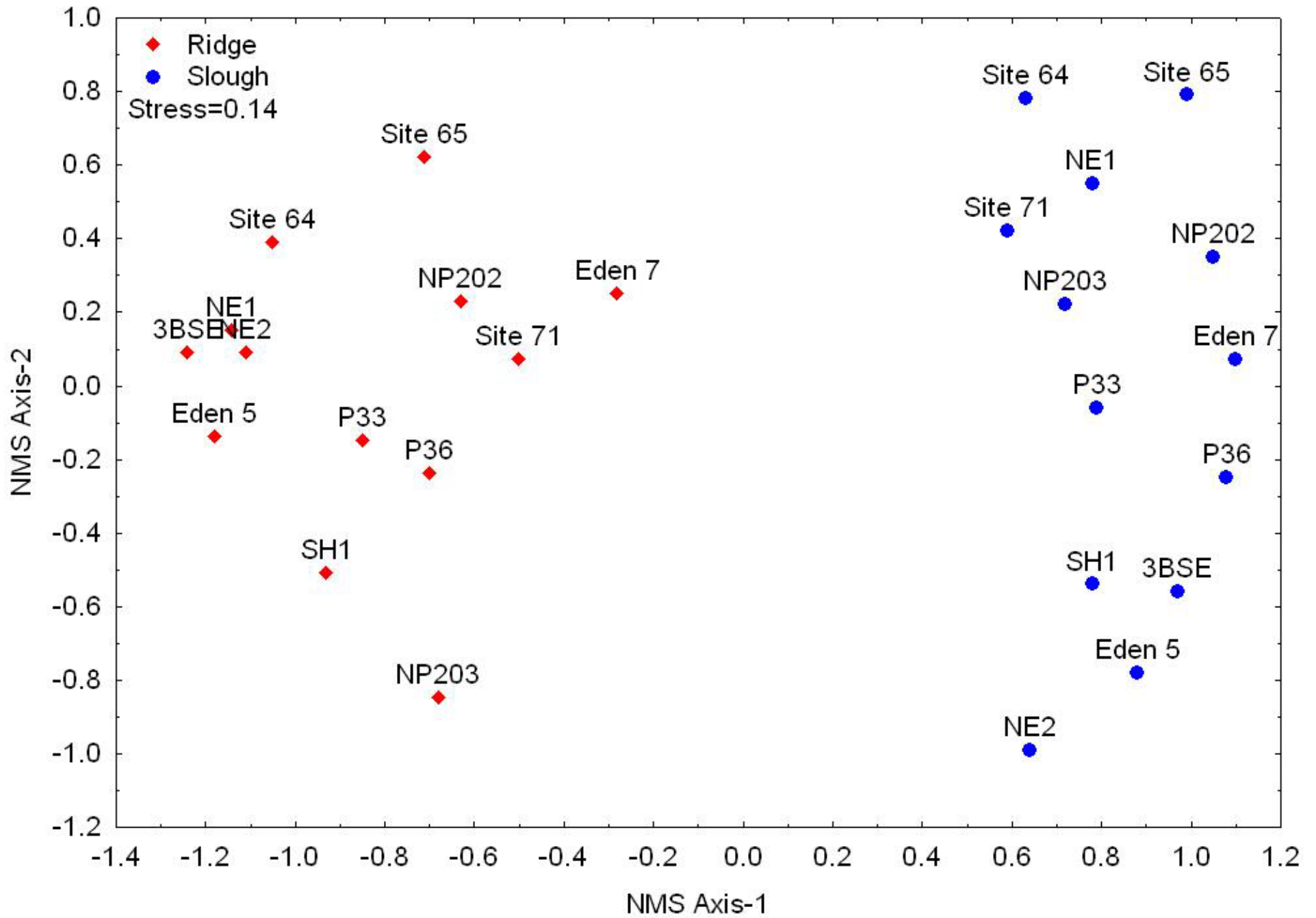
Percent Occurance of Ridge Species



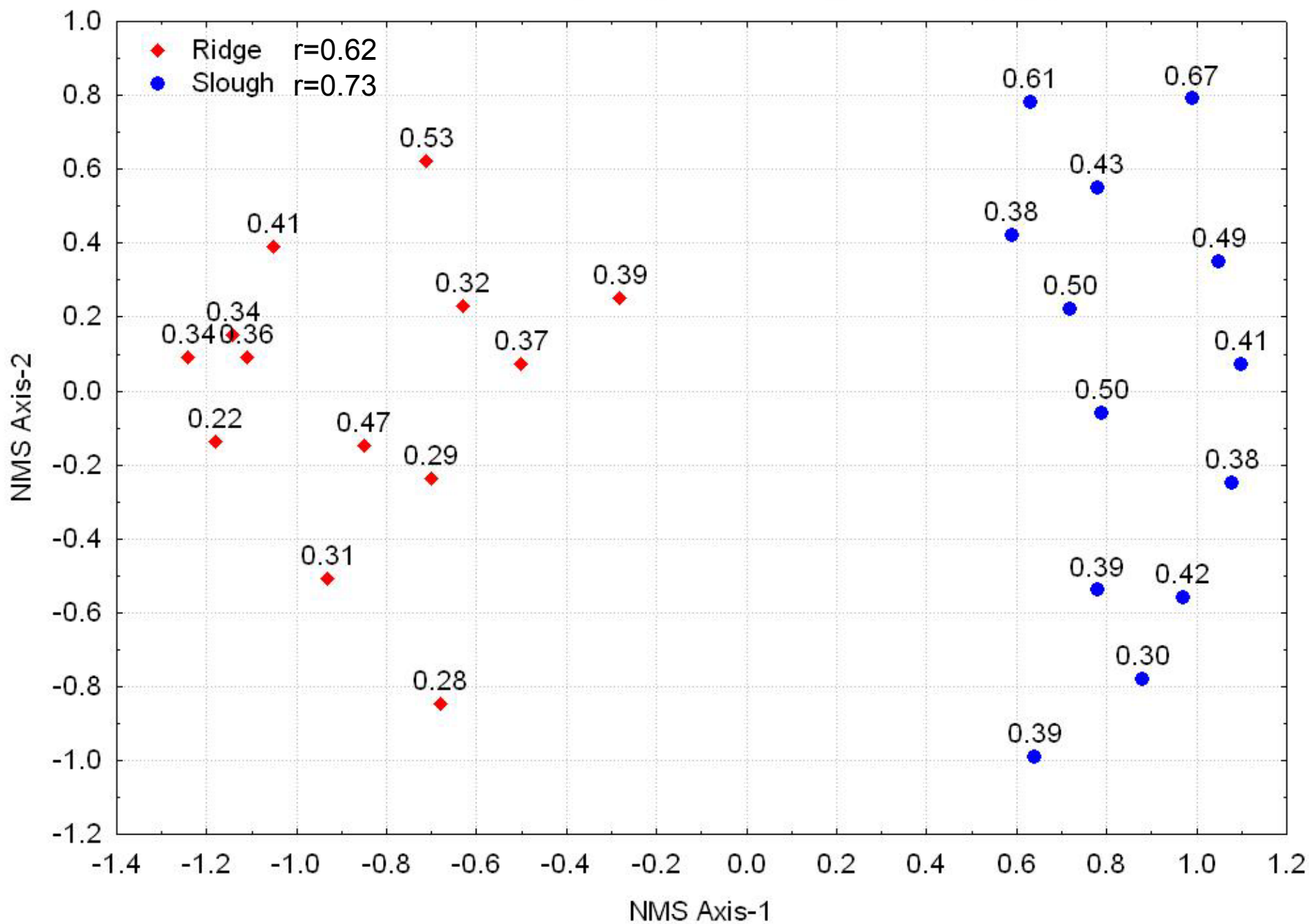
Percent Occurance of Slough Species



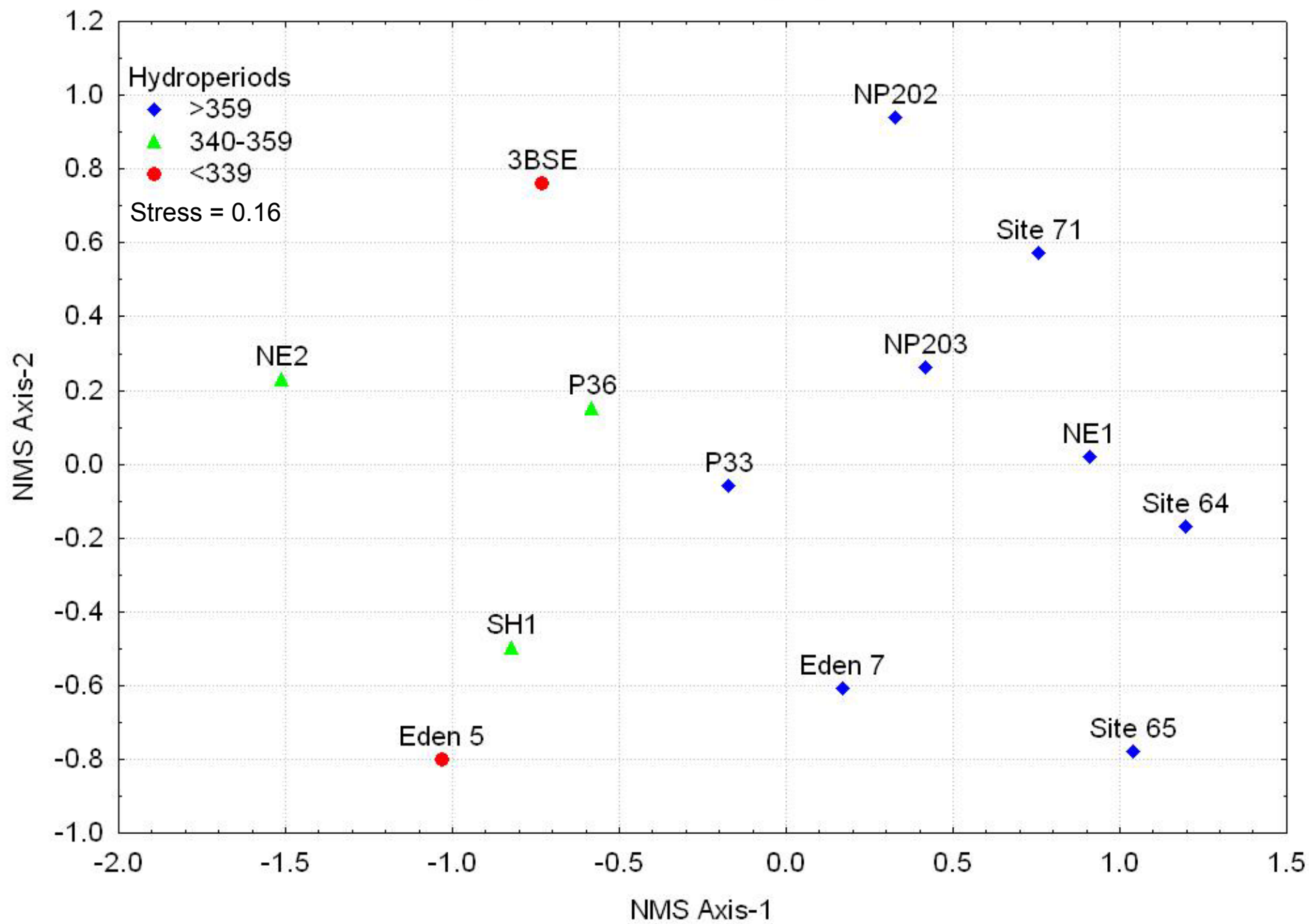
NMS Ordination by site



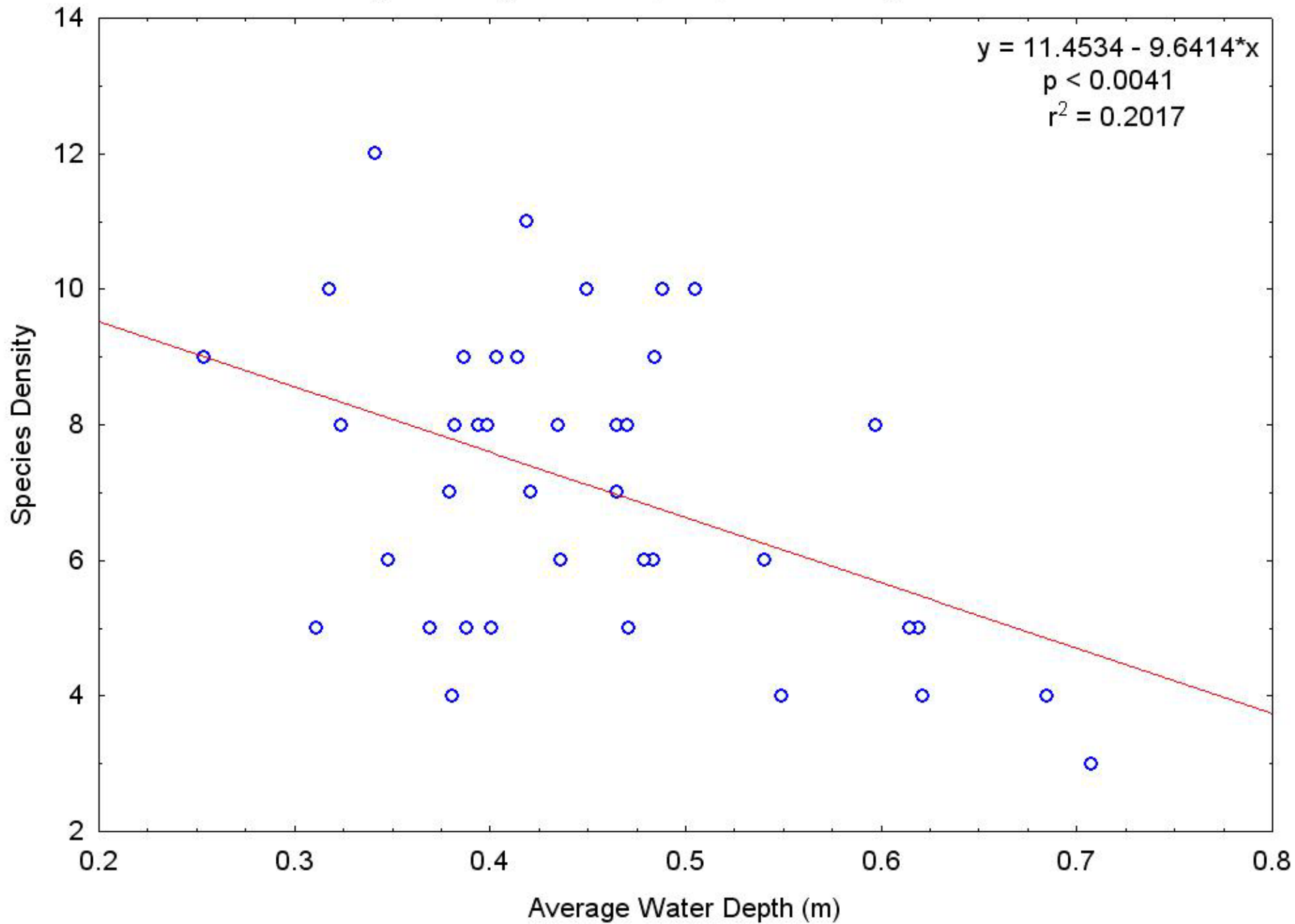
Plot Ordination with corresponding Mean Average Water Depth(m)



Slough sites correlate with Hydroperiod

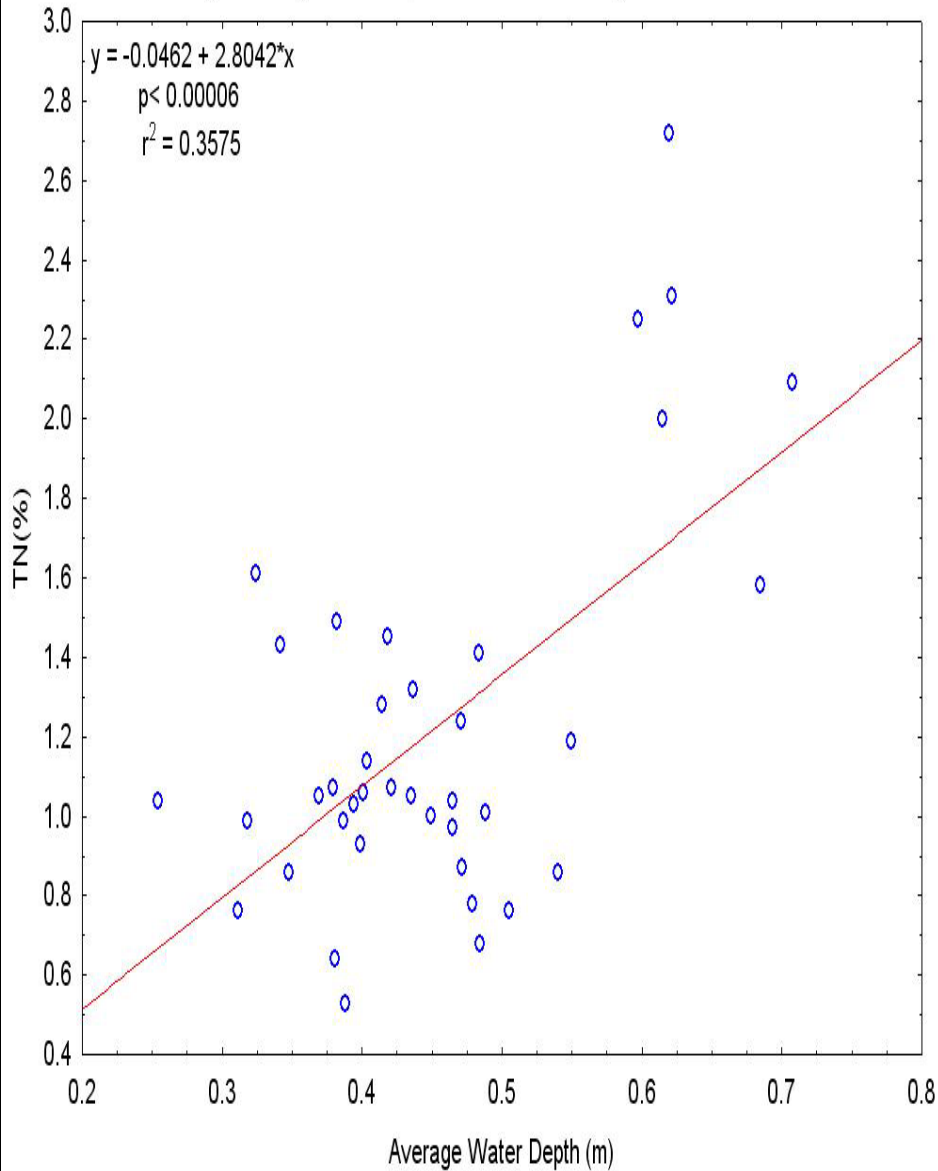


Slough: Average Water Depth-Species Density Trend

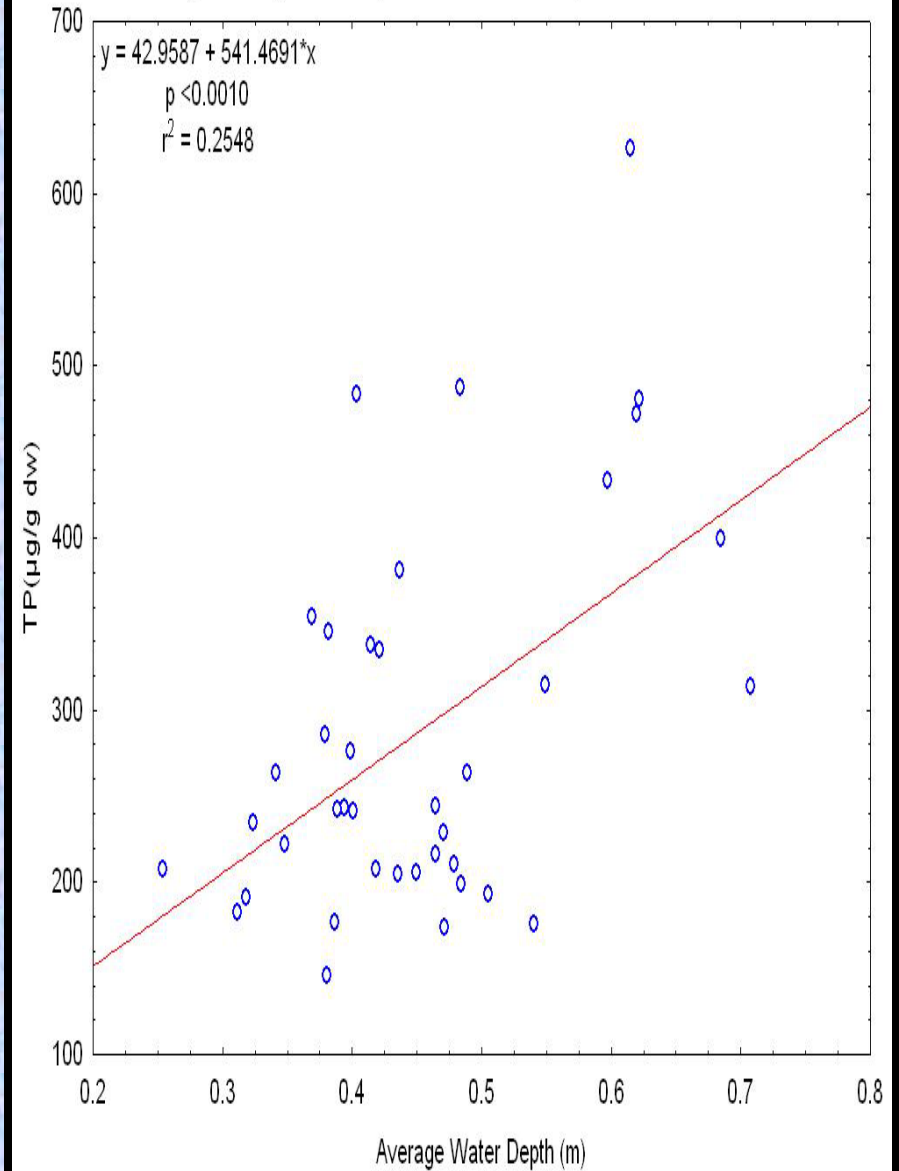


Slough: Average Water Depth-vegetation nutrient content trends

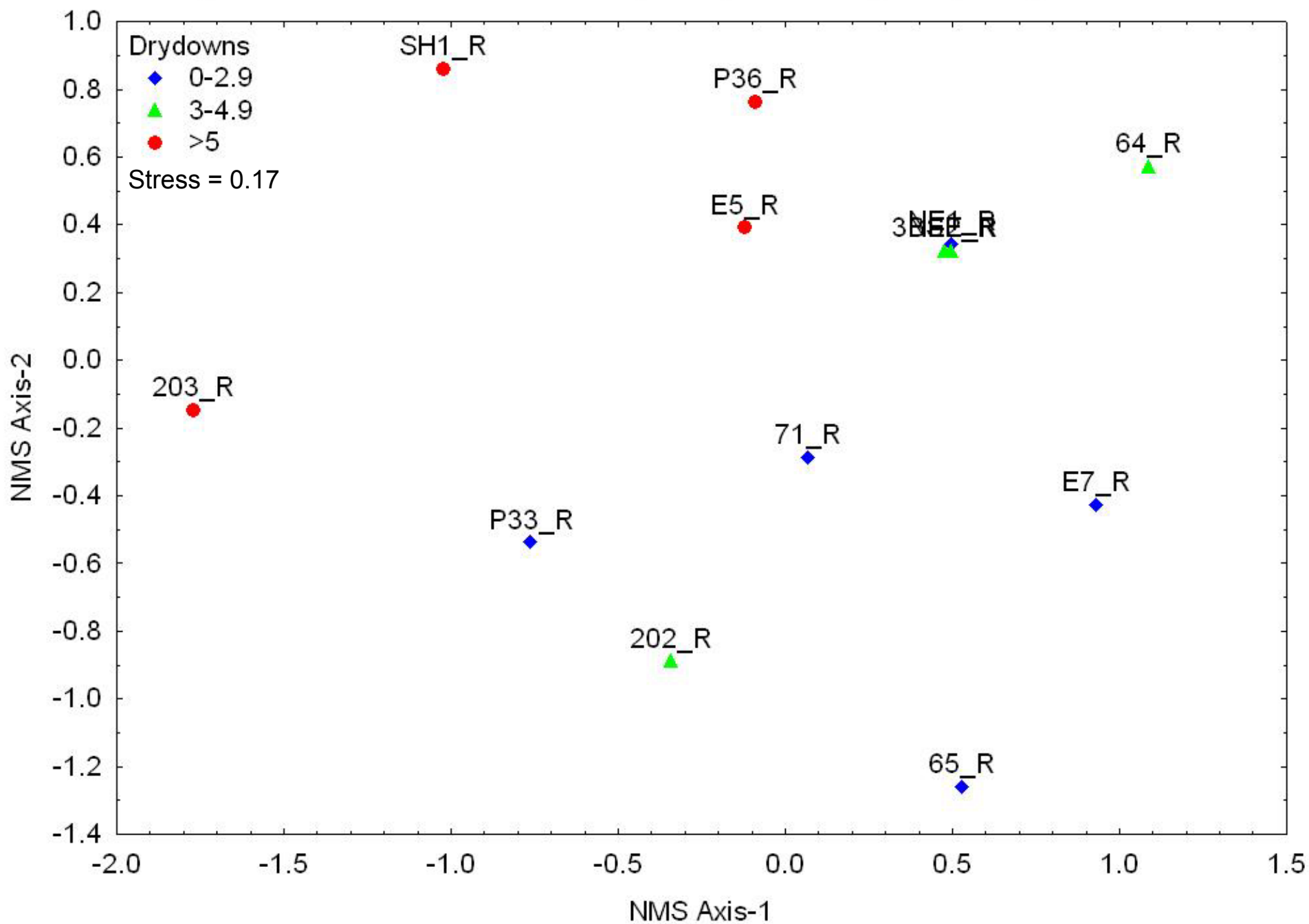
Slough: Average Water Depth-Biomass Total Nitrogen Content Trend



Slough: Average Water Depth-Biomass Total Phosphorus Content Trend

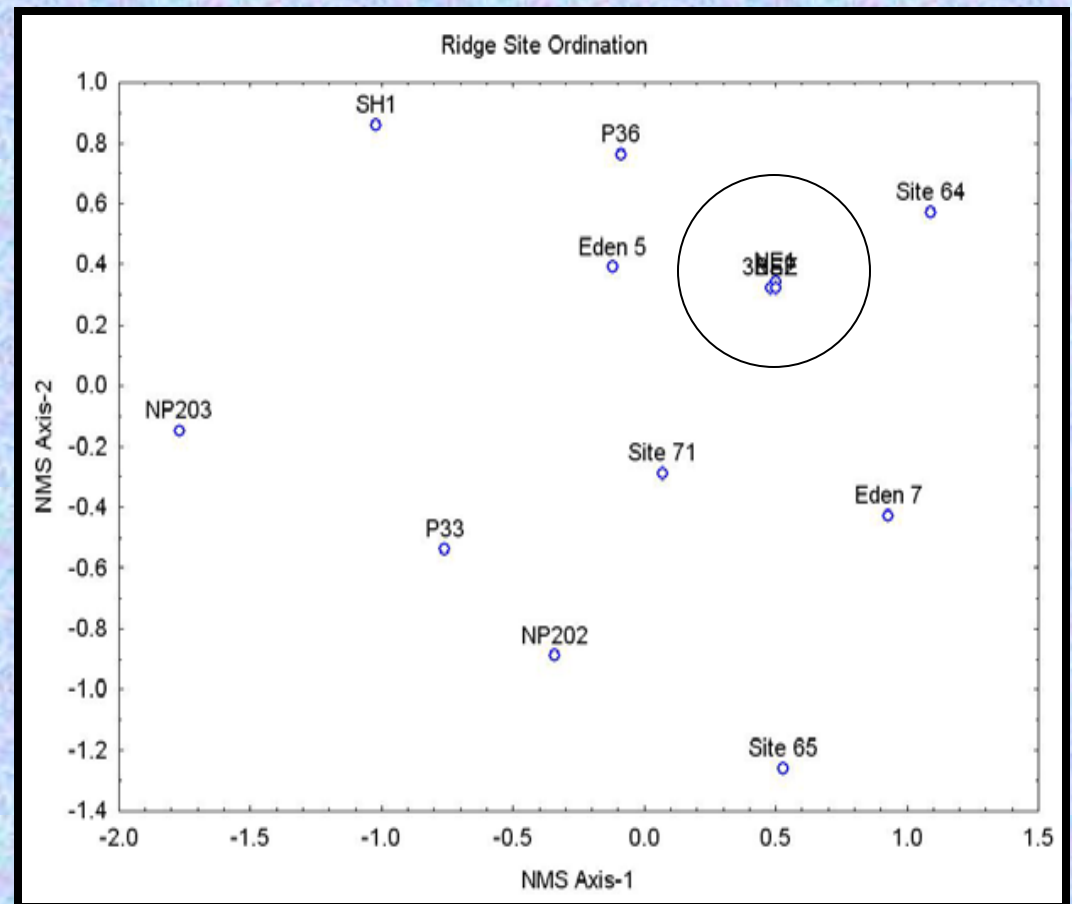


Ridge Sites correlate with number of drydown periods in 6 year hydrologic record

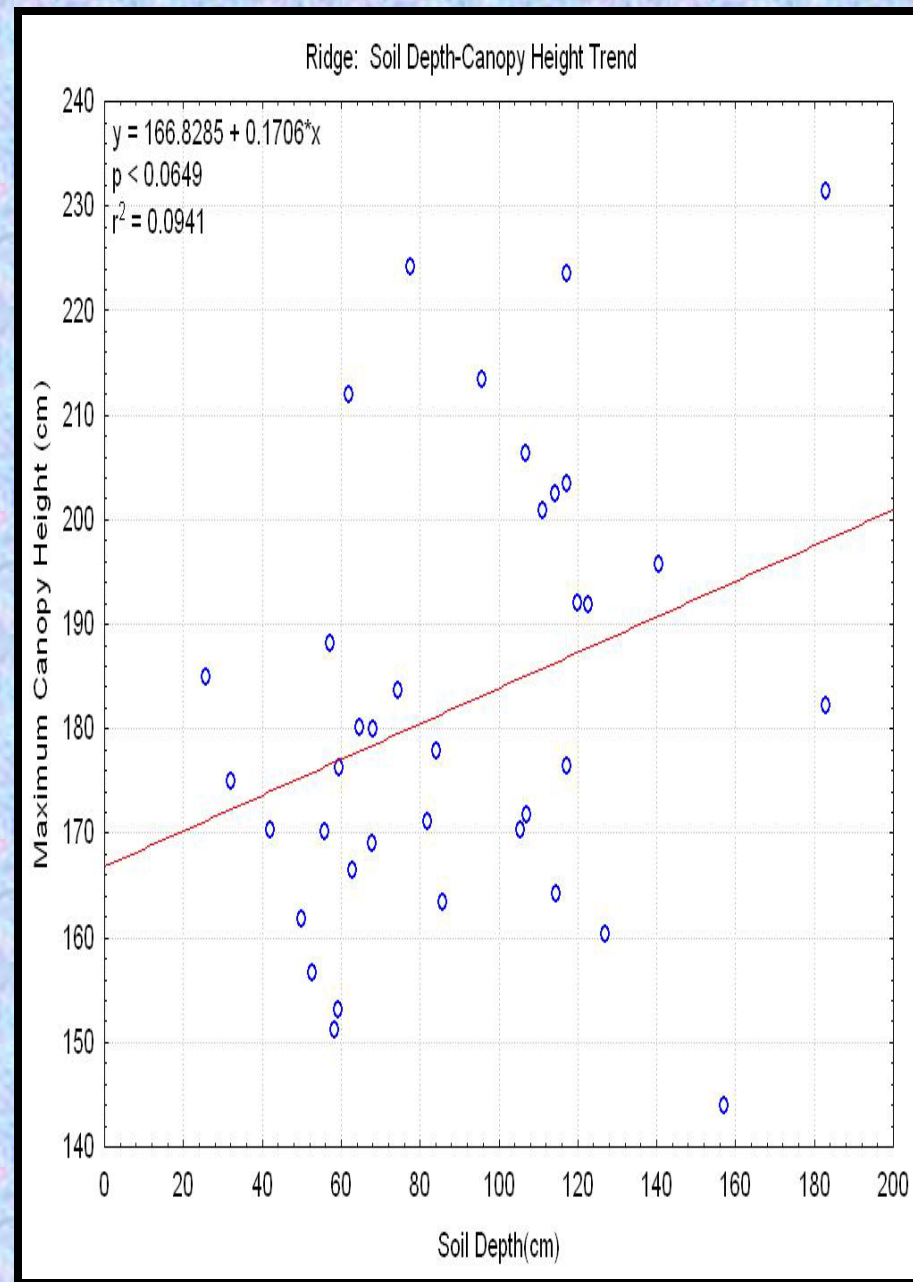
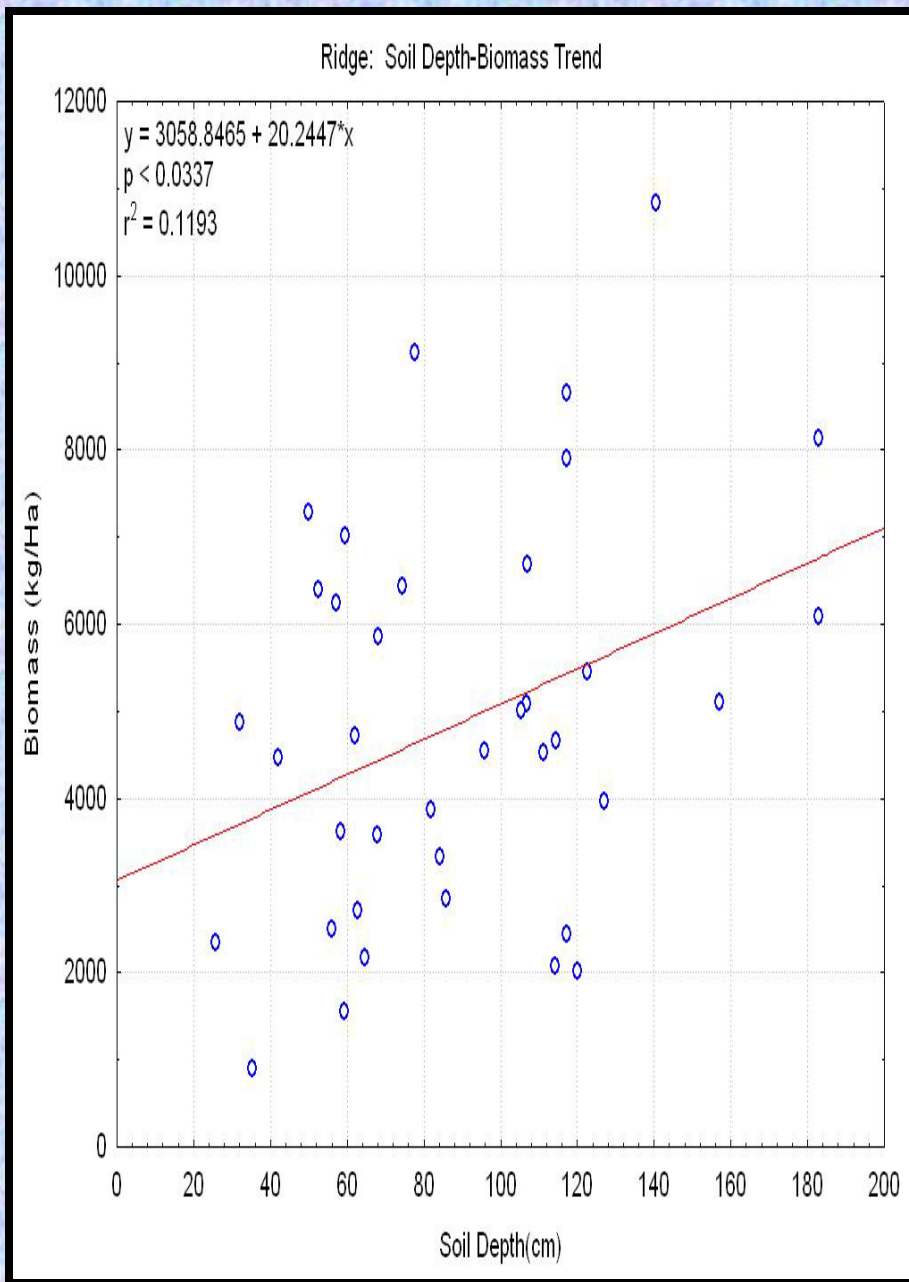


	3BSE_R	NE1_R	NE2_R
Average Water Depth (m)	0.34	0.34	0.36
Ground Elevation(cm)	125.0	131.4	122.7
Number of Species	2	5	6
CLAJAM cover value	74.6	72.4	74.1

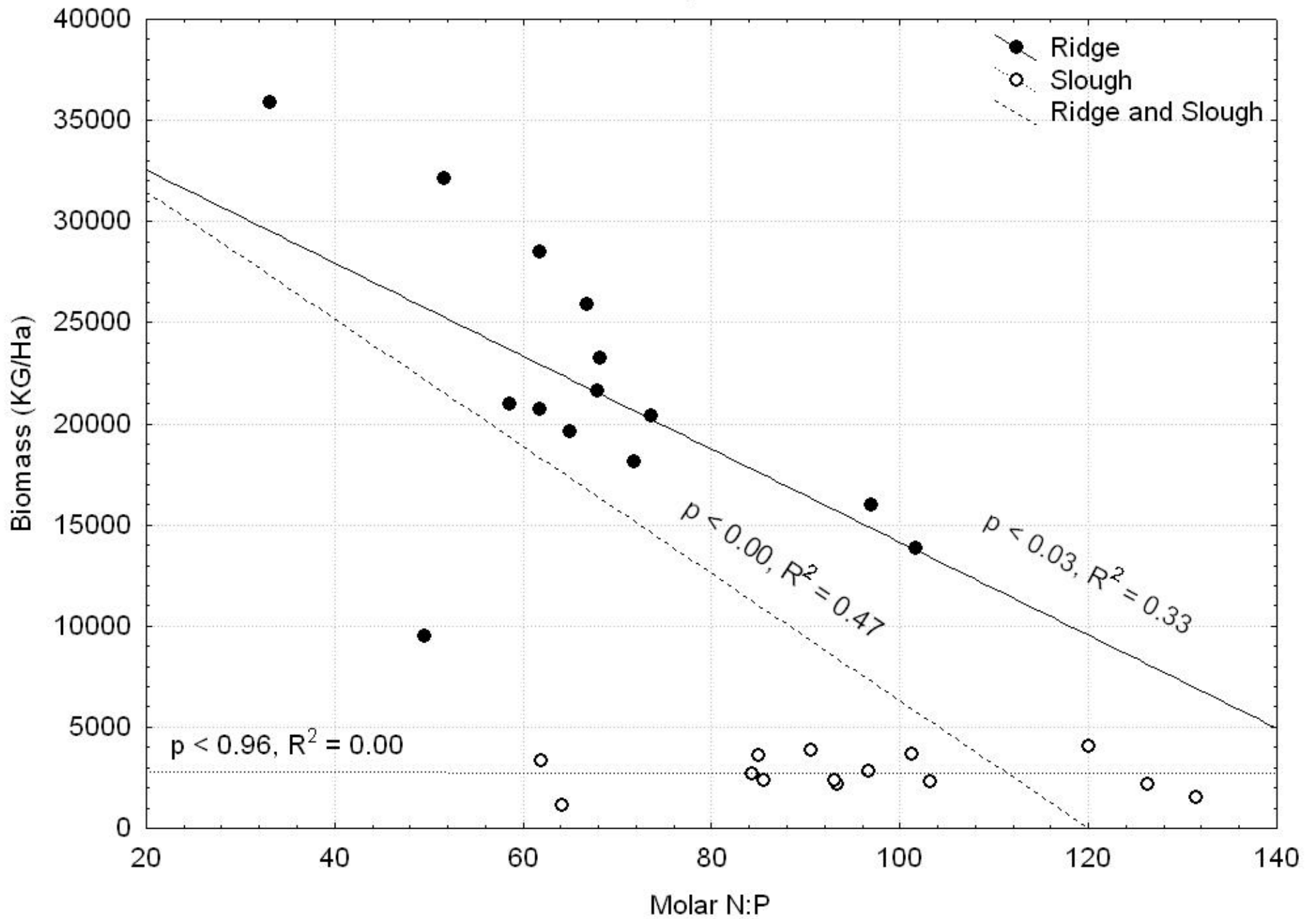
Sites NE1, NE2, and 3BSE
are very well correlated



Trends in Ridges with Soil Depth



Molar N:P ratio by Biomass



Conclusions

- Ridges and sloughs remain unique components of the Everglades landscape**
- Hydroperiod is the primary factor driving the characteristic differences in landscape units**
- Water Depth is a key factor in determining the vegetative community make-up of sloughs**
- The number of dry down periods and soil depth of ridges are key factors determining structure and composition of ridge vegetative communities**
- The nutrient content of both ridge and slough vegetation is a good indicator of the amount vegetative biomass per unit area.**
- By further incorporating water and soil nutrient data, nutritional pathways and their effect on the structure and composition of the vegetative community may be identified.**



Future Directions

-Incorporate the data from Len Scinto's work on the soil, pore water, and water column characteristics to relate to our current suite of variables

-Tie our findings to the mesocosm hydroperiod experiment and the artificial ridge and slough experiment to make broader statements about restoration of the ridge and slough landscape

Acknowledgements

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