Does Nutrient Enrichment from Adjacent Upland Agriculture Affect the Growth of *Phragmites australis*?

Zack Hayden, R.M. Chambers et al.
Keck Environmental Field Lab
USDA
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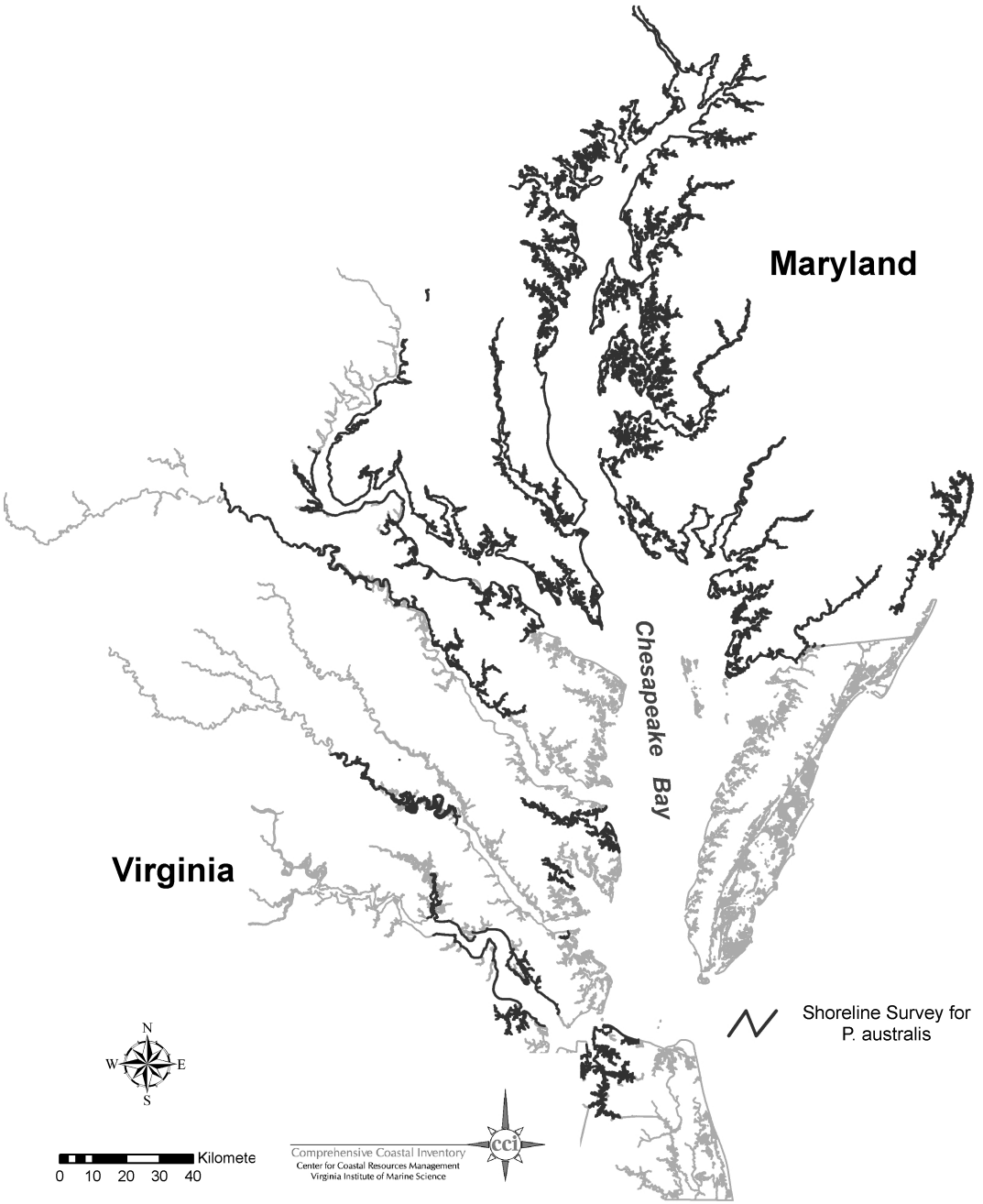
Phragmites australis -
the common reed

-Native and Non-native forms
-Rapid expansion
-Associated with development and nutrient enrichment

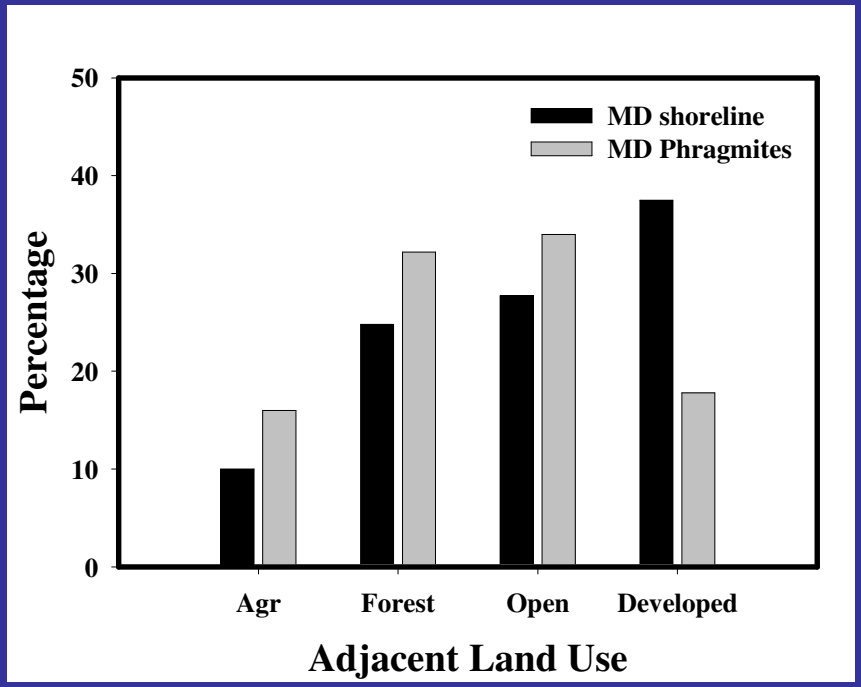
Phragmites Distribution in the Chesapeake Bay

- Is wetland distribution of Phragmites correlated with adjacent land use?

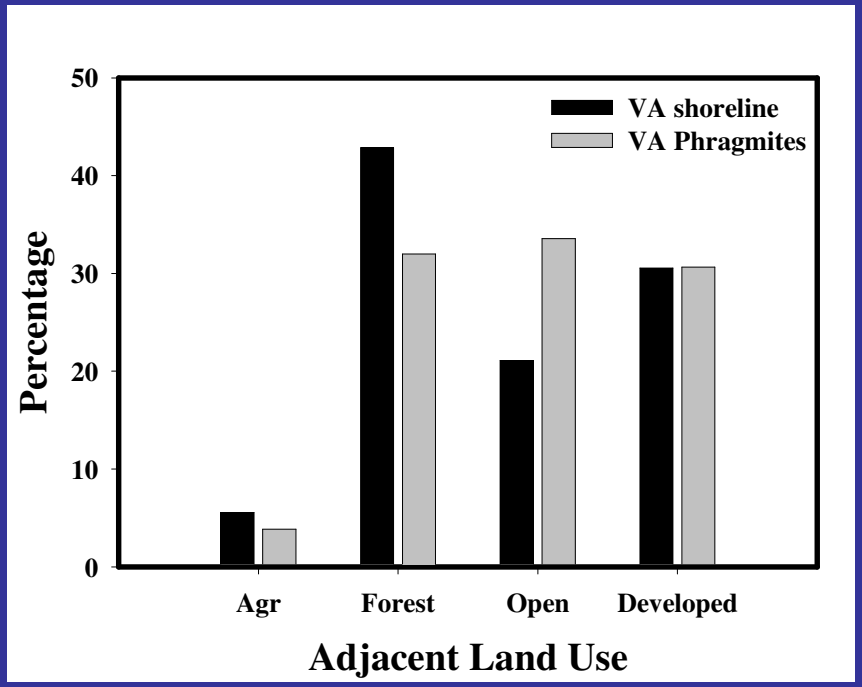
-Influence from agricultural nutrient enrichment?



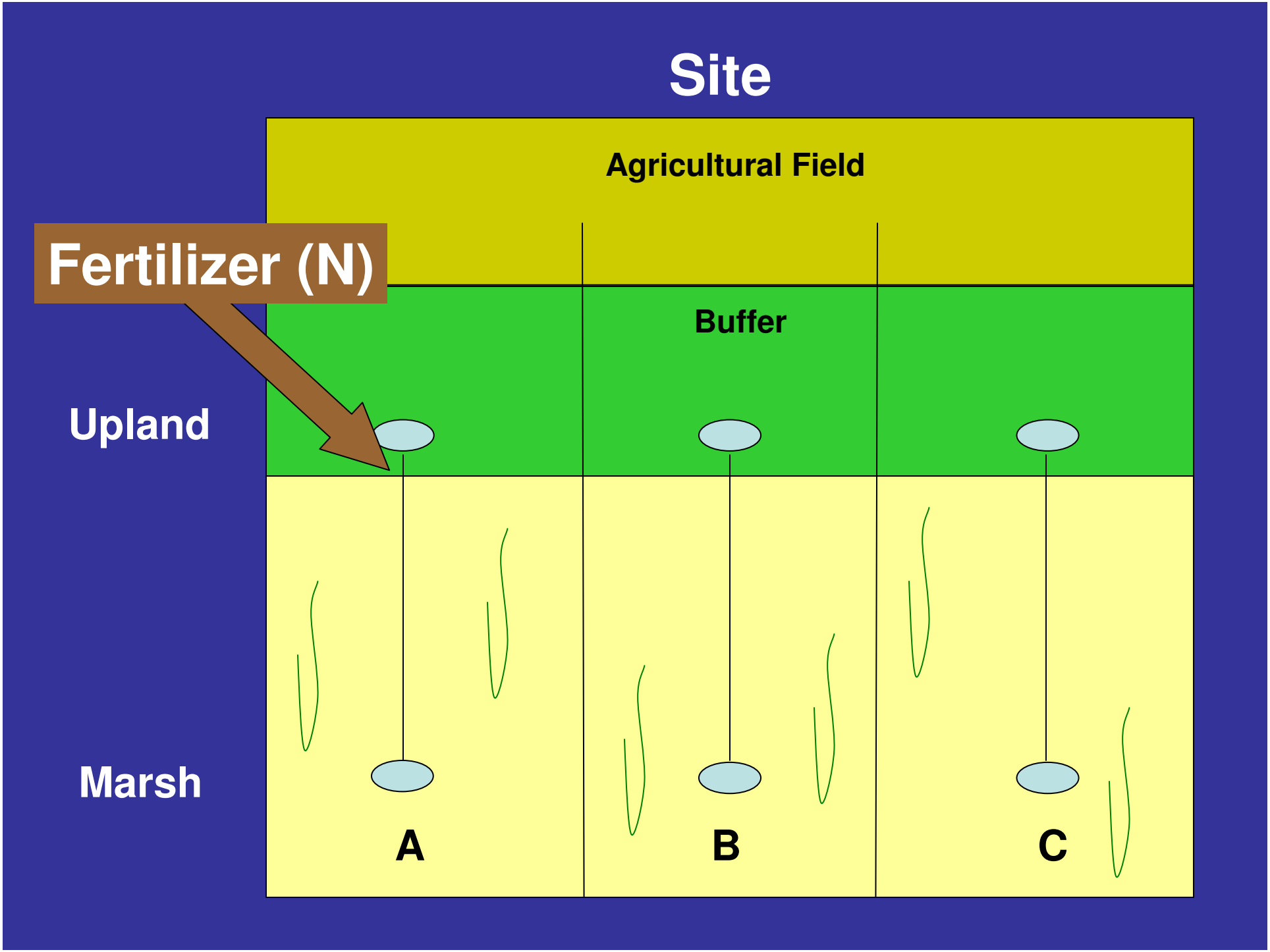
Maryland



Virginia



- More Phragmites in MD than VA
- Over-represented adjacent to agricultural land in MD
-But not in VA (BMP use?)
-Additional research needed


Site
Agricultural Field
Fertilizer (N)
Buffer
Upland
Marsh
A
B
C

Data and Goals

Sampled:

1. **Groundwater** – Analyzed for NH_4^+, NO_3^-, and DIP
2. **Plants** – Stem Density, Height, Weight, and Elemental Composition (C, N, P)

To Demonstrate:

1. Upland nutrient enrichment influences nutrient levels in marsh
2. Plant growth is correlated with nutrient levels

Groundwater Nutrient Analysis

No Significant Difference in Nutrient Levels:
-Upland vs. Marsh
-Fertilized vs. Unfertilized Transects

-Denitrification masking fertilizer effects?

Phragmites Response to Nutrient Levels

1. Incorporate N into tissues differently
2. Grow “bigger” in height, weight, or stem density
3. Spread farther into marsh

Plant Elemental Content

Leaves and Stems:

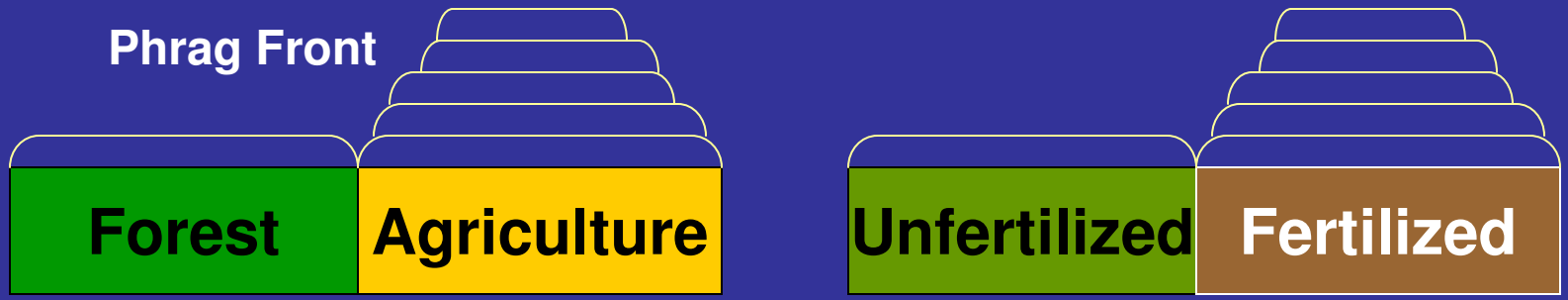
-No significant difference between sites

Stem Density, Height, and Weight

- No correlation to nutrient levels in groundwater

VIMS and GIS

- Expansion adjacent to nutrient enrichment?



Conclusion

- No support for adjacent agriculture's influence on Phragmites expansion

- Success of Agricultural BMPs?