

Geospatial Data and Soil Survey Interpretations for Siting Artificial Nitrogen Sinks

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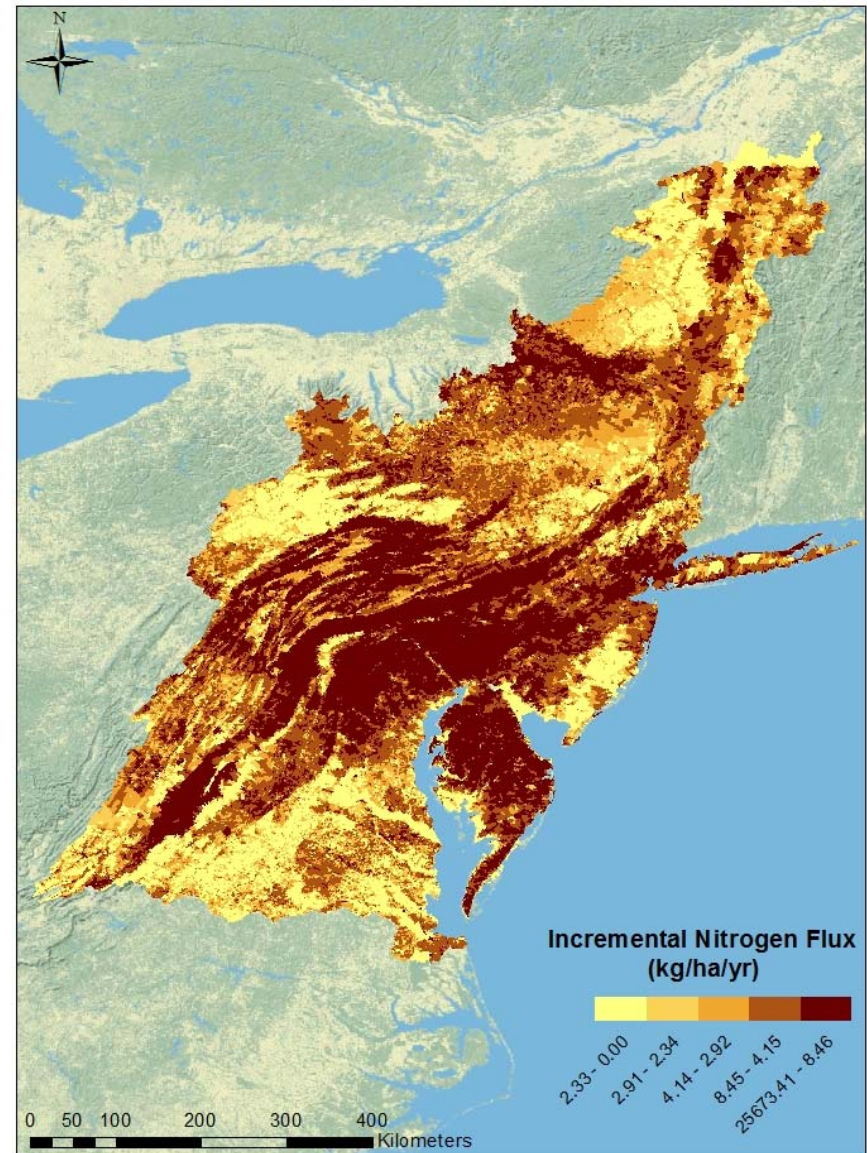
Objectives

- Assess utility of geospatial data at multiple scales for siting and understanding constraints of artificial N sinks in the Chesapeake Bay and Upper Mississippi Watersheds
- Develop state-level soil survey interpretations to assess and enhance the utility of soil survey data for the siting of artificial N sinks
- Outreach/training

Four Scale Approach

Watershed Scale

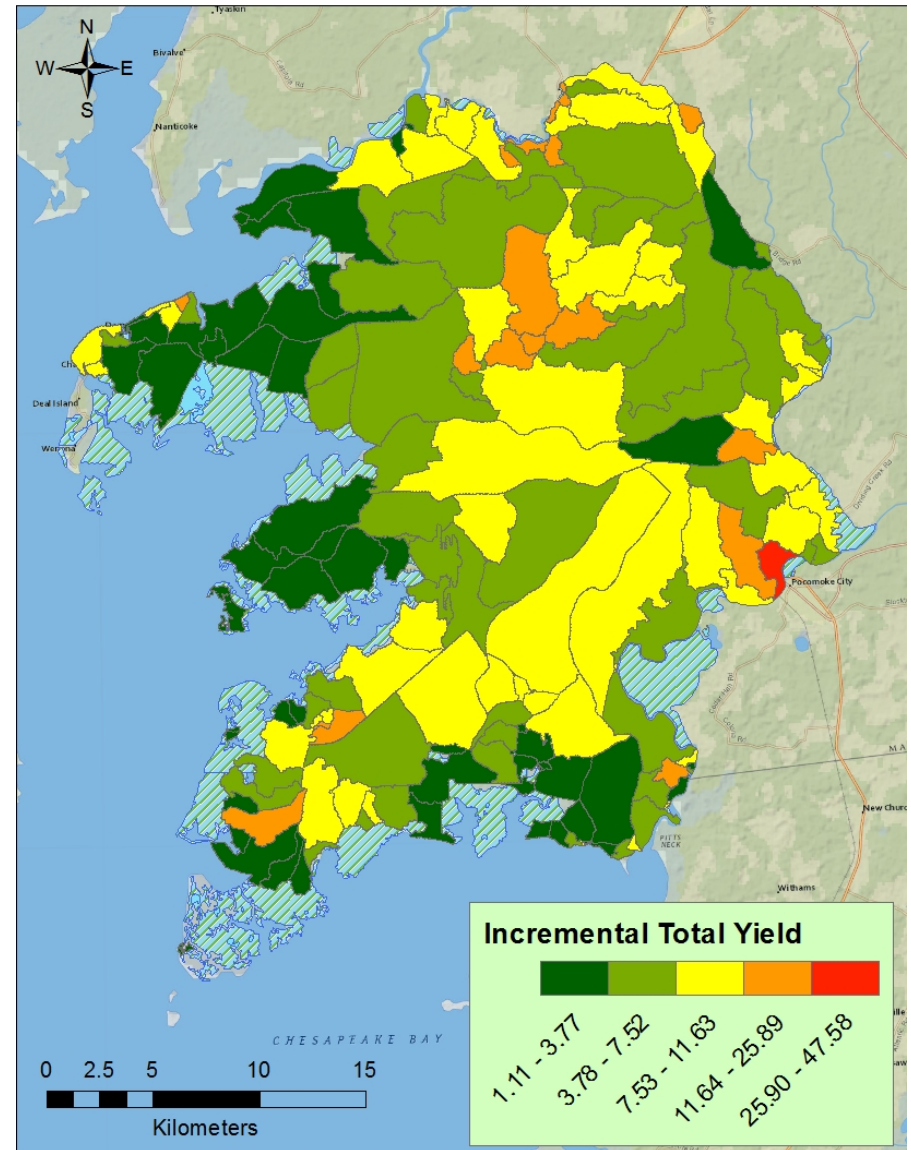
- Identify broad spatial trends, such as climatic variations and regions with high nitrogen inputs
- Physiographic analysis



Four Scale Approach

County Scale – Somerset
County, MD

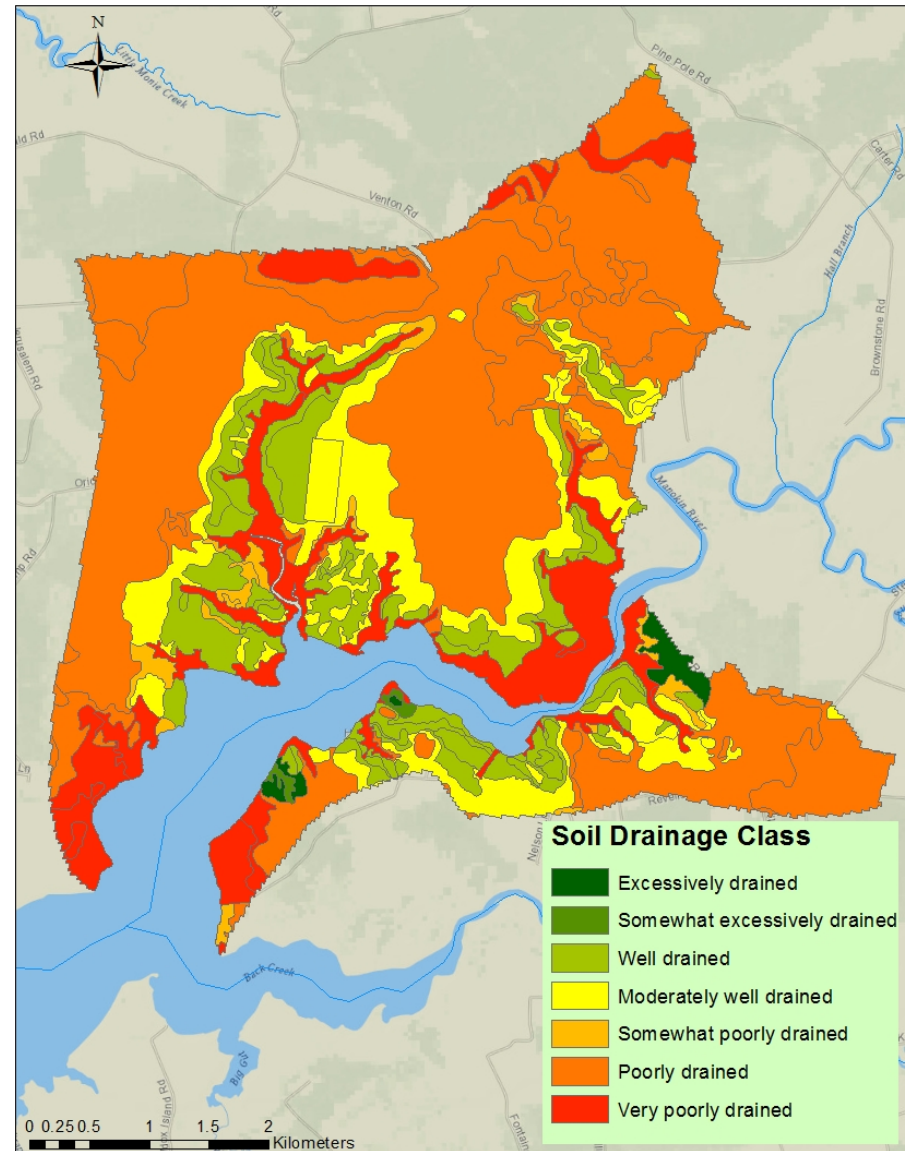
- Maps relevant to county-level planning and siting.



Four Scale Approach

Catchment Scale

- Allows for analysis of landscape-scale processes



Four Scale Approach

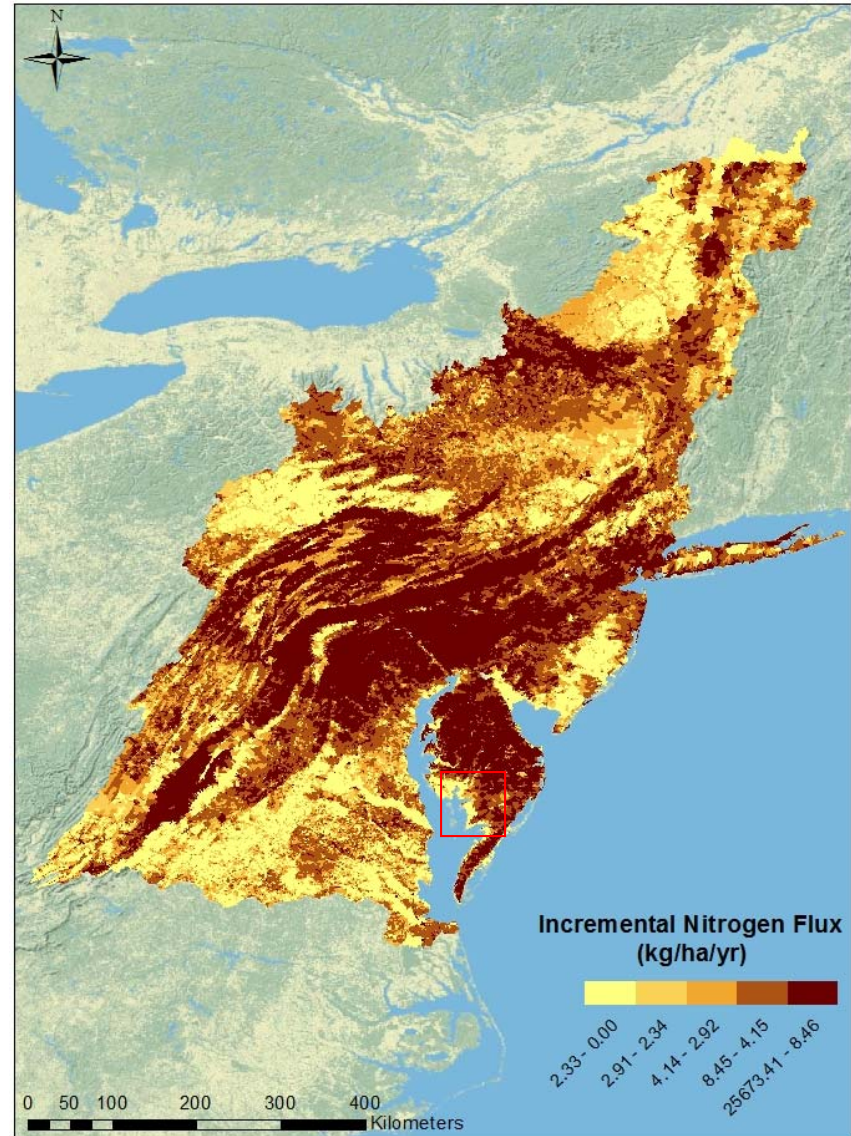
Field Scale

- Provide information for on-site investigations and installations



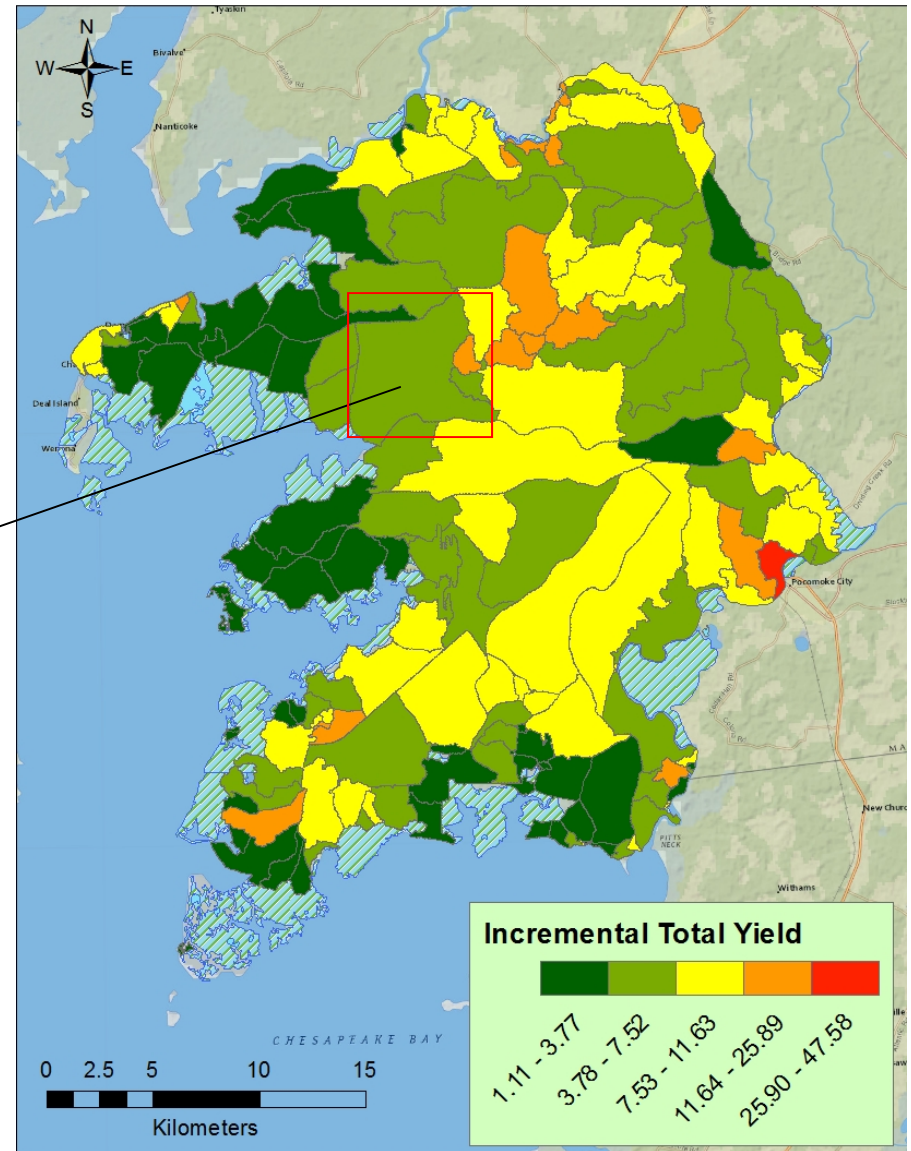
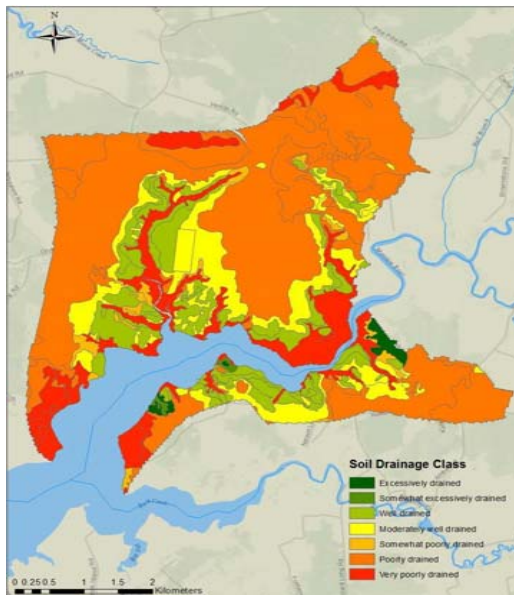
SPARROW

- SPATIALLY Referenced Regressions On Watershed attributes
- Predicts N fluxes and delivery on catchment basis



Using SPARROW at the county-scale

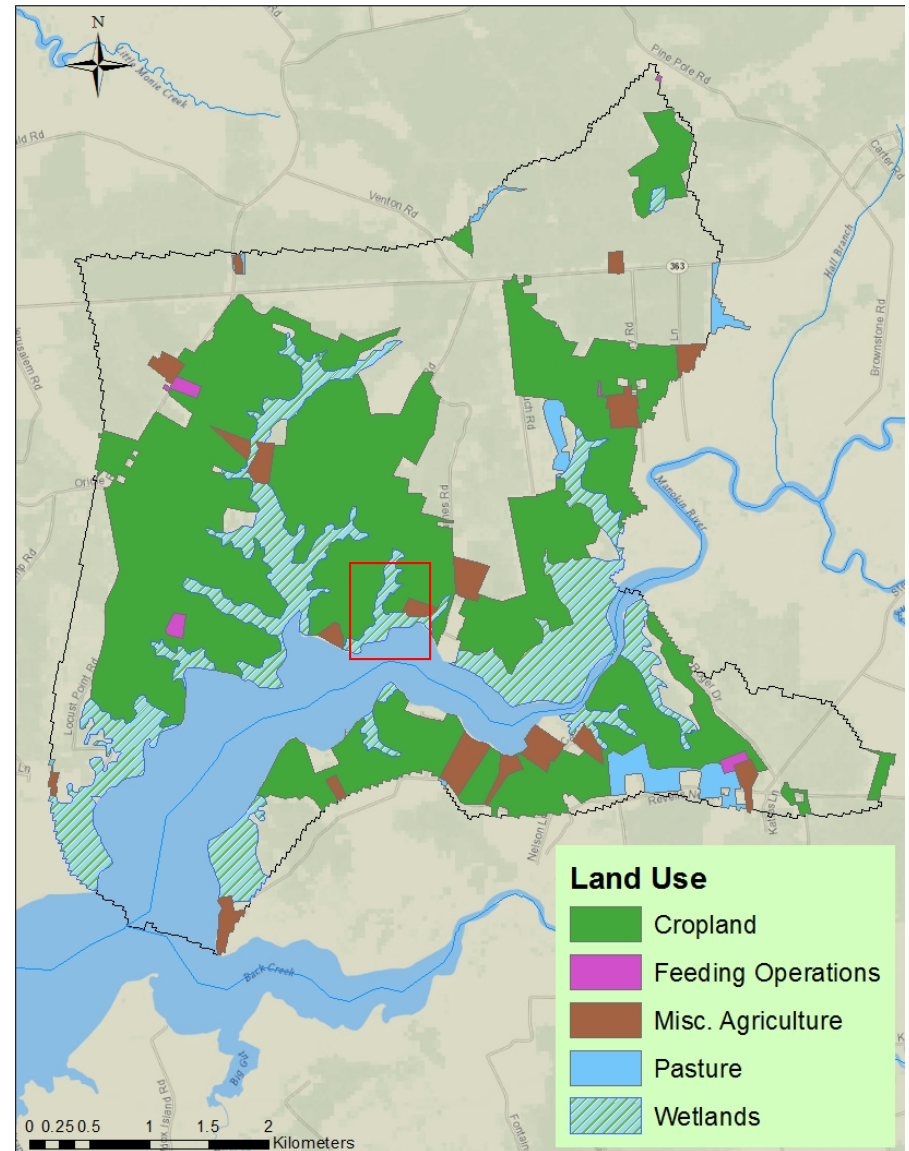
Identify catchments of interest



Land Use

Catchment Scale

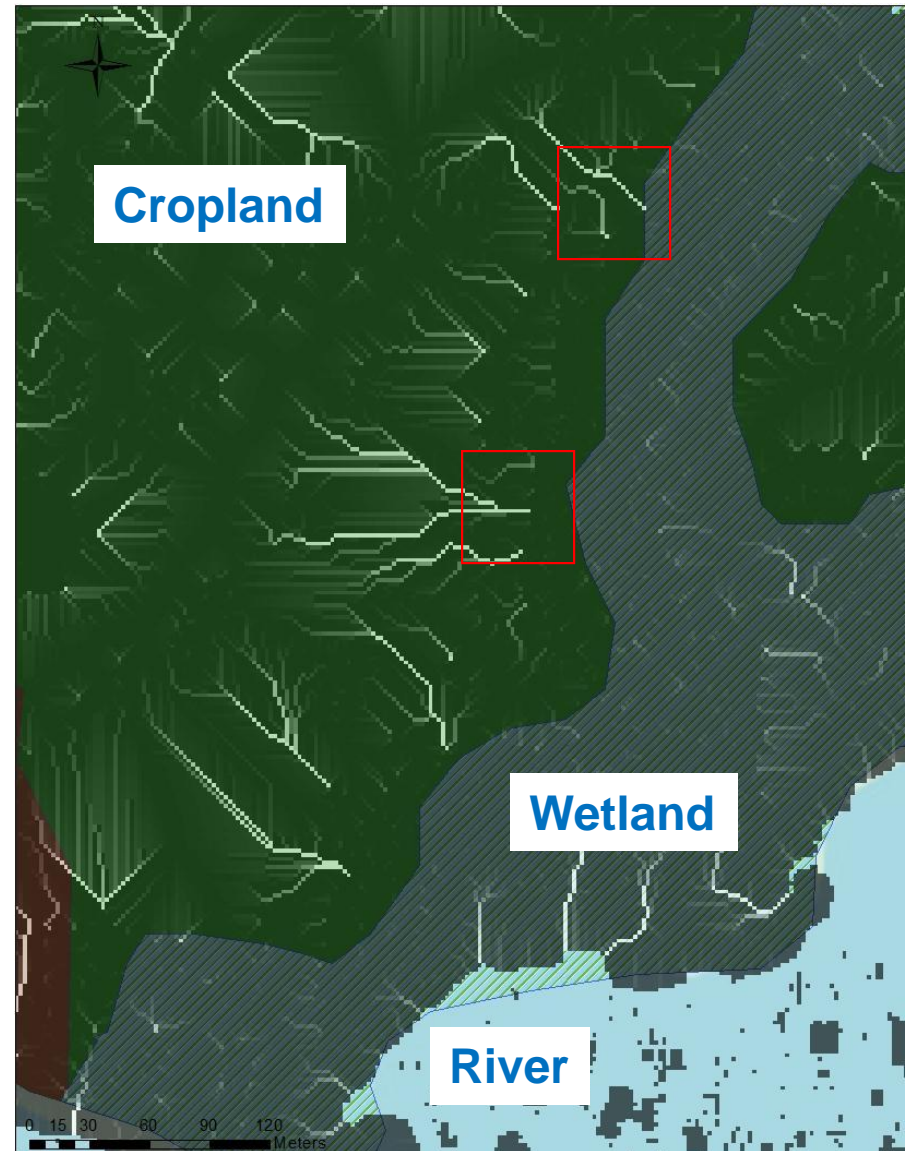
- Maryland Department of Planning Land Use Data
- Artificial nitrogen sinks would be ideally located at edge of field in cropland



Flow Accumulation

Field Scale

- Flow accumulation generated from Lidar
- White areas depict predicted flowpaths, areas that may collect runoff
- Requires field verification



Soil survey interpretations

- Develop, implement, and assess two new interpretations for the states of Maryland, Delaware, and Illinois
 - Carbon Bioreactors
 - Constructed Wetlands for Agricultural N Treatment
- NRCS collaborators: Amanda Moore (MD & DE), Gary Struben (IL)
- Primarily focusing on soil hydrologic properties

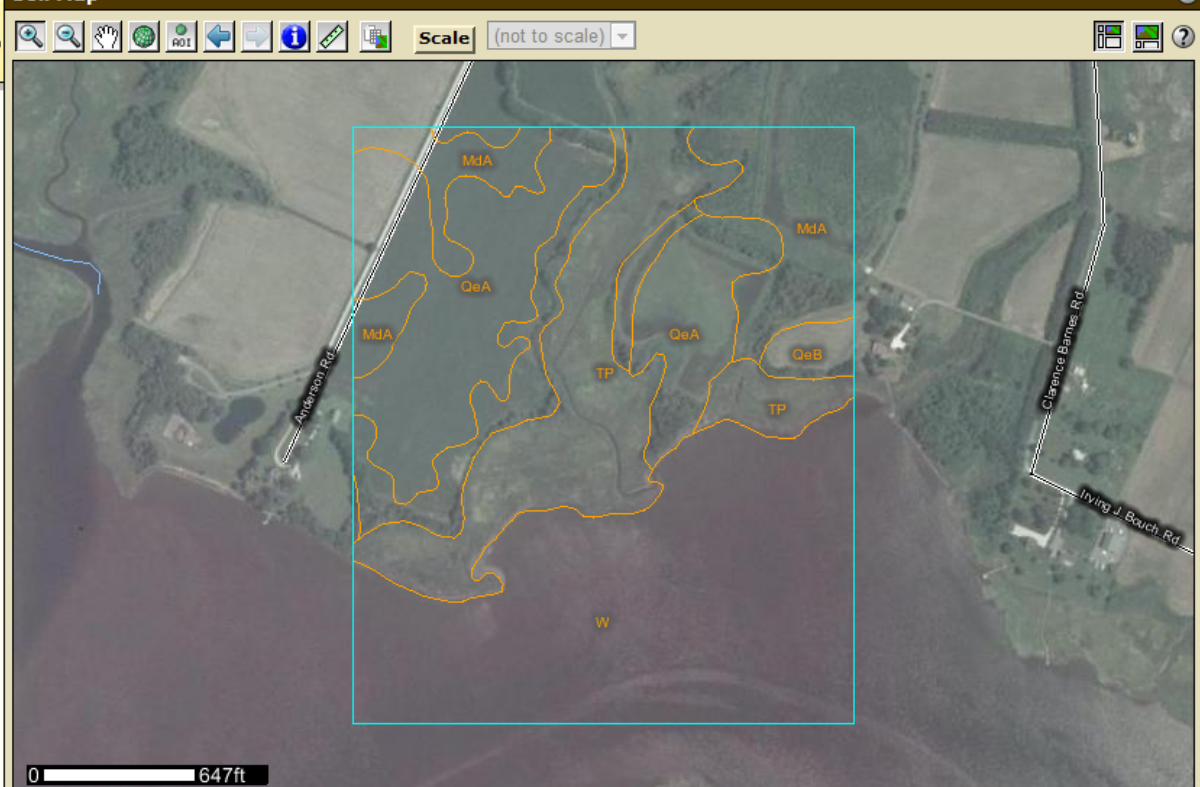
Search

Suitabilities and Limitations Ratings

Open All | Close All

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications**
- Conservation Tree and Shrub Group
- Ecological Site ID
- Ecological Site Name
- Farmland Classification
- Forage Suitability Group ID (Component Table)
- Hydric Rating by Map Unit
- Irrigated Capability Class
- Irrigated Capability Subclass
- NH Forest Soil Group
- Nonirrigated Capability Class
- Nonirrigated Capability Subclass
- Soil Taxonomy Classification
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities
- Vegetative Productivity
- Waste Management
- Water Management

Soil Map



Warning: Soil Map may not be valid at this scale.

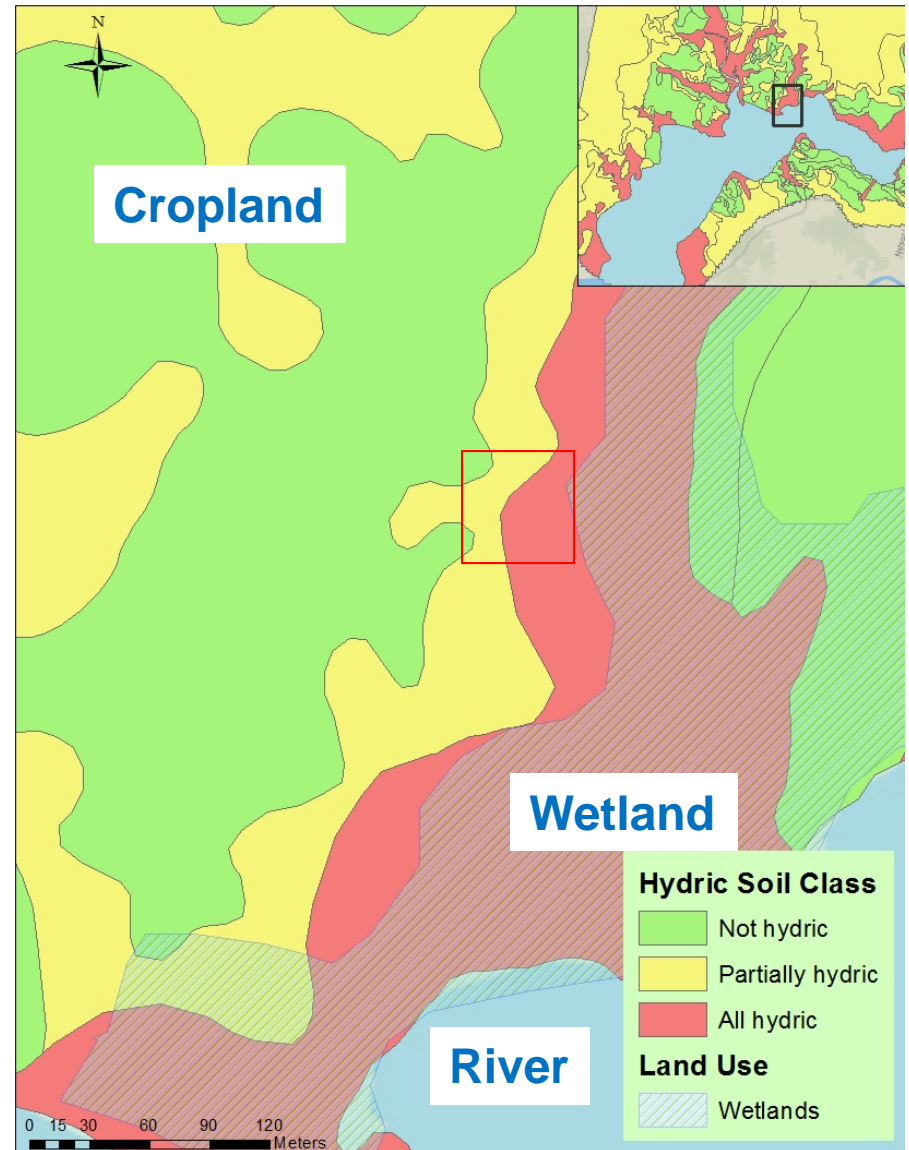
You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:12,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Hydric Soils

Field Scale

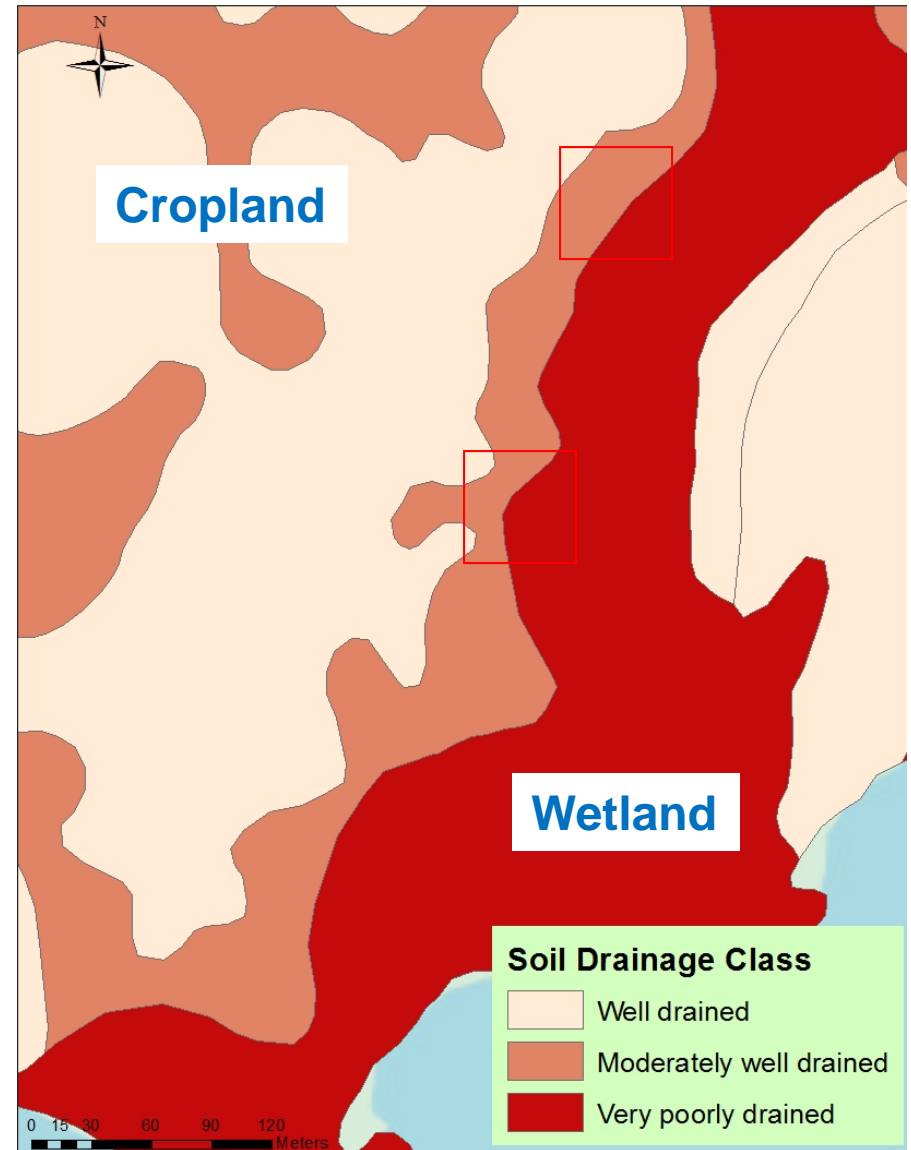
- Drained wetlands may be appropriate for wetland restoration at edge of field



Natural Soil Drainage Class

Field Scale

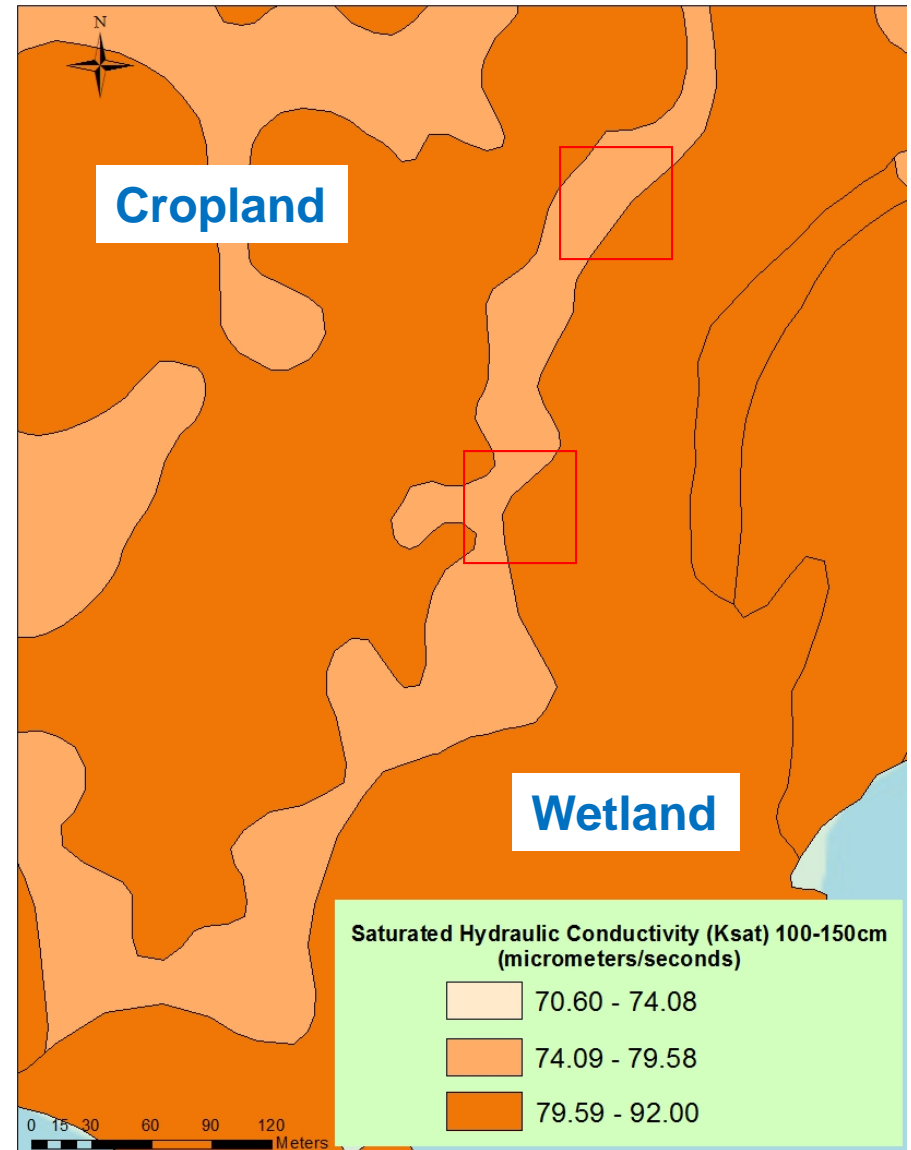
- A measure of seasonally high water table under undrained conditions
- Flow accumulation points on border of MWD and VPD soils



Saturated Hydraulic Conductivity (Ksat)

Field Scale

- Ksat may help constrain estimates of flow rate into a nitrogen sink



Additional data sets

- Climate
- Land drainage
- Cropping systems
- Surficial geology
- Watershed water quality models (such as the Chesapeake Bay Watershed model)
- Physiographic provinces

Acknowledgements

- Data Sources
 - Maryland Department of Planning (Land Use Data)
 - USGS (SPARROW) (Brian Milstead, EPA)
 - Horizon Systems Corporation (NHDPlus)
 - USDA (SSURGO Soils Data)
 - NOAA Digital Coast (LiDAR)
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