Using Geographic Information Systems to Target Priorities for Forest Restoration and Conservation

Maryland DNR Forest Service
Presentation to the
Chesapeake Bay Program
Forestry Work Group Meeting

November 18, 2008

Objectives of the Analysis

- Develop a scientifically based scheme that can be used to identify areas in the Bay watershed for better riparian forest buffer placement with an expectation of full performance.

In Short…

- Provide a local level analysis that county/township officials can use to prioritize forest conservation and restoration activities.

- Use “off the shelf” data that is readily available and easily downloaded.

Matrix Development

- Original Matrix provided by Judy Okay was based on Ferraro (2001) and FWG Technical Team (2004) Targeting Matrices.
- New matrix was developed to reduce redundancy in the data while still providing a relevant, scientifically based analysis.

Matrix

Attribute	*Component*	***4 - High***	***3- Med High***	***2 - Med Low***	***1 - Low***	***0 - N/A or Poor***	***Weight***
Hydrology (depth to water table)	SSURGO *Depth to Water Table from SSURGO Soils*	within 1 meter	within 2 meters	N/A	N/A	>2 meters	**10**
Slope	SSURGO and/or SPARROW *Greater than or equal to 15% slope* *Used MD LiDAR Coverage for Anne Arundel County*	Greater than or equal to 15% slope	N/A	N/A	N/A	All other slopes	**8**
Land use	RLA/RESAC land cover *RESAC 2000*	Urban/Resident/Rec. Barren, pasture/hay, croplands, "natural" grass	Developed	Extractive or wetlands	forest or wooded wetland	impervious surface or open water	**6**
Source Nutrient Loading	SPARROW *Total delivered yield of Nitrogen (mg/L?)*	15+	10 to 15	5 to 10	1 to 5	0 to 1	**4**

Model Processing

Input Layer

1.2	2.6	2.3
2	0.3	1.1
4.3	0.7	0.1
4.1	4.9	0.8

10 Meters

Layer Weight

Total Model Weight

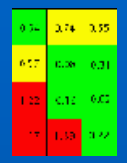
For Example: Slopes

Layer Weight (8)

Total Model Weight (28)

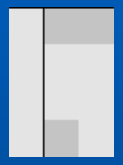
Weighted Layer Multiplier = 0.285714

X 0.285714



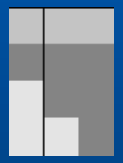
Slopes

+



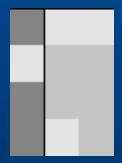
Landuse

+



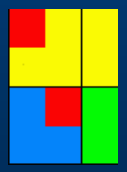
Depth to Water Table

+

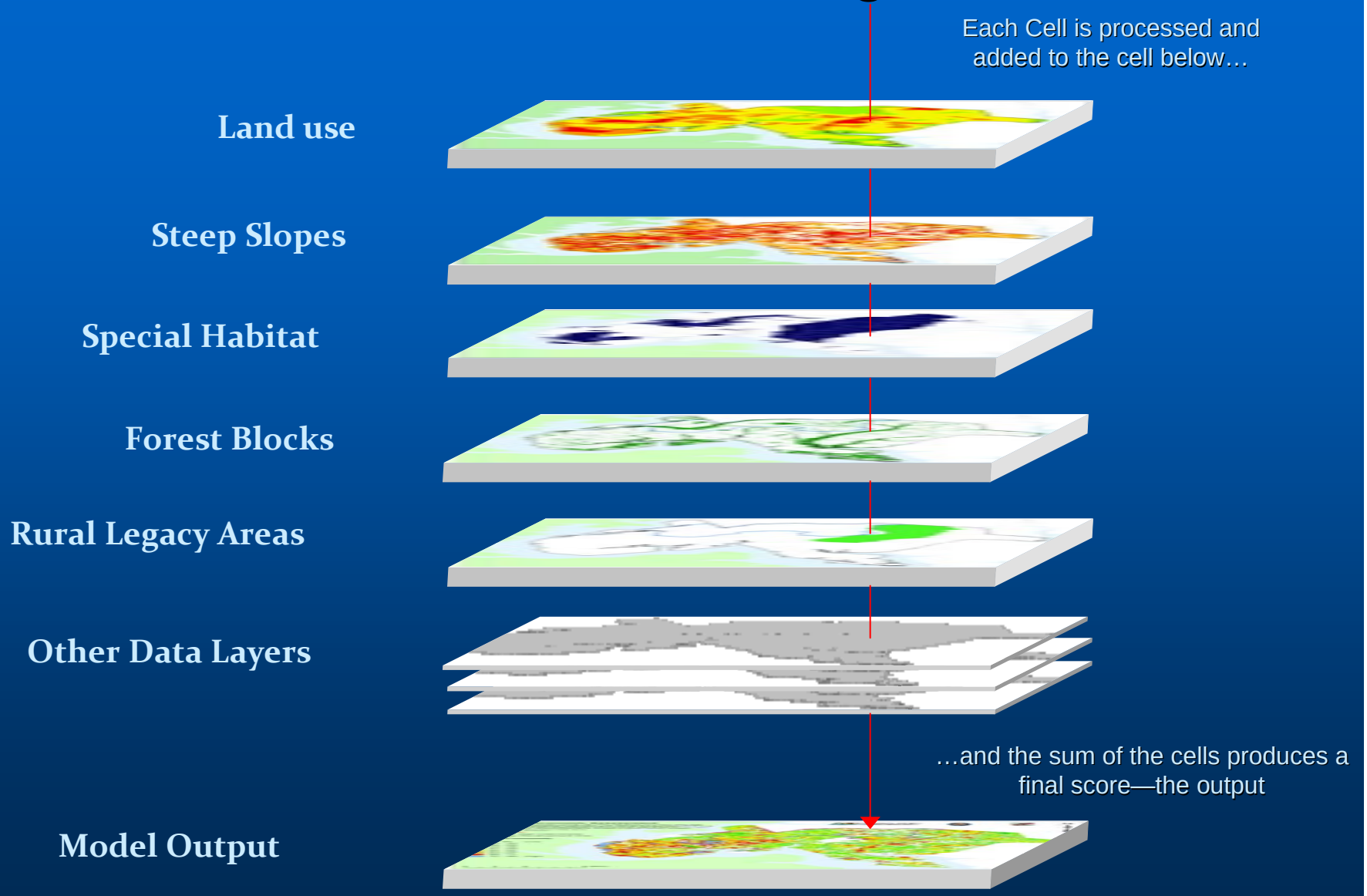


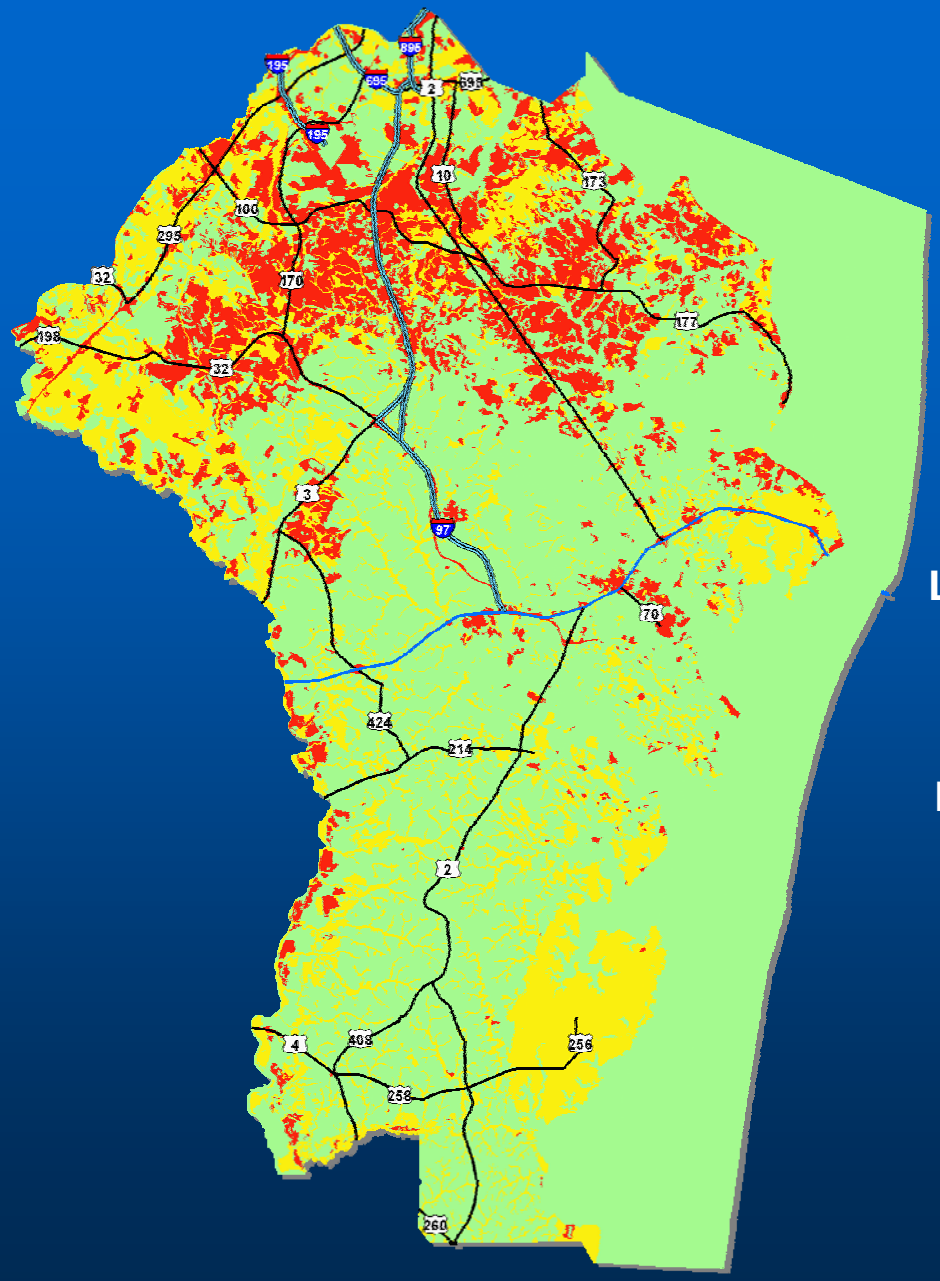
SPARROW

Model Output Layer



Model Processing

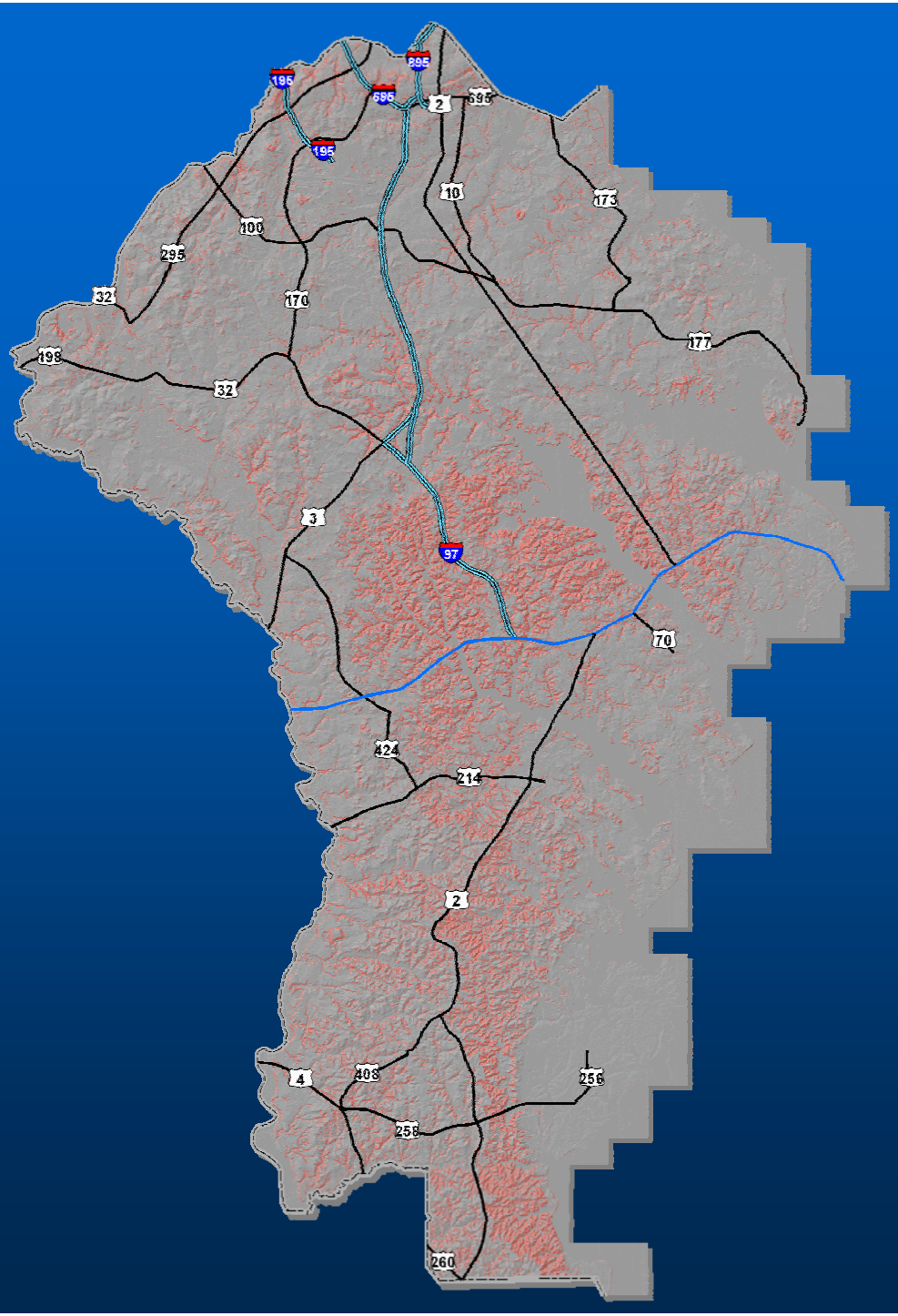




Depth to Water Table

From NRCS Soil Survey

Least Favorable		**> 2 Meters**
		1 to 2 Meters
Most Favorable		**< 1 Meter**

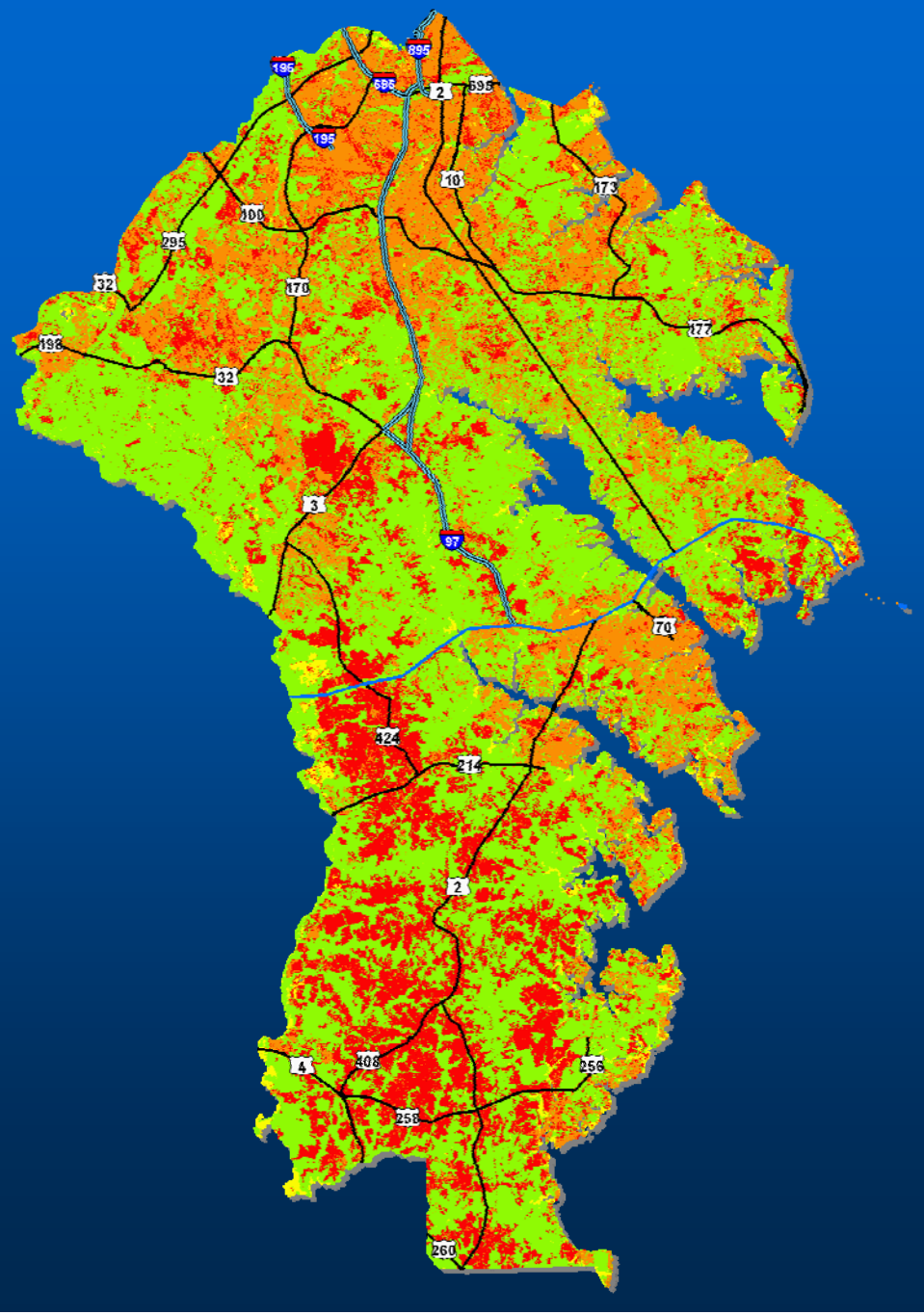


Steep Slopes

From LiDAR Data for Anne Arundel County

Less Priority **< 15 % Grades**

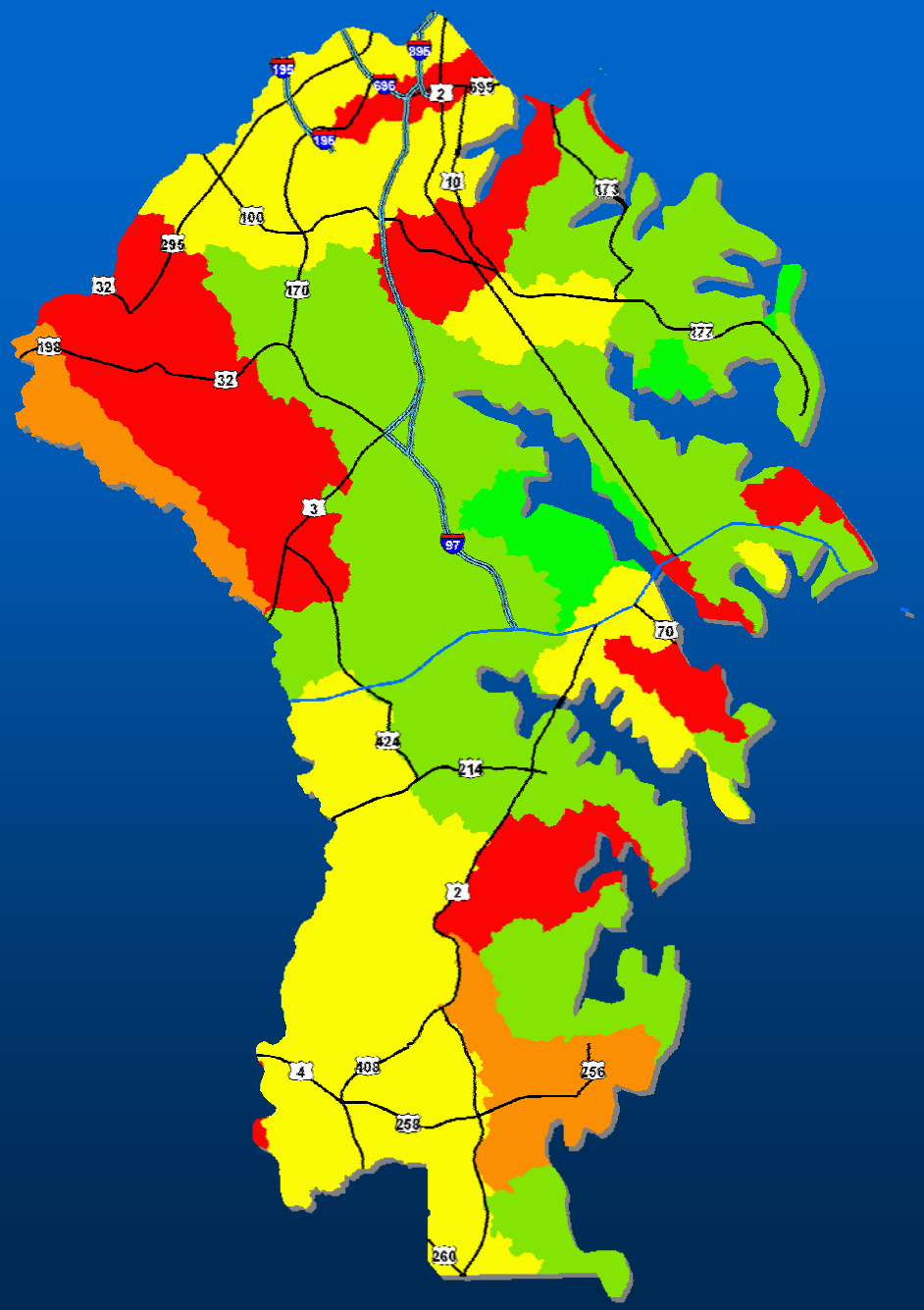
Most Priority **> 15 % Grades**



Land Use

From Maryland RESAC Data

1		**Least Favorable**
2		
3		
4		**Most Favorable**

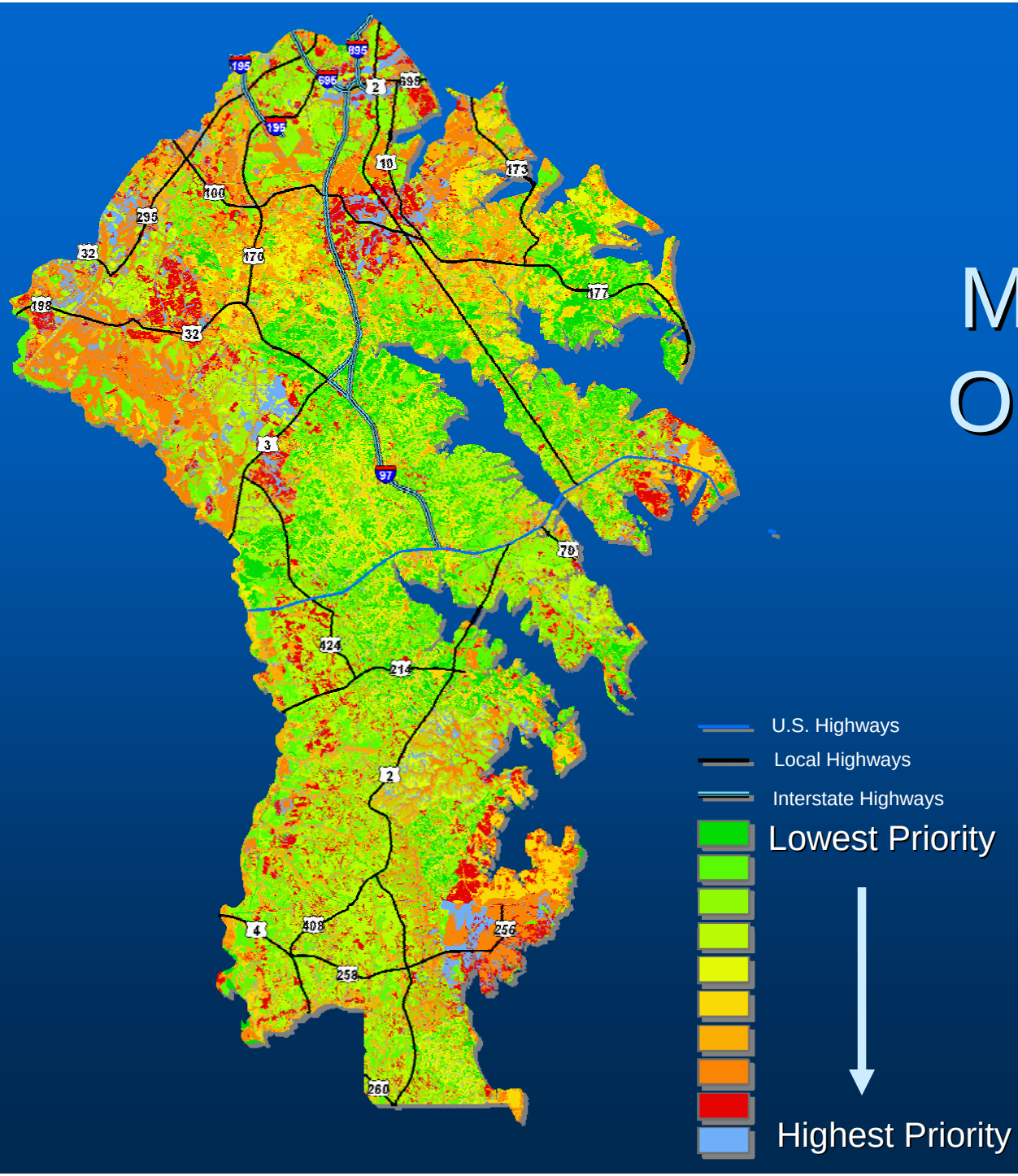


USGS SPARROW Model Outputs

Based on Total Delivered Nitrogen (mg/L)

1		**Least Favorable**
2		
3		
4		**Most Favorable**

Model Output



Charles County

Strategic Forest Lands Assessment for Forest Conservation and Restoration

Ted Weber – MD DNR

Charles County Objectives

- Create a Polygon shapefile for the Mattawoman Stream Valley.
- Update/create a new Resource Protection Zone (RPZ) Polygon shapefile.
- Perform a Strategic Forest Land Assessment style analysis on Charles County Forests.
  - Utilized County GIS Data whenever possible.

Objectives of the Analysis

Provide Charles County Planners with Models to:

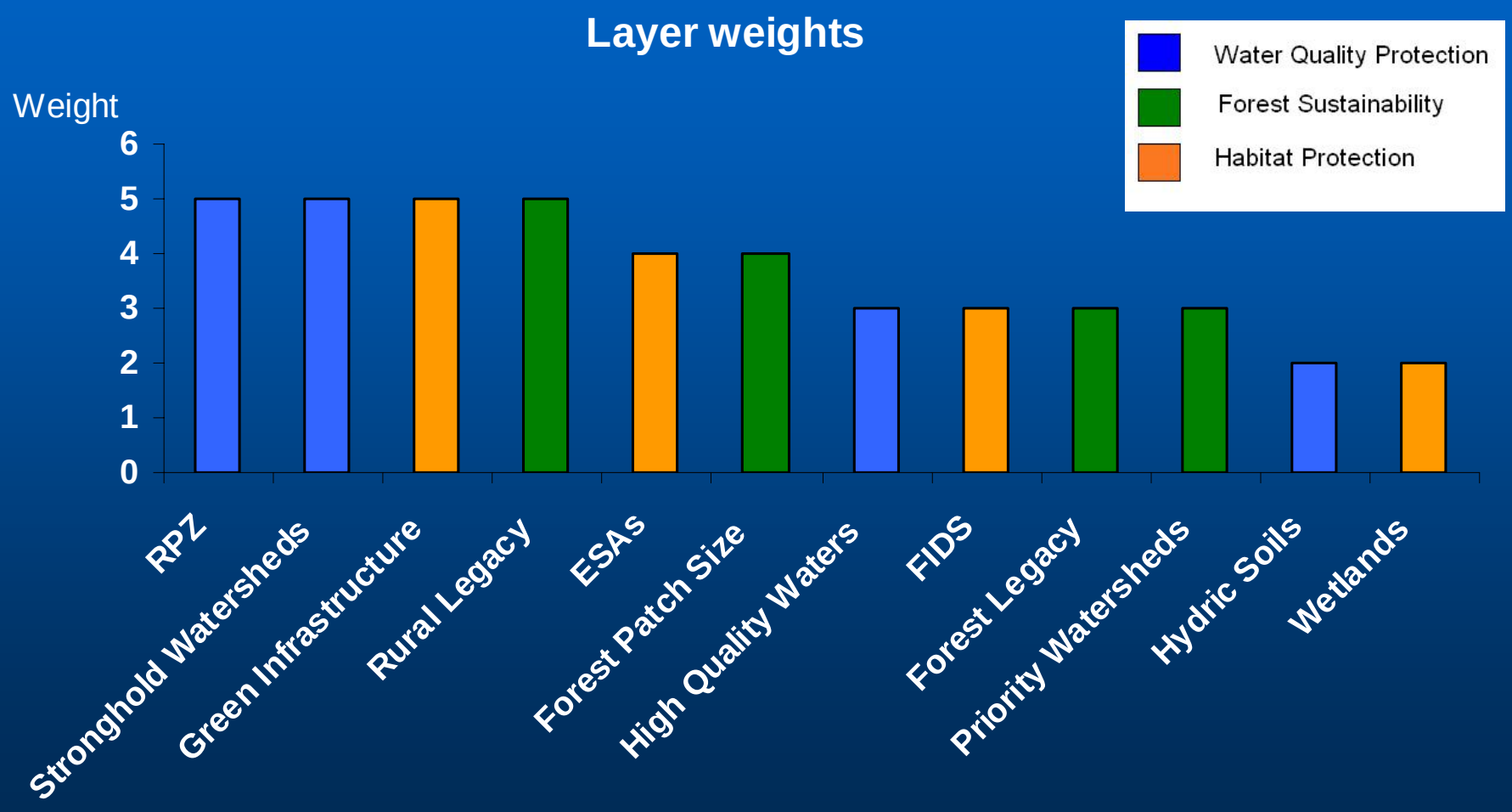
- Assist planners with siting development as it relates to Maryland's Forest Conservation Act (FCA).
- Protect and enhance areas within the Critical Area.
- Identify forest that is critical to water quality and areas that could benefit water quality if converted to forest.
- Identify areas to acquire to meet 50% Open Space goal.
- Identify critical forest within the Port Tobacco Watershed for the Watershed Restoration Action Strategy (WRAS).

Conservation of Forest

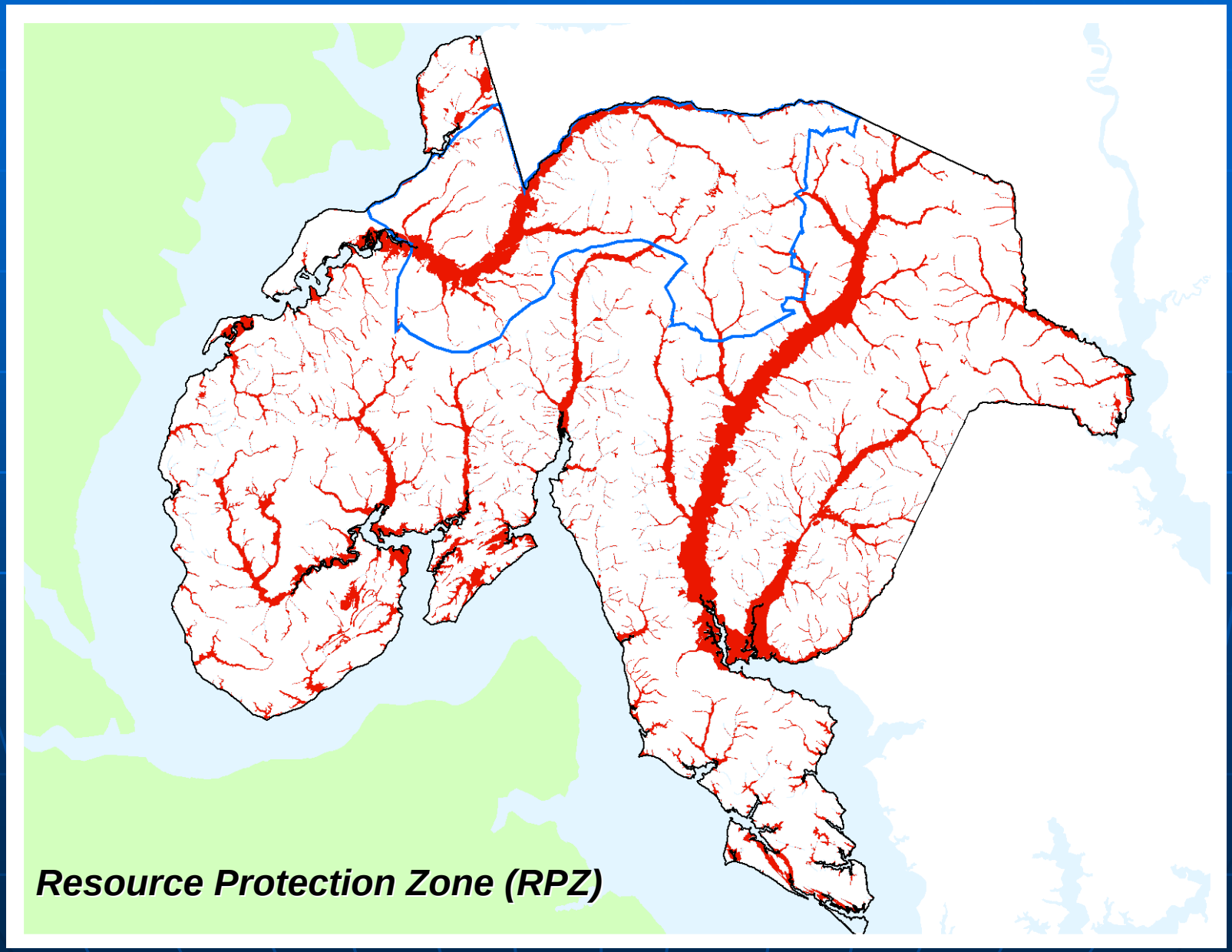
For

Forest Conservation Act (FCA): Restoration/Mitigation Potential

Forest Conservation Act: Conservation



Forest Conservation Act: Conservation



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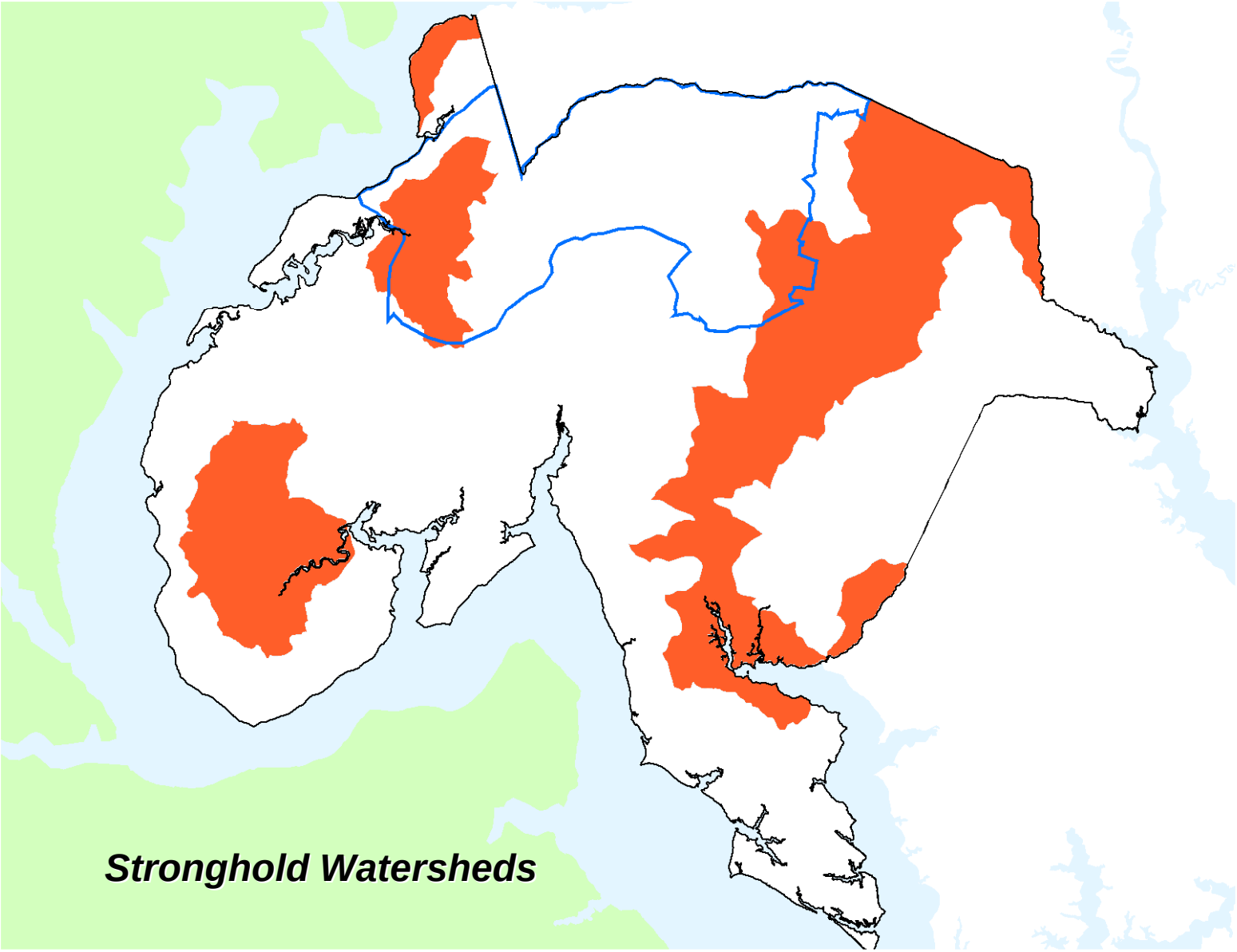

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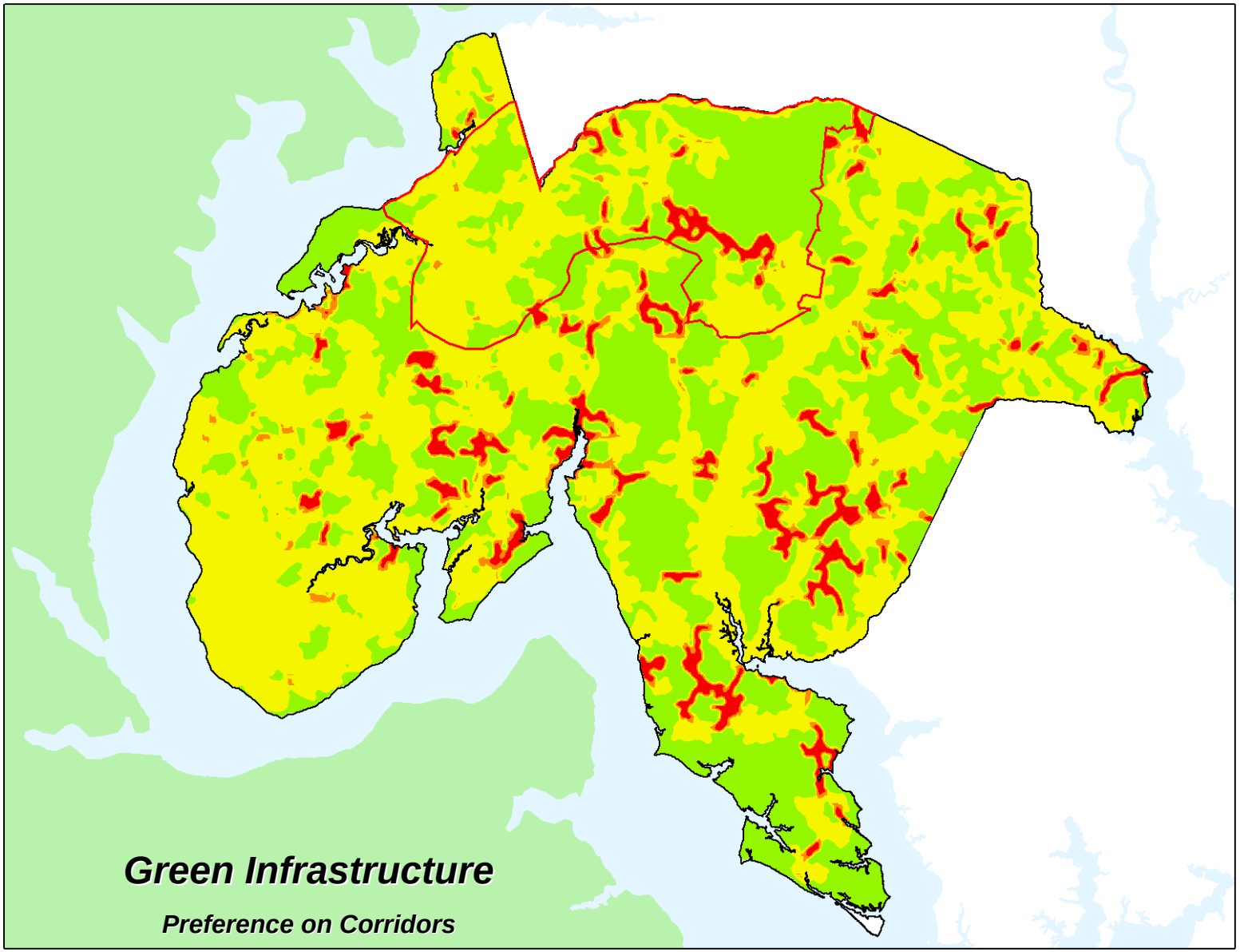

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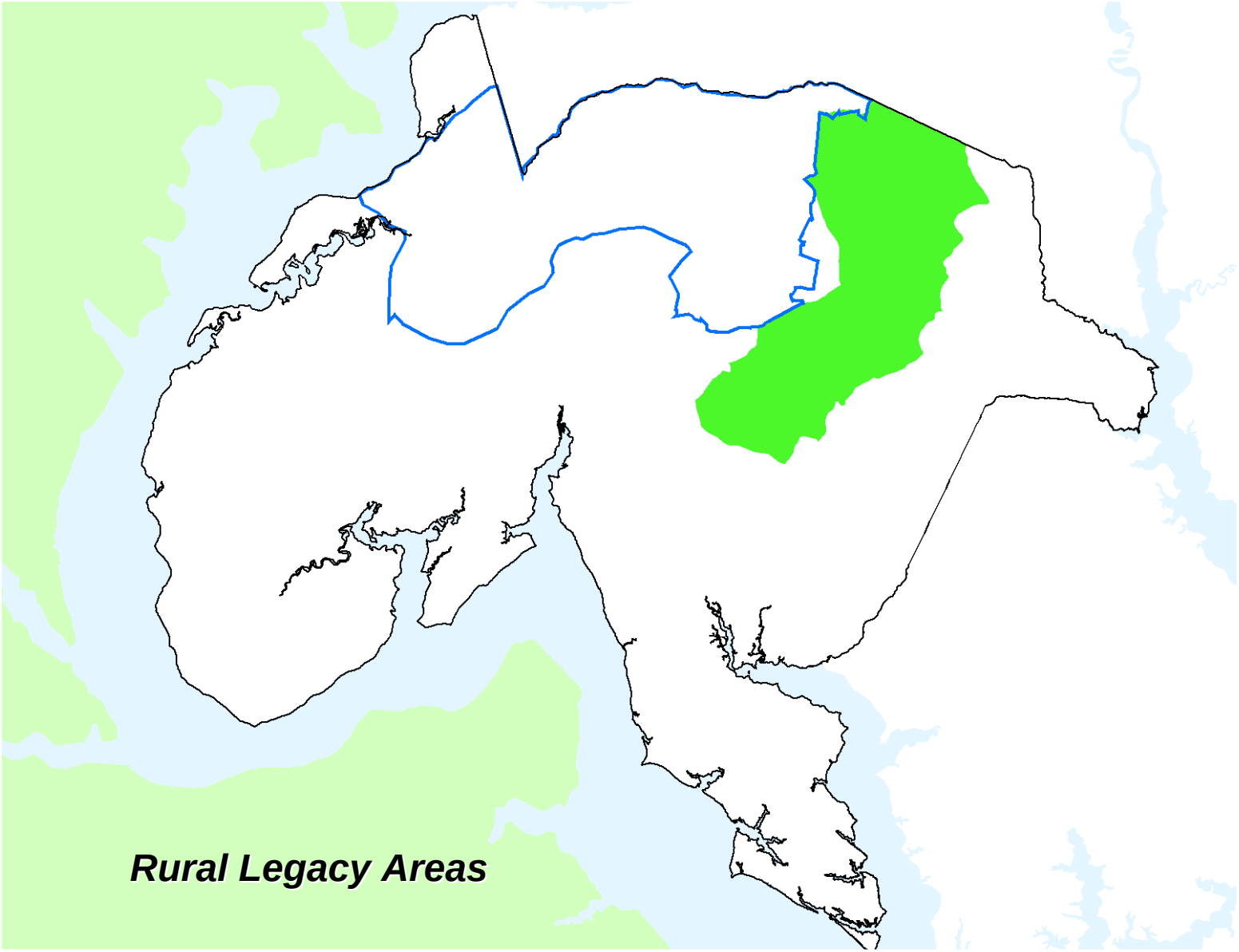

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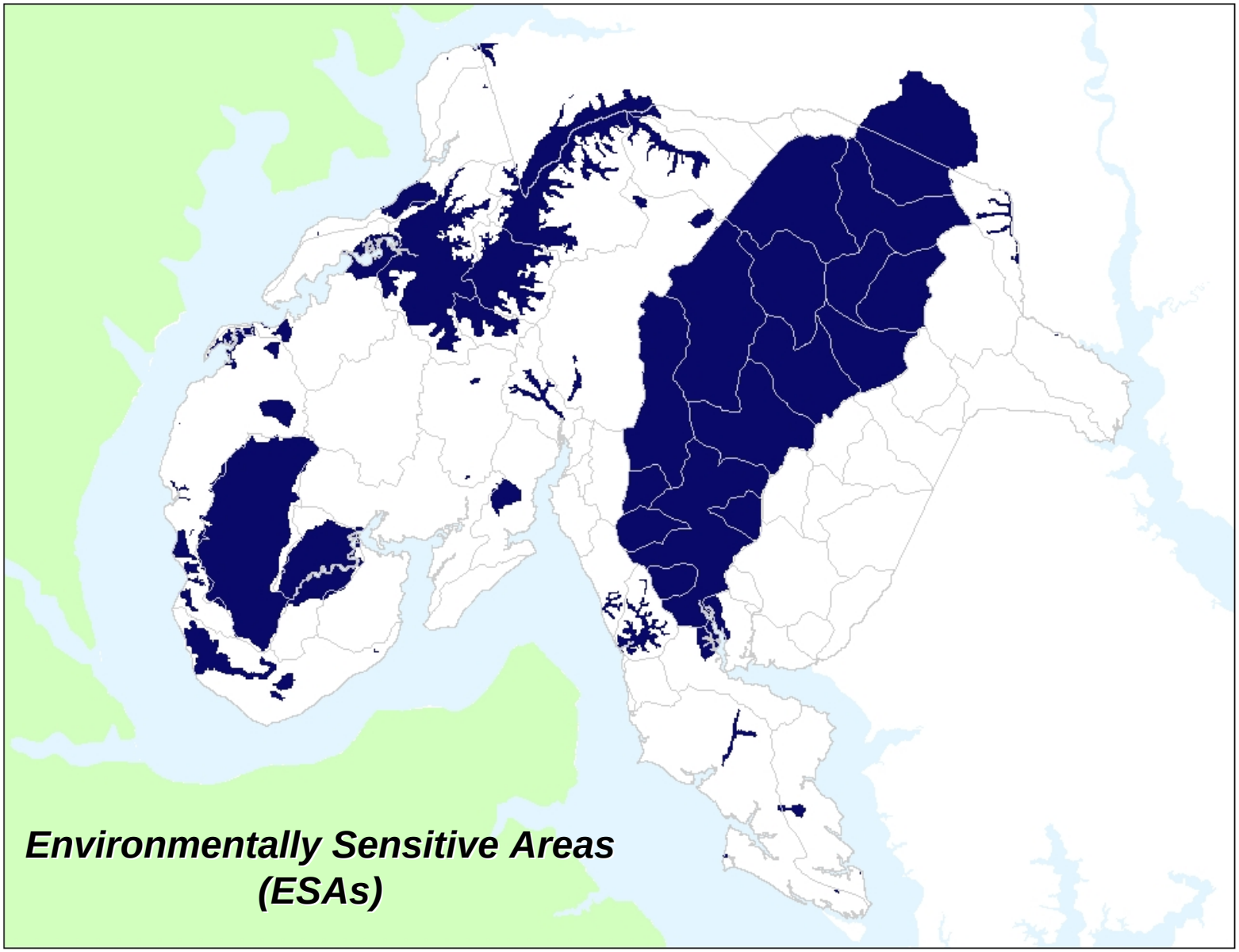

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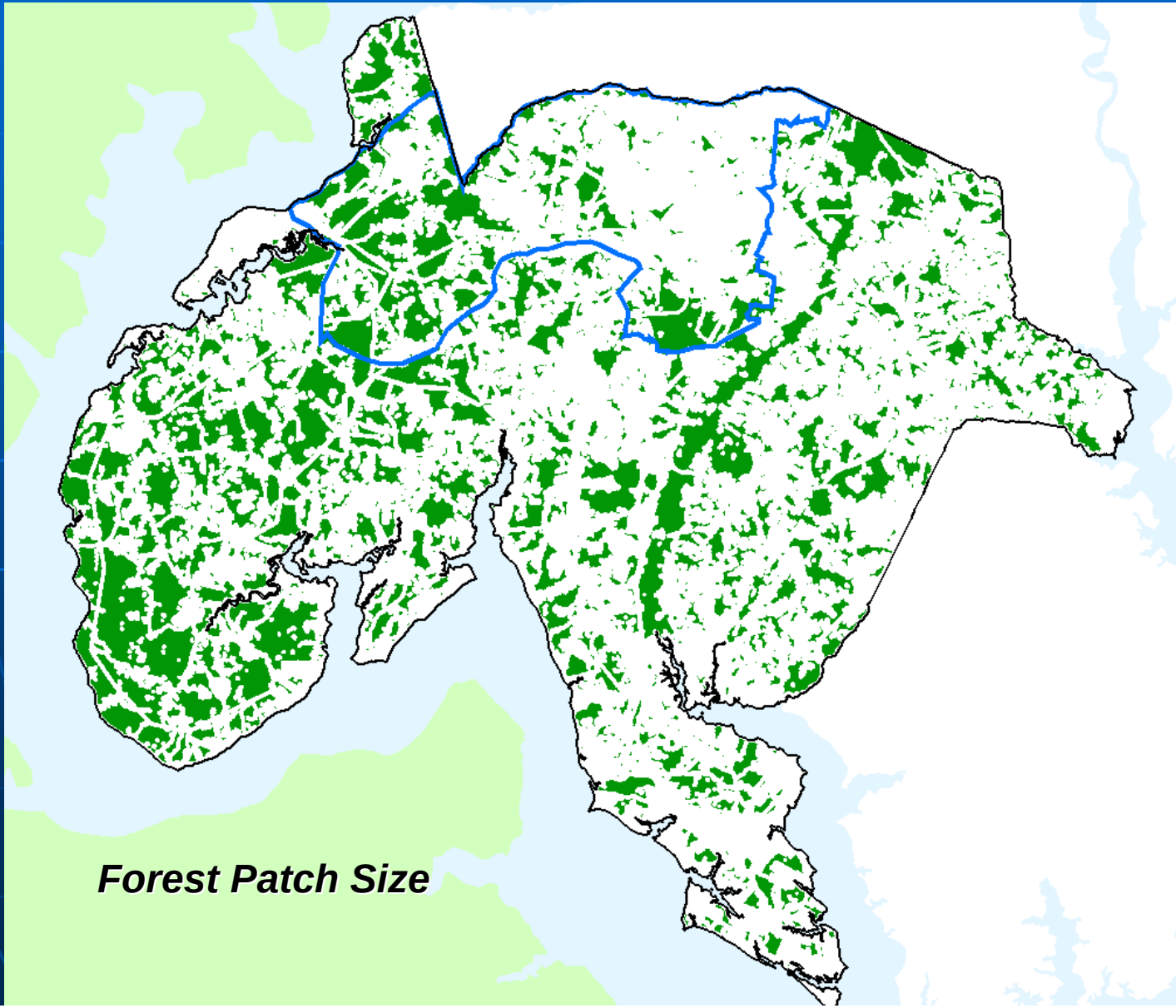

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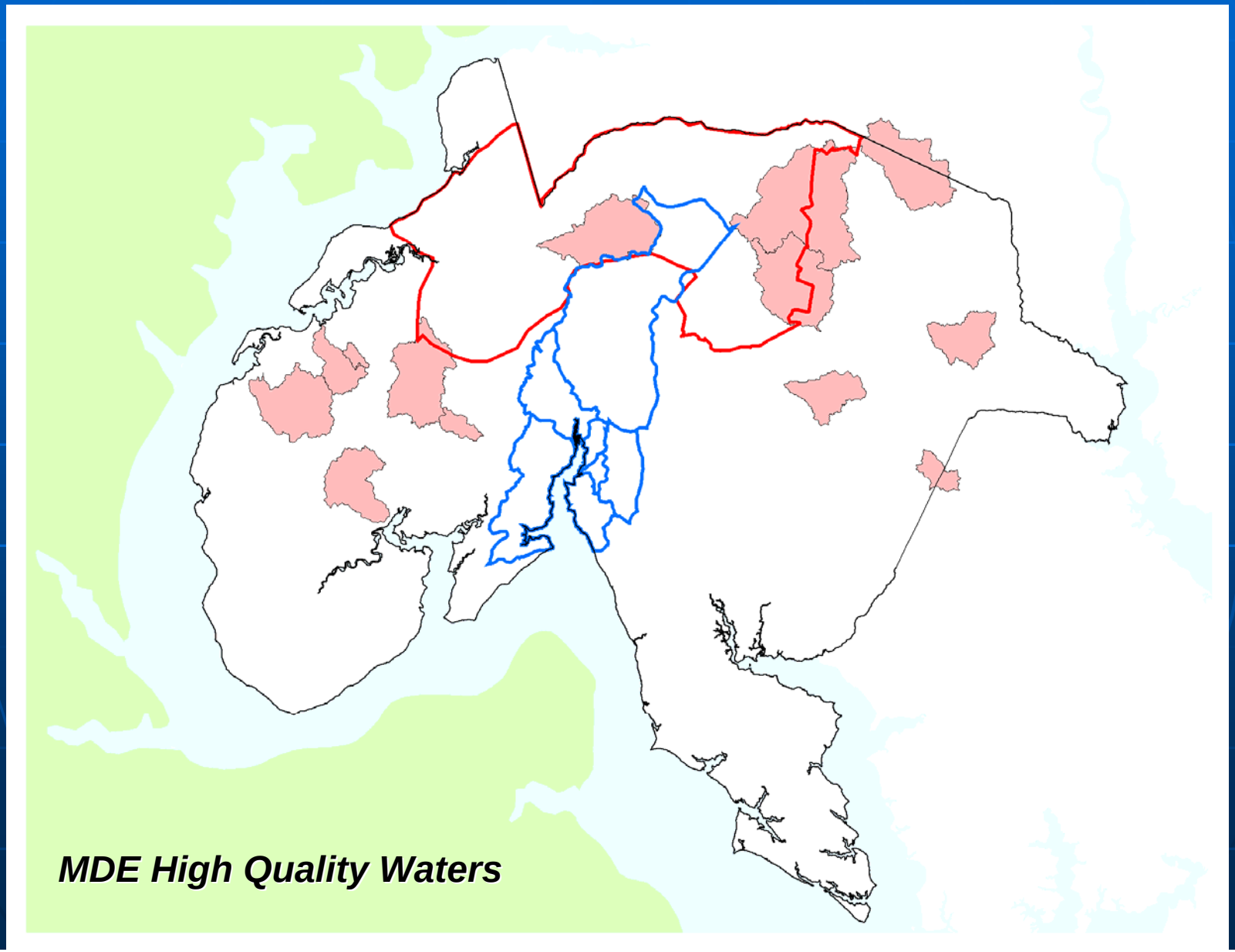

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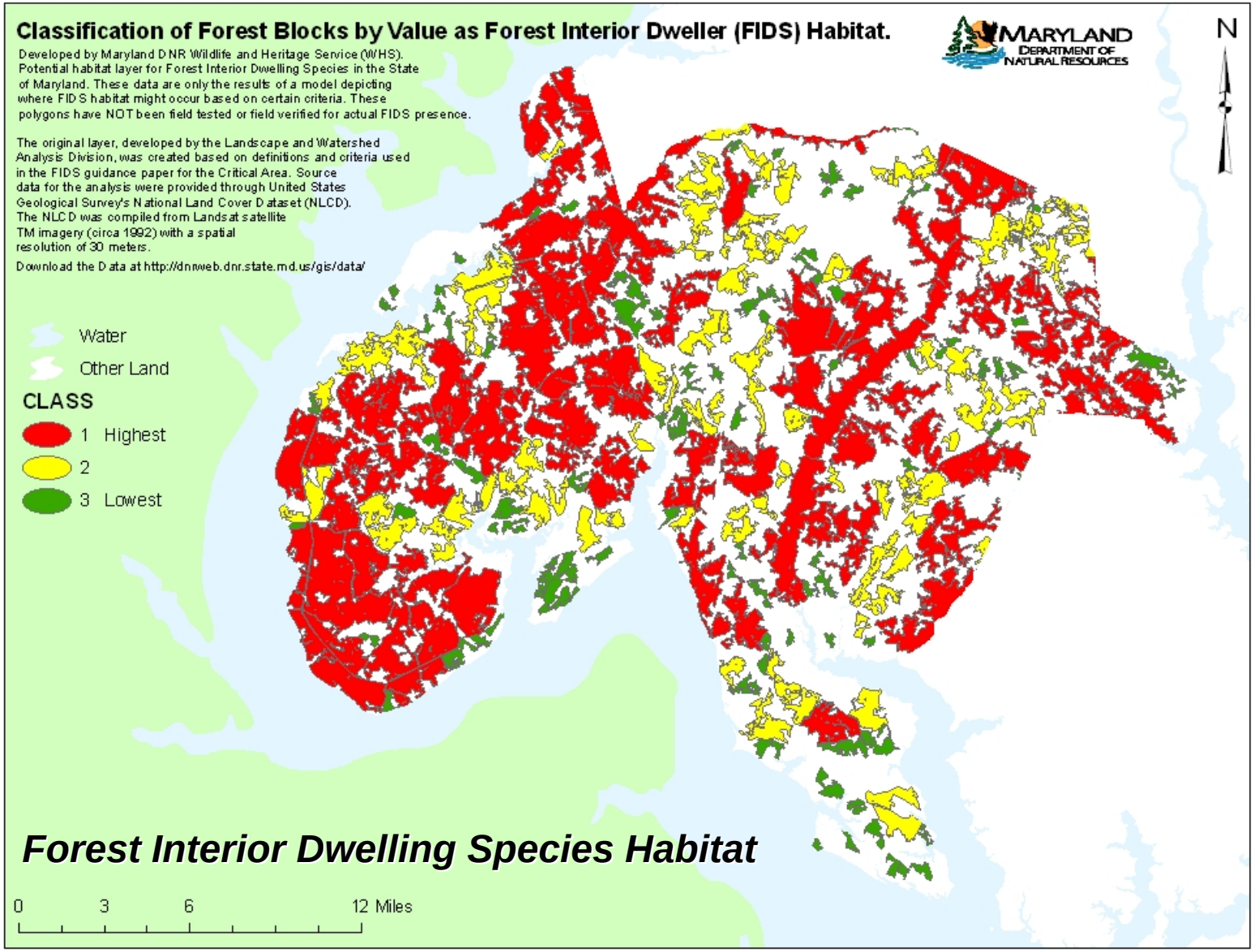

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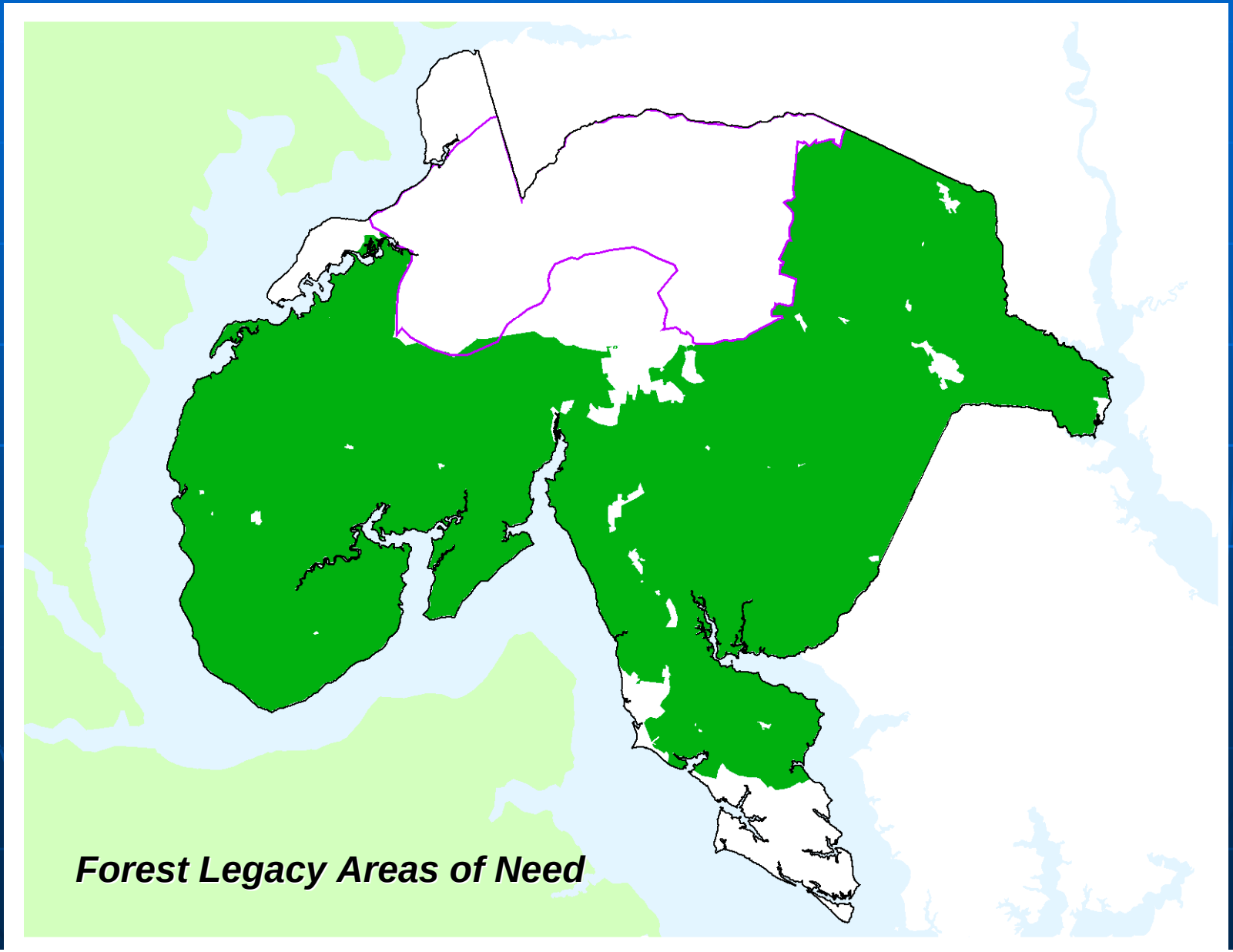

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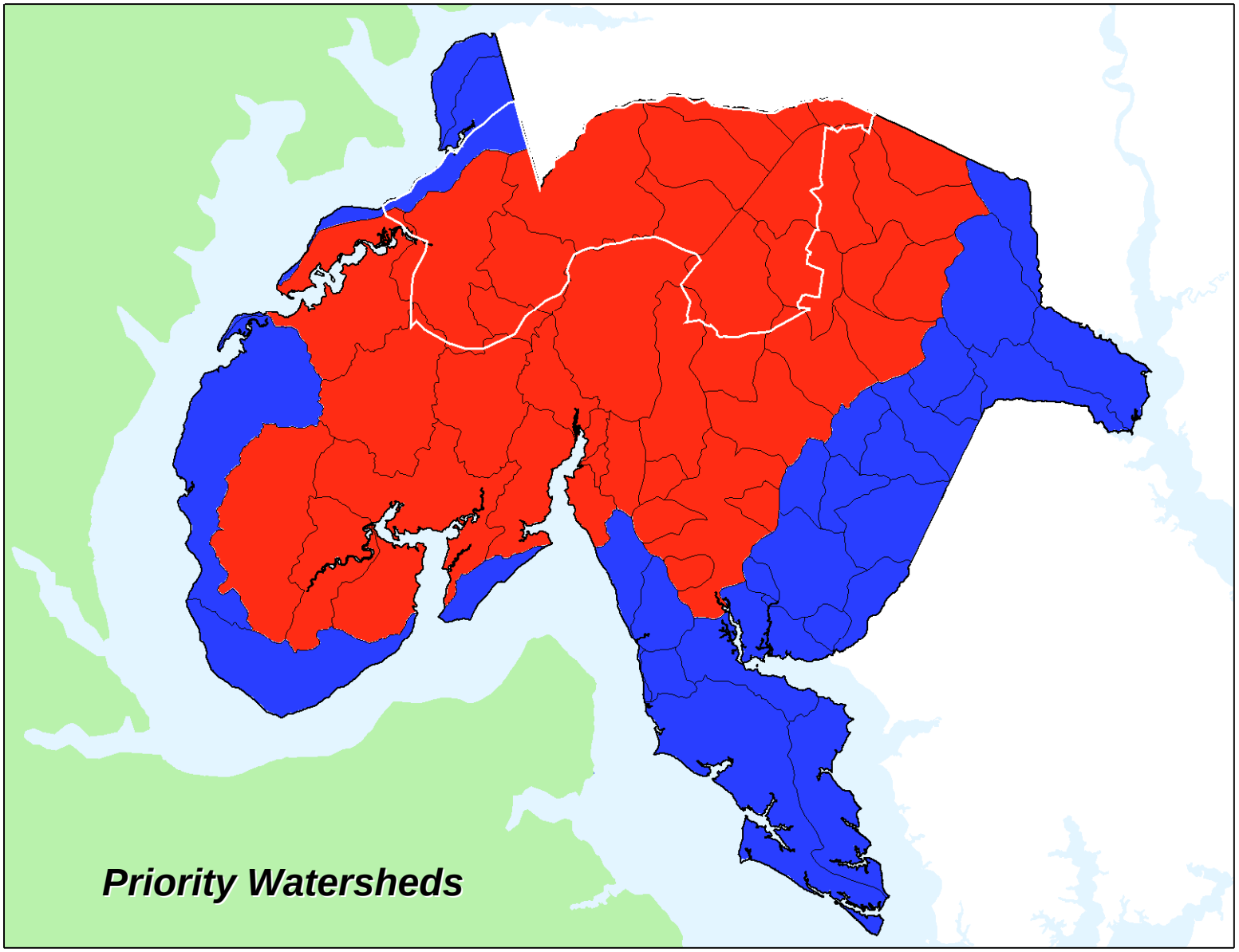

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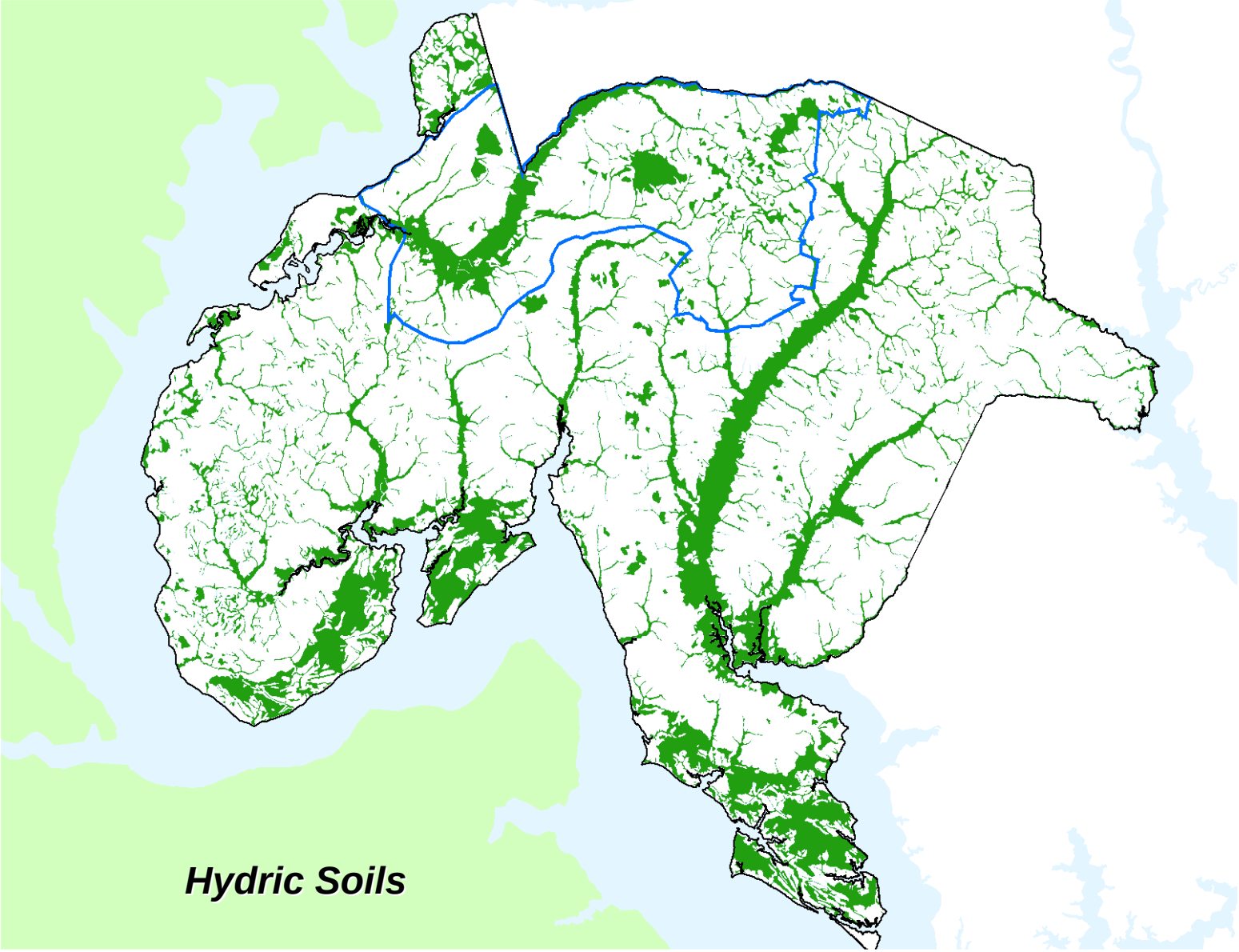

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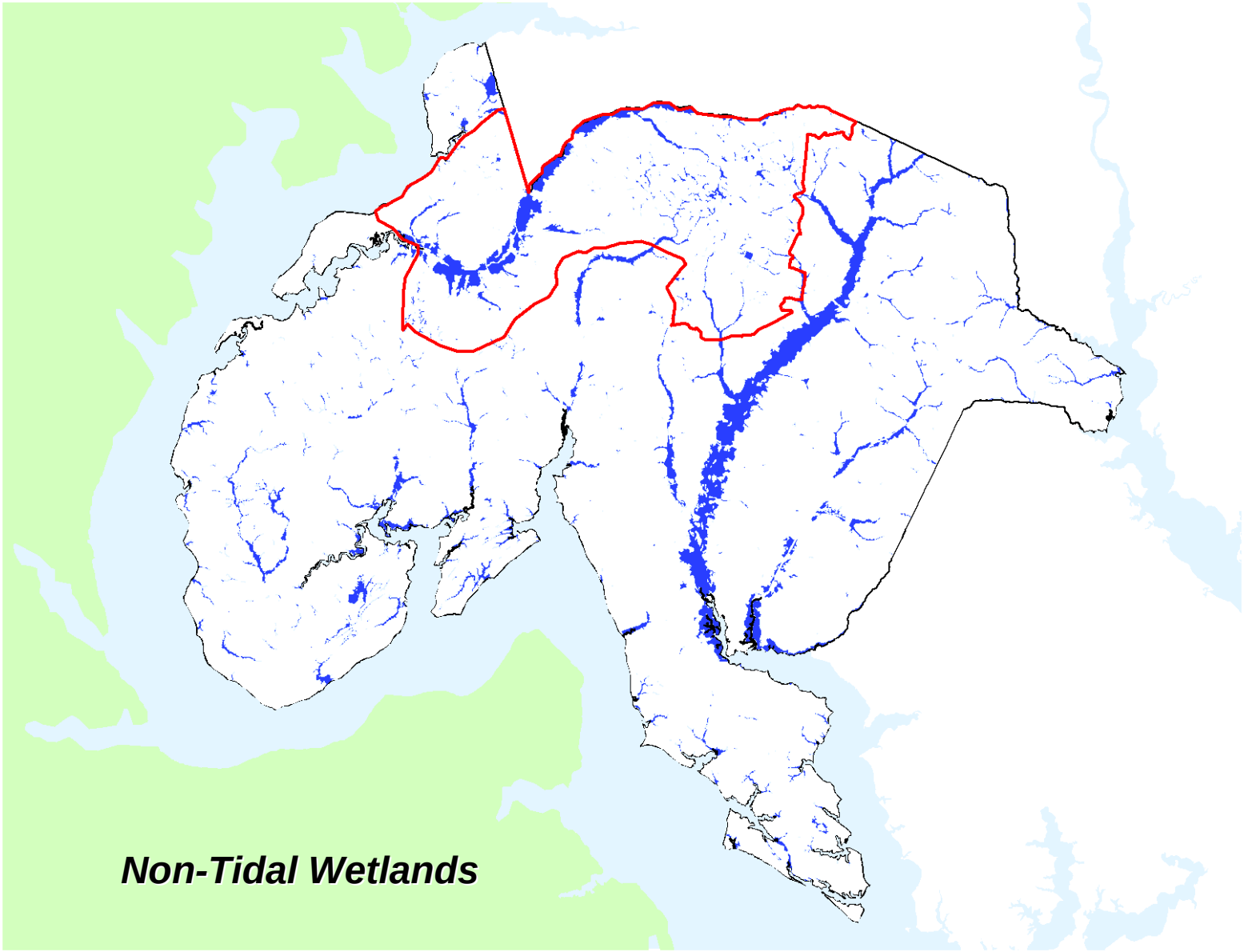

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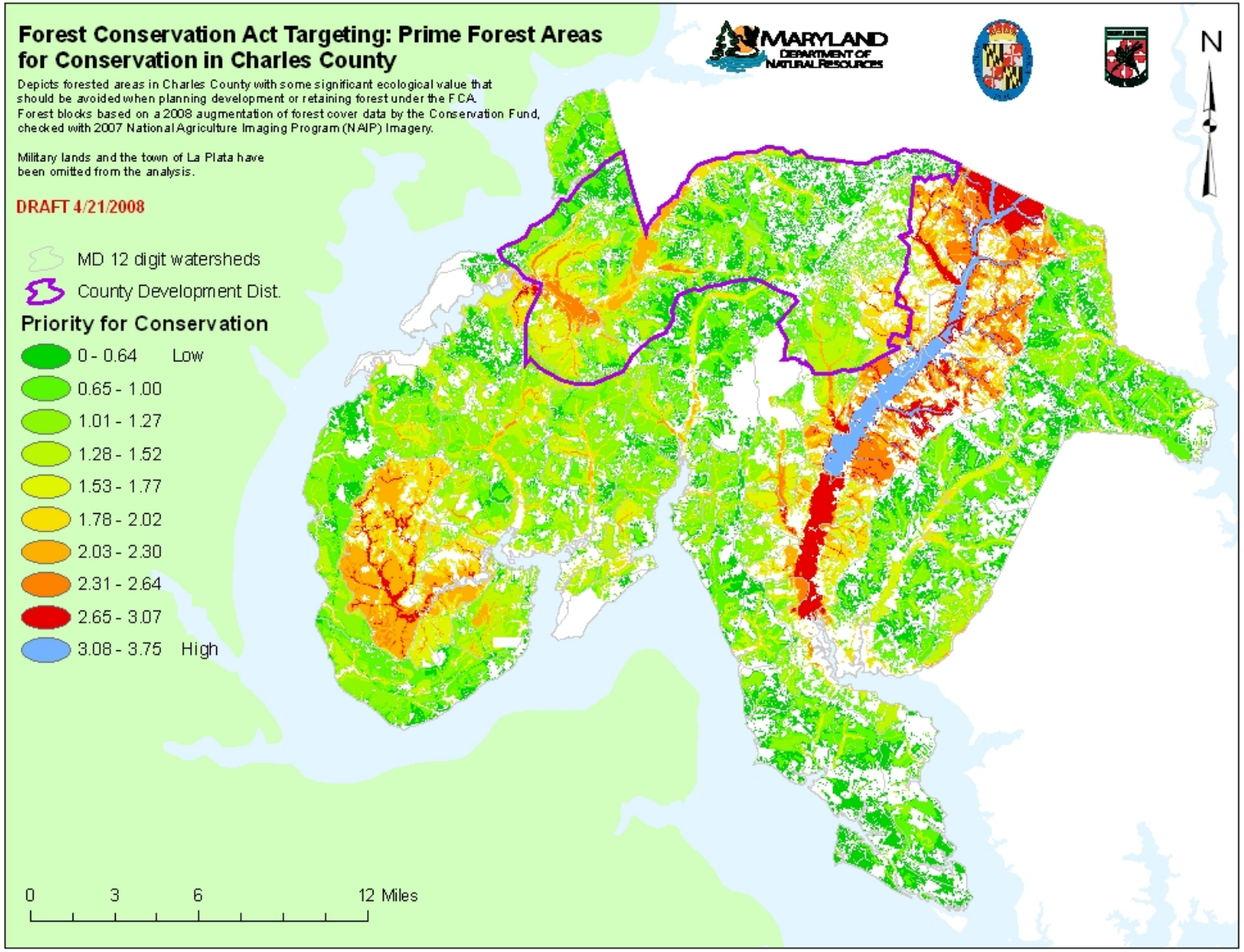
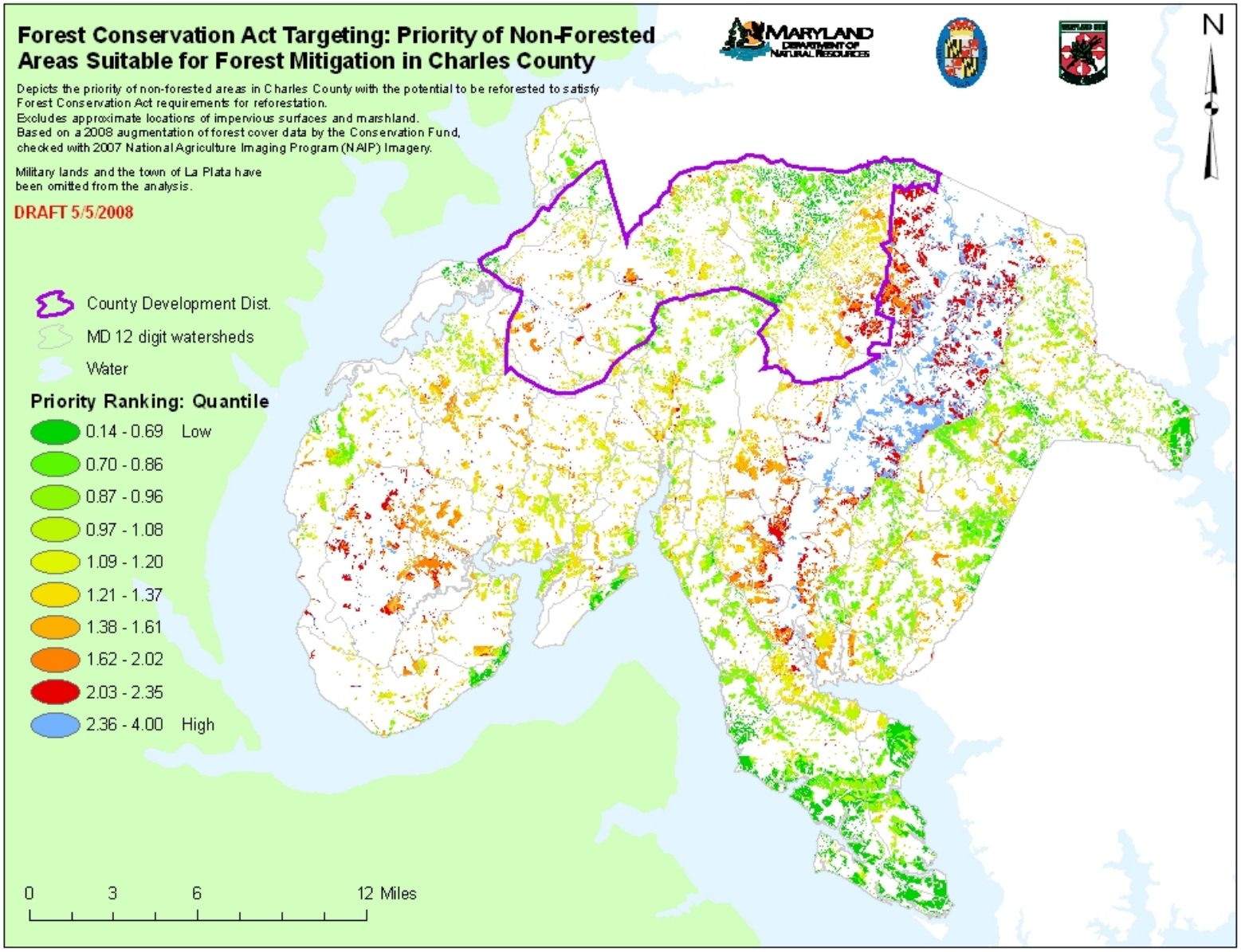


Forest Conservation Act: Restoration Model



Questions?