

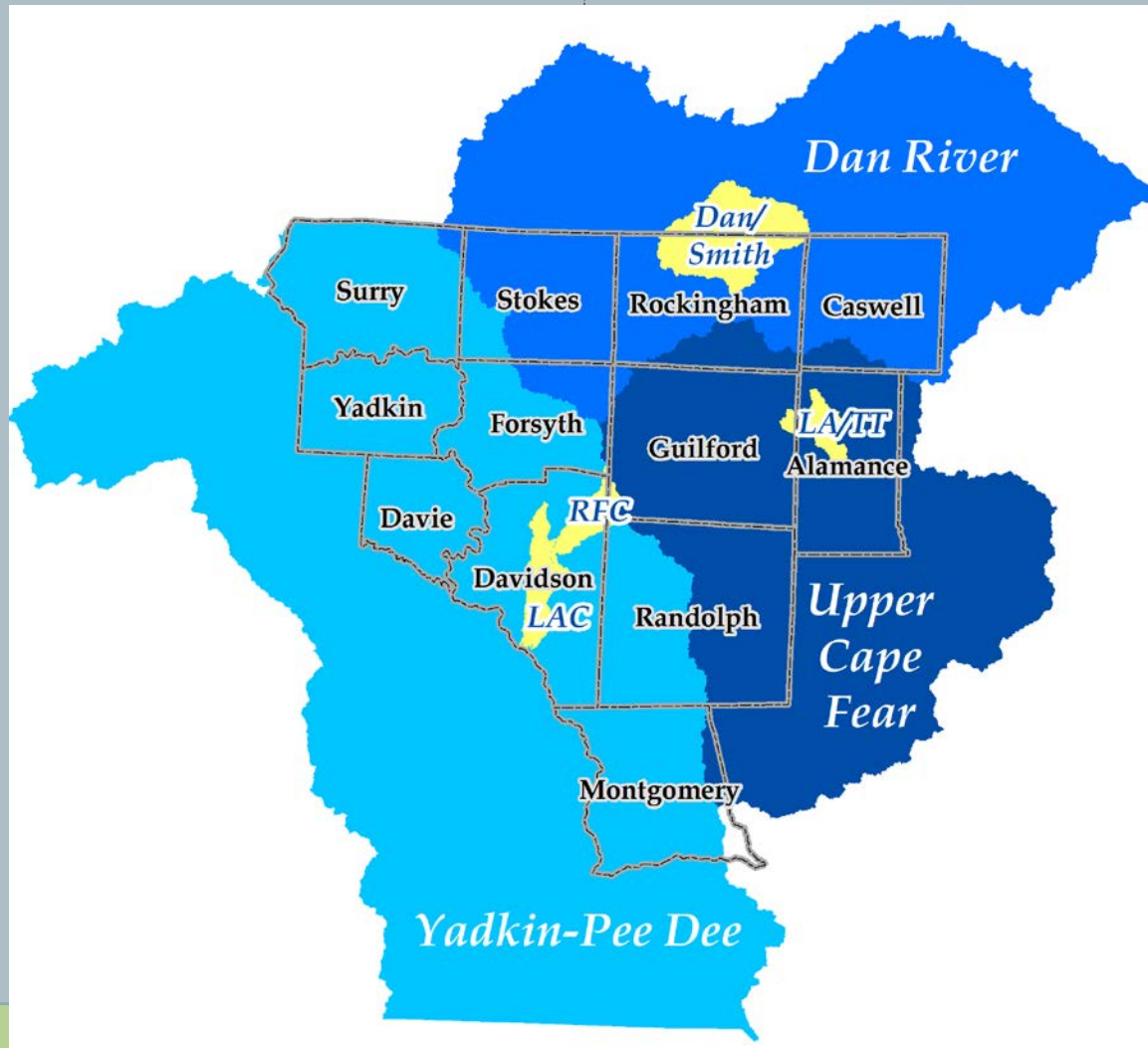
Eden Area Watershed



GIS Analysis

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GIS Manager
Piedmont Triad Regional Council
January 23, 2013

Current/Previous Projects



Conservation/Stress



- Conservation Analysis selects projects that:

- Will protect ecosystem services
- We don't want to lose
- Act as good demonstrations in the watershed

- Stress Analysis selects projects that:

- Highlight areas we want to improve
- Aim to recover function and value to the watershed



Previous Projects:

Abbotts Creek Conservation Assessment

Point System for Parcel Conservation Assessment and Ranking				
Criteria	Data Source	Factors	Possible Points	Weight
Low Impervious Surface Cover	2001 NLCD	0-4%	3	1
		5-9%	2	
		10-19%	1	
High Forest Cover	2001 NLCD	> 50%	1	1
1st & 2nd Order Streams	NC CGIA	Within 50 foot buffer	3	1
		Within 100 foot buffer	2	
		Within 330 foot buffer	1	
Large Parcel Size	Davidson County	> 50 acres	3	2
		20-49 acres	2	
		10-19 acres	1	
Low Impact Land Use	2011 County Data (Updated)	Forest, Recreation	1	2
		Agriculture, SFR (Rural Res. >= 5 acres), Vacant, VAD	1	1
Publicly Owned Land & Managed Conservation Lands	2011 County Data	City, County, or State	1	2
Significant Natural Heritage Area & Natural Heritage Element Occurrences*	DENR (Oct 2010)	4 points - any SNHA	6	1
		3 points - any NHEO S1 or S2 rank that is not a SNHA	5	
		2 points - any NHEO S3 or S4 rank that is not a SNHA	4	
		1 point - floodzones of the Greensboro Burrowing Crayfish combined areas (even though "very low" spatial accuracy)	3	
		0 points - all other "very low" spatial accuracy or "historic" species	2	
**overlapping polygons were summed; values range from 0 to 6		1		
Landscape Habitat Indicator Guilds	NHP		1	1
Parcels with Lake/River Access	PTCOG; Davidson County	Existing Public	2	1
		Existing Private or Proposed Public	1	
Wetlands	NWI		1	1
Hydric Soils	SSURGO	All Hydric	2	1
		Partially Hydric	1	
Erodibility (K factor)	SSURGO	0.40-0.49	2	1
		0.24-0.39	1	
500 Year Floodplain	NC Flood Map		1	1
Steep Slopes	USGS 1/9 Arc Second DEM	> 15% Gradient	1	1
Conservation BMP Locations	PTCOG Field Data	Point	2	1
		0.25 mile buffer	1	
Proposed Greenways	PTCOG; Davidson County	Primary	2	1
		Secondary	1	
Bike Paths	PTCOG; Davidson County	0.25 mile buffer	1	1
Total Possible Points			39	



**Previous
Projects:**

Abbotts Creek

*Stress
Assessment*

Point System for Parcel Stressor Assessment and Ranking				
Criteria	Data Source	Factors	Possible Points	Weight
High Impervious Surface Cover	2001 NLCD	> 20%	3	1
		10-19%	2	
		5-9%	1	
Low Forest Cover	2001 NLCD	<50%	1	1
1st & 2nd Order Streams	NC CGIA	Within 50 foot buffer	3	1
		Within 100 foot buffer	2	
		Within 330 foot buffer	1	
Large Parcel Size	Davidson County	> 20 acres	3	2
		10-20 acres	2	
		5-10 acres	1	
High Impact Land Use	2011 County Data (Updated)	Commercial, Industrial	1	2
		Government, Institutional, MFR, Office, Utilities	1	1
Publically Owned Land	2011 County Data	City, County, or State	1	2
Wetlands	NWI		1	1
Hydric Soils	SSURGO	All Hydric	2	1
		Partially Hydric	1	
Erodibility (K factor)	SSURGO	0.40-0.49	2	1
		0.24-0.39	1	
500 Year Floodplain	NC Flood Map		1	1
Steep Slopes	USGS 1/9 Arc Second DEM	>15% Gradient	1	1
Stress BMP Locations	PTCOG Field Data	Point	2	1
		0.25 mile buffer	1	
Animal Operation Permits	NC CGIA		1	1
High Potential for Future Growth			0 - 18	0.25
Total Possible Points			32.5	



Previous Projects:

Abbotts Creek

Future Growth Model

(Used in Stress Assessment)

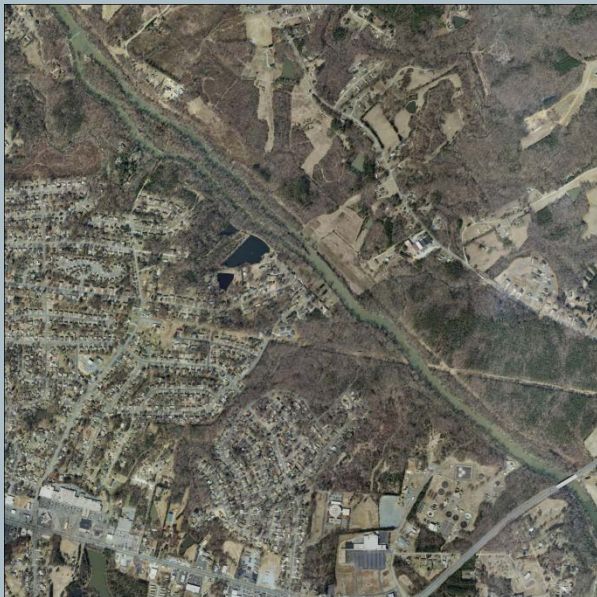
Point System for Future Growth Layer				
Criteria	Data Source	Factors	Possible Points	Weight
Municipal Boundaries	Davidson County		1	1
ETJ Boundaries	Davidson County		1	2
Sewer (Outside City)	City GIS website (selected parcels that intersected sewer lines outside city)		1	3
Water (Outside City)	City GIS website (selected parcels that intersected water lines outside city)		1	2
Future Sewer	NC CGIA		1	2
Future Water	NC CGIA		1	1
Davidson County and City of Lexington CTPs	6 - Expressway/Freeway - Needs Improvement (0.25 Mile Buffer)	13 - 16	5	1
	5 - Expressway/Freeway- Existing (0.25 Mile Buffer)			
	4 - Boulevard/Major Thoroughfare - Needs Improvement (0.25 Mile Buffer)	10 - 12	4	
	3 - Boulevard/Major Thoroughfare- Existing (0.25 Mile Buffer)			
	2 - Minor Thoroughfare - Needs Improvement (0.10 Mile Buffer)	7 - 9	3	
1 - Minor Thoroughfare - Existing (0.10 Mile Buffer)	4 - 6	2		
	**The points from overlapping road buffer areas were summed (values ranged from 0 to 16)	1 - 3	1	
Population Density (Persons/Sq Mi)	2010 Census	11 - 298	1	1
		298 - 789	2	
		789 - 1,871	3	
		1,871 - 23,525	4	
Population Density Change	2000 & 2010 Census	1 - 3	1	1
		12 - 55	2	
		71 - 109	3	
Vacant Household Density (Vacant HH/Sq Mi)	2010 Census	1-16	1	1
		16-83	2	
		83-248	3	
		248-4,253	4	
Total Possible Points			27	

Layer Input Example

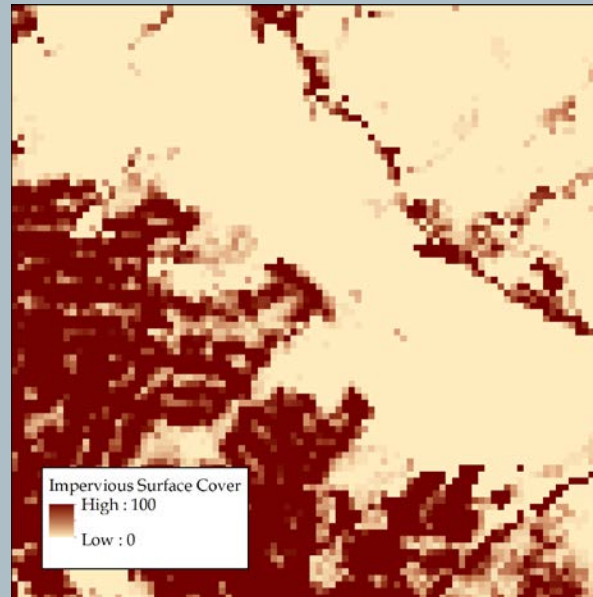


Raster

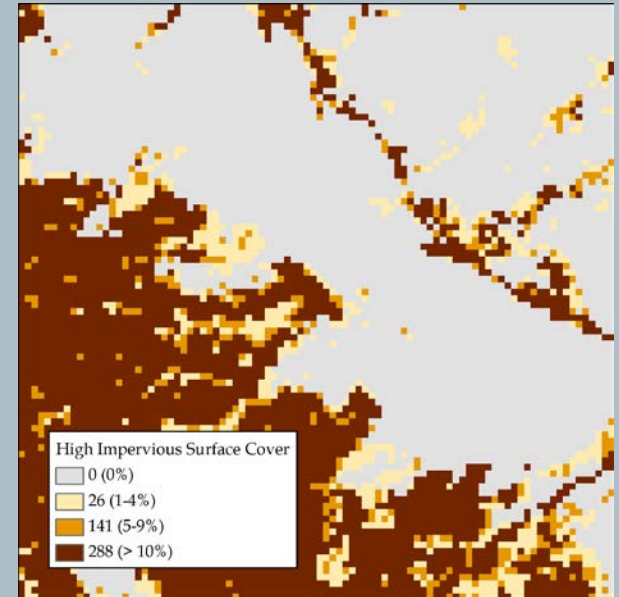
Aerial – Ground Cover



Original Raster



Reclassified Raster

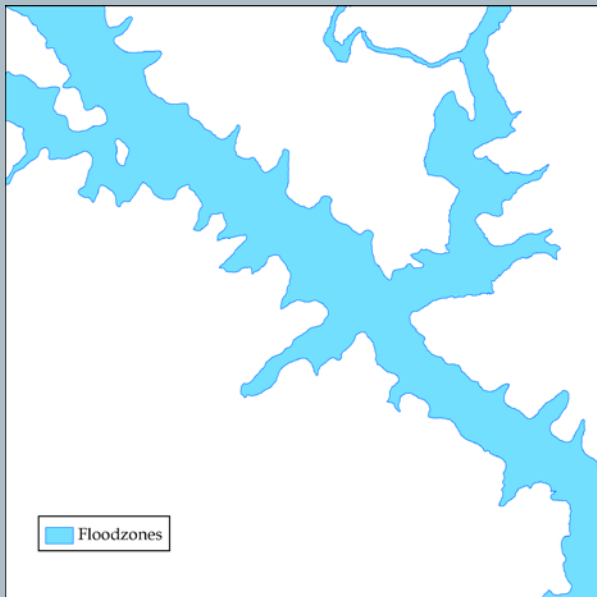


Layer Input Example

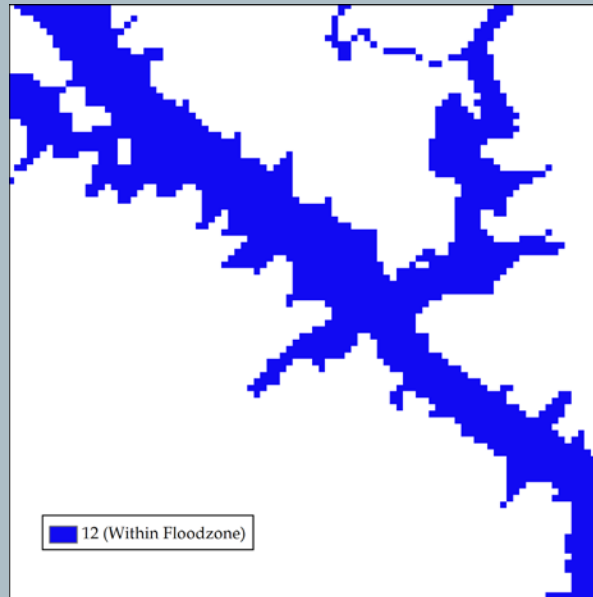


Vector

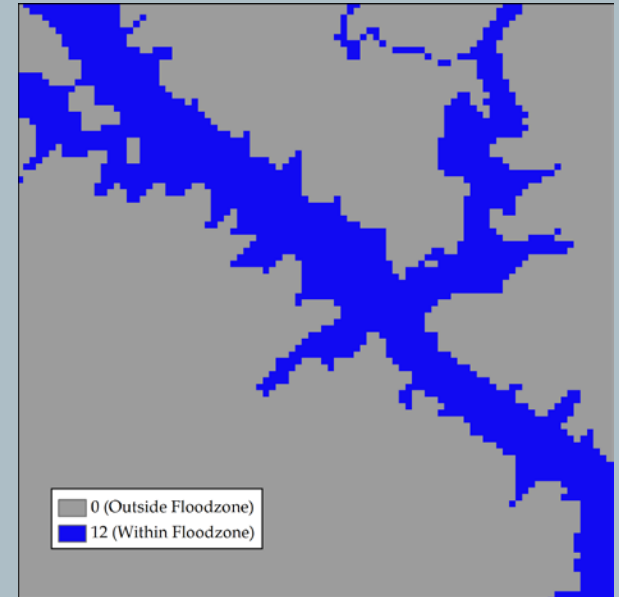
Original Vector Data



Conversion to Raster



Reclassified Raster

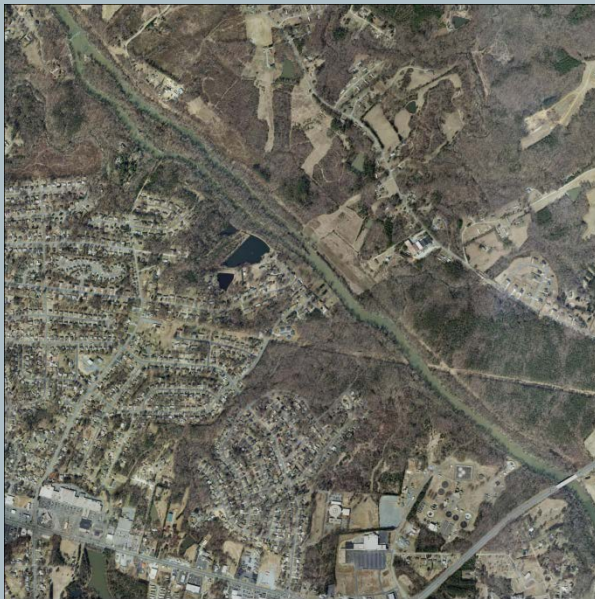


Layer Input Example

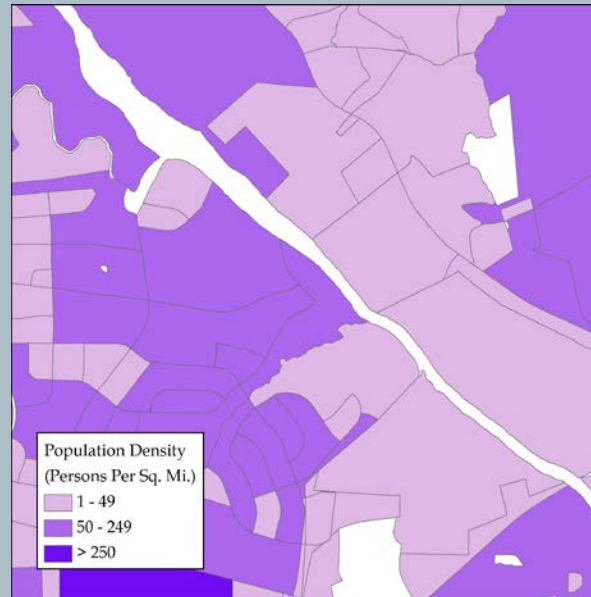


Vector

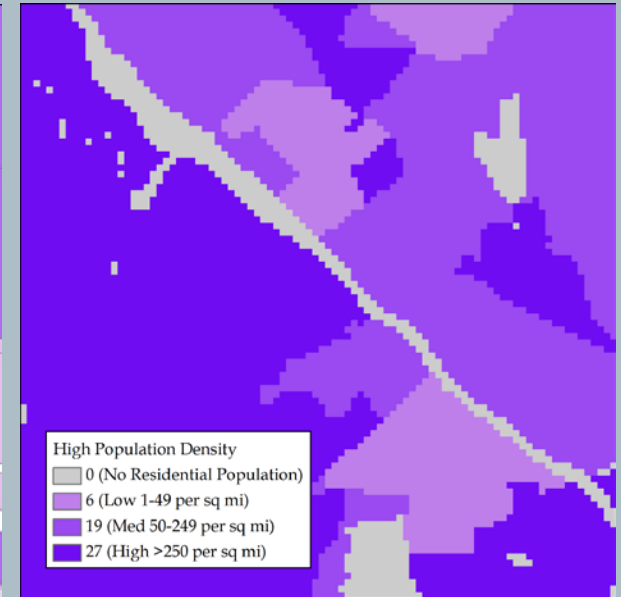
Aerial – Ground Cover



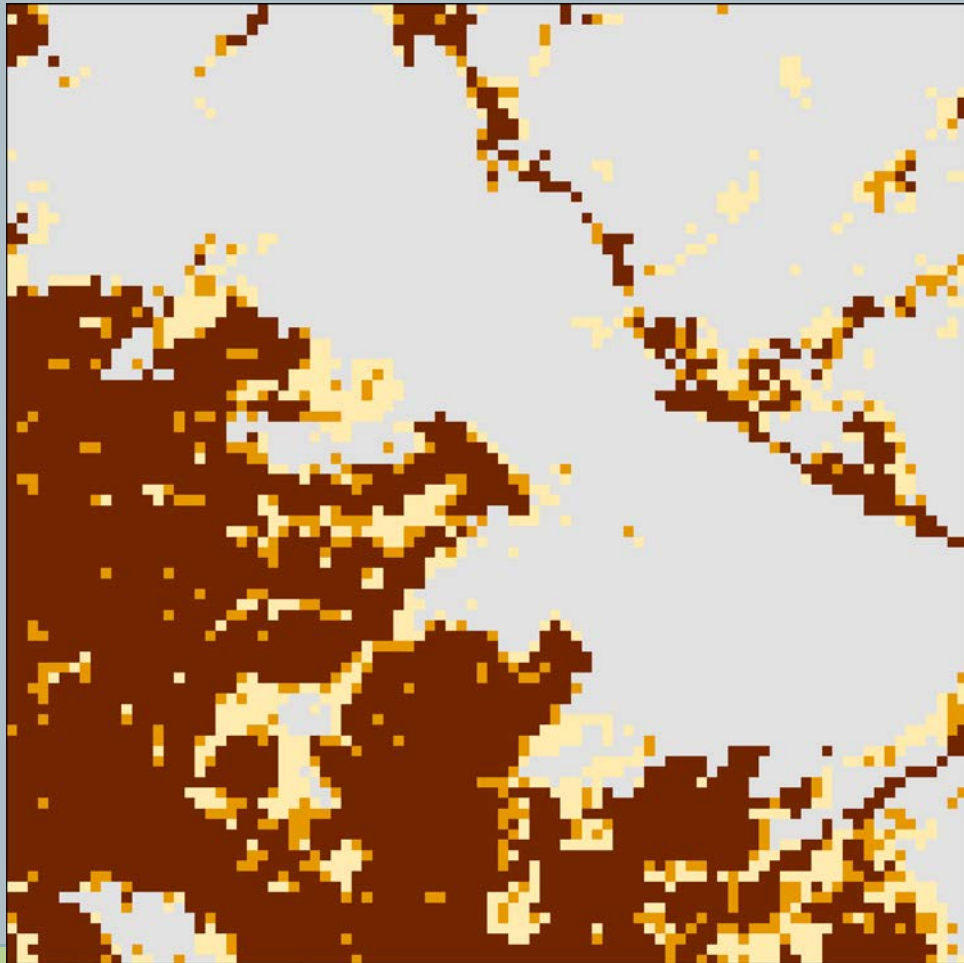
Original Census Blocks



Reclassified Raster



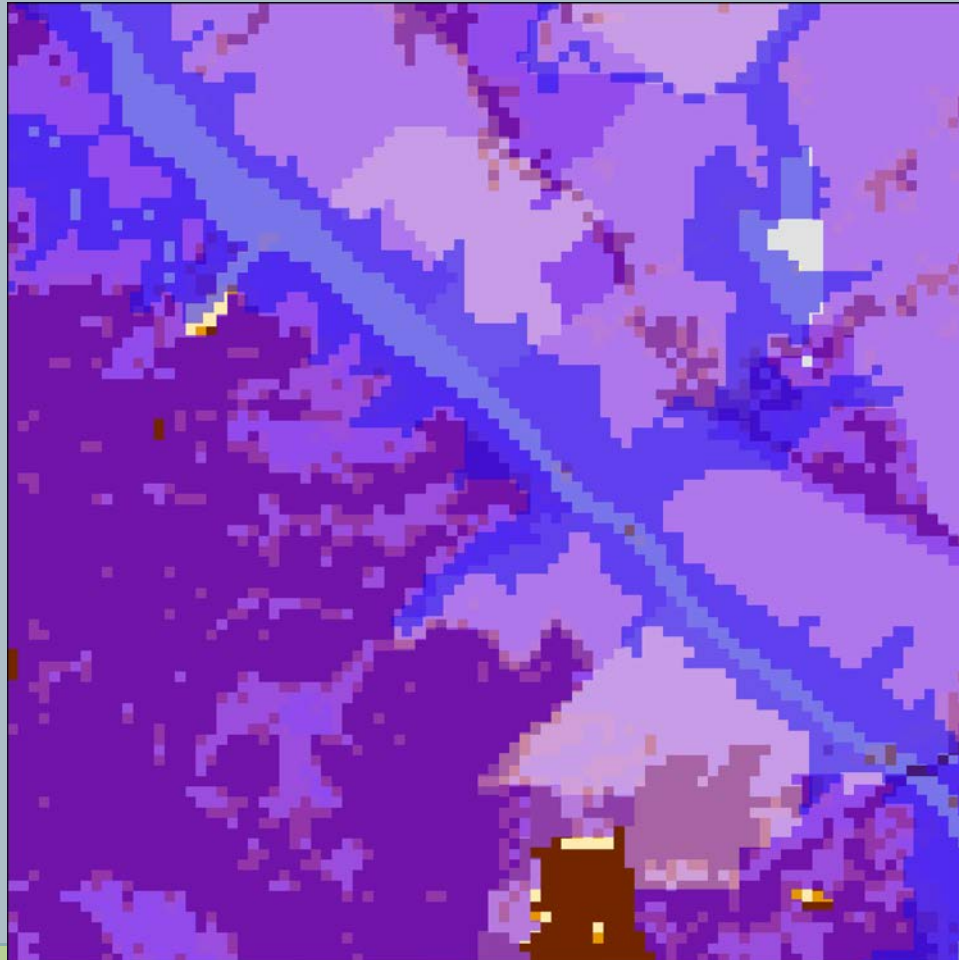
Layer Input Example



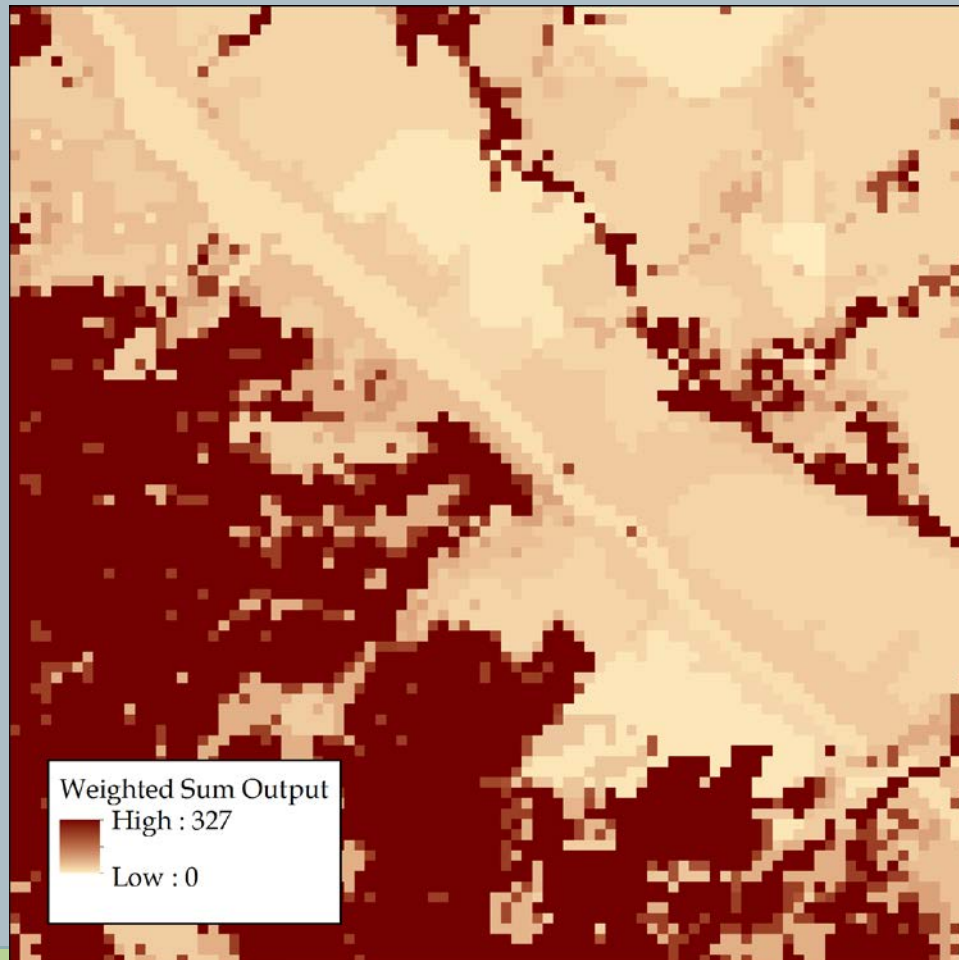
Layer Input Example



Layer Input Example

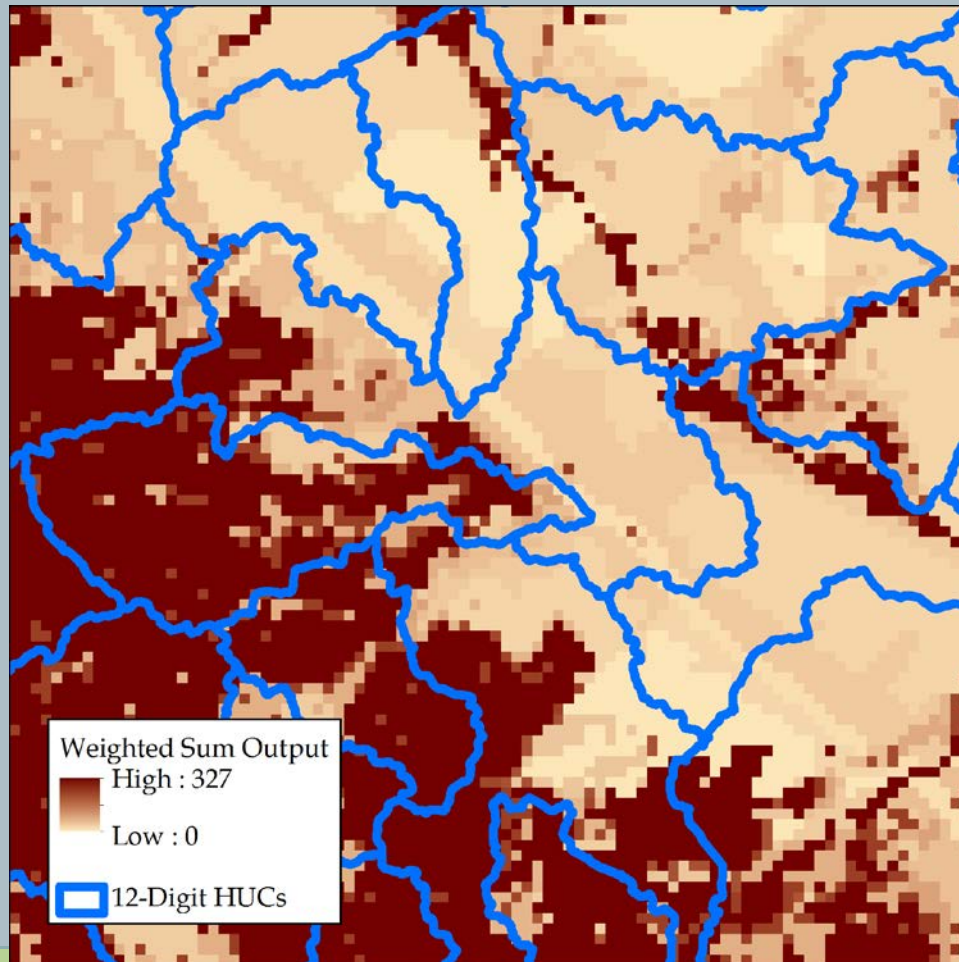


Output Example

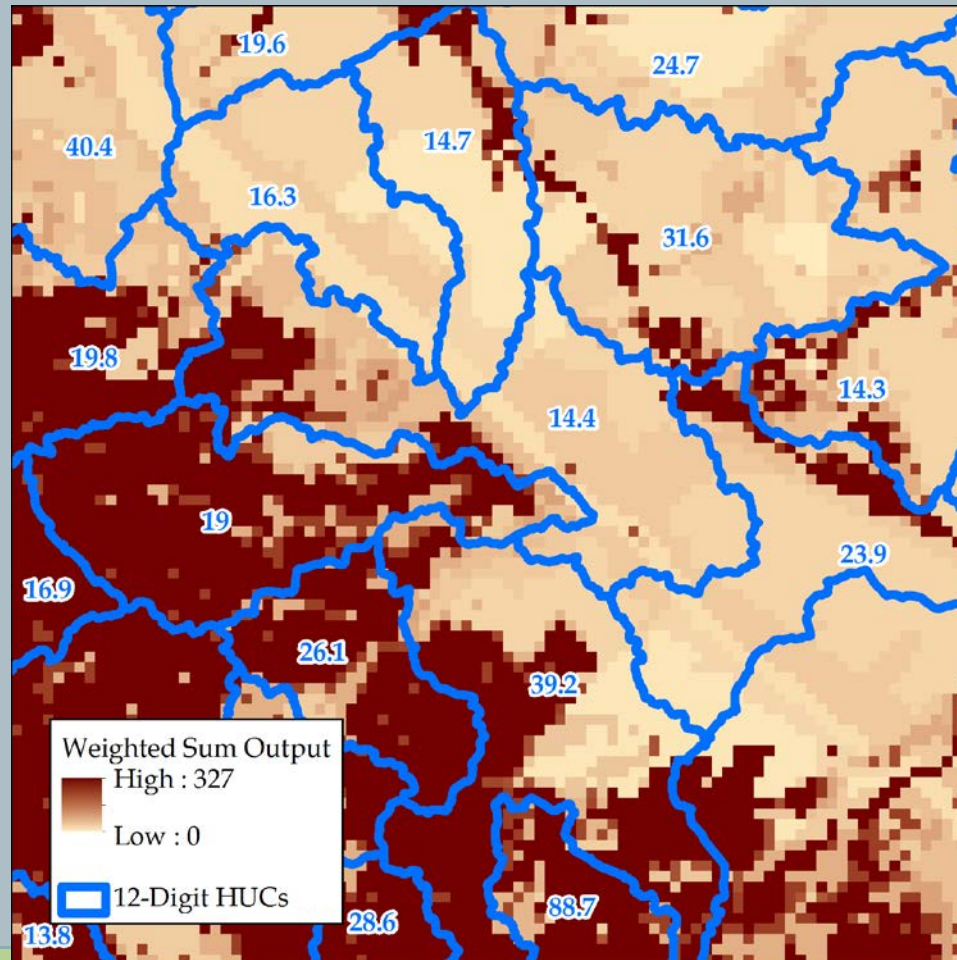


Weighted Sum Output
High : 327
Low : 0

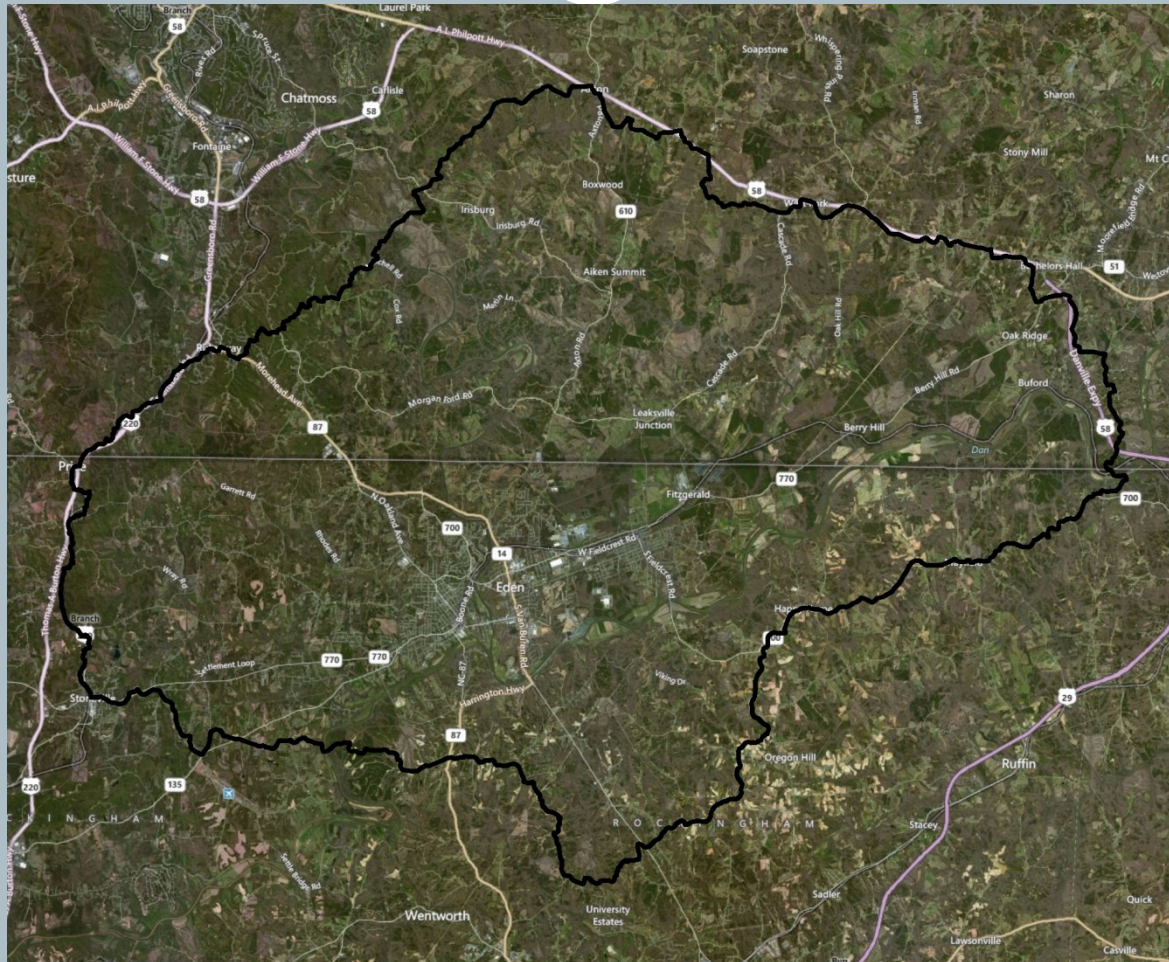
Overlay HUC Boundaries



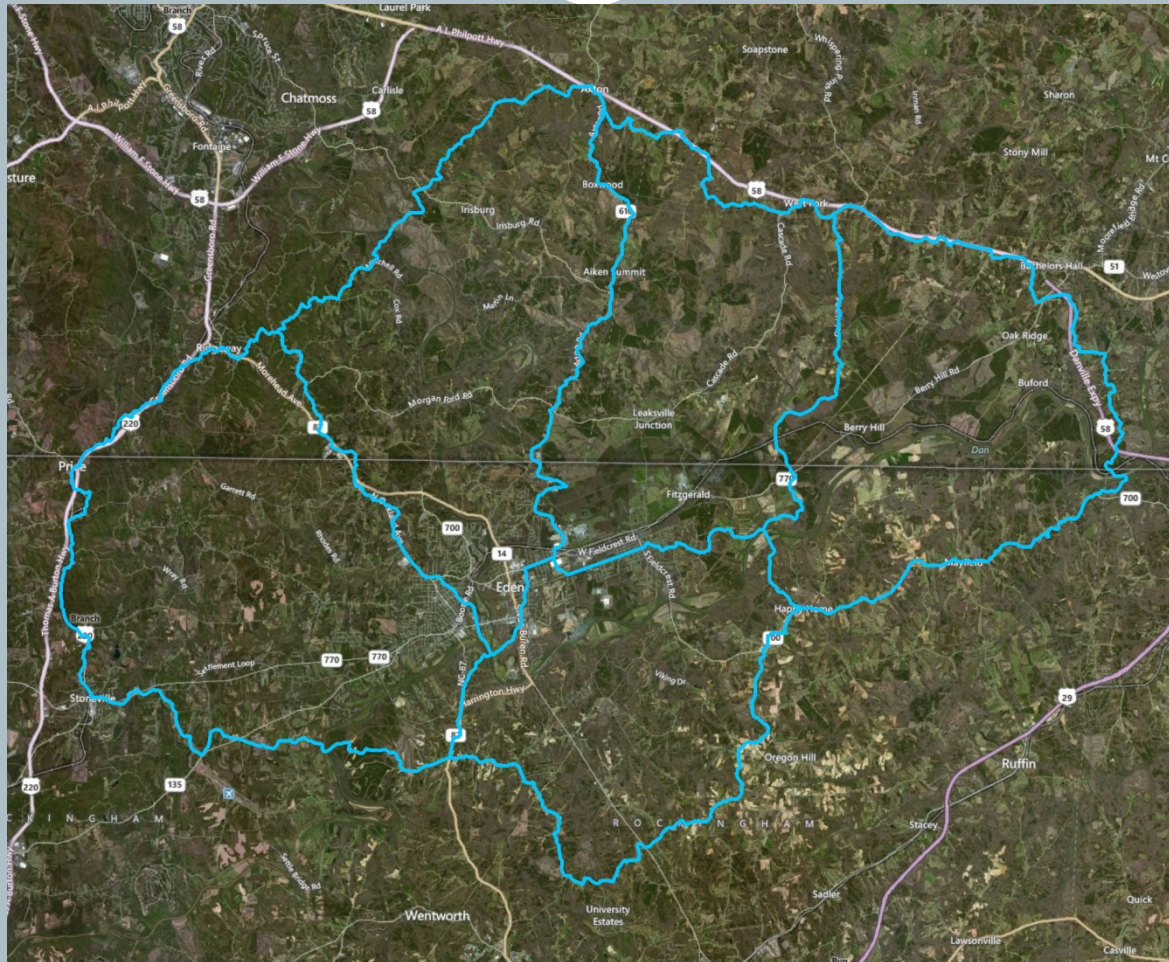
Zonal Statistics



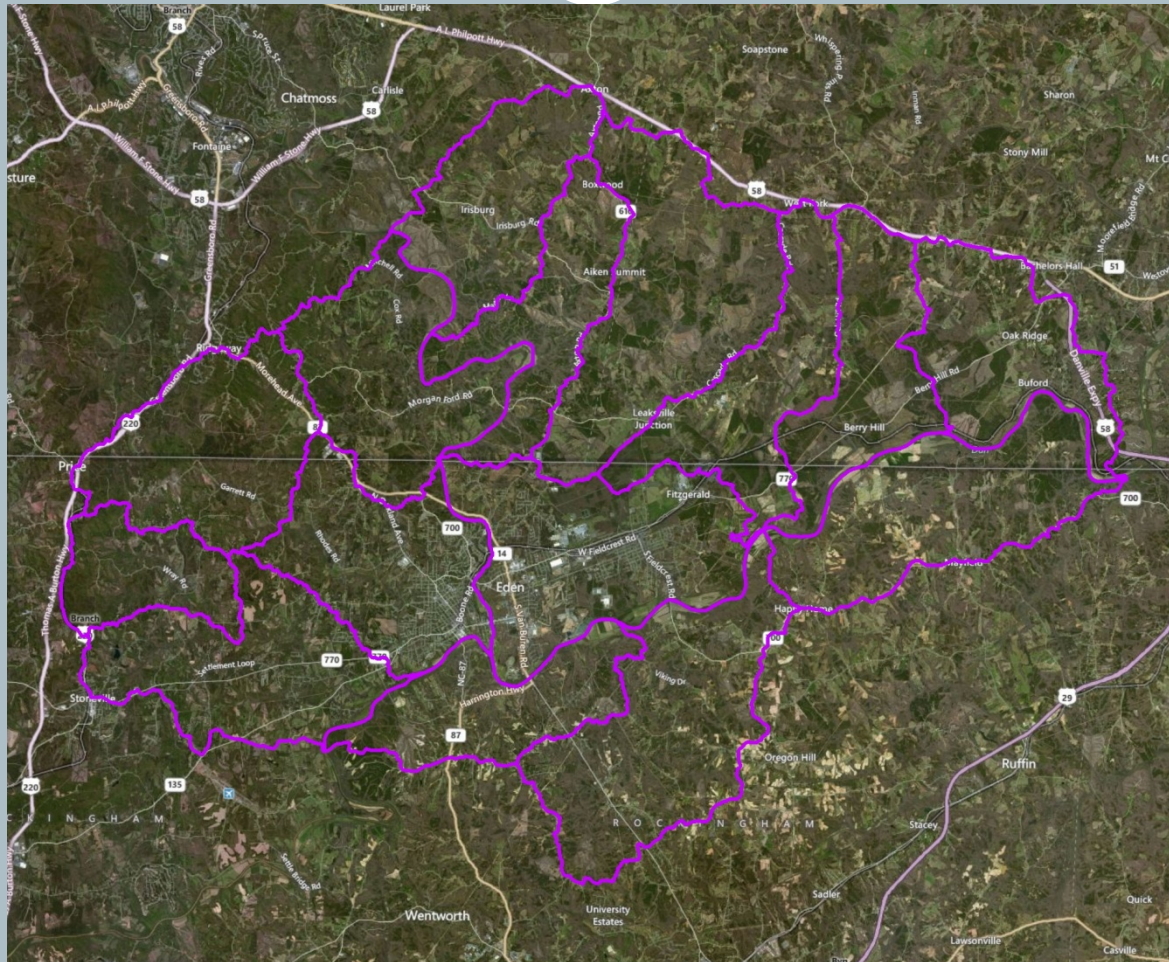
Watershed Boundary



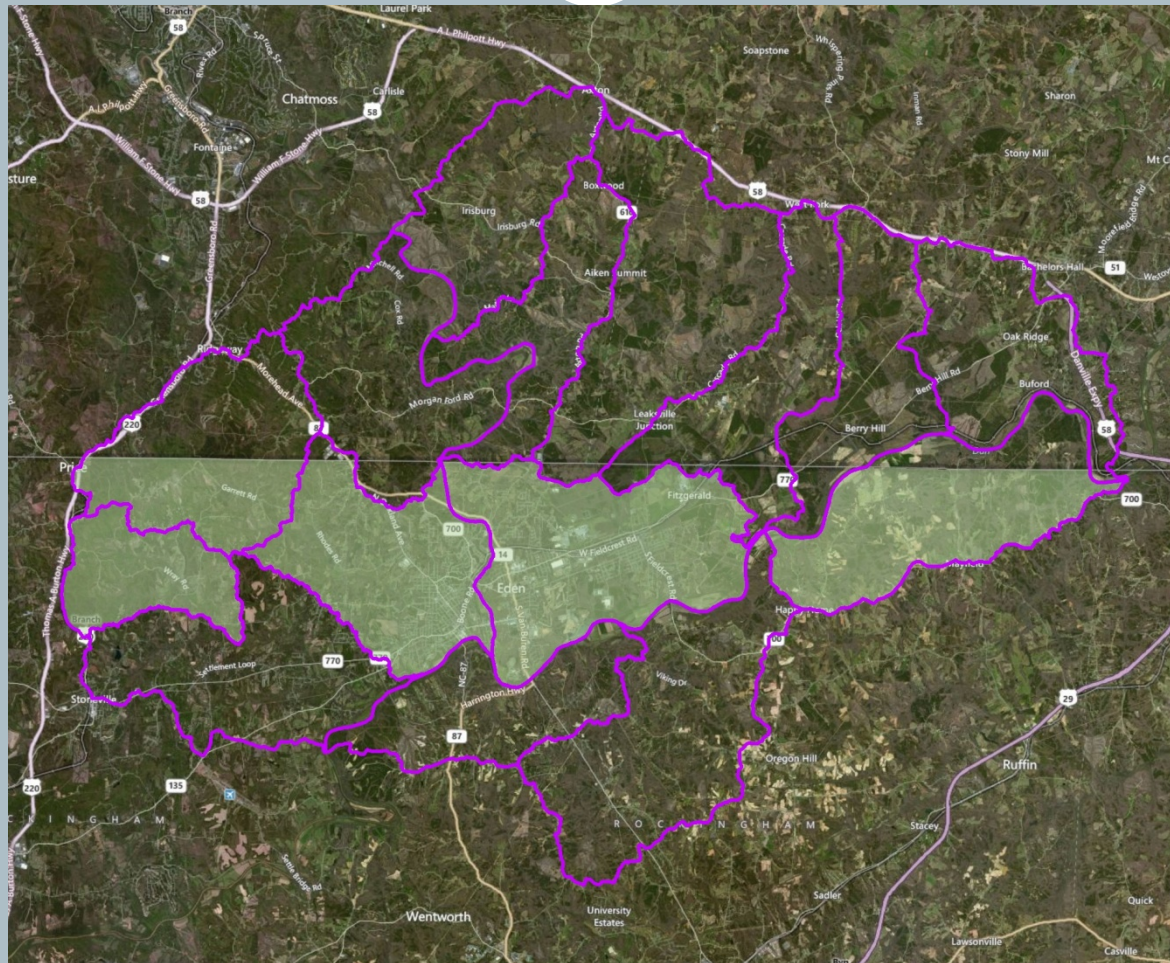
12-Digit HUCs



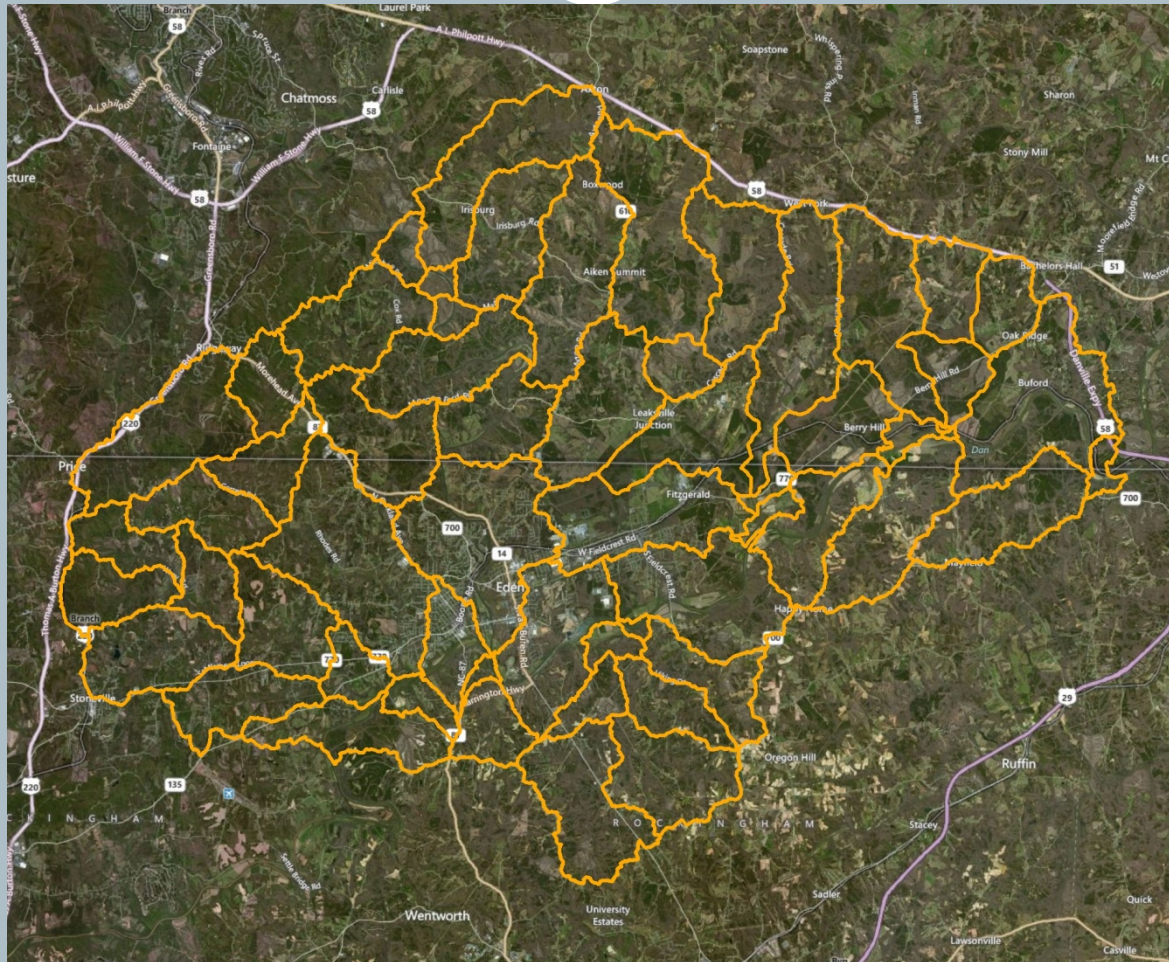
Subwatersheds (Identified by PTRC using ArcHydro catchments)



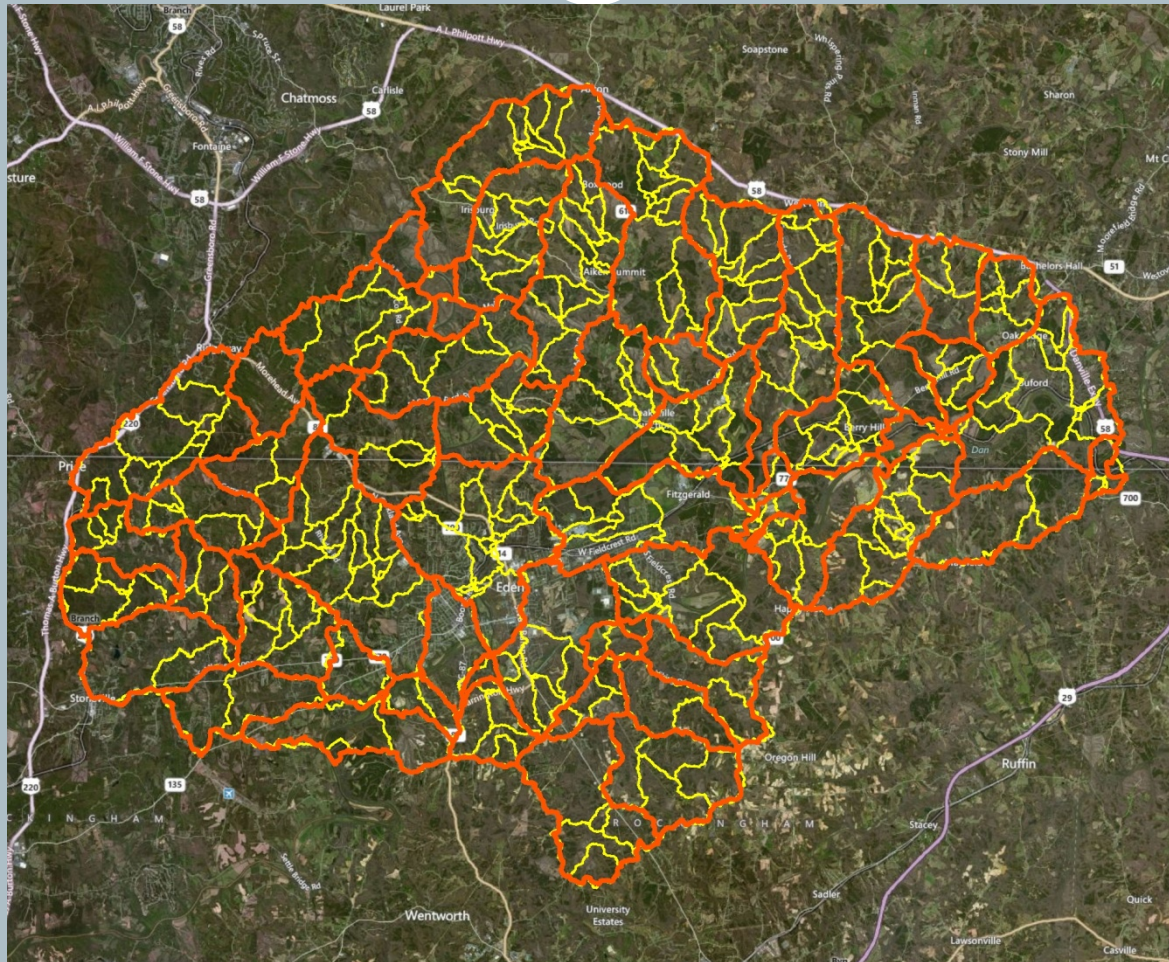
Field Work Assessment



Catchments (Identified by ArcHydro)



Catchments (NHDPlus)



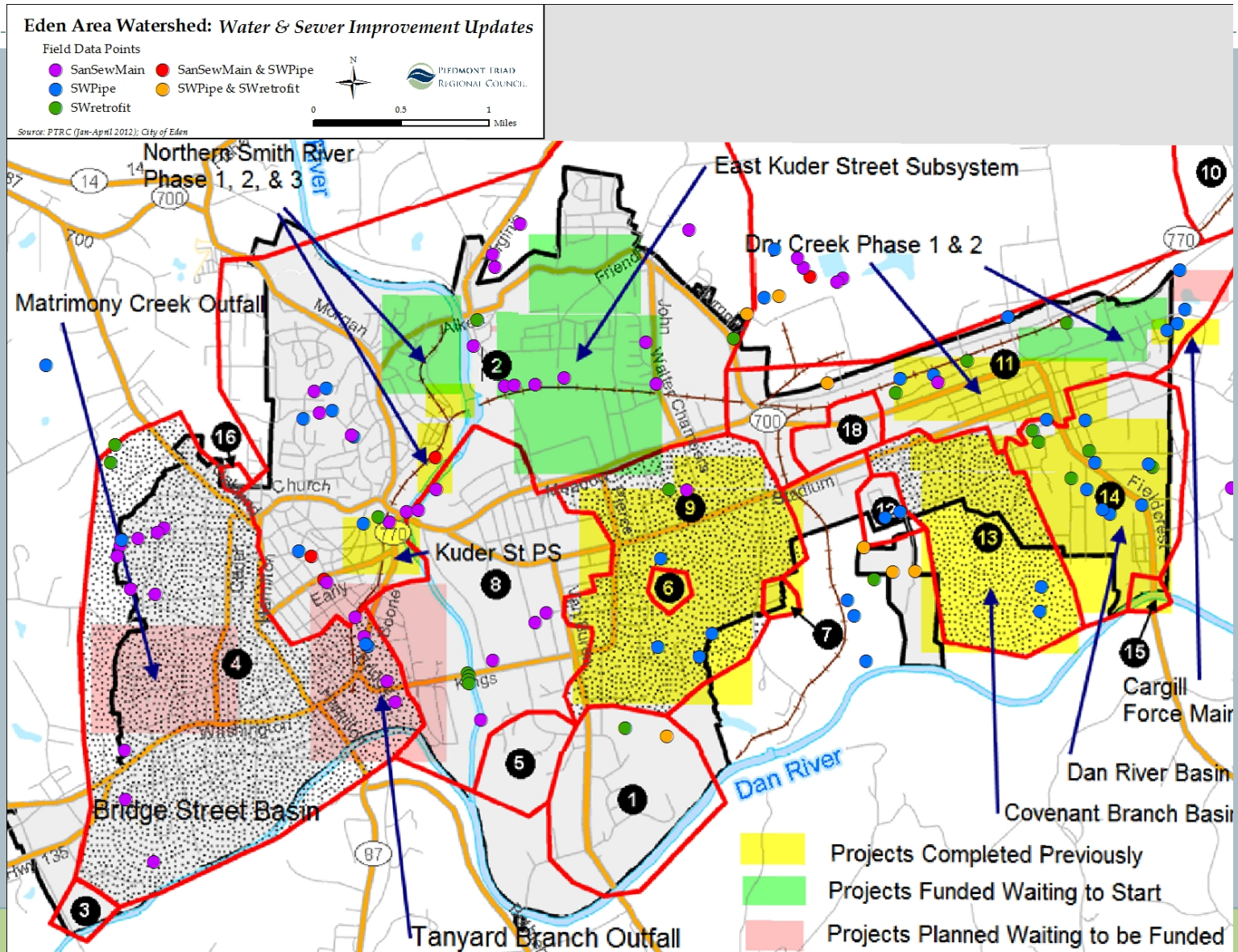
Subwatershed 8



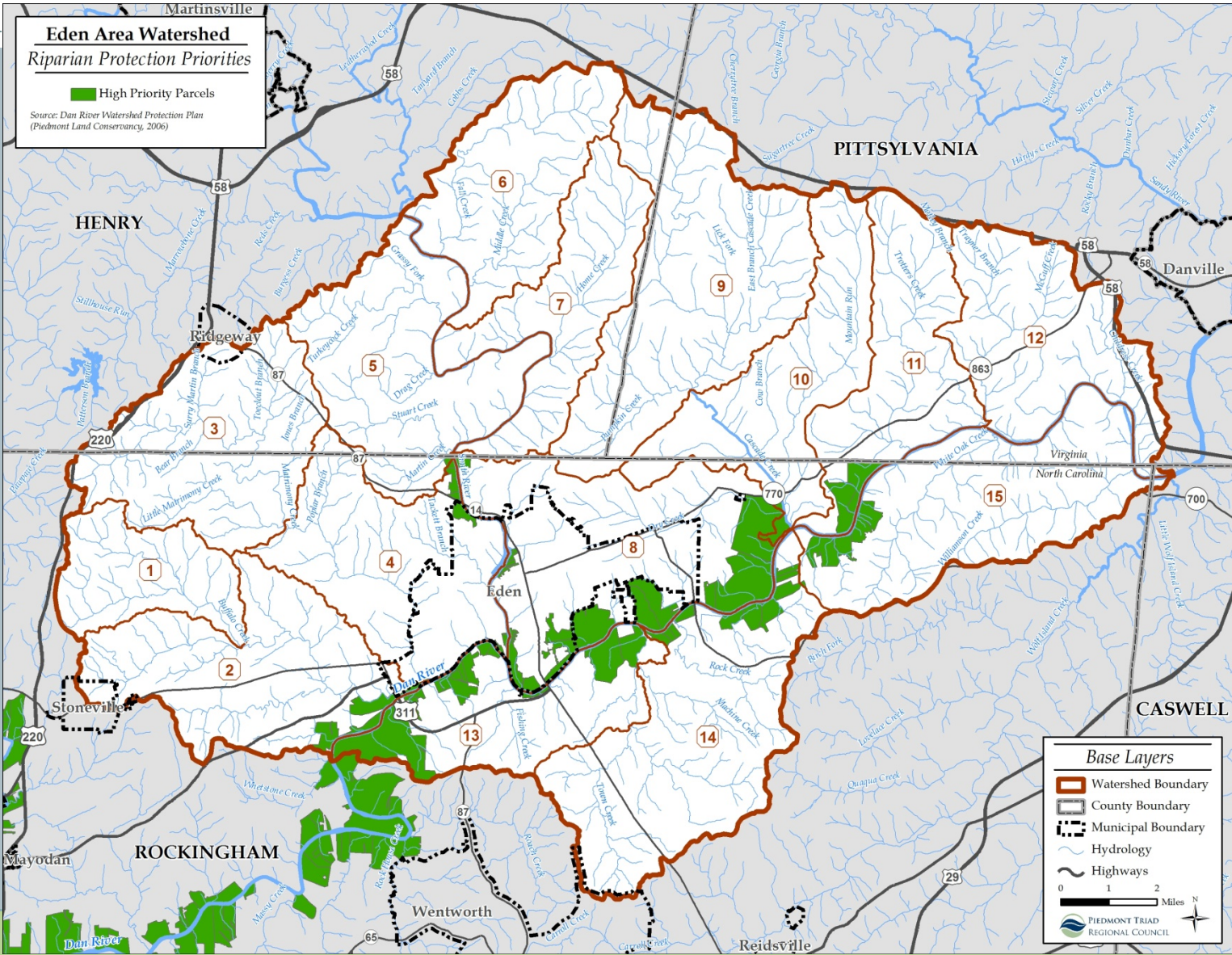
Parcel Level



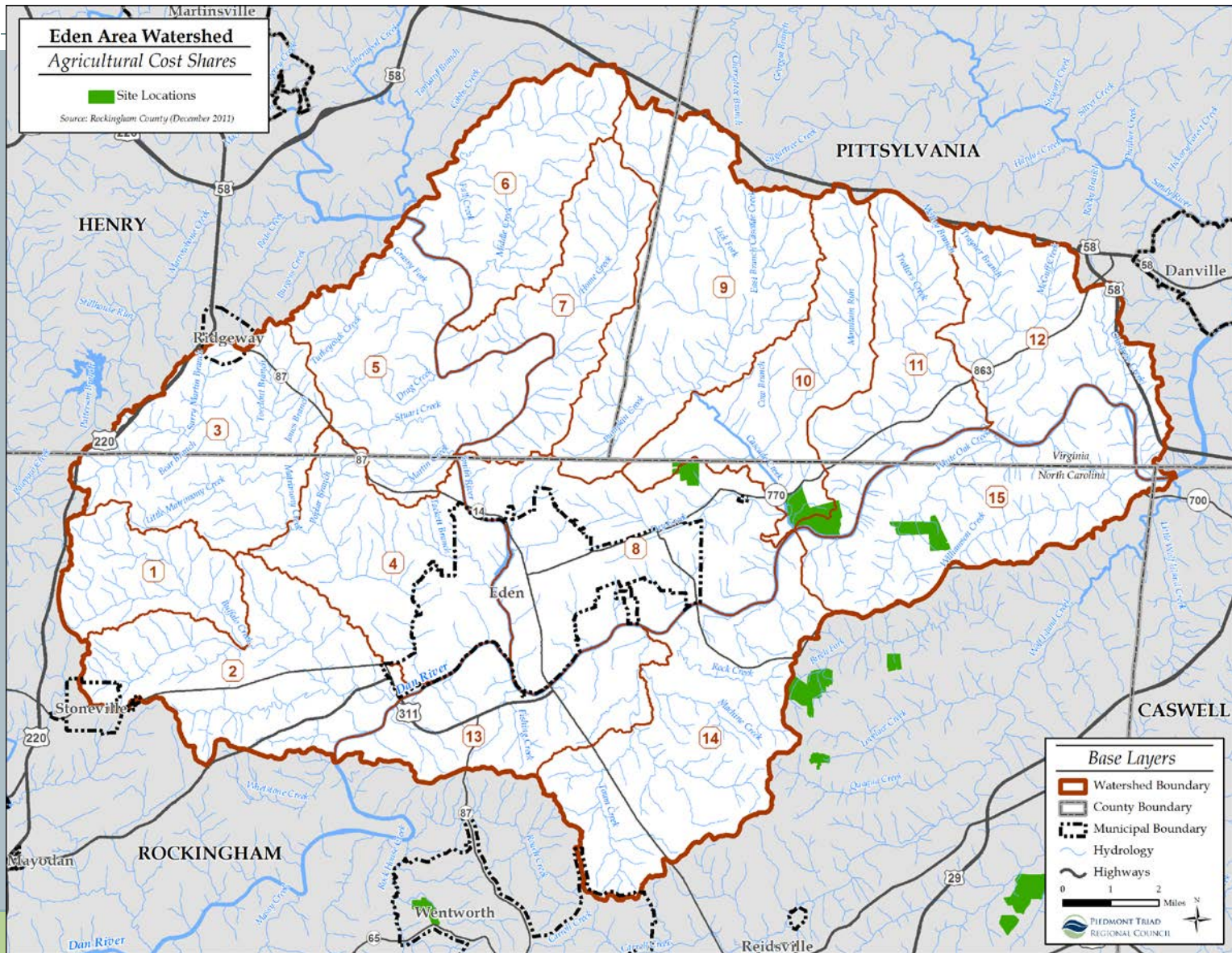
Data to incorporate: City Projects



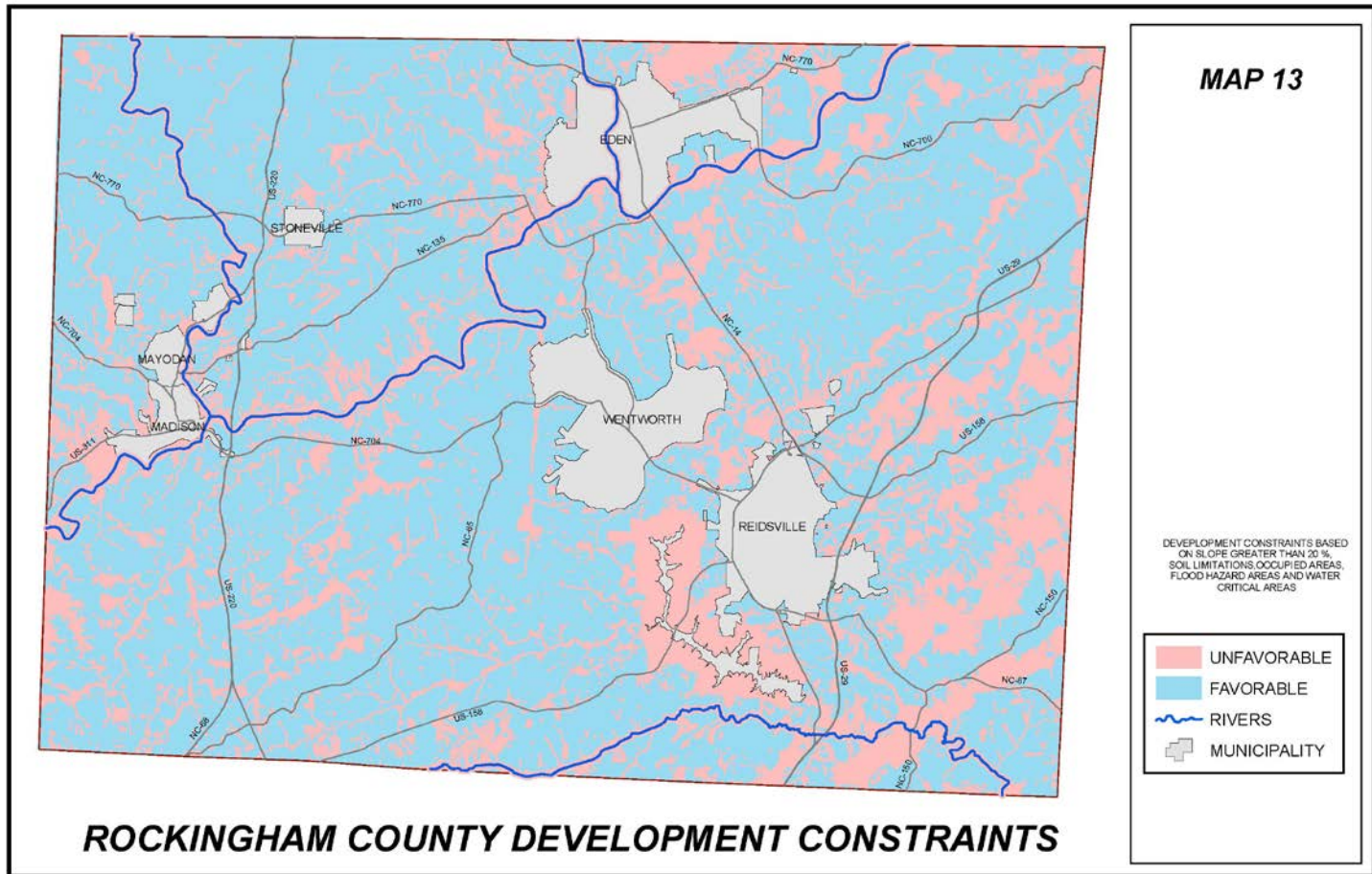
Data to incorporate: PLC Protection Plan



Data to incorporate: County BMPs



Data to incorporate: County approach to unfavorable conditions



Data to incorporate: County approach to unfavorable conditions



- Steep Slopes (>20%)
- Hydric Soils
- Shallow Depth-to-rock (bedrock) content)
- High shrink-swell potential
- Slow permeability
- Flood Hazards (100-year)
- Watershed critical areas
- Occupied areas (parcels > 2 acres with a structure of value)

Data to incorporate: County approach to unfavorable conditions



- Steep Slopes (>15%)
- Hydric Soils
- ~~Shallow Depth to rock (bedrock) content~~
- ~~High shrink-swell potential~~
- ~~Slow permeability~~
- Flood Hazards (500-year)
- ~~Watershed critical areas~~
- ~~Occupied areas (parcels > 2 acres with a structure of value)~~
- Erodible soils
- Future Growth Input layers

Project Atlas Example



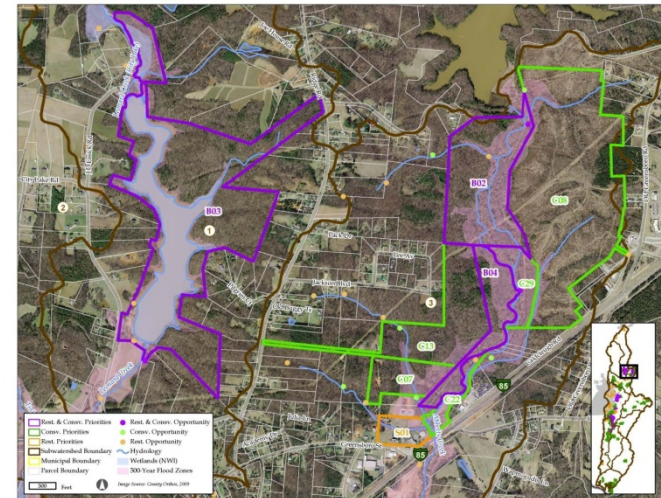
Project 01: Davidson County School Administration Site



Recommended Actions:

- Immediately contact landowner to determine willingness to retrofit site for improved stormwater management (IC = 42%)
 - Develop a site-specific retrofit plan in concert with City of Lexington, NCSU B&AE staff, and Stormwater SMART
 - Currently no stormwater management on-site at all
 - Include green roofs, depressed parking islands, enhanced tree cover, and constructed wetland
 - Determine financial value of ecosystem services in on-site forest, especially to absorb emission pollutants of bus fleet
- Integrate stormwater plan with site needs, including bus fleet maintenance, school curricula needs, and Safe Routes to Schools

Project 03A: City Lake



Recommended Actions:

- Place a conservation/recreation easement on 204-acre City Lake property, create City Lake recreational plan, and invest in site as recreational/greenway feature using PART-F, CWMTF, and Healthy Communities monies
- Place conservation/recreation easement on the 115-acre 500-yr floodplain along Abbots Creek
- Work with WRC, Davidson Co. TRIP, and a certified forester to determine a forestry management or recreation plan for priority parcels
 - Determine a reforestation plan for C-08 that serves landowner and watershed needs

We need your input....



- How to add new data (PLC, County, etc)
- Any other new data?
- How to evaluate differences in NC and VA data
- How to weight data
- Project Atlas deliverable

Contact Us



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