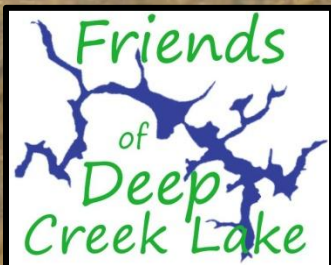


MD State Highway 219 Culvert Assessment Project 2012

Prepared for the Policy and Review Board
Meeting, 7/23/2012



Funded by Constellation Energy EcoStar

The Project



- **Six miles** of Maryland State Highway 219 transect the Deep Creek Lake watershed
- **How many** culverts pass under this stretch of road?
- **What condition** are they in structurally?
- **What negative impacts**, if any, do they have on the lake?
- **What can be done** to mitigate any negative impacts?



The Culverts

- A total of **53 culverts** pass under Maryland State Highway 219 in the Deep Creek Lake watershed
- Assessed for:
 - structural condition
 - private property impacts
 - number and condition of sources
 - number and condition of swale culverts
 - composition and condition of swale
 - possible pollutants and contaminants
- **Material** (metal, concrete, plastic, or combination), size, and location
- **Prioritized** on scale of 1-5

The Culverts

- SC053
- SC052
- SC050
- SC049
- McHenry
- SC048
- Marsh Run Cove
- SC047
- SC046
- SC043
- SC041
- SC037
- SC036
- SC035
- SC033
- SC032
- SC034
- SC028
- SC029
- SC026
- SC025
- SC023
- SC024
- SC021
- SC022
- SC019
- SC020
- SC014
- SC016
- SC009
- SC011
- SC005
- SC007
- SC004
- SC003
- SC002
- SC001

North Glade Cove



Culvert Drainage Areas

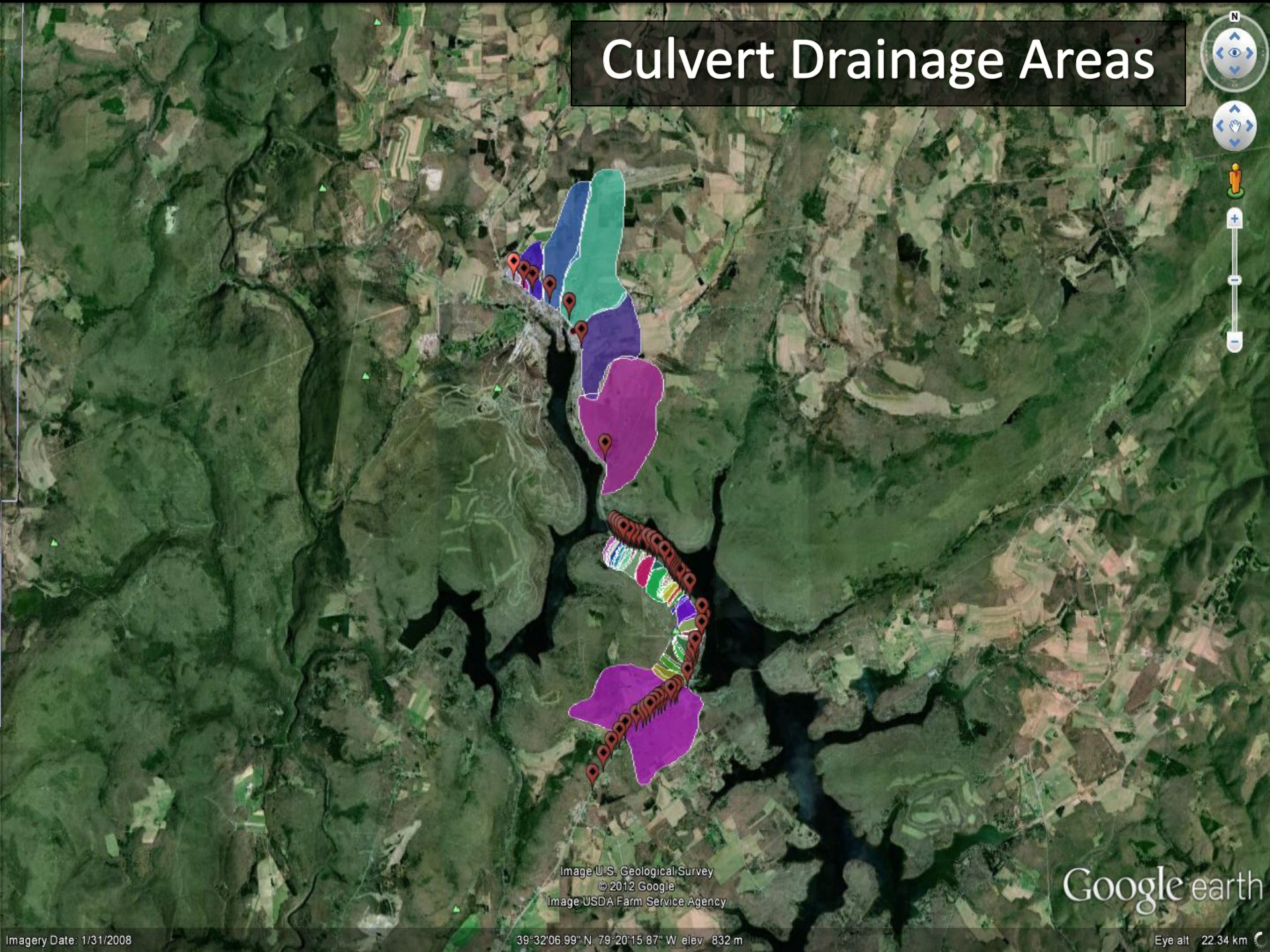


Image U.S. Geological Survey
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Image USDA Farm Service Agency

Google earth

Culvert Drainage Areas

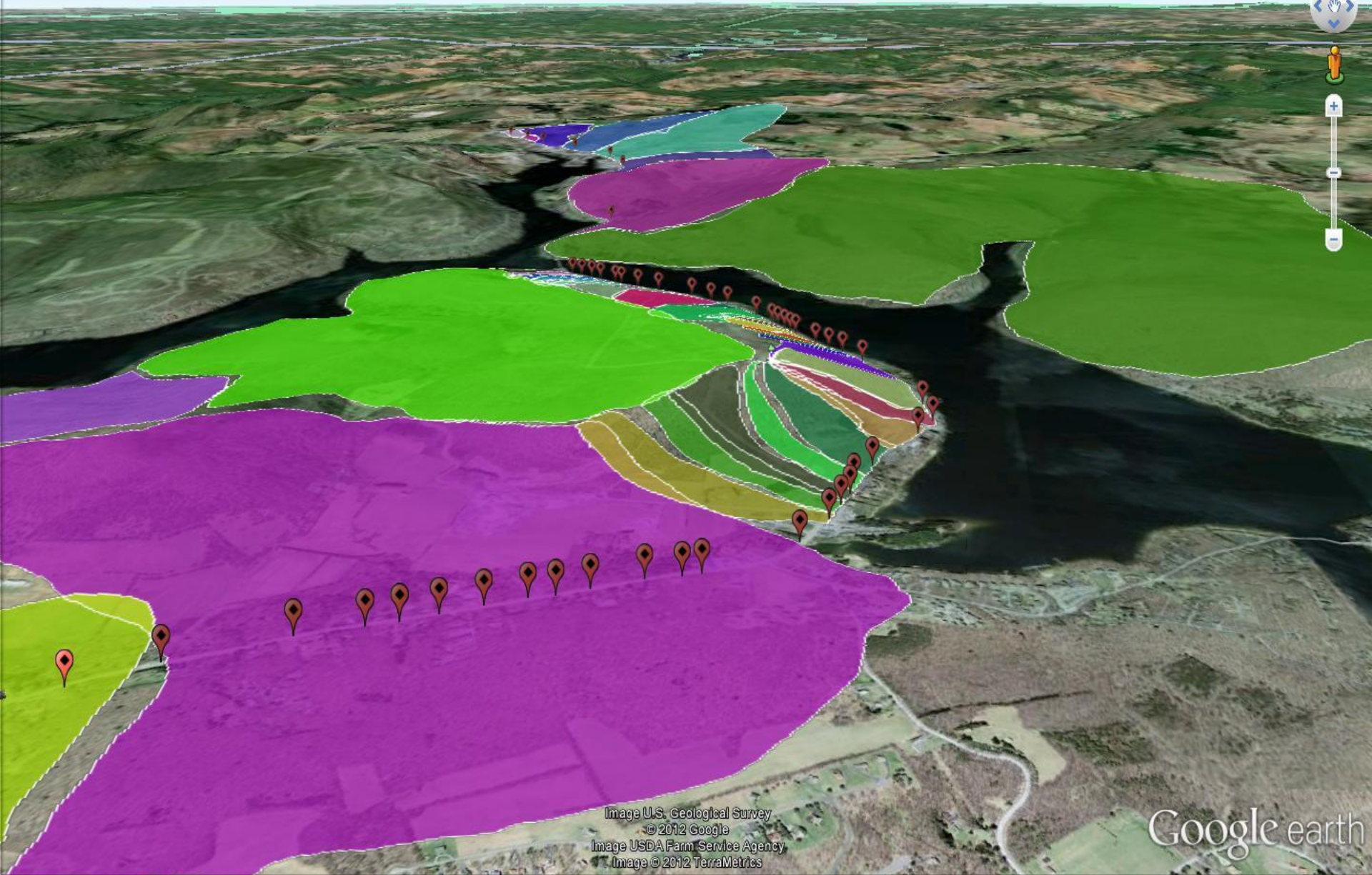


Image U.S. Geological Survey
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Culvert Drainage Areas

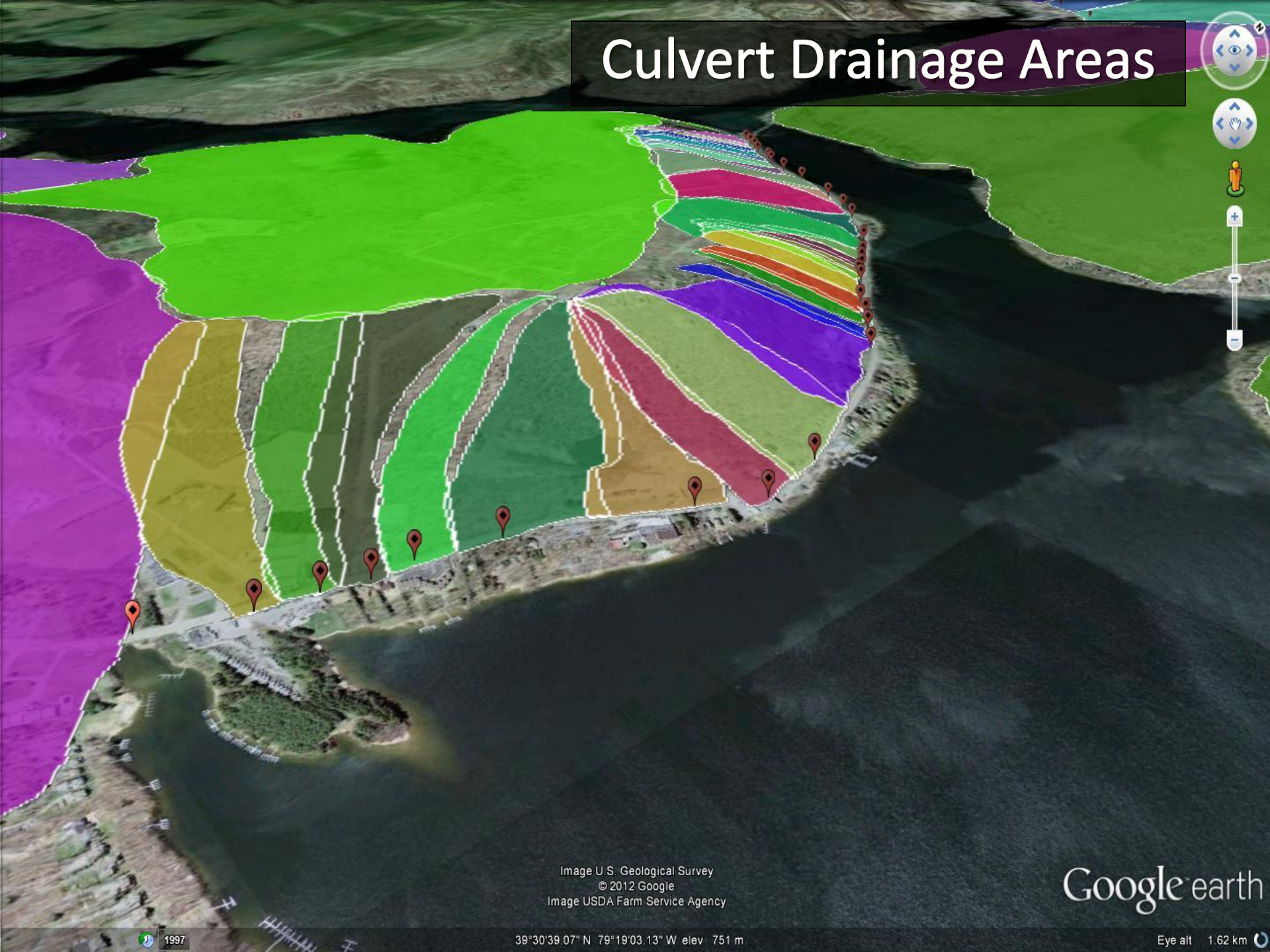


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Google earth

1997

39°30'39.07" N 79°19'03.13" W elev 751 m

Eye alt 1.62 km

Culvert Drainage Areas



Image U.S. Geological Survey
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Image USDA Farm Service Agency
Image © 2012 TerraMetrics

39°31'07.16" N 79°19'55.39" W elev 826 m

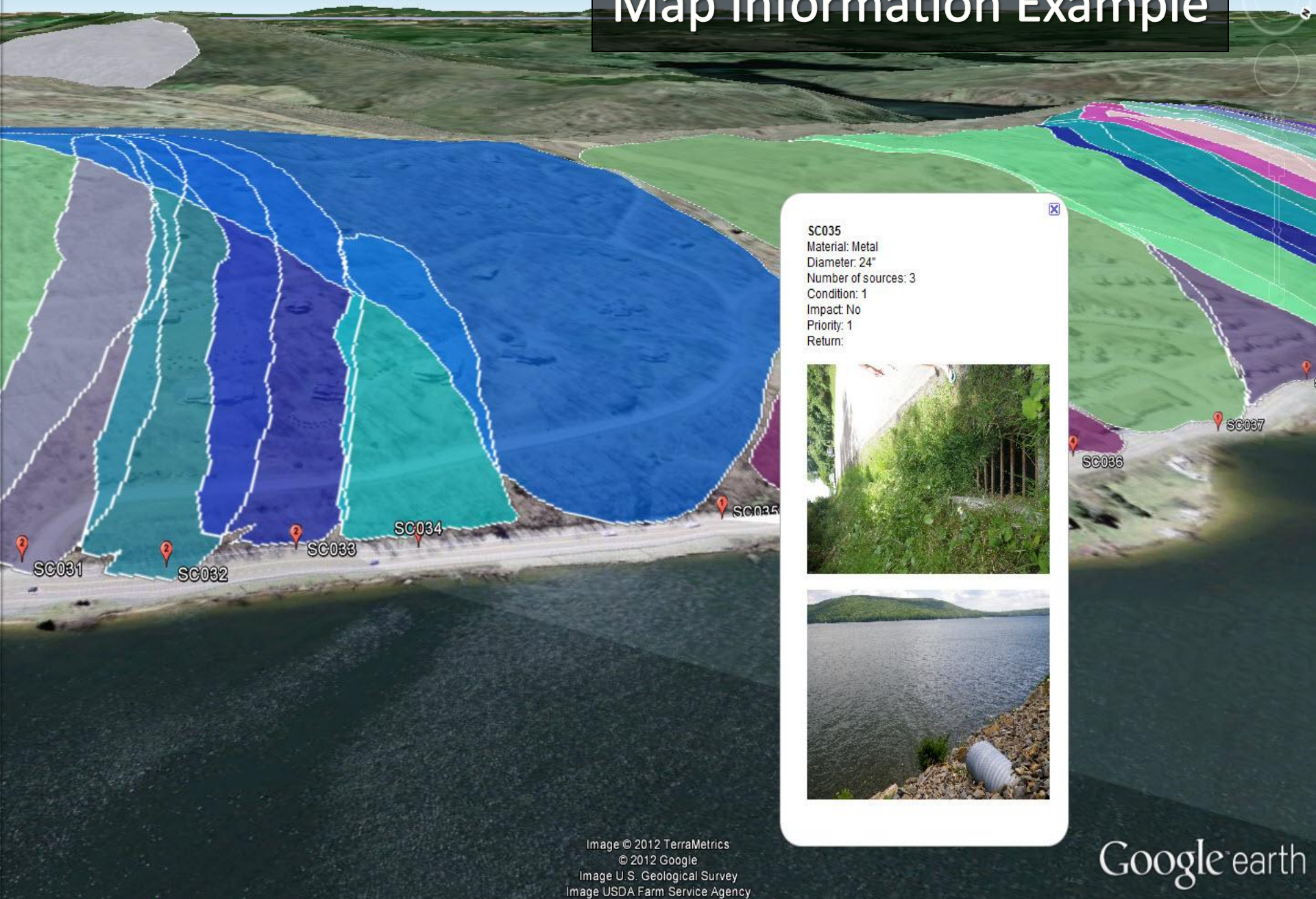
1997

Eye alt 1.49 km



Google earth

Map Information Example



SC035
Material: Metal
Diameter: 24"
Number of sources: 3
Condition: 1
Impact: No
Priority: 1
Return:



Image © 2012 TerraMetrics
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Image U.S. Geological Survey
Image USDA Farm Service Agency

Google earth

Property Map

Garrett County

OBJECTID_1: 11073
 SDAT URL: http://sdatcert3.resiusa.org/rp_rewrite/details.aspx?County=12&SearchType=ACCT&District=18&AccountNumber=040778
 Account ID: 1218040778
 Shape: Polygon

http://sdatcert3.resiusa.org/rp_rewr...

Identify

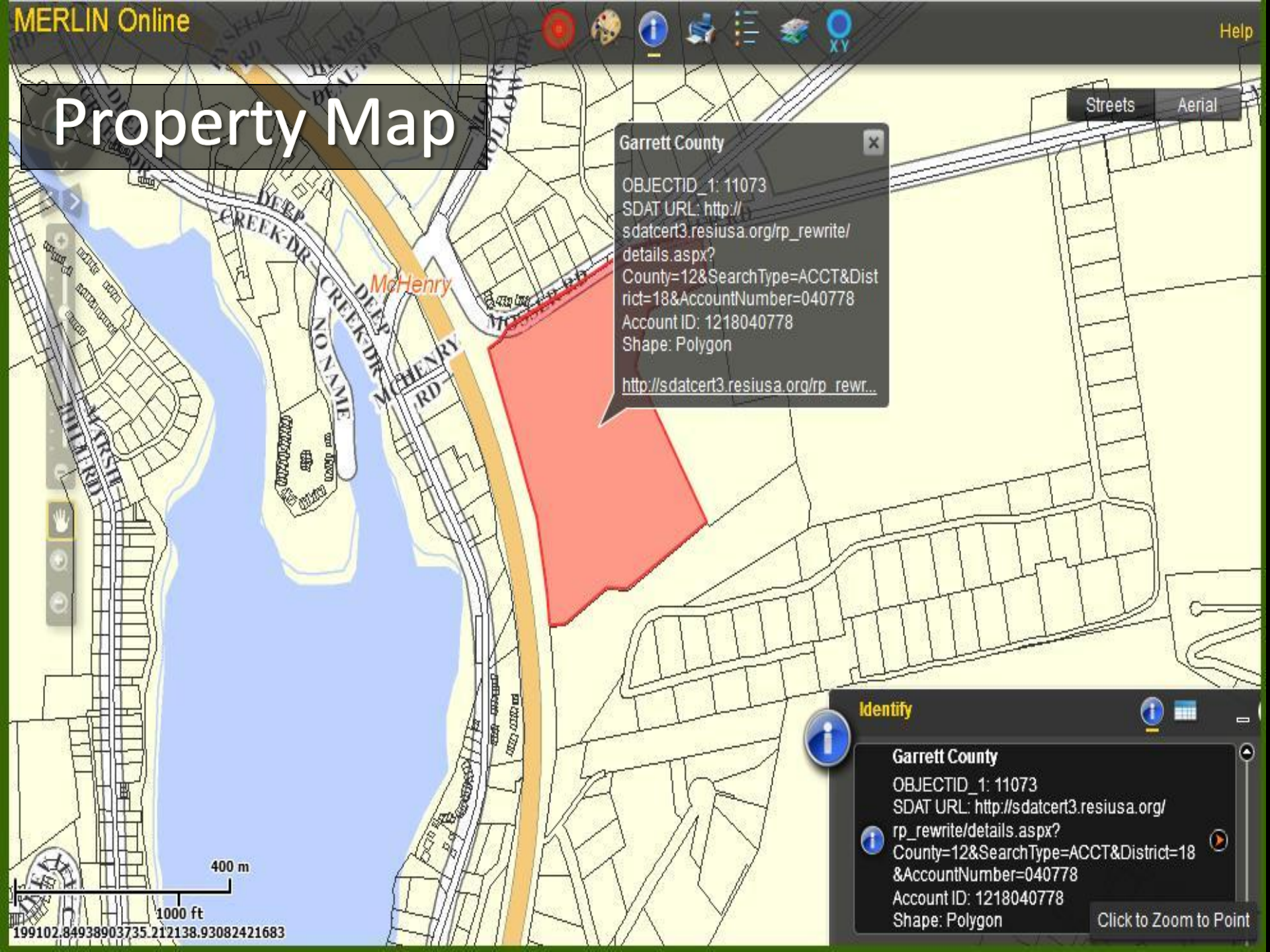
Garrett County

OBJECTID_1: 11073
 SDAT URL: http://sdatcert3.resiusa.org/rp_rewrite/details.aspx?County=12&SearchType=ACCT&District=18&AccountNumber=040778
 Account ID: 1218040778
 Shape: Polygon

Click to Zoom to Point



199102.84938903735.212138.93082421683



Priority Ranking



- Based on:
 - structural condition of culvert
 - number of sources
 - amount of impervious surfaces in drainage area
 - potential for negative impact on lake
 - presence or absence of vegetated buffer



The Findings

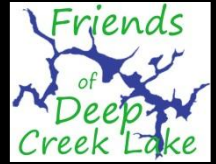
- 19 culverts in Priority 5
- 5 culverts in Priority 4
- 8 culverts in Priority 3
- 13 culverts in Priority 2
- 8 culverts in Priority 1
 - need of urgent attention by SHA

The Contaminants



- **Runoff** from impervious surfaces, i.e. roads, parking lots, driveways, and roofs
- **Trash**
- **Sediment** from erosion of swales and other sources
- Gravel and **road treatment**— salt used by SHA
- **Nutrients** from fertilizers, agricultural fields, household products
- **Debris** such as leaf litter, grass clippings, sticks, and other natural materials
- **Deterioration** of materials in culverts and retaining walls

The Problems



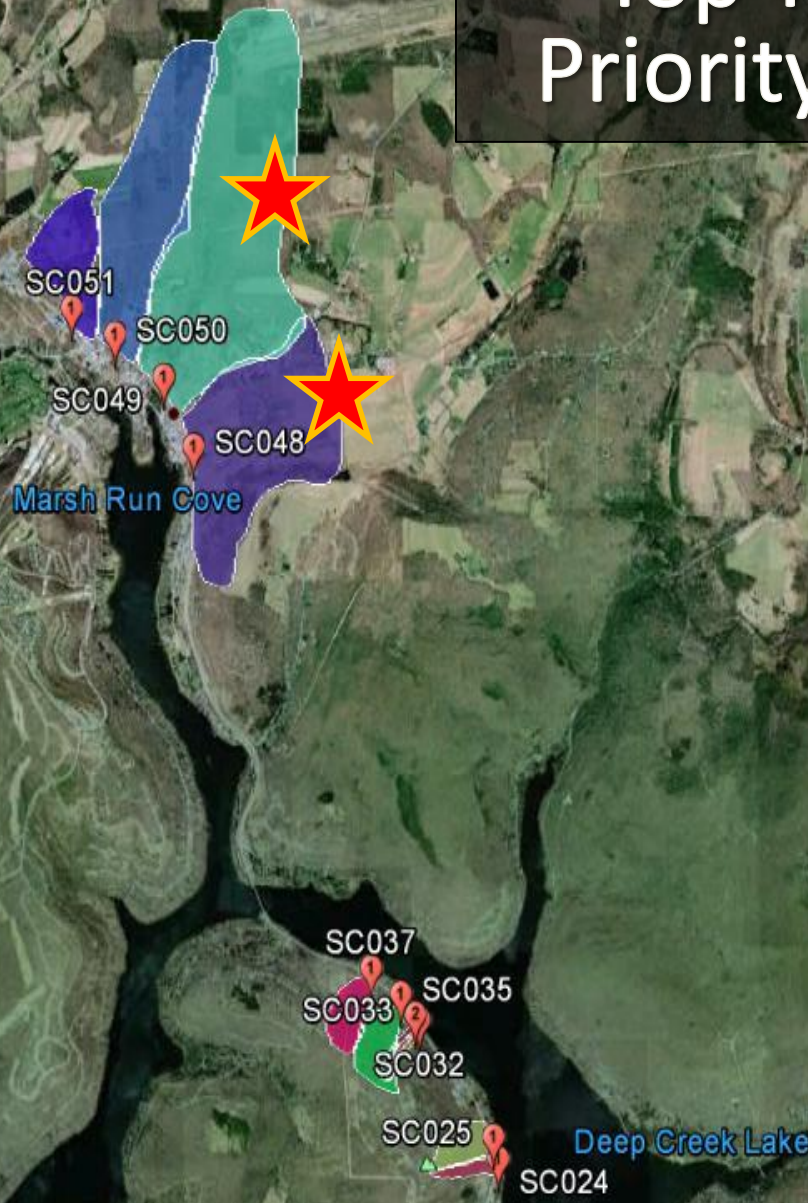
- Culverts **clogged** with debris, sediment, and gravel
- Impacts on private property (several property owner **complaints**)
- Increased **erosion** in swale, lake shore, and private property
- Potential for high nutrients and **pollutants**
- **Unfiltered** runoff dumping directly into Deep Creek Lake

High Priority Culverts



- All 8 culverts in Priority 1 category and 2 culverts (of 13) in Priority 2 category
- Chosen based on direct impact to Deep Creek Lake
 - Runoff, sediment, nutrients, and other pollutants
 - Absence of adequate vegetated buffer
 - Poor structural integrity
 - Large number of sources, especially those with impervious surfaces or potential for high nutrients

Top Ten High Priority Culverts



#2 – SC049



- Wooded area north of Mosser Road on east side drains into Marsh Run Cove on west side
- Potential for high nutrients from residential and agricultural areas upstream



#2 – SC049



1 SC049

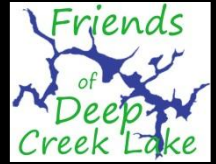
McHenry

Marsh Run Cove

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Image U.S. Geological Survey

Google earth

#1 – SC048



- Drains extensive area, including many roads, residential areas, part of Garrett College campus including new construction area, RV Park, and the entire fairgrounds and their new 600 car asphalted parking lot
- Water appears incredibly polluted



#1 – SC048

McHenry

SC048

Marsh Run Cove

© 2012 Google
Image U.S. Geological Survey

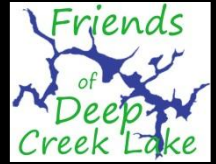
Google earth

Range of Solutions



- Swales should be **vegetated** with sedges and other native plants known for their nutrient retention properties
- Property owners, County, and State Highway maintenance staff should all **cease mowing** of swales
- Debris, sediment, and gravel should be **removed** – infiltration will increase; nutrient and sediment load will decrease
- All culverts should have **bio-retention structures**, not flow straight into lake or through the DNR buffer strip.

Additional Solutions



- In the 8 sites of highest impact on Deep Creek Lake, SHA will need to undertake **engineering studies** to determine runoff retention options. Given they are located at the waters edge, finding room to install bio-retention options represents a serious planning challenge
- The site identified by DNR as a problem area is not ranked as high priority– due to existence of extensive storm drain system and buffering along tributary



Next Steps

- Water Quality testing
 - Suspended Solids and Turbidity
 - Sites selected based on field observations, ranking
 - Pre- and post-rain event testing on most critical sites
- Fall and Winter assessment of selected sites
- Report to State Highway Administration and follow-up with them to reduce impacts on the lake
- Compilation of best management practices manual for both County and State road departments

Thank You

Questions?

Credits



This study organized by:
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With a grant from:
Constellation Energy EcoStar

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Heather Fisher

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