CULVERT SIZING PROJECT

Prioritizing Culverts and Dams in the Hudson River Estuary Watershed

LHCCD Annual Conference
Wednesday, October 15, 2014

New York State Water Resources Institute

Cornell University

Hudson River Estuary

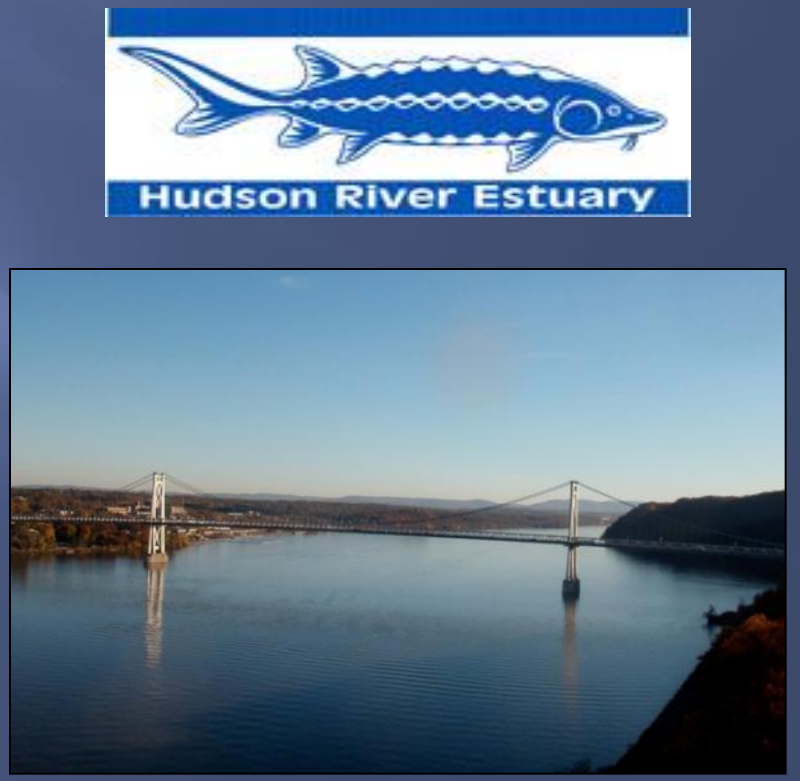
LHCCD
LOWER HUDSON COALITION OF CONSERVATION DISTRICTS

Orange County Soil & Water Conservation District

Hudson River Estuary Program

Core Mission

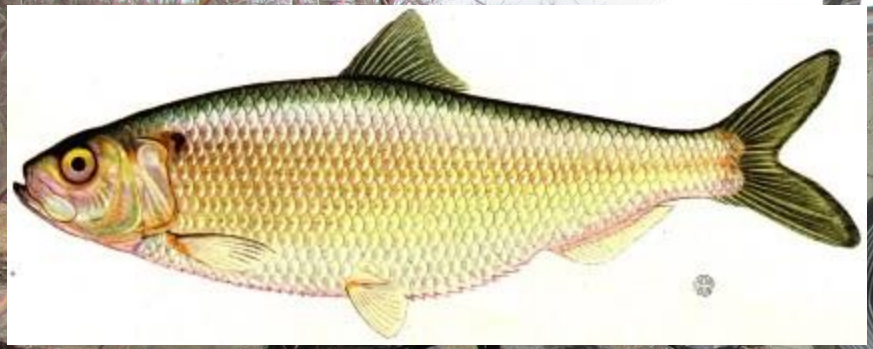
- Ensure ***clean water***
- Protect and restore fish, wildlife, and their ***habitats***
- Provide water recreation and river ***access***
- Adapt to ***climate change***
- Conserve world-famous ***scenery***



Aquatic barriers

- Biologically Important Barriers project
- Culvert Sizing project

Barrier impacts



- Habitat
- Aquatic communities
- Sediment and debris
- Water quality
- Hydrology
- Maintenance/Replacement costs

- Projects are quickly accomplished.
- Benefits can be shown quickly.
- Average annual cost can be cheaper over the lifetime of an upgraded culvert.

TNC 2013

Economics of barrier mitigation

Number of barriers

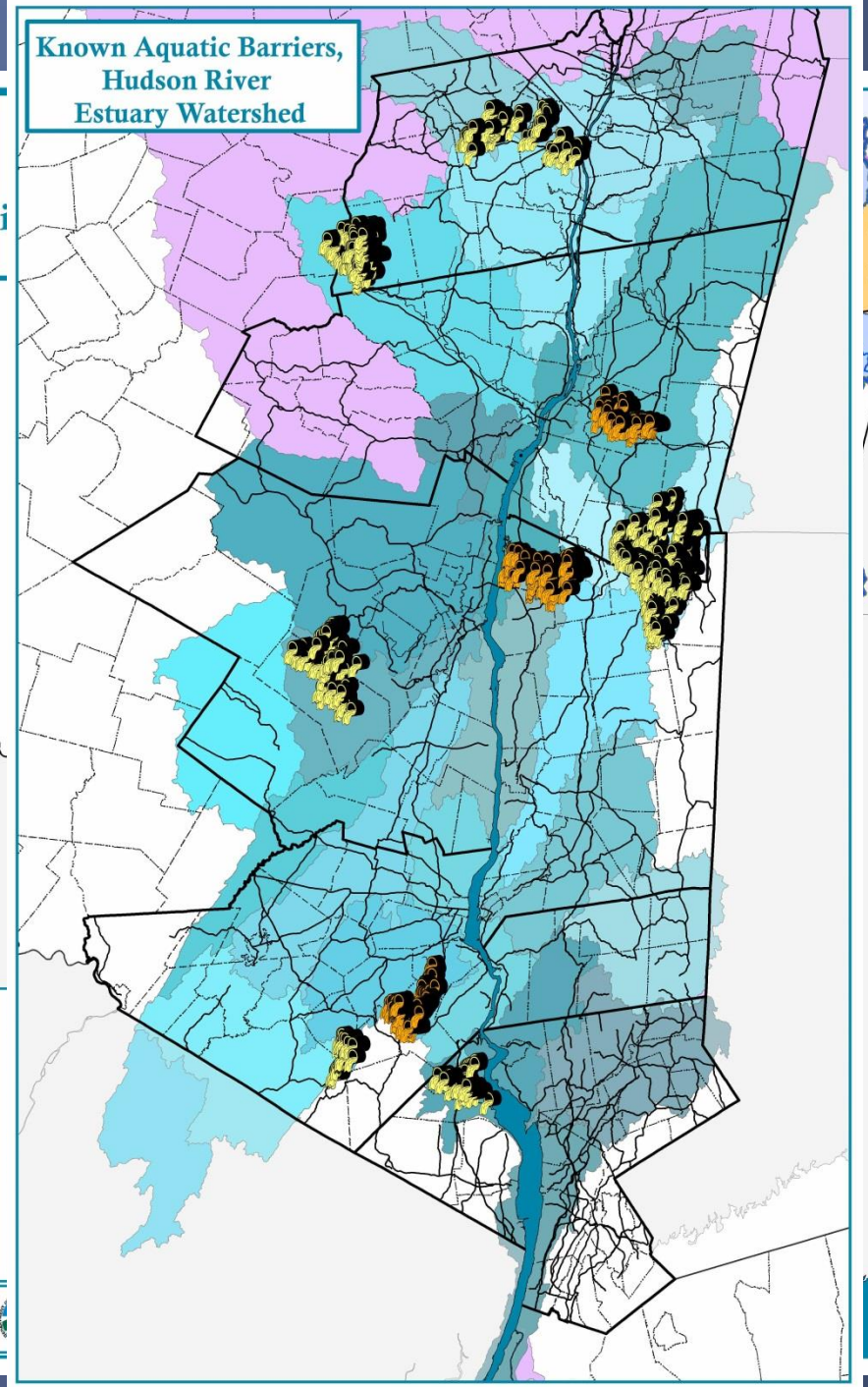
- 64% not fully passable, Great Lakes basin (Janushowski-Hartley et al. 2013)
- Over 60% not fully passable, Green Mountain National Forest (USFS 2013)
- 1 million culverts statewide (NYSDOT)

Cost of Mitigation

- Ecologically-based designs increase cost by 80%, and 300% for small culverts (as cited in draft TNC NYSDOT culvert prioritization project report)
- Improved crossings can be 50-100% higher (TNC 2013)

Culvert Sizing project

- Field assessments
- Model current and future stream flow
- Passability score
- Prioritize culvert replacements for the town



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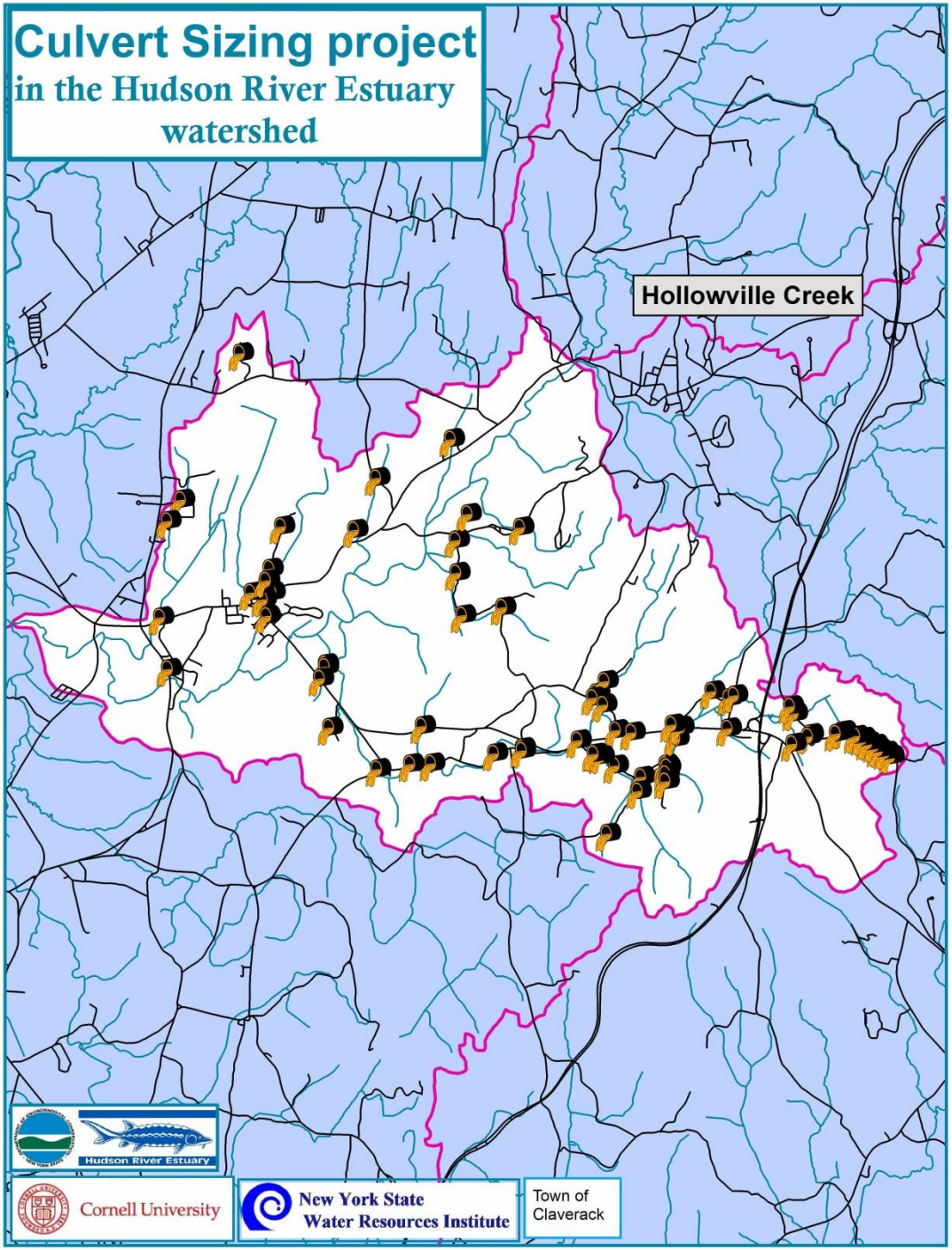
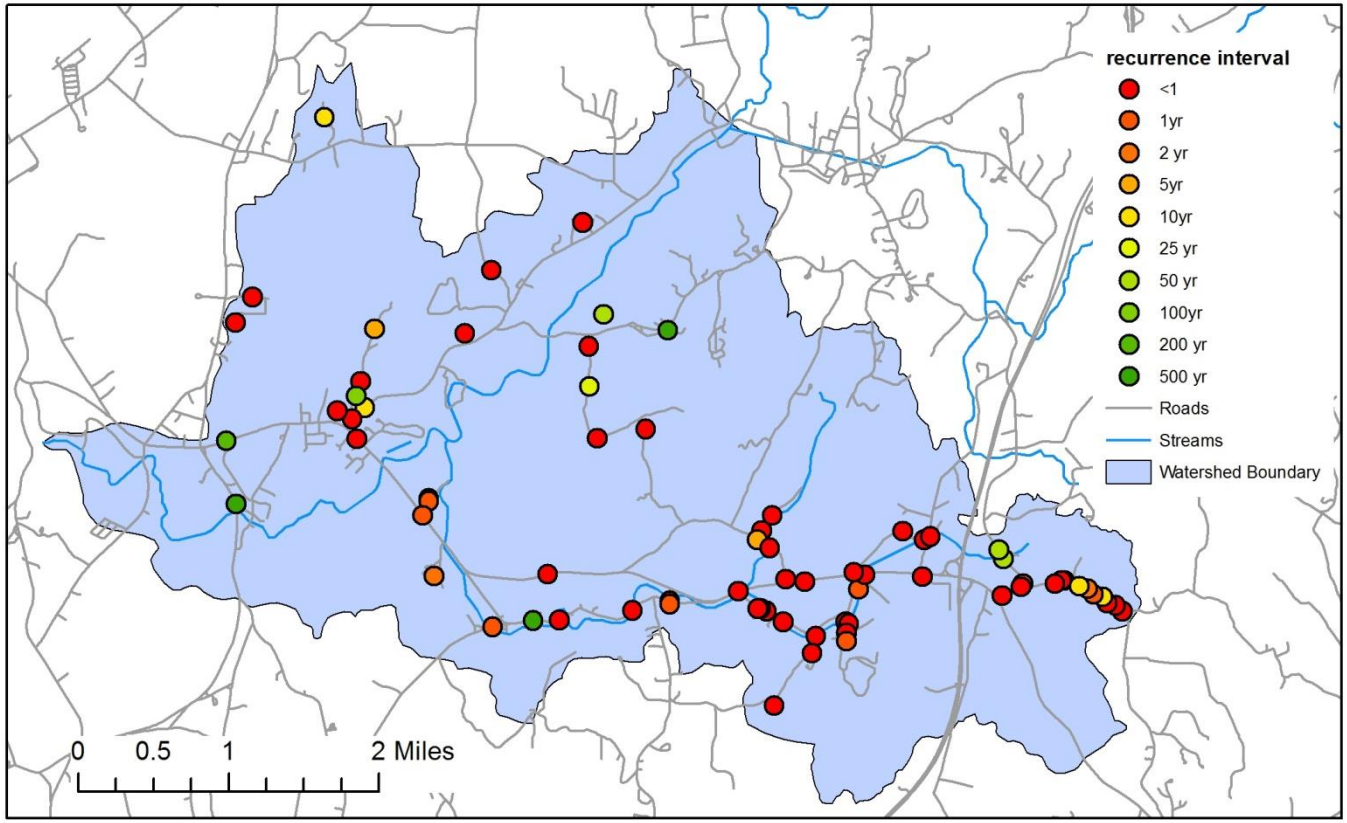
ULSTER COUNTY SOIL AND WATER CONSERVATION DISTRICT 1945

Orange County
Soil & Water
Conservation District

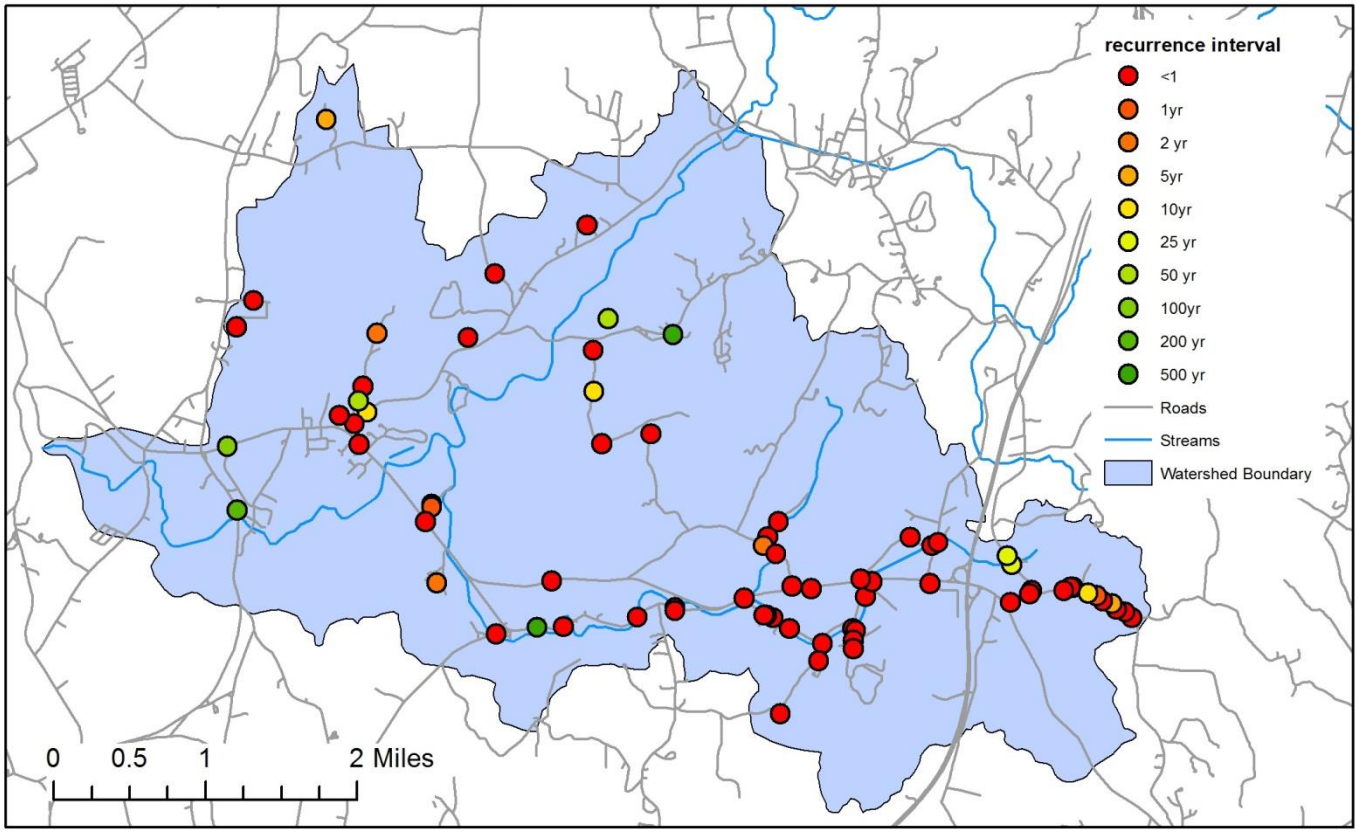
SOIL AND WATER CONSERVATION DISTRICT


Culvert Sizing project
in the Hudson River Estuary watershed
Hollowville Creek
Hudson River Estuary
Cornell University
New York State Water Resources Institute
Town of Claverack

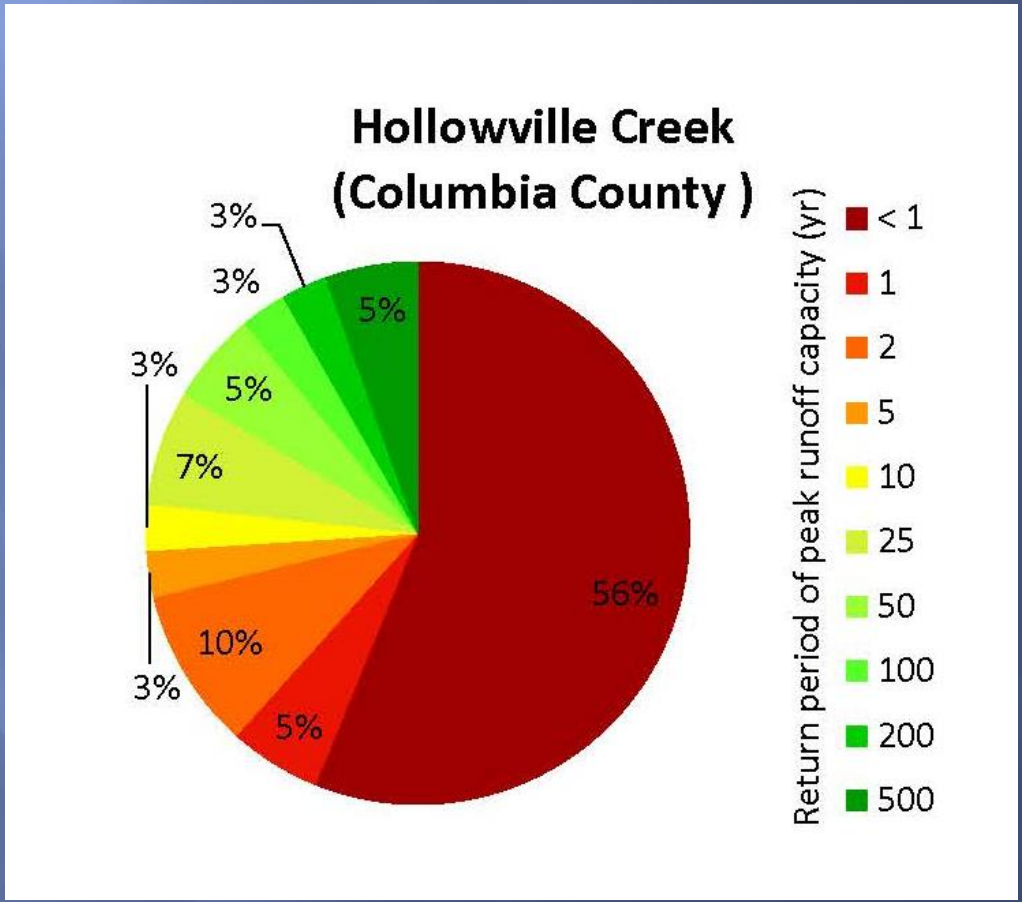
With 2013 rainfall/runoff



With 2050 predicted rainfall/runoff



- Many culverts are undersized



Culverts are largely on town roads

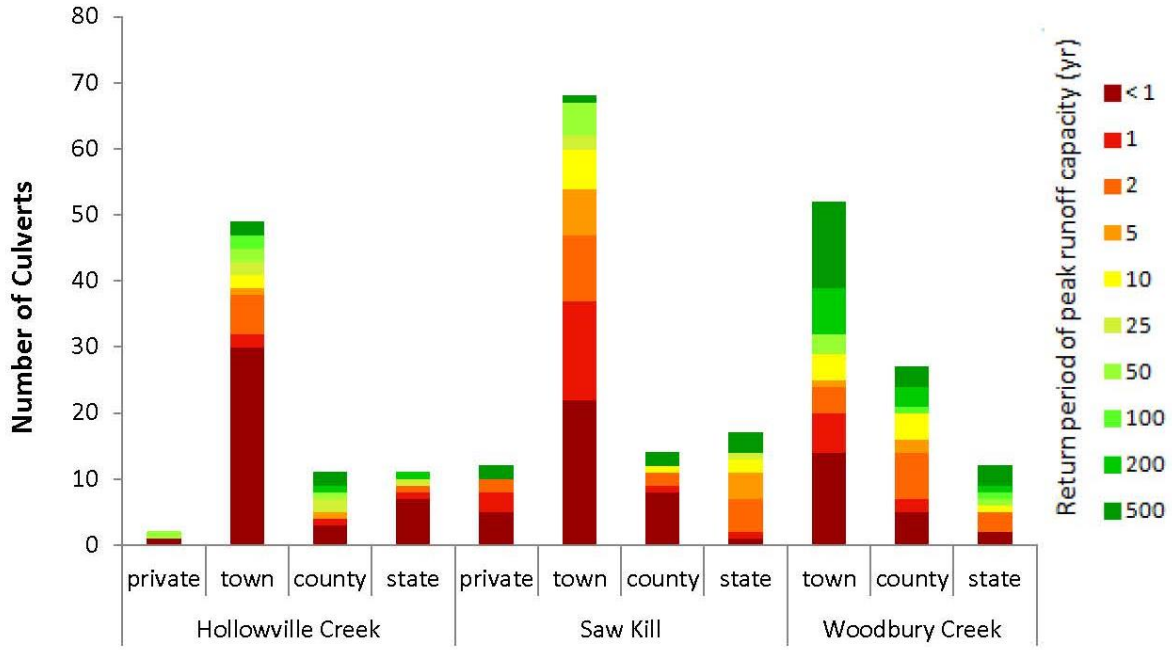
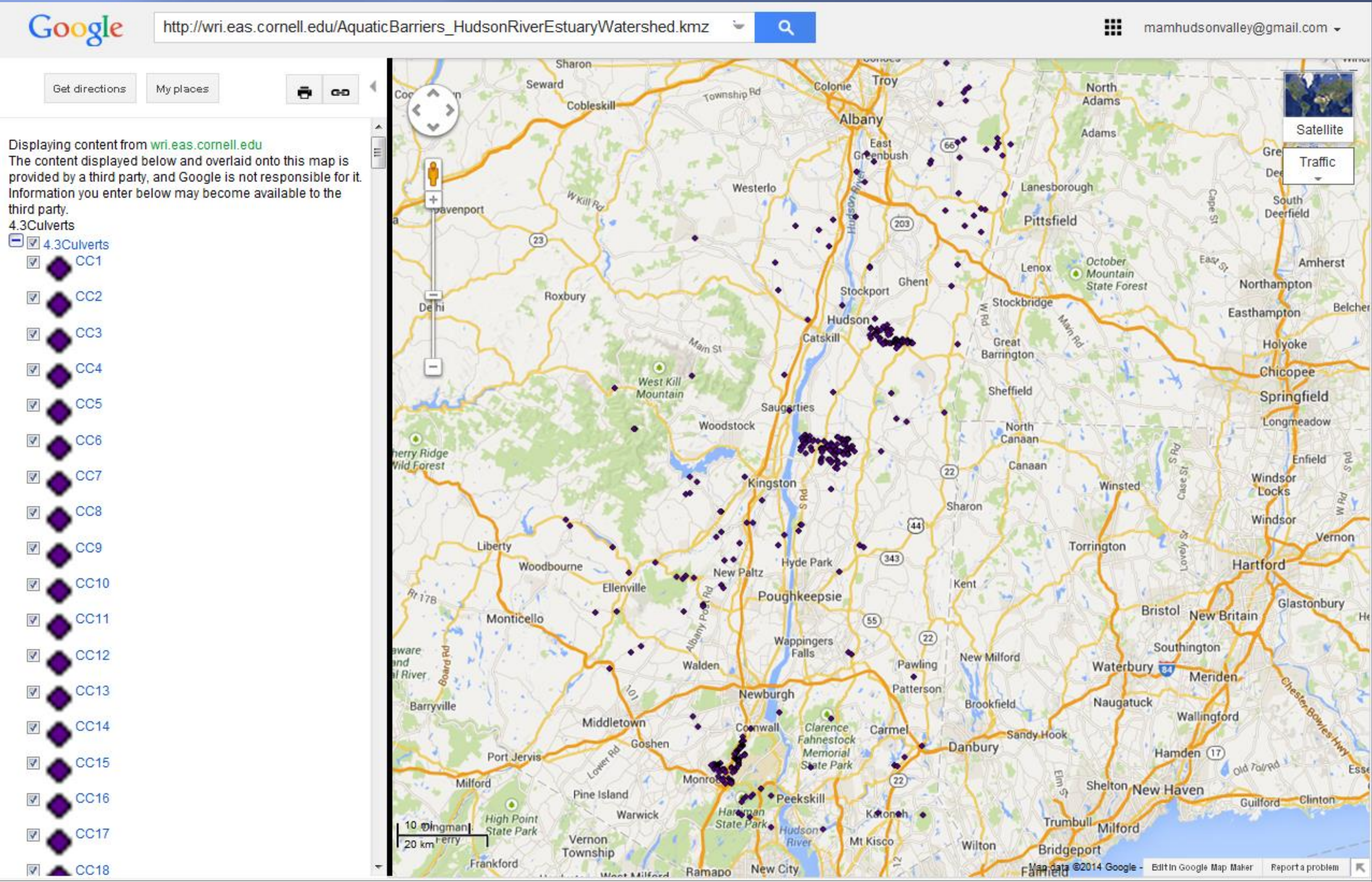


Figure 2. Distribution of return period of culvert peak flow capacity (submerged outlet), displayed by road ownership and watershed.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Troy
Albany
Pittsfield
Hudson
Catskill
Saugerties
Kingston
Poughkeepsie
Newburgh
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Danbury
Hartford
Springfield
New Haven
Bridgeport
Waterbury
Middletown
Monticello
New City
10 mi
20 km
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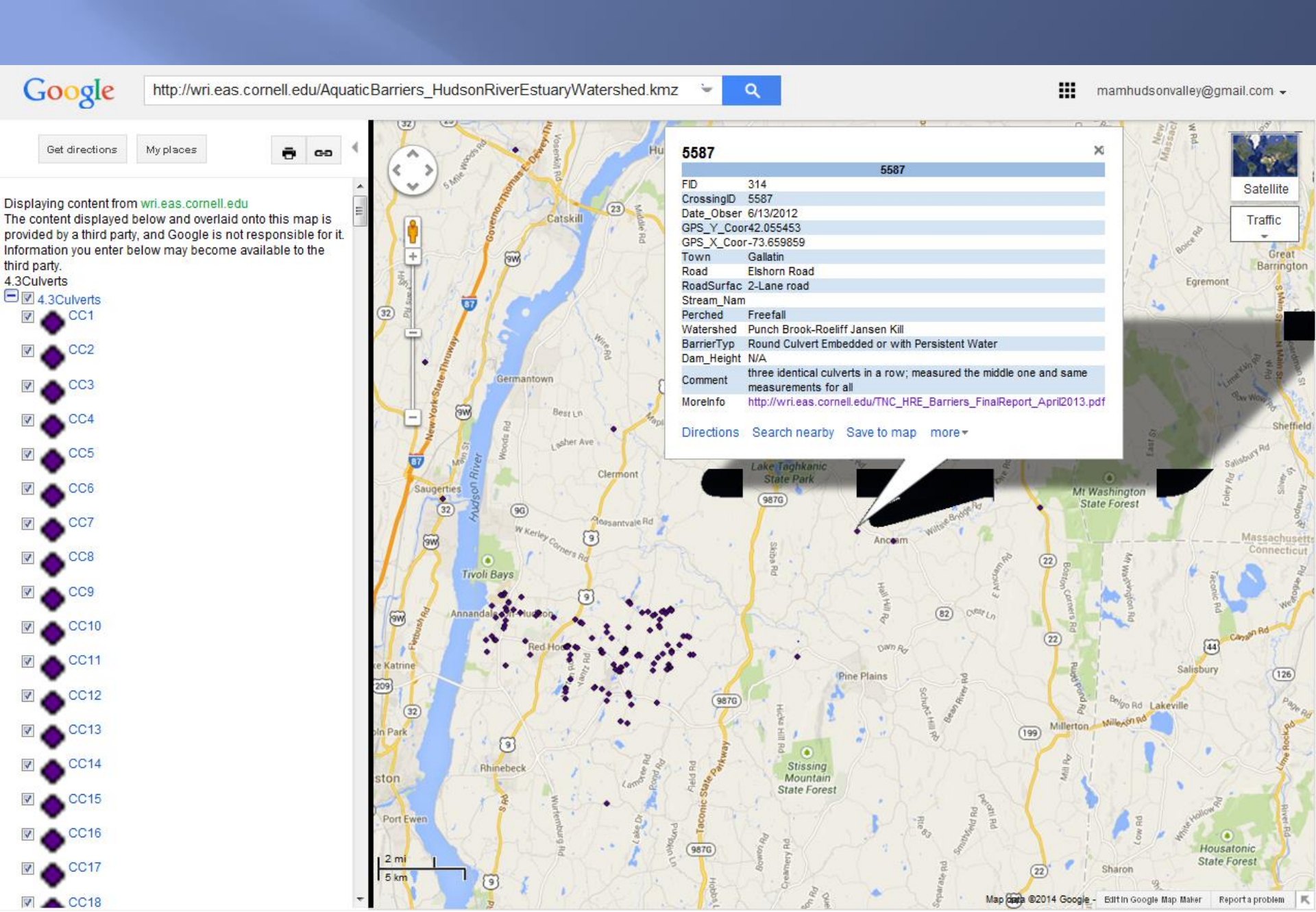
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5587
5587
FID 314
CrossingID 5587
Date_Obser 6/13/2012
GPS_Y_Coor 42.055453
GPS_X_Coor -73.659859
Town Gallatin
Road Elshorn Road
RoadSurfac 2-Lane road
Stream_Nam
Perched Freefall
Watershed Punch Brook-Roeliff Jansen Kill
BarrierTyp Round Culvert Embedded or with Persistent Water
Dam_Height N/A
Comment three identical culverts in a row; measured the middle one and same measurements for all
MoreInfo http://wri.eas.cornell.edu/TNC_HRE_Barriers_FinalReport_April2013.pdf
Directions
Search nearby
Save to map
more
Satellite
Traffic
Catskill
Germantown
Clermont
Saugerties
Tivoli Bays
Red Hook
Rhinebeck
Pine Plains
Ancram
Lake Taghkanic State Park
Mt Washington State Forest
Stissing Mountain State Forest
Taconic State Parkway
Hudson River
New York State Thruway
Millerton
Salisbury
Lakeville
Sharon
Housatonic State Forest
Egremont
Great Barrington
Sheffield
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Connecticut
2 mi
5 km
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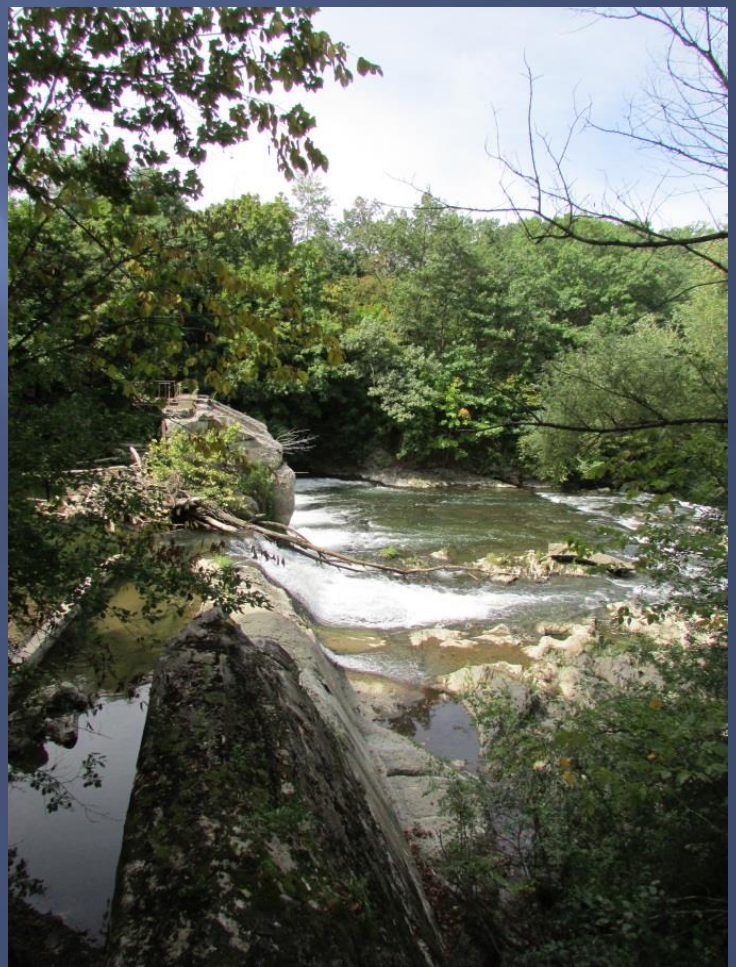
- Funding opportunities
- Resources



Aquatic barriers "…sit unneeded, unused, undermaintained—a growing ecological and fiscal liability" National Forest System Legacy Roads and Trails program 2013

USFS Legacy Roads and Trails program 2013

Improving Watershed Resiliency

- Plan for climate adaptation
- Integrate water resource protection into municipal plans
- Move infrastructure out of floodplains
- Create partnerships, work intermunicipally and with watershed groups

Improving Watershed Resiliency

- Replace undersized road crossings
- Remove dams where feasible
- Manage runoff with green infrastructure
- Build demonstration sites
- Protect forests, wetlands, floodplains
- Restore vegetation along streams

New York State Water Resources Institute

Andrew Meyer

Hudson River Estuary Program

New York State Department of Environmental Conservation
in cooperation with
Cornell University
NYS Water Resources Institute