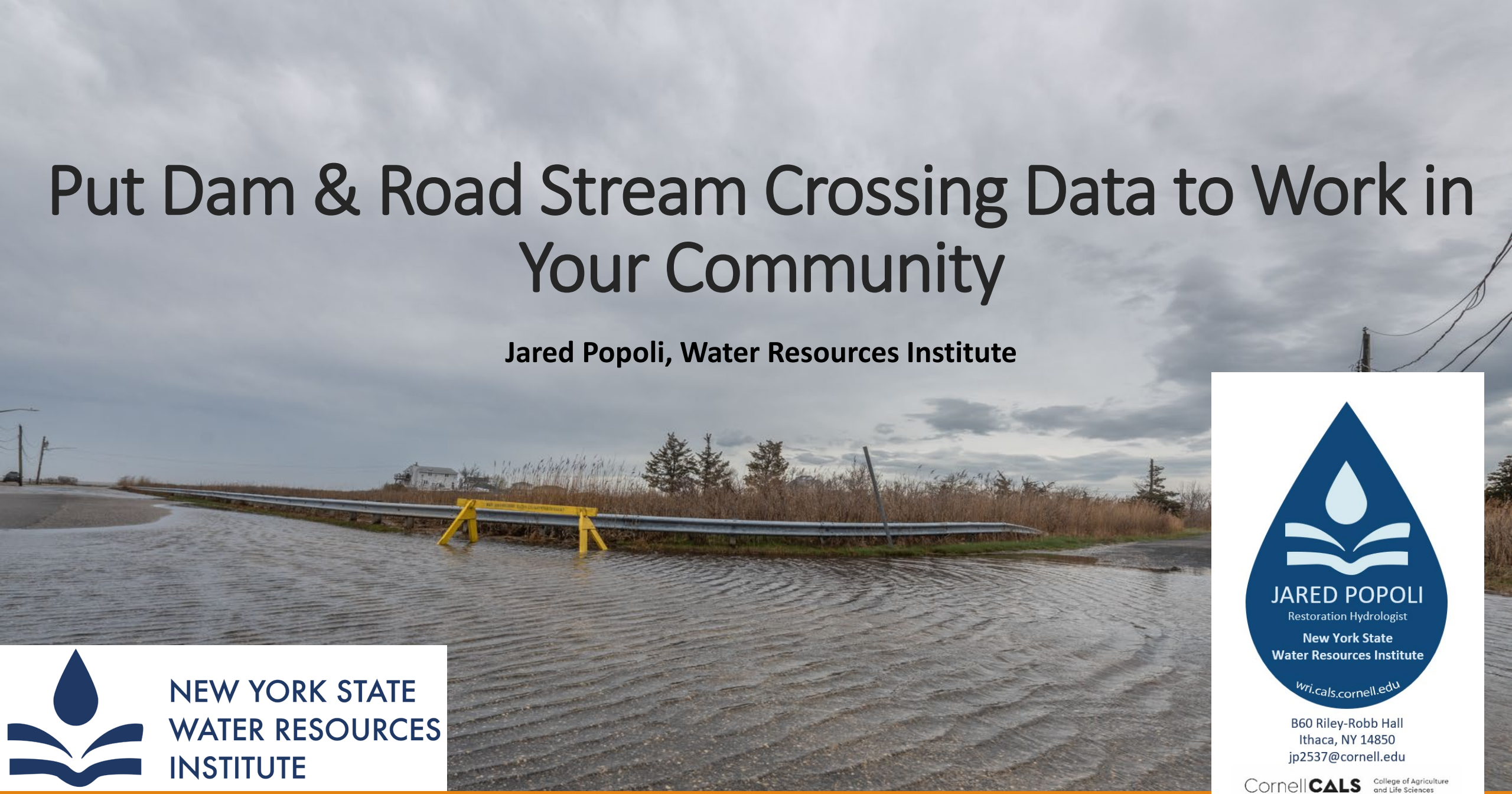
Put Dam & Road Stream Crossing Data to Work in Your Community

Jared Popoli, Water Resources Institute



NEW YORK STATE WATER RESOURCES INSTITUTE

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Agenda

- Dam & Road Stream Crossing Impacts
- Assessment Efforts/Data Collected
- Uses of Data Available Information
- Assistance Resources

Inventory
What is Considered an Aquatic Barrier?

Dams
- Manmade structures built to impound water
- Includes large and small unregulated structures, diversion structures, lowhead dams
- Includes information on passability

Assessed Road-Stream Crossings
- Manmade structures built to pass water under a road
- Includes culverts, fords, slabs, low water crossings, bridges
- Includes structures considered passable and impassable

Waterfalls
- Natural rock/bedrock structures
- Based on USGS National Dataset
- Not used to prioritize, but to break network and calculate miles opened.
- Includes structures considered passable and impassable

~124,000 Road Stream Crossings

There are a LOT of crossings…

Approximately 40% Have been assessed

Ecological Impact

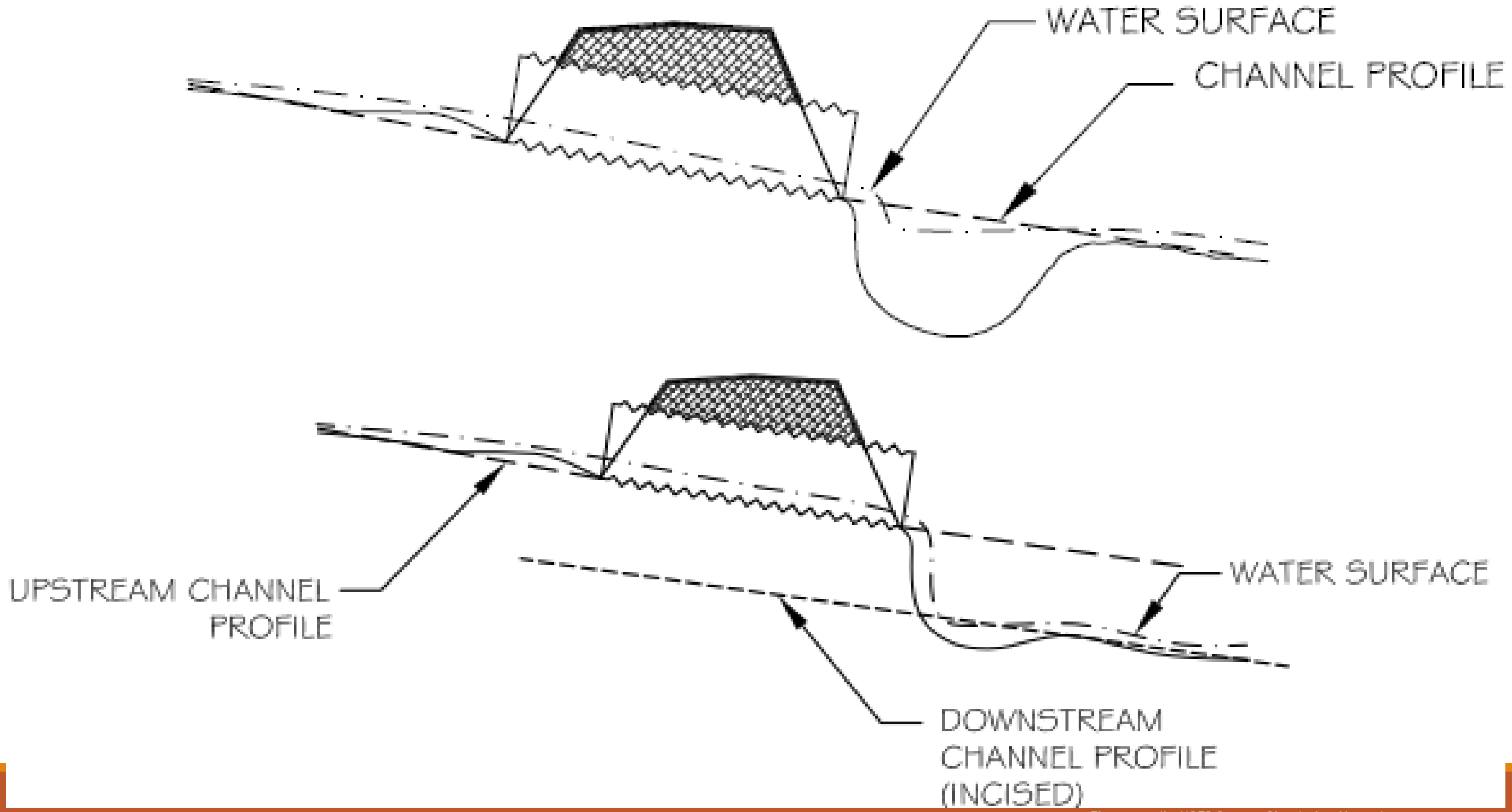


Figure credit: USFS Stream Simulation Manual

The problem with road-stream crossings

- Road-stream Crossings (i.e. culverts and bridges) are generally undersized
  - Causes flooding and road damage/closures
  - Cuts off access to homes communities and resources
- Aging infrastructure increases the risk of failure and flood impacts
- Often a source of scour and erosion & disrupt streamflow and sediment transport

Increasing storm event intensity increases this problem

Problem Examples

= Undersized
= Impassable
= Poor Condition
= Erosion

Bad culvert in one is often a bad culvert in all

Common challenges for municipalities

- Lack of capacity
- Restricted internal budgets
- Lack of funding or ability to apply for external funds
- Lack of training/knowledge on proper stream crossing design
- No inventory/prioritization or long-term plans

North Atlantic Aquatic Connectivity Collaborative (NAACC)

The North Atlantic Aquatic Connectivity Collaborative (NAACC) is a network of individuals focused on improving aquatic connectivity across a thirteen-state region, from Maine to West Virginia.

Expanding to National Program

- Started in 2015
- Developed protocol, electronic data form, scoring system
- In person and online trainings
- Web based tool, mapper, and data for prioritization/assessment
- Assessments for Aquatic Organism Passage (AOP)
- Data collected has many other potential uses

NAACC Assessment Modules

Aquatic Connectivity - Non tidal

Protocol for the assessment of aquatic passability for road crossings on non-tidal streams and rivers, including data forms, instructions, and training materials. A web-based database serves as a convenient repository of the data collected in crossings surveys.

Aquatic Connectivity - Tidal

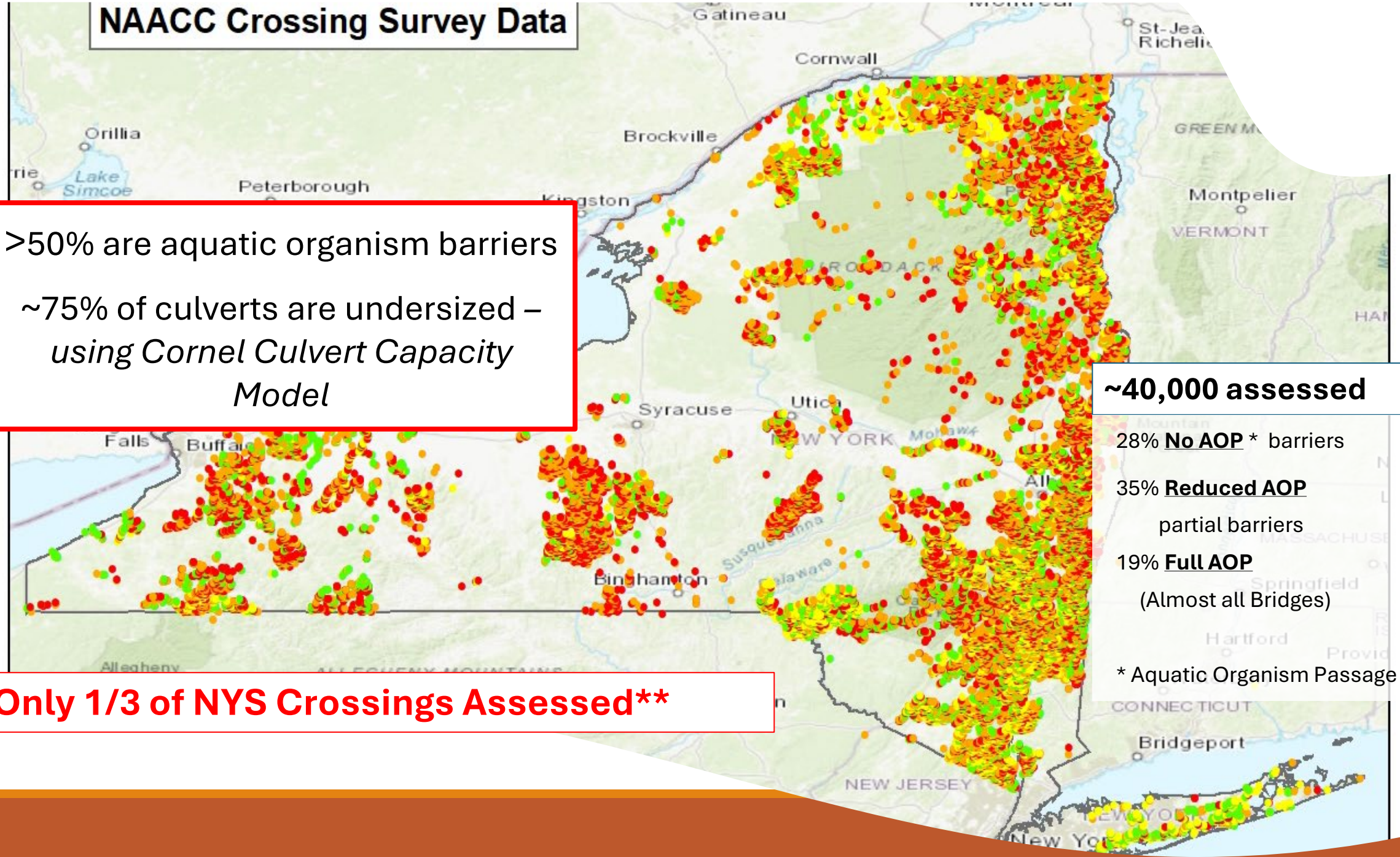
An assessment protocol to evaluate aquatic organism passage for tidal streams and rivers, including: salt marsh creeks, salt/brackish flow-through streams, and freshwater tidal rivers and streams.

Risk of Failure/ Vulnerability

The NAACC has developed a Culvert Condition Assessment protocol that can be used to assess the structural integrity of culverts and evaluate their risk of structural failure. This protocol is expected to be available for the 2019 field season. Others have been working on methodologies to assess geomorphic and hydraulic risk of crossing failure.

Terrestrial Connectivity

https://streamcontinuity.org/naacc/assessments/naacc-documentsThe terrestrial passability assessment module for road-stream crossings is an assessment protocol that evaluates passability for terrestrial wildlife. A single assessment protocol is used to collect data that are then used to calculate a passability score for various animal groups. This protocol will be available for the 2019 field season.



>50% are aquatic organism barriers

~75% of culverts are undersized – *using Cornel Culvert Capacity Model*

~40,000 assessed

28% **No AOP** * barriers

35% **Reduced AOP** partial barriers

19% **Full AOP** (Almost all Bridges)

* Aquatic Organism Passage

****Only 1/3 of NYS Crossings Assessed****

Field Data Collected

Crossing Data:

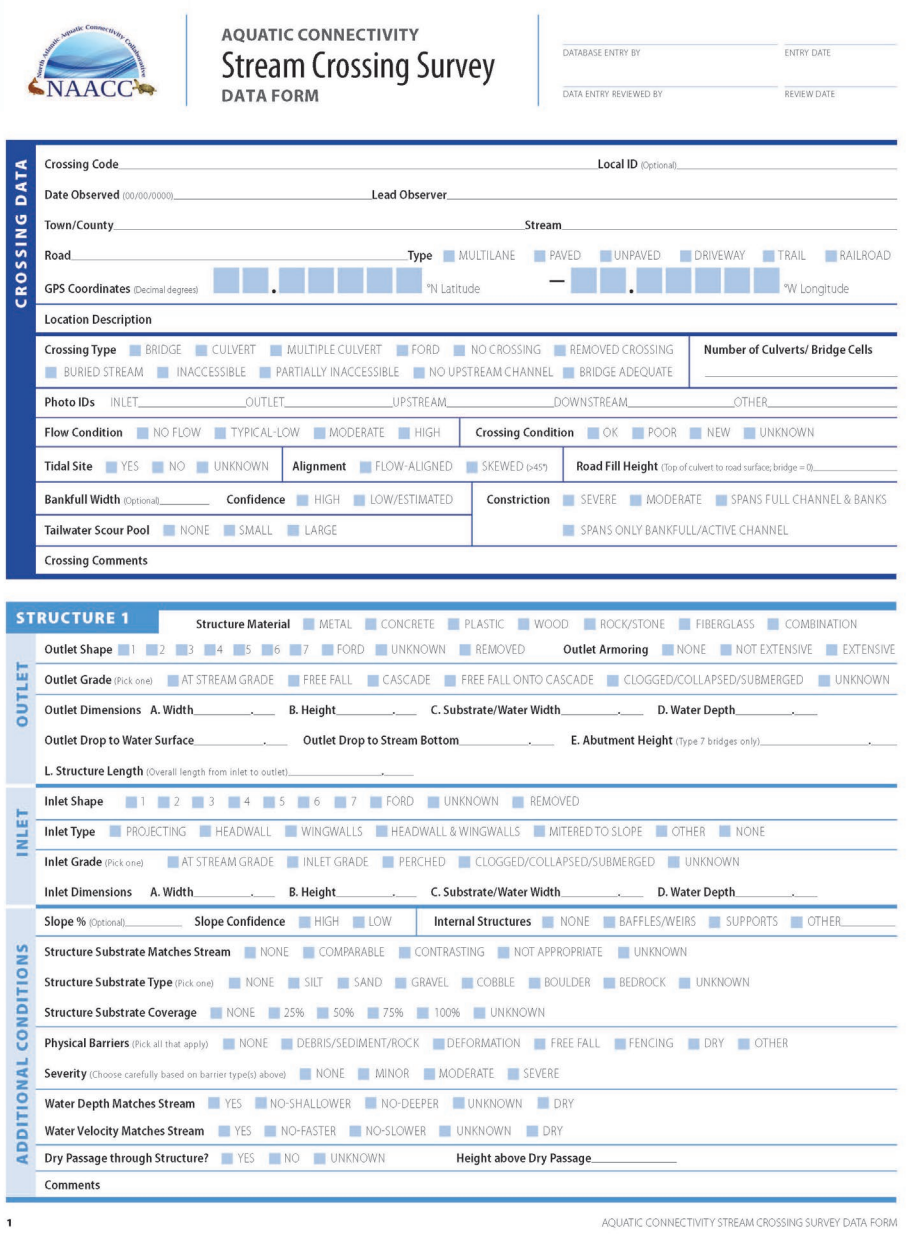
- Dimensions (Inlet/Outlet), Road Height
- Crossing Type, Shape, Headwalls/Wingwalls
- Condition, Photos

Additional Metrics

- Outlet Drop
- Scour Pool Size, Type
- Physical Barriers/Blockages
- Deformation, Constriction
- Substrate Type/Coverage

Data Uploaded to Database: Automatically scores AOP

- Full AOP, Reduced AOP, No AOP
- AOP Score (0.0 to 1.0), Barrier Severity



AQUATIC CONNECTIVITY
Stream Crossing Survey
DATA FORM

DATABASE ENTRY BY | ENTRY DATE
DATA ENTRY REVIEWED BY | REVIEW DATE

CROSSING DATA

Crossing Code | Local ID (Optional)
Date Observed (00/00/0000) | Lead Observer
Town/County | Stream
Road | Type: MULTILANE PAVED UNPAVED DRIVEWAY TRAIL RAILROAD
GPS Coordinates (Decimal degrees) °N Latitude — °W Longitude
Location Description
Crossing Type: BRIDGE CULVERT MULTIPLE CULVERT FORD NO CROSSING REMOVED CROSSING BURIED STREAM INACCESSIBLE PARTIALLY INACCESSIBLE NO UPSTREAM CHANNEL BRIDGE ADEQUATE | Number of Culverts/ Bridge Cells
Photo IDs: INLET OUTLET UPSTREAM DOWNSTREAM OTHER
Flow Condition: NO FLOW TYPICAL-LOW MODERATE HIGH | Crossing Condition: OK POOR NEW UNKNOWN
Tidal Site: YES NO UNKNOWN | Alignment: FLOW-ALIGNED SKEWED (>45°) | Road Fill Height (Top of culvert to road surface; bridge = 0)
Bankfull Width (Optional) | Confidence: HIGH LOW/ESTIMATED | Constriction: SEVERE MODERATE SPANS FULL CHANNEL & BANKS SPANS ONLY BANKFULL/ACTIVE CHANNEL
Tailwater Scour Pool: NONE SMALL LARGE
Crossing Comments

STRUCTURE 1

Structure Material: METAL CONCRETE PLASTIC WOOD ROCK/STONE FIBERGLASS COMBINATION

OUTLET
Outlet Shape: 1 2 3 4 5 6 7 FORD UNKNOWN REMOVED | Outlet Armoring: NONE NOT EXTENSIVE EXTENSIVE
Outlet Grade (Pick one): AT STREAM GRADE FREE FALL CASCADE FREE FALL ONTO CASCADE CLOGGED/COLLAPSED/SUBMERGED UNKNOWN
Outlet Dimensions: A. Width . B. Height . C. Substrate/Water Width . D. Water Depth .
Outlet Drop to Water Surface . | Outlet Drop to Stream Bottom . | E. Abutment Height (Type 7 bridges only) .
L. Structure Length (Overall length from inlet to outlet) .

INLET
Inlet Shape: 1 2 3 4 5 6 7 FORD UNKNOWN REMOVED
Inlet Type: PROJECTING HEADWALL WINGWALLS HEADWALL & WINGWALLS MITERED TO SLOPE OTHER NONE
Inlet Grade (Pick one): AT STREAM GRADE INLET GRADE PERCHED CLOGGED/COLLAPSED/SUBMERGED UNKNOWN
Inlet Dimensions: A. Width . B. Height . C. Substrate/Water Width . D. Water Depth .

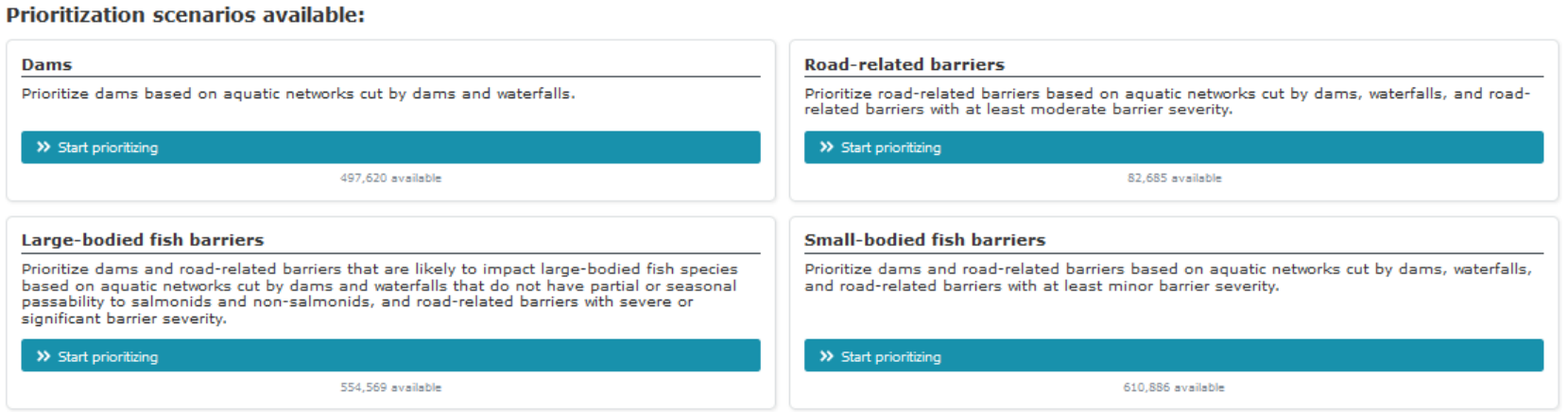
ADDITIONAL CONDITIONS
Slope % (Optional) | Slope Confidence: HIGH LOW | Internal Structures: NONE BAFFLES/WEIRS SUPPORTS OTHER
Structure Substrate Matches Stream: NONE COMPARABLE CONTRASTING NOT APPROPRIATE UNKNOWN
Structure Substrate Type (Pick one): NONE SILT SAND GRAVEL COBBLE BOULDER BEDROCK UNKNOWN
Structure Substrate Coverage: NONE 25% 50% 75% 100% UNKNOWN
Physical Barriers (Pick all that apply): NONE DEBRIS/SEDIMENT/ROCK DEFORMATION FREE FALL FENCING DRY OTHER
Severity (Choose carefully based on barrier type(s) above): NONE MINOR MODERATE SEVERE
Water Depth Matches Stream: YES NO-SHALLOWER NO-DEEPER UNKNOWN DRY
Water Velocity Matches Stream: YES NO-FASTER NO-SLOWER UNKNOWN DRY
Dry Passage through Structure?: YES NO UNKNOWN | Height above Dry Passage
Comments

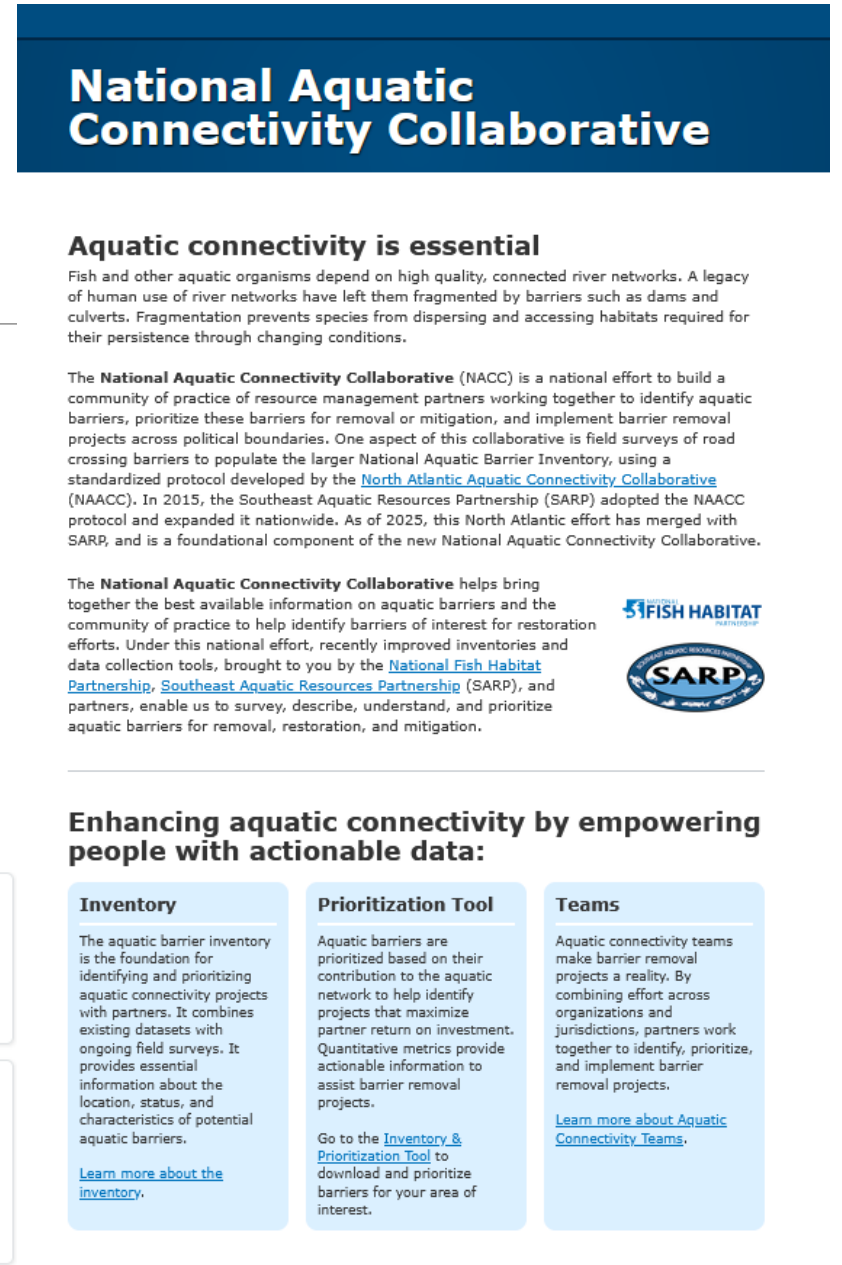
1 AQUATIC CONNECTIVITY STREAM CROSSING SURVEY DATA FORM

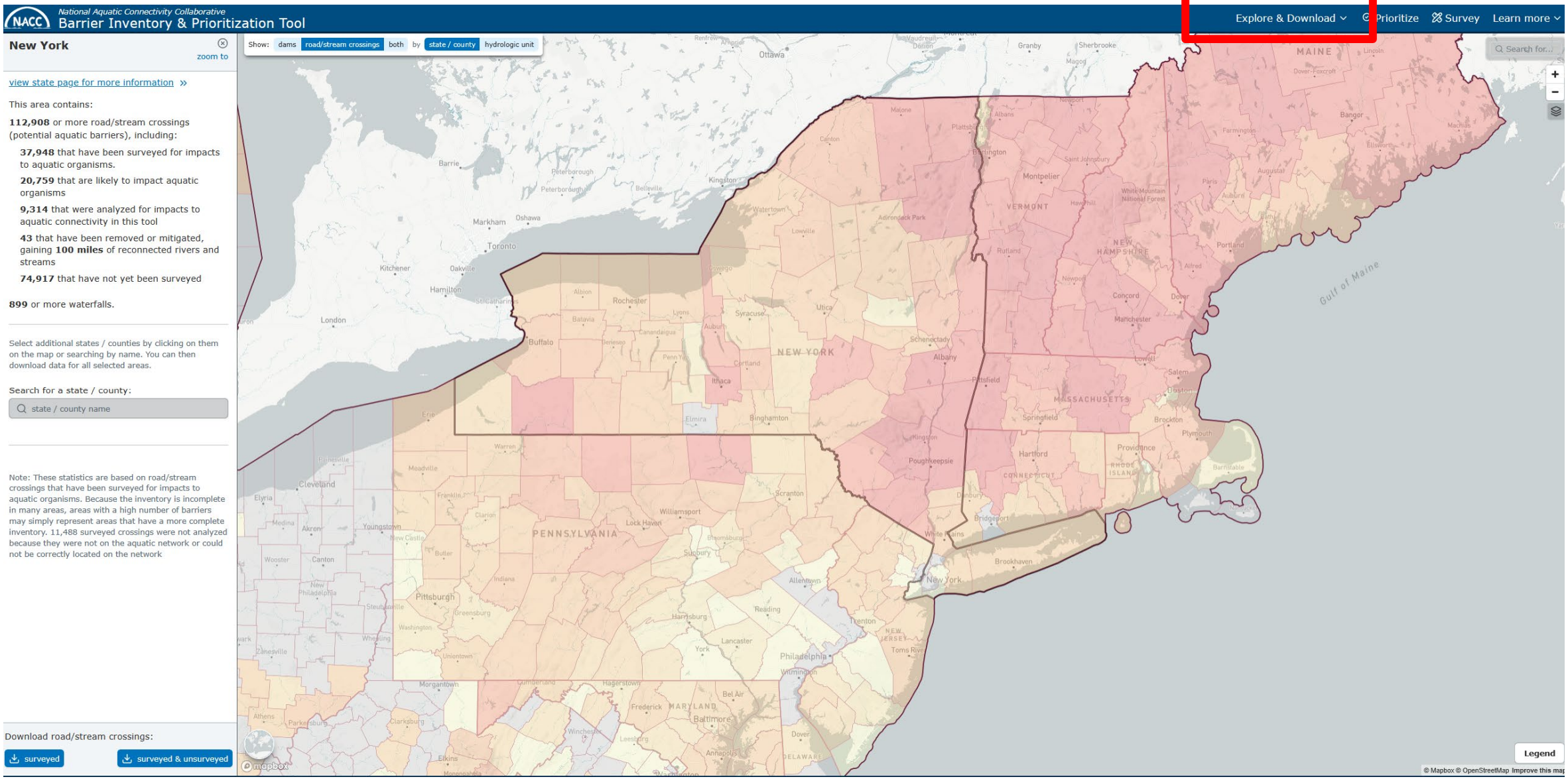
https://aquaticbarriers.org/

National Aquatic Connectivity Collaborative

- *National Aquatic Barrier Inventory & Prioritization Tool*
  - Inventory, Mapper and Prioritization Metrics
  - Provides filters, statistics & additional attributes in datasets
- Taking over database management this year






National Aquatic Connectivity Collaborative
Barrier Inventory & Prioritization Tool
Explore & Download
Prioritize
Survey
Learn more
New York
zoom to
view state page for more information »
This area contains:
112,908 or more road/stream crossings (potential aquatic barriers), including:
37,948 that have been surveyed for impacts to aquatic organisms.
20,759 that are likely to impact aquatic organisms
9,314 that were analyzed for impacts to aquatic connectivity in this tool
43 that have been removed or mitigated, gaining 100 miles of reconnected rivers and streams
74,917 that have not yet been surveyed
899 or more waterfalls.
Select additional states / counties by clicking on them on the map or searching by name. You can then download data for all selected areas.
Search for a state / county:
state / county name
Note: These statistics are based on road/stream crossings that have been surveyed for impacts to aquatic organisms. Because the inventory is incomplete in many areas, areas with a high number of barriers may simply represent areas that have a more complete inventory. 11,488 surveyed crossings were not analyzed because they were not on the aquatic network or could not be correctly located on the network
Download road/stream crossings:
surveyed
surveyed & unsurveyed
Show: dams road/stream crossings both by state / county hydrologic unit
Search for...
Legend
© Mapbox © OpenStreetMap Improve this map
NEW YORK
PENNSYLVANIA
VERMONT
NEW HAMPSHIRE
MAINE
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
NEW JERSEY
MARYLAND
DELAWARE
Gulf of Maine

Statistics for selected areas

These areas contain:

2,288 inventoried dams, including:

- **1,595** that were analyzed for impacts to aquatic connectivity in this tool
- **10** that have been removed or mitigated, gaining **36 miles** of reconnected rivers and streams

29,902 or more road/stream crossings (potential aquatic barriers), including:

- **5,626** that have been surveyed for impacts to aquatic organisms.
- **3,336** that are likely to impact aquatic organisms
- **1,475** that were analyzed for impacts to aquatic connectivity in this tool
- **8** that have been removed or mitigated, gaining **23 miles** of reconnected rivers and streams
- **24,268** that have not yet been surveyed

308 or more waterfalls.

Download: dams & surveyed crossings

Show: dams | road/stream crossings | both | by | state / county | hydrologic unit

Search for...

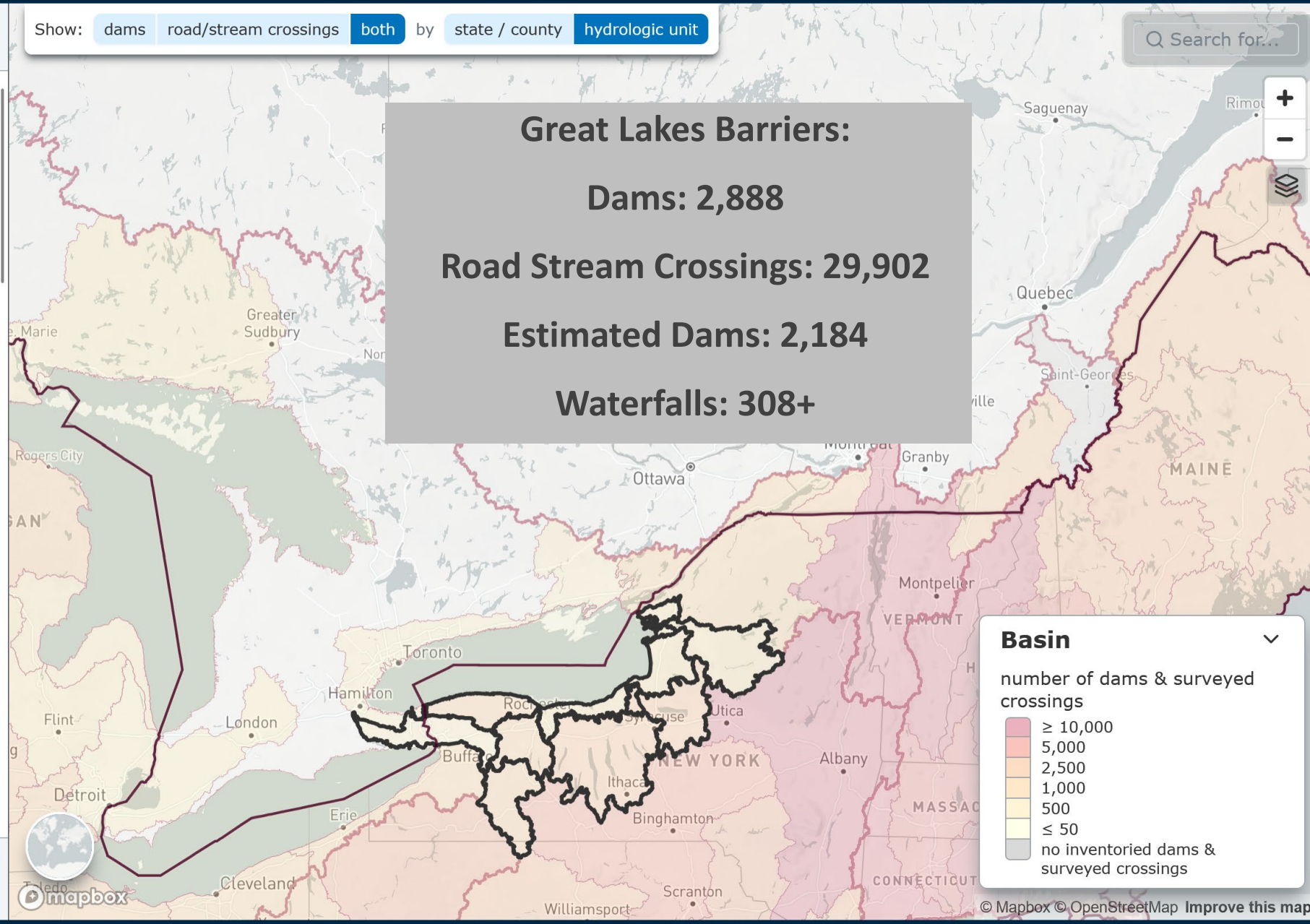
Great Lakes Barriers:

Dams: 2,888

Road Stream Crossings: 29,902

Estimated Dams: 2,184

Waterfalls: 308+



Basin

number of dams & surveyed crossings

- ≥ 10,000
- 5,000
- 2,500
- 1,000
- 500
- ≤ 50
- no inventoried dams & surveyed crossings

Statistics for selected areas

These areas contain:

27 inventoried dams, including:

- **21** that were analyzed for impacts to aquatic connectivity in this tool
- **1** that have been removed or mitigated, gaining **11 miles** of reconnected rivers and streams

119 or more road/stream crossings (potential aquatic barriers), including:

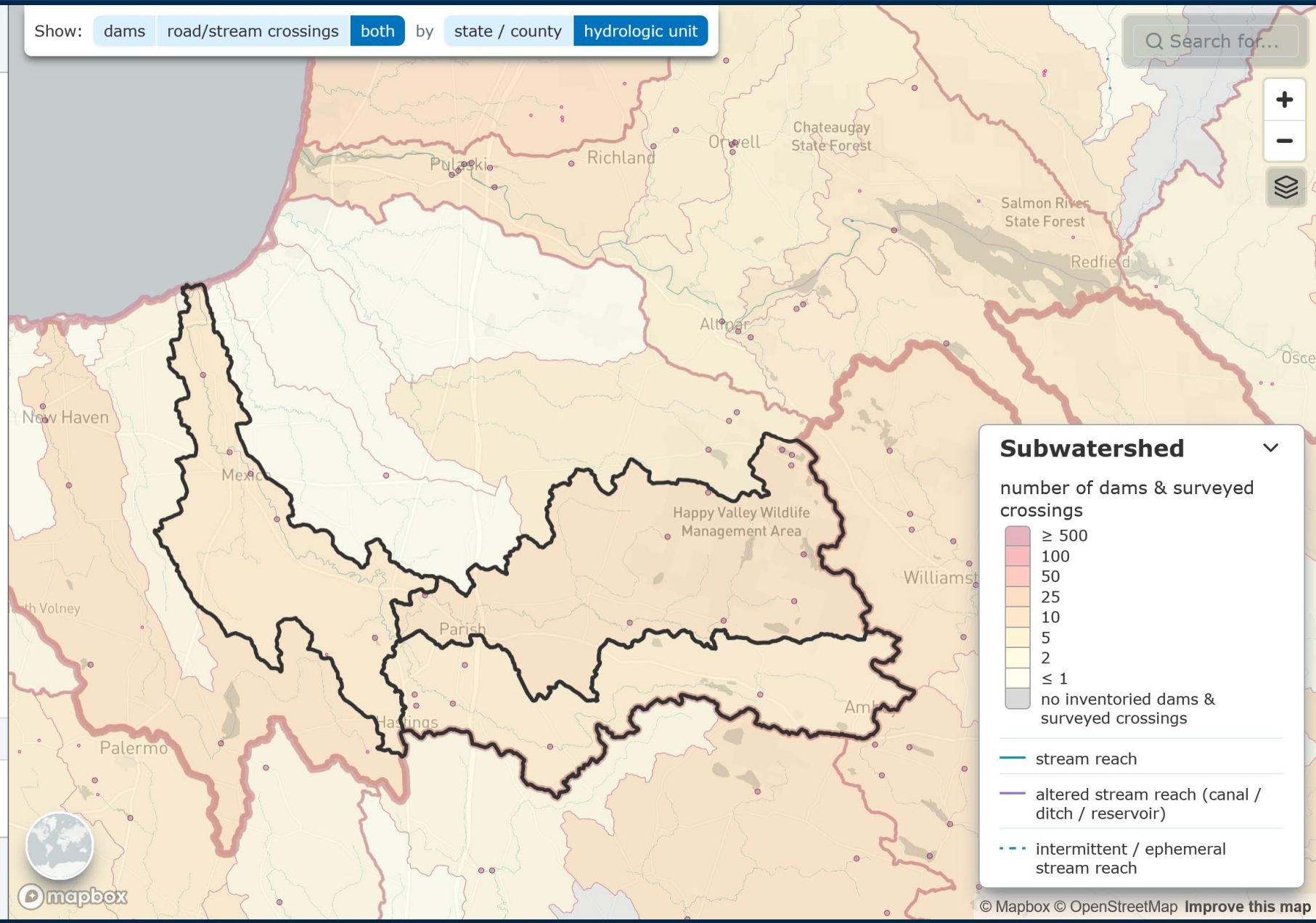
- **6** that have been surveyed for impacts to aquatic organisms.
- **2** that are likely to impact aquatic organisms
- **1** that was analyzed for impacts to aquatic connectivity in this tool
- **113** that have not yet been surveyed

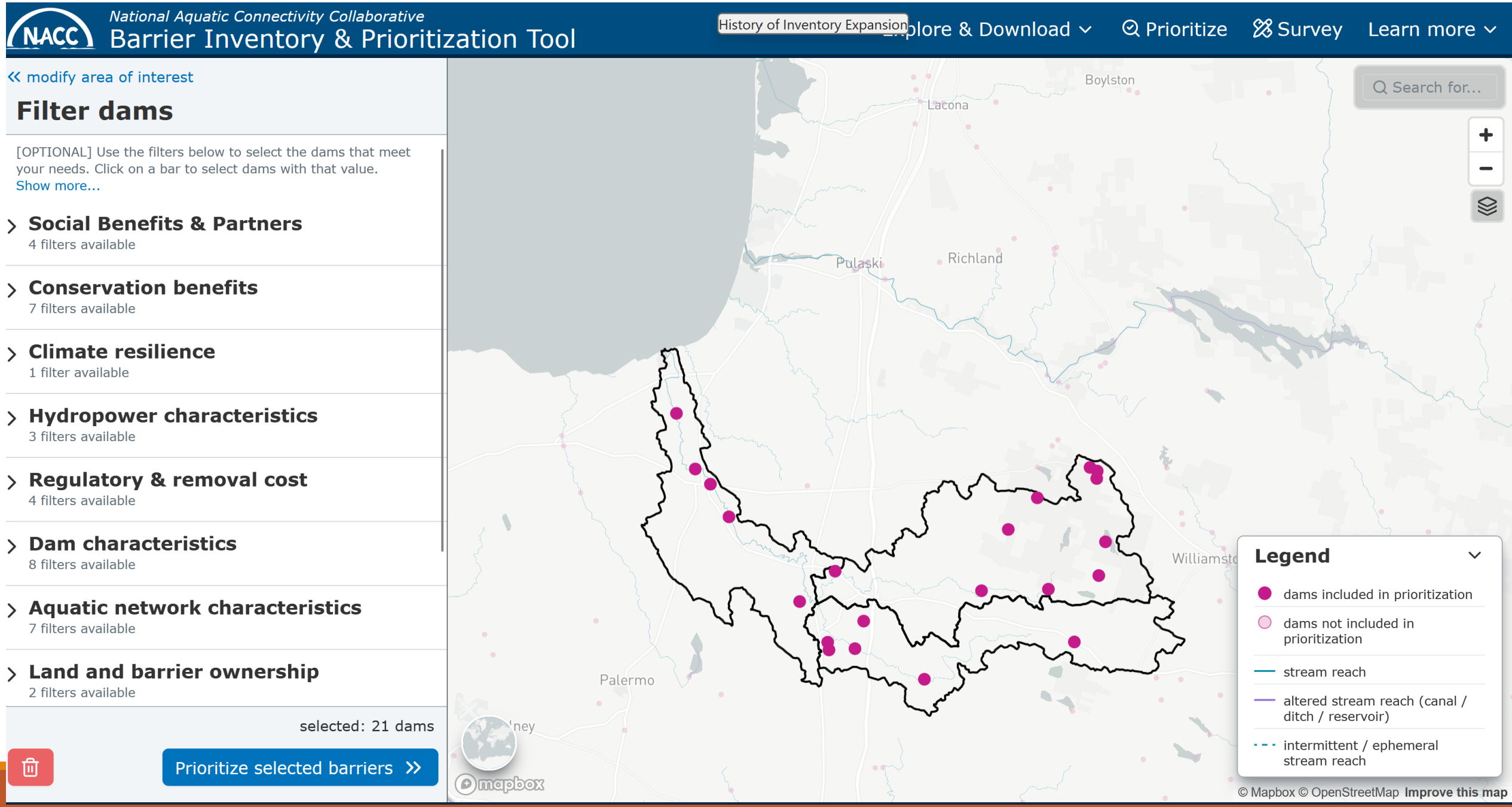
0 or more waterfalls.

Selected areas:

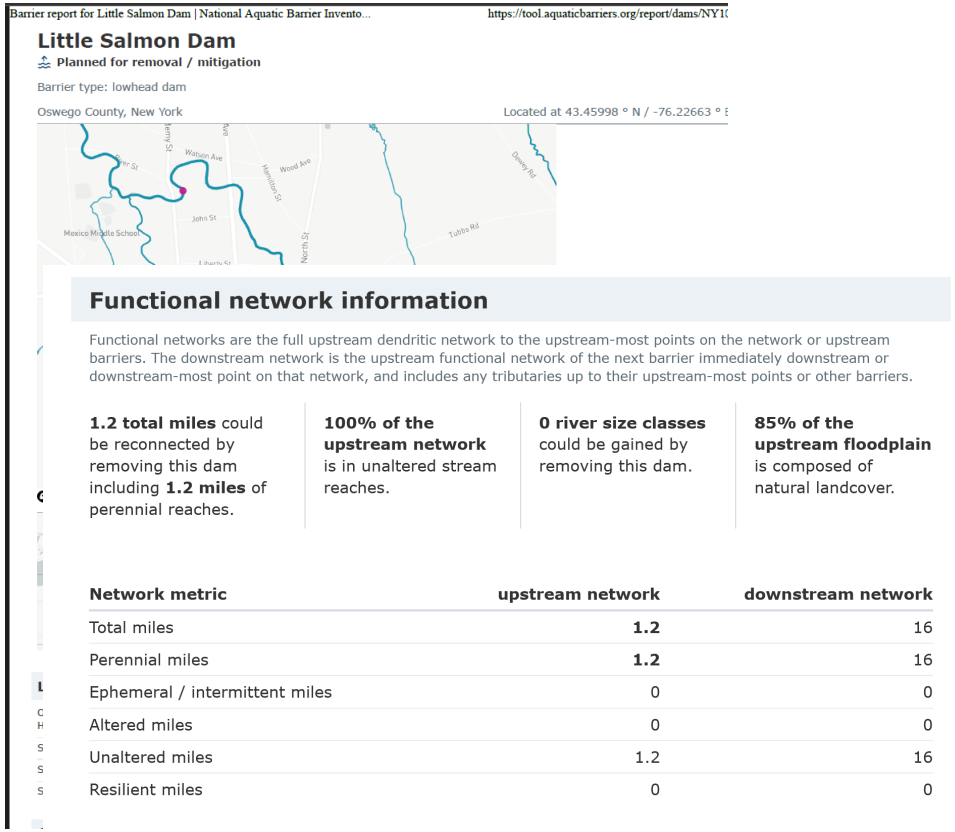
Little Salmon River
HUC12: 041401020903
6 dams and 5 surveyed road/stream crossings

Download: dams & surveyed crossings




National Aquatic Connectivity Collaborative
Barrier Inventory & Prioritization Tool
History of Inventory Expansion
Explore & Download
Prioritize
Survey
Learn more
« modify area of interest
Filter dams
[OPTIONAL] Use the filters below to select the dams that meet your needs. Click on a bar to select dams with that value.
Show more...
Social Benefits & Partners
4 filters available
Conservation benefits
7 filters available
Climate resilience
1 filter available
Hydropower characteristics
3 filters available
Regulatory & removal cost
4 filters available
Dam characteristics
8 filters available
Aquatic network characteristics
7 filters available
Land and barrier ownership
2 filters available
selected: 21 dams
Prioritize selected barriers
Search for...
Boylston
Lacona
Pulaski
Richland
Palermo
Legend
dams included in prioritization
dams not included in prioritization
stream reach
altered stream reach (canal / ditch / reservoir)
intermittent / ephemeral stream reach
© Mapbox © OpenStreetMap Improve this map

Report - Village of Mexico Little Salmon River Dam



Functional network information

Functional networks are the full upstream dendritic network to the upstream-most points on the network or upstream barriers. The downstream network is the upstream functional network of the next barrier immediately downstream or downstream-most point on that network, and includes any tributaries up to their upstream-most points or other barriers.

1.2 total miles could be reconnected by removing this dam including **1.2 miles** of perennial reaches.

100% of the upstream network is in unaltered stream reaches.

0 river size classes could be gained by removing this dam.

85% of the upstream floodplain is composed of natural landcover.

Network metric	upstream network	downstream network
Total miles	**1.2**	16
Perennial miles	**1.2**	16
Ephemeral / intermittent miles	0	0
Altered miles	0	0
Unaltered miles	1.2	16
Resilient miles	0	0

Report - Village of Mexico Little Salmon River Dam

Functional network information

Functional networks are the full upstream dendritic network to the upstream-most points on the network or upstream barriers. The downstream network is the upstream functional network of the next barrier immediately downstream or downstream-most point on that network, and includes any tributaries up to their upstream-most points or other barriers.

1.2 total miles could be reconnected by removing this dam including **1.2 miles** of perennial reaches.

100% of the upstream network is in unaltered stream reaches.

0 river size classes could be gained by removing this dam.

85% of the upstream floodplain is composed of natural landcover.

Network metric	upstream network	downstream network
Total miles	1.5	**1.2**
Perennial miles	1.5	**1.2**
Ephemeral / intermittent miles	0	0
Altered miles	0	0
Unaltered miles	1.5	1.2
Resilient miles	0	0

This network intersects **0 acres** of unaltered lakes and ponds and **0 acres** of unaltered freshwater wetlands.

Municipal roads and crossings

- Municipal DPW and County DPW/DOT account for and maintain ~60% of roadways in NY
- A major portion of most municipal budgets goes towards stream crossing (culvert & bridge) repairs and maintenance
- Most flood/roadway damage is responsibility of the DPW/DOT to repair
- These repairs usually come from internal budgets

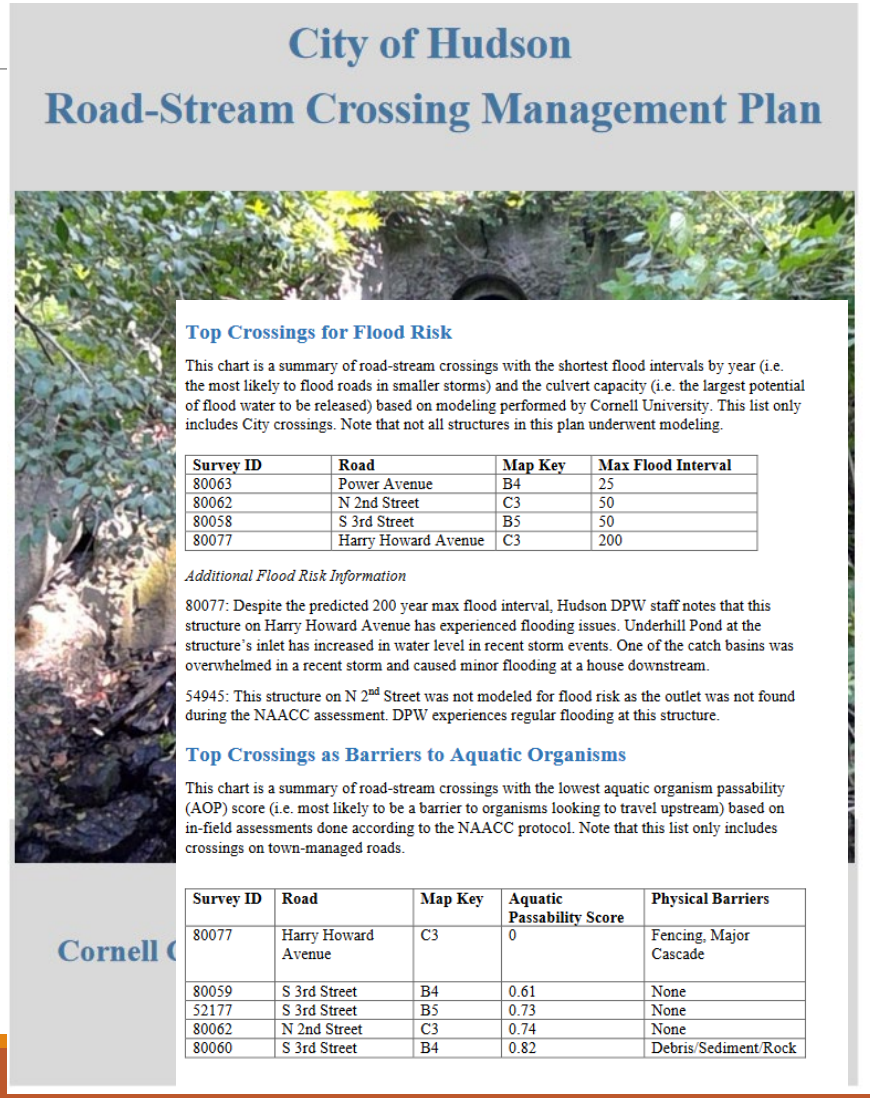
Why care about assessment data?

Municipal Resource/Asset Inventory

- Identify Culverts
- Road Stream Crossing Management Plan
- County Emergency Management Plans

Collected Data Used to: Identify Crossings that are….

- Undersized, impassable, damaged/failing or poor condition
- Obtaining Funding/Justification
- Grant Applications
- Permit Applications
- Engineering Design



City of Hudson

Road-Stream Crossing Management Plan

Top Crossings for Flood Risk

This chart is a summary of road-stream crossings with the shortest flood intervals by year (i.e. the most likely to flood roads in smaller storms) and the culvert capacity (i.e. the largest potential of flood water to be released) based on modeling performed by Cornell University. This list only includes City crossings. Note that not all structures in this plan underwent modeling.

Survey ID	Road	Map Key	Max Flood Interval
80063	Power Avenue	B4	25
80062	N 2nd Street	C3	50
80058	S 3rd Street	B5	50
80077	Harry Howard Avenue	C3	200

Additional Flood Risk Information

80077: Despite the predicted 200 year max flood interval, Hudson DPW staff notes that this structure on Harry Howard Avenue has experienced flooding issues. Underhill Pond at the structure's inlet has increased in water level in recent storm events. One of the catch basins was overwhelmed in a recent storm and caused minor flooding at a house downstream.

54945: This structure on N 2nd Street was not modeled for flood risk as the outlet was not found during the NAACC assessment. DPW experiences regular flooding at this structure.

Top Crossings as Barriers to Aquatic Organisms

This chart is a summary of road-stream crossings with the lowest aquatic organism passability (AOP) score (i.e. most likely to be a barrier to organisms looking to travel upstream) based on in-field assessments done according to the NAACC protocol. Note that this list only includes crossings on town-managed roads.

Survey ID	Road	Map Key	Aquatic Passability Score	Physical Barriers
80077	Harry Howard Avenue	C3	0	Fencing, Major Cascade
80059	S 3rd Street	B4	0.61	None
52177	S 3rd Street	B5	0.73	None
80062	N 2nd Street	C3	0.74	None
80060	S 3rd Street	B4	0.82	Debris/Sediment/Rock

Cornell

Tools and Data

NEW YORK STATE WATER RESOURCES INSTITUTE

Developing Online Mapping Dashboard:

- Interactive Mapper to visualize, download, sort crossing and habitat data to assist with Grant Applications, Designs, Permits, and Documentation…
- Ownership/Jurisdiction
- Estimated Flood Flows & Crossing Capacity (maximum passable storm event), Ideal Crossing Dimensions (to meet DEC Bridge and Culvert Guidelines),
- Permits Required, Funding Sources
- Trout/Fish or other important ecological areas or species
- NYS Department of Environmental Conservation, NYS Department of Transportation, FEMA, United States Fish and Wildlife Service, The Nature Conservancy, Trout Unlimited and more.

ArcGIS StoryMap: Interactive document and maps…

- Introduction & Inventory
- AOP
- Habitat
- Hydrology & Hydraulics
- Culvert Parameters

If this information is needed /useful, please let us know*

How can we tackle this BIG problem

- **Build capacity at all levels**
  - Municipalities/DPW/DOT
  - Project managers, engineers/consultants, contractors
  - Community/watershed planners
  - Agency staff
- **Fill knowledge gaps**
  - Provide trainings
  - Fill data gaps in assessments & prioritizations
- **Obtain or guide funding**
  - Develop tools for bridging gaps
  - Funding planning design/engineering
  - Group projects together to lessen administrative burden

Requires big coordination effort at all levels

Moving Forward….

- Additional Technical Design Tools, Methods, Assistance
- Create Mapping Tool/Dashboard for NYS…
  - AND trainings on developing grant application, project estimates, rough design using data
- Workshops and Trainings for Contractors, Municipalities, Floodplain Managers/Code Enforcement, Conservation Agencies, Engineers
- Regional Priority Project Collaboration

- **Project Identification/Inventory**
- **Engineering/Design**
- **Funding/Grant Management**
- **Construction & Implementation**
- **Permit Assistance**

Thoughts? Questions?

Comments?

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Funding Opportunities….

- NYS Environmental Bond Act Funding Finder – Online Mapper for Funding Opportunities by area https://environmentalbondact.ny.gov/pages/funding-opportunities

- NYS DEC Water Quality Improvement Program (WQIP)

Eligible Project Types & Required Match (2025)*

- Wastewater Treatment Improvement (25%)
- Nonagricultural Nonpoint Source Abatement and Control (25%)
- Vacuum Trucks in Municipal Separate Storm Sewer System (MS4) Areas (25%)
- Land Acquisition for Source Water Protection (25%)
- Salt Storage and Road Salt Reduction (25%)
- Dam Safety Repair/Rehabilitation and Removal (25%)
- Aquatic Connectivity (25%)
- Marine District Habitat Restoration (25%)
- Fish and Wildlife Habitat Restoration and Enhancement (25%)

NYSDEC Water Quality Improvement Program (WQIP)

Trout Unlimited - WQIP Round 17 Aquatic Connectivity Project Example

Implementation funding for culvert replacements

- Non-Agricultural Nonpoint Source Abatement and Control (Stream Culvert Repair and Replacement)
- Aquatic Connectivity

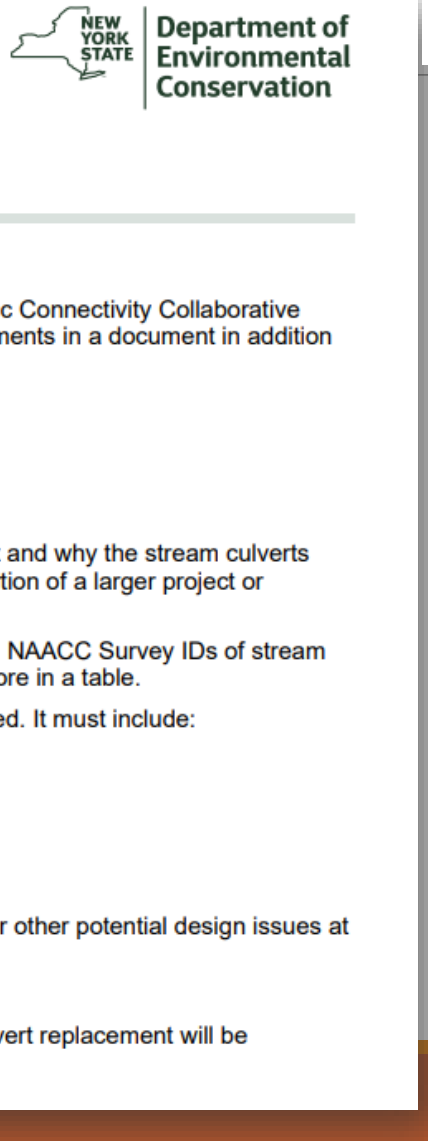
Maximum award amount: $2,000,000 per project

25% match required (cash or in-kind, federal grants)

Eligible applicants: municipalities, SWCDs, non-profit organizations

CFA possibly opening in May, through 7/31/2026*

NYS DEC Non Point Source Planning Grant



Nonpoint Source Planning Grant

NEW YORK STATE | Department of Environmental Conservation

Stream Culvert Assessment Report Outline

Introduction

Reports for stream culvert assessments using the North Atlantic Aquatic Connectivity Collaborative (NAACC) assessment protocol must include the following required elements in a document in addition to uploading stream crossing information to the NAACC Data Center.

Required Elements

I. Cover Page: (project title, owner, prepared by and date)

II. Executive Summary: Overview of the project's purpose

III. Projective Objectives: Provide a narrative that explains the project and why the stream culverts were selected to be assessed. Indicate whether the elements are a portion of a larger project or initiative.

IV. Existing Conditions: Based on NAACC barrier assessment, list all NAACC Survey IDs of stream culverts assessed and their associated NAACC Aquatic Passability Score in a table.

V. Existing Conditions Graphic: A map of all stream culverts assessed. It must include:

a. North arrow / legend

b. Graphical scale

c. Location of each stream culvert assessed

d. Location relative to the 100-year floodplain

e. Other site considerations (hotspots, brownfield remediation or other potential design issues at the site)

VI. Project Description: Describe goals for culvert repair and how culvert replacement will be prioritized.

Stream Culvert Repair and Replacement category

- Funding available for planning phase of projects
- Maximum award amount in this category is $50,000
- 10% match required
- Eligible applicants: municipalities, SWCDs, non-profit organizations
- CFA possibly opening in May, through 7/31/2026*

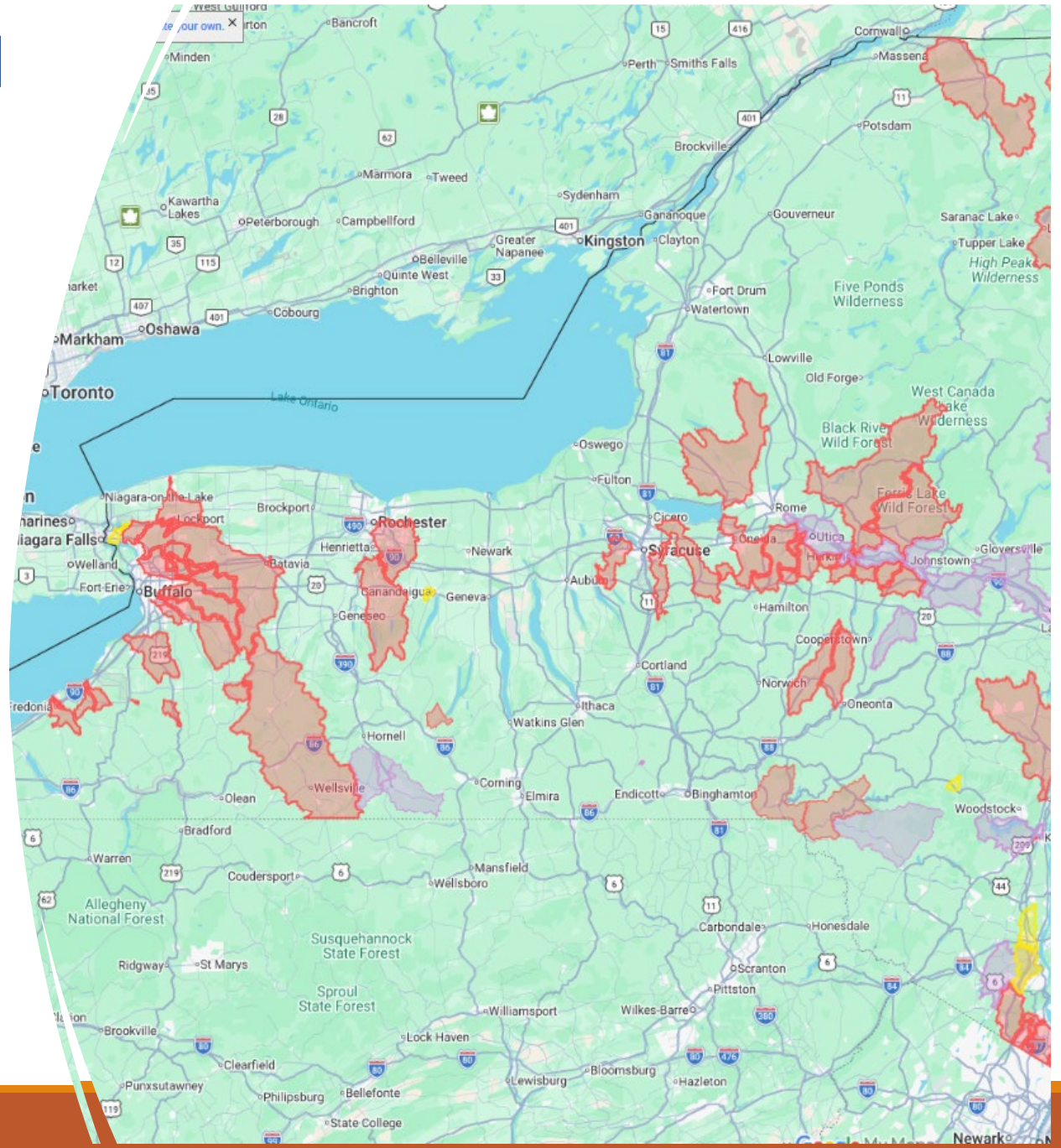
RESILIENT NY PROGRAM

Inland riverine flooding-focused studies

Still growing: new study areas are being considered for the future

Real-world application: specifically recommends projects that provide a meaningful impact on flooding

Pathway to funding: reports align with Resilient Watersheds Grant and are a strong attachment for others



Resilient NY Fact Sheets Available

Resilient NY

Ninemile Creek

NEW YORK STATE | Department of Environmental Conservation

The **Resilient NY** program develops state-of-the-art studies that investigate the causes of flooding and recommends projects to build resilience in flood-prone communities throughout New York State. These studies account for climate change by incorporating future streamflow projections, anticipated sea level rise, and storm surge in the engineering analysis. The resulting reports identify specific projects that communities can choose to undertake that can help mitigate existing and future flooding while simultaneously promoting healthy stream and riparian habitats.

What is the study area?

The Ninemile Creek watershed is **located primarily in Onondaga County** with a small portion of the watershed in Cortland County. It flows generally northeast from the outlet of Otisco Lake in the Town of Marcellus to where it discharges into Onondaga Lake in the Town of Geddes.

Within the Ninemile Creek watershed, this study focused on the towns of Marcellus, Camillus, Onondaga, Van Buren, and Geddes. The study identified two high risk areas: upstream of the Main Street bridge in the Village of Camillus, and upstream of the State Route 174 bridge in the Village of Marcellus.

Ninemile Creek watershed Resilient NY study area

What are the concerns?

Flooding associated with:

- Snowmelt, which can be made worse by rainfall;
- Short-duration, high-intensity storms; and
- Long-duration precipitation events like tropical storms/hurricanes.

How were recommendations developed?

- Data collection, including public engagement meetings
- Field assessments to characterize the study area and identify potential project areas
- Hydrologic and hydraulic modeling to quantify flood reduction benefits
- Findings synthesized into final report

What are the recommendations?

Section 7 of the report identifies **five priority recommendations** (listed below in order of priority), including installing flood benches, modifying bridges, and others. Section 8 of the report contains basin-wide strategies such as installing an early warning flood detection system and protecting floodplains.

Study Recommendation	Description	Rough Order of Magnitude Cost
1-6	Flood Acquisitions/Buyouts/Elevation	Variable
1-4	Construct Modifications to Main Street Bridge	$1,000,000–$5,000,000[1]
2-4	Streambank Stabilization	Variable
2-1	Create Flood Bench Upstream of Route 174 Bridge (Sta 710+52 to 715+26)	$100,000–$500,000[2]
2-3	Create Flood Bench Upstream of Route 174 Bench (Sta 710+52 to 720+00)	$500,000–$1,000,000[2]

[1] Estimate does not include land acquisition costs for survey, appraisal, or engineering coordination.

[2] Estimate is for a single streambank stabilization location. Multiple locations may be required for each tributary.

What funding opportunities are there?

Opportunities to fund recommendations found in this Resilient NY report include, but are not limited to:

- **NYSDEC Resilient Watersheds Grant program**, funded by the 2022 Clean Water, Clean Air, and Green Jobs Environmental Bond Act;
- **NYSDEC Non-Agricultural Nonpoint Source Planning and MS4 Mapping Grant** and **Water Quality Improvement Project**, supported by New York's Environmental Protection Fund; and
- **Great Lakes Sediment and Nutrient Reduction Program**, and other programs funded through the federal Great Lakes Restoration Initiative.

For additional funding opportunities, please review this Resilient NY report or use the Funding Finder (https://environmentalbondact.ny.gov/pages/funding-opportunities).

CONTACT INFORMATION

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Federal Funding Opportunities

US Fish and Wildlife Service (FWS)
- National Fish Passage Program (regular & BIL)

USDA Natural Resources Conservation Service (NRCS)
- Conservation Innovation Grant Program, RCPP

US Environmental Protection Agency (EPA)
- Urban Waters Small Grants
- Five Star and Urban Waters Program
- NEP Coastal Watershed Grant Program (via RAE)**

Federal Emergency Management Agency (FEMA)
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- Pre-Disaster Mitigation Grants

National Oceanic and Atmospheric Administration (NOAA)
- Coastal and Marine Habitat Restoration Grant Program
- Coastal Ecosystem Resiliency Grant Program

US Department of Transportation
- AOP Anadromous Fish Species Program

New or existing programs coming from the Infrastructure Investments and Jobs Act *

Funding Opportunities….

Grant	Organization	Amount
National Culvert Removal, Replacement, and Restoration Grants (Culvert AOP Program)	USDOT	
United States Department of Agriculture: Emergency Watershed Protection Program (EWP)	NRCS	
Atlantic Coastal Fish Habitat Partnership	Atlantic Coastal Fish Habitat Partnership	$200,000.00
National Fish Passage Program	USFWS	$250,000-$10mil
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program	USDOT	$1 million rural, $5 million urban- $25 million max
Bridge Investment Program – Large and Small Bridge and Planning Project	USDOT	
PROTECT	USDOT FHA	
Green Innovation Grant Program	NYS EFC	
National Fish & Wildlife Foundation	NFWF	

Grant	Organization	Amount
Water Quality Improvement Project (WQIP)	NYSDEC	
Climate Smart Communities (CSC) Grants	NYSDEC	$10,000-$200,000
BridgeNY	NYSDOT	
Non-Agricultural Nonpoint Source Planning and MS4 Mapping Grant	NYSDEC	Up to $50,000-$75,000
Clean Water State Revolving Fund	NYS EFC	
Transformational Habitat Restoration and Coastal Resilience Grants	NOAA	$750,000 to $10 million
Restoring Fish Passage Through Barrier Removal Grants	NOAA	$750,000 to $8 million
Rail and Port Grants Solicitation	NYSDOT	up to $10 million
Regional Conservation Partnership Program	USDA NRCS	
Watershed Protection and Flood Prevention Operations (WFPO) Program	USDA NRCS	
Section 206 - Aquatic Ecosystem Restoration	USACE	up to $10 million
Natural Resource Damage Assessment and Restoration	USDOI	
National Fish & Wildlife Foundation	NFWF	