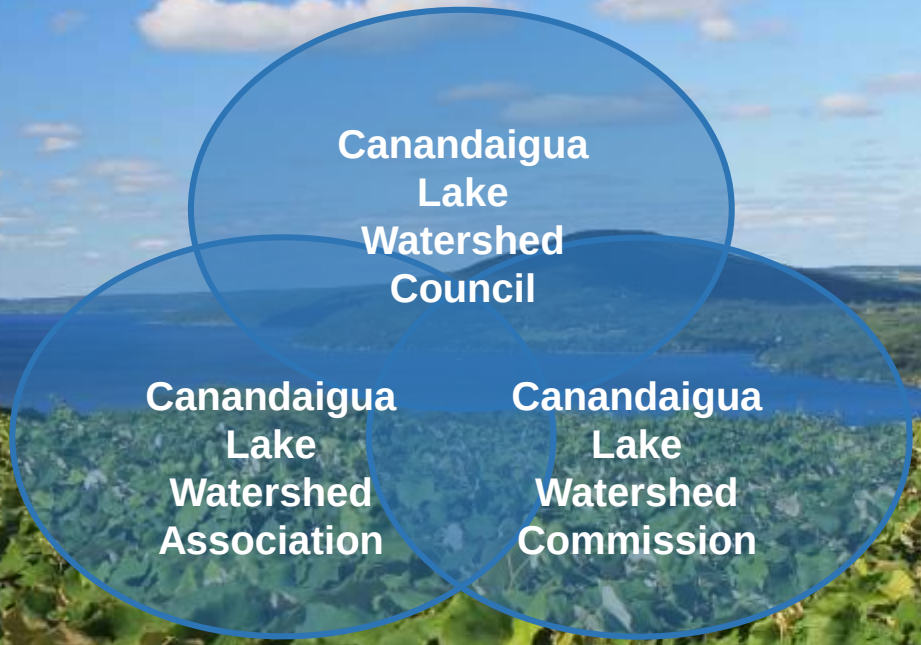
Canandaigua Lake Watershed Program
Partners in Watershed Protection



5 PROTECTION THEMES

- Research
- Education
- Restoration
- Open Space Protection
- Regulation

****Along with the individual municipalities and numerous county, state and federal agencies and land trusts.

Canandaigua Lake Watershed Facts

- Lake Length: 15. 5 miles
- Average Width: 1.1 miles
- Maximum Depth: 276 feet
- Surface area of Lake: 10,550 acres
- Watershed Land Area: 109,000 acres or 174 sq. miles
- Volume: 429 billion gallons
- Hydraulic Retention Time: 13.4 years
- DEC Water Quality Classification: AA , TS
- Shoreline Length: 36 miles (97% privately owned)
- Subwatersheds: 34
- Estimated Total Length of Tributaries: 350 miles
- Over $1 billion in shoreline assessed value – some areas $11,000/ft of shoreline
- Major Municipalities within Watershed: 12
- Water Purveyors: 6 (City of Canandaigua,
- Palmyra, Newark, Gorham, Rushville and Bristol Harbor)- 70,000+ people use it as a water supply

Finger Lakes Region

Map of the Finger Lakes Region in Central New York.

What will be our Legacy??

- In the next 20-30 years will we see increasing phosphorus levels, algae blooms, aquatic weed growth, beach closures, increased water filtration costs, more invasive species and a whole host of other problems?

- Cost effective program to promote and protect our Natural Capital and the resulting ecosystem services that are provided

- It is never the one issue or one source that will cause this lake to be substantially impacted and it is not the one protection theme or one group that will provide comprehensive protection.

Tonight's Expert Panel

Dr. Greg Boyer - *Director of the Great Lakes Research Consortium, and Professor at the State University of New York College of Environmental Science and Forestry*

Dr. Boyer has done extensive research on biologically active natural products produced by algae. As Director of the Great Lakes Research Consortium, he works with affiliates in NYS and Canada on all aspects of Great Lakes science, policy, and ecology

Scott Kishbaugh, P.E. - *Chief, Lake Monitoring and Assessment Section, NYS Department of Conservation Division of Water*

Scott has expertise in Blue Green Algae blooms through his work for the NYS DEC. He is also the Program Director for the Citizen's Statewide Lake Assessment Program (CSLAP), which is a volunteer-based lake monitoring program across NYS that focuses on eutrophication indicators.

Dr. Bruce Gilman – *Professor at Finger Lakes Community College in the Department of Environmental Conservation & Horticulture*

Dr. Gilman has been conducting water quality monitoring on Canandaigua Lake for over 20 years and has an extensive knowledge of long term water quality trends on the lake.

Overview of tonight's discussion

1. Kevin Olvany- Recap of the 2015 Blue Green Algae Bloom
2. Dr. Greg Boyer- SUNY ESF- will review the science behind Harmful Algal Blooms
3. Scott Kishbaugh P.E.- NYS Blue Green Algae Program and Canandaigua Lake
4. Kevin Olvany- Review Watershed Protection Strategies
5. Extensive Question and Answer period

How did the Lake go from

This to That!

Monthly Chlorophyll-a readings

Station	chlorophyll "a" (ug/L) ★					
	28-Apr-15	27-May-15	24-Jun-15	29-Jul-15	28-Aug-15	30-Sep-15
Fallbrook	0.62	2.09	2.39	9.87	3.29	6.03
Hope Point	0.69	5.88	3.56	3.33	4.51	3.81
Deep Run	0.94	6.22	4.45	5.31	4.37	3.03
Seneca Point	1.35	5.69	3.63	3.77	4.39	4.30
Vine Valley	1.36	3.50	2.42	3.33	1.58	2.64
West River	4.79	11.40	5.31	3.82	2.79	9.98
mean	1.63	5.80	3.63	3.91	3.49	4.97
mean (without WR)	0.99	4.68	3.29	3.94	3.63	3.96

9/1/15 – 7:10 pm

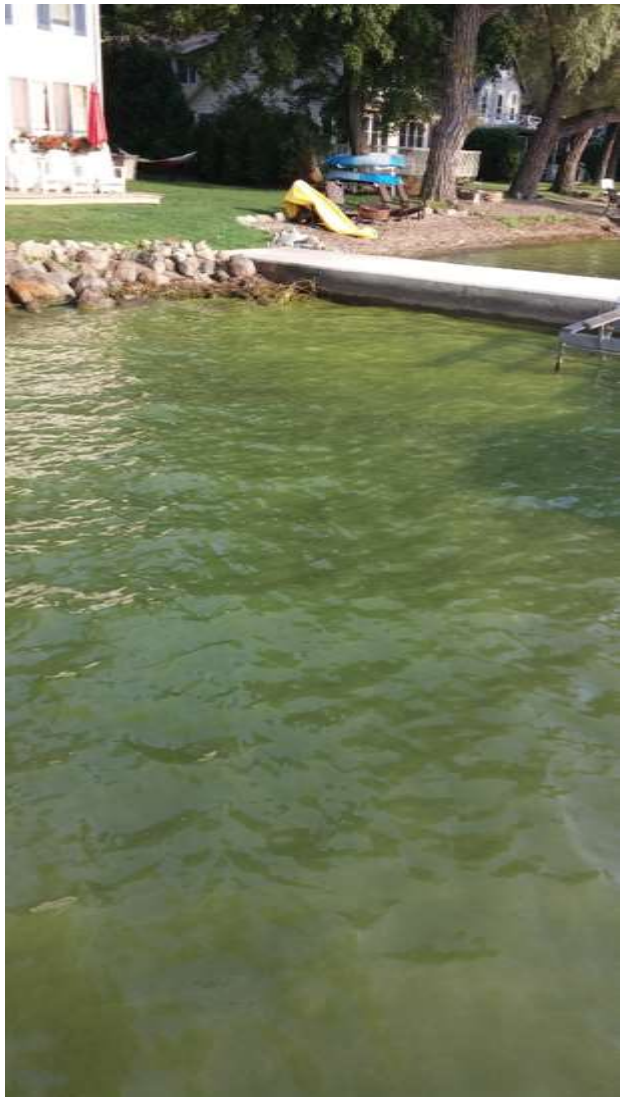
Mid Lake- 1, 000 south of boat buoys- Kershaw

Mid Lake- just north Yacht Club

Location	Total chlorophyll	Blue green chlorophyll	Microcystin-LR levels
Middle of the lake about 1000 feet south of the buoy markers for the boats to go 5 mph (about ½ mile from Kershaw Beach)	15 ug/L	8 ug/L	no data
Middle of the lake just north of the Yacht Club in a surface streak of algae	46 ug/L	39 ug/L	16.7 ug/l

Toxin Results received on Sept 8th

9/3/15 – 5:41 pm



Cottage City Area- isolated cove conditions

Sample Location	Total Chlorophyll-a (ug/L)
Cottage City Shore – 6 pm	31.23
Deep Run Beach - pm	21.19
Deep Run Beach (9 am) September 4th	3.23

9/4/15 – 1:49 pm

Mid lake off of the Yacht Club

Sample Location	Total Chlorophyll-a (ug/L)
Canandaigua Water Treatment Plant – 500 feet from shore	5.75
Yacht Club – Mid Lake	10.72
Squaw Island – East Side, 200 feet from the island	4.33
Kershaw Beach – 1000 feet from shore, in the boat area	5.17
Tichner Point – North side of point, 100 feet from shore	6.44
Menteth Creek – Mid-lake, ½ mile north of the creek	7.46
Onanda Beach – 300 feet from the ropes	7.43
Rushville Plant – 200 feet offshore	6.56
Pelican Point – 1000 feet south of the point, 200 feet from shore	6.89
1 mile north of Deep Run, 300 feet from shore	8.11

100 yards off shore, just north of Tichenor Point- 2:15pm

9/8/15 – 1:15 pm- Just north of School House Beach (Butler Beach)

Location	Total chlorophyll	Blue green algae chlorophyll	Microcystins Concentration
High density bloom area along the west shore- Butler Road Beach (see picture). This is about ½ mile from the intake pipes for the City.	205 ug/L total	192 ug/L – Bloom	40.9 ug/L - High toxicity
City Dock at the north end of the lake; very close proximity (300 feet) from where the swimmers will be for the triathlon; about 200 feet from shore	2.6 ug/L total	1.6 ug/L	0.3 ug/L - Low toxicity
Raw water sample from the City water treatment plant in order to see if any toxin is making it to the intake pipes.	1.5 ug/L total	0.7 ug/L total	nd (<0.4 ug/L)* - Minimal

9/9/15 – 2:03 pm

9/10/15 – 8:28 am – sample point

Location	Total chlorophyll	Blue green algae chlorophyll	Microcystins Concentration
Triathlon #1 - End of Swim Course	2.5 ug/L total	0 . ug/L (low)	1.14 ug/L – moderate toxicity
Triathlon #2 - Middle Course Buoys	2.73 ug/L total	1.05 ug/L (low)	1.03 ug/L – moderate toxicity
Triathlon #3 - 100 yds from Shore	10.34 ug/L total	8.69 ug/L total (medium)	1.40 ug/L – moderate toxicity

Middle of the lake, end of the triathlon course

9/10/15 – 2:16 pm

Poplar Beach

9/11/15 – 9:35 am

Kershaw Park

City Dock

9/11/15 – 9:50 am

Poplar Beach

9/11/15 – 11:43 am

Large foam streak that can be seen from 4 miles away

9/15/15 – 3:18 pm

1000 feet from shore off of Onalinda Drive

9/15/15 – 3:24 pm

Crystal Beach Area – ¼ mile off of shore

9/15/15 – 4:07 pm

North end of the lake
(foam glaciers)

9/15/15 – 3:06 pm

½ mile from shore off of Onalinda Drive

9/16/15 – 11:05 am

Kershaw Park

9/16/15 – 2:03 pm

Kershaw Park

9/16/15 – 2:07 pm

Kershaw walking bridge at the Canandaigua Lake/Outlet interface

9/17/15 – 11:47 am

Kershaw Park

9/17/2015- afternoon
Photos taken by Keith Cutri

Thanks Keith!

Kershaw- 9/21- 9:46am

City Pier- 9/21- 10:01am

Location	Total chlorophyll	Blue green algae chlorophyll	Microcystins Concentration
City Pier- easterly wind pattern accumulating algae along the east side of Pier	12.4 ug/L total	6.3 ug/L – Medium	3.5ug/L – moderate toxicity
City Dock at the north end of the lake;	3.6 ug/L total	1.7 ug/L - Low	1.2ug/L – moderate toxicity

City Pier- 9/22- 8:06am

9/22- Mid Lake- Yacht Club- 3:09pm

City Dock- 12:27pm

9/22- Mid Lake- Water Treatment Plant 3:05pm

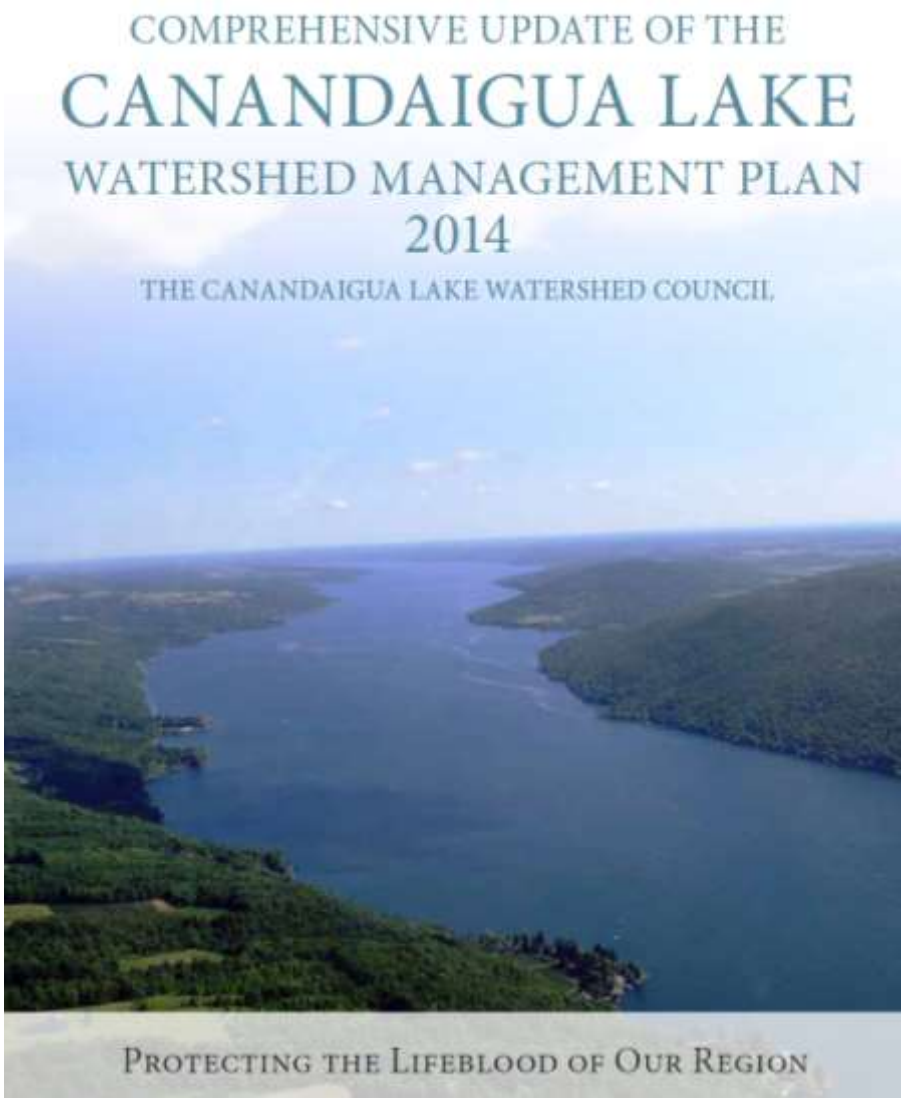
Picture taken from Foster Road- Retreat House- 9/23- 11:39am

9/24/15 – 12:50 pm

Small isolated bloom located just south of Menteth Point -County Road 16

Mid-lake across from the Yacht Club

Location	Total chlorophyll	Blue green algae chlorophyll	Microcystins Concentration
Onanda Fishing Pier	2.1 ug/L total	0.6 ug/L - medium	0.3 ug/L – minimal toxicity
Small isolated area with concentrated bloom just south of Menteth Point	94 ug/L	83 ug/L - Bloom	17.6 ug/L – high toxicity
Mid-lake Yacht Club	7.1 ug/L total	3.7 ug/L - medium	1.75 ug/L – moderate toxicity

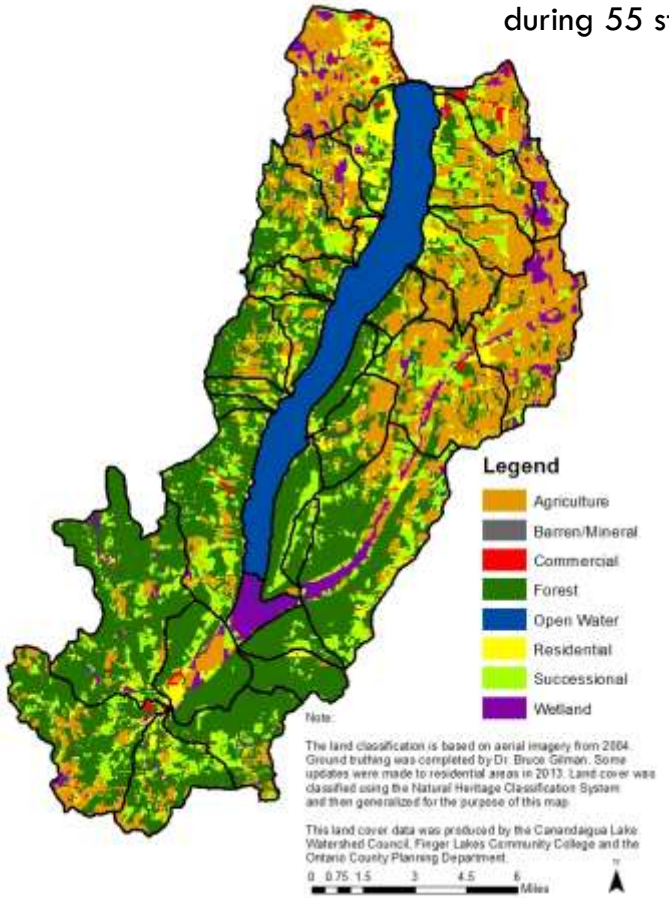


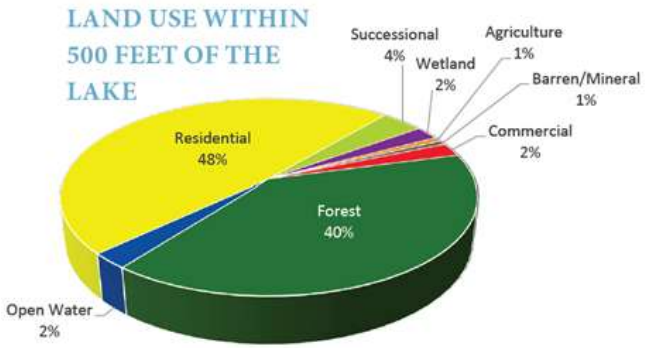
Watershed Management Categories

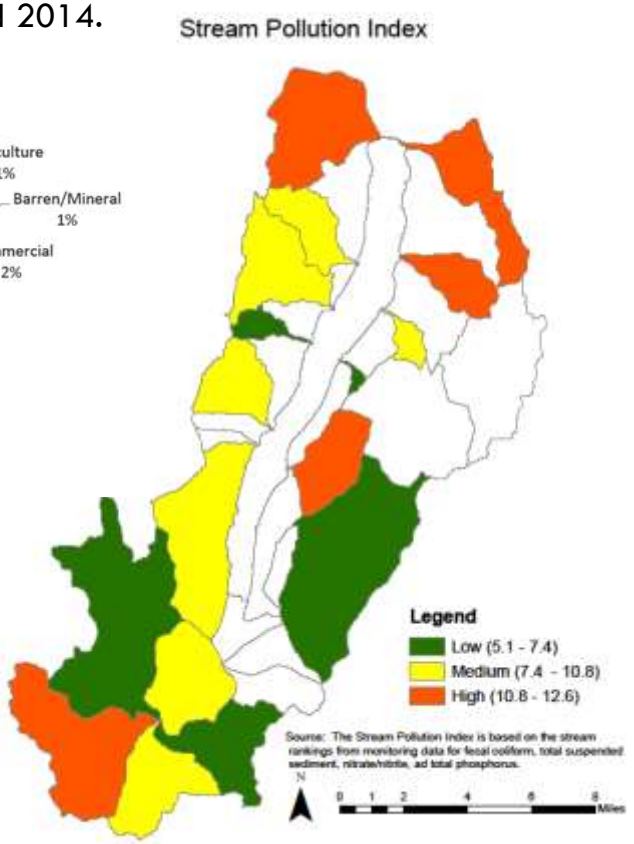
1. **New and Existing Development**
2. **Lawn and Landscaping Practices**
3. **Municipal Roads and Highway Facilities**
4. **Stream and Shoreline Management**
5. **Wetlands and Floodplains**
6. **Wastewater Management**
7. **Agriculture**
8. **In-Lake Issues: Invasive Species, Harmful Algal Blooms and Fish Kill Management**
9. **Recreation**
10. **Lake Level Management**
11. **Forestry**
12. **Mining and Natural Gas Extraction**
13. **Chemical Contamination Prevention**

Tributary Water Quality Monitoring

Seventeen tributary streams were monitored (grab samples) during 55 storm/melt events between 1997 and 2014.

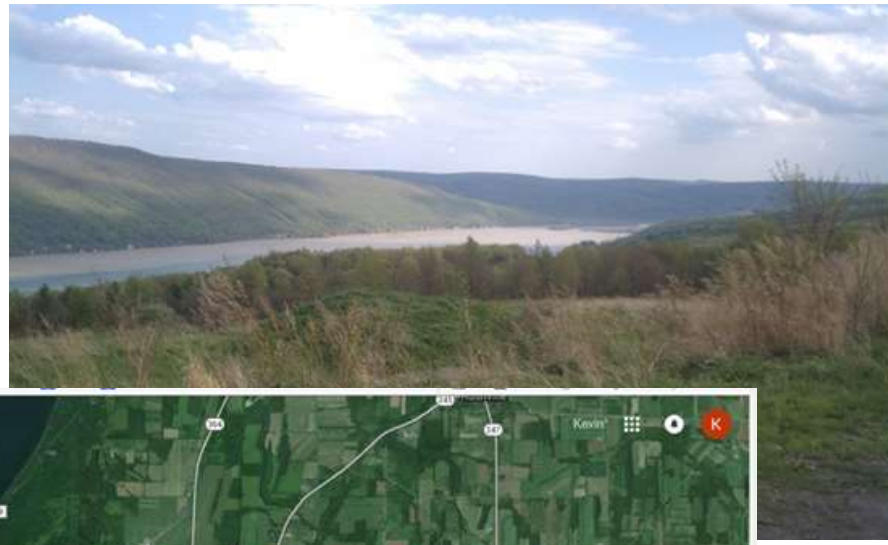




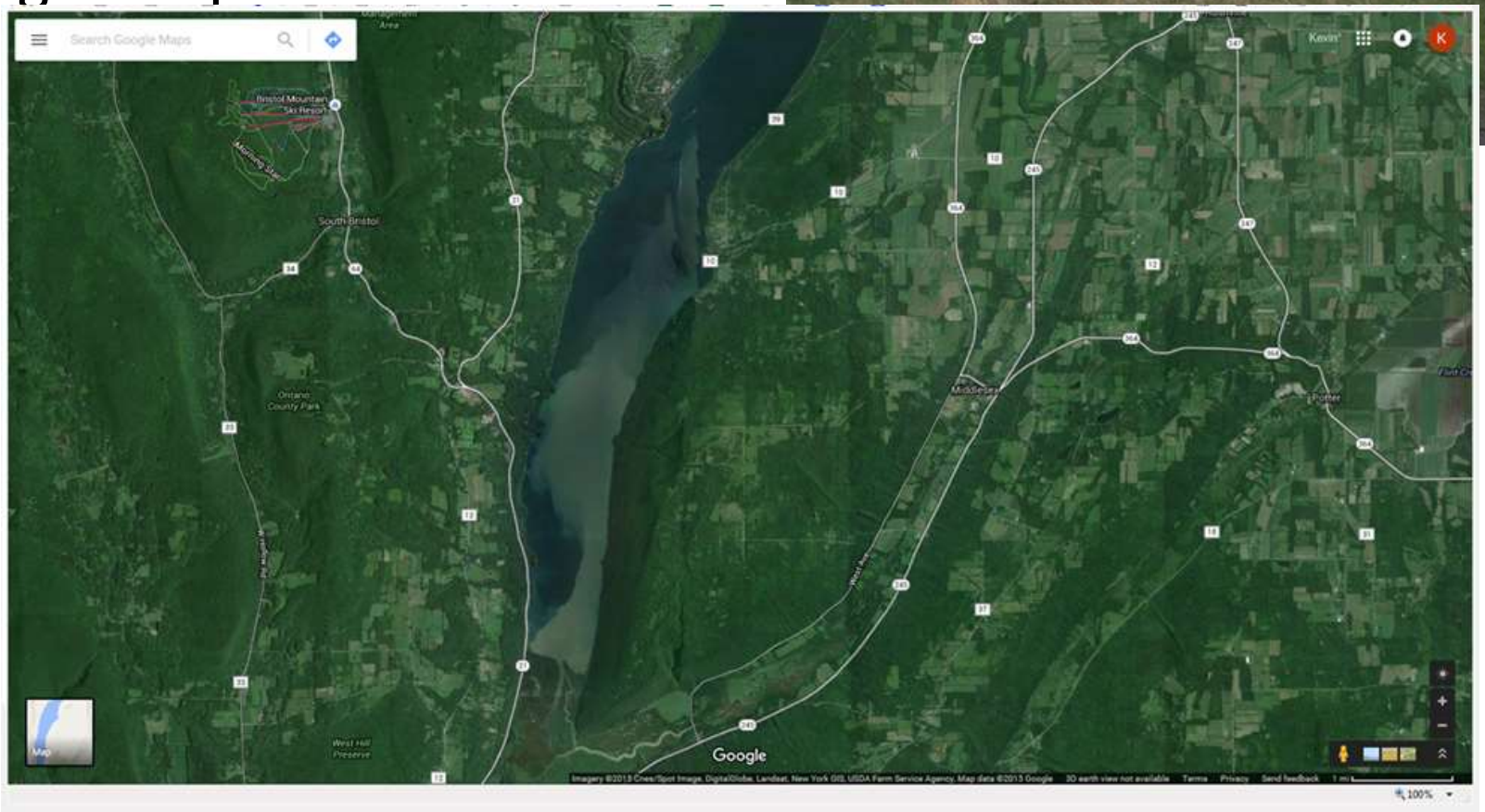


North End Plume from Fall Brook Stream- 6/6/15- 2:45pm

South End Plumes



- Google Maps- Summer 2015

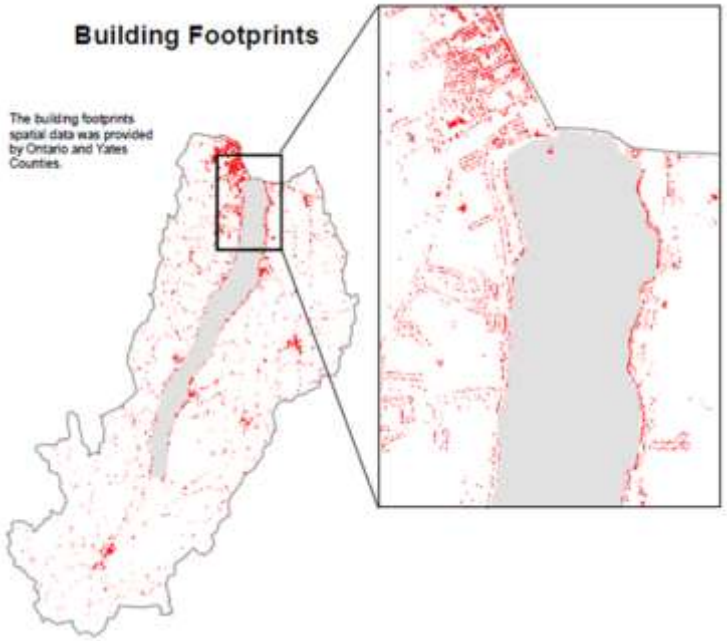


Enhanced Water Quality Monitoring

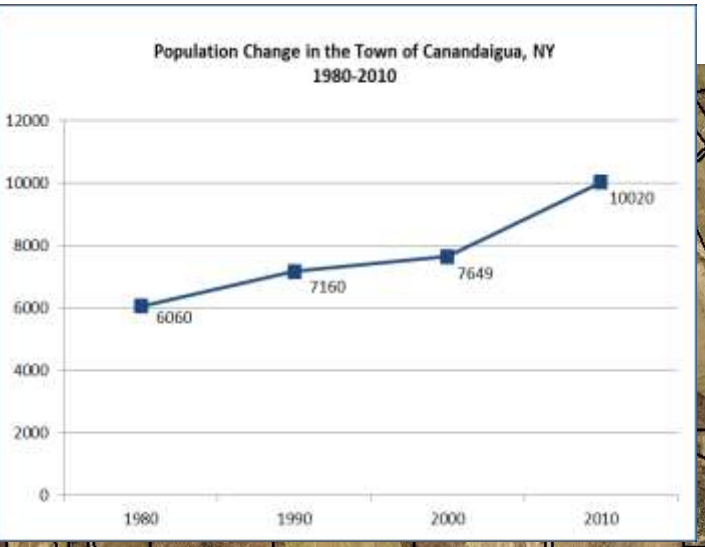
- Continue and Enhance the tributary monitoring program
- Measure density and age classification of Quagga and Zebra Mussels
- Blue green algae sensor for upgraded water quality monitoring probe
  - Allows for immediate results on blue green algae concentrations (cells/mL)
  - The Watershed Council, Association and FLCC have partnered to purchase the new probe
- Long Term – may apply for additional funding for a water quality buoy- real time data

Existing and New Development

1. Increase municipal management of stormwater
2. Encourage local-level comprehensive land use planning
3. Expand green infrastructure and low impact development



New Development in the Town of Canandaigua



Lawn and Landscape Practices

1. Improve educational programs on fertilizer and pesticide use.

2. Monitor streams and lake for nutrients and pesticides

Photo from the Klamath River, California
Source: http://ehp.niehs.nih.gov/122-a206/

Streambank and Shoreline protection

1. Monitor streambanks and shorelines for erosion and lack of buffers

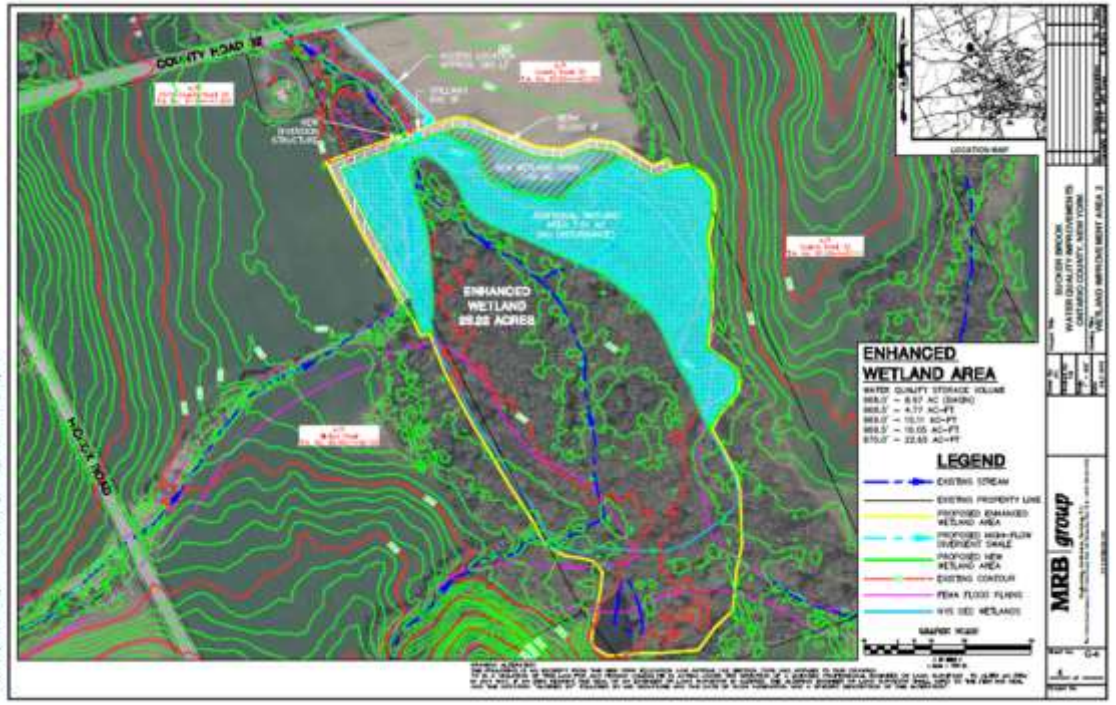
2. Protect, restore and stabilize streamside areas

3. Protect shoreline areas through enhanced regulations

Wetland and Floodplain Management

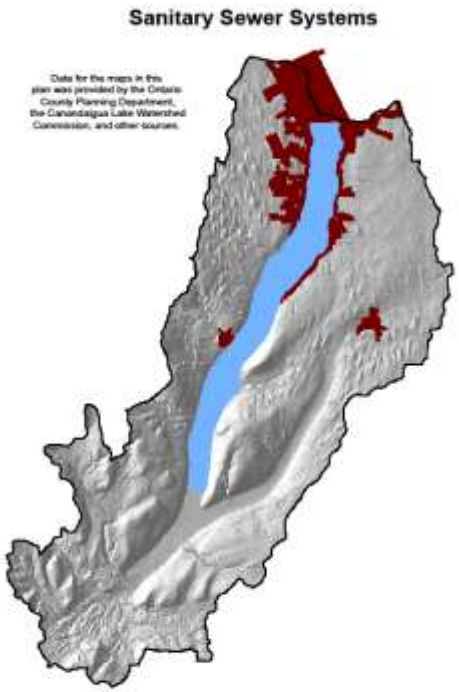
1. Protect, restore and create wetlands and floodplains

2. Expand floodplain regulations



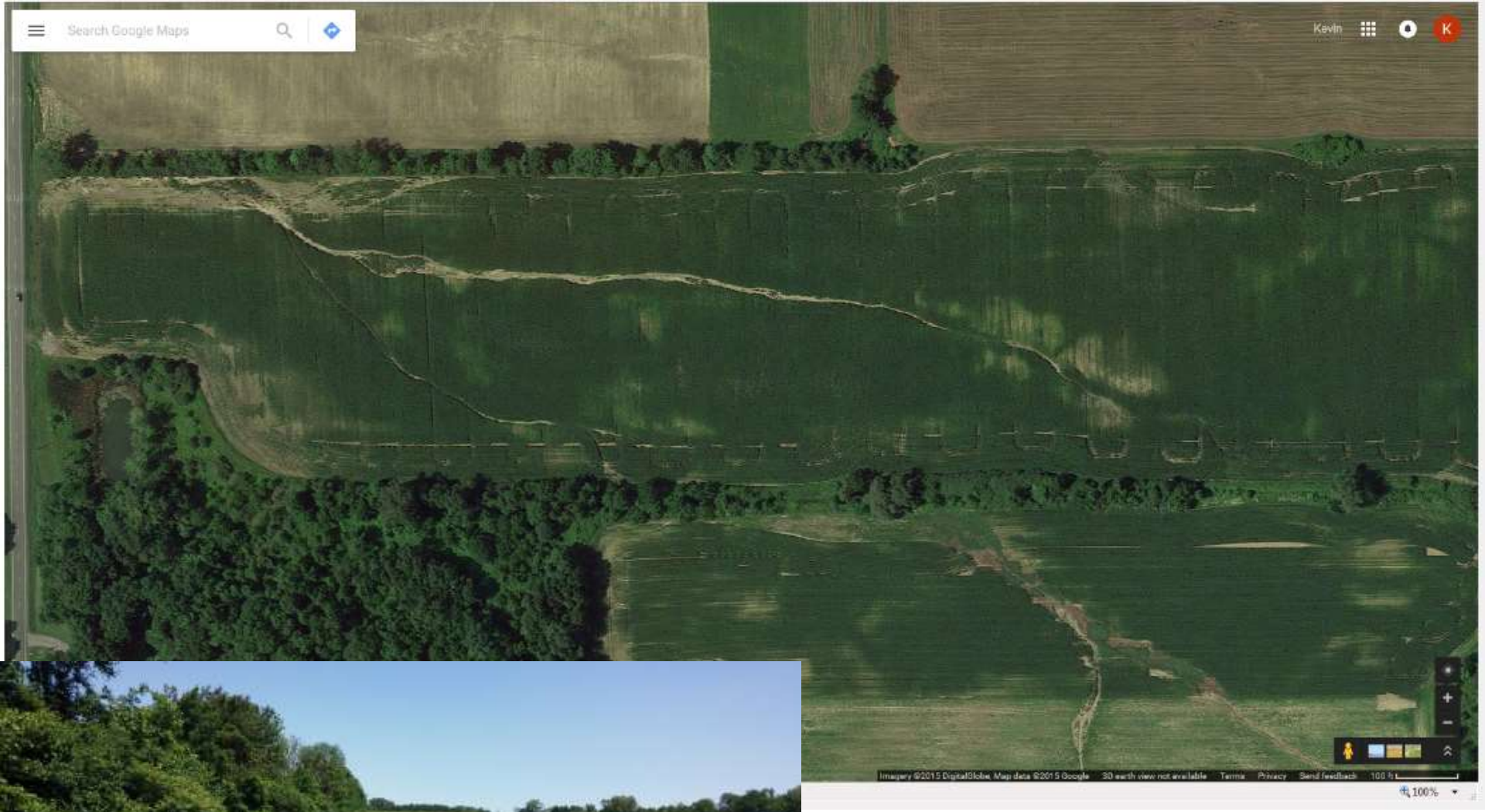
Wastewater Management

1. **Encourage municipalities to strengthen onsite wastewater system rules and regulations**
2. **Maintain Digital/Mapped Database of onsite systems**
3. **Educate Landowners on proper maintenance**
4. **Extend sewers where appropriate**



Agricultural Management

1. **Promote, partner and enhance the programs offered by Soil and Water and NRCS.**
2. **Promote buffers between Ag Lands and streams/Road side ditches**
3. **Increase the size and capabilities of wetlands downstream of Ag Lands to reduce flooding and improve water quality**
4. **Utilize Local funding and private contributions to partner with farmers to make the necessary changes to adapt to the severe weather conditions that have become the norm.**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Invasive Species Management

1. Establish an early detection and rapid response protocol for invasive species

2. Prevent the spread of invasive species from recreation

2A. Promote the local funding of the Watercraft Steward Program and advocate for continued state funding.

Photo Credit: Mike McMurray

Watercraft Steward Emma Taylor inspects a boat at NYS Boat Launch in Canandaigua.

Funding for Monitoring and Watershed Management

- Municipalities provide base funding for Watershed Council and Commission
- Membership contributions by citizens toWatershed Association
- The Watershed Council applied for project funding through the CFA application in NYS
  - Three potential funding sources: NYS DEC, NYS Department of State, and NYS Environmental Facilities Corp

What will be our Legacy??

- In the next 20-30 years will we see increasing phosphorus levels, algae blooms, aquatic weed growth, beach closures, increased water filtration costs, more invasive species and a whole host of other problems?

- Cost effective program to promote and protect our Natural Capital and the resulting ecosystem services that are provided

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