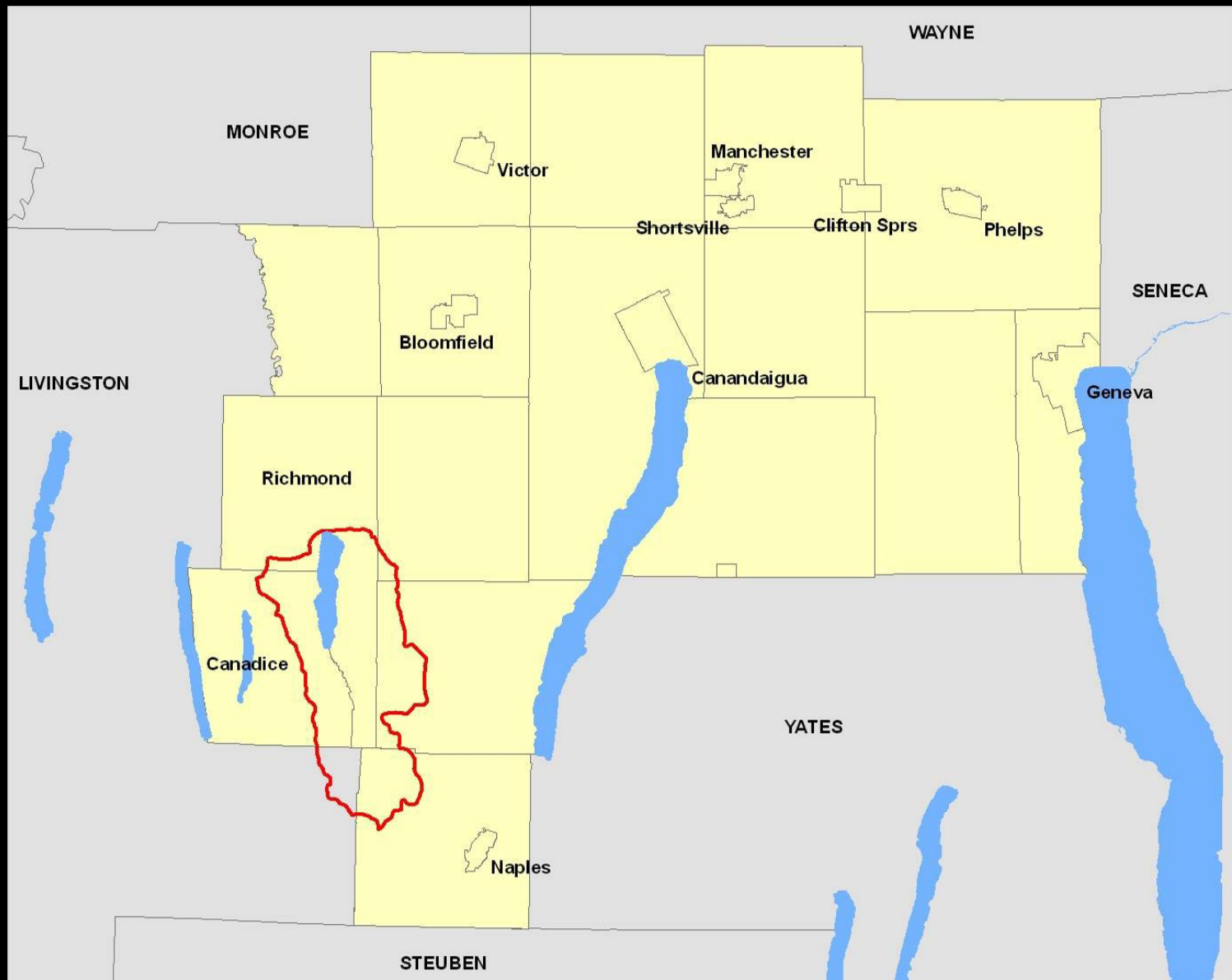




Good Afternoon !



Occupies a glacially scoured valley

Of the eleven Finger Lakes,

shallowest at $z_m = 30$ feet

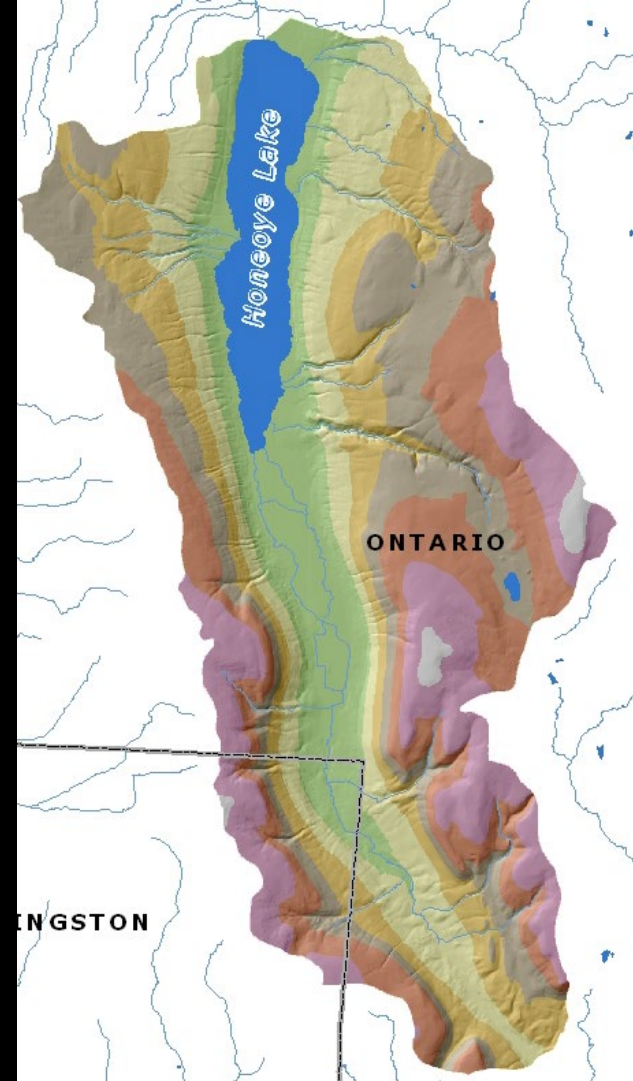
second smallest surface area

Discontinuous cold polymictic lake

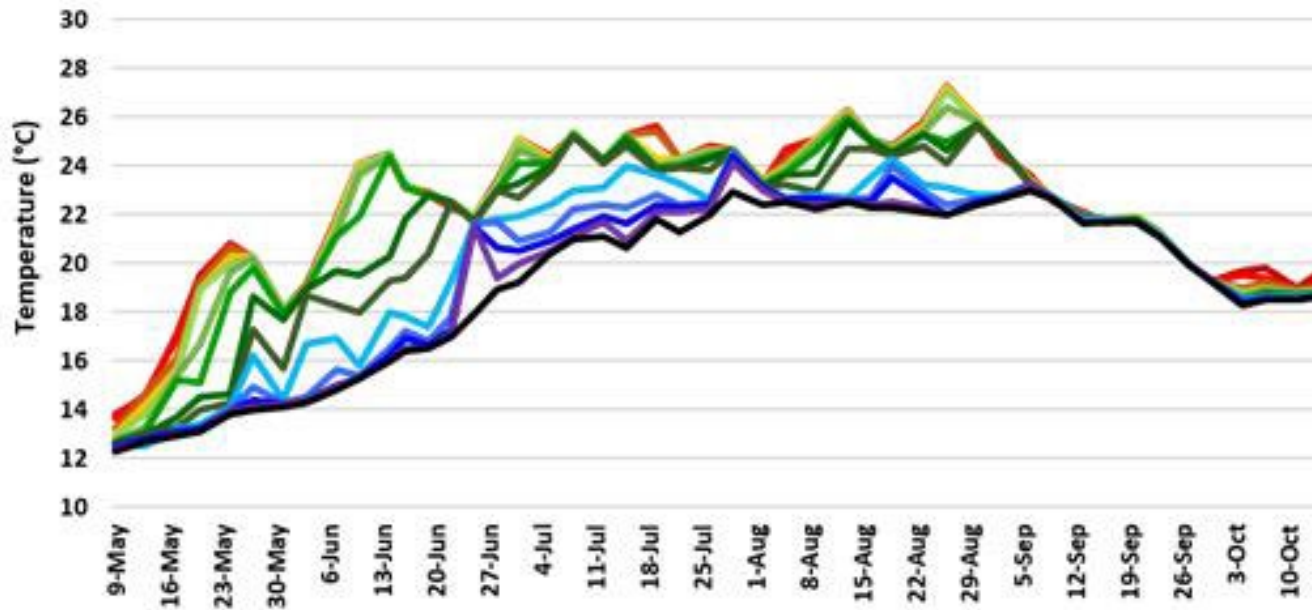
Eutrophic nutrient status

Nutrient budget dominated by internal loading of phosphorus

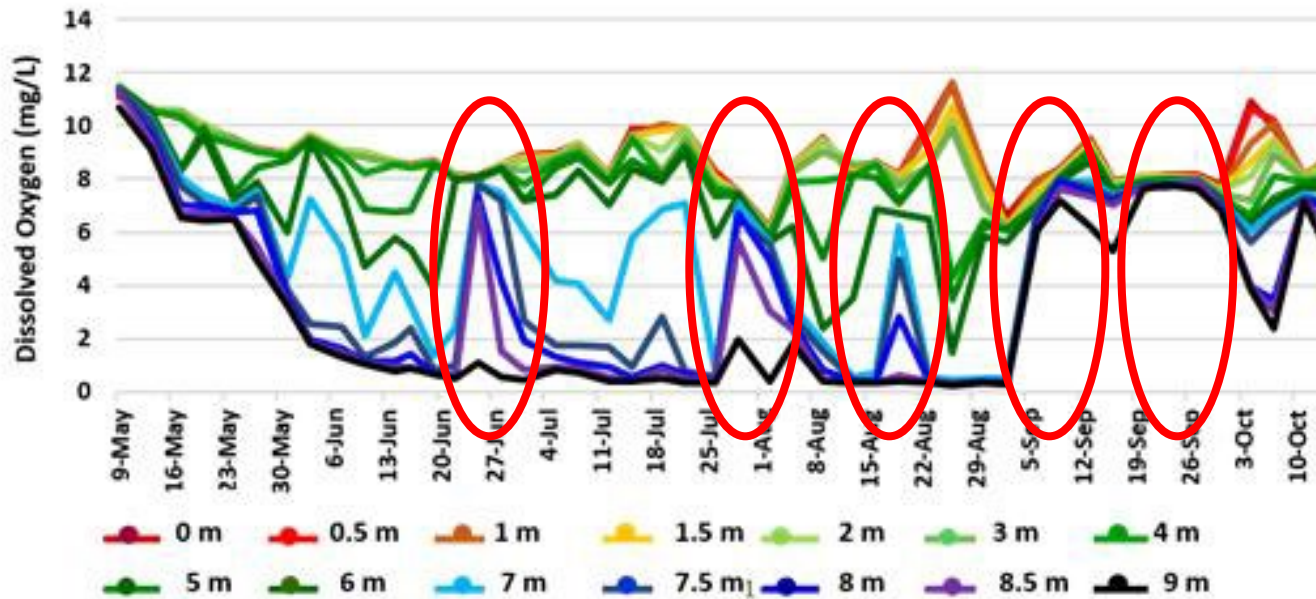
Periodic blooms of cyanobacteria



Honeoye Lake Deep Temperature 2021



Honeoye Lake Deep Dissolved Oxygen 2021



Research Questions:

- How much phosphorus is stored in the deep bottom sediments?
- Could historic land use practices be a contributing factor in the accumulation of phosphorus in the lake bottom?
- What historic land use data is available to help explore this question?



sediment corer

Constructing historic land use – land cover patterns for the Honeoye Lake watershed and exploring their relationship to modern lake condition.



1940



2006

Dr. Bruce Gilman

Science Advisor
Honeoye Valley Association



Kyle Ritts

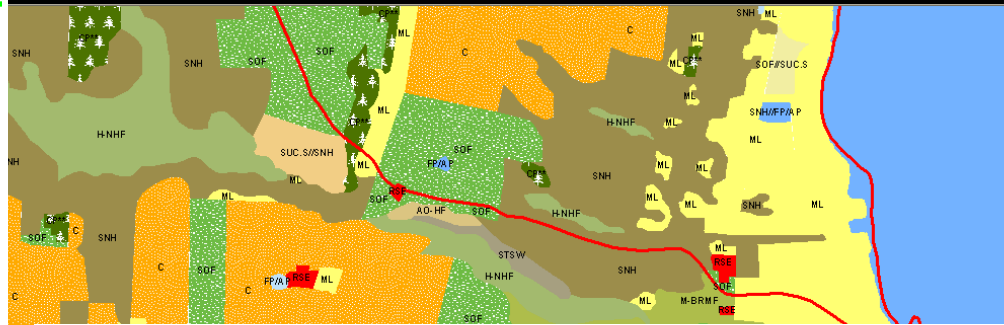
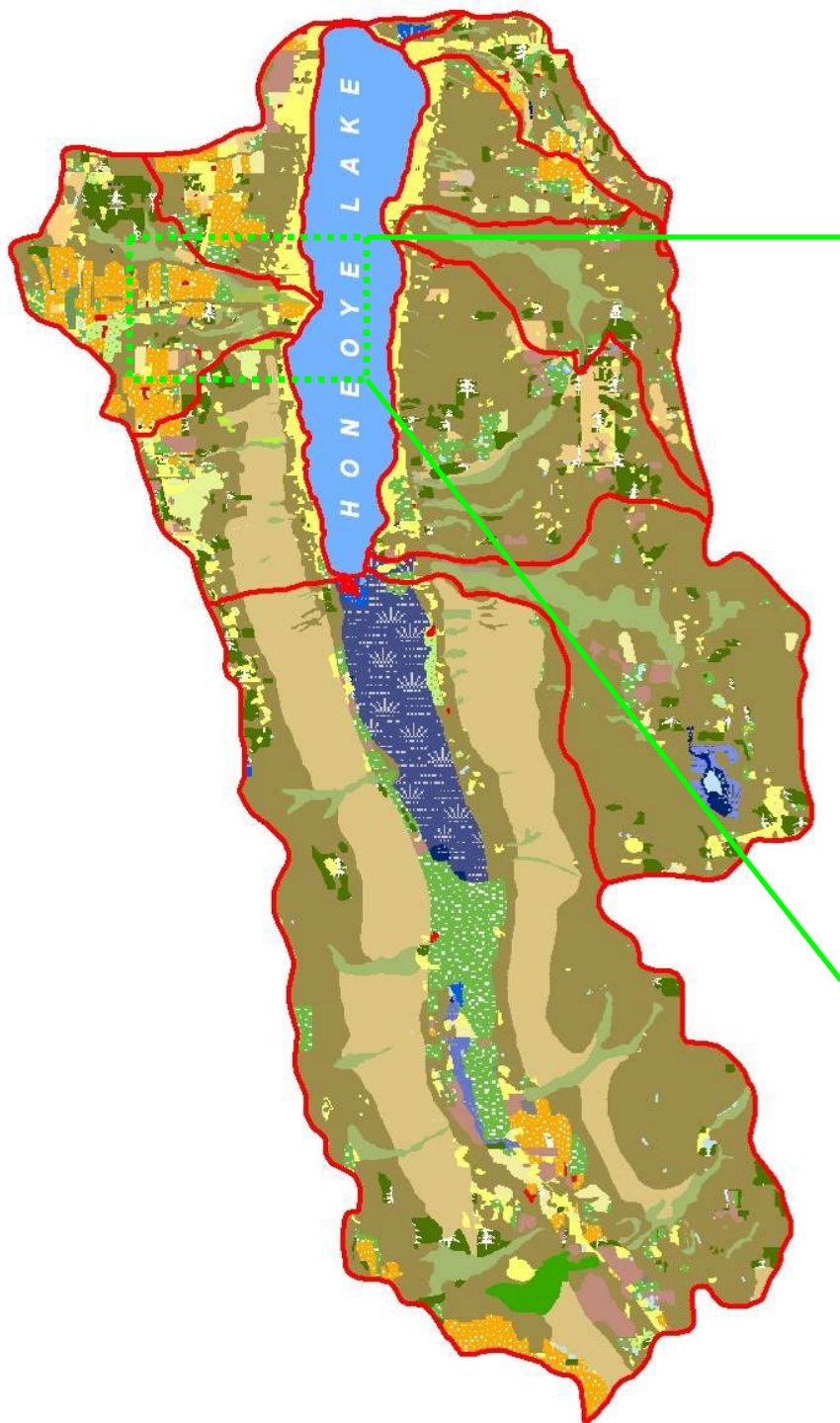
Planning Aide
Ontario County Planning Department





Land Use - Land Cover Mapping

- Initial assessment based on air photo interpretation (Eagleview © imagery)
- Extensive field investigations reveal errors in initial assessment
- Update polygons to create “truth image”
- Attribute polygons
- Produce summary data table and final land use – land cover map



LEGEND

- Honeoye Lake Sub-Watersheds - (24,497 Total Acres)
- Riverine Covertypes - (>1)**
- Natural Streams**
- Confined River-CR (>1)
- Lacustrine Covertypes - (1,925)**
- Lacustrine Cultural - (84)**
- Farm Pond\Artificial Pond-FF/AF - (84)
- Natural Lakes & Ponds - (1,841)**
- Eutrophic Pond-EP - (11)
- Winter-Stratified Monomictic Lake-W-SMML - (1,830)
- Palustrine Covertypes - (983)**
- Forested Mineral Soil Wetlands - (876)**
- Hemlock-Hardwood Swamp-H-HS - (51)
- Floodplain Forest-FF - (60)
- Silver Maple-Ash Swamp-SM-AS - (765)
- Open Mineral Soil Wetlands - (107)**
- Deep Emergent Marsh-DEM - (10)
- Shrub Swamp-SS - (41)
- Shallow Emergent Marsh-SEM - (56)
- Terrestrial Covertypes - (21,576)**
- Barrens & Woodlands - (42)**
- Successional Red Cedar Woodland-SRCW - (9)
- Suc Red Cedar Woodland\Suc N. Hardwoods-SRC//SNH** - (11)
- Shale Talus Slope Woodland-STSW - (22)
- Forested Uplands - (15,551)**
- Fitch Fine-Oak Forest-FF-OF - (4)
- Appalachian Oak-Fine Forest-AO-PF - (20)
- Maple-Basswood Rich Mesic Forest-M-BRMF - (27)
- Suc Northern Hardwood\Conifer Plantation-SNH//CP** - (145)
- Hemlock-Northern Hardwood Forest-H-NHF - (1,205)
- Appalachian Oak-Hickory Forest-AO-HF - (3,350)
- Successional Northern Hardwoods-SNH - (10,800)
- Open Uplands - (2,200)**
- Sand Beach-SB - (>1)
- Suc Old Field\Conifer Plantation-SOF//CP** - (36)
- Suc Old Field\Suc Shrubland-SOF//SUC.S - (188)
- Suc Northern Hardwoods\Suc Shrubland-SNH//SUC.S - (295)
- Successional Shrubland-SUC.S - (493)
- Successional Old Field-SOF - (1,187)
- Terrestrial Cultural - (3,783)**
- Unpaved Road\Fath-UR/P - (2)
- Vineyard-V - (4)
- Gravel Mine-GM - (10)
- Urban Structure Exterior-USE - (36)
- Rural Structure Exterior-RSE - (37)
- Pastureland-P - (105)
- Outdoor Recreation-OR** - (112)
- Cropland-C - (985)
- Conifer Plantation-CP** - (1,132)
- Mowed Land/Residential-ML - (1,360)

Modern Watershed



- 4 major systems: riverine, lacustrine, palustrine and terrestrial
- 10 subsystems: natural and cultural categories
- 38 community cover types and numerous linear and point features
- 5 natural communities have significant NY-NHP state-wide ranking: discontinuous cold polymictic lake, floodplain forest, silver maple-ash swamp, shale talus slope woodland, and maple-basswood rich mesic forest

For the Historic Watershed, luck was on our side!

- Problems with City of Rochester water supply
 - Contamination of city neighborhood wells
- Acquire an upland reservoir system
 - Hemlock Lake and Canadice Lake
 - add Honeoye Lake to the upland reservoir system?



- 1929 aerial photography of Honeoye Lake watershed and downstream region

But not always as lucky as it might seem...

- 17 images
- Summertime
- Black and white
- Low resolution
- Image scale varies (non-orthographic)
- Changes in locations of major roads

DISCLAIMER!!





North end of Honeoye Lake in 1929

System/Subsystem Comparisons:

1929

- Lacustrine - 1,815 acres
- Palustrine – 1,331 acres
- Terrestrial – 22,114 acres
 - barrens and woodlands
38 acres
 - forested uplands
9,425 acres (43%)
 - open uplands
3,372 acres (15%)
 - terrestrial cultural
9,317 acres (42%)

Modern

- Lacustrine - 1,925 acres
- Palustrine - 983 acres
- Terrestrial - 21,576 acres
 - barrens and woodlands
42 acres
 - forested uplands
15,551 acres (72%) 
 - open uplands
2,200 acres (10%)
 - terrestrial cultural
3,783 acres (18%) 

Lacustrine Comparisons:

1929

- Honeoye Lake
1815 acres
- Man-made pond
1 acre
- Eutrophic pond
1 acre
- Vernal pool
2 acres

Modern

- Honeoye Lake
1,830 acres
- Man-made pond
84 acres
- Eutrophic pond
11 acres
- Vernal pool
2 acres

Palustrine Comparisons:

1929

modern

- | | |
|--|--|
| • Silver maple-ash swamp
599 acres | • Silver maple-ash swamp
765 acres |
| • Floodplain forest
72 acres | • Floodplain forest
60 acres |
| • Shallow emergent marsh
135 acres | • Shallow emergent marsh
56 acres |
| • Hemlock-northern
hardwood swamp
99 acres | • Hemlock-northern
hardwood swamp
51 acres |

Natural Terrestrial Comparisons:

1929

- Successional northern hardwood forest
2,543 acres
- Appalachian oak- hickory forest
5,364 acres
- Hemlock-northern hardwood ravine forest
1,218 acres
- Successional old field
2,301 acres

modern

- Successional northern hardwood forest
10,800 acres
- Appalachian oak- hickory forest
3,350 acres
- Hemlock-northern hardwood ravine forest
1,205 acres
- Successional old field
1,187 acres

Cultural Terrestrial Comparisons:

1929

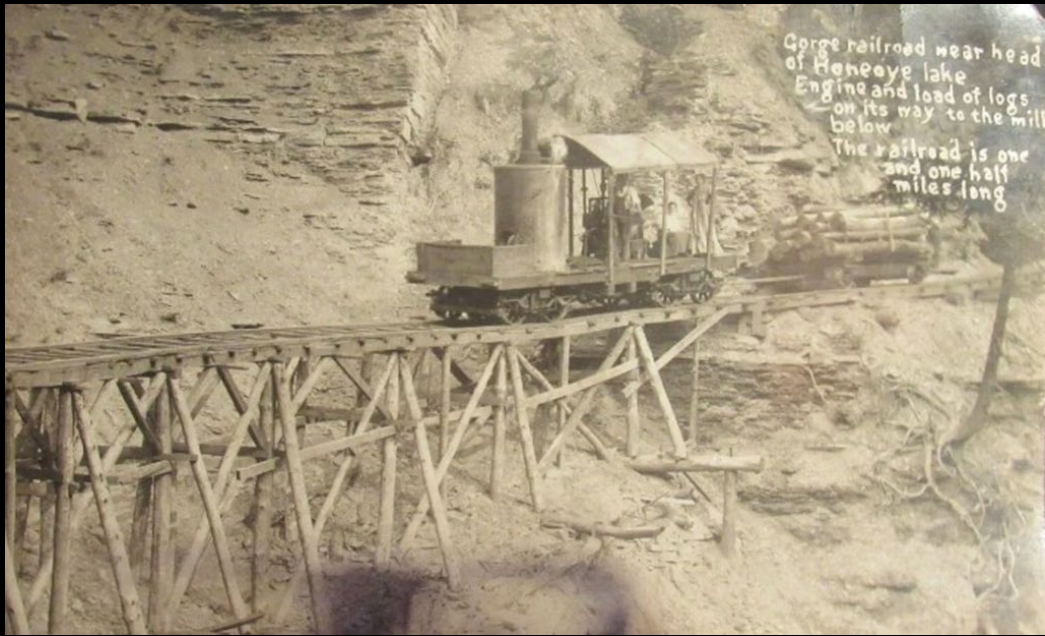
- Mowed lawn
165 acres
- Conifer plantation
16 acres
- Cropland
4,794 acres
- Pasture
4,055 acres

modern

- Mowed lawn
1,360 acres
- Conifer plantation
1,132 acres
- Cropland
985 acres **down 80%**
- Pasture
105 acres **down 97%**

Conclusions

- Watersheds experience significant change in land use and land cover over time
- Nutrient enrichment from historic human activities will affect modern lake water quality and likely drive HAB's
- Lake restoration actions, normally designed to address modern concerns, also need to recognize and mitigate problems that have an historic origin



Coque railroad near head
of Honeoye lake
Engine and load of logs
on its way to the mill
below
The railroad is one
and one half
miles long



Honeoye Lake. 1906.



Meyer's mill at the
foot of the Lake.

The lake research never ends...





Swamp forest in the
Southern Honeoye Valley