

MADISON CORBEIL

MAY 14, 2018

STORMWATER COALITION OF ALBANY COUNTY

UNIVERSITY AT ALBANY – SUNY STUDENT MAPPING PROJECTS

NYSDEC WQIP GRANT CONTRACT C00081GG

ERIE CANAL PROJECT

OR SO WE THOUGHT...

ORIGINS OF PROJECT

- Stormwater Coalition interest in locating historic Canal infrastructure
- Had run into suspected canal infrastructure when managing stormwater systems in several municipalities
- Lack of map data on where the canal ran and what happened to it over time

GOAL OF PROJECT



- Gain an understanding of where the canal system existed (and still exists today) in Albany county
- Analyze areas of interest for interactions between stormwater systems and aging canal infrastructure
- Support economic development through reduced building costs in urban communities with canal infrastructure

STEPS OF PROJECT

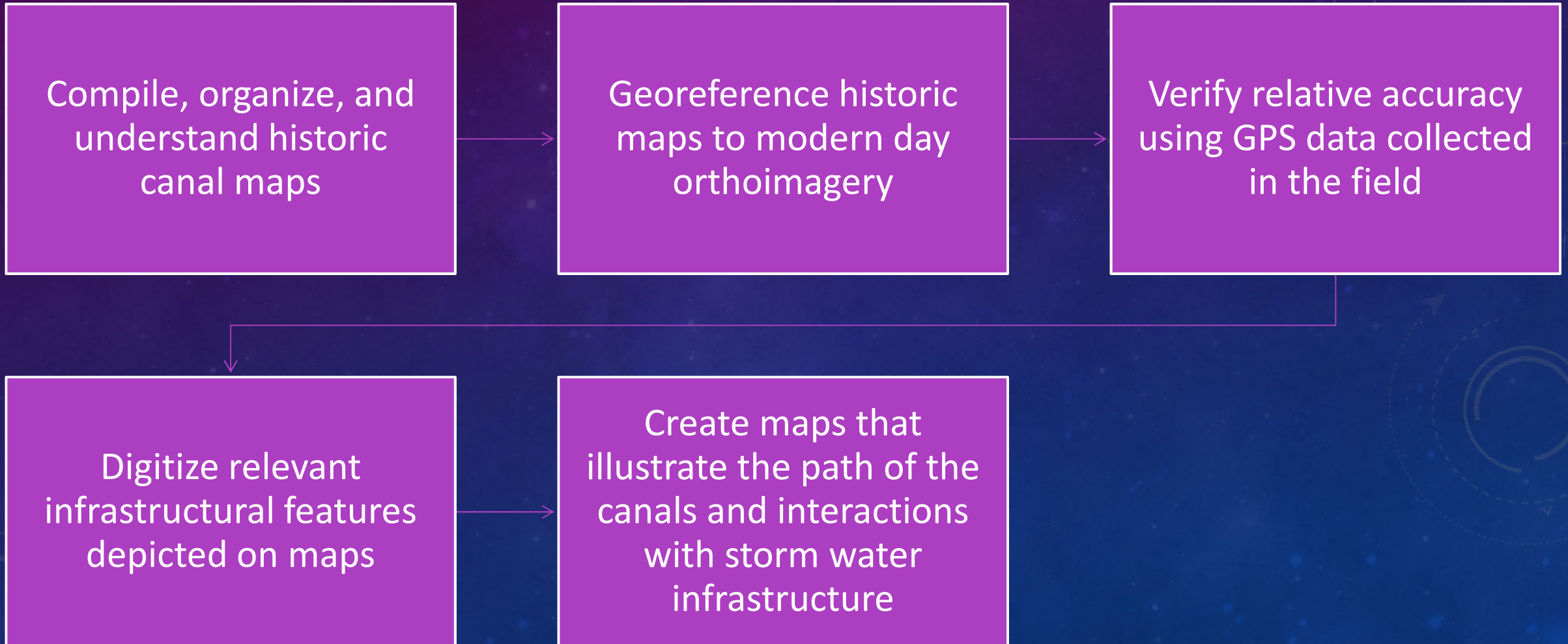
Compile, organize, and
understand historic
canal maps

Georeference historic
maps to modern day
orthoimagery

Verify relative accuracy
using GPS data collected
in the field

Digitize relevant
infrastructural features
depicted on maps

Create maps that
illustrate the path of the
canals and interactions
with storm water
infrastructure



The background is a blue gradient with faint, light-colored concentric circles and degree markings (150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260) on the left side, suggesting a circular scale or compass. The text is white and centered in the lower right area.

HISTORICAL CONTEXT AND BACKGROUND INFORMATION

HISTORICAL TIMELINE

1825

The Original Erie Canal aka “Clinton’s Ditch” opened for travel

1835

NYS authorized a plan to enlarge the canal
The rights to a portion of the Original Erie were transferred to the Cohoes Company

1843

The enlargement is completed

1918

The Barge Canal is completed marking the retirement of much of the Erie Canal

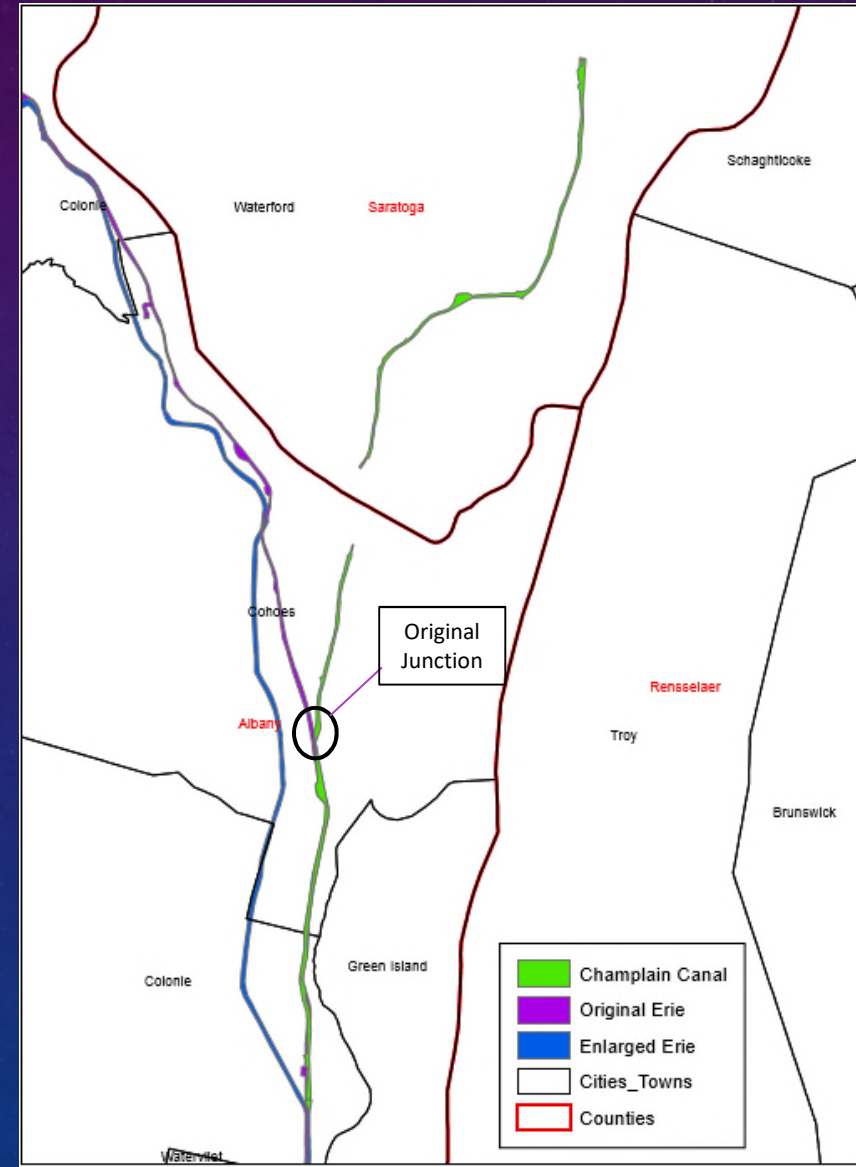
THE ORIGINAL ERIE CANAL OR “CLINTON’S DITCH”

- Opened for business in 1825
- The canal was dug from Albany to Buffalo covering a distance of 363 miles
- Dimensions: 4 feet deep by 40 feet wide
- 77 stone locks (15 x 90 feet)



THE CHAMPLAIN CANAL

- Opened 2 years prior to the Erie Canal in 1823
- Covered 64 miles from Cohoes to Whitewall
- Branches off from the Erie Canal at the original junction in Cohoes
 - When the junction was moved south during the enlargement, a portion of the Erie canal was absorbed by the Champlain



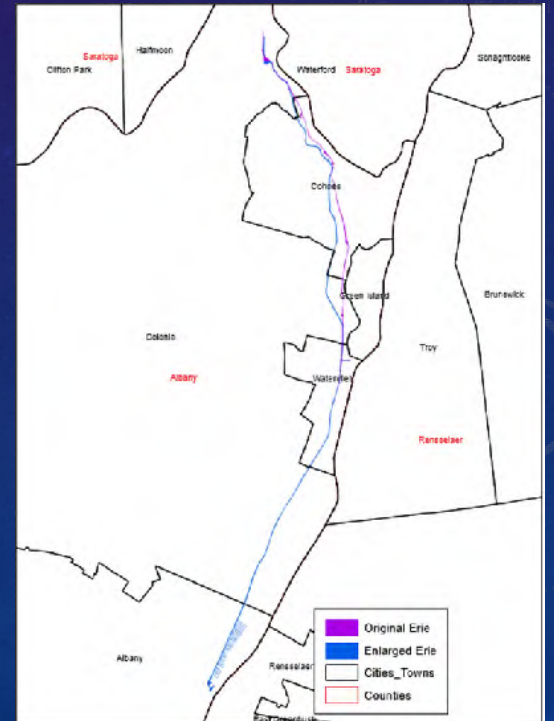
THE ENLARGED ERIE CANAL

- 10 years after the opening of the Original Erie Canal, legislation was approved to enlarge it due to overwhelming demand
- The enlargement was completed in 1843
- Dimensions: 70 feet wide by 7 feet deep



This enlargement involved:

- rerouting some portions of the canal
- converting single locks to double locks
- locks were enlarged to 18 x 110 feet
- Integrating more durable building materials

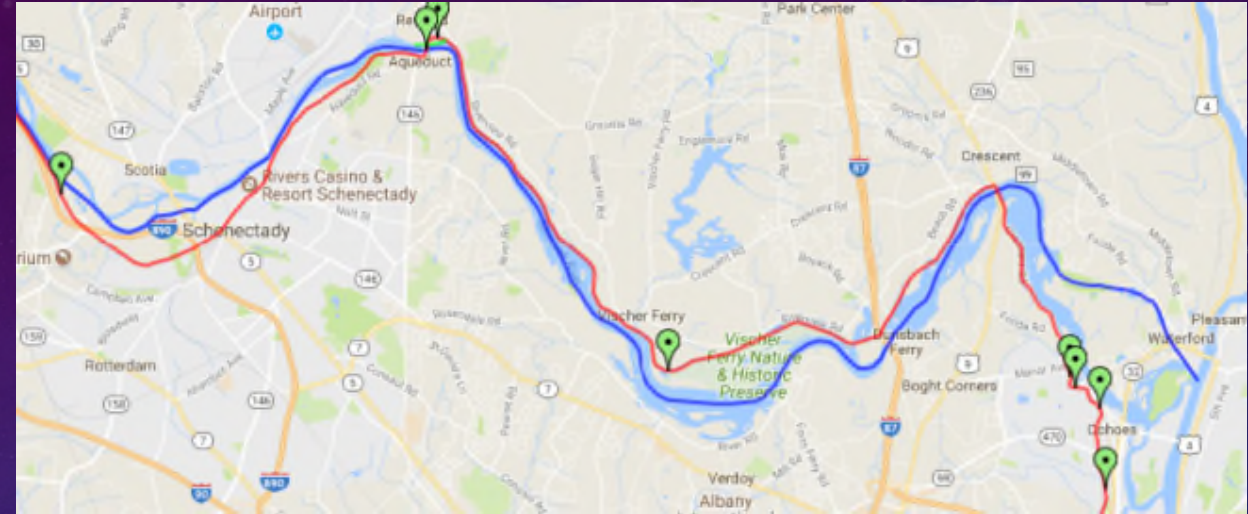


THE COHOES POWER CANAL

- Around 1835, the state purchased land from the Cohoes Company to be used as part of the Enlarged Canal path.
- In exchange, the Cohoes Company was given the rights to the abandoned Clinton's Ditch portion through Cohoes.
- Sections of Clinton's Ditch were then converted to a power canal in the City of Cohoes to power their growing mill industries

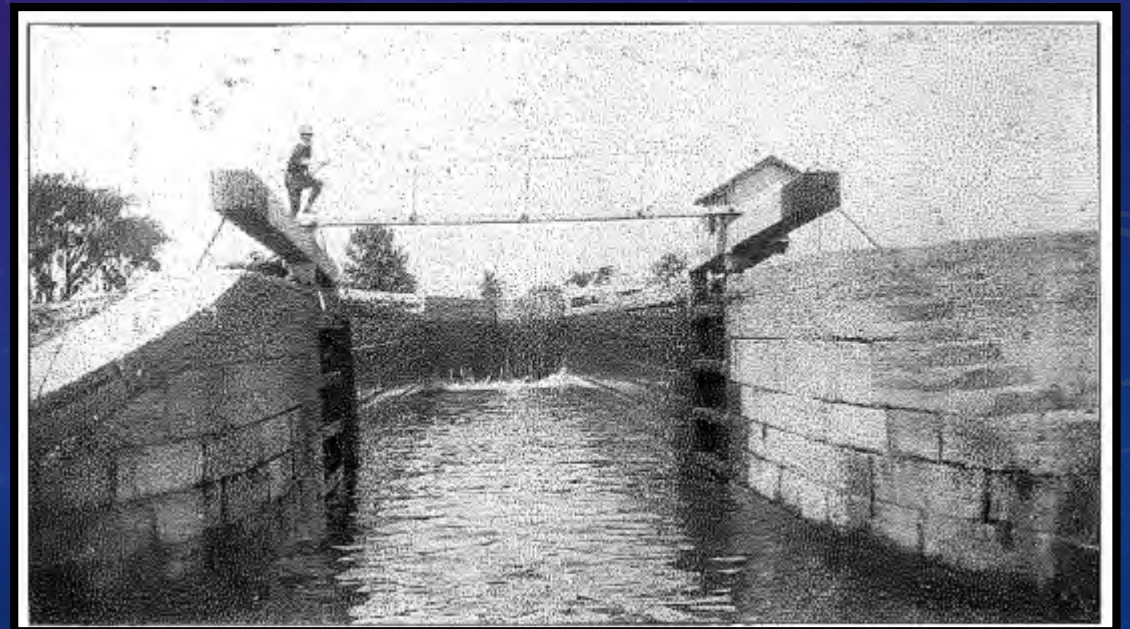
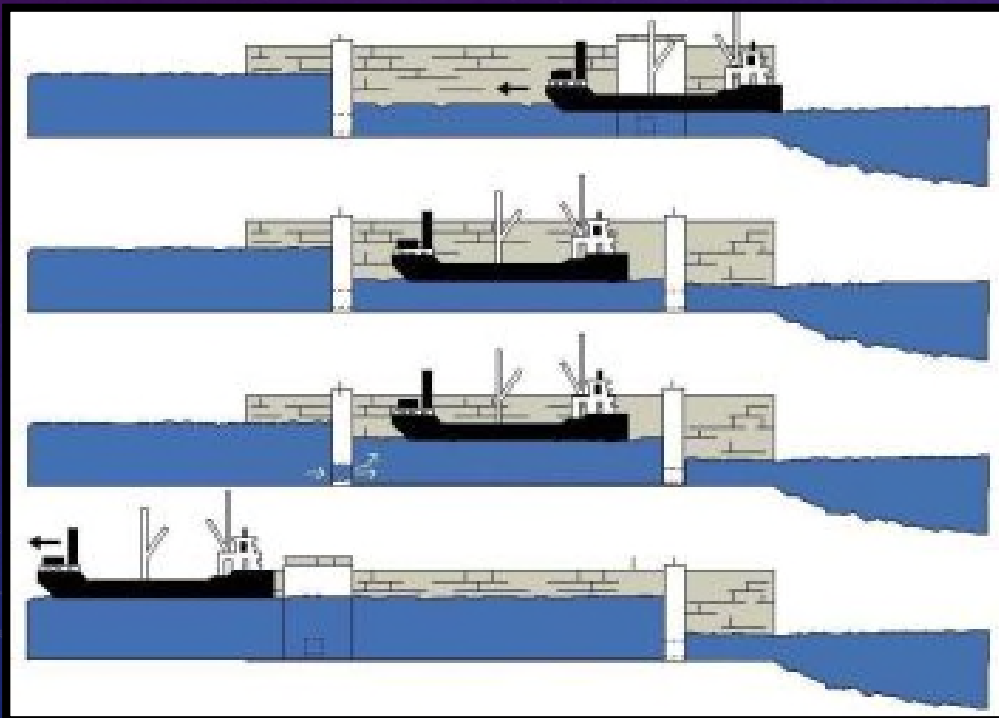
THE BARGE CANAL

- In 1903, NYS passed the Barge Canal Act, which combined the Erie, Champlain, Oswego, Cayuga, and Seneca canals into the New York State Barge Canal System.
- Much of the Erie Canal was retired, abandoned, or filled in following the opening of the Barge Canal in 1918

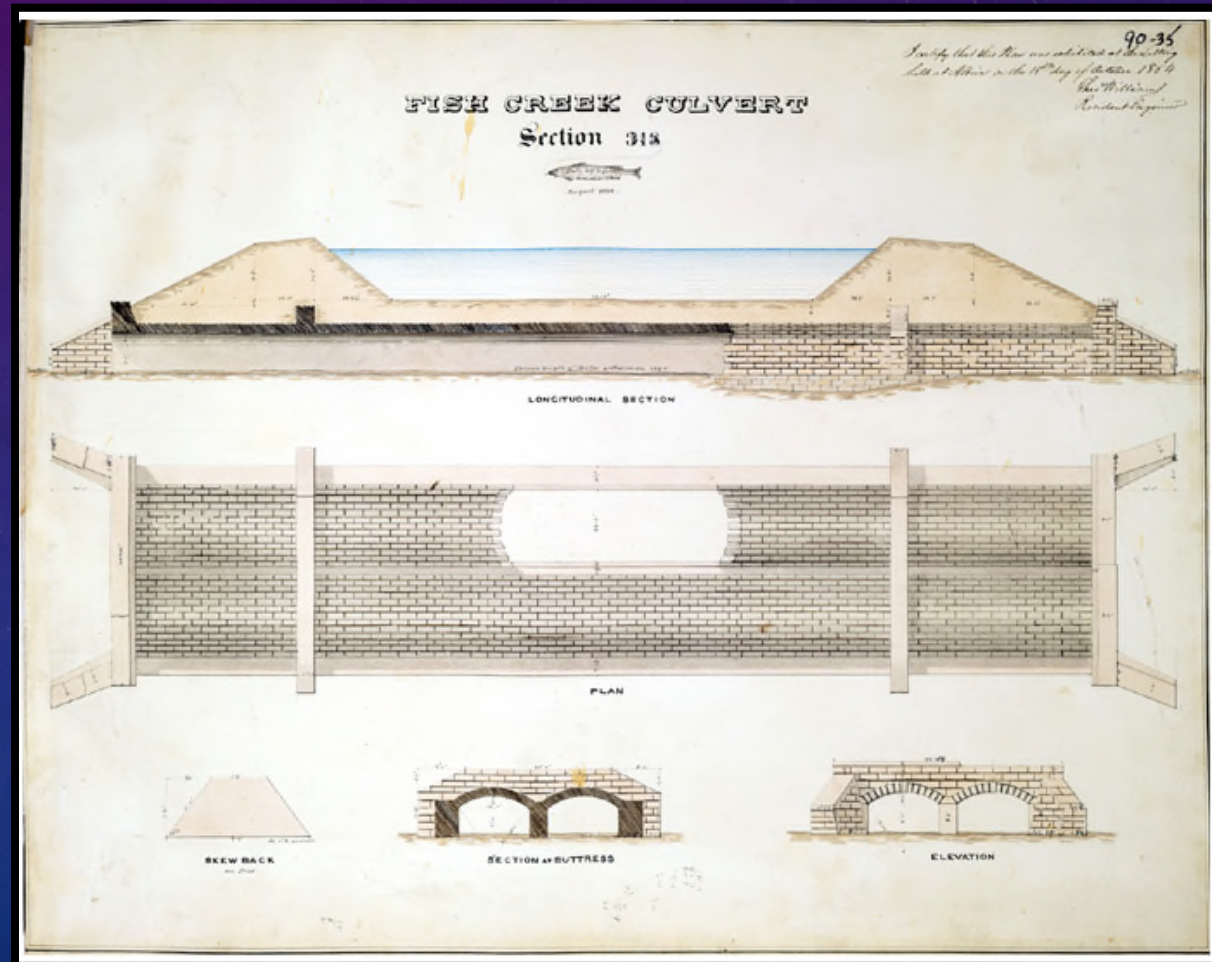


COMMON CANAL INFRASTRUCTURE

Locks



Culverts

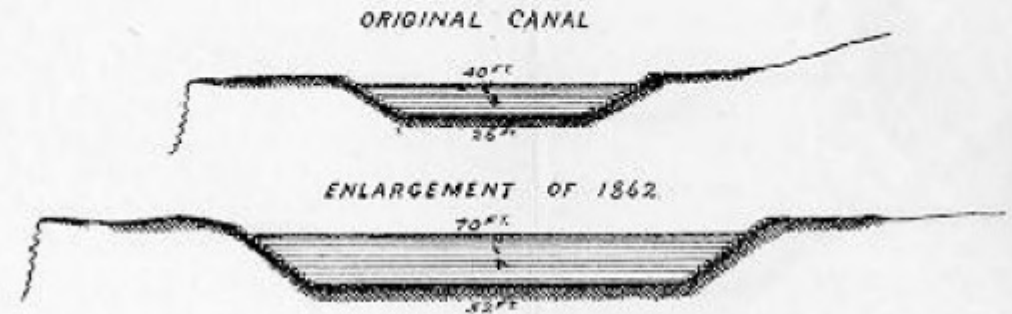


COMMON CANAL INFRASTRUCTURE

CANAL PRISM



TYPICAL CROSS SECTIONS OF ERIE CANAL PRISM



COMPILE, ORGANIZE, AND UNDERSTAND HISTORIC MAPS

Received 3 sets of maps, each representing a different time period, from Craig Williams

- Hutchinson (1834) – Original Erie Canal or “Clinton’s Ditch”
- Schillner (1895) – Enlarged Erie Canal
- Blue Line (1921) – Transition from the Erie Canal to the Barge Canal

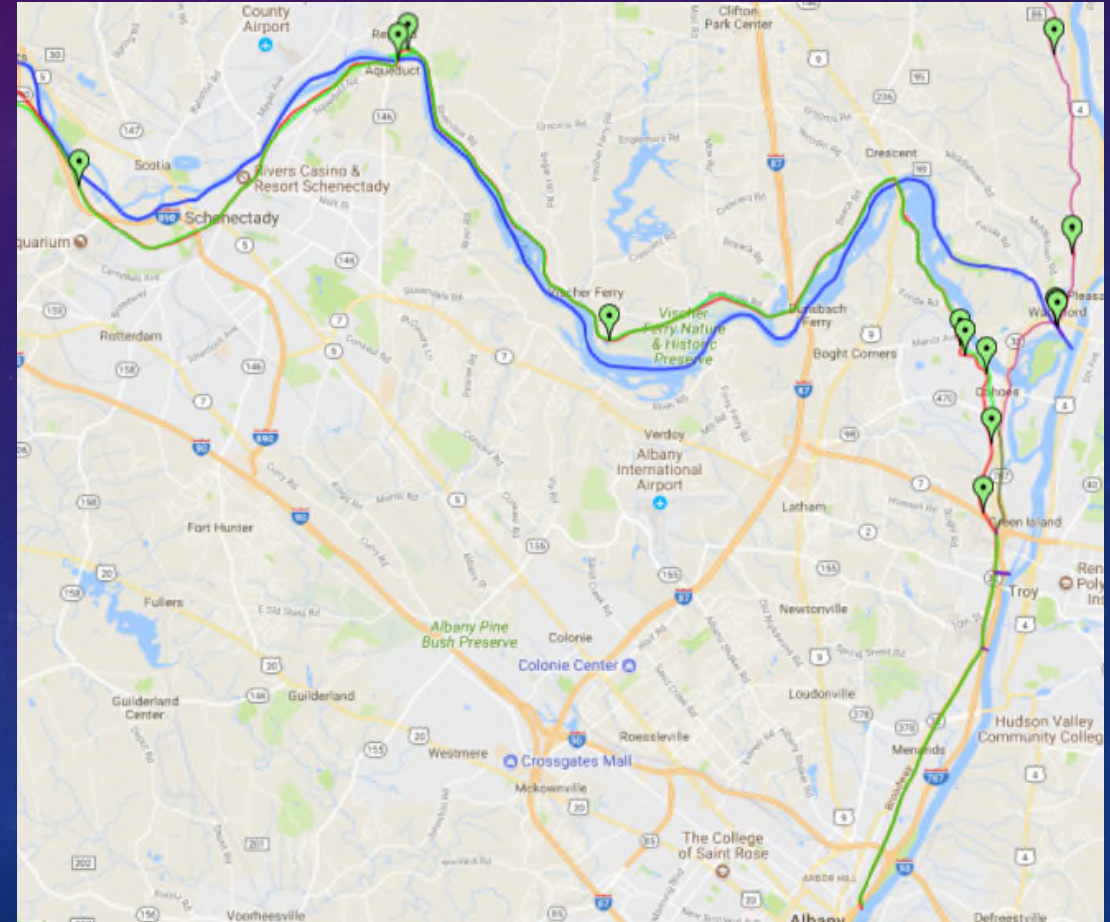
The maps came in the form of numerous individual tiles that needed to be assembled to reveal the larger comprehensive maps



ADDITIONAL RESOURCES: ERIE CANAL MAPPING PROJECT

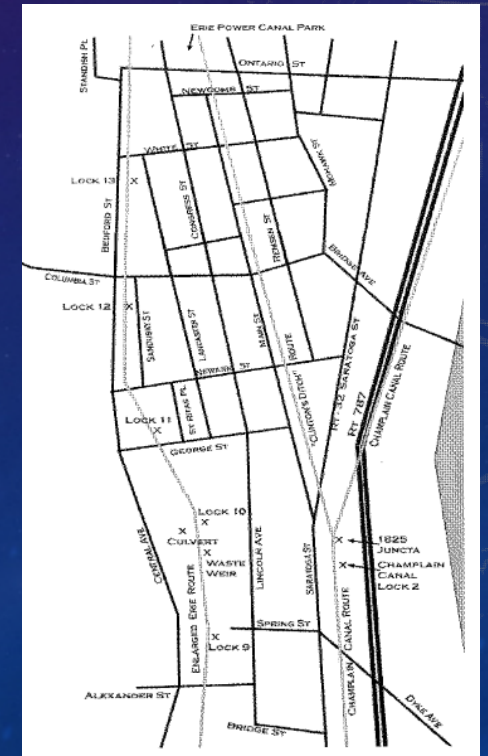
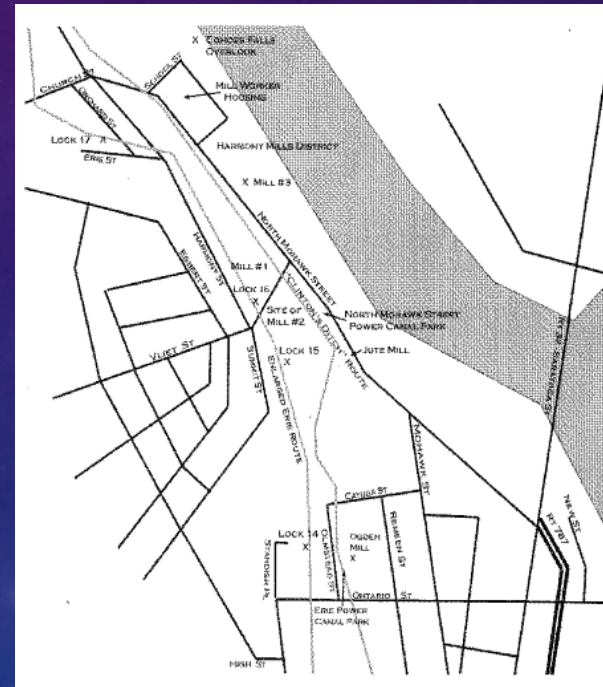
[HTTP://WWW.ERIECANALMAPPINGPROJECT.COM/](http://www.eriecanalmappingproject.com/)

- Bill Leshar, a retired canal enthusiast, generated a map estimating the canal path based on research and a series of field visits
 - This was accomplished using GPS and google earth
- This website served as a guide through the map tile orientation process
- It also identified several sites of existing canal infrastructure for our own GPS excursion



CANALS OF ALBANY COUNTY BOOK BY AMELIA O'SHEO

- Provided useful street maps including local landmarks and features of interest
- Text provided qualitative details such as type of bridge, lock number, when a feature was dismantled, or if the feature still exists today



SELECTING MAPS TO GEOREFERENCE

The first map to be georeferenced was the 1895 Schillner map

- Includes portions of the Champlain and Enlarged Erie Canal and runs from Albany to North Colonie
- The plan was to rely mostly on street intersections as common features between historic maps and present day orthoimagery
- This map was chosen because of its detailed abundance of streets
- This map also covered the largest area of the canal system including sections of the Champlain and Cohoes power canal



GEOREFERENCING: METHODOLOGY

- Looked for any street names on Schillner maps
- Attempted to match those streets with present day streets layer
- Took some investigation as some street names have changed over time



SELECTING MAPS TO GEOREFERENCE

A portion of the Hutchinson map was also georeferenced:

- The goal of this was to investigate the convergence of Clinton's ditch to the Cohoes Power Canal
- This was done using the previously georeferenced Schillner maps as well as any enduring geographical features as control points

Hutchinson Maps 1834

- Older maps = less streets to use as reference points (harder to georeference)
- Spanned from Watervliet to North Colonie (a subset of the larger map)
- Includes mainly Original Erie Canal or "Clinton's Ditch"
 - Small portion of Champlain canal



GEOREFERENCING: METHODOLOGY

- Looked for any commonalities between Schillner and Hutchinson maps
- Attempted to match those features to present day orthoimagery
- This was more difficult than the Schillner georeferencing because there are far less distinguishable features



Hutchinson

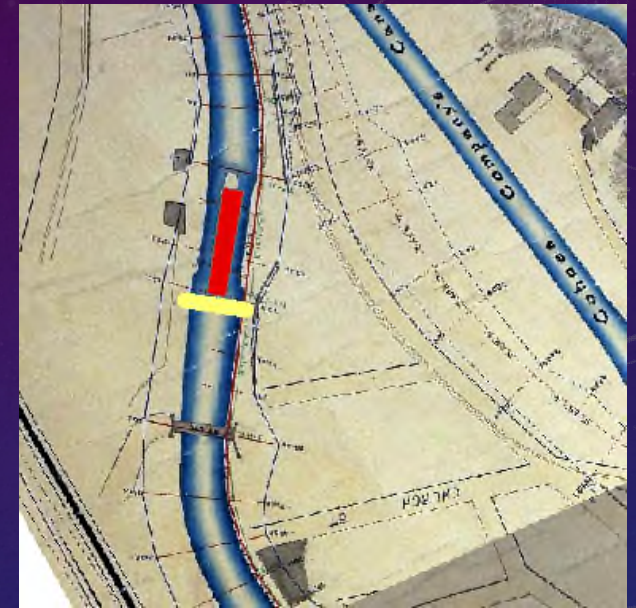


Schillner



GPS VERIFICATION

Visited several locations
with partially preserved
locks



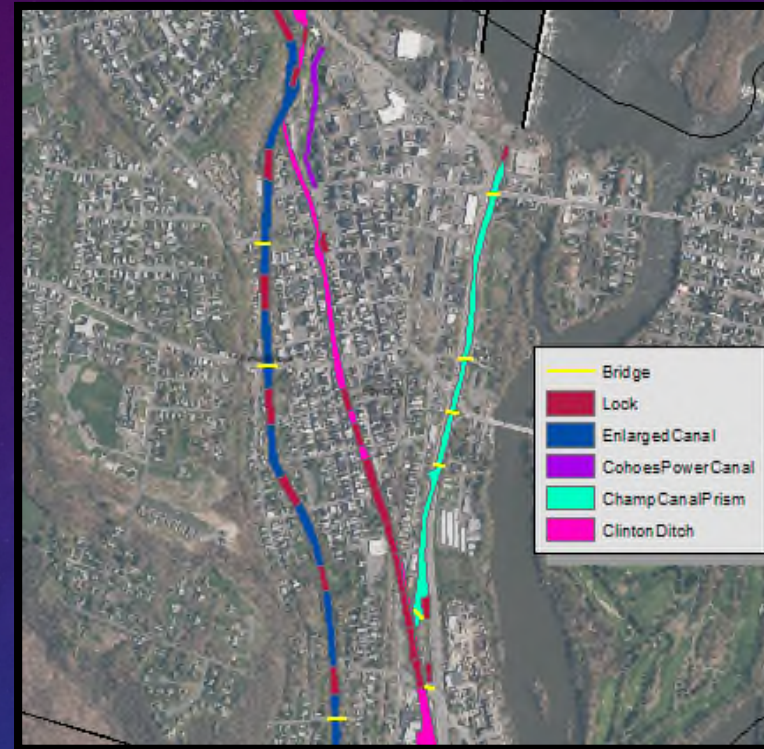
Collected GPS coordinates
on approx. size and
location of locks

Compared GPS coordinates to
canal maps to assess accuracy
of geo-referencing




















DIGITIZATION

- Digitized all canal features depicted on maps
- Added any information found through literary review (type of bridge, approximate date of construction, lock number, etc.)

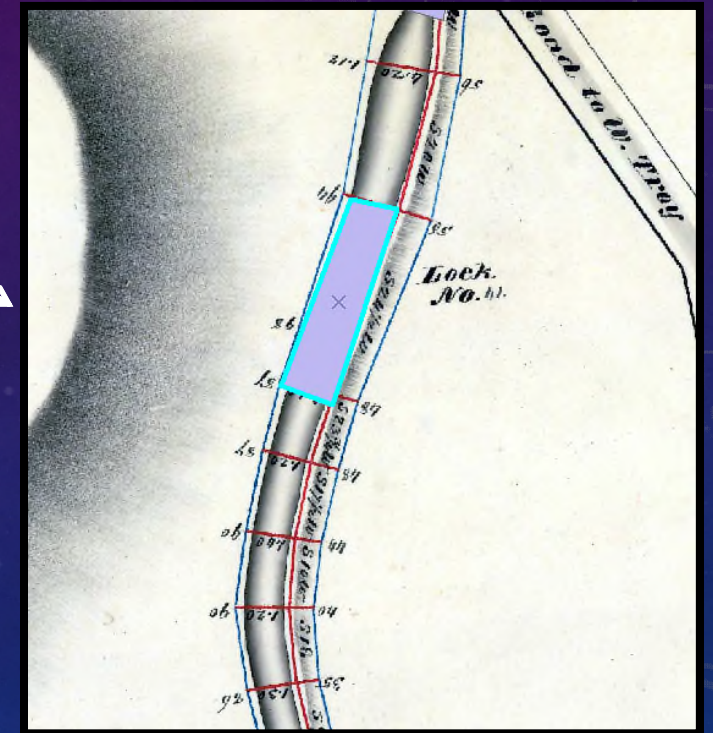
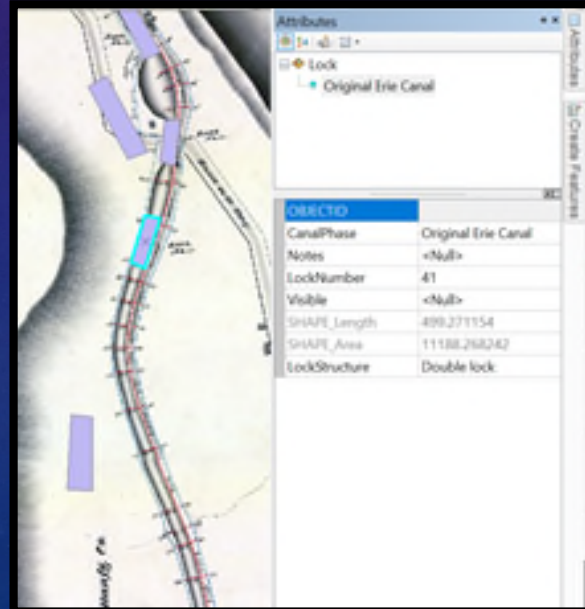
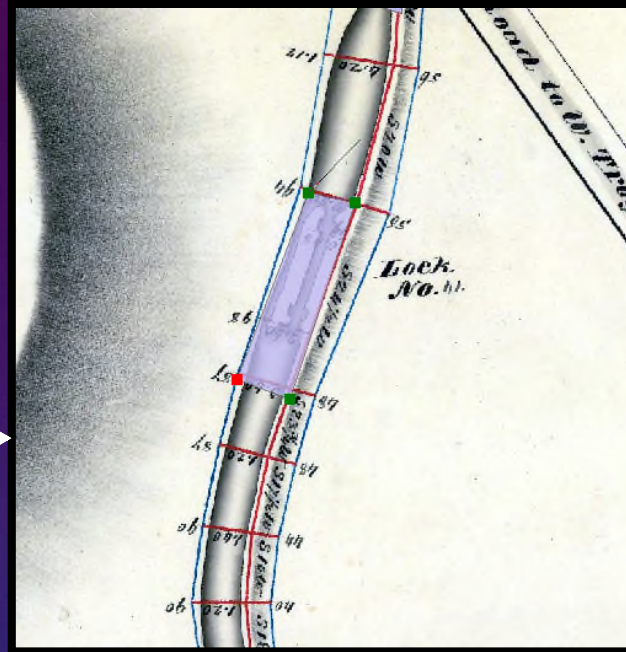
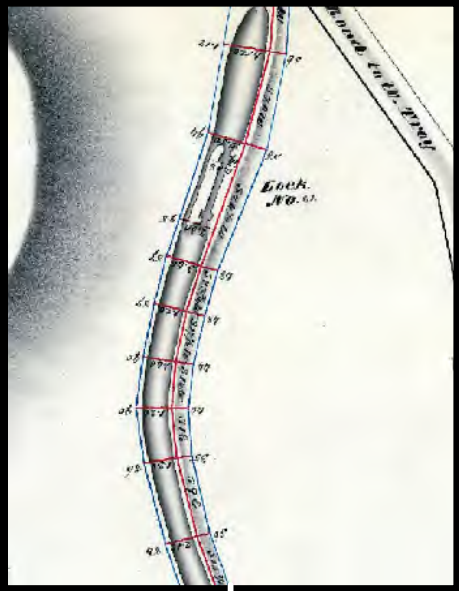


Digitized Features

-  Bridge
-  Basin
-  Bridge
-  Champ Canal
-  Clinton Ditch
-  Coal Trestle
-  Cohoes Power Canal
-  Culverts
-  Dam
-  Dry River
-  Enlarged Canal
-  Hydraulic Canal
-  Lock
-  Side Cut
-  Slip
-  Waste Weir
-  Weigh Lock

CanalPhase	Notes	LockNumber
Enlarged Erie Canal	One of the best preserved locks in Cohoes. The house next to the lock is the old locktender's house.	9
Enlarged Erie Canal	One wall of lock 10 remains.	10
Enlarged Erie Canal	Lock 11 is located behind the church and part of it was made into a grotto.	11
Enlarged Erie Canal	Part of lock 12 can be seen under the firehouse	12
Enlarged Erie Canal	Lock 13 is under a gray, 4 bay garage about halfway down Bedford St., just before White St.	13
Enlarged Erie Canal	Lock 14 is behind the bowling alley. It is partly buried and very overgrown.	14
Enlarged Erie Canal	Lock 15 is in very good shape. The small house on the east side of the lock is the lock tender's house.	15
Enlarged Erie Canal	Lock 16 is just north of Vliet St. buried behind Harmony Mill #1. The capstones can be seen in the grass.	16

DIGITIZATION DEMO



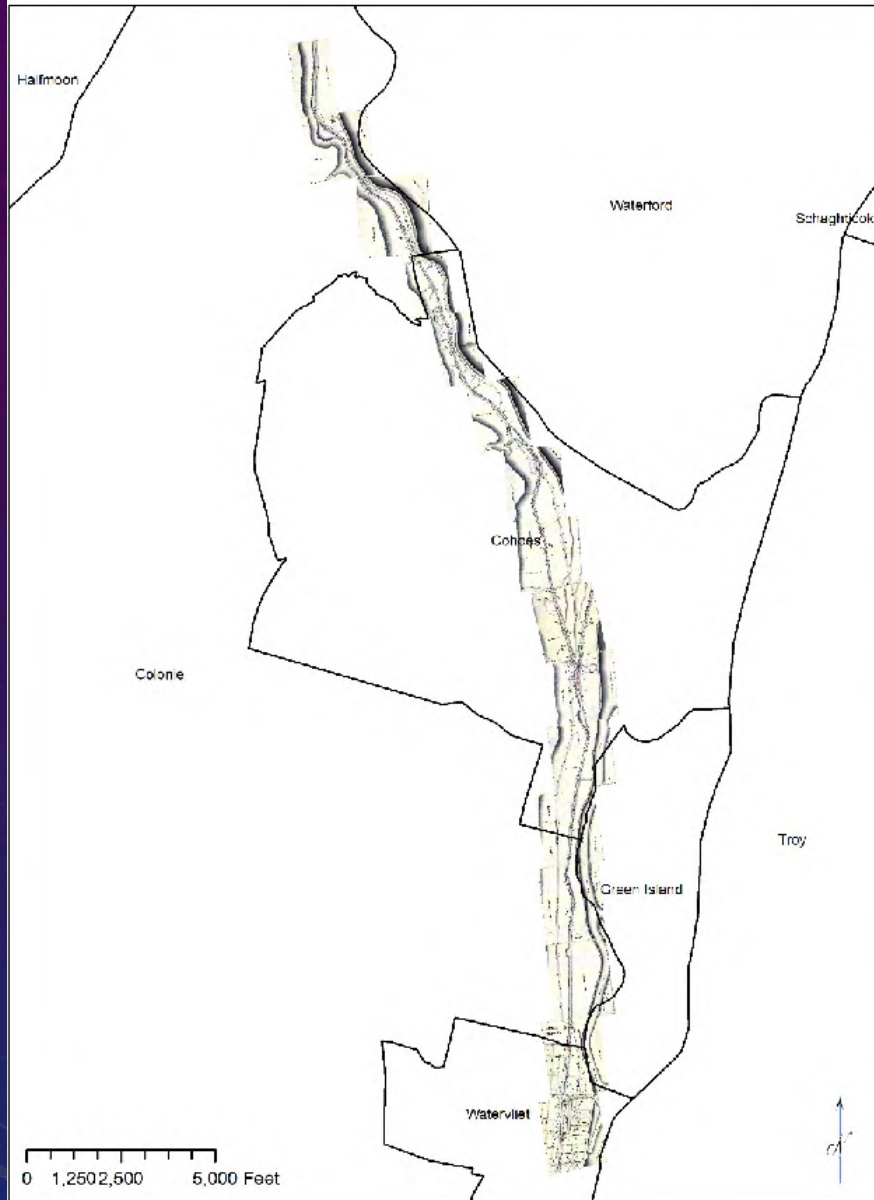
ANALYSIS OF INTERACTIONS BETWEEN CANAL AND STORMWATER SYSTEMS

- Imported stormwater systems mapping for Cohoes, Menands, and Watervliet
- Looked for areas where the digitized canal path coincided with field check locations or heavy stormwater infrastructure activities



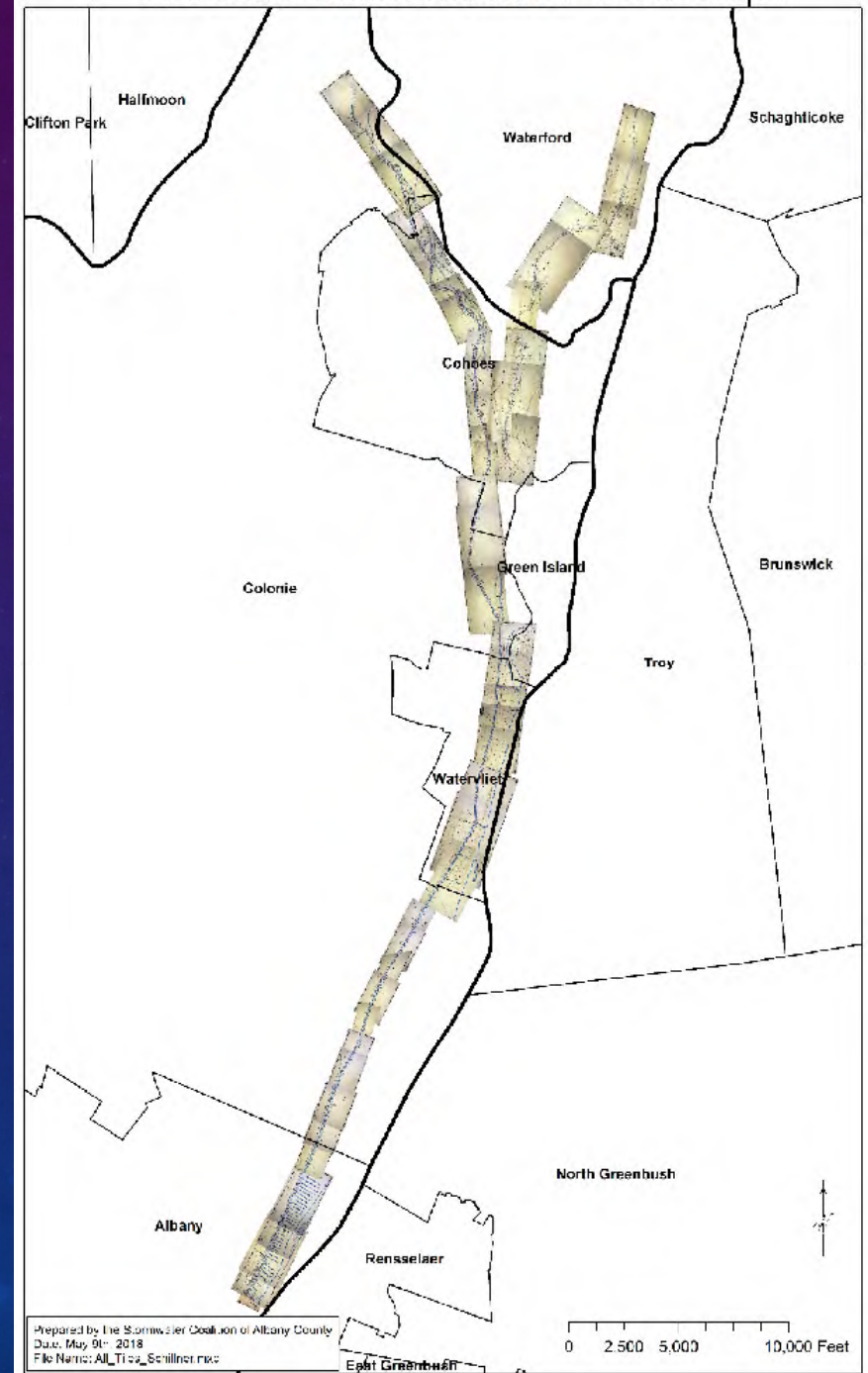
MAPS GENERATED

Georeferenced Hutchinson 1834 Maps



Prepared by the Stormwater Coalition of Albany County
 Date: May 9th, 2018
 File Name: HutchinsonAllTiles.mxd

Georeferenced Schillner 1895 Maps



Prepared by the Stormwater Coalition of Albany County
 Date: May 9th, 2018
 File Name: All_Tiles_Schillner.mxd

Waterford

Saratoga

Cohoes

Albany

Cohoes Power Canal

Champlain Canal

Original Erie

Enlarged Erie

Sources: Esri, HERE, Garmin, USGS, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NOAA, and OpenStreetMap contributors, and the GIS User Community

Prepared by the Stormwater Coalition of Albany County
Date: May 9th, 2018
File Name: DigitizedCanalPath

Prepared by the Stormwater Coalition of Albany County
Date: May 9th, 2018
File Name: DigitizedCanalFeatures_Sidecut.mxd

Canal Era Culverts and their Interactions with Streams and Water Bodies



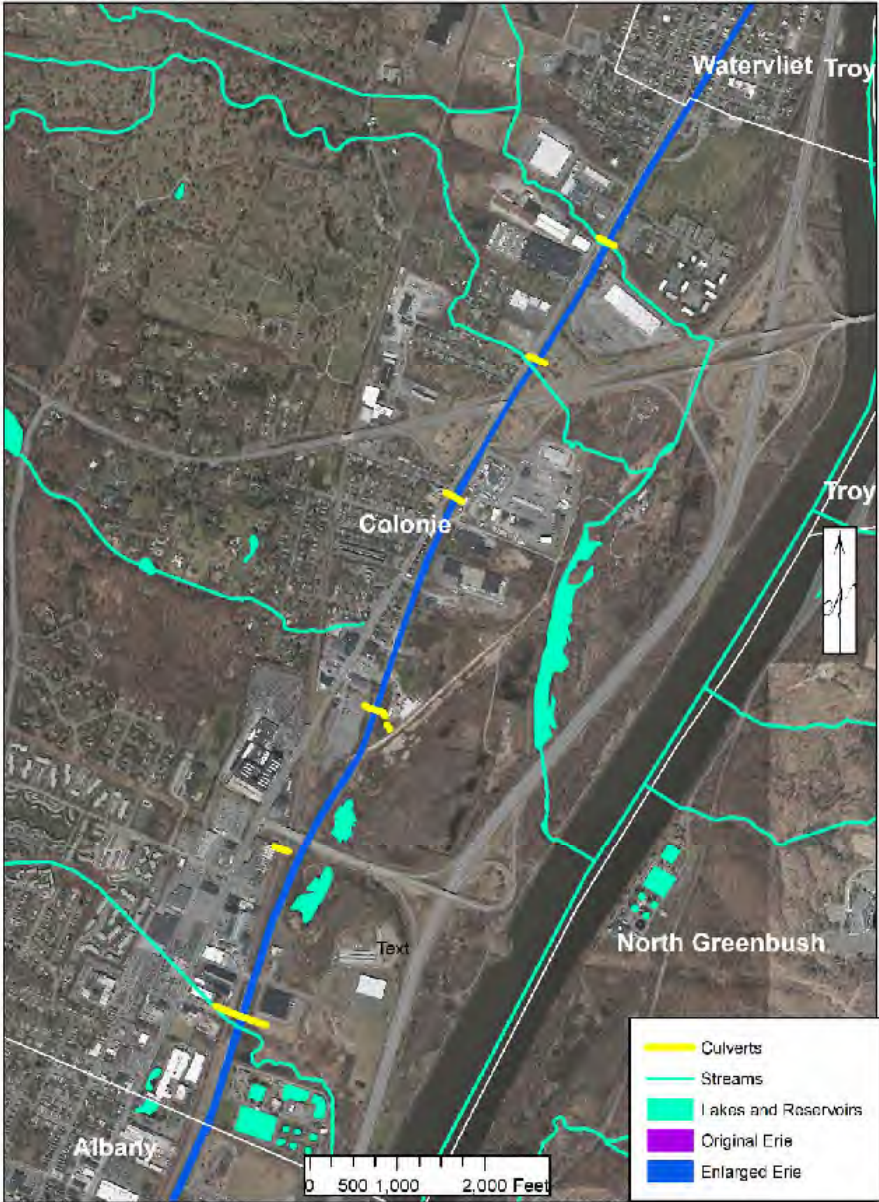
Prepared by the Stormwater Coalition of Albany County
Date: May 2018
File Name: DigitizedCanalFeatures_StreamsCulverts_1

Canal Era Culverts and their Interactions with Streams and Water Bodies



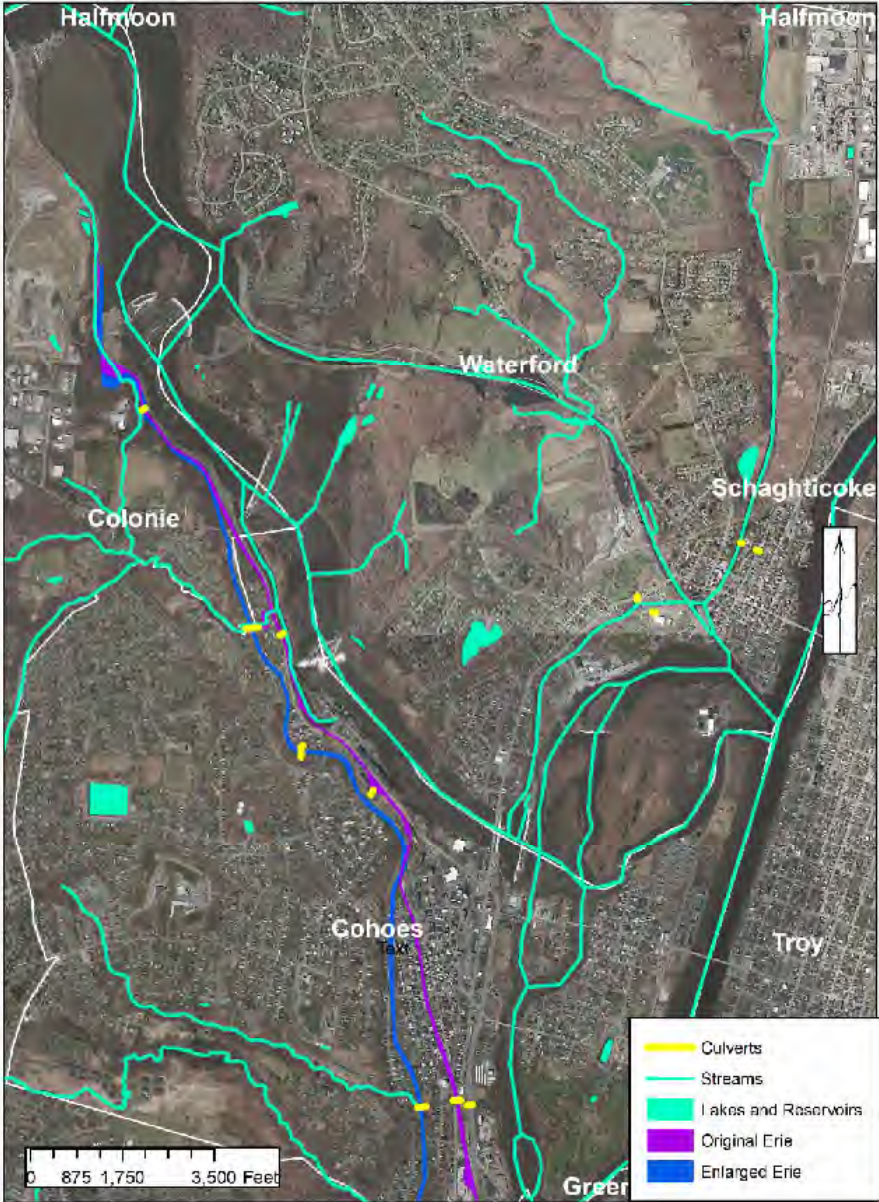
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Canal Era Culverts and their Interactions with
Streams and Water Bodies



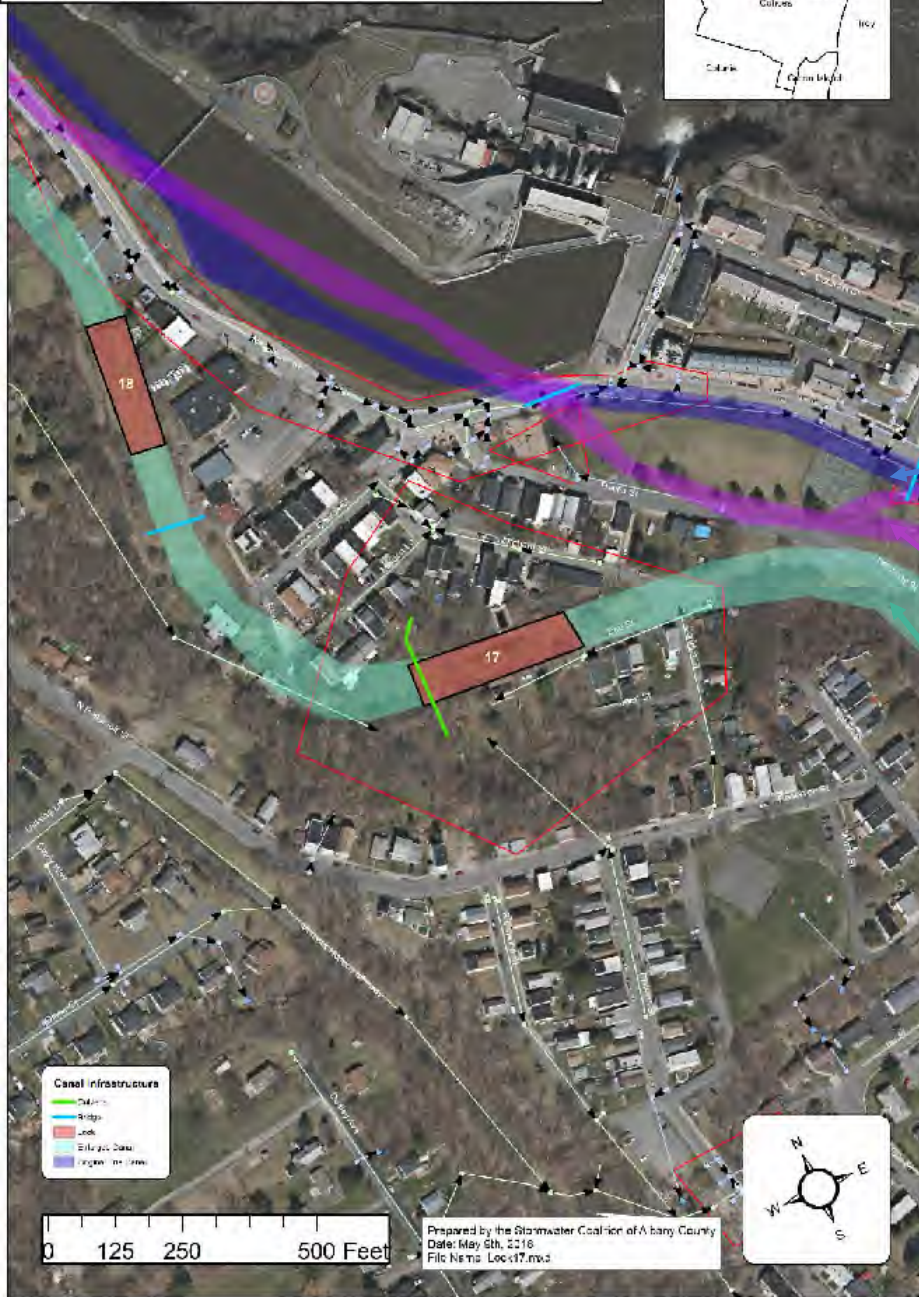
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Canal Era Culverts and their Interactions with
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Erie Canal Lock 17 Stromwater Infrastructure Interactions



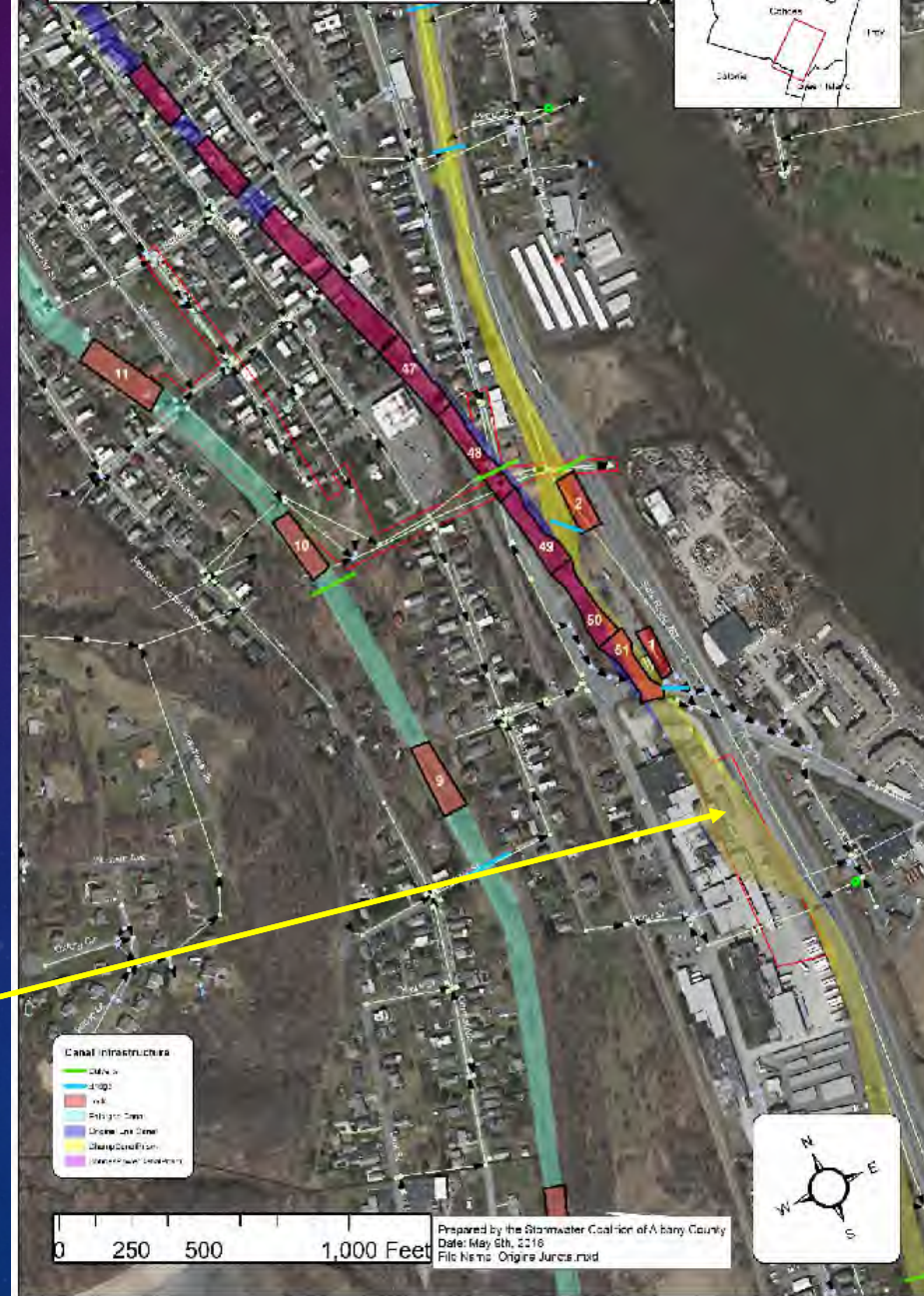
Original Erie Canal
(1825)

Cohoes Power Canal
(~1843)

Enlarged Erie Canal
(1843)

Champlain Canal
(1825)

Erie Canal Original Juncta Stromwater Infrastructure Interactions



VALUABLE TAKE-AWAYS

- Provides insights into where canal infrastructure once existed and may still exist today
- Suggests the general age of some storm infrastructure
 - Culverts below Cohoes were most likely built in 1825 with the Original Erie Canal
 - May explain some problems with aging infrastructure
- An accurate map of the Albany County canal paths georeferenced to present day geography does not exist (to our knowledge)

ACKNOWLEDGEMENTS

Anthony Opalka – point of contact for historical maps
and advisor on municipal boundaries

Historic Preservation Program Analyst

Division for Historic Preservation

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12188-0189

518-268-2177

Anthony.Opalka@parks.ny.gov

www.nyparks.com/shpo

Craig Williams – Provided historical map files and
photographs of the canal

Canal Society of New York

Former NYS Museum Curator

QUESTIONS?

Erie Canal in Menands looking south just south of the Schuyler Flats entrance to Albany rural cemetery on right



Erie Canal at Cohoes Crescent area with carriage and barges

Photos courtesy of Kevin Franklin,
Town of Colonie Historian