

THE NEW YORK STATE  
BARGE CANAL

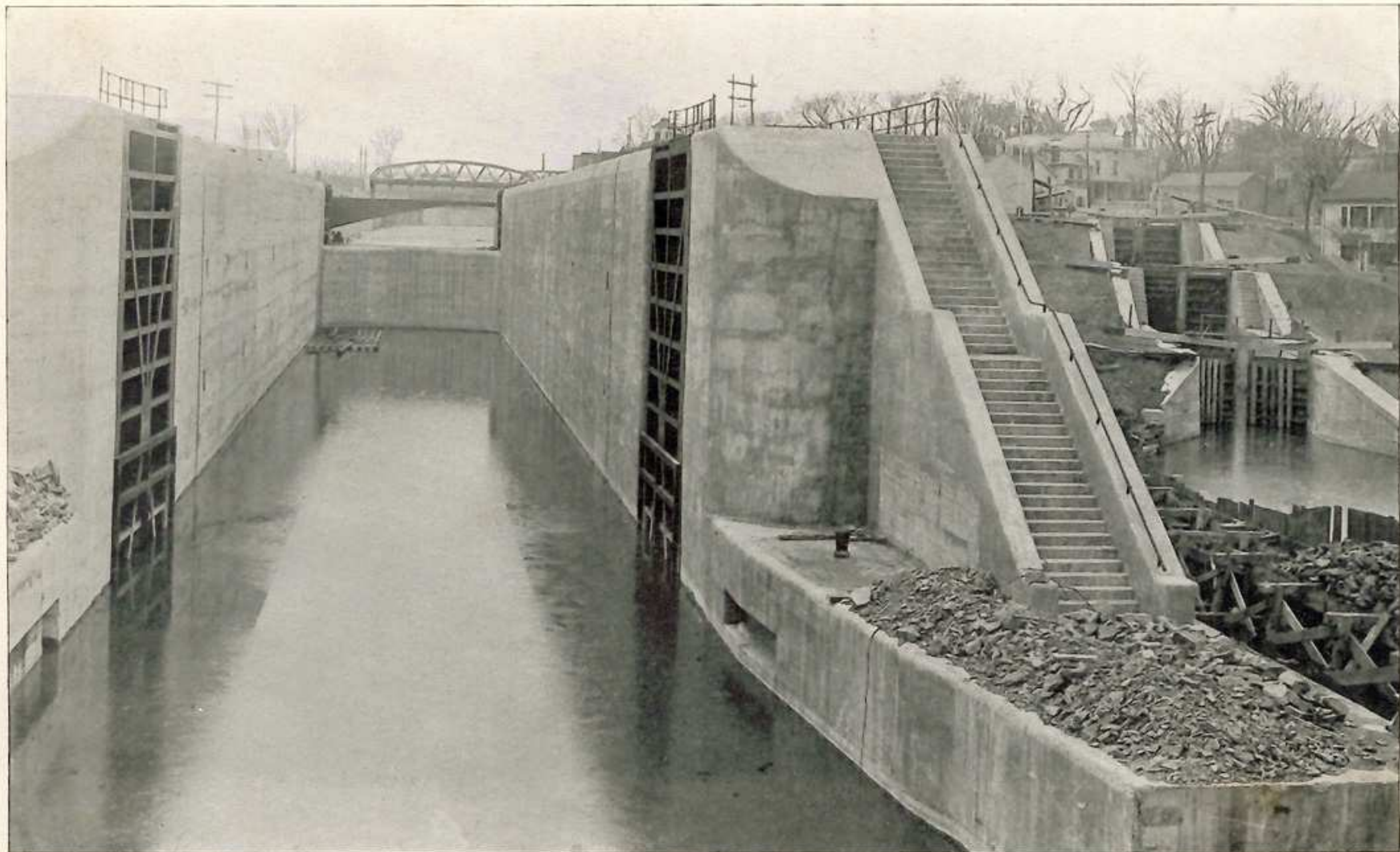
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J. A. BENSEL  
STATE ENGINEER AND SURVEYOR  
1912





View of a typical Barge canal lock, with a flight of three locks of present canal dimensions at the right.



# NEW YORK STATE BARGE CANAL

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**T**O understand the canal enlargement which New York State is now engaged in, a brief glance at the history of canal-building in the State is needed. The first work of interior waterway improvement was performed by two private companies, chartered in 1792. By the end of the eighteenth century they had completed most of their works. About 1808 agitation for State-built canals was begun. In 1817 the work of construction was commenced, the main branch being completed in 1825. Within the next decade several lateral canals were built. This period was closely followed by the first enlargement of three of the chief canals,—a work protracted through many years and not completed till 1862. Then followed some two decades of little activity, during the latter part of which several of the lateral branches were abandoned. In 1884 the period of later improvements was begun by a series of lock-lengthenings, which continued for about ten years. The last decade and a half has witnessed the undertaking of two enlargements, the latter of which is the work now in progress — the Barge canal.

During the history of its canals New York State has opened 1,050 miles of navigable waterways, including a hundred miles of interior lake navigation. In addition there are nearly 500 miles of lake and river navigation along the Canadian and Vermont borders, and 150 miles on the Hudson river. Some 350 miles of these canals have been officially abandoned, while about 50 miles more have fallen into disuse. The work of improvement now going on, known as Barge canal construction, consists of the enlargement of four of the existing canals, large portions of the channels, however, being relocated. On one of these canals this is the second enlargement since its original building, on two this is the third enlargement, while on the other branch it is the fourth.

The four canals being improved are: (1) The Erie, or main canal, which stretches across the State from east to west, joining the Hudson river and Lake Erie; (2) the Champlain, which runs northerly from the eastern terminus of the Erie and enters the head of Lake Champlain; (3) the Oswego, which starts north, midway on the line of the Erie, and reaches Lake Ontario; (4) the Cayuga and Seneca, which leaves the Erie a little to the west of the Oswego junction and extends south, first to Cayuga lake and then to Seneca lake.



The original Erie canal was begun in 1817 and finished in 1825. It had a bottom width of 28 feet, a width at water-surface of 40 feet and 4 feet depth of water. The first enlargement was made between 1836 and 1862. At that time the section of waterway was 70 feet at water-line,  $52\frac{1}{2}$  or 56 feet at bottom, according to slope of sides, and 7 feet deep. The second enlargement was begun in 1896, when a depth of 9 feet was attempted, but this work was completed only at disconnected localities.

The original Champlain canal, begun in 1817 and finished in 1823, had widths of 26 and 40 feet, respectively, at bottom and water-surface, and 4 feet depth. In 1860 widths of 35 and 50 feet, respectively, at bottom and water-line, and a depth of 5 feet were authorized. In 1870 increased widths of 44 and 58 feet, respectively, and a depth of 7 feet were ordered by the Legislature. This improvement, however, was not completed. The enlargement of 1896-8 called for a depth of 7 feet, but this work also was not completed.

The original Oswego canal, which was begun in 1825 and finished in 1828, had the same dimensions as the original Champlain, namely, 26 and 40 by 4 feet. The first enlargement was started in 1852 and completed in 1862, and gave a channel of the same size as the Erie at that time —  $52\frac{1}{2}$  and 70 by 7 feet. The second enlargement, that of 1896-8, was also similar to that of the Erie, a depth of 9 feet being attempted, but the work was never wholly completed.

The original prism of the Cayuga and Seneca canal, which was constructed between 1826 and 1828, was the same in size as the Erie, 28 and 40 by 4 feet. The first enlargement, accomplished from 1854 to 1862, was also similar to that of the Erie —  $52\frac{1}{2}$  and 70 by 7 feet. This branch did not share with the other three in the enlargement of 1896-8.

The dimensions of the present enlargement, or Barge canal improvement, are the same for all four branches of the system. Briefly it may be stated that the law requires a channel at least 75 feet wide at the bottom and having 12 feet of water. In rivers and lakes the width is 200 feet, and 72 per cent of the length of the whole system is in river or lake channel. The locks are 328 feet long between gates, 45 feet wide, and have 12 feet of water over the sills.

These few pages cannot give any detailed account of route or of structures. The description might be extended indefinitely, for there is much of interest to be found throughout the 440 miles of construction and the 350 miles of intervening lakes or adjoining rivers. The accompanying map, however, will show the route of the Barge canal, as well as those of the earlier waterways.

In general it may be stated that the Barge canal project is largely a river canalization scheme. Previous State canals have been chiefly



independent, or artificial channels, built in several instances on cross-country locations. Now, however, the route returns to the natural watercourses. The bed or the valley of the Mohawk is utilized from the Hudson to the old portage near Rome. Then Wood creek, Oneida lake, and Oneida, Seneca and Clyde rivers are used, carrying the channel to the western part of the State, where the streams run north and the alignment of the old channel is retained for the new canal. The other branches of the Barge canal occupy natural streams throughout most of their lengths.

The accompanying statistical tabulation gives some of the leading facts concerning the Barge canal.

### Statistics—Barge Canal

As certain plans are still under consideration, the following figures are subject to change. All canals are meant, unless otherwise specified.

Erie branch, length of canal, not including Hudson and Niagara river termini.....	323.2	miles
Erie branch, number of locks.....	35	
Oneida lake, not included in above mileage, no improvement needed.....	about 19	miles
Spurs to Erie branch (Syracuse and Rochester harbors)....	10.26	miles
Champlain branch, length of canal.....	61.5	miles
Champlain branch, number of locks.....	11	
Oswego branch, length of canal.....	22.8	miles
Oswego branch, number of locks.....	7	
Cayuga and Seneca branch, length of canal (including spurs at heads of lakes), approximate.....	27.3	miles
Cayuga and Seneca branch, number of locks.....	4	
Cayuga and Seneca lakes, portions needing no improvement and not included in above mileage.....	65	miles
Width of channel, land line, earth section, bottom, minimum..	75	feet
Width of channel, land line, earth section, water-surface....	123 to 171	feet
Width of channel, land line, rock section, bottom, minimum..	94	feet
Width of channel, river line, bottom, generally.....	200	feet
Depth of channel, land line and minimum river line.....	12	feet
Locks, length between gates.....	328	feet
Locks, available length.....	310	feet
Locks, width of chamber.....	45	feet
Locks, depth of water on sills.....	12	feet
Dams, new.....	28	
Dams, old, with new crests.....	6	
Dams, old, used without change.....	5	
Bridges.....	199	
Boats, capacity, utilizing full lock with.....	about 3,000	tons
Boats, capacity, built for two to pass in most restricted channel and for two, traveling tandem, to be locked at one lockage..	about 1,500	tons
Authorization of work (Erie, Champlain and Oswego canals).....		

Chapter 147, Laws of 1903



Authorization of work (Cayuga and Seneca canal) .....	Chapter 391, Laws of 1909
Appropriation (Erie, Champlain and Oswego canals) .....	\$101,000,000
Appropriation (Cayuga and Seneca canal) .....	\$7,000,000
Construction work begun (Champlain canal) .....	April 24, 1905
Construction work begun (Erie canal) .....	June 7, 1905
Excavation, preliminary (1903) estimate, not including work for dams, bridges, highway, railway, and stream changes and other small items (Erie, Champlain and Oswego canals) .....	132,225,800 cu. yds.
Excavation, contract plans (Erie, Champlain and Oswego canals), approximate .....	100,580,000 cu. yds.
Excavation, contract plans (Cayuga and Seneca canal), approximate .....	9,100,000 cu. yds.
Concrete, preliminary (1903) estimate (Erie, Champlain and Oswego canals) .....	3,243,100 cu. yds.
Concrete, contract plans (Erie, Champlain and Oswego canals), approximate .....	2,800,000 cu. yds.
Concrete, contract plans (Cayuga and Seneca canal), approximate .....	150,000 cu. yds.
Length under contract, September 1, 1912 .....	424.6 miles
Value of work under contract, September 1, 1912 (contract prices, including alterations) .....	\$76,334,218
Value of work done on contracts to September 1, 1912 .....	\$49,000,000





Completed channel, typical of the Rochester-Lockport level, where in general the alignments of the Barge canal and the present canal are identical.





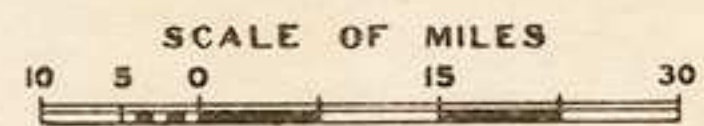
View of the completed dam at Delta reservoir, showing the partially filled reservoir. The dam, which is 1,100 feet long and stands 100 feet high above the lowest foundation, forms a lake two miles across at its greatest width and four miles long. This is one of the two large reservoirs added to the State water storage system for supplying the canal.



# CANAL MAP OF THE STATE OF NEW YORK

ISSUED BY THE  
STATE ENGINEER AND SURVEYOR

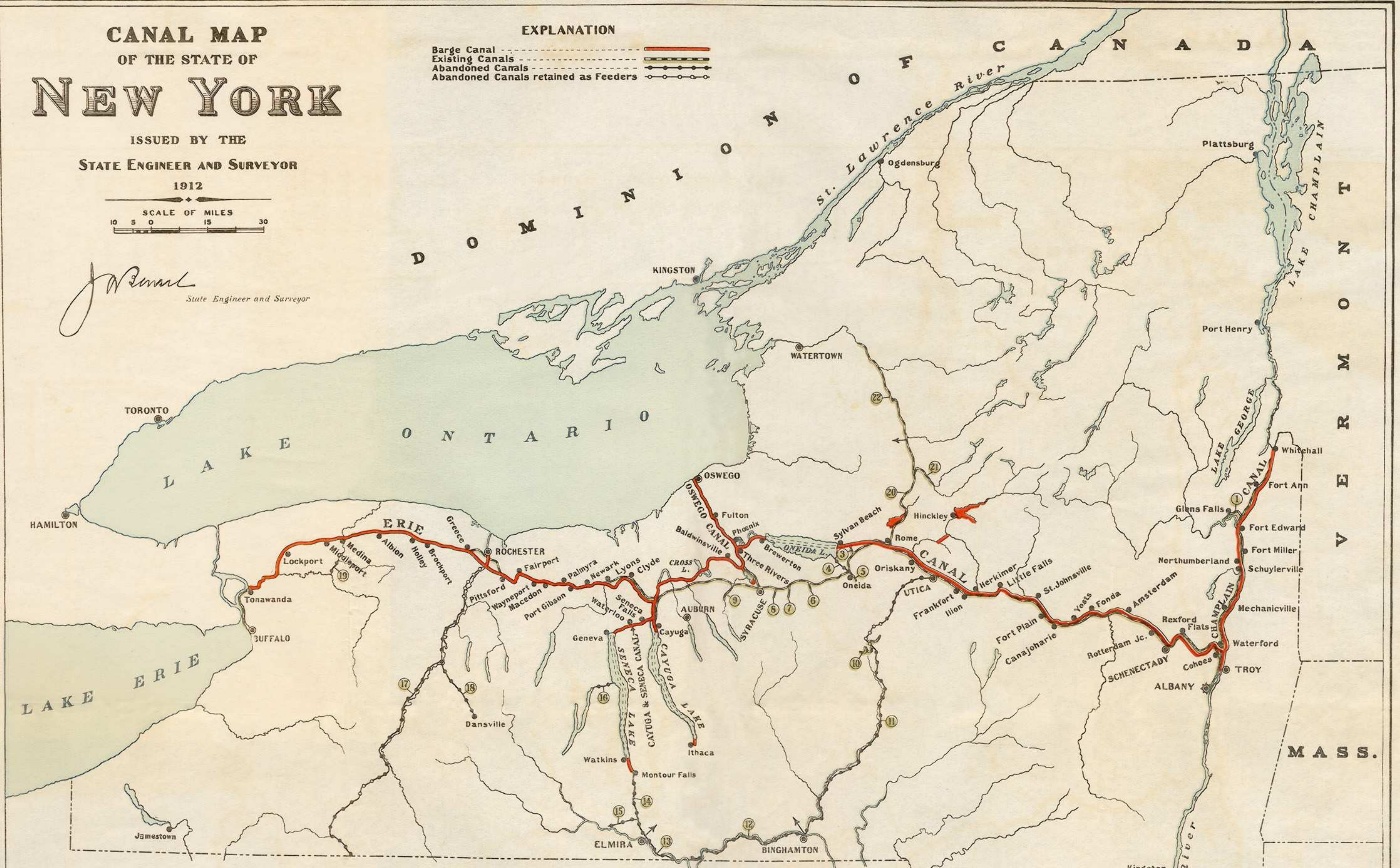
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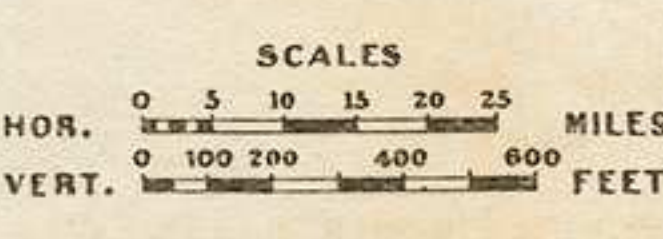
*J.W. Sewall*  
State Engineer and Surveyor

### EXPLANATION

- Barge Canal
- Existing Canals
- Abandoned Canals
- Abandoned Canals retained as Feeders



- Glens Falls Feeder
- Delaware & Hudson Canal
- Old Oneida Lake Canal
- New Oneida Lake Canal
- Oneida Feeder
- Chittenango Cr. Feeder
- Limestone Cr. Feeder
- Butternut Cr. Feeder
- Camillus Feeder
- Madison L. & Other Reservoirs
- Chenango Canal
- Chenango Extension Canal
- Junction Canal
- Chemung Canal
- Chemung Canal Feeder
- Crooked Lake Canal
- Genesee Valley Canal
- Dansville Br. Genesee Valley Canal
- Oak Orchard Cr. Feeder
- Black River Canal
- Forestport Feeder
- Black River Improvement



PROFILE OF BARGE CANAL

G. J. Schiller