

The Genesee River Drainage Basin, Gorge and Mount Morris Dam

by Robert D. Hennigan

New York State has literally thousands of dams to control water availability and flow. They were built to serve a variety of societal purposes. These purposes, in rough historical and chronological order, include: mechanical power to operate grist mills and sawmills for settlers; creation of reservoirs and addition of storage on top of existing lakes (e.g., the Finger Lakes) to provide water for canal use; development of water supplies for domestic and industrial use and to fight fires; generation of electricity; protection against floods; regulation of the extreme flows in streams and rivers; storage of water to protect against droughts; and to provide recreational opportunities.

The dams as you might expect are of varying sizes. The vast majority would be considered low dams – those less than 15 feet in height. The large dams range in height from over 15 feet, up to the largest at 230 feet above the streambed. The latter is the Mount Morris Dam on the Genesee River.

The Genesee River watershed is a unique and beautiful river system in this state. Two of its special aspects are the Letchworth Gorge and the Mount Morris Dam. The Gorge is called the “Grand Canyon of the East,” although it is only one-tenth the size of the Grand Canyon. The Mt. Morris Dam is the largest dam of its type – concrete (as opposed to earth fill with a small part concrete) – east of the Mississippi River. There is no other landform in the state comparable to the Genesee Gorge or, for that matter, the Genesee River watershed.

Genesee River Watershed

The Genesee River is 157 miles long, from its source in Pennsylvania to Lake Ontario. It drains an area of 2,400 square miles. Unlike the other river systems along the Pennsylvania border, within New York State the Genesee drains south to north while the other rivers run north to south, including the Delaware, Susquehanna, Chemung and Allegany rivers.

The watershed divides into the Upper Genesee Basin and the Lower Genesee Basin with the divide between the upper and lower basins about 90 miles from the source in Pennsylvania. The Village of Mt. Morris is centrally located near the dividing line (Figure 1). The river then flows about 67 miles to meet Lake Ontario. The upper portion is characterized by a steep gradient (8.9 feet/mile) within a narrow valley while the lower portion forms an alluvial lake plain at a much more moderate gradient (0.8 feet/mile).

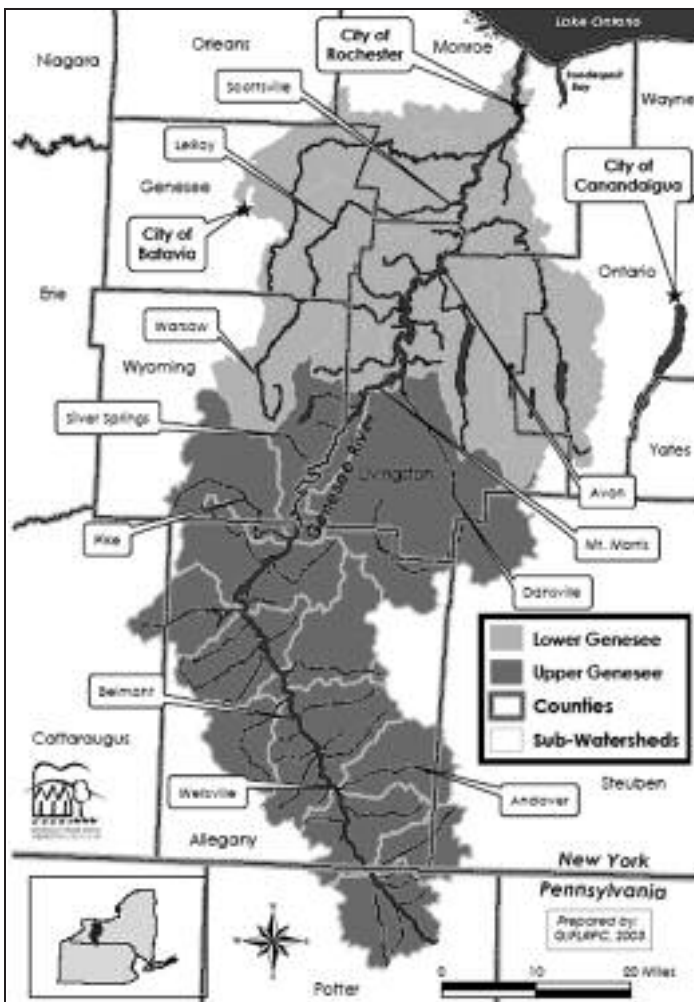
The main physical feature on the upper basin is the Genesee Gorge formed when the river eroded the geologic rock formation of the Appalachian Plateau. The gorge runs from about 25 miles up-river from Mt. Morris and ends a relatively short distance below Mt. Morris where it levels out to form the lake plain. The gorge is up to 580 deep and 1,000-plus feet wide. There are three falls within the gorge called, as you might expect, the Upper Falls (UF), the Middle Falls (MF) and the Lower Falls (LF). The total drop over the falls is 312 feet – UF at 157 feet, MF at 100 feet, and LF at 55 feet.

A written description of the gorge does not capture the real impact of the system on the senses. Some pictures included here may give



Photo by Nick Theodorakis

Middle Falls rushing through the Genesee Gorge



Courtesy of Genesee/Finger Lakes Regional Planning Council

Figure 1. Overview of the Genesee River Basin, delineating the lower and upper sections, and pointing out location of Mt. Morris

one a feel for this phenomenal scenic vista. The Gorge is surrounded by Letchworth State Park and is available to all to see.

Mt. Morris Dam

The Mount Morris Dam received its name from the small community located near its site. The US Army Corps of Engineers constructed the Mt. Morris Dam from 1948 to 1952 under the Flood Control Act of 1944. This dam is the largest one of this type – concrete gravity – that is east of the Mississippi. Most of the western dams are of this type. Dams in the east are usually earth fill with a concrete center section, which includes the spillway, release works, and sometimes with a roadway on top. Mt. Morris Dam is 1,028 feet in length and 230 feet high above the riverbed. Both the length and height make it unique in this part of the country.

Compared with the Conklingville dam and reservoir that is on the Upper Hudson Basin and created the Great Sacandaga Lake (GSL), Mt. Morris Dam is not as large. That Conklingville reservoir (GSL) is the largest in the state with a capacity of 282.2 billion gallons. Mt. Morris Dam has a capacity of 98.4 billion gallons. The length of the dams is about equal, and the Conklingville Dam has a height of 95 feet while Mt. Morris is a height of 230 feet above the streambed. GSL dam is an earth fill type.

Mt. Morris is a single purpose flood control dam although a conservation pool is maintained during the tourist season to enhance the beauty of the park and gorge.

The Lower Genesee Basin was subjected to major floods on a seven-year average. After the 1913 flood and subsequent floods that devastated Rochester and the surrounding country, the decision was made to proceed to build the Mt. Morris Dam. The regular flooding ceased after the dam went into operation. It protected the downstream area and the dam was never filled to spillway level.

The biggest flooding threat was Tropical Storm Agnes. The dam was filled to capacity and millions of dollars worth of damage was avoided. Tropical Storm Agnes, in 1972, put it to the test. The reservoir was filled to within six feet of the spillway. The decision was made to start releasing water downstream to prevent overflowing the spill-



Visitors view the spectacular Middle Falls.

Photo by Footprint Press Recreation Guidebooks/www.footprintpress.com

way. This was done because of the debris load in the reservoir could partially block the spillway and the fear of downstream damage. The water released caused minor flood damage downstream. The debris was cleaned out after the storm passed.

The Mt. Morris Dam was well designed and built. It has returned the investment of \$25 million many times over in preventing flood damage and loss of life downstream. It is another example of the value of dams in managing water resources and protecting the people and property in Rochester and environs. Both the Conklingville and Mt. Morris dams are prime examples of the value of dams properly designed and sited.

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Sources:

Footprint Press Recreation Guidebooks/www.footprintpress.com
Genesee/Finger Lakes Regional Planning Council/www.gflrpc.org
<http://theodorakis.net/>
www.answers.com/topic/genesee-river
www.lrb.usace.army.mil/WhoWeAre/MMD/MMD.html
www.wikipedia.org/wiki/Genesee_River



Mt. Morris Dam, the largest concrete dam east of the Mississippi, as seen by air

Courtesy of Ken Winters, Visual Information Specialist, USACE-Buffalo District