Electric Lake and New Island: A Landscape in Transition

Tracy L. Allen, PhD, Chair, Department of Geography
Associate Professor of Geography and the Environmental Sciences Program, SUNY College at Oneonta

This research documents 100 years of land use change and hydroseral succession in a 322-hectare urban city park. New Island and former Electric Lake are located along the banks of the Susquehanna River, within the city limits of Oneonta in upstate New York. Its rich natural history weaves a mosaic of both human and ecosystem events. Once a site of extensive forested wetlands, it was briefly urbanized by human settlement, agricultural production, cottage industry, electric power generation, and railroad and interstate development. The Island was created in 1915, when a dam was constructed to impound water behind a powerhouse. The reservoir, called Electric Lake, produced electricity and recreational opportunities, until it was drained in 1958. Railroad tracks bisected New Island, severing hydraulic connectivity with the River and a switching-yard devastated the forest. Between 1937 and 1960, there was a substantial decrease in agricultural land; Electric Lake began to desiccate. New Island became mostly scrub shrubs and grasslands. Shrubs propagated to a young forest, and the adjacent land cover was completely urbanized. After falling into disuse by 1970, the Island’s railroad property was acquired by the State of New York for the construction of an interstate. Over the next 45 years, the park had few visitors and experienced little interaction with its adjacent urban land uses. Through facilitation and hydroseral succession, New Island has recovered remarkably, from past disturbances and is discernible from similar urban riparian lowlands by considerable biological diversity.

Landcover and Landuse Change

New Island, Upper Susquehanna

- Urban/Built-up Land
- Agricultural Land
- Forest
- Scrub/Shrub/Grassland
- Water
- Railroads Trucks

1937
1960
1973
1998

The approximate location of former Electric Lake superimposed on a 2010 aerial mosaic of New Island and Oneonta, NY

Historic Images of Electric Lake

Dammed and Powerhouse: A 174-foot-long Upper Dam diverted water from the Susquehanna River. The water was then impounded downstream from the dam, forming a 450-acre lake behind a 5-foot-high, 55-foot-long dam and powerhouse.

Riparian Vegetation of Former Electric Lake and New Island

Data collected from 6 belt transects ranging across former Electric Lake and New Island

1937 Air Photo: Electric Lake reservoir retaining the maximum amount of water
1960 Air Photo: Electric Lake drying-up and filling in following the 1958 removal of Upper Dam.
1973 Air Photo: Drier conditions with increasing riparian vegetation. The Construction of Interstate-89 contributed tons of fill material to the bottom of the Island. Fill was stored on New Island and transported to the roadway. Electric Lake remains further filled.
1998 Air Photo: Depressional, marshy vegetation, wetland plant species. Shrubs early to mid-successional species persisted. Black Willows overstory is dominant of remaining Electric Lake depressions.

Levees: Constructed by the railroad to prevent erosion of the Island.

Skunk Cabbage’s pungent smell attracts pollinators such as black flies, snow flies, and bees. Skunk cabbage is thermogenic (produces heat), giving it the ability to warm its flower, thus helping it emerge as a secondary result of cellular respiration. Thus it is the first species to emerge in early spring.

Japanese Knotweed is invasive to Europe. It crowds the forest (here on New Island) garlic mustard readily outcompetes native species. It contains allelochemicals that, in effect, poison its competitors. Our Garlic mustard plant produces many seeds which can germinate up to five years after. Once garlic mustard is established, it is difficult to eradicate.

Japanese Knotweed is invasive to eastern Asia. It is considered one of the world’s 100 worst invasive species. Japanese knotweed will infiltrate riparian zones and has been known to grow through the pipes. The main concern is that this plant is non-native species for resources and space and causes erosion.

Vascular plants of the former Electric Lake

- Dominant Species: Forest Floor: Skunk cabbage; sensitive fern, garlic mustard and Japanese knotweed
- Dominant Overstory in Wet Areas: Ash, black cherry, silver maple, black willow, red maple, balsam, and sycamore
- Dominant Overstory in Dry Areas: Red maple, quaking aspen, black locust, and silver maple

Invasive Species: Garlic Mustard

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Summary of vegetation changes from oblate wetland species to mixed wetland and upland species. By removing the dam and diversion gates Electric Lake no longer had an inflow of water. Over time, standing water was replaced with sediments as the basin in-filled. Without stream-flow, Lake water evaporated and precipitated to groundwater and vegetation progressively adjusted to dryer conditions. Today, “Electric Lake” consists of a few small wet depressions formed where the watertable surfaces or watertable is perched rather than from the river.

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The railroad remains a barrier that impedes hydrologic connectivity between the floodplain, river, and natural depressions.

1937 USGS Topographic Map - New Island was created in 1899 as water was diverted by the Oneonta Upper River Dam to form Electric Lake.

The land-use/land-cover of New Island changed significantly from 1915 to 2006. Between 1937 and 1960 there was a substantial decrease in agricultural land, and Electric Lake was drained.

New Island became mostly scrub shrubs and grasslands. By 1973, the scrub shrubland grasslands gave way to a forested and urbanized upland land base to increase. Intersite construction in the early 1970’s significantly contributed to urbanization. The 1938 map illustrates continued secondary succession and much of New Island became riparian forest. Only small patches of scrub shrub persisted and evidence of Electric Lake as big game. New Island is literally an island once again surrounded by a sea of urbanization.