New Jersey Department of Environmental Protection
Division of Water Monitoring and Standards
Bureau of Freshwater and Biological Monitoring

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New Jersey Lakes

AUGUST 2020

New Jersey lakes are an invaluable resource for recreation, tourism, agriculture, fishing and drinking water as well as providing habitat for aquatic plant and animal life

HOW ARE LAKES DEFINED?

Thet New Jersey Department of Environmental Protection (DEP) specifically defines lakes and ponds for monitoring purposes. In order to be included in a current lake monitoring program a body of water must satisfy the following:

- Permanent lentic (non-flowing) body of water,
- Greater than or equal to 5 acres in surface area,
- Minimum of 1 meter deep at its deepest location.

There are roughly 1,900 waterbodies that meet the 5 acre monitoring criteria. However, there are also more than 9,000 small ponds between half an acre and five acres in size. These small ponds have a cumulative lake area of over 13,000 acres. While this is a large area (roughly 20 square miles), nearly 83% of lake acreage and an even higher percentage of lake volume is covered by the 5-acre requirement and have the potential to be included in NJ monitoring networks.

Size Category (acres)	Number of Waterbodies	Total Acreage
0.5-5	9,400	13,580
>5	1,914	68,523

ARE THEY NATURAL OR MAN-MADE?

Natural lakes are a characteristic of the glaciated part of the state (see Lake Distribution map). They were formed by ice sheets or glaciers either depositing material which blocked drainage channels, leaving depressions in deposited material or underlying rock, or a combination of related activities.

It is estimated that the number of naturally occurring lakes in NJ is between 60 and 70 (Salisbury et al., 1902; Widmer, 1964). All of these lakes are found in the area north of the furthest extent of glaciation. Their aggregate area is only about 16 square miles, with Lake Hopatcong, Greenwood Lake and Swartswood

Lake accounting for nearly half of that total area. Some of these lakes are large and deep, such as Wawayanda Lake (~100 feet), but many more are relatively small and shallow depressions.

Most lakes and ponds in NJ have artificial (i.e., man-made) beginnings and were constructed with dams or other means to satisfy a specific need. Some common uses or origins include:

- Agriculture and irrigation
- Recreation
- Water supply
- Mining
- Stormwater management
- Milling (grain, lumber, other industry)
- Iron furnaces

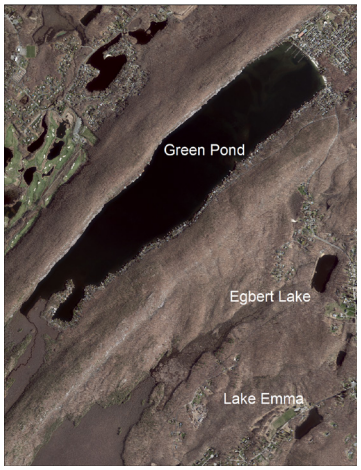
WHERE ARE LAKES IN NEW JERSEY?

Due to human influence, lakes are more evenly distributed across NJ than would exist naturally. Even though glacial activity is responsible for lake abundance in the northern part of the state, the southern counties of the Coastal Plain have close to 300 more lakes and ponds. There is a larger area covered by lakes in North Jersey however; 39,000 acres versus 30,000 acres in the Coastal Plain. This equates to a denser 12.5 lake acres per square mile (acres/sq^2) in North Jersey compared to just 7 acres/sq^2 in the Coastal Plain.

DEP lake monitoring staff retrieving a sediment core from an unnamed lake in Franklin Township, Hunterdon County. Photo Credit: NJDEP

Lake, Pond or Reservoir?

Although it is generally accepted that a pond is a smaller, shallower body of water than a lake, there is no formal distinction between the two. The use of either in the name of a lake can be arbitrary, with several examples of large deep "ponds" and small shallow "lakes".



Green Pond (507 acres) and the much smaller Egbert Lake (15 acres) and Lake Emma (10 acres).

Reservoir also has multiple definitions and uses. Waterbodies referred to as "reservoirs" are usually large dammed drinking water sources, but the term is sometimes used interchangeably with impoundment to refer to any lake formed by a man-made dam.

NEW JERSEY LAKE MONITORING PROGRAMS

- Statewide statistical (probabilistic) survey
  - Randomly selected and spatially-balanced sites. Data provides statewide status, baseline values and trends.
- Reference
  - Site from minimally-disturbed watershed. Data used to aid in nutrient criteria development and track changes over time.
- Regional Targeted
  - Sites selected from water regions as part of the Regional Comprehensive Assessment Method: www.nj.gov/dep/wms/bears/assessment.htm.

Ten Largest Lakes (by acreage)

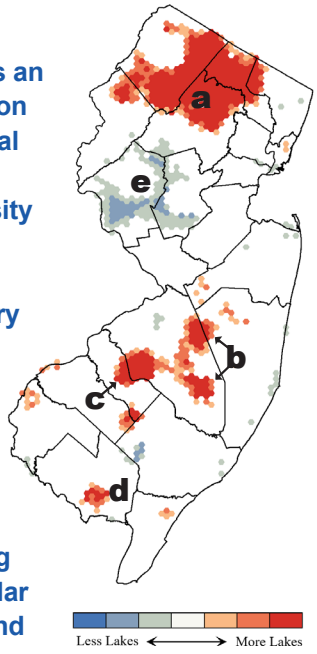
Lake Hopatcong	2,493
Round Valley Reservoir	2,272
Wanaque Reservoir	1,971
Greenwood Lake*	1,849
Spruce Run Reservoir	1,355
Lake Tappan*	919
Union Lake	865
Boonton Reservoir	801
Lake Mohawk	759
Oradell Reservoir	714

** These lakes are located in both NJ and NY*

Lake Distribution

In northern counties, there is an expected higher concentration of lakes due to historic glacial activity. Man-made drinking water reservoirs add to density in this area (a).

Reservoirs used for cranberry irrigation (b) and lake communities, like those near Medford (c), are responsible for the high density of ponds in Burlington, Camden and Ocean counties. Abandoned sand mining operations may explain similar concentrations in Cumberland County (d).



Somerset and Hunterdon Counties have low lake density when compared to the rest of the state (e). Land-use patterns concerning agriculture and sub-urbanization may offer an explanation.

Harmful Algal Blooms in Lakes

A cyanobacterial Harmful Algal Bloom (HAB) is the name given to the excessive growth of cyanobacteria, some of which produce potentially harmful toxins. HABs can occur under suitable environmental conditions of light, temperature, nutrients, and calm water. These "blooms" often result in a thick coating or "mat" on the surface of a waterbody, often in summer or early fall. A variety of information on HABS, including example pictures and monitoring/analysis capabilities, can be found on the Cyanobacterial Harmful Algal Blooms website.

DEP's 2020 Cyanobacterial Harmful Algal Bloom (HAB) Freshwater Recreational Response Strategy provides a unified, statewide approach for responding to HABs to protect the public from risks associated with these toxins. If you observe what you think might be a HAB in any waterbody, a suspected HAB report can be submitted by smartphone or PC using the DEP HAB Interactive Map Reporting and Communication System.

Additional Resources and References:

- USEPA's website on National Lakes Assessment: www.epa.gov/national-aquatic-resource-surveys/nla
- Salisbury, R.D., Kümmel H.B., Peet, C.E. and Knapp, G.N. 1902. *The Glacial Geology of New Jersey* Volume V of the Final Report of the State Geologist. Trenton, NJ: MacCrellish & Quigley, 802 pp.
- Widmer, K. (1964). *The Geology and Geography of New Jersey*. Princeton, N.J: D. Van Nostrand.

Contact:

- DEP Bureau of Freshwater and Biological Monitoring: www.state.nj.us/dep/wms/bfbm/lakes.html
  609-292-0427

Scan QR Code with your smartphone's camera:

Report a Harmful Algal Bloom