

Chapter 4. Limnology



Chapter 4: Limnology

4.1 Introduction

This chapter of the Cayuga Watershed Characterization Report is a compilation and analysis of water quality conditions in Cayuga Lake and its tributaries. Water quality and ecological conditions in Cayuga Lake are the result of complex physical, chemical, and biological processes. Important attributes of the lake ecosystem are determined by its geological history, climatic setting, hydrology, and land use patterns. Limnology, the science of freshwater lakes and streams, provides a framework for examining these processes and interpreting ambient conditions. The focus of Chapter 6 is on the interrelationships between water quality conditions and the health of the lake and its tributary streams from the perspectives of lake ecology and human use.

Multiple sources of data were reviewed to complete this limnological characterization of Cayuga Lake. Research and monitoring efforts date back to the early 1900s. Generations of students and faculty at area universities have examined aspects of the lake and watershed. State agencies, notably NYSDEC and NYSDOH, conduct ambient monitoring programs to characterize water quality and the fish community and identify any impairment to designated uses. Two federal agencies, USGS and EPA, have included Cayuga Lake in research programs. Some long-term monitoring has been done by county and regional agencies such as the Soil and Water Conservation Districts. Users of the resource, for public drinking water supply, wastewater disposal, or noncontact cooling water, monitor to meet permit requirements.

Each of the research or monitoring programs carried out on Cayuga Lake has been designed to meet specific objectives. A central task of the limnological characterization was to integrate the findings of the various investigations into an assessment of the “existing state” of water quality and ecological conditions. The “existing state” of Cayuga Lake was assessed by Professor Ray Oglesby of Cornell University using data through the mid-1970s. His monograph on Cayuga Lake was included in the NYSDEC series on Lakes of New York State (Jay Bloomfield, editor, 1978).

There are several areas where additional data are needed to fully characterize the existing state of the resource. Some of the areas are specific water quality parameters; others are specific locations in the lake and tributaries. Data gaps are identified and discussed in terms of their potential significance to the baseline assessment of use attainment.

