The CEBIC Summer Institute 2003 provided teachers in grades 6-8 an understanding of the role of some key elements in the aquatic environment and an opportunity to assess their ecological effects on ecosystem dynamics.

The major question threaded throughout the week-long program was: How do natural and anthropogenic changes in physical (temperature, conductivity, pH, light), chemical (carbon dioxide, nitrogen, iron, mercury concentrations), and biological (dissolved oxygen, predator-prey abundance) parameters affect the health of aquatic ecosystems? This question and subsequent hands-on exercises targeted many of the New Jersey Core Curriculum Content Standards covered in grades 6-8. These include, ecosystems (water, carbon, and nitrogen cycles), oceans (pollution and components of seawater), and chemistry (density of liquids, solutions and suspensions, ionic compounds, acids, bases and salts).

The underlying goal of this institute was to enhance middle school teachers’ capabilities to understand and teach critical thinking skills and to extend learning beyond knowledge and comprehension to application, analysis, synthesis and evaluation, particularly for global environmental problems. To accomplish these goals, both structured and guided-inquiry exercises included a collaborative group research project on aquatic respiration using Carnegie Lake as a model system. Seasonal changes in climate and nutrient input was addressed by manipulating these parameters within aquaria microcosms in the laboratory. Additional hands-on exercises illustrated basic principles of lake/ocean dynamics and focus on sources and inputs of nutrients and toxics, including the effects of the magnitude of natural processes such as eutrophication and bioaccumulation.
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