Lake Okeechobee: Lowered Lake Reveals Important Ecological Lessons

Lake Okeechobee and its surrounding wetlands lie at the center of the Greater Everglades watershed that stretches from the Kissimmee River through the Everglades and finally into Florida Bay (see map). Lake Okeechobee provides natural habitat for fish, wading birds, and other wildlife, and is also a key component of south Florida's water supply and flood control systems. The lake's health has been threatened in recent decades by excessive inflow of nutrients from agricultural and urban activities and also by harmful high and low water levels. Restoration of the lake is a priority within Everglades restoration efforts.

Since 1994 we have had the opportunity to see how ecological conditions in Lake Okeechobee respond to a variety of managed lake stages, hurricanes, and drought. In April 2008, a new and lower lake regulation schedule was implemented for Lake Okeechobee, designed to keep the water level of the lake approximately one foot lower compared to the previous schedule, and even lower than earlier regulations required. As a result, for most of the past 6 years, the Lake level has remained within or below an ecologically preferred range of 12.5 to 15.5 feet above sea level.

The best indicators of habitat quality in a hydrologically restored lake are considered to be emergent aquatic plants in the marsh and submerged aquatic vegetation in the nearshore zone. Generally speaking, the total extent of vegetated acres is a good proxy for environmental conditions of Lake Okeechobee.

Analysis of marsh plant data, collected along transects since 2003, reveals that under lower lake-level conditions, the area of the southern and western shoreline zone colonized by emergent aquatic plants expanded, as did the nearshore area colonized by submerged aquatic vegetation, resulting in an increase in total vegetated acres in the shoreline and nearshore zones, suggesting an improvement in available habitat. Other taxonomic groups, including periphyton, sport fish, and wading birds are also showing increased abundance under the generally lower lake levels.

Of course, achieving ecologically beneficial lake levels by simply draining large volumes of water from Lake Okeechobee when needed, as currently takes place, entails serious negative consequences for both water supply and for east and west coast estuaries that consequently receive environmentally damaging high flows from the lake. A regional restoration solution is required that will both permanently improve lake levels and protect the estuaries. Bi-directional northern watershed storage to better control lake levels, coupled with additional water projects that improve water quality and allow excess water to once again flow southward through the Everglades ecosystem, are important goals of both the CERP and the CEPP.

For a more detailed version of this case study, see the 2014 System-Wide Ecological Indicator Report.