National Lakes Assessment

Fact Sheet

December 2009

Purpose

Report on the condition of the Nation's lakes, ponds, and reservoirs

Help states and tribes implement lake monitoring and assessment programs

Establish a baseline for lake condition that can be used for future trend assessments

What is the National Lakes Assessment?

The National Lakes Assessment (NLA) is the first-ever baseline study of the condition of the nation's lakes. It is the latest in a series of surveys of the nation's aquatic resources being conducted by EPA and its state and tribal partners.

The NLA provides unbiased estimates of the condition of natural and man-made freshwater lakes, ponds, and reservoirs greater than 10 acres and at least one meter deep. Using a statistical survey design, lakes were selected at random to represent the condition of the larger population of lakes across the lower 48 states. A total of 1,028 lakes were sampled for the NLA during summer 2007, representing the condition of about 50,000 lakes nationwide. The Great Lakes and Great Salt Lake were not included in the survey.

Field crews collected samples using the same methods at all lakes to ensure that results can be compared across the country. Researchers processed and analyzed 680,000 measurements, including indicators of water quality such as nutrients, dissolved oxygen and algal density; biological indicators such as phytoplankton and zooplankton (algae and microscopic animals); recreational indicators such as algal toxins and pathogens; and physical habitat indicators such as lakeshore and shallow water habitat cover.

What are the Key Findings of the NLA?

Biological Health

The NLA finds that 56% of the nation's lakes support healthy biological communities when compared to least disturbed sites (Fig.1). Another 21% of lakes are in fair condition, and 22% are in poor biological condition. This rating is based on an index of phytoplankton and zooplankton taxa loss – the percentage of taxa observed compared to those that are expected, based on conditions at least-disturbed lakes.

The survey measured a set of key stressors to lake condition to determine their extent across the nation. Analysts also examined the relationship between these stressors and lake biological health, much as medical researchers examine the relationship between cholesterol and heart health.
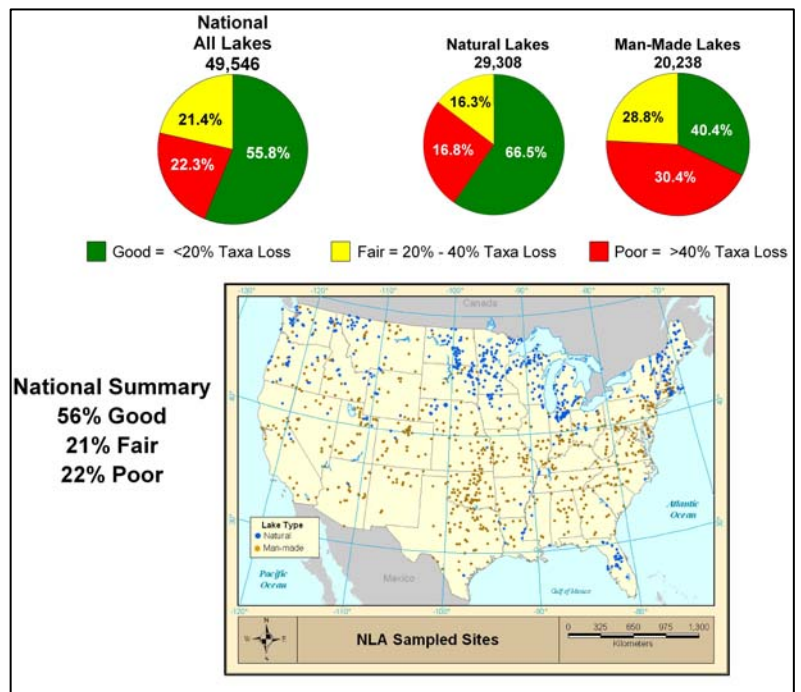

Figure 1. Biological Condition of the Nation's Lakes

Poor habitat conditions along the lakeshore and high levels of the nutrients nitrogen and phosphorus are the most significant stressors of those assessed in the survey (Fig. 2). These stressors increase the likelihood (*i.e.*, relative risk) of degraded biological condition.

- Lakeshore habitat is rated poor in 36% of lakes. Poor biological health is three times more likely in lakes with poor lakeshore habitat relative to lakes with good habitat.

- The nutrients nitrogen and phosphorus are at high levels in about twenty percent of lakes. Poor biological health is 2.5 times more likely in lakes with high nutrient levels.

Recreational Condition

Lakes are widely used for swimming, boating, and many other recreational activities. However, a number of microbial organisms, algal toxins, and other contaminants in lakes can potentially affect human health. The NLA conducted the first-ever national study of algal toxins in lakes. Microcystin – a toxin that can harm humans, pets, and wildlife – was found to be present in about one third of lakes and at levels of concern in 1% of lakes.

Figure 2. Relative Extent of Stressors and Relative Risk of Impact to Lake Biological Condition

A parallel study of fish tissue contaminants in the nation's lakes shows that mercury concentrations in game fish exceed health-based limits in 49% of lakes, and polychlorinated biphenyls (PCBs) are found at potential levels of concern in 17% of lakes.

Trends and Trophic Status

A comparison of NLA data to a subset of wastewater-impacted lakes sampled 35 years ago suggests that the nation's investments in wastewater treatment and other pollution control activities are working despite increased population pressures across the United States. The report finds that nearly 75% of the 800 lakes sampled in the 1970s showed either improvements or no change in phosphorus levels. Trophic status, a measure of the biological productivity of lakes which changes very slowly under natural conditions, also improved or remained the same in about 75% of those lakes. The NLA provides a national baseline against which lake managers can track the rate of change in trophic status at national and regional scales, and compare that to the rate of change in specific lakes they manage.
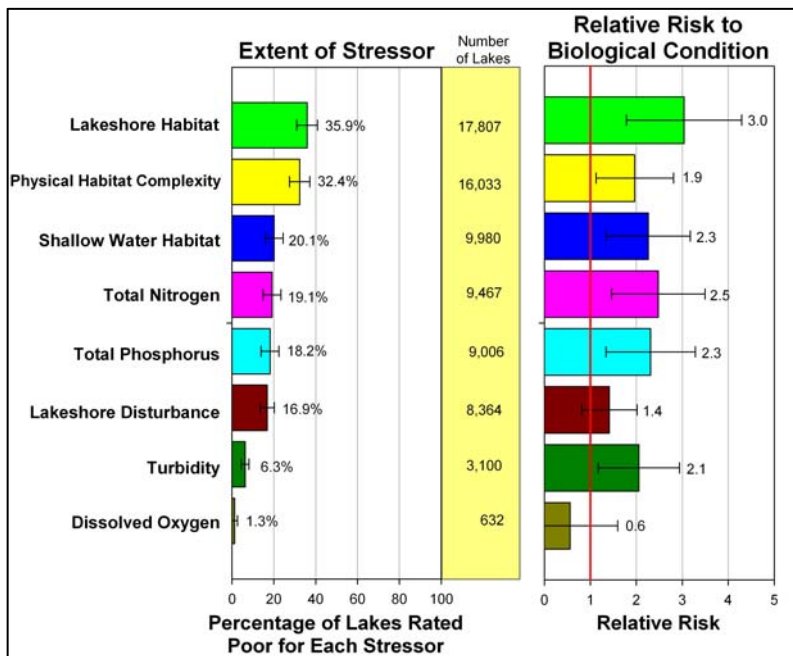
This is the first time a national monitoring study of the overall condition of lakes has been conducted using a statistically-valid approach. EPA has produced reports using a similar approach for streams (*The Wadeable Streams Assessment*) and estuaries and coastal waters (*The National Coastal Condition Reports*). National studies of rivers and streams and wetlands are underway. To learn about these National Aquatic Resource Surveys, visit www.epa.gov/aquaticsurveys.

For more information on the National Lakes Assessment, visit http://www.epa.gov/lakessurvey.
For more information on the National Lake Fish Tissue Study, visit http://www.epa.gov/waterscience/fish/study/.

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