National Lake Assessment Monitoring Design

Anthony R. Olsen[1], David V. Peck[1], Steven G. Paulsen[1], Carol Peterson[2], and Susan Holdsworth[2]
[1]USEPA NHEERL Western Ecology Division
[2]USEPA Office of Water

Abstract

The USEPA designed the National Lake Assessment in 2005-6 with field sampling being completed in 2007. The objective of the assessment is to estimate the ecological condition of lakes and reservoirs nationally. The objective of this paper is to describe the national survey design and report on the lake evaluation portion of the study, including national and regional estimates of number of lakes in the target population, sampling population, and non-sampleable lake population. For purposes of this survey "lakes" refers to natural and man-made freshwater lakes, ponds, and reservoirs greater than 10 acres (4 hectares) in the conterminous U.S., excluding the Great Lakes. A national unequal probability survey design was used to select lakes for sampling. The sample size was set to include 1,000 lake sampling events. The result was the inclusion of 909 discrete lakes, with 91 of the lakes to be scheduled for revisits. An 'oversample' of additional lakes was also done so that any state wishing to conduct a state scale survey could be accommodated. Lake selection for the survey provided for 5 size class categories, as well as spatial distribution across the lower 48 states and 9 aggregated Omernik Level 3 ecoregions. The design was constructed to include a representative subset of the lakes that were included in the National Lake Eutrophication Study (NES), conducted by EPA in 1972. This will allow for an extrapolation of changes to the full set of NES lakes. The National Hydrography Dataset (NHD) was used to derive a list of lakes for potential inclusion in the survey. Each selected lake was evaluated to determine if it met the definition of a lake for the survey and if it could be sampled. Based on these evaluations, estimates of the number of lakes in the 48 conterminous U.S. will be presented.

Keywords

National Lake Assessment, Great Lakes, National Lake Eutrophication Study (NES), National Hydrography Dataset (NHD)