



## Project Summary

# A Comparative Study of Water Chemistry Analyses from Canada, Norway, and the United States: Analytical Methods and Raw Data

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**This report is a description of analytical methods and a data compendium of results obtained by Canadian and Norwegian laboratories for a comparative study conducted during the Eastern Lakes Survey (Phase I) of the National Surface Water Survey.**

**One-hundred-and-ten identical split samples from 97 lakes in North Carolina were routed to one analytical laboratory in Norway and one in the United States. In addition, 105 split samples from 92 lakes in New York State were routed to two laboratories in Canada and to a second laboratory in the United States. The analytical methods used by each of the five laboratories are documented. The data from the analyses conducted by the Norwegian and Canadian laboratories are presented. Results from the U.S. laboratories are published elsewhere. Statistical analyses and interpretation of the data are encouraged for subsequent investigation.**

***This Project Summary was developed by EPA's Environmental Monitoring Systems Laboratory, Las Vegas, NV, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).***

### Introduction

The National Surface Water Survey (NSWS) is a three-phase project within

the National Acid Precipitation Assessment Program (NAPAP). The U.S. Environmental Protection Agency (EPA) initiated the NSWS in 1983. The purpose of Phase I of the NSWS was to document the present chemical status of lakes and streams in areas of the United States that are potentially susceptible to the effects of acid deposition.

There are no standard international methodologies for the analysis of water samples. Observed differences in water chemistry analysis from different laboratories may be attributed to acidification processes, differences in methodologies, or both. This study was to provide information for the comparison of analytical methods used during the NSWS Eastern Lake Survey - Phase I with those used in Canadian and Norwegian laboratories. Samples from two regions were used in the study. Identical split samples from lakes in New York state were analyzed by two Canadian laboratories and by an EPA contract laboratory. The two Canadian laboratories analyzed for different parameters. Split samples from lakes in North Carolina were analyzed by a Norwegian laboratory and by a second EPA contract laboratory.

### Method

#### Collection of Samples

All ELS-I samples were collected, preserved, and prepared as aliquots by using standard techniques. For the study described here, 110 identical split samples from 97 lakes in the Southern

Blue Ridge Mountains of North Carolina were routed by air charter to the Norwegian Institute for Water Research and to Global Geochemical Corporation. In addition, 105 split samples from 92 lakes in the Adirondack region of New York were routed by air charter to three laboratories: the Water Quality National Laboratory of the Canada Centre for Inland Waters, Environmental Monitoring and Services, Inc., and the Water Quality Section of the Ontario Ministry of the Environment. The samples were analyzed for different parameters at the two Canadian laboratories.

A rigorous quality assurance program was implemented to minimize the variance introduced during sample collection, transportation, and preservation.

### Laboratory Analytical Methods

The Canada Centre for Inland Waters analyzed for 13 parameters, and the Ontario Ministry of the Environment analyzed for 5 parameters. The Norwegian Institute for Water Research analyzed for 11 parameters. Global and EMSI analyzed for all ELS-I parameters. Eighteen of these parameters correspond to parameters for which the Canadian and Norwegian laboratories analyzed. All the parameters measured, type of method used and references are given in tabular form.

### Results and Discussion

The results from this study will be used to compare the various analytical methods used for surface water analyses. Statistical analyses of the data

will be presented in publications in the scientific literature.

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*The complete report, entitled "A Comparative Study of Water Chemistry Analyses from Canada, Norway, and the United States: Analytical Methods and Raw Data," (Order No. PB 88-139 753/AS; Cost: \$12.95, subject to change) will be available only from:*

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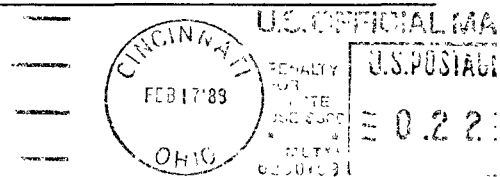
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