



## Project Summary

# Geographic Information System Documentation of Watershed Data for Direct/Delayed Response Project — Northeast Database

Dorothy Mortenson

**The Direct/Delayed Response Project (DDRP) was designed by the U.S. Environmental Protection Agency (EPA) within the National Acid Precipitation Assessment Program (NAPAP) to predict the long-term response of watersheds and surface waters to acidic deposition. The purpose of the DDRP is to investigate and distinguish the time scales over which surface water systems might change chemically under varying levels of acidic deposition. The DDRP is examining a sub-set of watersheds sampled in the EPA - National Surface Water Survey (NSWS). In the Northeast Region of the United States, 145 watersheds are under study. The DDRP required detailed watershed information on those characteristics thought important relative to the effects of acid deposition. This information was then mapped, then entered into a Geographic Information System (GIS). The purpose of this document is to discuss what protocols, guidelines, and standards were used to complete GIS entry of the mapping data, and what quality control procedures were used to ensure accuracy and consistency.**

***This Project Summary was developed by EPA's Environmental Research Laboratory, Corvallis, OR, 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

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The DDRP required detailed watershed information on those characteristics thought important relative to the effects of acid deposition. Such characteristics include soils, vegetation, depth to bedrock, land use, geology, and streams. This information was mapped by the USDA - Soil Conservation Service and EPA - Environmental Monitoring Systems Laboratory in Las Vegas (EMLS-LV) in cooperation with the EPA. These maps were then entered into a Geographic Information System (GIS). The purpose of this document is to discuss what protocols, guidelines, and standards were used to complete GIS entry of the mapping data, and what quality control

(QC) procedures were used to ensure accuracy and consistency.

### General Procedures

Although the mapped information came from several different sources, the same general QC measures were taken to ensure accuracy and consistency. First, the registration of the manuscript maps was checked. Any necessary corrections were made before proceeding. Second, a standard allowance for transformation error was set to control the accuracy of digital registration. Third, editing software was used to detect and correct any errors within a coverage. Next, preliminary plots were made and overlaid with the original maps. Any line discrepancies were corrected before continuing. Attributes

were written on each plot and then added to the digitized map. The attributes were checked with the data file for completeness. The coverage was then plotted for the final quality check. This plot was overlaid with the original map and checked for line and attribute discrepancies. If an error was found, it was corrected and any necessary QC procedures repeated. If no errors were found, the plot was checked again individually by another technician. If any discrepancies were found by the second technician, they were corrected and any necessary QC procedures repeated until both technicians agreed the final plot to be accurate.

After the data were entered, further QC measures were taken. First the attributes

were listed, sorted, and checked for consistency and accuracy throughout the dataset. Next, total area for each coverage within a particular watershed was calculated and compared. Lastly, the data were compiled into reports for the project analysis. These reports matched the attribute code to the description of that code. Any possible ambiguous codes were detected and suitably modified during this process.

### Conclusion

These QC procedures were followed throughout the entire dataset. We conclude that there is only a minimal amount of error introduced during digitization of the mapped data.

*Dorothy Mortenson is with NSI, Corvallis, OR 97333.  
M. R. Church is the EPA Project Officer (see below).  
The complete report, entitled "Geographical Information System Documentation of Watershed Data for Direct/Delayed Response Project—Northeast Database," (Order No. PB 89-222 483/AS; Cost: \$13.95, subject to change) will be available only from:  
National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
Telephone: 703-487-4650  
The EPA Project Officer can be contacted at:  
Environmental Research Laboratory  
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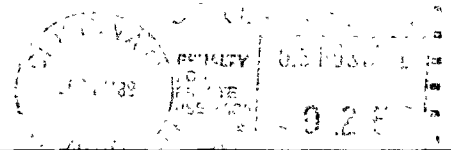
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