

Maine Geologic Facts and Localities
September, 2004

USGS National Geochemical Survey



Text by
Robert Johnston



Introduction

The Maine Geological Survey is cooperating with the United States Geological Survey (USGS) this summer in the [National Geochemical Survey](#). This collaborative project is a two-year program to gather detailed geochemical data from stream sediment samples from northern Maine. So far this summer, staff from the MGS and a student intern have collected over 130 samples. Bagged and dried samples will be sent to the USGS office in Denver, Colorado and analyzed using a nationally consistent set of lab methods. The object of the National Geochemical Survey is to compile a nationwide geochemical coverage of the United States. The data will be used to generate geochemical maps for different elements, allow for estimates of concentrations of elements, and provide baseline data for many environmental studies.



Figure 1. Geochemical sampling along a tributary of the South Branch of the Penobscot River in Bald Mountain Township.



Target Area

The target of the sampling program in Maine is the area north of the 45th parallel. Data for southern Maine has already been compiled (below the 45th parallel) by the National Uranium Resource Evaluation program (NURE), conducted in the 1970's. Stream sample collection sites are based on 10 x 10 kilometer grids drawn in the UTM coordinate system. Each 10 x 10 kilometer cell is divided into four quadrants, and one quadrant is selected at random for sampling (Figure 2).

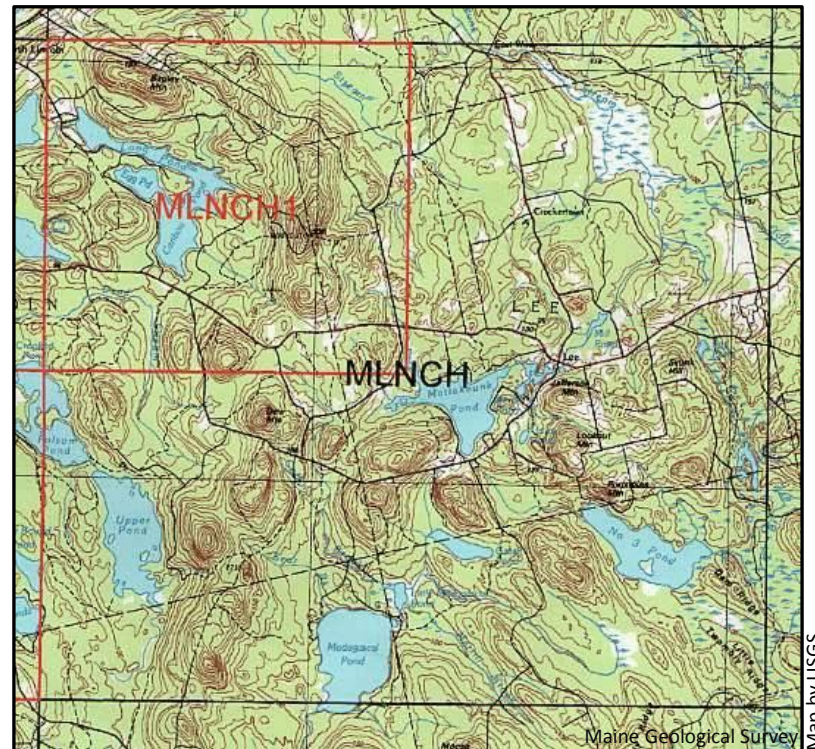


Figure 2. Ten by ten kilometer grid divided into four quadrants with the selected quadrant in red.

Target Area

Over 200 quadrants fall within the northern Maine sampling area (Figure 3). Small streams within the quadrant are identified, and one stream is selected for sampling. The drainage basin of the stream sampling site should largely fall within the quadrant.



Figure 3. Map of Maine north of the 45th parallel showing sampling grid.

Methods

Sample sites are not supposed to be close to sources of contamination, including roads (Figure 4).



Figure 4. Typical sampling location (tributary of Big Brook in T14 R10).

Methods

At each stream sampling site, 6 to 10 areas containing fine-grained particulate matter within a 10-20 m reach of the stream are sampled for a <2 mm size fraction (Figure 5).



Figure 5. National Geochemical Survey sampling equipment.

Methods

The goal is to collect a sample that best represents the materials that have moved down that stream. Collected material is sieved through a 2 mm mesh screen (Figure 6). After homogenization and bagging, a sub-sample will be submitted for chemical analysis.



Photo by Robert Johnston

Maine Geological Survey

Figure 6. Two-millimeter mesh screen sieve in operation.



Methods

A detailed data sheet is filled out for each site recording latitude and longitude, stream and basin width, grain size, sample and water color, potential contamination sources, and miscellaneous other information. Photographs upstream and downstream are taken, along with a photo of the sample on top of the labeled sample bags (Figure 7). Bagged samples are stored and dried in the Maine Geological Survey Core Repository until shipment to Denver, Colorado where chemical analysis will be conducted. Results of chemical analysis are available on the [USGS National Geochemical Survey website](#).

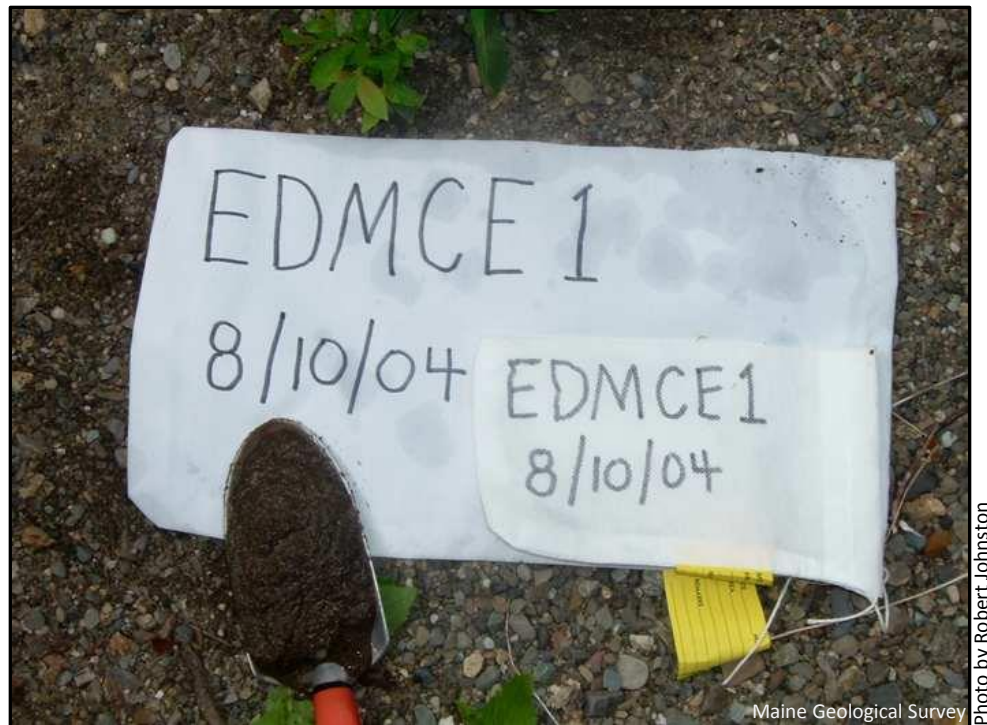


Photo by Robert Johnston

Figure 7. Sample on trowel (for color coding) and sample bags.