CATALOG DOCUMENTATION
EMAP-GREAT LAKES PROGRAM LEVEL DATABASE
1994 LAKE ONTARIO NEARSHORE AND OFFSHORE
GRAIN SIZE COMPOSITION DATA

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1. DATA SET IDENTIFICATION

1.1 Title of Catalog document

EMAP-Great Lakes Program Level Database
1994 Lake Ontario Nearshore and Offshore
Grain Size Composition

1.2 Author of the Catalog entry

Greg Elonen, ILS

1.3 Catalog revision date

24 April 1997

1.4 Data set name

LOPART94

1.5 Task Group

Great Lakes

1.6 Data set identification code

512

1.7 Version

001

1.8 Requested Acknowledgment

These data were produced as part of the U.S. EPA's Environmental Monitoring and Assessment Program (EMAP). If you plan to publish these data in any way, EPA requires a standard statement for work it has supported:

"Although the data described in this article has been funded wholly or in part by the U.S. Environmental Protection Agency through its EMAP-Great Lakes Program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigator

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3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

Sediment grain size analyses were conducted on each EMAP station sediment sample homogenate. The samples were obtained from the top 2 cm of sediment grab samples, representing the most recent depositional layer. The grain size analysis included measurements of per cent sand, per cent silt, and per cent clay.

3.2 Keywords for the Data Set

Lake Ontario, sand, silt, clay, grain size, nearshore.

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

The Environmental Monitoring and Assessment Program (EMAP) was designed to periodically estimate the status and trends of the Nation's ecological resources on a regional basis. EMAP provides a strategy to identify and bound the extent, magnitude and location of environmental degradation and improvement on a regional scale based on station sites randomly located in the Great Lakes. Base grid and three-fold enhanced sampling sites from nearshore and offshore regions of Lake Ontario are included in this data set.

4.2 Data Set Objective

The objective of the sediment grain size data set is to characterize the grain size distribution of sediments collected from the nearshore and offshore regions of Lake Ontario. These samples represent the top 2 cm of sediment.

4.3 Background Discussion

The structural characteristics of the sediment is used as the primary physical habitat indicator for all resource classes considered. Physical habitat quality characterizes the physical conditions that may limit the biological components from reaching their full potential expected for an ecological zone within a lake.

4.4 Summary of Data Set Parameters

Grain size characterized as clay, silt, and sand.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Collect sediment samples suitable for the analysis of sediment constituents. One (1) or two (2) sediment samples were expected to be collected at each station.

5.1.2 Sample Collection Methods Summary

For successful box core samples, the overlying water was allowed to settle for a few minutes before being siphoned off. Four core tubes were then placed into the sediment. The core tubes were then capped and removed one at a time. The top 2 cm of sediment was extruded, composited, then homogenized. A subsample was removed, placed into 60 mL Whirlpak bags and refrigerated for laboratory analysis. Ponar sediment samples were obtained by removing the top 2-3 cm, homogenizing the sample then removing a subsample. The subsample was then placed in a 60 mL Whirlpak bag and refrigerated for laboratory analysis.

5.1.3 Beginning Sampling Date

3 September 1994

5.1.4 Ending Sampling Date

19 September 1994

5.1.5 Platform

Sampling was conducted from the R/V Guardian.

5.1.6 Sampling Equipment

At all sediment stations within the depositional zone, sediment collection was performed using a 15"x 15"x 20" box core sampler. At stations located outside the depositional zone, either a box core sampler or a standard size Ponar was used depending on the type of bottom substrate.

5.1.7 Manufacturer of Instrument

Wildco Manufacturing Company

5.1.8 Key Variables

The number of samples collected at each station was recorded at the time of collection.

5.1.9 Collection Method Calibration

The sampling gear did not require any calibration beyond inspection for damage due to rough handling or rock damage.

5.1.10 Collection Quality Control

Criteria for rejection of Ponar samples: Soft bottom- sampler must be at least 3/4 full and show minimal signs of disturbance. Hard bottom- presence of rocks, signs of disturbance, or sampler less than 1/4 full.
Criteria for rejection of box core sampler: sediment shows signs of disturbance, or less than 30 cm of sediment or less than 15 cm of overlying water present.

5.1.11 Sample Collection Method Reference

Strobel, C.J. and S.C. Schimmel, 1991. Environmental Monitoring and Assessment Program-Near Coastal. 1991 Virginian Province, Field Operations and Safety Manual. U.S. EPA, NHEERL-AED, Narragansett, RI. June 1991.

5.2 Data Processing and Sample Processing

5.2.1 Sample Processing Objective

Process sediment samples to characterize the grain size composition of surface sediments.

5.2.2 Sample Processing Methods Summary

The sediment samples were homogenized with a spatula before removing an aliquot for analysis. Approximately 10-40 g of material was removed and placed in 60 mL polyethylene bottles and weighed. Contents of the bottle were emptied into a 75 um sieve. A 0.2% sodium hexametaphosphate solution was used to rinse any remaining material onto the sieve from the bottle. The elutriate volume was recorded, then placed in a churn splitter and agitated vigorously. Approximately 150 mL of suspension was poured into a beaker and stirred on a magnetic stirrer. Three 15.0 mL sub-samples were removed and placed into three pre-weighed weigh pans. Samples were dried at 1000 C and weighed. The procedure for the portion > 75 um was to decant the sediment remaining in the sieve onto a series of stainless steel sieves. The sediment was then washed with distilled water. Washings from each sieve were then washed into pre-weighed weigh pans, dried at 1000 C and weighed.

5.2.3 Sample Processing Method Calibration

Not applicable.

5.2.4 Sample Processing Quality Control

The sum of the three fractions must be between 90% and 110%.

5.2.5 Sample Processing Method Reference

Integrated Laboratory Systems grain size analysis standard operating procedure #ILS-PS-001.

5.2.6 Sample Processing Method Deviations

None reported.

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Values

SAND%, SILT%, CLAY%

6.2 Data Manipulation Description

The per cent sand fraction was determined to be the sum of the per cent fractions greater than 60 um. The per cent silt fraction was determined to be the sum of the per cent fractions between 2 um and 60 um. The per cent clay fraction was determined to be the sum of the per cent fractions less than 2 um.

6.3 Data Manipulation Examples

6.3.1 Per Cent Sand

Sand% = (Sum of all size fractions >60 um /Total weight of all size fractions) * 100

6.3.2 Per Cent Silt

Silt% = (Sum of all size fractions >2 um and < 60 um) /Total weight of all size fractions) * 100

6.3.3 Per Cent Clay

Clay% = (Sum of all size fractions <2 um /Total weight of all size fractions) * 100

7. DATA DESCRIPTION

7.1 Description of Parameters

#	Name	Type	Length	Format	Parameter Label
1	STA_NAME	Char	10	10.	Station Name
2	DATE	Num	6	6.	Sampling Date (YYMMDD)
3	CLAY%	Num	4	2.2	% Clay in sediment sample
4	SILT%	Num	4	2.2	% Silt in sediment sample
5	SAND%	Num	4	2.2	% Sand in sediment sample
6	TOTAL%	Num	8	6.2	Sum of sand, silt and clay (%)

7.1.1 Precision to which values are reported

Per cent clay, silt, and sand are reported to 2 decimal places.

7.1.2 Minimum Value in Data Set

SAND%	0.68
SILT%	5.31
CLAY%	0.36

7.1.3 Maximum Value in Data Set

SAND%	94.33
SILT%	85.38
CLAY%	27.74

7.2 Data Record Example

7.2.1 Column Names for Example Records

STA_NAME, DATE, SAND%, SILT%, CLAY%, TOTAL%

7.2.2 Example Data Records

L094-81	940906	47.37	49.32	3.31	100.00
L094-82	940907	50.32	47.83	1.86	100.00

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-79 deg 29' 59"

8.2 Maximum Longitude

-76 deg 19' 22"

8.3. Minimum Latitude

42 deg 27' 29"

8.4 Maximum Latitude

43 deg 52' 57"

8.5 Name of Area or Region

Nearshore and Offshore Lake Ontario:
Stations were located within the Nearshore and Offshore resource class of Lake Ontario. The nearshore sites were within the non-depositional zone (13 sites) and the offshore sites were within the depositional zone (45 sites).

9. QUALITY CONTROL/QUALITY ASSURANCE

9.1 Measurement Quality Objectives

The maximum allowable precision goal for sediment grain composition was 10%.

9.2. Data Quality Assurance Procedures

Data validation by Principal Investigator.

9.3 Actual Measurement Quality

None reported.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the EMAP Website.

10.2 Data Access Restrictions

Not applicable.

10.3 Data Access Contact Persons

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10.4 Data Set Format

Data from the Website are in ASCII fixed format.

10.5 Information Concerning Anonymous FTP

Not accessible.

10.6 Information Concerning WWW

Data can be downloaded from the EMAP Website.

10.7 EMAP CD-ROM Containing the Data Set

Data are not available on CD-ROM.

11. REFERENCES

Hedtke, S., A. Pilli, D. Dolan, G. McRae, B. Goodno, R. Kreis, G. Warren, D. Swackhamer, and M. Henry. 1992. Great Lakes Monitoring and Research Strategy: Environmental Monitoring and Assessment Program. USEPA, Office of Research and Development, ERL-Duluth, Duluth, Minnesota. EPA/602/R-92/001. 204 p.

12. TABLE OF ACRONYMS

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