

US EPA ARCHIVE DOCUMENT

CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 1
1993-1994 FISH TISSUE CONTAMINATION IN MAINE LAKES
FISH TISSUE METAL CONCENTRATIONS BY COMPOSITE DATA

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1. DATA SET IDENTIFICATION

1.1 Title of Catalog document

Regional Environmental Monitoring and Assessment Program - Region 1
1993-94 Fish Tissue Contamination in Maine Lakes
Fish Tissue Metal Concentrations by Composite Data Set

1.2 Author of the Catalog entry

Melissa Hughes, OAO Corporation

1.3 Catalog revision date

12 March 1998

1.4 Data set name

FISHMET

1.5 Task Group

Region 1

1.6 Data set identification code

000011

1.7 Version

001

1.8 Requested Acknowledgment

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 have been funded wholly or in part by the U. S. Environmental Protection Agency through its Regional EMAP 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 Investigators

Barry Mower
Jeanne DiFranco
Linda Bacon
David Courtemanch
State of Maine Department of Environmental Protection

2.2 Investigation Participant-Sample Collection

Not applicable

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The R-EMAP Region 1 Fish Tissue Metal Concentrations by Composite data set presents the results of chemical analyses on a composite of fish tissue. Up to ten predators and five omnivores from one lake were homogenized into separate samples, either as whole fish or fillets. Inorganic compounds of interest included mercury, cadmium and lead. Mercury was also measured in individual predator fillet homogenates.

3.2 Keywords for the Data Set

Lake, Maine, fish, fish tissue, mercury, lead, cadmium

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The primary goal of this study was to estimate the levels of contamination in fish populations, and the risk these levels pose to human and wildlife consumers. The primary objective was to determine concentrations of cadmium, lead, mercury, PCBs and selected pesticides in fish collected from Maine lakes.

4.2 Data Set Objective

Present the inorganic compound fish tissue homogenate concentrations to characterize the relationships among the following factors: fish community and age structure, trophic level and contaminant distribution.

4.3 Data Set Background Discussion

Because high levels of contaminants have been found in Maine fish since the early 1970's, studies were begun to assess the relationship of these findings to low bald eagle reproduction rates. These studies revealed high mercury and polychlorinated biphenyls (PCBs) levels in nesting eaglets, while studies in other states have continued to report high levels of these and other contaminants in fish. These findings led the Maine DEP to initiate this study to measure levels of contamination in fish populations in the State's lakes and ponds, in order to determine the potential risks to both ecological and human health.

4.4 Summary of Data Set Parameters

The concentration of three inorganic compounds (lead, cadmium and mercury) are presented for each fish tissue composite; Quality Assurance problems are flagged, as necessary.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Target fish specimen collection based on size, trophic level, distribution and desirability as game fish.

5.1.2 Sample Collection Methods Summary

Fish were collected by various methods to accumulate ten predators and five omnivores of the same species from each lake. Samples were extracted for age analysis. Fish were rinsed in lake water, and wrapped in aluminum foil and kept on ice in a cooler.

5.1.3 Sampling Start Date

June 1993
September 1994

5.1.4 Sampling End Date

September 1993
September 1994

5.1.5 Platform

Not applicable.

5.1.6 Sampling Equipment

fishing rods, gill nets, trap nets, dip nets and beach seines

5.1.7 Manufacturer of Sampling Equipment

Not known

5.1.8 Key Variables

Data are based on analytical measurements.

5.1.9 Sampling Method Calibration

Not applicable.

5.1.10 Sample Collection Quality Control

Care was taken to keep fish clean and free of contamination.

5.1.11 Sample Collection Method Reference

Maine Department of Environmental Protection et. al., 1993. Project Work/Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. December 20, 1993.

5.2 Data Preparation and Sample Processing

Specimens were frozen upon return from the field. Whole predator fish, predator fillets and whole omnivore fish samples were ground, combined into a composite by lake and homogenized. An aliquot was extracted for analysis.

6. DATA MANIPULATIONS

6.1 Name of new or modified values

Not applicable

6.2 Data Manipulation Description

Not applicable

6.3 Data Manipulation Examples

Not applicable

7. DATA DESCRIPTION

7.1 Description of Parameters

CONTENTS

```
Data Set Name: FISHMET      Observations:    354
Engine:      V612          Variables:       15
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#	Parameter SAS Name	Data Type	Len	Format	Parameter Label
1	T	Char	8	\$8.	T
2	LAKE	Char	12	\$12.	Lake name
3	MIDAS	Char	11	\$11.	Lake identification number
4	SPEC	Char	8	\$8.	Species in composite
5	CODE	Char	6	\$6.	PF=predator fillet,PW=predator whole,OW=Omnivore whole
6	TOTAL	Num	8	7.	Total number of fish in composite
7	HG_PPM	Num	8	10.3	Mercury (ppm)
8	HG_F	Char	6	\$6.	Mercury flag
9	CD_PPM	Num	8	9.3	Cadmium (ppm)
10	CD_F	Char	8	\$8.	Cadmium flag
11	PB_PPM	Num	8	9.3	Lead (ppm)
12	PB_F	Char	7	\$7.	Lead Flag
13	YR	Char	7	\$7.	Year of fish collection

7.1.6 Precision to which values are reported

Data were reported to the number of decimal places noted in 7.1.

7.1.7 Minimum values in data set

Variable	Minimum
TOTAL	1
HG_PPM	0.002
CD_PPM	0.009
PB_PPM	0.020

7.1.8 Maximum values in data set

Variable	Maximum
TOTAL	5
HG_PPM	2.500
CD_PPM	0.600
PB_PPM	0.640

7.2 Data Record Example

7.2.1 Column Names for Example Records

T;LAKE;MIDAS;SPEC;CODE;TOTAL;HG_PPM;HG_F;CD_PPM;CD_F;PB_PPM;PB_F;YR;

7.2.2 Example Data Records

T;LAKE;MIDAS;SPEC;CODE;TOTAL;HG_PPM;HG_F;CD_PPM;CD_F;PB_PPM;PB_F;YR;
Y;BRAN;4492;LLS;PF;3;0.430; ;9.999; ;9.999; ;93;
;SAND;3566;BKT;PF;5;0.370; ;9.999; ;9.999; ;93;
;SYMM;3892;YLP;PF;5;0.180; ;9.999; ;9.999; ;93;
;BRAC;1068;SMB;PF;5;0.310; ;9.999; ;9.999; ;93;
;OTTE;3972;BKT;PF;3;0.130; ;9.999; ;9.999; ;93;

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-71 Degrees 00 Minutes 47 Decimal Seconds

8.2 Maximum Longitude

-67 Degrees 10 Minutes 30 Decimal Seconds

8.3 Minimum Latitude

43 Degrees 15 Minutes 21 Decimal Seconds

8.4 Maximum Latitude

47 Degrees 07 Minutes 11 Decimal Seconds

8.5 Name of area or region

EPA Region 1

The sampling area included the entire state of Maine.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Data Quality Objectives

The data quality objective was to have less than 50% relative percent difference for all split samples.

9.2 Data Quality Assurance Procedures

The following is a list of QA samples analyzed: split samples between laboratories and duplicate, spiked and reference samples analyzed in one laboratory. These procedures are detailed in the documents listed under REFERENCES.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Not Applicable

10.3 Data Access Contact Persons

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10.4 Data Set Format

Data files are in ASCII semi-colon delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data Set

Data are not available on CD-ROM

11. REFERENCES

DiFranco et. al., 1995. Fish Tissue Contamination in Maine Lakes. Data Report. State of Maine Department of Environmental Protection, Bureau of Land and Water Quality, Division of Environmental Assessment. September 1995.

Maine Department of Environmental Protection et. al., 1993. Project Work/ Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife and U.S. EPA Region 1 Environmental Services Division. December 20, 1993.

12. TABLE OF ACRONYMS

ACRONYM	DESCRIPTION
DEP	Maine Department of Environmental Protection
DIFW	Maine Department of Inland Fisheries and Wildlife
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
HetL	Maine Department of Human Services Health and Environmental Testing Laboratory
MIDAS	Maine Information Display Analysis System - unique number assigned to each Maine lake
PCBs	polychlorinated biphenyls
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
REMAP	Regional Environmental Monitoring and Assessment Program
UMO	National Biological Survey and Sawyer Environmental Chemistry Laboratories at the University of Maine at Orono

13. PERSONNEL INFORMATION

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