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REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 1
1993-1994 FISH TISSUE CONTAMINATION IN MAINE LAKES
FISH TISSUE ORGANIC 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 Organic 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

ORGANICS

1.5 Task Group

Region 1

1.6 Data set identification code

000013

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 Organic Concentrations by Composite data set presents the organic concentrations (ppb, wet wt.) measured in 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. Organic compounds of interest included pesticides, PCBs and DDTs. Per cent moisture and % lipids were also measured.

3.2 Keywords for the Data Set

Lake, Maine, fish, fish tissue, PCBs, DDTs, pesticides, % lipids, % moisture, organic compounds

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

Organic compound concentrations from fish tissue homogenates are presented 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 organic compound groups (PCBs, DDTs, pesticides) are presented for each fish tissue composite; Quality Assurance issues 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: ORGANICS Observations: 235
Engine: V612 Variables: 61

#	Parameter SAS Name	Data Type	Len	Format	Parameter Label
1	MIDAS	Char	9	$9.	Lake identification number
2	SPEC	Char	7	$7.	Species
3	FISH_NO	Char	6	$6.	Fish Composite # assigned by lab
4	ALDRIN_F	Char	6	$6.	Aldrin Flag (code)
5	ALDRIN	Num	8	10.5	Aldrin (ppb, wet wt.)
6	A_BHC_F	Char	5	$5.	Alpha BHC Flag (code)
7	A_BHC	Num	8	10.5	Alpha BHC

8	B_BHC_F	Char	7	$7.	Beta BHC Flag (code)
9	B_BHC	Num	8	10.5	Beta BHC (ppb, wet wt.)
10	D_BHC_F	Char	5	$5.	Delta BHC Flag (code)
11	D_BHC	Num	8	11.5	Delta BHC (ppb, wet wt.)
12	G_BHC_F	Char	5	$5.	Gamma BHC Flag (code)
13	G_BHC	Num	8	10.5	Gamma BHC (ppb, wet wt.)
14	A_CHLO_F	Char	5	$5.	Alpha-chlordane Flag (code)
15	A_CHLO	Num	8	10.5	Alpha-chlordane (ppb, wet wt.)
16	G_CHLO_F	Char	5	$5.	Gamma-chlordane Flag (code)
17	G_CHLO	Num	8	9.5	Gamma-chlordane (ppb, wet wt.)
18	DIELD_F	Char	5	$5.	Dieldrin Flag (code)
19	DIELDRIN	Num	8	10.5	Dieldrin (ppb, wet wt.)
20	ENDS_I_F	Char	5	$5.	Endosulfan I Flag (code)
21	ENDOS_I	Num	8	10.5	Endosulfan I (ppb, wet wt.)
22	ENDS_IIF	Char	5	$5.	Endosulfan II Flag (code)
23	ENDOS_II	Num	8	11.5	Endosulfan II (ppb, wet wt.)
24	ENDS_S_F	Char	5	$5.	Endosulfan sulfate Flag (code)
25	ENDOS_S	Num	8	10.5	Endosulfan sulfate (ppb, wet wt.)
26	ENDRIN_F	Char	6	$6.	Endrin Flag (code)
27	ENDRIN	Num	8	10.5	Endrin (ppb, wet wt.)
28	END_AL_F	Char	5	$5.	Endrin Aldehyde Flag (code)
29	END_ALD	Num	8	10.5	Endrin Aldehyde (ppb, wet wt.)
30	END_KE_F	Char	5	$5.	Endrin Ketone Flag (code)
31	END_KET	Num	8	11.5	Endrin Ketone (ppb, wet wt.)
32	HPT_EP_F	Char	5	$5.	Heptachlor Epoxide Flag (code)
33	HEPT_EPO	Num	8	10.5	Heptachlor Epoxide (ppb, wet wt.)
34	HPTACH_F	Char	5	$5.	Heptachlor Flag (code)
35	HEPTACH	Num	8	11.5	Heptachachlor (ppb, wet wt.)
36	PPDDE_F	Char	5	$5.	PP'DDE Flag (code)
37	PPDDE	Num	8	11.5	PP'DDE (ppb, wet wt.)
38	PPDDT_F	Char	6	$6.	PP'DDT Flag (code)
39	PPDDT	Num	8	10.5	PP'DDT (ppb, wet wt.)
40	PPDDD_F	Char	7	$7.	PP'DDD Flag (code)
41	PPDDD	Num	8	10.5	PP'DDD (ppb, wet wt.)
42	TOXAPH_F	Char	3	$3.	Toxaphene Flag (code)
43	TOXAPH	Num	8	10.5	Toxaphene (ppb, wet wt.)
44	AC1221_F	Char	3	$3.	Aroclor 1221 Flag (code)
45	AC1221	Num	8	8.5	Aroclor 1221 (ppb, wet wt.)
46	AC1232_F	Char	3	$3.	Aroclor 1232 Flag (code)
47	AC1232	Num	8	10.5	Aroclor 1232 (ppb, wet wt.)
48	AC1242_F	Char	6	$6.	Aroclor 1242 Flag (code)
49	AC1242	Num	8	10.5	Aroclor 1242 (ppb, wet wt.)
50	AC1248_F	Char	4	$4.	Aroclor 1248 Flag (code)
51	AC1248	Num	8	12.5	Aroclor 1248 (ppb, wet wt.)
52	AC1254_F	Char	8	$8.	Aroclor 1254 Flag (code)
53	AC1254	Num	8	12.5	Aroclor 1254 (ppb, wet wt.)
54	AC1260_F	Char	9	$9.	Aroclor 1260 Flag (code)
55	AC1260	Num	8	12.5	Aroclor 1260 (ppb, wet wt.)
56	AC1268_F	Char	11	$11.	Aroclor 1268 Flag (code)
57	AC1268	Num	8	11.5	Aroclor 1268 (ppb, wet wt.)
58	PCTSUR_R	Num	8	14.3	Percent surrogate recovery
59	PCT_MOIS	Num	8	12.3	Moisture (%)
60	PCT_LIPI	Num	8	9.3	Lipids (%)
61	ANALDATE	Char	11	$11.	Analytical Date

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

ALDRIN	0.10000
A_BHC	0.10000
B_BHC	0.10000
D_BHC	0.10000
G_BHC	0.10000
A_CHLO	0.10000
G_CHLO	0.10000
DIELDRIN	1.00000
ENDOS_I	1.00000
ENDOS_II	1.00000
ENDOS_S	1.00000
ENDRIN	1.00000
END_ALD	1.00000
END_KET	1.00000
HEPT_EPO	1.00000
HEPTACH	0.10000
PPDDE	0.10000
PPDDT	0.10000
PPDDD	0.10000
TOXAPH	10.00000
AC1221	10.00000
AC1232	10.00000
AC1242	10.00000
AC1248	10.00000
AC1254	10.00000
AC1260	8.70000
AC1268	10.00000
PCTSUR_R	0.653
PCT_MOIS	14.500
PCT_LIPI	0.090

7.1.8 Maximum values in data set

Variable	Maximum
ALDRIN	0.55000
A_BHC	8.33000
B_BHC	2.00000
D_BHC	1.25000
G_BHC	7.90000
A_CHLO	8.00000
G_CHLO	5.70000
DIELDRIN	5.00000
ENDOS_I	5.10000
ENDOS_II	5.00000
ENDOS_S	12.20000
ENDRIN	5.42000
END_ALD	5.00000
END_KET	5.00000
HEPT_EPO	5.00000
HEPTACH	1.30000
PPDDE	382.00000
PPDDT	30.00000
PPDDD	410.00000
TOXAPH	40.00000
AC1221	50.00000
AC1232	50.00000
AC1242	50.00000
AC1248	50.00000
AC1254	186.00000
AC1260	126.00000
AC1268	50.00000
PCTSUR_R	97.500

PCT_MOIS 79.900
PCT_LIPI 50.100

7.2 Data Record Example

7.2.1 Column Names for Example Records

MIDAS;SPEC;FISH_NO;ALDRIN_F;ALDRIN;A_BHC_F;A_BHC;B_BHC_F;B_BHC;D_BHC_F;D_BHC;G_BHC_F
;
G_BHC;A_CHLO_F;A_CHLO;G_CHLO_F;G_CHLO;DIELD_F;DIELDRIN;ENDS_I_F;ENDOS_I;ENDS_IIF;
ENDOS_II;ENDS_S_F;ENDOS_S;ENDRIN_F;ENDRIN;END_AL_F;END_ALD;END_KE_F;END_KET;HEPT_EPO
;
HEPT_EPO;HPTACH_F;HEPTACH;PPDDE_F;PPDDE;PPDDT_F;PPDDT;PPDDD_F;PPDDD;TOXAPH_F;TOXAPH;
AC1221_F;AC1221;AC1232_F;AC1232;AC1242_F;AC1242;AC1248_F;AC1248;AC1254_F;AC1254;
AC1260_F;AC1260;AC1268_F;AC1268;PCTSUR_R;PCT_MOIS;PCT_LIPI;ANALDATE;

7.2.2 Example Data Records

41;WHS;5;ND;0.10000;ND;0.10000;ND;0.10000;ND;0.10000;ND;0.10000;.;0.25000;ND;0.10000
;
ND;1.00000;ND;1.00000;ND;1.00000;ND;1.00000;ND;1.00000;ND;1.00000;ND;1.00000;ND;
1.00000;ND;0.10000;.;7.24000;.;0.48000;.;2.51000;ND;20.00000;ND;10.00 000;ND;
10.00000;ND;10.00000;ND;10.00000;.;12.00000;ND;12.00000;55.500;73.000;6.000;11/25/93

41;YLP;5;ND;0.10000;.;0.30000;S;0.45000;ND;0.10000;ND;0.10000;ND;0.10000;ND;0.10000;
ND;5.00000;ND;5.00000;ND;5.00000;ND;5.00000;ND;5.00000;ND;5.00000;ND;5.00000;ND;
5.00000;ND;0.10000;B;1.07000;ND;0.10000;.;1.01000;ND;20.00000;ND;10.00000;ND;
10.00000;ND;10.00000;ND;10.00000;ND;10.00000;ND;10.00000,21.100,69.700,4.080,05/02/9
4

78;LKT;3;.;0.45000;.;0.79000;ND;0.10000;ND;0.10000;.;0.34000;.;2.79000;.;0.82000;
NA3;99.99999;NA3;99.99999;NA3;99.99999;NA3;99.99999;NA3;99.99999;NA3;99.999 99;NA3;
99.99999;NA3;99.99999;SND;0.10000;.;51.40000;.;10.30000;S;9.82000;ND;20.00000;ND;
10.00000;ND;10.00000;ND;10.00000;ND;10.00000;.;67.00000;ND;10.00000,62.800,69.100,7.
580,04/15/94

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 a 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
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

Linda C. Bacon
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Data Librarian EMAP-Information Management
U.S. EPA NHEERL-AED
(401) 782-3184 (Tele)
(401) 782-3030 (FAX)
hughes.melissa@epa.gov

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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