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Appendix 1.3.1. List of Parameters Analyzed and Principal Investigators for the LMMBP

Parameter	Focus Group	Media	Notes	Principal Investigator
Atrazine, Deethylatrazine (DEA), Deisopropylatrazine (DIA), Terbuthylazine	IUAA	Atmospheric Vapor and Particulate Phase, Precipitation	Sleeping Bear Dunes site only.	Ron Hites, Indiana University. Keri Hornbuckle, U. of Iowa used this data to calculate loadings.
Atrazine, DEA, DIA, d5-Atrazine	WSAA	Atmospheric Vapor and Particulate Phase, Precipitation	All stations except Sleeping Bear Dunes site.	Clyde Sweet, Illinois State Water Survey. Keri Hornbuckle, U. of Iowa used this data to calculate loadings.
Atrazine	RULA	Open Lake		Steven Eisenreich, Rutgers University
Atrazine	RUTA	Tributary		Steven Eisenreich, Rutgers University. David Hall, USGS used this data to calculate loads.
Alkalinity, Conductivity, Hardness, pH, Turbidity	GPLN	Open Lake		Marvin Palmer, GLNPO. Analysis by Grace Analytical Labs.
Alkalinity, Chloride, Conductivity, NO_2+NO_3, Organic Carbon, pH, Total Phosphorus, TKN	GRAN	Atmospheric		Glenn Warren, GLNPO. Analysis by Grace Analytical Labs.

Parameter	Focus Group	Media	Notes	Principal Investigator
Conductivity, DO, pH, Temperature	USTN	Tributary		Peter Hughes, USGS
Alkalinity, Chloride, Conductivity, NH_4, NO_2+NO_3, Orthophosphorus, SiO_4/SiO_3, Sulfate, Total Phosphorus, TSS, TKN	LHTN	Tributary		George Bowman, Wisconsin State Lab of Hygiene. David Hall, USGS used this data to calculate loads.
Chloride, Ammonium-Nitrogen (NH_4N), NO_2+NO_3, Dissolved Phosphorus, Orthophosphorus, Total Phosphorus, Dissolved Silica , TKN	GRLN	Open Lake		Glenn Warren, GLNPO, Analysis by Grace Analytical Labs.
Phosphorus (Base Extractable as PO_4), Total Phosphorus, Biogenic Silica (SiO_2-bio)	GLSN	Sediment, Sediment Traps		Thomas Johengen, NOAA/GLERL
Total Organic Carbon, Total Organic Nitrogen	NASN	Sediment, Sediment Traps		Brian Eadie, NOAA/GLERL
Organic Carbon (DOC, POC), TSS	BALN	Open Lake		Eric Crecelius, Battelle Marine Sciences
Organic Carbon (DOC, POC)	WWTN	Tributary		Martin Shafer, University of Wisconsin Water Quality Laboratory
Mercury	MIAH	Atmospheric Vapor, Particulate, and Precipitation	Monthly deposition/ concentration calculated by Matt Landis, University of Michigan	Jerry Keeler, University of Michigan
Mercury	MDLH	Open Lake		Robert Mason, U. of Maryland. David Hall, USGS used this data to calculate loads.
Mercury	MNPH	Plankton		Edward Nater, U. of Minnesota

Parameter	Focus Group	Media	Notes	Principal Investigator
Mercury	LLSH	Sediment, Sediment Trap		Ronald Rossmann, LLRS
Mercury, Methylmercury	WWTH	Tributary		Jim Hurley, U. of Wisconsin, Water Quality Laboratory. David Hall, USGS used this data to calculate loads.
Mercury	MIFH	Fish		Jerome Nriagu, U. of Michigan
Congener PCBs, *trans*-nonachlor	IUAP	Atmospheric Vapor and Particulate Phase, Precipitation	Sleeping Bear Dunes site only.	Ron Hites, Indiana University. Keri Hornbuckle, U. of Iowa used this data to calculate loadings.
Congener PCBs, *trans*-nonachlor	WSAP	Atmospheric Vapor and Particulate Phase, Precipitation	All stations except Sleeping Bear Dunes site.	Clyde Sweet, Illinois State Water Survey. Keri Hornbuckle, U. of Iowa used this data to calculate loadings.
Congener PCBs, *trans*-nonachlor	RUAP	Atmospheric Dry Deposition	Includes both land and over-lake sampling sites.	Steven Eisenreich, Rutgers University
Congener PCBs, *trans*-nonachlor	BALP	Open Lake		Eric Crecelius, Battelle Marine Sciences Laboratory
Congener PCBs, *trans*-nonachlor	LHTP	Tributary		William Sonzogni, Wisconsin State Lab of Hygiene
Congener PCBs, *trans*-nonachlor	NASP	Sediment, Sediment Trap		Pat Van Hoof, NOAA/GLERL
Congener PCBs, *trans*-nonachlor	MNPP	Plankton, *Mysis, Diporeia*		Deborah Swackhamer, U. of Minnesota
Congener PCBs, *trans*-nonachlor	MNFP	Forage Fish, Lake Trout, Coho Salmon		Deborah Swackhamer, U. of Minnesota

Parameter	Focus Group	Media	Notes	Principal Investigator
Seabird Temperature, Chlorophyll *a*, Transmissivity	N/A	Open Lake	Chlorophyll *a* calculated from fluorescence data	Glenn Warren, GLNPO
Chlorophyll *a*	WSLH	Tributary		George Bowman, Wisconsin State Lab of Hygiene. David Hall, USGS used this data to calculate loads.
Primary Productivity	GRLY	Open Lake Phytoplankton		Glenn Warren, GLNPO. Analyzed by Grace Analytical Laboratory
Abundance/Biomass	GRLP	Phytoplankton		Glenn Warren, GLNPO. Analyzed by Grace Analytical Laboratory.
Abundance/Biomass	GRLZ	Zooplankton		Glenn Warren, GLNPO. Analyzed by Grace Analytical Laboratory.
Diet Information	BSDB	Forage Fish		John Gannon/ Jacqueline Savino, USGS, National Biological Survey
Diet Information	BSDB	Lake Trout		John Gannon/Edward Brown, USGS, National Biological Survey
Diet Information	FSDB	Coho Salmon		Mark Holey, U.S. Fish and Wildlife Service
Cs-137 and Pb-210	NASR	Sediment		John Robbins, NOAA/GLERL
Sediment Bulk Density, Fraction Dry weight , Porosity, Sediment Mixing Depth, Vertical Sediment Transport, Net Mass Accumulation Rate	N/A	Sediment		John Robbins, NOAA/GLERL

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Appendix 1.3.2. Example of Data Verification Checklist Used for the LMMBP

Data Verification Checklist

FOCUS _____ Version Number _____ Date Received _____

Description: _____

1. Read any documentation which came with data files: _____

2. Make sure I understand field names in RDMQ files: _____

3. Check fields which according to RDMQ should not be flagged/or indicate some question, with data (e.g. RS_NMAND, RS_WARN, RS_UPDAT).

RS_NMAND _____

RS_WARN _____

RS_UPDAT _____

4. Make sure every RFS and field duplicate has station, date, depth collected information.

_____

_____

5. Check to make sure every sample has station name that is valid.

_____

_____

6. Check number of RFS and field duplicates for every analyte. Total Samples _____

Analyte _____ RFS _____ FDn _____

Analyte _____ RFS _____ FDn _____

Analyte _____ RFS _____ FDn _____

Analyte _____ RFS _____ FDn _____

Analyte _____ RFS _____ FDn _____

Analyte _____ RFS _____ FDn _____

7. Analysis Results for RFS and field duplicates for every analyte.

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

Analyte _____ Avg _____ Min _____ Max _____ Count _____

8. Check date ranges of data to see if they are reasonable.

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

Analyte _____ Min _____ Max _____

9. Check to verify units information looks alright.

_____

_____

10. Number of significant digits for each analyte.

_____

_____

11. Number of negative values for each analyte.

_____

_____

12. Check flags on RFS and field duplicates.

13. Core slice range (sediment)/species, age, length, weight (fish).

14. Check blank correction, dilution, and surrogate correction fields.

15. Questions about QC Coordinator remarks (RECSTAT). Check flags for whole record (RECSTATF). Questions about Station Notes (STNNOTES), Field Remarks (FREMARK), and Sample Description (SAMPDESC).

16. Additional Questions.

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Appendix 1.3.3. Printout of Information Stored in the LMMBP Tracking Database (R:\\Access2000\\lmmb\lmtrack.mdb)

LMMBP DATA ARCHIVE - QUICK REPORT

Note: All Data Archived on llrssrv2 in /usr/lmmbdata.

Library No.	LM10001	PI:	David Scwab
Description	Hourly Lake Michigan wind, wave, and atmospheric data (5 km grid) for 1982, 1983, 1994, 1995. Original data files were converted to SEDZL and POM formerly by M. Settles. Also, bathymetric data for Lake Michigan.		
Library No.	LM10002	PI:	William Richardson
Description	STORET conventional and general chemistry data for Lake Michigan, April 1962 - August 1993. Note: Date range varies by parameter, includes original file, reformatted spreadsheet, and MS Access file.		
Library No.	LM10003	PI:	David Scwab
Description	2D and 3D GLERL hydrodynamics data for the Lake Michigan 5 km grid. 2D data: January 1982-September 1983; 3D: covers January-July 1982. Program//llrssrv2/~model/dev/PATRIC2D/RCS is for 2D processing, no 3D programming yet.		
Library No.	LM10004	PI:	Steven Eisenreich
Description	Open Lake (RULA) and tributary (RUTA), atrazine, DEA, DIA data for LMMBP. Open lake 325 samples (1/17/94 - 4/17/95). Tributary: 126 samples (4/4/95 - 5/15/96). Revised version of data sent 2/19/98.		
Library No.	LM10005	PI:	Angela Bandemehr
Description	Hourly meteorological data (air temperature, solar radiation, relative humidity, wind speed and direction, and precipitation) from 13 air sampling sites both in and outside of the Lake Michigan basin. 11/30/90 - 12/31/96 (Dates vary by site).		

Library No.	LM10006	PI:	Glenn Warren
Description	Seabird water temperature data for seven LMMBP surveys, April 1994 - October 1995. Data collected at 0.5 m intervals. Does not include January 1994 survey. Note: Data received was extensively revised from original version.		
Library No.	LM10007	PI:	David Hall
Description	Tributary flow data for 11 tributaries to Lake Michigan (Fox, Grand, Indiana Harbor, Kalamazoo, Manistique, Menominee, Milwaukee, Muskegon, Pere Marquette, Sheboygan, St. Joseph), 1/1/94 - 12/31/95. Some data estimated.		
Library No.	LM10008	PI:	Glenn Warren
Description	Open lake organic carbon (dissolved and particulate), and solids data for eight LMMBP cruises. Sampling date was 4/14/94 - 10.13/96. Data also received in D-base (dbf) format. Focus: BALN		
Library No.	LM10009	PI:	Debra Piper
Description	Open Lake Michigan nutrient data (chlorophyll, ammonia, NO_2+NO_3, total phosphorus, dissolved phosphorus, orthophosphate, silica, and TKN), 4/24/94 - 10/13/95 (orthophosphate, NH_4-N started 10/14/94). Focus GRLN, collected and analyzed by Grace Labs. Focus: GRLN.		
Library No.	LM10010	PI:	David Hall
Description	Total and dissolved mercury loading estimates for monitored and unmonitored tributaries to Lake Michigan - 1/1/94 - 12/31/95. Note: Associated flow data is included in an earlier release of this data.		
Library No.	LM10011	PI:	David Schwab
Description	Lake Michigan final report, hourly circulation, meteorology, and wave data (5 km grid) for 1982, 1983, 1994, 1995. Includes intake, cruise, mooring, water level data. Also, HTML files and images, model results (XDR format), Fortran and IDL programs.		
Library No.	LM10012	PI:	David Rockwell
Description	Open lake conventional data (alkalinity, conductivity, total hardness, pH, turbidity) from eight LMMBP cruises, 4/24/94 - 10/13/95. Data received in D-base, and Lotus formats. Focus: GPLN.		
Library No.	LM10013	PI:	Peter Hughes
Description	Conventional data (conductivity, dissolved oxygen, pH, temperature) collected from 11 Lake Michigan tributaries, 3/29/94 - 12/5/95. Note: Five dissolved oxygen samples were flagged as invalid (INV) and should not be used. Files in D-base and Lotus formats. Focus: USTN.		
Library No.	LM10014	PI:	Robert Mason
Description	Open lake mercury data (particulate and total), collected 6/17/94 - 10/10/95. Note: There are 11 invalid samples (flagged as INV) in this data set which should not be used. Data received in D-base, Lotus, SAS, and tabular delimited formats. Focus: MDLH.		
Library No.	LM10015	PI:	David Rockwell
Description	Secchi depth data collected during eight LMMBP cruise, 1/16/94 - 10/11/95. Focus: GPLS.		
Library No.	LM10016	PI:	Matt Landis
Description	Mercury deposition/concentration data estimated into the NOAA/GLERL 5 km over water grid. All data are monthly averages. Covers time period: July 1994 - October 1995.		

Library No.	LM10017	PI:	Glenn Warren
Description	By species and by functional group, abundance, and biomass value, for open lake zooplankton data collected during eight LMMBP cruses (4/24/94 - 10/10/95). Focus Group: GRLZ.		
Library No.	LM10018	PI:	George Bowman
Description	Tributary chlorophyll *a* data, collected 3/24/94 - 10/31/95. Focus Group: LHTL.		
Library No.	LM10019	PI:	Tom Johengen
Description	Sediment nutrient data (NaOH extractable PO_4, total phosphorus, biogenic silica), 6/24/94 - 5/22/96. Note: One sample was flagged as invalid (INV) for all parameters and should not be used. Focus Group: GLSN.		
Library No.	LM10020	PI:	Keri Hornbuckle
Description	Atmospheric atrazine and nutrient (NO_3, total phosphorus, TKN) wet deposition loading data for Lake Michigan 5 km grid cells used in hydrodynamic model. Atrazine wet deposition and particulate monthly concentration data. Data for 10/94 - 10/95 (nutrient) and 5/94 - 10/95 (atrazine).		
Library No.	LM10021	PI:	David Hall
Description	Tributary inorganic/nutrient loading data for 10 parameters (alkalinity, ammonia, chloride, NO_2+NO_3, orthophosphate, dissolved silica, TKN, total nitrogen, total phosphorus, total suspended solids) collected from 11 monitored Lake Michigan tributaries. Data collected 1/1/94 - 12/31/95.		
Library No.	LM10022	PI:	David Hall
Description	Atrazine, DEA, DIA tributary loading data for 11 monitored tributaries and atrazine data for unmonitored tributaries to Lake Michigan. Data covers the time period: 1/1/94 - 12/31/95.		
Library No.	LM10023	PI:	Glenn Warren
Description	Primary productivity data collected during eight surveys for the LMMBP study. Data covers the time period: 4/24/94 - 10/13/95. Data did not go through RDMQ, but was QA'd by Deb Piper, Grace Analytical. Focus Group: GRLY.		
Library No.	LM10024	PI:	Glenn Warren
Description	Abundance and biomass for plankton samples collected during the LMMBP. Data covers the time period: 4/24/94 - 10/10/95. Data is reported both by individual species and by functional group. Focus: GRLP.		
Library No.	LM10025	PI:	John Robbins
Description	Sediment radiochemistry (Pb-210, Cs-137), physical properties (mass, fraction dry weight, soluble fraction, bulk density, porosity, age) of Lake Michigan sediment collected 1994-1996. Station location and modeled data (mixing rates, settling) also included. Focus: NASR.		
Library No.	LM10026	PI:	Nathan Hawley
Description	Current velocity, water transparency, temperature from three stations, 10/31/94 - 10/11/95. In-situ sediment resuspension from sediment flume experiments (8/12/95 - 9/23/98). Also profile data - temperature, dissolved oxygen, conductivity, BAT, pH, fluorescence, TSM data from six stations in Lake Michigan (1/4/95 - 11/29/95).		

Library No.	LM10027	PI:	Barry Lesht
Description	Current velocity and direction, bottom wave orbital velocity, temperature, beam attenuation, and TSM data collected from Tripod Station 98(latitude 42 52.18, longitude 87 42.41), during the EEGLE project, 4/2/98 - 12/1/98. Data collected every 30 minutes.		
Library No.	LM10028	PI:	Michael Settles
Description	NEMA and NOAA wind speed and direction, wave height and period data for six stations in Lake Michigan, retrieved from ACOE Web Site (http://bigfoot.wes.army.mil/c300.html). 1980-1998 (not all stations cover entire date range). NEMO-Daily data, NOAA-Hourly data.		
Library No.	LM10029	PI:	Keri Hornbuckle
Description	Daily gas phase congener, total PCBs, and *trans*-nonachlor concentration data for LMMBP 5 km grid. Covers time period: 1/1/94 - 9/30/95.		
Library No.	LM10030	PI:	Catherine Taylor
Description	Sedflume data gathered from Catherine Taylor's masters thesis. Excel files contain erosion data at different energy levels and graphs of shear stress at different erosional stresses.		
Library No.	LM10031	PI:	Ronald Rossmann
Description	Surficial sediment/sediment trap mercury data collected during eight LMMBP cruises, 7/18/94 - 8/28/95. Surficial sediment samples collected by R. Rossmann, trap samples by Brian Eadie, NOAA. All analysis by R. Rossmann. D-base files from RDMQ output. GLNPO Focus LLSH.		
Library No.	LM10032	PI:	Keri Hornbuckle
Description	Congener, total PCBs, *trans*-nonachlor monthly and annual loading and flux data (particulate and precipitation data) for eight land stations around Lake Michigan and from Lake Guardian. Monthly and annual precipitation loading for LMMBP 5 km grid (text files). 4/94 - 9/95.		
Library No.	LM10033	PI:	Ken Klewin
Description	Nutrient data (chlorophyll, NO_2+NO_3, silica, total dissolved phosphorus, and total phosphorus for 1998 spring and summer GLNPO surveys of all five Great Lakes. Lake Michigan data was collected 4/25/98 - 5/10/98 and August 1998 - first week in September 1998.		
Library No.	LM10034	PI:	Rich Quintal
Description	1994-1995 Lake Michigan diet, length, weight, age, and migration data (coho only) for forage fish, coho salmon and lake trout. Data compiled by Lauri Davis based on data received from R. Quintal.		
Library No.	LM10035	PI:	Marcia Kuehl
Description	Open water congener PCBs and *trans*-nonachlor data collected during eight LMMBP cruises, 4/24/94 - 10/13/95. Data analyzed by Battelle Marine Science Lab (Focus: BALP).		
Library No.	LM10036	PI:	Deborah Swackhamer
Description	Lower food chain (phytoplankton, zooplankton, *Mysis, Diporeia*) congener PCBs, total PCBs, *trans*-nonachlor, lipids and moisture data collected during LMMBP cruises (6/17/94 - 10/10/95). Focus group: MNPP.		
Library No.	LM10037	PI:	James Hickey
Description	Lipids, moisture, congener PCBs data for composite samples of two predator fish species (coho salmon, lake trout) and five forage fish (alewife, bloater, deepwater sculpin, slimy sculpin, and smelt). Length/weight data also. Data collected during LMMBP.		

Library No.	LM10038	PI:	Ken Klewin
Description	Nutrient data (chlorophyll, dissolved and total phosphorus, dissolved silica, NO_2+NO_3) collected and analyzed by GLNPO for spring (4/9 - 4/30/00) and summer (8/2 - 8/28/00) 2000 cruises for selected stations for all five Great Lakes. Note: File is a Lotus 123 file, the rest are Excel files.		
Library No.	LM10039	PI:	Glenn Warren
Description	Seabird chlorophyll *a* transmissivity profiles for eight LMMBP cruises (4/25/94 - 10/13/95). Chlorophyll *a* calculated by John Goldsmith, GLNPO. Most 1/2 m depth intervals.		
Library No.	LM10040	PI:	Pat Van Hoof
Description	Surficial sediment and sediment trap PCB congeners, total PCBs, and *trans*-nonachlor data collected 10/5/94 - 5/22/96 (surficial), 7/4/94 - 8/28/95 (traps), analyzed by Pat Van Hoof. Samples are from top 1 cm of box and gravity cores, and ponar samples.		
Library No.	LM10041	PI:	David Hall
Description	Daily tributary loading data (1/1/94 - 12/31/95) for PCB congeners, total PCBs, and *trans*-nonachlor for 11 monitored and 18 unmonitored tributaries to Lake Michigan. Data analyzed by Wisconsin Laboratory of Hygiene. Loading estimates by David Hall and Faye Blondin.		

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Appendix 1.3.4. Generalized Format for the LMMBP Water Data to be Analyzed With IDL Programs

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
1 - 7	Cruise Name	A7	A	Blank
8 - 8	Blank Space	1X	N/A	N/A
9 - 14	Latitude (ddd.ddd)	F6.3		Blank
15 - 15	Blank Space	1X	N/A	N/A
16 - 22	Longitude (-ddd.ddd)	F7.3		Blank
23 - 23	Blank Space	1X	N/A	N/A
24 - 35	Station Name	A12	A	Blank
36 - 36	Blank Space	1X	N/A	N/A
37 - 44	Depth Sampled	F8.0	A	Blank
45 - 45	Blank Space	1X	N/A	N/A
46 - 53	Sampling Start Date (mm/dd/yy)	A8	A	Blank
54 - 54	Blank Space	1X	N/A	N/A
55 - 58	Sampling Start Time (24-hour clock)	A4		Blank
59 - 59	Blank Space	1X	N/A	N/A

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
60 - 67	Sampling End Date (mm/dd/yy)	A8	A	Blank
68 - 68	Blank Space	1X	N/A	N/A
69 - 72	Sampling End Time (24-hour clock)	A4		Blank
73 - 73	Blank Space	1X	N/A	N/A
74 - 75	Filter Fraction	A2	A	Blank
76 - 76	Blank Space	1X	N/A	N/A
77 - 79	Sample Type	A3	D	Blank
80 - 80	Blank Space	1X	N/A	N/A
81 - 88	Value Parameter 1	F8.0		-9999
89 - 103	Parameter 1 Flags	A15		Blank
104 - 111	Value Parameter 2	F8.0		-9999
112 - 126	Parameter 1 Flags	A15		Blank
				
	Value Parameter n	F8.0		-9999
	Parameter n Flags	A15		Blank

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Appendix 1.3.5. Generalized Format for the LMMBP Sediment Data to be Analyzed With IDL Programs

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
1 - 6	Latitude (ddd.ddd)	F6.3		Blank
7 - 7	Blank Space	1X	N/A	N/A
8 - 14	Longitude (-ddd.ddd)	F7.3		Blank
15 - 15	Blank Space	1X	N/A	N/A
16 - 27	Station Name	A12	A	Blank
28 - 28	Blank Space	1X	N/A	N/A
29 - 36	Station Depth	F8.0		Blank
37 - 37	Blank Space	1X	N/A	N/A
38 - 47	Sampling Start Date (mm/dd/yyyy)	A10		Blank
48 - 48	Blank Space	1X	N/A	N/A
49 - 58	Sampling End Date (mm/dd/yy)	A8		Blank
59 - 59	Blank Space	1X	N/A	N/A
60 - 65	Top of Core Slice	F6.0	A	Blank
66 - 66	Blank Space	1X	N/A	N/A

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
67 - 72	Bottom of Core Slice	F6.0		Blank
73 - 73	Blank Space	1X	N/A	N/A
74 - 75	Filter Fraction	A2	A	Blank
76 - 76	Blank Space	1X	N/A	N/A
77 - 79	Sample Type	A3	D	Blank
80 - 80	Blank Space	1X	N/A	N/A
81 - 87	Collection Method	A7		Blank
88 - 88	Blank Space	1X	N/A	N/A
89 - 96	Value Parameter 1	F8.0		-9999
97 - 111	Parameter 1 Flags	A15		Blank
112 - 119	Value Parameter 2	F8.0		-9999
120 - 134	Parameter 1 Flags	A15		Blank
				
	Value Parameter n	F8.0		-9999
	Parameter n Flags	A15		Blank

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Appendix 1.3.6. Generalized Format for the LMMBP Fish Data to be Analyzed With IDL Programs

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
1 - 13	Species	A13		Blank
14 - 14	Blank Space	1X	N/A	N/A
15 - 27	Biota Zone	A13		Blank
28 - 28	Blank Space	1X	N/A	N/A
29 - 41	Station Name	A13		Blank
42 - 42	Blank Space	1X	N/A	N/A
43 - 45	No. of Samples in Composite	I3		Blank
46 - 46	Blank Space	1X	N/A	N/A
47 - 49	Minimum Age	I3		Blank
50 - 50	Blank Space	1X	N/A	N/A
51 - 52	Maximum Age	I2		Blank
53 - 53	Blank Space	1X	N/A	N/A
54 - 58	Minimum Length	F5.0		Blank
59 - 59	Blank Space	1X	N/A	N/A
60 - 64	Maximum Length	F5.0		Blank

Beginning - Ending Columns	Variable Description	Format (A = Alpha, F = Floating Point No., I = Integer, X = Skip)	Sort Order (A = Ascending, D = Descending, Blank = None)	Missing Data Code
65 - 65	Blank Space	1X	N/A	N/A
66 - 87	Gender	A22		Blank
88 - 88	Blank Space	1X	N/A	N/A
89 - 99	Sampling Start Date (mm/dd/yyyy)	A11		Blank
100 - 100	Blank Space	1X	N/A	N/A
101 - 110	Sampling End Date (mm/dd/yy)	A10		Blank
111 - 111	Blank Space	1X	N/A	N/A
112 - 119	Parameter Units	A8		Blank
120 - 120	Blank Space	1X	N/A	N/A
121 - 128	Biota Part Sampled	A8		Blank
129 - 129	Blank Space	1X	N/A	N/A
130 - 137	Value Parameter 1	F8.0		-9999
138 - 138	Blank Space	1X	N/A	N/A
139 - 146	Value Parameter 2	F8.0		-9999
147 - 147	Blank Space	1X	N/A	N/A
				
	Value Parameter n	F8.0		-9999
	Parameter n Flags	A15		Blank

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Appendix 1.3.7. Documents From Marcia Kuehl Discussing How Total PCBs Were Calculated by Focus Group

PCBs total routines
2/28/01

IUAP: reported by PI as pcbtot, is in rdmq output. PI added all congeners except 30, 204, 14, 65, 166 , and in two cases 44 due to interference. As PI added prior to rdmq verification, INV data included in totals and totals not surrogate corrected. Dyncorp redid, using surrogate corrected values for summation and excluding INV results and #44 as indicated by PI. Values are called pcbtot2 in the rdmq output.

WSAP: PI added prior to rdmq verification and gave to modeler. Not reported to GLNPO and therefore not in rdmq output. INV data included in totals. Added all congeners except 30, 204, 14, 65, 166. Dyncorp did totals, using surrogate corrected values for summation and excluding INV results. Some samples have no pcbtot due to whole sample invalidated from biased Lake Guardian sampling location.

RUAP: PI added and included mention of protocol in ES&T journal article. Not reported to GLNPO and therefore not in rdmq output. Added all congeners except 30, 204, 14, 65, 166, and 4+10, 6, 8+5, 7+9 due to interference/contamination. Each sample had its associated field blank (FMB) subtracted from it. No mention of how to handle negative results included, but I would assume negative values revert become zero. Dyncorp did totals including INV results and blank subtraction with negative results reverting to zero. Totals were qualified as field blank corrected (FBC).

LHTP: Modeler added. Not reported to GLNPO and therefore not in rdmq output. INV data not included in totals. Added all congeners except 30, 204, 14, 65, 166. Dyncorp did using these rules and totals were verified against Faye Blondin's totals.

BALP: Not reported to GLNPO and therefore not in rdmq output. Excluded 14, 65, 166, 103, 30, 204 and any INV flagged results for first run at totals. Subsequent runs may also exclude INT, UNC values and/or replacement of zeros with a value (my thesis work). Some samples have no pcbtot due to whole sample invalidated due to extremely low surrogate recoveries. Dyncorp has done using these rules.

NASP: Not reported to GLNPO and therefore not in rdmq output. PI developed routine which excludes congeners that had small peak heights: 12, 13, 77, 119, 129, 130, 189 and those with interference: 33, 49, 201 and low recoveries in QC spikes: 16, 19. All trap samples lab blank corrected on a congener by congener

basis, negative results become zero. Low level (< 4 ng/g) ponar samples lab blank corrected if total pcbs in lab blank is > 10% of total pcbs in sample, blank correction done on a congener by congener basis, negative results become zero. If > 33% of blank corrected results are 0, and/or NAI, pcbtot flagged with LOB. Any lab blank corrected pcbtot values flagged with (LBC). INV results excluded from any pcbtot calculation. Dyncorp has done using these rules.

MNPP: As per PI: " We generally summed all congeners, and those below the MDL were assigned a value of zero for summation purposes. HOWEVER we then applied lots of expert judgement in looking at the sums, and applied some other criteria (for instance, if a single congener made up more than 10% of the mass of the sum we rejected it entirely) - and if you simply sum you will definitely get different results than we are publishing (on a significant number of samples)." PI supplied totals using below MDL values as reported and considering them zero. I chose to have Dyncorp enter the PI totals that used the below MDL values in the total as the biggest difference between the two methods was $\leq$ 7 %.

BSFP: Not reported to GLNPO and therefore not in rdmq output. Added all congeners reported (no 14, 65, 166, 30, 204 reported for BSFP) for each RFS. No INV DATA TO BE INCLUDED.

Spreadsheet Highlighting Differences and Similarities in How Total PCBs Were Calculated In Different LMMBP Focus Groups

FOCUS	INV Flagged Congeners Excluded	Surrogate Corrected	LOB Flagged Congeners Excluded*	HIB Flagged Congeners Excluded*	MDL Flagged Congeners Excluded*	Blank Corrected	Other Conditions
IUAP	Y	Y	N	N	Y	N	BZ #44 excluded in two cases
WSAP	Y	Y	N	N	Y	N	
RUAP	Y	N	N	N	Y	Y, flagged FBC*	If field blank subtraction yielded negative value, reverted to 0
BALP	Y	Y	N	N	Y	N	
LHTP	Y	Y	N	N	Y	N	
NASP	Y	Y	N	N	Y	Y, flagged LCB*, LOB* if > 33% results = 0 or NAI*	If lab blank correction yielded neg. value, reverted to 0. Small peak height congeners excluded: BZ#12, 13, 77, 119, 129, 130, 189. Excluded congeners with interferences: BZ# 33, 49, 201. Excluded low matrix spike recovery congeners: BZ# 16, 19.
MNPP	Y	Y	N	N	Y	N	"Expert judgment" and any congener > 10% total was excluded and retotal done
BSFP	Y	Y	N	N	Y	N	

*Key to Flags: LOB = Low Bias Flag, HIB = High Bias Flag, MDL = Method Detection Limit Flag, FCB = Field Corrected Blank, LCB = Lab Corrected Blank, NAI = Not Analyzed Due to Interference Flag

PART 1

INTRODUCTION

Appendix 1.3.8. Uncertainty of Z Values (Slope of Linear Regression Line) for PCBs in Media Modeled at the LLRS for the LMMBP

Media	Z - Mean	Z - sd	Number of Samples	95% Confidence Interval Lower	95% Confidence Interval Upper
Dissolved Water	1.53924569	0.290911927	369	1.509305468	1.569185912
Particulate Water	1.353079101	0.120677122	372	1.340709374	1.365448829
Surficial Sediment	1.17528269	0.05661207	132	1.16550663	1.18505875
Phytoplankton	1.432619553	0.355361646	86	1.356363486	1.50887562
Zooplankton	1.462624095	0.399167732	77	1.371918262	1.553329928
Diporeia	1.3641858	0.0432741	42	1.3506909	1.3776807
Mysis	1.312835	0.04129	62	1.302347	1.323322
Alewife <120mm	1.439713618	0.140086181	60	1.403380756	1.47604648
Alewife >120mm	1.434390619	0.08071193	70	1.415096777	1.45368446
Bloater <160mm	1.479266265	0.049654336	70	1.467396609	1.491135922
Bloater >160mm	1.487545716	0.109039931	67	1.46090302	1.514188411
Deepwater Sculpin	1.533308409	0.089680915	74	1.512520571	1.554096246
Slimy Sculpin	1.495781353	0.110647788	69	1.469140496	1.52242221
Adult Smelt	1.44344149	0.166498179	73	1.41625314	1.470629841
Adult Lake Trout	1.489208126	0.06449037	246	1.481079185	1.497337067

Coho Salmon - Hatchery	1.280547696	0.028621549	5	1.245015047	1.316080345
Coho Salmon - Yearling	1.485910089	0.112380374	8	1.391942816	1.579877362
Coho Salmon - Adult	1.448267317	0.074873035	54	1.427797757	1.468736876

Z values for the LMMBP Total PCBs Data in Various Media. Z = Y/X, where X = Sum of all modeled congeners, as measured by Principal Investigator (PI), and Y = PI Calculated Total PCBs.

Notes from David Miller, Statistician at the LLRS:

"I used Histograms with a normal distribution overlayed upon them as well as quantile-quantile plots (Q-Q Plots) to analyze these data sets for normality.

The assumption of normality appears to be supported for these data sets, although the following observations should be noted.

Dissolved and particulate water, surficial sediment, phytoplankton, zooplankton, deepwater sculpin, and adult coho, appear to exhibit some degree of kurtosis. Thus, the confidence intervals for the mean of these data sets will be conservative.

Bloater >160mm and adult lake trout appear to have a few values at the upper end of the distribution that fall higher than the rest of the distribution (appear under-represented according to a quantile-quantile plot).

Surficial sediments have some outlying values on the low end of the distribution as examined by the quantile-quantile plot.

Coho salmon - Hatchery and coho salmon - Yearling have too few data to make a determination."