2001 annual fish and shellfish report

Massachusetts Water Resources Authority

Environmental Quality Department
Report ENQUAD 2002-14

Citation:

Lefkovitz L, Abramson S, Hillman R, Moore M, and Field J. 2002. 2001 annual fish and shellfish report. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2002-14. p. 175.

FINAL

2001 ANNUAL

FISH AND SHELLFISH REPORT

submitted to

MWRA Water Resources Authority
Environmental Quality Department
100 First Avenue
Charlestown Navy Yard
Boston, MA 02129
(617) 242-6000

prepared by

Lisa Lefkovitz[1]
Stacy Abramson[1]
Dr. Robert Hillman[1]
Dr. Michael Moore[2]
Jennifer Field[1]

[1]Battelle
397 Washington Street
Duxbury, MA 02332
(781) 934-0571

[2]Woods Hole Oceanographic Institution
Woods Hole, MA 02543

August 2002

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

2.0 METHODS 2-1
2.1 Winter Flounder Monitoring 2-1
2.1.1 Stations and Sampling 2-1
2.1.2 Age Determination 2-1
2.1.3 Dissection of Fish 2-2
2.1.4 Histological Processing 2-2
2.1.5 Histological Analysis 2-2
2.1.6 Tissue Processing and Chemical Analyses 2-3
2.1.7 Data Reduction and Statistical Analyses 2-3
2.1.8 Deviations From the CW/QAPP 2-3
2.2 Lobster Monitoring 2-3
2.2.1 Stations and Sampling 2-4
2.2.2 Size and Sex Determination 2-4
2.2.3 Dissection of Lobster 2-4
2.2.4 Tissue Processing and Chemical Analyses 2-4
2.2.5 Data Reduction and Statistical Analyses 2-4
2.2.6 Deviations from the CW/QAPP 2-5
2.3 Mussel Bioaccumulation Monitoring 2-5
2.3.1 Stations and Reference Area 2-5
2.3.2 Mussel Collection 2-5
2.3.3 Mussel Deployment 2-5
2.3.4 Mussel Retrieval 2-6
2.3.5 Tissue Processing and Chemical Analyses 2-6
2.3.6 Data Reduction and Statistical Analyses 2-6
2.3.7 Deviations from the CW/QAPP 2-6
2.4 Chemical Analyses of Tissue Samples 2-7
2.4.1 Organic Tissue Extraction 2-7
2.4.2 Metals Tissue Digestion 2-7
2.4.3 Organic Analyses 2-8
2.4.4 Metals Analyses 2-8
2.5 General Data Treatment and Reduction 2-9
2.5.1 Statistical Analyses 2-10

3.0 RESULTS AND DISCUSSIONS 3-1
3.1 Winter Flounder 3-1
3.1.1 Fish Collected 3-1
3.1.2 Age/Length Parameters 3-1
3.1.3 External Condition 3-1
3.1.4 Inter-station Comparison of Liver Lesion Prevalence 3-1
3.1.5 Relationships Between Age, Length and Lesion Prevalence 3-2
3.1.6 Spatial Comparison of Tissue Contaminant Levels in 2001 3-2
3.1.6.1 Edible Tissue 3-2
3.1.6.2 Liver 3-2
3.1.7 Comparison of 2001 Contaminant Levels to Baseline Data 3-3
3.1.7.1 Edible Tissue 3-3
3.1.7.2 Liver 3-3
3.1.8 Relationship of Contaminant Levels to Threshold Values 3-3

TABLE OF CONTENTS (continued)

3.2 Lobster....3-4
3.2.1 Lobster Collection....3-4
3.2.2 Size, Sex, and External Conditions....3-4
3.2.3 Spatial Comparison of Tissue Contaminant Levels in 2001....3-4
3.2.3.1 Edible Tissue....3-4
3.2.3.2 Hepatopancreas....3-4
3.2.4 Comparison of 2001 Tissue Contaminant Levels to Baseline Data....3-5
3.2.4.1 Edible Tissues....3-5
3.2.4.2 Hepatopancreas....3-5
3.2.5 Relationship of Contaminant Levels to Threshold Values....3-5
3.3 Blue Mussel....3-6
3.3.1 Mussels Collected....3-6
3.3.1.1 Survival....3-6
3.3.2 Spatial Comparison of Tissue Contaminant Levels in 2001....3-6
3.3.2.1 Mercury and Lead....3-6
3.3.2.2 Polychlorinated Biphenyls....3-6
3.3.2.3 Pesticides....3-6
3.3.2.4 PAH Compounds....3-7
3.3.2.5 Lipid Results....3-7
3.3.3 Comparison of 2001 Contaminant Levels to Baseline Data....3-8
3.3.3.1 Mercury and Lead....3-8
3.3.3.2 Polychlorinated Biphenyls....3-8
3.3.3.3 Pesticides....3-8
3.3.3.4 PAHs....3-8
3.4 Relationship of Contaminants in Blue Mussel to Threshold Values....3-9
3.5 Evaluation of 2001 Mussel Tissue Contaminant Threshold Exceedance....3-9

4.0 CONCLUSIONS....4-1
4.1 Winter Flounder....4-1
4.2 Lobster....4-1
4.3 Blue Mussel....4-1

5.0 REFERENCES....5-1

TABLE OF CONTENTS (continued)

LIST OF TABLES

Table 2-1. Planned and Actual Sampling and Locations for Flounder Surveys. 2-11
Table 2-2. Planned and Actual Sampling and Locations for Lobster Surveys. 2-11
Table 2-3. Planned and Actual Sampling and Locations for Mussels Surveys. 2-11
Table 2-4. Summary of Mussel Deployment Scheme. 2-12
Table 2-5. Summary of Chemical Analyses Performed by Organism. 2-12
Table 2-6. Fish and Shellfish Sample Analyses. 2-13
Table 2-7. Specific Chemical Analytes Included in Tissue Chemistry Analyses. 2-14
Table 2-8. Statistical Analyses Performed by Tissue Type. 2-15
Table 3-1. Catch per Unit Effort (CPU) for Winter Flounder Trawled in April 2001. 3-11
Table 3-2. Summary of Physical Characteristics of Winter Flounder Collected in 2001. 3-11
Table 3-3. Prevalence (%) of Lesions in Winter Flounder Liver from Five Stations in Massachusetts and Cape Cod Bays – 2001. 3-12
Table 3-4. ANOVA Results Comparing Contaminant Concentrations in Flounder Fillets in 2001. 3-12
Table 3-5. ANOVA Results Comparing Contaminant Concentrations in Flounder Livers in 2001. 3-13
Table 3-6. Comparison of MWRA Caution and Warning Levels to Mean 2001 Flounder Fillet Concentrations for Selected Parameters. 3-14
Table 3-7. Mean Length, Weight, and Sex Ratio of Lobsters Collected in 2001. 3-15
Table 3-8. Mean Score – 2001 Lobster External Condition. 3-15
Table 3-9. ANOVA Results Comparing Contaminant Concentrations in Lobster Meat in 2001. 3-15
Table 3-10. ANOVA Results Comparing Contaminant Concentrations in Lobster Hepatopancreas in 2001. 3-16
Table 3-11. Comparison of MWRA Caution and Warning Levels to Mean 2001 Lobster Meat Concentrations for Selected Parameters. 3-16
Table 3-12. Samples Collected During 40-day Retrieval. 3-17
Table 3-13. Samples Collected During 60-day Retrieval. 3-17
Table 3-14. 2001 Caged Mussels Survival Data. 3-17
Table 3-15. ANOVA Results Comparing Contaminant Concentrations in Deployed Mussels in 2001. 3-18
Table 3-16. T-test Results Comparing Contaminant Levels in Deployed Mussels with Pre-deployed Mussels in 2001. 3-19
Table 3-17. Summary of PAH Lists of Analytes Used for Bioaccumulation Study 1992 - 2001. 3-20
Table 3-18. Comparison of MWRA Caution and Warning Levels to Mean 2001 Mussel Concentrations for Selected Parameters. 3-21
Table 3-19. Predicted Mussel Concentrations Over a Range of Dilutions Compared to Measured Concentrations in OS Mussels. 3-21

TABLE OF CONTENTS (continued)

LIST OF FIGURES

Figure 1-1. Boston Harbor and the Bays with Outfall Site. 1-2
Figure 2-1. Flounder Monitoring Locations. 2-16
Figure 2-2. Lobster Monitoring Locations. 2-17
Figure 2-3. Mussel Collection and Deployment Locations. 2-18
Figure 3-1. Temporal Comparison of Neoplasia Prevalence by Station Over Time. 3-22
Figure 3-2. Temporal Comparison of Prevalence of Centrotubular Hydropic Vacuolation by Station Over Time. 3-23
Figure 3-3. Centrotubular Hydropic Vacuolation Severity Compared Between Sites and Years. 3-24
Figure 3-4. Total PCB in Flounder Fillets at the Five Collection Sites from 1992-2001. 3-25
Figure 3-5. Total DDT in Flounder Fillets at the Five Collection Sites from 1992-2001. 3-25
Figure 3-6. Mercury in Flounder Fillets at the Five Collection Sites from 1992-2001. 3-26
Figure 3-7. Total PCB in Flounder Livers at the Five Collection Sites from 1992-2001. 3-26
Figure 3-8. Total DDT in Flounder Livers at the Five Collection Sites from 1992-2001. 3-27
Figure 3-9. Mercury in Flounder Livers at the Five Collection Sites from 1992-2001. 3-27
Figure 3-10. Lead in Flounder Livers at the Five Collection Sites from 1992-2001. 3-28
Figure 3-11. Total PCB in Lobster Meat at DIF, OS, and ECCB from 1992-2001. 3-28
Figure 3-12. Total DDT in Lobster Meat at DIF, OS, and ECCB from 1992-2001. 3-29
Figure 3-13. Mercury in Lobster Meat at DIF, OS, and ECCB from 1992-2001. 3-29
Figure 3-14. Total PCB in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001. 3-30
Figure 3-15. Total DDT in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001. 3-30
Figure 3-16. Mercury in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001. 3-31
Figure 3-17. Lead in Lobster Hepatopancreas at DIF, OS and ECCB from 1992-2001. 3-31
Figure 3-18. Silver in Lobster Hepatopancreas at DIF, OS and ECCB from 1992-2001. 3-32
Figure 3-19. Mercury in 2001 Pre-deployed Mussels and Four Deployment Locations. 3-32
Figure 3-20. Lead in 2001 Pre-deployed Mussels and Four Deployment Locations. 3-33
Figure 3-21. Total PCB in 2001 Pre-deployed Mussels and Four Deployment Locations. 3-33
Figure 3-22. Pesticides in 2001 Pre-deployed Mussels and Four Deployment Locations. 3-34
Figure 3-23. Total Low and High Molecular Weight PAHs in 2001 Pre-deployed Mussels and Four Deployment Locations Using the Total PAH List. 3-34
Figure 3-24. Mercury in Pre-deployed and Deployed Mussels from 1993-2001. 3-35
Figure 3-25. Lead in Pre-deployed and Deployed Mussels from 1991 and 1993-2001. 3-35
Figure 3-26. Total PCB in Pre-deployed and Deployed Mussels from 1991-2001. 3-36
Figure 3-27. Total DDT in Pre-deployed and Deployed Mussels from 1991-2001. 3-36
Figure 3-28. Total Chlordane in Pre-deployed and Deployed Mussels from 1991-2001. 3-37
Figure 3-29. Total PAHs (Using the "Historical NOAA List") in Pre-deployed and Deployed Mussels from 1991-2001. 3-38

TABLE OF CONTENTS (continued)

APPENDICES

Appendix A: Summary of Measurement Program from 1992 - 2001
Appendix B: Summary Tables of Lipids (% dry wt), PCB/Pesticide, PAH and Metals for Individual Composites of Flounder, Lobster and Mussels
Appendix C: Historical Data Tables
Appendix D: Results of Statistical Analyses
Appendix E: Additional Figures of Contaminant Concentrations

EXECUTIVE SUMMARY

The Massachusetts Water Resources Authority (MWRA) continued to conduct its biomonitoring program for fish and shellfish in 2001. The 2001 activities represent the latest year in a continuing biomonitoring program that supports evaluation of the MWRA effluent discharged into Massachusetts Bay and also represents the first year of post-discharge monitoring. All 2001 Fish and Shellfish samples were collected after the outfall went on-line in September 2000. The goal of the biomonitoring program is to obtain data that may be used to assess the potential environmental impact of the effluent discharge on Massachusetts Bay, and to evaluate the facility's compliance against the NPDES effluent discharge permit.

The specific objective of the 2001 fish and shellfish monitoring program was to define the post-discharge condition of three indicator species: winter flounder (*Pseudopleuronectes americanus*), lobster (*Homarus americanus*), and blue mussel (*Mytilus edulis*). Flounder and lobster specimens were collected from three core sites in Boston Harbor and the Bays: Deer Island Flats (DIF), the Outfall Site (OS), and East Cape Cod Bay (ECCB). Flounder were also collected at two ancillary sites, Broad Sound (BS) and off Nantasket Beach (NB), to provide information on flounder in the general area of the former Deer Island outfall. Caged mussels, collected from Rockport, MA, were deployed at sites in Boston Harbor and the Bays to evaluate bioaccumulation potential. All collection (except Broad Sound and off Nantasket Beach) and deployment sites are discussed in the 2001 Fish and Shellfish Report in terms of chemical contaminants. Histological parameters are considered in flounder only.

Post-discharge conditions of the species collected were characterized in terms of biological parameters (*e.g.* length, weight, age); external condition; and concentrations of organic and inorganic compounds in both edible and liver/hepatopancreas tissue. Flounder livers were examined for the extent and severity of lesions. The monitored parameters were examined for spatial distribution among stations in 2001 and inter-annual variations from previous monitoring data. In addition, body burdens of certain pesticides, PCBs, lead and mercury were compared to FDA Action Limits and monitoring program threshold values to evaluate potential risk or trends.

Flounder

Winter flounder were collected at the five established monitoring locations in 2001. The mean length, weight, and age of fish collected at DIF was higher than the other stations. The external condition of fish indicated few abnormalities. While low at all stations, a fin erosion index was higher at Deer Island than other stations.

Flounder liver histology results indicated that the prevalence of tubular and centrotubular hydropic vacuolation (CHV) was highest at DIF and absent at ECCB. Inter-annual comparison showed that CHV prevalence has decreased substantially at NB and BS since 1991. Also, CHV prevalence at OS fell sharply from 2000 levels and rose slightly at DIF. Neoplasm prevalence at DIF has fallen from elevated levels in the 1980's to undetectable levels during the period 1992-2001.

Fifteen winter flounder were collected at each of the three core locations (DIF, OS, ECCB) for chemical analysis of edible and liver tissues. The spatial patterns of tissue contaminant levels in winter flounder were examined. Mean 2001 concentrations of organic compounds in fillets were generally highest at DIF and lowest at ECCB. In general, metals were higher in fillet tissue and liver tissue at OS than at other sites.

Both tissue and liver organic contaminant levels for 2001 were consistently similar to or lower than those measured in the baseline period (1992-2000) at all stations. The highest concentrations are historically found at DIF and the lowest in ECCB. Mercury concentrations measured in edible tissue and liver were

similar to or lower than values measured in recent years. Concentrations of other metals were variable over the period from 1992-2001. Spatially, levels of most metals appeared to be higher at OS, rather than DIF, with concentrations of Pb, Cd, Cr, and Ni near the upper end of the historical range at OS.

Comparison was made between flounder edible tissue contaminant levels and MWRA Caution and Warning Thresholds, based on the baseline data and FDA Action Limits, respectively. The 2001 levels, like those detected in previous monitoring years (1992-2000), were well below the federal action limits and the MWRA Threshold Levels.

Lobster

Fifteen lobsters were collected at each of the three core monitoring stations for the 2001 study (DIF, OS, and ECCB). All lobsters were obtained from commercial traps located within the vicinity of the designated sampling stations. The size, sex, and external appearance (*i.e*. black gill disease, shell erosion, external tumors, etc.) were determined for the collected lobsters. Little difference in length and weight were noted among stations. The ratio of males and females, however, differed greatly between stations, with mostly males found at ECCB and DIF and mostly females collected at OS. No deleterious external conditions were noted.

Mean 2001 concentrations of organic compounds in edible tail meat tissue and the hepatopancreas were generally highest at DIF and lowest in ECCB. Mean mercury concentrations in the meat and hepatopancreas were highest at OS. Comparison of 2001 data with baseline years (1992-2000) indicates that most spatial distributions were similar. Concentrations of total PCB in lobster hepatopancreas continued to be elevated above pre-1995 levels at DIF. Total DDTs and total chlordanes have noticeably decreased compared to recent years and were similar to pre-1995 values at all three locations.

Comparison was made between contaminant levels in lobster edible tissue and MWRA Caution and Warning Thresholds, based on the baseline data and FDA Action Limits, respectively. The 2001 levels, like those detected in previous monitoring years (1992-2000), were well below the federal action limits and the MWRA Threshold Levels and indicate no risk for human consumption.

Mussels

Mussels were collected at one reference site (Rockport) and deployed for up to 60 days in arrays at Deer Island (DI), Boston Inner Harbor (BIH), Outfall Site (OS), and Cape Cod Bay (CCB). A full set of arrays was successfully retrieved at sixty-days from DI, BIH, OS, and CCB. Mussel survival within the deployed arrays upon recovery was high (≥98%).

The 2001 data were similar to previous years with the highest body burdens of contaminants generally observed in mussels deployed in BIH and the lowest concentrations in mussels deployed at OS or CCB. Concentration of total chlordane, however, was highest in mussels deployed at OS.

Comparison was made between mussel tissue contaminant levels and MWRA Caution and Warning Thresholds, based on the baseline data and FDA Action Limits (for Total PCBs, pesticides, Total PAHs, mercury, and lead only). The 2001 levels of Total PAHs and Total Chlordane exceeded the MWRA Caution Thresholds set for these compounds. An investigative study was conducted to further the understanding of the factors that lead to this unexpected exceedance.

Results of this study showed that the PAH and chlordane concentrations measured in the mussels deployed in the vicinity of the outfall in 2001 appear to be consistent with predictions based on recent theory of bioaccumulation in mussels. Although thresholds were exceeded, an evaluation of published effects indices and standard risk analysis indicated that the potential environmental impact from these exceedances are low or non-existent.

While this study has lead to a further understanding of many of the factors that controlled the exceedances of PAHs and chlordane in deployed mussels in 2001, several factors were identified as being critical to the prediction of levels of contaminants in caged mussels. These factors include:

- Duration and frequency of exposure to the diluted effluent plume,
- Ambient water contaminant concentrations,
- Effluent contaminant concentrations,
- Measurement errors and estimates of K_{ow}.

Further deployments and more rigorous effluent testing during the deployment period in 2002 may help to gain additional insight into some of these items and help determine if the present threshold values and/or deployment locations are appropriate for the intended purpose of the fish and shellfish monitoring program

1.0 INTRODUCTION

The Massachusetts Water Resources Authority (MWRA) has implemented a long-term Harbor and Outfall Monitoring (HOM) Program for Massachusetts and Cape Cod Bays. The objectives of the HOM Program are to test whether the environmental impacts of the MWRA discharge are consistent with SEIS projections and do not exceed any Contingency Plan thresholds (MWRA 2001a). A detailed description of the monitoring and its rationale is provided in the Effluent Outfall Monitoring Plan developed for the baseline period and the post-discharge monitoring plan (MWRA 1997).

One aspect of the MWRA HOM program is a long-term biomonitoring program for fish and shellfish (MWRA, 1991). The goal of the biomonitoring is to provide data that may be used to assess potential environmental impact of effluent discharge into Massachusetts Bay. This data will be used to ensure that discharge from the new outfall does not result in adverse impacts to fish and shellfish by comparing values with established thresholds (MWRA 2001a).

The objective of the fish and shellfish monitoring is to define the condition of three indicator species: winter flounder (*Pseudopleuronectes americanus),* lobster (*Homarus americanus),* and blue mussel *(Mytilus edulis*). Measured parameters include length, weight, biological condition, the presence of external or internal disease, and inorganic and organic contaminant tissue concentrations. This characterization of the health of winter flounder, lobster, and mussel in Boston Harbor, Massachusetts Bay, and Cape Cod Bay (hereafter: Boston Harbor and the Bays) forms the basis for assessing potential changes resulting from the relocation of the outfall discharge (Figure 1-1).

The scope of the 2001 fish and shellfish report is focused primarily towards comparing the biomonitoring data collected during 2001 to the baseline biomonitoring data collected from 1992 through 2000. 2001 data represent the first year of monitoring after the start up of the Massachusetts Bay outfall. The report first provides a summary of the survey and laboratory methods (Section 2). Section 3 presents the results of biomonitoring data from surveys conducted during 2001, as well as selected data from previous studies, and Section 4 presents the conclusions drawn from the 2001 survey results and historical trends. Finally, recommendations for future sampling and analyses are summarized in Section 5.

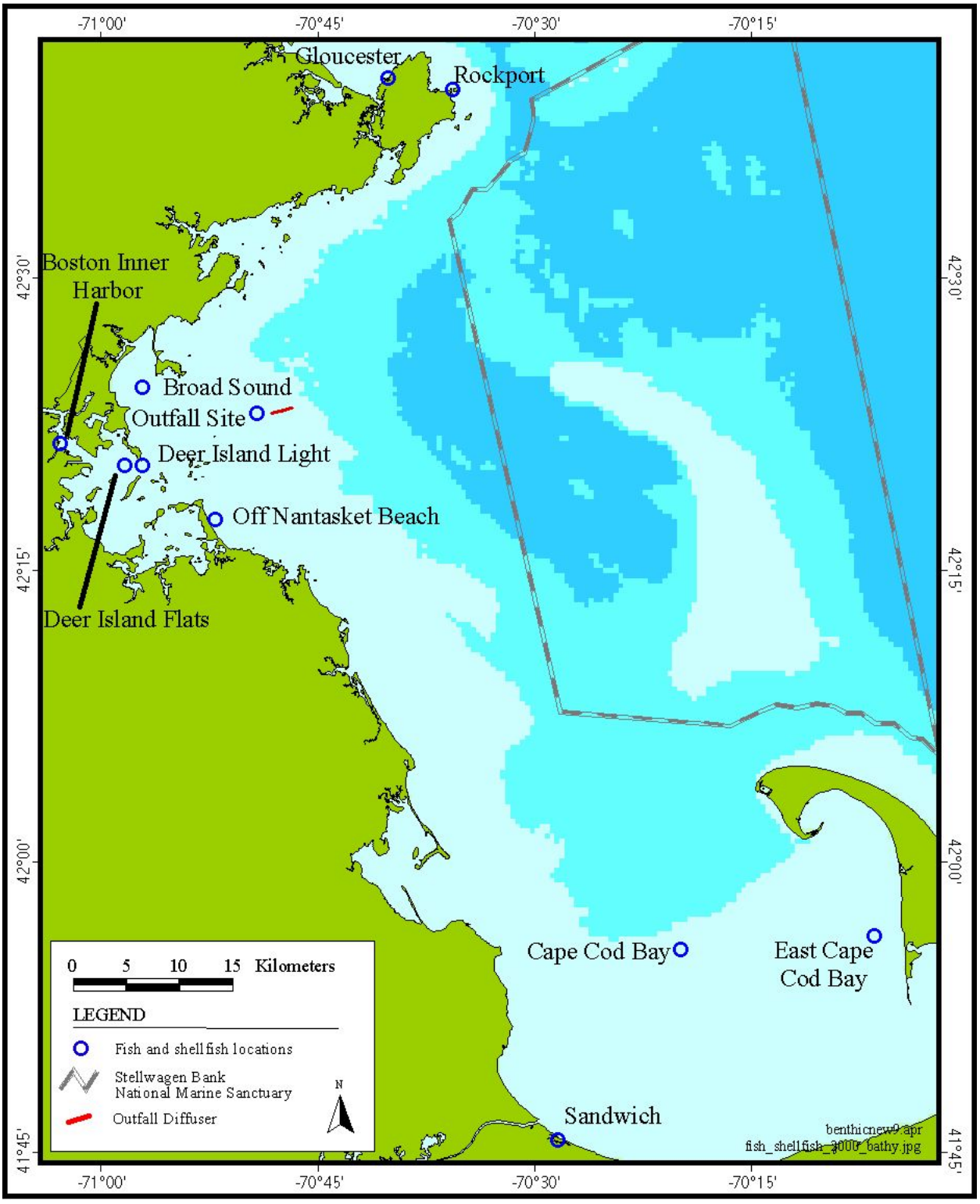


Figure 1-1. Boston Harbor and the Bays with Outfall Site.

2.0 METHODS

This section provides an overview of the methods and protocols used in the three surveys conducted to collect biological specimens. More detailed descriptions of the methods are contained in *Fish and Shellfish Monitoring CW/QAPP for the Fish and Shellfish Monitoring 1998-2001* ((*Fish and Shellfish Monitoring CW/QAPP)* Lefkovitz *et al*., 2001).

2.1 Winter Flounder Monitoring

Winter flounder *(Pseudopleuronectes americanus)* were collected from 5 locations in Boston Harbor and the Bays to obtain specimens for age, weight, and length determination, gross examination of health, histology of livers, and chemical analyses of tissues to determine contaminant exposure. Chemical data were used to determine whether contaminant tissue burdens approach human health consumption limits.

2.1.1 Stations and Sampling

The 2001 flounder survey was conducted on April 25, 26, and 29, 2001. Five sites were sampled to collect winter flounder for histological and chemical analyses:

- Deer Island Flats (DIF)
- Off Nantasket Beach (NB)
- Broad Sound (BS)
- Outfall Site (OS)
- East Cape Cod Bay (ECCB).

Table 2-1 provides the planned and actual sampling sites and locations for the 2001 flounder sampling. Adjustments in location and time were made to maximize collection efforts in an attempt to collect the required 50 flounder per site. Figure 2-1 shows the monitoring locations.

At each of the five designated sampling sites, otter-trawl tows were conducted from the F/V *Odessa* (captained by Captain William Crossen) to collect 50 sexually mature (4-5 years old, total length ≥30 cm) winter flounder. Thirty-five fish (at DIF, OS, and ECCB) and fifty fish (at NB and BS) were assigned unique identification numbers to indicate date, time, and site of collection. These fish were killed at sea by cervical section and used for histological processing. They were examined externally and their external condition noted prior to histological processing. The gonads of each flounder were examined to determine sexual maturity. All specimens were weighed, and total and standard lengths were determined. Scales were then taken from each specimen for age determination.

Of the flounder collected from DIF, OS, and ECCB, 15 were designated for tissue chemical analysis. Because contaminant-free conditions were not available on board the vessel, the fish used for chemical analysis were returned to the laboratory for organ dissection. These fish were maintained alive on-board and transported to Battelle (Duxbury) for histological and chemical analyses. These fish were also examined for external condition in the laboratory. Fifteen additional unique sample identification numbers were generated at sea at the time of fish collection, however, actual assignment of IDs to individual fish did not occur until the fish were sacrificed at the laboratory.

2.1.2 Age Determination

Scales from each specimen were collected for age determination. Scales were removed after first removing any mucus, debris, and epidermis from the dorsum of the caudal peduncle by wiping in the

direction of the tail with a blunt-edged table knife. Scales were then collected from the cleaned area by applying quick, firm, scraping motions in the direction of the head. The loosened scales were placed in the labeled age-sample envelope by inserting the knife between the liner of the sample envelope and scraping off the scales. The age of each flounder was determined by scientists at the National Marine Fisheries Services (NMFS) in Woods Hole, Massachusetts through analysis of growth rings (annuli).

2.1.3 Dissection of Fish

The flounder tissues were removed in the laboratory under contaminant-free conditions. Tissue processing was conducted in a Class-100 clean room. The fillets (muscle) were removed from the flounder and the skin was removed from the fillet, using a pre-cleaned (*i.e.*, rinsed with 10% HCL, Milli-Q (18 megohm) water, acetone, DCM, and hexane) stainless steel knife.

From each site, three composites were prepared; each composed of approximately equal masses of top and bottom tissue from five randomly chosen fish. Homogenization was performed using a stainless steel TEKMAR® tissuemizer. Each composite was placed in a sample container clearly identified with the unique sample identifier.

Livers from the 15 fish selected for chemical analyses were removed using a titanium knife and analyzed for chemical parameters, after sectioning for histopathology analysis. (Livers from the remaining 35 fish not used for chemical analyses were removed shipboard and processed as described below). Following the processing for histology analysis, the livers were individually homogenized by finely chopping with the titanium knife and divided into three separate composites to correspond to the composites made for the fillets (*e.g.*, the livers of the same five specimens used for each edible tissue composite were combined). This was done to ensure comparability between fillet and liver chemical analyses. Each composite was placed in a sample container clearly identified with the unique sample identifier. This resulted in 18 pooled samples for analysis in 2001 (9 pooled fillets and 9 pooled livers). The homogenized tissue and liver samples were frozen and stored. Any remaining tissue from each specimen was archived frozen in case additional analysis was required.

At least one homogenization blank was carried out for each batch of 20 fish to monitor for sample contamination during the homogenization process. For the blank sample, a known quantity (about 100 ml) of Milli-Q water was transferred to a clear glass jar and "tissuemized" for two minutes. The blank was held for analysis of both PCB/Pesticides and Hg (fillet measurements only).

2.1.4 Histological Processing

After the fish were completely examined and scales removed, the livers were removed (either on-board the ship or in the lab, as described above) and examined for visible gross abnormalities ("Gross Liver Lesion"). The livers were then preserved in 10% neutral buffered formalin for histological analysis. Liver samples from each fish were placed in a separate clearly labeled sample container.

2.1.5 Histological Analysis

Livers of 50 flounder from each site were prepared for histological analysis by Experimental Pathology Laboratories in Herndon, VA. Transverse sections of flounder livers fixed as part of tissue sample processing were removed from the buffered formalin after at least 24 hours, rinsed in running tap water, dehydrated through a series of ethanols, cleared in xylene, and embedded in paraffin. Paraffin-embedded material was sectioned on a rotary microtome at a thickness of 5 μm. Each block contained three liver slices, resulting in one slide with three slices per slide per fish and a total of 250 slides (50 fish X 5 sites). The sections were stained in hematoxylin and eosin.

Each slide was examined under bright-field illumination at 25x, 100x, and 200x to quantify the presence and extent of:

- Three types of vacuolation (centrotubular, tubular, and focal)
- Macrophage aggregation
- Biliary duct proliferation
- Neoplasia

The severity of each lesion was rated on a scale of 0 to 4, where: 0 = absent; 1 = minor; 2 = moderate; 3 = severe; and 4 = extreme. For each lesion and each fish, a histopathological index was then calculated as a mean of scores from three slices on one slide.

2.1.6 Tissue Processing and Chemical Analyses

Chemical analyses were performed on composite samples of flounder from DIF, OS, and ECCB. Two tissue types (fillet, liver) were analyzed. Flounder fillet and livers were analyzed for PCBs/Pesticides, lipids, and mercury. In addition, flounder livers were analyzed for PAHs, lead, silver, cadmium, chromium, copper, nickel, and zinc. The individual steps involved in the tissue processing and chemical analyses of these samples are detailed in Section 2.4 Chemical Analysis of Tissues.

2.1.7 Data Reduction and Statistical Analyses

Data reduction was conducted as described in the Fish and Shellfish Monitoring CW/QAPP (Lefkovitz *et al.*, 1998; Lefkovitz *et al.*, 2001) and in Section 2.5 of this report. Histopathological indices and prevalence of lesions were compared between classes of flounder by differences in station, age, sex and length. Chemical constituents were presented graphically and compared among stations using ANOVA analysis. Temporal patterns of contaminants in flounder fillet and liver tissue were evaluated through available data from 1992 through 2001.

Histopathological observations of the livers of the winter flounder from all sites were conducted and, where possible, comparisons of the results with those of previous years were made.

In addition to reporting the prevalence and lesion index of hydropic vacuolation, historical data has included several other lesions, including macrophage aggregates, biliary proliferation, neoplasia, and a lesion unreported before 1993, referred to as “balloon hepatocytes” (Hillman & Peven, 1995).

Where relevant, the levels of contaminants measured in edible tissues were compared to Food and Drug Administration (FDA) Action Levels (U.S. EPA, 1989) for those contaminants.

2.1.8 Deviations From the CW/QAPP

Station locations were determined by Loran and non-differential GPS, since the hand-held Garmin GPS required almost an hour to obtain a position fix based on local satellites. As a result, GPS-based latitude/longitude data were not obtained for the first Deer Island Flats trawl (0910 on 4/25/01). The lack of this backup data was not a serious problem, as the primary location was determined as planned from Loran readings, which were recorded for this trawl, and which confirmed the location to be within the selected area for sampling. This backup problem was resolved for all subsequent trawls, as the GPS remained appropriately calibrated to the closest satellites after the initial reading.

2.2 Lobster Monitoring

Lobsters *(Homarus americanus)* were collected from three sampling sites for gross examination (to determine specimen health) and chemical analyses (to determine tissue burden of contaminants).

2.2.1 Stations and Sampling

Lobster surveys were conducted on July 10, 2001 (DIF), August 22, 2001 (ECCB), and September 7, 2001 (OS).

Table 2-2 provides the planned and actual sampling sites and locations for the lobster surveys. Figure 2-2 illustrates the sampling locations in Boston Harbor and the Bays. Adjustments in location and time were made to maximize collection efforts and to coincide with the availability of commercial lobstermen and of lobster in the planned collection locations.

Lobsters were purchased from commercial lobstermen. The location was verified by placing a Battelle staff member on board during collection operations. Individual lobsters retained for analyses were assigned a unique identification number to indicate date, time, and site of collection. Lobsters were measured for carapace length and width and the gender was determined. Lobster specimens were visually examined and the condition noted. Processing of the hepatopancreas and edible tissue samples was conducted in the laboratory.

2.2.2 Size and Sex Determination

Carapace length was determined with calipers by measuring the distance from the posterior of the eye socket to the midpoint of the posterior of the carapace. Measurements were recorded to the nearest millimeter. Specimen weight was recorded to the nearest gram. Specimens were visually examined for the presence and severity of gross external abnormalities, such as black gill disease, shell erosion, and parasites. Data for each specimen were recorded on a lobster sample collection log.

2.2.3 Dissection of Lobster

The hepatopancreas was removed and frozen for chemical analysis. The tail and claw meat (edible tissue) was stored frozen in the shells until processed in the laboratory. Samples were placed in sample containers that were clearly identified with a conventional label containing the pertinent sample information.

The 15 lobsters collected at each site were randomly divided into three groups of five lobsters each. Within each of the three groups, edible meat (tail and claw) and hepatopancreas from the same five lobsters were pooled by tissue type. Homogenization of lobster meat was performed using a stainless steel TEKMAR® tissuemizer. Hepatopancreas samples were homogenized using a titanium knife to avoid metals contamination. Each composite was placed in a sample container clearly identified with the unique sample identifier. This resulted in 18 pooled samples for analysis in 2001 (nine edible meat samples and nine hepatopancreas samples).

2.2.4 Tissue Processing and Chemical Analyses

Chemical analyses were performed on the composite samples of lobster (edible meat and hepatopancreas). Edible lobster meat and hepatopancreas were analyzed for PCBs/Pesticides, lipids, and mercury. In addition, hepatopancreas samples were analyzed for PAHs, lead, silver, cadmium, chromium, copper, nickel, and zinc. The individual steps involved in the tissue processing and chemical analyses of these samples are detailed in Section 2.4 Chemical Analysis of Tissues.

2.2.5 Data Reduction and Statistical Analyses

Data reduction was conducted as described in the Fish and Shellfish Monitoring CW/QAPP (Lefkovitz *et al.*, 1998; Lefkovitz *et al.*, 2001) and Section 2.5 of this report. Temporal patterns of contaminants in edible lobster tissue and hepatopancreas tissue were evaluated through available data from 1992 through

2001. Spatial distributions were analyzed among stations using ANOVA analysis. Comparisons were made to the FDA Action Limits and other appropriate levels of regulatory concern.

2.2.6 Deviations from the CW/QAPP

Lobster reports indicated that lobster collection was poor in 2001 due to cold water temperatures (Lazar, 2001). It was decided that to obtain lobsters from the Outfall Site, Battelle would pay Mr. Bob Carr to deploy and collect lobsters at the Outfall site in early September.

2.3 Mussel Bioaccumulation Monitoring

Blue mussels *(Mytilus edulis)* were collected from a reference location and deployed in suspended cages at three sites in Boston Harbor and the Bays. Mussels were recovered for determination of short-term accumulation of anthropogenic contaminants in soft tissues.

2.3.1 Stations and Reference Area

During the 2001 surveys, mussels were collected from a reference site in Rockport, MA and deployed at four sites:

- Off Deer Island Light (DI) (~2 m above bottom)
- Outfall Site (OS)
  - Outfall Site "B" Buoy (LNB)
  - Outfall Site Array 1 (M4)
  - Outfall Site Array 3 (4R)
- Boston Inner Harbor (BIH)
- Cape Cod Bay (CCB)

Table 2-3 provides the planned and actual sampling sites and locations. Figure 2-3 illustrates the sampling locations in Boston Harbor and Massachusetts Bay.

2.3.2 Mussel Collection

On June 25, 2001, approximately 2800 mussels were collected from Rockport, MA to be used for organic and inorganic analyses. Mussels were harvested during low tide and 480 mussels were individually checked for length. The length of the measured mussels ranged from 41 to 91 mm, with 35% of the mussels being smaller than 55 mm and 10% being larger than 65 mm. A sub-sample of Rockport mussels were randomly selected and set aside for pre-deployment biological and chemical analyses.

2.3.3 Mussel Deployment

After collection, the mussels were randomly distributed to plastic cages for deployment as an array (*i.e.*, set of cages) in sufficient number to provide the necessary biological material. At least 10% additional mussels were included to account for potential mortality. Mussels were deployed on June 26 and June 27, 2001 in replicate arrays at the four sites (Table 2-3 and Figure 2-3). Table 2-4 lists the minimum numbers of mussels and the number of cages and corresponding arrays that were deployed at each location.

At each location, a minimum of three arrays was deployed except for OS, where five arrays were deployed. Each array was deployed on a separate mooring and each with enough mussels to provide sufficient tissue to complete the study. The locations of the arrays were recorded using Differential Global Positioning System (DGPS).

2.3.4 Mussel Retrieval

Mussel retrieval was planned for two occasions with collection of up to one half of the mussels at 40-days to provide tissue in the event of failure of the 60-day collection. The 40-day retrieval occurred on August 7 and 8, 2001. At BIH, DIF, OS, and CCB, 60-day mussels were retrieved on August 27 and 28, 2001. Actual mussel recovery is discussed in Section 3.3. The amount of biofouling of the arrays was also assessed at 40 days.

2.3.5 Tissue Processing and Chemical Analyses

Individual mussels were pooled into a single composite for organic and inorganic (Hg and Pb) analyses. A total of five pooled samples, each containing 17 Rockport mussels deployed at and collected from DIF and BIH were created. At OS and CCB, eight pooled samples of 17 Rockport mussels each were created. Rockport pre-deployment mussels were also analyzed for organic and inorganic parameters. Details of actual mussel retrievals are discussed in Section 3.3.

Mussel composites were prepared from individual mussels by cleaning of attached material, removing all byssal threads and placing all soft tissue including fluids directly into a clean glass jar. Mussel composite samples were prepared for both organic and inorganic chemical analyses by homogenization using a Titanium Tekmar "tissumizer" rinsed with methanol and de-ionized water prior to use. A 20-gram split for metals analyses was taken using a titanium or Teflon utensil and placed in a pre-cleaned 4 ounce plastic jar. All composite splits were stored frozen prior to analysis.

Chemical analyses were performed on composite samples of mussel tissue. The mussel tissue was analyzed for PCBs/Pesticides, PAHs, lipids, mercury, and lead. The individual steps involved in the tissue processing and chemical analyses of these samples are detailed in Section 2.4 Chemical Analysis of Tissue Samples.

2.3.6 Data Reduction and Statistical Analyses

The extent of bioaccumulation of contaminants in the mussels was evaluated. Data reduction was conducted as described in the Fish and Shellfish Monitoring CW/QAPP (Lefkovitz *et al.*, 1998; Lefkovitz *et al.*, 2001) and in Section 2.5 of this report. The 2001 results were compared statistically to initial contaminant levels in the control mussels using two-sample t-tests. Further evaluation focused on spatial and temporal patterns in contaminant accumulation by ANOVA analysis.

2.3.7 Deviations from the CW/QAPP

Approximately 35% of the mussels collected at Rockport were smaller than the 55 mm minimum size specified in the Fish and Shellfish Monitoring CW/QAPP (Lefkovitz *et al.*, 1998; Lefkovitz *et al.*, 2001). The use of these smaller mussels was discussed with and approved by MWRA.

At the Outfall Site, the western-most two arrays, (numbers three and four) were inadvertently placed too close to the diffuser heads and were analyzed for organic and inorganic contaminants. As a result, the mussels that were analyzed from array number three (and the data generated from them) were held for review. Mussels from array number one, which was placed correctly, were then analyzed. The mussels from array number two were collected during the 40-day retrieval and archived. Due to the threshold exceedance, the mussels from the array placed closest to the Boston B-Buoy were analyzed at the request of MWRA for comparison to the Outfall Site mussels.

Instead of pooling mussels from separate sites for organics and inorganic analyses, as done in previous years, a single pool was prepared and homogenized. Each composite was then split for organic and inorganic analyses. In previous years (prior to 2000) mussels were collected from separate locations for organic and inorganic analyses and required separate pools. However, in 2001, all mussels were collected

from a single location (Rockport) and to create a more representative split for organics and inorganics, a single composite was prepared for each replicate. Due to the slightly smaller size of the Rockport mussels, relative to previous years, 2 additional mussels were included in the pooled samples, to provide sufficient mussel tissue to allow for potential re-analyses for organics.

2.4 Chemical Analyses of Tissue Samples

Table 2-5 summarizes the analyses performed on each type of tissue sample. Table 2-6 lists the analysis methods, units of measurement and method reference. The chemical analytes of interest are listed in Table 2-7. The same analytical methods were used for all tissues.

2.4.1 Organic Tissue Extraction

Tissues were extracted and cleaned following the procedures of Peven and Uhler (1993), as described in Battelle SOP 5-190. Approximately 30-g of tissue homogenate was weighed into a Teflon extraction jar, spiked with the appropriate surrogate internal standard (SIS), combined with 75 mL dichloromethane (DCM) and sodium sulfate, macerated with a Tissumizer, and centrifuged. An aliquot of the original sample was also taken for dry weight determination. The extract was decanted into an Erlenmeyer flask. This process was repeated once using 75 mL DCM. After each maceration, the centrifuged solvent extracts were combined in the Erlenmeyer flask. An additional extraction was performed using 50 mL DCM and shaking techniques, the sample centrifuged a third time, and the extract combined with the other two. A 10-mL aliquot of the combined extracts was removed for lipid weight determination. Lipid results were gravimetrically measured by evaporating the aliquot of organic extract and weighing the remaining residue. Results were reported in percent dry weight.

The combined extract was dried over sodium sulfate, processed through an alumina cleanup column, and concentrated to approximately 900-µL for additional HPLC cleanup. Raw extracts (post-alumina) were fractionated by HPLC (BOS SOP 5-191). The post-HPLC extract was concentrated under nitrogen to approximately 0.5 mL and spiked with recovery internal standard (RIS). Dry weight determinations were performed by oven drying a portion of each composite sample.

Extracts requiring both PCB/Pesticide and PAH analyses were split for analysis, one half remaining in DCM for PAH analysis, and the other half solvent-exchanged with isooctane for PCB and pesticide analysis.

2.4.2 Metals Tissue Digestion

Flounder Liver and Fillet; Lobster Hepatopancreas and Edible Tissue - To prepare flounder and lobster tissue samples for metals analysis, samples were freeze-dried and homogenized in a ball-mill. A 200- to 300-mg aliquot of each dried, homogeneous sample was digested using aqua regia (nitric and hydrochloric acids at a ratio of 5.0 mL: 3.5 mL) according to Battelle SOP MSL-I-006 *Aqua Regia Sediment and Tissue Digestion*. The freeze-dried tissue and digestion acids were combined in a Teflon bomb and heated in an oven at 130 ºC (±10 ºC) overnight. After heating and cooling, deionized water was added to the acid-digested tissue and the digestates were submitted for analysis.

Mussel Tissue - To prepare mussel tissue samples for metals analysis, samples were freeze-dried and homogenized in a ball-mill. An approximately 300-mg aliquot of each dried, homogeneous sample was digested using nitric acid according to Battelle SOP MSL-I-005 *Hot Nitric Acid Digestion of Sediments and Tissues*. The freeze-dried tissue and digestion acid were combined in a glass vial. The vials were loosely capped and heated on a hot plate at a temperature just high enough to boil the acid, without boiling over or evaporating the sample to dryness. After heating and cooling, deionized water was added to the acid-digested tissue and the digestates were submitted for analysis.

2.4.3 Organic Analyses

Organic analyses performed on the flounder, lobster, and mussel tissues included PAHs and PCB/Pesticides as summarized in Table 2-5.

PAH Analysis - Trace level organic compounds (PAH) were identified using electron impact gas chromatography/mass spectrometry (GC/MS). Target compounds were separated using an HP 5890 Series II gas chromatograph, equipped with a 60-m x 0.25-mm-inner diameter (0.25-um film thickness) DB-5 column (J&W Scientific), and measured using a HP 5972a mass selective detector operated in the selective ion monitoring (SIM) mode following Battelle SOP 5-157. Concentrations for all target analytes were determined by the method of internal standard, using SISs for quantification. All PAH results were reported in ng/g dry wt.

PCB/Pesticide Analysis - Pesticides and PCB congeners were analyzed and quantified using gas chromatography/electron capture detection (GC/ECD) (Hewlett Packard 5890 Series 2 GC) using a 60-m DBS column and hydrogen as the carrier gas following Battelle SOP 5-128, including a second column for confirmation. Concentrations for all target analytes were determined by the method of internal standard, using SISs for quantification. All PCB and pesticide results were reported in ng/g dry wt.

2.4.4 Metals Analyses

Analysis of Hg - Sample digestates were analyzed for Hg using cold-vapor atomic absorption spectroscopy (CVAA) according to Battelle SOP MSL-I-016 *Total Mercury in Tissues and Sediments by Cold Vapor Atomic Absorption*, which is based on EPA Method 245.6 *Determination of Mercury in Tissues by Cold Vapor Atomic Absorption Spectrometry* (EPA 1991a). Results were reported in units of µg/g on a dry-weight basis.

Analysis of Ag, Cd, Cr, Cu, Ni, Pb, and Zn - For analysis of multiple metals simultaneously, sample digestates were analyzed using inductively coupled plasma - mass spectrometry (ICP-MS) or by inductively coupled plasma – atomic emission spectrometry (ICP-AES). For analysis of a single element at a time (except Hg), sample digestates were analyzed by graphite furnace atomic absorption (GFAA).

ICP-MS analysis was conducted according to Battelle SOP MSL-I-022 *Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. This procedure is based on two methods modified and adapted for analysis of solid sample digestates, EPA Method 1638 *Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma - Mass Spectrometry* (EPA 1996) and EPA Method 1640 *Determination of Trace Elements in Water by Preconcentration and Inductively Coupled Plasma - Mass Spectrometry* (EPA 1997). Results were reported in units of µg/g on a dry-weight basis.

ICP-AES analysis was conducted according to Battelle SOP ML-I-027 *Determination of Metals in Aqueous and Digestate Samples by ICP/AES*. This procedure is based on EPA Method 200.7 *Determination of Metals and Trace Elements by Inductively Coupled Plasma-Atomic Emission Spectrometry* (EPA 1994) and SW-846 Method 6010B *Inductively Coupled Plasma-Atomic Emission Spectrometry* (update 12/96). Results are reported in units of µg/g on a dry-weight basis.

GFAA analysis was conducted according to Battelle SOP MSL-I-029 *Determination of Metals in Aqueous and Digestate Samples by GFAA*. This procedure is based on EPA Method 200.9 *Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry* (EPA 1991b). Results were reported in units of µg/g on a dry-weight basis.

2.5 General Data Treatment and Reduction

This section describes the data reduction performed on 2001 Fish and Shellfish data, as well as historical data, as part of the 2001 MWRA Harbor and Outfall Monitoring Project.

Specifics of data handling are as follows:

- All 2001 chemical data were generated at Battelle and loaded directly into the HOM database. During the preparation of the 1999 Fish and Shellfish Annual Report, data issues and inconsistencies in the historical data were identified and corrections were made to the database.
- All fish and shellfish data (2001 and historical) were extracted directly from the HOM database and exported into Excel files, where graphical presentations and statistical analyses were preformed.
- All laboratory duplicates for pre-1998 data were averaged for reporting and calculating. No laboratory duplicate data were entered for 1999, 2000, or 2001 data.
- Contaminant data were reported as mean, standard error, and *n* by station and year.
- 1992 flounder collection consisted of 3 individual fish and a composite of seven fish. Results were calculated by treating the composite as seven individual fish and averaging those values with the values of the other three individual fish (i.e., [(7*val1 +val2 + val3 + val4)/10]). MWRA decided that the appropriate standard error and *n* values for this composite are null (Appendix C). This manipulation was done in the script used to query the data from the database and is not reflected in the EM&MS database.
- 1993 lobster selection consisted of two animals collected in June and one in August. Results were calculated by taking the average of these three animals ($n = 3$). The difference in sample collection times was footnoted.
- Total PCB was calculated as the sum of twenty PCB congeners (Table 2-7).
- Total DDT was calculated as the sum of six DDT-related compounds: 2,4'-DDD, 4,4'-DDD, 2,4'-DDE, 4,4'-DDE, 2,4'-DDT, and 4,4'-DDT (Table 2-7).
- Total chlordane was calculated as the sum of four compounds: heptachlor, heptachlorepoxide, cis-chlordane, and trans-nonachlor (Table 2-7).
- For the temporal presentation and analysis of data, the "Historical NOAA List" was used to calculate Total PAHs (Table 3-17). For the spatial presentation and analysis of data, the "Total PAH List" was used to calculate Total PAHs.
- In 1995, the individual five alkylated PAHs on the "Historical NOAA List" were not measured in mussels. Instead, the C1-, C2-, and C3-alkylated napthalene homologue groups were quantified. To make 1995 results more comparable to the "Historical NOAA List", values for the individual alkylated naphthalene compounds were estimated using ratios of the individuals to their respective homologue groups from 1996 and 1997 data sets.
- The "f" qualifier was used to indicate compounds that were quantified but were below the detection limit. "f"-flagged data were included in the graphical presentation of results and the calculations of thresholds and baseline means.

- The "G" qualifier was used to indicate compounds that co-eluted with a second known/unknown compound. The values for "G"-flagged data are estimated values and were included in the graphical presentations of results and the calculations of thresholds and baseline means.
- The "s" qualifier was used to indicate suspect data. "s"-flagged data were not included in any calculations or graphs.
- The 'q" qualifier was used to indicate possibly suspect/invalid data that may not be fit for use. These data are currently under investigation and were not included in any calculations or graphs.
- All non-detects used in calculations and trend analyses in this report were treated as zero.
- All data entered into the database are in dry weight units.
- Wet weight tissue concentrations were calculated from the wet/dry ratio and used in comparison to MWRA Appreciable Change levels and FDA action levels.

2.5.1 Statistical Analyses

Statistical analyses were conducted to evaluate whether the various contaminant concentrations in flounder tissue (fillet and liver), lobster tissue (edible meat and hepatopancreas), and mussel tissue were significantly different between sampling sites. Table 2-8 presents the various chemical contaminant analyses for a given tissue type. A Single Factor Analysis of Variance (ANOVA) was used to evaluate each particular contaminant-tissue type combination (*e.g.*, total PCBs in flounder liver; total DDTs in flounder fillet; mercury in lobster meat; etc.).

All ANOVAs were run in SAS version 8.01 (SAS Institute Inc., 1999). Data were tested for normality and homogeneity of variance prior to running each ANOVA. In the few cases where the data were not normal or variances were not equal or both, data were log transformed and the ANOVA run. Following each ANOVA, multiple comparison procedures (between individual sites) were conducted. Tukey's Studentized Range Test was used for the individual comparisons between any two sites (for any particular tissue-contaminant combination). ANOVA results and individual site comparisons are presented by tissue type in Section 3.

Table 2-1. Planned and Actual Sampling and Locations for Flounder Surveys.

Station #	Station Abbrev.	Sampling Site	Number of Tows	Planned Locations		Actual Locations[1]	
				N Latitude	W Longitude	N Latitude	W Longitude
1	DIF	Deer Island Flats	4	42º20.4’	70º58.4’	42º21.0’	70º58.0’
2	NB	Off Nantasket Beach	2	42º17.6’	70º52.2’	42º17.4’	70º51.3’
3	BS	Broad Sound	3	42º24.4’	70º57.2’	42º24.4’	70º57.7’
4	OS	Outfall Site	1	42º23.1’	70º49.3’	42º22.9’	70º49.4’
5	ECCB	East Cape Cod Bay	1	41º56.2’	70º06.6’	41º58.2’	70º07.3’

[1]Based on an average of the Latitude and Longitude of several tows

Table 2-2. Planned and Actual Sampling and Locations for Lobster Surveys.

Station #	Station Abbrev.	Sampling Site	Planned Location		Actual Location	
			N Latitude	W Longitude	N Latitude	W Longitude
1	DIF	Deer Island Flats[a]	42º20.4’	70º58.4’	42º20.2’	70º48.5’
4	OS	Outfall Site[b]	42º23.1’	70º49.3’	41º55.6’	70º21.3’
5	ECCB	East Cape Cod Bay[c]	41º56.2’	70º06.6’	42º20.2’	70º57.8’

[a]July 10, 2001
[b]September 7, 2001
[c]August 22, 2001

Table 2-3. Planned and Actual Sampling and Locations for Mussels Surveys.

Station #	Station Abbrev.	Sampling Site	Planned Location		Actual Location	
			N Latitude	W Longitude	N Latitude	W Longitude
1M	DI	Deer Island Light	42º20.4’	70º57.2’	42º20.4’	70º57.2’
M4	OS	Outfall Site - Mussel Array 1	42º23.1’	70º49.3’	42°23.2’	70°47.3’
4R	OS	Outfall Site - Mussel Array 3	42º23.1’	70º49.3’	42°23.2’	70°47.7’
LNB	OS	Boston “B” Buoy	42º23.1’	70º49.3’	42º22.7’	70º47.1’
6	BIH	Boston Inner Harbor	42º21.5’	71º02.9’	42°21.5’	71°62.9’
9	CCB	Cape Cod Bay	41°55.5'	70°20.0'	41°54.7’	70°20.1’
RP	Rockport	Rockport – Pre-deployment	42º39.6’	70º35.7’	42º39.7’	70º35.7’

Table 2-4. Summary of Mussel Deployment Scheme.

Site	Description/ Location	Water Depth[a]	Cage Height Above Bottom	# Arrays	# Cages/Array	# Mussels/ Cage
DI	Deer Island Light	2-5 m	<1-1.5m	3	2	45
OS	Outfall Site	33m	12m	5	3	48
BIH	Boston Inner Harbor	8-11m	1.5-4.5m[b]	3	3	30
CCB	Cape Cod Bay	40m	12m	3	3	48

[a] Rise and fall with tide, so that it is at a constant depth below the water surface.

[b] Based on historical data.

Table 2-5. Summary of Chemical Analyses Performed by Organism.

Sample Type	Number of Samples	Metals (1) (other than Hg and Pb)	Hg	Pb	PCBs	PAHs	Pesticides	Lipids
Flounder Meat	9	NR	*	NR	*	NR	*	*
Flounder Liver	9	*	*	*	*	*	*	*
Lobster Meat	9	NR	*	NR	*	NR	*	*
Lobster Hepatopancreas	9	*	*	*	*	*	*	*
Mussel Tissue	23	NR	*	*	*	*	*	*

*Targeted for Analysis
(1) Additional metals: Ag, Cd, Cr, Cu, Ni, and Zn
NR = Not Required

Table 2-6. Fish and Shellfish Sample Analyses.

Parameter	Unit of Measurement	Method	Reference
Organic Analyses			
Organic Extraction	NA	Tissuemize/Methylene Chloride	Peven and Uhler (1993) Battelle SOP 5-190
Polycyclic Aromatic Hydrocarbons (PAH)	ng/g dry wt.	GC/MS	Peven and Uhler (1993) Battelle SOP 5-157
Polychlorinated Biphenyls (PCB)/Pesticides	ng/g dry wt.	GC/ECD	Peven and Uhler (1993) Battelle SOP 5-128
Metals Analyses			
Digestion: Ag, Cd, Cr, Cu, Ni, Pb	NA	Aqua regia Nitric acid	MSL-I-006 MSL-I-005
Analysis: Cr, Ni, Pb	µg/g dry wt	ICP-MS GFAA (as required)	MSL-I-022 MSL-I-029
Analysis: Ag, Cd, Cu, Zn	µg/g dry wt	ICP AES	MSL-I-027
Analysis: Hg	µg/g dry wt	CVAA-FIAS (Hg)	MSL-I-016
Ancillary Parameters			
Lipids	% by dry weight	Gravimetric	Peven and Uhler (1993)
Dry Weight	% by dry weight	Gravimetric	Peven and Uhler (1993)

Table 2-7. Specific Chemical Analytes Included in Tissue Chemistry Analyses.

Chemical Analytes	
Trace Metals[a]	**Polynuclear Aromatic Hydrocarbons (PAHs)** (continued)
Ag Silver	C_1-Phenanthrenes/anthracene
Cd Cadmium	C_2-Phenanthrenes/anthracene
Cr Chromium	C_3-Phenanthrenes/anthracene
Cu Copper	C_4-Phenanthrenes/anthracene
Hg Mercury[b,d]	Dibenzothiophene
Ni Nickel	C_1-dibenzothiophenes
Pb Lead[d]	C_2-dibenzothiophenes
Zn Zinc	C_3-dibenzothiophenes
Polychlorinated biphenyls (PCBs)[c,d]	Fluoranthene
2,4'-Cl_2(8)	Pyrene
2,2′,5-Cl_3(18)	C_1-fluoranthenes/pyrene
2,4,4′-Cl_3(28)	C_2-fluoranthenes/pyrene
2,2′,3,5′-Cl_4(44)	C_3-fluoranthenes/pyrene
2,2′,5,5′-Cl_4(52)	Benzo[*a*]anthracene
2,3′,4,4′-Cl_4(66)	Chrysene
3,3′,4,4′-Cl_4(77)	C_1-chrysene
2,2′4,5,5′-Cl_5(101)	C_2-chrysene
2,3,3′,4,4′-Cl_5(105)	C_3-chrysene
2,3′,4,4′5-Cl_5(118)	C_4-chrysene
3,3′,4,4′,5-Cl_5(126)	Benzo[*b*]fluoranthene
2,2′,3,3',4,4′-Cl_6(128)	Benzo[*k*]fluoranthene
2,2′,3,4,4′,5′-Cl_6(138)	Benzo[*a*]pyrene
2,2′4,4′,5,5′-Cl_6(153)	Dibenzo[*a,h*]anthracene
2,2′3,3',4,4′,5-Cl_7(170)	Benzo[g,h,i]perylene
2,2′,3,4,4′,5,5′-Cl_7(180)	Indeno[1,2,3-*c,d*]pyrene
2,2′,3,4',5,5′,6-Cl_7(187)	Perylene
2,2′,3,3′,4,4′,5,6-Cl_8(195)	Biphenyl
2,2′,3,3′4,4′,5,5′,6-Cl_9(206)	Benzo[*e*]pyrene
Decachlorobiphenyl-Cl_{10}(209)	Dibenzofuran
Polynuclear Aromatic Hydrocarbons (PAHs)[a,d]	Benzothiazole
Naphthalene	**Pesticides**[c,d]
C_1-naphthalenes	Hexachlorobenzene
C_2-naphthalenes	Lindane
C_3-naphthalenes	Endrin
C_4-naphthalenes	Aldrin
1-methylnaphthalenes[e]	Dieldrin
2-methylnaphthalenes[e]	Mirex
2,6-methylnaphthalenes[e]	Heptachlor
2,3,5-methylnaphthalenes[e]	Heptachlorepoxide
Acenaphthylene	cis-chlordane
Acenaphthene	trans-nonachlor
Fluorene	2,4′-DDD
C_1-fluorenes	4,4′-DDD
C_2-fluorenes	2,4′-DDE
C_3-fluorenes	4,4′-DDE
Phenanthrene	2,4′-DDT
1-methylphenanthrene[e]	4,4′-DDT
Anthracene	DDMU
	Lipids[c,d]

[a] Flounder liver; lobster hepatopancreas
[b] Flounder and lobster edible tissue
[c] Flounder edible tissue and liver; lobster edible tissue and hepatopancreas
[d] Mussel soft tissue
[e] Measured in mussel tissue in 1992–1994 and 1996–2001

Table 2-8. Statistical Analyses Performed by Tissue Type.

Matrix	Test	Data
Flounder Fillets	ANOVA	Compare 2001 stations for Total PCBs, Pesticides, Total Chlordane, and mercury.
Flounder Liver	ANOVA	Compare 2001 stations for Total PAHs, Total PCBs, Pesticides, Total Chlordane, and select metals.
Lobster Meat	ANOVA	Compare 2001 stations for Total PCBs, Pesticides, Total Chlordane, and mercury.
Lobster Hepatopancreas	ANOVA	Compare 2001 stations for Total PCBs, Total PAHs, Pesticides, Total Chlordane, and select metals.
Mussels	ANOVA	Compare 2001 60 day deployed station data for Total PCBs, Total LMW-PAHs, Total HMW-PAHs, Pesticides, Total Chlordane, lead, and mercury.
Mussels	t-test	Compare background to 60-day data for Total PCBs, Total LMW-PAHs, Total HMW-PAHs, Pesticides, Total Chlordane, lead, and mercury.

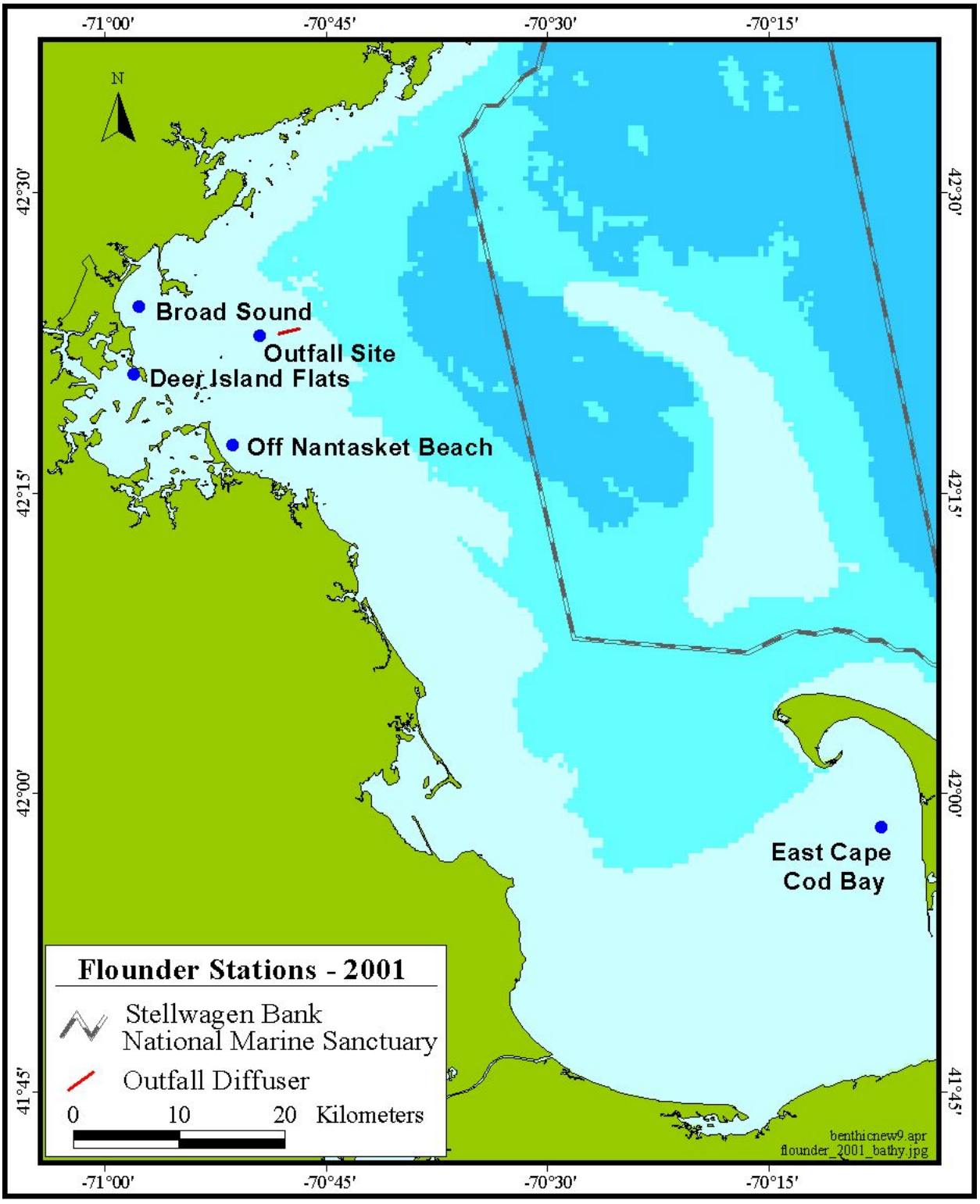


Figure 2-1. Flounder Monitoring Locations.

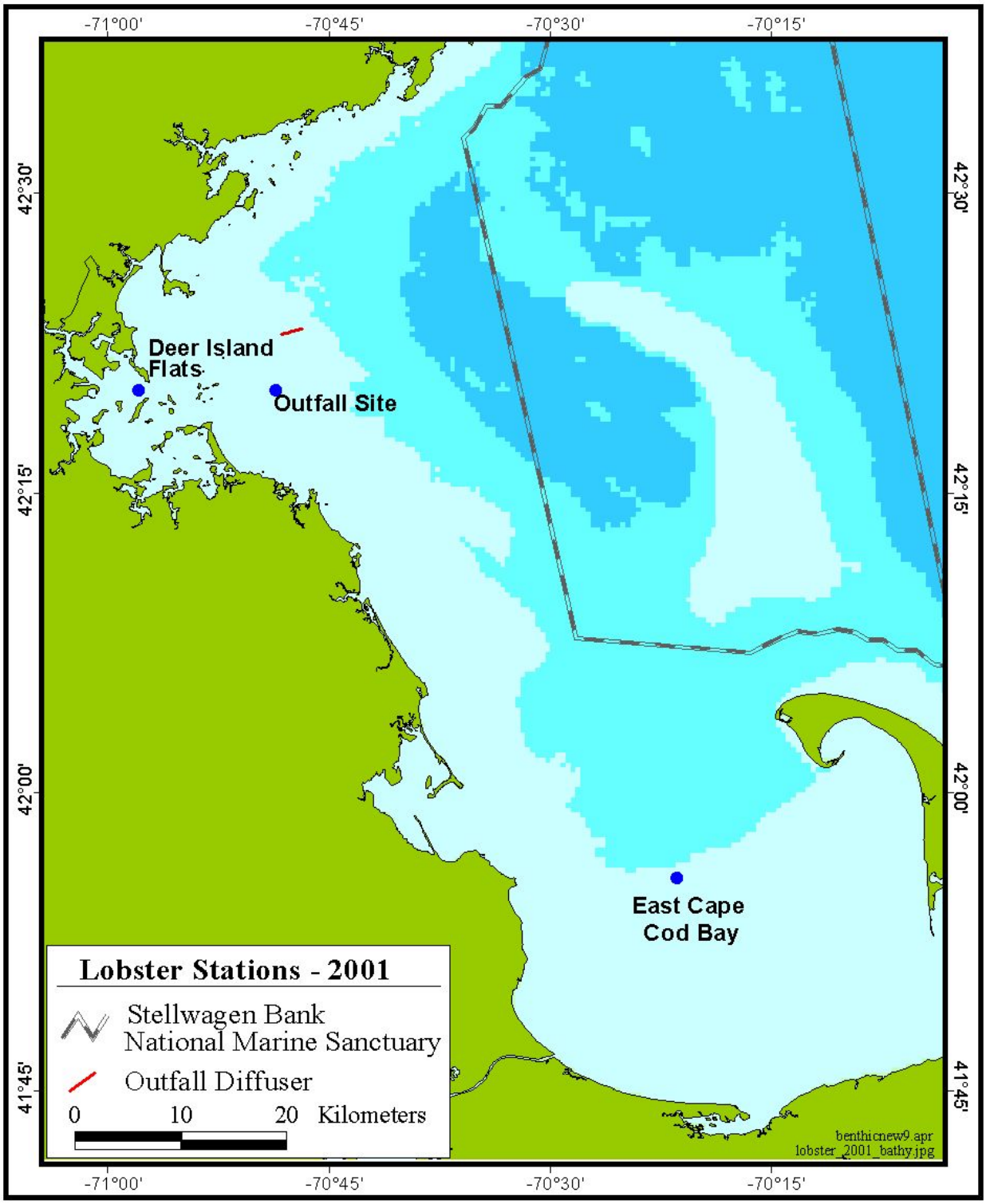


Figure 2-2. Lobster Monitoring Locations.

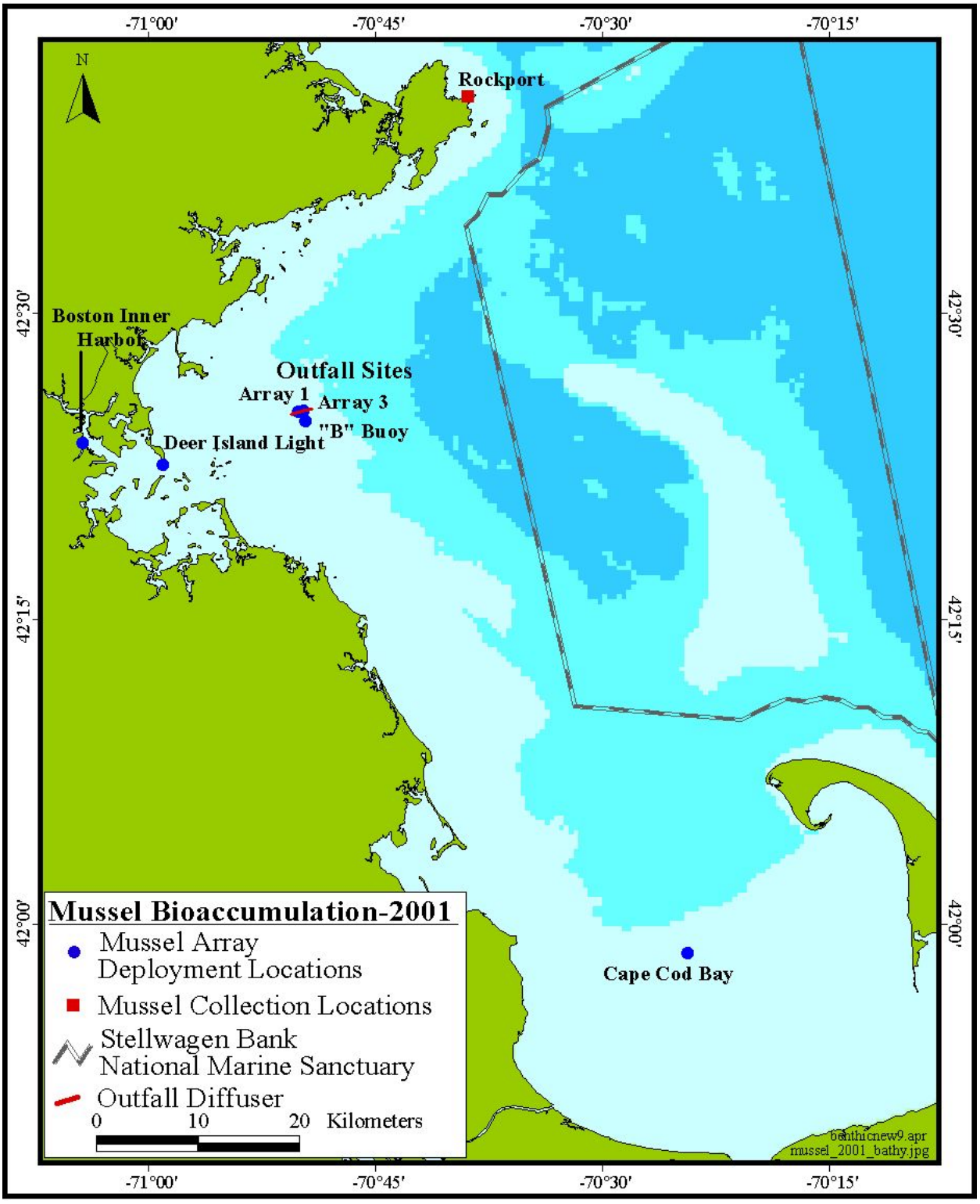


Figure 2-3. Mussel Collection and Deployment Locations.

3.0 RESULTS AND DISCUSSIONS

3.1 Winter Flounder

3.1.1 Fish Collected

Winter flounder, each a minimum 30 cm in length, were collected on April 25, 26, and 29, 2001 at five stations in the study area (Figure 2-1). Fifty flounder were collected from each station. All fish were sampled for liver histology and age. Fifteen of the fish from DIF, OS, and ECCB were sampled for chemical analysis of liver and fillet. The catch per unit effort (CPU), defined as the number of fish obtained per minute of bottom trawling time, is reported per station in Table 3-1. The catch at Outfall Site increased the CPU at that station to the highest level seen in this project. CPU values for the other sites were within historical ranges but were generally higher than in recent years.

3.1.2 Age/Length Parameters

The physical characteristics (*i.e.* mean length, weight, age) of the winter flounder collected in 2001 are given in Table 3-2. Mean total length at each station ranged from 34.0 cm at NB to 38.9 cm at DIF (Table 3-2). Mean weight ranged from 497.5 g at NB to 727.6 g at DIF. Mean age ranged from 4.0 years at NB to 5.1 years at DIF.

3.1.3 External Condition

The external conditions (*i.e.* fin erosion) of winter flounder collected in 2001 are presented as averages per station in Table 3-2. As described in Section 2.1.5, each of the individual winter flounder collected was assessed for external conditions, and rated on a scale of 0 to 4 (no units), with 0 indicating the absence of the condition and 4 indicating extreme abnormalities (or erosion). As shown in Table 3-2, the incidence and severity of external lesions and fin erosion continue to be low at all stations.

3.1.4 Inter-station Comparison of Liver Lesion Prevalence

Neoplasms have not been observed in any of the winter flounder collected from the five stations since 1998, when one fish from Broad Sound was found with a hepatic tumor (Figure 3-1). Neoplasms have always been rare or absent from all sites other than Deer Island and Broad Sound.

Along with neoplasms, hydropic vacuolation, because of its relationship to environmental contaminants, has been one of the principal lesions monitored in winter flounder throughout the program. Centrotubular hydropic vacuolation (CHV) is the least severe and most common form of the lesions observed in the collections (Table 3-3). In 2001, CHV prevalence at Deer Island rose to 50 percent from 46 percent in 2000 (Figure 3-2). This four percent increase from last year probably does not constitute a major change in prevalence. The 2001 prevalences of CHV at Broad Sound (16 percent) and Nantasket Beach (10 percent) were virtually unchanged from what was observed at those sites in 2000. Centrotubular hydropic vacuolation at the Outfall Site dropped sharply from over 20 percent in 2000 to only 6 percent in 2001, the lowest prevalence of CHV at that site since the beginning of the monitoring program. Also, for the first time during the study, no CHV was observed at the reference site in Eastern Cape Cod Bay.

While the prevalence of CHV at the Deer Island site in 2001 was generally what it was in 2000, the mean severity of the lesion appeared to increase for the second straight year (Figure 3-3). In contrast to that observation, however, mean severity dropped considerably at the Outfall Site, and slightly at Broad Sound and Nantasket Beach. As indicated above, CHV was not observed in any fish from Eastern Cape Cod Bay. Assessment of severity is subjective as contrasted with the objective observation of presence or

absence of the lesion. The subjectivity of the assessment should be kept in mind when considering the significance of slight changes in the severity index from year to year.

3.1.5 Relationships Between Age, Length and Lesion Prevalence

In previous years, there were no obvious relationships observed between age or length and lesion prevalence at any of the sites. In 2001, however, it might be suggested that the increases in both prevalence and mean severity of CHV at Deer Island could be related to the somewhat larger and slightly older fish collected there this year. However, fish collected at the Outfall Site were very nearly the same age as those from Deer Island, though somewhat smaller, and both prevalence and mean severity were down sharply at that site. There continues to be no obvious relationship between lesion prevalence and age or length of the fish at any of the other sites.

3.1.6 Spatial Comparison of Tissue Contaminant Levels in 2001

The body burdens of contaminants were determined for both edible tissue (fillets) and liver tissue for winter flounder collected in the 2001 survey. Mean values for selected organic compounds and metals were compared and tested for significance using single factor ANOVA followed by multiple comparison procedures. All analyses assume equal sampling distribution and variances (SAS v8.01) ($p=0.05$). Statistically significant results of the flounder analyses ($p < 0.05$) performed in 2001 are presented in Table 3-4 (for fillets) and Table 3-5 (for livers). All 2001 individual replicate concentrations for each contaminant can be found in Appendix B. Means, standard error, and *n* were determined for all stations and all years, and are presented in Appendix C.

3.1.6.1 Edible Tissue

Comparison of the 2001 mean concentrations of organic compounds in fillets across the study area indicates that the highest concentrations of organic contaminants were found at DIF and the lowest concentrations were found at ECCB (Figures 3-4 and 3-5 and Appendix E). The only exception was mirex, which was highest at ECCB and not detected at DIF. Mercury, the only metal measured in edible tissue, was highest in fillet samples from OS and lowest in those from ECCB (Figure 3-6).

Results from the single factor ANOVA evaluating whether contaminants in flounder fillet differ between sampling sites suggest that mercury, total PCB, total DDT, total chlordane, dieldrin, hexachlorobenzene, and mirex concentrations were significantly different between the sampling sites ($p < 0.05$) (Table 3-4). For total PCB, total DDT, total chlordane, dieldrin, and hexachlorobenzene, the concentrations at DIF were significantly higher than at OS and ECCB. Also, concentrations of total PCB and total chlordane were significantly higher at OS than at ECCB. Concentrations of mirex, however, were significantly higher at ECCB than at the other two stations, and mirex was undetected at DIF. Concentrations of mercury were significantly lower at ECCB than at DIF and OS.

3.1.6.2 Liver

Comparison of the 2001 mean concentrations of organic compounds in flounder livers across the study area showed a similar trend as that observed for edible tissue. In general, the highest concentrations of organic contaminants were found in samples from DIF and the lowest in those from ECCB (Figures 3-7 and 3-8 and Appendix E). Metal concentrations in livers were generally highest at OS and lowest at ECCB (Figures 3-9 and 3-10).

Of the organic contaminants measured, total PCB, total DDT, total PAH, total chlordane, dieldrin, hexachlorobenzene, and mirex were significantly different between the sampling sites in 2001 ($p < 0.05$) (Table 3-5). Total PCB, total PAH, and total chlordane were significantly higher at DIF than at OS and ECCB. For total PCB, total DDT, total PAH, total chlordane, dieldrin, hexachlorobenzene, and mirex, concentrations in 2001 at ECCB were significantly lower than those at DIF and OS. Of the inorganic

contaminants measured, lead, mercury, and nickel showed a statistically significant difference in liver contaminant concentrations among any of the three sites tested ($p = <0.05$). Lead levels were significantly higher at OS than at DIF and ECCB, and mercury was significantly higher at OS than at ECCB. Nickel concentrations at ECCB were significantly lower than at OS and DIF.

3.1.7 Comparison of 2001 Contaminant Levels to Baseline Data

Body burdens of selected contaminants have been measured in winter flounder since 1992. This section discusses the temporal trends observed from 1992 through the present. A summary of means and standard errors of the replicate analyses for both 2001 and historical fillet and liver tissues are provided in Appendix C.

3.1.7.1 Edible Tissue

Body burdens of organic compounds monitored in edible tissue in 2001 were generally similar to or lower than the levels measured in previous years (Figures 3-4 and 3-5 and Appendix E). Concentrations of total PCBs and hexachlorobeneze at DIF were higher than in recent years, and total DDT, total PCB, dieldrin, and hexachlorobenzene concentrations at DIF were greater than in 2000. The concentration of mirex at ECCB was the highest measured during the program.

Mercury was the only metal measured in edible tissue from winter flounder. The 2001 concentrations of mercury at DIF, OS, and ECCB were similar to the concentrations in 1999 and 2000 (Figure 3-6). Mercury concentrations at all stations have been variable over time, with the lowest concentrations routinely found at ECCB.

3.1.7.2 Liver

Concentrations of organic contaminants (PCBs, chlorinated pesticides, PAHs) in livers from winter flounder in 2001 were generally comparable to or lower than those measured in previous years (Figures 3-7 and 3-8 and Appendix E). Generally, the highest concentrations in all years were detected in livers from fish collected at DIF and the lowest concentrations were observed at ECCB.

The spatial pattern in metals concentrations, for the most part, did not follow that of organic contaminants (Figures 3-9 and 3-10 and Appendix E). Metals concentrations tended to be highest at OS and ECCB throughout the baseline period, rather than at DIF, as observed for organic contaminants. Inorganic contaminants showed no clear trends during the baseline period. 2001 concentrations were generally within the established baseline range at DIF and ECCB. At OS, however, lead, cadmium, chromium, and nickel were at the upper end of the historical range in 2001. 2001 concentrations of mercury at ECCB were the lowest measured during the program.

3.1.8 Relationship of Contaminant Levels to Threshold Values

The U.S. Food and Drug Administration (FDA) has set action limits for the maximum tissue concentrations of specific contaminants in the edible portions of fish and fishery products. For the MWRA biomonitoring program, Caution and Warning thresholds have been set for tissue contaminant concentrations (organic and inorganic) and liver disease incidence (MWRA 2001a, MWRA 2001b). These thresholds are derived from either the FDA Action Limits, when available, or from the baseline mean of contaminant concentrations at OS. These two levels provide reference benchmarks for detecting adverse changes (and their potential human health risks) of the outfall discharge. The 2001 mean concentrations of target analytes in flounder edible meat, per station, were compared to the FDA's Action Limits and the MWRA Caution and Warning Thresholds (Table 3-6). All fillet chemical concentrations were below both FDA and MWRA Threshold levels.

3.2 Lobster

3.2.1 Lobster Collection

The 2001 lobster survey was conducted by purchasing lobster from commercial lobstermen. Fifteen lobsters were collected from each location (DIF, OS, ECCB).

3.2.2 Size, Sex, and External Conditions

The mean length and weight of lobsters collected in 2001 are presented in Table 3-7. Little difference in lobster length or weight was observed between the three sampling sites. The ratio of female to male lobster is also presented in Table 3-7. Mostly males were found at ECCB and DIF and mostly females at OS.

The size, sex, and external conditions (*i.e.* black gill disease, shell erosion, parasites, external tumors, etc.) were determined for the lobsters collected in the 2001 survey. Table 3-8 presents the average values for general external observations made for the 15 lobsters collected at each station in the 2001 survey. In general, no deleterious conditions were noted in any of the lobsters collected during the survey.

3.2.3 Spatial Comparison of Tissue Contaminant Levels in 2001

The body burdens of contaminants were determined for both edible tissue (tail and claw meat) and liver tissue (hepatopancreas) for lobster collected in the 2001 survey. Mean values for selected organic compounds and metals were compared and tested for significance using single factor ANOVA followed by multiple comparison procedures. All analyses assume equal sampling distribution and variances (SAS v8.01) ($p=0.05$). Statistically significant results ($p < 0.05$) of the lobster analyses performed in 2001 are presented in Table 3-9 (for meat) and Table 3-10 (for hepatopancreas). All 2001 individual replicate concentrations for each contaminant can be found in Appendix B. Means, standard error, and *n* were determined for all stations and all years, and are presented in Appendix C.

3.2.3.1 Edible Tissue

Comparison of the 2001 mean concentrations of organic compounds in lobster meat across the study area indicates that the highest concentrations were generally found at DIF and the lowest concentrations were found at ECCB (Figures 3-11 and 3-12 and Appendix E). Concentrations of total DDTs and hexachlorobenzene were similar at all three stations. Mercury, the only metal measured in lobster meat, was highest in samples from OS and lowest at ECCB (Figure 3-13).

Mercury, total chlordane, and dieldrin in lobster edible tissue had statistically significantly different results from the ANOVA analysis (Table 3-9). The concentration of total chlordane at ECCB was significantly lower than at DIF and OS, and the concentration of dieldrin at OS was significantly lower than at ECCB, which had the highest concentration. Concentrations of mercury were significantly lower at ECCB than at DIF and OS.

3.2.3.2 Hepatopancreas

Comparison of the 2001 mean concentrations of organic compounds in lobster hepatopancreas across the study area showed the same spatial pattern as for edible tissue, with the highest concentrations generally found in samples from DIF and the lowest in samples from ECCB (Figures 3-14 and 3-15 and Appendix E). However, the lowest concentrations of hexachlorobenzene and mirex were at OS. Metal body burdens tended to be highest in samples from OS and lowest from ECCB, except for nickel, where it was highest at ECCB (Figures 3-16 through 3-18 and Appendix E).

Total PCBs, total PAHs, total chlordanes, and dieldrin were significantly higher at DIF than at ECCB (Table 3-10). In addition, PAHs and chlordanes were statistically higher at DIF than at OS. Of the inorganic contaminants, cadmium and nickel concentrations were found to be significantly lower at DIF than at OS and ECCB.

3.2.4 Comparison of 2001 Tissue Contaminant Levels to Baseline Data

Body burdens of selected contaminants have been measured in lobster since 1992. The data for stations DIF, OS, and ECCB are presented below.

3.2.4.1 Edible Tissues

The general spatial pattern observed in 2001 (*i.e.,* DIF having the highest and ECCB the lowest body burdens of organic contaminants) is consistent with the historical spatial patterns (Figure 3-11 and 3-12 and Appendix E). Generally, 2001 concentrations were at the lower end of the historical range of values. The concentration of total chlordane at ECCB was one of the lowest ever measured during the baseline period.

The spatial pattern of mercury body burdens observed in 2001 (*i.e*., OS generally the highest and ECCB the lowest) was consistent with historical trends (Figure 3-13). 2001 mercury concentrations at all three stations tended to be in the middle of the historical range.

3.2.4.2 Hepatopancreas

The spatial pattern of organic contaminants observed in lobster hepatopancreas in 2001 was consistent with historical patterns (*i.e*., DIF having the highest and ECCB the lowest body burdens of organic contaminants) (Figures 3-14 and 3-15 and Appendix E). At all three stations, the concentrations of organic contaminants measured in 2001, including total DDTs, total PCBs, and total chlordanes, were within the historical range. Total PCBs and DDTs at DIF still appear to be elevated above pre-1995 values, while the other two sites have concentrations that are similar to pre-1995 values. Total PAHs appear to have decreased during the baseline period at OS and ECCB; however, PAH concentrations at DIF were considerably higher in 2000 and remained elevated in 2001.

Historically, metal body burdens have been more variable than the organic burdens, with ECCB and OS metals often being as high or higher than those from DIF (Figures 3-16, 3-17, and 3-18 and Appendix E). In 2001, tissue concentrations of inorganics were generally within the historical range of values. A few metals, however, were at the upper end of the historical range, including cadmium (at DIF and OS), copper (at OS), lead (at ECCB), and zinc (at OS and ECCB). Concentrations of lead at ECCB have been elevated since 1998. Silver concentrations at all three stations were higher than in 2000 and remain considerably higher than in the early years of the program.

3.2.5 Relationship of Contaminant Levels to Threshold Values

The U.S. Food and Drug Administration (FDA) has set action limits for the maximum tissue concentrations of specific contaminants in the edible portions of fish and fishery products. For the MWRA biomonitoring program, Caution and Warning thresholds have been set for organic and inorganic tissue contaminant concentrations (MWRA 2001a, MWRA 2001b). These thresholds are derived from either the FDA Action Limits, when available, or from the baseline mean of contaminant concentrations at OS. These two levels provide reference benchmarks for detecting adverse changes (and their potential human health risks) of the outfall discharge. The 2001 mean concentrations of target analytes in lobster edible meat were compared to the FDA's Action Limits and the MWRA Caution and Warning Threshold

levels for the outfall (Table 3-11). Lobster meat tissues did not exceed any of the FDA Action Limits or MWRA thresholds.

3.3 Blue Mussel

3.3.1 Mussels Collected

The 40-day mussel retrieval was performed on August 7 and 8, 2001. Samples were successfully collected at BIH, DI, OS, and CCB stations (Table 3-12). The 60-day retrieval was performed on August 27 and 28, 2001. Samples were successfully recovered at BIH, DI, OS, and CCB stations (see Table 3-13).

3.3.1.1 Survival

The percent survival observed in the caged mussels was high (98 – 100%) at all stations for both the 40- and 60-day harvested mussels (Table 3-14).

3.3.2 Spatial Comparison of Tissue Contaminant Levels in 2001

The differences in mussel tissue contaminant levels were examined across the various sampling and deployment locations. Mean values for selected organic compounds and metals were compared and tested for significance using single factor ANOVA followed by multiple comparison procedures. All analyses assume equal sampling distribution and variances (SAS v8.01) ($p=0.05$). Details of the results of the mussel analyses performed in 2001 are presented in Tables 3-15 and 3-16 and discussed below. All 2001 individual replicate concentrations for each contaminant can be found in Appendix B. Means, standard error, and *n* were determined for all stations and all years, and are presented in Appendix C.

3.3.2.1 Mercury and Lead

Mercury tissue concentrations were highest at BIH and lowest at CCB (Figure 3-19). The concentration of mercury at OS was significantly lower than at BIH but significantly higher than at CCB (Table 3-15). Mercury levels at CCB were significantly lower than levels in the Rockport mussels (Table 3-16). There was not a significant difference between the mercury concentrations in deployed mussels from DI, OS, BIH and the pre-deployment mussels from Rockport.

The spatial pattern of lead concentrations was similar to that seen in mercury concentrations, with the highest concentrations at BIH and the lowest concentrations at CCB (Figure 3-20). Mussels at OS and CCB had lead concentrations significantly lower than at BIH and DI. The mussels deployed at BIH and DI had lead concentrations that were significantly higher than in the Rockport mussels. OS and CCB mussel lead concentrations were similar to, but slightly lower than, the pre-deployed values.

3.3.2.2 Polychlorinated Biphenyls

Mussel tissues were analyzed for 20 polychlorinated biphenyl (PCB) congeners. The total concentrations of these 20 PCBs were significantly higher at BIH than at the other stations (Figure 3-21). OS and CCB had concentrations of total PCBs that were significantly lower than at BIH and DI (Table 3-15). Concentrations of total PCBs in BIH, DI, OS, and CCB deployed mussels were significantly higher than the pre-deployed Rockport mussels (Table 3-16).

3.3.2.3 Pesticides

Mussel tissues were analyzed for individual chlorinated pesticides. Most pesticides measured were detected in the mussels at each location. Only aldrin, endrin, and mirex were not detected in any of the samples from any of the stations. In general, highest pesticide concentrations were found in mussels deployed at BIH (Figure 3-22). Total DDT, dieldrin, and HCB concentrations were significantly higher

in mussels deployed at BIH than at the other stations (Table 3-15). Concentrations of total chlordane, however, were significantly higher at OS than at BIH, DI, or CCB. Concentrations of total DDT and HCB in mussels deployed at OS were significantly lower than in mussels deployed at DI or BIH. Concentrations of total chlordane and dieldrin were significantly lower in mussels from CCB, and concentrations of lindane were similar at DI, OS, and CCB.

The concentrations at BIH, DI, OS, and CCB were significantly higher than in the pre-deployed mussels for total DDT, total chlordane, and dieldrin (Table 3-16). Also, concentrations of HCB were significantly higher at BIH, DI, and CCB than at Rockport. Concentrations of lindane in the deployed mussels were either similar to or lower than pre-deployment levels.

3.3.2.4 PAH Compounds

Total PAHs, as well as total low and high molecular weight PAHs, have been calculated by different methodologies during the course of this study. For purposes of comparison across multiple study years, the method common to most years was used for evaluating temporal trends (see section 3.3.3). This method is referred to here as the "Historical NOAA List" (see Table 3-17). This list is much less comprehensive than the current list, referred to as the "Total PAH List"(Table 3-17). The historical NOAA list includes primarily parent PAH compounds and only five individual alkylated naphthalenes. The lack of quantitation of additional alklyated groups (*e.g.* alkyl dibenzothiophenes, phenanthrenes, anthracenes, etc.) results in a significantly lower calculated total PAH value. In addition, in 1995, the individual five alkylated "NOAA" PAHs were not measured. Instead, the C1, C2, and C3-napthalene homologue groups were quantified. To make 1995 results more comparable to the NOAA historical list, values for the individual naphthalene compounds were estimated using ratios of the individuals to their respective homologue groups from 1996 and 1997 data sets.

Current data are discussed in terms of the more recent "Total PAH List". Temporal trends, discussed in Section 3.3.3, are presented using the "Historical NOAA List".

The target list of PAH compounds analyzed in 2001 is presented in Table 3-17 and includes all compounds in the "Total PAH List".

Summary tables of total low molecular weight PAHs (LMW-PAH) (defined as those target 2 and 3 ringed compounds) and total high molecular weight PAHs (HMW-PAH) (defined 4, 5 and 6 ringed compounds) for individual mussel composites are included in Appendix B. Mean concentrations of total LMW-PAH and total HMW-PAH are presented in Appendix C, as are the standard errors and *n* values associated with these means for each station. The concentrations of LMW- and HMW-PAHs at all locations are shown in Figure 3-23.

The 2001 average body burdens of total LMW- and HMW-PAH were significantly higher in mussels deployed at BIH and significantly lower at CCB (Table 3-15). Concentrations of LMW-PAH were significantly higher at OS than at DI, and HMW-PAH concentrations were similar at DI and OS. Concentrations of both LMW- and HMW-PAHs at BIH, DI, and OS were significantly higher than the pre-deployed concentrations observed at Rockport, but only HMW PAHs were significantly higher at CCB as compared to the pre-deployed mussels (Table 3-16).

3.3.2.5 Lipid Results

Lipid concentrations were measured in all mussel composites (Appendix B). Values in 2001 were very similar for RP (5.5 ±0.6% dry) and BIH (5.3 ± 0.7% dry), and higher for DI (7.1 ± 0.5% dry) and OS (7.5 ±1.0% dry). The lipid concentration at CCB was the highest but also was very variable between individual composites compared with the other stations (9.3 ± 4.2% dry).

3.3.3 Comparison of 2001 Contaminant Levels to Baseline Data

Mussel tissue burdens were also compared across the various study years. In the past, when an analyte was reported as not detected, the detection limit value was used in calculations. For consistency with other fish and shellfish data and to avoid the problems introduced by the use of varying magnitudes of reporting/detection limits used over the years, all non-detects were equated with "zero" in this report. The following section provides a discussion of trends observed for the analytes measured. Selected figures are presented to illustrate these trends.

3.3.3.1 Mercury and Lead

Mercury concentrations measured in mussels in 2001 at all sites were within the historical range of concentrations but slightly higher than 2000 levels at BIH and OS (Figure 3-24). The spatial pattern in 2001 was similar to the spatial pattern observed in 1998 – 2000, except that concentrations at DI were less than those at OS.

Lead concentrations measured in 2001 at Rockport were among the lowest measured since the beginning of the program (Figure 3-25). Lead concentrations measured at DI in 2001 were at the low end of the historical range, and values at BIH in 2001 were at the upper end of the historical range. Lead levels at OS were within the historical range of concentrations.

3.3.3.2 Polychlorinated Biphenyls

Data for 2001 PCBs were within the historical range at DI and OS, with concentrations at BIH being the lowest ever measured in the program (Figure 3-26). As in 2000, Rockport mussels had the lowest concentration of PCBs ever measured in pre-deployment mussels during the program. The spatial pattern observed in 2001 was similar to the pattern observed in previous years, with BIH having the highest concentrations and OS the lowest concentrations.

3.3.3.3 Pesticides

2001 concentrations of total DDTs and dieldrin were similar to or lower than concentrations observed in previous years (Figure 3-27 and Appendix E). Total chlordane concentrations at OS, however, were the highest measured during the program and were higher than those measured at the other deployment sites (Figure 3-28). Except for chlordane, spatial patterns have generally remained constant over time, with concentrations in BIH mussels higher than at other stations. Pesticide concentrations in the Rockport mussels were at the lower end of the historical range for pre-deployment mussels.

3.3.3.4 PAHs

Pre-deployment total PAHs in mussels collected in 2001 were at the low end of the historical range of concentrations, with the levels of LMW-PAHs being the lowest measured in pre-deployment mussels since 1991 (Figure 3-29). Total PAH was within the historical range of values at BIH and DI. While concentrations at BIH have remained relatively constant since 1993, concentrations at DI appear to have shown a general decline. Concentrations of Total PAH at OS, however, were the highest ever measured during the monitoring program and consisted mainly of HMW-PAHs, a change from previous years where LMW-PAHs generally dominated. Analytical problems in 2000 increased the LMW concentrations in mussels. Total PAH in mussels deployed at DI and BIH has always been dominated by HMW-PAHs; however, mussels deployed at DI have always had a higher proportion of LMW-PAHs relative to mussels deployed at BIH. 2001 data show a continuing relative decrease in the proportion of LMW PAHs at DI. This observation is not surprising, given the cessation of sludge discharge in 1991, the upgraded primary treatment plant in 1995, the upgraded secondary treatment plant in 1997, and limits on industrial discharges of petroleum products into the MWRA system.

3.4 Relationship of Contaminants in Blue Mussel to Threshold Values

The U.S. Food and Drug Administration (FDA) has set action limits for the maximum tissue concentrations of specific contaminants in the edible portions of fish and fishery products. For the MWRA biomonitoring program, Caution and Warning thresholds have been set for tissue contaminant concentrations (organic and inorganic) and liver disease incidence (MWRA 2001a, MWRA 2001b). These thresholds are derived from either the FDA Action Limits, when available, or from the baseline mean of contaminant concentrations at OS. These two levels provide reference benchmarks for detecting adverse changes (and their potential human health risks) of the outfall discharge. The 2001 mean concentrations of target analytes in mussel tissue, per station, were compared to the FDA's Action Limits and the MWRA Caution and Warning Thresholds for the outfall (Table 3-18). In 2001, concentrations of Total PAHs and Total Chlordane in the mussels deployed at OS exceeded the MWRA Caution thresholds for these compounds.

3.5 Evaluation of 2001 Mussel Tissue Contaminant Threshold Exceedance

The threshold exceedances in mussels were unexpected, since the thresholds had been set at a level above any expected change from baseline (Table 3-18). As a result, an investigative study was conducted to understand why the levels were greater than expected and to evaluate possible factors affecting measured contaminant levels in caged mussels. The approach taken was to compare calculated expected mussel concentrations with measured values using recently published bioaccumulation factors and measured effluent concentrations and field dilutions. In a similar manner, water column contaminant concentrations were calculated from the concentrations measured in mussels and compared with recent low level contaminant analyses (Shea1997). The methods and approach used to estimate contaminant concentrations in mussel and water and the results of the comparisons are provided in a report to MWRA (Hunt *et al*. 2002). Recommendations for further understanding these factors are also included.

The estimated mussel concentrations were calculated based on theoretical bioaccumulation equations described in Hunt *et al.* (2002), using measured 2001 effluent concentrations (Table 3-19). Estimates were made for a range of effluent dilutions from 70:1 to 400:1. The 90:1 dilution is approximately the initial dilution[1] measured at the outfall on July 19, 2001 during the MWRA plume tracking study (Hunt *et al.* 2002). Concentrations measured in mussels from the OS are shown in Table 3-19 for comparison. The measured concentrations of organic contaminants in mussels fall within a factor of about 2 – 3 of the predicted concentrations estimated for the measured dilution of 90:1. For total chlordane, the measured concentrations exceed predictions. For the two PCB congeners, the predicted values exceed the measured ones by 2-3 fold. The disparity between the measured and predicted chlordane concentrations may be due to analytical interferences and several sources of error or uncertainty in the calculations used to derive these estimates and in the data itself.

Ambient water contaminant concentrations were not directly measured as a part of the study. The same theoretical bioaccumulation equations used to predict tissue concentrations were rearranged and used to predict water concentrations by plugging in the measured mussel contaminant concentrations at the various mussel stations and solving for the dissolved water concentrations. The concentrations calculated were assumed to represent only the bioavailable (primarily dissolved) fraction in the water column. Actual measured water column concentrations measured in Massachusetts Bay in 1996 by Shea (1997) were used for comparison. It was determined that the Cape Cod Bay mussel-derived water estimates were the best background concentrations to use for the purposes of this study, given the information available. Actual measurements, however, are necessary to achieve a better understanding of actual background concentrations.

[1] Dilution achieved at the point the hydraulic mixing of effluent into the ocean is complete.

Water quality criteria for PAHs and chlordanes were met before dilution, and the mussels deployed at different MWRA monitoring stations contained concentrations of polycyclic aromatic hydrocarbons (PAHs) and chlordane well below the applicable FDA limits (Table 3-18). In addition, two measures of ecological risk were evaluated (Hunt *et al.* 2002) and based on the results, the mussels deployed near the wastewater diffuser were at low risk of harm from PAHs in the effluent.

The PAH and chlordane concentrations measured in the mussels deployed in the vicinity of the outfall in 2001 appear to be consistent with predictions based on recent theory of bioaccumulation in mussels. Although thresholds were exceeded, based in an evaluation of published effects indices and standard risk analysis, the potential environmental impact from these exceedances appears to be low or non-existent.

While this study has lead to a further understanding of many of the factors that controlled the exceedances of PAHs and chlordane in deployed mussels in 2001, several factors were identified as being critical to the prediction of levels of contaminants in caged mussels. These factors include:

- Duration and frequency of exposure to the diluted effluent plume,
- Ambient water contaminant concentrations,
- Effluent contaminant concentrations,
- Measurement errors and estimates of K_{ow} (octanol/water partition coefficient).

Further deployments and more rigorous effluent testing during the deployment period in 2002 may help to gain additional insight into some of these items and help determine if the present threshold values and/or deployment locations are appropriate for the intended purpose of the fish and shellfish monitoring program.

Table 3-1. Catch per Unit Effort (CPU) for Winter Flounder Trawled in April 2001.

Location	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Deer Island	0.38	0.23	0.15	0.16	0.10	0.16	0.16	0.56	1.09	0.18	0.47
Nantasket Beach	0.48	1.29	1.52	0.88	0.88	0.77	0.43	0.41	0.21	0.38	1.15
Broad Sound	1.26	2.80	0.49	0.46	0.29	0.23	0.59	0.69	0.38	0.26	1.1
Outfall Site	0.10	0.48	0.62	0.25	0.60	0.31	0.81	0.42	0.31	1.67	2.36
East Cape Cod Bay	0.67	0.49	0.77	0.45	0.50	1.38	0.32	0.50	0.92	0.94	1.12

CPU = # fish caught per minute of bottom time
The same vessel and net were used at all times

Table 3-2. Summary of Physical Characteristics of Winter Flounder Collected in 2001.

Station Name		DIF	NB	BS	OS	ECCB
Station Number		**1**	**2**	**3**	**4**	**5**
N		50	50	50	50	50
Total Length (mm)	Mean	389.1*	340.4*	348.9*	348.5	349.7
	Std. Dev.	44.4	25.9	32.5	30.1	34.8
	AVOVA[1,2]	2,3,4,5	1	1	1	1
Weight (g)	Mean	727.6	497.5*	549.2	530.7	540.0**
	Std. Dev.	217.0	115.0	159.5	156.2	191.7
	ANOVA[1,2]	2,3,4,5	1	1	1	1
Age (years)	Mean	5.1	4.0	4.3	5.0	4.2
	Std. Dev.	1.4	0.8	1.1	1.1	0.9
	ANOVA[1,2]	2,3,5	1,4	1,4	2,3,5	1,4
Fin erosion (0-4)	Mean	0.5	0.0	0.1	0.0	0.0
	Std. Dev.	0.9	0.0	0.5	0.2	0.1
	ANOVA[2]	2,3,4,5	1	1	1	1

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.

[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

* $n = 49$

** $n = 48$

Table 3-3. Prevalence (%) of Lesions in Winter Flounder Liver from Five Stations in Massachusetts and Cape Cod Bays – 2001.

Station Name		DIF	NB	BS	OS	ECCB
Station Number		**1**	**2**	**3**	**4**	**5**
N		50	50	50	50	50
Lesion type*	Neoplasm	0	0	0	0	0
	Focal HV	6	0	2	0	0
	Tubular HV	32	6	8	4	0
	Centrotubular HV	50	10	16	6	0
	Macrophage Aggregation	78	68	74	86	74
	Biliary Proliferation	32	24	22	12	22

*Prevalence calculated as the percentage of fish from each station showing each lesion type
HV – Hydropic Vacuolation

Table 3-4. ANOVA Results Comparing Contaminant Concentrations in Flounder Fillets in 2001.

Station Name		DIF	OS	ECCB
Station Number		**1**	**4**	**5**
N		3	3	3
Mercury (p=0.0038)	Mean	0.358	0.486	0.179
	Std. Dev.	0.075	0.051	0.070
	ANOVA[2]	5	5	1,4
Total PCB (p=<0.0001)	Mean	348.60	157.76	51.34
	Std. Dev.	40.74	20.53	3.56
	ANOVA[1,2]	4,5	1,5	1,4
Total DDT (p=0.0002)	Mean	28.09	12.05	8.20
	Std. Dev.	3.63	2.86	0.26
	ANOVA[1,2]	4,5	1	1
Total Chlordane (p=<0.0001)	Mean	10.38	2.92	1.74
	Std. Dev.	1.55	0.76	0.15
	ANOVA[1,2]	4,5	1,5	1,4
Total Dieldrin (p=0.0002)	Mean	2.84	1.37	1.08
	Std. Dev.	0.28	0.27	0.07
	ANOVA[1,2]	4,5	1	1
Hexachlorobenzene (p=0.0163)	Mean	0.93	0.65	0.571
	Std. Dev.	0.14	0.08	0.10
	ANOVA[2]	4,5	1	1
Mirex (p=0.0469)	Mean	0.00	0.12	0.50
	Std. Dev.	0.00	0.22	0.28
	ANOVA[1,2]	5		1

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.
[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

Table 3-5. ANOVA Results Comparing Contaminant Concentrations in Flounder Livers in 2001.

Station Name		DIF	OS	ECCB
Station Number		**1**	**4**	**5**
N		3	3	3
Lead (p=0.0004)	Mean	2.95	7.41	3.13
	Std. Dev.	0.72	0.72	0.72
	ANOVA[2]	4	1,5	4
Mercury (p=0.015)	Mean	0.353	0.475	0.175
	Std. Dev.	0.060	0.113	0.078
	ANOVA[2]		5	4
Nickel (p=0.0027)	Mean	0.51	0.77	0.32
	Std. Dev.	0.11	0.09	0.05
	ANOVA[1,2]	5	5	1,4
Total PCB (p=<0.0001)	Mean	3611.60	2512.71	424.33
	Std. Dev.	523.32	119.48	47.71
	ANOVA[1,2]	4,5	1,5	1,4
Total DDT (p=0.0011)	Mean	232.29	175.27	62.44
	Std. Dev.	39.46	31.54	6.56
	ANOVA[2]	5	5	1,4
Total PAH (p=<0.0003)	Mean	141.16	99.38	60.83
	Std. Dev.	9.07	9.36	13.18
	ANOVA[2]	4,5	1,5	1,4
Total Chlordane (p=<0.0001)	Mean	91.87	41.35	13.51
	Std. Dev.	10.61	9.39	2.14
	ANOVA[2]	4,5	1,5	1,4
Dieldrin (p=0.0016)	Mean	19.96	14.98	6.45
	Std. Dev.	2.43	5.30	0.59
	ANOVA[1,2]	5	5	1,4
Hexachlorobenzene (p=0.0069)	Mean	5.06	5.36	3.55
	Std. Dev.	0.41	0.29	0.64
	ANOVA[2]	5	5	1,4
Mirex (p=<0.0001)	Mean	4.07	3.96	1.43
	Std. Dev.	0.32	0.37	0.20
	ANOVA[2]	5	5	1,4

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.
[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

Table 3-6. Comparison of MWRA Caution and Warning Levels to Mean 2001 Flounder Fillet Concentrations for Selected Parameters.

Station	Liver Disease Incidence (%)			Total PCB (ng/g wet wt.)			Total DDT (ng/g lipid)			Total Chlordane (ng/g lipid)			Dieldrin (ng/g lipid)			Mercury (μg/g wet wt.)		
	mean	se	n	mean	se	n	mean	se	n	mean	se	n	mean	se	n	mean	se	n
Outfall Site	6	0	50	26.5	1.4	3	596	105	3	144.00	24.00	3	68.10	11.50	3	0.08	0.01	3
MWRA Caution Level	44.94			1000			1552			484			127			0.5		
MWRA Warning Level	NA			1600			NA			NA			NA			0.8		
FDA Limit	NA			2000			5000			300			300			1		

Table 3-7. Mean Length, Weight, and Sex Ratio of Lobsters Collected in 2001.

Parameter	N	DIF		OS		ECCB	
		Station Mean	S.D.	Station Mean	S.D.	Station Mean	S.D.
Carapace Length (mm)	15	89.4	5.4	85.5	1.7	88.8	4.3
Weight (g)	15	533.1	93.9	489.5	53.9	516.8	97.7
RATIO Male/Female*	15	10/5	NA	5/10	NA	12/3	NA

S.D. = Standard Deviation
* This value is a ratio, not a mean

Table 3-8. Mean Score – 2001 Lobster External Condition.

Parameter	N	DIF		OS		ECCB	
		Station Mean	S.D.	Station Mean	S.D.	Station Mean	S.D.
Black Gill	15	0	0	0	0	0	0
External Tumors	15	0	0	0	0	0	0
Parasites	15	0	0	0	0	0	0
Shell Erosion	15	0	0	0	0	0	0

Note: Values range from 0 (absent) to 4 (extreme).
S.D. = Standard Deviation

Table 3-9. ANOVA Results Comparing Contaminant Concentrations in Lobster Meat in 2001.

Station Name		DIF	OS	ECCB
Station Number		**1**	**4**	**5**
N		3	3	3
Mercury (p=0.01)	Mean	0.873	1.024	0.53
	Std. Dev.	0.067	0.202	0.087
	ANOVA[2]	5	5	1,4
Total Chlordane (p=0.0053)	Mean	2.13	1.14	0.43
	Std. Dev.	1.14	0.23	0.11
	ANOVA[1,2]	5	5	1,4
Dieldrin (p=0.0212)	Mean	3.67	2.83	3.92
	Std. Dev.	0.49	0.26	0.25
	ANOVA[2]		5	4

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.
[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

Table 3-10. ANOVA Results Comparing Contaminant Concentrations in Lobster Hepatopancreas in 2001.

Station Name		DIF	OS	ECCB
Station Number		**1**	**4**	**5**
N		3	3	3
Cadmium (p=0.001)	Mean	8.10	15.5	12.7
	Std. Dev.	1.95	0.78	0.5
	ANOVA[2]	4,5	1	1
Nickel (p=0.0074)	Mean	0.51	0.73	0.79
	Std. Dev.	0.03	0.05	0.11
	ANOVA[2]	4,5	1	1
Total PCB (p=0.0116)	Mean	8018.57	3696.13	2029.80
	Std. Dev.	4117.81	1207.46	177.64
	ANOVA[1,2]	5		1
Total PAH (p=<0.0001)	Mean	10733.90	2196.43	1410.87
	Std. Dev.	2672.92	467.34	134.06
	ANOVA[1,2]	4,5	1	1
Total Chlordane (p=0.0001)	Mean	97.12	37.14	22.29
	Std. Dev.	11.86	9.43	4.12
	ANOVA[2]	4,5	1	1
Dieldrin (p=0.0423)	Mean	48.10	27.09	20.55
	Std. Dev.	13.96	11.52	2.17
	ANOVA[2]	5		1

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.
[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

Table 3-11. Comparison of MWRA Caution and Warning Levels to Mean 2001 Lobster Meat Concentrations for Selected Parameters.

Station	Total PCB (ng/g wet wt.)			Total DDT (ng/g lipid)			Total Chlordane (ng/g lipid)			Dieldrin (ng/g lipid)			Mercury (µg/g wet wt.)		
	mean	**se**	**n**	**mean**	**se**	**n**	**mean**	**se**	**n**	**mean**	**se**	**n**	**mean**	**se**	**n**
Outfall Site	9.74	0	3	305	0	3	49.50	0	3	172.00	0	3	0.15	0	3
MWRA Caution Level	1000			683			150			322			0.5		
MWRA Warning Level	1600			NA			NA			NA			0.8		
FDA Limit	2000			5000			300			300			1		

Table 3-12. Samples Collected During 40-day Retrieval.

Site	Array ID	# Cages	Approximate # Mussels/ Cage	Approximate Total # Mussels
DI	1	2	45	90
OS	2	3	48	144
BIH	1	3	30	90
CCB	2	3	48	144

Table 3-13. Samples Collected During 60-day Retrieval.

Site	Array ID	# Cages	Approximate # Mussels/ Cage	Approximate Total # Mussels
DI	3	2	45	90
OS	1,3,4, "B" Buoy	12	48	576
BIH	2,3	6	30	180
CCB	1,3	6	48	288

Table 3-14. 2001 Caged Mussels Survival Data.

Collection	Site	Total Mussels	Dead Mussels	Survival Rate
40-day	DI	90	0	100%
	OS	147	1	99%
	BIH	91	2	98%
	CCB	144	0	100%
60-day	DI	92	0	100%
	OS	142	3	98%
	BIH	180	0	100%
	CCB	288	1	100%

Table 3-15. ANOVA Results Comparing Contaminant Concentrations in Deployed Mussels in 2001.

Station Name		DI	OS	BIH	CCB
Station Number		**1M**	**M4**	**6**	**9**
N		5	8	5	8
Lead (p=<0.0001)	Mean	3.50	1.86	10.06	1.75
	Std. Dev.	0.61	0.28	2.01	0.57
	ANOVA[1,2]	M4,6,9	1M,6	1M,M4,9	1M,6
Mercury (p=<0.0001)	Mean	0.127	0.141	0.203	0.10
	Std. Dev.	0.010	0.013	0.069	0.028
	ANOVA[1,2]	6	6,9	1M,M4,9	M4,6
Total PCB (p=<0.0001)	Mean	219.39	81.01	398.09	70.54
	Std. Dev.	19.49	7.24	23.18	14.35
	ANOVA[1,2]	M4,6,9	1M,6	1M,M4,9	1M,6
Total HMW-PAHs (p=<0.0001)	Mean	251.60	280.21	1769.61	70.57
	Std. Dev.	31.33	16.40	176.77	7.38
	ANOVA[1,2]	6,9	6,9	1M,M4,9	1M,M4,6
Total LMW-PAHs (p=<0.0001)	Mean	167.70	471.85	987.50	41.29
	Std. Dev.	21.51	34.93	100.41	10.90
	ANOVA[1,2]	M4,6,9	1M,6,9	1M,M4,9	1M,M4,6
Total DDT (p=<0.0001)	Mean	25.33	15.23	47.67	15.11
	Std. Dev.	1.58	1.66	4.49	2.46
	ANOVA[1,2]	M4,6,9	1M,6	1M,M4,9	1M,6
Total Chlordane (p=<0.0001)	Mean	8.69	18.55	12.25	4.81
	Std. Dev.	0.52	1.89	1.18	0.68
	ANOVA[1,2]	M4,6,9	1M,6,9	1M,M4,9	1M,M4,6
Dieldrin (p=<0.0001)	Mean	1.58	1.86	2.94	1.19
	Std. Dev.	0.19	0.15	0.44	0.50
	ANOVA[1,2]	6,9	6,9	1M,M4,9	1M,M4,6
HCB (p=<0.0001)	Mean	0.51	0.32	0.75	0.41
	Std. Dev.	0.11	0.04	0.27	0.08
	ANOVA[1,2]	M4,6	M1,6	1M,M4,9	6
Lindane (p=0.0037)	Mean	0.22	0.35	0.08	0.33
	Std. Dev.	0.12	0.04	0.18	0.14
	ANOVA[1,2]		6	M4,9	6

[1]Data were transformed to meet ANOVA assumptions of normality and homogeneity of variance.

[2]Differences by ANOVA given as the station(s) that differed significantly from the station in that column.

Table 3-16. T-test Results Comparing Contaminant Levels in Deployed Mussels with Pre-deployed Mussels in 2001.

Station Name		DI	OS	BIH	CCB	Pre-deployed
Station Number		1M	M4	6	9	RP
N		5	8	5	8	5
Lead	Mean	3.50	1.86	10.06	1.75	1.91
	Std. Dev.	0.61	0.28	2.01	0.57	0.49
	Prob.	**0.0019**	0.8464	**0.0005**	0.6273	NA
Mercury	Mean	0.127	0.141	0.203	0.10	0.150
	Std. Dev.	0.010	0.013	0.069	0.028	0.048
	Prob.	0.3449	0.6825	0.2004	**0.0322**	NA
Total PCB	Mean	219.39	81.01	398.09	70.54	18.75
	Std. Dev.	19.49	7.24	23.18	14.35	5.99
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	NA
Total HMW-PAHs	Mean	251.60	280.21	1769.61	70.57	38.05
	Std. Dev.	31.33	16.40	176.77	7.38	7.81
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	NA
Total LMW-PAHs	Mean	167.70	471.85	987.50	41.29	27.80
	Std. Dev.	21.51	34.93	100.41	10.90	11.02
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	0.0535	NA
Total DDT	Mean	25.33	15.23	47.67	15.11	6.71
	Std. Dev.	1.58	1.66	4.49	2.46	1.79
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	NA
Total Chlordane	Mean	8.69	18.55	12.25	4.81	2.87
	Std. Dev.	0.52	1.89	1.18	0.68	0.58
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	**0.0003**	NA
Dieldrin	Mean	1.58	1.86	2.94	1.19	0.59
	Std. Dev.	0.19	0.15	0.44	0.50	0.23
	Prob.	**<0.0001**	**<0.0001**	**<0.0001**	**0.0321**	NA
HCB	Mean	0.51	0.32	0.75	0.41	0.30
	Std. Dev.	0.11	0.04	0.27	0.08	0.07
	Prob.	**0.0056**	0.5336	**0.0185**	**0.0231**	NA
Lindane	Mean	0.22	0.35	0.08	0.33	0.31
	Std. Dev.	0.12	0.04	0.18	0.14	0.03
	Prob.	0.1625	0.0595	**0.0456**	0.6849	NA

Table 3-17. Summary of PAH Lists of Analytes Used for Bioaccumulation Study 1992 - 2001.

Total PAH List	"Historical" NOAA PAH List
Low Molecular Weight PAHs	**Low Molecular Weight PAHs**
1-METHYLNAPHTHALENE*	1-METHYLNAPHTHALENE
1-METHYLPHENANTHRENE*	1-METHYLPHENANTHRENE
2,3,5-TRIMETHYLNAPHTHALENE*	2,3,5-TRIMETHYLNAPHTHALENE
2,6-DIMETHYLNAPHTHALENE*	2,6-DIMETHYLNAPHTHALENE
2-METHYLNAPHTHALENE*	2-METHYLNAPHTHALENE
ACENAPHTHENE	ACENAPHTHENE
ACENAPHTHYLENE	ACENAPHTHYLENE
ANTHRACENE	ANTHRACENE
BENZOTHIAZOLE*	
BIPHENYL	BIPHENYL
C1-DIBENZOTHIOPHENES	
C1-FLUORENES	
C1-NAPHTHALENES	
C1-PHENANTHRENES/ANTHRACENES	
C2-DIBENZOTHIOPHENES	
C2-FLUORENES	
C2-NAPHTHALENES	
C2-PHENANTHRENES/ANTHRACENES	
C3-DIBENZOTHIOPHENES	
C3-FLUORENES	
C3-NAPHTHALENES	
C3-PHENANTHRENES/ANTHRACENES	
C4-NAPHTHALENES	
C4-PHENANTHRENES/ANTHRACENES	
DIBENZOFURAN	
DIBENZOTHIOPHENE	
FLUORENE	FLUORENE
NAPHTHALENE	NAPHTHALENE
PHENANTHRENE	PHENANTHRENE
High Molecular Weight PAHs	**High Molecular Weight PAHs**
BENZ(A)ANTHRACENE	BENZ(A)ANTHRACENE
BENZO(A)PYRENE	BENZO(A)PYRENE
BENZO(B)FLUORANTHENE	BENZO(B)FLUORANTHENE
BENZO(E)PYRENE	BENZO(E)PYRENE
BENZO(G,H,I)PERYLENE	BENZO(G,H,I)PERYLENE
BENZO(K)FLUORANTHENE	BENZO(K)FLUORANTHENE
C1-CHRYSENES	
C1-FLUORANTHRENES/PYRENES	
C2-CHRYSENES	
C2-FLUORANTHENES/PYRENES	
C3-CHRYSENES	
C3-FLUORANTHENES/PYRENES	
C4-CHRYSENES	
CHRYSENE	CHRYSENE
DIBENZO(A,H)ANTHRACENE	DIBENZO(A,H)ANTHRACENE
FLUORANTHENE	FLUORANTHENE
INDENO(1,2,3-C,D)PYRENE	INDENO(1,2,3-C,D)PYRENE
PERYLENE	PERYLENE
PYRENE	PYRENE

*** Not Included in Total PAH**

Table 3-18. Comparison of MWRA Caution and Warning Levels to Mean 2001 Mussel Concentrations for Selected Parameters.

Station	Total PCB (ng/g wet wt.)			Total DDT (ng/g lipid)			Total Chlordane (ng/g lipid)			Dieldrin (ng/g lipid)			Total PAH[1] (ng/g lipid)			Mercury (µg/g wet wt.)			Lead (µg/g wet wt.)		
	mean	se	n	mean	se	n	mean	se	n	mean	se	n	mean	se	n	mean	se	n	mean	se	n
Outfall Site	9.61	0.70	8	205.0	21.0	8	250.0	30.0	8	25.2	4.4	8	3020	160.0	8	0.02	0.001	8	0.24	0.03	8
MWRA Caution Level	1000			483			205			50			2160			0.5			2		
MWRA Warning Level	1600			NA			NA			NA			NA			0.8			3		
FDA Limit	2000			5000			300			300			NA			1.000			3.75		

[1]Based on NOAA PAHs only

Table 3-19. Predicted Mussel Concentrations Over a Range of Dilutions Compared to Measured Concentrations in OS Mussels.

Contaminant Group	Predicted Mussel Concentrations at Various Dilutions						Measured Mussel Conc.
	70:1	*90:1*	*120:1*	*150:1*	*200:1*	*400:1*	OS
24 NOAA PAHs (ng/g wet)	71.9	58.0	45.8	38.4	31.1	20.1	26.4
NOAA LMW PAHs (ng/g wet)	6.4	5.6	4.8	4.4	3.9	3.2	3.0
NOAA HMW PAHs (ng/g wet)	65.5	52.4	40.9	34.1	27.2	16.9	23.4
Total Chlordane (ng/g wet)	0.83	0.76	0.70	0.67	0.63	0.57	2.2
PCB 138 (ng/g wet)	4.10	3.52	3.00	2.69	2.39	1.92	1.7
PCB 153 (ng/g wet)	7.15	5.95	4.90	4.27	3.65	2.70	2.5

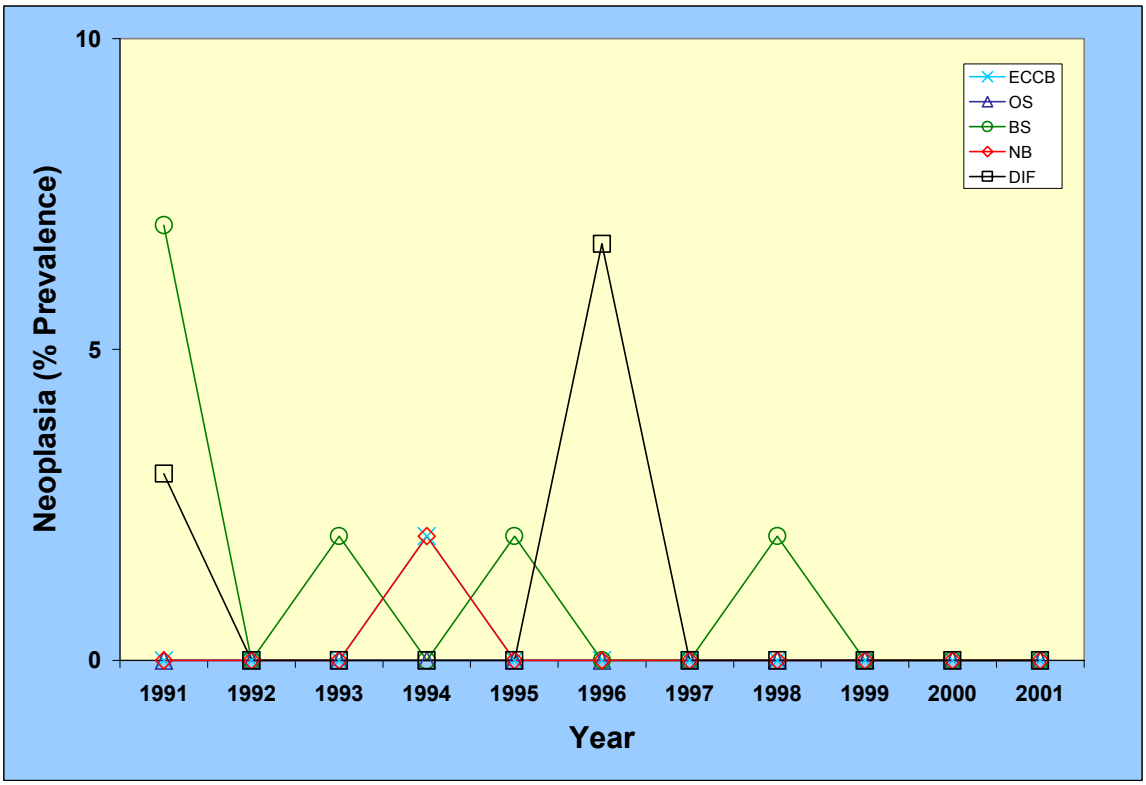


Figure 3-1. Temporal Comparison of Neoplasia Prevalence in Winter Flounder by Station Over Time.

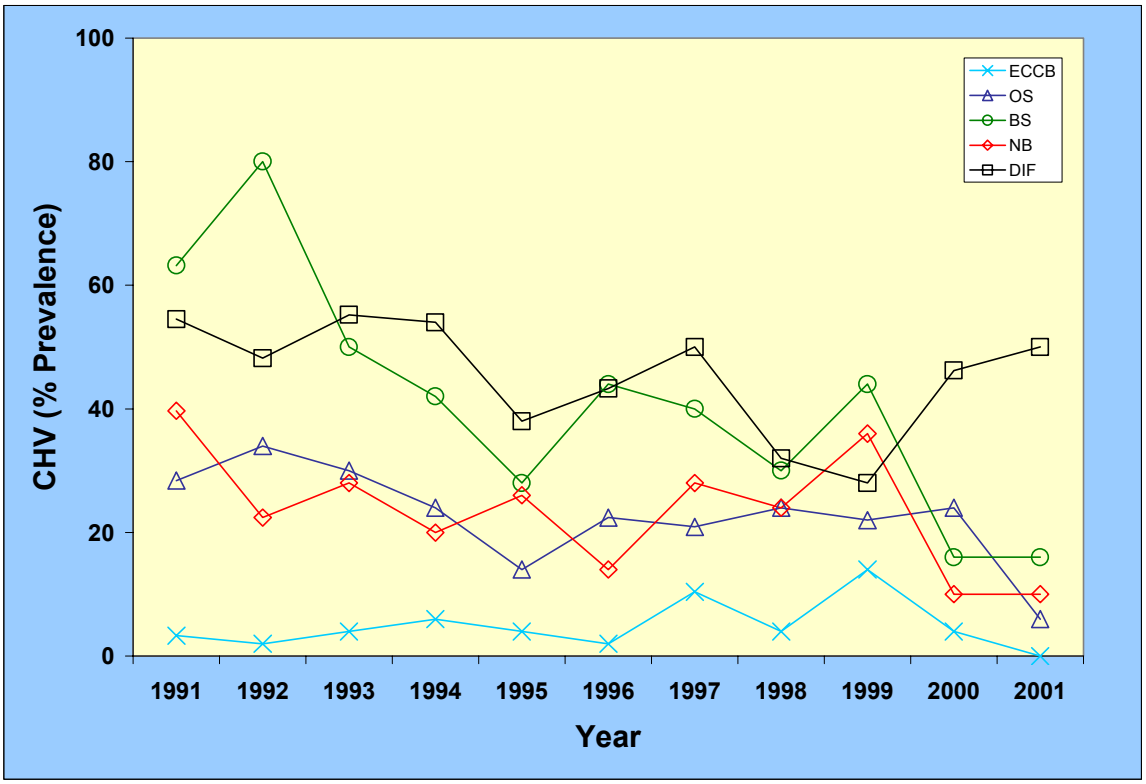


Figure 3-2. Temporal Comparison of Prevalence of Centrotubular Hydropic Vacuolation in Winter Flounder by Station Over Time.

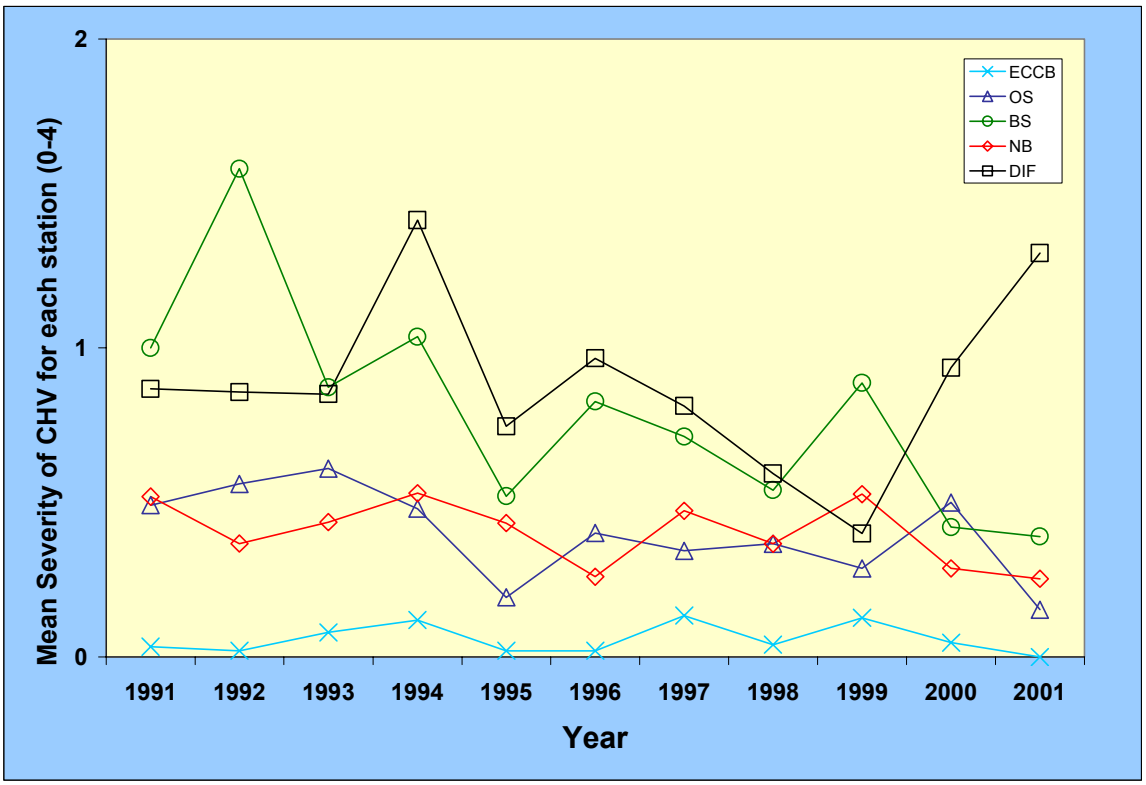


Figure 3-3. Centrotubular Hydropic Vacuolation Severity in Winter Flounder Compared Between Sites and Years.

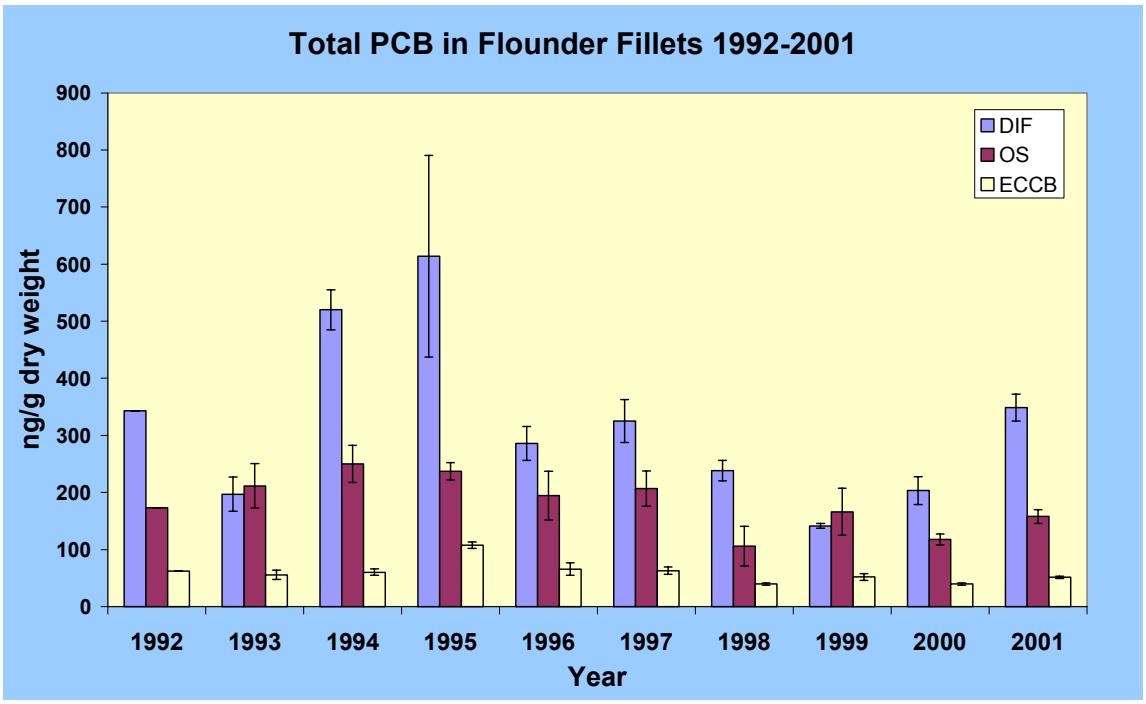


Figure 3-4. Total PCB in Flounder Fillets at the Five Collection Sites from 1992-2001.

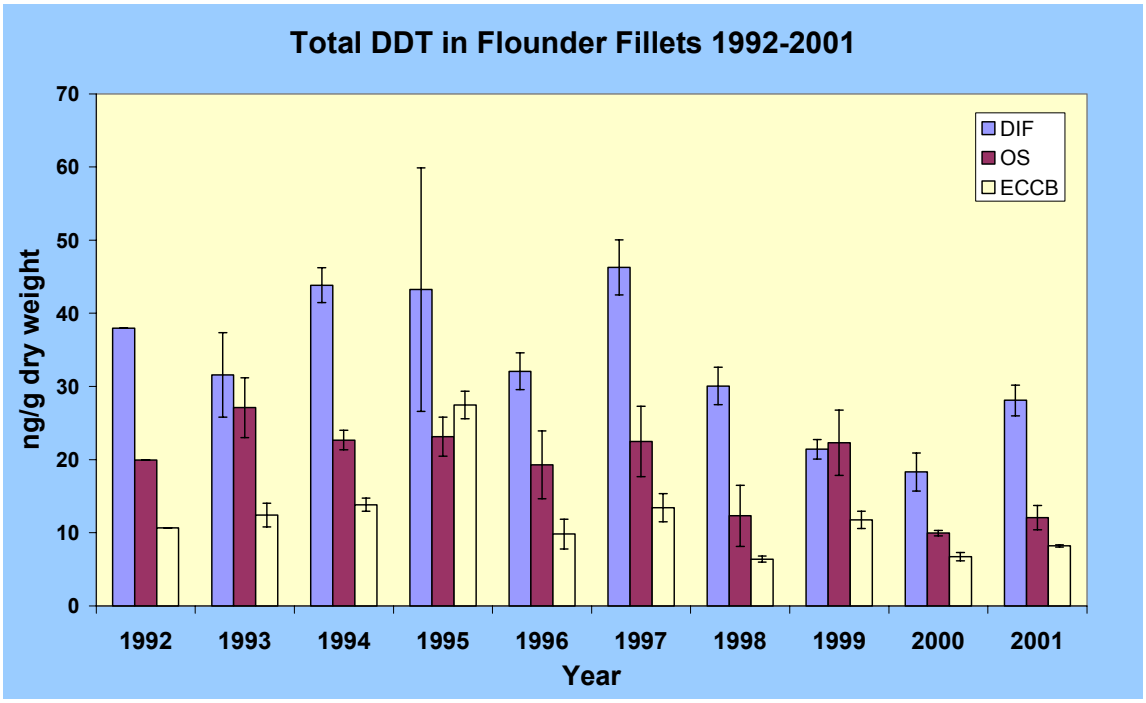


Figure 3-5. Total DDT in Flounder Fillets at the Five Collection Sites from 1992-2001.

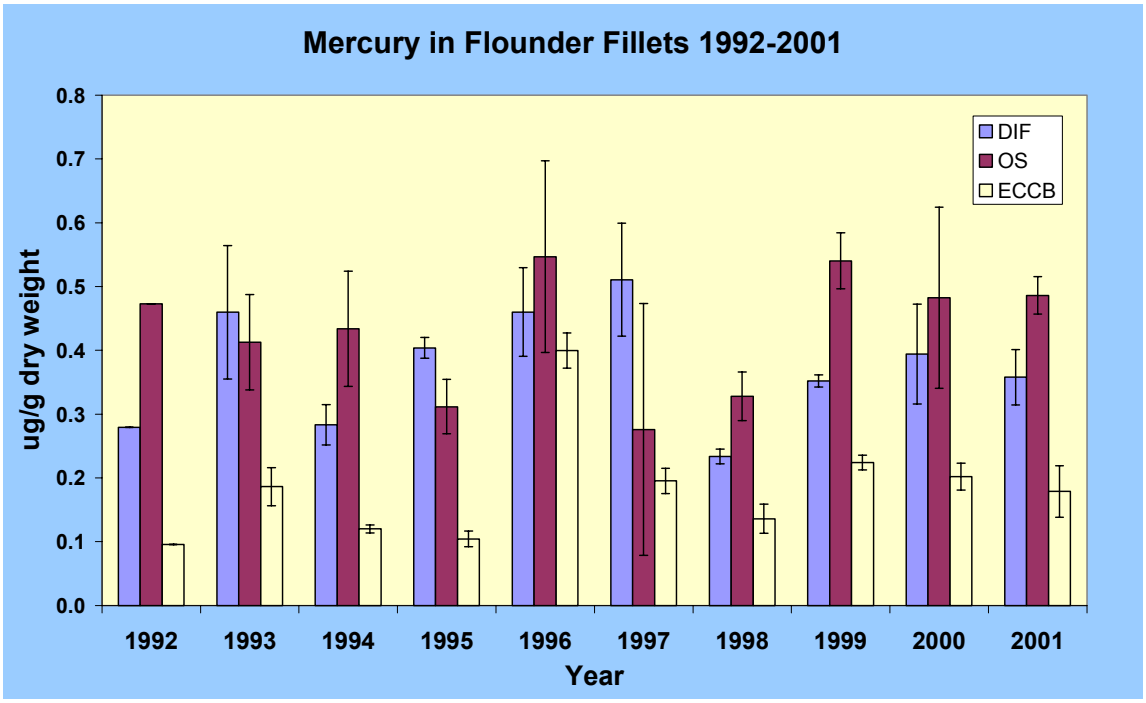


Figure 3-6. Mercury in Flounder Fillets at the Five Collection Sites from 1992-2001.

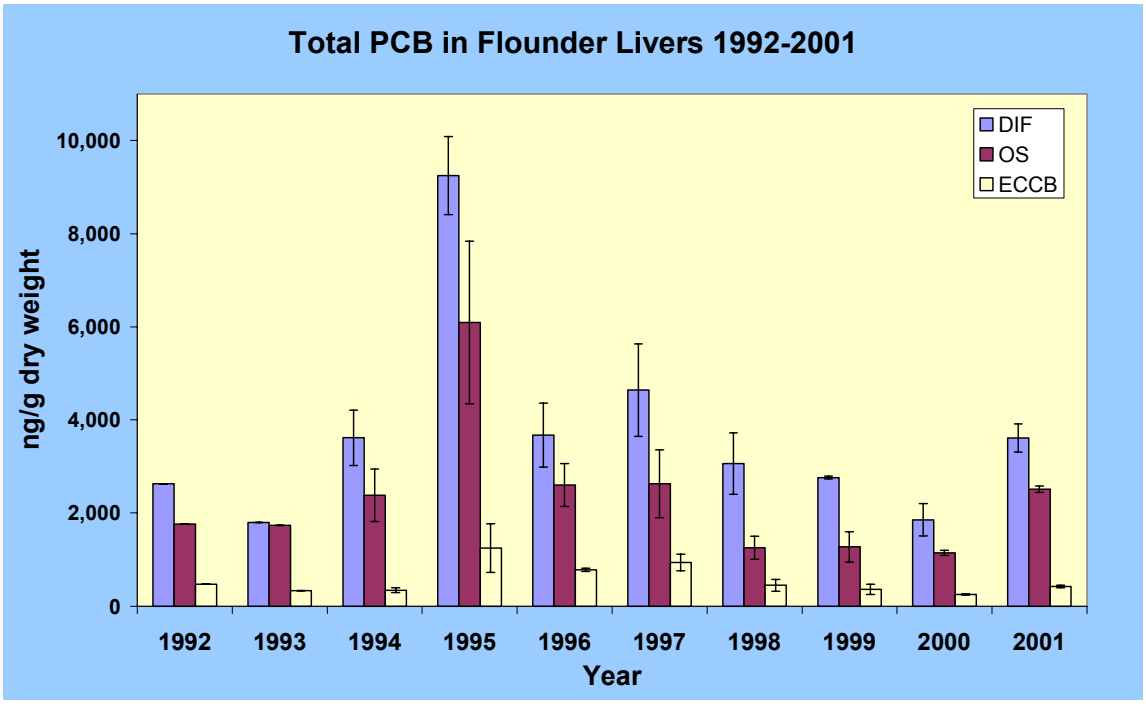


Figure 3-7. Total PCB in Flounder Livers at the Five Collection Sites from 1992-2001.

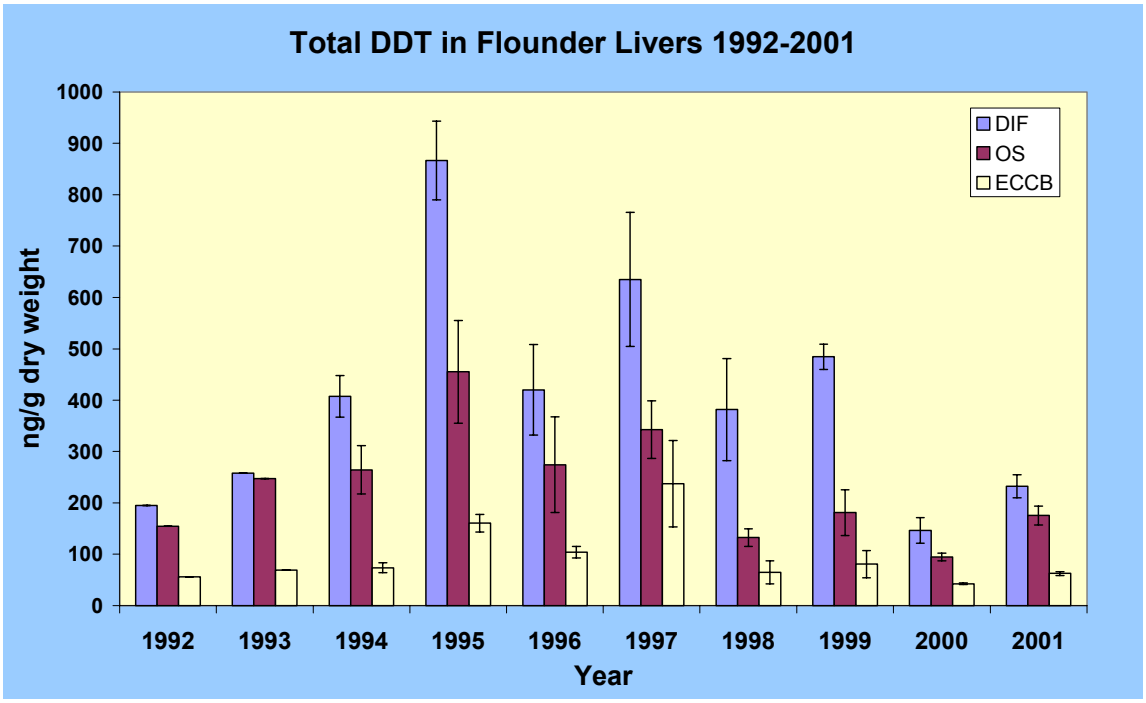


Figure 3-8. Total DDT in Flounder Livers at the Five Collection Sites from 1992-2001.

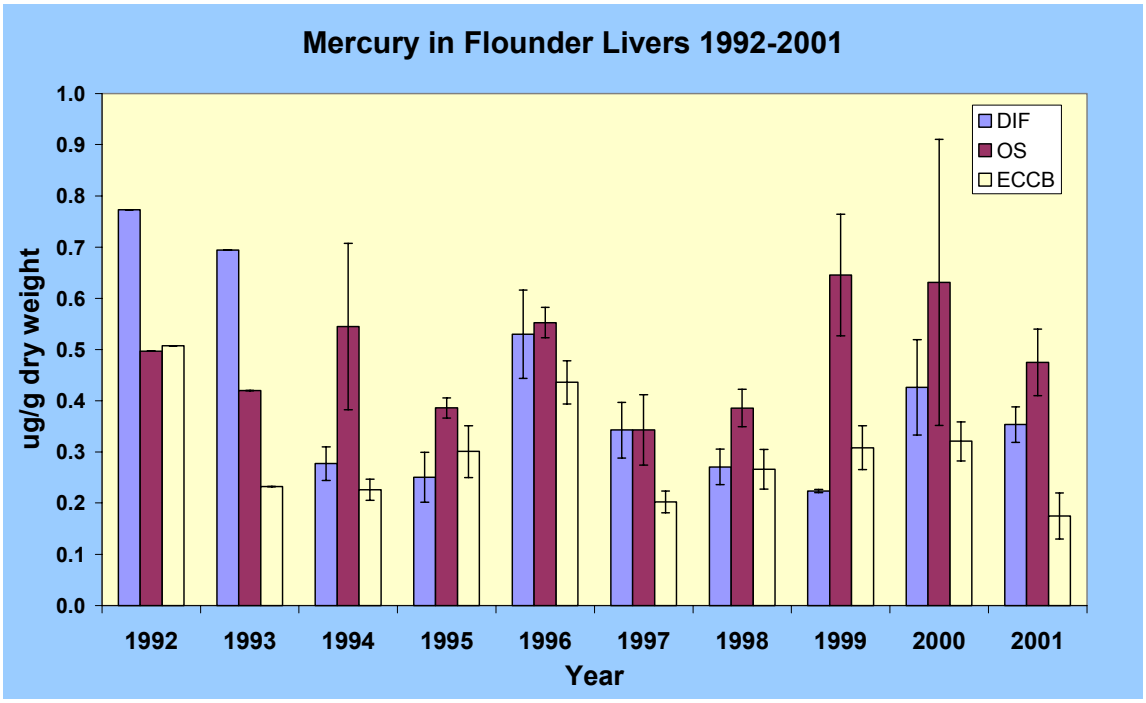


Figure 3-9. Mercury in Flounder Livers at the Five Collection Sites from 1992-2001.

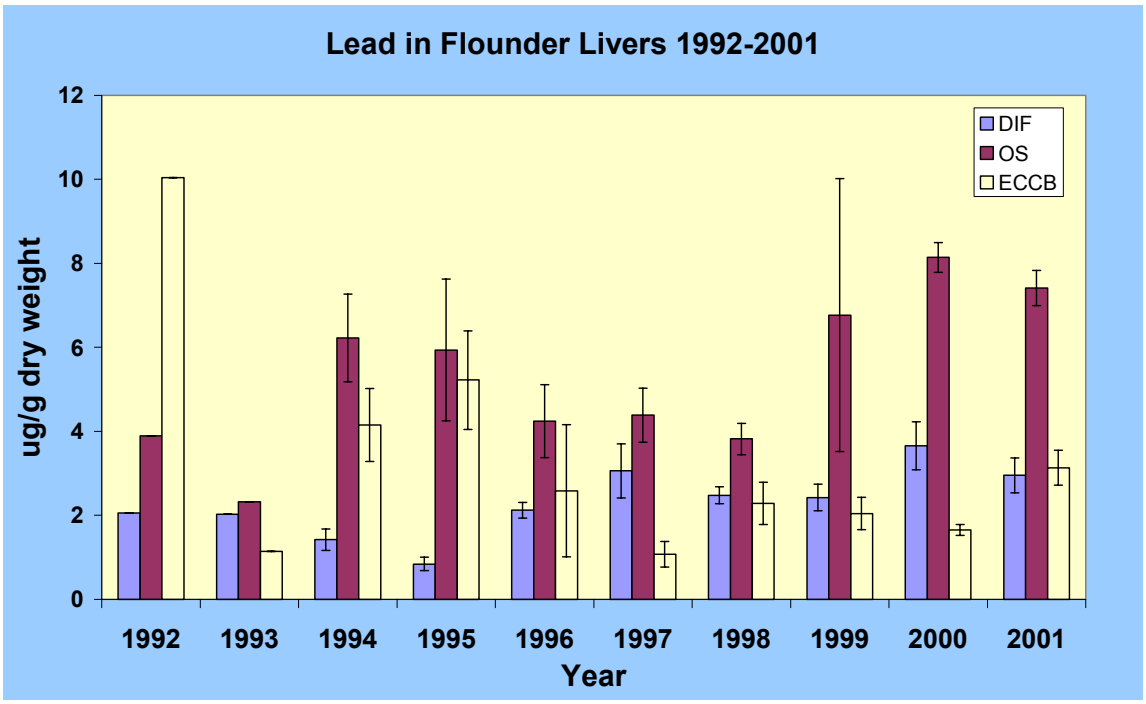


Figure 3-10. Lead in Flounder Livers at the Five Collection Sites from 1992-2001.

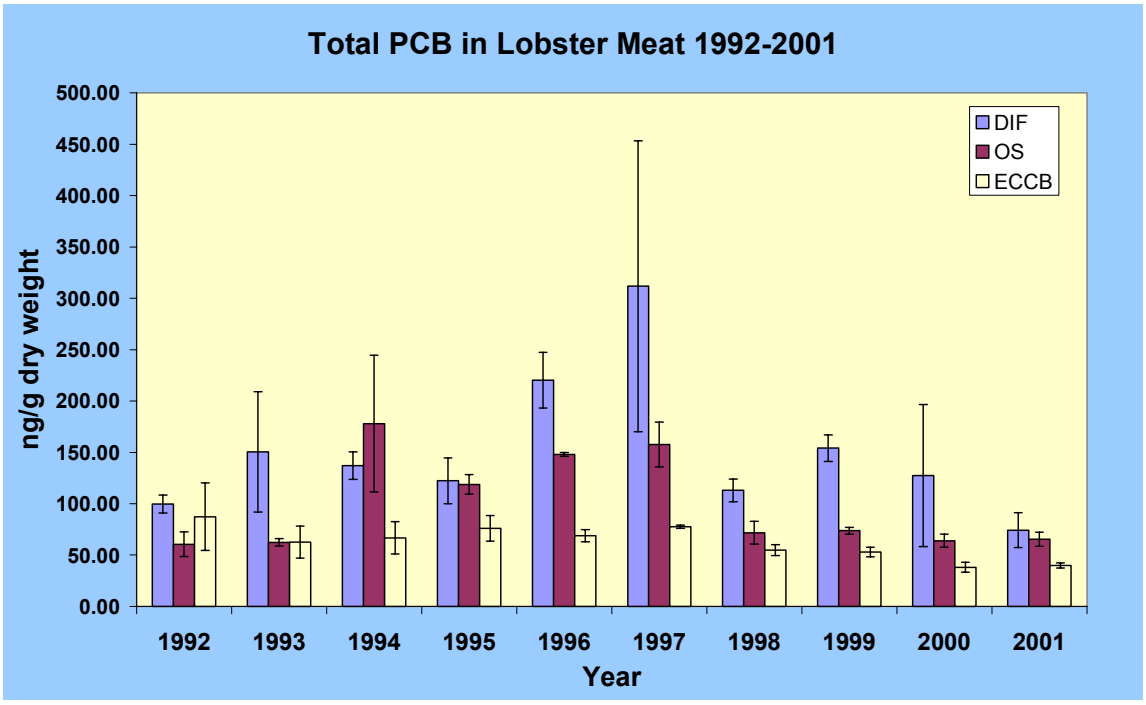


Figure 3-11. Total PCB in Lobster Meat at DIF, OS, and ECCB from 1992-2001.

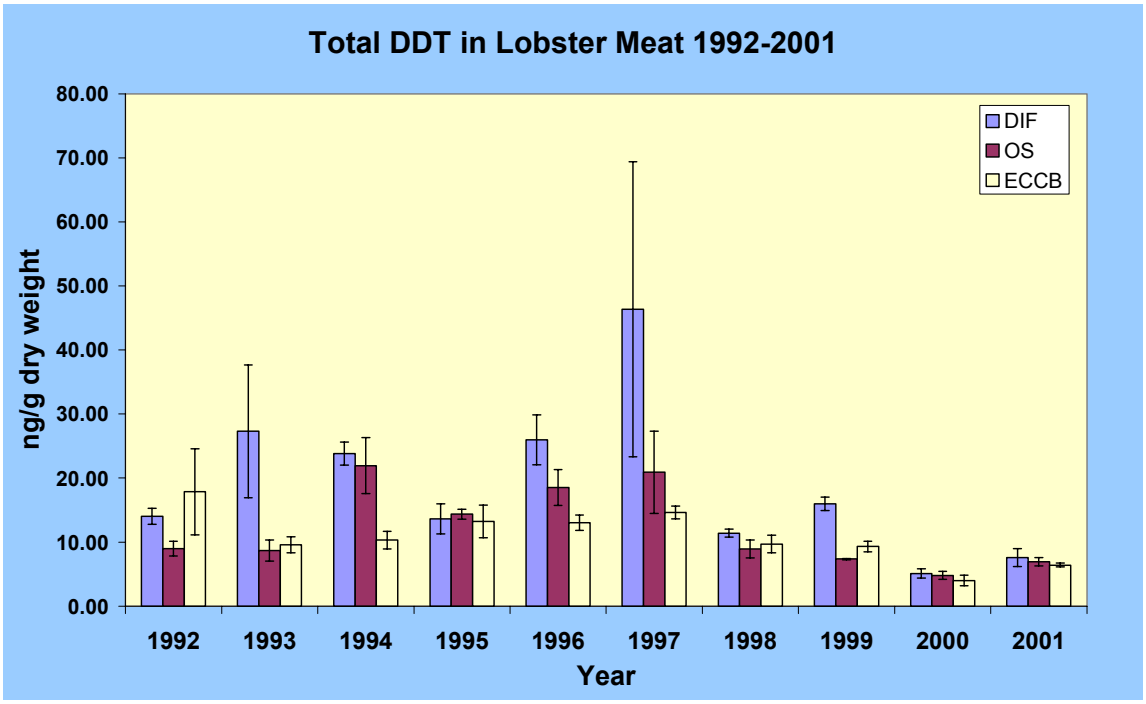


Figure 3-12. Total DDT in Lobster Meat at DIF, OS, and ECCB from 1992-2001.

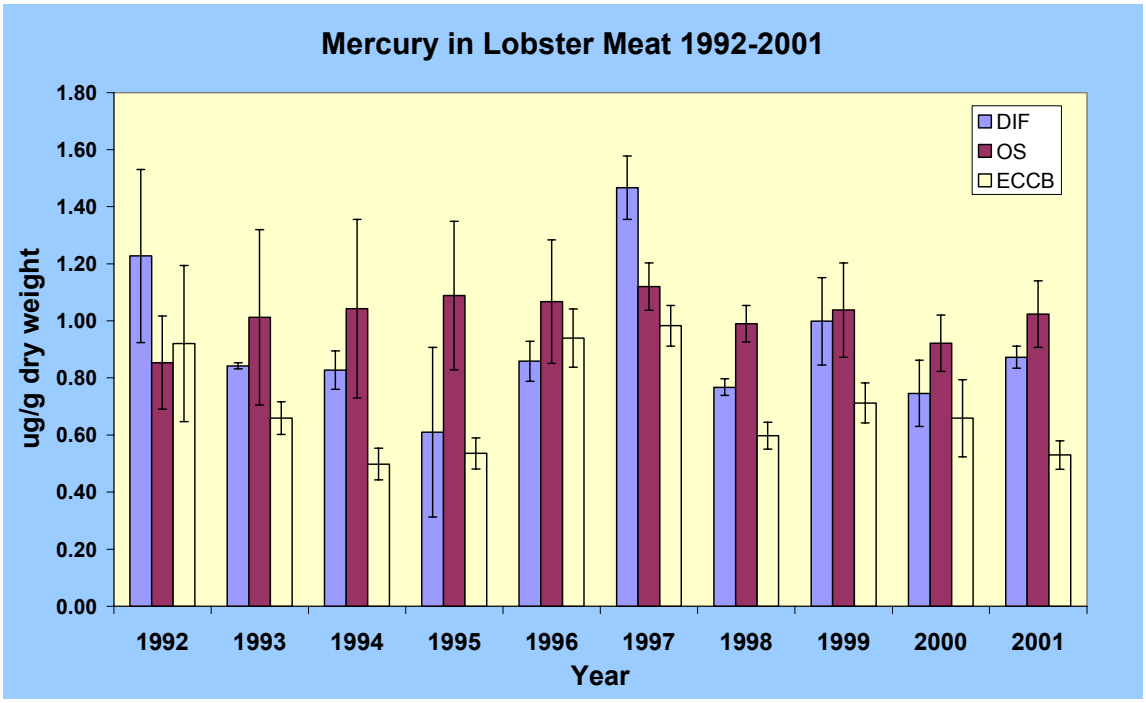


Figure 3-13. Mercury in Lobster Meat at DIF, OS, and ECCB from 1992-2001.

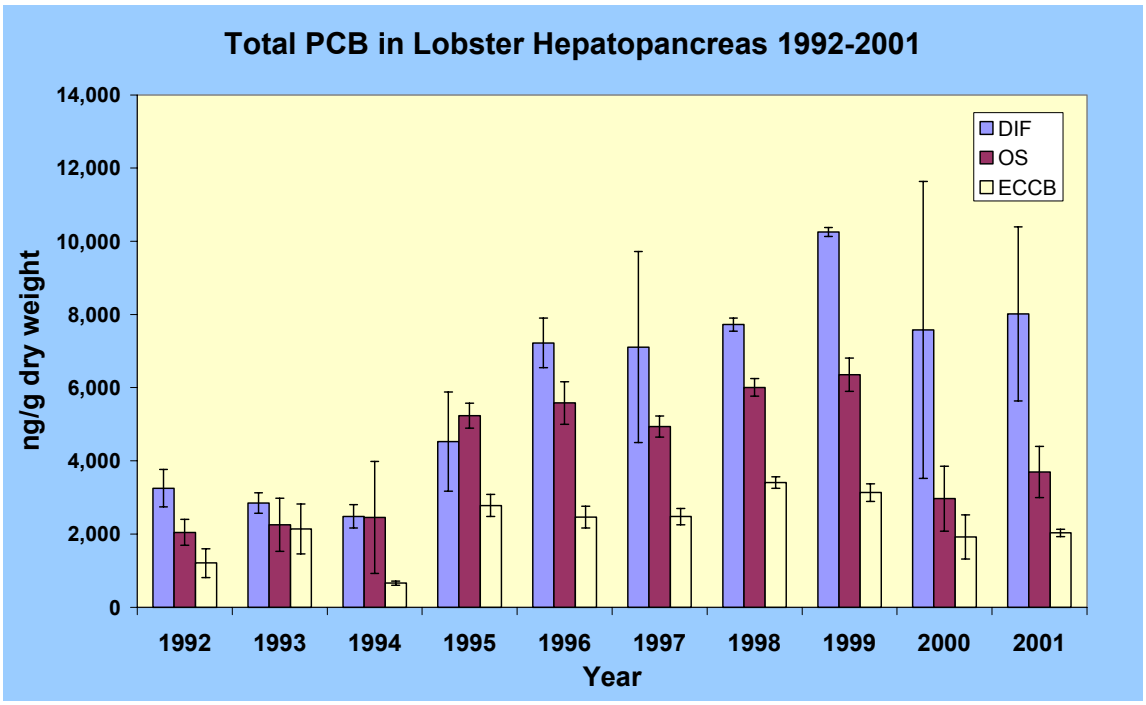


Figure 3-14. Total PCB in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.

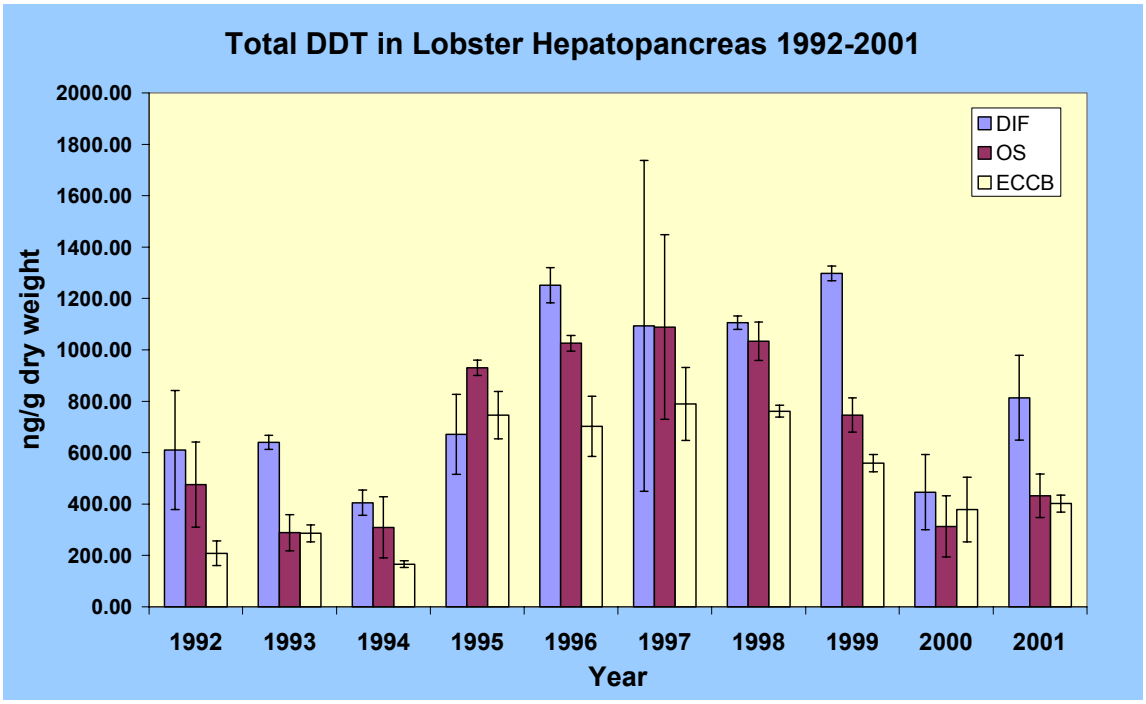


Figure 3-15. Total DDT in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.

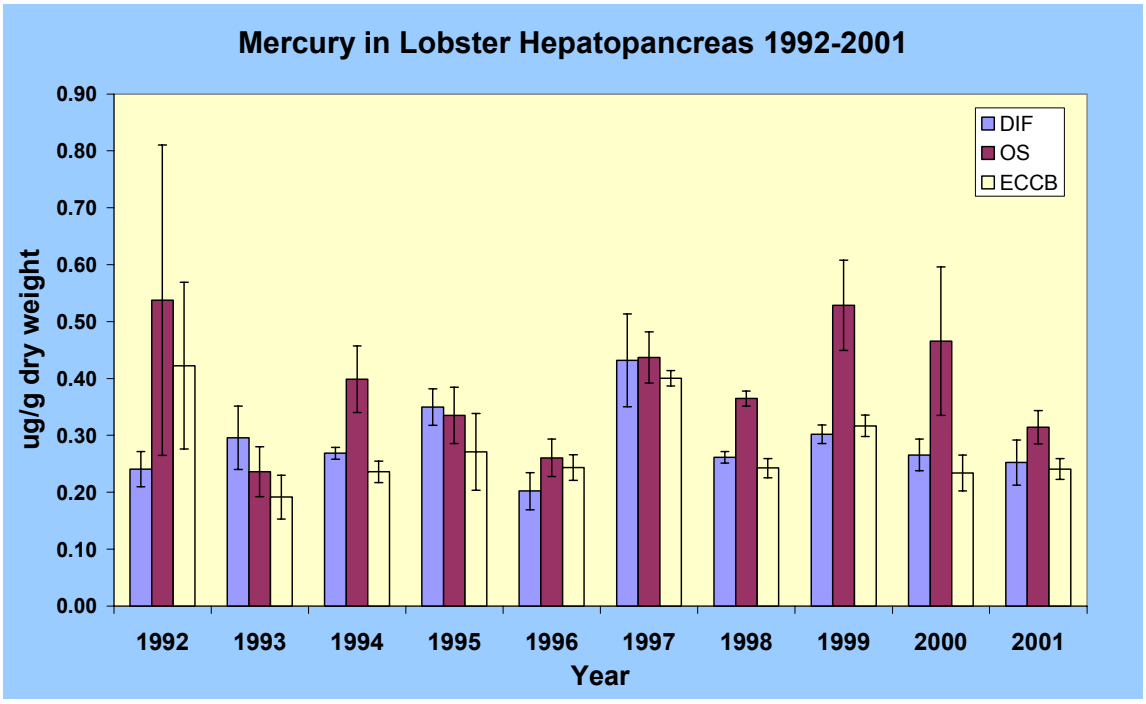


Figure 3-16. Mercury in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.

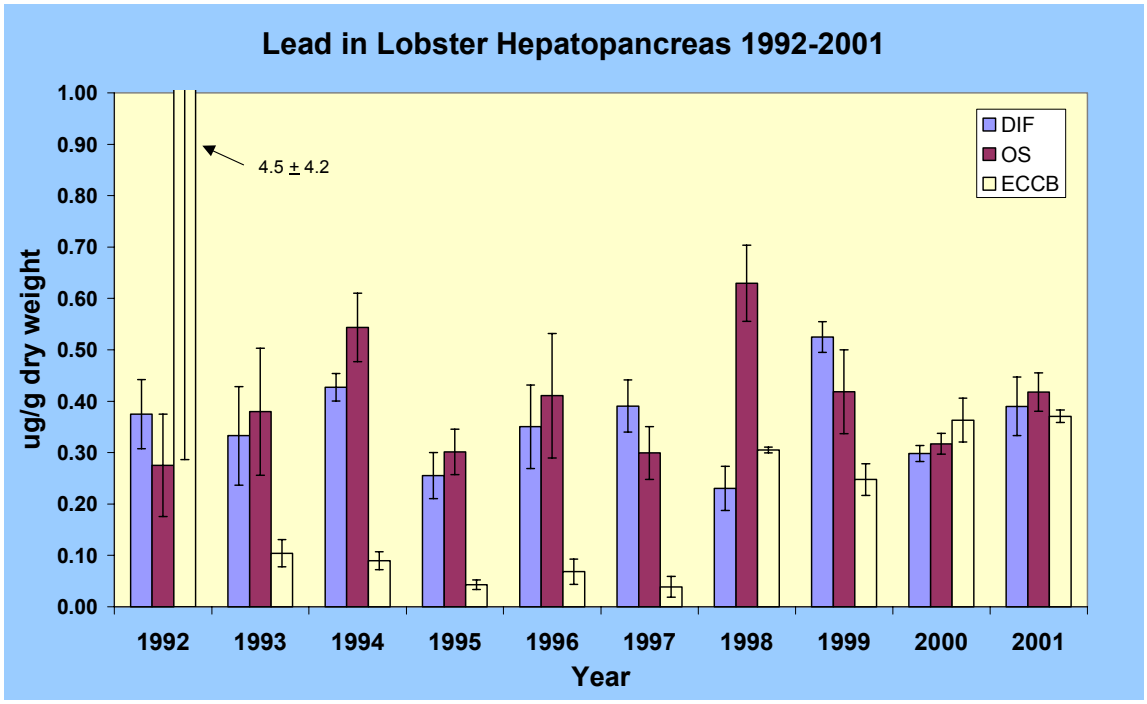


Figure 3-17. Lead in Lobster Hepatopancreas at DIF, OS and ECCB from 1992-2001.

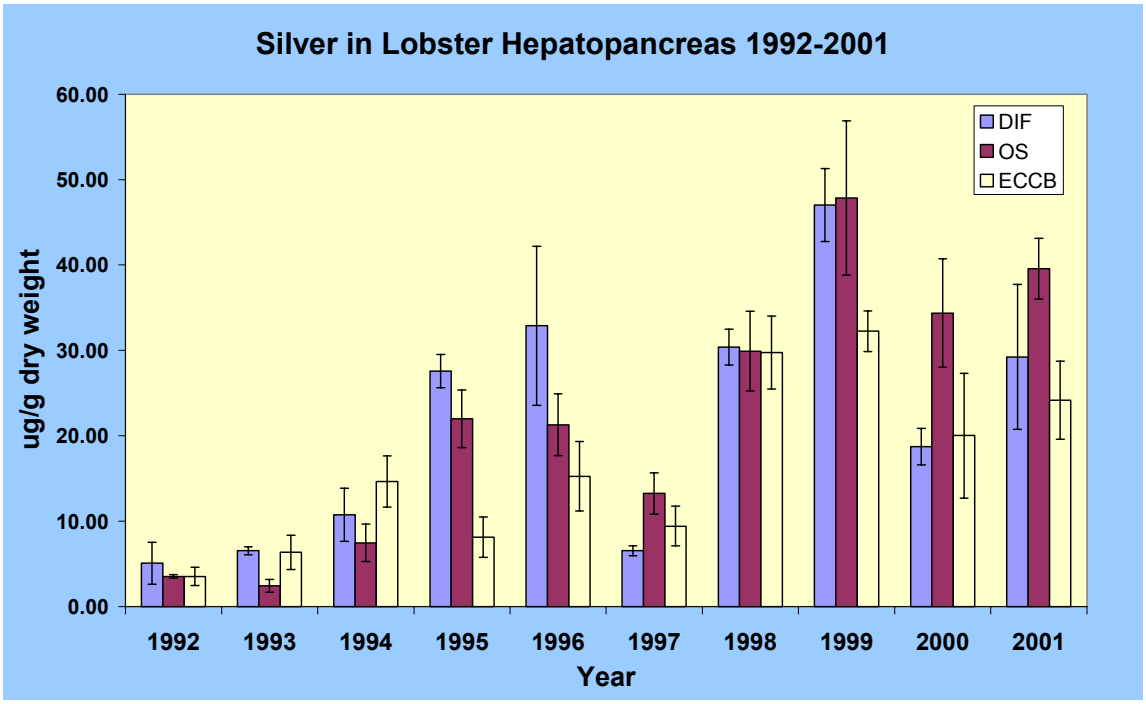


Figure 3-18. Silver in Lobster Hepatopancreas at DIF, OS and ECCB from 1992-2001.

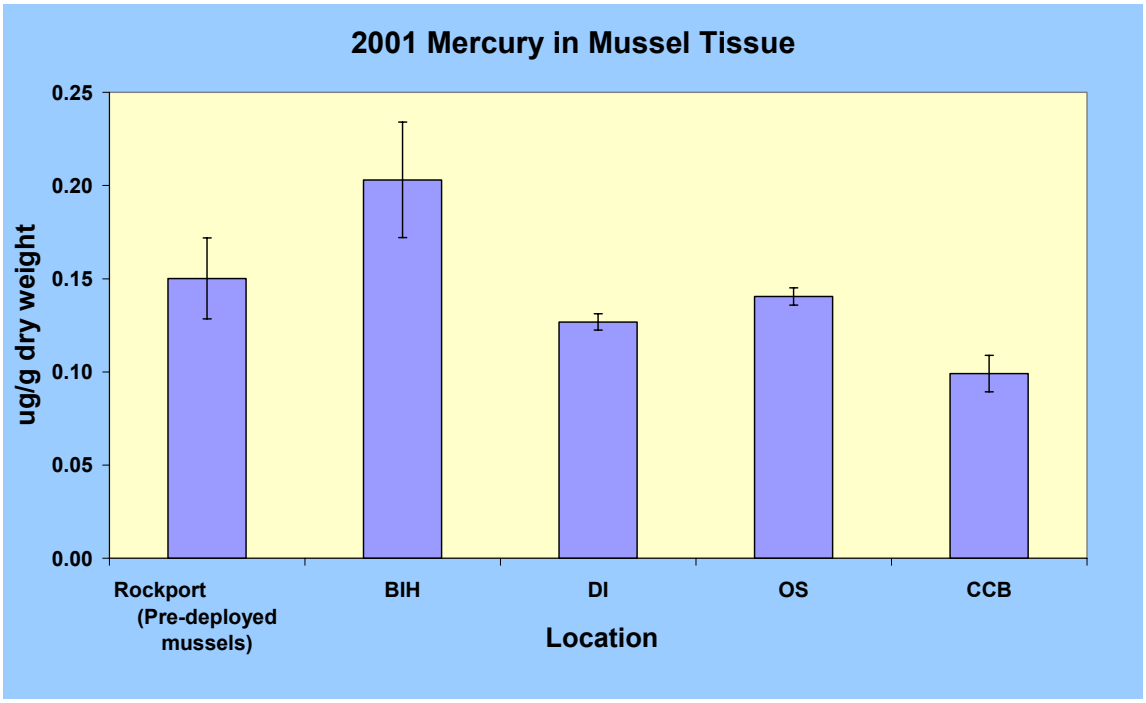


Figure 3-19. Mercury in 2001 Pre-deployed Mussels and Four Deployment Locations.

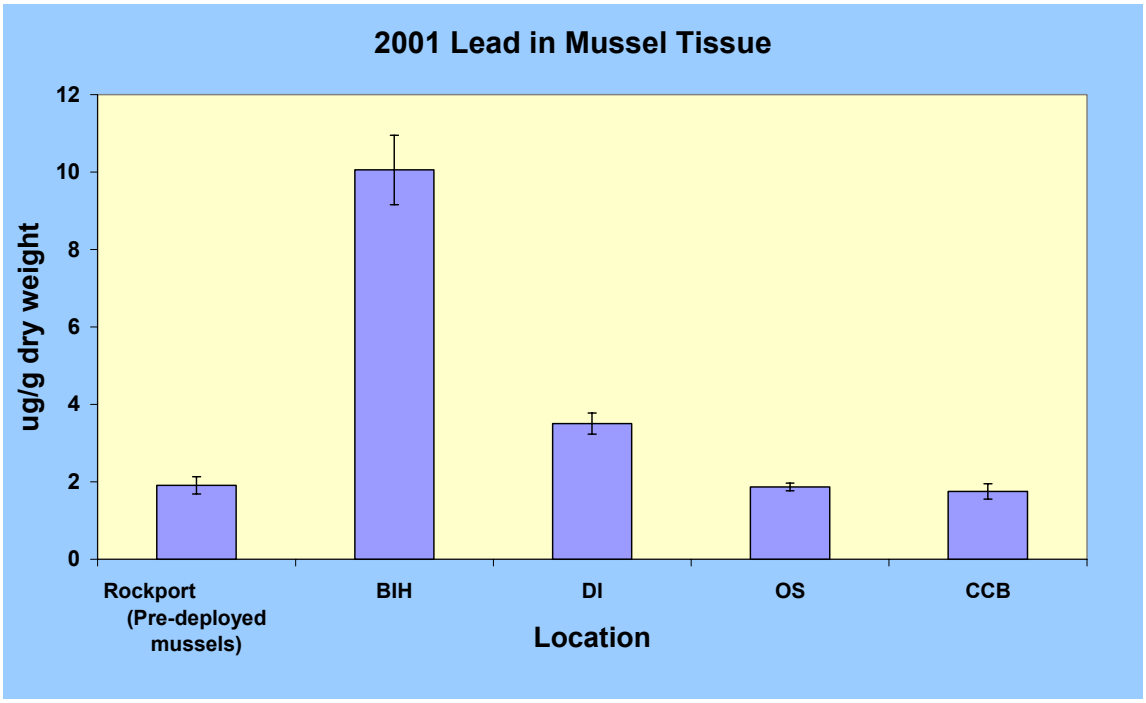


Figure 3-20. Lead in 2001 Pre-deployed Mussels and Four Deployment Locations.

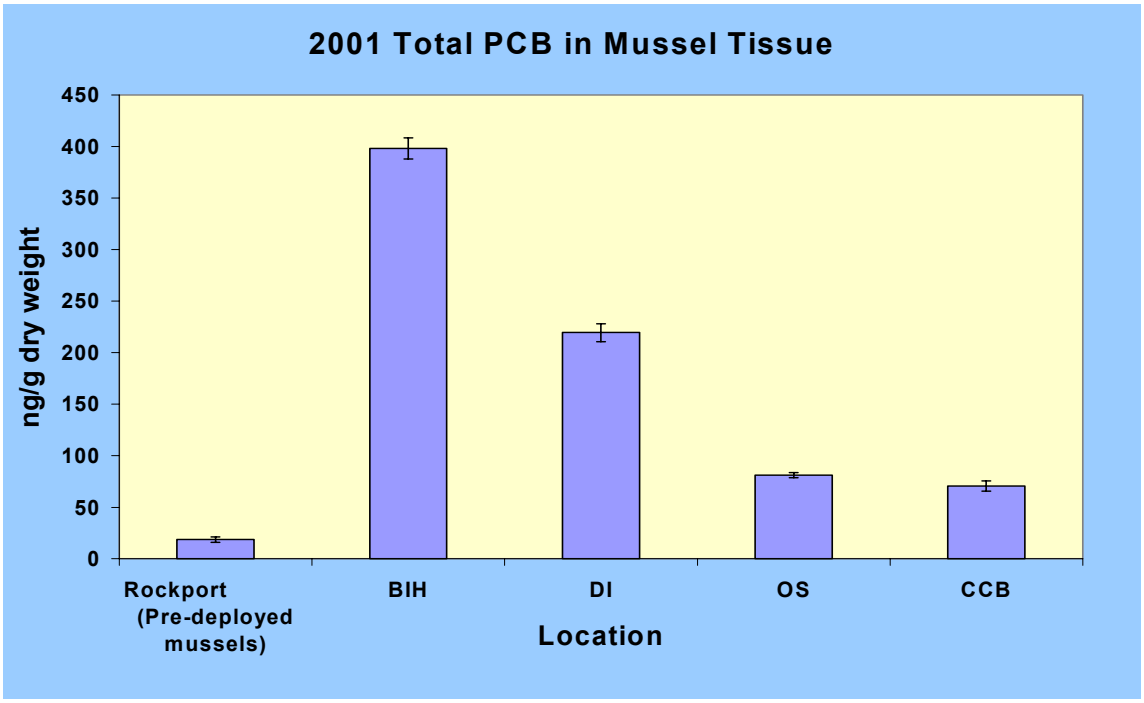


Figure 3-21. Total PCB in 2001 Pre-deployed Mussels and Four Deployment Locations.

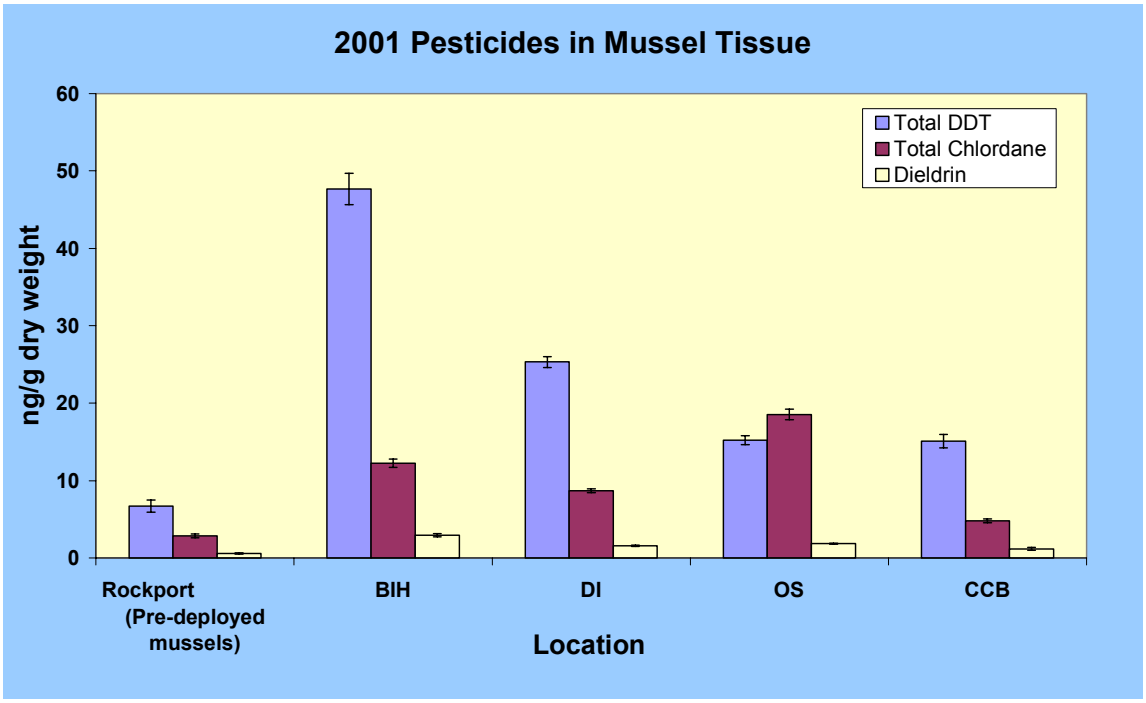


Figure 3-22. Pesticides in 2001 Pre-deployed Mussels and Four Deployment Locations.

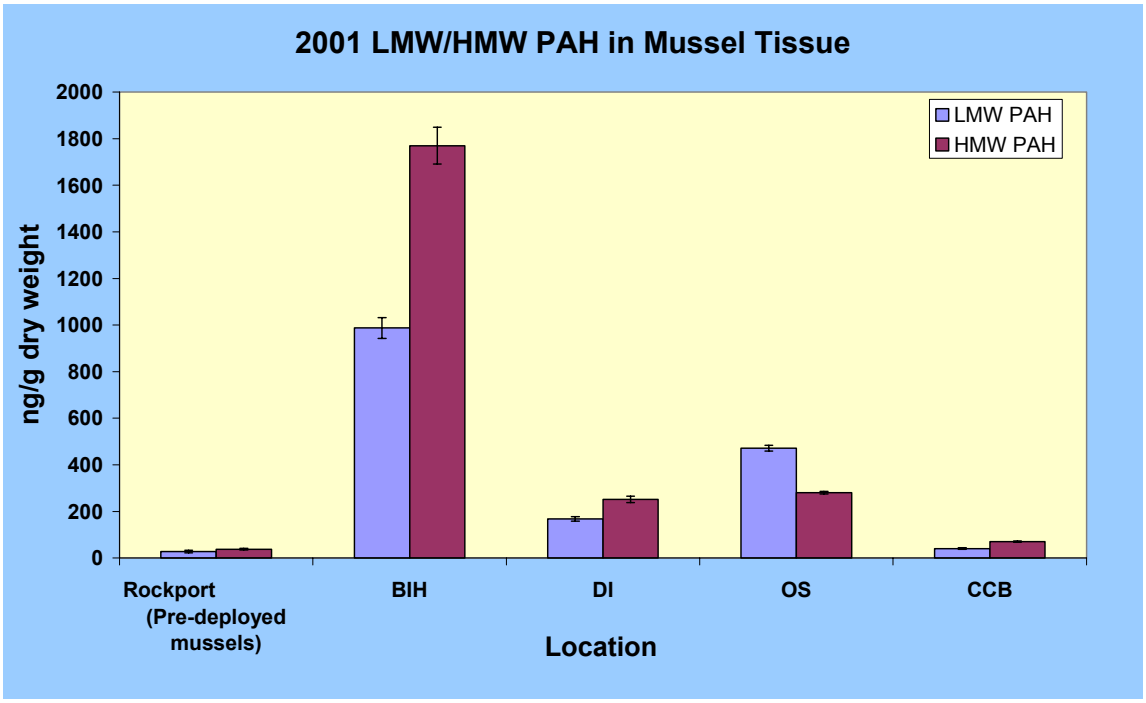


Figure 3-23. Total Low and High Molecular Weight PAHs in 2001 Pre-deployed Mussels and Four Deployment Locations Using the Total PAH List.

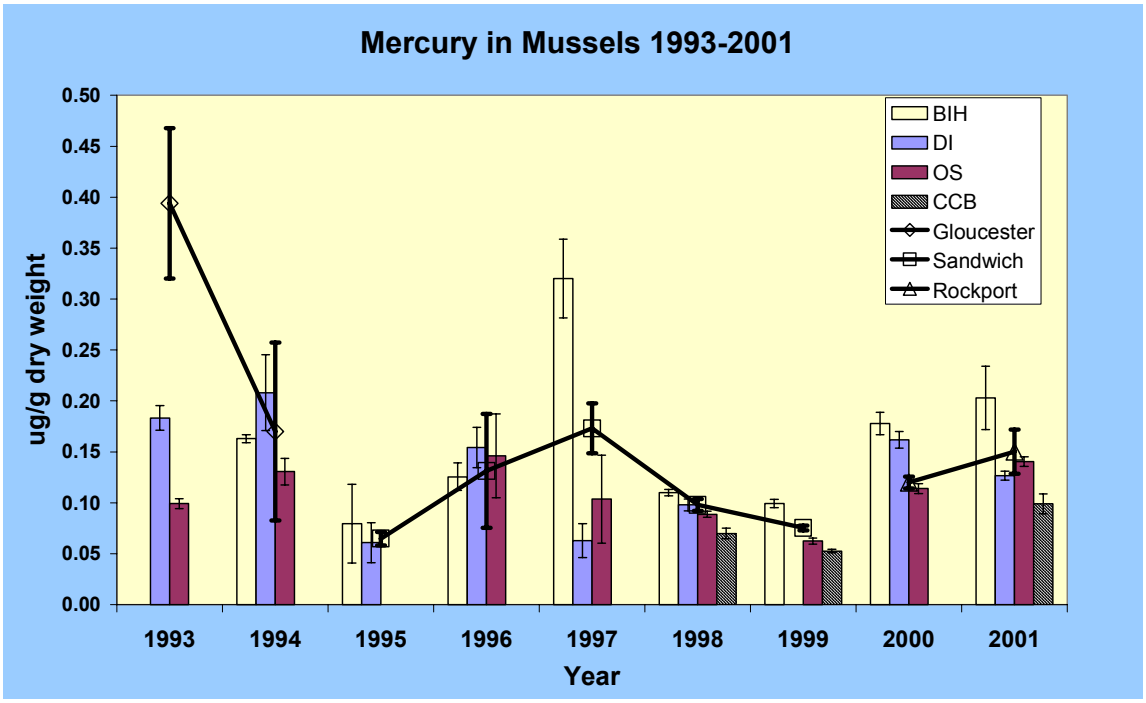


Figure 3-24. Mercury in Pre-deployed and Deployed Mussels from 1993-2001.

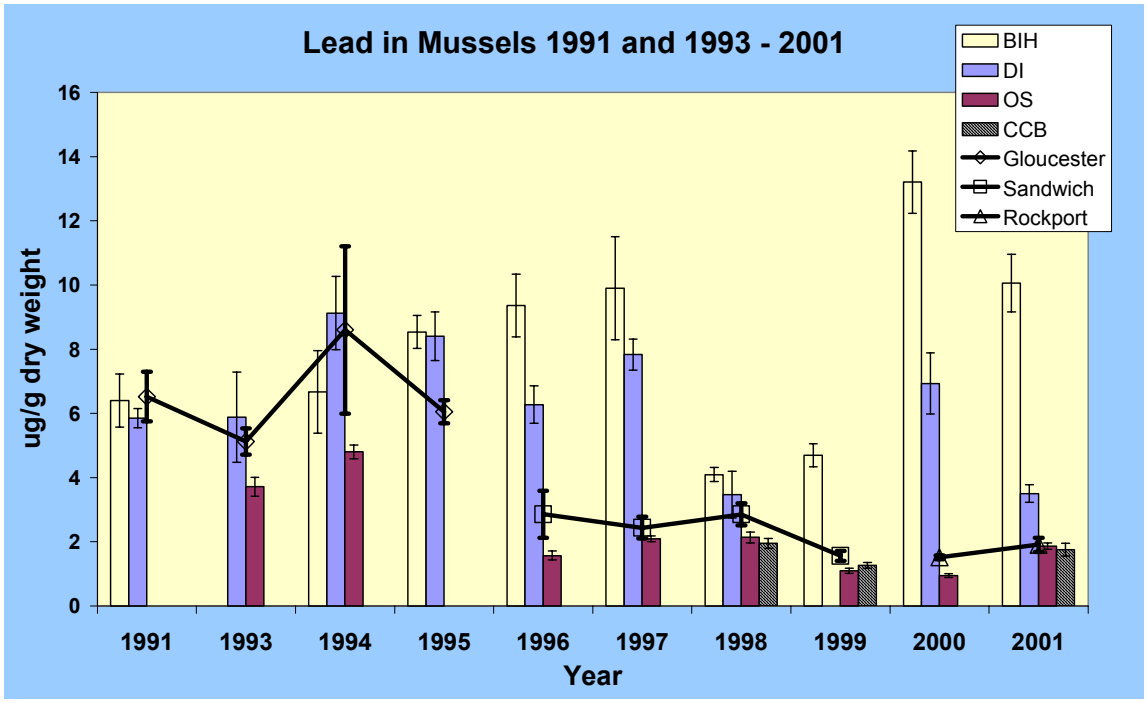


Figure 3-25. Lead in Pre-deployed and Deployed Mussels from 1991 and 1993-2001.

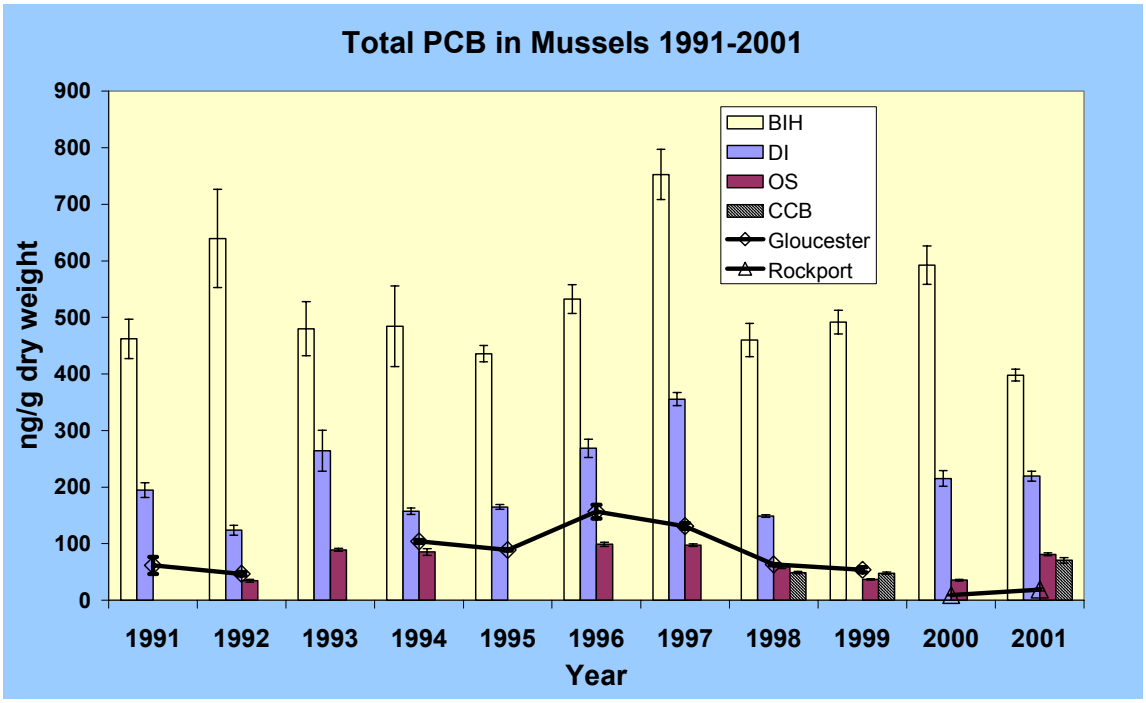


Figure 3-26. Total PCB in Pre-deployed and Deployed Mussels from 1991-2001.

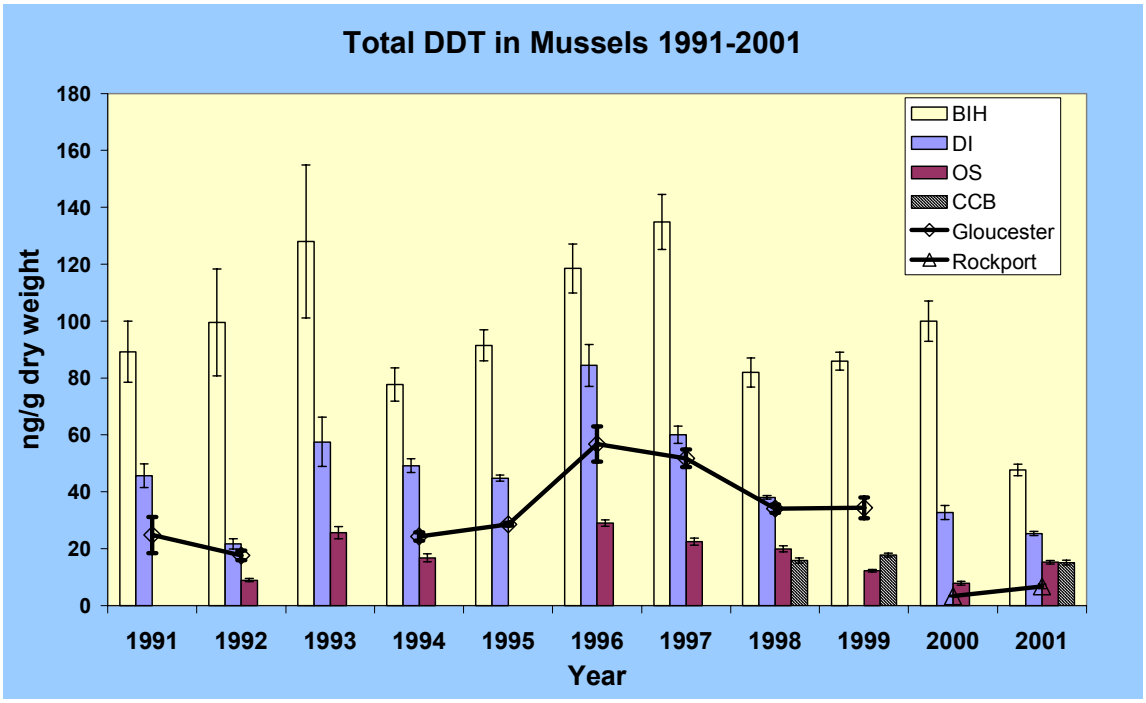


Figure 3-27. Total DDT in Pre-deployed and Deployed Mussels from 1991-2001.

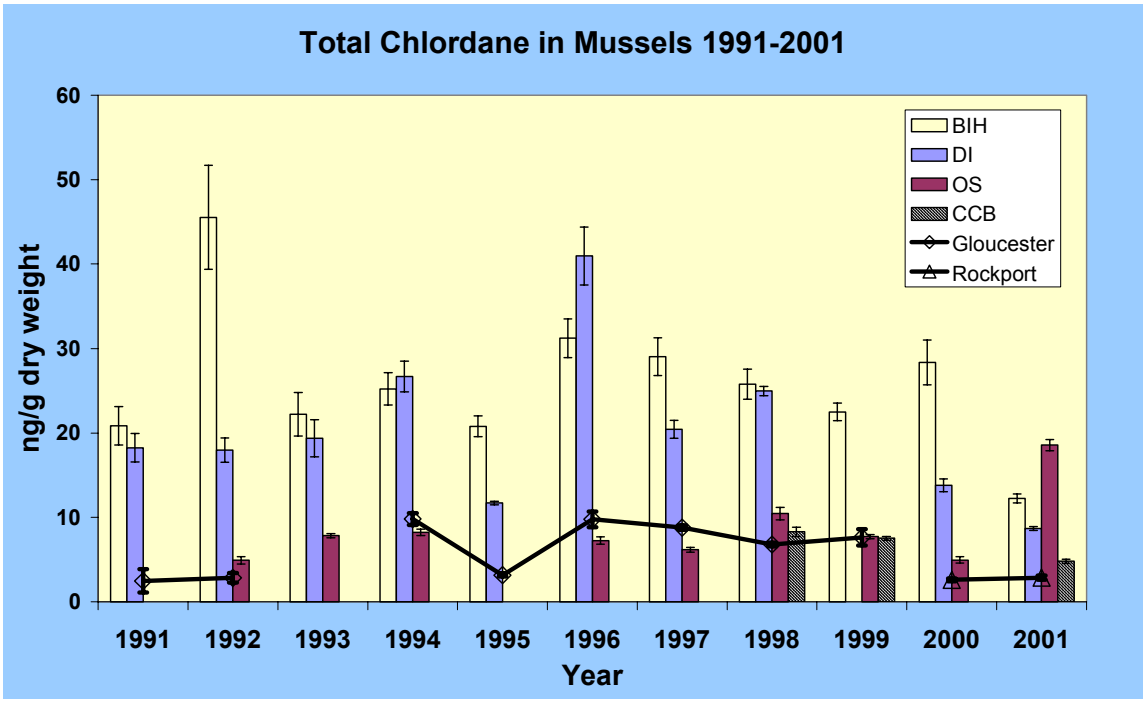
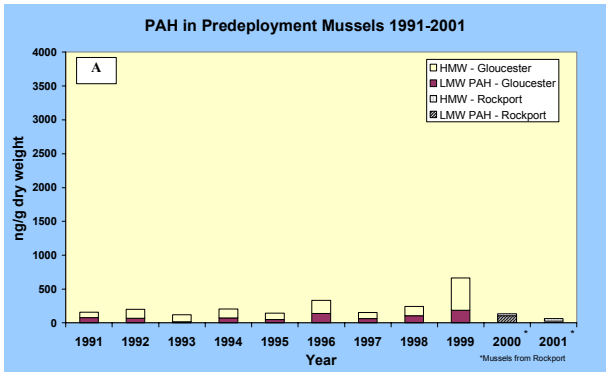
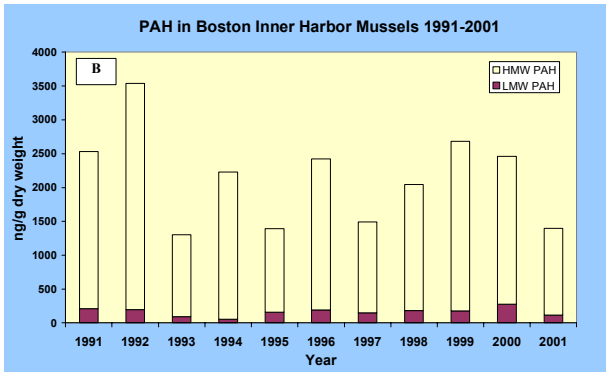
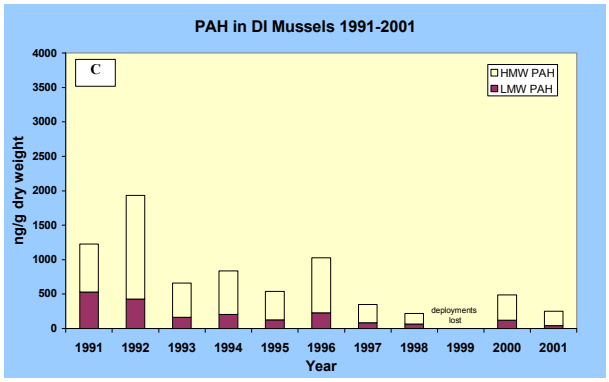
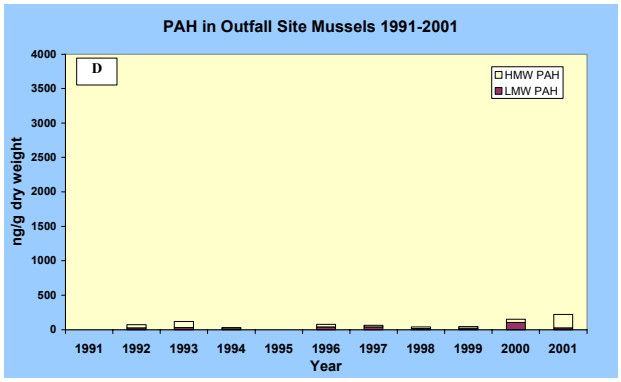


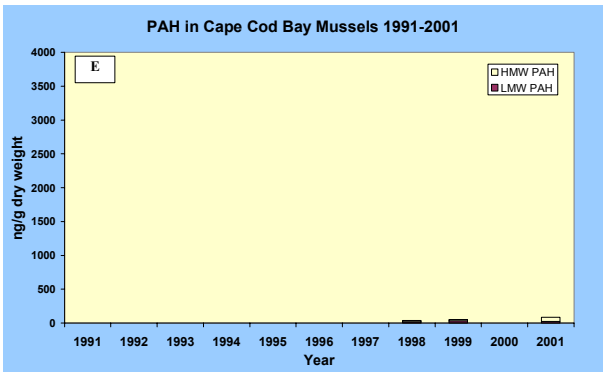
Figure 3-28. Total Chlordane in Pre-deployed and Deployed Mussels from 1991-2001.











A = Rockport (Pre-deployment), B = BIH (Deployed), C = DI (Deployed), D = OS (Deployed), E = CCB (Deployed)

Figure 3-29. Total PAHs (Using the "Historical NOAA List") in Pre-deployed and Deployed Mussels from 1991-2001.

4.0 CONCLUSIONS

The 2001 Fish and Shellfish Monitoring Program was completed successfully and generated data consistent with past years. Results provided in this report document the first year of post-discharge conditions. Biological conditions in all organisms continue to be stable or improving since the beginning of the program in 1992. There are some apparent upward trends in contaminant concentrations since 1996, especially in the lobster hepatopancreas, that were observed prior to offshore discharge that continue to be elevated. Only OS mussels showed significantly elevated concentrations of selected organic contaminants in 2001 compared to previous years. Conclusions for the various animals from the surveys are given below.

4.1 Winter Flounder

The 2001 Flounder Survey provided samples from five locations (DIF, NB, BS, OS, and ECCB) and was conducted in a manner consistent with previous surveys. Catch per unit effort at OS was the highest of any year since the project began in 1991. Flounder continue to be in reasonably good health from all stations. There is none of the high neoplasm prevalence characteristic of fish from Deer Island Flats in the mid- to late-1980s. The differences between stations continue to be discernible and relatively stable, but at a more subtle level than observed early in the baseline period. East Cape Cod Bay continues to be a useful reference site. The levels of most tissue contaminant concentrations were similar to or lower than those measured in previous years. Highest concentrations are routinely found at DIF and the lowest concentrations are found in ECCB. All fillet chemical concentrations were below both FDA and MWRA Caution and Warning Threshold Levels.

4.2 Lobster

The 2001 Lobster Survey collected specimens from three sampling locations by direct shipboard collection from commercial lobstermen. The spatial pattern of tissue contaminants was similar to that measured in past years, with the highest concentrations of organic contaminants generally found at DIF and the lowest at ECCB reference location. Most organic and metals concentrations in 2001 were similar to or lower than those measured in previous baseline years. However, PAH and total PCB concentrations in hepatopancreas collected from DIF lobsters continued to be elevated compared to earlier years. Similar trends observed in past years for DDT were not present. Lobster edible tissue contaminant concentrations were below the FDA Action Limits and the Caution and Warning Threshold Levels set by MWRA.

4.3 Blue Mussel

The 2001 Mussel Bioaccumulation study involved deployment of caged mussels at two offshore locations (OS and CCB) and two near-shore locations (BIH and DI). Among the stations previously studied, concentrations were routinely highest at BIH and lowest at CCB for organics, lead, and mercury. In 2001, concentrations at BIH, DI, and CCB were generally within the historical range of values. However, Total PAH and Total Chlordane concentrations at OS were higher than the historical range. The values were below FDA Action Limits and the MWRA Warning Threshold but exceeded the MWRA Caution Threshold Levels. An investigative study was conducted to understand why the levels were greater than expected and evaluate possible factors affecting measured contaminant levels in caged mussels (Hunt *et al*. 2002). The results generally supported the measured tissue concentrations observed at OS, and the overall environmental impact of these exceedances is thought to be low. Further evaluation as to whether the present threshold values are appropriate for the intended purpose of the fish and shellfish monitoring program may be warranted.

5.0 REFERENCES

Downey PC. 1994. Bioaccumulation of Selected Organic Compounds and Metals in Mussels Deployed Near DIF Discharge and in Massachusetts Bay, 1993. MWRA Environmental Quality Department Technical Report Series No. 94-8. Boston: Massachusetts Water Resources Authority.

EPA (United States Environmental Protection Agency). 1991a. Methods for the Determination of Metals in Environmental Samples. EPA-600/4-91-010. Method 245.6: Determination of Mercury in Tissues by Cold Vapor Atomic Absorption Spectrometry. Environmental Protection Agency, Environmental Services Division, Monitoring Management Branch. Cincinnati, Ohio.

EPA (United States Environmental Protection Agency). 1991b. Methods for the Determination of Metals in Environmental Samples. EPA-600/4-91-010. Method 200.9: Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry. Environmental Protection Agency, Environmental Services Division, Monitoring Management Branch. Cincinnati, Ohio.

EPA (United States Environmental Protection Agency). 1994. Methods for the Determination of Metals in Environmental Samples. EPA-600/4-91-010. Method 200.7: Determination of Metals and Trace Elements by Inductively Coupled Plasma-Atomic Emission Spectrometry. Environmental Protection Agency, Environmental Services Division, Monitoring Management Branch. Cincinnati, Ohio.

EPA (United States Environmental Protection Agency). 1996. Method 1638: Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma - Mass Spectrometry. EPA Office of Water and Office of Science and Technology. Washington, DC.

EPA (United States Environmental Protection Agency). 1997. Method 1640: Determination of Trace Elements in Water by Preconcentration and Inductively Coupled Plasma - Mass Spectrometry. EPA Office of Water and Office of Science and Technology. Washington, DC.

Hillman RE, Peven CS. 1995. 1994 Annual Fish and Shellfish Report. MWRA Environmental Quality Department Technical Report Services No. 95-5. Boston: Massachusetts Water Resources Authority.

Hunt C.D., S. Abramson, L.F. Lefkovitz, J. Neff, G. Durell, K.E. Keay, M.P. Hall. 2002 Evaluation of 2001 Mussel tissue contaminant threshold exceedance. Boston: Massachusetts Water Resources Authority. Report 2002-05. 48 p.

Lazar K. 2001. Lobstermen can't catch a break. Boston Herald. Online: http://www.bostonherald.com//news/local_regional/lobs08132001.htm.

Lefkovitz L, McLeod LA. 1999. 1998 annual fish and shellfish report. Boston: Massachusetts Water Resources Authority. Report ENQUAD 99-06. Draft 156 pp.

Lefkovitz L, Abramson S, Field, J. 2000. 1999 annual fish and shellfish report. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2000-10. 155 pp.

Lefkovitz L, Moore MJ. 2001. Combined work/quality assurance plan revision 1 for fish and shellfish monitoring: 1998–2001. MWRA Environmental Quality Technical Report Series NO. MS-49 Revision 1. Boston: Massachusetts Water Resources Authority. 64 pp.

Mitchell DF, Butler E, McGrath D. 1995. Combined work/quality assurance plan for fish and shellfish monitoring: 1995-1997. MWRA Environmental Quality Technical Report Series No. MS-39. Boston: Massachusetts Water Resources Authority. 71 pp.

Mitchell DF, Sullivan K, Moore M, Downey P. 1998. 1997 Annual Fish and Shellfish Report. MWRA Environmental Quality Technical Report Series 98-12. Boston: Massachusetts Water Resources Authority.

Moore MJ, Woodin BR, Stegeman JJ. 1992. Liver pathology of winter flounder: Boston Harbor, Mass. Bay and Cape Cod Bay - 1991. Final Report to MWRA Jan 31 1992.

Moore MJ, Shea D, Hillman RE, Stegeman JJ. 1996. Trends in hepatic tumors and hydropic vacuolation, fin erosion, organic chemicals and stable isotope ratios in winter flounder from Massachusetts, USA. Marine Pollution Bulletin, Vol 32, No. 6. Great Britain. 12 pp.

MWRA. 1991. Massachusetts Water Resources Authority effluent outfall monitoring plan. Phase I: baseline studies. MWRA Environmental Quality Department, November 1991. Boston: Massachusetts Water Resources Authority. 95 pp.

MWRA. 1997. Massachusetts Water Resources Authority effluent outfall monitoring plan: Phase II post-discharge monitoring. MWRA Environmental Quality Department Miscellaneous Report No. ms-44 Boston: Massachusetts Water Resources Authority. 61 pp.

MWRA. 2001a. Massachusetts Water Resources Authority Contingency Plan Revision 1. Boston: Massachusetts Water Resources Authority. Report ENQUAD ms-071. 47p.

MWRA 2001b. Calculation methods for threshold values and baselines for fish and shellfish; Revision 1. Boston: Massachusetts Water Resources Authority.

MWRA. 2002. Massachusetts Water Resources Authority, Permit Number MA0103284, Notification Pursuant to Part I.8. Contingency Plan. January 25, 2002.

O'Connor TP, Beliaeff B. 1995. Recent Trends in Coastal Environmental Quality: Results from the Mussel Water Project 1986 to 1993. NOAA Office of Ocean Resources, Conservation and Assessment. Coastal Monitoring and Bioeffects Assessment Division Rockville, MD.

Peven CS, Uhler AD. 1993. Analytical procedures to quantify organic contaminants. In Sampling and Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Project. Volume IV. NOAA Technical Memorandum NOS ORCA 71. National Oceanic and Atmospheric Administration, Silver Spring, MD.

Shea, D. 1997. Unpublished.

APPENDIX A

Summary of Measurement Program from 1992 - 2001

There have been a number of changes in fish and shellfish monitoring over the past 8 years of monitoring. The following table summarizes those changes.

Table A-1. Summary of Changes in Fish and Shellfish Monitoring 1992 – 2001.

Organism	Laboratory		Chemistry Composites per Station	Organisms per Composite
Flounder	**Chemistry**	**Histology/Physiology[a]**		
1992	Battelle	M. Moore	4	1
1993	Battelle	M. Moore	9-10	1
1994	Battelle	M. Moore	3	1
1995	ADL/ENVITEC	M. Moore	3	5
1996	ADL/ENVITEC	M. Moore	3	5
1997	ADL/ENVITEC	M. Moore	3	5
1998	Battelle	M. Moore	3	5
1999	Battelle	M. Moore	3	5
2000	Battelle	M. Moore	3	5
2001	Battelle	R. Hillman/M. Moore	3	5
Lobster	**Chemistry**	**Physiology**		
1992	Battelle	Battelle	3	1
1993	Battelle	Battelle	2–10	1
1994	Battelle	Battelle	2–3	5
1995	ADL/ENVITEC	ENSR	3	5
1996	ADL/ENVITEC	ENSR	3	5
1997	ADL/ENVITEC	ENSR	3	5
1998	Battelle	Battelle	3	5
1999	Battelle	Battelle	3	5
2000	Battelle	Battelle	3	5
2001	Battelle	Battelle	3	5
Mussel	**Chemistry**	**Biological Condition**		
1992	Aquatec	Aquatec	5-8	10
1993	Aquatec	Aquatec	3-8	10
1994	Aquatec	Aquatec	3-8	10
1995	ADL/ENVITEC	Aquatec	5	At least 200 g
1996	ADL/ENVITEC	Aquatec	5	At least 200 g
1997	ADL/ENVITEC	Aquatec	5	At least 200 g
1998	Battelle	Battelle	5-8	5
1999	Battelle	Battelle	5-8	5
2000	Battelle	Battelle	5-8	5-10
2001	Battelle	Battelle	5-8	5-10

[a]Individual livers/fish

APPENDIX B

Summary Tables of Lipid (% dry wt.), PCB/Pesticide, PAH and Metals Results for Individual Composites of Flounder, Lobster and Mussels

Table B-1. 2001 Lipid Data - Individual Replicates.

Matrix	Station	Sample	Bottle	Parameter	Value	Val Qual	Unit Code
Flounder Fillet	DIF	FF01110C1	YV39	LIPID	2.5		PCTDRYWT
Flounder Fillet	DIF	FF01110C2	YV40	LIPID	1.8		PCTDRYWT
Flounder Fillet	DIF	FF01110C3	YV41	LIPID	2.3		PCTDRYWT
Flounder Fillet	OS	FF01140C1	YV45	LIPID	1.9		PCTDRYWT
Flounder Fillet	OS	FF01140C2	YV46	LIPID	2.1		PCTDRYWT
Flounder Fillet	OS	FF01140C3	YV47	LIPID	2.1		PCTDRYWT
Flounder Fillet	ECCB	FF01150C1	YV63	LIPID	1.8		PCTDRYWT
Flounder Fillet	ECCB	FF01150C2	YV64	LIPID	2.1		PCTDRYWT
Flounder Fillet	ECCB	FF01150C3	YV65	LIPID	2.1		PCTDRYWT
Flounder Liver	DIF	FF01110C1	YV42	LIPID	18.3		PCTDRYWT
Flounder Liver	DIF	FF01110C2	YV43	LIPID	20.9		PCTDRYWT
Flounder Liver	DIF	FF01110C3	YV44	LIPID	16.9		PCTDRYWT
Flounder Liver	OS	FF01140C1	YV48	LIPID	25.9		PCTDRYWT
Flounder Liver	OS	FF01140C2	YV49	LIPID	22.2		PCTDRYWT
Flounder Liver	OS	FF01140C3	YV50	LIPID	20.1		PCTDRYWT
Flounder Liver	ECCB	FF01150C1	YV66	LIPID	18.1		PCTDRYWT
Flounder Liver	ECCB	FF01150C2	YV67	LIPID	17.1		PCTDRYWT
Flounder Liver	ECCB	FF01150C3	YV68	LIPID	17.9		PCTDRYWT
Lobster Meat	DIF	FL0111-C1	ZH31	LIPID	3		PCTDRYWT
Lobster Meat	DIF	FL0111-C2	ZH32	LIPID	2.9		PCTDRYWT
Lobster Meat	DIF	FL0111-C3	ZH33	LIPID	2		PCTDRYWT
Lobster Meat	OS	FL0114-C1	ZI54	LIPID	2.4		PCTDRYWT
Lobster Meat	OS	FL0114-C2	ZI55	LIPID	2.4		PCTDRYWT
Lobster Meat	OS	FL0114-C3	ZI56	LIPID	2.1		PCTDRYWT
Lobster Meat	ECCB	FL0115-C1	ZH37	LIPID	3.1		PCTDRYWT
Lobster Meat	ECCB	FL0115-C2	ZH38	LIPID	2.9		PCTDRYWT
Lobster Meat	ECCB	FL0115-C3	ZH39	LIPID	3.3		PCTDRYWT
Lobster Hepatopancreas	DIF	FL0111-C1	ZH34	LIPID	55.2		PCTDRYWT
Lobster Hepatopancreas	DIF	FL0111-C2	ZH35	LIPID	49.3		PCTDRYWT
Lobster Hepatopancreas	DIF	FL0111-C3	ZH36	LIPID	55.6		PCTDRYWT
Lobster Hepatopancreas	OS	FL0114-C1	ZI51	LIPID	48.1		PCTDRYWT
Lobster Hepatopancreas	OS	FL0114-C2	ZI52	LIPID	52.9		PCTDRYWT
Lobster Hepatopancreas	OS	FL0114-C3	ZI53	LIPID	53.9		PCTDRYWT
Lobster Hepatopancreas	ECCB	FL0115-C1	ZH40	LIPID	46.8		PCTDRYWT
Lobster Hepatopancreas	ECCB	FL0115-C2	ZH41	LIPID	51.7		PCTDRYWT
Lobster Hepatopancreas	ECCB	FL0115-C3	ZH42	LIPID	51.3		PCTDRYWT
Mussels	RP	FM011ZA69	ZA69	LIPID	5.0		PCTDRYWT
Mussels	RP	FM011ZA70	ZA70	LIPID	6.3		PCTDRYWT
Mussels	RP	FM011ZA71	ZA71	LIPID	6.1		PCTDRYWT
Mussels	RP	FM011ZA72	ZA72	LIPID	5.2		PCTDRYWT
Mussels	RP	FM011ZA73	ZA73	LIPID	4.9		PCTDRYWT
Mussels	DI	FM011ZH67	ZH67	LIPID	7.4		PCTDRYWT
Mussels	DI	FM011ZH68	ZH68	LIPID	7.4		PCTDRYWT
Mussels	DI	FM011ZH69	ZH69	LIPID	7.6		PCTDRYWT
Mussels	DI	FM011ZH70	ZH70	LIPID	6.5		PCTDRYWT

Table B-1. 2001 Lipid Data - Individual Replicates.
(Continued)

Matrix	Station	Sample	Bottle	Parameter	Value	Val Qual	Unit Code
Mussels	DI	FM011ZH71	ZH71	LIPID	6.8		PCTDRYWT
Mussels	BIH	FM011ZH62	ZH62	LIPID	5.7		PCTDRYWT
Mussels	BIH	FM011ZH63	ZH63	LIPID	5.0		PCTDRYWT
Mussels	BIH	FM011ZH64	ZH64	LIPID	5.2		PCTDRYWT
Mussels	BIH	FM011ZH65	ZH65	LIPID	6.3		PCTDRYWT
Mussels	BIH	FM011ZH66	ZH66	LIPID	4.5		PCTDRYWT
Mussels	CCB	FM011ZH80	ZH80	LIPID	3.1		PCTDRYWT
Mussels	CCB	FM011ZH81	ZH81	LIPID	7.0		PCTDRYWT
Mussels	CCB	FM011ZH82	ZH82	LIPID	11.9		PCTDRYWT
Mussels	CCB	FM011ZH83	ZH83	LIPID	10.3		PCTDRYWT
Mussels	CCB	FM011ZH84	ZH84	LIPID	10.5		PCTDRYWT
Mussels	CCB	FM011ZH85	ZH85	LIPID	16.7		PCTDRYWT
Mussels	CCB	FM011ZH86	ZH86	LIPID	9.7		PCTDRYWT
Mussels	CCB	FM011ZH87	ZH87	LIPID	5.6		PCTDRYWT
Mussels	OS	FM011ZP27	ZP27	LIPID	6.5		PCTDRYWT
Mussels	OS	FM011ZP28	ZP28	LIPID	6.6		PCTDRYWT
Mussels	OS	FM011ZP29	ZP29	LIPID	7.3		PCTDRYWT
Mussels	OS	FM011ZP30	ZP30	LIPID	7.1		PCTDRYWT
Mussels	OS	FM011ZP31	ZP31	LIPID	8.1		PCTDRYWT
Mussels	OS	FM011ZP32	ZP32	LIPID	7.0		PCTDRYWT
Mussels	OS	FM011ZP33	ZP33	LIPID	9.5		PCTDRYWT
Mussels	OS	FM011ZP34	ZP34	LIPID	8.1		PCTDRYWT

Table B-2. 2001 Percent Dry Weight Data - Individual Replicates.

Matrix	Station	Sample	Bottle	Parameter	Value	Val Qual	Unit Code
Flounder Fillet	DIF	FF01110C1	YV39	PCTDRYWT	15.6		PCT
Flounder Fillet	DIF	FF01110C2	YV40	PCTDRYWT	17.5		PCT
Flounder Fillet	DIF	FF01110C3	YV41	PCTDRYWT	17.8		PCT
Flounder Fillet	OS	FF01140C1	YV45	PCTDRYWT	17.1		PCT
Flounder Fillet	OS	FF01140C2	YV46	PCTDRYWT	17.3		PCT
Flounder Fillet	OS	FF01140C3	YV47	PCTDRYWT	16.1		PCT
Flounder Fillet	ECCB	FF01150C1	YV63	PCTDRYWT	17.9		PCT
Flounder Fillet	ECCB	FF01150C2	YV64	PCTDRYWT	16.9		PCT
Flounder Fillet	ECCB	FF01150C3	YV65	PCTDRYWT	18.6		PCT
Flounder Liver	DIF	FF01110C1	YV42	PCTDRYWT	21.8		PCT
Flounder Liver	DIF	FF01110C2	YV43	PCTDRYWT	22.7		PCT
Flounder Liver	DIF	FF01110C3	YV44	PCTDRYWT	21.7		PCT
Flounder Liver	OS	FF01140C1	YV48	PCTDRYWT	24.7		PCT
Flounder Liver	OS	FF01140C2	YV49	PCTDRYWT	21.4		PCT
Flounder Liver	OS	FF01140C3	YV50	PCTDRYWT	22.2		PCT
Flounder Liver	ECCB	FF01150C1	YV66	PCTDRYWT	23.7		PCT
Flounder Liver	ECCB	FF01150C2	YV67	PCTDRYWT	18.7		PCT
Flounder Liver	ECCB	FF01150C3	YV68	PCTDRYWT	22.8		PCT
Lobster Meat	DIF	FL0111-C1	ZH31	PCTDRYWT	15.6		PCT
Lobster Meat	DIF	FL0111-C2	ZH32	PCTDRYWT	14.3		PCT
Lobster Meat	DIF	FL0111-C3	ZH33	PCTDRYWT	13.9		PCT
Lobster Meat	OS	FL0114-C1	ZI54	PCTDRYWT	16.5		PCT
Lobster Meat	OS	FL0114-C2	ZI55	PCTDRYWT	14.2		PCT
Lobster Meat	OS	FL0114-C3	ZI56	PCTDRYWT	14.0		PCT
Lobster Meat	ECCB	FL0115-C1	ZH37	PCTDRYWT	13.9		PCT
Lobster Meat	ECCB	FL0115-C2	ZH38	PCTDRYWT	16.5		PCT
Lobster Meat	ECCB	FL0115-C3	ZH39	PCTDRYWT	14.0		PCT
Lobster Hepatopancreas	DIF	FL0111-C1	ZH34	PCTDRYWT	34.4		PCT
Lobster Hepatopancreas	DIF	FL0111-C2	ZH35	PCTDRYWT	27.6		PCT
Lobster Hepatopancreas	DIF	FL0111-C3	ZH36	PCTDRYWT	31.4		PCT
Lobster Hepatopancreas	OS	FL0114-C1	ZI51	PCTDRYWT	39.7		PCT
Lobster Hepatopancreas	OS	FL0114-C2	ZI52	PCTDRYWT	30.5		PCT
Lobster Hepatopancreas	OS	FL0114-C3	ZI53	PCTDRYWT	30.3		PCT
Lobster Hepatopancreas	ECCB	FL0115-C1	ZH40	PCTDRYWT	27.3		PCT
Lobster Hepatopancreas	ECCB	FL0115-C2	ZH41	PCTDRYWT	31.4		PCT
Lobster Hepatopancreas	ECCB	FL0115-C3	ZH42	PCTDRYWT	27.1		PCT
Mussels	RP	FM011ZA69	ZA69	PCTDRYWT	7.6		PCT
Mussels	RP	FM011ZA70	ZA70	PCTDRYWT	9.9		PCT
Mussels	RP	FM011ZA71	ZA71	PCTDRYWT	8.8		PCT
Mussels	RP	FM011ZA72	ZA72	PCTDRYWT	9.4		PCT
Mussels	RP	FM011ZA73	ZA73	PCTDRYWT	9.3		PCT
Mussels	DI	FM011ZH67	ZH67	PCTDRYWT	13.1		PCT
Mussels	DI	FM011ZH68	ZH68	PCTDRYWT	14.6		PCT
Mussels	DI	FM011ZH69	ZH69	PCTDRYWT	14.5		PCT
Mussels	DI	FM011ZH70	ZH70	PCTDRYWT	14.3		PCT

Table B-2. 2001 Percent Dry Weight Data - Individual Replicates. (Continued)

Matrix	Station	Sample	Bottle	Parameter	Value	Val Qual	Unit Code
Mussels	DI	FM011ZH71	ZH71	PCTDRYWT	12.6		PCT
Mussels	BIH	FM011ZH62	ZH62	PCTDRYWT	8.1		PCT
Mussels	BIH	FM011ZH63	ZH63	PCTDRYWT	8.9		PCT
Mussels	BIH	FM011ZH64	ZH64	PCTDRYWT	10.1		PCT
Mussels	BIH	FM011ZH65	ZH65	PCTDRYWT	11.1		PCT
Mussels	BIH	FM011ZH66	ZH66	PCTDRYWT	9.8		PCT
Mussels	CCB	FM011ZH80	ZH80	PCTDRYWT	16.1		PCT
Mussels	CCB	FM011ZH81	ZH81	PCTDRYWT	17.0		PCT
Mussels	CCB	FM011ZH82	ZH82	PCTDRYWT	17.5		PCT
Mussels	CCB	FM011ZH83	ZH83	PCTDRYWT	19.6		PCT
Mussels	CCB	FM011ZH84	ZH84	PCTDRYWT	18.6		PCT
Mussels	CCB	FM011ZH85	ZH85	PCTDRYWT	18.6		PCT
Mussels	CCB	FM011ZH86	ZH86	PCTDRYWT	20.8		PCT
Mussels	CCB	FM011ZH87	ZH87	PCTDRYWT	20.3		PCT
Mussels	OS	FM011ZP27	ZP27	PCTDRYWT	11.5		PCT
Mussels	OS	FM011ZP28	ZP28	PCTDRYWT	11.3		PCT
Mussels	OS	FM011ZP29	ZP29	PCTDRYWT	11.3		PCT
Mussels	OS	FM011ZP30	ZP30	PCTDRYWT	12.3		PCT
Mussels	OS	FM011ZP31	ZP31	PCTDRYWT	11.5		PCT
Mussels	OS	FM011ZP32	ZP32	PCTDRYWT	13.6		PCT
Mussels	OS	FM011ZP33	ZP33	PCTDRYWT	10.3		PCT
Mussels	OS	FM011ZP34	ZP34	PCTDRYWT	12.7		PCT

Table B-3. 2001 Flounder Fillet Data - Individual Replicates.

Parameter	DI(1)	OS(4)	ECCB(5)
Mercury	0.444	0.494	0.131
Mercury	0.321	0.533	0.259
Mercury	0.309	0.432	0.147
Total DDT	30.552	9.360	8.105
Total DDT	23.920	11.733	8.002
Total DDT	29.797	15.058	8.494
Total PCB	355.995	134.941	47.725
Total PCB	304.664	163.608	51.434
Total PCB	385.127	174.722	54.849
Total CHLOR	9.863	2.048	1.707
Total CHLOR	9.157	3.241	1.608
Total CHLOR	12.123	3.463	1.906
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Dieldrin	2.999	1.150	1.061
Dieldrin	2.522	1.298	1.156
Dieldrin	3.009	1.676	1.023
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Hexachlorobenzene	1.013	0.557	0.582
Hexachlorobenzene	0.773	0.706	0.669
Hexachlorobenzene	1.005	0.693	0.462
Mirex	0.000	0.374	0.743
Mirex	0.000	0.000	0.575
Mirex	0.000	0.000	0.197
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000

Table B-4. 2001 Flounder Liver Data - Individual Replicates.

Parameter	DI(1)	OS(4)	ECCB(5)
Mercury	0.336	0.571	0.128
Mercury	0.304	0.502	0.265
Mercury	0.420	0.351	0.132
Cadmium	1.380	1.920	1.490
Cadmium	0.851	2.090	2.300
Cadmium	2.370	7.410	0.923
Copper	37.500	61.500	137.000
Copper	59.000	163.000	66.200
Copper	58.900	83.900	41.400
Nickel	0.583	0.746	0.347
Nickel	0.381	0.685	0.262
Nickel	0.551	0.870	0.348
Silver	1.940	6.240	9.610
Silver	4.080	15.600	4.720
Silver	4.990	6.950	2.380
Zinc	105.000	102.000	124.000
Zinc	106.000	132.000	135.000
Zinc	101.000	128.000	127.000
Total DDT	241.709	161.176	64.860
Total DDT	266.196	153.243	55.010
Total DDT	188.970	211.400	67.437
Total PCB	3547.250	2507.796	405.198
Total PCB	4164.124	2395.765	389.157
Total PCB	3123.437	2634.570	478.635
Total PAH	150.510	106.044	55.497
Total PAH	140.568	103.413	75.846
Total PAH	132.400	88.682	51.159
Total CHLOR	90.271	33.958	13.552
Total CHLOR	103.187	38.189	11.356
Total CHLOR	82.155	51.911	15.632
Chromium	0.174	0.149	0.150
Chromium	0.178	0.156	0.106
Chromium	0.292	0.427	0.141
Lead	3.640	8.180	3.280
Lead	2.200	7.300	2.350
Lead	3.010	6.750	3.760
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Dieldrin	20.479	12.038	6.779
Dieldrin	22.077	11.796	6.795
Dieldrin	17.312	21.094	5.763
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000

Table B-4. 2001 Flounder Liver Data - Individual Replicates. (Continued)

Parameter	DI(1)	OS(4)	ECCB(5)
Hexachlorobenzene	5.457	5.686	3.389
Hexachlorobenzene	5.083	5.142	4.257
Hexachlorobenzene	4.633	5.257	2.999
Mirex	4.109	3.536	1.531
Mirex	4.365	4.205	1.568
Mirex	3.731	4.138	1.202
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000

Table B-5. 2001 Lobster Meat Data - Individual Composites.

Parameter	DIF (1)	OS(4)	ECCB(5)
Mercury	0.853	1.240	0.445
Mercury	0.947	0.839	0.527
Mercury	0.818	0.993	0.618
Total DDT	6.683	7.077	6.814
Total DDT	10.317	5.740	5.816
Total DDT	5.683	8.009	6.569
Total PCB	66.356	63.210	42.312
Total PCB	106.821	54.954	34.889
Total PCB	49.610	78.379	42.489
Total CHLOR	1.705	1.369	0.454
Total CHLOR	3.413	0.903	0.306
Total CHLOR	1.257	1.134	0.525
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Dieldrin	3.796	3.728	3.132
Dieldrin	4.096	3.836	2.689
Dieldrin	3.129	4.208	2.672
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Hexachlorobenzene	0.368	0.339	0.379
Hexachlorobenzene	0.295	0.351	0.318
Hexachlorobenzene	0.315	0.386	0.333
Mirex	0.165	0.138	0.000
Mirex	0.190	0.115	0.000
Mirex	0.000	0.000	0.000
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000
Lindane	0.000	0.000	0.000

Table B-6. 2001 Lobster Hepatopancreas Data - Individual Composites.

Parameter	DIF (1)	OS(4)	ECCB(5)
Lead	0.283	0.344	0.385
Lead	0.477	0.464	0.347
Lead	0.410	0.445	0.380
Mercury	0.186	0.258	0.277
Mercury	0.323	0.355	0.217
Mercury	0.248	0.330	0.228
Cadmium	6.590	15.000	12.700
Cadmium	10.300	16.400	13.200
Cadmium	7.420	15.100	12.200
Chromium	0.373	0.262	0.321
Chromium	0.261	0.296	0.225
Chromium	0.307	0.271	0.218
Copper	424.000	653.000	759.000
Copper	966.000	852.000	323.000
Copper	529.000	829.000	482.000
Nickel	0.507	0.686	0.902
Nickel	0.537	0.783	0.780
Nickel	0.472	0.715	0.679
Silver	20.400	32.700	33.300
Silver	46.200	41.400	19.700
Silver	21.100	44.600	19.500
Zinc	62.200	85.200	112.000
Zinc	89.600	96.300	76.800
Zinc	72.100	133.000	95.200
Total DDT	620.795	262.497	335.936
Total DDT	1142.930	522.387	423.467
Total DDT	676.835	510.312	444.208
Total PCB	5935.558	2303.914	1841.353
Total PCB	12761.720	4326.987	2053.872
Total PCB	5358.437	4457.503	2194.172
Total PAH	12769.923	1673.107	1357.130
Total PAH	7707.041	2572.124	1563.455
Total PAH	11724.750	2344.060	1312.012
Total CHLOR	83.939	26.387	24.108
Total CHLOR	106.943	44.008	17.565
Total CHLOR	100.484	41.031	25.186
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Aldrin	0.000	0.000	0.000
Dieldrin	42.609	14.082	20.229
Dieldrin	63.975	31.184	18.557
Dieldrin	37.719	36.000	22.868
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000
Endrin	0.000	0.000	0.000

Table B-6. 2001 Lobster Hepatopancreas Data - Individual Composites. (Continued)

Parameter	DIF (1)	OS(4)	ECCB(5)
Hexachlorobenzene	0.000	4.602	8.814
Hexachlorobenzene	8.769	9.072	7.164
Hexachlorobenzene	13.585	8.077	8.563
Mirex	5.611	3.252	4.580
Mirex	8.868	5.962	5.186
Mirex	4.735	6.463	6.313
Lindane	3.630	2.567	3.373
Lindane	3.886	4.016	2.506
Lindane	4.651	2.517	1.468

Table B-7. 2001 Mussel Data - Individual Replicates.

Parameter	DI(1)	OS(4)	BIH(6)	CCB (9)	Rockport (RP)
Lead	3.43	2.37	10.20	3.10	2.54
Lead	3.04	1.63	11.60	1.43	2.03
Lead	3.02	1.84	7.38	1.83	1.33
Lead	3.49	1.57	12.30	1.56	2.14
Lead	4.53	1.88	8.80	1.29	1.49
Lead	NA	2.11	NA	1.65	NA
Lead	NA	1.95	NA	1.68	NA
Lead	NA	1.56	NA	1.47	NA
Mercury	0.118	0.160	0.194	0.155	0.234
Mercury	0.121	0.137	0.191	0.091	0.123
Mercury	0.122	0.149	0.148	0.119	0.150
Mercury	0.131	0.119	0.322	0.108	0.125
Mercury	0.142	0.135	0.160	0.073	0.119
Mercury	NA	0.148	NA	0.080	NA
Mercury	NA	0.148	NA	0.092	NA
Mercury	NA	0.128	NA	0.076	NA
Total DDT	26.14	14.05	46.66	15.87	6.25
Total DDT	25.59	14.21	50.70	15.39	9.67
Total DDT	22.70	14.84	53.30	13.61	6.62
Total DDT	25.35	14.71	46.04	16.00	6.24
Total DDT	26.85	15.69	41.65	17.76	4.80
Total DDT	NA	19.12	NA	15.70	NA
Total DDT	NA	14.25	NA	16.78	NA
Total DDT	NA	14.95	NA	9.77	NA
Total PCB	217.15	74.01	394.59	57.65	14.93
Total PCB	211.85	78.87	427.27	73.61	27.29
Total PCB	205.61	79.17	397.49	64.43	22.56
Total PCB	208.92	80.89	407.58	77.30	16.11
Total PCB	253.43	80.70	363.51	80.15	12.86
Total PCB	NA	98.13	NA	83.29	NA
Total PCB	NA	78.78	NA	84.43	NA
Total PCB	NA	77.54	NA	43.44	NA
Total CHLOR	8.98	16.88	12.48	4.35	2.82
Total CHLOR	8.42	17.32	13.00	4.98	3.51
Total CHLOR	7.98	18.01	13.36	4.22	3.25
Total CHLOR	8.73	18.21	12.08	5.31	2.77
Total CHLOR	9.33	19.42	10.33	4.89	1.98
Total CHLOR	NA	22.85	NA	5.37	NA
Total CHLOR	NA	17.66	NA	5.69	NA
Total CHLOR	NA	18.06	NA	3.66	NA
Total LMW-PAH	39.52	26.73	115.79	19.02	24.86
Total LMW-PAH	39.14	23.23	139.81	29.38	23.27
Total LMW-PAH	35.10	25.11	85.29	20.14	31.82
Total LMW-PAH	43.96	23.60	123.50	29.54	20.87
Total LMW-PAH	33.57	26.17	107.20	30.93	18.09

Table B-7. 2001 Mussel Data - Individual Replicates. (Continued)

Parameter	DI(1)	OS(4)	BIH(6)	CCB (9)	Rockport (RP)
Total LMW-PAH	NA	29.20	NA	21.06	NA
Total LMW-PAH	NA	24.84	NA	19.96	NA
Total LMW-PAH	NA	27.46	NA	20.41	NA
Total HMW-PAH	224.37	209.89	1248.77	50.88	41.10
Total HMW-PAH	209.02	189.20	1476.00	70.24	36.32
Total HMW-PAH	205.93	208.51	1235.91	60.34	42.11
Total HMW-PAH	221.76	198.49	1355.86	66.35	45.38
Total HMW-PAH	187.64	188.13	1091.76	62.98	25.34
Total HMW-PAH	NA	218.28	NA	58.35	NA
Total HMW-PAH	NA	183.42	NA	56.30	NA
Total HMW-PAH	NA	186.92	NA	60.66	NA
Aldrin	0.00	0.00	0.00	0.00	0.00
Aldrin	0.00	0.00	0.00	0.00	0.00
Aldrin	0.00	0.00	0.00	0.00	0.00
Aldrin	0.00	0.00	0.00	0.00	0.00
Aldrin	0.00	0.00	0.00	0.00	0.00
Aldrin	NA	0.00	NA	0.00	NA
Aldrin	NA	0.00	NA	0.00	NA
Aldrin	NA	0.00	NA	0.00	NA
Dieldrin	1.62	1.82	2.84	1.14	0.52
Dieldrin	1.84	1.96	2.57	1.30	0.99
Dieldrin	1.46	1.88	3.47	1.14	0.55
Dieldrin	1.63	1.84	3.33	1.34	0.49
Dieldrin	1.36	1.85	2.51	1.53	0.41
Dieldrin	NA	2.15	NA	0.00	NA
Dieldrin	NA	1.71	NA	1.54	NA
Dieldrin	NA	1.69	NA	1.49	NA
Endrin	0.00	0.00	0.00	0.00	0.00
Endrin	0.00	0.00	0.00	0.00	0.00
Endrin	0.00	0.00	0.00	0.00	0.00
Endrin	0.00	0.00	0.00	0.00	0.00
Endrin	0.00	0.00	0.00	0.00	0.00
Endrin	NA	0.00	NA	0.00	NA
Endrin	NA	0.00	NA	0.00	NA
Endrin	NA	0.00	NA	0.00	NA
Hexachlorobenzene	0.44	0.36	0.61	0.53	0.33
Hexachlorobenzene	0.48	0.37	0.71	0.46	0.41
Hexachlorobenzene	0.70	0.32	0.61	0.30	0.27
Hexachlorobenzene	0.49	0.28	1.22	0.37	0.25
Hexachlorobenzene	0.45	0.32	0.60	0.37	0.26
Hexachlorobenzene	NA	0.36	NA	0.49	NA
Hexachlorobenzene	NA	0.28	NA	0.45	NA
Hexachlorobenzene	NA	0.29	NA	0.34	NA

Table B-7. 2001 Mussel Data - Individual Replicates. (Continued)

Parameter	DI(1)	OS(4)	BIH(6)	CCB (9)	Rockport (RP)
Mirex	0.00	0.00	0.00	0.00	0.00
Mirex	0.00	0.00	0.00	0.00	0.00
Mirex	0.00	0.00	0.00	0.00	0.00
Mirex	0.00	0.00	0.00	0.00	0.00
Mirex	0.00	0.00	0.00	0.00	0.00
Mirex	NA	0.00	NA	0.00	NA
Mirex	NA	0.00	NA	0.00	NA
Mirex	NA	0.00	NA	0.00	NA
Lindane	0.26	0.34	0.00	0.31	0.32
Lindane	0.30	0.38	0.00	0.34	0.31
Lindane	0.22	0.33	0.40	0.00	0.34
Lindane	0.29	0.34	0.00	0.41	0.32
Lindane	0.00	0.34	0.00	0.37	0.26
Lindane	NA	0.42	NA	0.37	NA
Lindane	NA	0.33	NA	0.40	NA
Lindane	NA	0.32	NA	0.47	NA
Total 97/98 LMW PAH	197.24	464.69	1058.02	34.12	26.29
Total 97/98 LMW PAH	150.96	411.30	1071.44	38.71	24.64
Total 97/98 LMW PAH	149.81	488.55	1049.17	39.88	46.28
Total 97/98 LMW PAH	183.75	476.45	903.45	53.01	25.19
Total 97/98 LMW PAH	156.76	492.26	855.44	58.81	16.61
Total 97/98 LMW PAH	NA	530.57	NA	28.57	NA
Total 97/98 LMW PAH	NA	463.27	NA	47.30	NA
Total 97/98 LMW PAH	NA	447.69	NA	29.91	NA
Total 97/98 HMW PAH	283.65	287.91	1778.58	59.53	41.10
Total 97/98 HMW PAH	262.48	263.11	2007.33	84.14	36.32
Total 97/98 HMW PAH	213.15	290.13	1716.34	69.38	42.11
Total 97/98 HMW PAH	274.79	271.86	1825.99	75.97	45.38
Total 97/98 HMW PAH	223.95	291.49	1519.83	72.78	25.34
Total 97/98 HMW PAH	NA	307.58	NA	67.55	NA
Total 97/98 HMW PAH	NA	262.46	NA	65.04	NA
Total 97/98 HMW PAH	NA	267.15	NA	70.18	NA

APPENDIX C

Historical Data Tables

Table C-1. Lipid Data - Flounder Fillet 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-353	92-353M	FILLET	LIPID	5.4		PCTDRYWT
1992	DIF	92-354	92-354M	FILLET	LIPID	4.3		PCTDRYWT
1992	DIF	92-359	92-359M	FILLET	LIPID	9.1		PCTDRYWT
1992	DIF	92-35C	92-35CM	FILLET	LIPID	5.7		PCTDRYWT
1992	OS	92-400	92-400M	FILLET	LIPID	9.1		PCTDRYWT
1992	OS	92-401	92-401M	FILLET	LIPID	16.5		PCTDRYWT
1992	OS	92-409	92-409M	FILLET	LIPID	4.6		PCTDRYWT
1992	OS	92-40C	92-40CM	FILLET	LIPID	12.9		PCTDRYWT
1992	ECCB	92-451	92-451M	FILLET	LIPID	2.3		PCTDRYWT
1992	ECCB	92-452	92-452M	FILLET	LIPID	4.7		PCTDRYWT
1992	ECCB	92-456	92-456M	FILLET	LIPID	1.8		PCTDRYWT
1992	ECCB	92-45C	92-45CM	FILLET	LIPID	5.7		PCTDRYWT
1993	DIF	F93010465	465SF	FILLET	LIPID	2.3		PCTDRYWT
1993	DIF	F93010466	466SF	FILLET	LIPID	5.8		PCTDRYWT
1993	DIF	F93010467	467SF	FILLET	LIPID	1.8		PCTDRYWT
1993	DIF	F93010468	468SF	FILLET	LIPID	2.4		PCTDRYWT
1993	DIF	F93010469	469SF	FILLET	LIPID	1.6		PCTDRYWT
1993	DIF	F93010470	470SF	FILLET	LIPID	2.6		PCTDRYWT
1993	DIF	F93010471	471SF	FILLET	LIPID	3.4		PCTDRYWT
1993	DIF	F93010472	472SF	FILLET	LIPID	1.9		PCTDRYWT
1993	DIF	F93010473	473SF	FILLET	LIPID	4.8		PCTDRYWT
1993	DIF	F93010474	474SF	FILLET	LIPID	5.4		PCTDRYWT
1993	OS	F93010565	565SF	FILLET	LIPID	3.6		PCTDRYWT
1993	OS	F93010566	566SF	FILLET	LIPID	1.6		PCTDRYWT
1993	OS	F93010567	567SF	FILLET	LIPID	2.6		PCTDRYWT
1993	OS	F93010569	569SF	FILLET	LIPID	3.1		PCTDRYWT
1993	OS	F93010570	570SF	FILLET	LIPID	4		PCTDRYWT
1993	OS	F93010571	571SF	FILLET	LIPID	1.5		PCTDRYWT
1993	OS	F93010572	572SF	FILLET	LIPID	1.6		PCTDRYWT
1993	OS	F93010573	573SF	FILLET	LIPID	5.1		PCTDRYWT
1993	OS	F93010574	574SF	FILLET	LIPID	1.6		PCTDRYWT
1993	ECCB	F93010625	625SF	FILLET	LIPID	1.6		PCTDRYWT
1993	ECCB	F93010626	626SF	FILLET	LIPID	3.2		PCTDRYWT
1993	ECCB	F93010627	627SF	FILLET	LIPID	3.4		PCTDRYWT
1993	ECCB	F93010628	628SF	FILLET	LIPID	2.8		PCTDRYWT
1993	ECCB	F93010629	629SF	FILLET	LIPID	4.5		PCTDRYWT
1993	ECCB	F93010630	630SF	FILLET	LIPID	2.3		PCTDRYWT
1993	ECCB	F93010631	631SF	FILLET	LIPID	3.8		PCTDRYWT
1993	ECCB	F93010632	632SF	FILLET	LIPID	4.8		PCTDRYWT
1993	ECCB	F93010633	633SF	FILLET	LIPID	1.6		PCTDRYWT
1993	ECCB	F93010634	634SF	FILLET	LIPID	1.5		PCTDRYWT
1994	DIF	FI101FLNDR	OU28	FILLET	LIPID	4.4		PCTDRYWT
1994	DIF	FI102FLNDR	OU29	FILLET	LIPID	4.7		PCTDRYWT
1994	DIF	FI103FLNDR	OU30	FILLET	LIPID	5.5		PCTDRYWT

Table C-1. Lipid Data - Flounder Fillet 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1994	OS	FI401FLNDR	OU37	FILLET	LIPID	6.5		PCTDRYWT
1994	OS	FI402FLNDR	OU38	FILLET	LIPID	3.6		PCTDRYWT
1994	OS	FI403FLNDR	OU39	FILLET	LIPID	6.3		PCTDRYWT
1994	ECCB	FI501FLNDR	OU40	FILLET	LIPID	6.3		PCTDRYWT
1994	ECCB	FI502FLNDR	OU41	FILLET	LIPID	6.5		PCTDRYWT
1994	ECCB	FI503FLNDR	OU42	FILLET	LIPID	3.5		PCTDRYWT
1995	DIF	P95111000C1	P95111000TC1	FILLET	LIPID	2.3		PCTDRYWT
1995	DIF	P95111000C2	P95111000TC2	FILLET	LIPID	0.9		PCTDRYWT
1995	DIF	P95111000C3	P95111000TC3	FILLET	LIPID	2.5		PCTDRYWT
1995	OS	P95114000C1	P95114000TC1	FILLET	LIPID	2.9		PCTDRYWT
1995	OS	P95114000C2	P95114000TC2	FILLET	LIPID	1.9		PCTDRYWT
1995	OS	P95114000C3	P95114000TC3	FILLET	LIPID	1.8		PCTDRYWT
1995	ECCB	P95115000C1	P95115000TC1	FILLET	LIPID	2.2		PCTDRYWT
1995	ECCB	P95115000C2	P95115000TC2	FILLET	LIPID	2.5		PCTDRYWT
1995	ECCB	P95115000C3	P95115000TC3	FILLET	LIPID	2.8		PCTDRYWT
1996	DIF	P96111000C1	P96111000TC1	FILLET	LIPID	2.6		PCTDRYWT
1996	DIF	P96111000C2	P96111000TC2	FILLET	LIPID	2		PCTDRYWT
1996	DIF	P96111000C3	P96111000TC3	FILLET	LIPID	1.8		PCTDRYWT
1996	OS	P96114000C1	P96114000TC1	FILLET	LIPID	1.5		PCTDRYWT
1996	OS	P96114000C2	P96114000TC2	FILLET	LIPID	2.3		PCTDRYWT
1996	OS	P96114000C3	P96114000TC3	FILLET	LIPID	1.9		PCTDRYWT
1996	ECCB	P96115000C1	P96115000TC1	FILLET	LIPID	2.2		PCTDRYWT
1996	ECCB	P96115000C2	P96115000TC2	FILLET	LIPID	2		PCTDRYWT
1996	ECCB	P96115000C3	P96115000TC3	FILLET	LIPID	2.6		PCTDRYWT
1997	DIF	P97111000C1	P97111000TC1	FILLET	LIPID	1.4		PCTDRYWT
1997	DIF	P97111000C2	P97111000TC2	FILLET	LIPID	1.5		PCTDRYWT
1997	DIF	P97111000C3	P97111000TC3	FILLET	LIPID	1.3		PCTDRYWT
1997	OS	P97114000C1	P97114000TC1	FILLET	LIPID	1.5		PCTDRYWT
1997	OS	P97114000C2	P97114000TC2	FILLET	LIPID	1.7		PCTDRYWT
1997	OS	P97114000C3	P97114000TC3	FILLET	LIPID	1.7		PCTDRYWT
1997	ECCB	P97115000C1	P97115000TC1	FILLET	LIPID	2.3		PCTDRYWT
1997	ECCB	P97115000C2	P97115000TC2	FILLET	LIPID	1.3		PCTDRYWT
1997	ECCB	P97115000C3	P97115000TC3	FILLET	LIPID	1		PCTDRYWT
1998	DIF	VQST11	VQ79	FILLET	LIPID	6		PCTDRYWT
1998	DIF	VQST12	VQ80	FILLET	LIPID	14		PCTDRYWT
1998	DIF	VQST13	VQ81	FILLET	LIPID	3		PCTDRYWT
1998	OS	VQST41	VQ85	FILLET	LIPID	2		PCTDRYWT
1998	OS	VQST42	VQ86	FILLET	LIPID	3		PCTDRYWT
1998	OS	VQST43	VQ87	FILLET	LIPID	11		PCTDRYWT
1998	ECCB	VQST51	VR06	FILLET	LIPID	9		PCTDRYWT
1998	ECCB	VQST52	VR07	FILLET	LIPID	5		PCTDRYWT
1998	ECCB	VQST53	VR08	FILLET	LIPID	6		PCTDRYWT
1999	DIF	FF99110C1	WQ73COMP	FILLET	LIPID	4.7		PCTDRYWT

Table C-1. Lipid Data - Flounder Fillet 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1999	DIF	FF99110C2	WQ74COMP	FILLET	LIPID	3.9		PCTDRYWT
1999	DIF	FF99110C3	WQ75COMP	FILLET	LIPID	3.9		PCTDRYWT
1999	OS	FF99140C1	WM70COMP	FILLET	LIPID	4.8		PCTDRYWT
1999	OS	FF99140C2	WM71COMP	FILLET	LIPID	5.3		PCTDRYWT
1999	OS	FF99140C3	WM72COMP	FILLET	LIPID	4.2		PCTDRYWT
1999	ECCB	FF99150C1	WM90COMP	FILLET	LIPID	3.2		PCTDRYWT
1999	ECCB	FF99150C2	WM91COMP	FILLET	LIPID	3.1		PCTDRYWT
1999	ECCB	FF99150C3	WM92COMP	FILLET	LIPID	3		PCTDRYWT
2000	DIF	FF00110C1	XT83	FILLET	LIPID	2.5		PCTDRYWT
2000	DIF	FF00110C2	XT84	FILLET	LIPID	2.8		PCTDRYWT
2000	DIF	FF00110C3	XT85	FILLET	LIPID	2.2		PCTDRYWT
2000	OS	FF00140C1	XT77	FILLET	LIPID	2.6		PCTDRYWT
2000	OS	FF00140C2	XT78	FILLET	LIPID	3.1		PCTDRYWT
2000	OS	FF00140C3	XT79	FILLET	LIPID	3.1		PCTDRYWT
2000	ECCB	FF00150C1	XU22	FILLET	LIPID	2.0		PCTDRYWT
2000	ECCB	FF00150C2	XU23	FILLET	LIPID	3.3		PCTDRYWT
2000	ECCB	FF00150C3	XU24	FILLET	LIPID	3.0		PCTDRYWT
2001	DIF	FF01110C1	YV39	FILLET	LIPID	2.5		PCTDRYWT
2001	DIF	FF01110C2	YV40	FILLET	LIPID	1.8		PCTDRYWT
2001	DIF	FF01110C3	YV41	FILLET	LIPID	2.3		PCTDRYWT
2001	OS	FF01140C1	YV45	FILLET	LIPID	1.9		PCTDRYWT
2001	OS	FF01140C2	YV46	FILLET	LIPID	2.1		PCTDRYWT
2001	OS	FF01140C3	YV47	FILLET	LIPID	2.1		PCTDRYWT
2001	ECCB	FF01150C1	YV63	FILLET	LIPID	1.8		PCTDRYWT
2001	ECCB	FF01150C2	YV64	FILLET	LIPID	2.1		PCTDRYWT
2001	ECCB	FF01150C3	YV65	FILLET	LIPID	2.1		PCTDRYWT

Table C-2. Lipid Data - Flounder Liver 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-353	92-353L	LIVER	LIPID	21.1		PCTDRYWT
1992	DIF	92-354	92-354L	LIVER	LIPID	13		PCTDRYWT
1992	DIF	92-359	92-359L	LIVER	LIPID	74		PCTDRYWT
1992	DIF	92-35C	92-35CL	LIVER	LIPID	22.7		PCTDRYWT
1992	OS	92-400	92-400L	LIVER	LIPID	25.5		PCTDRYWT
1992	OS	92-401	92-401L	LIVER	LIPID	52.4		PCTDRYWT
1992	OS	92-409	92-409L	LIVER	LIPID	20.15		PCTDRYWT
1992	OS	92-40C	92-40CL	LIVER	LIPID	22.5		PCTDRYWT
1992	ECCB	92-451	92-451L	LIVER	LIPID	15.9		PCTDRYWT
1992	ECCB	92-452	92-452L	LIVER	LIPID	18.5		PCTDRYWT
1992	ECCB	92-456	92-456L	LIVER	LIPID	29.9		PCTDRYWT
1992	ECCB	92-45C	92-45CL	LIVER	LIPID	22.1		PCTDRYWT
1993	DIF	FI1-04	FI1-04CL	LIVER	LIPID	34		PCTDRYWT
1993	OS	FI4-05	FI4-05CL	LIVER	LIPID	22.6		PCTDRYWT
1993	ECCB	FI5-06	FI5-06CL	LIVER	LIPID	20		PCTDRYWT
1994	DIF	FI101FLNDR	OV83	LIVER	LIPID	98.5		PCTDRYWT
1994	DIF	FI102FLNDR	OV84	LIVER	LIPID	75.1		PCTDRYWT
1994	DIF	FI103FLNDR	OV85	LIVER	LIPID	84.3		PCTDRYWT
1994	OS	FI401FLNDR	OV92	LIVER	LIPID	37.4		PCTDRYWT
1994	OS	FI402FLNDR	OV93	LIVER	LIPID	35.6		PCTDRYWT
1994	OS	FI403FLNDR	OV94	LIVER	LIPID	31.4		PCTDRYWT
1994	ECCB	FI501FLNDR	OV95	LIVER	LIPID	34.2		PCTDRYWT
1994	ECCB	FI502FLNDR	OV96	LIVER	LIPID	14.7		PCTDRYWT
1994	ECCB	FI503FLNDR	OV97	LIVER	LIPID	50		PCTDRYWT
1995	DIF	P95111000C1	P95111000LC1	LIVER	LIPID	28.5		PCTDRYWT
1995	DIF	P95111000C2	P95111000LC2	LIVER	LIPID	44.9		PCTDRYWT
1995	DIF	P95111000C3	P95111000LC3	LIVER	LIPID	25.7		PCTDRYWT
1995	OS	P95114000C1	P95114000LC1	LIVER	LIPID	24		PCTDRYWT
1995	OS	P95114000C2	P95114000LC2	LIVER	LIPID	20.6		PCTDRYWT
1995	OS	P95114000C3	P95114000LC3	LIVER	LIPID	25		PCTDRYWT
1995	ECCB	P95115000C1	P95115000LC1	LIVER	LIPID	11.2		PCTDRYWT
1995	ECCB	P95115000C2	P95115000LC2	LIVER	LIPID	15.2		PCTDRYWT
1995	ECCB	P95115000C3	P95115000LC3	LIVER	LIPID	16.4		PCTDRYWT
1996	DIF	P96111000C1	P96111000LC1	LIVER	LIPID	28.3		PCTDRYWT
1996	DIF	P96111000C2	P96111000LC2	LIVER	LIPID	22.6		PCTDRYWT
1996	DIF	P96111000C3	P96111000LC3	LIVER	LIPID	20.2		PCTDRYWT
1996	OS	P96114000C1	P96114000LC1	LIVER	LIPID	24.1		PCTDRYWT
1996	OS	P96114000C2	P96114000LC2	LIVER	LIPID	27.2		PCTDRYWT
1996	OS	P96114000C3	P96114000LC3	LIVER	LIPID	21.4		PCTDRYWT
1996	ECCB	P96115000C1	P96115000LC1	LIVER	LIPID	28.9		PCTDRYWT
1996	ECCB	P96115000C2	P96115000LC2	LIVER	LIPID	26.3		PCTDRYWT
1996	ECCB	P96115000C3	P96115000LC3	LIVER	LIPID	20.2		PCTDRYWT
1997	DIF	P97111000C1	P97111000LC1	LIVER	LIPID	13.3		PCTDRYWT
1997	DIF	P97111000C2	P97111000LC2	LIVER	LIPID	15		PCTDRYWT
1997	DIF	P97111000C3	P97111000LC3	LIVER	LIPID	11.2		PCTDRYWT
1997	OS	P97114000C1	P97114000LC1	LIVER	LIPID	16.3		PCTDRYWT

Table C-2. Lipid Data - Flounder Liver 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1997	OS	P97114000C2	P97114000LC2	LIVER	LIPID	14		PCTDRYWT
1997	OS	P97114000C3	P97114000LC3	LIVER	LIPID	14.1		PCTDRYWT
1997	ECCB	P97115000C1	P97115000LC1	LIVER	LIPID	15.4		PCTDRYWT
1997	ECCB	P97115000C2	P97115000LC2	LIVER	LIPID	17.7		PCTDRYWT
1997	ECCB	P97115000C3	P97115000LC3	LIVER	LIPID	23.2		PCTDRYWT
1998	DIF	VQST11	VQ82	LIVER	LIPID	51		PCTDRYWT
1998	DIF	VQST12	VQ83	LIVER	LIPID	54		PCTDRYWT
1998	DIF	VQST13	VQ84	LIVER	LIPID	57		PCTDRYWT
1998	OS	VQST41	VQ88	LIVER	LIPID	65		PCTDRYWT
1998	OS	VQST42	VQ89	LIVER	LIPID	42		PCTDRYWT
1998	OS	VQST43	VQ90	LIVER	LIPID	29		PCTDRYWT
1998	ECCB	VQST51	VR09	LIVER	LIPID	42		PCTDRYWT
1998	ECCB	VQST52	VR10	LIVER	LIPID	25		PCTDRYWT
1998	ECCB	VQST53	VR11	LIVER	LIPID	20		PCTDRYWT
1999	DIF	FF99110C1	WQ76COMP	LIVER	LIPID	50.2		PCTDRYWT
1999	DIF	FF99110C2	WQ77COMP	LIVER	LIPID	38.8		PCTDRYWT
1999	DIF	FF99110C3	WQ78COMP	LIVER	LIPID	43.5		PCTDRYWT
1999	OS	FF99140C1	WM73COMP	LIVER	LIPID	30.5		PCTDRYWT
1999	OS	FF99140C2	WM74COMP	LIVER	LIPID	24.7		PCTDRYWT
1999	OS	FF99140C3	WM75COMP	LIVER	LIPID	27.8		PCTDRYWT
1999	ECCB	FF99150C1	WM93COMP	LIVER	LIPID	87.3		PCTDRYWT
1999	ECCB	FF99150C2	WM94COMP	LIVER	LIPID	27.2		PCTDRYWT
1999	ECCB	FF99150C3	WM95COMP	LIVER	LIPID	35.1		PCTDRYWT
2000	DIF	FF00110C1	XT86	LIVER	LIPID	41.5		PCTDRYWT
2000	DIF	FF00110C2	XT87	LIVER	LIPID	35.6		PCTDRYWT
2000	DIF	FF00110C3	XT88	LIVER	LIPID	55.5		PCTDRYWT
2000	OS	FF00140C1	XT80	LIVER	LIPID	48.1		PCTDRYWT
2000	OS	FF00140C2	XT81	LIVER	LIPID	48.7		PCTDRYWT
2000	OS	FF00140C3	XT82	LIVER	LIPID	42.2		PCTDRYWT
2000	ECCB	FF00150C1	XU25	LIVER	LIPID	32.1		PCTDRYWT
2000	ECCB	FF00150C2	XU26	LIVER	LIPID	36.2		PCTDRYWT
2000	ECCB	FF00150C3	XU27	LIVER	LIPID	31.8		PCTDRYWT
2001	DIF	FF01110C1	YV42	LIVER	LIPID	18.3		PCTDRYWT
2001	DIF	FF01110C2	YV43	LIVER	LIPID	20.9		PCTDRYWT
2001	DIF	FF01110C3	YV44	LIVER	LIPID	16.9		PCTDRYWT
2001	OS	FF01140C1	YV48	LIVER	LIPID	25.9		PCTDRYWT
2001	OS	FF01140C2	YV49	LIVER	LIPID	22.2		PCTDRYWT
2001	OS	FF01140C3	YV50	LIVER	LIPID	20.1		PCTDRYWT
2001	ECCB	FF01150C1	YV66	LIVER	LIPID	18.1		PCTDRYWT
2001	ECCB	FF01150C2	YV67	LIVER	LIPID	17.1		PCTDRYWT
2001	ECCB	FF01150C3	YV68	LIVER	LIPID	17.9		PCTDRYWT

Table C-3. Lipid Data - Lobster Meat 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-467	92-467M	MEAT	LIPID	16.2		PCTDRYWT
1992	DIF	92-469	92-469M	MEAT	LIPID	19.6		PCTDRYWT
1992	DIF	92-482	92-482M	MEAT	LIPID	21.8		PCTDRYWT
1992	OS	92-460	92-460M	MEAT	LIPID	14.8		PCTDRYWT
1992	OS	92-463	92-463M	MEAT	LIPID	13.2		PCTDRYWT
1992	OS	92-464	92-464M	MEAT	LIPID	12.6		PCTDRYWT
1992	ECCB	92-465	92-465M	MEAT	LIPID	13.6		PCTDRYWT
1992	ECCB	92-466	92-466M	MEAT	LIPID	26.9		PCTDRYWT
1992	ECCB	92-476	92-476M	MEAT	LIPID	8.3		PCTDRYWT
1993	DIF	F93010KG34	KG34SM	MEAT	LIPID	3.2		PCTDRYWT
1993	DIF	S93030KI06	KI06SM	MEAT	LIPID	1.6		PCTDRYWT
1993	DIF	S93030KI07	KI07SM	MEAT	LIPID	2.7		PCTDRYWT
1993	OS	S93030KH97	KH97SM	MEAT	LIPID	3.5		PCTDRYWT
1993	OS	S93030KH98	KH98SM	MEAT	LIPID	3.8		PCTDRYWT
1993	ECCB	LOB-F0KH99	KH99SM	MEAT	LIPID	6.8		PCTDRYWT
1993	ECCB	LOB-F0KI01	KI01SM	MEAT	LIPID	4.8		PCTDRYWT
1993	ECCB	LOB-F0KI02	KI02SM	MEAT	LIPID	4.5		PCTDRYWT
1993	ECCB	LOB-F0KI03	KI03SM	MEAT	LIPID	2.8		PCTDRYWT
1993	ECCB	LOB-F0KI04	KI04SM	MEAT	LIPID	7.6		PCTDRYWT
1993	ECCB	LOB-F0KI05	KI05SM	MEAT	LIPID	2.1		PCTDRYWT
1993	ECCB	LOB-F0KI21	KI21SM	MEAT	LIPID	0.4		PCTDRYWT
1993	ECCB	LOB-F0KI22	KI22SM	MEAT	LIPID	7.1		PCTDRYWT
1993	ECCB	LOB-F0KI23	KI23SM	MEAT	LIPID	4.1		PCTDRYWT
1993	ECCB	LOB-F0KI24	KI24SM	MEAT	LIPID	1.6		PCTDRYWT
1994	DIF	FI101LOBST	OV31	MEAT	LIPID	10.9		PCTDRYWT
1994	DIF	FI102LOBST	OV32	MEAT	LIPID	9.7		PCTDRYWT
1994	DIF	FI103LOBST	OV33	MEAT	LIPID	6.2		PCTDRYWT
1994	OS	FI401LOBST	OV34	MEAT	LIPID	13.4		PCTDRYWT
1994	OS	FI402LOBST	OV35	MEAT	LIPID	9.4		PCTDRYWT
1994	ECCB	FI501LOBST	OV36	MEAT	LIPID	5		PCTDRYWT
1994	ECCB	FI502LOBST	OV37	MEAT	LIPID	4.8		PCTDRYWT
1994	ECCB	FI503LOBST	OV38	MEAT	LIPID	4.9		PCTDRYWT
1995	DIF	L95111000C1	L95111000TC1	MEAT	LIPID	4.4		PCTDRYWT
1995	DIF	L95111000C2	L95111000TC2	MEAT	LIPID	5.5		PCTDRYWT
1995	DIF	L95111000C3	L95111000TC3	MEAT	LIPID	4.9		PCTDRYWT
1995	OS	L95114000C1	L95114000TC1	MEAT	LIPID	5.2		PCTDRYWT
1995	OS	L95114000C2	L95114000TC2	MEAT	LIPID	4.3		PCTDRYWT
1995	OS	L95114000C3	L95114000TC3	MEAT	LIPID	3.3		PCTDRYWT
1995	ECCB	L95115000C1	L95115000TC1	MEAT	LIPID	5.1		PCTDRYWT
1995	ECCB	L95115000C2	L95115000TC2	MEAT	LIPID	4.4		PCTDRYWT
1995	ECCB	L95115000C3	L95115000TC3	MEAT	LIPID	4.5		PCTDRYWT
1996	DIF	L96111000C1	L96111000TC1	MEAT	LIPID	3.8		PCTDRYWT
1996	DIF	L96111000C2	L96111000TC2	MEAT	LIPID	3.4		PCTDRYWT
1996	DIF	L96111000C3	L96111000TC3	MEAT	LIPID	4.2		PCTDRYWT
1996	OS	L96114000C1	L96114000TC1	MEAT	LIPID	3.3		PCTDRYWT

Table C-3. Lipid Data - Lobster Meat 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1996	OS	L96114000C2	L96114000TC2	MEAT	LIPID	3.3		PCTDRYWT
1996	OS	L96114000C3	L96114000TC3	MEAT	LIPID	3.4		PCTDRYWT
1996	ECCB	L96115000C1	L96115000TC1	MEAT	LIPID	3.3		PCTDRYWT
1996	ECCB	L96115000C2	L96115000TC2	MEAT	LIPID	3.2		PCTDRYWT
1996	ECCB	L96115000C3	L96115000TC3	MEAT	LIPID	3		PCTDRYWT
1997	DIF	L97111000C1	L97111000TC1	MEAT	LIPID	4		PCTDRYWT
1997	DIF	L97111000C2	L97111000TC2	MEAT	LIPID	3.1		PCTDRYWT
1997	DIF	L97111000C3	L97111000TC3	MEAT	LIPID	3.1		PCTDRYWT
1997	OS	L97114000C1	L97114000TC1	MEAT	LIPID	3.2		PCTDRYWT
1997	OS	L97114000C2	L97114000TC2	MEAT	LIPID	3.6		PCTDRYWT
1997	OS	L97114000C3	L97114000TC3	MEAT	LIPID	3.3		PCTDRYWT
1997	ECCB	L97115000C1	L97115000TC1	MEAT	LIPID	3.4		PCTDRYWT
1997	ECCB	L97115000C2	L97115000TC2	MEAT	LIPID	3		PCTDRYWT
1997	ECCB	L97115000C3	L97115000TC3	MEAT	LIPID	3.5		PCTDRYWT
1998	DIF	VZST11	VZ35COMP	MEAT	LIPID	4		PCTDRYWT
1998	DIF	VZST12	VZ36COMP	MEAT	LIPID	3		PCTDRYWT
1998	DIF	VZST13	VZ37COMP	MEAT	LIPID	6		PCTDRYWT
1998	OS	VZST41	VZ23COMP	MEAT	LIPID	2		PCTDRYWT
1998	OS	VZST42	VZ24COMP	MEAT	LIPID	5		PCTDRYWT
1998	OS	VZST43	VZ25COMP	MEAT	LIPID	5		PCTDRYWT
1998	ECCB	VZST91	VZ29COMP	MEAT	LIPID	4		PCTDRYWT
1998	ECCB	VZST92	VZ30COMP	MEAT	LIPID	4		PCTDRYWT
1998	ECCB	VZST93	VZ31COMP	MEAT	LIPID	3		PCTDRYWT
1999	DIF	FL9911C1	XJ42	MEAT	LIPID	2.2		PCTDRYWT
1999	DIF	FL9911C2	XJ43	MEAT	LIPID	1.6		PCTDRYWT
1999	DIF	FL9911C3	XJ44	MEAT	LIPID	1.9		PCTDRYWT
1999	OS	FL9914C1	XJ45	MEAT	LIPID	1.7		PCTDRYWT
1999	OS	FL9914C2	XJ46	MEAT	LIPID	1.3		PCTDRYWT
1999	OS	FL9914C3	XJ47	MEAT	LIPID	1.5		PCTDRYWT
1999	ECCB	FL9915C1	XJ48	MEAT	LIPID	2.6		PCTDRYWT
1999	ECCB	FL9915C2	XJ49	MEAT	LIPID	1.7		PCTDRYWT
1999	ECCB	FL9915C3	XJ50	MEAT	LIPID	1.8		PCTDRYWT
2000	DIF	FL0011C1	YC90	MEAT	LIPID	1.9		PCTDRYWT
2000	DIF	FL0011C2	YC91	MEAT	LIPID	1.6		PCTDRYWT
2000	DIF	FL0011C3	YC92	MEAT	LIPID	2.1		PCTDRYWT
2000	OS	FL0014C1	YC93	MEAT	LIPID	1.7		PCTDRYWT
2000	OS	FL0014C2	YC94	MEAT	LIPID	1.7		PCTDRYWT
2000	OS	FL0014C3	YC95	MEAT	LIPID	1.7		PCTDRYWT
2000	ECCB	FL0015C1	YC87	MEAT	LIPID	2.0		PCTDRYWT
2000	ECCB	FL0015C2	YC88	MEAT	LIPID	2.3		PCTDRYWT
2000	ECCB	FL0015C3	YC89	MEAT	LIPID	1.9		PCTDRYWT
2001	DIF	FL0111-C1	ZH31	MEAT	LIPID	3		PCTDRYWT
2001	DIF	FL0111-C2	ZH32	MEAT	LIPID	2.9		PCTDRYWT
2001	DIF	FL0111-C3	ZH33	MEAT	LIPID	2		PCTDRYWT

Table C-3. Lipid Data - Lobster Meat 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2001	OS	FL0114-C1	ZI54	MEAT	LIPID	2.4		PCTDRYWT
2001	OS	FL0114-C2	ZI55	MEAT	LIPID	2.4		PCTDRYWT
2001	OS	FL0114-C3	ZI56	MEAT	LIPID	2.1		PCTDRYWT
2001	ECCB	FL0115-C1	ZH37	MEAT	LIPID	3.1		PCTDRYWT
2001	ECCB	FL0115-C2	ZH38	MEAT	LIPID	2.9		PCTDRYWT
2001	ECCB	FL0115-C3	ZH39	MEAT	LIPID	3.3		PCTDRYWT

Table C-4. Lipid Data - Lobster Hepatopancreas 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-467	92-467L	HEPATOPANC	LIPID	65.8		PCTDRYWT
1992	DIF	92-469	92-469L	HEPATOPANC	LIPID	73.7		PCTDRYWT
1992	DIF	92-482	92-482L	HEPATOPANC	LIPID	66.3		PCTDRYWT
1992	OS	92-460	92-460L	HEPATOPANC	LIPID	57		PCTDRYWT
1992	OS	92-463	92-463L	HEPATOPANC	LIPID	47.1		PCTDRYWT
1992	OS	92-464	92-464L	HEPATOPANC	LIPID	79.2		PCTDRYWT
1992	ECCB	92-465	92-465L	HEPATOPANC	LIPID	18.8		PCTDRYWT
1992	ECCB	92-466	92-466L	HEPATOPANC	LIPID	82.5		PCTDRYWT
1992	ECCB	92-476	92-476L	HEPATOPANC	LIPID	30.1		PCTDRYWT
1993	DIF	F93010KG34	KG34SH	HEPATOPANC	LIPID	34.3		PCTDRYWT
1993	DIF	S93030KI06	KI06SH	HEPATOPANC	LIPID	35.2		PCTDRYWT
1993	DIF	S93030KI07	KI07SH	HEPATOPANC	LIPID	55.8		PCTDRYWT
1993	OS	S93030KH97	KH97SH	HEPATOPANC	LIPID	56.2		PCTDRYWT
1993	OS	S93030KH98	KH98SH	HEPATOPANC	LIPID	45.3		PCTDRYWT
1993	ECCB	LOB-F0KH99	KH99SH	HEPATOPANC	LIPID	72.9		PCTDRYWT
1993	ECCB	LOB-F0KI01	KI01SH	HEPATOPANC	LIPID	33.6		PCTDRYWT
1993	ECCB	LOB-F0KI02	KI02SH	HEPATOPANC	LIPID	57.9		PCTDRYWT
1993	ECCB	LOB-F0KI03	KI03SH	HEPATOPANC	LIPID	43.5		PCTDRYWT
1993	ECCB	LOB-F0KI04	KI04SH	HEPATOPANC	LIPID	65.5		PCTDRYWT
1993	ECCB	LOB-F0KI05	KI05SH	HEPATOPANC	LIPID	33.7		PCTDRYWT
1993	ECCB	LOB-F0KI21	KI21SH	HEPATOPANC	LIPID	39.4		PCTDRYWT
1993	ECCB	LOB-F0KI22	KI22SH	HEPATOPANC	LIPID	40.3		PCTDRYWT
1993	ECCB	LOB-F0KI23	KI23SH	HEPATOPANC	LIPID	56.4		PCTDRYWT
1993	ECCB	LOB-F0KI24	KI24SH	HEPATOPANC	LIPID	67.2		PCTDRYWT
1994	DIF	FI101LOBST	OV42	HEPATOPANC	LIPID	72.4		PCTDRYWT
1994	DIF	FI102LOBST	OV43	HEPATOPANC	LIPID	71.5		PCTDRYWT
1994	DIF	FI103LOBST	OV44	HEPATOPANC	LIPID	67.5		PCTDRYWT
1994	OS	FI401LOBST	OV45	HEPATOPANC	LIPID	59.2		PCTDRYWT
1994	OS	FI402LOBST	OV46	HEPATOPANC	LIPID	56.5		PCTDRYWT
1994	ECCB	FI501LOBST	OV47	HEPATOPANC	LIPID	79		PCTDRYWT
1994	ECCB	FI502LOBST	OV48	HEPATOPANC	LIPID	67.3		PCTDRYWT
1994	ECCB	FI503LOBST	OV49	HEPATOPANC	LIPID	61.7		PCTDRYWT
1995	DIF	L95111000C1	L95111000HC1	HEPATOPANC	LIPID	70.8		PCTDRYWT
1995	DIF	L95111000C2	L95111000HC2	HEPATOPANC	LIPID	64.3		PCTDRYWT
1995	DIF	L95111000C3	L95111000HC3	HEPATOPANC	LIPID	55.9		PCTDRYWT
1995	OS	L95114000C1	L95114000HC1	HEPATOPANC	LIPID	70.9		PCTDRYWT
1995	OS	L95114000C2	L95114000HC2	HEPATOPANC	LIPID	60.4		PCTDRYWT
1995	OS	L95114000C3	L95114000HC3	HEPATOPANC	LIPID	61.8		PCTDRYWT
1995	ECCB	L95115000C1	L95115000HC1	HEPATOPANC	LIPID	57.7		PCTDRYWT
1995	ECCB	L95115000C2	L95115000HC2	HEPATOPANC	LIPID	64.7		PCTDRYWT
1995	ECCB	L95115000C3	L95115000HC3	HEPATOPANC	LIPID	79.6		PCTDRYWT
1996	DIF	L96111000C1	L96111000HC1	HEPATOPANC	LIPID	49.5		PCTDRYWT
1996	DIF	L96111000C2	L96111000HC2	HEPATOPANC	LIPID	60.1		PCTDRYWT
1996	DIF	L96111000C3	L96111000HC3	HEPATOPANC	LIPID	59.4		PCTDRYWT
1996	OS	L96114000C1	L96114000HC1	HEPATOPANC	LIPID	47.4		PCTDRYWT

Table C-4. Lipid Data - Lobster Hepatopancreas 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1996	OS	L96114000C2	L96114000HC2	HEPATOPANC	LIPID	54.1		PCTDRYWT
1996	OS	L96114000C3	L96114000HC3	HEPATOPANC	LIPID	52.4		PCTDRYWT
1996	ECCB	L96115000C1	L96115000HC1	HEPATOPANC	LIPID	59.1		PCTDRYWT
1996	ECCB	L96115000C2	L96115000HC2	HEPATOPANC	LIPID	65.1		PCTDRYWT
1996	ECCB	L96115000C3	L96115000HC3	HEPATOPANC	LIPID	60.6		PCTDRYWT
1997	DIF	L97111000C1	L97111000HC1	HEPATOPANC	LIPID	46.3		PCTDRYWT
1997	DIF	L97111000C2	L97111000HC2	HEPATOPANC	LIPID	56.5		PCTDRYWT
1997	DIF	L97111000C3	L97111000HC3	HEPATOPANC	LIPID	44.5		PCTDRYWT
1997	OS	L97114000C1	L97114000HC1	HEPATOPANC	LIPID	64.2		PCTDRYWT
1997	OS	L97114000C2	L97114000HC2	HEPATOPANC	LIPID	62.8		PCTDRYWT
1997	OS	L97114000C3	L97114000HC3	HEPATOPANC	LIPID	44.7		PCTDRYWT
1997	ECCB	L97115000C1	L97115000HC1	HEPATOPANC	LIPID	58.6		PCTDRYWT
1997	ECCB	L97115000C2	L97115000HC2	HEPATOPANC	LIPID	61.0		PCTDRYWT
1997	ECCB	L97115000C3	L97115000HC3	HEPATOPANC	LIPID	57.7		PCTDRYWT
1998	DIF	VZST11	VZ38COMP	HEPATOPANC	LIPID	104.0		PCTDRYWT
1998	DIF	VZST12	VZ39COMP	HEPATOPANC	LIPID	66.0		PCTDRYWT
1998	DIF	VZST13	VZ40COMP	HEPATOPANC	LIPID	68.0		PCTDRYWT
1998	OS	VZST41	VZ26COMP	HEPATOPANC	LIPID	68.0		PCTDRYWT
1998	OS	VZST42	VZ27COMP	HEPATOPANC	LIPID	70.0		PCTDRYWT
1998	OS	VZST43	VZ28COMP	HEPATOPANC	LIPID	60.0		PCTDRYWT
1998	ECCB	VZST91	VZ32COMP	HEPATOPANC	LIPID	59.0		PCTDRYWT
1998	ECCB	VZST92	VZ33COMP	HEPATOPANC	LIPID	60.0		PCTDRYWT
1998	ECCB	VZST93	VZ34COMP	HEPATOPANC	LIPID	59.0		PCTDRYWT
1999	DIF	FL9911C1	XJ51	HEPATOPANC	LIPID	32.3		PCTDRYWT
1999	DIF	FL9911C2	XJ52	HEPATOPANC	LIPID	30.0		PCTDRYWT
1999	DIF	FL9911C3	XJ53	HEPATOPANC	LIPID	31.8		PCTDRYWT
1999	OS	FL9914C1	XJ54	HEPATOPANC	LIPID	30.2		PCTDRYWT
1999	OS	FL9914C2	XJ55	HEPATOPANC	LIPID	58.7		PCTDRYWT
1999	OS	FL9914C3	XJ56	HEPATOPANC	LIPID	40.8		PCTDRYWT
1999	ECCB	FL9915C1	XJ57	HEPATOPANC	LIPID	35.2		PCTDRYWT
1999	ECCB	FL9915C2	XJ58	HEPATOPANC	LIPID	37.3		PCTDRYWT
1999	ECCB	FL9915C3	XJ59	HEPATOPANC	LIPID	43.4		PCTDRYWT
2000	DIF	FL0011C1	YC81	HEPATOPANC	LIPID	53.5		PCTDRYWT
2000	DIF	FL0011C2	YC82	HEPATOPANC	LIPID	57.6		PCTDRYWT
2000	DIF	FL0011C3	YC83	HEPATOPANC	LIPID	57.7		PCTDRYWT
2000	OS	FL0014C1	YC84	HEPATOPANC	LIPID	42.7		PCTDRYWT
2000	OS	FL0014C2	YC85	HEPATOPANC	LIPID	52.9		PCTDRYWT
2000	OS	FL0014C3	YC86	HEPATOPANC	LIPID	56.8		PCTDRYWT
2000	ECCB	FL0015C1	YC78	HEPATOPANC	LIPID	51.3		PCTDRYWT
2000	ECCB	FL0015C2	YC79	HEPATOPANC	LIPID	58.6		PCTDRYWT
2000	ECCB	FL0015C3	YC80	HEPATOPANC	LIPID	57.3		PCTDRYWT
2001	DIF	FL0111-C1	ZH34	HEPATOPANC	LIPID	55.2		PCTDRYWT
2001	DIF	FL0111-C2	ZH35	HEPATOPANC	LIPID	49.3		PCTDRYWT
2001	DIF	FL0111-C3	ZH36	HEPATOPANC	LIPID	55.6		PCTDRYWT

Table C-4. Lipid Data - Lobster Hepatopancreas 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2001	OS	FL0114-C1	ZI51	HEPATOPANC	LIPID	48.1		PCTDRYWT
2001	OS	FL0114-C2	ZI52	HEPATOPANC	LIPID	52.9		PCTDRYWT
2001	OS	FL0114-C3	ZI53	HEPATOPANC	LIPID	53.9		PCTDRYWT
2001	ECCB	FL0115-C1	ZH40	HEPATOPANC	LIPID	46.8		PCTDRYWT
2001	ECCB	FL0115-C2	ZH41	HEPATOPANC	LIPID	51.7		PCTDRYWT
2001	ECCB	FL0115-C3	ZH42	HEPATOPANC	LIPID	51.3		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1991	DI	M91143957	M91143957	SOFT_TISSUE	LIPID	2.1		PCTDRYWT
1991	DI	M91143958	M91143958	SOFT_TISSUE	LIPID	4.5		PCTDRYWT
1991	DI	M91143959	M91143959	SOFT_TISSUE	LIPID	4.0		PCTDRYWT
1991	DI	M91143960	M91143960	SOFT_TISSUE	LIPID	3.2		PCTDRYWT
1991	DI	M91143961	M91143961	SOFT_TISSUE	LIPID	2.8		PCTDRYWT
1991	DI	M91143962	M91143962	SOFT_TISSUE	LIPID	3.4		PCTDRYWT
1991	DI	M91143963	M91143963	SOFT_TISSUE	LIPID	3.1		PCTDRYWT
1991	DI	M91143964	M91143964	SOFT_TISSUE	LIPID	3.0		PCTDRYWT
1991	BIH	M91143739	M91143739	SOFT_TISSUE	LIPID	7.9		PCTDRYWT
1991	BIH	M91143740	M91143740	SOFT_TISSUE	LIPID	4.2		PCTDRYWT
1991	BIH	M91143741	M91143741	SOFT_TISSUE	LIPID	6.8		PCTDRYWT
1991	BIH	M91143742	M91143742	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1991	BIH	M91143743	M91143743	SOFT_TISSUE	LIPID	4.7		PCTDRYWT
1991	Glouc.	M91143626	M91143626	SOFT_TISSUE	LIPID	4.4		PCTDRYWT
1991	Glouc.	M91143627	M91143627	SOFT_TISSUE	LIPID	8.1		PCTDRYWT
1991	Glouc.	M91143628	M91143628	SOFT_TISSUE	LIPID	4.7		PCTDRYWT
1991	Glouc.	M91143629	M91143629	SOFT_TISSUE	LIPID	1.8		PCTDRYWT
1991	Glouc.	M91143630	M91143630	SOFT_TISSUE	LIPID	3.9		PCTDRYWT
1991	Glouc.	M91143631	M91143631	SOFT_TISSUE	LIPID	1.8		PCTDRYWT
1991	Glouc.	M91143632	M91143632	SOFT_TISSUE	LIPID	2.4		PCTDRYWT
1991	Glouc.	M91143633	M91143633	SOFT_TISSUE	LIPID	3.9		PCTDRYWT
1991	Glouc.	M91143634	M91143634	SOFT_TISSUE	LIPID	8.4		PCTDRYWT
1991	Glouc.	M91143635	M91143635	SOFT_TISSUE	LIPID	4.8		PCTDRYWT
1992	DI	M92164479	M92164479	SOFT_TISSUE	LIPID	4.4		PCTDRYWT
1992	DI	M92164480	M92164480	SOFT_TISSUE	LIPID	5.5		PCTDRYWT
1992	DI	M92164481	M92164481	SOFT_TISSUE	LIPID	4.8		PCTDRYWT
1992	DI	M92164482	M92164482	SOFT_TISSUE	LIPID	5.8		PCTDRYWT
1992	DI	M92164483	M92164483	SOFT_TISSUE	LIPID	4.8		PCTDRYWT
1992	DI	M92164484	M92164484	SOFT_TISSUE	LIPID	3.6		PCTDRYWT
1992	DI	M92164485	M92164485	SOFT_TISSUE	LIPID	4.6		PCTDRYWT
1992	DI	M92164486	M92164486	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
1992	BIH	M92164487	M92164487	SOFT_TISSUE	LIPID	5.7		PCTDRYWT
1992	BIH	M92164488	M92164488	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1992	BIH	M92164489	M92164489	SOFT_TISSUE	LIPID	4.1		PCTDRYWT
1992	BIH	M92164490	M92164490	SOFT_TISSUE	LIPID	5.8		PCTDRYWT
1992	BIH	M92164491	M92164491	SOFT_TISSUE	LIPID	4.6		PCTDRYWT
1992	Glouc.	M92162679	M92162679	SOFT_TISSUE	LIPID	4.5		PCTDRYWT
1992	Glouc.	M92162680	M92162680	SOFT_TISSUE	LIPID	3.6		PCTDRYWT
1992	Glouc.	M92162681	M92162681	SOFT_TISSUE	LIPID	4.0		PCTDRYWT
1992	Glouc.	M92162682	M92162682	SOFT_TISSUE	LIPID	4.4		PCTDRYWT
1992	Glouc.	M92162683	M92162683	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
1992	OS	M92164492	M92164492	SOFT_TISSUE	LIPID	5.4		PCTDRYWT
1992	OS	M92164493	M92164493	SOFT_TISSUE	LIPID	3.8		PCTDRYWT
1992	OS	M92164494	M92164494	SOFT_TISSUE	LIPID	4.7		PCTDRYWT
1992	OS	M92164495	M92164495	SOFT_TISSUE	LIPID	3.3		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	OS	M92164496	M92164496	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
1992	OS	M92164497	M92164497	SOFT_TISSUE	LIPID	3.5		PCTDRYWT
1992	OS	M92164498	M92164498	SOFT_TISSUE	LIPID	3.1		PCTDRYWT
1992	OS	M92164499	M92164499	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
1993	DI	M93196384	M93196384	SOFT_TISSUE	LIPID	6.5	j	PCTDRYWT
1993	DI	M93196385	M93196385	SOFT_TISSUE	LIPID	6.5	j	PCTDRYWT
1993	DI	M93196386	M93196386	SOFT_TISSUE	LIPID	6.5	j	PCTDRYWT
1993	DI	M93196387	M93196387	SOFT_TISSUE	LIPID	6.5	j	PCTDRYWT
1993	DI	M93196388	M93196388	SOFT_TISSUE	LIPID	6.5	j	PCTDRYWT
1993	BIH	M93196389	M93196389	SOFT_TISSUE	LIPID	5.3	j	PCTDRYWT
1993	BIH	M93196390	M93196390	SOFT_TISSUE	LIPID	5.3	j	PCTDRYWT
1993	BIH	M93196391	M93196391	SOFT_TISSUE	LIPID	5.3	j	PCTDRYWT
1993	BIH	M93196392	M93196392	SOFT_TISSUE	LIPID	5.3	j	PCTDRYWT
1993	Glouc.	M93188933	M93188933	SOFT_TISSUE	LIPID	8.0	j	PCTDRYWT
1993	Glouc.	M93188934	M93188934	SOFT_TISSUE	LIPID	8.0	j	PCTDRYWT
1993	Glouc.	M93188936	M93188936	SOFT_TISSUE	LIPID	8.0	j	PCTDRYWT
1993	Glouc.	M93188937	M93188937	SOFT_TISSUE	LIPID	8.0	j	PCTDRYWT
1993	Glouc.	M93188941	M93188941	SOFT_TISSUE	LIPID	8.0	j	PCTDRYWT
1993	OS	M93196376	M93196376	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196377	M93196377	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196378	M93196378	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196379	M93196379	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196380	M93196380	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196381	M93196381	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196382	M93196382	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93196383	M93196383	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93203265R	M93203265R	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93203266R	M93203266R	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1993	OS	M93203279	M93203279	SOFT_TISSUE	LIPID	7.1	j	PCTDRYWT
1994	DI	M94233366	M94233366	SOFT_TISSUE	LIPID	4.4		PCTDRYWT
1994	DI	M94233367	M94233367	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1994	DI	M94233368	M94233368	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1994	DI	M94233369	M94233369	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1994	BIH	M94233371	M94233371	SOFT_TISSUE	LIPID	4.8		PCTDRYWT
1994	BIH	M94233372	M94233372	SOFT_TISSUE	LIPID	6.6		PCTDRYWT
1994	BIH	M94233373	M94233373	SOFT_TISSUE	LIPID	5.1		PCTDRYWT
1994	Glouc.	M94225475	M94225475	SOFT_TISSUE	LIPID	3.3		PCTDRYWT
1994	Glouc.	M94225476	M94225476	SOFT_TISSUE	LIPID	4.6		PCTDRYWT
1994	Glouc.	M94225477	M94225477	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
1994	Glouc.	M94225478	M94225478	SOFT_TISSUE	LIPID	4.0		PCTDRYWT
1994	OS	M94233376	M94233376	SOFT_TISSUE	LIPID	3.6		PCTDRYWT
1994	OS	M94233377	M94233377	SOFT_TISSUE	LIPID	4.7		PCTDRYWT
1994	OS	M94233378	M94233378	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
1994	OS	M94233379	M94233379	SOFT_TISSUE	LIPID	4.1		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1994	OS	M94233381	M94233381	SOFT_TISSUE	LIPID	6.5		PCTDRYWT
1994	OS	M94233382	M94233382	SOFT_TISSUE	LIPID	6.4		PCTDRYWT
1994	OS	M94233383	M94233383	SOFT_TISSUE	LIPID	8.1		PCTDRYWT
1994	OS	M94233384	M94233384	SOFT_TISSUE	LIPID	5.7		PCTDRYWT
1995	DI	M9511D1H7TC1	M9511D1H7TC1	SOFT_TISSUE	LIPID	10.2		PCTDRYWT
1995	DI	M9511D1H7TC2	M9511D1H7TC2	SOFT_TISSUE	LIPID	11.9		PCTDRYWT
1995	DI	M9511D1H7TC3	M9511D1H7TC3	SOFT_TISSUE	LIPID	11.6		PCTDRYWT
1995	DI	M9511D1H7TC4	M9511D1H7TC4	SOFT_TISSUE	LIPID	11.0		PCTDRYWT
1995	DI	M9511D1H7TC5	M9511D1H7TC5	SOFT_TISSUE	LIPID	11.5		PCTDRYWT
1995	BIH	M9511D6H7TC1	M9511D6H7TC1	SOFT_TISSUE	LIPID	10.0		PCTDRYWT
1995	BIH	M9511D6H7TC2	M9511D6H7TC2	SOFT_TISSUE	LIPID	10.1		PCTDRYWT
1995	BIH	M9511D6H7TC3	M9511D6H7TC3	SOFT_TISSUE	LIPID	10.4		PCTDRYWT
1995	BIH	M9511D6H7TC4	M9511D6H7TC4	SOFT_TISSUE	LIPID	10.2		PCTDRYWT
1995	BIH	M9511D6H7TC5	M9511D6H7TC5	SOFT_TISSUE	LIPID	8.5		PCTDRYWT
1995	Glouc.	M9511H7TC1	M9511H7TC1	SOFT_TISSUE	LIPID	9.2		PCTDRYWT
1995	Glouc.	M9511H7TC2	M9511H7TC2	SOFT_TISSUE	LIPID	8.1		PCTDRYWT
1995	Glouc.	M9511H7TC3	M9511H7TC3	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
1995	Glouc.	M9511H7TC4	M9511H7TC4	SOFT_TISSUE	LIPID	8.2		PCTDRYWT
1995	Glouc.	M9511H7TC5	M9511H7TC5	SOFT_TISSUE	LIPID	9.6		PCTDRYWT
1996	DI	M9611D1H7TC1	M9611D1H7TC1	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1996	DI	M9611D1H7TC2	M9611D1H7TC2	SOFT_TISSUE	LIPID	15.0		PCTDRYWT
1996	DI	M9611D1H7TC3	M9611D1H7TC3	SOFT_TISSUE	LIPID	13.4		PCTDRYWT
1996	DI	M9611D1H7TC4	M9611D1H7TC4	SOFT_TISSUE	LIPID	14.9		PCTDRYWT
1996	DI	M9611D1H7TC5	M9611D1H7TC5	SOFT_TISSUE	LIPID	16.7		PCTDRYWT
1996	BIH	M9611D6H7TC1	M9611D6H7TC1	SOFT_TISSUE	LIPID	8.7		PCTDRYWT
1996	BIH	M9611D6H7TC2	M9611D6H7TC2	SOFT_TISSUE	LIPID	10.3		PCTDRYWT
1996	BIH	M9611D6H7TC3	M9611D6H7TC3	SOFT_TISSUE	LIPID	10.9		PCTDRYWT
1996	BIH	M9611D6H7TC4	M9611D6H7TC4	SOFT_TISSUE	LIPID	8.9		PCTDRYWT
1996	BIH	M9611D6H7TC5	M9611D6H7TC5	SOFT_TISSUE	LIPID	11.4		PCTDRYWT
1996	Glouc.	M9611H7TC1	M9611H7TC1	SOFT_TISSUE	LIPID	7.1		PCTDRYWT
1996	Glouc.	M9611H7TC2	M9611H7TC2	SOFT_TISSUE	LIPID	11.6		PCTDRYWT
1996	Glouc.	M9611H7TC3	M9611H7TC3	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1996	OS	M9611D4H7TC1	M9611D4H7TC1	SOFT_TISSUE	LIPID	8.8		PCTDRYWT
1996	OS	M9611D4H7TC2	M9611D4H7TC2	SOFT_TISSUE	LIPID	10.5		PCTDRYWT
1996	OS	M9611D4H7TC3	M9611D4H7TC3	SOFT_TISSUE	LIPID	12.2		PCTDRYWT
1996	OS	M9611D4H7TC4	M9611D4H7TC4	SOFT_TISSUE	LIPID	10.4		PCTDRYWT
1996	OS	M9611D4H7TC5	M9611D4H7TC5	SOFT_TISSUE	LIPID	10.9		PCTDRYWT
1997	DI	M9711D1H7TC1	M9711D1H7TC1	SOFT_TISSUE	LIPID	9.3		PCTDRYWT
1997	DI	M9711D1H7TC2	M9711D1H7TC2	SOFT_TISSUE	LIPID	9.7		PCTDRYWT
1997	DI	M9711D1H7TC3	M9711D1H7TC3	SOFT_TISSUE	LIPID	7.8		PCTDRYWT
1997	DI	M9711D1H7TC4	M9711D1H7TC4	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
1997	DI	M9711D1H7TC5	M9711D1H7TC5	SOFT_TISSUE	LIPID	9.1		PCTDRYWT
1997	BIH	M9711D6H7TC1	M9711D6H7TC1	SOFT_TISSUE	LIPID	8.8		PCTDRYWT
1997	BIH	M9711D6H7TC2	M9711D6H7TC2	SOFT_TISSUE	LIPID	7.7		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1997	BIH	M9711D6H7TC3	M9711D6H7TC3	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
1997	BIH	M9711D6H7TC4	M9711D6H7TC4	SOFT_TISSUE	LIPID	7.8		PCTDRYWT
1997	BIH	M9711D6H7TC5	M9711D6H7TC5	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
1997	Glouc.	M9711H7TC1	M9711H7TC1	SOFT_TISSUE	LIPID	8.2		PCTDRYWT
1997	Glouc.	M9711H7TC2	M9711H7TC2	SOFT_TISSUE	LIPID	8.1		PCTDRYWT
1997	Glouc.	M9711H7TC3	M9711H7TC3	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
1997	Glouc.	M9711H7TC4	M9711H7TC4	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
1997	Glouc.	M9711H7TC5	M9711H7TC5	SOFT_TISSUE	LIPID	9.1		PCTDRYWT
1997	OS	M9711D4H7TC1	M9711D4H7TC1	SOFT_TISSUE	LIPID	7.2		PCTDRYWT
1997	OS	M9711D4H7TC2	M9711D4H7TC2	SOFT_TISSUE	LIPID	8.9		PCTDRYWT
1997	OS	M9711D4H7TC3	M9711D4H7TC3	SOFT_TISSUE	LIPID	9.6		PCTDRYWT
1997	OS	M9711D4H7TC4	M9711D4H7TC4	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1997	OS	M9711D4H7TC5	M9711D4H7TC5	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1998	Glouc.	FM9812GVX01	VX01	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	Glouc.	FM9812GVX02	VX02	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	Glouc.	FM9812GVX03	VX03	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
1998	Glouc.	FM9812GVX04	VX04	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	Glouc.	FM9812GVX05	VX05	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	Sand.	FM9811SVX06	VX06	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
1998	DI	FM9821GVX17	VX17	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	DI	FM9821GVX18	VX18	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	DI	FM9821GVX19	VX19	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	DI	FM9821GVX20	VX20	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	DI	FM9821GVX21	VX21	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	OS	FM9822GVX22	VX22	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	OS	FM9822GVX23	VX23	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	OS	FM9822GVX24	VX24	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	OS	FM9822GVX25	VX25	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1998	OS	FM9822GVX26	VX26	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	OS	FM9822GVX27	VX27	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	OS	FM9822GVX28	VX28	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	OS	FM9822GVX29	VX29	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
1998	BIH	FM9832GVX12	VX12	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	BIH	FM9832GVX13	VX13	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	BIH	FM9832GVX14	VX14	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	BIH	FM9832GVX15	VX15	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	BIH	FM9832GVX16	VX16	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1998	CCB	FM9833GVX30	VX30	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	CCB	FM9833GVX31	VX31	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1998	CCB	FM9833GVX32	VX32	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	CCB	FM9833GVX33	VX33	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	CCB	FM9833GVX34	VX34	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1998	CCB	FM9833GVX35	VX35	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1998	CCB	FM9833GVX36	VX36	SOFT_TISSUE	LIPID	8.0		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1998	CCB	FM9833GVX37	VX37	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1999	Glouc.	FM9912GXD74	XD74	SOFT_TISSUE	LIPID	7.8		PCTDRYWT
1999	Glouc.	FM9912GXD75	XD75	SOFT_TISSUE	LIPID	5.6		PCTDRYWT
1999	Glouc.	FM9912GXD76	XD76	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
1999	Glouc.	FM9912GXD77	XD77	SOFT_TISSUE	LIPID	6.4		PCTDRYWT
1999	Glouc.	FM9912GXD78	XD78	SOFT_TISSUE	LIPID	5.6		PCTDRYWT
1999	BIH	FM9931GXD79	XD79	SOFT_TISSUE	LIPID	5.6		PCTDRYWT
1999	BIH	FM9931GXD80	XD80	SOFT_TISSUE	LIPID	6.2		PCTDRYWT
1999	BIH	FM9931GXD81	XD81	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
1999	BIH	FM9931GXD82	XD82	SOFT_TISSUE	LIPID	6.4		PCTDRYWT
1999	BIH	FM9931GXD83	XD83	SOFT_TISSUE	LIPID	6.5		PCTDRYWT
1999	CCB	FM9933GXD92	XD92	SOFT_TISSUE	LIPID	11.3		PCTDRYWT
1999	CCB	FM9933GXD93	XD93	SOFT_TISSUE	LIPID	13.8		PCTDRYWT
1999	CCB	FM9933GXD94	XD94	SOFT_TISSUE	LIPID	12.1		PCTDRYWT
1999	CCB	FM9933GXD95	XD95	SOFT_TISSUE	LIPID	10.5		PCTDRYWT
1999	CCB	FM9933GXD96	XD96	SOFT_TISSUE	LIPID	9.9		PCTDRYWT
1999	CCB	FM9933GXD97	XD97	SOFT_TISSUE	LIPID	11.5		PCTDRYWT
1999	CCB	FM9933GXD98	XD98	SOFT_TISSUE	LIPID	11.9		PCTDRYWT
1999	CCB	FM9933GXD99	XD99	SOFT_TISSUE	LIPID	14.2		PCTDRYWT
1999	OS	FM9932GXD84	XD84	SOFT_TISSUE	LIPID	8.7		PCTDRYWT
1999	OS	FM9932GXD85	XD85	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
1999	OS	FM9932GXD86	XD86	SOFT_TISSUE	LIPID	6.9		PCTDRYWT
1999	OS	FM9932GXD87	XD87	SOFT_TISSUE	LIPID	7.9		PCTDRYWT
1999	OS	FM9932GXD88	XD88	SOFT_TISSUE	LIPID	9.0		PCTDRYWT
1999	OS	FM9932GXD89	XD89	SOFT_TISSUE	LIPID	8.4		PCTDRYWT
1999	OS	FM9932GXD90	XD90	SOFT_TISSUE	LIPID	8.3		PCTDRYWT
1999	OS	FM9932GXD91	XD91	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
2000	RP	FM001RPYE67	YE67	SOFT_TISSUE	LIPID	4.9		PCTDRYWT
2000	RP	FM001RPYE68	YE68	SOFT_TISSUE	LIPID	5.4		PCTDRYWT
2000	RP	FM001RPYE69	YE69	SOFT_TISSUE	LIPID	4.7		PCTDRYWT
2000	RP	FM001RPYE70	YE70	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
2000	RP	FM001RPYE71	YE71	SOFT_TISSUE	LIPID	5.4		PCTDRYWT
2000	DI	FM0031YE77	YE77	SOFT_TISSUE	LIPID	6.6		PCTDRYWT
2000	DI	FM0031YE78	YE78	SOFT_TISSUE	LIPID	7.6		PCTDRYWT
2000	DI	FM0031YE79	YE79	SOFT_TISSUE	LIPID	7.5		PCTDRYWT
2000	DI	FM0031YE80	YE80	SOFT_TISSUE	LIPID	7.6		PCTDRYWT
2000	DI	FM0031YE81	YE81	SOFT_TISSUE	LIPID	7.7		PCTDRYWT
2000	BIH	FM0036YE72	YE72	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
2000	BIH	FM0036YE73	YE73	SOFT_TISSUE	LIPID	8.0		PCTDRYWT
2000	BIH	FM0036YE74	YE74	SOFT_TISSUE	LIPID	7.9		PCTDRYWT
2000	BIH	FM0036YE75	YE75	SOFT_TISSUE	LIPID	8.2		PCTDRYWT
2000	BIH	FM0036YE76	YE76	SOFT_TISSUE	LIPID	8.6		PCTDRYWT
2000	OS	FM0034YE82	YE82	SOFT_TISSUE	LIPID	6.0		PCTDRYWT
2000	OS	FM0034YE83	YE83	SOFT_TISSUE	LIPID	7.5		PCTDRYWT

Table C-5. Lipid Data - Mussels 1991 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2000	OS	FM0034YE84	YE84	SOFT_TISSUE	LIPID	7.1		PCTDRYWT
2000	OS	FM0034YE85	YE85	SOFT_TISSUE	LIPID	6.5		PCTDRYWT
2000	OS	FM0034YE86	YE86	SOFT_TISSUE	LIPID	7.6		PCTDRYWT
2000	OS	FM0034YE87	YE87	SOFT_TISSUE	LIPID	7.4		PCTDRYWT
2000	OS	FM0034YE88	YE88	SOFT_TISSUE	LIPID	7.4		PCTDRYWT
2000	OS	FM0034YE89	YE89	SOFT_TISSUE	LIPID	7.6		PCTDRYWT
2001	RP	FM011ZA69	ZA69	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
2001	RP	FM011ZA70	ZA70	SOFT_TISSUE	LIPID	6.3		PCTDRYWT
2001	RP	FM011ZA71	ZA71	SOFT_TISSUE	LIPID	6.1		PCTDRYWT
2001	RP	FM011ZA72	ZA72	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
2001	RP	FM011ZA73	ZA73	SOFT_TISSUE	LIPID	4.9		PCTDRYWT
2001	DI	FM011ZH67	ZH67	SOFT_TISSUE	LIPID	7.4		PCTDRYWT
2001	DI	FM011ZH68	ZH68	SOFT_TISSUE	LIPID	7.4		PCTDRYWT
2001	DI	FM011ZH69	ZH69	SOFT_TISSUE	LIPID	7.6		PCTDRYWT
2001	DI	FM011ZH70	ZH70	SOFT_TISSUE	LIPID	6.5		PCTDRYWT
2001	DI	FM011ZH71	ZH71	SOFT_TISSUE	LIPID	6.8		PCTDRYWT
2001	BIH	FM011ZH62	ZH62	SOFT_TISSUE	LIPID	5.7		PCTDRYWT
2001	BIH	FM011ZH63	ZH63	SOFT_TISSUE	LIPID	5.0		PCTDRYWT
2001	BIH	FM011ZH64	ZH64	SOFT_TISSUE	LIPID	5.2		PCTDRYWT
2001	BIH	FM011ZH65	ZH65	SOFT_TISSUE	LIPID	6.3		PCTDRYWT
2001	BIH	FM011ZH66	ZH66	SOFT_TISSUE	LIPID	4.5		PCTDRYWT
2001	CCB	FM011ZH80	ZH80	SOFT_TISSUE	LIPID	3.1		PCTDRYWT
2001	CCB	FM011ZH81	ZH81	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
2001	CCB	FM011ZH82	ZH82	SOFT_TISSUE	LIPID	11.9		PCTDRYWT
2001	CCB	FM011ZH83	ZH83	SOFT_TISSUE	LIPID	10.3		PCTDRYWT
2001	CCB	FM011ZH84	ZH84	SOFT_TISSUE	LIPID	10.5		PCTDRYWT
2001	CCB	FM011ZH85	ZH85	SOFT_TISSUE	LIPID	16.7		PCTDRYWT
2001	CCB	FM011ZH86	ZH86	SOFT_TISSUE	LIPID	9.7		PCTDRYWT
2001	CCB	FM011ZH87	ZH87	SOFT_TISSUE	LIPID	5.6		PCTDRYWT
2001	OS	FM011ZP27	ZP27	SOFT_TISSUE	LIPID	6.5		PCTDRYWT
2001	OS	FM011ZP28	ZP28	SOFT_TISSUE	LIPID	6.6		PCTDRYWT
2001	OS	FM011ZP29	ZP29	SOFT_TISSUE	LIPID	7.3		PCTDRYWT
2001	OS	FM011ZP30	ZP30	SOFT_TISSUE	LIPID	7.1		PCTDRYWT
2001	OS	FM011ZP31	ZP31	SOFT_TISSUE	LIPID	8.1		PCTDRYWT
2001	OS	FM011ZP32	ZP32	SOFT_TISSUE	LIPID	7.0		PCTDRYWT
2001	OS	FM011ZP33	ZP33	SOFT_TISSUE	LIPID	9.5		PCTDRYWT
2001	OS	FM011ZP34	ZP34	SOFT_TISSUE	LIPID	8.1		PCTDRYWT

Table C-6. Percent Dry Weight - Flounder Fillet 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-353	92-353M	FILLET	PCTDRYWT	18.1		PCT
1992	DIF	92-354	92-354M	FILLET	PCTDRYWT	18.5		PCT
1992	DIF	92-359	92-359M	FILLET	PCTDRYWT	21.3		PCT
1992	DIF	92-35C	92-35CM	FILLET	PCTDRYWT	20.6		PCT
1992	OS	92-400	92-400M	FILLET	PCTDRYWT	17.3		PCT
1992	OS	92-401	92-401M	FILLET	PCTDRYWT	21.0		PCT
1992	OS	92-409	92-409M	FILLET	PCTDRYWT	18.9		PCT
1992	OS	92-40C	92-40CM	FILLET	PCTDRYWT	20.3		PCT
1992	ECCB	92-451	92-451M	FILLET	PCTDRYWT	18.4		PCT
1992	ECCB	92-452	92-452M	FILLET	PCTDRYWT	22.2		PCT
1992	ECCB	92-456	92-456M	FILLET	PCTDRYWT	19.8		PCT
1992	ECCB	92-45C	92-45CM	FILLET	PCTDRYWT	20.3		PCT
1993	DIF	F93010465	465SF	FILLET	PCTDRYWT	20.5		PCT
1993	DIF	F93010466	466SF	FILLET	PCTDRYWT	21.3		PCT
1993	DIF	F93010467	467SF	FILLET	PCTDRYWT	15.3		PCT
1993	DIF	F93010468	468SF	FILLET	PCTDRYWT	17.5		PCT
1993	DIF	F93010469	469SF	FILLET	PCTDRYWT	18.8		PCT
1993	DIF	F93010470	470SF	FILLET	PCTDRYWT	20.4		PCT
1993	DIF	F93010471	471SF	FILLET	PCTDRYWT	12.6		PCT
1993	DIF	F93010472	472SF	FILLET	PCTDRYWT	16.1		PCT
1993	DIF	F93010473	473SF	FILLET	PCTDRYWT	17.9		PCT
1993	DIF	F93010474	474SF	FILLET	PCTDRYWT	21.1		PCT
1993	OS	F93010565	565SF	FILLET	PCTDRYWT	19.4		PCT
1993	OS	F93010566	566SF	FILLET	PCTDRYWT	16.7		PCT
1993	OS	F93010567	567SF	FILLET	PCTDRYWT	21.2		PCT
1993	OS	F93010569	569SF	FILLET	PCTDRYWT	18.7		PCT
1993	OS	F93010570	570SF	FILLET	PCTDRYWT	18.3		PCT
1993	OS	F93010571	571SF	FILLET	PCTDRYWT	16.4		PCT
1993	OS	F93010572	572SF	FILLET	PCTDRYWT	17.2		PCT
1993	OS	F93010573	573SF	FILLET	PCTDRYWT	16.0		PCT
1993	OS	F93010574	574SF	FILLET	PCTDRYWT	17.6		PCT
1993	ECCB	F93010625	625SF	FILLET	PCTDRYWT	14.7		PCT
1993	ECCB	F93010626	626SF	FILLET	PCTDRYWT	16.0		PCT
1993	ECCB	F93010627	627SF	FILLET	PCTDRYWT	19.2		PCT
1993	ECCB	F93010628	628SF	FILLET	PCTDRYWT	17.8		PCT
1993	ECCB	F93010629	629SF	FILLET	PCTDRYWT	17.4		PCT
1993	ECCB	F93010630	630SF	FILLET	PCTDRYWT	16.9		PCT
1993	ECCB	F93010631	631SF	FILLET	PCTDRYWT	19.5		PCT
1993	ECCB	F93010632	632SF	FILLET	PCTDRYWT	19.7		PCT
1993	ECCB	F93010633	633SF	FILLET	PCTDRYWT	16.3		PCT
1993	ECCB	F93010634	634SF	FILLET	PCTDRYWT	20.2		PCT
1994	DIF	FI101FLNDR	OU28	FILLET	PCTDRYWT	17.4		PCT
1994	DIF	FI102FLNDR	OU29	FILLET	PCTDRYWT	17.4		PCT
1994	DIF	FI103FLNDR	OU30	FILLET	PCTDRYWT	17.1		PCT
1994	OS	FI401FLNDR	OU37	FILLET	PCTDRYWT	18.6		PCT

Table C-6. Percent Dry Weight - Flounder Fillet 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1994	OS	FI402FLNDR	OU38	FILLET	PCTDRYWT	17.7		PCT
1994	OS	FI403FLNDR	OU39	FILLET	PCTDRYWT	17.1		PCT
1994	ECCB	FI501FLNDR	OU40	FILLET	PCTDRYWT	19.0		PCT
1994	ECCB	FI502FLNDR	OU41	FILLET	PCTDRYWT	17.7		PCT
1994	ECCB	FI503FLNDR	OU42	FILLET	PCTDRYWT	17.7		PCT
1995	DIF	P95111000C1	P95111000TC1	FILLET	PCTDRYWT	17.1		PCT
1995	DIF	P95111000C2	P95111000TC2	FILLET	PCTDRYWT	16.6		PCT
1995	DIF	P95111000C3	P95111000TC3	FILLET	PCTDRYWT	17.4		PCT
1995	OS	P95114000C1	P95114000TC1	FILLET	PCTDRYWT	17.9		PCT
1995	OS	P95114000C2	P95114000TC2	FILLET	PCTDRYWT	16.8		PCT
1995	OS	P95114000C3	P95114000TC3	FILLET	PCTDRYWT	17.5		PCT
1995	ECCB	P95115000C1	P95115000TC1	FILLET	PCTDRYWT	17.4		PCT
1995	ECCB	P95115000C2	P95115000TC2	FILLET	PCTDRYWT	18.0		PCT
1995	ECCB	P95115000C3	P95115000TC3	FILLET	PCTDRYWT	18.1		PCT
1996	DIF	P96111000C1	P96111000TC1	FILLET	PCTDRYWT	18.4		PCT
1996	DIF	P96111000C2	P96111000TC2	FILLET	PCTDRYWT	16.1		PCT
1996	DIF	P96111000C3	P96111000TC3	FILLET	PCTDRYWT	20.3		PCT
1996	OS	P96114000C1	P96114000TC1	FILLET	PCTDRYWT	18.4		PCT
1996	OS	P96114000C2	P96114000TC2	FILLET	PCTDRYWT	17.2		PCT
1996	OS	P96114000C3	P96114000TC3	FILLET	PCTDRYWT	21.9		PCT
1996	ECCB	P96115000C1	P96115000TC1	FILLET	PCTDRYWT	16.7		PCT
1996	ECCB	P96115000C2	P96115000TC2	FILLET	PCTDRYWT	20.1		PCT
1996	ECCB	P96115000C3	P96115000TC3	FILLET	PCTDRYWT	18.0		PCT
1997	DIF	P97111000C1	P97111000TC1	FILLET	PCTDRYWT	17.9		PCT
1997	DIF	P97111000C2	P97111000TC2	FILLET	PCTDRYWT	17.7		PCT
1997	DIF	P97111000C3	P97111000TC3	FILLET	PCTDRYWT	17.6		PCT
1997	OS	P97114000C1	P97114000TC1	FILLET	PCTDRYWT	18.3		PCT
1997	OS	P97114000C2	P97114000TC2	FILLET	PCTDRYWT	17.6		PCT
1997	OS	P97114000C3	P97114000TC3	FILLET	PCTDRYWT	17.0		PCT
1997	ECCB	P97115000C1	P97115000TC1	FILLET	PCTDRYWT	17.4		PCT
1997	ECCB	P97115000C2	P97115000TC2	FILLET	PCTDRYWT	18.1		PCT
1997	ECCB	P97115000C3	P97115000TC3	FILLET	PCTDRYWT	17.7		PCT
1998	DIF	VQST11	VQ79	FILLET	PCTDRYWT	16.9		PCT
1998	DIF	VQST12	VQ80	FILLET	PCTDRYWT	18.1		PCT
1998	DIF	VQST13	VQ81	FILLET	PCTDRYWT	20.8		PCT
1998	OS	VQST41	VQ85	FILLET	PCTDRYWT	18.5		PCT
1998	OS	VQST42	VQ86	FILLET	PCTDRYWT	23.0		PCT
1998	OS	VQST43	VQ87	FILLET	PCTDRYWT	21.2		PCT
1998	ECCB	VQST51	VR06	FILLET	PCTDRYWT	22.7		PCT
1998	ECCB	VQST52	VR07	FILLET	PCTDRYWT	22.8		PCT
1998	ECCB	VQST53	VR08	FILLET	PCTDRYWT	20.4		PCT
1999	DIF	FF99110C1	WQ73COMP	FILLET	PCTDRYWT	17.9		PCT
1999	DIF	FF99110C2	WQ74COMP	FILLET	PCTDRYWT	17.3		PCT
1999	DIF	FF99110C3	WQ75COMP	FILLET	PCTDRYWT	17.6		PCT
1999	OS	FF99140C1	WM70COMP	FILLET	PCTDRYWT	15.8		PCT

Table C-6. Percent Dry Weight - Flounder Fillet 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1999	OS	FF99140C2	WM71COMP	FILLET	PCTDRYWT	16.8		PCT
1999	OS	FF99140C3	WM72COMP	FILLET	PCTDRYWT	14.8		PCT
1999	ECCB	FF99150C1	WM90COMP	FILLET	PCTDRYWT	16.5		PCT
1999	ECCB	FF99150C2	WM91COMP	FILLET	PCTDRYWT	17.0		PCT
1999	ECCB	FF99150C3	WM92COMP	FILLET	PCTDRYWT	16.6		PCT
2000	DIF	FF00110C1	XT83	FILLET	PCTDRYWT	17.3		PCT
2000	DIF	FF00110C2	XT84	FILLET	PCTDRYWT	16.6		PCT
2000	DIF	FF00110C3	XT85	FILLET	PCTDRYWT	17.7		PCT
2000	OS	FF00140C1	XT77	FILLET	PCTDRYWT	17.0		PCT
2000	OS	FF00140C2	XT78	FILLET	PCTDRYWT	17.4		PCT
2000	OS	FF00140C3	XT79	FILLET	PCTDRYWT	16.0		PCT
2000	ECCB	FF00150C1	XU22	FILLET	PCTDRYWT	17.6		PCT
2000	ECCB	FF00150C2	XU23	FILLET	PCTDRYWT	16.1		PCT
2000	ECCB	FF00150C3	XU24	FILLET	PCTDRYWT	16.4		PCT
2001	DIF	FF01110C1	YV39	FILLET	PCTDRYWT	15.6		PCT
2001	DIF	FF01110C2	YV40	FILLET	PCTDRYWT	17.5		PCT
2001	DIF	FF01110C3	YV41	FILLET	PCTDRYWT	17.8		PCT
2001	OS	FF01140C1	YV45	FILLET	PCTDRYWT	17.1		PCT
2001	OS	FF01140C2	YV46	FILLET	PCTDRYWT	17.3		PCT
2001	OS	FF01140C3	YV47	FILLET	PCTDRYWT	16.1		PCT
2001	ECCB	FF01150C1	YV63	FILLET	PCTDRYWT	17.9		PCT
2001	ECCB	FF01150C2	YV64	FILLET	PCTDRYWT	16.9		PCT
2001	ECCB	FF01150C3	YV65	FILLET	PCTDRYWT	18.6		PCT

Table C-7. Percent Dry Weight - Flounder Liver 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-353	92-353L	LIVER	PCTDRYWT	20.4		PCT
1992	DIF	92-354	92-354L	LIVER	PCTDRYWT	21.5		PCT
1992	DIF	92-359	92-359L	LIVER	PCTDRYWT	24.5		PCT
1992	DIF	92-35C	92-35CL	LIVER	PCTDRYWT	23.1		PCT
1992	OS	92-400	92-400L	LIVER	PCTDRYWT	24.1		PCT
1992	OS	92-401	92-401L	LIVER	PCTDRYWT	25.7		PCT
1992	OS	92-409	92-409L	LIVER	PCTDRYWT	22.1		PCT
1992	OS	92-40C	92-40CL	LIVER	PCTDRYWT	24.7		PCT
1992	ECCB	92-451	92-451L	LIVER	PCTDRYWT	20.7		PCT
1992	ECCB	92-452	92-452L	LIVER	PCTDRYWT	22.2		PCT
1992	ECCB	92-456	92-456L	LIVER	PCTDRYWT	25.7		PCT
1992	ECCB	92-45C	92-45CL	LIVER	PCTDRYWT	23.3		PCT
1993	DIF	FI1-04	FI1-04CL	LIVER	PCTDRYWT	20.2		PCT
1993	OS	FI4-05	FI4-05CL	LIVER	PCTDRYWT	20.5		PCT
1993	ECCB	FI5-06	FI5-06CL	LIVER	PCTDRYWT	20.3		PCT
1994	DIF	FI101FLNDR	OV83	LIVER	PCTDRYWT	15.9		PCT
1994	DIF	FI102FLNDR	OV84	LIVER	PCTDRYWT	23.7		PCT
1994	DIF	FI103FLNDR	OV85	LIVER	PCTDRYWT	22.7		PCT
1994	OS	FI401FLNDR	OV92	LIVER	PCTDRYWT	18.4		PCT
1994	OS	FI402FLNDR	OV93	LIVER	PCTDRYWT	26.9		PCT
1994	OS	FI403FLNDR	OV94	LIVER	PCTDRYWT	19.8		PCT
1994	ECCB	FI501FLNDR	OV95	LIVER	PCTDRYWT	22.0		PCT
1994	ECCB	FI502FLNDR	OV96	LIVER	PCTDRYWT	17.8		PCT
1994	ECCB	FI503FLNDR	OV97	LIVER	PCTDRYWT	20.6		PCT
1995	DIF	P95111000C1	P95111000LC1	LIVER	PCTDRYWT	20.3		PCT
1995	DIF	P95111000C2	P95111000LC2	LIVER	PCTDRYWT	19.4		PCT
1995	DIF	P95111000C3	P95111000LC3	LIVER	PCTDRYWT	18.7		PCT
1995	OS	P95114000C1	P95114000LC1	LIVER	PCTDRYWT	20.5		PCT
1995	OS	P95114000C2	P95114000LC2	LIVER	PCTDRYWT	21.1		PCT
1995	OS	P95114000C3	P95114000LC3	LIVER	PCTDRYWT	19.4		PCT
1995	ECCB	P95115000C1	P95115000LC1	LIVER	PCTDRYWT	20.3		PCT
1995	ECCB	P95115000C2	P95115000LC2	LIVER	PCTDRYWT	18.6		PCT
1995	ECCB	P95115000C3	P95115000LC3	LIVER	PCTDRYWT	19.6		PCT
1996	DIF	P96111000C1	P96111000LC1	LIVER	PCTDRYWT	20.7		PCT
1996	DIF	P96111000C2	P96111000LC2	LIVER	PCTDRYWT	21.4		PCT
1996	DIF	P96111000C3	P96111000LC3	LIVER	PCTDRYWT	22.7		PCT
1996	OS	P96114000C1	P96114000LC1	LIVER	PCTDRYWT	18.2		PCT
1996	OS	P96114000C2	P96114000LC2	LIVER	PCTDRYWT	23.1		PCT
1996	OS	P96114000C3	P96114000LC3	LIVER	PCTDRYWT	19.0		PCT
1996	ECCB	P96115000C1	P96115000LC1	LIVER	PCTDRYWT	19.7		PCT
1996	ECCB	P96115000C2	P96115000LC2	LIVER	PCTDRYWT	22.0		PCT
1996	ECCB	P96115000C3	P96115000LC3	LIVER	PCTDRYWT	21.4		PCT
1997	DIF	P97111000C1	P97111000LC1	LIVER	PCTDRYWT	21.5		PCT
1997	DIF	P97111000C2	P97111000LC2	LIVER	PCTDRYWT	21.2		PCT
1997	DIF	P97111000C3	P97111000LC3	LIVER	PCTDRYWT	23.3		PCT

Table C-7. Percent Dry Weight - Flounder Liver 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1997	OS	P97114000C1	P97114000LC1	LIVER	PCTDRYWT	21.4		PCT
1997	OS	P97114000C2	P97114000LC2	LIVER	PCTDRYWT	22.3		PCT
1997	OS	P97114000C3	P97114000LC3	LIVER	PCTDRYWT	21.3		PCT
1997	ECCB	P97115000C1	P97115000LC1	LIVER	PCTDRYWT	24.1		PCT
1997	ECCB	P97115000C2	P97115000LC2	LIVER	PCTDRYWT	23.5		PCT
1997	ECCB	P97115000C3	P97115000LC3	LIVER	PCTDRYWT	25.4		PCT
1998	DIF	VQST11	VQ82	LIVER	PCTDRYWT	21.4		PCT
1998	DIF	VQST12	VQ83	LIVER	PCTDRYWT	21.7		PCT
1998	DIF	VQST13	VQ84	LIVER	PCTDRYWT	18.9		PCT
1998	OS	VQST41	VQ88	LIVER	PCTDRYWT	20.6		PCT
1998	OS	VQST42	VQ89	LIVER	PCTDRYWT	27.7		PCT
1998	OS	VQST43	VQ90	LIVER	PCTDRYWT	29.1		PCT
1998	ECCB	VQST51	VR09	LIVER	PCTDRYWT	22.9		PCT
1998	ECCB	VQST52	VR10	LIVER	PCTDRYWT	31.5		PCT
1998	ECCB	VQST53	VR11	LIVER	PCTDRYWT	48.6		PCT
1999	DIF	FF99110C1	WQ76COMP	LIVER	PCTDRYWT	28.0		PCT
1999	DIF	FF99110C2	WQ77COMP	LIVER	PCTDRYWT	26.5		PCT
1999	DIF	FF99110C3	WQ78COMP	LIVER	PCTDRYWT	30.5		PCT
1999	2	FF99120C1	WM23COMP	LIVER	PCTDRYWT	19.6		PCT
1999	2	FF99120C2	WM24COMP	LIVER	PCTDRYWT	24.3		PCT
1999	2	FF99120C3	WM25COMP	LIVER	PCTDRYWT	22.5		PCT
1999	3	FF99130C1	WM14COMP	LIVER	PCTDRYWT	23.8		PCT
1999	3	FF99130C2	WM15COMP	LIVER	PCTDRYWT	17.1		PCT
1999	3	FF99130C3	WM16COMP	LIVER	PCTDRYWT	21.8		PCT
1999	OS	FF99140C1	WM73COMP	LIVER	PCTDRYWT	22.4		PCT
1999	OS	FF99140C2	WM74COMP	LIVER	PCTDRYWT	22.1		PCT
1999	OS	FF99140C3	WM75COMP	LIVER	PCTDRYWT	21.6		PCT
1999	ECCB	FF99150C1	WM93COMP	LIVER	PCTDRYWT	13.7		PCT
1999	ECCB	FF99150C2	WM94COMP	LIVER	PCTDRYWT	22.3		PCT
1999	ECCB	FF99150C3	WM95COMP	LIVER	PCTDRYWT	21.0		PCT
2000	DIF	FF00110C1	XT86	LIVER	PCTDRYWT	24.8		PCT
2000	DIF	FF00110C2	XT87	LIVER	PCTDRYWT	23.7		PCT
2000	DIF	FF00110C3	XT88	LIVER	PCTDRYWT	22.8		PCT
2000	OS	FF00140C1	XT80	LIVER	PCTDRYWT	23.0		PCT
2000	OS	FF00140C2	XT81	LIVER	PCTDRYWT	23.1		PCT
2000	OS	FF00140C3	XT82	LIVER	PCTDRYWT	22.4		PCT
2000	ECCB	FF00150C1	XU25	LIVER	PCTDRYWT	24.0		PCT
2000	ECCB	FF00150C2	XU26	LIVER	PCTDRYWT	23.2		PCT
2000	ECCB	FF00150C3	XU27	LIVER	PCTDRYWT	23.9		PCT
2001	DIF	FF01110C1	YV42	LIVER	PCTDRYWT	21.8		PCT
2001	DIF	FF01110C2	YV43	LIVER	PCTDRYWT	22.7		PCT
2001	DIF	FF01110C3	YV44	LIVER	PCTDRYWT	21.7		PCT
2001	OS	FF01140C1	YV48	LIVER	PCTDRYWT	24.7		PCT
2001	OS	FF01140C2	YV49	LIVER	PCTDRYWT	21.4		PCT
2001	OS	FF01140C3	YV50	LIVER	PCTDRYWT	22.2		PCT

Table C-7. Percent Dry Weight - Flounder Liver 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2001	ECCB	FF01150C1	YV66	LIVER	PCTDRYWT	23.7		PCT
2001	ECCB	FF01150C2	YV67	LIVER	PCTDRYWT	18.7		PCT
2001	ECCB	FF01150C3	YV68	LIVER	PCTDRYWT	22.8		PCT

Table C-8. Percent Dry Weight - Lobster Meat 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-467	92-467M	MEAT	PCTDRYWT	22.1		PCT
1992	DIF	92-469	92-469M	MEAT	PCTDRYWT	23.1		PCT
1992	DIF	92-482	92-482M	MEAT	PCTDRYWT	20.0		PCT
1992	OS	92-460	92-460M	MEAT	PCTDRYWT	17.3		PCT
1992	OS	92-463	92-463M	MEAT	PCTDRYWT	16.6		PCT
1992	OS	92-464	92-464M	MEAT	PCTDRYWT	21.3		PCT
1992	ECCB	92-465	92-465M	MEAT	PCTDRYWT	16.3		PCT
1992	ECCB	92-466	92-466M	MEAT	PCTDRYWT	21.7		PCT
1992	ECCB	92-476	92-476M	MEAT	PCTDRYWT	17.2		PCT
1993	DIF	F93010KG34	KG34SM	MEAT	PCTDRYWT	14.3		PCT
1993	DIF	S93030KI06	KI06SM	MEAT	PCTDRYWT	12.5		PCT
1993	DIF	S93030KI07	KI07SM	MEAT	PCTDRYWT	13.5		PCT
1993	OS	S93030KH97	KH97SM	MEAT	PCTDRYWT	12.9		PCT
1993	OS	S93030KH98	KH98SM	MEAT	PCTDRYWT	18.9		PCT
1993	ECCB	LOB-F0KH99	KH99SM	MEAT	PCTDRYWT	12.2		PCT
1993	ECCB	LOB-F0KI01	KI01SM	MEAT	PCTDRYWT	18.8		PCT
1993	ECCB	LOB-F0KI02	KI02SM	MEAT	PCTDRYWT	14.4		PCT
1993	ECCB	LOB-F0KI03	KI03SM	MEAT	PCTDRYWT	12.8		PCT
1993	ECCB	LOB-F0KI04	KI04SM	MEAT	PCTDRYWT	19.6		PCT
1993	ECCB	LOB-F0KI05	KI05SM	MEAT	PCTDRYWT	13.7		PCT
1993	ECCB	LOB-F0KI21	KI21SM	MEAT	PCTDRYWT	12.5		PCT
1993	ECCB	LOB-F0KI22	KI22SM	MEAT	PCTDRYWT	14.7		PCT
1993	ECCB	LOB-F0KI23	KI23SM	MEAT	PCTDRYWT	20.2		PCT
1993	ECCB	LOB-F0KI24	KI24SM	MEAT	PCTDRYWT	15.3		PCT
1994	DIF	FI101LOBST	OV31	MEAT	PCTDRYWT	10.7		PCT
1994	DIF	FI102LOBST	OV32	MEAT	PCTDRYWT	12.5		PCT
1994	DIF	FI103LOBST	OV33	MEAT	PCTDRYWT	11.5		PCT
1994	OS	FI401LOBST	OV34	MEAT	PCTDRYWT	16.9		PCT
1994	OS	FI402LOBST	OV35-MEAN	MEAT	PCTDRYWT	13.3		PCT
1994	ECCB	FI501LOBST	OV36	MEAT	PCTDRYWT	16.9		PCT
1994	ECCB	FI502LOBST	OV37	MEAT	PCTDRYWT	16.2		PCT
1994	ECCB	FI503LOBST	OV38	MEAT	PCTDRYWT	15.5		PCT
1995	DIF	L95111000C1	L95111000TC1	MEAT	PCTDRYWT	11.4		PCT
1995	DIF	L95111000C2	L95111000TC2	MEAT	PCTDRYWT	12.3		PCT
1995	DIF	L95111000C3	L95111000TC3	MEAT	PCTDRYWT	12.5		PCT
1995	OS	L95114000C1	L95114000TC1	MEAT	PCTDRYWT	13.6		PCT
1995	OS	L95114000C2	L95114000TC2	MEAT	PCTDRYWT	12.6		PCT
1995	OS	L95114000C3	L95114000TC3	MEAT	PCTDRYWT	11.4		PCT
1995	ECCB	L95115000C1	L95115000TC1	MEAT	PCTDRYWT	14.0		PCT
1995	ECCB	L95115000C2	L95115000TC2	MEAT	PCTDRYWT	14.6		PCT
1995	ECCB	L95115000C3	L95115000TC3	MEAT	PCTDRYWT	15.0		PCT
1996	DIF	L96111000C1	L96111000TC1	MEAT	PCTDRYWT	15.6		PCT
1996	DIF	L96111000C2	L96111000TC2	MEAT	PCTDRYWT	15.0		PCT
1996	DIF	L96111000C3	L96111000TC3	MEAT	PCTDRYWT	15.3		PCT
1996	OS	L96114000C1	L96114000TC1	MEAT	PCTDRYWT	14.4		PCT
1996	OS	L96114000C2	L96114000TC2	MEAT	PCTDRYWT	15.2		PCT

Table C-8. Percent Dry Weight - Lobster Meat 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1996	OS	L96114000C3	L96114000TC3	MEAT	PCTDRYWT	15.5		PCT
1996	ECCB	L96115000C1	L96115000TC1	MEAT	PCTDRYWT	17.6		PCT
1996	ECCB	L96115000C2	L96115000TC2	MEAT	PCTDRYWT	21.0		PCT
1996	ECCB	L96115000C3	L96115000TC3	MEAT	PCTDRYWT	19.6		PCT
1997	DIF	L97111000C1	L97111000TC1	MEAT	PCTDRYWT	15.3		PCT
1997	DIF	L97111000C2	L97111000TC2	MEAT	PCTDRYWT	13.2		PCT
1997	DIF	L97111000C3	L97111000TC3	MEAT	PCTDRYWT	12.4		PCT
1997	OS	L97114000C1	L97114000TC1	MEAT	PCTDRYWT	18.4		PCT
1997	OS	L97114000C2	L97114000TC2	MEAT	PCTDRYWT	10.7		PCT
1997	OS	L97114000C3	L97114000TC3	MEAT	PCTDRYWT	12.4		PCT
1997	ECCB	L97115000C1	L97115000TC1	MEAT	PCTDRYWT	14.2		PCT
1997	ECCB	L97115000C2	L97115000TC2	MEAT	PCTDRYWT	17.1		PCT
1997	ECCB	L97115000C3	L97115000TC3	MEAT	PCTDRYWT	16.2		PCT
1998	DIF	VZST11	VZ35COMP	MEAT	PCTDRYWT	14.1		PCT
1998	DIF	VZST12	VZ36COMP	MEAT	PCTDRYWT	15.5		PCT
1998	DIF	VZST13	VZ37COMP	MEAT	PCTDRYWT	14.7		PCT
1998	OS	VZST41	VZ23COMP	MEAT	PCTDRYWT	13.5		PCT
1998	OS	VZST42	VZ24COMP	MEAT	PCTDRYWT	13.7		PCT
1998	OS	VZST43	VZ25COMP	MEAT	PCTDRYWT	13.6		PCT
1998	ECCB	VZST91	VZ29COMP	MEAT	PCTDRYWT	15.1		PCT
1998	ECCB	VZST92	VZ30COMP	MEAT	PCTDRYWT	13.4		PCT
1998	ECCB	VZST93	VZ31COMP	MEAT	PCTDRYWT	14.7		PCT
1999	DIF	FL9911C1	XJ42	MEAT	PCTDRYWT	13.0		PCT
1999	DIF	FL9911C2	XJ43	MEAT	PCTDRYWT	15.4		PCT
1999	DIF	FL9911C3	XJ44	MEAT	PCTDRYWT	18.1		PCT
1999	OS	FL9914C1	XJ45	MEAT	PCTDRYWT	14.1		PCT
1999	OS	FL9914C2	XJ46	MEAT	PCTDRYWT	13.0		PCT
1999	OS	FL9914C3	XJ47	MEAT	PCTDRYWT	13.6		PCT
1999	ECCB	FL9915C1	XJ48	MEAT	PCTDRYWT	13.5		PCT
1999	ECCB	FL9915C2	XJ49	MEAT	PCTDRYWT	12.7		PCT
1999	ECCB	FL9915C3	XJ50	MEAT	PCTDRYWT	12.7		PCT
2000	DIF	FL0011C1	YC90	MEAT	PCTDRYWT	13.1		PCT
2000	DIF	FL0011C2	YC91	MEAT	PCTDRYWT	13.2		PCT
2000	DIF	FL0011C3	YC92	MEAT	PCTDRYWT	12.9		PCT
2000	OS	FL0014C1	YC93	MEAT	PCTDRYWT	13.6		PCT
2000	OS	FL0014C2	YC94	MEAT	PCTDRYWT	14.7		PCT
2000	OS	FL0014C3	YC95	MEAT	PCTDRYWT	12.7		PCT
2000	ECCB	FL0015C1	YC87	MEAT	PCTDRYWT	13.0		PCT
2000	ECCB	FL0015C2	YC88	MEAT	PCTDRYWT	14.8		PCT
2000	ECCB	FL0015C3	YC89	MEAT	PCTDRYWT	15.0		PCT
2001	DIF	FL0111-C1	ZH31	MEAT	PCTDRYWT	15.6		PCT
2001	DIF	FL0111-C2	ZH32	MEAT	PCTDRYWT	14.3		PCT
2001	DIF	FL0111-C3	ZH33	MEAT	PCTDRYWT	13.9		PCT

Table C-8. Percent Dry Weight - Lobster Meat 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2001	OS	FL0114-C1	ZI54	MEAT	PCTDRYWT	16.5		PCT
2001	OS	FL0114-C2	ZI55	MEAT	PCTDRYWT	14.2		PCT
2001	OS	FL0114-C3	ZI56	MEAT	PCTDRYWT	14.0		PCT
2001	ECCB	FL0115-C1	ZH37	MEAT	PCTDRYWT	13.9		PCT
2001	ECCB	FL0115-C2	ZH38	MEAT	PCTDRYWT	16.5		PCT
2001	ECCB	FL0115-C3	ZH39	MEAT	PCTDRYWT	14.0		PCT

Table C-9. Percent Dry Weight - Lobster Hepatopancreas 1992 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	DIF	92-467	92-467L	HEPATOPANC	PCTDRYWT	38.5		PCT
1992	DIF	92-469	92-469L	HEPATOPANC	PCTDRYWT	50.8		PCT
1992	DIF	92-482	92-482L	HEPATOPANC	PCTDRYWT	40.5		PCT
1992	OS	92-460	92-460L	HEPATOPANC	PCTDRYWT	35.4		PCT
1992	OS	92-463	92-463L	HEPATOPANC	PCTDRYWT	31.9		PCT
1992	OS	92-464	92-464L	HEPATOPANC	PCTDRYWT	51.9		PCT
1992	ECCB	92-465	92-465L	HEPATOPANC	PCTDRYWT	18.9		PCT
1992	ECCB	92-466	92-466L	HEPATOPANC	PCTDRYWT	54.5		PCT
1992	ECCB	92-476	92-476L	HEPATOPANC	PCTDRYWT	22.7		PCT
1993	DIF	F93010KG34	KG34SH	HEPATOPANC	PCTDRYWT	18.1		PCT
1993	DIF	S93030KI06	KI06SH	HEPATOPANC	PCTDRYWT	25.6		PCT
1993	DIF	S93030KI07	KI07SH	HEPATOPANC	PCTDRYWT	18.8		PCT
1993	OS	S93030KH97	KH97SH	HEPATOPANC	PCTDRYWT	20.0		PCT
1993	OS	S93030KH98	KH98SH	HEPATOPANC	PCTDRYWT	30.1		PCT
1993	ECCB	LOB-F0KH99	KH99SH	HEPATOPANC	PCTDRYWT	28.5		PCT
1993	ECCB	LOB-F0KI01	KI01SH	HEPATOPANC	PCTDRYWT	35.9		PCT
1993	ECCB	LOB-F0KI02	KI02SH	HEPATOPANC	PCTDRYWT	32.2		PCT
1993	ECCB	LOB-F0KI03	KI03SH	HEPATOPANC	PCTDRYWT	13.4		PCT
1993	ECCB	LOB-F0KI04	KI04SH	HEPATOPANC	PCTDRYWT	40.4		PCT
1993	ECCB	LOB-F0KI05	KI05SH	HEPATOPANC	PCTDRYWT	20.8		PCT
1993	ECCB	LOB-F0KI21	KI21SH	HEPATOPANC	PCTDRYWT	14.0		PCT
1993	ECCB	LOB-F0KI22	KI22SH	HEPATOPANC	PCTDRYWT	17.8		PCT
1993	ECCB	LOB-F0KI23	KI23SH	HEPATOPANC	PCTDRYWT	34.6		PCT
1993	ECCB	LOB-F0KI24	KI24SH	HEPATOPANC	PCTDRYWT	20.7		PCT
1994	DIF	FI101LOBST	OV42	HEPATOPANC	PCTDRYWT	29.9		PCT
1994	DIF	FI102LOBST	OV43	HEPATOPANC	PCTDRYWT	28.6		PCT
1994	DIF	FI103LOBST	OV44	HEPATOPANC	PCTDRYWT	24.3		PCT
1994	OS	FI401LOBST	OV45	HEPATOPANC	PCTDRYWT	27.6		PCT
1994	OS	FI402LOBST	OV46	HEPATOPANC	PCTDRYWT	30.3		PCT
1994	ECCB	FI501LOBST	OV47	HEPATOPANC	PCTDRYWT	29.0		PCT
1994	ECCB	FI502LOBST	OV48	HEPATOPANC	PCTDRYWT	30.6		PCT
1994	ECCB	FI503LOBST	OV49	HEPATOPANC	PCTDRYWT	25.0		PCT
1995	DIF	L95111000C1	L95111000HC1	HEPATOPANC	PCTDRYWT	37.4		PCT
1995	DIF	L95111000C2	L95111000HC2	HEPATOPANC	PCTDRYWT	38.2		PCT
1995	DIF	L95111000C3	L95111000HC3	HEPATOPANC	PCTDRYWT	31.0		PCT
1995	OS	L95114000C1	L95114000HC1	HEPATOPANC	PCTDRYWT	37.6		PCT
1995	OS	L95114000C2	L95114000HC2	HEPATOPANC	PCTDRYWT	28.9		PCT
1995	OS	L95114000C3	L95114000HC3	HEPATOPANC	PCTDRYWT	28.5		PCT
1995	ECCB	L95115000C1	L95115000HC1	HEPATOPANC	PCTDRYWT	29.3		PCT
1995	ECCB	L95115000C2	L95115000HC2	HEPATOPANC	PCTDRYWT	35.3		PCT
1995	ECCB	L95115000C3	L95115000HC3	HEPATOPANC	PCTDRYWT	35.8		PCT
1996	DIF	L96111000C1	L96111000HC1	HEPATOPANC	PCTDRYWT	29.7		PCT
1996	DIF	L96111000C2	L96111000HC2	HEPATOPANC	PCTDRYWT	35.4		PCT
1996	DIF	L96111000C3	L96111000HC3	HEPATOPANC	PCTDRYWT	38.6		PCT

Table C-9. Percent Dry Weight - Lobster Hepatopancreas 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1996	OS	L96114000C1	L96114000HC1	HEPATOPANC	PCTDRYWT	35.2		PCT
1996	OS	L96114000C2	L96114000HC2	HEPATOPANC	PCTDRYWT	31.2		PCT
1996	OS	L96114000C3	L96114000HC3	HEPATOPANC	PCTDRYWT	34.3		PCT
1996	ECCB	L96115000C1	L96115000HC1	HEPATOPANC	PCTDRYWT	38.3		PCT
1996	ECCB	L96115000C2	L96115000HC2	HEPATOPANC	PCTDRYWT	43.4		PCT
1996	ECCB	L96115000C3	L96115000HC3	HEPATOPANC	PCTDRYWT	42.8		PCT
1997	DIF	L97111000C1	L97111000HC1	HEPATOPANC	PCTDRYWT	30.0		PCT
1997	DIF	L97111000C2	L97111000HC2	HEPATOPANC	PCTDRYWT	31.3		PCT
1997	DIF	L97111000C3	L97111000HC3	HEPATOPANC	PCTDRYWT	27.1		PCT
1997	OS	L97114000C1	L97114000HC1	HEPATOPANC	PCTDRYWT	41.3		PCT
1997	OS	L97114000C2	L97114000HC2	HEPATOPANC	PCTDRYWT	25.8		PCT
1997	OS	L97114000C3	L97114000HC3	HEPATOPANC	PCTDRYWT	25.8		PCT
1997	ECCB	L97115000C1	L97115000HC1	HEPATOPANC	PCTDRYWT	33.8		PCT
1997	ECCB	L97115000C2	L97115000HC2	HEPATOPANC	PCTDRYWT	33.9		PCT
1997	ECCB	L97115000C3	L97115000HC3	HEPATOPANC	PCTDRYWT	35.7		PCT
1998	DIF	VZST11	VZ38COMP	HEPATOPANC	PCTDRYWT	36.9		PCT
1998	DIF	VZST12	VZ39COMP	HEPATOPANC	PCTDRYWT	33.5		PCT
1998	DIF	VZST13	VZ40COMP	HEPATOPANC	PCTDRYWT	33.5		PCT
1998	OS	VZST41	VZ26COMP	HEPATOPANC	PCTDRYWT	29.0		PCT
1998	OS	VZST42	VZ27COMP	HEPATOPANC	PCTDRYWT	34.0		PCT
1998	OS	VZST43	VZ28COMP	HEPATOPANC	PCTDRYWT	34.2		PCT
1998	ECCB	VZST91	VZ32COMP	HEPATOPANC	PCTDRYWT	28.7		PCT
1998	ECCB	VZST92	VZ33COMP	HEPATOPANC	PCTDRYWT	29.3		PCT
1998	ECCB	VZST93	VZ34COMP	HEPATOPANC	PCTDRYWT	31.3		PCT
1999	DIF	FL9911C1	XJ51	HEPATOPANC	PCTDRYWT	45.8		PCT
1999	DIF	FL9911C2	XJ52	HEPATOPANC	PCTDRYWT	32.7		PCT
1999	DIF	FL9911C3	XJ53	HEPATOPANC	PCTDRYWT	36.2		PCT
1999	OS	FL9914C1	XJ54	HEPATOPANC	PCTDRYWT	29.1		PCT
1999	OS	FL9914C2	XJ55	HEPATOPANC	PCTDRYWT	31.2		PCT
1999	OS	FL9914C3	XJ56	HEPATOPANC	PCTDRYWT	28.6		PCT
1999	ECCB	FL9915C1	XJ57	HEPATOPANC	PCTDRYWT	26.0		PCT
1999	ECCB	FL9915C2	XJ58	HEPATOPANC	PCTDRYWT	26.0		PCT
1999	ECCB	FL9915C3	XJ59	HEPATOPANC	PCTDRYWT	24.1		PCT
2000	DIF	FL0011C1	YC81	HEPATOPANC	PCTDRYWT	30.8		PCT
2000	DIF	FL0011C2	YC82	HEPATOPANC	PCTDRYWT	35.7		PCT
2000	DIF	FL0011C3	YC83	HEPATOPANC	PCTDRYWT	30.7		PCT
2000	OS	FL0014C1	YC84	HEPATOPANC	PCTDRYWT	31.7		PCT
2000	OS	FL0014C2	YC85	HEPATOPANC	PCTDRYWT	31.2		PCT
2000	OS	FL0014C3	YC86	HEPATOPANC	PCTDRYWT	32.1		PCT
2000	ECCB	FL0015C1	YC78	HEPATOPANC	PCTDRYWT	27.4		PCT
2000	ECCB	FL0015C2	YC79	HEPATOPANC	PCTDRYWT	33.7		PCT
2000	ECCB	FL0015C3	YC80	HEPATOPANC	PCTDRYWT	23.8		PCT
2001	DIF	FL0111-C1	ZH34	HEPATOPANC	PCTDRYWT	34.4		PCT
2001	DIF	FL0111-C2	ZH35	HEPATOPANC	PCTDRYWT	27.6		PCT
2001	DIF	FL0111-C3	ZH36	HEPATOPANC	PCTDRYWT	31.4		PCT

Table C-9. Percent Dry Weight - Lobster Hepatopancreas 1992 – 2001. (Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2001	OS	FL0114-C1	ZI51	HEPATOPANC	PCTDRYWT	39.7		PCT
2001	OS	FL0114-C2	ZI52	HEPATOPANC	PCTDRYWT	30.5		PCT
2001	OS	FL0114-C3	ZI53	HEPATOPANC	PCTDRYWT	30.3		PCT
2001	ECCB	FL0115-C1	ZH40	HEPATOPANC	PCTDRYWT	27.3		PCT
2001	ECCB	FL0115-C2	ZH41	HEPATOPANC	PCTDRYWT	31.4		PCT
2001	ECCB	FL0115-C3	ZH42	HEPATOPANC	PCTDRYWT	27.1		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1991	DI	M91143957	M91143957	SOFT_TISSUE	PCTDRYWT	13.6		PCT
1991	DI	M91143958	M91143958	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1991	DI	M91143959	M91143959	SOFT_TISSUE	PCTDRYWT	10.8		PCT
1991	DI	M91143960	M91143960	SOFT_TISSUE	PCTDRYWT	12.0		PCT
1991	DI	M91143961	M91143961	SOFT_TISSUE	PCTDRYWT	12.9		PCT
1991	DI	M91143962	M91143962	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1991	DI	M91143963	M91143963	SOFT_TISSUE	PCTDRYWT	13.8		PCT
1991	DI	M91143964	M91143964	SOFT_TISSUE	PCTDRYWT	14.0		PCT
1991	BIH	M91143739	M91143739	SOFT_TISSUE	PCTDRYWT	14.7		PCT
1991	BIH	M91143740	M91143740	SOFT_TISSUE	PCTDRYWT	8.0		PCT
1991	BIH	M91143741	M91143741	SOFT_TISSUE	PCTDRYWT	12.2		PCT
1991	BIH	M91143742	M91143742	SOFT_TISSUE	PCTDRYWT	11.1		PCT
1991	BIH	M91143743	M91143743	SOFT_TISSUE	PCTDRYWT	9.8		PCT
1991	Glouc.	M91143626	M91143626	SOFT_TISSUE	PCTDRYWT	13.5		PCT
1991	Glouc.	M91143627	M91143627	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1991	Glouc.	M91143628	M91143628	SOFT_TISSUE	PCTDRYWT	12.7		PCT
1991	Glouc.	M91143629	M91143629	SOFT_TISSUE	PCTDRYWT	13.4		PCT
1991	Glouc.	M91143630	M91143630	SOFT_TISSUE	PCTDRYWT	13.1		PCT
1991	Glouc.	M91143631	M91143631	SOFT_TISSUE	PCTDRYWT	9.7		PCT
1991	Glouc.	M91143632	M91143632	SOFT_TISSUE	PCTDRYWT	8.4		PCT
1991	Glouc.	M91143633	M91143633	SOFT_TISSUE	PCTDRYWT	9.0		PCT
1991	Glouc.	M91143634	M91143634	SOFT_TISSUE	PCTDRYWT	8.1		PCT
1991	Glouc.	M91143635	M91143635	SOFT_TISSUE	PCTDRYWT	8.0		PCT
1992	DI	M92164479	M92164479	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1992	DI	M92164480	M92164480	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1992	DI	M92164481	M92164481	SOFT_TISSUE	PCTDRYWT	11.7		PCT
1992	DI	M92164482	M92164482	SOFT_TISSUE	PCTDRYWT	10.5		PCT
1992	DI	M92164483	M92164483	SOFT_TISSUE	PCTDRYWT	10.8		PCT
1992	DI	M92164484	M92164484	SOFT_TISSUE	PCTDRYWT	11.9		PCT
1992	DI	M92164485	M92164485	SOFT_TISSUE	PCTDRYWT	11.6		PCT
1992	DI	M92164486	M92164486	SOFT_TISSUE	PCTDRYWT	11.7		PCT
1992	BIH	M92164487	M92164487	SOFT_TISSUE	PCTDRYWT	5.7		PCT
1992	BIH	M92164488	M92164488	SOFT_TISSUE	PCTDRYWT	9.6		PCT
1992	BIH	M92164489	M92164489	SOFT_TISSUE	PCTDRYWT	11.0		PCT
1992	BIH	M92164490	M92164490	SOFT_TISSUE	PCTDRYWT	10.0		PCT
1992	BIH	M92164491	M92164491	SOFT_TISSUE	PCTDRYWT	10.6		PCT
1992	Glouc.	M92162679	M92162679	SOFT_TISSUE	PCTDRYWT	14.7		PCT
1992	Glouc.	M92162680	M92162680	SOFT_TISSUE	PCTDRYWT	12.8		PCT
1992	Glouc.	M92162681	M92162681	SOFT_TISSUE	PCTDRYWT	15.9		PCT
1992	Glouc.	M92162682	M92162682	SOFT_TISSUE	PCTDRYWT	13.5		PCT
1992	Glouc.	M92162683	M92162683	SOFT_TISSUE	PCTDRYWT	14.4		PCT
1992	OS	M92164492	M92164492	SOFT_TISSUE	PCTDRYWT	14.5		PCT
1992	OS	M92164493	M92164493	SOFT_TISSUE	PCTDRYWT	16.6		PCT
1992	OS	M92164494	M92164494	SOFT_TISSUE	PCTDRYWT	15.3		PCT
1992	OS	M92164495	M92164495	SOFT_TISSUE	PCTDRYWT	15.5		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1992	OS	M92164496	M92164496	SOFT_TISSUE	PCTDRYWT	15.2		PCT
1992	OS	M92164497	M92164497	SOFT_TISSUE	PCTDRYWT	16.9		PCT
1992	OS	M92164498	M92164498	SOFT_TISSUE	PCTDRYWT	16.1		PCT
1992	OS	M92164499	M92164499	SOFT_TISSUE	PCTDRYWT	16.0		PCT
1993	DI	M93196384	M93196384	SOFT_TISSUE	PCTDRYWT	14.5		PCT
1993	DI	M93196385	M93196385	SOFT_TISSUE	PCTDRYWT	13.5		PCT
1993	DI	M93196386	M93196386	SOFT_TISSUE	PCTDRYWT	14.4		PCT
1993	DI	M93196387	M93196387	SOFT_TISSUE	PCTDRYWT	14.9		PCT
1993	DI	M93196388	M93196388	SOFT_TISSUE	PCTDRYWT	14.5		PCT
1993	BIH	M93196389	M93196389	SOFT_TISSUE	PCTDRYWT	10.3		PCT
1993	BIH	M93196390	M93196390	SOFT_TISSUE	PCTDRYWT	11.0		PCT
1993	BIH	M93196391	M93196391	SOFT_TISSUE	PCTDRYWT	10.5		PCT
1993	BIH	M93196392	M93196392	SOFT_TISSUE	PCTDRYWT	11.1		PCT
1993	Glouc.	M93188933	M93188933	SOFT_TISSUE	PCTDRYWT	10.6		PCT
1993	Glouc.	M93188934	M93188934	SOFT_TISSUE	PCTDRYWT	9.8		PCT
1993	Glouc.	M93188936	M93188936	SOFT_TISSUE	PCTDRYWT	11.8		PCT
1993	Glouc.	M93188937	M93188937	SOFT_TISSUE	PCTDRYWT	14.7		PCT
1993	Glouc.	M93188941	M93188941	SOFT_TISSUE	PCTDRYWT	12.5		PCT
1993	OS	M93196376	M93196376	SOFT_TISSUE	PCTDRYWT	19.1		PCT
1993	OS	M93196377	M93196377	SOFT_TISSUE	PCTDRYWT	17.5		PCT
1993	OS	M93196378	M93196378	SOFT_TISSUE	PCTDRYWT	18.4		PCT
1993	OS	M93196379	M93196379	SOFT_TISSUE	PCTDRYWT	18.4		PCT
1993	OS	M93196380	M93196380	SOFT_TISSUE	PCTDRYWT	18.3		PCT
1993	OS	M93196381	M93196381	SOFT_TISSUE	PCTDRYWT	17.9		PCT
1993	OS	M93196382	M93196382	SOFT_TISSUE	PCTDRYWT	18.9		PCT
1993	OS	M93196383	M93196383	SOFT_TISSUE	PCTDRYWT	19.7		PCT
1993	OS	M93203265R	M93203265R	SOFT_TISSUE	PCTDRYWT	18.4		PCT
1993	OS	M93203266R	M93203266R	SOFT_TISSUE	PCTDRYWT	17.9		PCT
1993	OS	M93203279	M93203279	SOFT_TISSUE	PCTDRYWT	16.9		PCT
1994	DI	M94233366	M94233366	SOFT_TISSUE	PCTDRYWT	13.3		PCT
1994	DI	M94233367	M94233367	SOFT_TISSUE	PCTDRYWT	12.8		PCT
1994	DI	M94233368	M94233368	SOFT_TISSUE	PCTDRYWT	13.1		PCT
1994	DI	M94233369	M94233369	SOFT_TISSUE	PCTDRYWT	12.7		PCT
1994	BIH	M94233371	M94233371	SOFT_TISSUE	PCTDRYWT	14.3		PCT
1994	BIH	M94233372	M94233372	SOFT_TISSUE	PCTDRYWT	11.7		PCT
1994	BIH	M94233373	M94233373	SOFT_TISSUE	PCTDRYWT	14.8		PCT
1994	Glouc.	M94225475	M94225475	SOFT_TISSUE	PCTDRYWT	13.5		PCT
1994	Glouc.	M94225476	M94225476	SOFT_TISSUE	PCTDRYWT	13.1		PCT
1994	Glouc.	M94225477	M94225477	SOFT_TISSUE	PCTDRYWT	13.7		PCT
1994	Glouc.	M94225478	M94225478	SOFT_TISSUE	PCTDRYWT	14.8		PCT
1994	OS	M94233376	M94233376	SOFT_TISSUE	PCTDRYWT	16.0		PCT
1994	OS	M94233377	M94233377	SOFT_TISSUE	PCTDRYWT	16.5		PCT
1994	OS	M94233378	M94233378	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1994	OS	M94233379	M94233379	SOFT_TISSUE	PCTDRYWT	17.0		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1994	OS	M94233381	M94233381	SOFT_TISSUE	PCTDRYWT	16.4		PCT
1994	OS	M94233382	M94233382	SOFT_TISSUE	PCTDRYWT	16.3		PCT
1994	OS	M94233383	M94233383	SOFT_TISSUE	PCTDRYWT	17.2		PCT
1994	OS	M94233384	M94233384	SOFT_TISSUE	PCTDRYWT	17.6		PCT
1995	DI	M9511D1H7TC1	M9511D1H7TC1	SOFT_TISSUE	PCTDRYWT	11.6		PCT
1995	DI	M9511D1H7TC2	M9511D1H7TC2	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1995	DI	M9511D1H7TC3	M9511D1H7TC3	SOFT_TISSUE	PCTDRYWT	13.6		PCT
1995	DI	M9511D1H7TC4	M9511D1H7TC4	SOFT_TISSUE	PCTDRYWT	11.2		PCT
1995	DI	M9511D1H7TC5	M9511D1H7TC5	SOFT_TISSUE	PCTDRYWT	10.7		PCT
1995	DI	M9511D1H8TC1	M9511D1H8TC1	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	DI	M9511D1H8TC2	M9511D1H8TC2	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	DI	M9511D1H8TC3	M9511D1H8TC3	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	DI	M9511D1H8TC4	M9511D1H8TC4	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	DI	M9511D1H8TC5	M9511D1H8TC5	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	BIH	M9511D6H7TC1	M9511D6H7TC1	SOFT_TISSUE	PCTDRYWT	12.3		PCT
1995	BIH	M9511D6H7TC2	M9511D6H7TC2	SOFT_TISSUE	PCTDRYWT	14.7		PCT
1995	BIH	M9511D6H7TC3	M9511D6H7TC3	SOFT_TISSUE	PCTDRYWT	13.7		PCT
1995	BIH	M9511D6H7TC4	M9511D6H7TC4	SOFT_TISSUE	PCTDRYWT	12.9		PCT
1995	BIH	M9511D6H7TC5	M9511D6H7TC5	SOFT_TISSUE	PCTDRYWT	11.9		PCT
1995	BIH	M9511D6H8TC1	M9511D6H8TC1	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	BIH	M9511D6H8TC2	M9511D6H8TC2	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	BIH	M9511D6H8TC3	M9511D6H8TC3	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	BIH	M9511D6H8TC4	M9511D6H8TC4	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	BIH	M9511D6H8TC5	M9511D6H8TC5	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	Glouc.	M9511H7TC1	M9511H7TC1	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1995	Glouc.	M9511H7TC2	M9511H7TC2	SOFT_TISSUE	PCTDRYWT	10.8		PCT
1995	Glouc.	M9511H7TC3	M9511H7TC3	SOFT_TISSUE	PCTDRYWT	11.3		PCT
1995	Glouc.	M9511H7TC4	M9511H7TC4	SOFT_TISSUE	PCTDRYWT	11.6		PCT
1995	Glouc.	M9511H7TC5	M9511H7TC5	SOFT_TISSUE	PCTDRYWT	11.8		PCT
1995	Sand.	M9511H8TC1	M9511H8TC1	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	Sand.	M9511H8TC2	M9511H8TC2	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	Sand.	M9511H8TC3	M9511H8TC3	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	Sand.	M9511H8TC4	M9511H8TC4	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1995	Sand.	M9511H8TC5	M9511H8TC5	SOFT_TISSUE	PCTDRYWT	0.0	e	PCT
1996	DI	M9611D1H7TC1	M9611D1H7TC1	SOFT_TISSUE	PCTDRYWT	9.7		PCT
1996	DI	M9611D1H7TC2	M9611D1H7TC2	SOFT_TISSUE	PCTDRYWT	11.4		PCT
1996	DI	M9611D1H7TC3	M9611D1H7TC3	SOFT_TISSUE	PCTDRYWT	13.2		PCT
1996	DI	M9611D1H7TC4	M9611D1H7TC4	SOFT_TISSUE	PCTDRYWT	13.3		PCT
1996	DI	M9611D1H7TC5	M9611D1H7TC5	SOFT_TISSUE	PCTDRYWT	12.0		PCT
1996	DI	M9611D1H8TC1	M9611D1H8TC1	SOFT_TISSUE	PCTDRYWT	14.2	j	PCT
1996	DI	M9611D1H8TC2	M9611D1H8TC2	SOFT_TISSUE	PCTDRYWT	14.2	j	PCT
1996	DI	M9611D1H8TC3	M9611D1H8TC3	SOFT_TISSUE	PCTDRYWT	14.2	j	PCT
1996	DI	M9611D1H8TC4	M9611D1H8TC4	SOFT_TISSUE	PCTDRYWT	14.2	j	PCT
1996	DI	M9611D1H8TC5	M9611D1H8TC5	SOFT_TISSUE	PCTDRYWT	14.2	j	PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1996	BIH	M9611D6H7TC1	M9611D6H7TC1	SOFT_TISSUE	PCTDRYWT	9.6		PCT
1996	BIH	M9611D6H7TC2	M9611D6H7TC2	SOFT_TISSUE	PCTDRYWT	16.9		PCT
1996	BIH	M9611D6H7TC3	M9611D6H7TC3	SOFT_TISSUE	PCTDRYWT	14.7		PCT
1996	BIH	M9611D6H7TC4	M9611D6H7TC4	SOFT_TISSUE	PCTDRYWT	16.4		PCT
1996	BIH	M9611D6H7TC5	M9611D6H7TC5	SOFT_TISSUE	PCTDRYWT	13.2		PCT
1996	BIH	M9611D6H8TC1	M9611D6H8TC1	SOFT_TISSUE	PCTDRYWT	16.3	j	PCT
1996	BIH	M9611D6H8TC2	M9611D6H8TC2	SOFT_TISSUE	PCTDRYWT	16.3	j	PCT
1996	BIH	M9611D6H8TC3	M9611D6H8TC3	SOFT_TISSUE	PCTDRYWT	16.3	j	PCT
1996	Glouc.	M9611H7TC1	M9611H7TC1	SOFT_TISSUE	PCTDRYWT	8.8		PCT
1996	Glouc.	M9611H7TC2	M9611H7TC2	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1996	Glouc.	M9611H7TC3	M9611H7TC3	SOFT_TISSUE	PCTDRYWT	14.6		PCT
1996	Sand.	M9611H8TC1	M9611H8TC1	SOFT_TISSUE	PCTDRYWT	17.8	j	PCT
1996	Sand.	M9611H8TC2	M9611H8TC2	SOFT_TISSUE	PCTDRYWT	17.8	j	PCT
1996	Sand.	M9611H8TC3	M9611H8TC3	SOFT_TISSUE	PCTDRYWT	17.8	j	PCT
1996	Sand.	M9611H8TC4	M9611H8TC4	SOFT_TISSUE	PCTDRYWT	17.8	j	PCT
1996	Sand.	M9611H8TC5	M9611H8TC5	SOFT_TISSUE	PCTDRYWT	17.8	j	PCT
1996	OS	M9611D4H7TC1	M9611D4H7TC1	SOFT_TISSUE	PCTDRYWT	13.9		PCT
1996	OS	M9611D4H7TC2	M9611D4H7TC2	SOFT_TISSUE	PCTDRYWT	17.4		PCT
1996	OS	M9611D4H7TC3	M9611D4H7TC3	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1996	OS	M9611D4H7TC4	M9611D4H7TC4	SOFT_TISSUE	PCTDRYWT	16.5		PCT
1996	OS	M9611D4H7TC5	M9611D4H7TC5	SOFT_TISSUE	PCTDRYWT	17.7		PCT
1996	OS	M9611D4H8TC1	M9611D4H8TC1	SOFT_TISSUE	PCTDRYWT	19.1	j	PCT
1996	OS	M9611D4H8TC2	M9611D4H8TC2	SOFT_TISSUE	PCTDRYWT	19.1	j	PCT
1996	OS	M9611D4H8TC3	M9611D4H8TC3	SOFT_TISSUE	PCTDRYWT	19.1	j	PCT
1996	OS	M9611D4H8TC4	M9611D4H8TC4	SOFT_TISSUE	PCTDRYWT	19.1	j	PCT
1996	OS	M9611D4H8TC5	M9611D4H8TC5	SOFT_TISSUE	PCTDRYWT	19.1	j	PCT
1997	DI	M9711D1H7TC1	M9711D1H7TC1	SOFT_TISSUE	PCTDRYWT	13.0		PCT
1997	DI	M9711D1H7TC2	M9711D1H7TC2	SOFT_TISSUE	PCTDRYWT	11.9		PCT
1997	DI	M9711D1H7TC3	M9711D1H7TC3	SOFT_TISSUE	PCTDRYWT	11.1		PCT
1997	DI	M9711D1H7TC4	M9711D1H7TC4	SOFT_TISSUE	PCTDRYWT	11.9		PCT
1997	DI	M9711D1H7TC5	M9711D1H7TC5	SOFT_TISSUE	PCTDRYWT	13.0		PCT
1997	DI	M9711D1H8TC1	M9711D1H8TC1	SOFT_TISSUE	PCTDRYWT	16.6	j	PCT
1997	DI	M9711D1H8TC2	M9711D1H8TC2	SOFT_TISSUE	PCTDRYWT	16.6	j	PCT
1997	DI	M9711D1H8TC3	M9711D1H8TC3	SOFT_TISSUE	PCTDRYWT	16.6	j	PCT
1997	DI	M9711D1H8TC4	M9711D1H8TC4	SOFT_TISSUE	PCTDRYWT	16.6	j	PCT
1997	DI	M9711D1H8TC5	M9711D1H8TC5	SOFT_TISSUE	PCTDRYWT	16.6	j	PCT
1997	BIH	M9711D6H7TC1	M9711D6H7TC1	SOFT_TISSUE	PCTDRYWT	16.1		PCT
1997	BIH	M9711D6H7TC2	M9711D6H7TC2	SOFT_TISSUE	PCTDRYWT	13.6		PCT
1997	BIH	M9711D6H7TC3	M9711D6H7TC3	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1997	BIH	M9711D6H7TC4	M9711D6H7TC4	SOFT_TISSUE	PCTDRYWT	13.2		PCT
1997	BIH	M9711D6H7TC5	M9711D6H7TC5	SOFT_TISSUE	PCTDRYWT	12.9		PCT
1997	BIH	M9711D6H8TC1	M9711D6H8TC1	SOFT_TISSUE	PCTDRYWT	17.4	j	PCT
1997	BIH	M9711D6H8TC2	M9711D6H8TC2	SOFT_TISSUE	PCTDRYWT	17.4	j	PCT
1997	BIH	M9711D6H8TC3	M9711D6H8TC3	SOFT_TISSUE	PCTDRYWT	17.4	j	PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1997	BIH	M9711D6H8TC4	M9711D6H8TC4	SOFT_TISSUE	PCTDRYWT	17.4	j	PCT
1997	BIH	M9711D6H8TC5	M9711D6H8TC5	SOFT_TISSUE	PCTDRYWT	17.4	j	PCT
1997	Glouc.	M9711H7TC1	M9711H7TC1	SOFT_TISSUE	PCTDRYWT	16.0		PCT
1997	Glouc.	M9711H7TC2	M9711H7TC2	SOFT_TISSUE	PCTDRYWT	16.9		PCT
1997	Glouc.	M9711H7TC3	M9711H7TC3	SOFT_TISSUE	PCTDRYWT	17.9		PCT
1997	Glouc.	M9711H7TC4	M9711H7TC4	SOFT_TISSUE	PCTDRYWT	17.1		PCT
1997	Glouc.	M9711H7TC5	M9711H7TC5	SOFT_TISSUE	PCTDRYWT	17.7		PCT
1997	Sand.	M9711H8TC1	M9711H8TC1	SOFT_TISSUE	PCTDRYWT	22.1	j	PCT
1997	Sand.	M9711H8TC2	M9711H8TC2	SOFT_TISSUE	PCTDRYWT	22.1	j	PCT
1997	Sand.	M9711H8TC3	M9711H8TC3	SOFT_TISSUE	PCTDRYWT	22.1	j	PCT
1997	Sand.	M9711H8TC4	M9711H8TC4	SOFT_TISSUE	PCTDRYWT	22.1	j	PCT
1997	Sand.	M9711H8TC5	M9711H8TC5	SOFT_TISSUE	PCTDRYWT	22.1	j	PCT
1997	OS	M9711D4H7TC1	M9711D4H7TC1	SOFT_TISSUE	PCTDRYWT	15.5		PCT
1997	OS	M9711D4H7TC2	M9711D4H7TC2	SOFT_TISSUE	PCTDRYWT	15.7		PCT
1997	OS	M9711D4H7TC3	M9711D4H7TC3	SOFT_TISSUE	PCTDRYWT	15.7		PCT
1997	OS	M9711D4H7TC4	M9711D4H7TC4	SOFT_TISSUE	PCTDRYWT	15.0		PCT
1997	OS	M9711D4H7TC5	M9711D4H7TC5	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1997	OS	M9711D4H8TC1	M9711D4H8TC1	SOFT_TISSUE	PCTDRYWT	19.6	j	PCT
1997	OS	M9711D4H8TC2	M9711D4H8TC2	SOFT_TISSUE	PCTDRYWT	19.6	j	PCT
1997	OS	M9711D4H8TC3	M9711D4H8TC3	SOFT_TISSUE	PCTDRYWT	19.6	j	PCT
1997	OS	M9711D4H8TC4	M9711D4H8TC4	SOFT_TISSUE	PCTDRYWT	19.6	j	PCT
1997	OS	M9711D4H8TC5	M9711D4H8TC5	SOFT_TISSUE	PCTDRYWT	19.6	j	PCT
1998	Glouc.	FM9812GVX01	VX01	SOFT_TISSUE	PCTDRYWT	12.3		PCT
1998	Glouc.	FM9812GVX02	VX02	SOFT_TISSUE	PCTDRYWT	10.6		PCT
1998	Glouc.	FM9812GVX03	VX03	SOFT_TISSUE	PCTDRYWT	11.1		PCT
1998	Glouc.	FM9812GVX04	VX04	SOFT_TISSUE	PCTDRYWT	10.4		PCT
1998	Glouc.	FM9812GVX05	VX05	SOFT_TISSUE	PCTDRYWT	11.3		PCT
1998	Sand.	FM9811SVW64	VW64	SOFT_TISSUE	PCTDRYWT	18.4		PCT
1998	Sand.	FM9811SVW65	VW65	SOFT_TISSUE	PCTDRYWT	14.3		PCT
1998	Sand.	FM9811SVW66	VW66	SOFT_TISSUE	PCTDRYWT	15.9		PCT
1998	Sand.	FM9811SVW67	VW67	SOFT_TISSUE	PCTDRYWT	15.5		PCT
1998	Sand.	FM9811SVW68	VW68	SOFT_TISSUE	PCTDRYWT	14.2		PCT
1998	Sand.	FM9811SVX06	VX06	SOFT_TISSUE	PCTDRYWT	13.3		PCT
1998	DI	FM9821GVX17	VX17	SOFT_TISSUE	PCTDRYWT	14.9		PCT
1998	DI	FM9821GVX18	VX18	SOFT_TISSUE	PCTDRYWT	13.9		PCT
1998	DI	FM9821GVX19	VX19	SOFT_TISSUE	PCTDRYWT	15.2		PCT
1998	DI	FM9821GVX20	VX20	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1998	DI	FM9821GVX21	VX21	SOFT_TISSUE	PCTDRYWT	15.7		PCT
1998	DI	FM9821SVW79	VW79	SOFT_TISSUE	PCTDRYWT	18.0		PCT
1998	DI	FM9821SVW80	VW80	SOFT_TISSUE	PCTDRYWT	16.7		PCT
1998	DI	FM9821SVW81	VW81	SOFT_TISSUE	PCTDRYWT	14.6		PCT
1998	DI	FM9821SVW82	VW82	SOFT_TISSUE	PCTDRYWT	15.8		PCT
1998	DI	FM9821SVW83	VW83	SOFT_TISSUE	PCTDRYWT	17.3		PCT
1998	OS	FM9822GVX22	VX22	SOFT_TISSUE	PCTDRYWT	14.3		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1998	OS	FM9822GVX23	VX23	SOFT_TISSUE	PCTDRYWT	14.5		PCT
1998	OS	FM9822GVX24	VX24	SOFT_TISSUE	PCTDRYWT	15.2		PCT
1998	OS	FM9822GVX25	VX25	SOFT_TISSUE	PCTDRYWT	16.2		PCT
1998	OS	FM9822GVX26	VX26	SOFT_TISSUE	PCTDRYWT	18.2		PCT
1998	OS	FM9822GVX27	VX27	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1998	OS	FM9822GVX28	VX28	SOFT_TISSUE	PCTDRYWT	14.9		PCT
1998	OS	FM9822GVX29	VX29	SOFT_TISSUE	PCTDRYWT	16.1		PCT
1998	OS	FM9822SVW84	VW84	SOFT_TISSUE	PCTDRYWT	14.8		PCT
1998	OS	FM9822SVW85	VW85	SOFT_TISSUE	PCTDRYWT	17.1		PCT
1998	OS	FM9822SVW86	VW86	SOFT_TISSUE	PCTDRYWT	14.8		PCT
1998	OS	FM9822SVW87	VW87	SOFT_TISSUE	PCTDRYWT	16.6		PCT
1998	OS	FM9822SVW88	VW88	SOFT_TISSUE	PCTDRYWT	20.0		PCT
1998	OS	FM9822SVW89	VW89	SOFT_TISSUE	PCTDRYWT	16.9		PCT
1998	OS	FM9822SVW90	VW90	SOFT_TISSUE	PCTDRYWT	17.1		PCT
1998	OS	FM9822SVW91	VW91	SOFT_TISSUE	PCTDRYWT	18.0		PCT
1998	BIH	FM9832GVX12	VX12	SOFT_TISSUE	PCTDRYWT	11.7		PCT
1998	BIH	FM9832GVX13	VX13	SOFT_TISSUE	PCTDRYWT	10.5		PCT
1998	BIH	FM9832GVX14	VX14	SOFT_TISSUE	PCTDRYWT	10.0		PCT
1998	BIH	FM9832GVX15	VX15	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1998	BIH	FM9832GVX16	VX16	SOFT_TISSUE	PCTDRYWT	13.5		PCT
1998	BIH	FM9832SVW74	VW74	SOFT_TISSUE	PCTDRYWT	13.2		PCT
1998	BIH	FM9832SVW75	VW75	SOFT_TISSUE	PCTDRYWT	15.7		PCT
1998	BIH	FM9832SVW76	VW76	SOFT_TISSUE	PCTDRYWT	12.1		PCT
1998	BIH	FM9832SVW77	VW77	SOFT_TISSUE	PCTDRYWT	16.1		PCT
1998	BIH	FM9832SVW78	VW78	SOFT_TISSUE	PCTDRYWT	14.1		PCT
1998	CCB	FM9833GVX30	VX30	SOFT_TISSUE	PCTDRYWT	17.0		PCT
1998	CCB	FM9833GVX31	VX31	SOFT_TISSUE	PCTDRYWT	17.7		PCT
1998	CCB	FM9833GVX32	VX32	SOFT_TISSUE	PCTDRYWT	17.5		PCT
1998	CCB	FM9833GVX33	VX33	SOFT_TISSUE	PCTDRYWT	18.1		PCT
1998	CCB	FM9833GVX34	VX34	SOFT_TISSUE	PCTDRYWT	18.1		PCT
1998	CCB	FM9833GVX35	VX35	SOFT_TISSUE	PCTDRYWT	19.4		PCT
1998	CCB	FM9833GVX36	VX36	SOFT_TISSUE	PCTDRYWT	19.9		PCT
1998	CCB	FM9833GVX37	VX37	SOFT_TISSUE	PCTDRYWT	19.0		PCT
1998	CCB	FM9833SVW92	VW92	SOFT_TISSUE	PCTDRYWT	18.8		PCT
1998	CCB	FM9833SVW93	VW93	SOFT_TISSUE	PCTDRYWT	18.2		PCT
1998	CCB	FM9833SVW94	VW94	SOFT_TISSUE	PCTDRYWT	21.4		PCT
1998	CCB	FM9833SVW95	VW95	SOFT_TISSUE	PCTDRYWT	18.0		PCT
1998	CCB	FM9833SVW96	VW96	SOFT_TISSUE	PCTDRYWT	25.6		PCT
1998	CCB	FM9833SVW97	VW97	SOFT_TISSUE	PCTDRYWT	17.4		PCT
1998	CCB	FM9833SVW98	VW98	SOFT_TISSUE	PCTDRYWT	22.0		PCT
1998	CCB	FM9833SVW99	VW99	SOFT_TISSUE	PCTDRYWT	21.8		PCT
1999	Glouc.	FM9912GXD74	XD74	SOFT_TISSUE	PCTDRYWT	14.0		PCT
1999	Glouc.	FM9912GXD75	XD75	SOFT_TISSUE	PCTDRYWT	12.6		PCT
1999	Glouc.	FM9912GXD76	XD76	SOFT_TISSUE	PCTDRYWT	12.8		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1999	Glouc.	FM9912GXD77	XD77	SOFT_TISSUE	PCTDRYWT	12.5		PCT
1999	Glouc.	FM9912GXD78	XD78	SOFT_TISSUE	PCTDRYWT	12.4		PCT
1999	Sand.	FM9911SXE01	XE01	SOFT_TISSUE	PCTDRYWT	11.4		PCT
1999	Sand.	FM9911SXE02	XE02	SOFT_TISSUE	PCTDRYWT	23.8		PCT
1999	Sand.	FM9911SXE03	XE03	SOFT_TISSUE	PCTDRYWT	20.8		PCT
1999	Sand.	FM9911SXE04	XE04	SOFT_TISSUE	PCTDRYWT	22.8		PCT
1999	Sand.	FM9911SXE05	XE05	SOFT_TISSUE	PCTDRYWT	20.5		PCT
1999	BIH	FM9931GXD79	XD79	SOFT_TISSUE	PCTDRYWT	9.4		PCT
1999	BIH	FM9931GXD80	XD80	SOFT_TISSUE	PCTDRYWT	10.7		PCT
1999	BIH	FM9931GXD81	XD81	SOFT_TISSUE	PCTDRYWT	11.9		PCT
1999	BIH	FM9931GXD82	XD82	SOFT_TISSUE	PCTDRYWT	13.6		PCT
1999	BIH	FM9931GXD83	XD83	SOFT_TISSUE	PCTDRYWT	12.9		PCT
1999	BIH	FM9931SXE06	XE06	SOFT_TISSUE	PCTDRYWT	18.8		PCT
1999	BIH	FM9931SXE07	XE07	SOFT_TISSUE	PCTDRYWT	18.1		PCT
1999	BIH	FM9931SXE08	XE08	SOFT_TISSUE	PCTDRYWT	20.0		PCT
1999	BIH	FM9931SXE09	XE09	SOFT_TISSUE	PCTDRYWT	19.6		PCT
1999	BIH	FM9931SXE10	XE10	SOFT_TISSUE	PCTDRYWT	19.2		PCT
1999	CCB	FM9933GXD92	XD92	SOFT_TISSUE	PCTDRYWT	21.6		PCT
1999	CCB	FM9933GXD93	XD93	SOFT_TISSUE	PCTDRYWT	18.8		PCT
1999	CCB	FM9933GXD94	XD94	SOFT_TISSUE	PCTDRYWT	20.3		PCT
1999	CCB	FM9933GXD95	XD95	SOFT_TISSUE	PCTDRYWT	21.7		PCT
1999	CCB	FM9933GXD96	XD96	SOFT_TISSUE	PCTDRYWT	17.1		PCT
1999	CCB	FM9933GXD97	XD97	SOFT_TISSUE	PCTDRYWT	20.7		PCT
1999	CCB	FM9933GXD98	XD98	SOFT_TISSUE	PCTDRYWT	20.6		PCT
1999	CCB	FM9933GXD99	XD99	SOFT_TISSUE	PCTDRYWT	20.0		PCT
1999	CCB	FM9933SXE19	XE19	SOFT_TISSUE	PCTDRYWT	23.1		PCT
1999	CCB	FM9933SXE20	XE20	SOFT_TISSUE	PCTDRYWT	23.2		PCT
1999	CCB	FM9933SXE21	XE21	SOFT_TISSUE	PCTDRYWT	21.3		PCT
1999	CCB	FM9933SXE22	XE22	SOFT_TISSUE	PCTDRYWT	23.9		PCT
1999	CCB	FM9933SXE23	XE23	SOFT_TISSUE	PCTDRYWT	22.1		PCT
1999	CCB	FM9933SXE24	XE24	SOFT_TISSUE	PCTDRYWT	23.2		PCT
1999	CCB	FM9933SXE25	XE25	SOFT_TISSUE	PCTDRYWT	23.6		PCT
1999	CCB	FM9933SXE26	XE26	SOFT_TISSUE	PCTDRYWT	25.4		PCT
1999	OS	FM9932GXD84	XD84	SOFT_TISSUE	PCTDRYWT	16.8		PCT
1999	OS	FM9932GXD85	XD85	SOFT_TISSUE	PCTDRYWT	18.5		PCT
1999	OS	FM9932GXD86	XD86	SOFT_TISSUE	PCTDRYWT	18.2		PCT
1999	OS	FM9932GXD87	XD87	SOFT_TISSUE	PCTDRYWT	18.5		PCT
1999	OS	FM9932GXD88	XD88	SOFT_TISSUE	PCTDRYWT	19.0		PCT
1999	OS	FM9932GXD89	XD89	SOFT_TISSUE	PCTDRYWT	18.7		PCT
1999	OS	FM9932GXD90	XD90	SOFT_TISSUE	PCTDRYWT	19.9		PCT
1999	OS	FM9932GXD91	XD91	SOFT_TISSUE	PCTDRYWT	18.9		PCT
1999	OS	FM9932SXE11	XE11	SOFT_TISSUE	PCTDRYWT	19.8		PCT
1999	OS	FM9932SXE12	XE12	SOFT_TISSUE	PCTDRYWT	21.6		PCT
1999	OS	FM9932SXE13	XE13	SOFT_TISSUE	PCTDRYWT	20.6		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
1999	OS	FM9932SXE14	XE14	SOFT_TISSUE	PCTDRYWT	20.8		PCT
1999	OS	FM9932SXE15	XE15	SOFT_TISSUE	PCTDRYWT	20.7		PCT
1999	OS	FM9932SXE16	XE16	SOFT_TISSUE	PCTDRYWT	19.4		PCT
1999	OS	FM9932SXE17	XE17	SOFT_TISSUE	PCTDRYWT	21.6		PCT
1999	OS	FM9932SXE18	XE18	SOFT_TISSUE	PCTDRYWT	20.8		PCT
2000	RP	FM001RPYE44	YE44	SOFT_TISSUE	PCTDRYWT	9.6		PCT
2000	RP	FM001RPYE45	YE45	SOFT_TISSUE	PCTDRYWT	10.3		PCT
2000	RP	FM001RPYE46	YE46	SOFT_TISSUE	PCTDRYWT	10.9		PCT
2000	RP	FM001RPYE47	YE47	SOFT_TISSUE	PCTDRYWT	9.3		PCT
2000	RP	FM001RPYE48	YE48	SOFT_TISSUE	PCTDRYWT	10.6		PCT
2000	RP	FM001RPYE67	YE67	SOFT_TISSUE	PCTDRYWT	9.0		PCT
2000	RP	FM001RPYE68	YE68	SOFT_TISSUE	PCTDRYWT	8.8		PCT
2000	RP	FM001RPYE69	YE69	SOFT_TISSUE	PCTDRYWT	8.6		PCT
2000	RP	FM001RPYE70	YE70	SOFT_TISSUE	PCTDRYWT	8.5		PCT
2000	RP	FM001RPYE71	YE71	SOFT_TISSUE	PCTDRYWT	8.3		PCT
2000	DI	FM0031YE54	YE54	SOFT_TISSUE	PCTDRYWT	14.6		PCT
2000	DI	FM0031YE55	YE55	SOFT_TISSUE	PCTDRYWT	10.9		PCT
2000	DI	FM0031YE56	YE56	SOFT_TISSUE	PCTDRYWT	9.0		PCT
2000	DI	FM0031YE57	YE57	SOFT_TISSUE	PCTDRYWT	11.2		PCT
2000	DI	FM0031YE58	YE58	SOFT_TISSUE	PCTDRYWT	12.1		PCT
2000	DI	FM0031YE77	YE77	SOFT_TISSUE	PCTDRYWT	13.7		PCT
2000	DI	FM0031YE78	YE78	SOFT_TISSUE	PCTDRYWT	13.6		PCT
2000	DI	FM0031YE79	YE79	SOFT_TISSUE	PCTDRYWT	12.5		PCT
2000	DI	FM0031YE80	YE80	SOFT_TISSUE	PCTDRYWT	12.9		PCT
2000	DI	FM0031YE81	YE81	SOFT_TISSUE	PCTDRYWT	13.0		PCT
2000	BIH	FM0036YE49	YE49	SOFT_TISSUE	PCTDRYWT	10.1		PCT
2000	BIH	FM0036YE50	YE50	SOFT_TISSUE	PCTDRYWT	9.3		PCT
2000	BIH	FM0036YE51	YE51	SOFT_TISSUE	PCTDRYWT	10.3		PCT
2000	BIH	FM0036YE52	YE52	SOFT_TISSUE	PCTDRYWT	9.4		PCT
2000	BIH	FM0036YE53	YE53	SOFT_TISSUE	PCTDRYWT	9.3		PCT
2000	BIH	FM0036YE72	YE72	SOFT_TISSUE	PCTDRYWT	10.2		PCT
2000	BIH	FM0036YE73	YE73	SOFT_TISSUE	PCTDRYWT	10.5		PCT
2000	BIH	FM0036YE74	YE74	SOFT_TISSUE	PCTDRYWT	10.5		PCT
2000	BIH	FM0036YE75	YE75	SOFT_TISSUE	PCTDRYWT	10.3		PCT
2000	BIH	FM0036YE76	YE76	SOFT_TISSUE	PCTDRYWT	10.1		PCT
2000	OS	FM0034YE59	YE59	SOFT_TISSUE	PCTDRYWT	12.4		PCT
2000	OS	FM0034YE60	YE60	SOFT_TISSUE	PCTDRYWT	15.1		PCT
2000	OS	FM0034YE61	YE61	SOFT_TISSUE	PCTDRYWT	13.1		PCT
2000	OS	FM0034YE62	YE62	SOFT_TISSUE	PCTDRYWT	12.7		PCT
2000	OS	FM0034YE63	YE63	SOFT_TISSUE	PCTDRYWT	12.2		PCT
2000	OS	FM0034YE64	YE64	SOFT_TISSUE	PCTDRYWT	11.2		PCT
2000	OS	FM0034YE65	YE65	SOFT_TISSUE	PCTDRYWT	11.4		PCT
2000	OS	FM0034YE66	YE66	SOFT_TISSUE	PCTDRYWT	13.3		PCT
2000	OS	FM0034YE82	YE82	SOFT_TISSUE	PCTDRYWT	11.8		PCT

Table C-10. Percent Dry Weight - Mussels 1991 – 2001.
(Continued)

Year	Station	Sample	Bottle	Fraction	Parameter	Value	Val Qual	Unit Code
2000	OS	FM0034YE83	YE83	SOFT_TISSUE	PCTDRYWT	13.5		PCT
2000	OS	FM0034YE84	YE84	SOFT_TISSUE	PCTDRYWT	14.2		PCT
2000	OS	FM0034YE85	YE85	SOFT_TISSUE	PCTDRYWT	14.4		PCT
2000	OS	FM0034YE86	YE86	SOFT_TISSUE	PCTDRYWT	14.5		PCT
2000	OS	FM0034YE87	YE87	SOFT_TISSUE	PCTDRYWT	14.4		PCT
2000	OS	FM0034YE88	YE88	SOFT_TISSUE	PCTDRYWT	14.6		PCT
2000	OS	FM0034YE89	YE89	SOFT_TISSUE	PCTDRYWT	14.0		PCT
2001	RP	FM011ZA69	ZA69	SOFT_TISSUE	PCTDRYWT	7.6		PCT
2001	RP	FM011ZA70	ZA70	SOFT_TISSUE	PCTDRYWT	9.9		PCT
2001	RP	FM011ZA71	ZA71	SOFT_TISSUE	PCTDRYWT	8.8		PCT
2001	RP	FM011ZA72	ZA72	SOFT_TISSUE	PCTDRYWT	9.4		PCT
2001	RP	FM011ZA73	ZA73	SOFT_TISSUE	PCTDRYWT	9.3		PCT
2001	DI	FM011ZH67	ZH67	SOFT_TISSUE	PCTDRYWT	13.1		PCT
2001	DI	FM011ZH68	ZH68	SOFT_TISSUE	PCTDRYWT	14.6		PCT
2001	DI	FM011ZH69	ZH69	SOFT_TISSUE	PCTDRYWT	14.5		PCT
2001	DI	FM011ZH70	ZH70	SOFT_TISSUE	PCTDRYWT	14.3		PCT
2001	DI	FM011ZH71	ZH71	SOFT_TISSUE	PCTDRYWT	12.6		PCT
2001	BIH	FM011ZH62	ZH62	SOFT_TISSUE	PCTDRYWT	8.1		PCT
2001	BIH	FM011ZH63	ZH63	SOFT_TISSUE	PCTDRYWT	8.9		PCT
2001	BIH	FM011ZH64	ZH64	SOFT_TISSUE	PCTDRYWT	10.1		PCT
2001	BIH	FM011ZH65	ZH65	SOFT_TISSUE	PCTDRYWT	11.1		PCT
2001	BIH	FM011ZH66	ZH66	SOFT_TISSUE	PCTDRYWT	9.8		PCT
2001	CCB	FM011ZH80	ZH80	SOFT_TISSUE	PCTDRYWT	16.1		PCT
2001	CCB	FM011ZH81	ZH81	SOFT_TISSUE	PCTDRYWT	17.0		PCT
2001	CCB	FM011ZH82	ZH82	SOFT_TISSUE	PCTDRYWT	17.5		PCT
2001	CCB	FM011ZH83	ZH83	SOFT_TISSUE	PCTDRYWT	19.6		PCT
2001	CCB	FM011ZH84	ZH84	SOFT_TISSUE	PCTDRYWT	18.6		PCT
2001	CCB	FM011ZH85	ZH85	SOFT_TISSUE	PCTDRYWT	18.6		PCT
2001	CCB	FM011ZH86	ZH86	SOFT_TISSUE	PCTDRYWT	20.8		PCT
2001	CCB	FM011ZH87	ZH87	SOFT_TISSUE	PCTDRYWT	20.3		PCT
2001	OS	FM011ZP27	ZP27	SOFT_TISSUE	PCTDRYWT	11.5		PCT
2001	OS	FM011ZP28	ZP28	SOFT_TISSUE	PCTDRYWT	11.3		PCT
2001	OS	FM011ZP29	ZP29	SOFT_TISSUE	PCTDRYWT	11.3		PCT
2001	OS	FM011ZP30	ZP30	SOFT_TISSUE	PCTDRYWT	12.3		PCT
2001	OS	FM011ZP31	ZP31	SOFT_TISSUE	PCTDRYWT	11.5		PCT
2001	OS	FM011ZP32	ZP32	SOFT_TISSUE	PCTDRYWT	13.6		PCT
2001	OS	FM011ZP33	ZP33	SOFT_TISSUE	PCTDRYWT	10.3		PCT
2001	OS	FM011ZP34	ZP34	SOFT_TISSUE	PCTDRYWT	12.7		PCT

Table C-11. Flounder Fillet Chemistry Data, 1991 – 2001.

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mercury	Fillets	1992	0.279	0.473	0.096	NA	NA	NA	NA	NA	NA
Mercury	Fillets	1993	0.460	0.413	0.186	0.105	0.075	0.030	10	9	10
Mercury	Fillets	1994	0.283	0.434	0.120	0.032	0.090	0.006	3	3	3
Mercury	Fillets	1995	0.404	0.312	0.104	0.016	0.043	0.012	3	3	3
Mercury	Fillets	1996	0.460	0.547	0.400	0.069	0.150	0.028	3	3	3
Mercury	Fillets	1997	0.511	0.276	0.195	0.089	0.198	0.020	3	3	3
Mercury	Fillets	1998	0.234	0.328	0.136	0.012	0.038	0.023	3	3	3
Mercury	Fillets	1999	0.352	0.540	0.224	0.009	0.044	0.012	3	3	3
Mercury	Fillets	2000	0.394	0.482	0.202	0.078	0.142	0.021	3	3	3
Mercury	Fillets	2001	0.358	0.486	0.179	0.043	0.030	0.040	3	3	3
Total DDT	Fillets	1992	37.96	19.91	10.68	NA	NA	NA	NA	NA	NA
Total DDT	Fillets	1993	31.57	27.08	12.40	5.77	4.09	1.62	10	9	10
Total DDT	Fillets	1994	43.83	22.66	13.82	2.38	1.33	0.88	3	3	3
Total DDT	Fillets	1995	43.23	23.13	27.47	16.63	2.66	1.88	3	3	3
Total DDT	Fillets	1996	32.07	19.28	9.81	2.53	4.62	2.01	3	3	3
Total DDT	Fillets	1997	46.27	22.47	13.41	3.75	4.80	1.93	3	3	3
Total DDT	Fillets	1998	30.06	12.30	6.37	2.54	4.18	0.41	3	3	3
Total DDT	Fillets	1999	21.40	22.31	11.74	1.33	4.45	1.20	3	3	3
Total DDT	Fillets	2000	18.30	9.94	6.74	2.60	0.40	0.57	3	3	3
Total DDT	Fillets	2001	28.09	12.05	8.20	2.10	1.65	0.15	3	3	3
Total PCB	Fillets	1992	343.21	172.72	62.49	NA	NA	NA	NA	NA	NA
Total PCB	Fillets	1993	197.09	211.58	55.43	29.98	38.88	8.31	10	9	10
Total PCB	Fillets	1994	520.05	249.88	60.23	34.98	32.54	5.75	3	3	3
Total PCB	Fillets	1995	613.88	237.16	107.61	176.48	15.01	5.60	3	3	3
Total PCB	Fillets	1996	285.76	194.68	65.69	29.69	42.59	10.86	3	3	3
Total PCB	Fillets	1997	325.09	206.67	62.78	37.38	30.71	6.69	3	3	3
Total PCB	Fillets	1998	238.43	105.61	39.42	17.85	34.73	2.09	3	3	3
Total PCB	Fillets	1999	141.52	166.19	51.70	4.43	41.14	5.80	3	3	3
Total PCB	Fillets	2000	203.29	117.59	39.46	24.23	9.21	1.98	3	3	3
Total PCB	Fillets	2001	348.60	157.76	51.34	23.52	11.85	2.06	3	3	3
Total CHLOR	Fillets	1992	22.11	6.94	2.91	NA	NA	NA	NA	NA	NA
Total CHLOR	Fillets	1993	15.40	16.20	4.80	2.61	3.97	0.87	10	9	10
Total CHLOR	Fillets	1994	18.78	7.55	2.93	1.71	0.74	0.03	3	3	3
Total CHLOR	Fillets	1995	15.47	5.77	4.63	3.32	0.47	0.19	3	3	3
Total CHLOR	Fillets	1996	11.30	3.67	1.08	0.31	0.47	0.55	3	3	3
Total CHLOR	Fillets	1997	13.93	5.66	1.66	1.27	0.68	0.20	3	3	3
Total CHLOR	Fillets	1998	13.86	5.54	1.29	1.15	1.93	0.09	3	3	3
Total CHLOR	Fillets	1999	9.73	7.12	2.34	0.34	2.79	0.49	3	3	3
Total CHLOR	Fillets	2000	10.03	3.25	1.91	1.97	0.47	0.03	3	3	3
Total CHLOR	Fillets	2001	10.38	2.92	1.74	0.89	0.44	0.09	3	3	3

Table C-11. Flounder Fillet Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Aldrin	Fillets	1992	0	0	0	NA	NA	NA	NA	NA	NA
Aldrin	Fillets	1993	0	0	0	0	0	0	10	9	10
Aldrin	Fillets	1994	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	1995	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	1996	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	1997	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	1998	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	1999	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	2000	0	0	0	0	0	0	3	3	3
Aldrin	Fillets	2001	0	0	0	0	0	0	3	3	3
Dieldrin	Fillets	1992	2.40	1.14	1.04	NA	NA	NA	NA	NA	NA
Dieldrin	Fillets	1993	3.30	2.96	2.02	0.34	0.64	0.17	10	9	10
Dieldrin	Fillets	1994	3.56	1.37	1.33	0.44	0.14	0.05	3	3	3
Dieldrin	Fillets	1995	3.00	1.10	0.00	1.61	0.55	0.00	3	3	3
Dieldrin	Fillets	1996	2.00	1.07	1.03	0.62	0.29	0.04	3	3	3
Dieldrin	Fillets	1997	2.97	1.73	1.08	0.24	0.09	0.11	3	3	3
Dieldrin	Fillets	1998	2.49	1.16	0.68	0.14	0.32	0.03	3	3	3
Dieldrin	Fillets	1999	3.72	4.79	0.74	1.10	1.72	0.18	3	3	3
Dieldrin	Fillets	2000	1.54	0.59	0.43	0.47	0.10	0.07	3	3	3
Dieldrin	Fillets	2001	2.84	1.37	1.08	0.16	0.16	0.04	3	3	3
Endrin	Fillets	1992	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA
Endrin	Fillets	1993	0.04	0.00	0.00	0.04	0.00	0	10	9	10
Endrin	Fillets	1994	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	1995	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	1996	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	1997	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	1998	0.38	0.11	0.00	0.04	0.06	0	3	3	3
Endrin	Fillets	1999	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	2000	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Endrin	Fillets	2001	0.00	0.00	0.00	0.00	0.00	0	3	3	3
Hexachlorobenzene	Fillets	1992	0.74	0.55	0.38	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	Fillets	1993	0.98	0.71	0.65	0.17	0.05	0.10	10	9	10
Hexachlorobenzene	Fillets	1994	0.83	0.59	0.60	0.05	0.04	0.16	3	3	3
Hexachlorobenzene	Fillets	1995	0.71	0.52	0.55	0.04	0.04	0.01	3	3	3
Hexachlorobenzene	Fillets	1996	0.70	0.69	0.76	0.09	0.16	0.04	3	3	3
Hexachlorobenzene	Fillets	1997	0.68	0.63	0.32	0.03	0.10	0.16	3	3	3
Hexachlorobenzene	Fillets	1998	0.66	0.44	0.38	0.02	0.11	0.05	3	3	3
Hexachlorobenzene	Fillets	1999	0.49	0.60	0.53	0.01	0.02	0.05	3	3	3
Hexachlorobenzene	Fillets	2000	0.60	0.49	0.41	0.06	0.02	0.08	3	3	3
Hexachlorobenzene	Fillets	2001	0.93	0.65	0.57	0.08	0.05	0.06	3	3	3

Table C-11. Flounder Fillet Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mirex	Fillets	1992	0.59	0.40	0.17	NA	NA	NA	NA	NA	NA
Mirex	Fillets	1993	0.50	0.49	0.24	0.08	0.10	0.05	10	9	10
Mirex	Fillets	1994	0.72	0.45	0.18	0.13	0.03	0.02	3	3	3
Mirex	Fillets	1995	0.36	0.28	0.16	0.05	0.03	0.08	3	3	3
Mirex	Fillets	1996	0.12	0.11	0.00	0.12	0.11	0.00	3	3	3
Mirex	Fillets	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Mirex	Fillets	1998	0.29	0.21	0.02	0.05	0.07	0.02	3	3	3
Mirex	Fillets	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Mirex	Fillets	2000	0.34	0.28	0.15	0.07	0.02	0.01	3	3	3
Mirex	Fillets	2001	0.00	0.12	0.51	0.00	0.12	0.16	3	3	3
Lindane	Fillets	1992	0.09	0.10	0.08	NA	NA	NA	NA	NA	NA
Lindane	Fillets	1993	0.09	0.00	0.00	0.07	0.00	0.00	10	9	10
Lindane	Fillets	1994	0.12	0.00	0.00	0.02	0.00	0.00	3	3	3
Lindane	Fillets	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Fillets	1996	0.05	0.04	0.00	0.05	0.04	0.00	3	3	3
Lindane	Fillets	1997	0.00	0.11	0.23	0.00	0.06	0.16	3	3	3
Lindane	Fillets	1998	0.15	0.08	0.06	0.01	0.04	0.03	3	3	3
Lindane	Fillets	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Fillets	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Fillets	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3

Table C-12. Flounder Liver Chemistry Data, 1991 – 2001.

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Lead	Liver	1992	2.06	3.89	10.04	NA	NA	NA	NA	NA	NA
Lead	Liver	1993	2.02	2.32	1.14	0.00	0.00	0.00	1	1	1
Lead	Liver	1994	1.42	6.22	4.15	0.26	1.04	0.87	3	3	3
Lead	Liver	1995	0.84	5.94	5.22	0.16	1.69	1.17	3	3	3
Lead	Liver	1996	2.12	4.24	2.58	0.19	0.87	1.57	3	3	3
Lead	Liver	1997	3.06	4.39	1.07	0.64	0.64	0.31	3	3	3
Lead	Liver	1998	2.47	3.82	2.28	0.20	0.37	0.50	3	3	3
Lead	Liver	1999	2.42	6.77	2.04	0.32	3.25	0.39	3	3	3
Lead	Liver	2000	3.65	8.14	1.65	0.57	0.35	0.13	3	3	3
Lead	Liver	2001	2.95	7.41	3.13	0.42	0.42	0.41	3	3	3
Mercury	Liver	1992	0.77	0.50	0.51	NA	NA	NA	NA	NA	NA
Mercury	Liver	1993	0.69	0.42	0.23	0.00	0.00	0.00	1	1	1
Mercury	Liver	1994	0.28	0.54	0.23	0.03	0.16	0.02	3	3	3
Mercury	Liver	1995	0.25	0.39	0.30	0.05	0.02	0.05	3	3	3
Mercury	Liver	1996	0.53	0.55	0.44	0.09	0.03	0.04	3	3	3
Mercury	Liver	1997	0.34	0.34	0.20	0.05	0.07	0.02	3	3	3
Mercury	Liver	1998	0.27	0.39	0.27	0.03	0.04	0.04	3	3	3
Mercury	Liver	1999	0.22	0.65	0.31	0.00	0.12	0.04	3	3	3
Mercury	Liver	2000	0.43	0.63	0.32	0.09	0.28	0.04	3	3	3
Mercury	Liver	2001	0.35	0.47	0.17	0.03	0.07	0.04	3	3	3
Cadmium	Liver	1992	3.04	2.39	1.02	NA	NA	NA	NA	NA	NA
Cadmium	Liver	1993	0.91	0.85	0.42	0.00	0.00	0.00	1	1	1
Cadmium	Liver	1994	0.98	2.16	0.97	0.44	0.89	0.21	3	3	3
Cadmium	Liver	1995	0.44	1.42	0.66	0.07	0.09	0.01	3	3	3
Cadmium	Liver	1996	0.90	3.33	1.09	0.30	0.79	0.20	3	3	3
Cadmium	Liver	1997	2.25	1.04	1.83	1.50	0.10	0.49	3	3	3
Cadmium	Liver	1998	0.66	1.22	1.65	0.10	0.29	0.51	3	3	3
Cadmium	Liver	1999	0.59	3.18	1.64	0.13	1.05	0.47	3	3	3
Cadmium	Liver	2000	1.65	2.68	1.25	0.63	0.72	0.35	3	3	3
Cadmium	Liver	2001	1.53	3.81	1.57	0.45	1.80	0.40	3	3	3
Copper	Liver	1992	35.39	94.05	113.65	NA	NA	NA	NA	NA	NA
Copper	Liver	1993	82.70	50.60	26.40	0.00	0.00	0.00	1	1	1
Copper	Liver	1994	51.81	112.20	121.30	6.84	29.95	5.67	3	3	3
Copper	Liver	1995	55.86	121.40	64.52	22.31	12.89	4.16	3	3	3
Copper	Liver	1996	42.28	125.51	65.55	19.58	34.36	7.73	3	3	3
Copper	Liver	1997	54.92	75.07	87.01	1.71	11.75	17.91	3	3	3
Copper	Liver	1998	42.55	91.60	138.85	9.30	19.57	29.87	3	3	3
Copper	Liver	1999	33.51	129.94	70.88	2.77	18.52	16.26	3	3	3
Copper	Liver	2000	117.67	181.00	100.50	1.45	44.00	29.48	3	3	3
Copper	Liver	2001	51.80	102.80	81.53	7.15	30.79	28.64	3	3	3

Table C-12. Flounder Liver Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Nickel	Liver	1992	0.49	0.94	0.45	NA	NA	NA	NA	NA	NA
Nickel	Liver	1993	0.62	0.65	0.40	0.00	0.00	0.00	1	1	1
Nickel	Liver	1994	0.24	0.60	0.37	0.01	0.04	0.05	3	3	3
Nickel	Liver	1995	0.14	0.44	0.46	0.02	0.11	0.05	3	3	3
Nickel	Liver	1996	0.00	0.17	0.00	0.00	0.10	0.00	3	3	3
Nickel	Liver	1997	0.41	0.38	0.42	0.12	0.03	0.07	3	3	3
Nickel	Liver	1998	0.58	0.64	0.66	0.29	0.07	0.15	3	3	3
Nickel	Liver	1999	0.17	0.58	0.38	0.05	0.14	0.12	3	3	3
Nickel	Liver	2000	0.61	0.63	0.49	0.08	0.04	0.08	3	3	3
Nickel	Liver	2001	0.51	0.77	0.32	0.06	0.05	0.03	3	3	3
Silver	Liver	1992	1.60	5.66	4.92	NA	NA	NA	NA	NA	NA
Silver	Liver	1993	5.46	4.78	1.41	0.00	0.00	0.00	1	1	1
Silver	Liver	1994	3.76	10.11	6.11	0.32	4.11	0.81	3	3	3
Silver	Liver	1995	3.42	9.89	4.55	1.88	2.60	0.39	3	3	3
Silver	Liver	1996	4.47	22.40	4.16	1.53	6.42	0.22	3	3	3
Silver	Liver	1997	5.47	9.17	8.02	0.10	1.36	1.22	3	3	3
Silver	Liver	1998	2.55	7.02	6.90	0.78	1.33	1.93	3	3	3
Silver	Liver	1999	2.37	11.57	4.53	0.20	1.88	0.53	3	3	3
Silver	Liver	2000	6.44	14.99	6.39	0.26	5.26	1.08	3	3	3
Silver	Liver	2001	3.67	9.60	5.57	0.90	3.01	2.13	3	3	3
Zinc	Liver	1992	118.50	158.30	161.70	NA	NA	NA	NA	NA	NA
Zinc	Liver	1993	86.70	85.30	82.30	0.00	0.00	0.00	1	1	1
Zinc	Liver	1994	112.27	154.00	176.67	0.37	9.02	15.59	3	3	3
Zinc	Liver	1995	105.68	151.65	138.12	1.38	6.49	11.65	3	3	3
Zinc	Liver	1996	87.07	120.99	126.28	24.87	5.77	2.45	3	3	3
Zinc	Liver	1997	127.46	141.24	137.22	2.55	6.67	7.10	3	3	3
Zinc	Liver	1998	106.26	113.63	147.75	1.59	10.19	6.29	3	3	3
Zinc	Liver	1999	101.54	108.54	112.21	4.63	7.42	4.36	3	3	3
Zinc	Liver	2000	127.67	139.33	136.67	8.01	3.38	1.86	3	3	3
Zinc	Liver	2001	104.00	120.67	128.67	1.53	9.40	3.28	3	3	3
Total DDT	Liver	1992	194.71	154.56	55.79	NA	NA	NA	NA	NA	NA
Total DDT	Liver	1993	257.91	247.30	69.41	0.00	0.00	0.00	1	1	1
Total DDT	Liver	1994	407.31	264.11	73.53	40.82	47.22	9.79	3	3	3
Total DDT	Liver	1995	866.33	455.23	160.30	76.78	100.00	17.05	3	3	3
Total DDT	Liver	1996	420.00	274.33	104.00	88.49	93.20	11.02	3	3	3
Total DDT	Liver	1997	635.20	342.40	237.37	130.23	56.21	84.22	3	3	3
Total DDT	Liver	1998	381.80	132.43	64.66	99.23	17.18	22.04	3	3	3
Total DDT	Liver	1999	484.47	181.02	80.56	24.62	44.79	26.59	3	3	3
Total DDT	Liver	2000	145.93	94.11	42.44	25.00	7.53	1.61	3	3	3
Total DDT	Liver	2001	232.29	175.27	62.44	22.79	18.21	3.79	3	3	3

Table C-12. Flounder Liver Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Total PCB	Liver	1992	2624.96	1762.19	468.91	NA	NA	NA	NA	NA	NA
Total PCB	Liver	1993	1796.95	1732.91	336.46	0.00	0.00	0.00	1	1	1
Total PCB	Liver	1994	3614.88	2381.50	343.67	595.95	561.77	52.94	3	3	3
Total PCB	Liver	1995	9242.98	6090.63	1249.36	839.25	1747.82	520.59	3	3	3
Total PCB	Liver	1996	3672.27	2600.57	778.10	687.72	463.19	33.60	3	3	3
Total PCB	Liver	1997	4637.97	2629.27	938.43	992.24	727.44	177.43	3	3	3
Total PCB	Liver	1998	3060.53	1256.03	448.36	659.52	246.76	128.00	3	3	3
Total PCB	Liver	1999	2761.07	1270.92	360.31	32.38	326.53	111.33	3	3	3
Total PCB	Liver	2000	1856.14	1140.65	249.87	347.83	55.42	14.50	3	3	3
Total PCB	Liver	2001	3611.60	2512.71	424.33	302.14	68.98	27.54	3	3	3
Total PAH	Liver	1992	q	q	q	q	q	q	q	q	q
Total PAH	Liver	1993	q	q	q	q	q	q	q	q	q
Total PAH	Liver	1994	217.68	243.83	148.17	27.81	72.81	39.85	3	3	3
Total PAH	Liver	1995	240.23	61.53	60.30	40.11	11.62	4.27	3	3	3
Total PAH	Liver	1996	268.63	339.23	284.70	37.22	81.93	38.27	3	3	3
Total PAH	Liver	1997	233.03	140.80	103.89	20.09	3.29	12.26	3	3	3
Total PAH	Liver	1998	76.31	49.42	34.29	13.20	9.08	8.59	3	3	3
Total PAH	Liver	1999	104.65	88.59	126.72	12.60	23.58	58.68	3	3	3
Total PAH	Liver	2000	104.68	131.99	69.35	5.80	53.35	19.45	3	3	3
Total PAH	Liver	2001	141.16	99.38	60.83	5.24	5.40	7.61	3	3	3
Total CHLOR	Liver	1992	201.92	80.20	14.15	NA	NA	NA	NA	NA	NA
Total CHLOR	Liver	1993	122.68	92.20	26.33	0.00	0.00	0.00	1	1	1
Total CHLOR	Liver	1994	207.94	112.99	19.39	22.57	34.53	2.83	3	3	3
Total CHLOR	Liver	1995	283.00	96.00	39.73	42.88	16.29	16.74	3	3	3
Total CHLOR	Liver	1996	169.87	86.33	20.23	36.87	10.99	3.40	3	3	3
Total CHLOR	Liver	1997	243.67	78.67	32.70	54.73	15.94	4.64	3	3	3
Total CHLOR	Liver	1998	176.10	51.33	11.87	54.99	6.82	3.39	3	3	3
Total CHLOR	Liver	1999	225.85	47.80	15.42	10.52	15.29	6.15	3	3	3
Total CHLOR	Liver	2000	95.72	30.35	12.39	25.61	3.57	1.33	3	3	3
Total CHLOR	Liver	2001	91.87	41.35	13.51	6.12	5.42	1.23	3	3	3
Chromium	Liver	1992	0.34	0.07	0.05	NA	NA	NA	NA	NA	NA
Chromium	Liver	1993	0.74	0.92	0.00	0.00	0.00	0.00	1	1	1
Chromium	Liver	1994	0.19	0.14	0.10	0.05	0.00	0.01	3	3	3
Chromium	Liver	1995	0.14	0.09	0.09	0.01	0.02	0.02	3	3	3
Chromium	Liver	1996	0.08	0.12	0.04	0.00	0.03	0.01	3	3	3
Chromium	Liver	1997	0.42	0.30	0.33	0.23	0.29	0.32	3	3	3
Chromium	Liver	1998	0.36	0.19	0.08	0.14	0.04	0.01	3	3	3
Chromium	Liver	1999	0.26	0.16	0.14	0.15	0.03	0.00	3	3	3
Chromium	Liver	2000	0.13	0.13	0.12	0.01	0.02	0.01	3	3	3
Chromium	Liver	2001	0.21	0.24	0.13	0.04	0.09	0.01	3	3	3

Table C-12. Flounder Liver Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Aldrin	Liver	1992	0.00	2.01	1.46	NA	NA	NA	NA	NA	NA
Aldrin	Liver	1993	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
Aldrin	Liver	1994	8.24	11.20	13.01	1.67	1.94	3.65	3	3	3
Aldrin	Liver	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Liver	1996	0.40	0.00	0.00	0.40	0.00	0.00	3	3	3
Aldrin	Liver	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Liver	1998	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Liver	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Liver	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Liver	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Dieldrin	Liver	1992	21.46	10.83	9.51	NA	NA	NA	NA	NA	NA
Dieldrin	Liver	1993	23.37	20.25	11.20	0.00	0.00	0.00	1	1	1
Dieldrin	Liver	1994	30.27	13.82	5.64	4.73	3.11	1.48	3	3	3
Dieldrin	Liver	1995	52.67	0.00	7.00	4.48	0.00	7.00	3	3	3
Dieldrin	Liver	1996	30.00	8.33	9.80	13.58	4.41	1.72	3	3	3
Dieldrin	Liver	1997	36.67	18.33	14.33	7.22	3.33	1.45	3	3	3
Dieldrin	Liver	1998	24.12	9.92	4.89	3.50	0.67	1.58	3	3	3
Dieldrin	Liver	1999	38.87	18.49	6.76	14.84	4.38	3.36	3	3	3
Dieldrin	Liver	2000	12.82	4.37	3.99	3.27	0.77	0.22	3	3	3
Dieldrin	Liver	2001	19.96	14.98	6.45	1.40	3.06	0.34	3	3	3
Endrin	Liver	1992	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA
Endrin	Liver	1993	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
Endrin	Liver	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	1996	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	1998	5.51	1.75	0.00	0.86	0.14	0.00	3	3	3
Endrin	Liver	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Liver	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Hexachlorobenzene	Liver	1992	5.49	4.22	2.51	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	Liver	1993	6.60	4.70	4.78	0.00	0.00	0.00	1	1	1
Hexachlorobenzene	Liver	1994	9.02	7.03	5.26	1.05	0.77	0.63	3	3	3
Hexachlorobenzene	Liver	1995	6.70	3.63	2.27	0.44	1.86	2.27	3	3	3
Hexachlorobenzene	Liver	1996	5.93	3.13	0.00	3.20	3.13	0.00	3	3	3
Hexachlorobenzene	Liver	1997	7.47	6.27	5.20	0.64	1.17	0.35	3	3	3
Hexachlorobenzene	Liver	1998	6.53	4.69	3.73	0.69	0.78	1.63	3	3	3
Hexachlorobenzene	Liver	1999	6.53	3.84	3.49	0.25	0.27	1.20	3	3	3
Hexachlorobenzene	Liver	2000	4.48	3.50	2.58	0.53	0.24	0.58	3	3	3
Hexachlorobenzene	Liver	2001	5.06	5.36	3.55	0.24	0.17	0.37	3	3	3

Table C-12. Flounder Liver Chemistry Data, 1991 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mirex	Liver	1992	0.57	1.45	1.04	NA	NA	NA	NA	NA	NA
Mirex	Liver	1993	2.98	4.25	1.47	0.00	0.00	0.00	1	1	1
Mirex	Liver	1994	5.87	4.44	0.00	1.65	0.95	0.00	3	3	3
Mirex	Liver	1995	4.90	3.80	1.39	0.29	0.35	0.89	3	3	3
Mirex	Liver	1996	1.80	0.00	0.00	1.80	0.00	0.00	3	3	3
Mirex	Liver	1997	11.77	6.77	3.40	2.62	0.15	0.21	3	3	3
Mirex	Liver	1998	3.49	2.87	0.46	0.60	1.52	0.23	3	3	3
Mirex	Liver	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Mirex	Liver	2000	2.87	2.33	0.98	0.61	0.02	0.11	3	3	3
Mirex	Liver	2001	4.07	3.96	1.43	0.18	0.21	0.12	3	3	3
Lindane	Liver	1992	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA
Lindane	Liver	1993	0.00	0.00	0.00	0.00	0.00	0.00	1	1	1
Lindane	Liver	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Liver	1995	1.40	0.97	0.00	0.15	0.49	0.00	3	3	3
Lindane	Liver	1996	0.87	0.00	0.00	0.87	0.00	0.00	3	3	3
Lindane	Liver	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Liver	1998	0.67	0.00	0.13	0.09	0.00	0.07	3	3	3
Lindane	Liver	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Liver	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Liver	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3

Table C-13. Lobster Meat Chemistry Data, 1992 – 2001.

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mercury	Meat	1992	1.23	0.85	0.92	0.30	0.16	0.27	3	3	3
Mercury	Meat	1993	0.84	1.01	0.66	0.01	0.31	0.06	3	2	10
Mercury	Meat	1994	0.83	1.04	0.50	0.07	0.31	0.06	3	2	3
Mercury	Meat	1995	0.61	1.09	0.54	0.30	0.26	0.05	3	3	3
Mercury	Meat	1996	0.86	1.07	0.94	0.07	0.22	0.10	3	3	3
Mercury	Meat	1997	1.47	1.12	0.98	0.11	0.08	0.07	3	3	3
Mercury	Meat	1998	0.77	0.99	0.60	0.03	0.06	0.05	3	3	3
Mercury	Meat	1999	1.00	1.04	0.71	0.15	0.17	0.07	3	3	3
Mercury	Meat	2000	0.75	0.92	0.66	0.12	0.10	0.14	3	3	3
Mercury	Meat	2001	0.87	1.02	0.53	0.04	0.12	0.05	3	3	3
Total DDT	Meat	1992	14.00	8.98	17.83	1.27	1.17	6.73	3	3	3
Total DDT	Meat	1993	27.29	8.67	9.57	10.37	1.63	1.24	3	2	10
Total DDT	Meat	1994	23.83	21.93	10.30	1.79	4.36	1.38	3	2	3
Total DDT	Meat	1995	13.62	14.34	13.22	2.36	0.79	2.55	3	3	3
Total DDT	Meat	1996	25.98	18.53	13.01	3.90	2.81	1.21	3	3	3
Total DDT	Meat	1997	46.34	20.90	14.61	23.02	6.43	1.01	3	3	3
Total DDT	Meat	1998	11.37	8.91	9.69	0.62	1.42	1.39	3	3	3
Total DDT	Meat	1999	15.98	7.36	9.32	1.06	0.10	0.83	3	3	3
Total DDT	Meat	2000	5.08	4.80	3.99	0.73	0.65	0.83	3	3	3
Total DDT	Meat	2001	7.56	6.94	6.40	1.41	0.66	0.30	3	3	3
Total PCB	Meat	1992	99.61	60.60	87.27	8.72	11.86	32.85	3	3	3
Total PCB	Meat	1993	150.56	62.36	62.66	58.57	3.48	15.49	3	2	10
Total PCB	Meat	1994	137.15	177.93	66.80	13.44	66.57	15.81	3	2	3
Total PCB	Meat	1995	122.31	118.76	76.08	22.28	9.56	12.45	3	3	3
Total PCB	Meat	1996	220.41	148.09	68.88	27.17	2.00	5.82	3	3	3
Total PCB	Meat	1997	311.83	157.62	77.55	141.59	21.88	1.47	3	3	3
Total PCB	Meat	1998	112.96	71.83	54.90	10.94	11.01	5.35	3	3	3
Total PCB	Meat	1999	154.22	73.73	52.91	12.97	3.18	4.50	3	3	3
Total PCB	Meat	2000	127.41	64.00	37.98	69.13	6.47	4.82	3	3	3
Total PCB	Meat	2001	74.26	65.51	39.90	16.98	6.86	2.50	3	3	3
Total CHLOR	Meat	1992	3.73	1.49	1.57	0.40	0.16	0.05	3	3	3
Total CHLOR	Meat	1993	6.07	1.54	1.82	1.15	0.07	0.60	3	2	10
Total CHLOR	Meat	1994	5.19	5.13	1.36	0.67	1.55	0.19	3	2	3
Total CHLOR	Meat	1995	0.39	0.59	0.06	0.20	0.21	0.05	3	3	3
Total CHLOR	Meat	1996	5.63	3.80	1.52	0.70	0.32	0.06	3	3	3
Total CHLOR	Meat	1997	6.41	3.59	1.83	1.32	1.07	0.29	3	3	3
Total CHLOR	Meat	1998	4.16	2.95	1.68	0.47	0.70	0.04	3	3	3
Total CHLOR	Meat	1999	5.47	2.30	1.49	0.09	0.23	0.04	3	3	3
Total CHLOR	Meat	2000	2.48	1.41	0.94	0.26	0.12	0.11	3	3	3
Total CHLOR	Meat	2001	2.13	1.14	0.43	0.66	0.13	0.06	3	3	3

Table C-13. Lobster Meat Chemistry Data, 1992 – 2001.(Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Aldrin	Meat	1992	0	0	0	0	0	0	3	3	3
Aldrin	Meat	1993	0	0	0.236	0	0	0.24	3	2	10
Aldrin	Meat	1994	0.65	0.42	0.50	0.21	0.02	0.02	3	2	3
Aldrin	Meat	1995	0	0	0	0	0	0	3	3	3
Aldrin	Meat	1996	0	0	0	0	0	0	3	3	3
Aldrin	Meat	1997	0	0	0.61	0	0	0.50	3	3	3
Aldrin	Meat	1998	0	0	0	0	0	0	3	3	3
Aldrin	Meat	1999	0	0	0	0	0	0	3	3	3
Aldrin	Meat	2000	0	0	0	0	0	0	3	3	3
Aldrin	Meat	2001	0	0	0	0	0	0	3	3	3
Dieldrin	Meat	1992	5.51	3.95	3.52	0.33	0.21	0.45	3	3	3
Dieldrin	Meat	1993	9.02	4.66	3.52	1.08	0.44	0.21	3	2	10
Dieldrin	Meat	1994	11.52	6.43	3.73	4.07	1.40	0.32	3	2	3
Dieldrin	Meat	1995	6.50	5.77	3.93	0.15	0.23	0.33	3	3	3
Dieldrin	Meat	1996	8.53	9.50	3.77	0.74	1.83	0.32	3	3	3
Dieldrin	Meat	1997	6.80	6.27	4.23	0.76	1.07	0.34	3	3	3
Dieldrin	Meat	1998	3.75	3.81	2.38	0.25	0.06	0.09	3	3	3
Dieldrin	Meat	1999	6.79	5.15	4.26	0.06	0.15	0.17	3	3	3
Dieldrin	Meat	2000	3.19	2.95	2.27	0.44	0.22	0.18	3	3	3
Dieldrin	Meat	2001	3.67	3.92	2.83	0.29	0.15	0.15	3	3	3
Endrin	Meat	1992	0	0	0	0	0	0	3	3	3
Endrin	Meat	1993	0	0	0	0	0	0	3	2	10
Endrin	Meat	1994	0	0	0	0	0	0	3	2	3
Endrin	Meat	1995	0	0	0	0	0	0	3	3	3
Endrin	Meat	1996	0	0	0	0	0	0	3	3	3
Endrin	Meat	1997	0	0.4	0.56	0	0.4	0.08386	3	3	3
Endrin	Meat	1998	0	0	0	0	0	0	3	3	3
Endrin	Meat	1999	0	0	0	0	0	0	3	3	3
Endrin	Meat	2000	0	0	0	0	0	0	3	3	3
Endrin	Meat	2001	0	0	0	0	0	0	3	3	3
Hexachlorobenzene	Meat	1992	0.36	0.37	0.35	0.04	0.08	0.07	3	3	3
Hexachlorobenzene	Meat	1993	0.47	0.39	0.31	0.04	0.10	0.03	3	2	10
Hexachlorobenzene	Meat	1994	0.79	0.74	0.63	0.08	0.04	0.02	3	2	3
Hexachlorobenzene	Meat	1995	0.00	0.21	0.25	0.00	0.21	0.25	3	3	3
Hexachlorobenzene	Meat	1996	0.59	1.00	0.52	0.05	0.10	0.08	3	3	3
Hexachlorobenzene	Meat	1997	0.42	0.63	0.53	0.06	0.08	0.06	3	3	3
Hexachlorobenzene	Meat	1998	0.42	0.69	0.53	0.02	0.13	0.01	3	3	3
Hexachlorobenzene	Meat	1999	0.47	0.46	0.33	0.02	0.01	0.03	3	3	3
Hexachlorobenzene	Meat	2000	4.15	0.47	0.17	3.13	0.04	0.17	3	3	3
Hexachlorobenzene	Meat	2001	0.33	0.36	0.34	0.02	0.01	0.02	3	3	3

Table C-13. Lobster Meat Chemistry Data, 1992 – 2001.(Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mirex	Meat	1992	0.27	0.24	0.29	0.06	0.02	0.11	3	3	3
Mirex	Meat	1993	0.39	0.27	0.28	0.06	0.05	0.05	3	2	10
Mirex	Meat	1994	0.26	0.16	0.29	0.05	0.16	0.05	3	2	3
Mirex	Meat	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Mirex	Meat	1996	0.27	0.36	0.23	0.05	0.06	0.03	3	3	3
Mirex	Meat	1997	0.32	0.00	0.35	0.32	0.00	0.06	3	3	3
Mirex	Meat	1998	0.00	0.15	0.10	0.00	0.07	0.05	3	3	3
Mirex	Meat	1999	0.56	0.31	0.23	0.10	0.04	0.02	3	3	3
Mirex	Meat	2000	0.22	0.04	0.10	0.05	0.04	0.05	3	3	3
Mirex	Meat	2001	0.12	0.08	0.00	0.06	0.04	0.00	3	3	3
Lindane	Meat	1992	0.80	0.00	0.00	0.80	0.00	0.00	3	3	3
Lindane	Meat	1993	4.78	4.93	4.70	0.44	0.30	0.97	3	2	10
Lindane	Meat	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	2	3
Lindane	Meat	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Meat	1996	2.00	0.73	0.00	2.00	0.73	0.00	3	3	3
Lindane	Meat	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Meat	1998	0.00	0.87	0.89	0.00	0.87	0.89	3	3	3
Lindane	Meat	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Lindane	Meat	2000	1.06	0.00	0.87	1.06	0.00	0.87	3	3	3
Lindane	Meat	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3

Table C-14. Lobster Hepatopancreas Chemistry Data, 1992 – 2001.

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Lead	Hepatopancreas	1992	0.37	0.28	4.49	0.07	0.10	4.21	3	3	3
Lead	Hepatopancreas	1993	0.33	0.38	0.10	0.10	0.12	0.03	3	2	10
Lead	Hepatopancreas	1994	0.43	0.54	0.09	0.03	0.07	0.02	3	2	3
Lead	Hepatopancreas	1995	0.26	0.30	0.04	0.04	0.04	0.01	3	3	3
Lead	Hepatopancreas	1996	0.35	0.41	0.07	0.08	0.12	0.02	3	3	3
Lead	Hepatopancreas	1997	0.39	0.30	0.04	0.05	0.05	0.02	3	3	3
Lead	Hepatopancreas	1998	0.23	0.63	0.30	0.04	0.07	0.01	3	3	3
Lead	Hepatopancreas	1999	0.52	0.42	0.25	0.03	0.08	0.03	3	3	3
Lead	Hepatopancreas	2000	0.30	0.32	0.36	0.02	0.02	0.04	3	3	3
Lead	Hepatopancreas	2001	0.39	0.42	0.37	0.06	0.04	0.01	3	3	3
Mercury	Hepatopancreas	1992	0.24	0.54	0.42	0.03	0.27	0.15	3	3	3
Mercury	Hepatopancreas	1993	0.30	0.24	0.19	0.06	0.04	0.04	3	2	10
Mercury	Hepatopancreas	1994	0.27	0.40	0.24	0.01	0.06	0.02	3	2	3
Mercury	Hepatopancreas	1995	0.35	0.34	0.27	0.03	0.05	0.07	3	3	3
Mercury	Hepatopancreas	1996	0.20	0.26	0.24	0.03	0.03	0.02	3	3	3
Mercury	Hepatopancreas	1997	0.43	0.44	0.40	0.08	0.04	0.01	3	3	3
Mercury	Hepatopancreas	1998	0.26	0.36	0.24	0.01	0.01	0.02	3	3	3
Mercury	Hepatopancreas	1999	0.30	0.53	0.32	0.02	0.08	0.02	3	3	3
Mercury	Hepatopancreas	2000	0.27	0.47	0.23	0.03	0.13	0.03	3	3	3
Mercury	Hepatopancreas	2001	0.25	0.31	0.24	0.04	0.03	0.02	3	3	3
Cadmium	Hepatopancreas	1992	6.15	12.97	27.12	2.65	2.60	11.22	3	3	3
Cadmium	Hepatopancreas	1993	3.33	13.26	10.92	0.68	4.24	1.62	3	2	10
Cadmium	Hepatopancreas	1994	8.31	12.30	16.14	1.63	2.31	3.56	3	2	3
Cadmium	Hepatopancreas	1995	5.29	5.32	7.94	0.25	0.59	0.22	3	3	3
Cadmium	Hepatopancreas	1996	3.32	9.30	14.44	0.33	1.20	0.47	3	3	3
Cadmium	Hepatopancreas	1997	6.98	11.89	13.71	1.06	1.89	0.98	3	3	3
Cadmium	Hepatopancreas	1998	3.98	17.32	7.56	0.95	3.60	0.36	3	3	3
Cadmium	Hepatopancreas	1999	4.58	15.53	12.42	0.35	3.85	1.51	3	3	3
Cadmium	Hepatopancreas	2000	6.41	11.00	9.44	0.44	0.75	2.01	3	3	3
Cadmium	Hepatopancreas	2001	8.10	15.50	12.70	1.12	0.45	0.29	3	3	3
Chromium	Hepatopancreas	1992	2.91	3.36	2.09	0.38	1.06	0.27	3	3	3
Chromium	Hepatopancreas	1993	1.46	1.27	1.09	0.05	0.06	0.11	3	2	10
Chromium	Hepatopancreas	1994	0.25	0.49	0.19	0.03	0.29	0.04	3	2	3
Chromium	Hepatopancreas	1995	0.24	0.18	0.09	0.04	0.03	0.03	3	3	3
Chromium	Hepatopancreas	1996	0.15	0.12	0.08	0.03	0.01	0.01	3	3	3
Chromium	Hepatopancreas	1997	0.26	0.30	0.10	0.02	0.07	0.02	3	3	3
Chromium	Hepatopancreas	1998	0.09	0.23	0.15	0.02	0.02	0.03	3	3	3
Chromium	Hepatopancreas	1999	0.19	0.17	0.22	0.02	0.06	0.08	3	3	3
Chromium	Hepatopancreas	2000	0.20	0.29	0.14	0.06	0.03	0.01	3	3	3
Chromium	Hepatopancreas	2001	0.31	0.28	0.25	0.03	0.01	0.03	3	3	3

Table C-14. Lobster Hepatopancreas Chemistry Data, 1992 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Copper	Hepatopancreas	1992	261.37	440.77	1014.40	193.14	372.74	496.44	3	3	3
Copper	Hepatopancreas	1993	642.00	309.00	463.51	162.25	178.00	126.55	3	2	10
Copper	Hepatopancreas	1994	537.00	557.51	283.67	93.83	63.51	88.99	3	2	3
Copper	Hepatopancreas	1995	324.73	314.35	125.24	60.19	35.15	33.84	3	3	3
Copper	Hepatopancreas	1996	485.11	371.03	166.57	98.85	70.86	43.40	3	3	3
Copper	Hepatopancreas	1997	641.20	513.48	294.48	106.74	202.59	40.56	3	3	3
Copper	Hepatopancreas	1998	612.43	610.80	572.67	42.08	89.83	53.69	3	3	3
Copper	Hepatopancreas	1999	895.20	830.47	477.97	16.91	103.16	71.31	3	3	3
Copper	Hepatopancreas	2000	454.67	693.00	422.00	59.43	92.83	109.62	3	3	3
Copper	Hepatopancreas	2001	639.67	778.00	521.33	165.96	62.85	127.39	3	3	3
Nickel	Hepatopancreas	1992	0.80	1.60	0.95	0.42	0.99	0.33	3	3	3
Nickel	Hepatopancreas	1993	0.65	0.47	1.31	0.19	0.03	0.21	3	2	10
Nickel	Hepatopancreas	1994	0.44	0.97	1.19	0.05	0.20	0.07	3	2	3
Nickel	Hepatopancreas	1995	0.42	0.43	0.45	0.09	0.04	0.04	3	3	3
Nickel	Hepatopancreas	1996	0.13	0.39	0.68	0.02	0.02	0.04	3	3	3
Nickel	Hepatopancreas	1997	0.57	1.26	0.89	0.07	0.23	0.24	3	3	3
Nickel	Hepatopancreas	1998	0.36	1.21	0.73	0.01	0.03	0.11	3	3	3
Nickel	Hepatopancreas	1999	0.65	0.69	1.33	0.07	0.03	0.16	3	3	3
Nickel	Hepatopancreas	2000	0.48	1.27	0.73	0.08	0.33	0.09	3	3	3
Nickel	Hepatopancreas	2001	0.51	0.73	0.79	0.02	0.03	0.06	3	3	3
Silver	Hepatopancreas	1992	5.07	3.52	3.53	2.44	0.20	1.08	3	3	3
Silver	Hepatopancreas	1993	6.53	2.43	6.35	0.47	0.75	2.01	3	2	10
Silver	Hepatopancreas	1994	10.74	7.47	14.63	3.11	2.21	3.00	3	2	3
Silver	Hepatopancreas	1995	27.55	21.99	8.10	1.95	3.37	2.35	3	3	3
Silver	Hepatopancreas	1996	32.89	21.28	15.25	9.31	3.63	4.06	3	3	3
Silver	Hepatopancreas	1997	6.52	13.23	9.42	0.58	2.41	2.33	3	3	3
Silver	Hepatopancreas	1998	30.38	29.90	29.75	2.10	4.66	4.28	3	3	3
Silver	Hepatopancreas	1999	47.03	47.84	32.24	4.28	9.05	2.37	3	3	3
Silver	Hepatopancreas	2000	18.73	34.37	20.01	2.12	6.36	7.31	3	3	3
Silver	Hepatopancreas	2001	29.23	39.57	24.17	8.49	3.56	4.57	3	3	3
Zinc	Hepatopancreas	1992	76.60	110.77	100.63	15.35	24.93	31.79	3	3	3
Zinc	Hepatopancreas	1993	74.80	83.55	49.73	34.54	33.45	6.90	3	2	10
Zinc	Hepatopancreas	1994	79.67	97.44	82.70	5.57	6.44	2.91	3	2	3
Zinc	Hepatopancreas	1995	43.94	51.60	54.44	2.24	3.18	1.30	3	3	3
Zinc	Hepatopancreas	1996	53.82	73.86	50.33	9.46	11.34	5.12	3	3	3
Zinc	Hepatopancreas	1997	84.09	80.33	57.92	23.69	13.78	3.42	3	3	3
Zinc	Hepatopancreas	1998	82.94	112.99	89.77	16.24	38.68	7.74	3	3	3
Zinc	Hepatopancreas	1999	88.07	47.37	75.73	7.41	5.39	3.06	3	3	3
Zinc	Hepatopancreas	2000	59.33	75.47	129.73	2.60	6.48	25.20	3	3	3
Zinc	Hepatopancreas	2001	74.63	104.83	94.67	8.01	14.44	10.16	3	3	3

Table C-14. Lobster Hepatopancreas Chemistry Data, 1992 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Total DDT	Hepatopancreas	1992	609.88	475.34	207.87	232.06	165.46	48.12	3	3	3
Total DDT	Hepatopancreas	1993	639.71	288.25	285.43	27.37	70.55	33.18	3	2	10
Total DDT	Hepatopancreas	1994	404.87	308.72	165.56	49.21	118.94	12.76	3	2	3
Total DDT	Hepatopancreas	1995	670.50	929.90	745.93	155.45	29.58	92.05	3	3	3
Total DDT	Hepatopancreas	1996	1251.00	1025.80	702.17	68.59	30.50	117.10	3	3	3
Total DDT	Hepatopancreas	1997	1093.03	1088.70	788.87	644.25	359.71	142.08	3	3	3
Total DDT	Hepatopancreas	1998	1105.64	1033.51	761.26	26.17	74.84	23.37	3	3	3
Total DDT	Hepatopancreas	1999	1297.83	745.89	559.12	28.87	66.67	33.46	3	3	3
Total DDT	Hepatopancreas	2000	445.32	312.76	378.70	146.37	119.42	125.67	3	3	3
Total DDT	Hepatopancreas	2001	813.52	431.73	401.20	165.50	84.69	33.18	3	3	3
Total PCB	Hepatopancreas	1992	3253.52	2046.37	1205.90	509.59	356.67	394.22	3	3	3
Total PCB	Hepatopancreas	1993	2846.44	2254.62	2140.82	281.20	726.82	683.69	3	2	10
Total PCB	Hepatopancreas	1994	2482.48	2452.34	657.09	318.88	1527.20	60.81	3	2	3
Total PCB	Hepatopancreas	1995	4524.95	5234.00	2779.17	1354.20	342.50	305.36	3	3	3
Total PCB	Hepatopancreas	1996	7225.17	5582.57	2465.19	677.31	579.67	298.96	3	3	3
Total PCB	Hepatopancreas	1997	7109.33	4935.30	2477.73	2612.85	285.52	225.11	3	3	3
Total PCB	Hepatopancreas	1998	7722.70	6003.53	3409.83	178.89	240.69	154.81	3	3	3
Total PCB	Hepatopancreas	1999	10255.41	6353.51	3132.17	125.72	452.04	241.29	3	3	3
Total PCB	Hepatopancreas	2000	7578.50	2964.92	1920.72	4057.85	889.20	607.35	3	3	3
Total PCB	Hepatopancreas	2001	8018.57	3696.13	2029.80	2377.42	697.13	102.56	3	3	3
Total PAH	Hepatopancreas	1992	29707.65	4060.10	4055.21	4885.54	272.53	731.12	3	3	3
Total PAH	Hepatopancreas	1993	11611.24	5782.40	3082.65	5639.79	2199.59	1001.65	3	2	10
Total PAH	Hepatopancreas	1994	16577.81	4602.39	786.94	2921.49	280.45	75.12	3	2	3
Total PAH	Hepatopancreas	1995	5386.28	6576.33	4321.43	716.50	669.94	836.64	3	3	3
Total PAH	Hepatopancreas	1996	12816.17	6243.43	2372.37	2478.38	1642.45	701.95	3	3	3
Total PAH	Hepatopancreas	1997	8424.20	3059.50	q	5170.05	1153.71	q	3	3	q
Total PAH	Hepatopancreas	1998	7413.13	2429.48	1478.32	500.61	249.53	84.87	3	3	3
Total PAH	Hepatopancreas	1999	7597.25	1562.97	1309.69	810.43	165.05	78.11	3	3	3
Total PAH	Hepatopancreas	2000	13051.28	2726.61	1364.43	2788.12	850.82	131.47	3	3	3
Total PAH	Hepatopancreas	2001	10733.90	2196.43	1410.87	1543.21	269.82	77.40	3	3	3
Total CHLOR	Hepatopancreas	1992	196.70	50.75	18.63	106.73	22.64	8.93	3	3	3
Total CHLOR	Hepatopancreas	1993	191.99	46.52	73.87	5.25	4.62	25.57	3	2	10
Total CHLOR	Hepatopancreas	1994	116.33	21.42	13.21	19.70	6.91	2.08	3	2	3
Total CHLOR	Hepatopancreas	1995	38.67	73.67	65.00	13.57	37.02	22.72	3	3	3
Total CHLOR	Hepatopancreas	1996	199.00	156.67	81.20	16.26	22.88	19.00	3	3	3
Total CHLOR	Hepatopancreas	1997	137.63	57.87	41.59	24.88	11.20	6.95	3	3	3
Total CHLOR	Hepatopancreas	1998	233.81	93.87	42.02	4.66	6.03	2.84	3	3	3
Total CHLOR	Hepatopancreas	1999	138.04	57.94	31.85	14.51	6.75	3.22	3	3	3
Total CHLOR	Hepatopancreas	2000	89.25	37.76	33.24	25.43	15.05	2.22	3	3	3
Total CHLOR	Hepatopancreas	2001	97.12	37.14	22.29	6.85	5.45	2.38	3	3	3

Table C-14. Lobster Hepatopancreas Chemistry Data, 1992 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Aldrin	Hepatopancreas	1992	2.53	0.00	0.00	2.53	0.00	0.00	3	3	3
Aldrin	Hepatopancreas	1993	0.00	0.00	0.00	0.00	0.00	0.00	3	2	10
Aldrin	Hepatopancreas	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	2	3
Aldrin	Hepatopancreas	1995	0.00	2.80	0.00	0.00	1.49	0.00	3	3	3
Aldrin	Hepatopancreas	1996	5.53	2.37	1.00	0.90	1.19	0.50	3	3	3
Aldrin	Hepatopancreas	1997	1.50	0.00	0.00	0.76	0.00	0.00	3	3	3
Aldrin	Hepatopancreas	1998	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Hepatopancreas	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Hepatopancreas	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Aldrin	Hepatopancreas	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Dieldrin	Hepatopancreas	1992	65.73	27.01	13.41	23.60	9.97	4.75	3	3	3
Dieldrin	Hepatopancreas	1993	124.70	56.60	39.79	25.34	10.59	5.41	3	2	10
Dieldrin	Hepatopancreas	1994	40.75	17.08	9.41	13.69	7.30	2.83	3	2	3
Dieldrin	Hepatopancreas	1995	52.67	106.67	30.00	26.84	11.79	15.04	3	3	3
Dieldrin	Hepatopancreas	1996	126.67	143.33	50.33	14.53	43.33	6.01	3	3	3
Dieldrin	Hepatopancreas	1997	46.00	50.67	32.67	4.16	12.13	2.19	3	3	3
Dieldrin	Hepatopancreas	1998	44.56	45.11	25.85	3.86	3.71	0.83	3	3	3
Dieldrin	Hepatopancreas	1999	59.63	51.66	28.13	3.69	6.31	1.94	3	3	3
Dieldrin	Hepatopancreas	2000	61.94	35.54	25.50	12.64	8.05	2.27	3	3	3
Dieldrin	Hepatopancreas	2001	48.10	27.09	20.55	8.06	6.65	1.25	3	3	3
Endrin	Hepatopancreas	1992	0.00	0.00	11.80	0.00	0.00	11.80	3	3	3
Endrin	Hepatopancreas	1993	0.00	0.00	0.00	0.00	0.00	0.00	3	2	10
Endrin	Hepatopancreas	1994	0.00	0.00	6.45	0.00	0.00	3.84	3	2	3
Endrin	Hepatopancreas	1995	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	1996	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	1997	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	1998	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	1999	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	2000	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Endrin	Hepatopancreas	2001	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Hexachlorobenzene	Hepatopancreas	1992	11.79	7.64	40.62	4.80	1.50	36.18	3	3	3
Hexachlorobenzene	Hepatopancreas	1993	9.03	8.26	8.83	1.66	1.39	1.66	3	2	10
Hexachlorobenzene	Hepatopancreas	1994	7.03	5.46	26.60	0.77	3.08	13.46	3	2	3
Hexachlorobenzene	Hepatopancreas	1995	10.13	11.67	8.80	0.75	0.33	0.90	3	3	3
Hexachlorobenzene	Hepatopancreas	1996	17.00	17.33	13.67	1.00	0.33	1.20	3	3	3
Hexachlorobenzene	Hepatopancreas	1997	9.13	13.27	11.30	0.93	3.37	0.91	3	3	3
Hexachlorobenzene	Hepatopancreas	1998	7.75	9.79	6.97	2.15	0.36	0.02	3	3	3
Hexachlorobenzene	Hepatopancreas	1999	6.97	8.81	7.04	0.34	0.67	0.38	3	3	3
Hexachlorobenzene	Hepatopancreas	2000	14.03	11.17	9.83	5.93	2.71	0.95	2	3	3
Hexachlorobenzene	Hepatopancreas	2001	7.45	7.25	8.18	3.98	1.35	0.51	3	3	3

Table C-14. Lobster Hepatopancreas Chemistry Data, 1992 – 2001. (Continued)

			Means			SE			N		
Parameter	**Tissue**	**Year**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**	**DIF(1)**	**OS(4)**	**ECCB(5)**
Mirex	Hepatopancreas	1992	8.39	6.52	2.68	1.25	3.27	1.99	3	3	3
Mirex	Hepatopancreas	1993	6.27	7.63	6.10	0.19	2.12	1.18	3	2	10
Mirex	Hepatopancreas	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	2	3
Mirex	Hepatopancreas	1995	7.05	8.57	6.10	0.73	0.59	0.51	3	3	3
Mirex	Hepatopancreas	1996	7.90	10.37	8.03	0.20	0.63	0.69	3	3	3
Mirex	Hepatopancreas	1997	8.00	10.37	7.83	1.00	2.89	1.06	3	3	3
Mirex	Hepatopancreas	1998	0.00	0.00	0.00	0.00	0.00	0.00	3	3	3
Mirex	Hepatopancreas	1999	11.43	9.76	6.92	3.59	0.54	0.37	3	3	3
Mirex	Hepatopancreas	2000	7.55	3.75	4.02	2.92	0.89	0.81	3	3	3
Mirex	Hepatopancreas	2001	6.40	5.23	5.36	1.26	1.00	0.51	3	3	3
Lindane	Hepatopancreas	1992	1.10	0.79	0.00	1.10	0.79	0.00	3	3	3
Lindane	Hepatopancreas	1993	6.86	3.84	10.16	0.48	3.84	1.93	3	2	10
Lindane	Hepatopancreas	1994	0.00	0.00	0.00	0.00	0.00	0.00	3	2	3
Lindane	Hepatopancreas	1995	5.50	5.13	2.67	0.26	0.90	0.32	3	3	3
Lindane	Hepatopancreas	1996	7.10	6.13	0.00	3.63	0.69	0.00	3	3	3
Lindane	Hepatopancreas	1997	3.27	2.33	0.00	0.52	0.12	0.00	3	3	3
Lindane	Hepatopancreas	1998	4.09	2.99	3.61	0.31	0.10	0.41	3	3	3
Lindane	Hepatopancreas	1999	0.00	1.80	2.52	0.00	0.90	0.04	3	3	3
Lindane	Hepatopancreas	2000	s	s	1.53	s	s	1.01	s	s	3
Lindane	Hepatopancreas	2001	4.06	3.03	2.45	0.31	0.49	0.55	3	3	3

Table C-15. Mussel Chemistry Data, 1991 – 2001.

		Means							SE							N						
Parameter	Year	Gloucester(7)	Sandwich(8)	Rockport(RP)	BIH(6)	DI(1)	OS(4)	CCB(9)	Glouc.	Sand.	RP	BIH	DI	OS	CCB	Glouc.	Sand.	RP	BIH	DI	OS	CCB
Lead	1991	6.52	NA	NA	6.40	5.85	NA	NA	0.77	NA	NA	0.83	0.30	NA	NA	5	NA	NA	5	8	NA	NA
Lead	1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1993	5.12	NA	NA	NA	5.88	3.71	NA	0.41	NA	NA	NA	1.40	0.30	NA	5	NA	NA	NA	5	8	NA
Lead	1994	8.60	NA	NA	6.67	9.13	4.80	NA	2.61	NA	NA	1.29	1.15	0.22	NA	3	NA	NA	3	4	8	NA
Lead	1995	6.05	NA	NA	8.53	8.40	NA	NA	0.36	NA	NA	0.51	0.76	NA	NA	5	NA	NA	5	5	NA	NA
Lead	1996	NA	2.86	NA	9.36	6.27	1.57	NA	NA	0.73	NA	0.98	0.58	0.14	NA	NA	5	NA	3	5	5	NA
Lead	1997	NA	2.44	NA	9.89	7.83	2.09	NA	NA	0.34	NA	1.61	0.49	0.09	NA	NA	5	NA	5	5	5	NA
Lead	1998	NA	2.85	NA	4.09	3.47	2.14	1.95	NA	0.35	NA	0.22	0.73	0.17	0.15	NA	5	NA	5	5	8	8
Lead	1999	NA	1.56	NA	4.69	NA	1.09	1.26	NA	0.15	NA	0.36	NA	0.08	0.09	NA	5	NA	5	NA	8	8
Lead	2000	NA	NA	1.52	13.21	6.93	0.94	NA	NA	NA	0.06	0.97	0.95	0.06	NA	NA	NA	5	5	5	8	NA
Lead	2001	NA	NA	1.91	10.06	3.50	1.86	1.75	NA	NA	0.22	0.90	0.27	0.10	0.20	NA	NA	5	5	5	8	8
Mercury	1991	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	1993	0.394	NA	NA	NA	0.183	0.099	NA	0.074	NA	NA	NA	0.012	0.005	NA	5	NA	NA	NA	5	8	NA
Mercury	1994	0.170	NA	NA	0.163	0.208	0.131	NA	0.087	NA	NA	0.004	0.037	0.013	NA	3	NA	NA	3	4	8	NA
Mercury	1995	NA	0.065	NA	0.079	0.061	NA	NA	NA	0.007	NA	0.039	0.020	NA	NA	NA	5	NA	5	5	NA	NA
Mercury	1996	NA	0.131	NA	0.126	0.154	0.146	NA	NA	0.056	NA	0.014	0.020	0.041	NA	NA	5	NA	3	5	5	NA
Mercury	1997	NA	0.173	NA	0.320	0.063	0.104	NA	NA	0.025	NA	0.039	0.017	0.043	NA	NA	5	NA	5	5	5	NA
Mercury	1998	NA	0.098	NA	0.110	0.098	0.089	0.070	NA	0.006	NA	0.003	0.006	0.003	0.005	NA	5	NA	5	5	8	8
Mercury	1999	NA	0.075	NA	0.099	NA	0.063	0.053	NA	0.002	NA	0.004	NA	0.003	0.002	NA	5	NA	5	NA	8	8
Mercury	2000	NA	NA	0.120	0.178	0.162	0.114	NA	NA	NA	0.006	0.011	0.008	0.005	NA	NA	NA	5	5	5	8	NA
Mercury	2001	NA	NA	0.150	0.203	0.127	0.141	0.099	NA	NA	0.022	0.031	0.004	0.005	0.010	NA	NA	5	5	5	8	8
Total DDT	1991	24.78	NA	NA	89.18	45.64	NA	NA	6.36	NA	NA	10.77	4.13	NA	NA	5	NA	NA	5	8	NA	NA
Total DDT	1992	17.63	NA	NA	99.48	21.73	8.91	NA	1.63	NA	NA	18.82	1.78	0.54	NA	5	NA	NA	5	7	8	NA
Total DDT	1993	NA	NA	NA	127.98	57.50	25.58	NA	NA	NA	NA	26.87	8.67	2.12	NA	NA	NA	NA	4	5	8	NA
Total DDT	1994	24.31	NA	NA	77.72	49.17	16.78	NA	1.49	NA	NA	5.83	2.41	1.47	NA	3	NA	NA	3	3	7	NA
Total DDT	1995	28.56	NA	NA	91.48	44.80	NA	NA	0.55	NA	NA	5.47	1.03	NA	NA	5	NA	NA	5	5	NA	NA
Total DDT	1996	56.77	NA	NA	118.50	84.40	29.02	NA	6.20	NA	NA	8.60	7.37	1.16	NA	3	NA	NA	5	5	5	NA
Total DDT	1997	51.76	NA	NA	134.86	60.04	22.42	NA	3.05	NA	NA	9.61	3.04	1.23	NA	5	NA	NA	5	5	5	NA
Total DDT	1998	34.08	NA	NA	81.95	38.04	19.91	15.82	1.45	NA	NA	5.12	0.63	1.03	0.85	4	NA	NA	5	5	8	8
Total DDT	1999	34.34	NA	NA	85.90	NA	12.19	17.72	3.65	NA	NA	3.14	NA	0.47	0.69	5	NA	NA	5	NA	8	8
Total DDT	2000	NA	NA	3.31	99.97	32.68	7.88	NA	NA	NA	0.24	7.07	2.49	0.65	NA	NA	NA	5	5	5	8	NA
Total DDT	2001	NA	NA	6.71	47.67	25.33	15.23	15.11	NA	NA	0.80	2.01	0.71	0.59	0.87	NA	NA	5	5	5	8	8

Table C-15. Mussel Chemistry Data, 1991 – 2001. (Continued)

		Means							SE							N						
Parameter	Year	Gloucester(7)	Sandwich(8)	Rockport(RP)	BIH(6)	DI(1)	OS(4)	CCB(9)	Glouc.	Sand.	RP	BIH	DI	OS	CCB	Glouc.	Sand.	RP	BIH	DI	OS	CCB
Total PCB	1991	61.46	NA	NA	462.04	194.73	NA	NA	14.91	NA	NA	34.85	12.93	NA	NA	5	NA	NA	5	8	NA	NA
Total PCB	1992	46.72	NA	NA	639.43	123.76	34.30	NA	3.22	NA	NA	87.00	8.73	2.72	NA	5	NA	NA	5	7	8	NA
Total PCB	1993	NA	NA	NA	480.00	264.34	89.05	NA	NA	NA	NA	47.98	36.12	2.68	NA	NA	NA	NA	4	5	8	NA
Total PCB	1994	104.03	NA	NA	484.36	157.46	85.14	NA	2.73	NA	NA	71.34	5.65	6.22	NA	3	NA	NA	3	3	7	NA
Total PCB	1995	88.65	NA	NA	436.02	164.75	NA	NA	1.01	NA	NA	14.49	4.43	NA	NA	5	NA	NA	5	5	NA	NA
Total PCB	1996	156.59	NA	NA	532.56	268.68	98.78	NA	12.04	NA	NA	25.31	16.16	3.62	NA	3	NA	NA	5	5	5	NA
Total PCB	1997	131.09	NA	NA	752.68	355.57	97.34	NA	5.18	NA	NA	44.53	11.67	2.23	NA	5	NA	NA	5	5	5	NA
Total PCB	1998	63.16	NA	NA	460.02	149.18	58.81	48.90	1.15	NA	NA	29.22	2.24	2.75	2.00	5	NA	NA	5	5	8	8
Total PCB	1999	53.73	NA	NA	491.80	NA	36.87	47.66	4.62	NA	NA	20.94	NA	1.07	1.93	5	NA	NA	5	NA	8	8
Total PCB	2000	NA	NA	9.13	592.29	215.25	35.49	NA	NA	NA	0.87	33.92	13.99	1.43	NA	NA	NA	5	5	5	8	NA
Total PCB	2001	NA	NA	18.75	398.09	219.39	81.01	70.54	NA	NA	2.68	10.37	8.72	2.56	5.07	NA	NA	5	5	5	8	8
LMW PAH	1991	78.00	NA	NA	209.00	528.25	NA	NA	23.18	NA	NA	21.43	88.49	NA	NA	5	NA	NA	4	8	NA	NA
LMW PAH	1992	70.14	NA	NA	194.78	426.01	27.33	NA	6.43	NA	NA	44.15	48.37	1.54	NA	5	NA	NA	5	8	7	NA
LMW PAH	1993	16.17	NA	NA	92.00	163.67	33.25	NA	6.50	NA	NA	15.13	22.41	4.37	NA	6	NA	NA	6	6	8	NA
LMW PAH	1994	71.67	NA	NA	53.33	203.67	14.7	NA	3.18	NA	NA	4.37	8.41	1.87	NA	3	NA	NA	3	3	7	NA
LMW PAH	1995	51.60	NA	NA	155.60	122.85	NA	NA	1.66	NA	NA	3.03	2.70	NA	NA	5	NA	NA	5	5	NA	NA
LMW PAH	1996	138.70	NA	NA	189.62	226.68	41.48	NA	17.92	NA	NA	6.36	41.08	4.14	NA	3	NA	NA	5	5	5	NA
LMW PAH	1997	65.70	NA	NA	147.50	83.46	40.75	NA	8.75	NA	NA	12.21	2.00	12.20	NA	5	NA	NA	5	5	5	NA
LMW PAH	1998	104.27	NA	NA	181.76	63.40	18.75	19.00	12.40	NA	NA	21.55	4.77	1.11	1.38	5	NA	NA	5	5	8	8
LMW PAH	1999	184.80	NA	NA	175.70	NA	21.46	33.66	24.22	NA	NA	16.20	NA	0.47	1.71	5	NA	NA	5	NA	8	8
LMW PAH	2000	NA	NA	105.89	277.20	119.46	106.42	NA	NA	NA	9.76	13.55	12.28	8.81	NA	NA	NA	5	5	4	8	NA
LMW PAH	2001	NA	NA	23.78	114.32	38.26	25.8	23.80	NA	NA	2.31	9.03	1.83	0.71	1.82	NA	NA	5	5	5	8	8
HMW PAH	1991	78.40	NA	NA	2324.50	699.56	NA	NA	25.23	NA	NA	206.77	74.42	NA	NA	5	NA	NA	4	8	NA	NA
HMW PAH	1992	132.42	NA	NA	3343.44	1504.43	45.10	NA	21.20	NA	NA	404.89	127.36	7.39	NA	5	NA	NA	5	8	7	NA
HMW PAH	1993	105.00	NA	NA	1210.33	495.17	83.63	NA	25.67	NA	NA	73.10	54.30	12.45	NA	6	NA	NA	6	6	8	NA
HMW PAH	1994	132.33	NA	NA	2175.67	632.67	18.29	NA	59.88	NA	NA	230.57	68.81	5.06	NA	3	NA	NA	3	3	7	NA
HMW PAH	1995	93.08	NA	NA	1238.00	415.30	NA	NA	6.15	NA	NA	29.54	19.52	NA	NA	5	NA	NA	5	5	NA	NA
HMW PAH	1996	195.13	NA	NA	2232.80	799.36	37.13	NA	19.05	NA	NA	127.27	129.11	1.65	NA	3	NA	NA	5	5	5	NA
HMW PAH	1997	88.47	NA	NA	1345.36	260.98	23.67	NA	3.82	NA	NA	96.48	13.91	1.67	NA	5	NA	NA	5	5	5	NA
HMW PAH	1998	138.57	NA	NA	1865.23	154.32	19.75	20.56	6.45	NA	NA	107.36	2.69	0.66	1.62	5	NA	NA	5	5	8	8
HMW PAH	1999	481.22	NA	NA	2506.05	NA	25.13	17.85	110.08	NA	NA	107.20	NA	0.74	1.01	5	NA	NA	5	NA	8	8
HMW PAH	2000	NA	NA	28.83	2182.52	365.56	43.17	NA	NA	NA	2.87	140.72	30.81	1.74	NA	NA	NA	5	5	4	8	NA
HMW PAH	2001	NA	NA	38.05	1281.66	209.74	197.85	60.76	NA	NA	3.49	64.23	6.56	4.58	2.11	NA	NA	5	5	5	8	8

Table C-15. Mussel Chemistry Data, 1991 – 2001. (Continued)

		Means							SE							N						
Parameter	Year	Gloucester(7)	Sandwich(8)	Rockport(RP)	BIH(6)	DI(1)	OS(4)	CCB(9)	Glouc.	Sand.	RP	BIH	DI	OS	CCB	Glouc.	Sand.	RP	BIH	DI	OS	CCB
Total CHLOR	1991	2.48	NA	NA	20.86	18.24	NA	NA	1.37	NA	NA	2.27	1.68	NA	NA	5	NA	NA	5	8	NA	NA
Total CHLOR	1992	2.85	NA	NA	45.53	17.97	4.92	NA	0.57	NA	NA	6.16	1.43	0.44	NA	5	NA	NA	5	7	8	NA
Total CHLOR	1993	NA	NA	NA	22.23	19.38	7.85	NA	NA	NA	NA	2.57	2.20	0.25	NA	NA	NA	NA	4	5	8	NA
Total CHLOR	1994	9.82	NA	NA	25.23	26.69	8.22	NA	0.70	NA	NA	1.92	1.81	0.39	NA	3	NA	NA	3	3	7	NA
Total CHLOR	1995	3.18	NA	NA	20.78	11.70	NA	NA	0.18	NA	NA	1.23	0.22	NA	NA	5	NA	NA	5	5	NA	NA
Total CHLOR	1996	9.77	NA	NA	31.22	40.96	7.25	NA	0.94	NA	NA	2.30	3.43	0.44	NA	3	NA	NA	5	5	5	NA
Total CHLOR	1997	8.80	NA	NA	29.04	20.43	6.18	NA	0.26	NA	NA	2.23	1.06	0.28	NA	5	NA	NA	5	5	5	NA
Total CHLOR	1998	6.79	NA	NA	25.76	24.97	10.47	8.30	0.21	NA	NA	1.77	0.56	0.74	0.54	5	NA	NA	5	5	8	8
Total CHLOR	1999	7.63	NA	NA	22.50	NA	7.72	7.52	0.98	NA	NA	1.05	NA	0.25	0.24	5	NA	NA	5	NA	8	8
Total CHLOR	2000	NA	NA	2.61	28.35	13.80	4.96	NA	NA	NA	0.17	2.64	0.74	0.37	NA	NA	NA	5	5	5	8	NA
Total CHLOR	2001	NA	NA	2.87	12.25	8.69	18.55	4.81	NA	NA	0.26	0.53	0.23	0.67	0.24	NA	NA	5	5	5	8	8
Aldrin	1991	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	8	NA	NA
Aldrin	1992	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	7	8	NA
Aldrin	1993	NA	NA	NA	0.00	0.00	0.00	NA	NA	NA	NA	0.00	0.00	0.00	NA	NA	NA	NA	4	5	8	NA
Aldrin	1994	1.22	NA	NA	0.00	0.00	0.38	NA	1.22	NA	NA	0.00	0.00	0.14	NA	3	NA	NA	3	3	7	NA
Aldrin	1995	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	5	NA	NA
Aldrin	1996	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	3	NA	NA	5	5	5	NA
Aldrin	1997	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	5	5	NA
Aldrin	1998	0.00	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	10	NA	NA	5	5	8	8
Aldrin	1999	0.00	NA	NA	0.00	NA	0.00	0.00	0.00	NA	NA	0.00	NA	0.00	0.00	5	NA	NA	5	NA	8	8
Aldrin	2000	NA	NA	0.00	0.00	0.00	0.00	NA	NA	NA	0.00	0.00	0.00	0.00	NA	NA	NA	5	5	5	8	NA
Aldrin	2001	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	5	5	5	8	8
Dieldrin	1991	0.00	NA	NA	9.00	2.92	NA	NA	0.00	NA	NA	0.84	0.25	NA	NA	5	NA	NA	5	8	NA	NA
Dieldrin	1992	0.15	NA	NA	6.73	2.66	1.09	NA	0.15	NA	NA	1.03	0.25	0.18	NA	5	NA	NA	5	7	8	NA
Dieldrin	1993	NA	NA	NA	4.53	3.16	2.24	NA	NA	NA	NA	0.82	0.91	0.07	NA	NA	NA	NA	4	5	8	NA
Dieldrin	1994	0.73	NA	NA	14.57	10.35	1.97	NA	0.73	NA	NA	9.87	0.42	0.13	NA	3	NA	NA	3	3	7	NA
Dieldrin	1995	1.54	NA	NA	6.94	3.15	NA	NA	0.06	NA	NA	0.35	0.09	NA	NA	5	NA	NA	5	5	NA	NA
Dieldrin	1996	0.00	NA	NA	9.28	5.60	1.36	NA	0.00	NA	NA	0.96	0.60	0.84	NA	3	NA	NA	5	5	5	NA
Dieldrin	1997	2.28	NA	NA	7.14	3.40	2.02	NA	0.08	NA	NA	0.29	0.25	0.10	NA	5	NA	NA	5	5	5	NA
Dieldrin	1998	2.83	NA	NA	7.61	4.10	2.25	2.82	0.13	NA	NA	0.40	0.08	0.09	0.13	5	NA	NA	5	5	8	8
Dieldrin	1999	1.44	NA	NA	9.06	NA	1.47	1.57	0.12	NA	NA	0.51	NA	0.04	0.08	5	NA	NA	5	NA	8	8
Dieldrin	2000	NA	NA	0.00	9.01	3.55	1.74	NA	NA	NA	0.00	0.63	0.10	0.09	NA	NA	NA	5	5	5	8	NA
Dieldrin	2001	NA	NA	0.59	2.94	1.58	1.86	1.19	NA	NA	0.10	0.20	0.08	0.05	0.18	NA	NA	5	5	5	8	8

Table C-15. Mussel Chemistry Data, 1991 – 2001. (Continued)

		Means							SE							N						
Parameter	Year	Gloucester(7)	Sandwich(8)	Rockport(RP)	BIH(6)	DI(1)	OS(4)	CCB(9)	Glouc.	Sand.	RP	BIH	DI	OS	CCB	Glouc.	Sand.	RP	BIH	DI	OS	CCB
Endrin	1991	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	1993	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	1995	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	5	NA	NA
Endrin	1996	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	3	NA	NA	5	5	5	NA
Endrin	1997	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	5	5	NA
Endrin	1998	0.00	0.00	NA	0.00	0.00	0.00	0.00	0.00	0.00	NA	0.00	0.00	0.00	0.00	10	1	NA	5	5	8	8
Endrin	1999	0.00	NA	NA	0.00	NA	0.00	0.00	0.00	NA	NA	0.00	NA	0.00	0.00	5	NA	NA	5	NA	8	8
Endrin	2000	NA	NA	0.00	0.00	0.00	0.12	NA	NA	NA	0.00	0.00	0.00	0.12	NA	NA	NA	5	5	5	8	NA
Endrin	2001	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	5	5	5	8	8
Hexachlorobenzene	1991	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	8	NA	NA
Hexachlorobenzene	1992	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	7	8	NA
Hexachlorobenzene	1993	NA	NA	NA	14.20	2.66	0.06	NA	NA	NA	NA	5.93	0.88	0.06	NA	NA	NA	NA	4	5	8	NA
Hexachlorobenzene	1994	0.91	NA	NA	0.00	0.00	0.10	NA	0.58	NA	NA	0.00	0.00	0.10	NA	3	NA	NA	3	3	7	NA
Hexachlorobenzene	1995	0.24	NA	NA	0.74	0.63	NA	NA	0.09	NA	NA	0.09	0.09	NA	NA	5	NA	NA	5	5	NA	NA
Hexachlorobenzene	1996	0.98	NA	NA	1.48	0.72	0.65	NA	0.28	NA	NA	0.11	0.19	0.05	NA	3	NA	NA	5	5	5	NA
Hexachlorobenzene	1997	0.53	NA	NA	0.68	0.44	0.23	NA	0.04	NA	NA	0.02	0.05	0.01	NA	5	NA	NA	5	5	5	NA
Hexachlorobenzene	1998	0.00	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	10	NA	NA	5	5	8	8
Hexachlorobenzene	1999	0.38	NA	NA	0.45	NA	0.22	0.36	0.08	NA	NA	0.03	NA	0.03	0.03	5	NA	NA	5	NA	8	8
Hexachlorobenzene	2000	NA	NA	0.00	1.04	0.39	0.44	NA	NA	NA	0.00	0.07	0.02	0.03	NA	NA	NA	5	5	5	8	NA
Hexachlorobenzene	2001	NA	NA	0.30	0.75	0.51	0.32	0.41	NA	NA	0.03	0.12	0.05	0.01	0.03	NA	NA	5	5	5	8	8
Mirex	1991	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	8	NA	NA
Mirex	1992	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	7	8	NA
Mirex	1993	NA	NA	NA	0.00	0.00	0.00	NA	NA	NA	NA	0.00	0.00	0.00	NA	NA	NA	NA	4	5	8	NA
Mirex	1994	1.98	NA	NA	0.00	0.00	0.00	NA	0.40	NA	NA	0.00	0.00	0.00	NA	3	NA	NA	3	3	7	NA
Mirex	1995	0.00	NA	NA	0.21	0.07	NA	NA	0.00	NA	NA	0.08	0.03	NA	NA	5	NA	NA	5	5	NA	NA
Mirex	1996	0.78	NA	NA	0.26	0.64	0.70	NA	0.07	NA	NA	0.02	0.06	0.18	NA	3	NA	NA	5	5	5	NA
Mirex	1997	0.07	NA	NA	0.24	0.50	0.26	NA	0.07	NA	NA	0.15	0.03	0.06	NA	5	NA	NA	5	5	5	NA
Mirex	1998	0.00	NA	NA	0.09	0.00	0.00	0.00	0.00	NA	NA	0.09	0.00	0.00	0.00	5	NA	NA	5	5	8	8
Mirex	1999	0.15	NA	NA	0.41	NA	0.05	0.05	0.02	NA	NA	0.01	NA	0.01	0.01	5	NA	NA	5	NA	8	8
Mirex	2000	NA	NA	0.00	0.00	0.00	0.05	NA	NA	NA	0.00	0.00	0.00	0.05	NA	NA	NA	5	5	5	8	NA
Mirex	2001	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	0.00	0.00	0.00	0.00	0.00	NA	NA	5	5	5	8	8

Table C-15. Mussel Chemistry Data, 1991 – 2001. (Continued)

		Means							SE							N						
Parameter	Year	Gloucester(7)	Sandwich(8)	Rockport(RP)	BIH(6)	DI(1)	OS(4)	CCB(9)	Glouc.	Sand.	RP	BIH	DI	OS	CCB	Glouc.	Sand.	RP	BIH	DI	OS	CCB
Lindane	1991	0.00	NA	NA	0.00	0.00	NA	NA	0.00	NA	NA	0.00	0.00	NA	NA	5	NA	NA	5	8	NA	NA
Lindane	1992	0.00	NA	NA	0.00	0.16	0.00	NA	0.00	NA	NA	0.00	0.16	0.00	NA	5	NA	NA	5	7	8	NA
Lindane	1993	NA	NA	NA	2.33	2.22	0.35	NA	NA	NA	NA	0.41	0.57	0.18	NA	NA	NA	NA	4	5	8	NA
Lindane	1994	0.42	NA	NA	0.00	1.56	0.00	NA	0.42	NA	NA	0.00	0.19	0.00	NA	3	NA	NA	3	3	7	NA
Lindane	1995	0.65	NA	NA	0.88	1.01	NA	NA	0.06	NA	NA	0.04	0.03	NA	NA	5	NA	NA	5	5	NA	NA
Lindane	1996	0.00	NA	NA	0.00	0.00	0.36	NA	0.00	NA	NA	0.00	0.00	0.36	NA	3	NA	NA	5	5	5	NA
Lindane	1997	0.00	NA	NA	0.00	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	0.00	NA	5	NA	NA	5	5	5	NA
Lindane	1998	0.42	NA	NA	0.61	0.75	0.46	0.17	0.01	NA	NA	0.05	0.03	0.08	0.09	5	NA	NA	5	5	8	8
Lindane	1999	0.30	NA	NA	0.28	NA	0.36	0.65	0.02	NA	NA	0.02	NA	0.01	0.04	5	NA	NA	5	NA	8	8
Lindane	2000	NA	NA	0.00	0.00	0.00	0.08	NA	NA	NA	0.00	0.00	0.00	0.08	NA	NA	NA	5	5	5	8	NA
Lindane	2001	NA	NA	0.31	0.08	0.22	0.35	0.33	NA	NA	0.01	0.08	0.06	0.01	0.05	NA	NA	5	5	5	8	8
Total 97/98 LMW PAH	2001	NA	NA	27.80	987.50	167.70	471.85	41.29	NA	NA	4.93	44.90	9.62	12.35	3.85	NA	NA	5	5	5	8	8
Total 97/98 HMW PAH	2001	NA	NA	38.05	1769.61	251.60	280.21	70.57	NA	NA	3.49	79.06	14.01	5.80	2.61	NA	NA	5	5	5	8	8

APPENDIX D

Results of Statistical Analyses

Table D-1. ANOVA Results Determining Whether Chemical Concentrations in Flounder Tissues Differ Significantly Between Sampling Stations.

Parameter	Probability	
	Fillet	Liver
Cadmium	NA	0.3149
Chromium	NA	0.3018
Copper	NA	0.3428
Lead	NA	0.0004
Mercury	0.0038	0.015
Nickel	NA	0.0027
Silver	NA	0.2285
Zinc	NA	0.0596
Total PCB	<0.0001	<0.0001
Total PAH	NA	<0.0003
Total DDT	0.0002	0.0011
Total Chlordane	<0.0001	<0.0001
Dieldrin	0.0002	0.0016
HCB	0.0163	0.0069
Mirex	0.0469	<0.0001

Table D-2. ANOVA Results Determining Whether Chemical Concentrations in Lobster Tissues Differ Significantly between Sampling Stations.

Parameter	Probability	
	Meat	Hepatopancreas
Cadmium	NA	0.001
Chromium	NA	0.3696
Copper	NA	0.4102
Lead	NA	0.7175
Mercury	0.01	0.2588
Nickel	NA	0.0074
Silver	NA	0.2274
Zinc	NA	0.2318
Total PCB	0.0654	0.0116
Total PAH	NA	<0.0001
Total DDT	0.6845	0.0656
Total Chlordane	0.0053	0.0001
Dieldrin	0.0212	0.0423
HCB	0.4989	0.9610
Mirex	0.2067	0.6625
Lindane	NA	0.1186

Table D-3. ANOVA Results Determining Whether Chemical Concentrations in Mussel Tissue Differ Significantly between Sampling Stations.

Parameter	Probability
Lead	<0.0001
Mercury	<0.0001
Total PCB	<0.0001
Total LMW-PAH	<0.0001
Total HMW-PAH	<0.0001
Total DDT	<0.0001
Total Chlordane	<0.0001
Dieldrin	<0.0001
HCB	<0.0001
Lindane	0.0037

APPENDIX E

Additional Figures of Contaminant Concentrations

Total Chlordane in Flounder Fillets at the Five Collection Sites from 1992-2001.
Dieldrin in Flounder Fillets at the Five Collection Sites from 1992-2001.
Hexachlorobenzene in Flounder Fillets at the Five Collection Sites from 1992-2001.
Mirex in Flounder Fillets at the Five Collection Sites from 1992-2001.

Cadmium in Flounder Livers at the Five Collection Sites from 1992-2001.
Chromium in Flounder Livers at the Five Collection Sites from 1992-2001.
Copper in Flounder Livers at the Five Collection Sites from 1992-2001.
Nickel in Flounder Livers at the Five Collection Sites from 1992-2001.
Silver in Flounder Livers at the Five Collection Sites from 1992-2001.
Zinc in Flounder Livers at the Five Collection Sites from 1992-2001.
Total PAH in Flounder Livers at the Five Collection Sites from 1992-2001.
Total Chlordane in Flounder Livers at the Five Collection Sites from 1992-2001.
Dieldrin in Flounder Livers at the Five Collection Sites from 1992-2001.
Hexachlorobenzene in Flounder Livers at the Five Collection Sites from 1992-2001.
Mirex in Flounder Livers at the Five Collection Sites from 1992-2001.

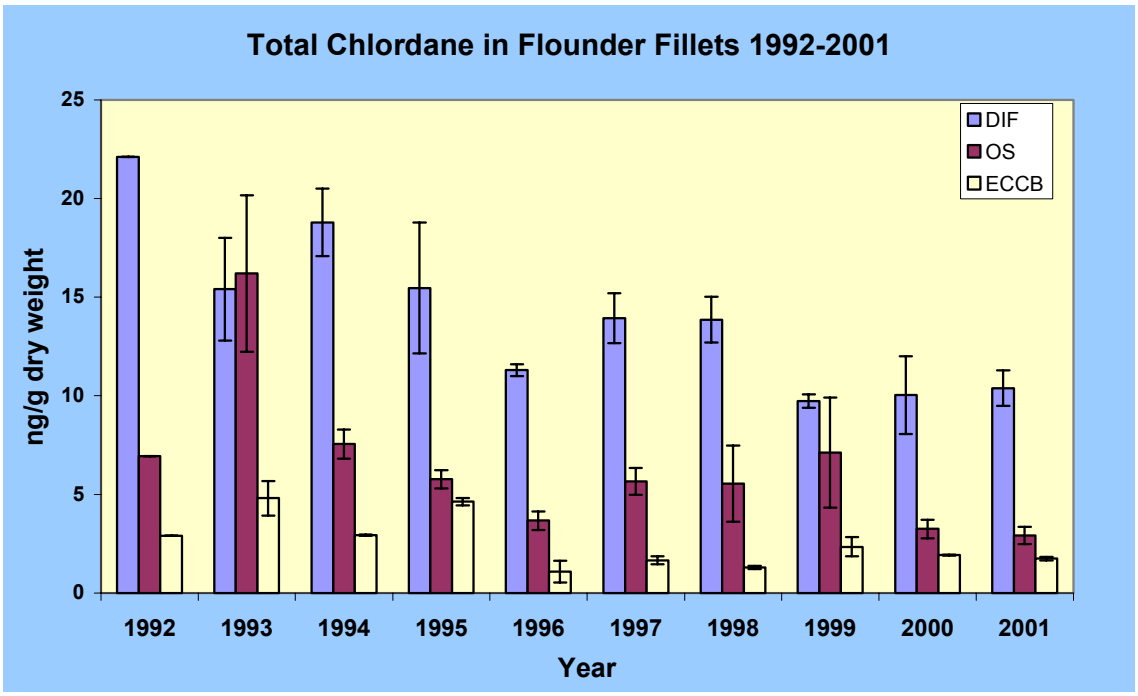
Total Chlordane in Lobster Meat at DIF, OS, and ECCB from 1992-2001.
Dieldrin in Lobster Meat at DIF, OS, and ECCB from 1992-2001.
Hexachlorobenzene in Lobster Meat at DIF, OS, and ECCB from 1992-2001.
Mirex in Lobster Meat at DIF, OS, and ECCB from 1992-2001.

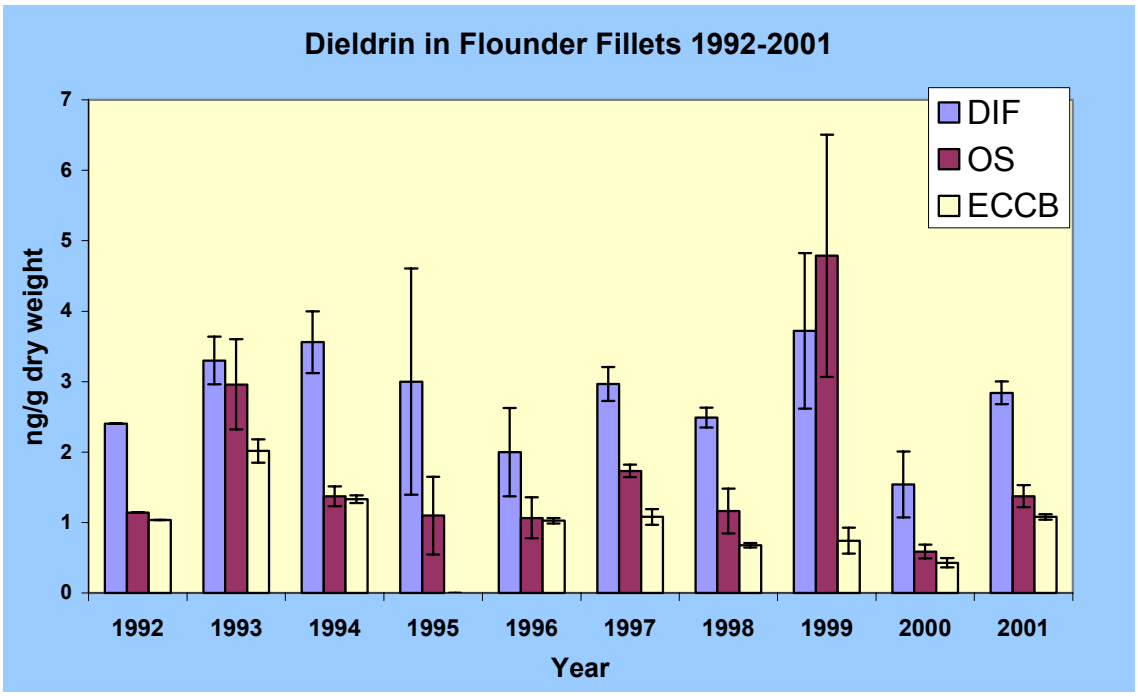
Total Chlordane in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.
Dieldrin in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.
Hexachlorobenzene in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.
Mirex in Lobster Hepatopancreas at DIF, OS, and ECCB from 1992-2001.

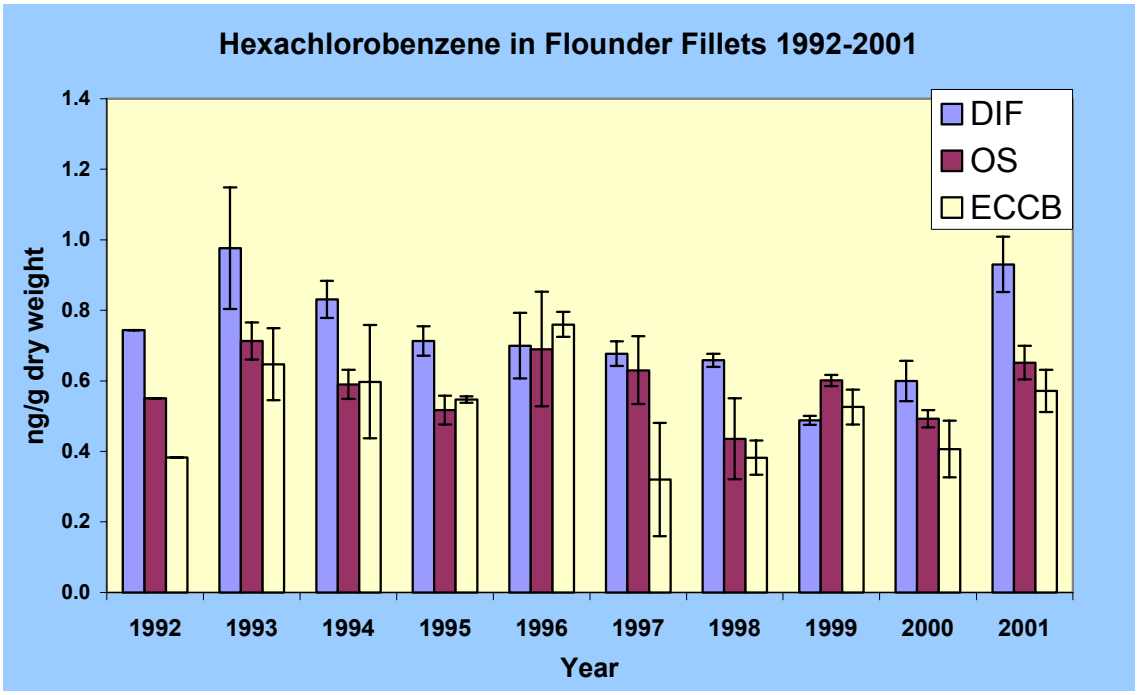
Cadmium in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Chromium in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Copper in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Nickel in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Zinc in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Total PAH in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Total Chlordane in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Dieldrin in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Hexachlorobenzene in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Mirex in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.
Lindane in Lobster Hepatopancreas at the Five Collection Sites from 1992-2001.

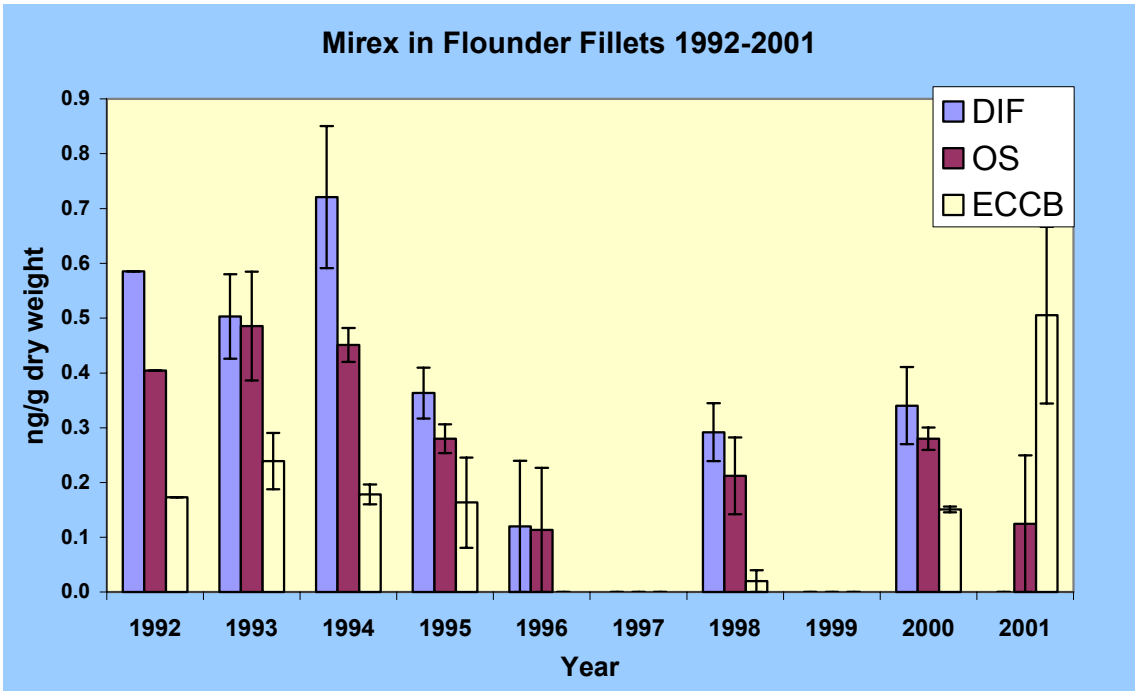
Hexachlorobenzene in 2001 Pre-deployed Mussels and Four Deployment Locations.
Lindane in 2001 Pre-deployed Mussels and Four Deployment Locations.

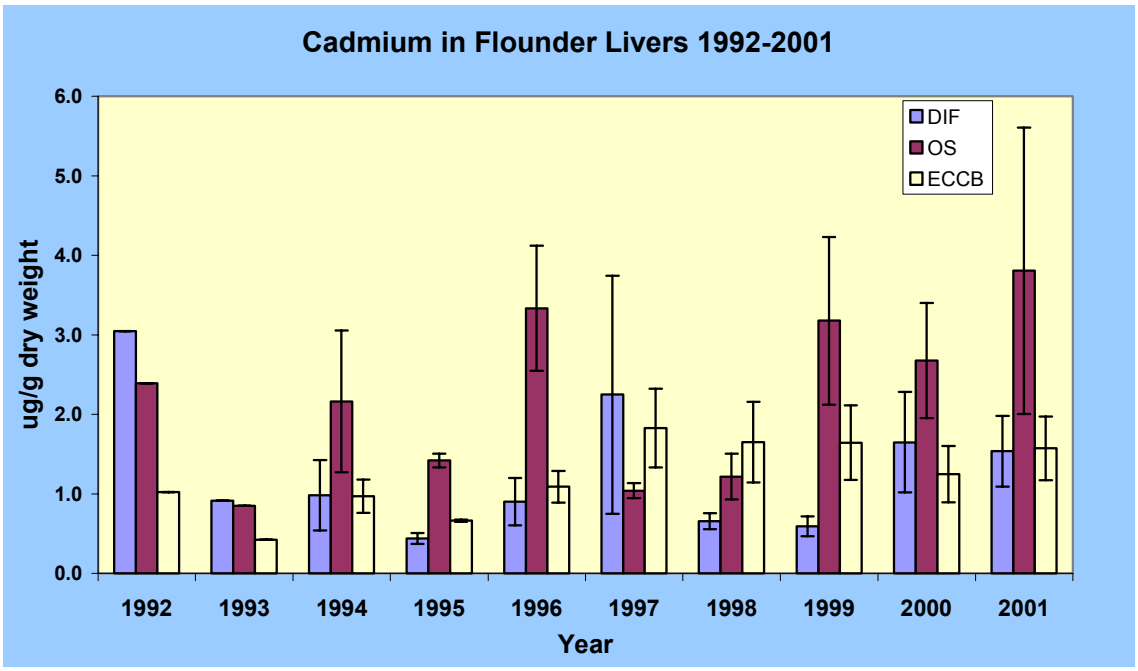
Dieldrin in Pre-deployed and Deployed Mussels from 1991-2001.
Hexachlorobenzene in Pre-deployed and Deployed Mussels from 1991-2001.
Lindane in Pre-deployed and Deployed Mussels from 1991-2001.

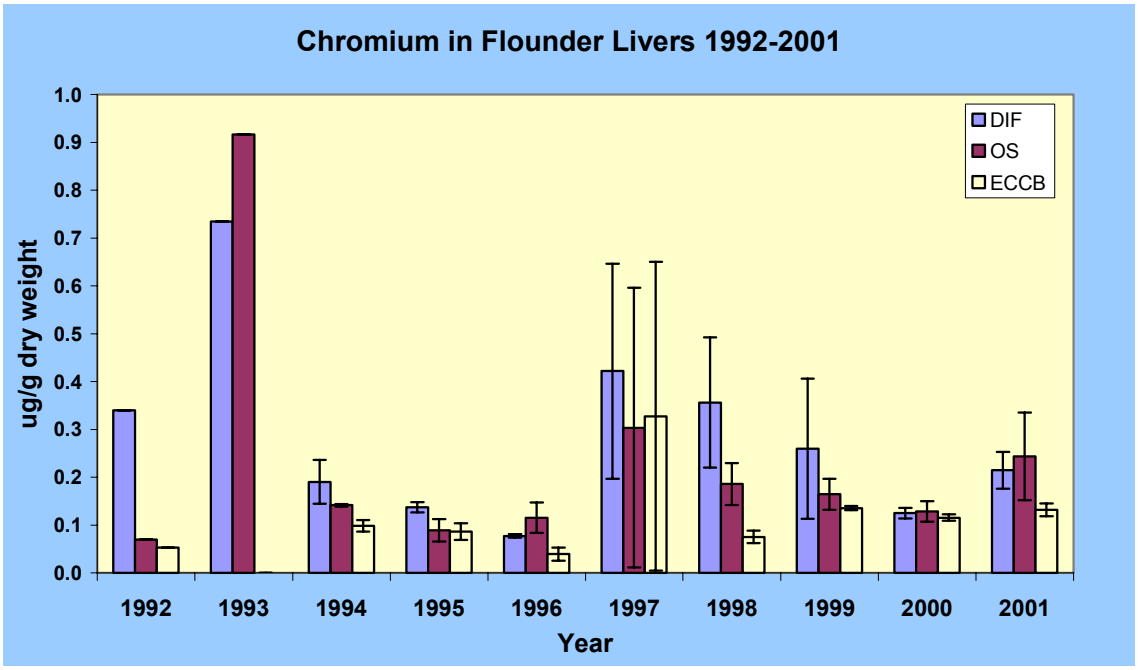

Total Chlordane in Flounder Fillets 1992-2001
ng/g dry weight
25
20
15
10
5
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

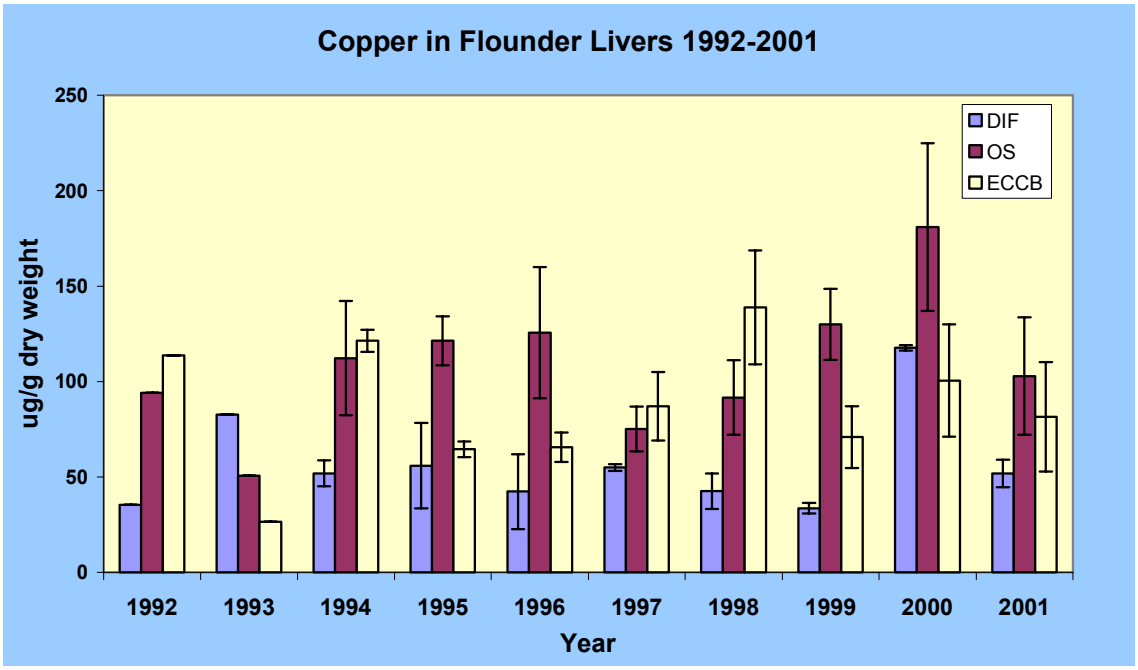

Dieldrin in Flounder Fillets 1992-2001
ng/g dry weight
7
6
5
4
3
2
1
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

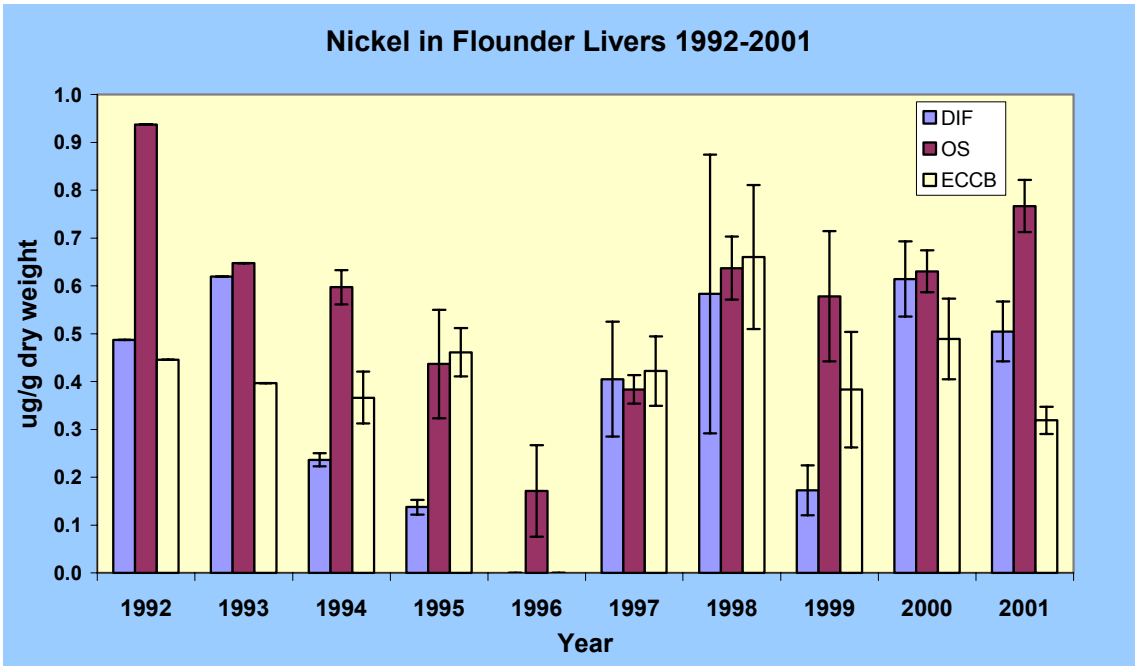

Hexachlorobenzene in Flounder Fillets 1992-2001
ng/g dry weight
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

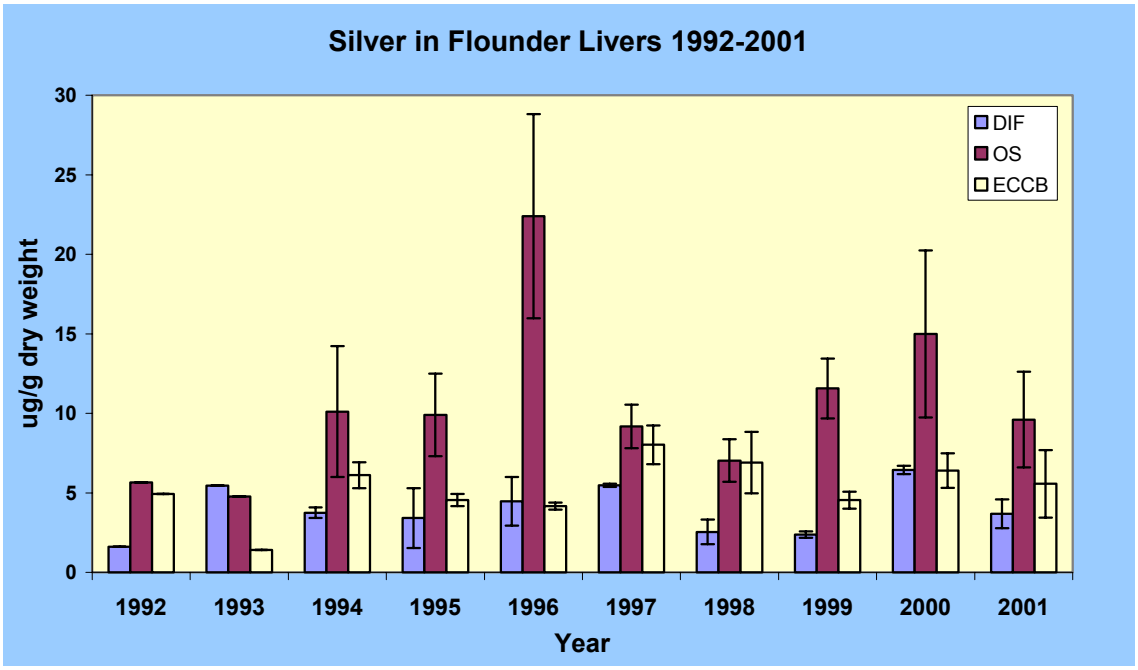

Mirex in Flounder Fillets 1992-2001
ng/g dry weight
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

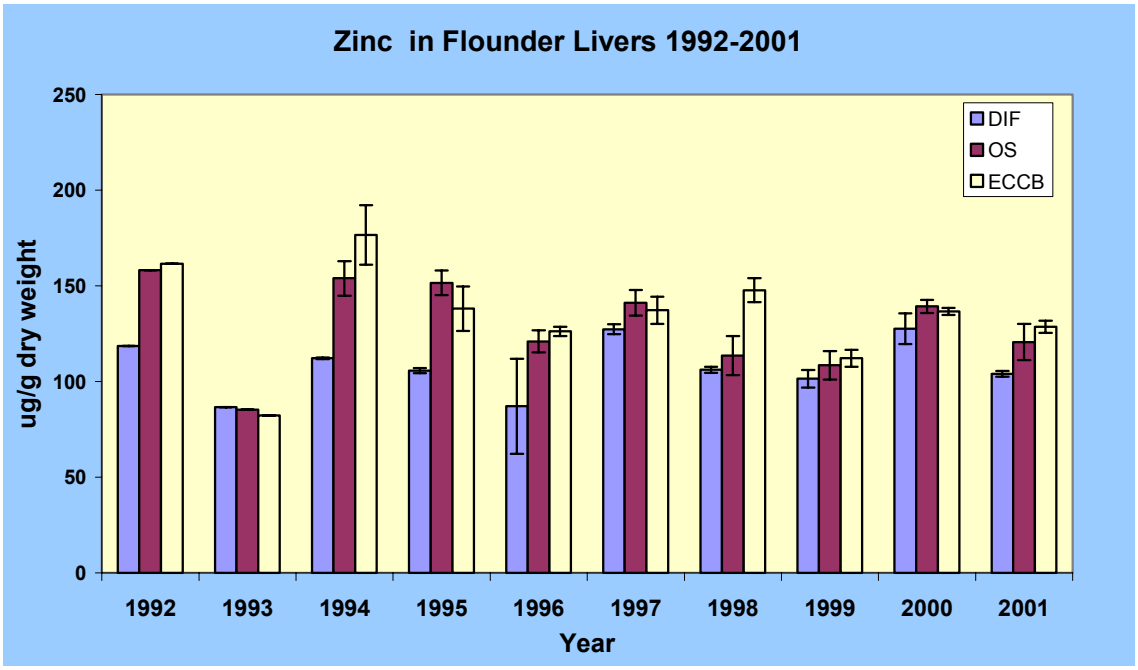

Cadmium in Flounder Livers 1992-2001
ug/g dry weight
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

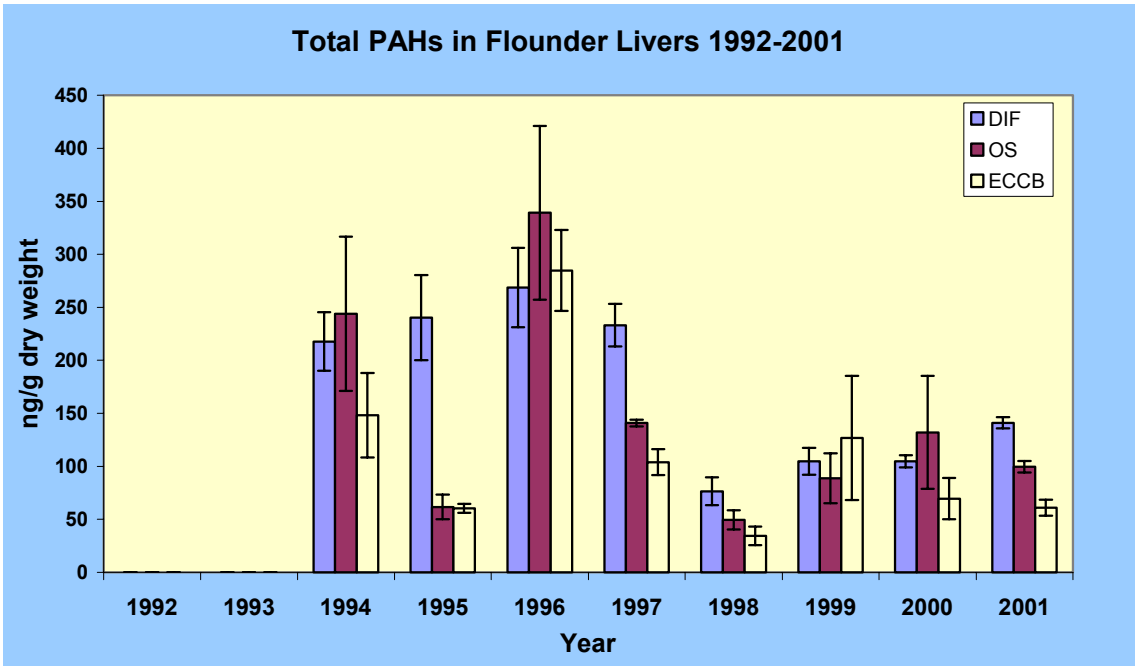

Chromium in Flounder Livers 1992-2001
ug/g dry weight
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

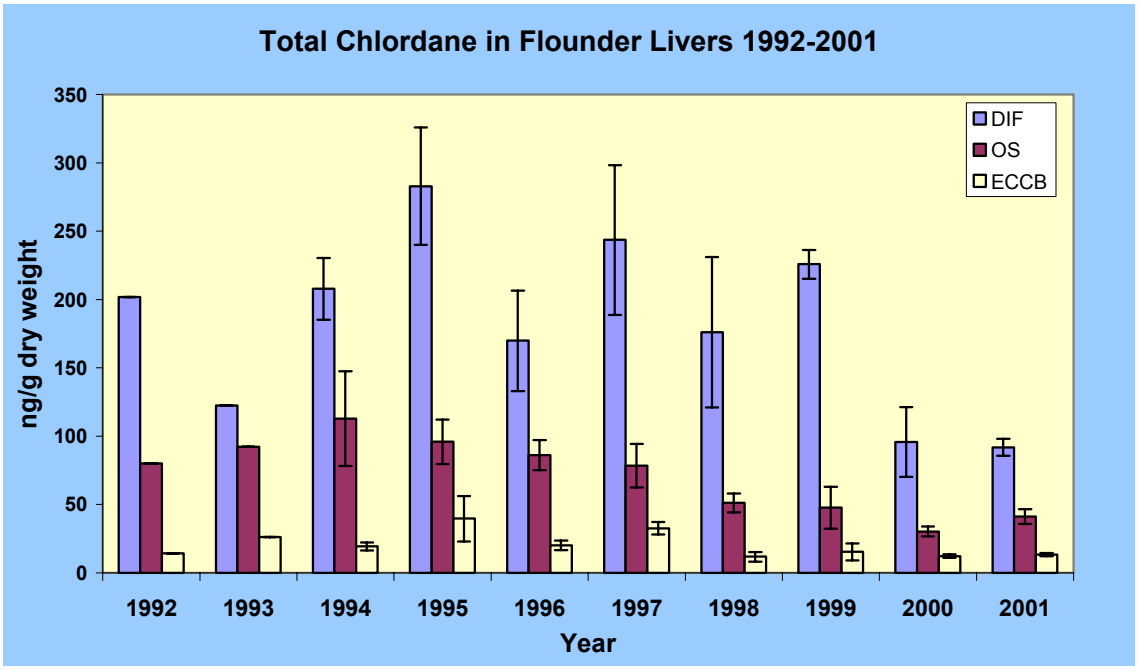

Copper in Flounder Livers 1992-2001
ug/g dry weight
250
200
150
100
50
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

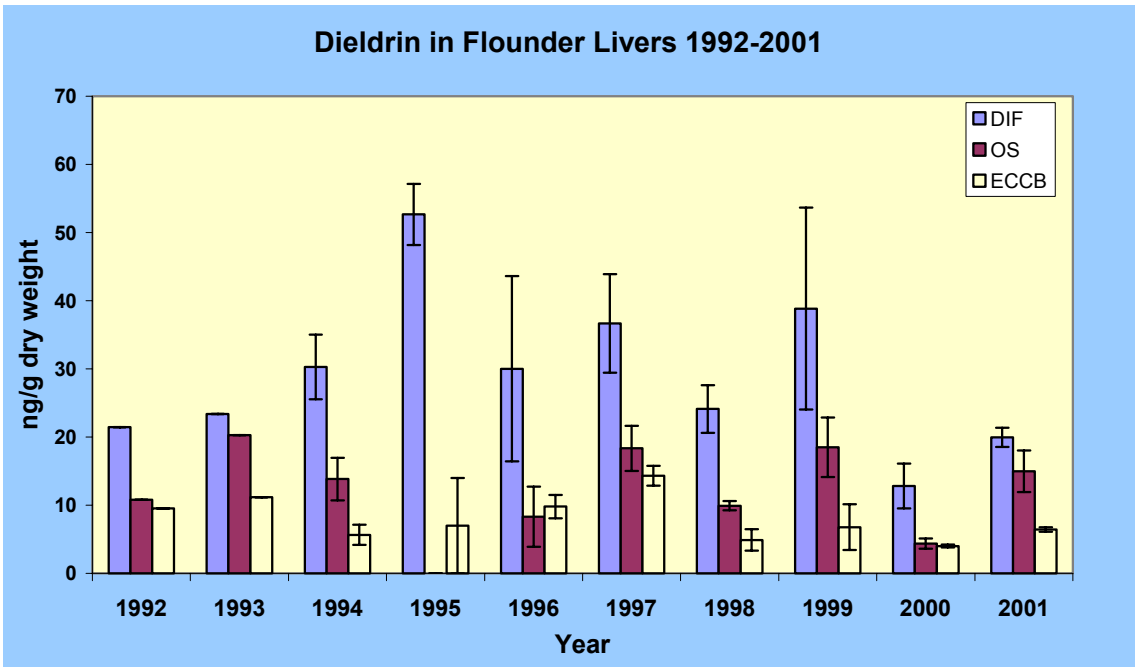

Nickel in Flounder Livers 1992-2001
ug/g dry weight
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

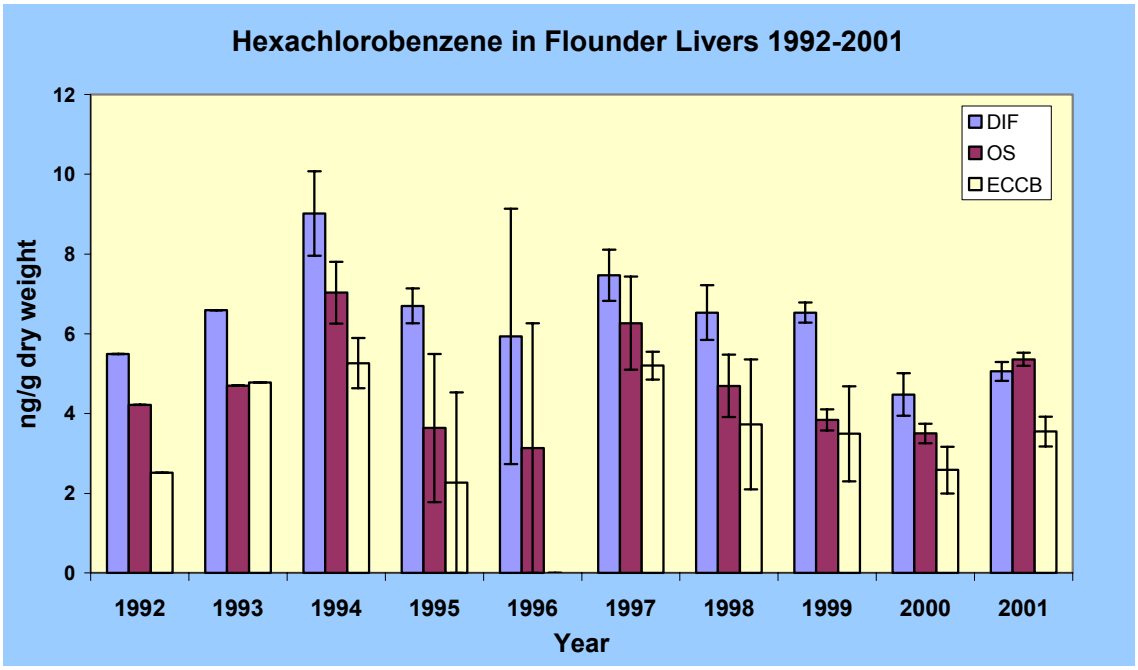

Silver in Flounder Livers 1992-2001
ug/g dry weight
30
25
20
15
10
5
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
DIF
OS
ECCB

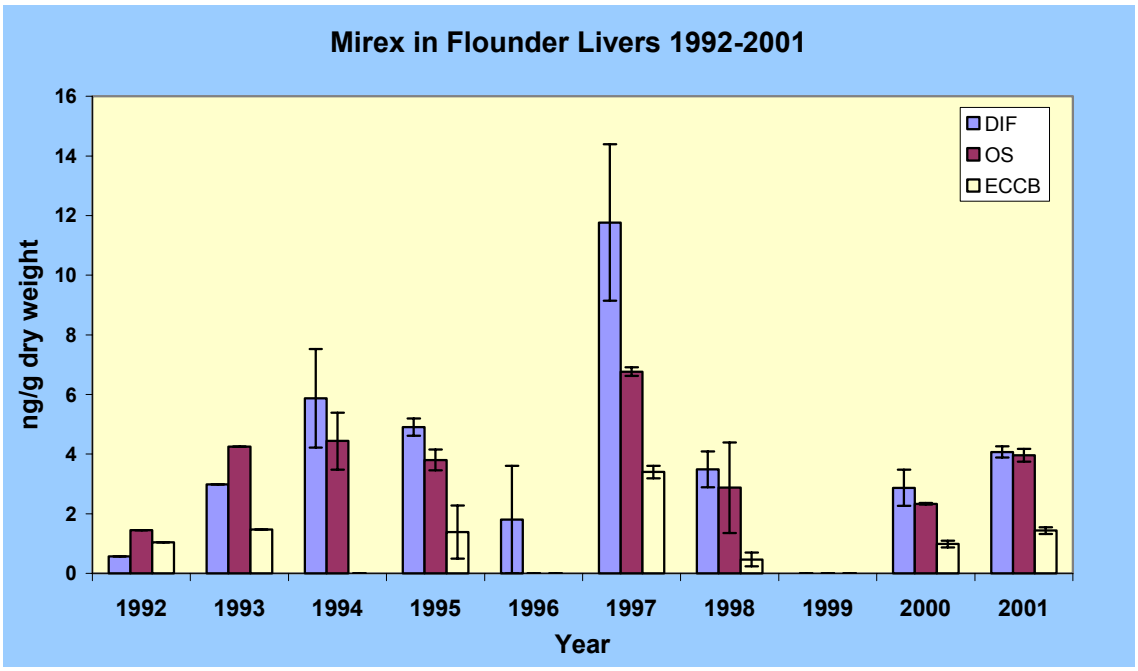

Zinc in Flounder Livers 1992-2001
ug/g dry weight
250
200
150
100
50
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
DIF
OS
ECCB

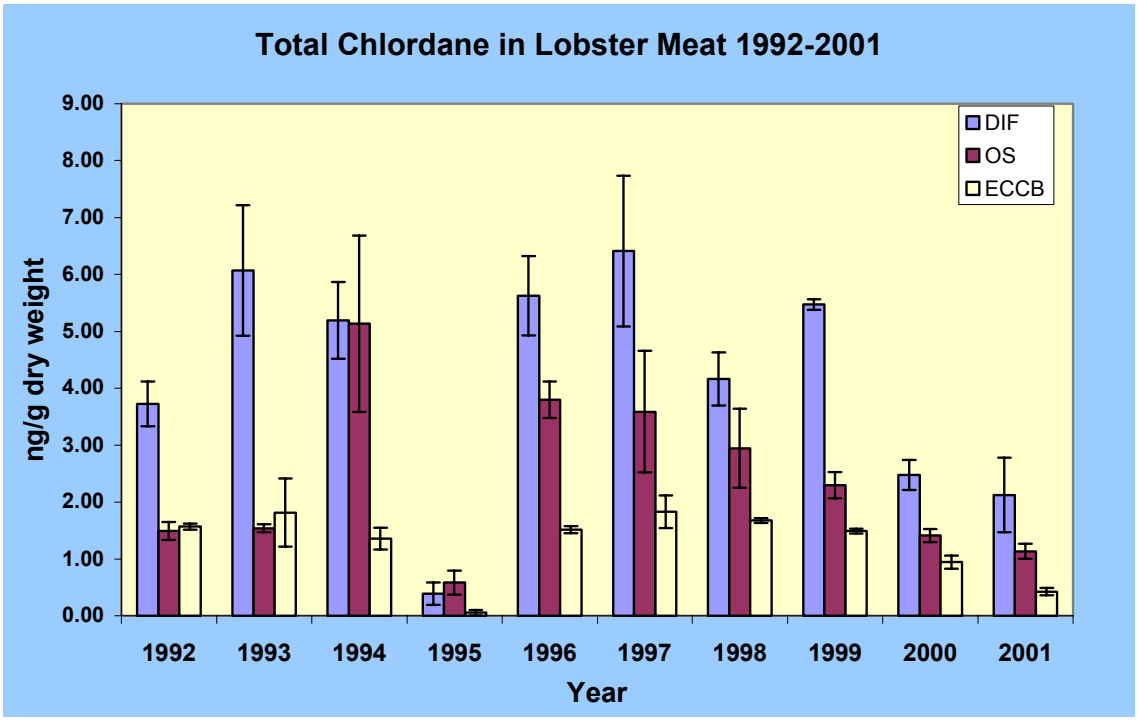

Total PAHs in Flounder Livers 1992-2001
ng/g dry weight
450
400
350
300
250
200
150
100
50
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

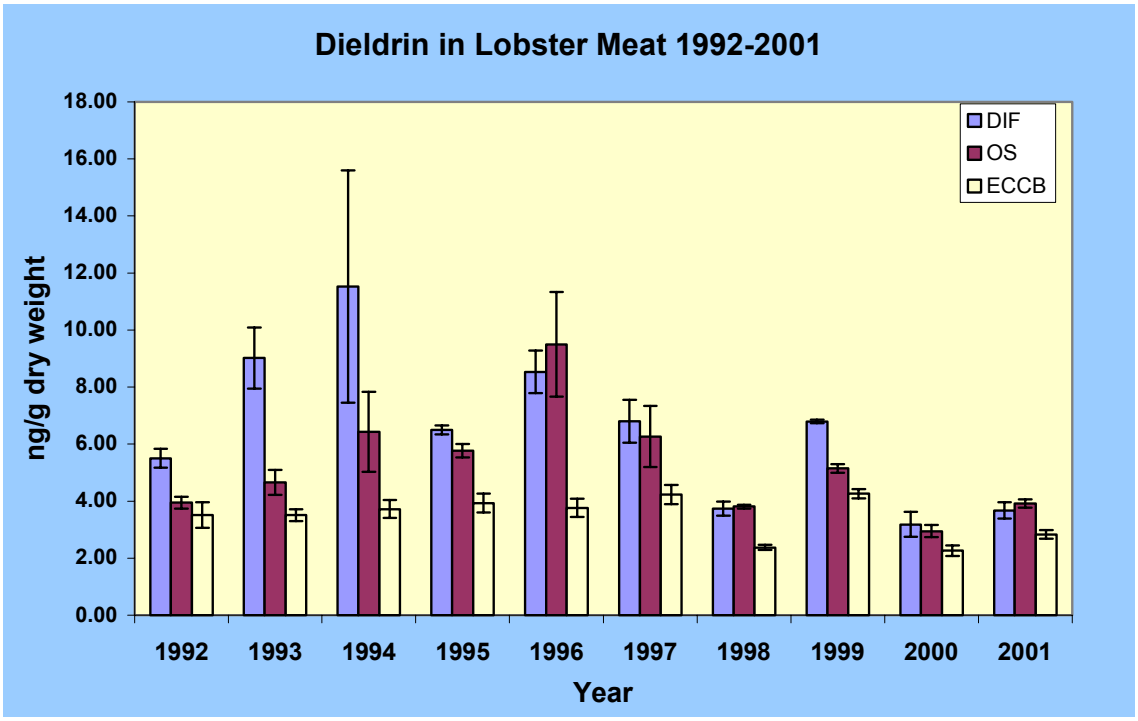

Total Chlordane in Flounder Livers 1992-2001
ng/g dry weight
350
300
250
200
150
100
50
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

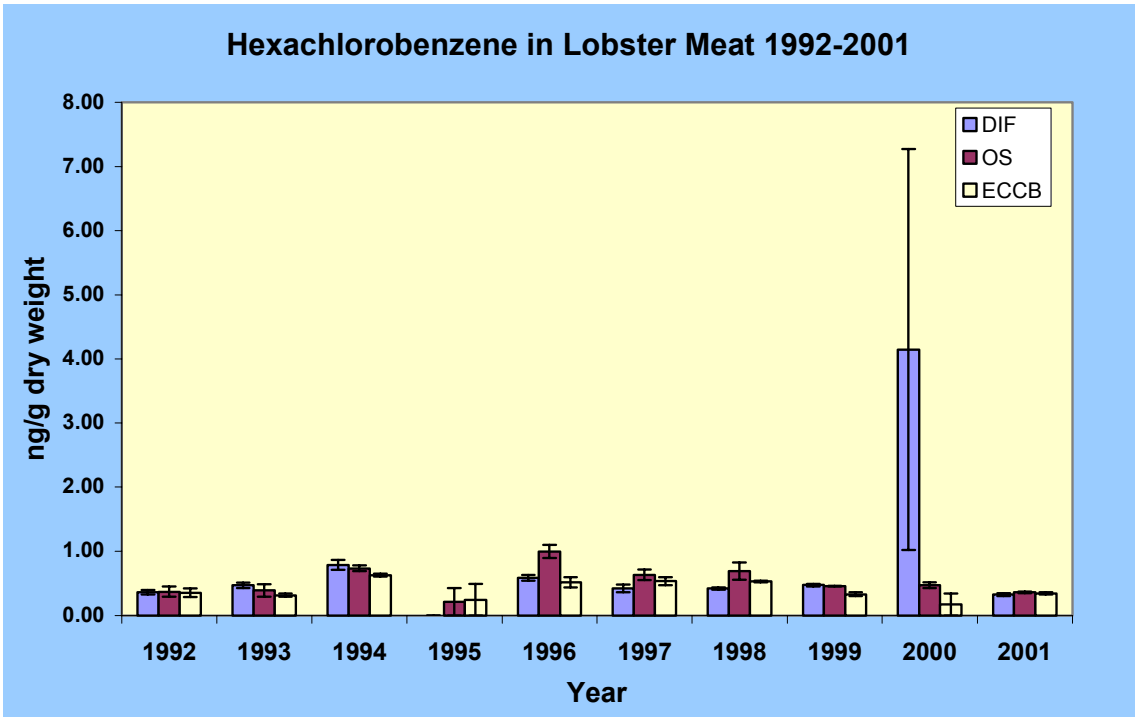

Dieldrin in Flounder Livers 1992-2001
ng/g dry weight
70
60
50
40
30
20
10
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

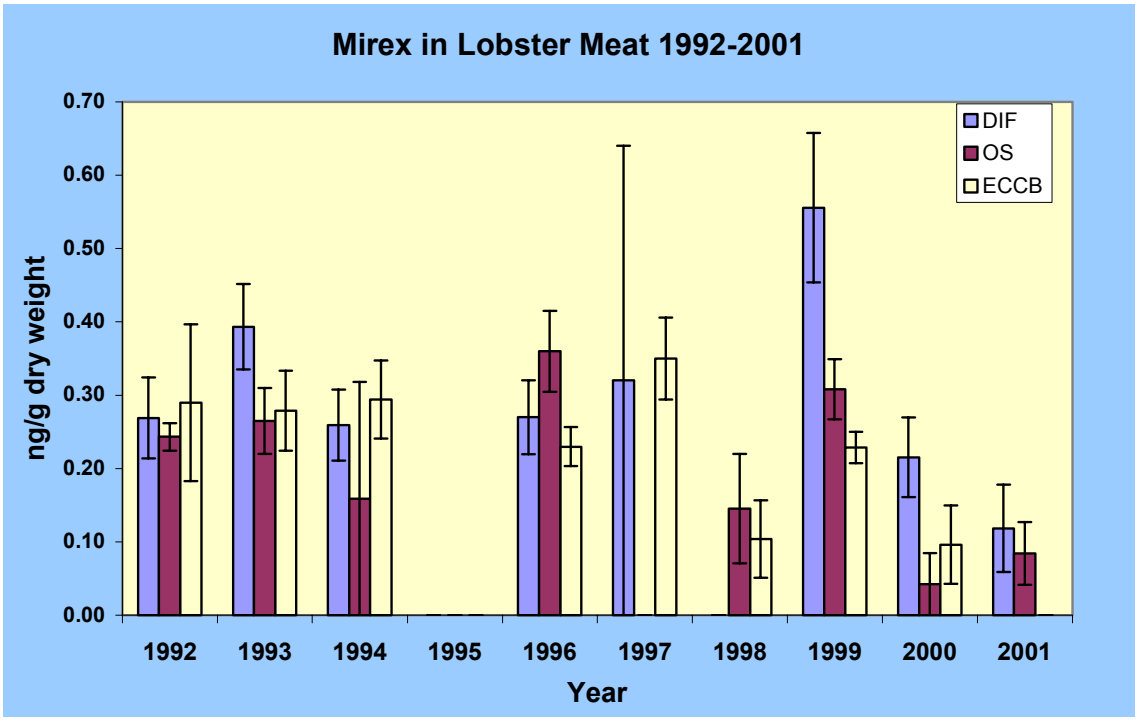

Hexachlorobenzene in Flounder Livers 1992-2001
ng/g dry weight
12
10
8
6
4
2
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

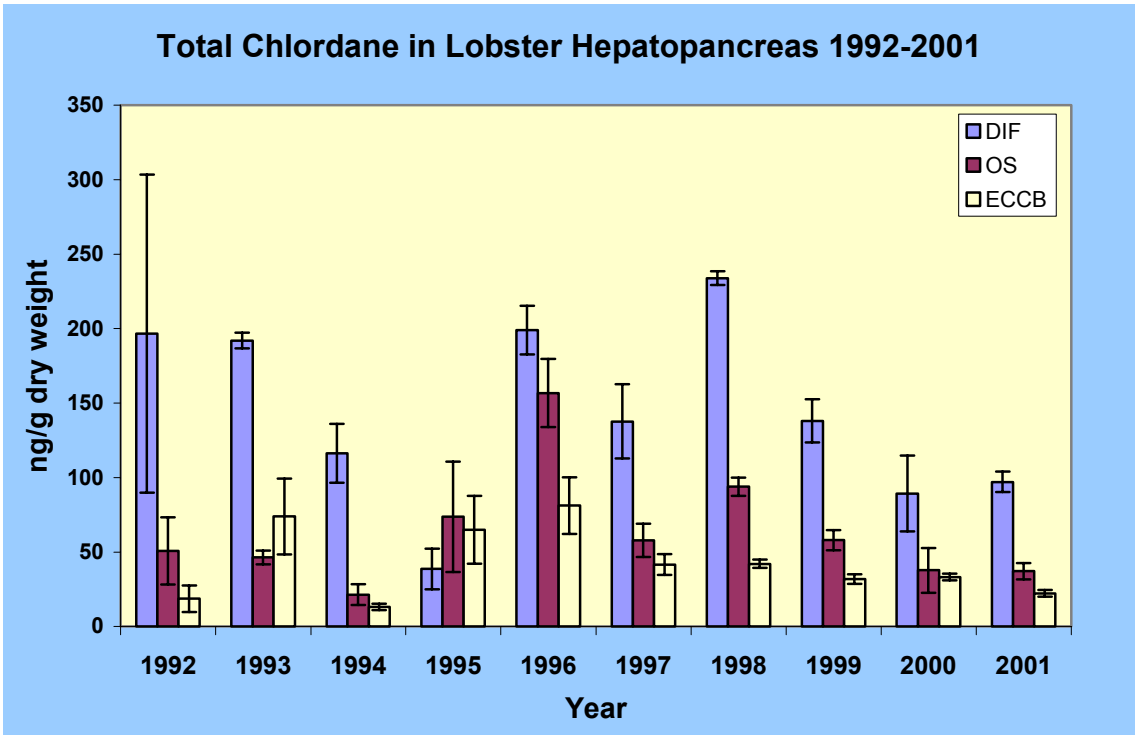

Mirex in Flounder Livers 1992-2001
ng/g dry weight
16
14
12
10
8
6
4
2
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

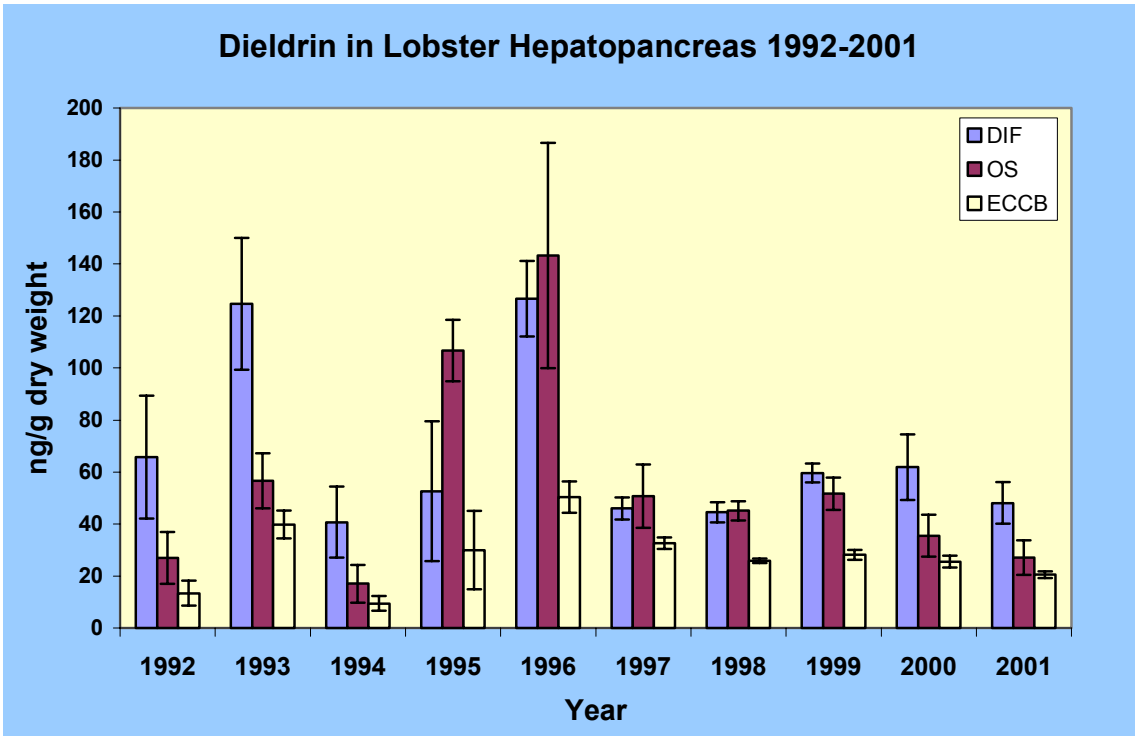

Total Chlordane in Lobster Meat 1992-2001
ng/g dry weight
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

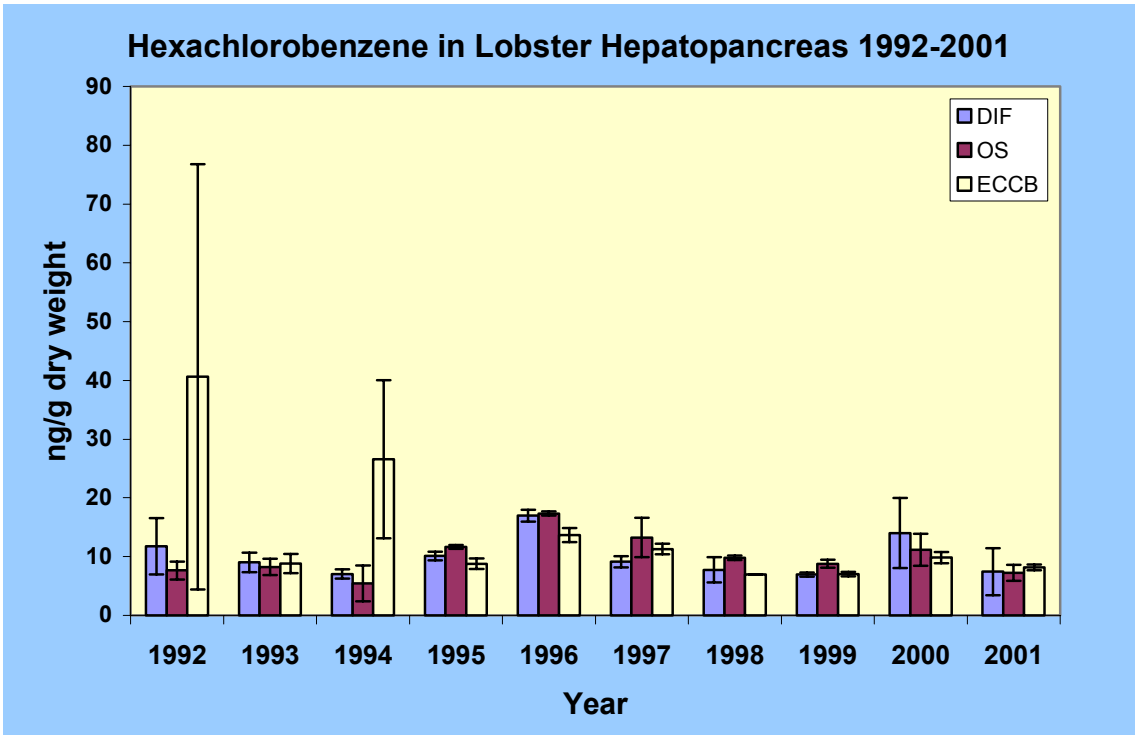

Dieldrin in Lobster Meat 1992-2001
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
ng/g dry weight
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

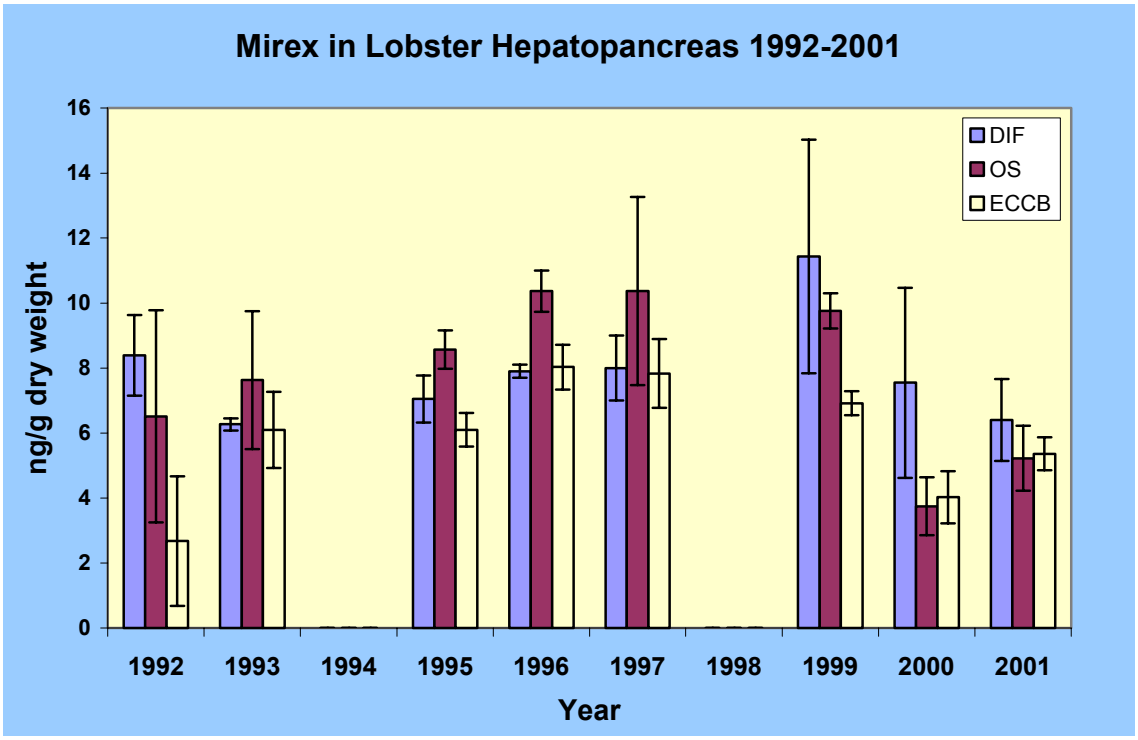

Hexachlorobenzene in Lobster Meat 1992-2001
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
ng/g dry weight
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

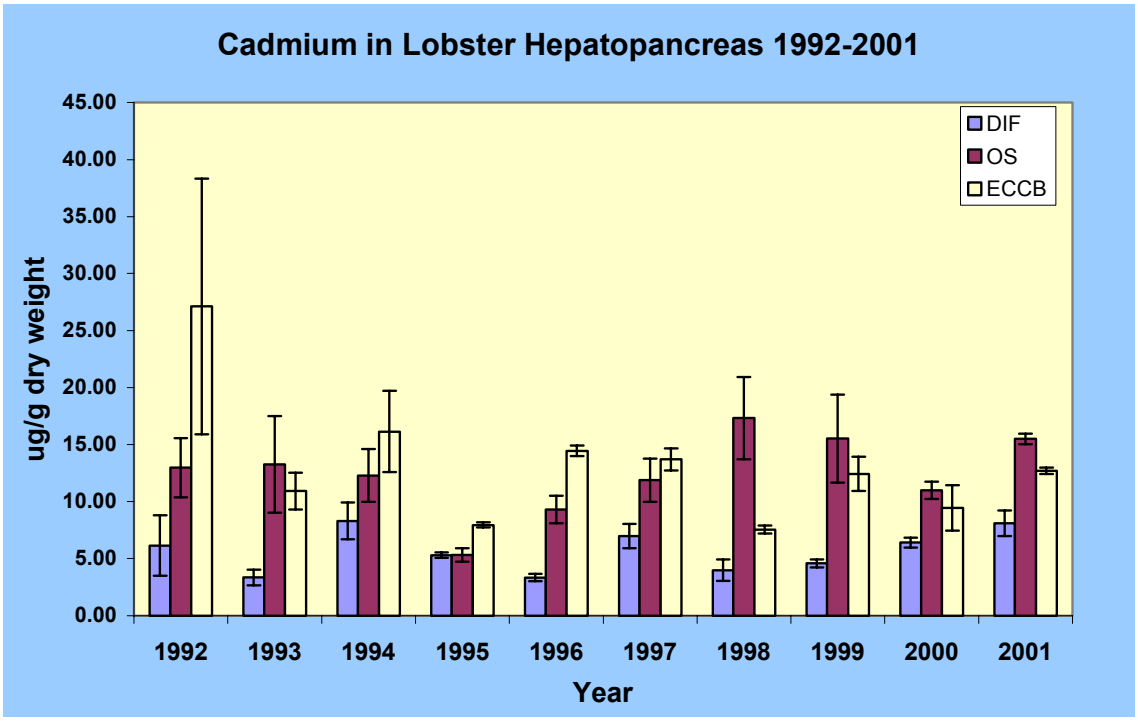

Mirex in Lobster Meat 1992-2001
ng/g dry weight
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

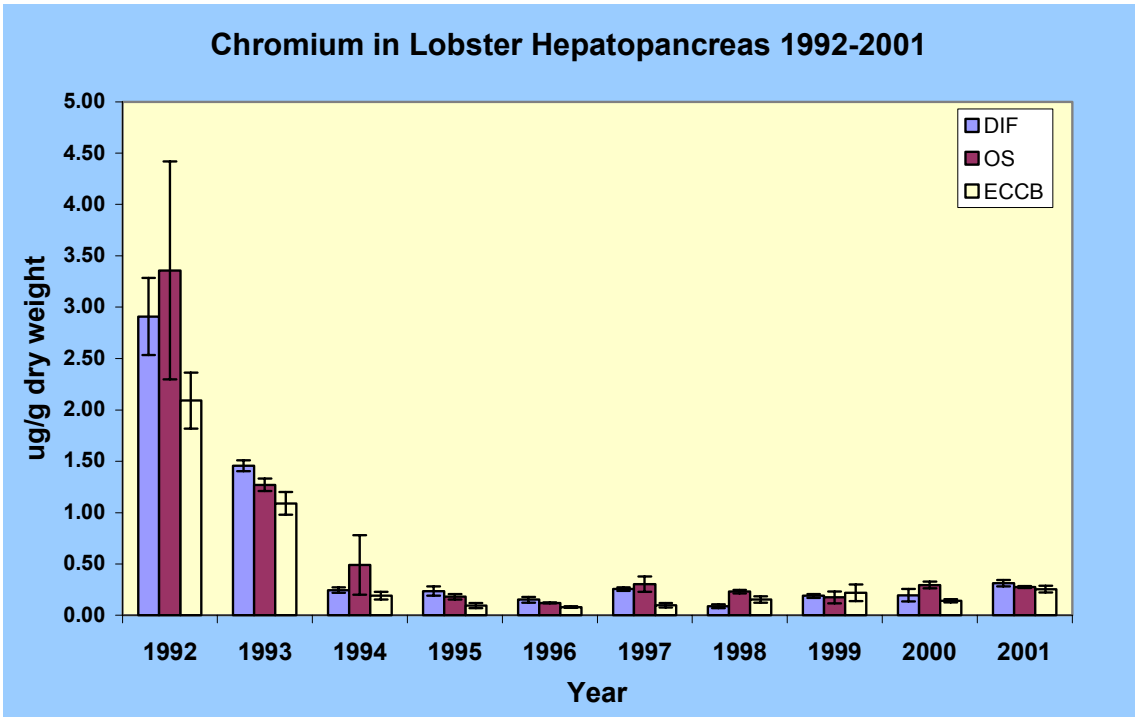

Total Chlordane in Lobster Hepatopancreas 1992-2001
ng/g dry weight
350
300
250
200
150
100
50
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

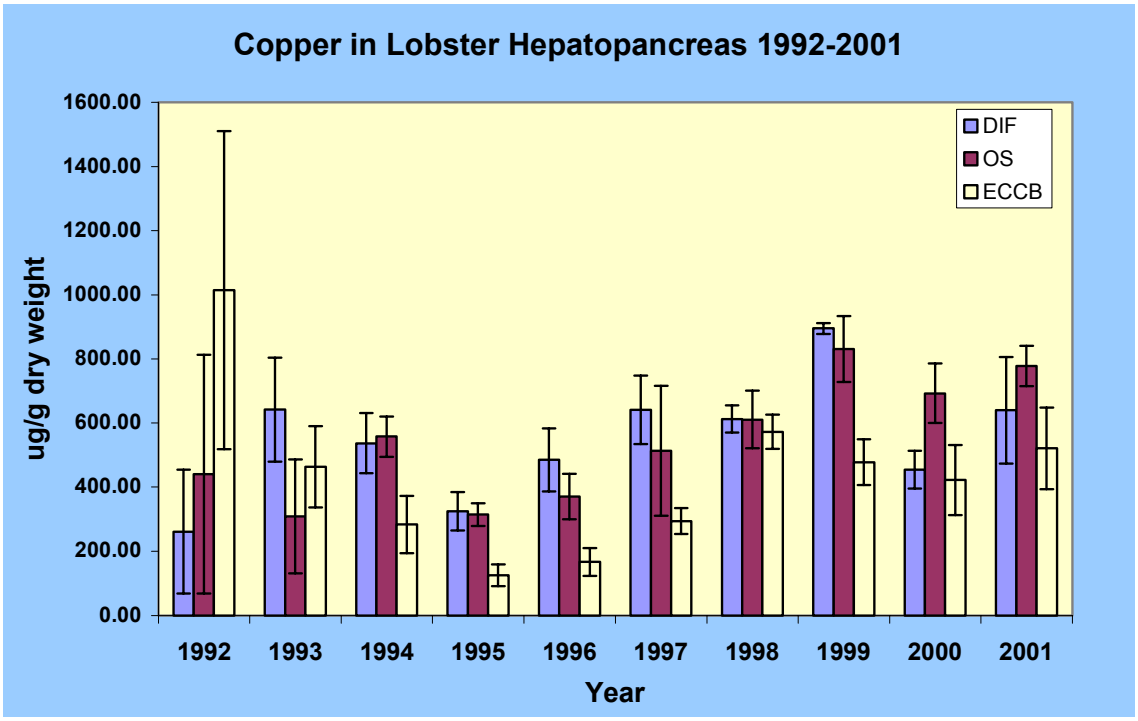

Dieldrin in Lobster Hepatopancreas 1992-2001
ng/g dry weight
200
180
160
140
120
100
80
60
40
20
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

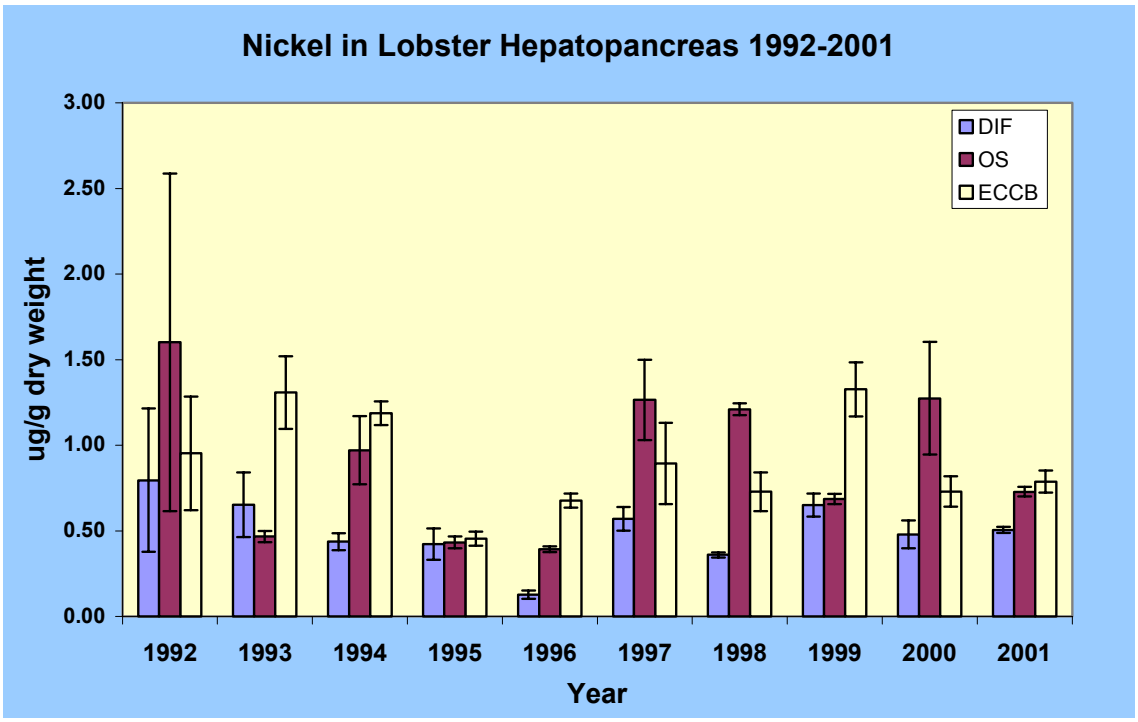

Hexachlorobenzene in Lobster Hepatopancreas 1992-2001
ng/g dry weight
90
80
70
60
50
40
30
20
10
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

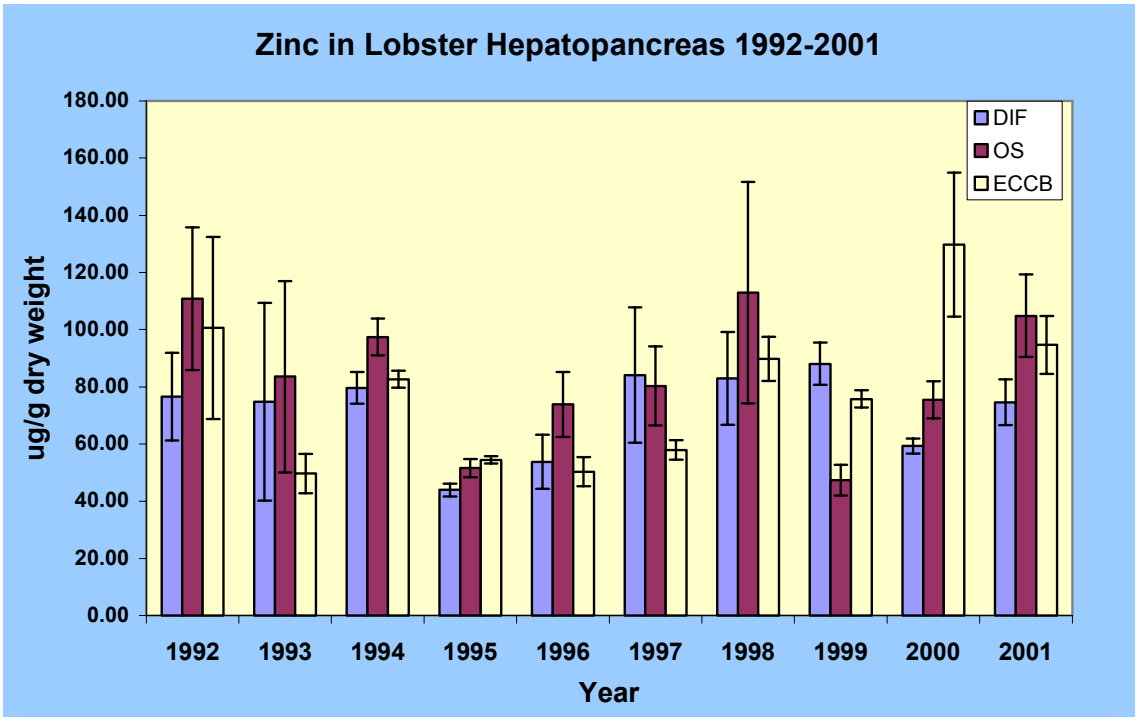

Mirex in Lobster Hepatopancreas 1992-2001
ng/g dry weight
16
14
12
10
8
6
4
2
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

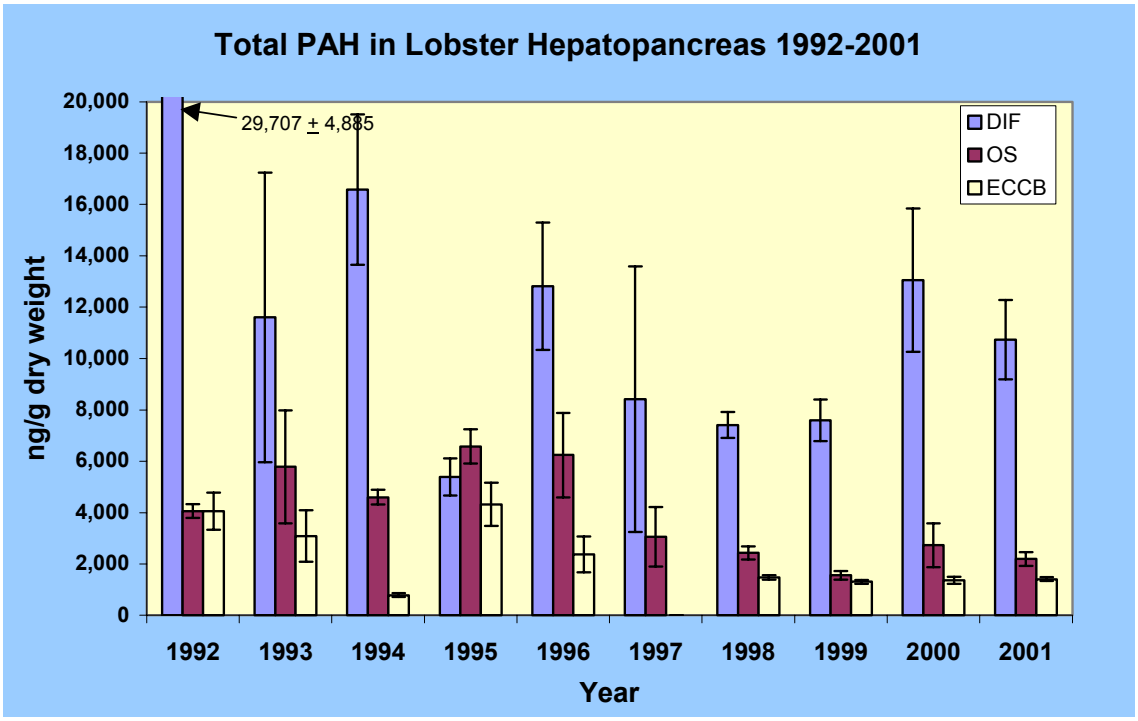

Cadmium in Lobster Hepatopancreas 1992-2001
ug/g dry weight
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

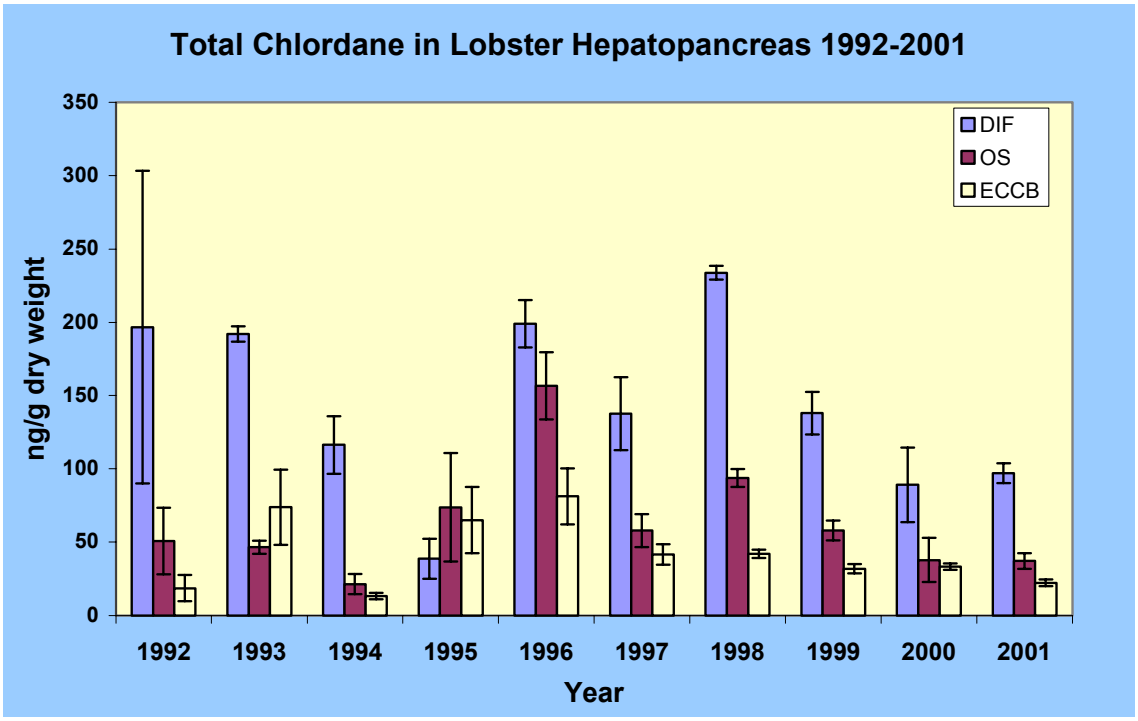

Chromium in Lobster Hepatopancreas 1992-2001
ug/g dry weight
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

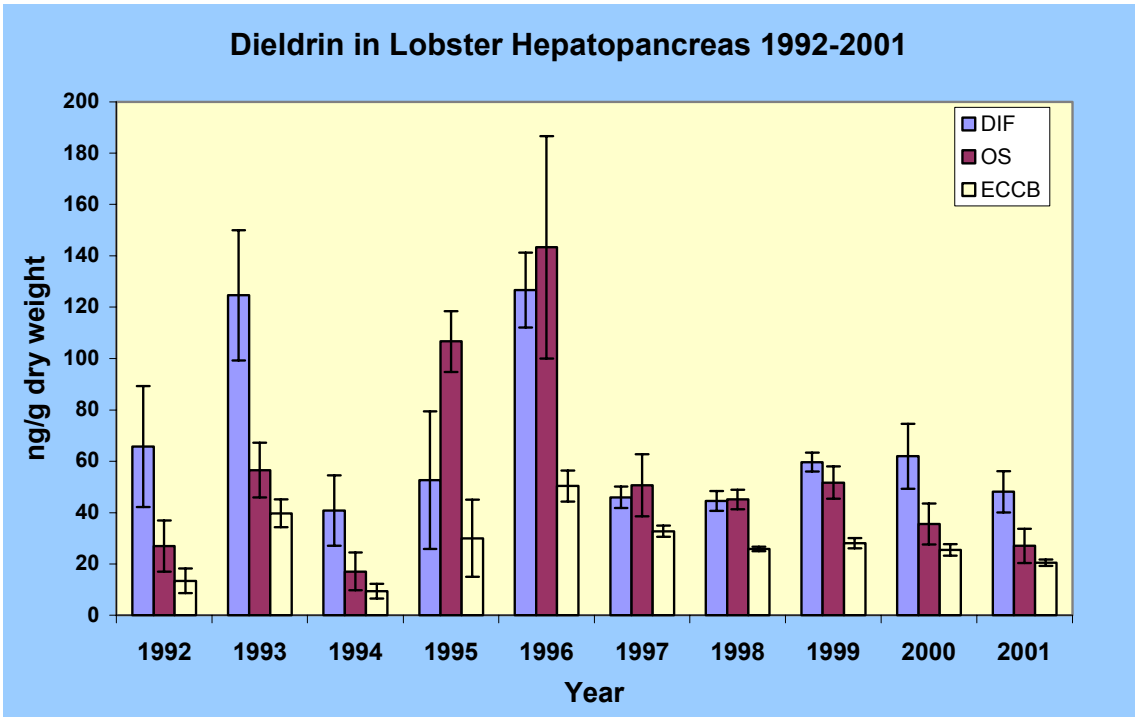

Copper in Lobster Hepatopancreas 1992-2001
ug/g dry weight
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

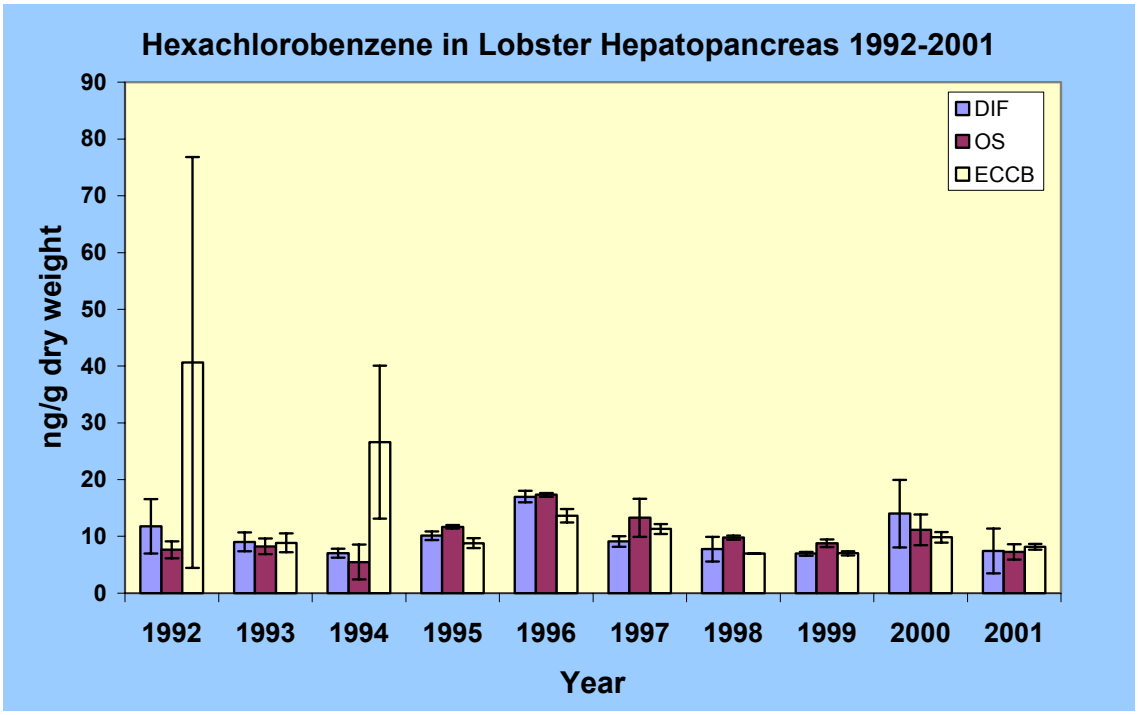

Nickel in Lobster Hepatopancreas 1992-2001
ug/g dry weight
3.00
2.50
2.00
1.50
1.00
0.50
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

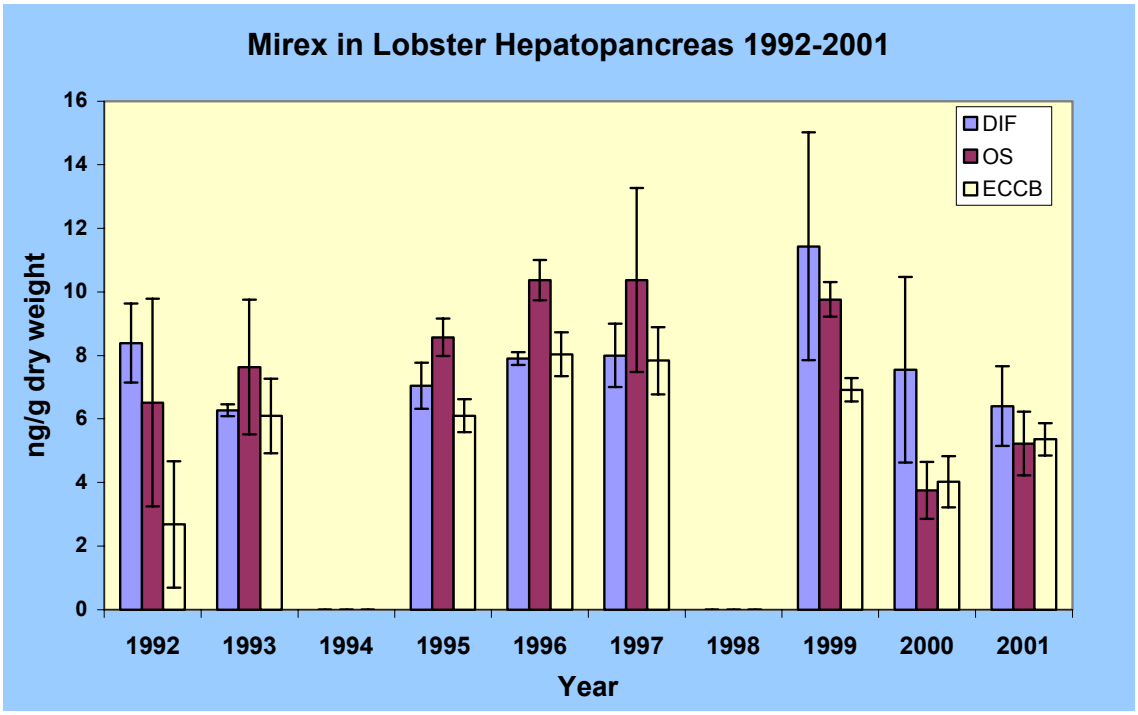

Zinc in Lobster Hepatopancreas 1992-2001
ug/g dry weight
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

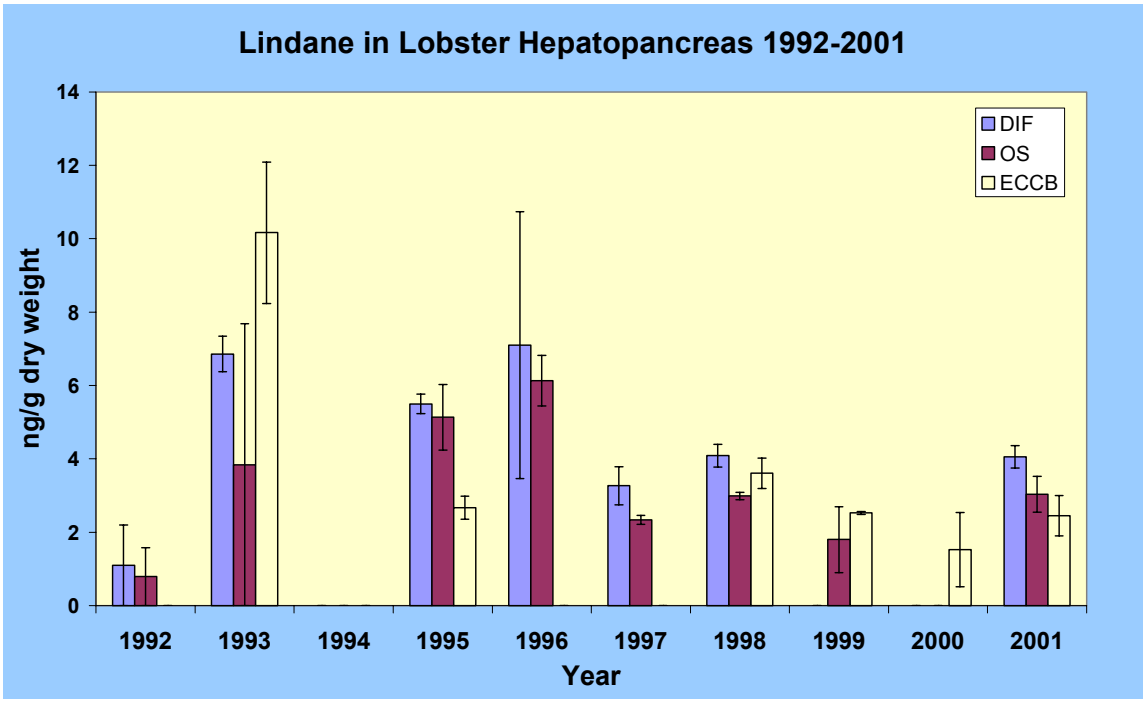

Total PAH in Lobster Hepatopancreas 1992-2001
ng/g dry weight
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
29,707 ± 4,885
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

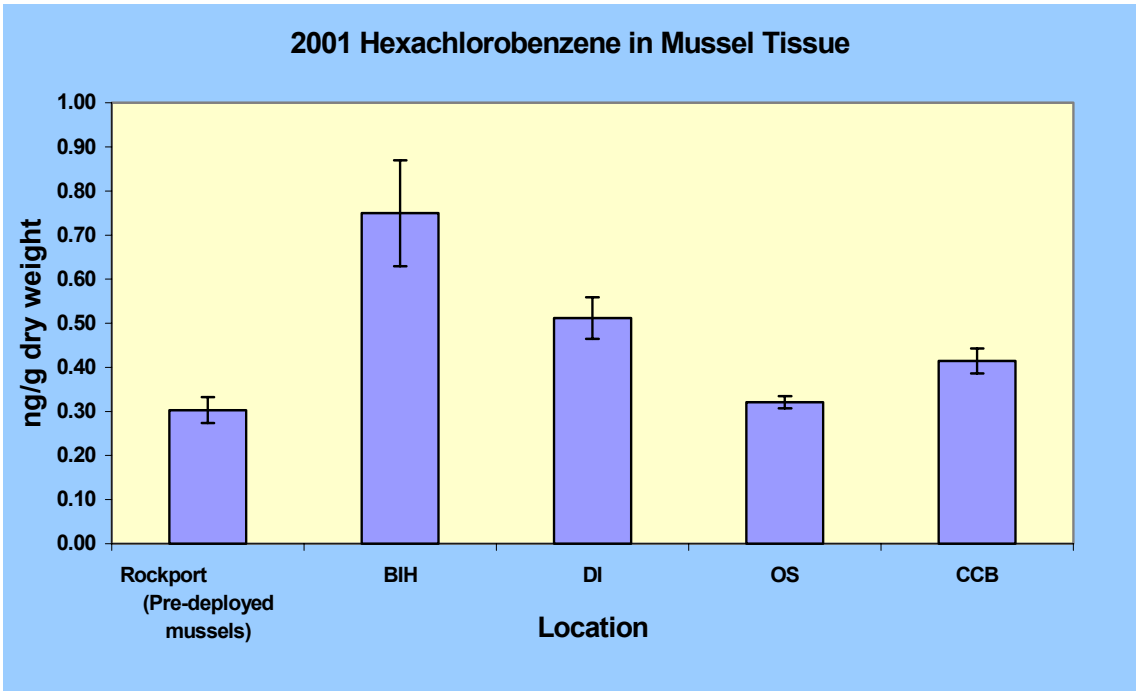

Total Chlordane in Lobster Hepatopancreas 1992-2001
ng/g dry weight
350
300
250
200
150
100
50
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

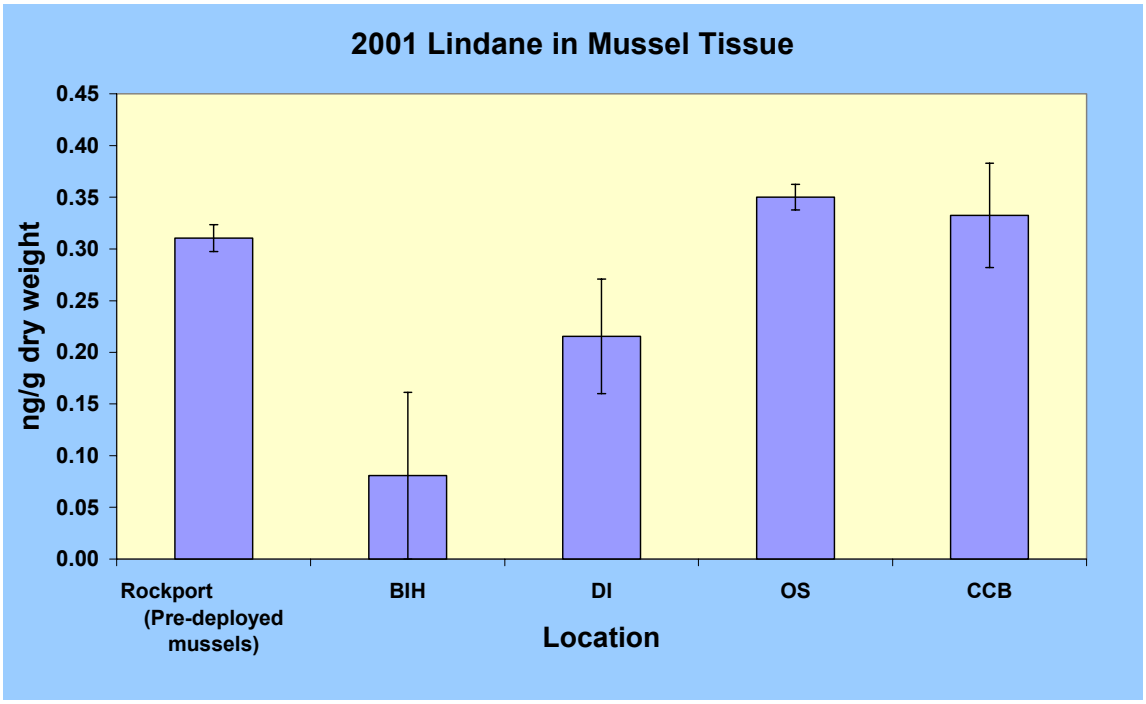

Dieldrin in Lobster Hepatopancreas 1992-2001
ng/g dry weight
200
180
160
140
120
100
80
60
40
20
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

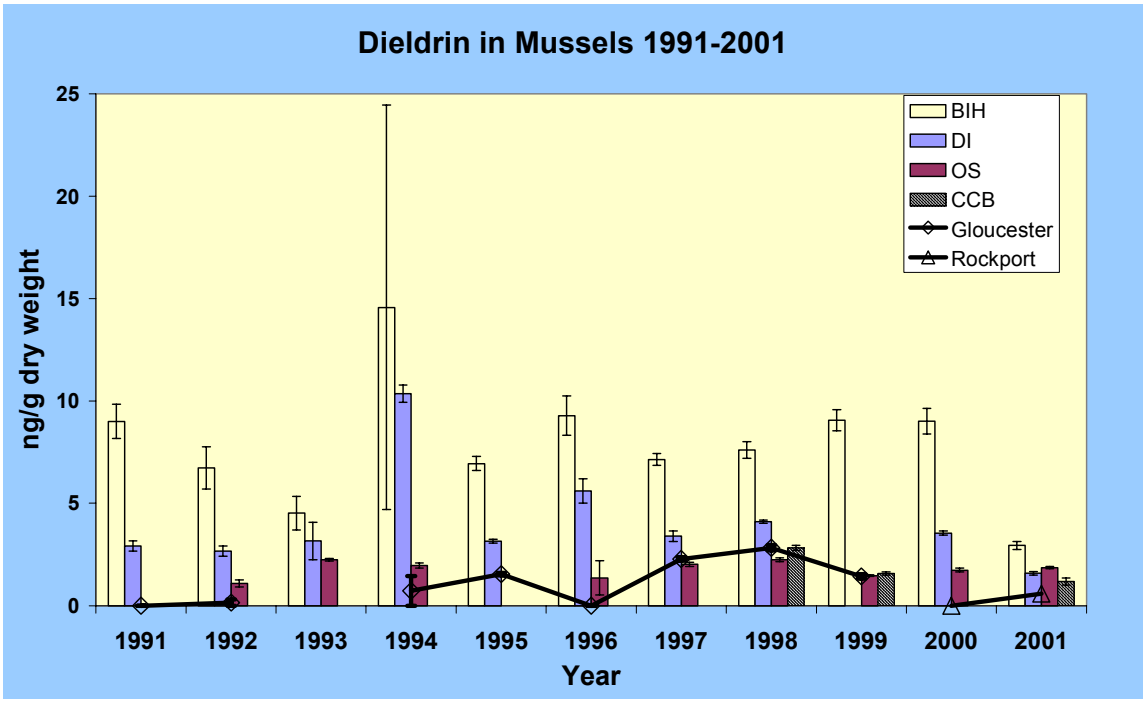

Hexachlorobenzene in Lobster Hepatopancreas 1992-2001
ng/g dry weight
90
80
70
60
50
40
30
20
10
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

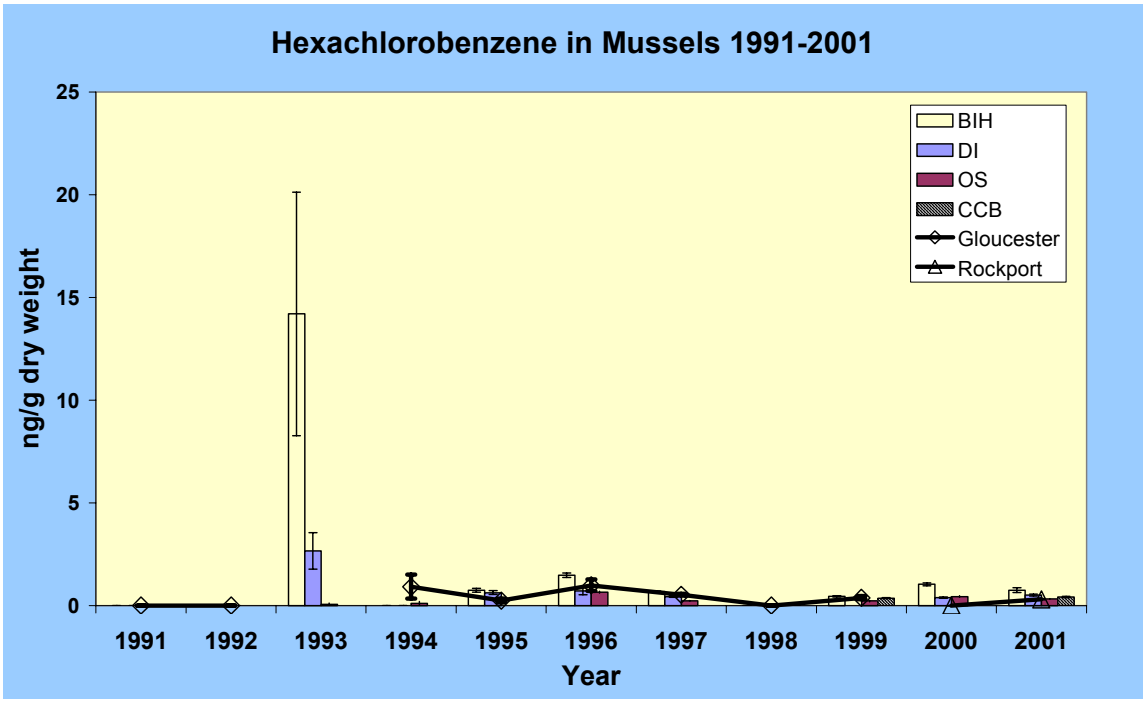

Mirex in Lobster Hepatopancreas 1992-2001
ng/g dry weight
16
14
12
10
8
6
4
2
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year

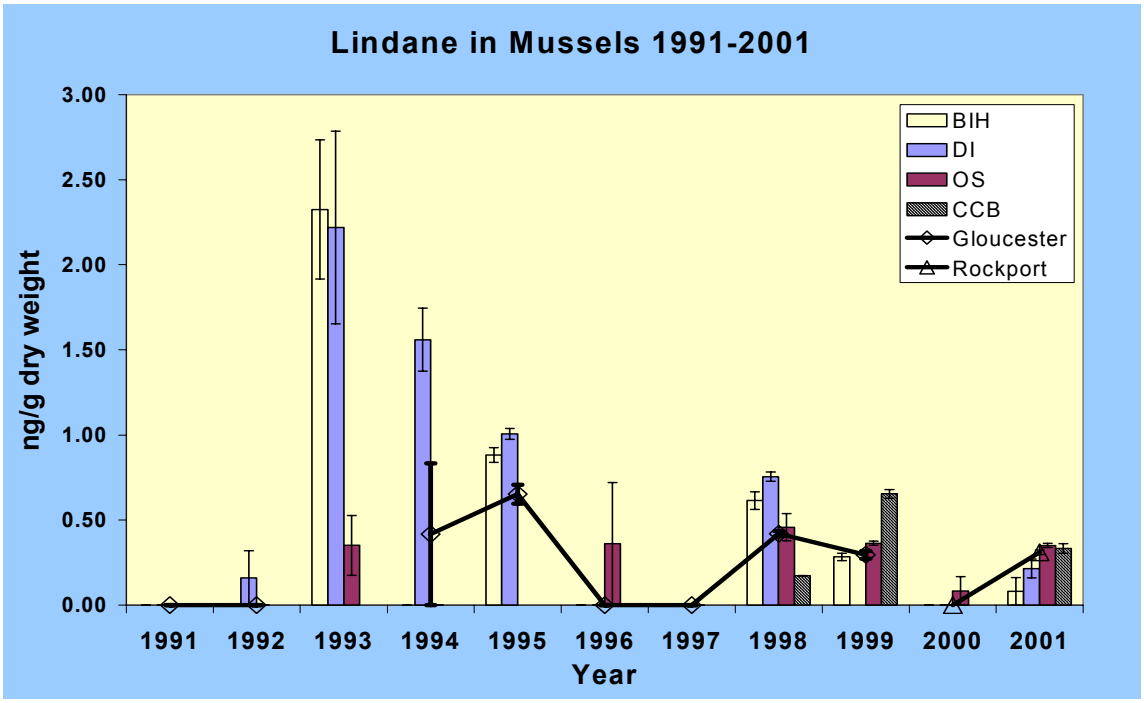

Lindane in Lobster Hepatopancreas 1992-2001
ng/g dry weight
14
12
10
8
6
4
2
0
DIF
OS
ECCB
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year


2001 Hexachlorobenzene in Mussel Tissue
ng/g dry weight
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Rockport (Pre-deployed mussels)
BIH
DI
OS
CCB
Location


2001 Lindane in Mussel Tissue
ng/g dry weight
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Rockport (Pre-deployed mussels)
BIH
DI
OS
CCB
Location


Dieldrin in Mussels 1991-2001
ng/g dry weight
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
BIH
DI
OS
CCB
Gloucester
Rockport


Hexachlorobenzene in Mussels 1991-2001
ng/g dry weight
25
20
15
10
5
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
BIH
DI
OS
CCB
Gloucester
Rockport


Lindane in Mussels 1991-2001
ng/g dry weight
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
Year
BIH
DI
OS
CCB
Gloucester
Rockport

Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000
http://www.mwra.state.ma.us