PCB Concentrations in Fishes From the Housatonic River, Connecticut, in 1984 to 1992

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by

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EXECUTIVE SUMMARY

Biological monitoring studies were conducted in 1992, pursuant to the requirements of Paragraphs II.B and IV.A of the Housatonic River Cooperative Agreement between the Connecticut Department of Environmental Protection and the General Electric Company. The studies also provided information on factors influencing PCB concentrations in fish, and documented PCB levels in crayfish from the Housatonic, Still and Shepaug rivers.

The main objectives of the 1992 studies were to measure PCB concentrations in selected fish (specified in the Cooperative Agreement) for comparison with studies conducted in 1984, 1986, 1988 and 1990; to monitor PCB concentrations in selected fish to further evaluate the need for fish consumption advisories; to provide information on patterns of PCB bioaccumulation by fish; to continue the insect monitoring program conducted previously by the State of Connecticut; and to estimate PCB concentrations in crayfish from the Housatonic and two tributaries.

Fish were collected from four stations on the Housatonic River in Connecticut. In upstream to downstream order, these are Cornwall, Bulls Bridge, Lake Lillinonah and Lake Zoar. The 1992 studies were similar in sampling locations, collecting techniques and analytical techniques to studies conducted in 1984, 1986, 1988 and 1990.

As in previous studies, PCB levels typically decreased downstream for species collected at more than one station. Data for brown trout and smallmouth bass at Cornwall indicate that 1992 PCB levels were not significantly different from 1990, but were somewhat higher than in 1984. Interpretation of this difference at Cornwall is complicated by statistical assumptions regarding data distributions, interrelationships among various parameters and differences in the timing of sampling in different study years relative to an apparent annual cycle in tissue PCB levels. For other stations and species, no temporal trend over the period 1984-1992 was evident.

Analyses to evaluate the need for fish consumption advisories were performed on American eel and white perch from Lake Zoar, sunfish from Lakes Zoar and Lillinonah, and yellow perch from Lake Zoar, Lake Lillinonah and Bulls Bridge. None of the yellow perch or sunfish exceeded the 2 mg/kg wet weight advisory threshold. This threshold was exceeded by 2 of 14 white perch and 3 of 5 eel, species which were collected only in Lake Zoar.

Estimates of PCB levels in caddisflies and in predatory insects (stoneflies and dobsonflies) from Cornwall fell within the respective ranges observed in studies since 1984.

Crayfish PCB concentrations in the Still and Shepaug rivers were approximately one-third and one-hundredth those in the Housatonic River, respectively. PCB levels are therefore significant in the Still River but not in the Shepaug. PCB composition in the Still River appears to differ from upstream Housatonic PCB by the presence of congeners associated with Aroclor 1242. A comparison of tissue levels of these congeners in smallmouth bass from the four Housatonic River stations indicates that the Still River is an apparent source of PCBs in Housatonic River fish downstream from the Still River confluence.

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INTRODUCTION

Since 1984, the Academy of Natural Sciences has conducted biennial fish surveys in the Connecticut portion of the Housatonic River. These studies have documented a reduction of PCBs in the biotic component of the river ecosystem, relative to pre-1984 levels. This monitoring program was continued in 1992, as called for in the Housatonic River Cooperative Agreement. The Academy also continued the benthic insect studies required by the Agreement. In addition, crayfish were collected from the Housatonic and two tributaries, and were analyzed for PCB.

The main objectives of the 1992 studies follow.

1. *Measure PCB concentrations in selected fish of the Housatonic River for comparison with studies conducted in 1984, 1986, 1988 and 1990.* As specified in the Cooperative Agreement, the groups monitored were brown trout from Cornwall and smallmouth bass from Cornwall, Bulls Bridge Station, Lake Lillinonah and Lake Zoar.

2. *Monitor PCB concentrations in selected fish to further evaluate the need for fish consumption advisories.* As specified in the Cooperative Agreement, the groups monitored were yellow perch from Bulls Bridge Station, yellow perch and sunfish from Lake Lillinonah, and yellow perch, white perch, sunfish and eel from Lake Zoar.

3. *Provide information on patterns of PCB bioaccumulation with respect to exposure time, lipid content and basic physiological properties of fish.* PCB concentrations and lipid content were analyzed in Cornwall brown trout collected at one-month intervals from June through October.

4. *Continue the insect monitoring program conducted in 1990 by the Connecticut Department of Environmental Protection.* This involved collecting and analyzing composite samples of three insect taxa from Cornwall, including filter-feeding caddisflies and predatory stoneflies and dobsonflies.

5. *Estimate PCB concentrations in crayfish from selected tributaries to provide indirect information on the relative magnitudes of PCB inputs to the Housatonic River.* Crayfish were collected from the Still River, Shepaug River and the Cornwall area of the Housatonic River, and were analyzed for PCB. The purpose of these analyses was to provide information on PCB levels in the two tributaries and, indirectly, on their relative importance as PCB sources to the Housatonic River.

The 1992 studies were undertaken pursuant to the requirements of Paragraphs II.B and IV.A of the Housatonic River Cooperative Agreement between the Connecticut Department of Environmental Protection and the General Electric Company. They also provide additional useful information on factors influencing PCB concentrations in fish and on PCB levels in the Still and Shepaug Rivers.

LOCATION OF SAMPLING AREAS

Fish were collected from four stations on the Housatonic River in 1992 for PCB analysis. In downstream order these were Cornwall, Bulls Bridge, Lake Lillinonah and Lake Zoar (Fig. 1). Five collecting trips were made during June to October (Table 1). Sampling locations within each station were generally the same as in previous years, except for a new site at the Cornwall station as described below.

Table 1. Summary of sampling methods and locations for 1992 ANSP fish collections on the Housatonic River, Connecticut.

Sampling Location	DATE 6/16-17/92 (Trip 1)	7/13-15/92 (Trip 2)	8/6-10/92 (Trip 3)	9/22/92 (Trip 4)	10/20-22/92 (Trip 5)
Cornwall	B,A	B,A	W*	W*	W*
Bulls Bridge			E		E
Lake Lillinonah			E		E
Lake Zoar			E		E

KEY:
* = Collection with State of Connecticut gear assisted by ANSP
B = Backpack electroshocking
E = Boat electroshocking
W = Walkalong (shore) electroshocking
A = Angling

Insects and crayfish were collected from three rivers in Fairfield and Litchfield counties: Housatonic River at Cornwall, the Still River and the Shepaug River.

Cornwall

In order to assess temporal patterns of PCB uptake, monthly samples of yearling brown trout were collected from the Cornwall site during June to October 1992. Recently stocked (28 May 1992) yearling brown trout were collected during the first sampling trip on 16-17 June by backpack electroshocking and angling from the "Abutments" and "Pushemup" areas about 3 to 4 km above the State Route 128 covered bridge and from the State Route 128 covered bridge area (Table 1). The covered bridge area consisted of the "trash pool" about 150 m downstream from the bridge, the riffle upstream of the trash pool, and areas just upstream and downstream of the bridge, including the mouth of Mill Brook (which enters the Housatonic River about 20 m upstream of the 128 bridge). Yearling brown trout were collected from the same locations during the second trip (13-15 July). The primary sampling trip was 6-7 August, timed to coincide

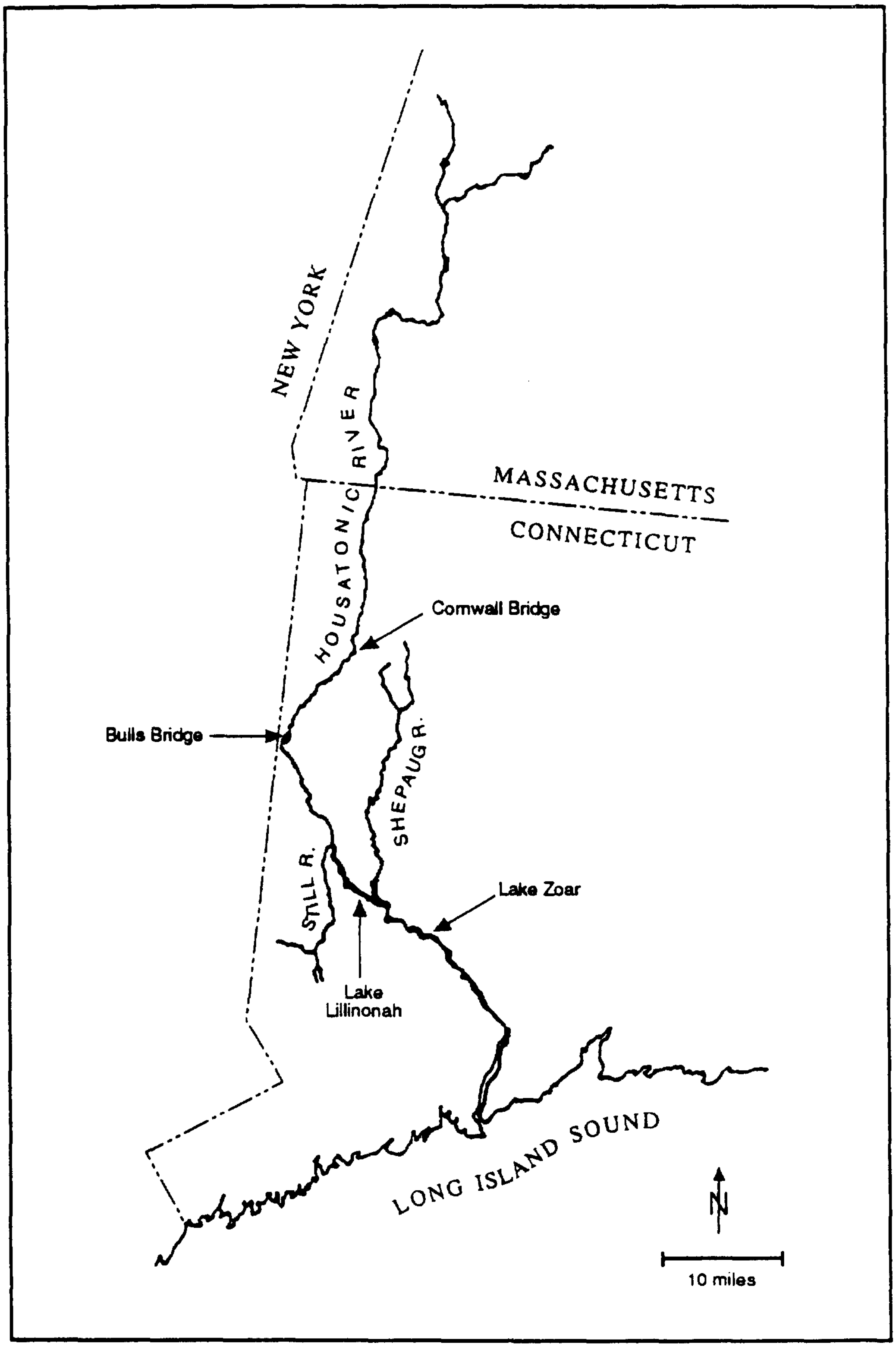


Figure 1. Map of the Housatonic River and sampling stations for the 1992 fish and macroinvertebrate collections.

with Connecticut's annual river survey. Brown trout and smallmouth bass were collected from the "Abutments" and "Pushemup" areas and in the covered bridge area. Fish were also collected from a new site: the "cellar hole" about 2 km downstream of the State Route 128 covered bridge. In trips 3-5, fish collections were made with the assistance of Connecticut State fisheries personnel using their walkalong electrofishing unit (Table 1).

Insects and crayfish were collected on 21 May 1992 from the Housatonic River at Highway US 7 and Connecticut Rte. 4

Bulls Bridge

Fish were collected on 6-7 August and 20 October 1992 by boat electroshocking throughout the reservoir, from the dam up to a point just above Kent, i.e. about 0.6 km above the State Route 341 bridge. The uppermost area sampled contained moderate current whereas the downstream areas had slower current velocities. Electroshocking was conducted over parts of the shoreline in places throughout the reservoir, primarily covering the upper half of the reservoir and the lower section near the dam. Rock cliffs, rock rip-rap, weed beds, snags, and sandy beaches were the main habitats sampled.

Lake Lillinonah

All specimens were collected by boat electroshocking above the Shepaug Arm (flooded mouth of Shepaug River). Most specimens were taken in inlets or coves and along the shorelines from about 0.5 km below State Route 133 bridge to approximately 6 km above State Route 133. The habitats sampled included rock ledges, weed beds, coves and brush piles.

Lake Zoar

Sampling was conducted along both banks at both upper and lower ends of the reservoir and at a few places within the middle section of the reservoir. Sampling in the upper end was from the boat ramp at Lakeside up to the outlet spillway of Lake Lillinonah. Sampling for adult fish in the lower end was from about 0.6 km above Stevenson Dam to the vicinity of the cove at Kettleworth State Park, about 5 km above Stevenson Dam.

Still River

Crayfish were collected on 20 May 1992 from the Still River between Grays Bridge Road and new US Highway 7 in Brookfield Township.

Shepaug River

Crayfish were collected on 20 May 1992 from the Shepaug River at Wellers Bridge Road in Roxbury Township.

METHODS

Fish Collection and Sample Preparation

Fish were collected by staff of The Academy of Natural Sciences of Philadelphia (ANSP), sometimes with the assistance of the Department of Fisheries of the State of Connecticut (at the Cornwall station). Fish were collected and transported on dry ice to ANSP in Philadelphia. From the fish collected, 150 were selected to be analyzed for PCBs. A summary of 1992 specimens is given in Table 2. White perch, yellow perch, smallmouth bass, brown trout, pumpkinseed, bluegill, redbreast sunfish, and American eel were analyzed. Carp, brown bullhead, largemouth bass, white catfish and rainbow trout were analyzed in past years but not in the present study.

Table 2. Number of each target species analyzed for PCBs in the Housatonic River during June to October 1992. Rainbow trout are trip blanks purchased from a fish department.

	STATION					
Species	Bulls Bridge	Cornwall	Lillinonah	Zoar	Trip Blanks	Total
American eel	0	0	0	5	0	5
Bluegill	0	0	4	3	0	7
Pumpkinseed	0	0	2	3	0	5
Redbreast sunfish	0	0	3	3	0	6
White perch	0	0	0	14	0	14
Yellow perch	12	0	8	8	0	28
Smallmouth bass	8	14	8	7	0	37
Brown trout	0	44	0	0	0	44
Total	20	58	25	43	0	146
Trip blanks						
Rainbow trout	0	0	0	0	2	2

Boat electroshocking was the main collecting technique employed during this study and was used in all the sites except Cornwall. A Coffelt model VVP-15 boat shocker powered by a Honda EG5000X generator was used over the following ranges depending on the site and conditions: 110-250 volts, 20-60% pulse width, 100 pulses/sec, and 5-7 amps. Boat shocking was typically done at night although some daytime and early evening shocking was conducted. Daytime shocking was very successful in Lake Zoar for yellow perch, white perch, eels and other species; daytime shocking was not as productive at Bulls Bridge. Most of the smallmouth bass were collected by boat electroshocking at night. Night shocking also collected sunfish species (bluegill, redbreast sunfish and pumpkinseed), white and yellow perch, and eels. Many other species, not needed for chemical analysis, were sampled by boat shocking and released. Two people collected the stunned fish with long-handled dip nets. When only target species were needed, many fish were shocked but not netted. Usually, only notes on the general abundance of these non-netted fish were taken.

A Smith-Root model VII D.C. backpack electrofishing unit (used at 0.3-0.4 amps, 6.5 ms pulse width, 60 Hz frequency and 200-400 volts) was used at the Cornwall station to collect fish in areas accessible to wading during trips 1 and 2.

During trips 3-5, electroshocking powered by a generator in a canoe (walkalong unit) was performed in cooperation with the Connecticut Department of Fisheries to collect brown trout (stocked fish in a catch-and-release section) and smallmouth bass from the Housatonic River at Cornwall. The above equipment is owned by the State of Connecticut, and typically is used during their annual August surveys along the trout fishing reaches of the Housatonic River. Fin clips identifying the ages and stocking times of the brown trout were recorded on the field data sheets along with other biological data.

Background sites were sampled during the 1988 study but were not required in the present study or in 1984, 1986 or 1990. Most sampling in 1992 was done with boat electroshocking because fish taken with gill nets and traps in past years were also susceptible to this technique. Each of these sampling techniques is biased towards adult fish (depending on the mesh sizes used for the gill nets). Trotlines (which tend to catch catfish and bullheads) were used during the 1984, 1986 and 1988 studies, but were not used in the present study because catfish and bullheads were not analyzed.

After capture, specimens were held in water or on wet ice until the field processing site was reached. Processing was done typically within 1 to 6 h of the time of capture. Fish not needed for chemical analysis were measured (total length in cm) and released or discarded.

At the field processing site, fish needed for chemical analysis were measured for total length in cm. Specimens were wrapped in clean aluminum foil. Specimens of the same species from the same locality were sometimes wrapped together. An aluminum tag was inserted inside each package, but without contacting the specimens. The inner label contained the date, species, number of specimens, locality and serial number. The foil packs were secured with freezer tape, and a wax pencil was used to label the outer tape with the same information that was on the inner tag. The foil packs containing the specimens were placed in coolers with dry ice and frozen.

Upon arrival at ANSP, fish data were logged into a computer database and the specimens placed into the ANSP fisheries section freezer until laboratory processing. All samples were accounted for in this way. Chain-of-custody forms were used to verify transfer of specimens from state collecting crews to ANSP field personnel and from ANSP field personnel to laboratory personnel for processing or storage.

Handling of fish followed the Academy's Standard Operating Procedure P-14-04 (Fish Preservation, Fixation, and Curation, Rev. 2). Quality control procedures were followed during field sampling and laboratory work, all efforts being made to minimize contamination of the specimens. In particular, sample material was prepared using clean equipment and on clean surfaces, avoiding contact between sample material from different specimens or contact with uncleaned laboratory surfaces.

Fish to be analyzed for PCBs were thawed in the laboratory, measured for total length (± 0.1 cm) and weight (± 0.1 g). The field identification of each specimen was verified. For the brown trout from Cornwall, fin clips, if present, were observed carefully and recorded. During sample preparation, any external or internal anomalies such as fin wear, trematodes, nematodes, etc., were noted and recorded in the database. The laboratory methods followed the Academy's Standard Operating Procedure P-14-12 (Preparation of Tissue Samples for Contaminant Analysis, Rev. 1 Draft).

Comparisons of field and laboratory lengths indicate that laboratory lengths are usually similar but slightly less than field lengths, indicating slight shrinkage of some fish, presumably due to freezing.

Each fish was given a four digit analysis number used for tracking through chemical analysis. Specimen data were entered directly into a computer database, with hard copy backup each day.

A clean glass plate and stainless steel fillet knife or scalpel blade were used for each specimen. Sterile scalpel blades were placed onto a scalpel handle and rinsed with dichloromethane prior to use in filleting and mincing. If necessary, debris and mucus were removed from the fish by rinsing in distilled water. The left fillet was taken unless both fillets were necessary to obtain sufficient sample material. Following standard practice based on typical human food-preparation customs, eels were processed with the skin and scales removed, whereas the skin and scales were left on the trout fillets. The fillets of the other species (yellow perch, white perch, smallmouth bass and sunfish species) had the skin on but with the scales removed. Fillets were taken to include the flesh covering the abdominal cavity. The entire fillet was minced and placed into clean glass jars with a clean piece of aluminum foil between the jar and the lid. Fillet weight and sex of the specimen were recorded. Otoliths of most target specimens (except for brown trout of known age; see brown trout section) were dissected and preserved separately in small vials with 95% ethanol. The fillets were delivered to the ANSP Chemistry Section along with a Chain-of-Custody form. The remains were wrapped in aluminum foil, labeled, and refrozen, permitting examination or analysis of additional material, if necessary.

Cleaning of the glass plates and fillet knives at the end of each lab session included the following steps:

1. wash with Alconox detergent and thoroughly rinse in tap water;

2. either: a) rinse in 50% nitric acid, rinse with distilled and double distilled water, and solvent-rinse with acetone and dichloromethane, or b) muffle overnight in a muffle furnace; and

3. cover with muffled aluminum foil to avoid contamination prior to use.

Aging of Fish

Ages of the specimens analyzed were estimated using otoliths and tags (brown trout). Examination of otoliths from 3 of the 44 brown trout was needed to verify their ages. The remainder of brown trout could be aged using fin clips (Table 3). All of the remaining specimens were aged using otoliths.

Table 3. Fin clips of the 44 brown trout, analyzed for PCBs, which were collected from the Cornwall station during June to October 1992. See table notes for key to fin clips. Fin abbreviations are ADP (adipose), LM (left maxillary), RM (right maxillary), LV (left ventral), RV (right ventral) and UM (no fin clips).

	CLIP								
	ADP-90	LM-91	LV-92	RM-90	RM-92	LM-92	RV-91	UM	Total
6/16-17/92	0	0	0	0	7	0	0	0	7
7/13-14/92	0	0	0	0	2	0	0	0	2
8/6-7/92	1	1	3	1	12	0	1	0	19
9/22/92	0	0	0	1	6	0	0	0	7
10/20/92	0	0	1	2	5	0	1	0	9
ALL	1	1	4	4	32	0	2	0	44

KEY:
ADP-90=Stocked in Spring 1990 as 2+ Burlington adult, age 4+ when collected
LM-91 =Stocked in 1991 as 1+ Survivor yearling, age 2+ when collected
LV-92 =Stocked on May 14, 1992 as 2+ adult, age 2+ when collected
RM-90 =Stocked in Spring 1990 as 1+ yearling, age 3+ when collected
RM-92 =Stocked on May 28, 1992 as 1+ yearling, age 1+ when collected
LM-92 =Stocked on May 28, 1992 as 1+ yearling, age 1+ when collected
(assume RM should have been clipped, same size as RM-92 fish)
RV-91 =Stocked in Spring 1991 as 2+ Burlington adult, age 3+ when collected
UM =Unmarked, or wild fish

The largest pair of otoliths (sagitta) were dissected from the fish in the lab during the filleting procedure and placed in small vials of 95% ethanol. One of these saggita was embedded with fast-cure epoxy resin and dried. Thin sections were cut transversely through the otolith with a Buehler Isomet low-speed saw. Three to five of these thin sections per fish were affixed to a microscope slide with emersion oil. Sections were examined under a dissecting microscope at 50x magnification, with either direct viewing or viewing through a video image on a monitor. Specimens which were more difficult to age (e.g., eels, white perch) were examined under a compound microscope (100-200x magnification) when it was necessary to examine the edge or kernel of the otolith more carefully for annuli.

When viewing the sectioned otoliths, annuli (annual marks) are visible as narrow, dark bands. Annuli are typically well-pronounced, with thin, faint bands representing other cycles of growth. Age was estimated using these pronounced bands, with the innermost band assumed to represent the first winter-spring (transition between age 0+ and 1+).

Ages were determined independently by two fisheries biologists who read the otoliths and then compared results. For 96% of the otoliths, age discrepancies between the two biologists were less than or equal to one year; exact agreement occurred for 65% of the otoliths. As in past ANSP studies, eels were responsible for major discrepancies in aging (3 of the 5 had to be re-examined with the compound microscope). A mutually agreed upon determination was accomplished for these discrepancies after re-examination of the otoliths and discussion.

Brown Trout

Most of the brown trout analyzed from the Cornwall station were identifiable by fin clips applied prior to stocking. These brown trout were stocked at ages 1+ or 2+ in the spring of 1990, 1991 or 1992 (Table 3). The oldest trout was a 4+ that was stocked in 1990 as a 2+ adult (based upon the adipose fin clip). Information regarding fin clips, stocking dates and age at stocking were provided by the State of Connecticut Inland Fisheries Division.

Yearling trout were identified by a right maxillary clip (51 collected of which 32 were analyzed) and were stocked at age 1+ on 28 May 1992. Trout with a left ventral clip (12 collected, of which 4 were analyzed) were stocked on 14 May 1992 as age 2+ adults.

Like the 1992 yearling fish, three larger, apparently holdover brown trout had right maxillary clips. Examination of otoliths of these three trout confirmed that they were from the Spring 1990 stockings which also used a right maxillary clip.

Total age of each specimen was assigned, adding river-age (time between stocking and collection) to age at stocking. Age at stocking was assigned assuming a hatching date of 1 January. For example, a yearling fish stocked in April was assigned an age at stocking of 1.4 years. River-age was the primary variable used for analysis of PCB uptake rates.

Analyses of PCBs

The laboratory method used for treatment of fish is based on Academy Standard Operating Procedure P-16-83, "Soxhlet Extraction and Cleanup of Tissue for PCB Congener Analysis."

Fish tissues received from the Academy's fisheries section were ground using a Tissuemizer. Each entire ground sample was desiccated by addition of three parts sodium sulphate to fish tissue by mass.

An aliquot of about 70 g of this material was placed into a glass extraction thimble and extracted over approximately 20 h using 1:1 acetone:hexane in a Soxhlet extraction tube. Surrogate standards (PCBs 14, 65, 166) were added to the sample before extraction began. Following extraction, the sample volume was reduced to about 1 ml using rotary evaporation, with final volume adjusted to 10 ml. An aliquot of 1 ml was removed from this volume for gravimetric analysis of lipids. The remaining extract was concentrated to about 2 ml, and washed with an equal volume of sulfuric acid. This volume was cooled overnight to separate the hexane and acid phases. The hexane phase was then transferred to another vial. Additional hexane washes were added, then all were combined. The hexane phase volume was reduced to about 2 ml.

The extract was cleaned by passing it through fully activated Florisil in a Sep-Pak cartridge, followed by three volumes of hexane. Internal standards (PCB 30 and 204) were then added to each sample.

Each sample was analyzed using capillary gas chromatography, employing electron capture detectors and DB-5 columns. The temperature program was slower than in previous years with the intent of separating some PCB congeners from each other or from non-PCB compounds such as hexachlorobenzene, *para, para'*-DDE, and pentachloroanisole. (Both hexachlorobenzene and *para, para'*-DDE were in fact found in the samples.) The oven temperature at injection was 50°C, ramped to 130°C at 5.0°C/min, to 203°C at 0.3°C/min, and finally to 280°C at 10.0°C/min. The compounds of interest were found in the range between 130°C and 203°C.

PCB identification was congener-specific, based on Academy Standard Operating Procedure P-16-84, "Congener-specific Quantitation of Polychlorinated Biphenyls (PCBs) by Capillary Column Gas Chromatography." The method uses Aroclors 1232, 1248 and 1262 mixed in a ratio of 250:180:180. The identification and mass of individual congeners in this mixture was generated by USEPA's Large Lakes Research Station at Grosse Ile, Michigan, and were enumerated by Mullin (1985). Up to 121 PCB congeners are found in this mixture, containing nearly all environmentally significant PCB. The three surrogate standards and two internal standards are included in this mixture in order to make a calibration standard.

Two methods were used for quantitating PCB concentrations based on the congener-specific data. The first was the same method used in previous Housatonic River projects. This method is based on estimating the concentrations of selected congeners which are essentially unique to Aroclor 1254 or 1260, extrapolating to Aroclor concentrations from the relative proportions of these congeners in each Aroclor, and then summing the two Aroclor estimates. The resulting estimate of total PCB concentration is called TPCB and assumes that all PCB congeners found in the original Aroclor mixture are found in the same relative proportions in fish tissue, which may not be the case in environmental samples.

The second method, used only in 1992, is simply to sum all of the 121 individual congeners analyzed to derive a total PCB value. These estimates are called CTPCB. This method does not require assumptions about the relative proportions of congeners in Aroclors, which are central to the first method. The effect of computing PCB concentrations by these two different methods is discussed later in this report in the section entitled "Relationship Between Congener and Aroclor Quantitation Methods".

There were also certain minor differences between the 1990 and 1992 analytical methods. These consist of the following: (1) The 1990 method employs an external standard, whereas the 1992 method uses the internal standard method for quantitation, adding standards (PCB congeners 30 and 204) to the sample before injection into the instrument. (2) The 1990 method uses a non-PCB surrogate (TCMX), whereas the 1992 method measures recovery using three PCB surrogates (PCB congeners 14, 65, and 166) added to the extraction solvent immediately before beginning extraction. (3) The 1992 method uses a slower temperature ramp to increase resolution of the chromatogram.

Of these differences, the only one likely to bias TPCB estimates is the faster temperature ramp used in the 1990 (and previous) studies. A faster ramp decreases chromatogram resolution, possibly preventing closely spaced peaks from being distinguished. The result is a potential bias toward elevated PCB estimates in pre-1992 studies. Such unresolved peaks were probably sufficiently rare that the resulting bias was small. TPCB estimates should therefore be comparable across all studies.

Crayfish Sampling and Processing

Crayfish were obtained either by carefully lifting individual rocks and capturing the animals by hand or by vigorously lifting the rocks and allowing the surge of water to wash the animals into a large downstream dip net.

Animals were placed in a large cooler rinsed in river water and later sorted according to species, sex and reproductive form. All individuals of a single category were double wrapped in muffled aluminum foil. An identifying coded rag paper label with the site and date written in pencil was placed between the two layers of foil. The foil package was then wrapped in duct tape and the tape labeled with a code number, locality, date of collection, sex, and where applicable, reproductive form. All samples were placed on wet ice but separated from contact by plastic trays. At the end of the day, the entire cooler was placed in a walk-in freezer.

Samples were packed in the freezer cooler with frozen blocks of "blue ice" and taken by vehicle to ANSP. In the laboratory, specimen identifications were rechecked, after which individuals of the same species (*Orconectes rusticus*) and sex (female) were selected for analysis. Eggs were stripped from each female's carapace. The eggs and females (whole body) were then separately ground using a Tissuemizer and processed as described above for fish fillets.

Aquatic Insect Sampling and Processing

Dobsonfly larvae (*Corydalus cornutus*) and perlid stoneflies were collected along with the crayfish when rocks were rapidly lifted and the animals swept into a downstream dip net. Hydropsychid caddisflies (*Macrostemum zebratum*) and perlid stoneflies were picked from the surfaces of individual rocks with forceps.

Aquatic insects were placed in I-Chem Superfund Analyzed glass jars bearing a duct tape label on the outside. The label bore a unique code number with the project name, site identification, date and name of the taxon. Samples were placed on wet ice, then transferred to the sample cooler in a walk-in freezer at the end of the day.

Samples were packed in the freezer cooler with frozen blocks of "blue ice" and taken by vehicle to ANSP. Specimens were ground in a Tissuemizer and processed as described above for fish samples.

Statistical Analysis

Measures of PCB Concentrations

Several measures of PCB concentrations were used in summarizing and analyzing PCB concentrations. The primary analytical measure used was total PCB concentration on a wet weight basis. Total PCB concentration is relevant to regulatory thresholds. As noted above, PCB concentrations were estimated by two methods of quantitation (see Methods: PCB analyses). The first is based on identifying characteristic congeners in Aroclors 1254 and 1260 and estimating total PCB (TPCB) from the proportion of these congeners in the Aroclors. This is the same method used in 1984-1990. For the sake of historical consistency, results obtained by the TPCB method were used in all comparisons with data collected in prior years. The second method is based on the sum of all identifiable congeners. This estimate (CTPCB) was used in 1992 only. Results from the CTPCB method are expected to be a more accurate measure of actual PCB concentrations.

Analysis of PCB concentrations was based on the logarithmic transform of TPCB or CTPCB:

$$LNTPCB = \ln(TPCB)$$

$$LNCTPCB = \ln(CTPCB),$$

where ln is the natural logarithm, TPCB is the Aroclor-based PCB concentration and CTPCB is the congener-based PCB concentration; both estimates are in mg/kg wet weight. This transformation was used to produce a variable whose standard deviation is independent of the mean, and whose variation about the mean is approximately normally distributed. These properties are desirable for standard statistical comparisons and to produce unbiased estimates of means. Another reason for transforming the data is that the standard deviations of (raw) TPCB and CTPCB measurements increase with the mean, as indicated by replicate analyses and the skewed distribution of TPCB values.

Reports of the 1984 and 1986 results (ANSP 1985, 1987) used a slightly different logarithmic transformation [LPCB = ln(TPCB+1)]. LNTPCB has the advantage of being naturally related to the geometric mean: the geometric mean = exp(LNTPCB). Unlike LPCB, LNTPCB attains negative values at low PCB concentrations (LNTPCB < 0 when TPCB < 1.0); LPCB is always positive.

Since PCBs partition preferentially into lipid, it is useful to normalize PCB concentrations to lipid content; e.g., for comparing bioaccumulation between species. The lipid-normalized measure is:

$$\text{PCBLIP} = \text{TPCB/LIPID}$$

$$\text{CPCBLIP} = \text{CTPCB/LIPID},$$

where LIPID is the proportion of lipid in the tissue sample. CTPCB, TPCB and LIPID are measured variables, and the statistical distributions of PCBLIP and CPCBLIP are expected to be highly skewed. Therefore, the geometric means of PCBLIP and CPCBLIP are used to describe mean lipid-normalized concentrations.

Because of the distribution of PCBLIP, it is not suitable for statistical analysis. The logarithmic transform is more appropriate for analysis:

$$\text{LPCBLIP} = \ln(\text{PCBLIP}).$$

However:

$$\text{LPCBLIP} = \ln(\text{TPCB/LIPID}) = \text{LNTPCB} - \ln(\text{LIPID}).$$

Because of this equivalence, analysis of PCB-lipid relationships were done for most comparisons by analyzing statistical relationships between LNTPCB and ln(LIPID). For example, ln(LIPID) (hereafter referred to as LNLIP) was used as a covariate in analyses of covariance (see next section).

Statistical Comparisons of Year and Station Differences

Assessment of differences between years and stations was one of the major goals of the study. Statistical tests for year and station differences were performed using analysis of variance (ANOVA) and analysis of covariance (ANCOVA), with computations done using the General Linear Model (GLM) procedure in SAS (SAS 1985). For these tests, year and station were considered discrete treatments, and comparisons of year, station and year-station interactions were performed.

Tests for effects of other variables on the PCB relationship were carried out for several reasons:

1) Sex, age and/or lipid content of individual fish may have major effects on PCB concentrations. Assessment of these effects can provide some information on methods of uptake and loss of PCBs by fish.

2) Individuals analyzed were not chosen randomly from the study populations, both because of the inherent bias in fish sampling techniques, and because of the desire to include fish of a range of sizes and ages in the samples. Because of differences in age composition of populations between years and stations, the samples naturally differed in age and size structure. Unless effects like sex, age and lipid are explicitly modeled, the results of station or year comparisons would depend on the sample composition within each set of samples.

3) Explicit modeling of sex, age (or size) and lipid effects can be used to estimate PCB concentrations in populations with different age structures or to compare results with those from other studies.

4) Sex, age and lipid may explain much of the variation in PCB concentrations within years and stations. Explicit inclusion of sex, age and lipid effects reduces the residual (within-year, within-station) variation, increasing the power of the statistical tests to detect year and station differences.

These additional effects were incorporated into the ANOVA and ANCOVA models as a discrete effect (for sex) or as covariates [age or ln(age), and LIPID or LNLIP], and as interactions between the various variables. The resultant models estimate a single parameter for the grand mean of all LNTPCB variables, a single parameter for each level of the discrete variables (station, year and sex), a slope for the linear relationship between LNTPCB and each covariate, and a parameter for each combination of levels of interactions between discrete variables. Where interactions between discrete variables and covariates are included in the model, a separate slope is estimated for each level of the discrete variable. Significance of effects was assessed by the F-value of the type III sum of squares associated with that effect (SAS 1985); this assesses the contribution of each effect after all other effects in the model have been incorporated.

Tests were made for each of the major species analyzed in 1992: brown trout, smallmouth bass, yellow perch, white perch, and American eel. Tests were done on the three species of sunfish together (bluegill, pumpkinseed and redbreast sunfish). Species was included as a discrete variable to test for differences in concentration between the sunfish species. Where species were caught at more than one station, tests were made for each station separately. Where these showed similar model structures (i.e., similar significant effects), tests were also performed with stations combined, and station as a discrete dependent variable. Tests were also made for some subsets of the data, mainly to provide more balanced designs where specimens had not been analyzed at one station during one year. For instance, no yellow perch, smallmouth bass or white perch were analyzed from Lake Zoar in 1986, complicating estimation of year and station effects for these species. Subsets were run excluding 1986 data (for yellow perch and smallmouth bass).

For each species or species-station test, a set of models was run, including different groups of main effects (station, year, sex, age and lipid) and interactions. Typically, models were first run using a number of main effects and interactions, and subsequent models dropped effects or interactions which were not significant in earlier versions. Finally, a model was run using only significant effects and interactions; this run was used in reported levels of significance, for estimating treatment effects, etc. The removal of non-significant terms from subsequent models pools variance associated with the removed effects with residual error. Since this increases both the sums of squares and degrees of freedom of the residual error, this procedure can increase or decrease the mean square error. While higher alpha levels than 0.05 have been suggested as the basis of removing non-significant terms (cf., Sokal and Rohlf 1969), this pooling did not greatly affect significance of other effects in the analyses performed. In general, once significant main effects were included in models, the significance of interactions did not depend on which other interaction terms were included (e.g., significance of a station-year interaction did not depend on inclusion of station-sex, year-sex or lipid-station interactions, although they did depend on the inclusion of year and station main effects).

The ANOVA and ANCOVA models were used to estimate model parameters (including slopes of the age or lipid relationships). The LSMEANS option (SAS 1985) was used to estimate the least square means associated with each treatment level. These are the mean values of LNTPCB for each treatment level (e.g., each year, station or sex) at the mean value of the covariate(s) (age and lipid) over all observations. The least square means adjust for the covariate effects and provide estimates of LNTPCB independent of the age composition or lipid contents within each set of samples.

Where there were more than two levels for a treatment variable, multiple range tests were used to indicate significant differences between individual levels (e.g., between pairs of stations or years). Where the ANOVA or ANCOVA models indicated a significant station or year effect, the REGWQ tests (SAS 1985) were used to define differences between pairs of means (the least significant difference in the REGWQ test). Multiple range tests are normally done on treatment means. This would not adjust for differences in distribution of covariate values among treatment levels (e.g., differences in age composition of samples between stations or years), which were frequent in these data. To avoid this problem, the least significant difference in the REGWQ test was used on the least square means (which adjust for the covariate values) rather than on the treatment means.

Most specimens analyzed were adults for which sex could be determined. However, sex of a few specimens could not be determined, because of sexual condition or immaturity of the individual. These cases were excluded from tests of models with sex as a dependent variable. Where sex was not significant, the test was repeated using all specimens and a model without sex as a dependent variable. All eels found in freshwater are sexually immature, so sex was not used as a dependent variable for tests involving eels.

Data from 1984-1990

Data on PCB concentrations and other specimen characteristics (age, lipid, etc.) used for analyses are those reported in earlier reports (ANSP 1985, 1987, 1990, 1991). However, in 1984, values of TPCB were calculated by taking the sum of Aroclor 1254 and Aroclor 1260 concentrations after rounding Aroclor concentrations to 2 decimal places. Subsequently, sums of Aroclor concentrations were taken prior to rounding. In this report (and in ANSP 1991), TPCB values for 1984 have been calculated consistently with subsequent practice. This introduces small changes in reported values of TPCB and summary statistics (means, etc.).

RESULTS

PCB Concentrations

The raw data on PCB concentrations in the samples are presented in Appendix A. Summaries of the 1992 results are presented in Table 4; these are compared with results from previous studies in Table 5. (For convenience, tables beginning with Table 4 appear at the end of this report.) The numbers of individuals analyzed and the age distributions of specimens analyzed are presented in Table 6. Reported values are mg/kg wet weight of the fillet. These summaries are not adjusted for differences in age and size distributions, sex ratio and lipid concentrations in samples from different years. Trend analyses, based on estimation and adjustment for age, lipid and sex differences, are presented later in this section.

Relationship Between Congener and Aroclor Quantitation Methods

As discussed previously, two methods were used in 1992 for quantitating total PCB concentrations: extrapolation from marker congeners in Aroclors 1254 and 1260 (TPCB), and simple summation of all measured congener concentrations (CTPCB). Prior studies used the TPCB method alone. This section discusses the relationship between these two methods.

Congener estimates of total PCB (CTPCB) are consistently lower than the corresponding Aroclor estimates (TPCB), but the two are highly correlated (Figs. 2 and 3). This high correlation allows accurate prediction of one estimate from the other, so that total congener concentrations can be predicted for the historical data (1984-1990). Predictions were based on a regression of ln(TPCB) on ln(CTPCB) (Fig. 4). Other discrete terms (station, species, and sex), covariates [LNLIP = ln(LIPID) and ln(age)] and interaction terms were also modeled to determine if the relationship between TPCB and CTPCB differed between groups of fish. Regressions of TPCB on CTPCB were also performed.

All regressions showed very high predictive power: the r^2 values were 0.999 for models examined. The dominant predictor was ln(CTPCB); r^2 values of 0.999 were found using only ln(CTPCB). While other group effects [e.g., species, station, station*species, LNLIP, ln(age)] were also significant, these added essentially no predictive power to the overall regression. Examination of deviations between predicted and observed ln(TPCB) values shows very good agreement for almost all data (Fig. 5). There are a few points with moderate deviation (particularly one pumpkinseed specimen). It is likely that some or much of the observed group, covariate and interaction effects reflect the effects of these single points.

For prediction, the regression used was:

$$\ln(TPCB) = 0.2246 + 1.005 * \ln(CTPCB),$$

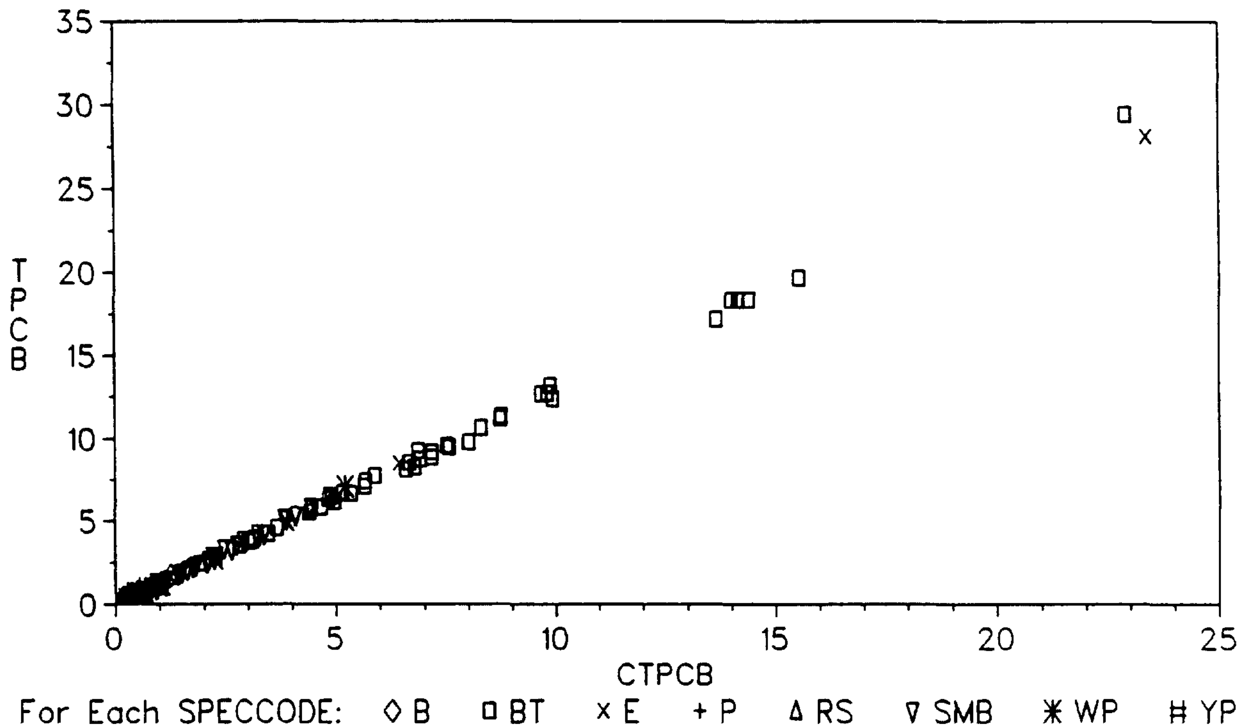


Figure 2. Relationship between TPCB (Aroclor-based quantitation method) and CTPCB (congener-based quantitation method) for 1992 samples.

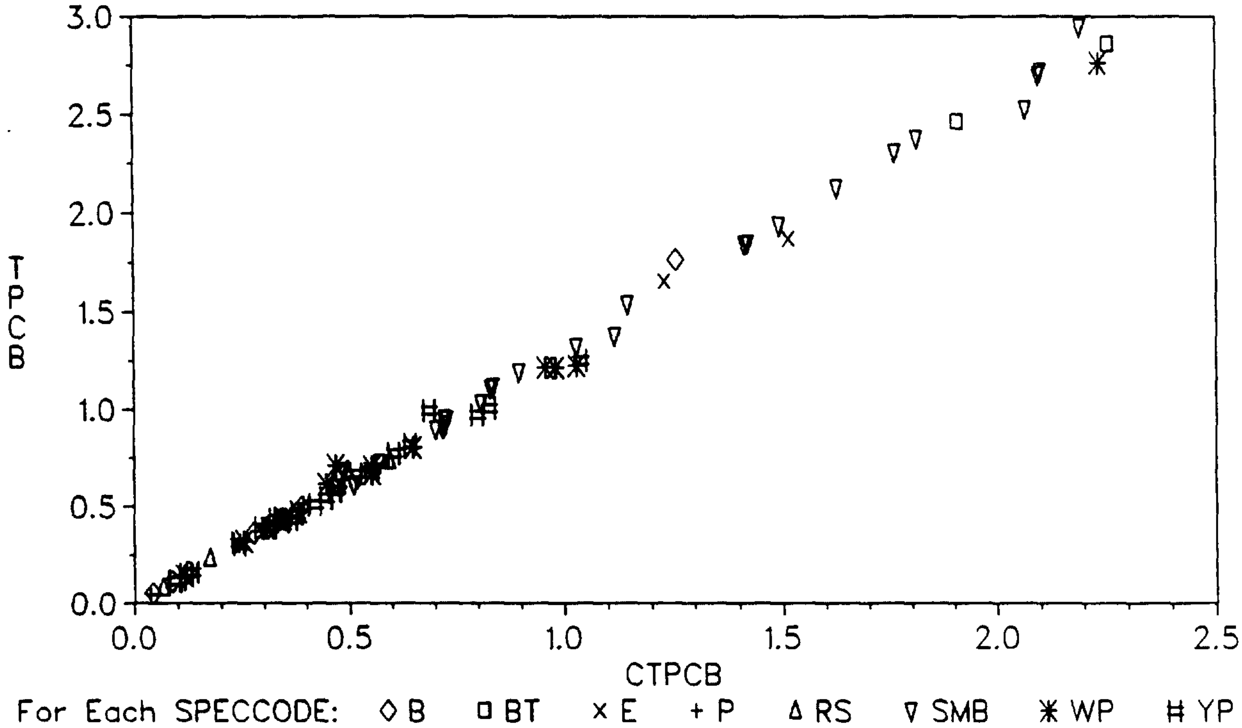


Figure 3. Relationship between TPCB (Aroclor-based quantitation method) and values of CTPCB less than 2.5 mg/kg (congener-based quantitation method) for 1992 samples.

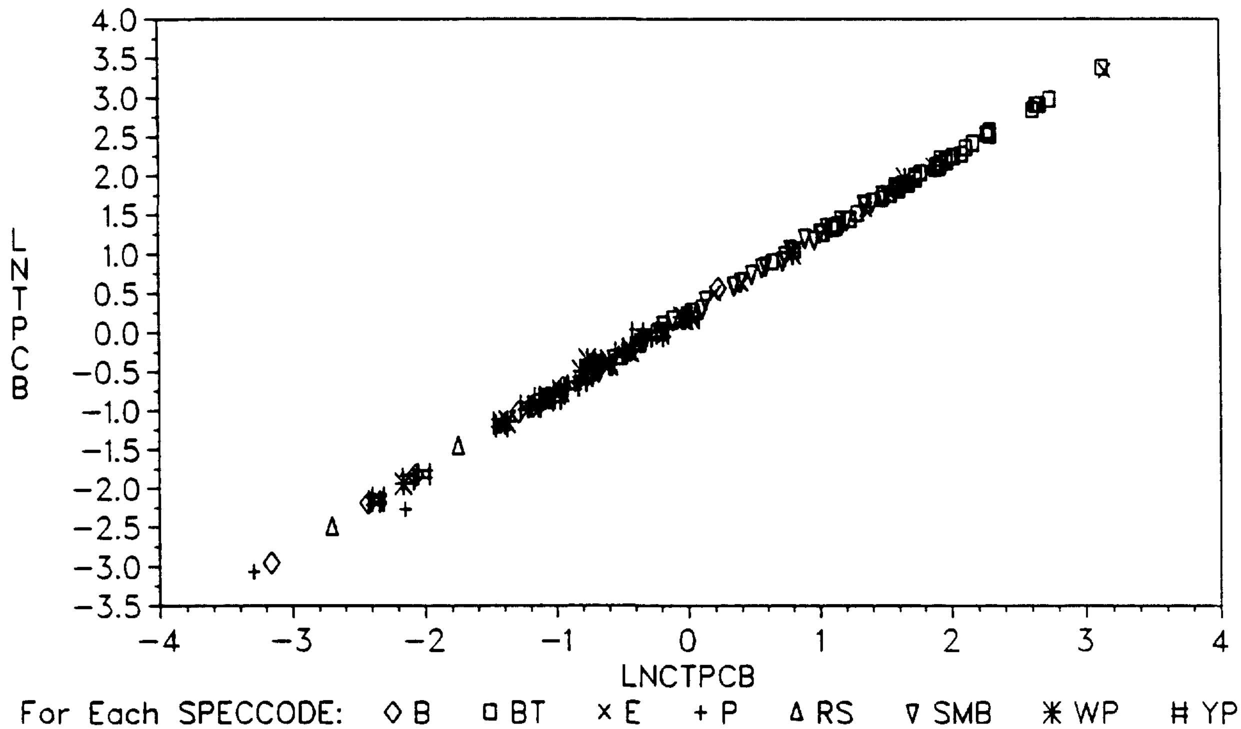


Figure 4. Relationship between LNTPCB (Aroclor-based quantitation method) and ln(CTPCB) (congener-based quantitation method) for 1992 samples.

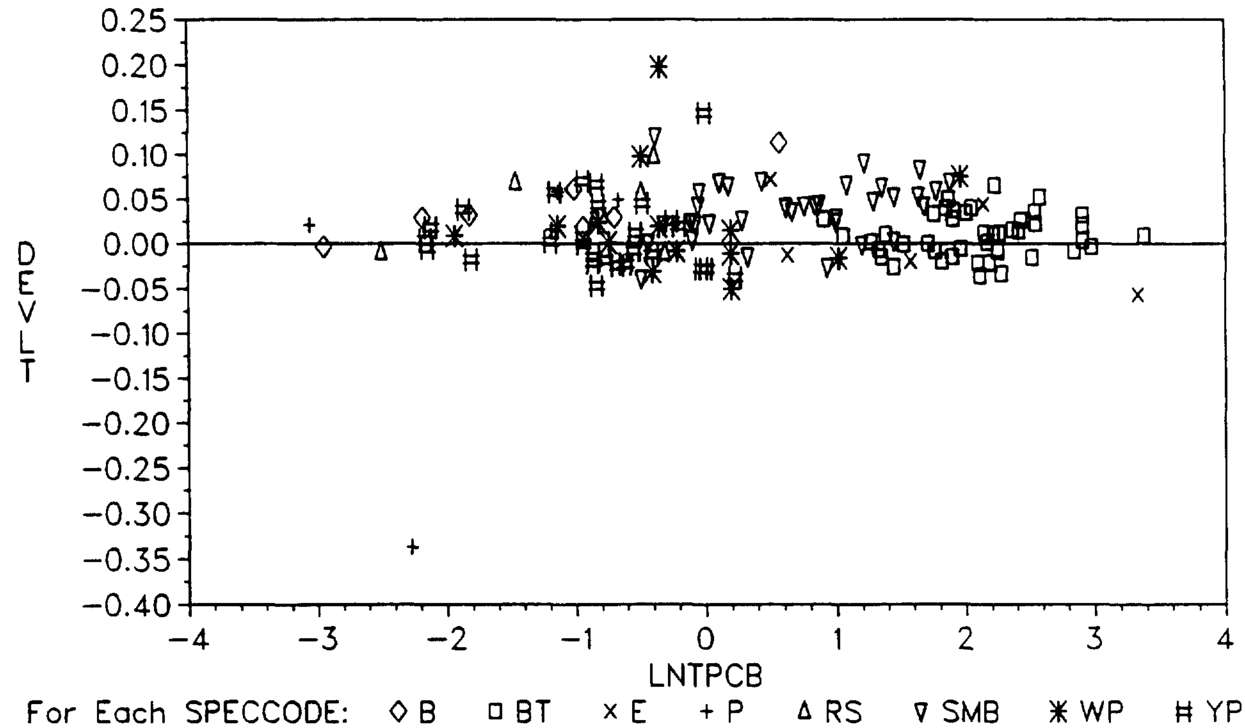


Figure 5. Deviation between predicted and observed values of LNTPCB as a function of LNTPCB. Predictions were based on the regression between TPCB and CTPCB.

and equivalents:

$$TPCB = 1.252*CTPCB^{1.005}$$

$$\ln(CTPCB) = [\ln(TPCB) - 0.2246]/1.005.$$

These regressions imply that TPCB is approximately directly proportional to CTPCB, and that TPCB estimates average about 28% higher than the CTPCB estimates. Similar results were obtained by Draper et al. (1991).

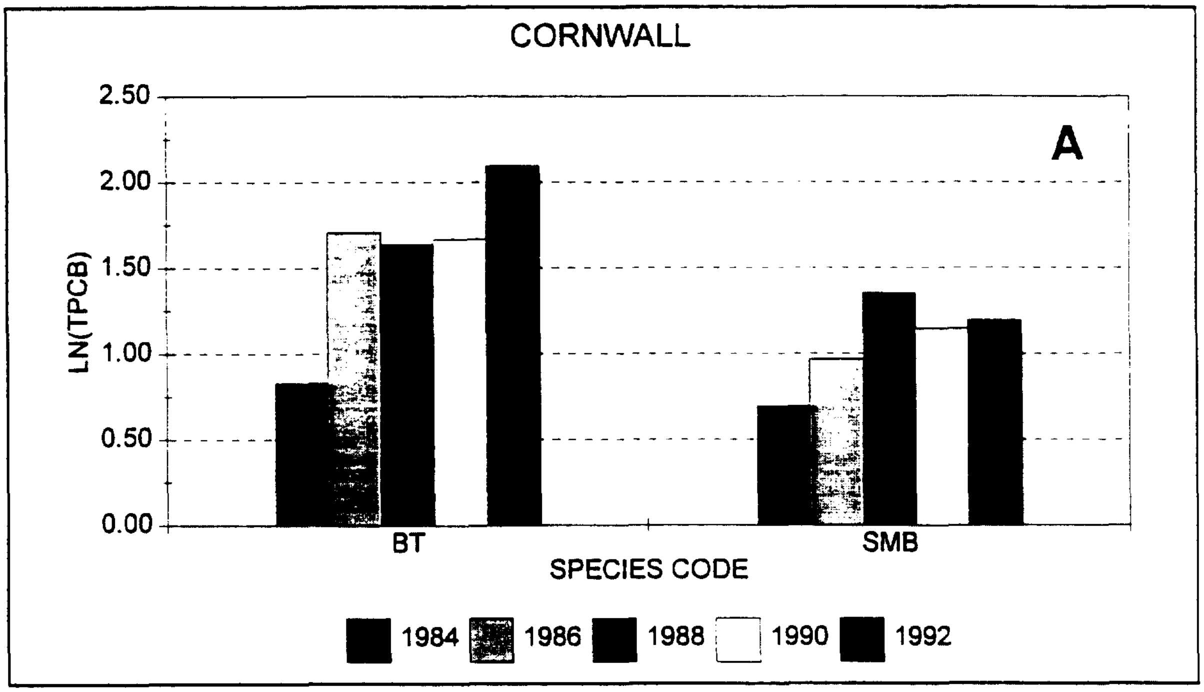
These regressions were used to estimate CTPCB from TPCB, using the 1984-1990 data (Table 7). CTPCB estimates were calculated likewise for the 1992 data to show the similarity between the estimated and predicted averages.

Trend Analyses: Differences in LNTPCB Between Stations and Years, and Relationship Between LNTPCB and Sex, Age and Lipid Content

Since previous studies used the Aroclor-based method of PCB quantitation (TPCB), the 1992 concentrations calculated by that method were used as the basis for trend analyses. Because of the distribution of PCB values, the logarithm of PCB was used as the dependent variable in these analyses. Log-transformed TPCB concentrations are referred to as LNTPCB; a concentration of 2.0 mg/kg corresponds to an LNTPCB of 0.69. Comparisons of LNTPCB values for different species within each station are shown in Figures 6-9. The relationships between LNTPCB, PCBLIP (lipid-normalized TPCB) and age for each species and location are displayed in Appendix B.

There were consistent differences in PCB concentrations between species within stations (Tables 4, 5 and 10; Figs. 6-9). Typically, the highest concentrations within each station were seen in brown trout (analyzed only from Cornwall), eel (especially in 1990 and 1992) and in carp, white catfish and brown bullhead (none of which was analyzed in 1992). Concentrations were generally intermediate in smallmouth bass, largemouth bass and white perch, and lowest in yellow perch and sunfish. Much of the difference can be attributed to differences in lipid content: the range of interspecific variation of lipid-normalized concentrations (PCBLIP) is much less than that of TPCB. The lowest average PCBLIP concentrations were seen in shorter-lived fish (e.g., the three sunfish species), while long-lived species like carp and catfish had higher average values.

As in past studies, there was a consistent decrease in PCB concentration downstream for species analyzed at several stations (Tables 4, 5 and 10; Figs. 10 and 11). For example, the geometric mean CTPCB level in smallmouth bass decreased 65% between Cornwall and Lake Zoar, and decreased 31% between Bulls Bridge and Lake Zoar (Table 4). In yellow perch, the



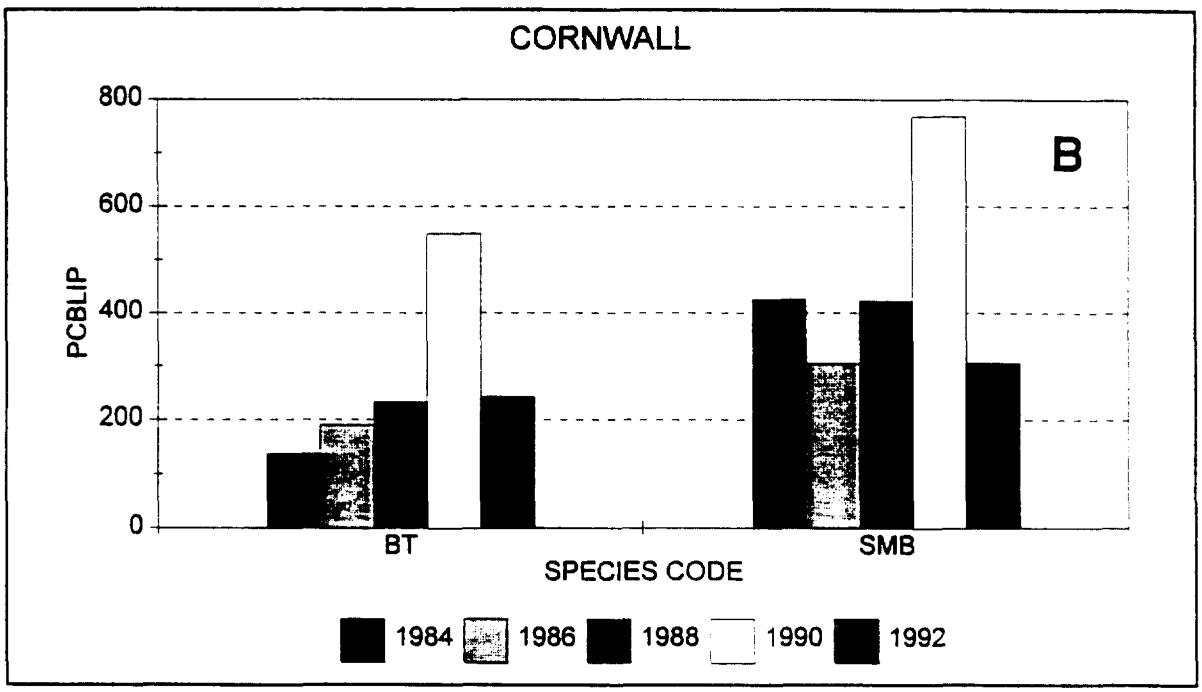


Figure 6. Temporal patterns of mean LNTPCB (A) and PCBLIP (B) for brown trout and smallmouth bass from Cornwall.

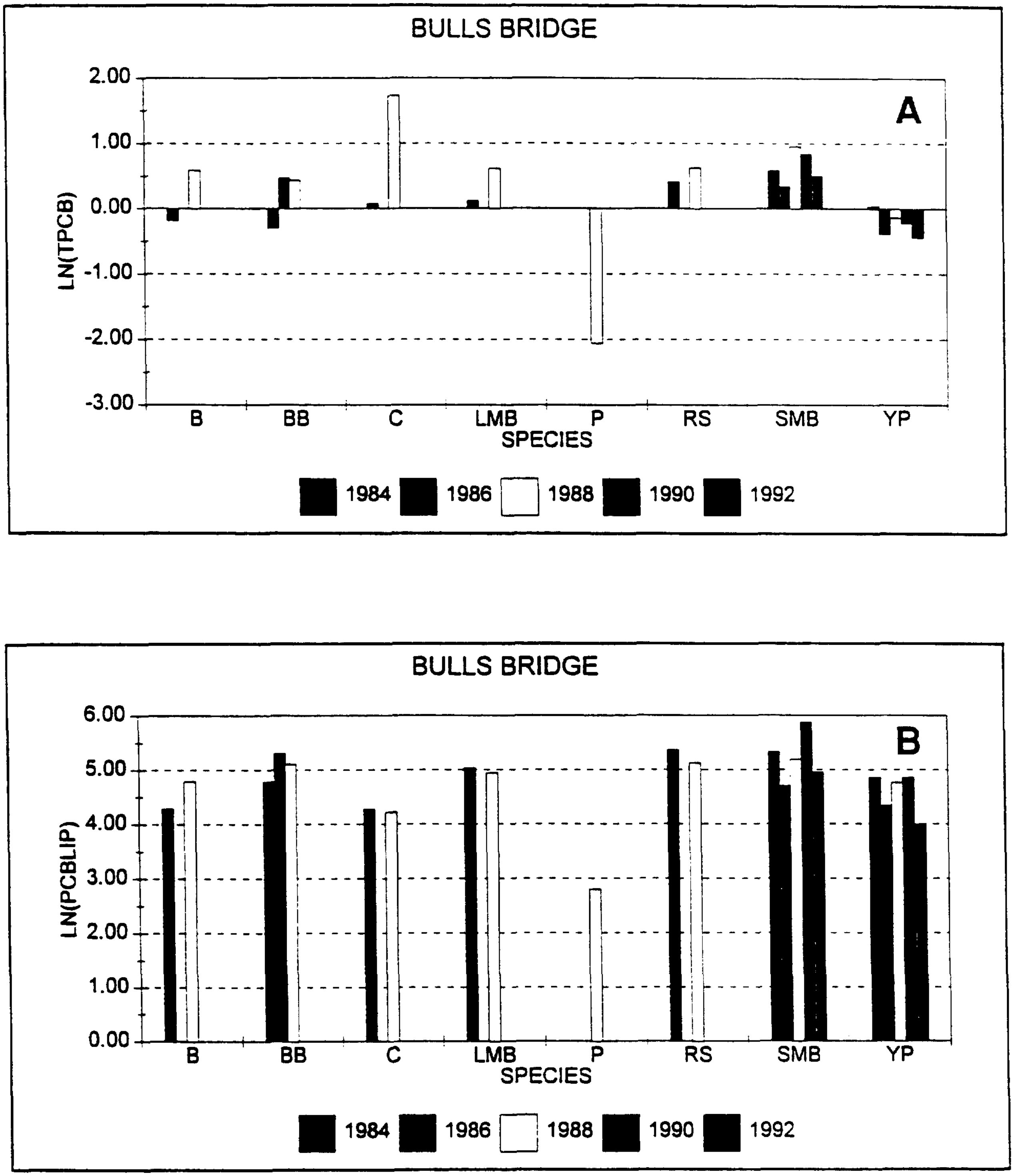


Figure 7. Mean LNTPCB (A) and ln(PCBLIP) (B) values for fish from Bulls Bridge Reservoir. A PCB concentration of 2.0 mg/kg corresponds to a LNTPCB value of 0.69. PCB concentrations were estimated as mg/kg wet weight using the Aroclor-based quantitation technique. Symbols: B = bluegill, P = pumpkinseed, RS = redbreast sunfish, BB = brown bullhead, C = carp, LMB = largemouth bass, SMB = smallmouth bass, YP = yellow perch.

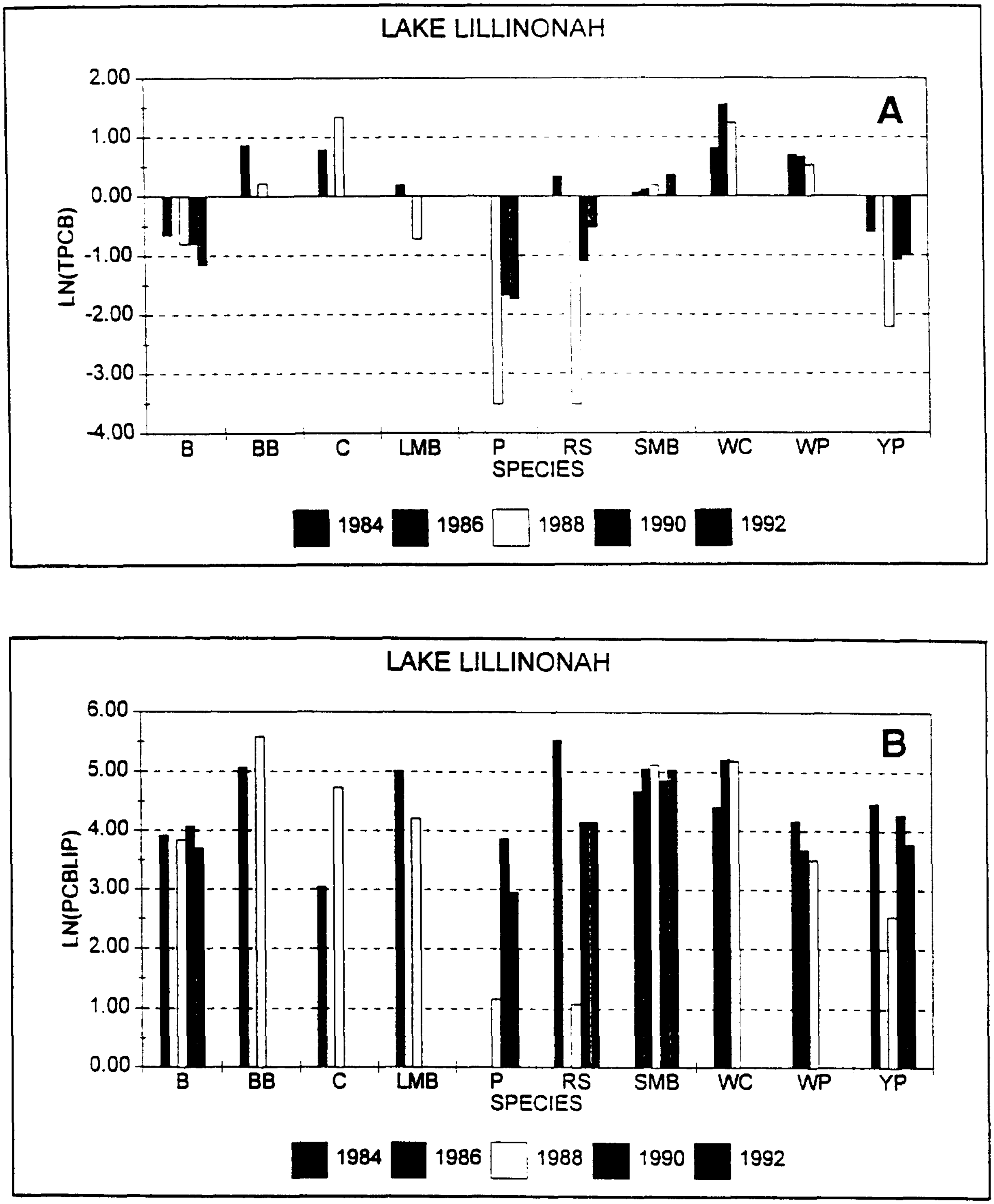


Figure 8. Mean LNTPCB (A) and ln(PCBLIP) (B) values for fish from Lake Lillinonah. A PCB concentration of 2.0 mg/kg corresponds to a LNTPCB value of 0.69. PCB concentrations were estimated as mg/kg wet weight using the Aroclor-based quantitation technique. Symbols: B = bluegill, P = pumpkinseed, RS = redbreast sunfish, BB = brown bullhead, C = carp, LMB = largemouth bass, SMB = smallmouth bass, WC = white catfish, WP = white perch, YP = yellow perch.

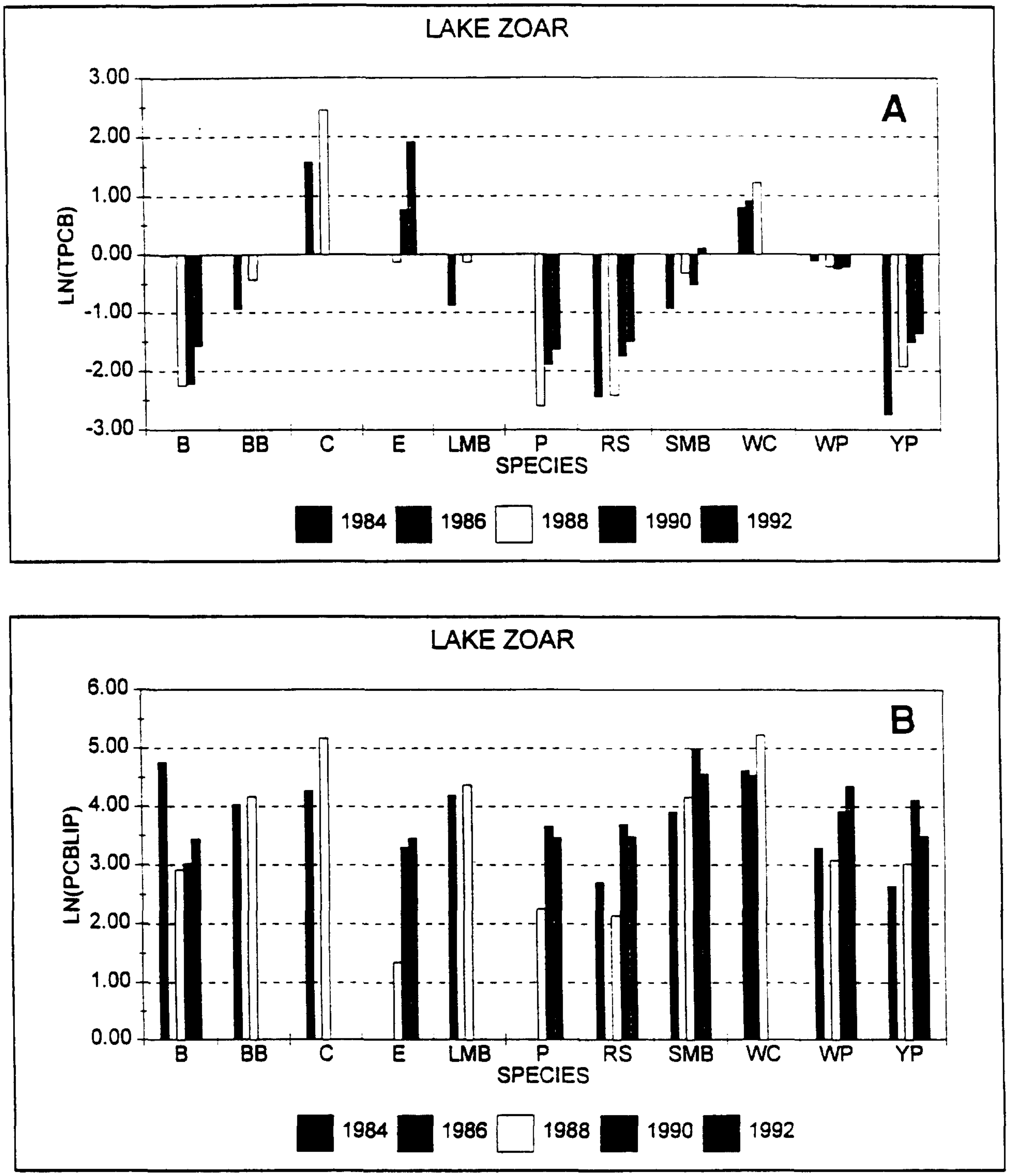
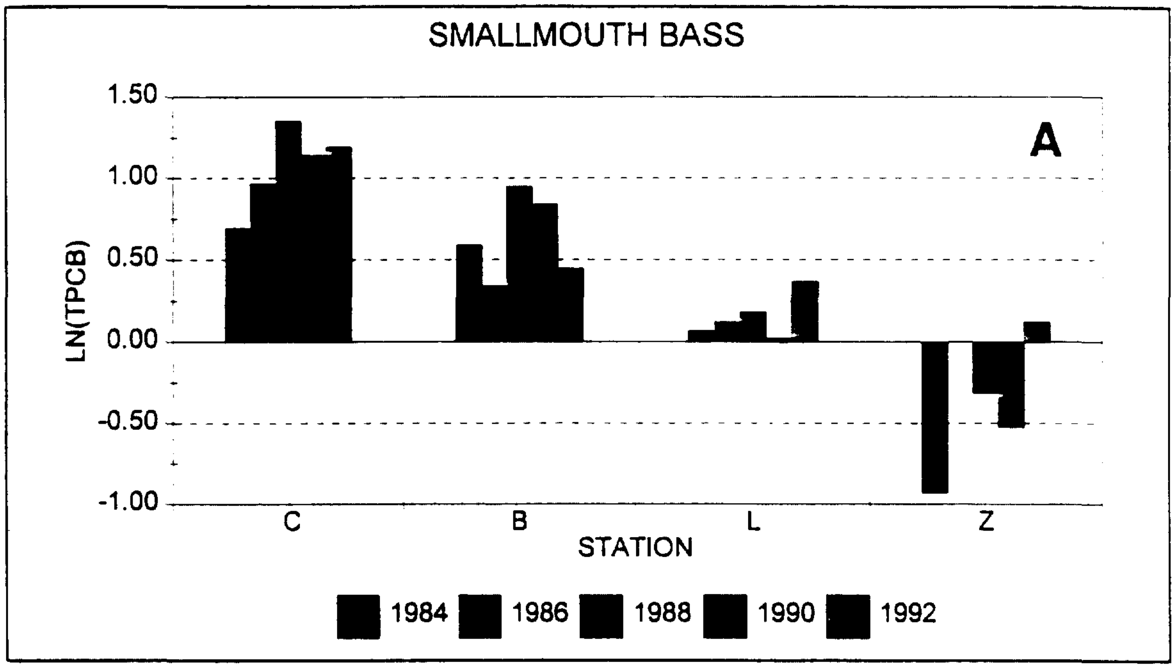


Figure 9. Mean LNTPCB (A) and ln(PCBLIP) (B) for fish from Lake Zoar. A PCB concentration of 2.0 mg/kg corresponds to a LNTPCB value of 0.69. PCB concentrations were estimated as mg/kg wet weight using the Aroclor-based quantitation technique. Symbols: B = bluegill, P = pumpkinseed, RS = redbreast sunfish, BB = brown bullhead, C = carp, LMB = largemouth bass, SMB = smallmouth bass, WC = white catfish, WP = white perch, YP = yellow perch, E = American eel.



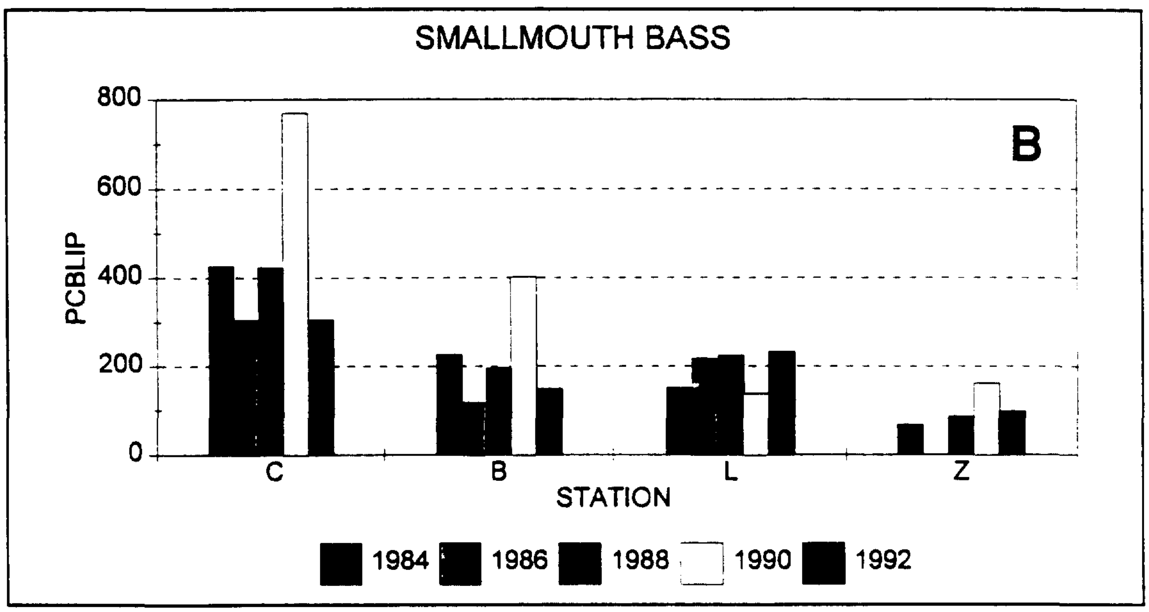
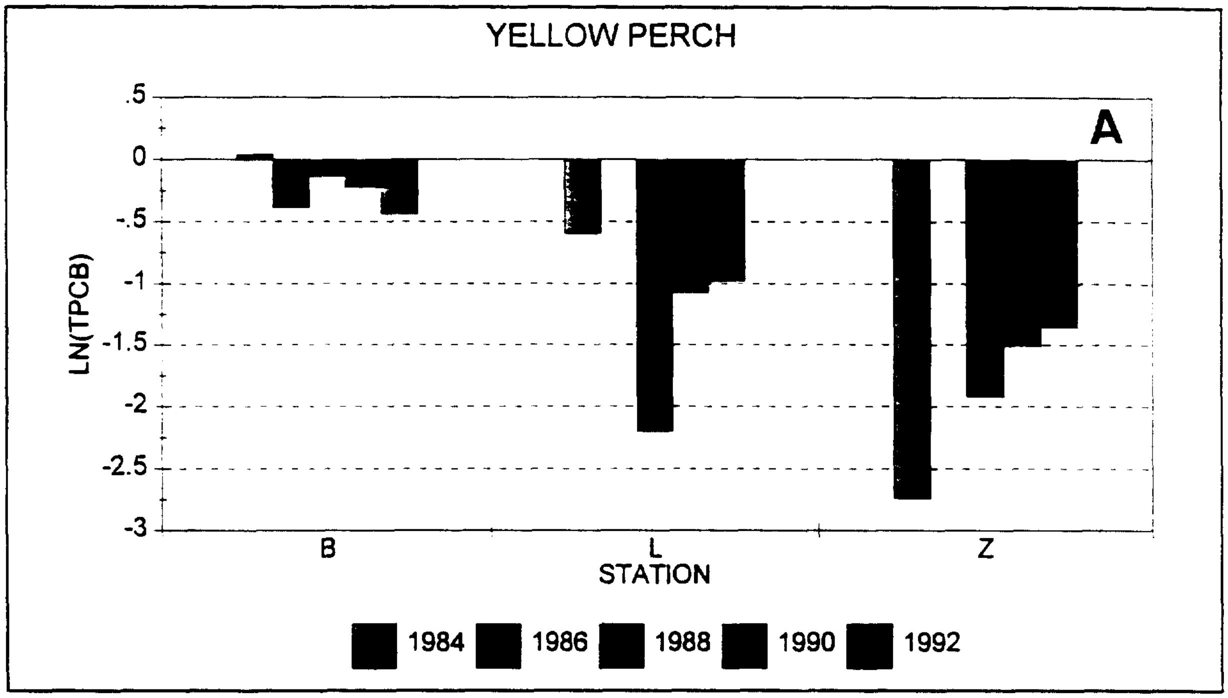


Figure 10. Mean LNTPCB (A) and PCBLIP (B) in smallmouth bass samples from four stations on the Housatonic River in Connecticut. PCB concentrations were estimated as mg/kg wet weight using the Aroclor-based quantitation technique. Symbols: C = Cornwall, B = Bulls Bridge, L = Lake Lillinonah, Z = Lake Zoar.



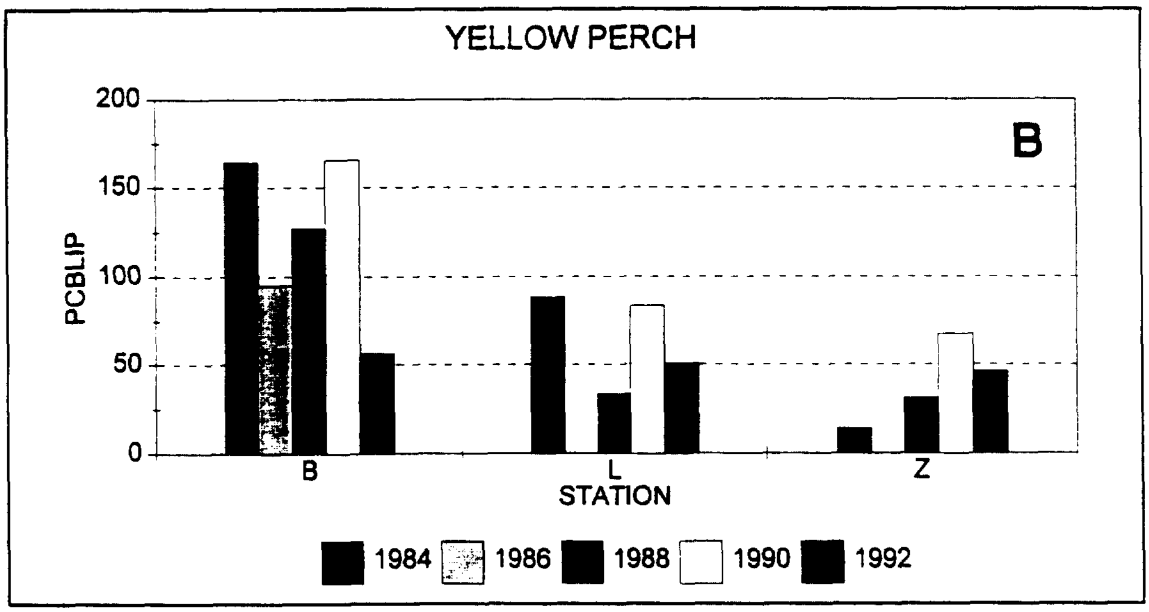


Figure 11. Mean LNTPCB (A) and PCBLIP (B) in yellow perch samples from three stations on the Housatonic River in Connecticut. PCB concentrations were estimated as mg/kg wet weight using the Aroclor-based quantitation technique. Symbols: B - Bulls Bridge, L - Lake Lillinonah, Z - Lake Zoar.

geometric mean CTPCB level decreased 61% between Bulls Bridge and Lake Zoar (Table 4). Similar decreases were observed in the geometric means of lipid-normalized CTPCB.

Temporal trends were assessed by analyzing between-year differences in LNTPCB after adjusting for age, lipid and sex effects. These trends are supported by the detailed ANOVA and ANCOVA analyses, which also indicate significant sex differences, lipid effects and year differences in some cases (Table 8). Significant interaction terms were sometimes noted, as well. Results of the statistical comparisons between years, sexes, etc., are presented in Table 9.

The total r^2 for a model indicates the degree to which the model fits the data. These values are often interpreted as the proportion of total variation explained by the dependent variables. The proportionate contributions of individual factors (discrete effect, covariate or interaction) to the total model fit can not be unambiguously stated, since these may depend on the order of introducing factors into the model. Nevertheless, a useful measure of the importance of a factor is the r^2 for a model including only that factor (Table 8). The sum of these partial r^2s may exceed the total r^2 because of correlations between factors (especially between a discrete effect and interaction terms involving that effect). Models for the two upstream stations (Cornwall and Bulls Bridge) generally provided better fits (higher r^2) than models for the two downstream stations (Lillinonah and Zoar, Table 8).

Where analyses were done on fish from several stations (yellow perch, smallmouth bass), station effects were the most important (Table 8). For single station comparisons, year effects or interactions (year-lipid, year-age, year-sex, year-species) were the most important for several groups (brown trout from Cornwall, smallmouth bass from Bulls Bridge and Zoar, eel from Zoar, yellow perch from Lillinonah and Zoar, and sunfish from Lillinonah). For smallmouth bass from Lillinonah and yellow perch from Bulls Bridge, age effects (or age-sex interactions) were most important.

The differences in relative importance of year or age effects may reflect differences in bioavailability or uptake/loss dynamics in different groups of fish. PCB bioaccumulation dynamics that lead to increasing concentration with age (i.e., an age effect) may be linked to relatively low responses to short-term changes, so that year effects are not seen.

Between-year differences were seen for a number of comparisons, either as direct year effects or as differences in the slopes of PCB-lipid or PCB-age relationships between years. However, these year differences did not usually suggest consistent temporal trends in PCB concentrations. As discussed in more detail below, possible temporal trends were seen only for brown trout and smallmouth bass at Cornwall and eels at Zoar. Trend analysis is complicated, however, by confounding effects of age, lipid level, and apparent seasonal cycles of PCB accumulation and depuration.

Brown Trout

As shown in Figure 6A, the unadjusted mean PCB concentration (expressed as LNTPCB) in brown trout at Cornwall was approximately the same from 1986 to 1990. Mean values appeared slightly higher in 1992 and lower in 1984. When normalized to lipid (Fig. 6B), the mean PCB level appears similar in 1992 and 1988, higher in 1990, and slightly lower in 1984 and 1986.

Further analyses of these data were conducted using ANOVA and ANCOVA to investigate possible effects of variables such as age and sex on PCB concentrations and to adjust for among-station differences in these variables in analyses of temporal trends.

For brown trout, river-age (length of time in river) rather than actual age was used for analyses of PCB-age relationships. Analyses indicate statistically significant differences between years, with different slopes of the LNTPCB-age relationship between years; the same was noted in analyses of the 1984-1990 data (ANSP 1991). The least square means show an apparent increasing temporal trend from 1984 through 1992. Based on the multiple comparison test, there was no significant difference between 1990 and 1992, but all other pairs of yearly means are significantly different.

These apparent differences between years and increases with time in the river mainly reflect differences in PCB concentrations in newly stocked fish (i.e., river-age less than 1 year). For holdover trout (river-age > 1 year), there is no significant river-age relationship. There are statistically significant lipid effects and year differences, although overall model fit is poorer than for newly-stocked trout. The critical range tests indicate higher TPCB concentrations in 1990-1992 than in 1984-1988; differences between other years were not significant or were only marginally significant.

As a caveat, we note that the PCB data for Cornwall brown trout present certain statistical problems which are difficult to surmount. Regardless of whether the data are ln-transformed, the residuals are noticeably leptokurtic (Fig. 12) and thus fail to closely approximate a normal distribution. This violates an assumption underlying ANOVA and ANCOVA analyses. Such analyses tend to be robust to small departures from normality (Scheffé, 1959), but exceptions are known and it is therefore prudent to interpret the present results cautiously.

In addition, previous monitoring studies have suggested seasonal patterns of variation within brown trout which may hinder temporal trend analyses. These patterns were further investigated in 1992 through collection and analysis of brown trout at five times during the year. The results of this investigation are reported separately below (see section, "Accumulation of PCBs by Newly-stocked Trout").

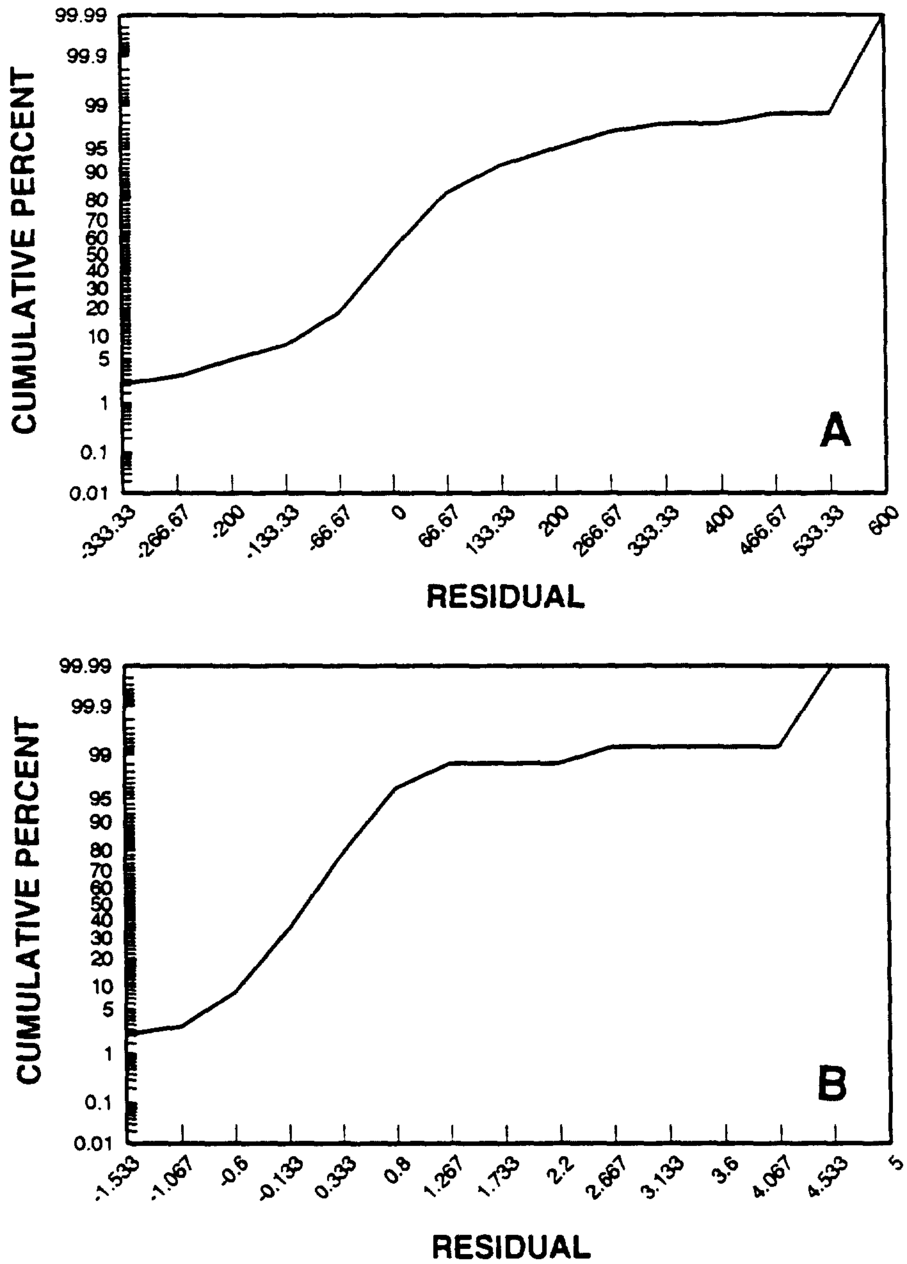


Figure 12. Distribution of residuals for brown trout from Cornwall. Graphs show cumulative probability plots of residuals about age- and year-specific means for 1992 Cornwall brown trout. A. Residuals for untransformed data. B. Residuals for ln-transformed data. Data which are normally distributed produce a straight line when plotted in this fashion. Note that neither raw nor ln-transformed data yield residuals closely approximating normality. In both cases, the cumulative distribution increases too slowly at small residuals (far left), too quickly near the mode (center), and too slowly at large residuals (far right). This pattern indicates a leptokurtic distribution; that is, the residuals are too tightly clustered about the mode, compared to a normal distribution.

Smallmouth Bass

As shown in Figure 6A, the unadjusted mean PCB level (LNTPCB) in Cornwall smallmouth bass appears similar in 1990 and 1992, slightly higher in 1988, and slightly lower in prior years. When normalized to lipid (Fig. 6B), the 1992 mean PCB level is the lowest of all five study years, while the 1990 level is the highest. In Bulls Bridge smallmouth bass, the unadjusted mean for 1992 is the lowest of all study years except 1986 (Fig. 10A). A similar pattern holds for the lipid-normalized means (Fig. 10B).

When these data are analyzed using ANOVA and ANCOVA, there are highly statistically significant differences between years, and females have significantly lower levels than males. There is no significant increase in PCB concentration with age at these stations (Tables 8 and 9). A significant LNLIP effect is seen at Bulls Bridge. At Cornwall, there were significant differences in the LNTPCB-LNLIP relationships between years and sexes. For Cornwall fish, the best model results in an apparent temporal trend of monotonically increasing adjusted mean concentrations (Table 9). The adjusted means for 1992, 1990 and 1988 are not statistically different but are somewhat higher than the adjusted means for 1986 and 1984. This temporal pattern was not seen at Bulls Bridge. In particular, adjusted concentrations in 1992 were the second lowest of any of the five study years.

For Lillinonah fish, there are no significant differences between years. Females have lower concentrations than males, and PCB concentrations increase with age, but there is no significant LIPID relationship. There was a significant LNLIP effect at Zoar; there was also a significant year-sex interaction, which is not easily interpretable.

Comparing fish from all four stations together (Fig. 10), there is a highly significant station difference (Cornwall and Bulls Bridge > Lillinonah > Zoar). There was a highly statistically significant difference between years, with concentrations in 1984 lower than in subsequent years. Concentrations in 1992, however, were essentially the same as in 1990 and 1988.

Yellow Perch

Comparing yellow perch from all stations together (Fig. 11), there are highly significant differences between years and sexes, and highly significant age and lipid effects. However, there is also a significant station-year interaction. Furthermore, there were relatively few samples from Lillinonah and Zoar prior to 1990. Therefore, comparisons within single stations are more useful.

The best information on yellow perch is from Bulls Bridge, which has been studied in each of the five study years. PCB concentrations clearly differed between groups of yellow perch at Bulls Bridge, with highly significant effects of lipid, age and year ($p<0.0001$ for all). There was a significant sex difference ($p<0.0001$ prior to adjustment for an age-sex interaction) and a significant age-sex interaction ($p<0.002$), i.e., a difference in the slope of the PCB-age relationship between males and females. The slope for males (0.153) was higher than that for females (0.066). Males had a higher rate of increase of LNTPCB with age than females; the LNTPCB-ln(age) lines for the two sexes cross around age 2.6, so that adult females tend to have lower TPCB concentrations than adult males. Other interaction terms tested were not significant. Multiple comparison tests indicate that after adjustments for the other factors, concentrations were significantly higher in 1984, 1988 and 1990, than in 1992 and 1986; significant differences within these groups could not be demonstrated.

At Lillinonah, there was also a significant year difference, with 1988 concentrations lower than those in 1990, 1992 and 1984. There is a significant between-sex difference in the LNTPCB-ln(age) relationship. There is a significant age effect; slopes of the TPCB-age relationship differed between years, but this difference may reflect the low sample sizes in 1984 and 1988. Fish from Lake Zoar showed similar relationships, with significant year effects and age effects, but no significant difference between sexes or significant between-sex slope difference. As at Lillinonah, slopes of the age relationship differed between years, but sample sizes were small in 1984 and 1988. Comparison of least square means indicate that 1990 concentrations were higher than 1984 or 1988 concentrations. Despite the year differences, PCB concentrations were relatively low at Lillinonah and Zoar in all three years: the maximum concentration was 1.16 mg/kg (1984), and the maximum least square mean PCB concentrations were 0.73 for Lillinonah (1984) and 0.32-0.41 for Zoar (1990), depending on the precise model.

White Perch

Most samples of white perch from Lake Zoar show similar ranges of PCB concentrations over the four years (1984, 1988, 1990 and 1992) in which samples were taken. However, comparisons are complicated by differences in age distributions between years, and by the presence of two specimens (from 1988) with very low concentrations. As a result, statistical models of LNTPCB trends and relationships are weak (e.g., r^2 of 0.29 for the preferred model). There were significant but complex effects of lipid and age on PCB concentrations: there was a highly significant lipid-age interaction term ($p<0.0007$ when lipid and age effects were also included; $p<0.0001$ when only the interaction term was modeled). The lipid-age interaction represents a multiplicative model, in which the LNTPCB concentration changes linearly with the product of lipid and age. The lipid and age terms were not significant or weakly significant and depended on the inclusion of other effects. These results reflect the variability of the data and the influence of a few specimens on the analysis. Relatively high concentrations were noted in a few specimens; these were either moderately old fish (7-9 years) with high lipid content (>4%) or an old fish (13 years) with low lipid content (<1%). Low concentrations were noted in old fish with low lipid content, and young fish with high lipid content. The preferred model shows an almost significant difference between years, significant lipid effects, and significantly different slopes of the age relationship between years. However, these effects are all relatively weak.

American Eel

Few specimens were analyzed in 1988, and lipid content varied with age (increasing with age, with the LIPID-ln(age) slope differing between years) and between years (higher in 1990), complicating comparisons between years. When LNLIP was included in the models, there was a weakly significant difference between years. The ordering of least square means for each year was 1992 > 1990 > 1988, with 1988 significantly lower than the other two years.

Sunfish

Few specimens of each species were analyzed, so that the statistical analyses have low power to detect differences. Graphs of data for each species do not indicate strong year differences. Analyses of the three species together were more powerful.

For sunfish from Lillinonah, there was a strong year difference ($p<0.001$), with concentrations in 1984 greater than those in 1988, 1990 and 1992. Males had significantly ($p<0.0001$) higher concentrations than females, but there was a weakly significant year-sex interaction (resulting from differences in concentrations in females from different years: higher concentrations in females in 1984 and 1990, and lower concentrations in 1988). There was some evidence of species differences in concentrations, with concentrations in pumpkinseed lower than those in bluegill and redbreast sunfish. However, these were marginally non-significant ($p<0.10$) when a year-sex interaction term was modeled. There was no evidence of significant relationships with age or lipid content. For these analyses, one specimen, whose sex could not be determined, and one hybrid were excluded.

For sunfish from Zoar, differences in concentrations between sexes were highly significant ($p<0.009$) (males higher than females). There was also a highly significant year difference and a weakly significant or marginally non-significant LIPID-year interaction (i.e., differences in slope of the PCB-LIPID relationship between years). Despite the significant year effect, no significant difference between given years could be demonstrated.

Accumulation of PCBs by Newly-Stocked Trout

PCB levels are quite low in hatchery trout (station code "HA", Appendix A) but increase rapidly during the first few months after stocking in the Housatonic River. Because of this marked change, newly stocked trout are useful for studying the determinants of PCB accumulation.

Previous monitoring studies examined newly stocked brown trout collected from July to October. Each study, however, addressed only one or two months of this period. Certain patterns were suggested when the results for all four months were assembled (ANSP 1991). The 1992 study reexamined these patterns by collecting brown trout every month from June through

October. This both extends the time interval covered by previous studies and documents the entire interval during a single year.

Important determinants of PCB concentrations in newly stocked trout include the initial concentration (from the hatchery), duration of exposure in the river, time of year during which that exposure occurred, and PCB concentrations in the trout's food. Concentrations in food organisms are the main link between trout and particle-bound PCB (suspended or in the bed). Uptake by routes other than food occurs but is almost certainly insignificant by comparison.

The importance of the time of year is due to the fact that food availability and water temperature are seasonal, so the relative magnitudes of food intake and metabolic expenditures change over the year. A given duration of exposure will result in a different rate of PCB accumulation if it occurs when the water is cool and food abundant (e.g., June) than if it occurs when the water is warm and food scarce (e.g., August).

The 1992 data suggest that the PCB uptake process during the period from June through October comprises three phases. In the first phase (June and July), body mass increases rapidly (Fig. 13A), indicating that food intake exceeds metabolic expenditures. Total PCB concentration in fillets increases similarly (Fig. 14A), while a more subtle increase occurs in percent lipid (Fig. 14B). Lipid-normalized PCB also increases (Fig. 14C).

In the second phase (August and September), body mass levels off, indicating that food intake is roughly balanced by metabolic expenditures. Total PCB in fillets shows a similar leveling off. Percent lipid levels off and begins to decrease, while lipid-normalized PCB continues to increase.

Body mass remains level in the third phase (October), as does total PCB in fillets. Percent lipid decreases, suggesting that lipid catabolism exceeds assimilation, but lipid-normalized PCB continues to increase.

The close correspondence observed between changes in body mass and changes in total PCB in fillets supports the contention that food intake is the dominant source of PCB in trout fillets. Trout appear to show a net accumulation of lipid in phase 1, but a net loss in phase 3. This shift may explain the fact that lipid-normalized PCB continues to increase in phases 2 and 3 when total PCB has leveled off: PCB depuration proceeds more slowly than lipid catabolism, so most PCB is retained as lipid disappears.

The 1992 data provide evidence that, in addition to the duration of exposure, the seasonal cycle is important in accounting for observed PCB levels. For example, fish more than 1 year old fall in the same data cluster as those less than 1 year old when lipid-normalized PCB is plotted against sampling month (Fig. 15A), but not when it is plotted against duration of exposure (Fig. 15B). Thus, older fish appear to repeat the seasonal pattern of change in lipid-normalized PCB seen in newly stocked fish rather than continuing to increase, despite the fact that total body mass does continue to increase (Fig. 13B). This suggests that overwintering fish lose PCB (along

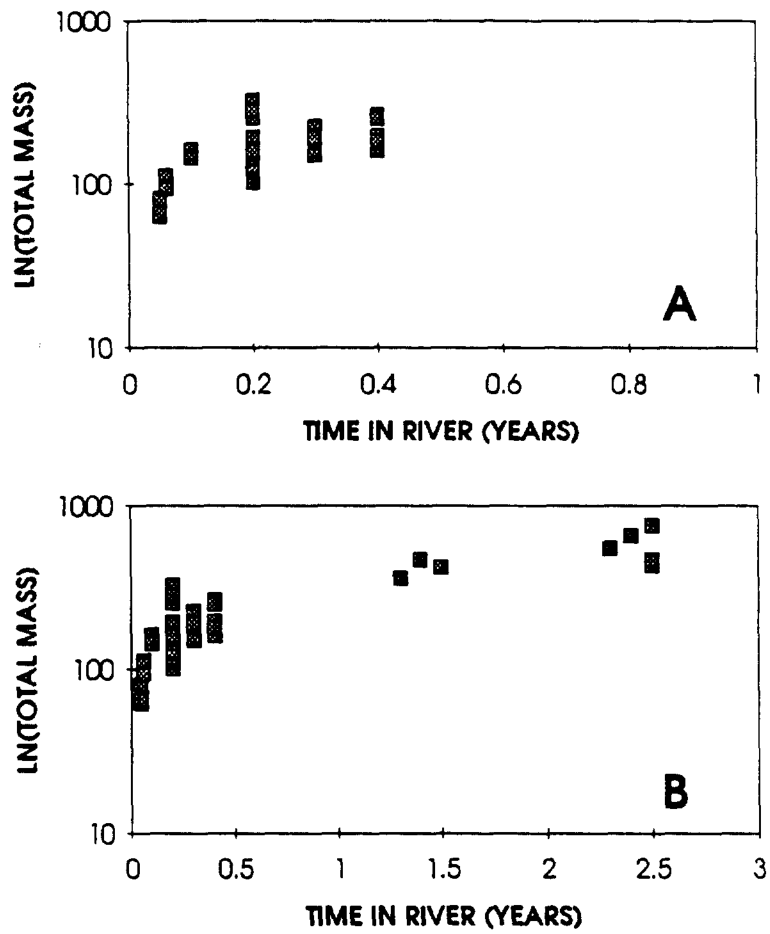


Figure 13. Relationship between total body mass and number of days in the river between stocking and collection for newly-stocked brown trout at Cornwall. A. Newly stocked trout only. B. Newly stocked trout plus holdovers. Note that mass continues to increase in holdovers.

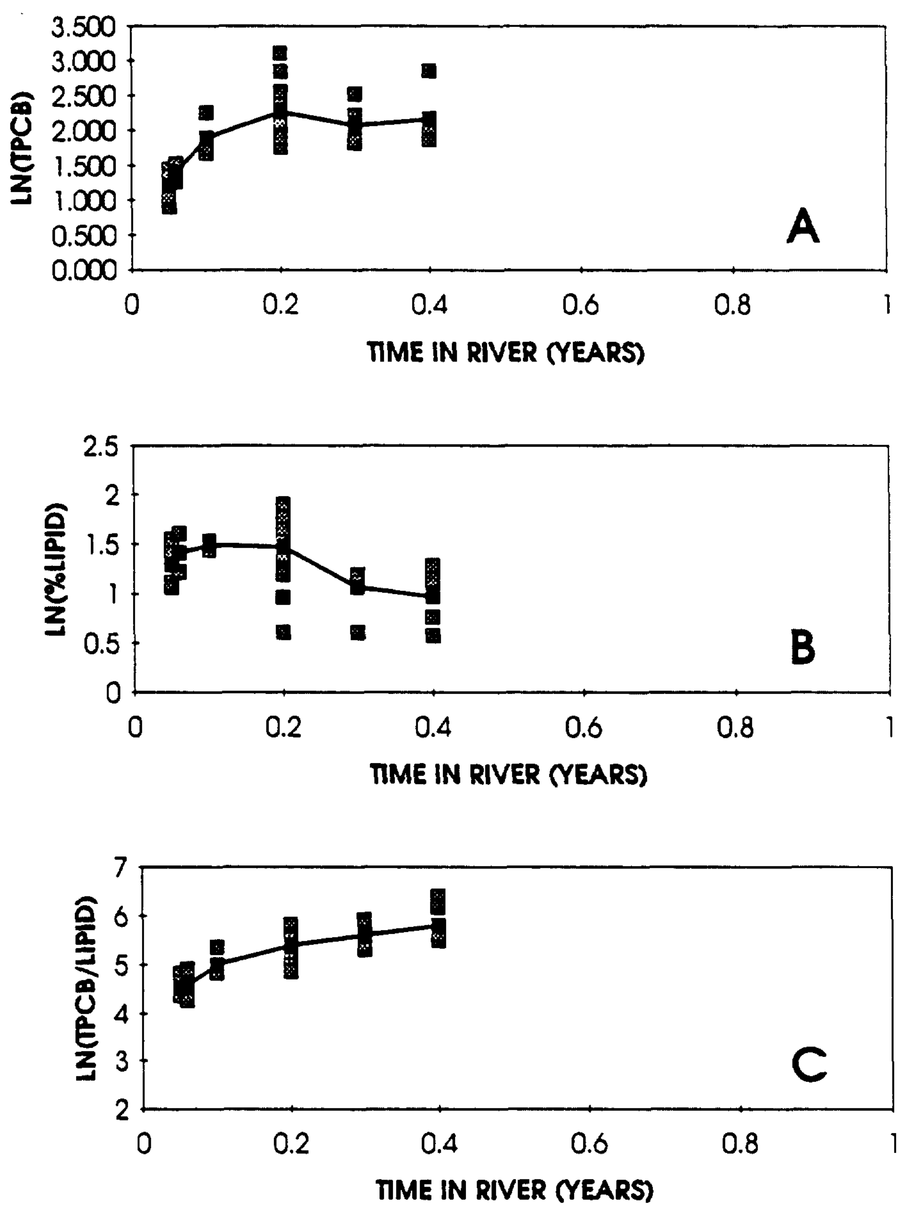


Figure 14. Total PCB, percent lipid and lipid-normalized PCB versus number of days in the river in newly-stocked brown trout at Cornwall. A. Log-transformed total PCB versus exposure time of fish. B. Log-transformed percent lipid versus exposure time. C. Log-transformed lipid-normalized PCB versus exposure time.

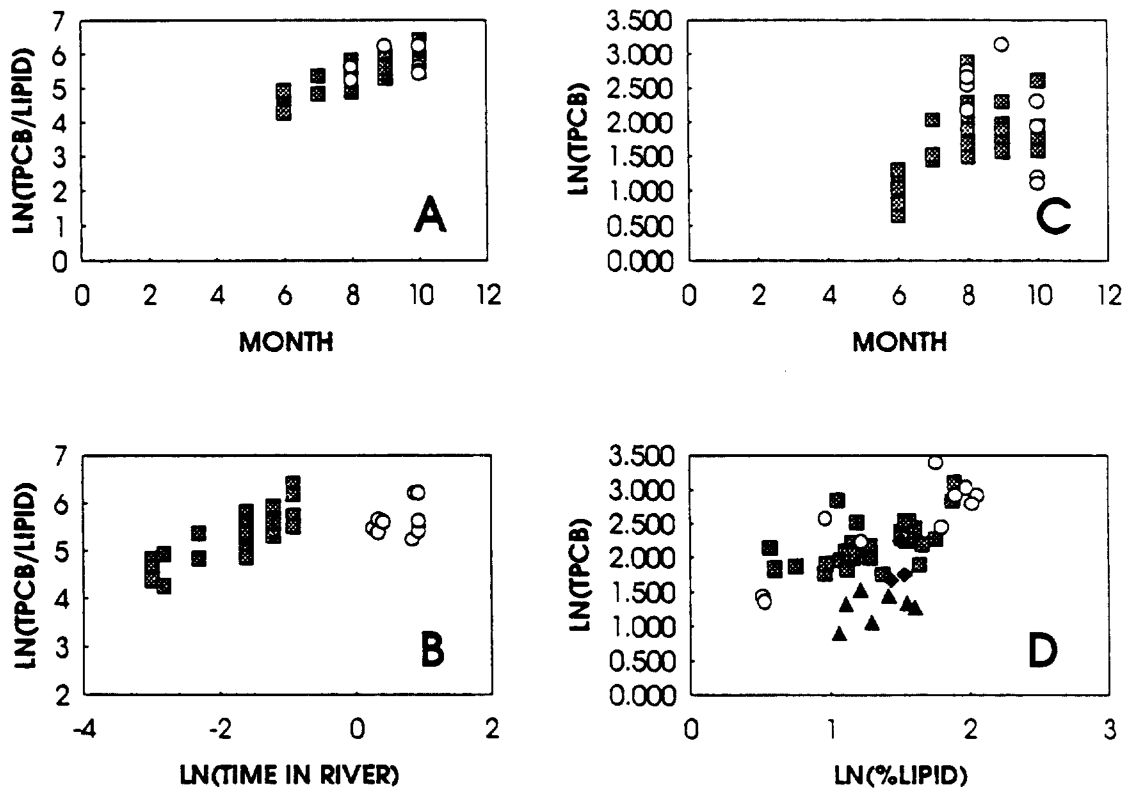


Figure 15. PCB level versus month of collection, time in the river, and percent lipid in newly-stocked brown trout at Cornwall. A. Lipid-normalized PCB versus month of the year in which a fish is collected. Symbols: shaded squares - newly stocked trout, open circles - holdovers. B. Lipid-normalized PCB versus exposure time. Symbols as in A. C. Total PCB versus month of collection. Symbols as in A. D. Total PCB versus percent lipid. Symbols: solid triangles - newly stocked trout exposed less than 1 month, solid diamonds - newly stocked trout exposed between 1 and 2 months, shaded squares - newly stocked trout exposed more than 2 months, open circles - holdovers.

with lipid), then regain it in the spring and summer. PCB levels in these fish do not, however, fall to levels as low as those seen in fish which have been in the river less than a month. These individuals still strongly reflect conditions in the hatchery, due to their brief duration of exposure to the river. That they are exceptional can be seen in Figure 15C, where total PCB is plotted against percent lipid (both log-transformed). Note that fish less than 1 month old have unusually low PCB concentrations for their lipid percentages. Note also that fish more than 1 year old fall in the same data cluster as those less than 1 year old (but more than 1 month old), again suggesting that they repeat an annual cycle of PCB levels rather than monotonically accumulating it.

A simple model of PCB bioaccumulation was developed to examine qualitative features resulting from seasonally driven PCB uptake. This model is an extension of models presented in previous reports, which did not address seasonal variation (ANSP 1990, 1991).

The model's state variables are lipid, nonlipid, and PCB masses. Dynamics are governed by seasonally varying food uptake, the PCB level in food, catabolism of lipid and nonlipid, and PCB depuration. PCB uptake by sources other than food is assumed to be negligible, though this is not a crucial assumption.

A derivation of the model is presented in Appendix C. Here we simply show an example of model output, illustrating the behavior discussed above. Fig. 16 shows the relationship between total PCB and percent lipid over a model run representing three years. The lipid and PCB scales in the figure are arbitrary. The important point is the qualitative behavior of the numerical solution. It shows a newly stocked fish with initially low PCB. The fish rapidly gains lipid and PCB, then loses both as food availability decreases, then gains both again as food availability increases, and so on. The solution trajectory asymptotically approaches a cycle with a one-year period. A newly stocked fish begins well off the cycle (its PCB level is too low) but rapidly winds onto it. This appears to be what occurs in brown trout at Cornwall (e.g., compare Fig. 15D).

Seasonally driven cycling of PCB is potentially important in the context of the Housatonic River biological monitoring studies. It may represent a source of substantial natural variability in PCB levels, making it difficult to detect a long-term trend. Moreover, seasonal variation is not strictly periodic, so adjusting for this source of variability is problematic.

Size Distribution of Fish in the Angling Catch

For this study fish were collected by a variety of techniques which are not used by anglers. Furthermore, fish were selected for analysis from among the specimens caught to provide a range of sizes. Thus, distributions of PCB concentrations may not match those of the fish population or of fish caught or kept by fishermen. Comparisons of size distributions in the 1984-1988 period (ANSP 1990) indicate that fish analyzed for PCBs tended to include more larger fish and fewer intermediate-sized fish than were caught by fishermen. For 1990 and later, only limited

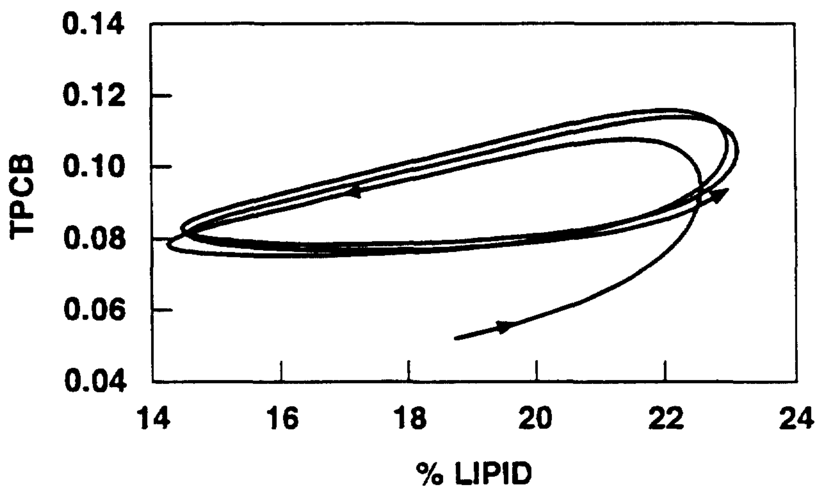


Figure 16. Sample output from the PCB bioaccumulation model, showing seasonal cycling of PCB and percent lipid. Scales and units are arbitrary. Behavior of a hypothetical newly stocked trout is shown. Note the winding onto an asymptotic cycle. This cycle has a period of one year and is driven by seasonal variation in food abundance. Compare Fig. 14D.

information is available on size distributions in the fish populations or anglers' catches. However, a creel survey of smallmouth bass at Cornwall conducted by the Connecticut Department of Fisheries provides information on the size of fish in anglers' catches in 1990. The creel survey included all sizes of fish caught. Only fish greater than 24.5 cm were analyzed for PCBs, since this has been considered the minimum size that would be likely to be kept and eaten. Frequencies of size classes in the anglers' catch are presented both as percentage among all fish caught, and as percentage among the 27.5% of the catch greater than 24.0 cm (Table 11). Data on angler-caught fish combines data from fly, bait and lure catches. The comparison of fish analyzed for PCBs and those caught by fishermen indicates that relatively more larger fish were analyzed than are caught by fishermen. However, the difference is not great: 25% of the fish analyzed for PCBs in 1990 and 29% in 1992 were greater than 30 cm in total length, compared to 20% in the fishery catch. The higher proportion in 1992 reflects the capture and analysis of two large specimens.

Precision and Replicate Analyses

Measurement precision was assessed by replicate analysis of subsamples from the same specimen (i.e., separate extraction and analysis). The standard deviations of replicate analyses (Table 12) tend to be proportional to the mean, so that precision is best expressed as the coefficient of variation (C.V.) of TPCB, or the standard deviation of LNTPCB. The median C.V. for 1992 replicate analyses was 0.12 and the median standard deviation of LNTPCB was 0.11. The precision of a pair of replicate analyses may be calculated as the relative % difference (RPD):

$$RPD = 100 * (R1 - R2)/MR$$

$$= \sqrt{2} * C.V.$$

Thus, the median RPD for the 1992 samples was 17.

Proportion of Population Above Regulatory Threshold

One of the primary goals of the 1990 and 1992 studies was to obtain more extensive information on concentrations of PCB in species and sites which had shown relatively low concentrations in previous years: yellow perch at Bulls Bridge, Lillinonah and Zoar; sunfish at Lillinonah and Zoar; and white perch at Zoar. In 1990, 18 individuals were analyzed from each of these groups, for a total of 108. In 1992, between 8 and 14 individuals of each group were analyzed, for a total of 60.

As discussed earlier in this report, PCB concentrations were calculated in 1992 using both a congener-based method (CTPCB) and an Aroclor-based method (TPCB). Congener-based estimates are believed to be more accurate, so CTPCB values are more appropriate for comparisons to the regulatory standard. Of the 108 fish analyzed in 1990, CTPCB exceeded 2.0 mg/kg in only one individual (a white perch from Lake Zoar). Only 2 of the 60 fish analyzed in 1992 had CTPCB concentrations greater than 2.0 mg/kg (both white perch from Lake Zoar).

Since the number of fish analyzed for each species and station is small, the observed proportion exceeding the regulatory standard is not necessarily a good estimate of the proportion in the total "fishable" population. If, however, the analyzed fish form a representative sample, then a theoretical estimate of the expected proportion of the total fishable population can be made. Because no clear temporal trend was established for these taxa, and because the theoretical estimates are sensitive to small sample sizes ($n \leq 30$), data from 1990 and 1992 were combined to provide a broader population base for this analysis.

Assuming the distribution of PCB concentrations is lognormal, the mean and standard deviation of LNCTPCB can be used to estimate the proportion of the population distribution with LNCTPCB greater than 0.69 (which corresponds to CTPCB greater than 2.0). This proportion is estimated as the proportion of the *t*-distribution lying to the right of the *t*-value for the population estimate [= (0.69 − mean LNCTPCB)/(standard deviation of LNCTPCB)]. For the groups with low concentrations, the combined 1990 and 1992 estimates are:

Taxon	Station	n	LNCTPCB		t-value	Percent > 0.69	
			mean	s.d.	of 0.69	Predicted	Observed
Sunfish	L	27	-1.35	0.72	2.84	0.4	0.0
Sunfish	Z	27	-2.04	0.78	3.51	0.1	0.0
White perch	Z	32	-0.46	0.81	1.43	8.2	9.4
Yellow perch	B	30	-0.52	0.55	2.18	1.9	0.0
Yellow perch	L	26	-1.27	0.48	4.07	0.0	0.0
Yellow perch	Z	26	-1.68	0.58	4.10	0.0	0.0

In preparing these estimates, TPCB values for 1990 were converted to CTPCB values using the regression equation from the section entitled "Relationship Between Congener and Aroclor Quantitation Methods". The predicted pattern indicates very low percentages of fish with PCB levels above 2.0 mg/kg for sunfish and yellow perch at Lillinonah and Zoar, and a somewhat higher percentage for white perch from Zoar.

These estimates may be affected by the length distribution in the samples, since the specimens analyzed were selected to include a range of sizes. This nonrandom selection could increase the mean and standard deviation of PCB concentrations relative to the fishable population, elevating the predicted percentages above 2.0 mg/kg. This effect is probably small, since correlations between PCB concentration and length are often low (ANSP 1990), particularly among relatively small species such as these. In this regard, note that the theoretical estimates are in rough agreement with the observed percentages.

In addition to species and stations which had shown low PCB concentrations in previous studies, PCB levels were also measured in American eel from Lake Zoar and compared with the regulatory standard. This species has historically shown elevated levels of PCB. In 1992, three of the five individuals collected exceeded the 2.0 mg/kg standard.

Insect and Crayfish Analyses

Results of the Cornwall insect analyses are displayed in Table 13. For two of the groups (caddisflies and stoneflies), it was possible to collect enough material in the field for two composite samples, providing a rough indication of the degree of variability in insect PCB analyses in this and previous monitoring studies. The results indicate that variability is substantial. Concentrations in the two caddisfly composites, for example, were 1.91 and 8.14 mg/kg wet weight. Conclusions drawn from these small sample sizes must therefore be interpreted cautiously. It is advisable to employ geometric means where possible, to reduce undue influence on sample means by occasional large values.

The geometric mean PCB level in caddisflies was 3.94 mg/kg (arithmetic mean = 5.03), while the geometric mean PCB level in predatory insects (stoneflies and dobsonflies) was 4.68 mg/kg (arithmetic mean = 4.97). Both values are within the respective ranges observed since 1984.

Crayfish were collected from the Cornwall area of the Housatonic River and two tributaries: the Still and Shepaug Rivers. Results of the crayfish analyses are also shown in Table 13. They indicate significant PCB accumulation in the Still River but not in the Shepaug. The measured concentration in the Still River is about one-third that in the Housatonic, while the Shepaug value is less than one-hundredth of the Housatonic value.

Examination of congener concentrations in crayfish from the three sources strongly suggests the presence of a unique Aroclor in the Still River; namely, Aroclor 1242. This issue is discussed further in the next section.

Evidence of Aroclor 1242 Inputs from the Still River

In order to make a preliminary assessment of Aroclor 1242 inputs from the Still River to the Housatonic River, we examined tissue concentrations of six PCB congeners found predominantly in Aroclor 1242. The samples employed were crayfish from the Still River, Shepaug River and the Cornwall area of the Housatonic River, and smallmouth bass from all four Housatonic River sites. We analyzed one composite sample of adult female *Orconectes rusticus* from each of the three rivers, and 14 smallmouth bass from Cornwall, 8 from Bulls Bridge, 7 from Lake Lillinonah and 6 from Lake Zoar. The six congeners are PCB 18, 17, 31+28 and 56+60, which elute as four peaks in our analytical system. Together, these congeners compose 37.3% of total PCB mass in Aroclor 1242, 1.13% of Aroclor 1254 and

0.61% of Aroclor 1260. Since very little is found in Aroclors 1254 and 1260, variation in these congeners among samples probably indicates a change in the contribution by Aroclor 1242.

Of the four Housatonic sampling sites, Cornwall and Bulls Bridge are upstream from the mouth of the Still River, while Lakes Lillinonah and Zoar are downstream.

Figure 17A shows that the six PCB congeners account for more than 15% of total PCB in crayfish from the Still River but less than 1.5% in crayfish from the Housatonic River at Cornwall. These results strongly suggest that Aroclor 1242 is a significant PCB component in the Still River but not in the Housatonic River.

Figure 17B shows that the percentages of the six PCB congeners in Housatonic smallmouth bass increase abruptly (approximately double) downstream from the mouth of the Still River. (Note that values for PCB 18 and 17 are shown 10 times greater than actual in Fig. 17B.) This pattern suggests that PCB observed in the Housatonic River below the Still River is partly from sources along the Still River. The observed elevation in congeners characteristic of Aroclor 1242 might provide a means of estimating the proportionate contribution of the Still River to PCB body burdens in Housatonic fish.

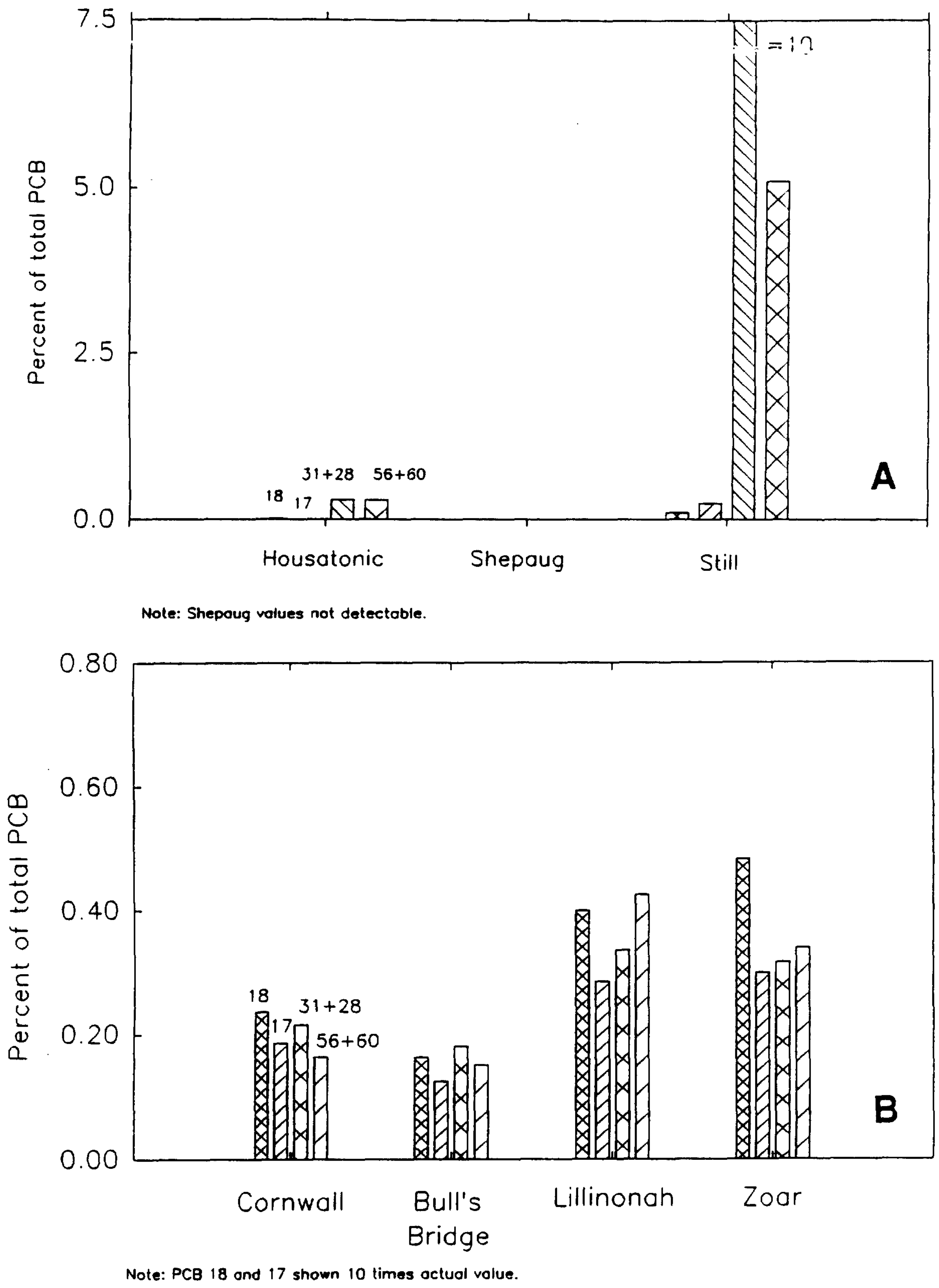


Figure 17. Percentages of PCB congeners 17, 18, 31+28 and 56+60 in crayfish and smallmouth bass. A. Results for crayfish in the Housatonic River at Cornwall, the Shepaug River and the Still River. B. Results for smallmouth bass at all four sampling stations on the Housatonic River, shown from left to right in upstream to downstream order. The Still River enters between Bulls Bridge and Lillinonah. (PCB congeners 17 and 18 are shown 10 times actual in B.)

DISCUSSION

Results of the 1992 study are basically consistent with previous biological monitoring studies on the Housatonic River in Connecticut. As in the past, PCB concentrations in fish fillets tend to decrease downriver in species collected at more than one station, and most species and stations show no temporal trend of increase or decrease since 1984. Results of analyses to evaluate the need for fish consumption advisories were also similar to those of previous studies. As in 1990, samples of sunfish from Lakes Lillinonah and Zoar and of yellow perch from Bulls Bridge, Lillinonah, and Zoar contained no individuals with PCB concentrations above the regulatory standard of 2.0 mg/kg. This standard was exceeded by 2 of 14 white perch and 3 of 5 American eel, all from Lake Zoar. PCB concentrations in insects at Cornwall fell within the range observed since 1984, and no temporal trend is discernible over this period.

A somewhat puzzling result is that when PCB concentrations are statistically adjusted to remove age or lipid differences between years (using analysis of covariance), recent levels in brown trout and smallmouth bass from Cornwall are higher than levels in prior years. Thus, the adjusted levels for brown trout are similar in 1990 and 1992 but higher than in 1984-1988; the adjusted values for smallmouth bass are similar in 1988-1992 but higher than in 1984-1986 (Table 9). Rather different patterns are seen if the data are lipid-normalized but otherwise left unadjusted. In this case, 1992 PCB levels at Cornwall are substantially lower than the 1990 levels in both brown trout and smallmouth bass (Fig. 6B). In brown trout, the 1992 level is similar to that in 1988 but, as with the adjusted data, somewhat higher than levels in 1984 and 1986. In smallmouth bass, however, the 1992 level is the lowest observed in any of the five studies conducted during 1984-1992.

It is not clear at this time whether the temporal trend seen in adjusted data for brown trout and smallmouth bass at Cornwall is real or is an artifact of sampling procedures or the method of statistical adjustment. For smallmouth bass, whether the 1992 PCB level is higher or lower than the 1984 level hinges on whether the effect of lipid on PCB bioaccumulation is accounted for by analyzing non-lipid-normalized data with lipid as a covariate (in which case the 1992 level exceeds the 1984 level) or by normalizing PCB data to lipid before analysis (in which case the 1992 level is lower than the 1984 level). The same problem affects the comparison between 1992 and 1990 levels in brown trout.

The apparent PCB increase in Cornwall brown trout could also be at least partly due to the time of year when Cornwall samples were collected in different study years. Previously, it was thought that a trout's duration of exposure (river age) was the key temporal property influencing its PCB burden. Samples from each of the study years were therefore collected so as to be well distributed among river ages (Fig. 18A). The 1992 data, however, suggest that time of year (sampling month) is also important, with trout tending to rapidly accumulate PCB during the spring and early summer when food is abundant and water temperatures are cool, and to maintain approximately constant levels during late summer and fall (after which it is postulated that PCB levels decrease during the winter months). One would therefore expect somewhat lower average PCB levels in trout caught in spring and early summer than in those

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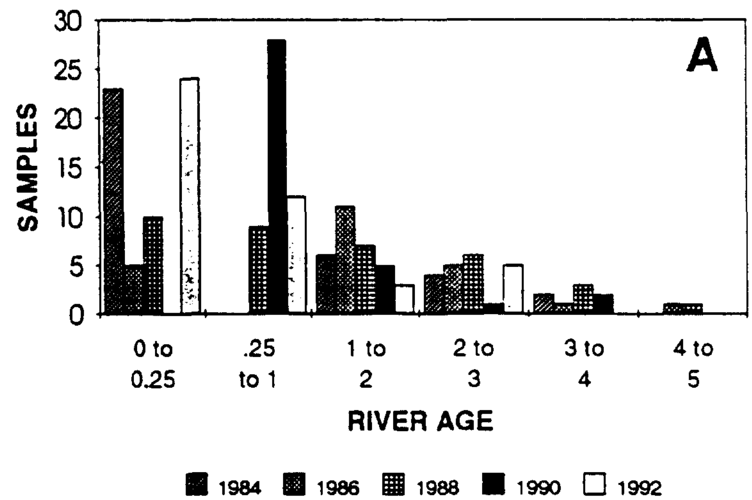

CORNWALL BROWN TROUT

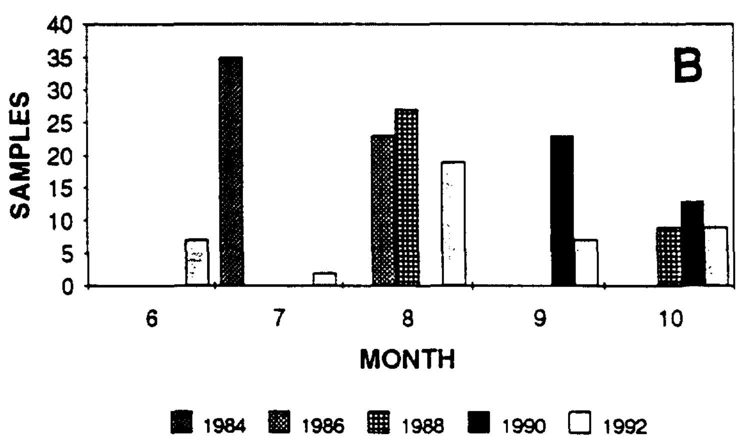

Figure 18. Distribution of 1984-1992 samples of Cornwall brown trout among river-ages (A) and collection months (B).

caught in late summer or fall. The distribution of samples versus collection month shows that from 1984 through 1990, trout were collected later in the year with each successive study (Fig. 18B). In particular, a large number of trout were collected relatively early in the year in 1984 and 1986. This pattern may at least partially explain the apparent increase in PCB levels in Cornwall brown trout in recent years. For smallmouth bass, a comparable database to assess temporal trends in relation to time of year does not exist.

A new feature of the 1992 study is the analysis of PCB concentrations in crayfish from the Housatonic River and two tributaries. The results indicate significant PCB levels in the Still River, suggesting that it might be a significant source to the Housatonic. Levels in the Shepaug River were lower by roughly two orders of magnitude. It was also found that several congeners characteristic of Aroclor 1242 are elevated in Still River crayfish, compared to those from the Housatonic. The same congeners appear to be elevated in Housatonic smallmouth bass at both sampling stations downstream from the Still River, compared to the two upstream stations. This result suggests that these congeners could be used to estimate the proportionate contribution of Still River PCB to fish tissue levels in the Housatonic River downstream.

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TABLES

Table 4. Results of 1992 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

STA		N	TOTAL LENGTH MIN	TOTAL LENGTH MAX	LIPID AVG	CTPCB %<2	CTPCB AVG	CTPCB MIN	CTPCB MAX	GEOM MEAN	95% CI GEOM MEAN	GEOM MEAN CTPCB/LIP	TPCB %<2	TPCB AVG	TPCB MIN	TPCB MAX	LNT AVG
C	BROWN TROUT	44	17.0	38.0	4.03	2	7.34	1.909	22.923	0.360	5.41-7.47	169.017	0	9.38	2.46	29.428	8.166
C	RIV AGE 0.05-0.06	7	17.0	21.2	3.83								0	3.62	2.46	4.59	3.56
C	RIV AGE 0.1	2	23.2	23.9	4.45								0	7.52	5.54	9.50	7.24
C	RIV AGE 0.2	15	20.8	31.0	4.43								0	9.65	5.78	19.66	9.12
C	RIV AGE 0.3	6	25.0	27.7	2.91								0	8.32	6.34	12.39	8.08
C	RIV AGE 0.4	6	24.8	29.8	2.69								0	9.23	6.49	17.19	8.67
C	RIV AGE 1-2	3	29.5	34.0	6.24								0	15.31	9.27	18.35	14.59
C	RIV AGE 2-3	5	33.8	38.0	4.60								0	15.26	3.99	29.43	12.68
C	SMALLMOUTH BASS	14	25.1	37.8	1.30	21	2.78	0.829	4.844	2.484	1.83-3.36	196.370	14	3.70	1.111	6.555	3.320
B	SMALLMOUTH BASS	8	26.5	33.5	1.18	88	1.33	0.807	2.096	1.257	4.10-6.94	108.853	75	1.73	1.032	2.701	1.648
L	SMALLMOUTH BASS	8	27.9	42.7	0.96	88	1.41	0.569	4.396	1.105	0.63-1.94	119.104	75	1.85	0.727	5.890	1.448
Z	SMALLMOUTH BASS	7	25.8	45.9	1.52	71	1.10	0.486	2.626	0.869	0.46-1.64	75.187	71	1.40	0.612	3.301	1.105
B	YELLOW PERCH	12	19.0	28.5	1.21	100	0.56	0.309	1.038	0.527	0.41-0.67	43.816	100	0.69	0.388	1.252	0.644
L	YELLOW PERCH	9	19.5	24.4	0.85	100	0.32	0.095	0.474	0.295	0.19-0.45	34.813	100	0.41	0.120	0.618	0.379
Z	YELLOW PERCH	8	20.0	25.1	0.79	100	0.26	0.092	0.686	0.204	0.11-0.38	26.050	100	0.34	0.115	0.993	0.259
L	BLUEGILL	4	18.0	18.7	0.80	100	0.44	0.088	1.257	0.257	0.04-1.62	32.137	100	0.61	0.112	1.765	0.333
L	PUMPKINSEED	2	14.1	14.3	0.92	100	0.18	0.117	0.240	0.167	0.00-16.1	18.1749	100	0.20	0.103	0.303	0.177
L	REDBREAST SUNFISH	3	17.1	19.6	0.95	100	0.47	0.333	0.593	0.458	0.22-0.95	48.911	100	0.61	0.426	0.733	0.596
Z	BLUEGILL	3	18.4	19.7	0.68	100	0.24	0.042	0.387	0.165	0.01-3.08	24.532	100	0.30	0.052	0.496	0.210
Z	PUMPKINSEED	3	16.2	16.5	0.63	100	0.22	0.037	0.392	0.153	0.01-3.38	24.779	100	0.29	0.047	0.513	0.198
Z	REDBREAST SUNFISH	3	17.4	18.9	0.70	100	0.24	0.067	0.465	0.176	0.02-1.87	25.280	100	0.31	0.082	0.614	0.225
Z	WHITE PERCH	14	15.5	25.1	1.24	86	1.01	0.115	5.217	0.638	0.37-1.09	60.947	56	1.31	0.144	7.102	0.811
Z	AMERICAN EEL	5	59.0	73.3	18.94	40	7.29	1.230	23.387	0.247	0.90-18.1	25.0286	40	8.99	1.656	28.101	5.155

Table 5. Comparison of results of 1984, 1986, 1988 and 1990 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
							White Perch					
Z	1992	14	15.5	25.1	1.24	56	1.31	0.14	7.10	0.81	0.47-1.39	78.26
Z	1990	18	16.3	24.4	2.03	94	1.00	0.18	3.64	0.78	0.56-1.10	50.60
Z	1988	12	14.9	25.9	3.98	83	1.49	0.03	3.87	0.82	0.34-1.96	21.85
Z	1984	24	16.8	23.7	3.44	96	0.95	0.55	2.04	0.90	0.78-1.03	27.03
							Yellow Perch					
B	1992	12	19.0	28.5	1.21	100	0.69	0.39	1.25	0.64	0.50-0.82	54.06
B	1990	18	17.8	30.1	0.66	100	0.95	0.16	1.89	0.80	0.59-1.09	127.74
B	1988	23	19.7	32.1	0.81	100	0.99	0.40	1.90	0.88	0.71-1.09	115.70
B	1986	25	21.6	30.9	1.02	96	0.82	0.20	2.12	0.68	0.53-0.87	76.10
B	1984	23	19.7	27.8	0.83	87	1.34	0.46	6.33	1.04	0.79-1.36	128.38
L	1992	9	19.5	24.4	0.85	100	0.41	0.120	0.62	0.38	0.24-0.58	45.60
L	1990	18	17.6	25.2	0.51	100	0.38	0.15	0.76	0.34	0.27-0.43	72.02
L	1988	6	18.9	24.3	0.88	100	0.23	0.03	0.62	0.11	0.03-0.36	12.76
L	1984	3	25.3	25.9	0.69	100	0.64	0.33	1.16	0.55	0.26-1.18	87.36
Z	1992	8	20.0	25.1	0.79	100	0.34	0.16	0.99	0.26	0.13-0.50	33.12
Z	1990	18	17.0	24.2	0.39	100	0.25	0.10	0.65	0.22	0.17-0.28	61.44
Z	1988	7	19.5	25.8	0.72	100	0.22	0.03	0.36	0.15	0.06-0.35	20.57
Z	1986	0	-	-	-	-	-	-	-	-	-	-
Z	1984	2	18.5	19.3	0.46	100	0.06	0.06	0.07	0.06	0.06-0.08	14.10
							Smallmouth Bass					
C	1992	14	25.1	37.8	1.30	14	3.70	1.11	6.555	3.32	2.45-4.50	259.82
C	1990	12	24.3	33.2	0.57	17	3.49	1.19	6.46	3.14	2.36-4.18	602.45
C	1988	13	24.5	36.0	1.63	8	4.76	1.59	13.62	3.88	2.74-5.48	272.60
C	1986	13	24.8	28.1	1.03	31	3.22	0.62	5.99	2.64	1.77-3.92	259.82
C	1984	16	22.4	33.5	0.64	38	2.40	0.61	6.26	2.00	1.44-2.78	327.67

Table 5 (continued). Comparison of results of 1984, 1986, 1988 and 1990 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
							Smallmouth (cont'd)					
B	1992	8	26.5	33.5	1.18	75	1.73	1.032	2.701	1.648	1.24-2.19	141.18
B	1990	6	25.8	36.6	0.74	17	2.54	0.87	3.77	2.32	1.53-3.53	355.31
B	1988	14	25.1	45.5	1.54	21	2.83	1.01	5.73	2.59	2.04-3.29	177.68
B	1986	12	25.8	34.0	1.33	58	1.57	0.73	2.79	1.41	1.06-1.87	109.51
B	1984	12	25.0	45.5	0.92	50	1.91	0.89	2.89	1.80	1.45-2.23	207.47
L	1992	8	27.9	42.7	0.96	75	1.85	0.727	5.890	1.448	0.82-2.57	154.47
L	1990	6	26.8	44.8	0.91	100	1.09	0.69	1.75	1.02	0.75-1.40	128.90
L	1988	25	25.8	45.0	0.79	88	1.40	0.46	3.67	1.20	0.97-1.49	166.00
L	1986	26	26.1	49.9	0.86	77	1.59	0.36	7.28	1.13	0.84-1.52	157.28
L	1984	25	25.1	45.6	1.23	92	1.18	0.44	2.78	1.07	0.89-1.28	107.55
Z	1992	7	25.8	45.9	1.52	71	1.40	0.612	3.301	1.105	0.58-2.12	95.58
Z	1990	6	25.1	43.4	0.41	100	0.65	0.27	1.04	0.59	0.39-0.89	147.67
Z	1988	16	24.7	47.9	1.28	88	0.97	0.14	2.14	0.73	0.48-1.10	63.94
Z	1986	0	-	-	-	-	-	-	-	-	-	-
Z	1984	24	24.6	38.2	0.86	100	0.50	0.01	1.08	0.39	0.27-0.57	49.80
							American Eel					
Z	1992	5	59.0	73.3	18.94	40	8.99	1.66	28.10	5.16	1.22-21.8	31.82
Z	1990	19*	35.5	77.6	9.44	56	2.90	0.34	8.96	2.17	1.49-3.17	27.28
Z	1988	3	58.1	64.7	23.65	100	1.20	0.25	1.82	0.89	0.25-3.17	3.83
							Sunfish					
L	1992	9	14.1	19.6	0.87	100	0.52	0.10	1.76	0.35	0.18-1.02	40.45
L	1990	18	15.0	20.5	0.63	100	0.37	0.11	1.02	0.31	0.22-0.42	56.20
L	1988	6	15.2	19.9	1.01	100	0.31	0.03	0.90	0.17	0.05-0.53	17.89
L	1984	4	18.4	20.5	0.80	100	0.99	0.52	1.86	0.86	0.47-1.59	112.51
Z	1992	9	16.2	19.7	0.67	100	0.30	0.05	0.61	0.21	0.10-0.46	31.82
Z	1990	18	15.3	19.7	0.48	100	0.17	0.03	0.43	0.14	0.10-0.19	31.88
Z	1988	6	14.6	21.0	0.86	100	0.15	0.03	0.38	0.09	0.03-0.24	11.42
Z	1984	4	16.1	20.9	0.76	100	0.55	0.07	1.25	0.29	0.07-1.22	41.72

Table 5 (continued). Comparison of results of 1984, 1986, 1988 and 1990 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
							Bluegill					
L	1992	4	18.0	18.7	0.80	100	0.61	0.11	1.77	0.33	0.05-2.33	42.10
L	1990	6	16.3	20.5	0.87	100	0.51	0.25	1.02	0.46	0.30-0.69	58.67
L	1988	3	15.2	19.9	1.11	100	0.52	0.32	0.90	0.45	0.23-0.90	46.15
L	1984	2	19.5	20.5	1.05	100	0.52	0.52	0.53	0.53	0.52-0.54	50.05
Z	1992	3	18.4	19.7	0.68	100	0.30	0.05	0.496	0.21	0.01-4.40	31.50
Z	1990	6	15.3	19.7	0.57	100	0.13	0.03	0.22	0.11	0.06-0.21	20.66
Z	1988	2	19.6	21.0	0.58	100	0.20	0.03	0.38	0.11	0.01-1.34	18.43
Z	1984	2	17.5	20.9	0.90	100	1.02	0.78	1.25	0.99	0.62-1.58	116.40
							Redbreast Sunfish					
L	1992	3	17.1	19.6	0.95	100	0.61	0.43	0.73	0.60	0.29-1.23	63.43
L	1990	6	15.4	19.6	0.57	100	0.40	0.11	0.64	0.34	0.19-0.59	63.24
L	1988	1	16.4	16.4	1.02	100	0.03	0.03	0.03	-	-	2.94
L	1984	2	18.4	18.9	0.56	100	1.46	1.06	1.86	1.40	0.80-2.46	252.90
Z	1992	3	17.4	18.9	0.70	100	0.31	0.08	0.61	0.225	0.02-2.73	32.46
Z	1990	6	16.5	19.2	0.46	100	0.21	0.08	0.43	0.18	0.10-0.30	40.25
Z	1988	2	17.3	18.6	1.16	100	0.15	0.03	0.27	0.09	0.01-0.81	8.47
Z	1984	2	16.1	18.3	0.62	100	0.09	0.07	0.11	0.09	0.06-0.14	14.95
							Pumpkinseed					
L	1992	2	14.1	14.3	0.92	100	0.20	0.10	0.303	0.177	-	19.11
L	1990	6	15.0	17.2	0.44	100	0.21	0.11	0.37	0.19	0.12-0.29	47.85
L	1988	1	17.0	17.0	0.94	100	0.03	0.03	0.03	0.03	-	3.19
L	1984	0	-	-	-	-	-	-	-	-	-	-
Z	1992	3	16.2	16.5	0.63	100	0.29	0.047	0.513	0.198	0.01-4.69	31.82
Z	1990	6	15.6	16.7	0.40	100	0.17	0.07	0.29	0.15	0.10-0.22	38.94
Z	1988	2	14.6	18.3	0.84	100	0.11	0.03	0.19	0.08	0.01-0.47	9.51
Z	1984	0	-	-	-	-	-	-	-	-	-	-

Table 5 (continued). Comparison of results of 1984, 1986, 1988 and 1990 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
							Pumpkinseed X Redbreast					
L	1990	0	-	-	-	-	-	-	-	-	-	-
L	1988	1	18.8	18.8	0.80	100	0.28	0.28	0.28	-		35.52
L	1984	0	-	-	-	-	-	-	-	-	-	-

Riv Age	Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI G.M.TPCB	geom mean of PCBLIP
							Brown Trout						
	C	1992	44	17.0	38.0	4.03	0	9.38	2.46	29.43	8.17	6.94-9.61	217.0
0.05-0.06	C	1992	7	17.0	21.2	3.83	0	3.62	2.46	4.59	3.56	2.92-4.35	94.4
0.1	C	1992	2	23.2	23.9	4.45	0	7.52	5.54	9.50	7.24	-	162.9
0.2	C	1992	15	20.8	31.0	4.43	0	9.65	5.78	19.66	9.12	7.54-11.01	215.3
0.3	C	1992	6	25.0	27.7	2.91	0	8.32	6.34	12.39	8.08	6.21-10.53	283.4
0.4	C	1992	6	24.8	29.8	2.69	0	9.23	6.49	17.19	8.67	6.00-12.53	331.6
1-2	C	1992	3	29.5	34.0	6.24	0	15.31	9.27	18.35	14.59	5.51-38.62	250.1
2-3	C	1992	5	33.8	38.0	4.60	0	15.26	3.99	29.43	12.68	5.07-31.69	312.9
	C	1990	36	21.7	30.0	1.29	0	5.57	2.93	9.30	5.30	4.75-5.90	483.48
0.4	C	1990	18	21.7	30.0	1.53	0	5.81	2.99	8.02	5.62	4.94-6.39	381.46
0.5	C	1990	10	21.9	25.7	0.56	0	3.95	2.93	5.52	3.89	3.46-4.37	746.20
1-2	C	1990	5	24.9	29.5	1.84	0	7.02	5.05	9.27	6.84	5.46-8.57	413.23
2-3	C	1990	3	28.4	30.0	0.56	0	7.10	4.17	9.30	6.75	2.40-19.0	614.00
	C	1988	36	17.8	40.8	2.91	0	5.69	2.60	16.70	5.14	4.46-5.92	209.77
0.2	C	1988	10	17.8	21.9	1.88	0	3.83	2.60	5.31	3.75	3.26-4.32	203.57
0.42	C	1988	9	19.2	24.7	1.32	0	4.57	3.22	7.66	4.41	3.68-5.29	362.85
1.2	C	1988	7	28.5	36.0	4.32	0	7.25	5.00	10.10	7.06	5.85-8.53	169.86
2.2	C	1988	6	24.5	40.0	4.36	0	5.52	3.55	9.60	5.22	3.92-6.96	125.71

Table 5 (continued). Comparison of results of 1984, 1986, 1988 and 1990 PCB analyses of selected groups of fish from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Riv Age	Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI G.M.TPCB	geom mean of PCBLIP
						Brown Trout cont'd							
	C	1986	24	21.5	47.0	3.79	4	6.81	1.92	23.57	5.51	4.23-7.17	152.17
0.2	C	1986	5	21.5	28.0	4.04	0	3.49	2.02	5.39	3.31	2.38-4.60	87.01
1.2	C	1986	10	23.6	29.5	3.83	0	5.54	2.27	9.64	5.17	3.99-6.70	141.17
2.2	C	1986	5	26.0	35.3	3.67	17	10.08	1.92	23.57	7.34	3.41-15.80	208.10
	C	1984	36	17.4	33.0	2.93	50	3.44	0.35	14.57	2.30	1.69-3.13	86.66
0.2	C	1984	23	17.4	30.1	2.81	74	1.64	0.35	4.12	1.37	1.05-1.79	53.73
1.2	C	1984	5	27.6	30.2	3.30	0	7.37	4.53	12.18	6.89	4.80-9.90	238.17
2.2	C	1984	3	31.8	33.0	2.23	0	5.41	3.23	6.96	5.14	3.21-8.28	246.66

* Only 18 samples were analyzed, one sample being a composite of 2 fish.

Table 6. Age distribution of specimens analyzed for PCB concentrations in 1984, 1986, 1988 and 1990 studies on the Housatonic River, Connecticut, by the Academy of Natural Sciences of Philadelphia. Station abbreviations are C (Cornwall), B (Bulls Bridge), L (Lake Lillinonah), and Z (Lake Zoar). Ages are in years.

Species	Site	Year	Age																										TOT
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	25	27	U	
Brown Trout+	C	1984	23	5	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	36
	C	1986	5	10	6	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	C	1988	19	7	6	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
	C	1990	28	5	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
	C	1992	36	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
Small-mouth bass	C	1984	-	-	-	2	5	1	-	1	1	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
	C	1986	-	-	-	-	-	-	12	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
	C	1988	-	-	-	5	1	-	2	1	2	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	13
	C	1990	-	-	-	2	-	3	4	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
	C	1992	-	-	-	-	-	8	1	-	1	1	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Small-mouth bass	B	1984	-	-	-	1	5	4	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	12
	B	1986	-	-	-	4	-	-	6	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
	B	1988	-	-	-	5	1	3	1	-	-	-	1	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	14
	B	1990	-	-	-	1	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	B	1992	-	-	-	-	-	6	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		8
Small-mouth bass	L	1984	-	-	-	10	14	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
	L	1986	-	-	2	11	4	1	3	-	2	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	26
	L	1988	-	-	1	1	12	5	-	4	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
	L	1990	-	-	-	2	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1992	-	-	-	-	3	2	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Small-mouth bass	Z	1984	-	-	-	7	13	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	Z	1988	-	-	-	2	8	1	-	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
	Z	1990	-	-	-	1	2	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Z	1992	-	-	-	-	-	3	2	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Large-mouth bass	B	1984	-	-	-	5	14	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	B	1988	23	-	1	3	3	-	-	1	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	34

Table 6 (continued). Age distribution of specimens analyzed for PCB concentrations in 1984, 1986, 1988 and 1990 studies on the Housatonic River, Connecticut, by the Academy of Natural Sciences of Philadelphia. Station abbreviations are C (Cornwall), B (Bulls Bridge), L (Lake Lillinonah), and Z (Lake Zoar). Ages are in years.

Species	Site	Year	Age																										TOT
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	25	27	U	
Large-mouth bass	L	1984	-	-	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1988	10	1	-	-	2	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Large-mouth bass	Z	1984	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	3	4	2	1	-	2	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
White perch	L	1984	-	-	-	20	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	L	1986	-	-	2	4	1	1	-	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	15
	L	1988	-	-	5	-	2	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
White perch	Z	1984	-	-	8	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	Z	1988	-	1	3	-	3	-	-	1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
	Z	1990	-	-	-	6	-	2	5	-	-	3	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	18
	Z	1992	-	-	1	-	1	2	2	-	3	-	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	14
Yellow perch	B	1984	-	-	2	2	7	1	1	2	1	3	3	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	23
	B	1986	-	-	2	3	7	1	7	-	1	1	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	25
	B	1988	-	-	4	-	8	1	3	1	5	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
	B	1990	-	2	2	3	4	-	1	-	1	-	4	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	18
	B	1992	-	1	7	1	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Yellow perch	L	1984	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	L	1988	-	-	2	-	1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1990	-	-	3	5	6	-	1	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	18
	L	1992	-	-	1	-	-	1	4	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Yellow perch	Z	1984	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	-	-	1	-	-	-	4	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
	Z	1990	-	-	-	7	3	-	1	1	3	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
	Z	1992	-	-	-	-	-	4	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8

Table 6 (continued). Age distribution of specimens analyzed for PCB concentrations in 1984, 1986, 1988 and 1990 studies on the Housatonic River, Connecticut, by the Academy of Natural Sciences of Philadelphia. Station abbreviations are C (Cornwall), B (Bulls Bridge), L (Lake Lillinonah), and Z (Lake Zoar). Ages are in years.

Species	Site	Year	Age 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	25	27	U	TOT
White catfish	L	1984	-	-	4	2	2	-	-	-	1	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	12
	L	1986	-	-	1	2	-	2	2	-	-	1	1	1	-	2	-	-	-	2	-	-	-	-	-	-	-	1	15
	L	1988	-	-	1	-	-	5	2	2	1	-	-	1	-	-	-	-	2	-	-	-	1	1	-	-	-	-	16
White catfish	Z	1984	-	-	2	1	-	-	-	1	2	-	1	2	1	1	-	1	-	-	-	-	-	-	-	-	-	-	12
	Z	1986	-	-	-	1	2	3	1	1	-	1	-	1	2	2	1	1	-	-	-	-	-	-	-	-	-	-	16
	Z	1988	-	-	-	-	-	-	-	8	2	-	-	-	2	-	-	4	1	3	-	-	1	-	-	-	-	-	21
Brown bullhead	B	1984	-	-	4	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	12
	B	1986	-	-	4	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	B	1988	-	-	1	1	5	1	3	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Brown bullhead	L	1984	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	L	1988	-	-	-	1	-	-	-	-	1	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Brown bullhead	Z	1984	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	-	-	-	-	1	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Carp	B	1984	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	B	1988	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3
Carp	L	1984	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	L	1988	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3
Carp	Z	1984	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Z	1988	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	-	3
Bluegill	B	1984	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	B	1988	38	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
Bluegill	L	1984	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	L	1988	45	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
	L	1990	-	-	2	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1992	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4

Table 6 (continued). Age distribution of specimens analyzed for PCB concentrations in 1984, 1986, 1988 and 1990 studies on the Housatonic River, Connecticut, by the Academy of Natural Sciences of Philadelphia. Station abbreviations are C (Cornwall), B (Bulls Bridge), L (Lake Lillinonah), and Z (Lake Zoar). Ages are in years.

Species	Site	Year	Age																										TOT
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	25	27	U	
Bluegill	Z	1984	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	60	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62
	Z	1990	-	-	2	2	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Z	1992	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Pumpkin-seed	B	1988	46	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
	L	1988	7	-	-	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9*
	L	1990	-	-	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1992	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	22	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
	Z	1990	-	-	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Z	1992	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Redbreast sunfish	B	1984	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	B	1988	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Redbreast sunfish	L	1984	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	L	1988	-	-	-	1*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2*
	L	1990	-	-	-	-	2	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	L	1992	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Redbreast sunfish	Z	1984	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1988	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Z	1990	-	-	-	1	-	1	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Z	1992	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Eel	Z	1988	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	Z	1990	-	-	-	-	1	1	-	1	-	2	4	3	2	3	-	-	-	1	-	-	-	-	-	-	-	-	18
	Z	1992	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	1	1	-	-	-	-	-	-	-	-	-	5

+ River-age (number of years since stocking) indicated.
* One hybrid pumpkinseed x redbreast sunfish included under both parental species.

Table 7. Estimated total PCB concentrations from sum of congeners for fishes from 4 stations on the Housatonic River, Connecticut. Estimates are based on regressions between the Aroclor-based estimates and the congener-based totals for 1992 data ($r^2 = 0.999$). These regressions were used to estimate congener-based total from the Aroclor-based estimates used in the 1984-1990 studies. Data are averages of estimated congener totals. For comparison, the average for the direct congener estimates for 1992 are shown in addition to the estimates from the regressions.

SPECIES	STA	ESTIMATED CTPCB					OBS CTPCB
		1984	1986	1988	1990	1992	1992
BROWN TROUT	C	2.68	5.28	4.42	4.33	7.27	7.34
RAINBOW TROUT	C	-	-	2.50	-	-	-
SMALLMOUTH BASS	C	1.87	2.50	3.70	2.72	2.88	2.78
BLUEGILL	B	0.69	-	1.74	-	-	-
BROWN BULLHEAD	B	0.63	1.43	1.57	-	-	-
CARP	B	0.85	-	5.16	-	-	-
LARGEMOUTH BASS	B	1.06	-	1.99	-	-	-
PUMPKINSEED	B	-	-	0.23	-	-	-
REDBREAST SUNFISH	B	1.19	-	1.54	-	-	-
SMALLMOUTH BASS	B	1.49	1.23	2.21	1.98	1.35	1.33
YELLOW PERCH	B	1.05	0.64	0.78	0.75	0.54	0.56
BLUEGILL	L	0.41	-	0.40	0.40	0.48	0.44
BROWN BULLHEAD	L	1.86	-	1.32	-	-	-
CARP	L	1.72	-	5.74	-	-	-
LARGEMOUTH BASS	L	1.03	-	1.07	-	-	-
PUMP X REDBREAST	L	-	-	0.22	-	-	-
PUMPKINSEED	L	-	-	0.02	0.17	0.16	0.18
REDBREAST SUNFISH	L	1.14	-	0.02	0.31	0.48	0.47
SMALLMOUTH BASS	L	0.92	1.24	1.09	0.85	1.44	1.41
WHITE CATFISH	L	5.03	6.48	4.37	-	-	-
WHITE PERCH	L	1.77	1.74	1.41	-	-	-
YELLOW PERCH	L	0.51	-	0.18	0.30	0.32	0.32
AMERICAN EEL	Z	-	-	0.94	2.26	6.10	6.39
BLUEGILL	Z	0.80	-	0.16	0.11	0.24	0.24
BROWN BULLHEAD	Z	0.32	-	0.54	-	-	-
CARP	Z	3.77	-	12.75	-	-	-
LARGEMOUTH BASS	Z	0.33	-	1.06	-	-	-
PUMPKINSEED	Z	-	-	0.09	0.13	0.23	0.22
REDBREAST SUNFISH	Z	0.07	-	0.12	0.17	0.24	0.24
SMALLMOUTH BASS	Z	0.39	-	0.76	0.51	1.09	1.10
WHITE CATFISH	Z	2.11	2.45	3.33	-	-	-
WHITE PERCH	Z	0.75	-	1.17	0.78	1.03	1.01
YELLOW PERCH	Z	0.05	-	0.17	0.20	0.27	0.26

Table 8. Summary of analyses of differences in PCB concentrations between groups of fish from the 1984, 1986, 1988, 1990 and 1992 surveys at four stations (STA) on the Housatonic River. Results are based on ANCOVA analyses. LNTPCB (=ln(TPCB)) is the dependent variable. r_T^2 is the total variance explained for models containing only significant terms. The remaining columns show the significance and r^2 for discrete effects (station, year and sex), covariates (age, ln(age), lipid and/or ln(lipid), interactions (between station, year and sex) and significant slope differences of age or lipid relationships (between station, year or sex). The r^2 associated with each treatment, covariate or interaction (shown in paretheses) is interpretable as the proportion of total variance explained by that factor (see text). Where only one significance value is given, the value is for the type III sums of squares; where two values are given, they are for type I and type III sums, respectively. ns indicates an effect that is not significant when other significant terms are included; na indicates a comparison that is not applicable. See text for explanation.

Species years	Sta	r_T^2	Station	Year	Sex	LnAge	LnLipid age+	Interactions lipid+	Slope differences Other effects
Brown trout									
All	C	0.66	na	0.0001 (0.34)	ns	0.0001# (0.12)	0.0001 (0.073)	ns	LnAge*Year 0.0001 (0.38)
Brown trout River-age <1									
All	C	0.76	na	0.069 (0.66)	ns	0.0001# (0.053)	0.0005 (0.013)	ns	LnLipid*Year 0.013 (0.57)
All	C	0.73	na	0.0001	ns	0.0001#	0.0005	ns	not included
Brown trout River-age >1									
All	C	0.31	na	0.0078 (0.19)	ns	ns	0.0021 (0.13)	ns	ns
Smallmouth bass									
All	B	0.52	na	0.0001 (0.24)	0.0005 (0.029)	ns	0.0001 (0.077)	ns	ns
Smallmouth bass									
All	C	0.55	na	0.0031 (0.14)	0.0001 (0.23)	ns	ns	ns	LnLipid*Year 0.023 (0.13) LnLipid*Sex 0.042 (0.13)
Smallmouth bass									
All	L	0.17	na	ns	0.040 (0.038)	0.0004 (0.12)	ns	ns	ns
Smallmouth bass									
84,88,90,92	Z	0.42	na	ns	ns	ns	0.025 (0.16)	Year*Sex 0.013 (0.35)	ns
Smallmouth bass									
84,88,90,92	CBLZ	0.57	0.0001 (0.44)	0.0049 (0.083)	0.0013 (0.029)	0.013 (0.10)	0.0025 (0.044)	ns	ns

Table 8 (continued). Summary of analyses of differences in PCB concentrations between groups of fish from the 1984, 1986, 1988, 1990 and 1992 surveys at four stations (STA) on the Housatonic River. Results are based on ANCOVA analyses. LNTPCB (=ln(TPCB)) is the dependent variable. r^2 is the total variance explained for models containing only significant terms. The remaining columns show the significance and r^2 for discrete effects (station, year and sex), covariates (age, ln(age), lipid and/or ln(lipid), interactions (between station, year and sex) and significant slope differences of age or lipid relationships (between station, year or sex). The r^2 associated with each treatment, covariate or interaction (shown in paretheses) is interpretable as the proportion of total variance explained by that factor (see text). Where only one significance value is given, the value is for the type III sums of squares; where two values are given, they are for type I and type III sums, respectively. ns indicates an effect that is not significant when other significant terms are included; na indicates a comparison that is not applicable. See text for explanation.

Species years	Stat	r_T^2	Sta	Year	Sex	LnAge age+	LnLipid lipid+	Interactions Other effects	Slope differences
White perch									
84,88,90,92	Z	0.29	na	ns	ns	0.0017 (0.029)	ns	ns	LnLipid*LnAge 0.0001 (0.17)
American eel									
88,90,92	Z	0.40	na	0.012 (0.24)	na	ns	0.027 (0.10)	ns	ns
88,90,92*	Z	0.30	na	0.040	na	ns	0.06	ns	ns
Yellow perch									
All	B	0.55	na	0.0001	0.04	0.0001	0.0001	ns	LnAge*Sex 0.0001
All	B	0.61	na	0.0001 (0.082)	0.0001/ns (0.12)	0.0001+ (0.21)	0.0001+ (0.028)	ns	LnAge*Sex 0.0019 (0.31)
Yellow perch (determinable male, female only)									
All	L	0.73	na	0.0001 (0.31)	ns	0.0017/ns (0.12)	ns	ns	LnAge*Year 0.0021 (0.24) LnAge*Sex 0.04 (0.15)
All	L	0.53	na	0.0009 (0.31)	ns	0.0016 (0.12)	0.021 (0.28)	ns	not included
Yellow perch									
All	Z	0.52	na	0.0044 (0.19)	ns	0.0020 (0.11)	0.05 (0.0087)	ns	LnAge*Year 0.08 (0.22)
All perch									
All	BLZ	0.72	0.0001 (0.44)	0.0001 (0.088)	0.06 (0.031)	0.0001 (0.052)	0.0001 (0.12)	Year*Sta 0.0001 (0.54)	LnAge*Sex 0.0005 (0.095)

Table 8 (continued). Summary of analyses of differences in PCB concentrations between groups of fish from the 1984, 1986, 1988, 1990 and 1992 surveys at four stations (STA) on the Housatonic River. Results are based on ANCOVA analyses. LNTPCB (=ln(TPCB)) is the dependent variable. r^2 is the total variance explained for models containing only significant terms. The remaining columns show the significance and r^2 for discrete effects (station, year and sex), covariates (age, ln(age), lipid and/or ln(lipid), interactions (between station, year and sex) and significant slope differences of age or lipid relationships (between station, year or sex). The r^2 associated with each treatment, covariate or interaction (shown in paretheses) is interpretable as the proportion of total variance explained by that factor (see text). Where only one significance value is given, the value is for the type III sums of squares; where two values are given, they are for type I and type III sums, respectively. ns indicates an effect that is not significant when other significant terms are included; na indicates a comparison that is not applicable. See text for explanation.

Species years	Stat	r_T^2	Sta	Year	Sex	LnAge age+	LnLipid lipid+	Interactions Other effects	Slope differences
Sunfish (3 species, one hybrid excluded)									
84,88,90,92	L	0.74	na	0.0013 (0.21)	ns	ns	ns	Year*Sex 0.0002 (0.58)	Species 0.0067 (0.21)
84,88,90,92	L	0.64	na	0.0016	ns	ns	ns	Year*Species 0.019	Species 0.013
Sunfish (3 species)									
84,88,90,92	Z	0.55	na	0.0037 (0.13)	0.0035 (0.19)	ns	0.10 (0.007)	ns	LnLipid*Year 0.09 (0.12)
84,88,90,92	Z	0.50	na	0.0087	0.0091	ns	not inc	ns	LnLipid*Year 0.08
84,88,90,92	Z	0.40	na	0.04	0.0019	ns	0.08	ns	not included

* One specimen (very high lipid content and TPCB) excluded from analyses.
# Based on ln(river-age), i.e., time since stocking.

Table 9. Least square means (LSM) or unadjusted means for LNTPCB (−ln(TPCB)) for ANCOVA and ANOVA models with significant sex or year differences (see Table 8 and text). Where there are significant or nearly significant covariate effects (age or lipid), LSMs are the mean for each sex and year after adjustment for covariate effects. Where there are no significant covariate effects, sex and year means are given. Years joined by lines are not significantly different by the REG multiple comparison test, using the critical range (CR) on the LSMs or unadjusted means.

Species years dep. variable	Sta	Female	Male	Year					Significant terms in model CR (year)
Brown trout									
84,86,88,90,92	C	ns	ns	92	90	88	86	84	Lnlipid Year
LNTPCB				2.14	1.91	1.60	1.35	0.97	Lnrivage*Year Lnrivage
Brown trout, river-age < 1									
84,86,88,90,92	C	ns	ns	92	90	88	86	84	Lnlipid Lnrivage
LNTPCB				1.76	1.51	1.33	1.03	0.55	Year Lnlipid*Year
Brown trout, river-age >1									
84,86,88,90,92	C	ns	ns	92	90	88	86	84	Lnlipid Year
LNTPCB				2.42	2.33	1.91	1.80	1.78	
Smallmouth bass									
84,86,88,90,92	C			92	90	88	86	84	Lnlipid*year
LNTPCB		0.59	1.31	1.45	1.24	1.07	0.70	0.30	Year Sex Lnlipid*Sex
84,86,88,90,92	B			90	88	84	92	86	Lnlipid Year Sex
LNTPCB		0.50	0.90	1.20	0.88	0.72	0.46	0.24	
84,86,88,90,92 LNTPCB	L	-0.0023	0.24	ns					Lnage Sex
84,88,90,92 LNTPCB	Z	ns	ns						Lnlipid Year*Sex
84,88,90,92	C,B,L,Z			90	92	88	84		Lnlipid lnage Year
LNTPCB		0.23	0.52	0.48	0.45	0.44	0.13		Sex Stat
Yellow perch									
84,86,88,90,92	B			84	90	88	92	86	Lnlipid Lnage
LNTPCB		-0.348	0.023	0.046	0.025	0.00	-0.32	-0.56	Year Sex LnAge*Sex
84,88,90,92	L	ns	ns	84	92	90	88		Year Lnage*Sex
LNTPCB				-0.31	-0.94	-0.97	-2.25		Lnage*Year

Table 9 (continued). Least square means (LSM) or unadjusted means for LNTPCB (= ln(TPCB)) for ANCOVA and ANOVA models with significant sex or year differences (see Table 8 and text). Where there are significant or nearly significant covariate effects (age or lipid), LSMs are the mean for each sex and year after adjustment for covariate effects. Where there are no significant covariate effects, sex and year means are given. Years joined by lines are not significantly different by the REG multiple comparison test, using the critical range (CR) on the LSMs or unadjusted means.

Species years dep. variable	Sta	Female	Male	Year				Significant terms in model CR (year)
Yellow perch								
84,88,90,92	Z	ns	ns	90	92	88	84	Lnlipid Lnage Year
LNTPCB				-1.14	-2.10	-2.48	n-e	Lnage*Year
84,88,90,92	Z	ns	ns	90	92	84	88	Lnlipid Lnage Year
LNTPCB				-0.89	-1.95	-2.11	-2.47	
White perch								
84,88,90,92	Z	ns	ns	ns				Lnlipid Lnlipid*LNage
LNTPCB								
Sunfish (3 species combined)								
84,88,90,92	L			84	92	90	88	Year Sex Species Year*Sex
LNTPCB		-0.63	-1.71	-0.15	-1.14	-1.18	-1.88	
84,88,90,92	Z			84	92	88	90	Lnage Year Sex
LNTPCB		-0.95	-1.82	-0.81	-1.27	-1.54	-1.77	Lnlipid*Year
84,88,90,92	Z			84	92	90	88	Year Sex
LNTPCB		-0.85	-1.84	-1.12	-1.15	-1.60	-1.67	Lnlipid*Year
American eel								
88,90,92	Z	na	na	92	90	88		Lnlipid Year
LNTPCB				1.36	0.94	-0.61		

Table 10. Comparison of results of 1984, 1986 and 1988 PCB analyses of fish not analyzed in 1990 and 1992 from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Species	Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
White perch	L	1988	11	18.7	25.8	5.18	55	1.81	0.79	2.80	1.68	1.29-2.17	33.18
	L	1986	15	19.5	27.4	5.16	53	2.24	0.86	5.18	1.95	1.48-2.57	39.57
	L	1984	24	18.9	26.6	3.34	50	2.26	0.86	5.25	2.02	1.66-2.46	64.59
Largemouth	B	1988	11	25.5	48.3	1.39	55	2.55	0.52	8.82	1.85	1.10-3.09	139.35
	B	1984	24	25.0	44.4	0.80	71	1.36	0.34	2.80	1.13	0.88-1.46	154.16
	L	1988	7	25.0	45.0	0.75	86	1.38	0.03	4.80	0.49	0.11-2.23	67.02
	L	1984	6	31.9	40.5	0.93	83	1.31	0.84	2.68	1.21	0.87-1.69	150.96
	Z	1988	7	26.9	48.2	1.36	86	1.36	0.24	4.40	0.89	0.42-1.86	79.28
	Z	1984	2	25.8	30.6	0.67	100	0.42	0.42	0.42	0.42	0.41-0.43	66.22
White catfish	L	1988	16	25.4	56.5	2.16	31	5.64	1.02	24.75	3.45	2.18-5.45	176.80
	L	1986	15	15.5	54.0	2.95	13	8.38	1.12	36.46	4.72	2.72-8.20	183.83
	L	1984	12	22.4	54.0	3.18	58	6.52	0.80	55.09	2.26	1.13-4.52	82.52
	Z	1988	21	31.1	48.5	1.98	19	4.28	0.86	18.05	3.38	2.51-4.55	186.79
	Z	1986	16	26.5	52.0	2.96	38	3.15	0.79	9.17	2.49	1.75-3.54	93.78
	Z	1984	12	23.3	55.5	2.32	42	2.71	0.97	8.58	2.22	1.54-3.19	101.70
Bluegill	B	1988	3	15.5	26.6	2.17	67	2.23	1.12	4.36	1.80	0.74-4.36	120.06
	B	1984	2	17.5	20.0	1.36	100	0.88	0.60	1.16	0.83	0.43-1.61	73.11
Redbreast	B	1988	2	17.9	19.0	1.16	100	1.97	1.36	2.57	1.87	1.00-3.52	167.67
	B	1984	2	17.8	19.4	0.72	100	1.52	1.45	1.59	1.52	1.39-1.67	214.43
Pumpkinseed	B	1988	2	16.3	16.4	0.78	100	0.29	0.03	0.55	0.13	0.01-2.36	16.41
Carp	B	1988	3	37.5	63.0	10.48	0	6.65	2.36	9.91	5.64	2.33-13.67	67.69
	B	1984	1	35.9	35.9	1.50	100	1.08	1.08	1.08	1.08	- -	72.02

Table 10 (continued). Comparison of results of 1984, 1986 and 1988 PCB analyses of fish not analyzed in 1990 and 1992 from the Housatonic River at Cornwall (C), Bulls Bridge (B), Lake Lillinonah (L), and Lake Zoar (Z). Variables are total PCB (TPCB, mg/kg wet weight), percentage lipid in the specimen, total length (TL, in cm), lipid-normalized PCB (PCBLIP, in mg/kg lipid), and geometric mean and confidence interval (CI) of the geometric mean of TPCB.

Species	Sta	Year	# of fish	min TL	max TL	mean % lipid	% <2.0 TPCB	mean TPCB	min TPCB	max TPCB	geom mean of TPCB	95% CI geom mean	geom mean of PCBLIP
Carp	L	1988	3	41.8	66.0	3.41	33	7.41	0.76	17.26	3.81	0.63-23.10	113.52
	L	1984	1	59.6	59.6	10.50	0	2.20	2.20	2.20	2.20	- -	20.95
	Z	1988	3	62.0	69.0	7.23	0	16.51	2.91	25.68	11.61	2.90-46.56	175.74
	Z	1984	1	58.5	58.5	6.80	0	4.85	4.85	4.85	4.85	- -	71.31
Brown bullhead	B	1988	14	25.5	31.5	1.03	57	2.02	0.39	6.41	1.54	1.02-2.34	164.51
	B	1986	6	25.5	34.7	1.08	67	1.83	0.84	3.08	1.61	1.02-2.54	201.14
	B	1984	12	19.1	29.2	0.66	100	0.80	0.38	1.43	0.75	0.59-0.95	119.34
	L	1988	5	29.1	34.5	0.50	60	1.70	0.55	4.13	1.24	0.57-2.70	264.54
	L	1948	3	28.5	32.9	1.50	0	2.39	2.23	2.60	2.38	2.17-2.61	159.02
	Z	1988	6	29.0	32.7	1.12	100	0.68	0.37	0.94	0.65	0.50-0.85	64.59
	Z	1984	2	21.3	31.4	0.72	100	0.41	0.30	0.52	0.39	0.23-0.68	56.43
Rainbow trout	C	1988	9	18.2	25.4	0.95	0	3.20	2.32	4.28	3.14	2.72-3.63	348.63

Table 11. Comparison of total lengths of smallmouth bass analyzed for PCBs in 1990 from the Cornwall station (n=12) and lengths of angler-caught fish (n=200).

Total length (cm)	Percent of fish in size class			
	PCB Analyses		Angler-caught	
	1990	1992	All	> 24.0 cm
16.0-16.9	-		1.0	-
17.0-17.9	-		1.5	-
18.0-18.9	-		3.5	-
19.0-19.9	-		2.5	-
20.0-20.9	-		14.0	-
21.0-21.9	-		20.5	-
22.0-21.9	-		18.5	-
23.0-23.9	-		11.0	-
24.0-24.9	16.7	-	5.5	20.0
25.0-25.9	8.3	14.3	5.5	20.0
26.0-26.9	8.3	14.3	4.0	14.5
27.0-27.9	25.0	21.4	2.5	9.1
28.0-28.9	0.0	14.3	3.0	10.9
29.0-29.9	16.7	7.1	1.5	5.5
30.0-30.9	8.3	-	0.0	0.0
31.0-31.9	8.3	7.1	2.5	9.1
32.0-32.9	0.0	-	1.0	3.6
33.0-33.9	8.3	7.1	0.0	0.0
34.0-34.9	-	7.1	0.0	0.0
35.0-35.9	-	-	2.0	7.3
36.0-26.9	-	-	--	
37.0-37.9	-	7.1	--	
Total Number	12	14	200	55
Mean Size	28.0	29.2	n/a	n/a

Table 12. Results of replicate analyses by ANSP (including separate extractions and analyses) of samples from the Housatonic River, Connecticut, in 1992. S.D. is the sample standard deviation for the replicate analyses of each specimen, and C.V. is the coefficient of variation (S.D./mean) for the replicates. Individual replicates are labeled A or B. The mean value is labeled M. LNTPCB is the LN(total PCB concentration, mg/kg). The M values in the table for LNTPCB are the transforms of the means of the TPCB values.

SPECIES	YEAR	S	SN	IND	TPCB			LIPID			IND	LNTPCB		
					Value	S.D.	C.V.	Value	S.D.	C.V.		Value	S.D.	C.V.
AMERICAN EEL	1992	Z	GECT92-Z0168	A	3.868			14.58			A	1.35		
AMERICAN EEL	1992	Z	GECT92-Z0168	B	5.298			15.67			B	1.67		
AMERICAN EEL	1992	Z	GECT92-Z0168	M	4.830	1.011	0.209	15.12	0.770	0.050	M	1.57	0.226	0.143
BLUEGILL	1992	L	GECT92-L0235	A	0.201			1.01			A	-1.60		
BLUEGILL	1992	L	GECT92-L0235	B	0.121			0.75			B	-2.11		
BLUEGILL	1992	L	GECT92-L0235	M	0.161	0.056	0.347	0.88	0.183	0.208	M	-1.82	0.361	0.198
BLUEGILL	1992	Z	GECT92-Z0246	A	0.402			0.78			A	-0.91		
BLUEGILL	1992	Z	GECT92-Z0246	B	0.325			0.76			B	-1.12		
BLUEGILL	1992	Z	GECT92-Z0246	M	0.363	0.054	0.148	0.77	0.014	0.018	M	-1.01	0.210	0.207
YELLOW PERCH	1992	B	GECT92-B0060	A	0.421			1.29			A	-0.86		
YELLOW PERCH	1992	B	GECT92-B0060	B	0.354			1.05			B	-1.04		
YELLOW PERCH	1992	B	GECT92-B0060	M	0.388	0.047	0.121	1.17	0.169	0.145	M	-0.95	0.127	0.133
YELLOW PERCH	1992	Z	GECT92-Z0222	A	0.325			1.01			A	-1.12		
YELLOW PERCH	1992	Z	GECT92-Z0222	B	0.278			0.90			B	-1.28		
YELLOW PERCH	1992	Z	GECT92-Z0222	M	0.302	0.033	0.109	0.96	0.077	0.081	M	-1.20	0.113	0.094
YELLOW PERCH	1992	B	GECT92-B0069	A	0.501			1.15			A	-0.69		
YELLOW PERCH	1992	B	GECT92-B0069	B	0.583			1.48			B	-0.54		
YELLOW PERCH	1992	B	GECT92-B0069	M	0.542	0.057	0.105	1.31	0.233	0.177	M	-0.61	0.106	0.173

Table 12 (continued). Results of replicate analyses by ANSP (including separate extractions and analyses) of samples from the Housatonic River, Connecticut, in 1992. S.D. is the sample standard deviation for the replicate analyses of each specimen, and C.V. is the coefficient of variation (S.D./mean) for the replicates. Individual replicates are labeled A or B. The mean value is labeled M. LNTPCB is the LN(total PCB concentration, mg/kg). The M values in the table for LNTPCB are the transforms of the means of the TPCB values.

SPECIES	YEAR	S	SN	IND	TPCB			LIPID			LNTPCB		
					Value	S.D.	C.V.	Value	S.D.	C.V.	Value	S.D.	C.V.
BROWN TROUT	1992	C	GECT92-C0194	A	6.171			3.085			1.82		
BROWN TROUT	1992	C	GECT92-C0194	B	7.319			3.218			1.99		
BROWN TROUT	1992	C	GECT92-C0194	M	6.745	0.811	0.120	3.152	0.094	0.029	1.91	0.120	0.062
BROWN TROUT	1992	C	GECT92-C0087	B	22.299			6.675			3.10		
BROWN TROUT	1992	C	GECT92-C0087	A	17.026			6.529			2.83		
BROWN TROUT	1992	C	GECT92-C0087	M	19.662	3.728	0.189	6.602	0.103	0.015	2.97	0.190	0.064
BROWN TROUT	1992	C	GECT92-C0086	A	16.243			7.556			2.79		
BROWN TROUT	1992	C	GECT92-C0086	B	20.457			7.268			3.02		
BROWN TROUT	1992	C	GECT92-C0086	M	18.350	2.979	0.162	7.412	0.203	0.027	2.91	0.162	0.055
BROWN TROUT	1992	C	GECT92-C0201	B	4.140			1.683			1.42		
BROWN TROUT	1992	C	GECT92-C0201	A	3.831			1.707			1.34		
BROWN TROUT	1992	C	GECT92-C0201	M	3.986	0.218	0.054	1.695	0.016	0.010	1.38	0.056	0.040
BROWN TROUT	1992	C	GECT92-C0017	B	5.303			4.207			1.67		
BROWN TROUT	1992	C	GECT92-C0017	A	5.767			4.624			1.75		
BROWN TROUT	1992	C	GECT92-C0017	M	5.535	0.328	0.059	4.415	0.294	0.066	1.71	0.056	0.033
SMALLMOUTH BASS	1992	Z	GECT92-Z0240	B	0.579			0.801			0.55		
SMALLMOUTH BASS	1992	Z	GECT92-Z0240	A	0.645			0.766			0.44		
SMALLMOUTH BASS	1992	Z	GECT92-Z0240	M	0.612	0.046	0.076	0.784	0.024	0.031	0.49	0.077	0.158
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	A	2.893			2.602			1.06		
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	B	2.547			2.519			0.93		
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	M	2.720	0.244	0.339	2.560	0.058	0.022	1.00	0.091	0.091
SMALLMOUTH BASS	1992	B	GECT92-B0073	B	1.083			1.114			0.08		
SMALLMOUTH BASS	1992	B	GECT92-B0073	A	1.154			1.170			0.14		
SMALLMOUTH BASS	1992	B	GECT92-B0073	M	1.119	0.050	0.044	1.142	0.039	0.034	0.11	0.042	0.385
SMALLMOUTH BASS	1992	B	GECT92-B0075	B	1.367			0.891			0.31		
SMALLMOUTH BASS	1992	B	GECT92-B0075	A	1.711			0.937			0.43		
SMALLMOUTH BASS	1992	B	GECT92-B0075	M	1.539	0.243	0.158	0.914	0.032	0.035	0.37	0.084	0.229
SMALLMOUTH BASS	1992	B	GECT92-B0052	B	1.743			1.143			0.56		
SMALLMOUTH BASS	1992	B	GECT92-B0052	A	1.951			1.344			0.67		
SMALLMOUTH BASS	1992	B	GECT92-B0052	M	1.847	0.147	0.079	1.244	0.142	0.114	0.61	0.077	0.127
Median of 16 1992 Analyses							0.12			0.034		0.110	
Median of 20 1990 Analyses							0.145			0.14		0.16	
Median of 40 1988 Analyses							0.125			0.13		0.135	
Median of 20 1986 Analyses							0.14			0.09		0.14	
Median of 33 1984 Analyses							0.14			0.11		0.14	

Table 12 (continued). Results of replicate analyses by ANSP (including separate extractions and analyses) of samples from the Housatonic River, Connecticut, in 1992. S.D. is the sample standard deviation for the replicate analyses of each specimen, and C.V. is the coefficient of variation (S.D./mean) for the replicates. Individual replicates are labeled A or B. The mean value is labeled M. LNTPCB is the LN(total PCB concentration, mg/kg). The M values in the table for LNTPCB are the transforms of the means of the TPCB values.

SPECIES	YEAR	S	SN	PCBLIP			NEWTP		
				Value	S.D.	C.V.	Value	S.D.	C.V.
AMERICAN EEL	1992	Z	GECT92-Z0168	26.54			3.241		
AMERICAN EEL	1992	Z	GECT92-Z0168	33.82			4.573		
AMERICAN EEL	1992	Z	GECT92-Z0168	31.94	5.147	1.161	3.907	0.941	0.241
BLUEGILL	1992	L	GECT92-L0235	19.88			0.154		
BLUEGILL	1992	L	GECT92-L0235	16.20			0.099		
BLUEGILL	1992	L	GECT92-L0235	18.31	2.602	0.142	0.126	0.039	0.309
BLUEGILL	1992	Z	GECT92-Z0246	51.24			0.303		
BLUEGILL	1992	Z	GECT92-Z0246	42.71			0.247		
BLUEGILL	1992	Z	GECT92-Z0246	46.97	6.031	0.128	0.275	0.040	0.144
YELLOW PERCH	1992	B	GECT92-B0060	32.66			0.337		
YELLOW PERCH	1992	B	GECT92-B0060	33.58			0.280		
YELLOW PERCH	1992	B	GECT92-B0060	33.07	0.650	0.019	0.309	0.040	0.130
YELLOW PERCH	1992	Z	GECT92-Z0222	32.16			0.268		
YELLOW PERCH	1992	Z	GECT92-Z0222	30.90			0.217		
YELLOW PERCH	1992	Z	GECT92-Z0222	31.57	0.890	0.028	0.242	0.036	0.149
YELLOW PERCH	1992	B	GECT92-B0069	43.77			0.408		
YELLOW PERCH	1992	B	GECT92-B0069	39.34			0.481		
YELLOW PERCH	1992	B	GECT92-B0069	41.27	3.123	0.075	0.445	0.051	0.115

SPECIES	YEAR	S	SN	IND	PCBLIP			NEWTP		
					Value	S.D.	C.V.	Value	S.D.	C.V.
BROWN TROUT	1992	C	GECT92-C0194	A	200.01			4.773		
BROWN TROUT	1992	C	GECT92-C0194	B	227.42			5.522		
BROWN TROUT	1992	C	GECT92-C0194	M	214.00	122.039	0.570	5.148	0.529	0.102
BROWN TROUT	1992	C	GECT92-C0087	B	334.08			17.837		
BROWN TROUT	1992	C	GECT92-C0087	A	260.78			13.247		
BROWN TROUT	1992	C	GECT92-C0087	M	297.84	52.382	0.175	15.542	3.245	0.208
BROWN TROUT	1992	C	GECT92-C0086	A	214.96			12.627		
BROWN TROUT	1992	C	GECT92-C0086	B	281.45			15.379		
BROWN TROUT	1992	C	GECT92-C0086	M	247.56	47.015	0.189	14.003	1.945	0.138
BROWN TROUT	1992	C	GECT92-C0201	B	245.93			3.278		
BROWN TROUT	1992	C	GECT92-C0201	A	224.49			2.986		
BROWN TROUT	1992	C	GECT92-C0201	M	235.14	15.160	0.064	3.132	0.206	0.066

Table 12 (continued). Results of replicate analyses by ANSP (including separate extractions and analyses) of samples from the Housatonic River, Connecticut, in 1992. S.D. is the sample standard deviation for the replicate analyses of each specimen, and C.V. is the coefficient of variation (S.D./mean) for the replicates. Individual replicates are labeled A or B. The mean value is labeled M. LNTPCB is the LN(total PCB concentration, mg/kg). The M values in the table for LNTPCB are the transforms of the means of the TPCB values.

SPECIES	YEAR	S	SN	IND	PCBLIP			NEWTP		
					Value	S.D.	C.V.	Value	S.D.	C.V.
BROWN TROUT	1992	C	GECT92-C0017	B	126.05			4.237		
BROWN TROUT	1992	C	GECT92-C0017	A	124.73			4.540		
BROWN TROUT	1992	C	GECT92-C0017	M	125.36	0.933	0.007	4.389	0.214	0.048
SMALLMOUTH BASS	1992	Z	GECT92-Z024	B	- 72.23			0.477		
SMALLMOUTH BASS	1992	Z	GECT92-Z0240	A	- 84.26			0.542		
SMALLMOUTH BASS	1992	Z	GECT92-Z0240	M	- 78.11	8.506	0.108	0.510	0.045	0.090
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	A	111.16			2.260		
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	B	101.11			1.941		
SMALLMOUTH BASS	1992	Z	GECT92-Z0243	M	106.22	7.106	0.066	2.100	0.225	0.107
SMALLMOUTH BASS	1992	B	GECT92-B0073	B	97.27			0.806		
SMALLMOUTH BASS	1992	B	GECT92-B0073	A	98.61			0.862		
SMALLMOUTH BASS	1992	B	GECT92-B0073	M	97.95	0.947	0.009	0.834	0.039	0.047
SMALLMOUTH BASS	1992	B	GECT92-B0075	B	153.33			1.035		
SMALLMOUTH BASS	1992	B	GECT92-B0075	A	168.32			1.144		
SMALLMOUTH BASS	1992	B	GECT92-B0075	M	160.82	10.599	0.065	1.089	0.077	0.070
SMALLMOUTH BASS	1992	B	GECT92-B0052	B	152.44			1.355		
SMALLMOUTH BASS	1992	B	GECT92-B0052	A	145.12			1.467		
SMALLMOUTH BASS	1992	B	GECT92-BO052	M	148.48	5.176	0.034	1.141	0.079	0.069
Median of 16 1992 analyses							0.070			0.111

Table 13. Results of 1992 PCB analyses of insects from the Housatonic River at Cornwall, and of crayfish from the Still River, Shepaug River and Housatonic River at Cornwall.

	Total PCB (mg/kg wet)	
	Old Method	New Method
CRAYFISH		
Housatonic River (Cornwall)		
Adult females	1.35	1.02
Eggs	4.40	3.53
Shepaug River		
Adult females	0.005	0.006
Eggs	0.045	0.038
Still River		
Adult females	0.43	0.36
INSECTS AT CORNWALL		
Hydropsychidae (Caddisflies)		
Sample 1	1.91	1.46
Sample 2	8.14	6.19
Geometric mean	3.94	3.01
Arithmetic mean	5.03	3.83
Perlidae (Stoneflies)		
Sample 1	4.07	3.30
Sample 2	3.38	2.75
Geometric mean	3.71	3.01
Arithmetic mean	3.75	3.03
Corydalidae (Dobsonflies)		
(One sample)	7.45	5.48

Appendix A. Data on PCB concentrations and other attributes of fish from 1984 through 1992 studies on the Housatonic River, Connecticut. Abbreviations used in the appendix are as followed:

STA	Station
	C — Cornwall
	B — Bull's Bridge
	L — Lake Lillinonah
	Z — Lake Zoar
	BL, BANT — Bantam Lake
	S, SAUG — Saugatuck Resevoir
	W, WA — Lake Waramaug
	FA — Farmington River
	CO — Coppermine Brook
	HA — Hatchery
	MI — Mill Brook
	PO — Pootatuck River
	SA — Sandy Brook
YEAR	Year of capture of fish.
MO	Month on capture of fish.
TPCB	Total PCB concentration in mg/kg wet weight of the fillet.
AGE	Age of fish.
TL	Total length of fish (cm).
TW	Wet weight of fish (g).
S	Sex of fish (M=male, F=female, I=immature, IM=immature male).
LIPID	Lipid content of fillet (%).
SN	Serial number of sample.
IND	Individual code (within serial number).
ANAL #	Number assigned to individual fish in chemistry, only reported for 1990 and 1992 data.
A1254	Concentration of Aroclor 1254 (mg/kg wet weight).
A1260	Concentration of Aroclor 1260 (mg/kg wet weight).
CTPCB	Congener based estimate of PCB in mg/kg wet weight.

Appendix A. (cont'd) Data on PCB concentrations and other attributes of fish from 1984 through 1992 studies on the Housatonic River, Connecticut. Abbreviations used in the appendix are as followed:

For brown trout and rainbow trout data, two other variables are included :

STO	Stock age, age when fish was stocked.	
ST	strain (hatchery origin) (84-90 only)	
	B,Bi	Bitterroot
	U,BU	Burlington
	Q	Quinebaug
	N	presumed native
	S	Survivor
	Er	Erwin

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL #	A1254	A1260	CTPCB
						SPECIES = BLUEGILL (B)								
B	1984	8	1.160	4	20	179.8	M	0.62	288 065A			0.42	0.74	
B	1984	10	0.600	4	17.5	114.7	M	2.10	235 097A			0.26	0.34	
B	1988	8	1.202	3	15.5	82.72	F	0.96	88-182	A		0.353	0.849	
B	1988	8	1.117	3	18.2	144.06	F	0.73	88-182	B		0.331	0.786	
B	1988	8	4.359	8	26.6	569.5	M	4.83	88-194			1.468	2.891	
L	1984	5	0.520	3	19.5	164.5	F	1.00	237 099A			0.12	0.4	
L	1984	5	0.530	3	20.5	198	M	1.10	286 072A			0.24	0.29	
L	1988	8	0.315	5	19.9	181.54	M	0.48	88-177	A		0.03	0.315	
L	1988	8	0.903	3	19.5	189.14	M	1.21	88-177	B		0.351	0.552	
L	1988	8	0.327	2	15.2	84.97	M	1.63	88-177	C		0.088	0.239	
L	1990	9	0.607	3	18.5	134.1	M	0.62	L0056	A	1383	0.18	0.427	
L	1990	9	0.250	2	18.1	143.9	M	0.53	L0056	B	1384	0.082	0.168	
L	1990	9	1.019	3	17	124.5	M	1.86	L0056	C	1385	0.317	0.702	
L	1990	9	0.318	2	16.3	96.2	F	1.01	L0057	A	1392	0.147	0.171	
L	1990	11	0.479	4	20.5	174.1	M	0.55	L0119	A	1381	0.133	0.346	
L	1990	11	0.380	3	18.7	143.3	F	0.66	L0119	B	1382	0.139	0.241	
L	1992	8	0.112	4	18.4	122.5	F	0.77	GECT92-L0125		2893			0.088
L	1992	10	0.161	4	18.7		F	0.88	GECT92-L0235		2889			0.126
L	1992	10	0.389	3	18.2	130.6	F	0.82	GECT92-L0236		2890			0.307
L	1992	10	1.765	4	18	113.5	M	0.71	GECT92-L0237		2895			1.257
Z	1984	8	1.250	3	17.5	112.1	F	1.20	277 069A			0.11	1.14	
Z	1984	10	0.780	4	20.9	161.4	F	0.60	269 085A			0.31	0.47	
Z	1988	8	0.030	7	21	267.09	F	0.64	88-070	A		0.03	0.03	
Z	1988	8	0.377	5	19.6	260.56	M	0.52	88-070	B		0.15	0.227	
Z	1990	8	0.064	8	18.9	152.1	F	0.41	Z0008	A	1307	0.029	0.035	
Z	1990	8	0.218	3	17.6	142.2	M	0.54	Z0008	B	1308	0.089	0.129	
Z	1990	8	0.196	3	15.8	85.4	F	1.06	Z0008	C	1309	0.093	0.103	
Z	1990	8	0.183	2	15.3	82.3	F	0.71	Z0008	D	1310	0.069	0.114	
Z	1990	8	0.028	2	18.2	119.7	F	0.37	Z0014		1329	0.014	0.014	
Z	1990	8	0.120	5	19.7	174.8	F	0.35	Z0019	A	1325	0.052	0.068	
Z	1992	8	0.496	4	19.5	144.2	M	0.63	GECT92-Z0148		2891			0.387
Z	1992	8	0.052	4	18.4	117.6	F	0.62	GECT92-Z0151		2894			0.042
Z	1992	10	0.363	5	19.7	159.7	M	0.77	GECT92-Z0246		2892			0.275

SPECIES = BROWN BULLHEAD (BB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
B	1984	8	0.547	4	29.2	361.3	F	0.73	211 029A			0.146	0.401	
B	1984	8	1.430	3	27.4	302	F	0.94	212 029B			0.19	1.24	
B	1984	8	1.020		25.8	272.2	M	0.58	213 029C			0.22	0.8	
B	1984	8	0.690	3	26	241.7	F	0.75	214 029D			0.19	0.5	
B	1984	8	0.550	2	19.1	100.5	M	0.56	215 029E			0.2	0.35	
B	1984	8	1.150	3	27.5	293.7	F	0.76	219 033A			0.3	0.85	
B	1984	8	0.450	2	23	168	F	0.58	220 033B			0.16	0.29	
B	1984	8	0.384	2	23.2	162.1	M	0.35	221 033C			0.094	0.29	
B	1984	8	0.970	3	27.5	268.2	M	0.35	222 034A			0.28	0.69	
B	1984	8	0.940	2	28.9	297.5	F	1.05	223R034B			0.23	0.71	
B	1984	8	0.560	3	25.4	205.4	M	0.56	225 034C			0.22	0.34	
B	1984	8	0.960		25.5	222.1	M	0.67	226 034D			0.24	0.72	
B	1986	8	1.960	2	28.1	278.3	M	0.96	86-43-139			0.69	1.27	
B	1986	8	0.960	2	28.2	342.3	M	0.66	86-43-141			0.23	0.73	
B	1986	8	2.900	5	34.7	704.4	F	1.10	86-43-142			0.56	2.34	
B	1986	8	1.230	2	30.5	417.9	F	0.79	86-43-143			0.32	0.91	
B	1986	8	0.840	2	25.5	230.03	F	0.17	86-43-144			0.23	0.61	
B	1986	8	3.080	4	34	588.8	F	2.80	86-44-145			0.82	2.26	
B	1988	8	6.412	8	31.5	417.23	F	2.28	88-197	A		1.784	4.628	
B	1988	8	2.065	4	29.2	378.39	F	1.06	88-197	B		0.461	1.604	
B	1988	8	0.391	6	28.7	304.94	F	0.90	88-202	A		0.096	0.295	
B	1988	8	1.410	6	29.5	340.47	F	0.38	88-202	B		0.296	1.114	
B	1988	8	1.500	4	25.7	242.02	M	0.89	88-204	A		0.416	1.084	
B	1988	8	0.750	3	26.6	269.26	F	0.75	88-204	B		0.192	0.558	
B	1988	8	2.844	9	31.3	377.96	F	1.39	88-205			0.558	2.286	
B	1988	10	3.679	9	31	418.46	F	1.75	88-273	A		0.648	3.031	
B	1988	10	0.514	5	31.3	445.28	M	0.75	88-273	B		0.03	0.514	
B	1988	10	2.435	4	25.5	201.96	M	0.86	88-274	A		0.422	2.013	
B	1988	10	2.842	6	30.4	362.3	M	0.69	88-274	B		0.682	2.16	
B	1988	10	1.220	2	26.6	232.8	M	0.81	88-274	C		0.326	0.894	
B	1988	10	0.974	4	28.6	286.88	F	0.91	88-277	A		0.203	0.771	
B	1988	10	1.210	4	25.7	205.02	F	0.94	88-277	B		0.332	0.878	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = BROWN BULLHEAD (BB)								
BL	1988	8	0.030	7	29.7	342.88	M	0.71	88-118	A		0.03	0.03	
BL	1988	8	0.030	6	29	322.06	M	1.61	88-118	B		0.03	0.03	
L	1984	6	2.230	4	32.9	481	M	1.40	015 005A			0.27	1.96	
L	1984	6	2.330	4	28.5	304.3	M	1.60	016 005B			0.66	1.67	
L	1984	6	2.600	5	30	400.8	F	1.50	017 005C			0.59	2.01	
L	1988	6	0.546	12	32.6	474.35	F	0.32	88-014	A		0.072	0.474	
L	1988	6	2.311	11	31.8	480.1	F	0.32	88-014	B		0.639	1.672	
L	1988	6	4.133	10	34.5	594.4	M	0.48	88-014	C		0.313	3.82	
L	1988	10	0.806	8	31.9	357.5	M	0.58	88-220	A		0.078	0.728	
L	1988	10	0.687	3	29.1	309	M	0.78	88-220	B		0.123	0.564	
S	1988	8	0.030	5	34.2	616.6	M	2.46	88-157			0.03	0.03	
S	1988	8	0.030	7	35.7	635.8	M	1.85	88-214	A		0.03	0.03	
S	1988	8	0.030	4	35.8	623.9	M	0.83	88-214	B		0.03	0.03	
W	1988	8	0.030	4	22.3	124.5	M	0.66	88-058	A		0.03	0.03	
W	1988	8	0.030	3	25.4	194.48	M	0.91	88-058	B		0.03	0.03	
W	1988	8	0.030	6	27	257.13	M	0.67	88-139	A		0.03	0.03	
Z	1984	8	0.520	4	31.4	411.3	F	0.86	289 064A			0.15	0.37	
Z	1984	8	0.300	2	21.3	122.1	M	0.57	290 064B			0.18	0.12	
Z	1988	8	0.938	7	30.7	399.56	F	1.51	88-074	A		0.302	0.636	
Z	1988	8	0.373	7	32	493.71	F	0.98	88-074	B		0.03	0.373	
Z	1988	8	0.866	4	32.2	441.06	M	0.47	88-074	C		0.138	0.728	
Z	1988	8	0.616	6	29	322.03	M	0.66	88-117			0.144	0.472	
Z	1988	10	0.618	6	32.7	486.5	F	1.53	88-238	A		0.12	0.498	
Z	1988	10	0.682	5	31.7	477.31	F	1.55	88-238	B		0.25	0.432	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = CARP (C)								
B	1984	8	1.080	2	35.9	759.2	M	1.50	322 077A			0.43	0.65	
B	1988	8	2.355	2	37.5	861.8	F	4.31	88-181			0.775	1.58	
B	1988	8	9.907	17	62.3	3967.1	F	20.62	88-185			2.93	6.977	
B	1988	8	7.688	4	63	4047.1	F	6.51	88-186			2.679	5.009	
L	1984	6	2.200	4	59.6	3700	F	10.50	006 009A			1	1.2	
L	1988	6	17.258	17	66	3995.8	F	2.61	88-016			5.209	12.05	
L	1988	8	0.765	2	41.8	1031.1	M	3.62	88-143			0.274	0.491	
L	1988	8	4.195	6	57.5	2450.6	M	4.01	88-145			1.589	2.606	
Z	1984	8	4.850	8	58.5	2528.6	M	6.80	340R071A			2.19	2.66	
Z	1988	8	25.676	25	69	4824.5	F	3.78	88-046			6.282	19.39	
Z	1988	8	2.909	13	62	3141.7	M	10.92	88-047			1.11	1.799	
Z	1988	8	20.952	22	65.5	4466.3	M	6.99	88-048			6.392	14.56	
						SPECIES = AMERICAN EEL (E)								
Z	1988	8	1.550	6	58.1	308.7		17.27	88-075	A		0.426	1.124	
Z	1988	8	0.249	11	63	439.12		26.20	88-075	C		0.03	0.249	
Z	1988	8	1.815	12	64.7	489.96		27.48	88-087			0.58	1.235	
Z	1990	8	1.965	13	62	461.4		6.30	Z0004		1445	0.816	1.149	
Z	1990	8	5.514	10	74.8	838		5.38	Z0021	A	1490	3.68	1.834	
Z	1990	8	1.538	13	66.5	710.7		6.83	Z0021	B	1488	0.69	0.848	
Z	1990	8	1.007	7	53.5	239.4		3.87	Z0021	C	1494	0.507	0.5	
Z	1990	8	2.403	11	65	459.2		10.47	Z0027		1444	0.922	1.481	
Z	1990	9	1.744	11	66	637.5		9.63	Z0046	A	1486	0.884	0.86	
Z	1990	9	1.014	5				0.97	Z0047	A/B	1487	0.375	0.639	
Z	1990	9	7.024	10	77.6	1278.3		14.53	Z0048		1491	3.388	3.636	
Z	1990	9	1.846	13	64	508.6		10.20	Z0049	A	1489	0.817	1.029	
Z	1990	9	0.344	9	61	478.4		9.06	Z0049	B	1492	0.224	0.12	
Z	1990	9	8.960	9	57.2	355.7		10.08	Z0049	C	1493	3.236	5.724	
Z	1990	9	5.474	17	60.5	477.3		14.79	Z0063	A	1446	2.57	2.904	
Z	1990	9	3.898	12	61.8	426.3		16.85	Z0063	B	1443	1.624	2.274	
Z	1990	10	1.598	12	66.3	687.6		12.93	Z0083		1447	0.665	0.933	
Z	1990	10	1.658	10	66.6	561		10.10	Z0084		1448	0.746	0.912	
Z	1990	10	2.758	11	61.1	468.7		17.05	Z0085		1449	1.204	1.554	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = AMERICAN EEL (E)								
Z	1990	10	1.193	4	40.4	113.2		3.62	Z0086		1442	0.465	0.728	
Z	1990	10	2.255	10	52.8	259.2		7.17	Z0087		1441	0.876	1.379	
Z	1992	8	8.502	18	67.8	558.9	I	21.09	GECT92-Z0166		2926			6.435
Z	1992	8	4.830	14	63	460.1	I	15.12	GECT92-Z0168		2930			3.907
Z	1992	8	28.101	12	73.3	897.5	I	32.71	GECT92-Z0183		2928			23.387
Z	1992	8	1.873	21	59	238.1	I	20.56	GECT92-Z0184		2927			1.512
Z	1992	10	1.656	12	65.4	553.7	I	5.21	GECT92-Z0223		2929			1.230
						SPECIES = LARGEMOUTH BASS (LMB)								
B	1984	8	0.920	4	31.9	589.5	F	0.90	291 042A			0.31	0.61	
B	1984	8	0.640	4	31.1	494.1	F	0.74	292 042B			0.18	0.46	
B	1984	8	0.530	4	33	569.1	M	1.10	293 042C			0.19	0.34	
B	1984	8	1.200	3	26	269.1	M	0.40	294 043A			0.48	0.72	
B	1984	8	1.110	3	25	241.7	F	0.40	295 043B			0.37	0.74	
B	1984	8	0.540	3	26.8	287.6	F	0.58	296 043C			0.21	0.33	
B	1984	8	1.765	5	32.1	545.7	M	0.98	297R043D			0.48	1.285	
B	1984	8	2.510	4	31.8	499.9	M	1.30	299 044A			0.68	1.83	
B	1984	8	0.340	4	29	394.8	F	0.81	300 044B			0.1	0.24	
B	1984	8	0.848	4	30	414.6	F	0.28	301 044C			0.18	0.668	
B	1984	8	0.770	5	32.2	517	F	0.44	302 045A			0.29	0.48	
B	1984	8	2.800	4	30.9	494.8	M	1.10	303 045B			0.83	1.97	
B	1984	8	0.720	4	31.4	522.9	F	0.55	304 045C			0.25	0.47	
B	1984	8	0.660	3	25.2	224.1	M	0.53	305 046A			0.2	0.46	
B	1984	8	0.895	6	40.5	1332.1	F	0.60	306R047A			0.26	0.635	
B	1984	8	0.640	3	27.5	295.9	F	0.39	308 048A			0.21	0.43	
B	1984	10	2.475	4	31.1	452.5	M	1.35	251R093A			0.665	1.81	
B	1984	10	2.020	4	30.6	420	M	0.99	314 094A			0.53	1.49	
B	1984	10	0.690	4	31.5	457	F	0.67	315 094B			0.24	0.45	
B	1984	10	1.840	4	29.1	401	F	1.30	316 094C			0.58	1.26	
B	1984	10	2.000	4	30.7	436.2	M	1.30	318 093C			0.45	1.55	
B	1984	10	2.720	6	40.5	1241.4	M	0.93	324 095A			0.81	1.91	
B	1984	10	2.730	7	44.4	1707.5	F	0.90	325 095B			0.77	1.96	
B	1984	10	1.195	4	29.4	348.8	F	0.71	337R093B			0.365	0.83	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = LARGEMOUTH BASS (LMB)														
B	1988	8	8.821	12	48.3	2184.9	M	1.97	88-187			2.255	6.566	
B	1988	8	0.637	3	25.5	259.27	M	1.75	88-190	A		0.5	0.137	
B	1988	8	3.272	8	35.9	835.2	M	1.60	88-190	B		1.005	2.267	
B	1988	8	0.663	4	31	482.64	M	0.80	88-191	A		0.199	0.464	
B	1988	8	1.788	7	34.6	781.6	M	0.94	88-191	B		0.466	1.322	
B	1988	8	2.074	3	31.9	533.2	M	1.76	88-201	B		0.62	1.454	
B	1988	8	0.518	4	34.1	747.3	M	0.72	88-207			0.152	0.366	
B	1988	8	1.903	3	31.7	573.6	F	1.41	88-208	A		0.505	1.398	
B	1988	8	2.520	4	32.8	577.1	M	1.57	88-208	B		0.82	1.7	
B	1988	10	1.915	2	27.6	328.95	M	1.45	88-276	A		0.618	1.297	
B	1988	10	3.948	9	42.4	1381.2	F	1.31	88-276	B		0.842	3.106	
L	1984	5	1.200	4	38.1	862.1	M	0.53	002 002B			0.4	0.8	
L	1984	5	0.980	5	40.5	1080.3	F	0.93	312 076A			0.37	0.61	
L	1984	5	0.840	5	40.3	1072.1	F	1.10	313 076B			0.36	0.48	
L	1984	5	2.680	5	39.5	1032.8	F	1.90	319 002A			1.08	1.6	
L	1984	7	1.070	3	31.9	439.9	F	0.76	285 075A			0.43	0.64	
L	1984	7	1.110	3	34.5	639.9	M	0.34	317 075B			0.3	0.81	
L	1988	6	1.000	6	45	1613.6	F	0.50	88-001	A		0.255	0.745	
L	1988	6	1.976	6	38.1	825.4	M	1.05	88-001	B		0.655	1.321	
L	1988	6	4.804	10	41.9	1115.2	M	0.82	88-012	B		1.095	3.709	
L	1988	8	0.826	4	32.9	552.5	M	0.71	88-165	A		0.324	0.502	
L	1988	8	0.974	5	32.4	520.8	M	0.86	88-167	A		0.302	0.672	
L	1988	10	0.030	4	28.3	228.8	M	0.53	88-224	C		0.03	0.03	
L	1988	10	0.030	1	25	211.92	F	0.82	88-225	B		0.03	0.03	
S	1988	8	0.030					1.02	88-162,210	CD,		0.03	0.03	
Z	1984	8	0.425	4	25.8	285.4	M	0.88	275R063A			0.215	0.21	
Z	1984	10	0.415	5	30.6	374	F	0.46	238R100A			0.195	0.22	
Z	1988	8	1.999	8	43.5	1442.8	F	2.09	88-049			0.78	1.219	
Z	1988	8	0.531	3	30.7	399.32	F	0.50	88-050	A		0.147	0.384	
Z	1988	8	0.409	5	35.1	868.9	M	0.69	88-050	B		0.149	0.26	
Z	1988	8	1.029	5	38.3	959.8	M	1.49	88-051			0.476	0.553	
Z	1988	8	4.398	9	48.2	2158.2	F	3.14	88-089			1.607	2.791	
Z	1988	8	0.902	2	26.9	296.3	F	1.00	88-100	A		0.422	0.48	
Z	1988	10	0.240	2	27.3	262.8	F	0.64	88-239	B		0.1	0.14	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = PUMPKINSEED								
B	1988	8	0.551	3	16.3	88.86	M	0.74	88-183	A		0.149	0.402	
B	1988	8	0.030	3	16.4	93.03	F	0.83	88-183	B		0.03	0.03	
L	1988	8	0.030	3	17	107.77	F	0.94	88-132			0.03	0.03	
L	1990	9	0.118	3	15.8	74.9	M	0.33	L0055		1377	0.033	0.085	
L	1990	11	0.108	3	16	82.1	F	0.48	L0117	A	1376	0.046	0.062	
L	1990	11	0.126	3	17.2	103.1	F	0.23	L0117	B	1378	0.052	0.074	
L	1990	11	0.296	3	16.6	89	M	0.43	L0121	A	1375	0.111	0.185	
L	1990	11	0.252	4	16.9	87.4	F	0.91	L0123	A	1379	0.105	0.147	
L	1990	11	0.370	3	15	65.4	M	0.25	L0123	B	1380	0.094	0.276	
L	1992	8	0.103	2	14.3	65.1	F	0.92	GECT92-L0114		2907			0.117
L	1992	8	0.303	2	14.1	57.5	F	0.93	GECT92-L0115		2906			0.240
Z	1988	8	0.189	5	18.3	132.01	F	0.55	88-072	A		0.03	0.189	
Z	1988	8	0.030	2	14.6	65.06	F	1.14	88-081			0.03	0.03	
Z	1990	8	0.200	3	16.4	102.9	M	0.44	Z0007	A	1250	0.081	0.119	
Z	1990	8	0.148	4	16.7	99	M	0.30	Z0007	B	1311	0.04	0.108	
Z	1990	8	0.110	3	15.6	86.5	F	0.53	Z0007	C	1312	0.049	0.061	
Z	1990	8	0.074	3	16.4	102.4	F	0.33	Z0018	A	1247	0.034	0.04	
Z	1990	8	0.288	3	15.7	94.8	M	0.50	Z0018	B	1248	0.142	0.146	
Z	1990	8	0.177	4	16.1	84.9	M	0.31	Z0018	C	1249	0.058	0.119	
Z	1992	8	0.513	4	16.3	81.3	M	0.55	GECT92-Z0155		2905			0.392
Z	1992	8	0.320	5	16.5	84.2	M	0.53	GECT92-Z0180		2908			0.243
Z	1992	8	0.047	3	16.2	85	F	0.80	GECT92-Z0180		2909			0.037
						SPECIES = REDBREAST SUNFISH (RS)								
B	1984	8	1.450	3	17.8	132.8	F	0.57	287 066A			0.43	1.02	
B	1984	10	1.590	3	19.4	149.8	F	0.88	236 098A			0.45	1.14	
B	1988	8	1.365	5	17.9	123.71	F	1.50	88-193	B		0.37	0.995	
B	1988	8	2.566	5	19	158.42	F	0.83	88-193	C		0.746	1.82	
L	1984	6	1.860	3	18.4	126.3	M	0.56	280 074A			0.55	1.31	
L	1984	6	1.060	3	18.9	129.7	M	0.55	281 074B			0.57	0.49	
L	1988	8	0.030	4	16.4	83.66	F	1.02	88-133			0.03	0.03	
L	1990	9	0.459	8	17.6	100.1	M	0.28	L0059	A	1386	0.081	0.378	
L	1990	9	0.609	6	17.7	98.9	F	0.46	L0059	B	1387	0.124	0.485	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = REDBREAST SUNFISH (RS)								
L	1990	9	0.191	5	16.3	86.6	F	0.87	L0060	A	1388	0.082	0.109	
L	1990	9	0.113	4	15.4	69.5	F	0.50	L0060	B	1389	0.059	0.054	
L	1990	9	0.641	4	16.9	88.7	M	0.50	L0061	A	1390	0.181	0.46	
L	1990	11	0.370	6	19.6	145	M	0.80	L0120		1391	0.094	0.276	
L	1992	8	0.680	4	17.1	98.8	M	0.85	GECT92-L0116		2899			0.494
L	1992	10	0.733	5	19.6	157.1	U	1.00	GECT92-L0230		2901			0.593
L	1992	10	0.426	5	19.3	135.2	F	1.00	GECT92-L0231		2902			0.333
Z	1984	8	0.110	2	18.3	104.4	F	0.42	278 070A			0.11	0.03	
Z	1984	8	0.070	3	16.1	79.9	F	0.82	279 070B			0.07	0.03	
Z	1988	8	0.271	6	18.6	128.6	F	0.69	88-071	B		0.102	0.169	
Z	1988	8	0.030	3	17.3	106.22	F	1.64	88-071	D		0.03	0.03	
Z	1990	8	0.140	6	18.1	117.2	F	0.35	Z0005	A	1327	0.04	0.1	
Z	1990	8	0.240	5	17.7	113.6	F	0.35	Z0005	B	1322	0.072	0.168	
Z	1990	8	0.078	6	17.2	99.6	F	0.59	Z0005	C	1323	0.042	0.036	
Z	1990	8	0.097	6	16.6	82.9	F	0.57	Z0006	A	1332	0.044	0.053	
Z	1990	8	0.433	8	19.2	124.1	M	0.27	Z0017	A	1331	0.095	0.338	
Z	1990	8	0.268	3	16.5	93.1	F	0.62	Z0017	B	1328	0.115	0.153	
Z	1992	8	0.231	8	18.9	132.6	F	0.71	GECT92-Z0159		2900			0.174
Z	1992	8	0.082	9	17.7	104.7	F	0.80	GECT92-Z0160		2903			0.067
Z	1992	8	0.614	7	17.4	89.3	F	0.59	GECT92-Z0182		2904			0.465
						SPECIES = PUMPKINSEED X REDBREAST (RXP)								
L	1988	8	0.284	3	18.8	148.91	F	0.80	88-176			0.03	0.284	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
B	1984	8	2.270	4	25	181.6	F	0.70	123 049A			0.7	1.57	
B	1984	8	1.740	5	27.4	246.4	F	0.69	309 049B			0.42	1.32	
B	1984	10	1.010	7	33.5	484.3	F	0.96	229 090A			0.35	0.66	
B	1984	10	0.890	5	28.5	262.1	M	0.69	230 090B			0.17	0.72	
B	1984	10	2.480	5	28.2	244.4	M	0.60	231 090C			0.66	1.82	
B	1984	10	1.540	3	25.9	204	F	0.99	232 091A			0.46	1.08	
B	1984	10	1.500	4	25.8	205.5	M	1.00	233R091B			0.53	0.97	
B	1984	10	2.230	4	26.3	202	M	0.78	234R091C			0.51	1.72	
B	1984	10	2.150	5	28.1	252.5	M	0.73	264 091E			0.42	1.73	
B	1984	10	2.630	4	26.6	220.5	M	0.82	265 091D			0.86	1.77	
B	1984	10	1.580	4	25.6	209.3	M	0.99	266 091F			0.47	1.11	
B	1984	10	2.890	16	45.5	1436.1	F	2.10	323 092A			0.87	2.02	
B	1986	8	2.070	3	26.4	275.8	M	1.60	86-33-102			0.55	1.52	
B	1986	8	0.850	6	28.8	362	F	1.30	86-33-103			0.25	0.6	
B	1986	8	2.790	7	31.6	474.3	M	2.00	86-33-104			0.6	2.19	
B	1986	8	0.960	8	34	589.5	F	1.20	86-33-105			0.32	0.64	
B	1986	8	2.150	6	30.3	419.4	F	1.60	86-34-106			0.73	1.42	
B	1986	8	2.410	6	29.6	369.1	M	1.30	86-34-107			0.59	1.82	
B	1986	8	0.730	6	31.1	437.1	F	0.84	86-34-108			0.22	0.51	
B	1986	8	1.340	3	26.6	290.5	F	1.40	86-35-109			0.29	1.05	
B	1986	8	2.420	3	25.8	227.7	M	1.70	86-35-110			0.8	1.62	
B	1986	8	0.920	3	27.1	277.8	M	0.96	86-35-111			0.27	0.65	
B	1986	8	1.350	6	28.4	320	M	0.84	86-35-112			0.33	1.02	
B	1986	8	0.830	6	30.1	388.6	F	1.20	86-36-113			0.24	0.59	
B	1988	8	3.386	3	25.1	228.67	F	2.01	88-188	A		0.891	2.495	
B	1988	8	2.316	3	25.3	214.45	F	2.37	88-188	B		0.692	1.624	
B	1988	8	1.439	3	25.9	220.13	F	1.56	88-188	C		0.423	1.016	
B	1988	8	1.009	4	29.3	351.79	F	1.12	88-188	D		0.341	0.668	
B	1988	8	5.734	5	32.6	459.05	M	1.96	88-189	B		1.468	4.266	
B	1988	8	2.944	10	38.5	872.7	F	2.48	88-198			0.7	2.244	
B	1988	10	3.308	12	40.7	1039.8	F	1.12	88-268			0.973	2.335	
B	1988	10	1.667	5	34.7	547.1	F	1.56	88-269	A		0.434	1.233	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
B	1988	10	4.315	11	35.6	661.8	F	1.37	88-269	B		0.762	3.553	
B	1988	10	2.433	6	29	324.11	M	0.95	88-270	A		0.493	1.94	
B	1988	10	2.374	3	25.5	177.14	F	0.83	88-270	B		0.514	1.86	
B	1988	10	2.342	5	32.7	538.7	M	1.04	88-270	C		0.657	1.685	
B	1988	10	3.533	3	29	349.15	F	1.68	88-275	A		0.736	2.797	
B	1988	10	2.814	15	45.5	1308.3	F	1.47	88-275	B		0.793	2.021	
B	1990	9	3.774	5	31	421.2	F	1.57	B0073	A	1414	1.198	2.576	
B	1990	9	2.506	4	28.7	324.7	M	0.72	B0073	B	1415	0.862	1.644	
B	1990	9	2.245	5	27	231.4	M	0.34	B0075	A	1416	0.538	1.707	
B	1990	10	3.228	5	36.6	673.8	M	0.47	BB0102		1413	1.114	2.114	
B	1990	10	0.874	6	31.3	420.8	F	0.49	BB0104		1412	0.308	0.566	
B	1990	10	2.606	3	25.8	238.6	F	0.87	BB0106		1411	0.958	1.648	
B	1992	8	1.847	5	30.4	378.8	F	1.24	GECT92-B0052		2953			1.411
B	1992	8	1.852	5	29.3	349.3	F	1.34	GECT92-B0053		2952			1.418
B	1992	8	1.378	5	27.4	300.1	M	0.92	GECT92-B0056		2949			1.115
B	1992	8	1.119	8	33.5	539.6	F	1.14	GECT92-B0073		2948			0.834
B	1992	8	1.539	7	32.3	488.5	M	0.91	GECT92-B0075		2951			1.144
B	1992	8	2.701	5	28	318.3	M	1.27	GECT92-B0076		2947			2.096
B	1992	8	1.032	5	26.5	274.9	F	1.26	GECT92-B0077		2950			0.807
B	1992	10	2.381	5	31.8	454.5	M	1.32	GECT92-B0212		2946			1.812
BA	1988	8	0.030	6	36.4	752.7	F	1.10	88-203			0.03	0.03	
BA	1988	8	0.030	7	41.6	1013.2	F	5.17	88-213			0.03	0.03	
C	1984	7	3.310	5	24.2	179.5	M	0.53	104 019A			0.76	2.55	
C	1984	7	1.520	7	27.2	229.3	M	0.57	105 019B			0.26	1.26	
C	1984	7	2.700	3	22.4	126.4	F	0.66	106 019C			0.58	2.12	
C	1984	7	3.076	4	24.1	168.9	M	0.65	107 021A			0.876	2.2	
C	1984	7	6.260	4	23	142.5	M	0.55	108 021B			1.28	4.98	
C	1984	7	2.310	4	23	138.2	M	0.64	109 021C			0.65	1.66	
C	1984	7	2.580	4	22.4	140.5	M	0.66	110 021D			0.74	1.84	
C	1984	7	1.250	9	32.4	428.7	F	0.60	127 020C			0.4	0.85	
C	1984	7	3.250	9	32.4	403.7	M	0.43	128 022A			0.55	2.7	
C	1984	7	0.830	8	30.6	361	F	0.43	129 022B			0.25	0.58	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = SMALLMOUTH BASS (SMB)														
C	1984	7	4.090	10	32.3	479.5	M	0.47	173 022C			0.51	3.58	
C	1984	7	2.120	9	33	384.4	F	0.40	174 022D			0.29	1.83	
C	1984	7	0.630	10	29.5	358.2	F	0.57	333 020A			0.26	0.37	
C	1984	7	0.610	11	33.5	569.5	F	1.27	334 020B			0.18	0.43	
C	1984	10	1.830	3	26	233.7	M	1.04	088B			0.4	1.43	
C	1984	10	2.070	4	27.4	249	M	0.79	326 088A			0.55	1.52	
C	1986	8	2.900	6	27.1	253.6	M	0.78	86-37-117			0.6	2.3	
C	1986	8	3.260	6	25.5	225.4	M	1.00	86-38-120			0.75	2.51	
C	1986	8	4.250	6	27.3	262	M	1.10	86-38-121			1.01	3.24	
C	1986	8	2.430	6	25.6	258	M	1.00	86-38-122			0.6	1.83	
C	1986	8	5.700	6	25.1	220.7	M	1.30	86-39-123			1.48	4.22	
C	1986	8	2.250	6	25	202.3	F	1.20	86-39-124			0.45	1.8	
C	1986	8	1.740	6	25.3	322.6	F	0.75	86-39-125			0.44	1.3	
C	1986	8	1.700	6	25	211.9	F	1.25	86-40-126			0.48	1.22	
C	1986	8	0.620	6	25.4	250.9	F	0.73	86-40-127			0.28	0.34	
C	1986	8	4.130	6	26.5	236.8	M	1.20	86-40-128			1.06	3.07	
C	1986	8	0.870	6	24.8	207.9	F	0.90	86-40-129			0.26	0.61	
C	1986	8	5.960	7	28.1	281.4	M	0.93	86-40-130			1.6	4.36	
C	1986	10	5.990	6	27.5	256.3	M	1.30	86-49-154			1.72	4.27	
C	1988	8	2.722	3	24.5	197.17	M	1.35	88-042			0.827	1.895	
C	1988	8	4.205	8	29.8	412.02	F	1.57	88-060	A		1.011	3.194	
C	1988	8	2.488	6	29.7	401.31	F	1.04	88-060	B		0.488	2	
C	1988	8	1.586	3	25.2	268.74	M	1.15	88-061	A		0.497	1.089	
C	1988	8	6.289	3	27	310.88	F	2.91	88-061	B		1.578	4.711	
C	1988	8	2.638	3	25.4	246.94	F	2.45	88-061	D		0.75	1.888	
C	1988	8	2.824	9	36	598.2	M	1.00	88-064			0.774	2.05	
C	1988	8	11.417	6	33.3	558.4	M	3.83	88-065			2.767	8.65	
C	1988	8	2.750	4	27.1	293.25	F	1.32	88-067	A		0.689	2.061	
C	1988	8	2.641	7	29.5	378.1	M	0.75	88-067	B		0.643	1.998	
C	1988	8	4.910	8	31.2	482.07	F	1.71	88-067	C		1.268	3.642	
C	1988	8	3.822	3	25	242.26	M	1.63	88-068	A		1.072	2.75	
C	1988	8	13.621	14	35.1	457.24	M	0.51	88-105	J		0.921	12.7	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
C	1990	9	2.212	3	24.3	202.2	F	0.52	C0028	A	1440	0.858	1.354	
C	1990	9	3.022	6	26.5	233.6	F	0.94	C0028	B	1438	1.161	1.861	
C	1990	9	4.064	5	27.6	266.4	M	0.52	C0028	C	1434	1.376	2.688	
C	1990	9	5.626	6	29.5	324.5	M	0.61	C0029	A	1439	1.948	3.678	
C	1990	9	6.459	7	31.9	380.4	M	0.25	C0029	B	1431	2.187	4.272	
C	1990	9	5.141	11	33.2	526.7	M	0.40	C0030	A	1429	1.493	3.648	
C	1990	9	2.840	5	25.4	224.5	F	1.23	C0030	B	1436	0.987	1.853	
C	1990	9	3.203	6	29.1	339.6	M	0.56	C0031	A	1437	1.051	2.152	
C	1990	9	1.819	6	27.2	265.1	F	0.53	C0031	B	1430	0.682	1.137	
C	1990	9	2.271	10	30	350.22	M	0.29	C0032	A	1432	0.555	1.716	
C	1990	9	1.186	5	27	268.9	F	0.41	C0032	B	1435	0.468	0.718	
C	1990	9	4.050	3	24.6	194	M	0.59	C0033		1433	1.428	2.622	
C	1992	8	3.878	8	29.7	370.3	M	1.12	GECT92-C0020		2881			2.888
C	1992	8	5.216	12	37.8	727.8	F	1.50	GECT92-C0021		2876			3.803
C	1992	8	3.623	12	34.8	619.3	F	1.01	GECT92-C0022		2872			2.743
C	1992	8	1.194	9	33.7	535.4	F	1.53	GECT92-C0023		2879			0.894
C	1992	8	3.383	13	31.9	359.9	F	0.89	GECT92-C0024		2875			2.453
C	1992	8	2.530	5	27.2	274.6	I	1.16	GECT92-C0026		2878			2.066
C	1992	8	1.111	5	28.5	373.4	F	1.56	GECT92-C0027		2877			0.829
C	1992	8	2.310	5	27.2	247	I	1.15	GECT92-C0042		2880			1.760
C	1992	8	2.946	5	26.2	230.7	F	1.29	GECT92-C0043		2882			2.192
C	1992	8	5.134	5	25.7	241.9	I	1.43	GECT92-C0082		2883			3.857
C	1992	8	4.248	5	25.1	235	F	2.01	GECT92-C0085		2885			3.360
C	1992	10	5.367	6	28.2	271.4	M	1.38	GECT92-C0206		2873			4.077
C	1992	10	4.266	5	26	221.7	M	1.28	GECT92-C0207		2874			3.210
C	1992	10	6.555	5	27	209.4	M	0.86	GECT92-C0209		2884			4.844
FA	1988	10	0.030	5	28.8	298.09	F	0.99	88-303	A		0.03	0.03	
FA	1988	10	0.030	5	26	243.73	F	1.00	88-303	B		0.03	0.03	
FA	1988	10	0.030	6	25.6	207.19	F	1.73	88-303	C		0.03	0.03	
L	1984	5	1.330	5	36.5	611	F	0.71	003 003A			0.39	0.94	
L	1984	5	0.580	4	31.4	442.1	F	0.64	004 003B			0.03	0.58	
L	1984	5	1.380	4	32.7	457.1	M	0.20	005 003C			0.48	0.9	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
L	1984	5	1.480	6	45.6	1387.6	M	0.94	008 008A			0.48	1	
L	1984	5	1.490	4	30.8	383.3	M	1.10	018 001A			0.52	0.97	
L	1984	5	0.490	4	32	394	M	1.30	019 001B			0.18	0.31	
L	1984	5	0.890	4	31.3	341.3	M	0.78	020 001C			0.26	0.63	
L	1984	5	1.490	4	31	318.2	M	0.74	021 001D			0.47	1.02	
L	1984	6	2.070	4	31.3	374.5	F	1.50	072 041A			0.78	1.29	
L	1984	6	1.600	4	33.9	465.1	M	0.69	073R041B			0.405	1.195	
L	1984	6	1.300	4	31.7	361.2	M	0.71	074 041C			0.46	0.84	
L	1984	6	1.130	3	25.9	161.1	F	0.70	075 041D			0.43	0.7	
L	1984	6	1.920	3	25.4	174.9	M	0.67	076 041E			0.66	1.26	
L	1984	6	1.010	3	25.1	162.5	M	0.67	170 041F			0.32	0.69	
L	1984	6	0.880	3	25.5	198.2	M	0.60	171 041G			0.3	0.58	
L	1984	7	0.970	3	29.5	248.9	M	0.65	010R007A			0.395	0.575	
L	1984	7	1.160	3	26.3	198.7	M	0.57	012 007B			0.3	0.86	
L	1984	7	1.010	3	27.5	243.4	M	0.66	013 007C			0.33	0.68	
L	1984	8	0.750	4	27.7	263.3	F	1.50	036 038A			0.37	0.38	
L	1984	8	1.240	4	27.5	294.2	F	2.10	037 038B			0.484	0.756	
L	1984	8	0.780	4	28.1	308.4	F	1.90	038 038C			0.46	0.32	
L	1984	8	0.720	3	25.7	226.1	F	2.20	039 038D			0.4	0.32	
L	1984	8	0.440	3	26.2	236.1	F	3.70	041 039B			0.18	0.26	
L	1984	8	0.590	4	29.5	293.9	M	2.90	042 039C			0.19	0.4	
L	1984	8	2.780	3	26.6	234	M	2.60	043 039A			0.74	2.04	
L	1986	6	0.770	3	27.2	245.6	F	0.53	8-6-18			0.18	0.59	
L	1986	6	0.660	6	31	369.3	M	0.62	86-4-10			0.25	0.41	
L	1986	6	0.760	4	27.9	246.2	F	0.58	86-4-11			0.21	0.55	
L	1986	6	0.870	3	27.4	231.5	F	0.24	86-4-12			0.28	0.59	
L	1986	6	0.880	3	32	392.3	F	0.22	86-4-13			0.27	0.61	
L	1986	6	0.670	3	29.5	302.9	M	0.26	86-4-9			0.25	0.42	
L	1986	6	2.100	8	46	1237.8	F	0.81	86-5-14			0.62	1.48	
L	1986	6	7.280	13	48	1587.2	M	0.75	86-5-15			2	5.28	
L	1986	6	1.430	3	30.8	326.92	M	0.53	86-6-16			0.55	0.88	
L	1986	6	1.370	2	29.5	280.5	F	0.40	86-6-17			0.34	1.03	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
L	1986	6	0.620	3	30.3	321.9	F	0.26	86-6-19			0.21	0.41	
L	1986	6	1.090	4	28.4	296.3	F	0.38	86-6-20			0.27	0.82	
L	1986	8	0.610	6	32.9	432.6	F	1.20	86-10-27			0.2	0.41	
L	1986	8	5.660	9	45.6	1358.2	M	2.70	86-11-28			2.24	3.42	
L	1986	8	2.580	13	49.9	1673.4	M	0.84	86-11-29			0.66	1.92	
L	1986	8	2.630	6	32	364.1	M	1.20	86-11-30			0.82	1.81	
L	1986	8	0.360	3	27.7	250.6	M	0.72	86-41-131			0.22	0.14	
L	1986	8	0.870	4	31.2	367.7	F	1.40	86-41-132			0.28	0.59	
L	1986	8	0.690	8	42.5	909.1	F	0.63	86-41-134			0.24	0.45	
L	1986	8	0.600	3	27.3	250	M	0.89	86-41-135			0.21	0.39	
L	1986	8	0.720	3	26.1	241.7	F	1.20	86-41-136			0.21	0.51	
L	1986	10	0.660	3	30.7	334.3	M	1.20	86-50-156			0.22	0.44	
L	1986	10	0.720	5	29.6	378.8	M	0.92	86-50-157			0.24	0.48	
L	1986	10	4.510	2	26.6	267.2	M	1.00	86-51-158			1.51	3	
L	1986	10	1.460	4	28.4	296	F	1.80	86-51-159			0.52	0.94	
L	1986	10	0.830	3	26.5	229.4	M	1.20	86-51-160			0.27	0.56	
L	1988	6	3.674	7	34.8	481.73	M	0.39	88-002	A		0.936	2.738	
L	1988	6	1.989	4	29.8	289.56	M	0.38	88-002	B		0.535	1.454	
L	1988	6	1.437	4	29.5	297.21	M	0.43	88-002	C		0.371	1.066	
L	1988	6	0.459	4	30	363.5	F	0.66	88-002	D		0.146	0.313	
L	1988	6	0.613	7	37.2	602.9	M	0.53	88-003	A		0.147	0.466	
L	1988	6	0.909	4	30.7	341.82	M	0.51	88-003	B		0.231	0.678	
L	1988	6	3.512	5	31.1	325.93	M	0.42	88-003	C		0.886	2.626	
L	1988	6	0.736	4	30.8	343.15	M	0.55	88-003	D		0.228	0.508	
L	1988	8	1.120	4	29.8	290.73	M	0.65	88-131			0.403	0.717	
L	1988	8	1.822	8	45	1086.3	M	1.21	88-144			0.45	1.372	
L	1988	8	1.241	7	42.5	904.9	M	0.72	88-146			0.335	0.906	
L	1988	8	3.400	7	42	1133.2	M	1.90	88-149	A		1.378	2.022	
L	1988	8	1.268	5	32	360.16	M	0.65	88-149	B		0.457	0.811	
L	1988	8	1.144	10	35.6	556.4	F	0.85	88-150	A		0.408	0.736	
L	1988	8	0.707	4	31.4	449.85	F	0.73	88-150	B		0.135	0.572	
L	1988	8	1.234	4	31.5	375.43	M	0.89	88-155			0.251	0.983	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = SMALLMOUTH BASS (SMB)								
L	1988	8	1.117	5	34.6	546.2	M	1.01	88-173			0.345	0.772	
L	1988	8	1.019	3	25.8	197.12	M	0.76	88-178	A		0.363	0.656	
L	1988	8	1.485	4	27.1	226.24	M	0.44	88-178	B		0.496	0.989	
L	1988	10	1.811	4	28.3	222.42	F	0.77	88-226	A		0.541	1.27	
L	1988	10	0.697	4	33.3	483.63	F	0.71	88-226	B		0.209	0.488	
L	1988	10	0.600	4	36.4	698.4	M	1.32	88-226	C		0.192	0.408	
L	1988	10	1.105	2	26.5	233.8	M	1.29	88-227	A		0.262	0.843	
L	1988	10	1.023	5	36.6	640.5	F	1.04	88-227	B		0.246	0.777	
L	1988	10	0.854	5	32.6	443.76	F	0.89	88-227	C		0.247	0.607	
L	1990	8	1.416	4	32.2	391	M	1.40	L0023	A	1425	0.678	0.738	
L	1990	8	1.748	4	30.1	326.5	F	1.66	L0023	B	1424	0.911	0.837	
L	1990	9	0.694	3	28.1	273.7	M	0.58	L0054	A	1427	0.313	0.381	
L	1990	9	0.744	3	26.8	229.8	M	0.40	L0054	C	1428	0.256	0.488	
L	1990	11	0.776	7	44.8	1202.7	M	0.86	L0114		1423	0.342	0.434	
L	1990	11	1.143	6	41.2	926.1	F	0.53	L0115		1426	0.49	0.653	
L	1992	8	2.130	8	42.7	1040.3	F	0.97	GECT92-L0093		2943			1.625
L	1992	8	1.323	8	40.2	560.1	F	0.78	GECT92-L0094		2941			1.028
L	1992	8	5.890	4	29.3	164	F	0.61	GECT92-L0097		2931			4.396
L	1992	8	0.956	5	30.1	307.9	F	1.10	GECT92-L0098		2934			0.721
L	1992	8	0.727	4	27.9	246	F	0.70	GECT92-L0100		2937			0.569
L	1992	10	1.939	5	39.8	807.8	M	1.29	GECT92-L0224		2942			1.490
L	1992	10	0.948	6	34.3	474.9	F	1.12	GECT92-L0225		2936			0.726
L	1992	10	0.898	4	31.7	397.9	F	1.16	GECT92-L0226		2935			0.701
SA	1988	8	0.030	4	26.5	216.94	M	0.53	88-163			0.03	0.03	
SA	1988	8	0.030	4	28.5	295.69	M	0.83	88-211			0.03	0.03	
WA	1988	8	0.030	4	26.7	257.86	M	2.41	88-138	A		0.03	0.03	
WA	1988	8	0.030	3	23.6	186.36	M	2.07	88-138	B		0.03	0.03	
Z	1984	8	0.480	4	38.2	738.6	F	1.40	111 023A			0.19	0.29	
Z	1984	8	1.080	5	36.1	526.5	M	0.33	112 023B			0.35	0.73	
Z	1984	8	0.970	7	35.5	648.1	M	0.71	162 060A			0.31	0.66	
Z	1984	8	0.380	4	25.1	191.1	M	0.52	172 058A			0.11	0.27	
Z	1984	8	0.010	4	26.2	209.9	F	0.57	202 059A			0.01	0.03	

SPECIES = SMALLMOUTH BASS (SMB)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
Z	1984	10	0.590	5	36	455.2	F	0.46	240R081A			0.23	0.36	
Z	1984	10	1.080	3	25.2	207.8	M	2.30	242 081B			0.33	0.75	
Z	1984	10	0.886	4	28.3	284	F	0.83	243 081C			0.414	0.472	
Z	1984	10	0.360	6	24.6	189.6	F	0.73	244 081D			0.09	0.27	
Z	1984	10	0.530	3	25	173	M	1.00	245 081E			0.23	0.3	
Z	1984	10	0.360	3	25.5	212.7	M	1.00	246 082A			0.13	0.23	
Z	1984	10	0.550	3	26.2	221.9	M	0.81	247R082B			0.15	0.4	
Z	1984	10	0.470	3	25.8	213.7	M	0.71	248 082C			0.15	0.32	
Z	1984	10	0.370	4	26.8	244	M	0.78	249 082D			0.14	0.23	
Z	1984	10	0.260	3	25.1	172.3	F	0.72	250 082E			0.12	0.14	
Z	1984	10	0.670	4	26	224.7	F	1.30	255 080A			0.27	0.4	
Z	1984	10	0.500	4	26.2	207.4	F	0.99	256 080B			0.19	0.31	
Z	1984	10	0.340	4	27.6	237.3	F	0.63	257 080C			0.15	0.19	
Z	1984	10	0.440	4	26.9	233.4	F	0.77	258 080D			0.17	0.27	
Z	1984	10	0.450	4	26.7	228.2	M	0.80	259R080E			0.17	0.28	
Z	1984	10	0.200	3	25.4	188.2	F	0.62	260 080F			0.2	0.03	
Z	1984	10	0.155	4	27.1	235.6	F	0.71	261R079A			0.155	0.03	
Z	1984	10	0.370	4	26.4	195.3	F	0.88	262 079B			0.16	0.21	
Z	1984	10	0.430	4	26.6	257.3	M	1.00	263 079C			0.17	0.26	
Z	1988	8	0.846	4	32.4	384.56	M	0.62	88-069	A		0.326	0.52	
Z	1988	8	0.532	3	27	239.48	M	0.86	88-069	B		0.153	0.379	
Z	1988	8	1.932	4	24.7	183.9	F	0.75	88-098	A		0.602	1.33	
Z	1988	8	0.233	4	24.9	203.41	M	0.78	88-098	B		0.078	0.155	
Z	1988	8	2.142	10	45	1139.3	F	2.98	88-099			0.68	1.462	
Z	1988	8	0.464	8	47.9	1490.1	F	1.61	88-108			0.156	0.308	
Z	1988	8	1.448	7	41.4	944.5	M	1.12	88-109			0.698	0.75	
Z	1988	8	0.518	5	37.8	841.8	M	1.62	88-110	A		0.17	0.348	
Z	1988	8	0.365	8	37.1	781.5	M	2.16	88-110	B		0.12	0.245	
Z	1988	10	0.457	4	27.3	235.89	M	0.74	88-234	A		0.193	0.264	
Z	1988	10	0.428	3	25.2	185.35	M	0.88	88-234	B		0.196	0.232	
Z	1988	10	1.640	4	28.6	185.29	F	0.73	88-234	C		0.34	1.3	
Z	1988	10	1.032	4	33.4	500.4	F	1.38	88-235			0.39	0.642	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = SMALLMOUTH BASS (SMB)														
Z	1988	10	2.054	7	37.8	754.7	F	2.21	88-243			0.822	1.232	
Z	1988	10	0.140	4	25.6	192.9	M	0.70	88-282	A		0.03	0.14	
Z	1988	10	1.249	4	32	430.43	F	1.40	88-282	B		0.471	0.778	
Z	1990	8	1.041	9	43.4	105.6	M	0.47	Z0001		1419	0.484	0.557	
Z	1990	8	0.271	4	25.1	211.3	M	0.31	Z0002	B	1418	0.143	0.128	
Z	1990	10	0.886	5	32.7	430.2	M	0.47	Z0076		1422	0.439	0.447	
Z	1990	10	0.744	5	32.5	421.7	F	0.32	Z0077		1417	0.371	0.373	
Z	1990	10	0.549	4	28	235.1	M	0.40	Z0078		1420	0.274	0.275	
Z	1990	10	0.429	3	25.7	183.8	M	0.50	Z0079		1421	0.211	0.218	
Z	1992	8	0.924	12	44.5	1307.4	M	0.80	GECT92-Z0128		2944			0.723
Z	1992	8	0.684	6	25.8	174	F	0.55	GECT92-Z0129		2938			0.486
Z	1992	8	3.301	6	35.2	584.7	F	4.23	GECT92-Z0174		2940			2.626
Z	1992	8	0.646	5	27.5	255	F	0.93	GECT92-Z0175		2939			0.517
Z	1992	10	0.612	5	28.7	259.9	F	0.78	GECT92-Z0240		2933			0.510
Z	1992	10	0.902	5	28.3	269.7	M	0.80	GECT92-Z0242		2932			0.719
Z	1992	10	2.720	10	45.9	1366	F	2.56	GECT92-Z0243		2945			2.100
SPECIES = WHITE CATFISH (WC)														
L	1984	5	3.860	17	42	1392.8	M	1.40	009 004A			0.86	3	
L	1984	6	1.000	3	29.2	313	M	1.20	007 006A			0.32	0.68	
L	1984	8	4.620	4	35.8	597.6	M	5.70	033R032A			2.41	2.21	
L	1984	8	55.090	16	54	2081.3	F	4.77	034R032C			23.96	31.13	
L	1984	8	1.455	3	31	365.9	M	3.00	139R030A			0.525	0.93	
L	1984	8	1.080	2	22.4	137.5	F	2.70	141 030B			0.56	0.52	
L	1984	8	0.850	2	22.9	135.9	M	2.90	142 030C			0.32	0.53	
L	1984	8	1.483	8	42	1042.9	F	5.10	143 030D			0.619	0.864	
L	1984	8	0.800	2	23.9	158.9	M	2.60	160 031A			0.37	0.43	
L	1984	8	3.040	4	32.7	429	F	4.80	161 031B			1.17	1.87	
L	1984	8	0.960	2	23.8	147.1	M	3.10	203 032B			0.45	0.51	
L	1984	8	4.000	12	43	988.9	M	0.86	346 031C			1.1	2.9	
L	1986	6	36.460	17	54	2400	F	6.17	86-1-1			11.05	25.41	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = WHITE CATFISH (WC)								
L	1986	6	6.540	10	42	1000	M	1.50	86-1-2			1.16	5.38	
L	1986	6	2.350	3	28	296.7	F	3.00	86-1-3			0.84	1.51	
L	1986	6	1.120	9	38.2	617.5	F	1.40	86-2-5			0.42	0.7	
L	1986	6	5.170	5	32.3	421.7	M	2.15	86-2-7			1.75	3.42	
L	1986	8	26.970	16	53.4	2080.5	M	4.00	86-12-31			7.63	19.34	
L	1986	8	2.430	3	28	252.3	F	3.90	86-12-32			1	1.43	
L	1986	8	9.060	13	39.5	802	M	3.30	86-12-33			2.97	6.09	
L	1986	8	1.340	11	33.1	414.2	F	1.40	86-57-180			0.22	1.12	
L	1986	8	2.210	2	15.5	36.8	M	0.78	86-7-21			1.41	0.8	
L	1986	8	2.880	6	38	671.3	M	3.05	86-7-22			1.08	1.8	
L	1986	8	2.290	6	40.8	724.8	F	1.50	86-7-23			0.75	1.54	
L	1986	8	2.310	5	42.7	1191.8	F	4.13	86-8-24			1.06	1.25	
L	1986	8	13.950	17	47.5	1262.6	F	3.40	86-9-25			2.69	11.26	
L	1986	8	10.600	13	43.2	1299.9	F	4.60	86-9-26			2.55	8.05	
L	1988	8	2.561	5	35.3	569.2	M	2.52	88-127			0.733	1.828	
L	1988	8	3.705	8	41	847.8	M	1.69	88-147	A		0.933	2.772	
L	1988	8	1.463	6	36.5	589.6	F	1.28	88-147	B		0.357	1.106	
L	1988	8	1.971	11	40.1	760.7	F	1.55	88-148			0.483	1.488	
L	1988	8	8.592	16	47.4	1641.1	F	3.10	88-152	A		1.922	6.67	
L	1988	8	2.118	5	35.5	535	M	4.32	88-152	B		0.729	1.389	
L	1988	8	22.533	21	50.8	1850.2	M	3.18	88-153			3.711	18.82	
L	1988	8	1.958	6	28.5	237.17	M	1.05	88-156	A		0.547	1.411	
L	1988	8	2.473	5	32	358.4	F	1.74	88-156	B		0.706	1.767	
L	1988	8	1.024	7	33.2	379.05	F	0.74	88-156	C		0.247	0.777	
L	1988	8	4.794	7	37	613.48	M	1.82	88-168			1.494	3.3	
L	1988	8	2.311	5	33.6	426.19	F	1.93	88-171			0.501	1.81	
L	1988	8	1.634	2	25.4	180.34	M	3.55	88-172	A		0.536	1.098	
L	1988	8	2.929	5	37.1	613.9	M	2.98	88-172	B		0.719	2.21	
L	1988	8	5.455	16	44.1	1254.5	M	1.69	88-179			1.311	4.144	
L	1988	10	24.752	20	56.5	2298.5	F	1.45	88-304			5.126	19.63	
Z	1984	8	2.750	8	35.9	550.3	M	2.50	091R025A			0.97	1.78	
Z	1984	8	1.110	12	33.6	466.3	F	0.98	093R025B			0.385	0.725	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = WHITE CATFISH (WC)														
Z	1984	8	3.260	7	35.9	677.7	M	3.40	096 025C			1.31	1.95	
Z	1984	8	2.970	11	33.2	450.8	M	2.45	097R025D			0.97	2	
Z	1984	8	8.585	15	55.5	2624.4	M	3.00	113R027A			2.81	5.775	
Z	1984	8	3.350	13	43.5	1201.7	M	1.70	121 024A			0.98	2.37	
Z	1984	8	1.420	3	28.6	302.9	M	3.00	130 026A			0.61	0.81	
Z	1984	8	1.450	2	25.9	190.2	M	1.90	131 026B			0.5	0.95	
Z	1984	8	0.970	8	34	507.2	F	1.70	132 026C			0.28	0.69	
Z	1984	8	3.290	11	36.4	574.7	M	1.40	137 026D			1	2.29	
Z	1984	8	1.210	2	23.3	129.4	F	2.80	138 026E			0.46	0.75	
Z	1984	8	2.140	10	40.5	951.4	M	3.00	210 024B			0.73	1.41	
Z	1986	8	7.420	14	48.5	1503.3	F	1.10	86-15-41			3.25	4.17	
Z	1986	8	3.250	9	45	1384.2	M	4.30	86-15-42			1.51	1.74	
Z	1986	8	2.780	7	42.2	1023.9	M	5.20	86-16-43			1.34	1.44	
Z	1986	8	0.790	5	32.5	440.5	F	6.40	86-16-44			0.4	0.39	
Z	1986	8	1.570	3	27.5	205.1	F	2.30	86-46-147			0.58	0.99	
Z	1986	8	1.790	5	26.5	220.6	F	1.90	86-47-148			0.85	0.94	
Z	1986	8	1.300	5	30.5	318.6	F	3.70	86-47-149			0.79	0.51	
Z	1986	8	1.330	4	29.2	272.5	F	3.70	86-47-150			0.62	0.71	
Z	1986	8	9.170	12	34	504.3	M	2.80	86-47-152			3	6.17	
Z	1986	10	2.340	4	36.5	563	M	2.65	86-53-169			0.98	1.36	
Z	1986	10	2.910	12	44.1	1162.4	M	2.17	86-54-170			1.06	1.85	
Z	1986	10	3.950	13	43.1	1026.8	M	1.40	86-54-171			1.28	2.67	
Z	1986	10	5.490	15	52	1884.9	M	1.60	86-55-173			2.75	2.74	
Z	1986	10	0.900	13	51.2	2051.6	M	3.70	86-55-174			0.27	0.63	
Z	1986	10	3.070	11	39.5	772.8	M	2.40	86-55-175			1.09	1.98	
Z	1986	10	2.290	6	33.4	487.1	M	2.05	86-56-176			1	1.29	
Z	1988	8	1.165	7	33.4	525.1	M	2.03	88-073			0.423	0.742	
Z	1988	8	3.574	8	35	498.14	M	1.20	88-085			0.917	2.657	
Z	1988	8	1.981	7	31.5	385.45	M	0.89	88-086	A		0.407	1.574	
Z	1988	8	2.160	7	31.4	357.96	F	2.09	88-086	B		0.614	1.546	
Z	1988	8	1.778	12	48.2	1565.1	M	1.64	88-090			0.577	1.201	
Z	1988	8	6.214	17	37.1	665.7	M	1.78	88-091			1.706	4.508	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = WHITE CATFISH (WC)								
Z	1988	8	18.054	17	43.4	1312.5	F	5.80	88-093			4.468	13.59	
Z	1988	8	5.175	12	43.7	1367.2	M	1.92	88-095			1.652	3.523	
Z	1988	8	6.827	15	47	1523.7	M	1.67	88-102			1.771	5.056	
Z	1988	8	4.548	7	31.1	390.42	M	2.11	88-103	A		1.44	3.108	
Z	1988	8	4.089	16	42.6	1277	M	1.59	88-103	B		1.406	2.683	
Z	1988	8	3.346	15	38.6	863.9	M	1.22	88-104	A		0.99	2.356	
Z	1988	8	4.055	7	37.5	706.3	M	1.07	88-112			1.455	2.6	
Z	1988	8	2.380	7	35.4	556.8	M	1.32	88-113			0.767	1.613	
Z	1988	8	2.668	15	43.8	1153.9	M	1.65	88-115			0.695	1.973	
Z	1988	10	5.594	17	48.5	1645.3	F	2.53	88-241	A		1.815	3.779	
Z	1988	10	0.863	7	36.5	691.8	F	2.72	88-241	B		0.307	0.556	
Z	1988	10	2.359	7	34	482.34	F	1.96	88-242	A		0.883	1.476	
Z	1988	10	7.750	15	41.7	1097.5	M	3.02	88-242	B		2.226	5.524	
Z	1988	10	2.786	8	44	1149.7	M	1.94	88-255			1.027	1.759	
Z	1988	10	2.564	20	43	1080.5	F	1.38	88-256			0.854	1.71	
						SPECIES = WHITE PERCH (WP)								
L	1984	5	2.660	4	25.3	214.7	F	3.20	148R050A			1.05	1.61	
L	1984	5	1.990	4	26.6	241.9	F	1.70	150 050B			0.71	1.28	
L	1984	5	2.920	3	22.3	197.3	F	2.70	151 050C			1.29	1.63	
L	1984	5	2.010	3	23.3	189.4	F	3.60	152 050D			0.89	1.12	
L	1984	5	5.250	3	23.5	192.3	M	4.10	153 050E			2.11	3.14	
L	1984	5	3.000	3	22.4	153.1	F	3.60	154 050F			1.24	1.76	
L	1984	5	1.380	3	19.1	97.2	F	1.80	271 087A			0.65	0.73	
L	1984	6	4.810	3	24.1	189.3	F	1.70	155 051A			1.89	2.92	
L	1984	6	3.780	3	21.2	127.7	M	3.10	158 051D			1.96	1.82	
L	1984	6	2.580	3	20	114.2	F	3.10	159 051E			1.08	1.5	
L	1984	6	2.950	3	18.9	83.9	F	1.80	268 089A			1.32	1.63	
L	1984	7	1.300	3	20	121.3	M	2.20	165 052A			0.52	0.78	
L	1984	7	2.700	3	21.3	148.5	F	3.60	166 052B			0.96	1.74	
L	1984	7	1.200	3	22.3	168.8	F	2.70	167 052C			0.23	0.97	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = WHITE PERCH (WP)														
L	1984	8	1.595	3	22.7	200.8	F	6.30	081R028A			0.78	0.815	
L	1984	8	1.990	4	25.5	261.6	M	2.85	083R028B			0.88	1.11	
L	1984	8	2.380	3	23.7	219.1	M	4.80	085R028C			1.27	1.11	
L	1984	8	1.760	3	21.6	171.7	F	4.40	087 028D			0.86	0.9	
L	1984	8	0.860	3	21.7	158.7	M	2.80	088 028E			0.45	0.41	
L	1984	8	1.150	3	23	196.8	F	3.30	089 037A			0.57	0.58	
L	1984	8	1.270	4	25.5	262.8	F	2.80	090 037B			0.53	0.74	
L	1984	8	0.970	3	22.6	164.8	F	3.30	205 037D			0.31	0.66	
L	1984	8	2.280	3	22.6	186.4	F	4.60	206 037C			0.97	1.31	
L	1984	8	1.520	3	20.5	150.1	F	6.00	207 037E			0.59	0.93	
L	1986	8	5.180	8	24.7	229.2	M	3.50	86-13-34			2.26	2.92	
L	1986	8	1.180	8	27.4	301.1	M	3.10	86-14-35			0.61	0.57	
L	1986	8	0.860	8	24.9	246	F	4.10	86-14-36			0.61	0.25	
L	1986	8	2.970	8	26	284.3	M	2.50	86-14-37			0.96	2.01	
L	1986	8	1.880	3	20.8	141.4	M	4.60	86-14-38			0.77	1.11	
L	1986	8	1.750	3	22.5	168.8	F	7.10	86-14-39			0.73	1.02	
L	1986	8	1.850	5	22.9	191.6	F	5.80	86-14-40			0.7	1.15	
L	1986	8	2.060	4	22.5	175.4	F	5.60	86-42-137			0.7	1.36	
L	1986	8	2.090	3	21.6	169.2	F	7.80	86-42-138			0.97	1.12	
L	1986	10	2.090	8	24.2	238.9	F	5.60	86-52-161			0.28	1.81	
L	1986	10	4.310	7	23.5	218.3	M	4.80	86-52-162			1.89	2.42	
L	1986	10	3.690		22	176.4	F	7.20	86-52-163			1.43	2.26	
L	1986	10	1.640	3	21	148.5	F	6.30	86-52-164			0.66	0.98	
L	1986	10	0.980	2	19.7	110	M	5.30	86-52-165			0.52	0.46	
L	1986	10	1.010	2	19.5	108.5	M	4.10	86-52-166			0.47	0.54	
L	1988	8	2.444	5	23.7	196.81	F	5.38	88-135	B		0.861	1.583	
L	1988	8	2.494	9	25.8	258.8	F	3.15	88-135	H		0.983	1.511	
L	1988	10	1.367	2	18.7	94.83	F	4.25	88-228	A		0.648	0.719	
L	1988	10	1.997	2	19	98.96	M	4.64	88-228	B		0.915	1.082	
L	1988	10	2.235	4	21.5	146.94	F	5.89	88-228	C		1.154	1.081	
L	1988	10	2.795	9	24.6	217.54	F	4.00	88-228	D		0.937	1.858	
L	1988	10	0.791	2	19.1	104.92	F	4.78	88-229	B		0.281	0.51	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = WHITE PERCH (WP)								
L	1988	10	0.973	2	19.5	110.32	F	5.02	88-229	C		0.472	0.501	
L	1988	10	1.050	2	19.7	119.81	F	6.52	88-229	D		0.441	0.609	
L	1988	10	2.059	4	21.9	161.35	M	6.10	88-229	E		0.972	1.087	
L	1988	10	1.705	5	23.5	194.62	F	7.28	88-229	F		0.693	1.012	
S	1988	8	0.030	4	27	280.28	F	2.04	88-158			0.03	0.03	
W	1988	8	0.030	3	18.8	86.47	M	2.33	88-140	A		0.03	0.03	
W	1988	8	0.030	3	18.1	81.15	M	3.20	88-140	B		0.03	0.03	
Z	1984	8	2.040	3	20.8	130.3	M	4.70	044 036A			1.12	0.92	
Z	1984	8	0.620	3	21.2	125.2	M	2.50	045 036B			0.37	0.25	
Z	1984	8	1.070	3	21.6	143.3	F	4.00	046 036C			0.68	0.39	
Z	1984	8	0.890	3	21.7	143.4	M	3.80	047 036D			0.42	0.47	
Z	1984	8	0.880	3	20.5	125	F	3.60	048 036E			0.49	0.39	
Z	1984	8	1.180	2	18.3	99.1	M	4.00	049 036F			0.67	0.51	
Z	1984	8	0.770	3	20.3	109.2	M	1.70	050 036G			0.44	0.33	
Z	1984	8	0.960	3	21.5	147	M	3.50	051 035A			0.55	0.41	
Z	1984	8	1.100	3	19.7	118.6	M	2.90	052 035B			0.53	0.57	
Z	1984	8	0.910	2	19.4	115.3	M	4.60	053 035C			0.51	0.4	
Z	1984	8	0.550	3	20.5	127.3	F	2.60	055 035E			0.32	0.23	
Z	1984	8	0.850	2	17.6	91.1	M	4.00	056 035F			0.46	0.39	
Z	1984	8	0.750	2	17.8	89.3	F	2.90	057 035G			0.42	0.33	
Z	1984	8	1.500	3	20.6	133.3	M	3.20	058 035H			0.84	0.66	
Z	1984	8	0.570	2	17.4	83	M	2.80	059 035I			0.32	0.25	
Z	1984	8	0.930	2	18.9	106.8	F	3.10	060 035J			0.52	0.41	
Z	1984	8	0.680	2	17.5	86.9	M	3.30	061 035K			0.44	0.24	
Z	1984	8	0.740	2	17.5	78.1	F	3.70	062 035L			0.37	0.37	
Z	1984	8	0.890	3	18.6	101.4	M	5.00	063 040A			0.44	0.45	
Z	1984	8	0.680	3	18.6	96.3	F	3.80	064 040B			0.39	0.29	
Z	1984	8	0.710	3	16.8	81.4	M	4.10	065 040C			0.46	0.25	
Z	1984	8	0.650	3	18.1	85.4	M	3.90	066 040D			0.39	0.26	
Z	1984	10	1.170	3	23.7	172.5	F	1.50	227 083A			0.52	0.65	
Z	1984	10	1.780	3	22.8	173.6	F	3.40	228 083B			0.86	0.92	
Z	1988	8	0.060	2	18.3	92.1	M	4.85	88-076	B		0.03	0.03	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = WHITE PERCH (WP)														
Z	1988	8	0.880	11	25.9	242.32	F	2.62	88-076	D		0.301	0.579	
Z	1988	8	3.866	9	24.1	194.85	M	4.48	88-076	E		1.572	2.294	
Z	1988	8	1.125	2	17.9	88.43	F	3.41	88-076	F		0.364	0.761	
Z	1988	8	1.738	4	21.6	145.85	M	2.68	88-076	H		0.752	0.986	
Z	1988	8	1.705	4	20.2	134.68	F	5.38	88-076	I		0.854	0.851	
Z	1988	8	0.832	8	23	195.97	F	3.09	88-088			0.34	0.492	
Z	1988	10	3.872	7	21.2	153.17	F	6.06	88-236	A		1.988	1.884	
Z	1988	10	1.286	9	23.7	184.67	F	2.00	88-236	D		0.617	0.669	
Z	1988	10	0.561	1	14.9	40.8	F	2.83	88-237	A		0.309	0.252	
Z	1988	10	0.030	2	18.6	87.73	F	5.04	88-237	B		0.03	0.03	
Z	1988	10	1.955	4	20	114.77	F	5.26	88-237	D		1.01	0.945	
Z	1990	8	0.864	6	21.7	134.8	F	1.82	Z0009	A	1347	0.468	0.396	
Z	1990	8	1.533	13	24.4	190.2	F	0.55	Z0009	B	1355	0.385	1.148	
Z	1990	8	0.379	9	23.4	186.2	F	0.69	Z0009	C	1351	0.106	0.273	
Z	1990	8	1.048	3	18.1	83.8	M	3.01	Z0009	D	1343	0.536	0.512	
Z	1990	8	0.618	3	19	101.3	F	3.49	Z0009	E	1338	0.33	0.288	
Z	1990	8	0.905	3	19.8	101.5	F	2.80	Z0009	F	1349	0.473	0.432	
Z	1990	8	0.724	3	17.1	71.2	M	3.15	Z0009	G	1354	0.363	0.361	
Z	1990	8	0.204	9	23.5	167.3	F	0.68	Z0010	A	1342	0.088	0.116	
Z	1990	8	0.694	3	16.3	58.8	M	2.47	Z0010	B	1356	0.356	0.338	
Z	1990	8	1.672	6	21.4	130.8	F	2.06	Z0011	A	1352	1.232	0.44	
Z	1990	8	0.914	3	19.5	95.3	F	2.25	Z0011	B	1353	0.429	0.485	
Z	1990	8	0.181	11	23.7	158.9	F	0.29	Z0012	A	1326	0.061	0.12	
Z	1990	8	1.839	6	22.1	140	F	1.91	Z0012	B	1345	1.078	0.761	
Z	1990	8	0.808	6	21.8	148.4	M	1.98	Z0013	A	1339	0.432	0.376	
Z	1990	8	3.643	9	24	228.3	F	6.62	Z0013	B	1340	2.233	1.41	
Z	1990	8	0.828	5	20.5	126.5	M	0.79	Z0016	A	1346	0.268	0.56	
Z	1990	8	0.582	6	20.5	110.6	M	1.01	Z0016	B	1348	0.242	0.34	
Z	1990	8	0.566	5	18.9	93.9	M	0.91	Z0016	C	1350	0.137	0.429	
Z	1992	8	0.144	11	23	145.9	F	0.56	GECT92-Z0132		2912			0.115
Z	1992	8	0.700	10	21.9	123.5	F	0.87	GECT92-Z0134		2918			0.550
Z	1992	8	1.214	8	20.9	114	F	0.85	GECT92-Z0135		2913			0.956

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = WHITE PERCH (WP)														
Z	1992	8	2.764	6	19.5	102.3	M	2.83	GECT92-Z0138		2910			2.234
Z	1992	8	0.803	5	17.9	80.9	F	1.48	GECT92-Z0141		2919			0.649
Z	1992	8	7.102	13	25.1	165.6	F	0.59	GECT92-Z0178A		2924			5.217
Z	1992	8	0.612	8	22.4	120.7	F	0.67	GECT92-Z0178B		2925			0.445
Z	1992	8	1.223	6	17.7	74.7	F	1.12	GECT92-Z0179A		2916			1.027
Z	1992	8	0.320	8	20.4	93.2	F	0.62	GECT92-Z0179B		2917			0.252
Z	1992	10	0.709	10	24.4	164.4	F	0.72	GECT92-Z0219		2915			0.467
Z	1992	10	0.669	4	17.5	75.6	F	2.17	GECT92-Z0220		2923			0.553
Z	1992	10	1.213	5	17.4	63.3	M	0.87	GECT92-Z0221		2914			0.979
Z	1992	10	0.438	11	25	193	F	0.85	GECT92-Z0238		2922			0.343
Z	1992	10	0.474	2	15.5	52.4	M	3.16	GECT92-Z0245		2911			0.380
SPECIES = YELLOW PERCH (YP)														
B	1984	8	3.315	7	26.8	275.5	M	1.15	175R053A			1.015	2.3	
B	1984	8	1.230	8	26.9	255.5	F	0.70	178 053B			0.31	0.92	
B	1984	8	3.400	10	25	211.8	M	0.98	179 053C			0.67	2.73	
B	1984	8	0.830	9	26.7	236.4	F	0.59	180 053D			0.26	0.57	
B	1984	8	0.800	4	25	210	F	0.79	181 053E			0.21	0.59	
B	1984	8	0.490	2	19.8	107.1	F	0.86	182 054A			0.18	0.31	
B	1984	8	0.730	10	26.5	216.2	F	0.78	183 054B			0.23	0.5	
B	1984	8	1.000	4	25.1	222	F	1.10	184 054C			0.35	0.65	
B	1984	8	0.840	10	26.6	252	F	0.97	185 054D			0.28	0.56	
B	1984	8	1.190	4	24.8	206	M	0.71	186 054E			0.38	0.81	
B	1984	8	0.650	3	20.9	110.6	F	0.73	187 054F			0.21	0.44	
B	1984	8	1.470	4	22.3	140.6	M	0.90	188 055A			0.43	1.04	
B	1984	8	0.460	2	19.7	92.4	M	0.78	189 055B			0.13	0.33	
B	1984	8	6.330	14	25.9	219.7	M	0.74	190 055C			1.32	5.01	
B	1984	8	1.110	4	25.3	221.2	F	0.88	191 055D			0.38	0.73	
B	1984	8	0.840	9	27	240.9	F	0.63	193 055F			0.22	0.62	
B	1984	8	1.160	6	26.1	254.5	F	1.10	194 055E			0.35	0.81	
B	1984	8	0.520	3	21.1	120.7	F	0.87	195 056A			0.21	0.31	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = YELLOW PERCH (YP)								
B	1984	8	0.540	4	23.1	173.1	F	0.80	196 056B			0.24	0.3	
B	1984	8	1.110	5	27.8	292.9	F	0.84	197R056C			0.405	0.705	
B	1984	8	0.680	4	25.4	213.2	F	0.73	198 057A			0.17	0.51	
B	1984	8	1.075	7	27.3	264.2	F	0.90	204R057B			0.345	0.73	
B	1984	8	1.050	9	26.9	250.2	F	0.46	311 057C			0.45	0.6	
B	1986	8	0.610	6	27.6	331.3	M	0.62	86-17-46			0.2	0.41	
B	1986	8	1.140	6	25.7	267.1	M	1.50	86-17-47			0.4	0.74	
B	1986	8	1.280	12	26	263.4	M	0.66	86-17-48			0.43	0.85	
B	1986	8	0.660	4	27.8	337.5	F	1.70	86-18-49			0.24	0.42	
B	1986	8	1.120	4	25.2	290.9	F	2.85	86-18-50			0.46	0.66	
B	1986	8	0.520	6	27.2	382.9	F	1.30	86-18-51			0.19	0.33	
B	1986	8	0.710	4	26.6	277	M	1.40	86-19-52			0.3	0.41	
B	1986	8	0.320	5	25.2	251	M	0.54	86-19-53			0.12	0.2	
B	1986	8	2.120	6	28.3	375.7	M	1.40	86-20-55			0.82	1.3	
B	1986	8	0.490	6	27.1	351.5	M	0.46	86-20-57			0.18	0.31	
B	1986	8	0.500	4	27	365.9	F	1.20	86-21-58			0.17	0.33	
B	1986	8	0.320	8	30.1	403.1	F	0.50	86-21-59			0.11	0.21	
B	1986	8	0.500	4	26.2	289.4	F	1.10	86-22-60			0.21	0.29	
B	1986	8	0.350	4	27.6	324.1	F	0.37	86-22-61			0.1	0.25	
B	1986	8	1.400	9	25.8	255.5	M	1.10	86-23-63			0.48	0.92	
B	1986	8	0.420	2	25	216.5	F	0.60	86-23-64			0.17	0.25	
B	1986	8	1.740	15	26.3	256.4	M	0.54	86-23-65			0.72	1.02	
B	1986	8	1.480	4	28.5	367.3	F	1.70	86-24-66			0.4	1.08	
B	1986	8	0.290	2	21.6	136	M	0.48	86-24-67			0.12	0.17	
B	1986	8	0.810	6	30.9	469.6	F	1.10	86-24-68			0.34	0.47	
B	1986	8	0.200	3	26.4	267.4	F	0.90	86-25-69			0.08	0.12	
B	1986	8	1.600	12	26.3	282.2	M	0.51	86-25-70			0.43	1.17	
B	1986	8	0.620	3	25	232.8	M	0.90	86-25-71			0.22	0.4	
B	1986	8	0.670	6	27.9	377.4	F	0.90	86-26-73			0.24	0.43	
B	1986	8	0.610	3	26.3	311.9	F	1.10	86-26-74			0.16	0.45	
B	1988	8	1.095	7	28.3	309.8	M	0.93	88-184	B		0.319	0.776	
B	1988	8	0.595	2	20.9	110.37	F	0.90	88-184	C		0.22	0.375	

SPECIES = YELLOW PERCH (YP)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
B	1988	8	0.442	2	21.1	109.19	F	0.72	88-184	D		0.143	0.299	
B	1988	8	1.381	6	26.4	189.26	M	0.81	88-184	E		0.452	0.929	
B	1988	8	0.742	8	28.2	308.74	F	0.89	88-184	F		0.252	0.49	
B	1988	8	0.536	10	29.5	346.76	F	0.78	88-184	G		0.15	0.386	
B	1988	8	0.400	6	30.4	302.19	F	0.58	88-184	H		0.136	0.264	
B	1988	8	0.536	2	22.4	123.75	F	0.32	88-195	B		0.138	0.398	
B	1988	8	0.971	2	19.7	87.01	M	0.66	88-195	C		0.271	0.7	
B	1988	8	1.489	8	29	324.66	F	0.53	88-195	D		0.431	1.058	
B	1988	8	1.683	8	32.1	511.5	F	1.15	88-195	E		0.55	1.133	
B	1988	8	0.688	4	25.5	201.95	F	0.74	88-196	A		0.194	0.494	
B	1988	8	1.899	5	27.3	261.95	M	1.54	88-196	B		0.618	1.281	
B	1988	8	0.400	4	24.4	182.35	F	0.73	88-196	C		0.144	0.256	
B	1988	8	0.785	4	27.4	252.35	F	0.42	88-196	D		0.246	0.539	
B	1988	8	1.053	8	27.3	234.83	F	0.46	88-196	E		0.356	0.697	
B	1988	8	0.983	4	27.8	273.81	F	0.82	88-196	F		0.27	0.713	
B	1988	8	0.476	4	28.3	309.96	F	0.63	88-196	G		0.153	0.323	
B	1988	8	0.759	4	25.3	227.18	F	0.72	88-196	H		0.207	0.552	
B	1988	8	1.858	4	23.6	189.35	M	1.36	88-196	I		0.599	1.259	
B	1988	8	1.843	4	25.9	238.6	F	0.91	88-199			0.438	1.405	
B	1988	10	1.469	8	30.6	381.67	F	1.12	88-272	A		0.449	1.02	
B	1988	10	0.791	6	31.6	401.39	F	0.85	88-272	B		0.259	0.532	
B	1990	9	1.362	2	22.5	155	F	1.60	B0064		1393	0.44	0.922	
B	1990	9	0.570	10	30	339.1	F	0.59	B0066	A	1394	0.157	0.413	
B	1990	9	0.750	4	25.3	244	F	0.81	B0066	B	1395	0.256	0.494	
B	1990	9	0.551	3	24	181.4	F	0.72	B0066	C	1396	0.178	0.373	
B	1990	9	0.376	3	19.5	98.8	M	0.61	B0067	A	1397	0.123	0.253	
B	1990	9	1.577	14	28.5	285	F	0.48	B0068	A	1398	0.421	1.156	
B	1990	9	1.318	8	29.3	258.5	F	0.46	B0068	B	1399	0.38	0.938	
B	1990	9	1.604	10	25.8	219.7	M	0.47	B0069	A	1400	0.412	1.192	
B	1990	9	0.512	1	18.5	75.9	F	0.59	B0069	B	1401	0.165	0.347	
B	1990	9	1.653	10	27.6	228.8	M	0.53	B0070	A	1402	0.48	1.173	
B	1990	9	0.744	4	23.5	184.4	F	0.54	B0070	B	1403	0.23	0.514	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = YELLOW PERCH (YP)														
B	1990	9	0.429	2	21.6	127.5	F	0.73	B0070	C	1410	0.136	0.293	
B	1990	10	0.931	6	27.1	226.6	F	0.54	BB0107	A	1404	0.284	0.647	
B	1990	10	1.886	10	30.1	321.2	F	0.50	BB0108	A	1409	0.555	1.331	
B	1990	10	0.688	3	25.4	189.3	F	0.82	BB0109	A	1407	0.232	0.456	
B	1990	10	1.277	1	17.8	64.3	F	0.48	BB0110	A	1405	0.376	0.901	
B	1990	10	0.745	4	26	224.7	F	0.77	BB0110	B	1408	0.248	0.497	
B	1990	10	0.160	4	24	185.5	F	0.68	BB0112	A	1406	0.045	0.115	
B	1992	8	0.510	4	27.1	293	F	1.12	GECT92-B0058		2849			0.419
B	1992	8	0.389	3	25.3	230.8	F	1.00	GECT92-B0059		2857			0.312
B	1992	8	0.388	2	23.9	210.7	F	1.17	GECT92-B0060		2852			0.309
B	1992	8	0.434	2	23.4	171.5	F	0.99	GECT92-B0064		2851			0.365
B	1992	8	1.252	2	22.3	177.4	F	1.72	GECT92-B0065		2886			1.038
B	1992	8	0.542	2	19	97.1	F	1.31	GECT92-B0069		2896			0.445
B	1992	8	0.817	2	21.3	130.3	F	1.12	GECT92-B0072		2887			0.641
B	1992	10	0.772	10	28.1	324.4	F	1.18	GECT92-B0213		2853			0.603
B	1992	10	0.577	2	26.6	240.5	F	1.10	GECT92-B0214		2854			0.466
B	1992	10	0.666	2	24.5	188.3	F	1.19	GECT92-B0215		2855			0.540
B	1992	10	1.004	4	28.5	324.9	F	1.24	GECT92-B0216		2856			0.826
B	1992	10	0.970	1	20	99.6	F	1.37	GECT92-B0217		2897			0.797
BL	1988	8	0.030	9	24.7	171.44	M	1.78	88-121	A		0.03	0.03	
BL	1988	8	0.030	9	25.4	187.12	M	0.62	88-121	C		0.03	0.03	
BL	1988	8	0.030	9	29.3	357.69	F	0.88	88-121	E		0.03	0.03	
L	1984	5	1.160	3	25.3	172.9	F	1.10	282 078A			0.67	0.49	
L	1984	5	0.330	5	25.4	166.3	F	0.46	283 078B			0.1	0.23	
L	1984	5	0.440	5	25.9	172.7	F	0.50	284 078C			0.15	0.29	
L	1988	8	0.030	2	19.6	82.37	M	0.82	88-175	A		0.03	0.03	
L	1988	8	0.030	2	18.9	76.81	F	0.98	88-175	B		0.03	0.03	
L	1988	8	0.255	6	22.7	126.26	M	1.09	88-175	C		0.098	0.157	
L	1988	8	0.030	4	22.1	121.05	M	0.82	88-175	D		0.03	0.03	
L	1988	8	0.619	6	24.3	177.93	M	0.75	88-175	E		0.03	0.619	
L	1988	8	0.435	6	23.5	166.56	M	0.80	88-175	F		0.133	0.302	
L	1990	9	0.153	4	23.5	175.6	F	0.31	L0050	A	1358	0.058	0.095	

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
						SPECIES = YELLOW PERCH (YP)								
L	1990	9	0.720	8	22.3	107.6	M	0.43	L0050	B	1359	0.206	0.514	
L	1990	9	0.387	3	20.6	97.1	F	0.46	L0050	C	1357	0.141	0.246	
L	1990	9	0.164	4	20.1	93.2	F	0.45	L0050	D	1360	0.058	0.106	
L	1990	9	0.434	2	18.5	66.1	F	0.85	L0050	E	1361	0.179	0.255	
L	1990	9	0.415	8	25.2	162	F	0.40	L0051	A	1362	0.131	0.284	
L	1990	9	0.554	12	23.6	146.9	M	0.35	L0051	B	1363	0.115	0.439	
L	1990	9	0.342	4	21.8	124.5	F	0.32	L0051	C	1364	0.126	0.216	
L	1990	9	0.455	3	19.9	97.4	F	0.52	L0051	D	1365	0.2	0.255	
L	1990	9	0.208	3	22.6	145.3	F	0.44	L0052	A	1373	0.076	0.132	
L	1990	9	0.291	3	21	107.4	F	0.29	L0052	B	1370	0.107	0.184	
L	1990	9	0.208	4	19.9	103.7	F	0.65	L0052	C	1371	0.1	0.108	
L	1990	9	0.278	3	19.5	78.8	F	0.62	L0052	D	1372	0.104	0.174	
L	1990	9	0.397	4	19.6	85.9	M	0.60	L0052	E	1368	0.135	0.262	
L	1990	9	0.421	2	17.9	68.7	F	1.00	L0053	A	1367	0.168	0.253	
L	1990	9	0.494	2	17.6	63.7	F	0.75	L0053	B	1369	0.216	0.278	
L	1990	9	0.756	6	22	114.1	M	0.36	L0053	C	1374	0.193	0.563	
L	1990	9	0.178	4	20	92.4	F	0.33	L0053	D	1366	0.059	0.119	
L	1992	8	0.314	6	24.4	142.3	F	0.85	GECT92-L0101		2850			0.238
L	1992	8	0.618	10	23.3	127.1	F	0.69	GECT92-L0102		2862			0.474
L	1992	8	0.421	6	22	105.5	F	0.79	GECT92-L0103		2869			0.345
L	1992	8	0.390	6	20.9	93.3	I	0.76	GECT92-L0105		2898			0.292
L	1992	8	0.421	2	19.5	81.8	I	1.33	GECT92-L0108		2888			0.343
L	1992	10	0.433	10	24.4	153.5	F	0.95	GECT92-L0227		2859			0.325
L	1992	10	0.585	5	23.5	110.4	F	0.72	GECT92-L0228		2861			0.464
L	1992	10	0.120	6	23	133.4	F	0.79	GECT92-L0229		2860			0.095
S	1988	8	0.030	5	25.1	187.03	F	0.91	88-160	A		0.03	0.03	
S	1988	8	0.030	7	22.4	141.62	M	0.56	88-160	B		0.03	0.03	
S	1988	8	0.030	5	19.5	164.64	M	0.49	88-160	C		0.03	0.03	
W	1988	8	0.030	9	21.6	111.4	F	1.07	88-141	A		0.03	0.03	
W	1988	8	0.030	9	19.9	154.75	M	0.68	88-141	B		0.03	0.03	
W	1988	8	0.030	9	19.3	143.42	F	0.49	88-141	C		0.03	0.03	
Z	1984	8	0.070	3	18.5	81.2	F	0.47	273 061A			0.07	0.03	

SPECIES = YELLOW PERCH (YP)

STA	YEAR	MO	TPCB	AGE	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
Z	1984	8	0.060	3	19.3	75.9	M	0.45	274 061B			0.06	0.03	
Z	1988	8	0.278	10	24	141.38	M	0.50	88-077			0.03	0.278	
Z	1988	8	0.365	6	19.5	101.07	M	0.86	88-101	K		0.125	0.24	
Z	1988	8	0.030	2	20.3	95	F	0.72	88-101	O		0.03	0.03	
Z	1988	8	0.347	6	23.1	151.6	F	0.78	88-101	P		0.163	0.184	
Z	1988	8	0.134	6	21.2	98.84	F	0.71	88-101	Q		0.053	0.081	
Z	1988	8	0.030	6	22.3	119.43	F	0.76	88-101	R		0.03	0.03	
Z	1988	8	0.354	9	25.8	191.74	F	0.74	88-101	S		0.162	0.192	
Z	1990	8	0.283	8	23.6	123.7	F	0.23	Z0003	A	1330	0.128	0.155	
Z	1990	8	0.186	3	18.2	76.95	F	0.36	Z0003	B	1321	0.081	0.105	
Z	1990	8	0.186	11	22	137.86	F	0.35	Z0015	A	1313	0.088	0.098	
Z	1990	8	0.098	4	21.1	117.7	F	0.33	Z0015	B	1335	0.062	0.036	
Z	1990	8	0.242	8	22	130.2	M	0.27	Z0015	C	1337	0.08	0.162	
Z	1990	8	0.110	6	21.2	116.6	F	0.25	Z0015	D	1341	0.062	0.048	
Z	1990	8	0.226	7	23.1	142.5	F	0.24	Z0015	E	1315	0.092	0.134	
Z	1990	8	0.219	3	21	117.2	F	0.49	Z0015	F	1316	0.105	0.114	
Z	1990	8	0.144	8	24.2	157	F	0.25	Z0015	G	1317	0.066	0.078	
Z	1990	8	0.390	11	24.2	147.9	F	0.31	Z0015	H	1336	0.154	0.236	
Z	1990	8	0.212	10	23.1	121.5	M	0.26	Z0015	I	1320	0.076	0.136	
Z	1990	8	0.105	3	19.8	89.7	F	0.41	Z0015	J	1344	0.061	0.044	
Z	1990	8	0.184	3	19.5	82.4	F	0.34	Z0015	K	1318	0.136	0.048	
Z	1990	8	0.410	3	17	61.3	F	0.76	Z0015	L	1324	0.198	0.212	
Z	1990	8	0.174	4	19.5	88.5	F	0.46	Z0015	M	1333	0.069	0.105	
Z	1990	8	0.406	4	18.5	79.3	M	0.53	Z0015	N	1319	0.141	0.265	
Z	1990	8	0.324	3	17.7	72.1	F	0.42	Z0015	O	1314	0.183	0.141	
Z	1990	8	0.648	3	18.3	70.2	F	0.69	Z0015	P	1334	0.298	0.35	
Z	1992	8	0.117	5	20	98.2	F	0.92	GECT92-Z0145		2871			0.095
Z	1992	8	0.115	5	22.3	125.9	F	0.62	GECT92-Z0147		2870			0.092
Z	1992	8	0.993	6	25.1	155.8	F	0.63	GECT92-Z0176		2863			0.686
Z	1992	8	0.439	8	24.4	143.3	F	0.79	GECT92-Z0176		2864			0.337
Z	1992	8	0.163	6	23.3	131	F	0.79	GECT92-Z0176		2865			0.134
Z	1992	8	0.461	8	21.4	113.9	F	0.85	GECT92-Z0177		2866			0.377
Z	1992	8	0.154	5	22.1	110	F	0.78	GECT92-Z0177		2867			0.120
Z	1992	10	0.302	5	21	101.7	F	0.96	GECT92-Z0222		2868			0.242

SPECIES = BROWN TROUT (BT)

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
C	1984	7	1.920			N	25.5	183.5	M	2.80	022 010A			0.79	1.13	
C	1984	7	2.238	1.5	1.3	B	21.2	100.3	M	2.60	023 010B			0.998	1.24	
C	1984	7	12.180	3.5	2.3	U	29.9	317.9	F	6.90	024 010C			4.4	7.78	
C	1984	7	0.550	1.5	1.3	B	25.2	159.5	M	2.60	025 010D			0.27	0.28	
C	1984	7	3.370	3	0	N	24	142.8	M	4.10	026 010E			2.28	1.09	
C	1984	7	2.530	2.5	2.3	U	29.2	253.9	F	3.00	028 011A			0.89	1.64	
C	1984	7	2.600	1.5	1.3	B	24.5	157	M	2.90	029 011B			1.09	1.51	
C	1984	7	0.350	2.5	2.3	U	24.6	160.6	M	3.70	030 011C			0.16	0.19	
C	1984	7	6.840	3.5	2.3	U	30.2	277.8	M	2.10	031 012A			1.63	5.21	
C	1984	7	1.630	2.5	2.3	B	26.2	215.2	M	4.30	032 012C			0.66	0.97	
C	1984	7	8.790	4.5	1.3	Q	31.5	308.7	F	2.35	035R012B			4.48	4.31	
C	1984	7	0.660	1.5	1.3	B	25.4	179.6	M	2.35	067R013A			0.275	0.385	
C	1984	7	4.530	2.5	1.3	Q	27.6	201.6	F	2.10	068 013B			1.51	3.02	
C	1984	7	1.960	1.5	1.3	B	26	185.1	M	3.80	069 013C			0.84	1.12	
C	1984	7	0.990	2.5	2.3	U	27.4	191	M	2.30	070 013D			0.31	0.68	
C	1984	7	4.120	1.5	1.3	B	23.2	136.4	M	3.10	099 017A			0.93	3.19	
C	1984	7	0.770	1.5	1.3	B	23.6	142.6	F	2.20	100 017B			0.34	0.43	
C	1984	7	0.980	1.5	1.3	B	26.5	174.4	M	1.25	101R017C			0.556	0.424	
C	1984	7	4.490	2	0	N	18.4	80.8	M	4.70	103 017D			1.53	2.96	
C	1984	7	1.790	1.5	1.3	B	17.4	59.1	M	0.29	117 015A			0.76	1.03	
C	1984	7	1.600	1.5	1.3	B	26.6	194.9	M	2.00	119 015C			0.53	1.07	
C	1984	7	6.960	3.5	1.3	Q	31.8	320.8	M	1.90	144 014B			2.1	4.86	
C	1984	7	14.570	5.5	2.3	U	32.4	297.2	F	3.60	145 014C			3.72	10.85	
C	1984	7	8.380	3.5	2.3	U	30.1	285.4	F	3.50	146 014D			2.44	5.94	
C	1984	7	1.160	2.5	2.3	U	19.9	80.9	M	2.70	147 018A			0.49	0.67	
C	1984	7	2.930	2.5	2.3	U	24.2	148.2	M	3.10	163 016B			1.06	1.87	
C	1984	7	1.780	2.5	2.3	U	23.9	144.1	M	2.00	164 016C			0.53	1.25	
C	1984	7	1.540	1.5	1.3	B	23	137.3	M	2.80	208 011D			0.68	0.86	
C	1984	7	0.960	1.5	1.3	B	20.6	86.4	F	2.80	209 011E			0.39	0.57	
C	1984	7	1.220	2.5	2.3	U	25.1	165.4	F	2.90	216 016D			0.46	0.76	
C	1984	7	3.235	4.5	2.3	U	32.1	334.9	M	1.40	217R018B			0.885	2.35	
C	1984	7	1.120	1.5	1.3	B	24.9	147.1	M	3.60	270 015D			0.51	0.61	

SPECIES = BROWN TROUT (BT)

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
C	1984	7	3.750	1.5	1.3	B	22.7	133.3	M	3.30	272 015B			1.26	2.49	
C	1984	7	0.550	2.5	2.3	U	30.1	304.3	F	5.00	320 012D			0.25	0.3	
C	1984	7	6.030	3.5	1.3	Q	33	380.5	F	3.40	328 014A			2.1	3.93	
C	1984	7	4.900	2.5	1.3	Q	27.7	208.6	F	1.90	329 016A			1.59	3.31	
C	1986	8	8.550	4.5	1.3	Q	35	463.2	F	3.70	86-27-75			2.86	5.69	
C	1986	8	16.170	6.5	2.3	B	40.2	696.2	M	4.35	86-27-76			5.11	11.06	
C	1986	8	9.350	3.5	1.3	B	35.3	428.6	M	1.90	86-27-77			2.65	6.7	
C	1986	8	1.920	3.5	1.3		26	208.9	M	4.70	86-27-78			0.7	1.22	
C	1986	8	6.780	2.5	1.3	B	28.1	287.7	M	3.50	86-28-80			2.18	4.6	
C	1986	8	5.390	1.5	1.3	B	28	280.6	F	6.10	86-28-81			2.39	3	
C	1986	8	2.730	2.5	2.3	B	24.3	164.5	M	2.20	86-29-84			1.21	1.52	
C	1986	8	3.500	3.5	2.3		26.3	190.4	M	2.30	86-29-85			1.1	2.4	
C	1986	8	23.570	4.5	2.3	B	33.4	422.6	F	4.40	86-29-86			8.33	15.24	
C	1986	8	8.470	3.5	1.3	B	31.3	330.9	M	3.70	86-29-87			2.11	6.36	
C	1986	8	5.360	2.5	1.3	B	29.5	316.4	F	3.70	86-29-88			1.77	3.59	
C	1986	8	2.020	2.5	2.3	B	23.1	164.1	M	3.40	86-30-89			0.75	1.27	
C	1986	8	14.080	3.5	1.3	B	31.8	350.6	M	3.40	86-30-90			4.26	9.82	
C	1986	8	5.600	2.5	1.3	B	29.2	277	M	3.20	86-30-91			1.88	3.72	
C	1986	8	2.270	3.5	2.3	B	29.4	290.7	F	4.40	86-30-92			0.88	1.39	
C	1986	8	3.100	3.5	1.3		27	244.7	F	3.90	86-30-93			1.02	2.08	
C	1986	8	3.500	1.5	1.3	B	21.5	137.2	M	3.40	86-31-94			0.3	3.2	
C	1986	8	9.640	2.5	1.3	B	25	207.8	M	6.10	86-31-95			2.83	6.81	
C	1986	8	3.790	2.5	2.3	B	25.8	211.3	M	5.10	86-31-96			1.24	2.55	
C	1986	8	4.420	2.5	1.3	B	29.2	293.5	M	2.50	86-31-97			1.38	3.04	
C	1986	8	7.820	2.5	1.3	B	28.2	287.9	F	5.00	86-32-100			2.56	5.26	
C	1986	8	5.280	2.5	1.3	B	23.6	148.2	M	2.80	86-32-98			1.79	3.49	
C	1986	8	4.740	2.5	1.3	B	26.8	361.4	F	4.80	86-32-99			1.62	3.12	
C	1986	10	5.290	4.9			47	943.4	F	2.40	86-48-153			2.24	3.05	
C	1988	8	4.693	3.5	1.3	Bi	39.4	689.9	M	3.65	88-032			1.539	3.154	
C	1988	8	4.759	4.5	1.3	Bi	40.4	792.3	M	4.45	88-033			1.465	3.294	
C	1988	8	5.741	5.5	1.3	Bi	40.8	689.7	M	3.60	88-034			2.014	3.727	
C	1988	8	6.089	3.5	1.3	Bi	39.5	767.1	M	6.16	88-035			1.772	4.317	

SPECIES = BROWN TROUT (BT)

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
C	1988	8	4.075	4.5	2.3	U	40	779.4	M	3.05	88-036			1.126	2.949	
C	1988	8	3.554	3.5	1.3	Bi	36.8	607.3	M	2.80	88-037			1.14	2.414	
C	1988	8	5.074	3.5	1.3	Bi	36.3	591.5	F	4.25	88-038			1.685	3.389	
C	1988	8	3.773	1.5	1.3	Bi	19.8	81.54	M	2.25	88-039	A		1.006	2.767	
C	1988	8	4.656	1.5	1.3	Bi	18.2	68.35	M	2.55	88-039	C		1.484	3.172	
C	1988	8	2.834	1.5	1.3	Bi	18.1	65.11	M	1.43	88-039	D		0.878	1.956	
C	1988	8	3.491	1.5	1.3	Bi	21.9	92.66	M	1.80	88-040	A		0.814	2.677	
C	1988	8	3.734	1.5	1.3	Bi	19.9	78.4	M	2.20	88-040	B		0.97	2.764	
C	1988	8	4.768	1.5	1.3	Bi	21.3	89.59	F	1.75	88-040	C		1.384	3.384	
C	1988	8	5.311	1.5	1.3	Bi	20.7	94.36	M	2.31	88-040	E		1.417	3.894	
C	1988	8	3.622	1.5	1.3	Bi	18.7	62.82	F	1.50	88-041	A		0.883	2.739	
C	1988	8	3.511	1.5	1.3	Bi	17.8	59.53	M	1.37	88-041	B		0.867	2.644	
C	1988	8	2.602	1.5	1.3	Bi	20.6	85.76	M	1.65	88-041	C		0.766	1.836	
C	1988	8	10.096	3.5	2.3	U	33.6	459.76	F	5.50	88-043	A		2.938	7.158	
C	1988	8	6.366	3.5	2.3	U	31.6	342.63	M	2.66	88-043	B		1.772	4.594	
C	1988	8	8.316	3.5	2.3	U	31.8	385.39	M	3.40	88-043	C		2.222	6.094	
C	1988	8	8.076	3.5	2.3	U	36	524.6	F	4.76	88-044	A		2.33	5.746	
C	1988	8	4.997	2.5	1.3	Bi	28.5	236.38	M	3.44	88-044	B		1.451	3.546	
C	1988	8	7.489	2.5	1.3	Bi	30.8	364.73	F	6.35	88-045	A		2.509	4.98	
C	1988	8	5.434	2.5	1.3	Bi	29.2	335.5	M	4.15	88-045	B		1.764	3.67	
C	1988	8	14.166	4.5	1.3	Bi	34.5	506.8	F	4.75	88-063	A		3.583	10.58	
C	1988	8	9.605	3.5	1.3	Bi	34.5	475.48	M	6.28	88-063	B		3.013	6.592	
C	1988	8	16.702	4.5	1.3	Bi	34.5	423.58	F	4.71	88-066			4.781	11.92	
C	1988	10	3.496	1.7	1.3	Bi	21.2	108.19	M	0.98	88-260	A		1.01	2.486	
C	1988	10	4.145	1.7	1.3	Bi	19.2	78.58	F	2.05	88-260	B		1.471	2.674	
C	1988	10	7.665	1.7	1.3	Bi	24.7	160.86	M	2.23	88-261			1.865	5.8	
C	1988	10	3.741	1.7	1.3	Bi	20.4	76.44	M	0.75	88-306	A		0.865	2.876	
C	1988	10	3.938	1.7	1.3	Bi	20.5	87.53	M	0.76	88-306	B		0.927	3.011	
C	1988	10	4.167	1.7	1.3	Bi	22.1	108.03	M	0.90	88-306	C		1.043	3.124	
C	1988	10	3.223	1.7	1.3	Bi	21.6	103.94	F	1.07	88-306	D		0.745	2.478	
C	1988	10	5.181	1.7	1.3	Bi	23.1	132.32	M	1.81	88-306	E		1.358	3.823	
C	1988	10	5.602	1.7	1.3	Bi	21.3	97.61	F	1.32	88-306	F		1.442	4.16	

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = BROWN TROUT (BT)																
C	1990	9	2.987	2.7	2.3	U	30	296.5	F	1.64	C0034	A	1459	1.453	1.534	
C	1990	9	3.805	2.7	2.3	U	28.4	228.4	M	0.98	C0034	B	1452	1.647	2.158	
C	1990	9	4.522	2.7	2.3	U	26.1	180.6	M	1.42	C0034	C	1450	1.991	2.531	
C	1990	9	6.699	2.7	2.3	U	28.6	247.3	M	2.29	C0035	A	1451	2.925	3.774	
C	1990	9	3.723	2.7	2.3	U	26.6	205.1	F	1.78	C0035	B	1457	1.714	2.009	
C	1990	9	5.225	1.7	1.3	S	25	156.4	M	1.03	C0036	A	1456	2.289	2.936	
C	1990	9	5.936	1.7	1.3	S	24.2	153.8	M	1.64	C0036	B	1454	2.554	3.382	
C	1990	9	6.291	1.7	1.3	S	23.4	135.37	M	1.31	C0036	C	1455	2.597	3.694	
C	1990	9	5.727	1.7	1.3	S	22.7	132.04	M	1.75	C0036	D	1453	2.484	3.243	
C	1990	9	6.669	1.7	1.3	S	24.5	169.8	F	1.53	C0038	A	1458	2.834	3.835	
C	1990	9	5.284	1.7	1.3	S	24.3	170.21	F	2.10	C0039	A	1470	2.336	2.948	
C	1990	9	6.785	1.7	1.3	S	22.4	111.2	F	1.16	C0039	B	1465	2.712	4.073	
C	1990	9	5.715	1.7	1.3	S	22.4	116.3	M	1.00	C0039	C	1468	2.343	3.372	
C	1990	9	7.312	1.7	1.3	S	22.5	112.1	M	1.28	C0039	D	1466	2.592	4.72	
C	1990	9	7.077	1.7	1.3	S	24	141.15	F	2.08	C0042	A	1471	2.985	4.092	
C	1990	9	8.016	1.7	1.3	S	21.7	112	M	1.58	C0042	B	1461	3.332	4.684	
C	1990	9	7.888	1.7	1.3	S	21.9	115.26	M	2.09	C0042	C	1462	3.346	4.542	
C	1990	9	4.959	1.7	1.3	S	22.3	109.8	F	0.92	C0042	D	1464	2.038	2.921	
C	1990	9	9.266	2.7	1.3	Bi	28	250.3	M	2.20	C0044	A	1472	3.896	5.37	
C	1990	9	8.341	2.7	1.3	Bi	27.5	222.6	F	3.11	C0044	B	1469	3.484	4.857	
C	1990	9	6.695	2.7	1.3	Bi	29.5	263.9	M	1.83	C0044	C	1460	2.819	3.876	
C	1990	9	5.732	2.7	1.3	Bi	27.6	214.7	M	1.21	C0044	D	1463	2.368	3.364	
C	1990	9	9.304	4.7	1.3		29.6	261.7	F	2.37	C0045		1467	3.534	5.77	
C	1990	10	4.557	1.8	1.3	S	24.9	160.77	M	0.70	C0089		1482	1.714	2.843	
C	1990	10	7.828	3.7	1.3	Bi	28.4	235.6	M	0.56	C0090		1473	2.646	5.182	
C	1990	10	3.447	1.8	1.3	S	23	182.7	M	0.79	C0091		1479	1.383	2.064	
C	1990	10	4.170	3.8	0.3		30	245.3	M	0.99	C0092		1483	1.826	2.344	
C	1990	10	4.221	1.8	1.3	S	25	161.56	M	0.80	C0093		1485	1.731	2.49	
C	1990	10	3.380	1.8	1.3	S	25.7	173.47	M	0.74	C0094		1474	1.401	1.979	
C	1990	10	5.052	2.8	1.3	Bi	24.9	154.72	M	0.82	C0095		1475	1.93	3.122	
C	1990	10	3.770	1.8	1.3	S	24	139.62	M	0.79	C0096		1484	1.443	2.327	
C	1990	10	3.333	1.8	1.3	S	23.8	127.99	M	0.26	C0097		1476	1.325	2.008	

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = BROWN TROUT (BT)																
C	1990	10	5.522	1.8	1.3	S	21.9	93.3	M	0.41	C0098		1481	2.124	3.398	
C	1990	10	4.008	1.8	1.3	S	23	124.25	M	0.38	C0099		1480	1.521	2.487	
C	1990	10	4.311	1.8	1.3	S	23.3	125.57	F	0.39	C0100		1477	1.695	2.616	
C	1990	10	2.933	1.8	1.3	S	23.1	115.7	F	0.36	C0101		1478	1.119	1.814	
C	1992	6	2.464	1.6	1.5		17	62.3	I	2.89	GECT92-C0002A		2989			1.90
C	1992	6	2.862	1.6	1.5		17.4	65.7	I	3.65	GECT92-C0003A		2994			2.25
C	1992	6	3.771	1.6	1.5		17.8	67.6	I	3.04	GECT92-C0004A		2988			3.01
C	1992	6	3.847	1.6	1.5		18.9	80.6	I	4.72	GECT92-C0005A		2993			3.10
C	1992	6	4.243	1.6	1.5		18.7	81	I	4.12	GECT92-C0006A		2992			3.45
C	1992	6	4.590	1.6	1.5		19.8	94.1	I	3.39	GECT92-C0011A		2991			3.64
C	1992	6	3.549	1.6	1.5		21.2	112.7	I	5.00	GECT92-C0015		2990			2.81
C	1992	7	5.535	1.6	1.5		23.9	162.1	I	4.42	GECT92-C0017		2986			4.38
C	1992	7	9.500	1.6	1.5		23.2	144	I	4.49	GECT92-C0019		2987			7.55
C	1992	8	11.368	3.6	1.3		35.2	547.5	M	6.08	GECT92-C0029		2957			8.74
C	1992	8	9.483	2.7	2.5		31	325.1	F	4.77	GECT92-C0033		2962			7.56
C	1992	8	8.867	2.7	2.5		27	252.7	F	5.26	GECT92-C0037		2954			7.16
C	1992	8	8.272	1.7	1.5		22.2	128.9	I	3.29	GECT92-C0038A		2982			6.78
C	1992	8	5.780	1.7	1.5		22.5	144.6	I	3.96	GECT92-C0038B		2983			4.43
C	1992	8	6.658	1.7	1.5		23.1	153.7	I	5.16	GECT92-C0038C		2984			5.35
C	1992	8	9.800	1.7	1.5		23.6	161.3	I	4.55	GECT92-C0038D		2985			8.01
C	1992	8	5.839	1.7	1.5		21.6	110.8	I	2.61	GECT92-C0039A		2964			4.66
C	1992	8	6.155	1.7	1.5		22.4	118.4	I	1.83	GECT92-C0039B		2965			4.97
C	1992	8	18.341	4.8	2.3		38	756.6	M	6.71	GECT92-C0044		2980			14.16
C	1992	8	18.327	2.6	1.3		29.5	359.3	M	7.89	GECT92-C0048		2955			14.39
C	1992	8	18.350	3.7	2.3		33.4	466.7	F	7.41	GECT92-C0086		2971			14.00
C	1992	8	19.662	2.7	2.5		27.9	281.3	M	6.60	GECT92-C0087		2970			15.54
C	1992	8	10.658	1.7	1.5		25.3	193.5	I	4.52	GECT92-C0089B		2972			8.29
C	1992	8	12.687	1.7	1.5		22	139.1	I	4.66	GECT92-C0090A		2973			9.67
C	1992	8	9.609	1.7	1.5		24.8	192.4	I	5.81	GECT92-C0090B		2974			7.50
C	1992	8	7.418	1.7	1.5		21.7	125.4	I	3.64	GECT92-C0091A		2966			5.67
C	1992	8	12.707	1.7	1.5		22.7	138.2	M	4.81	GECT92-C0091B		2967			9.81
C	1992	8	11.201	1.7	1.5		20.8	101.8	IM	4.99	GECT92-C0092		2959			8.72

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = BROWN TROUT (BT)																
C	1992	9	12.393	1.8	1.5		25	150.1	M	3.30	GECT92-C0187		2960			9.93
C	1992	9	7.107	1.8	1.5		26	187.9	IM	2.94	GECT92-C0188		2956			5.65
C	1992	9	8.132	1.8	1.5		26.6	192.5	IM	3.04	GECT92-C0191		2978			6.57
C	1992	9	9.172	1.8	1.5		26.3	186.9	IM	3.19	GECT92-C0192		2977			7.17
C	1992	9	6.338	1.8	1.5		25.6	189	I	1.83	GECT92-C0193		2968			4.82
C	1992	9	6.745	1.8	1.5		27.7	225	M	3.15	GECT92-C0194		2958			5.14
C	1992	9	29.428	3.7	1.3		38	658	M	5.88	GECT92-C0195		2979			22.92
C	1992	10	6.684	1.9	1.5		26.3	195.8	I	2.65	GECT92-C0196		2969			5.15
C	1992	10	6.487	1.9	1.5		25.6	180.8	IM	2.13	GECT92-C0197		3243			4.88
C	1992	10	17.187	1.9	1.5		24.8	160	M	2.87	GECT92-C0198		2961			13.66
C	1992	10	8.745	1.9	1.5		29.2	262.7	I	3.61	GECT92-C0200		2981			6.90
C	1992	10	3.986	3.8	1.3		34.5	466.9	F	1.70	GECT92-C0201		2976			3.13
C	1992	10	7.740	1.9	1.5		28.3	249.4	I	3.13	GECT92-C0202		3244			5.88
C	1992	10	8.526	2.9	2.5		29.8	264.2	I	1.77	GECT92-C0203		2975			6.66
C	1992	10	13.188	3.8	1.3		33.8	429.7	F	2.64	GECT92-C0204		2963			9.88
C	1992	10	9.266	3.8	2.3		34	419.4	M	3.41	GECT92-C0205		3242			6.86
CO	1988	8	0.030	2			14.2	31.94	M	2.69	88-053	A		0.03	0.03	
CO	1988	8	0.030	2			25.3	157.58	F	2.25	88-053	B		0.03	0.03	
CO	1988	8	0.030	3			27	196.41	F	2.90	88-053	D		0.03	0.03	
FA	1988	10	0.030	2			30.2	290.26	M	1.98	88-302	A		0.03	0.03	
FA	1988	10	0.030	2			31	354.33	F	2.04	88-302	B		0.03	0.03	
FA	1988	10	0.030	2			27	217.1	M	2.78	88-302	C		0.03	0.03	
HA	1987	5	0.025	1	1	B		51.97		0.21	87-58-183			0.03	0.03	
HA	1987	5	0.030	1	1	B		75.88		0.25	87-58-184			0.03	0.03	
HA	1987	5	0.055	1	1	B		50.98		0.20	87-58-185			0.03	0.03	
HA	1987	5	0.030	1	1	B		27.92		0.13	87-58-186			0.03	0.03	
HA	1987	5	0.030	1	1	B		17.8		0.20	87-58-187			0.03	0.03	
HA	1987	5	0.030	2	2	Q		365.18		0.45	87-59-189			0.03	0.03	
HA	1987	5	0.030	2	2	Q		359.96		0.54	87-59-189			0.03	0.03	
HA	1987	5	0.030	2	2	Q		307.67		0.64	87-59-190			0.03	0.03	
HA	1987	5	0.030	2	2	Q		299.22		0.70	87-59-191			0.03	0.03	
HA	1987	5	0.030	2	2	Q		437.78		0.60	87-59-192			0.03	0.03	
HA	1987	5	0.030	2	2	Q		407.62		0.48	87-59-193			0.03	0.03	

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
SPECIES = BROWN TROUT (BT)																
HA	1988	5	0.030	1.3	1.3	Bi	18.5	60.17		2.12	88-026	A		0.03	0.03	
HA	1988	5	2.342	1.3	1.3	Bi	17.1	45.66		1.01	88-030	A		0.272	2.07	
HA	1988	5	0.030	1.3	1.3	Bi	17.8	57.67		2.00	88-030	B		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	17.7	51.23		2.04	88-030	C		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	19.1	74.27		2.68	88-030	D		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	17.6	53.55		0.95	88-030	E		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	16.5	41.45		2.18	88-031	A		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	16.4	44		1.38	88-031	B		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	17.9	52.33		1.79	88-031	C		0.03	0.03	
HA	1988	5	0.030	1.3	1.3	Bi	18.1	56.44		1.46	88-031	D		0.03	0.03	
HA	1988	5	0.543	1.3	1.3	Bi	16.2	42.07		2.36	88-031	E		0.159	0.384	
HA	1989	5	0.030	1		Q	17.7	48.12		3.28	89-2	A		0.03	0.03	
HA	1989	5	0.030	1		Q	16	39.93		3.26	89-2	B		0.03	0.03	
HA	1989	5	0.030	1		Q	17.5	51.63		4.60	89-2	C		0.03	0.03	
HA	1989	5	0.030	1		Q	16.1	47.19		4.86	89-2	D		0.03	0.03	
HA	1989	5	0.030			Q				3.04	89-2	EM		0.03	0.03	
HA	1989	5	0.030	1		Q	16.3	40.96		3.58	89-2	F		0.03	0.03	
HA	1989	5	0.030	1		Q	16	43.93		4.10	89-2	G		0.03	0.03	
HA	1989	5	0.030	1		Q	17.4	51.95		4.98	89-2	H		0.03	0.03	
HA	1989	5	0.030	1		Q	14.4	36.75		3.22	89-2	I		0.03	0.03	
HA	1989	5	0.030	1		Q	15	35.77		1.99	89-2	J		0.03	0.03	
HA	1989	5	0.030	1		Q	16.7	43.02		3.33	89-2	K		0.03	0.03	
HA	1989	5	0.030	1		Q	15.4	37.36		2.54	89-2	L		0.03	0.03	
HA	1989	5	0.030	1		Q	17.2	51		4.12	89-2	N		0.03	0.03	
HA	1989	5	0.030	1		Q	16.5	41.82		3.52	89-2	O		0.03	0.03	
MI	1988	8	0.030	3			26.5	208.58	F	4.65	88-056	A		0.03	0.03	
MI	1988	8	0.030	2			25.7	181.78	F	3.61	88-056	C		0.03	0.03	
MI	1988	8	0.030	2			17	49.63	M	2.50	88-056	D		0.03	0.03	
MI	1988	8	0.030	2			17.4	53.49	F	1.64	88-056	E		0.03	0.03	
PO	1988	8	0.030	2			16.5	51.25	M	4.40	88-055	A		0.03	0.03	
PO	1988	8	0.030	2			22.2	106.14	F	2.70	88-055	B		0.03	0.03	
SA	1988	8	0.030	3			24.1	145.4	M	2.10	88-054	A		0.03	0.03	
SA	1988	8	0.030	3			25.4	166.64	F	3.15	88-054	B		0.03	0.03	
SA	1988	8	0.030	3			25.1	159.36	F	0.55	88-054	C		0.03	0.03	

STA	YEAR	MO	TPCB	AGE	STO	ST	TL	TW	S	LIPID	SN	IND	ANAL	A1254	A1260	CTPCB
								SPECIES = RAINBOW TROUT (RT)								
C	1988	8	3.925	0.9	0.7	Er	19.2	70.71	M	1.24	88-105	A		1.169	2.756	
C	1988	8	2.949	0.9	0.7	Er	18.8	60.67	M	0.82	88-105	B		0.879	2.07	
C	1988	8	2.952	0.9	0.7	Er	20	83.26	M	1.04	88-105	C		0.854	2.098	
C	1988	8	3.400	0.9	0.7	Er	19	65.89	F	0.72	88-105	D		0.96	2.44	
C	1988	8	2.342	0.9	0.7	Er	19.1	77.67	M	1.22	88-105	E		0.824	1.518	
C	1988	8	4.285	0.9	0.7	Er	18.2	51.56	F	0.59	88-105	F		0.767	3.518	
C	1988	8	2.910	0.9	0.7	Er	20.6	93.15	F	0.60	88-105	G		0.827	2.083	
C	1988	8	2.322	0.9	0.7	Er	18.8	74.95	M	0.73	88-106			0.693	1.629	
C	1988	10	3.753	1.1	0.7	Er	25.4	180.47		1.63	88-305			1.024	2.73	
HA	1988	5	0.030			Er				5.38	88-021	AB		0.03	0.03	
HA	1988	5	0.030			Er				5.10	88-022	AB		0.03	0.03	
HA	1988	5	0.030			Er				6.54	88-023	AB		0.03	0.03	
HA	1988	5	0.030			Er				4.94	88-023	CD		0.03	0.03	
HA	1988	5	0.030			Er				5.27	88-025	AB		0.03	0.03	
HA	1988	5	0.030			Er				5.93	88-025	CE		0.03	0.03	
HA	1989	5	0.030			BU				8.15	89-1	AD		0.03	0.03	
HA	1989	5	0.030			BU				7.37	89-1	BC		0.03	0.03	
HA	1989	5	0.030			BU				7.74	89-1	EF		0.03	0.03	
HA	1989	5	0.030			BU				7.31	89-1	GK		0.03	0.03	
HA	1989	5	0.030							8.65	89-1	HL		0.03	0.03	
HA	1989	5	0.030			BU				8.51	89-1	IJ		0.03	0.03	

APPENDIX B.

GRAPHS OF LNTPCB AND LPCBLIP BY YEAR AND AGE FOR EACH SPECIES AND STATION

LIST OF FIGURES

APPENDIX B.

GRAPHS OF LNTPCB AND LPCBLIP BY YEAR AND AGE FOR EACH SPECIES AND STATION

LIST OF FIGURES

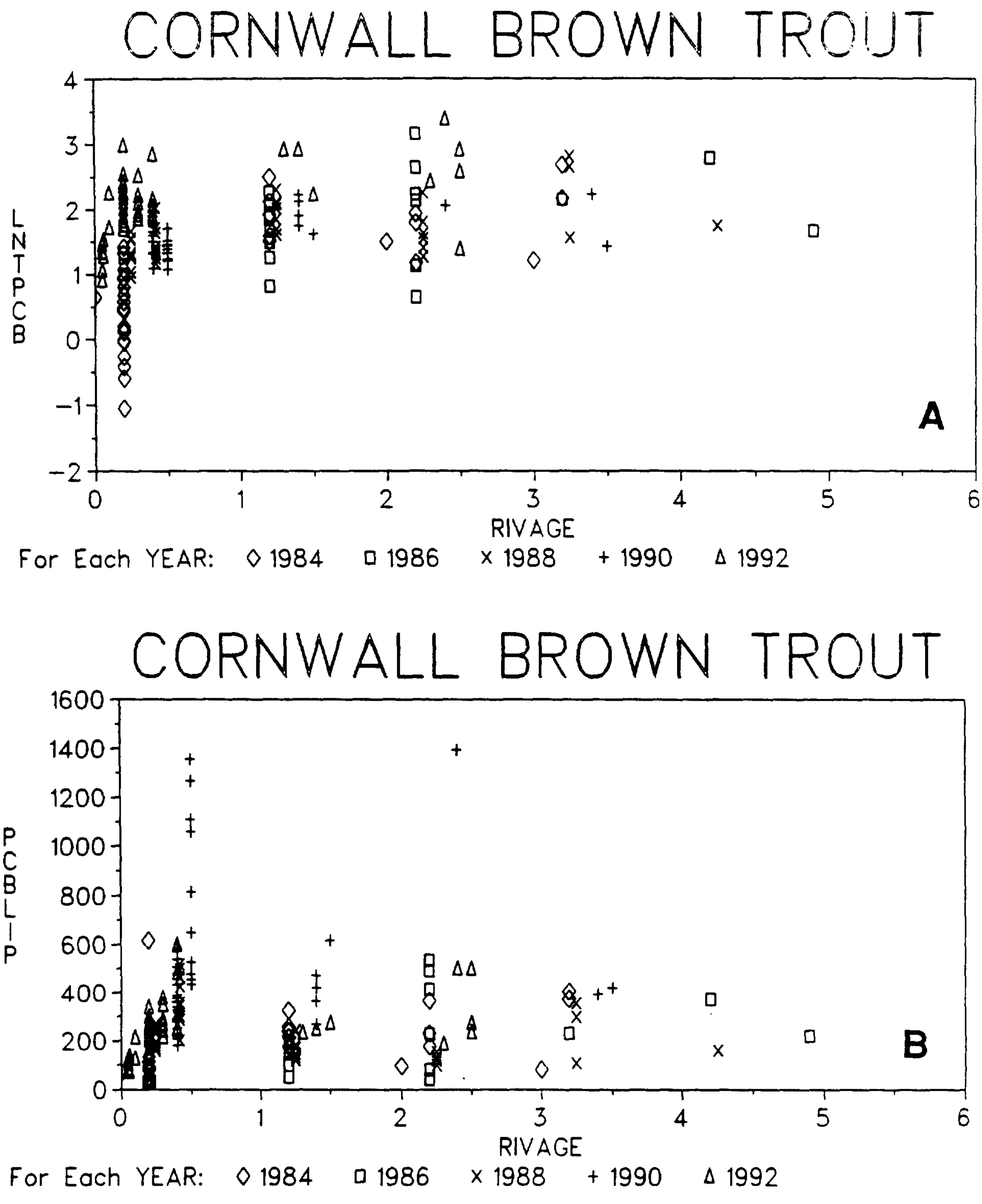


Figure B1. PCB (A) and lipid-normalized PCB (B) concentrations in brown trout from Cornwall as a function of river-age (number of years in the river since stocking). Data are from the Aroclor-based quantitation technique.

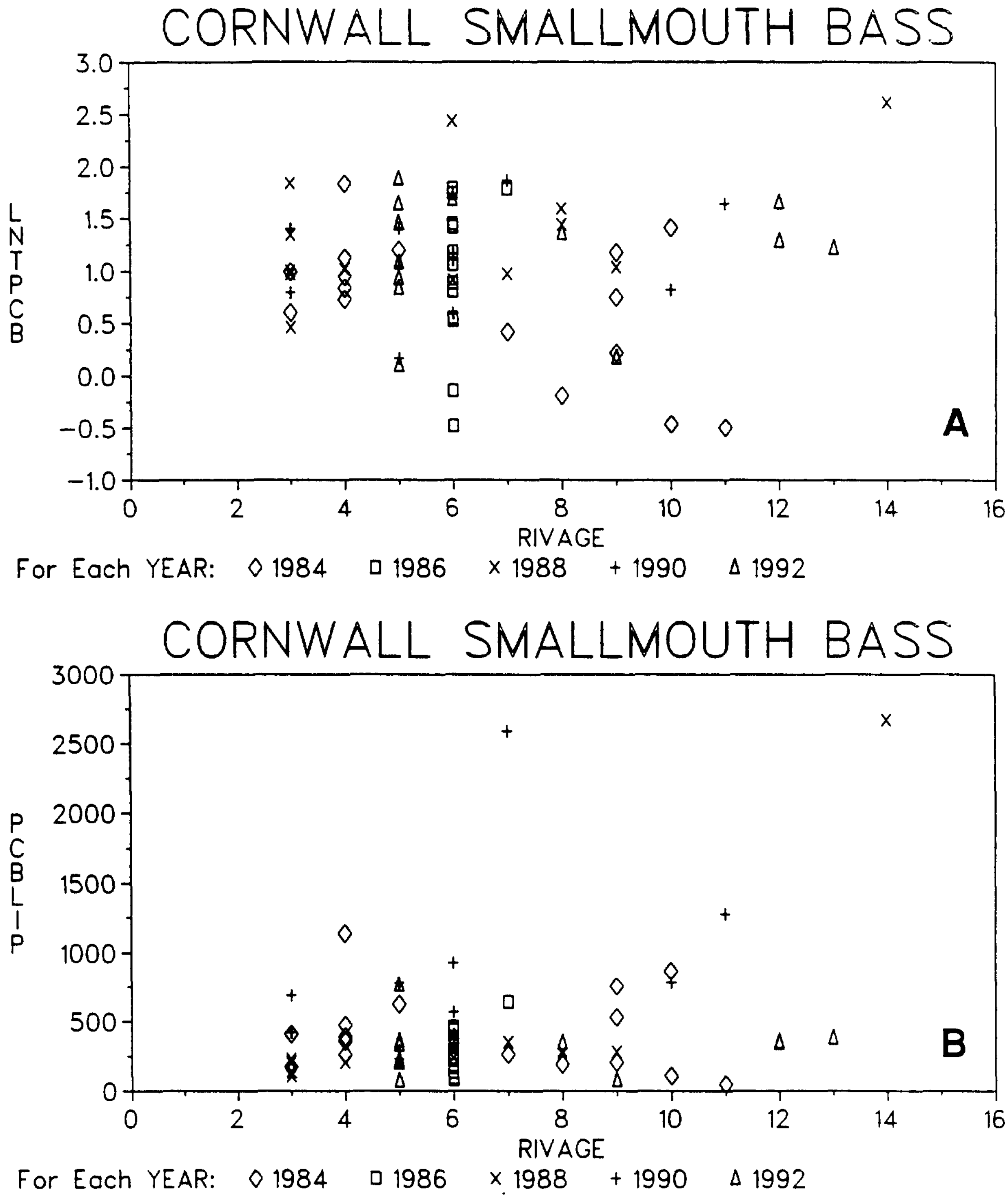


Figure B2. PCB (A) and lipid-normalized PCB (B) concentrations in smallmouth bass from Cornwall as a function of age. Data are from the Aroclor-based quantitation technique.

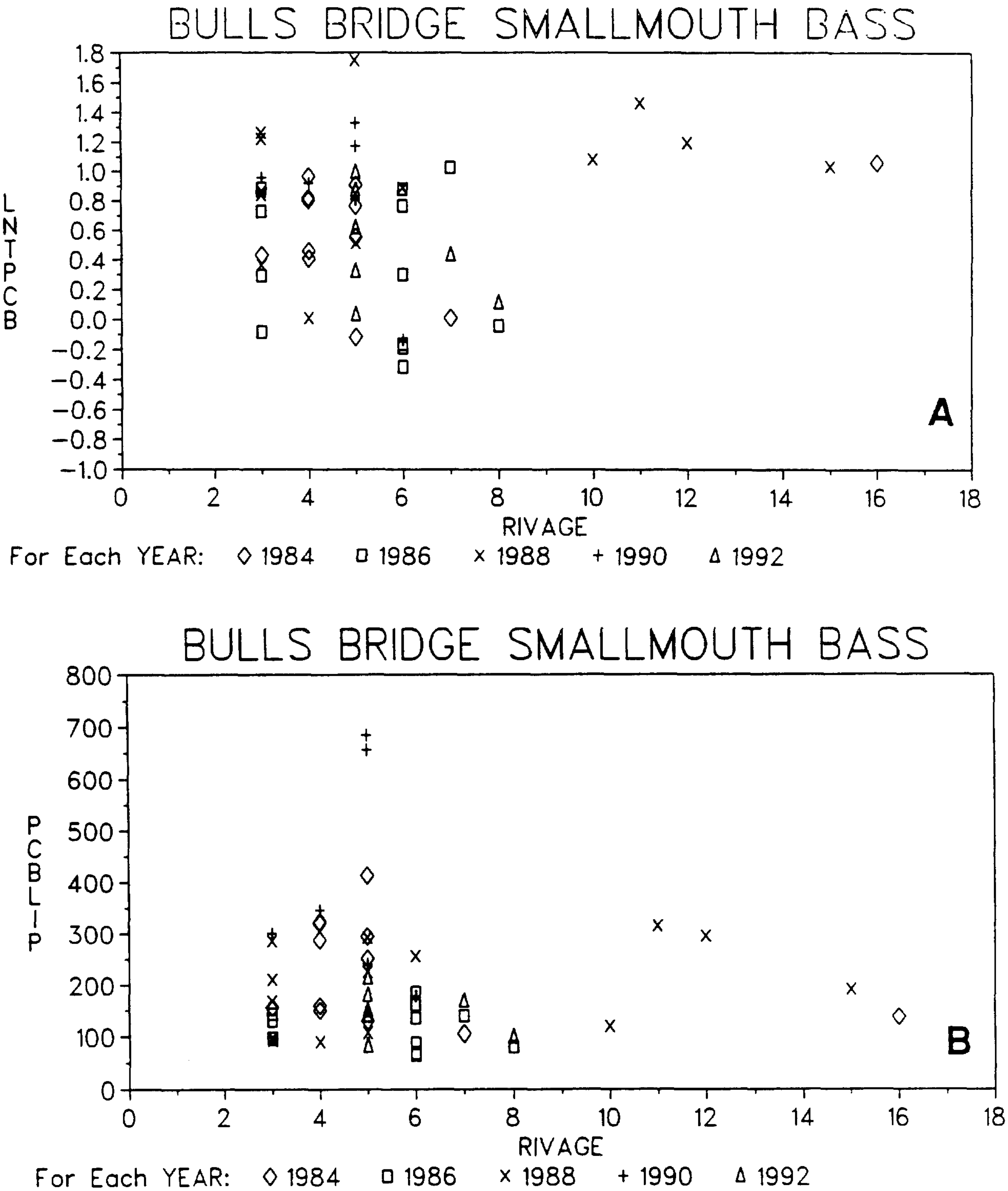
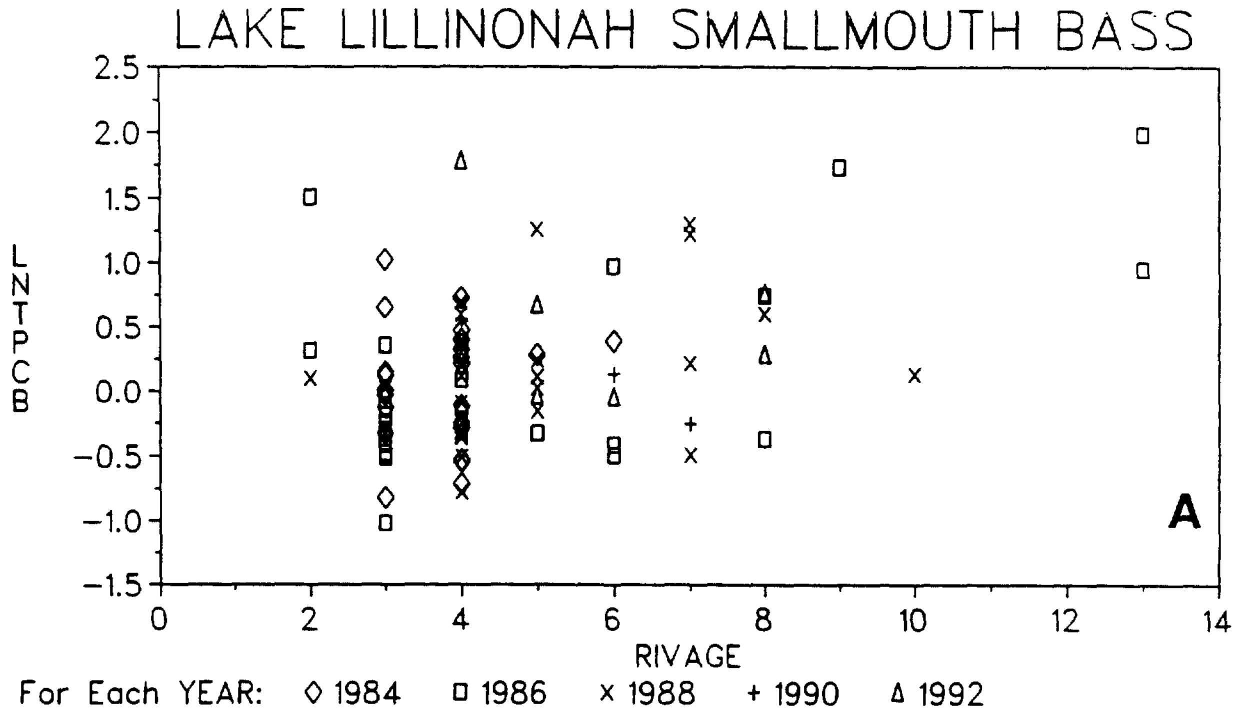


Figure B3. PCB (A) and lipid-normalized PCB (B) concentrations in smallmouth bass from Bulls Bridge as a function of age. Data are from the Aroclor-based quantitation technique.



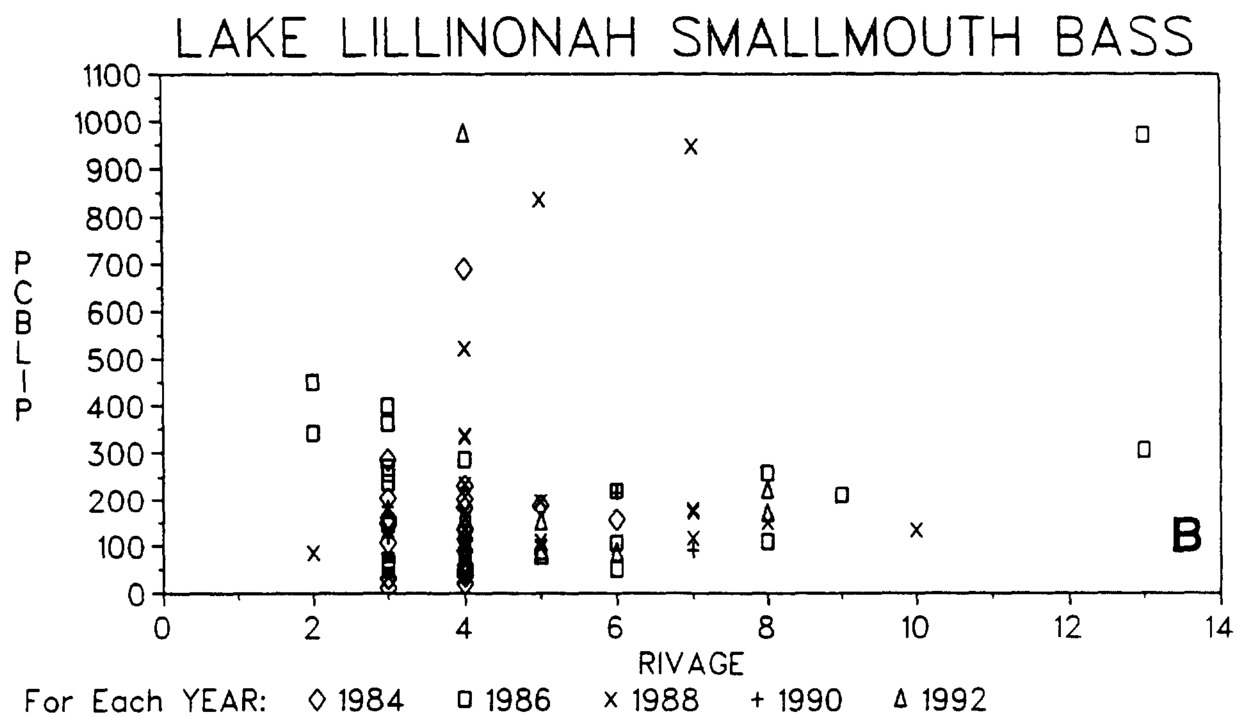


Figure B4. PCB (A) and lipid-normalized PCB (B) concentrations in smallmouth bass from Lake Lillinonah as a function of age. Data are from the Aroclor-based quantitation technique.

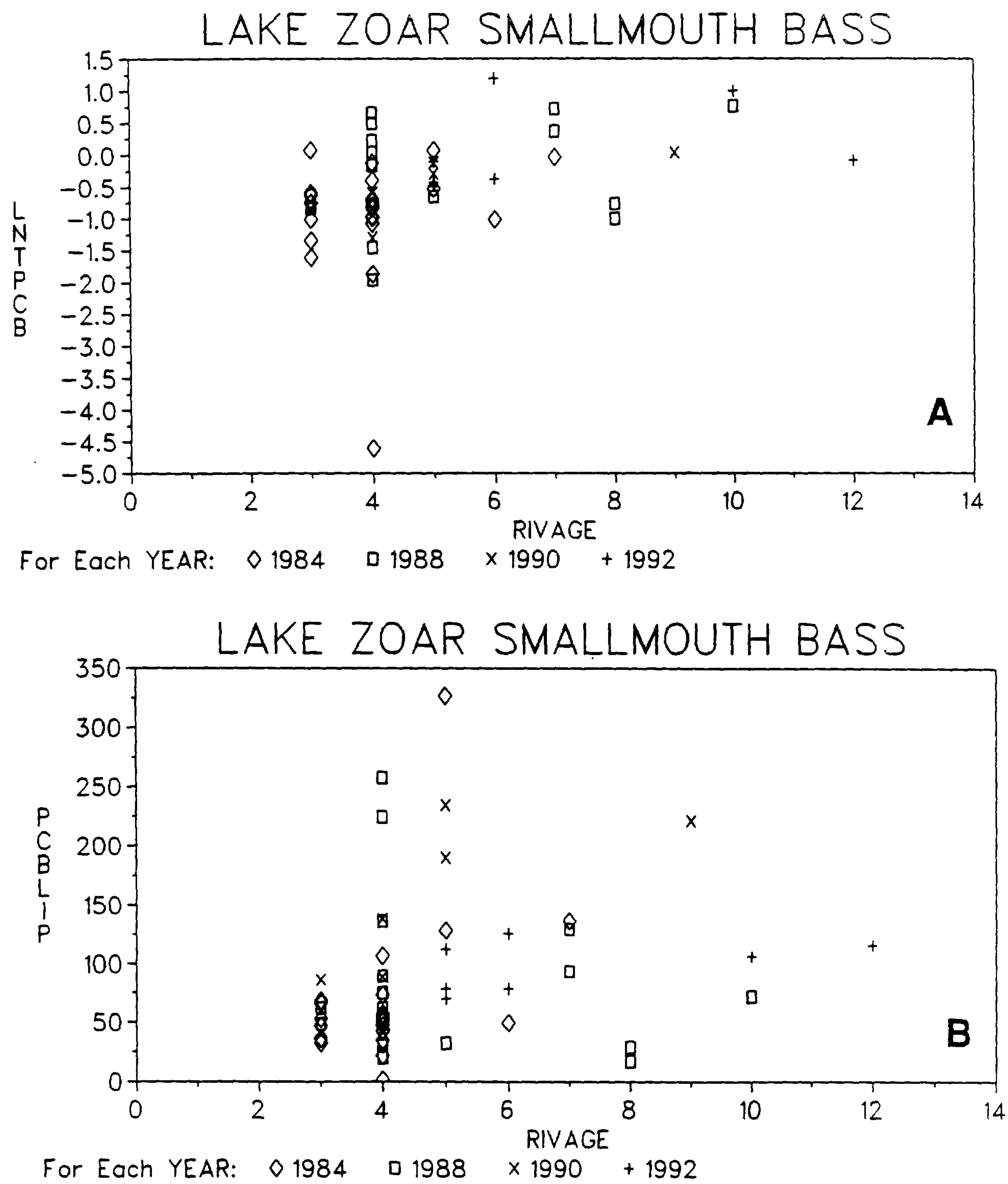
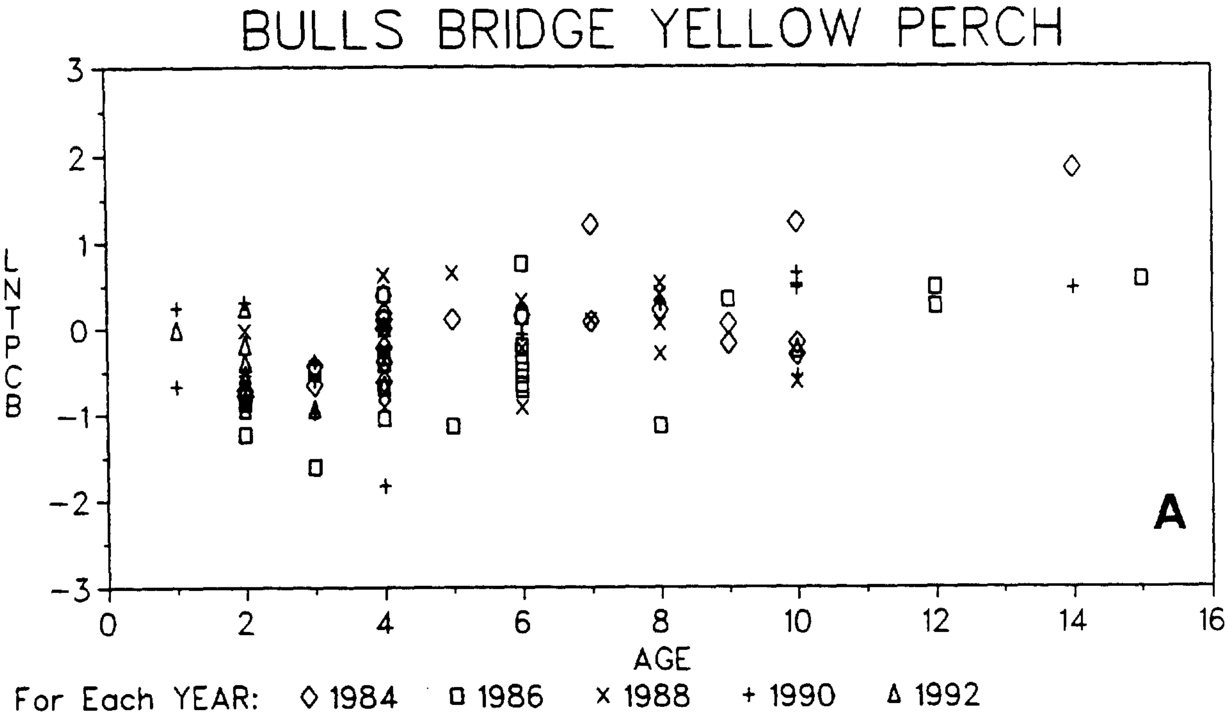


Figure B5. PCB (A) and lipid-normalized PCB (B) concentrations in smallmouth bass from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.



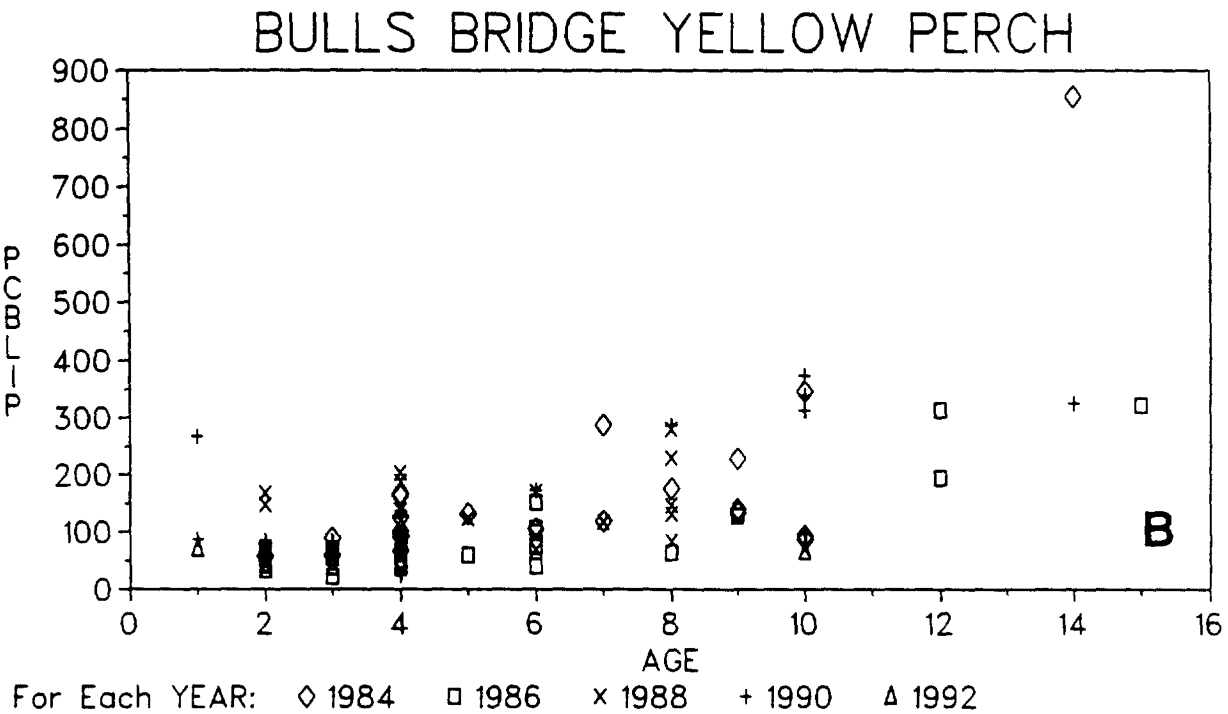
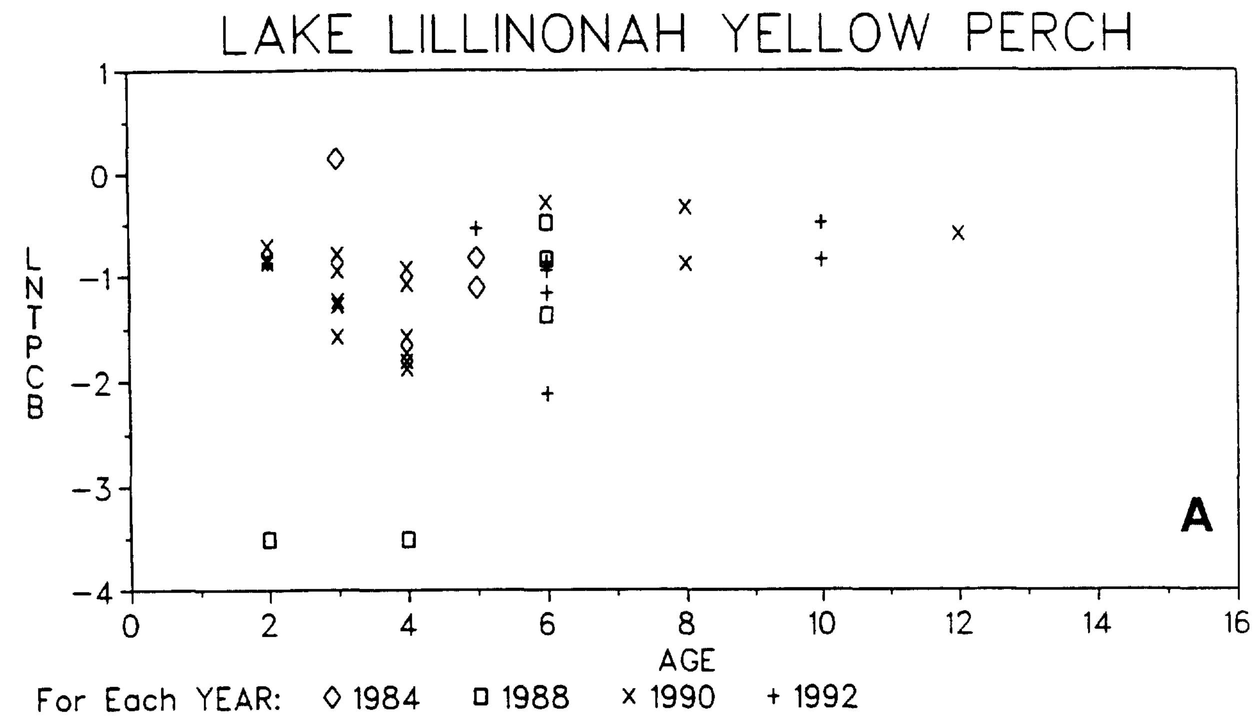


Figure B6. PCB (A) and lipid-normalized PCB (B) concentrations in yellow perch from Bulls Bridge as a function of age. Data are from the Aroclor-based quantitation technique.



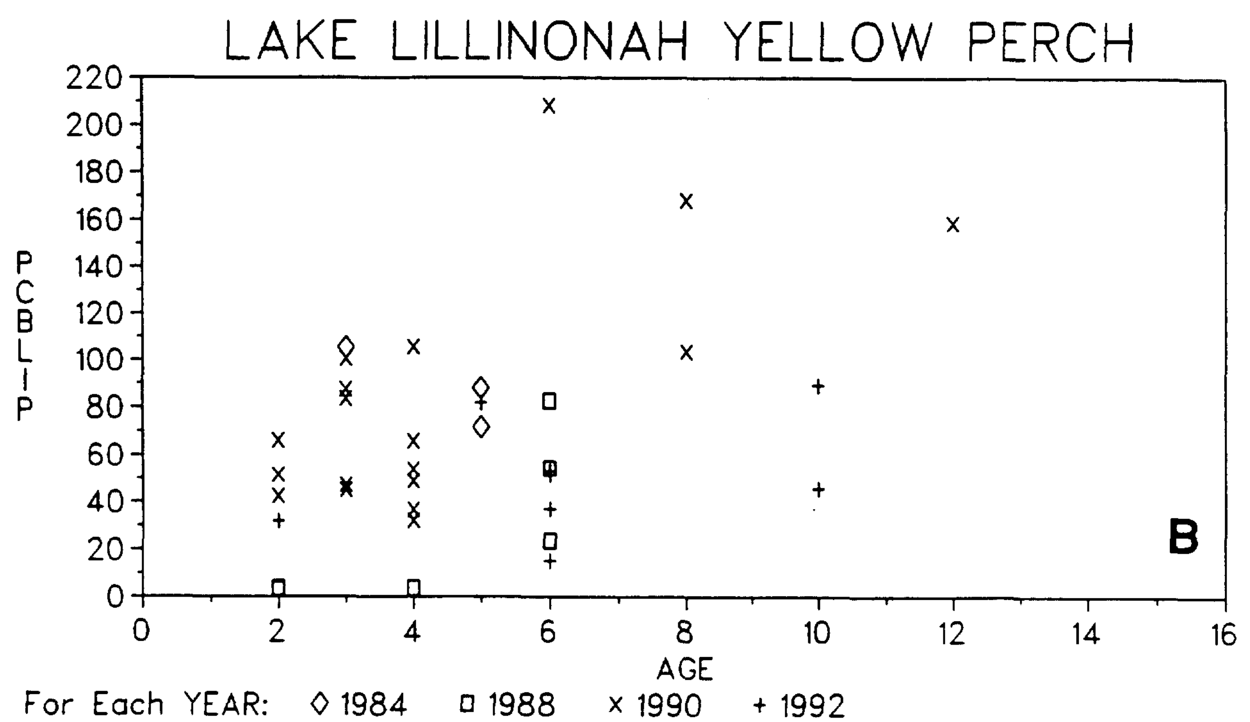


Figure B7. PCB (A) and lipid-normalized PCB (B) concentrations in yellow perch from Lake Lillinonah as a function of age. Data are from the Aroclor-based quantitation technique.

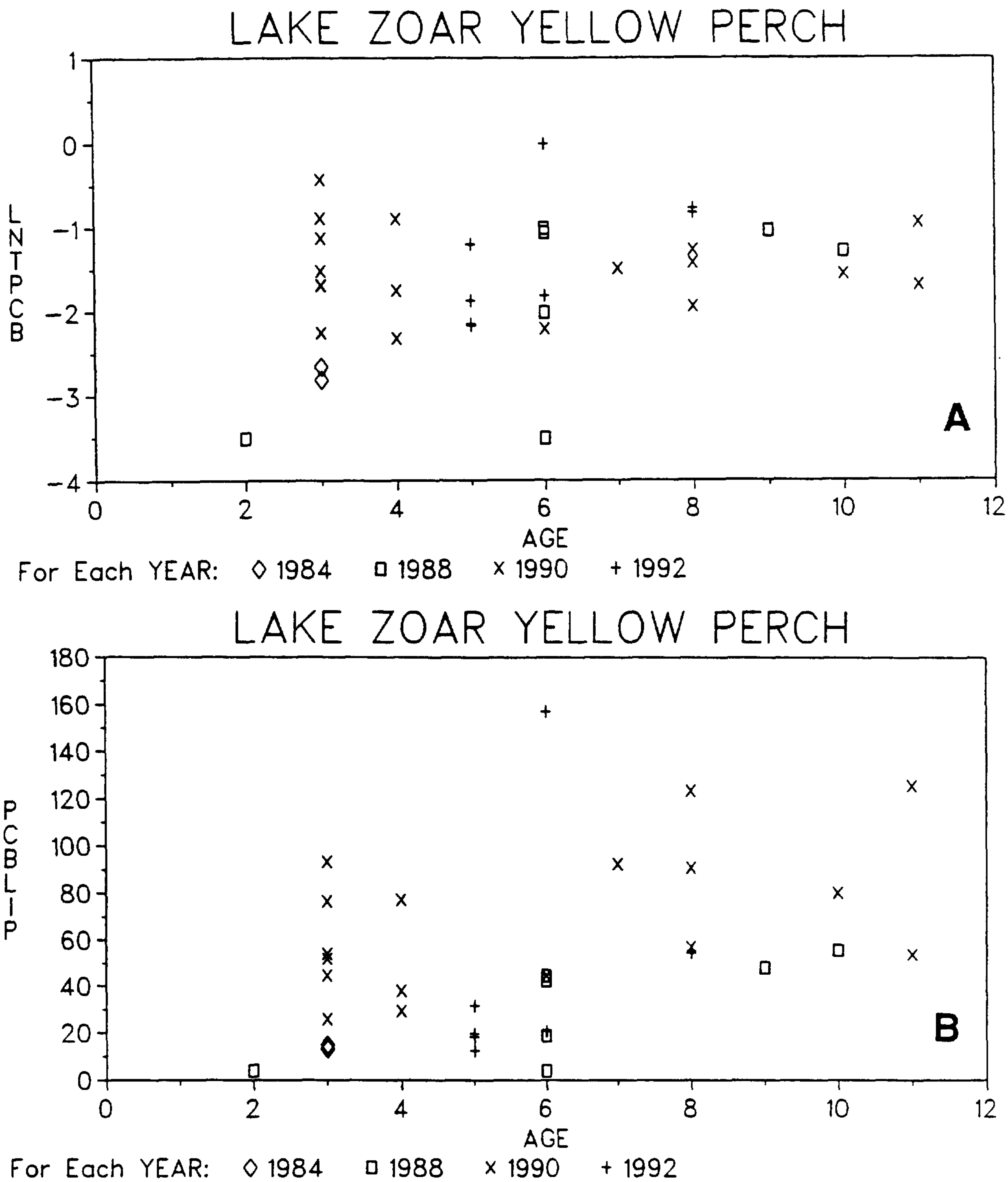


Figure B8. PCB (A) and lipid-normalized PCB (B) concentrations in yellow perch from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

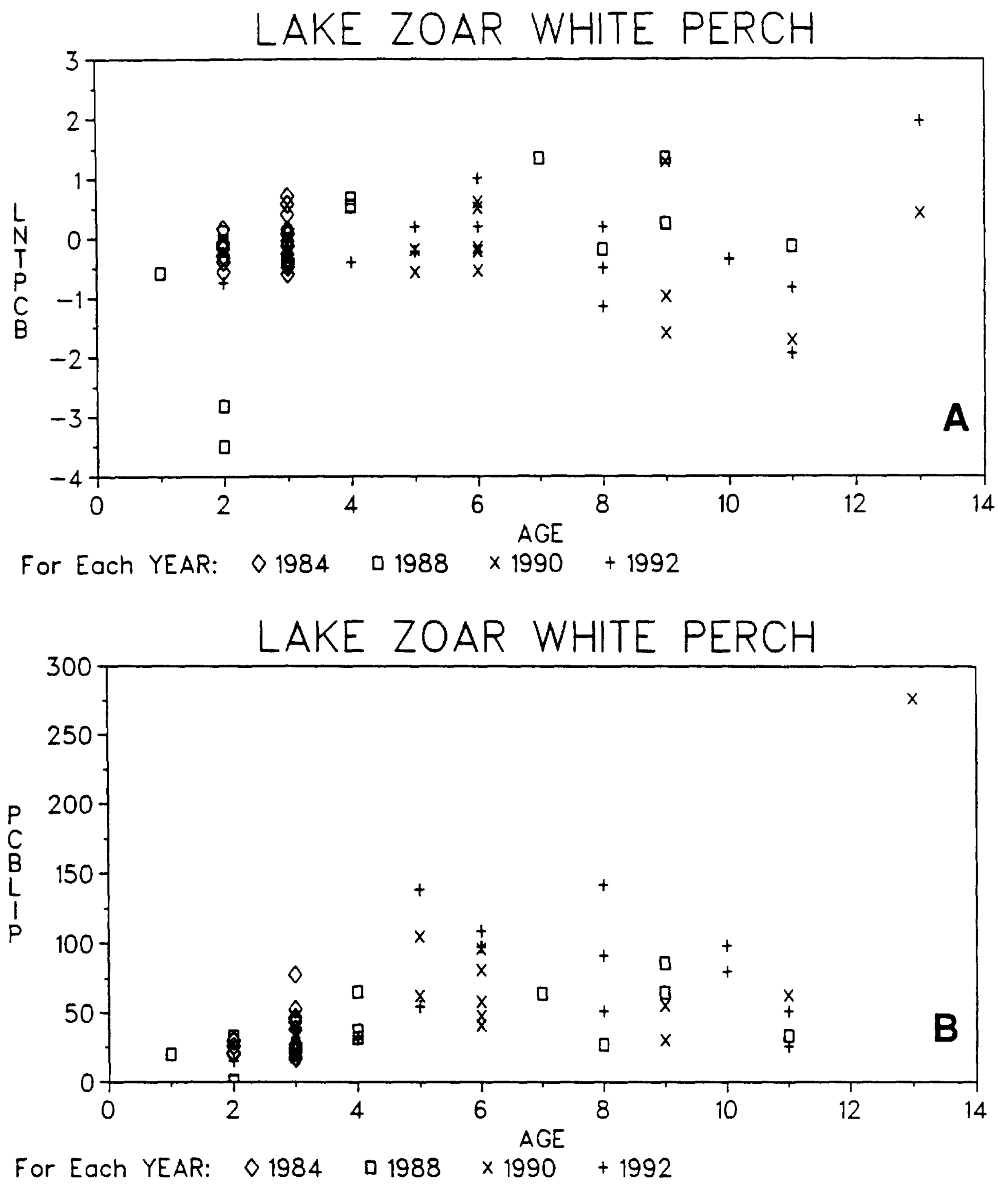


Figure B9. PCB (A) and lipid-normalized PCB (B) concentrations in white perch from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

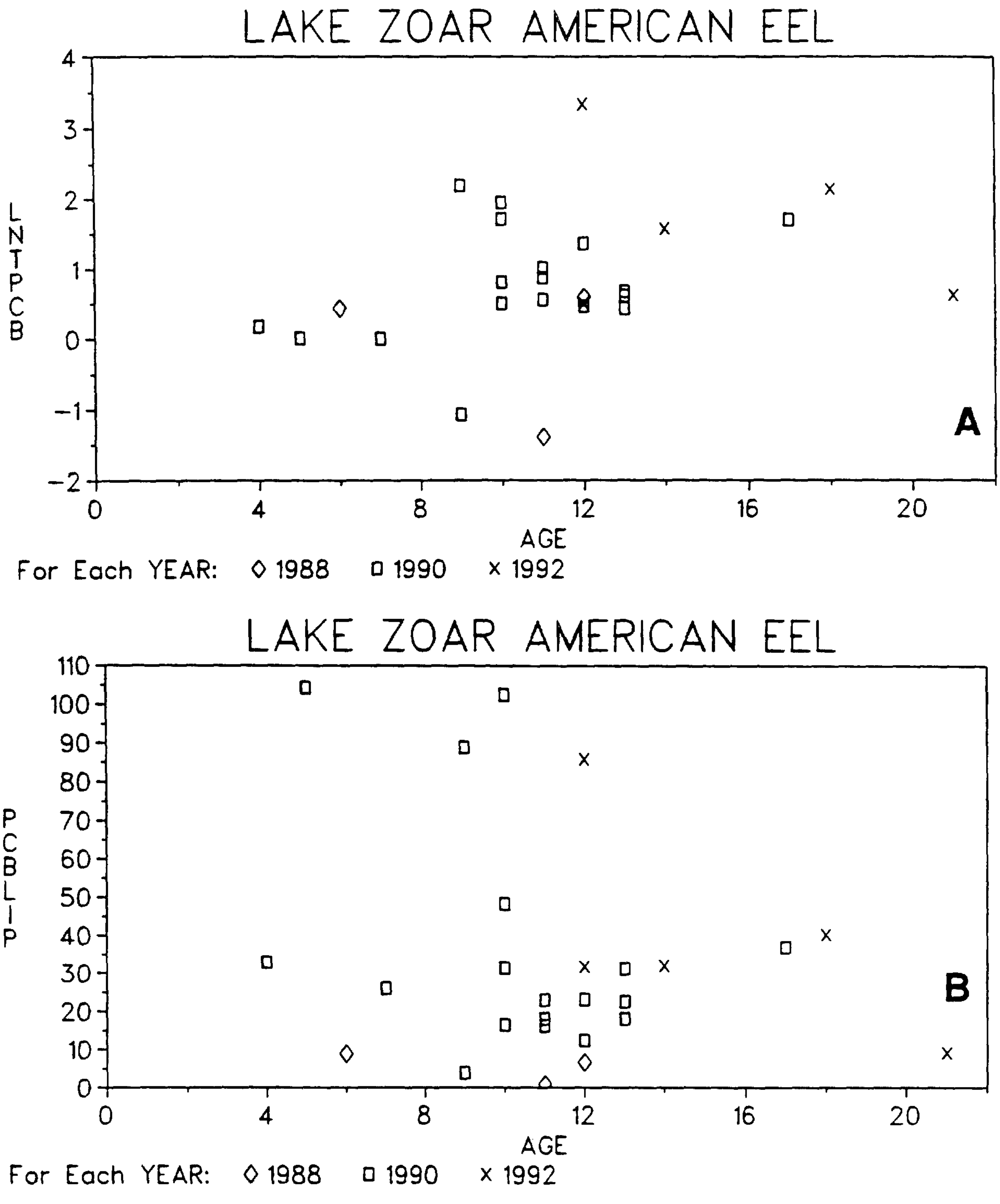


Figure B10. PCB (A) and lipid-normalized PCB (B) concentrations in American eel from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

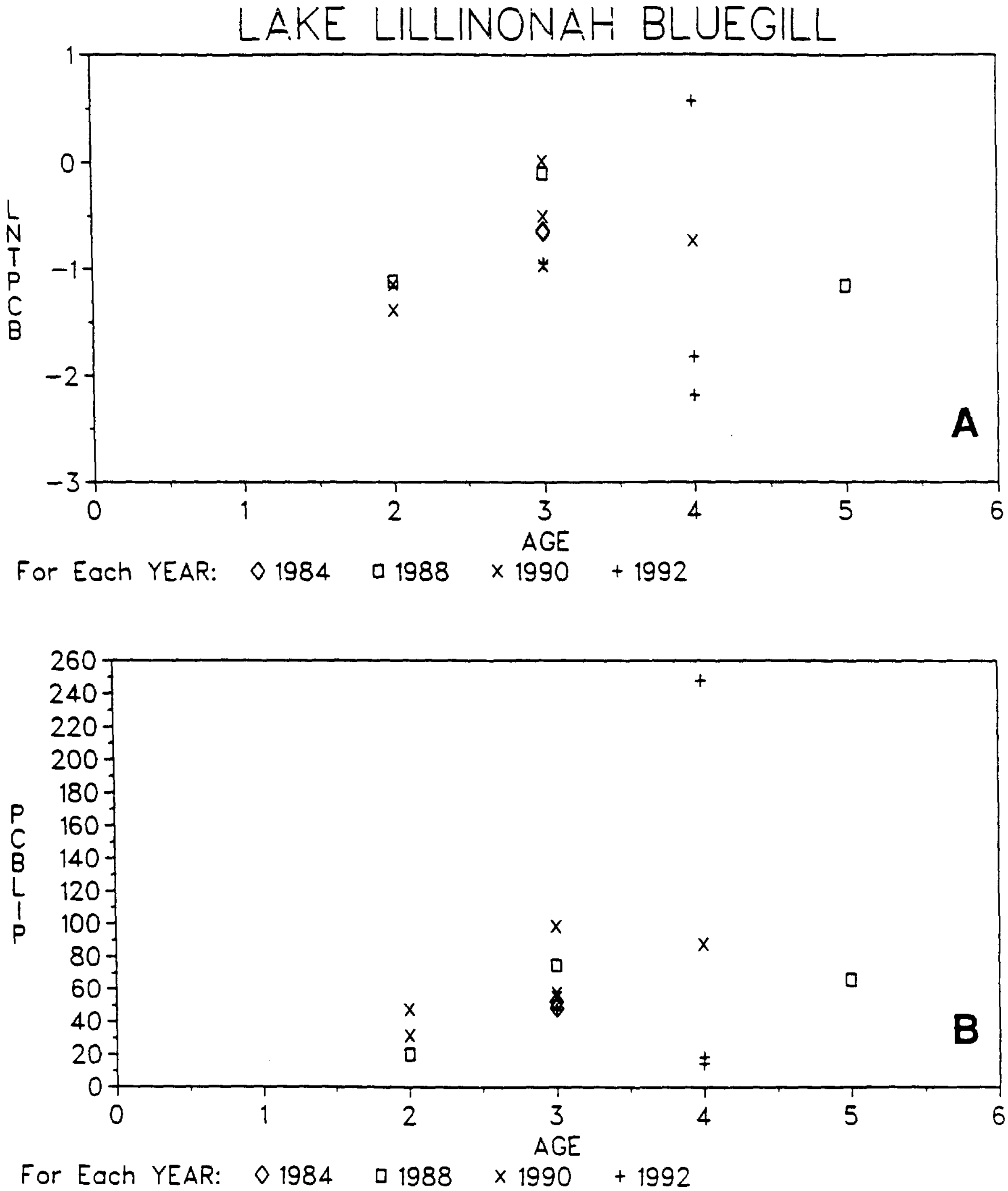
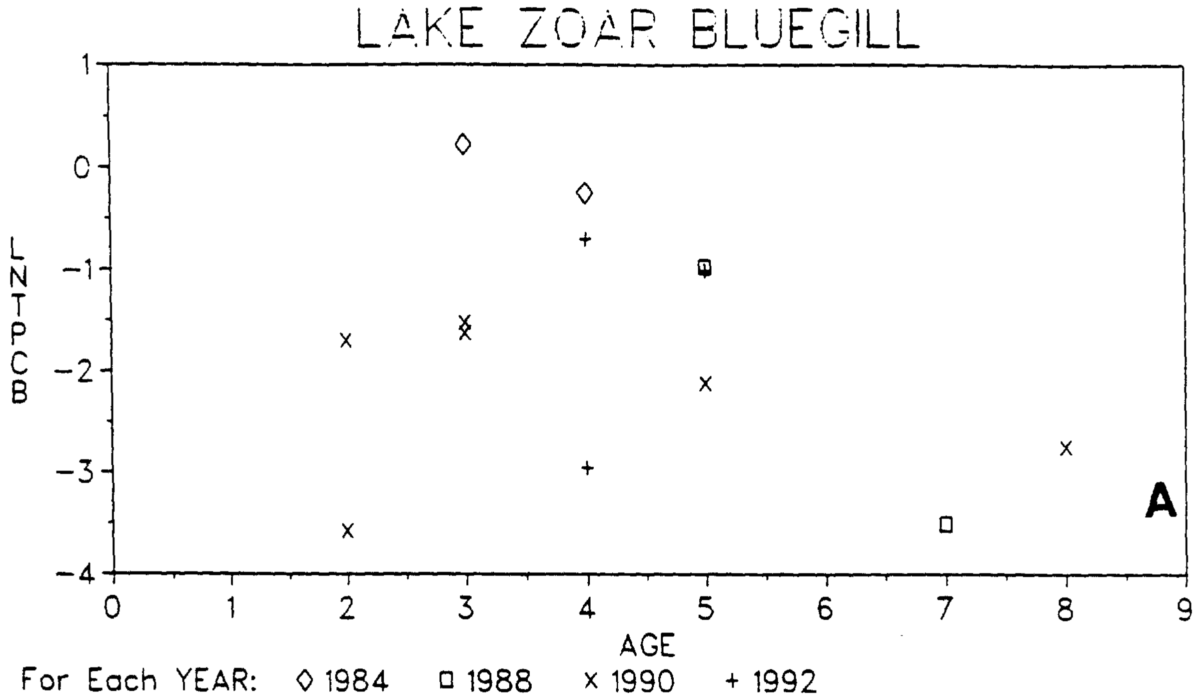


Figure B11. PCB (A) and lipid-normalized PCB (B) concentrations in bluegill from Lake Lillinonah as a function of age. Data are from the Aroclor-based quantitation technique.



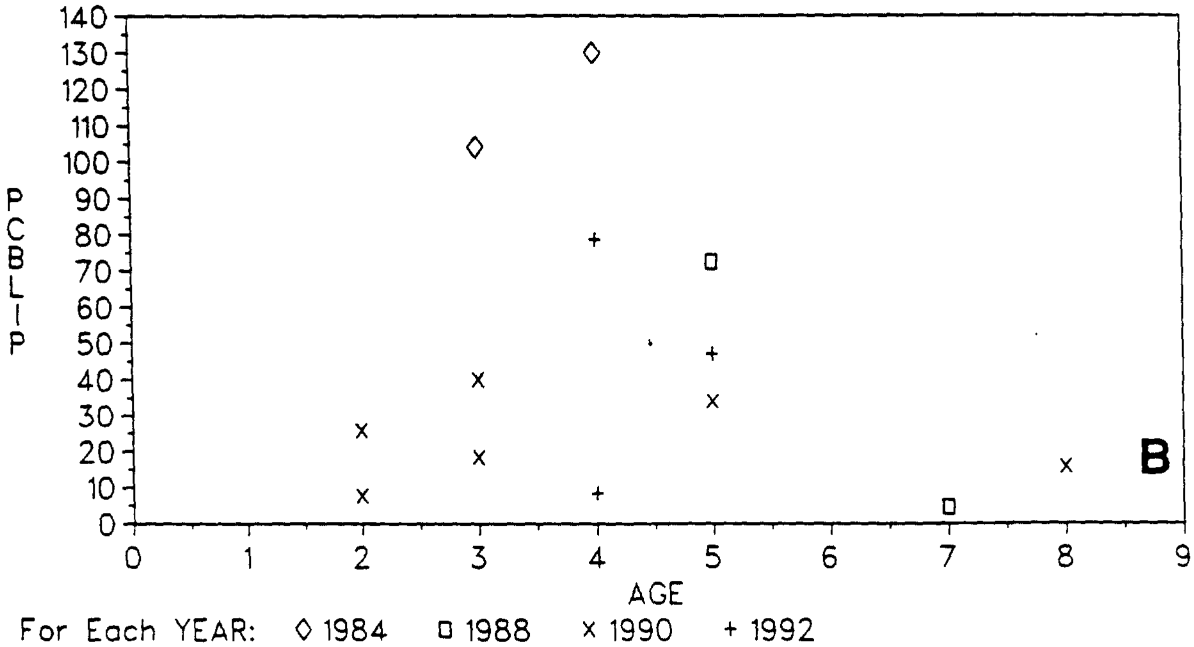


Figure B12. PCB (A) and lipid-normalized PCB (B) concentrations in bluegill from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

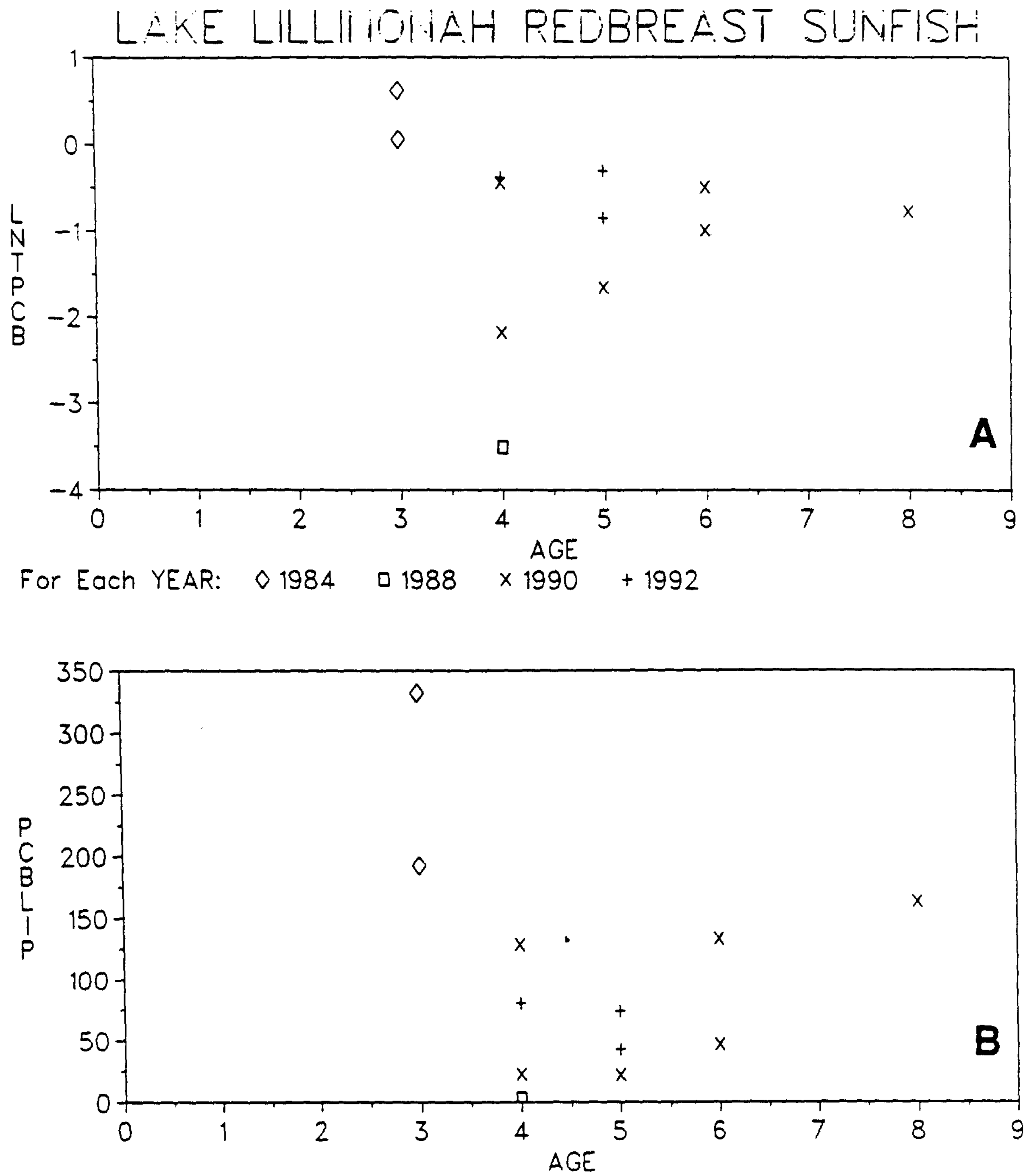


Figure B13. PCB (A) and lipid-normalized PCB (B) concentrations in redbreast sunfish from Lake Lillinonah as a function of age. Data are from the Aroclor-based quantitation technique.

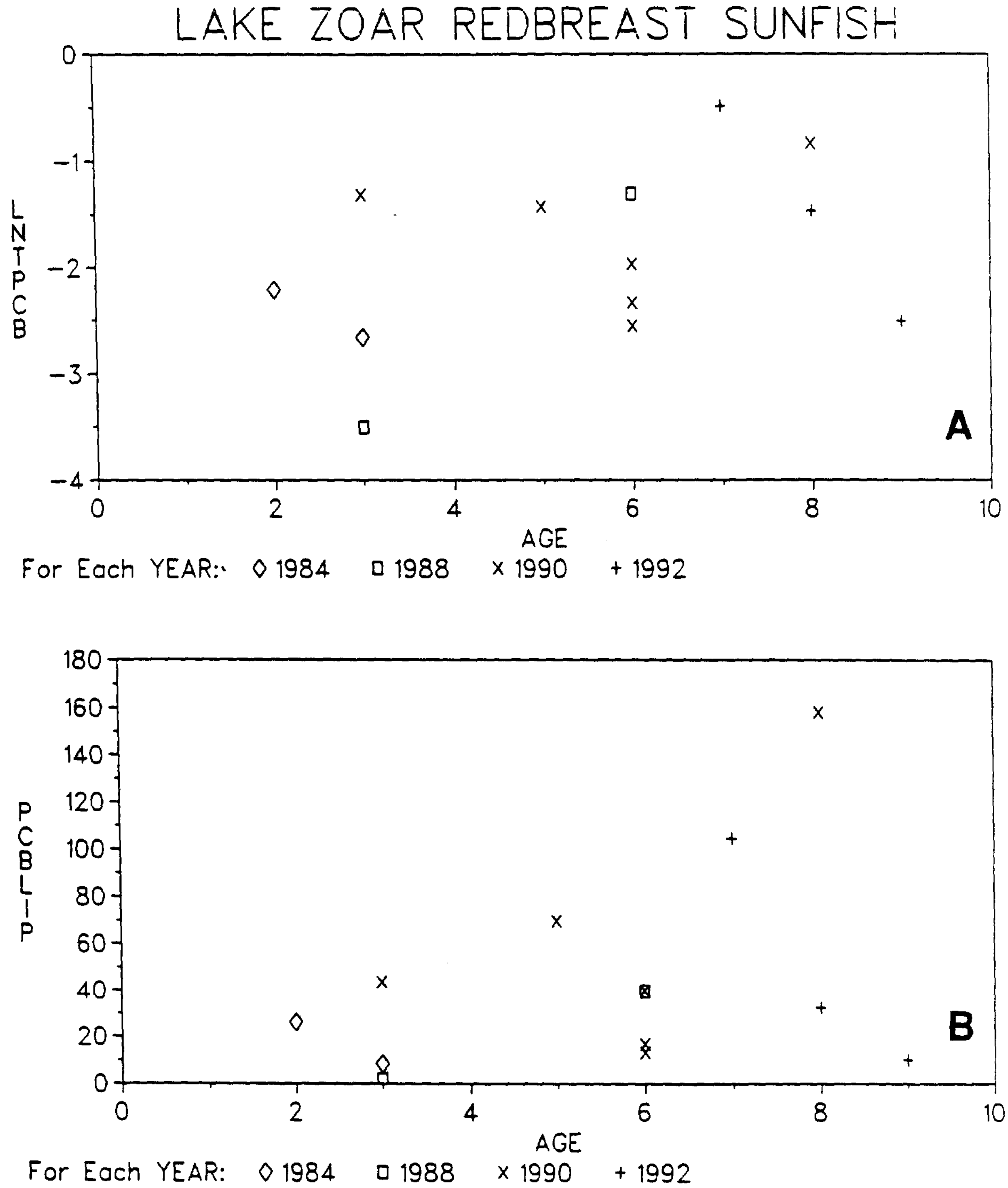


Figure B14. PCB (A) and lipid-normalized PCB (B) concentrations in redbreast sunfish from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

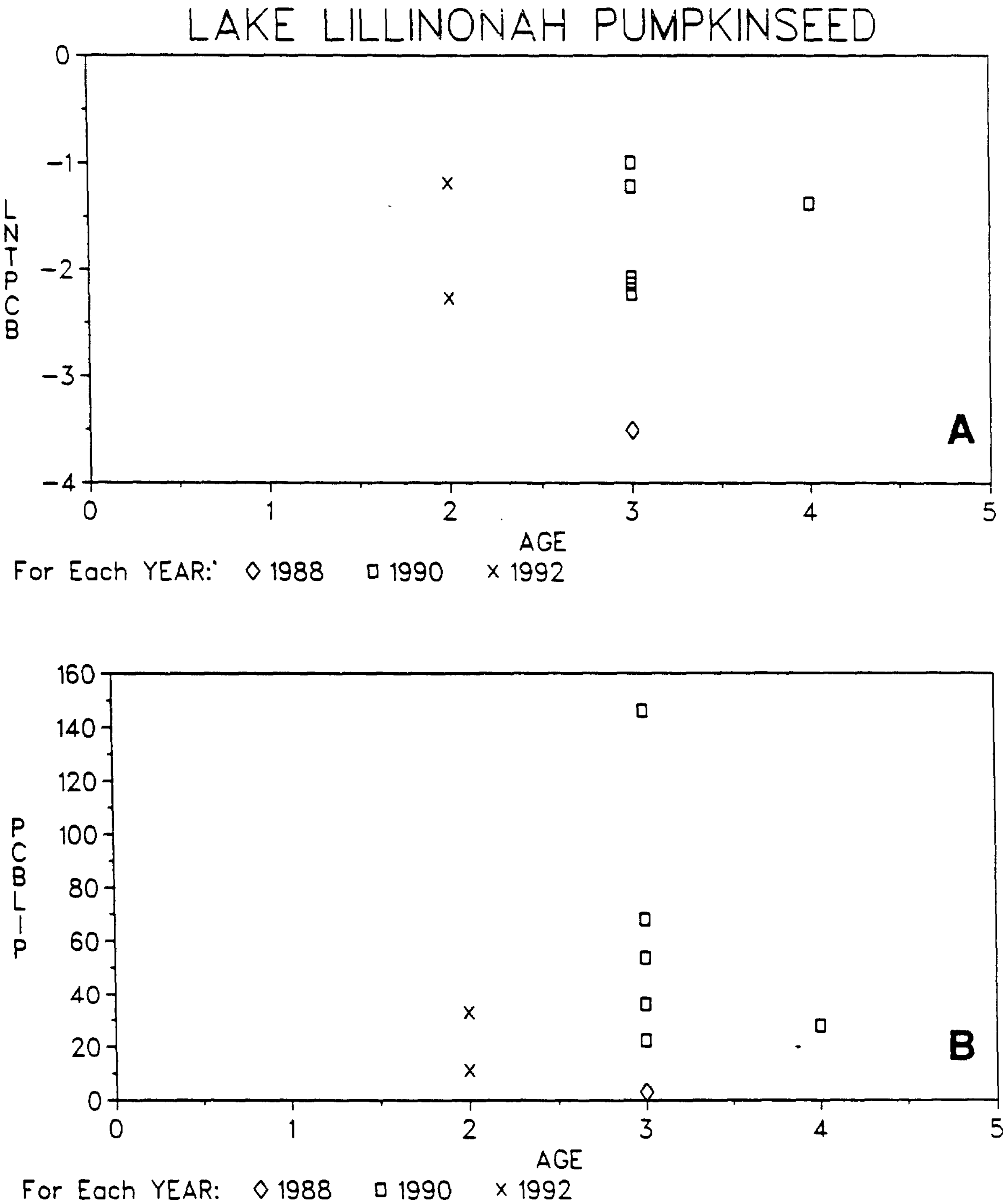


Figure B15. PCB (A) and lipid-normalized PCB (B) concentrations in pumpkinseed from Lake Lillinonah as a function of age. Data are from the Aroclor-based quantitation technique.

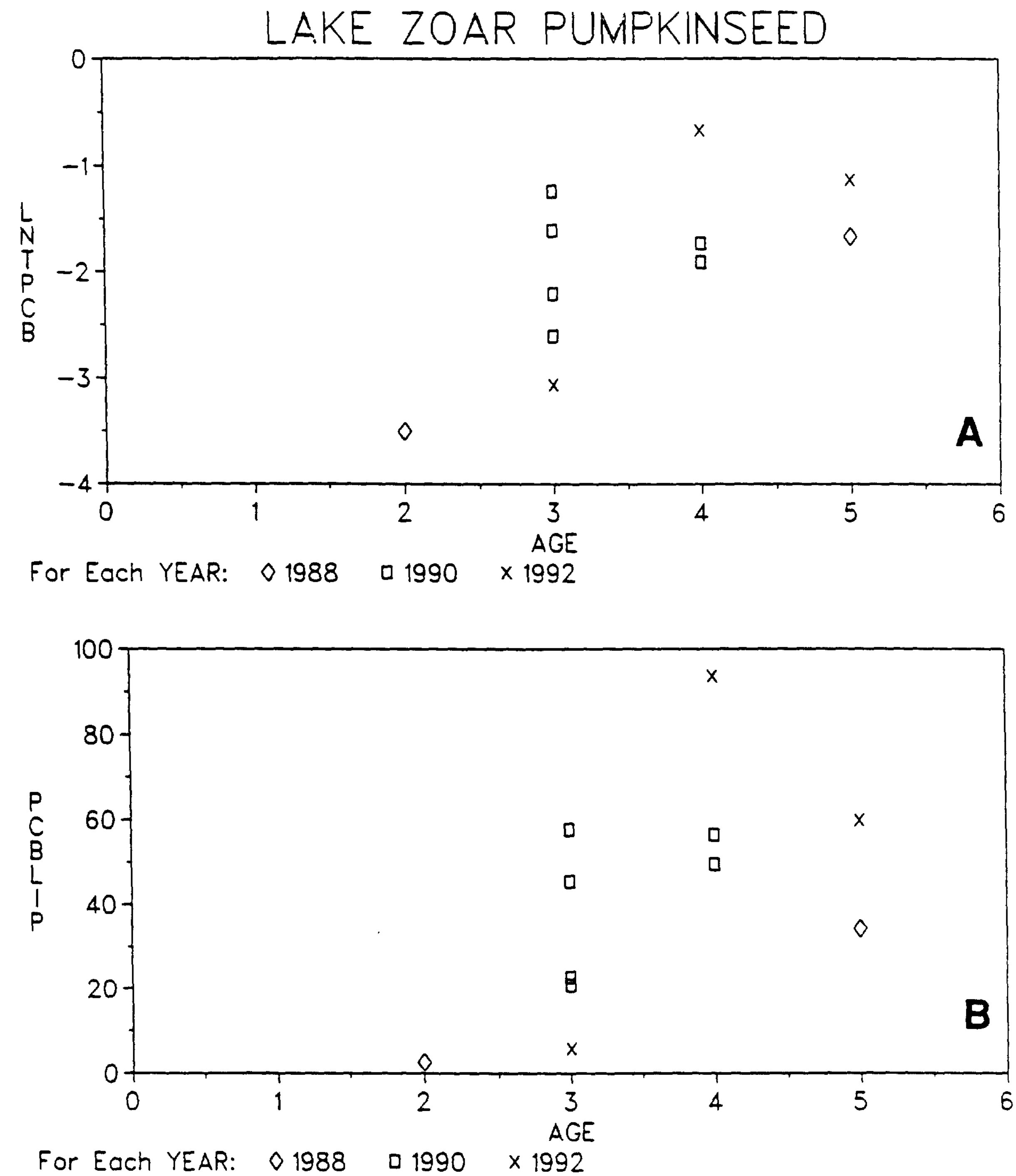


Figure B16. PCB (A) and lipid-normalized PCB (B) concentrations in pumpkinseed from Lake Zoar as a function of age. Data are from the Aroclor-based quantitation technique.

APPENDIX C: MODEL DERIVATION

To develop a model for PCB body burden in brown trout, we begin by considering the fate of a group of newly stocked fish. We introduce an m-dimensional physiological space Ω, an open subset of Euclidean m-space. The dimensions or "axes" of Ω represent physiological entities (lipid content, PCB content, etc.) assumed to govern fish dynamics over the period of interest. These dynamics constitute a motion through the physiological space. To characterize them, we must specify forms for the flux vector and any source or sink terms in the governing continuity equation.

Let t denote exposure time. Let $n(t,\mathbf{x})dV$ denote the number of newly stocked fish in a volume element of Ω containing the point $\mathbf{x}:=(x_i)$, where $\mathbf{x}$ is a collection of m physiological variables. Then density function n obeys the continuity equation,

$$\partial n/\partial t + \nabla\cdot\boldsymbol{\phi} + \mu n = 0,$$

where ∇ is the del operator, $\boldsymbol{\phi} := (\phi_i)$ is the flux vector, and μ denotes the sum of mortality and emigration. Components of the flux vector have form

$$\phi_i = n(t,x)\gamma_i,$$

where γ_i denotes the rate of change in physiological variable x_i; that is,

$$dx_i/dt = \gamma_i, \qquad i=1,2,...,k.$$

The solutions $\mathbf{x}(t)$ of this system are the characteristic curves of the continuity equation. Initial data $\mathbf{x}(0)$ and $n(0,\mathbf{x}(0))$ are considered given.

The continuity equation can be used to study the fate of an entire group of fish, including changes in the total number of individuals caused by mortality and emigration. The set of ordinary differential equations governing $\mathbf{x}(t)$ is used to study physiological change within individuals. We are concerned with the latter problem.

A large number of physiological variables might reasonably be included in the model. To be useful in practice, however, only a small number can be incorporated. We therefore restrict attention to three key quantities: lipid mass, nonlipid mass (protein, carbohydrate, etc.), and PCB mass per fish. Lipid, nonlipid, and PCB dynamics can be studied once forms have been specified for functions γ_1, γ_2, and γ_3.

Assume the feeding rate of a fish depends on seasonally varying food availability and on the fish's nonlipid mass. More specifically, suppose the dependence on food availability has Michaelis-Menten form, and that feeding increases slower than linearly in nonlipid mass Let food be composed of lipid and nonlipid fractions, with PCB concentrated in lipid. Let lipid and nonlipid be catabolized, and PCB depurated, at rates which are linear in lipid, nonlipid, and PCB mass, respectively.

It is probably true that food composition (lipid versus nonlipid, and PCB content), assimilation, catabolism, and depuration all vary seasonally. We assume, however, that the dominant source of variation is food availability. In fact, since we are interested only in qualitative features of the model's behavior, we assume these other properties remain constant.

The resulting model is a nonlinear, nonautonomous system of three ordinary differential equations. It has the following simple form:

$$\frac{dx_L}{dt} = \frac{f(t)a}{1+hf(t)} p_L x_N^{\theta} - k_L x_L$$

$$\frac{dx_N}{dt} = \frac{f(t)a}{1+hf(t)} (1-p_L) x_N^{\theta} - k_N x_N$$

$$\frac{dx_P}{dt} = \frac{f(t)a}{1+hf(t)} p_L c_{PL} x_N^{\theta} - k_P x_P,$$

where $f(t)$ represents food availability as a function of time, a denotes assimilation efficiency, p_L, is the proportion of lipid in food, c_{PL} is the concentration of PCB in food lipid, h is a measure of time spent per food item eaten, k_L and k_N are the specific catabolic rates for lipid and nonlipid, and k_P is the specific PCB depuration rate. The power θ obeys $0 < \theta < 1$. Seasonal change in food availability is incorporated by assuming that $f(t)$ is periodic in t, with a period of one year.

Though nonlinear, this system can be solved analytically. To see this, note that the second equation does not depend on the other two. Since it is a Bernoulli equation, it can easily be solved analytically. We may therefore treat $x_N(t)$ as a known function in the remaining equations, which thus become independent linear equations and are analytically solvable. We do not exhibit the solution of the system, however, since it is too complex to be transparent. We simply note that solutions wind onto an annual cycle driven by seasonal variation in $f(t)$.

A numerical example is shown in Fig. 40, with $f(t)$ chosen as a constant plus a sine function. The relationship between total PCB and percent lipid is shown, for comparison with Fig. 39C. Only the qualitative nature of the curve is of interest, since available data permit neither estimation of all parameter values nor accurate choice of $f(t)$.

Appendix D. Data on PCB concentrations and other attributes of replicate samples of fish from 1984 through 1992 studies on the Housatonic River, Connecticut. Abbreviations used in the appendix are as followed:

STA — Station

C	Cornwall
B	Bull's Bridge
L	Lake Lillinonah
Z	Lake Zoar
BL, BANT	Bantam Lake
S, SAUG	Saugatuck Resevoir
HATC	Hatchery

YEAR — Year of capture of fish.

MO — Month on capture of fish.

TPCB — Total PCB concentration in mg/kg wet weight of the fillet.

AGE — Age of fish.

TL — Total length of fish (cm).

TW — Wet weight of fish (g).

S — Sex of fish (M=male, F=female, I=immature, IM=immature male).

LIPID — Lipid content of fillet (%).

SN — Serial number of sample.

IND — Individual code (within serial number).

CTPCB — Congener based estimate of PCB in mg/kg wet weight.

For brown trout and rainbow trout data, two other variables are included :

STO — Stock age, age when fish was stocked.

ST — strain (hatchery origin) (84-90 only)

B,Bi	Bitterroot
U,BU	Burlington
Q	Quinebaug
N	presumed native
S	Survivor
Er	Erwin

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
BLUEGILL	B	1988	8	3.912	8			26.6	569.5	M	5.890	88-194		R1	
BLUEGILL	B	1988	8	4.805	8			26.6	569.5	M	3.770	88-194		R2	
BLUEGILL	B	1988	8	4.359	8			26.6	569.5	M	4.830	88-194		MR	
BLUEGILL	L	1988	8	0.253	5			19.9	181.5	M	0.480	88-177	A	R1	
BLUEGILL	L	1988	8	0.377	5			19.9	181.5	M	0.480	88-177	A	R2	
BLUEGILL	L	1988	8	0.315	5			19.9	181.5	M	0.480	88-177	A	MR	
BLUEGILL	L	1992	10	0.201	4			18.7		F	1.01	GECT92-L0235		R1	0.154
BLUEGILL	L	1992	10	0.161	4			18.7		F	0.88	GECT92-L0235		R2	0.126
BLUEGILL	L	1992	10	0.121	4			18.7		F	0.75	GECT92-L0235		MR	0.099
BLUEGILL	Z	1992	10	0.402	5			19.7	159.7	M	0.78	GECT92-Z0246		R1	0.303
BLUEGILL	Z	1992	10	0.363	5			19.7	159.7	M	0.77	GECT92-Z0246		R2	0.275
BLUEGILL	Z	1992	10	0.325	5			19.7	159.7	M	0.76	GECT92-Z0246		MR	0.247
BROWN BULLHEAD	B	1984	8	1.180	2			28.9	297.5	F	1.100	224R034B		R	
BROWN BULLHEAD	B	1984	8	0.700	2			28.9	297.5	F	0.990	223R034B		R	
BROWN BULLHEAD	B	1984	8	0.940	2			28.9	297.5	F	1.045	223R034B		M	
BROWN BULLHEAD	B	1986	8	2.630	5			34.7	704.4	F	1.000	86-43-142		R	
BROWN BULLHEAD	B	1986	8	3.150	5			34.7	704.4	F	1.200	86-43-142		R	
BROWN BULLHEAD	B	1986	8	2.900	5			34.7	704.4	F	1.100	86-43-142		M	
BROWN BULLHEAD	B	1988	8	5.443	8			31.5	417.2	F	2.440	88-197	A	R1	
BROWN BULLHEAD	B	1988	8	7.380	8			31.5	417.2	F	2.110	88-197	A	R2	
BROWN BULLHEAD	B	1988	8	6.412	8			31.5	417.2	F	2.275	88-197	A	MR	
BROWN BULLHEAD	B	1988	8	4.375	9			31.3	378.0	F	1.600	88-205		R1	
BROWN BULLHEAD	B	1988	8	1.313	9			31.3	378.0	F	1.180	88-205		R2	
BROWN BULLHEAD	B	1988	8	2.844	9			31.3	378.0	F	1.390	88-205		MR	
BROWN BULLHEAD	Z	1988	10	0.641	6			32.7	486.5	F	1.680	88-238	A	R1	
BROWN BULLHEAD	Z	1988	10	0.596	6			32.7	486.5	F	1.370	88-238	A	R2	
BROWN BULLHEAD	Z	1988	10	0.618	6			32.7	486.5	F	1.525	88-238	A	MR	
BROWN TROUT	C	1984	7	8.270	3.2	Q	1.3	31.5	308.7	F	1.900	201R012B		R	
BROWN TROUT	C	1984	7	9.310	3.2	Q	1.3	31.5	308.7	F	2.800	035R012B		R	
BROWN TROUT	C	1984	7	8.790	3.2	Q	1.3	31.5	308.7	F	2.350	035R012B		M	
BROWN TROUT	C	1984	7	0.790	0.2	B	1.3	25.4	179.6	M	2.300	071R013A		R	
BROWN TROUT	C	1984	7	0.530	0.2	B	1.3	25.4	179.6	M	2.400	067R013A		R	
BROWN TROUT	C	1984	7	0.660	0.2	B	1.3	25.4	179.6	M	2.350	067R013A		M	
BROWN TROUT	C	1984	7	1.020	0.2	B	1.3	26.5	174.4	M	1.200	102R017C		R	
BROWN TROUT	C	1984	7	0.941	0.2	B	1.3	26.5	174.4	M	1.300	101R017C		R	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
BROWN TROUT	C	1984	7	0.980	0.2	B	1.3	26.5	174.4	M	1.250	101R017C		M	
BROWN TROUT	C	1984	7	3.120	2.2	U	2.3	32.1	334.9	M	1.400	218R018B		R	
BROWN TROUT	C	1984	7	3.350	2.2	U	2.3	32.1	334.9	M	1.400	217R018B		R	
BROWN TROUT	C	1984	7	3.235	2.2	U	2.3	32.1	334.9	M	1.400	217R018B		M	
BROWN TROUT	C	1986	8	15.340	4.2	B	2.3	40.2	696.2	M	3.800	86-27-76		R	
BROWN TROUT	C	1986	8	17.000	4.2	B	2.3	40.2	696.2	M	4.900	86-27-76		R	
BROWN TROUT	C	1986	8	16.170	4.2	B	2.3	40.2	696.2	M	4.350	86-27-76		M	
BROWN TROUT	C	1988	8	4.128	2.25	U	2.3	40.0	779.4	M	2.750	88-036		R1	
BROWN TROUT	C	1988	8	4.023	2.25	U	2.3	40.0	779.4	M	3.350	88-036		R2	
BROWN TROUT	C	1988	8	4.075	2.25	U	2.3	40.0	779.4	M	3.050	88-036		MR	
BROWN TROUT	C	1988	8	9.991	1.25	U	2.3	33.6	459.8	F	6.050	88-043	A	R1	
BROWN TROUT	C	1988	8	10.201	1.25	U	2.3	33.6	459.8	F	4.950	88-043	A	R2	
BROWN TROUT	C	1988	8	10.096	1.25	U	2.3	33.6	459.8	F	5.500	88-043	A	MR	
BROWN TROUT	C	1988	8	8.444	1.25	U	2.3	36.0	524.6	F	4.660	88-044	A	R1	
BROWN TROUT	C	1988	8	7.708	1.25	U	2.3	36.0	524.6	F	4.850	88-044	A	R2	
BROWN TROUT	C	1988	8	8.076	1.25	U	2.3	36.0	524.6	F	4.755	88-044	A	MR	
BROWN TROUT	C	1988	8	10.528	2.25	Bi	1.3	34.5	475.5	M	4.250	88-063	B	R1	
BROWN TROUT	C	1988	8	8.681	2.25	Bi	1.3	34.5	475.5	M	8.300	88-063	B	R2	
BROWN TROUT	C	1988	8	9.605	2.25	Bi	1.3	34.5	475.5	M	6.275	88-063	B	MR	
BROWN TROUT	C	1988	10	5.940	0.42	Bi	1.3	21.3	97.6	F	1.260	88-306	F	R1	
BROWN TROUT	C	1988	10	5.264	0.42	Bi	1.3	21.3	97.6	F	1.380	88-306	F	R2	
BROWN TROUT	C	1988	10	5.602	0.42	Bi	1.3	21.3	97.6	F	1.320	88-306	F	MR	
BROWN TROUT	C	1992	7	5.303	1.6		1.5	23.9	162.1	I	4.21	GECT92-C0017		R1	4.237
BROWN TROUT	C	1992	7	5.767	1.6		1.5	23.9	162.1	I	4.62	GECT92-C0017		R2	4.540
BROWN TROUT	C	1992	7	5.535	1.6		1.5	23.9	162.1	I	4.42	GECT92-C0017		MR	4.389
BROWN TROUT	C	1992	8	16.243	3.7		2.3	33.4	466.7	F	7.56	GECT92-C0086		R1	2.627
BROWN TROUT	C	1992	8	20.457	3.7		2.3	33.4	466.7	F	7.27	GECT92-C0086		R2	5.379
BROWN TROUT	C	1992	8	18.350	3.7		2.3	33.4	466.7	F	7.41	GECT92-C0086		MR	4.003
BROWN TROUT	C	1992	8	22.299	2.7		2.5	27.9	281.3	M	6.67	GECT92-C0087		R1	7.837
BROWN TROUT	C	1992	8	17.026	2.7		2.5	27.9	281.3	M	6.53	GECT92-C0087		R2	3.247
BROWN TROUT	C	1992	8	19.662	2.7		2.5	27.9	281.3	M	6.60	GECT92-C0087		MR	5.542
BROWN TROUT	C	1992	9	6.171	1.8		1.5	27.7	225	M	3.09	GECT92-C0194		R1	4.773
BROWN TROUT	C	1992	9	7.319	1.8		1.5	27.7	225	M	3.22	GECT92-C0194		R2	5.522
BROWN TROUT	C	1992	9	6.745	1.8		1.5	27.7	225	M	3.15	GECT92-C0194		MR	5.148
BROWN TROUT	C	1992	10	4.140	3.8		1.3	34.5	466.9	F	1.68	GECT92-C0201		R1	3.278

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
BROWN TROUT	C	1992	10	3.831	3.8		1.3	34.5	466.9	F	1.71	GECT92-C0201		R2	2.986
BROWN TROUT	C	1992	10	3.986	3.8		1.3	34.5	466.9	F	1.70	GECT92-C0201		MR	3.132
BROWN TROUT	HATC	1987	5	0.030	0	Q	2		437.8		0.580	87-59-192		R	
BROWN TROUT	HATC	1987	5	0.030	0	Q	2		437.8		0.580	87-59-192		R	
BROWN TROUT	HATC	1987	5	0.030	0	Q	2		437.8		0.600	87-59-192		M	
CARP	B	1988	8	2.750	2			37.5	861.8	F	4.290	88-181		R1	
CARP	B	1988	8	1.960	2			37.5	861.8	F	4.320	88-181		R2	
CARP	B	1988	8	2.355	2			37.5	861.8	F	4.305	88-181		MR	
CARP	L	1988	6	16.686	17			66.0	3995.8	F	2.810	88-016		R1	
CARP	L	1988	6	17.830	17			66.0	3995.8	F	2.400	88-016		R2	
CARP	L	1988	6	17.258	17			66.0	3995.8	F	2.605	88-016		MR	
CARP	Z	1984	8	4.120	8			58.5	2528.6	M	6.200	321R071A		R	
CARP	Z	1984	8	5.580	8			58.5	2528.6	M	7.400	340R071A		R	
CARP	Z	1984	8	4.850	8			58.5	2528.6	M	6.800	340R071A		M	
EEL	Z	1988	8	0.565	6			58.1	308.7		16.030	88-075	A	R1	
EEL	Z	1988	8	2.533	6			58.1	308.7		18.500	88-075	A	R2	
EEL	Z	1988	8	1.550	6			58.1	308.7		17.265	88-075	A	MR	
EEL	Z	1992	8	3.868	14			63	460.1	I	14.58	GECT92-Z0168		R1	3.241
EEL	Z	1992	8	4.830	14			63	460.1	I	15.12	GECT92-Z0168		R2	3.907
EEL	Z	1992	8	5.298	14			63	460.1	I	15.67	GECT92-Z0168		MR	4.573
LARGEMOUTH BASS	B	1984	10	2.230	4			31.1	452.5	M	1.500	252R093A		R	
LARGEMOUTH BASS	B	1984	10	2.720	4			31.1	452.5	M	1.200	251R093A		R	
LARGEMOUTH BASS	B	1984	10	2.475	4			31.1	452.5	M	1.350	251R093A		M	
LARGEMOUTH BASS	B	1984	8	1.540	5			32.1	545.7	M	0.990	298R043D		R	
LARGEMOUTH BASS	B	1984	8	1.990	5			32.1	545.7	M	0.960	297R043D		R	
LARGEMOUTH BASS	B	1984	8	1.765	5			32.1	545.7	M	0.975	297R043D		M	
LARGEMOUTH BASS	B	1984	8	0.890	6			40.5	1332.1	F	0.630	307R047A		R	
LARGEMOUTH BASS	B	1984	8	0.900	6			40.5	1332.1	F	0.570	306R047A		R	
LARGEMOUTH BASS	B	1984	8	0.895	6			40.5	1332.1	F	0.600	306R047A		M	
LARGEMOUTH BASS	B	1984	10	1.260	4			29.4	348.8	F	0.830	254R093B		R	
LARGEMOUTH BASS	B	1984	10	1.130	4			29.4	348.8	F	0.590	337R093B		R	
LARGEMOUTH BASS	B	1984	10	1.195	4			29.4	348.8	F	0.710	337R093B		M	
LARGEMOUTH BASS	B	1988	8	0.383	4			34.1	747.3	M	0.700	88-207		R1	
LARGEMOUTH BASS	B	1988	8	0.653	4			34.1	747.3	M	0.740	88-207		R2	
LARGEMOUTH BASS	B	1988	8	0.518	4			34.1	747.3	M	0.720	88-207		MR	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
LARGEMOUTH BASS	B	1988	8	3.080	4			32.8	577.1	M	1.570	88-208	B	R1	
LARGEMOUTH BASS	B	1988	8	1.961	4			32.8	577.1	M	1.560	88-208	B	R2	
LARGEMOUTH BASS	B	1988	8	2.520	4			32.8	577.1	M	1.565	88-208	B	MR	
LARGEMOUTH BASS	L	1988	6	0.560	6			45.0	1613.6	F	0.340	88-001	A	R1	
LARGEMOUTH BASS	L	1988	6	1.310	6			45.0	1613.6	F	0.580	88-001	A	R2	
LARGEMOUTH BASS	L	1988	6	1.130	6			45.0	1613.6	F	0.580	88-001	A	R3	
LARGEMOUTH BASS	L	1988	6	1.000	6			45.0	1613.6	F	0.500	88-001	A	MR	
LARGEMOUTH BASS	L	1988	6	2.174	6			38.1	825.4	M	1.235	88-001	B	R1	
LARGEMOUTH BASS	L	1988	6	2.145	6			38.1	825.4	M	1.050	88-001	B	R2	
LARGEMOUTH BASS	L	1988	6	1.610	6			38.1	825.4	M	0.860	88-001	B	R3	
LARGEMOUTH BASS	L	1988	6	1.976	6			38.1	825.4	M	1.048	88-001	B	MR	
LARGEMOUTH BASS	L	1988	6	2.586	10			41.9	1115.2	M	0.505	88-012	B	R1	
LARGEMOUTH BASS	L	1988	6	8.318	10			41.9	1115.2	M	1.240	88-012	B	R2	
LARGEMOUTH BASS	L	1988	6	3.509	10			41.9	1115.2	M	0.720	88-012	B	R3	
LARGEMOUTH BASS	L	1988	6	4.804	10			41.9	1115.2	M	0.822	88-012	B	MR	
LARGEMOUTH BASS	L	1988	8	0.828	4			32.9	552.5	M	0.960	88-165	A	R1	
LARGEMOUTH BASS	L	1988	8	0.826	4			32.9	552.5	M	0.450	88-165	A	R2	
LARGEMOUTH BASS	L	1988	8	0.826	4			32.9	552.5	M	0.705	88-165	A	MR	
LARGEMOUTH BASS	L	1988	8	1.430	5			32.4	520.8	M	1.320	88-167	A	R1	
LARGEMOUTH BASS	L	1988	8	0.518	5			32.4	520.8	M	0.390	88-167	A	R2	
LARGEMOUTH BASS	L	1988	8	0.974	5			32.4	520.8	M	0.855	88-167	A	MR	
LARGEMOUTH BASS	SAUG	1988	8	0.030							0.760	88-162,210CD	A	CR1	
LARGEMOUTH BASS	SAUG	1988	8	0.030							1.280	88-162,210CD	A	CR2	
LARGEMOUTH BASS	SAUG	1988	8	0.030							1.020	88-162,210CD	A	MCR	
LARGEMOUTH BASS	Z	1984	10	0.320	5			30.6	374.0	F	0.450	239R100A		R	
LARGEMOUTH BASS	Z	1984	10	0.510	5			30.6	374.0	F	0.470	238R100A		R	
LARGEMOUTH BASS	Z	1984	10	0.415	5			30.6	374.0	F	0.460	238R100A		M	
LARGEMOUTH BASS	Z	1984	8	0.460	4			25.8	285.4	M	0.840	276R063A		R	
LARGEMOUTH BASS	Z	1984	8	0.390	4			25.8	285.4	M	0.910	275R063A		R	
LARGEMOUTH BASS	Z	1984	8	0.425	4			25.8	285.4	M	0.875	275R063A		M	
LARGEMOUTH BASS	Z	1988	8	3.011	9			48.2	2158.2	F	3.050	88-089		R1	
LARGEMOUTH BASS	Z	1988	8	5.785	9			48.2	2158.2	F	3.230	88-089		R2	
LARGEMOUTH BASS	Z	1988	8	4.398	9			48.2	2158.2	F	3.140	88-089		MR	
RAINBOW TROUT	C	1988	10	3.981	0.42	Er	0.7	25.4	180.5		1.790	88-305		R1	
RAINBOW TROUT	C	1988	10	3.525	0.42	Er	0.7	25.4	180.5		1.460	88-305		R2	
RAINBOW TROUT	C	1988	10	3.754	0.42	Er	0.7	25.4	180.5		1.625	88-305		MR	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
SMALLMOUTH BASS	B	1984	10	1.630	4			25.8	205.5	M	0.890	341R091B		R	
SMALLMOUTH BASS	B	1984	10	1.370	4			25.8	205.5	M	1.100	233R091B		R	
SMALLMOUTH BASS	B	1984	10	1.500	4			25.8	205.5	M	1.000	233R091B		M	
SMALLMOUTH BASS	B	1984	10	2.110	4			26.3	202.0	M	0.780	342R091C		R	
SMALLMOUTH BASS	B	1984	10	2.340	4			26.3	202.0	M	0.770	234R091C		R	
SMALLMOUTH BASS	B	1984	10	2.230	4			26.3	202.0	M	0.775	234R091C		M	
SMALLMOUTH BASS	B	1986	8	0.690	6			31.1	437.1	F	0.740	86-34-108		R	
SMALLMOUTH BASS	B	1986	8	0.770	6			31.1	437.1	F	0.950	86-34-108		R	
SMALLMOUTH BASS	B	1986	8	0.730	6			31.1	437.1	F	0.840	86-34-108		M	
SMALLMOUTH BASS	B	1988	8	3.216	10			38.5	872.7	F	1.970	88-198		R1	
SMALLMOUTH BASS	B	1988	8	2.673	10			38.5	872.7	F	2.980	88-198		R2	
SMALLMOUTH BASS	B	1988	8	2.944	10			38.5	872.7	F	2.475	88-198		MR	
SMALLMOUTH BASS	B	1988	10	3.095	11			35.6	661.8	F	1.140	88-269	B	R1	
SMALLMOUTH BASS	B	1988	10	5.536	11			35.6	661.8	F	1.600	88-269	B	R2	
SMALLMOUTH BASS	B	1988	10	4.315	11			35.6	661.8	F	1.370	88-269	B	MR	
SMALLMOUTH BASS	B	1992	8	1.743	5			30.4	378.8	F	1.14	GECT92-B0052		R1	1.355
SMALLMOUTH BASS	B	1992	8	1.951	5			30.4	378.8	F	1.34	GECT92-B0052		R2	1.467
SMALLMOUTH BASS	B	1992	8	1.847	5			30.4	378.8	F	1.24	GECT92-B0052		MR	1.411
SMALLMOUTH BASS	B	1992	8	1.083	8			33.5	539.6	F	1.11	GECT92-B0073		R1	0.806
SMALLMOUTH BASS	B	1992	8	1.154	8			33.5	539.6	F	1.17	GECT92-B0073		R2	0.862
SMALLMOUTH BASS	B	1992	8	1.119	8			33.5	539.6	F	1.14	GECT92-B0073		MR	0.834
SMALLMOUTH BASS	B	1992	8	1.367	7			32.3	488.5	M	0.89	GECT92-B0075		R1	1.035
SMALLMOUTH BASS	B	1992	8	1.711	7			32.3	488.5	M	0.94	GECT92-B0075		R2	1.253
SMALLMOUTH BASS	B	1992	8	1.539	7			32.3	488.5	M	0.91	GECT92-B0075		MR	1.144
SMALLMOUTH BASS	BANT	1988	8	0.030	6			36.4	752.7	F	1.210	88-203		R1	
SMALLMOUTH BASS	BANT	1988	8	0.030	6			36.4	752.7	F	0.980	88-203		R2	
SMALLMOUTH BASS	BANT	1988	8	0.030	6			36.4	752.7	F	1.095	88-203		MR	
SMALLMOUTH BASS	C	1986	8	1.020	6			25.3	322.6	F	0.520	86-39-125		R	
SMALLMOUTH BASS	C	1986	8	2.480	6			25.3	322.6	F	0.980	86-39-125		R	
SMALLMOUTH BASS	C	1986	8	1.740	6			25.3	322.6	F	0.750	86-39-125		M	
SMALLMOUTH BASS	C	1986	8	1.580	6			25.0	211.9	F	1.100	86-40-126		R	
SMALLMOUTH BASS	C	1986	8	1.840	6			25.0	211.9	F	1.400	86-40-126		R	
SMALLMOUTH BASS	C	1986	8	1.700	6			25.0	211.9	F	1.250	86-40-126		M	
SMALLMOUTH BASS	C	1988	8	5.115	8			31.2	482.1	F	1.610	88-067	C	R1	
SMALLMOUTH BASS	C	1988	8	4.706	8			31.2	482.1	F	1.800	88-067	C	R2	
SMALLMOUTH BASS	C	1988	8	4.910	8			31.2	482.1	F	1.705	88-067	C	MR	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
SMALLMOUTH BASS	L	1984	7	0.580	3			29.5	248.9	M	0.390	011R007A		R	
SMALLMOUTH BASS	L	1984	7	1.360	3			29.5	248.9	M	0.910	010R007A		R	
SMALLMOUTH BASS	L	1984	7	0.970	3			29.5	248.9	M	0.650	010R007A		M	
SMALLMOUTH BASS	L	1984	6	1.480	4			33.9	465.1	M	0.650	073R041B		R	
SMALLMOUTH BASS	L	1984	6	1.720	4			33.9	465.1	M	0.730	116R041B		R	
SMALLMOUTH BASS	L	1984	6	1.600				33.9	465.1	M	0.690	116R041B		M	
SMALLMOUTH BASS	L	1986	6	0.610	3			29.5	302.9	M	0.280	86-4-9		R	
SMALLMOUTH BASS	L	1986	6	0.740	3			29.5	302.9	M	0.240	86-4-9		R	
SMALLMOUTH BASS	L	1986	6	0.670	3			29.5	302.9	M	0.260	86-4-9		M	
SMALLMOUTH BASS	L	1986	8	0.520	4			31.2	367.7	F	1.200	86-41-132		R	
SMALLMOUTH BASS	L	1986	8	1.240	4			31.2	367.7	F	1.600	86-41-132		R	
SMALLMOUTH BASS	L	1986	8	0.870	4			31.2	367.7	F	1.400	86-41-132		R	
SMALLMOUTH BASS	L	1986	8	0.870	4			31.2	367.7	F	1.400	86-41-132		M	
SMALLMOUTH BASS	L	1986	6	2.060	8			46.0	1237.8	F	0.780	86-5-14		R	
SMALLMOUTH BASS	L	1986	6	2.120	8			46.0	1237.8	F	0.840	86-5-14		R	
SMALLMOUTH BASS	L	1986	6	2.100	8			46.0	1237.8	F	0.810	86-5-14		M	
SMALLMOUTH BASS	L	1986	6	5.360	13			48.0	1587.2	M	0.530	86-5-15		R	
SMALLMOUTH BASS	L	1986	6	8.200	13			48.0	1587.2	M	0.710	86-5-15		R	
SMALLMOUTH BASS	L	1986	6	8.280	13			48.0	1587.2	M	1.000	86-5-15		R	
SMALLMOUTH BASS	L	1986	6	7.280	13			48.0	1587.2	M	0.750	86-5-15		M	
SMALLMOUTH BASS	L	1988	6	5.268	7			34.8	481.7	M	0.400	88-002	A	R1	
SMALLMOUTH BASS	L	1988	6	2.078	7			34.8	481.7	M	0.375	88-002	A	R2	
SMALLMOUTH BASS	L	1988	6	3.674	7			34.8	481.7	M	0.388	88-002	A	MR	
SMALLMOUTH BASS	L	1988	6	1.465	4			29.5	297.2	M	0.480	88-002	C	R1	
SMALLMOUTH BASS	L	1988	6	1.410	4			29.5	297.2	M	0.380	88-002	C	R2	
SMALLMOUTH BASS	L	1988	6	1.437	4			29.5	297.2	M	0.430	88-002	C	MR	
SMALLMOUTH BASS	L	1988	6	0.492	4			30.0	363.5	F	0.610	88-002	D	R1	
SMALLMOUTH BASS	L	1988	6	0.427	4			30.0	363.5	F	0.700	88-002	D	R2	
SMALLMOUTH BASS	L	1988	6	0.459	4			30.0	363.5	F	0.655	88-002	D	MR	
SMALLMOUTH BASS	L	1988	6	0.623	7			37.2	602.9	M	0.575	88-003	A	R1	
SMALLMOUTH BASS	L	1988	6	0.602	7			37.2	602.9	M	0.480	88-003	A	R2	
SMALLMOUTH BASS	L	1988	6	0.613	7			37.2	602.9	M	0.528	88-003	A	MR	
SMALLMOUTH BASS	L	1988	6	0.652	4			30.7	341.8	M	0.400	88-003	B	R1	
SMALLMOUTH BASS	L	1988	6	1.165	4			30.7	341.8	M	0.620	88-003	B	R2	
SMALLMOUTH BASS	L	1988	6	0.909	4			30.7	341.8	M	0.510	88-003	B	MR	
SMALLMOUTH BASS	L	1988	6	3.312	5			31.1	325.9	M	0.380	88-003	C	R1	

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SMALLMOUTH BASS	L	1988	6	3.711	5			31.1	325.9	M	0.460	88-003	C	R2	
SMALLMOUTH BASS	L	1988	6	3.512	5			31.1	325.9	M	0.420	88-003	C	MR	
SMALLMOUTH BASS	L	1988	6	0.695	4			30.8	343.2	M	0.560	88-003	D	R1	
SMALLMOUTH BASS	L	1988	6	0.778	4			30.8	343.2	M	0.540	88-003	D	R2	
SMALLMOUTH BASS	L	1988	6	0.736	4			30.8	343.2	M	0.550	88-003	D	MR	
SMALLMOUTH BASS	Z	1984	10	0.770	5			36.0	455.2	F	0.530	343R081A		R	
SMALLMOUTH BASS	Z	1984	10	0.510	5			36.0	455.2	F	0.410	241R081A		R	
SMALLMOUTH BASS	Z	1984	10	0.500	5			36.0	455.2	F	0.430	240R081A		R	
SMALLMOUTH BASS	Z	1984	10	0.590	5			36.0	455.2	F	0.460	240R081A		M	
SMALLMOUTH BASS	Z	1984	10	0.490	4			26.7	228.2	M	0.720	344R080E		R	
SMALLMOUTH BASS	Z	1984	10	0.410	4			26.7	228.2	M	0.870	259R080E		R	
SMALLMOUTH BASS	Z	1984	10	0.450	4			26.7	228.2	M	0.795	259R080E		M	
SMALLMOUTH BASS	Z	1984	10	0.600	3			26.2	221.9	M	0.800	336R082B		R	
SMALLMOUTH BASS	Z	1984	10	0.500	3			26.2	221.9	M	0.810	247R082B		R	
SMALLMOUTH BASS	Z	1984	10	0.550	3			26.2	221.9	M	0.805	247R082B		M	
SMALLMOUTH BASS	Z	1984	10	0.190	4			27.1	235.6	F	0.610	267R079A		R	
SMALLMOUTH BASS	Z	1984	10	0.150	4			27.1	235.6	F	0.800	261R079A		R	
SMALLMOUTH BASS	Z	1984	10	0.155	4			27.1	235.6	F	0.705	261R079A		M	
SMALLMOUTH BASS	Z	1992	10	0.579	5			28.7	259.9	F	0.80	GECT92-Z0240		R1	0.477
SMALLMOUTH BASS	Z	1992	10	0.645	5			28.7	259.9	F	0.77	GECT92-Z0240		R2	0.542
SMALLMOUTH BASS	Z	1992	10	0.612	5			28.7	259.9	F	0.78	GECT92-Z0240		MR	0.510
SMALLMOUTH BASS	Z	1992	10	2.893	10			45.9	1366	F	2.60	GECT92-Z0243		R1	2.260
SMALLMOUTH BASS	Z	1992	10	2.547	10			45.9	1366	F	2.52	GECT92-Z0243		R2	1.941
SMALLMOUTH BASS	Z	1992	10	2.720	10			45.9	1366	F	2.56	GECT92-Z0243		MR	2.100
WHITE CATFISH	L	1984	8	2.710	4			35.8	597.6	M	3.900	199R032A		R	
WHITE CATFISH	L	1984	8	6.530	4			35.8	597.6	M	7.500	033R032A		R	
WHITE CATFISH	L	1984	8	4.620	4			35.8	597.6	M	5.700	033R032A		M	
WHITE CATFISH	L	1984	8	54.980	16			54.0	2081.3	F	3.300	200R032C		R2	
WHITE CATFISH	L	1984	8	43.070	16			54.0	2081.3	F	4.400	327R032C		R1	
WHITE CATFISH	L	1984	8	67.240	16			54.0	2081.3	F	6.600	034R032C		R3	
WHITE CATFISH	L	1984	8	55.090	16			54.0	2081.3	F	4.770	034R032C		M2	
WHITE CATFISH	L	1984	8	1.870	3			31.0	365.9	M	3.600	140R030A		R	
WHITE CATFISH	L	1984	8	1.040	3			31.0	365.9	M	2.400	139R030A		R	
WHITE CATFISH	L	1984	8	1.455	3			31.0	365.9	M	3.000	139R030A		M	
WHITE CATFISH	L	1986	6	30.210	17			54.0	2400.0	F	4.300	86-1-1		R1	
WHITE CATFISH	L	1986	6	38.450	17			54.0	2400.0	F	5.600	86-1-1		R	
WHITE CATFISH	L	1986	6	40.700	17			54.0	2400.0	F	8.600	86-1-1		R1	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
WHITE CATFISH	L	1986	6	36.460	17			54.0	2400.0	F	6.170	86-1-1		M1	
WHITE CATFISH	L	1986	6	1.070	9			38.2	617.5	F	1.400	86-2-5		R	
WHITE CATFISH	L	1986	6	1.170	9			38.2	617.5	F	1.400	86-2-5		R	
WHITE CATFISH	L	1986	6	1.120	9			38.2	617.5	F	1.400	86-2-5		M	
WHITE CATFISH	L	1986	6	3.530	5			32.3	421.7	M	1.800	86-2-7		R	
WHITE CATFISH	L	1986	6	6.800	5			32.3	421.7	M	2.500	86-2-7		R	
WHITE CATFISH	L	1986	6	5.170	5			32.3	421.7	M	2.150	86-2-7		M	
WHITE CATFISH	L	1986	8	2.370	6			38.0	671.3	M	2.800	86-7-22		R	
WHITE CATFISH	L	1986	8	3.390	6			38.0	671.3	M	3.300	86-7-22		R	
WHITE CATFISH	L	1986	8	2.880	6			38.0	671.3	M	3.050	86-7-22		M	
WHITE CATFISH	L	1986	8	1.770	5			42.7	1191.8	F	2.900	86-8-24		R	
WHITE CATFISH	L	1986	8	2.190	5			42.7	1191.8	F	3.800	86-8-24		R	
WHITE CATFISH	L	1986	8	2.950	5			42.7	1191.8	F	5.700	86-8-24		R	
WHITE CATFISH	L	1986	8	2.310	5			42.7	1191.8	F	4.130	86-8-24		M	
WHITE CATFISH	L	1988	8	0.858	7			33.2	379.1	F	0.570	88-156	C	R1	
WHITE CATFISH	L	1988	8	1.190	7			33.2	379.1	F	0.900	88-156	C	R2	
WHITE CATFISH	L	1988	8	1.024	7			33.2	379.1	F	0.735	88-156	C	MR	
WHITE CATFISH	L	1988	10	30.420	20			56.5	2298.5	F	1.710	88-304		R1	
WHITE CATFISH	L	1988	10	19.086	20			56.5	2298.5	F	1.180	88-304		R2	
WHITE CATFISH	L	1988	10	24.752	20			56.5	2298.5	F	1.445	88-304		MR	
WHITE CATFISH	Z	1984	8	3.270	8			35.9	550.3	M	2.600	092R025A		R	
WHITE CATFISH	Z	1984	8	2.230	8			35.9	550.3	M	2.400	091R025A		R	
WHITE CATFISH	Z	1984	8	2.750	8			35.9	550.3	M	2.500	091R025A		M	
WHITE CATFISH	Z	1984	8	0.980	12			33.6	466.3	F	0.960	094R025B		R	
WHITE CATFISH	Z	1984	8	1.240	12			33.6	466.3	F	1.000	093R025B		R	
WHITE CATFISH	Z	1984	8	1.110	12			33.6	466.3	F	0.980	093R025B		M	
WHITE CATFISH	Z	1984	8	2.990	11			33.2	450.8	M	2.400	098R025D		R	
WHITE CATFISH	Z	1984	8	2.950	11			33.2	450.8	M	2.500	097R025D		R	
WHITE CATFISH	Z	1984	8	2.970	11			33.2	450.8	M	2.450	097R025D		M	
WHITE CATFISH	Z	1984	8	10.640	15			55.5	2624.4	M	3.200	114R027A		R	
WHITE CATFISH	Z	1984	8	6.530	15			55.5	2624.4	M	2.800	113R027A		R	
WHITE CATFISH	Z	1984	8	8.585	15			55.5	2624.4	M	3.000	113R027A		M	
WHITE CATFISH	Z	1986	10	2.190	4			36.5	563.0	M	2.200	86-53-169		R	
WHITE CATFISH	Z	1986	10	2.500	4			36.5	563.0	M	3.100	86-53-169		R	
WHITE CATFISH	Z	1986	10	2.340	4			36.5	563.0	M	2.650	86-53-169		M	
WHITE CATFISH	Z	1986	10	1.600	12			44.1	1162.4	M	1.600	86-54-170		R	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
WHITE CATFISH	Z	1986	10	2.650	12			44.1	1162.4	M	2.100	86-54-170		R	
WHITE CATFISH	Z	1986	10	4.490	12			44.1	1162.4	M	2.800	86-54-170		R	
WHITE CATFISH	Z	1986	10	2.910	12			44.1	1162.4	M	2.170	86-54-170		M	
WHITE CATFISH	Z	1986	10	1.940	6			33.4	487.1	M	1.900	86-56-176		R	
WHITE CATFISH	Z	1986	10	2.630	6			33.4	487.1	M	2.200	86-56-176		R	
WHITE CATFISH	Z	1986	10	2.290	6			33.4	487.1	M	2.050	86-56-176		M	
WHITE CATFISH	Z	1988	8	4.886	12			43.7	1367.2	M	1.860	88-095		R1	
WHITE CATFISH	Z	1988	8	5.465	12			43.7	1367.2	M	1.970	88-095		R2	
WHITE CATFISH	Z	1988	8	5.175	12			43.7	1367.2	M	1.915	88-095		MR	
WHITE CATFISH	Z	1988	8	2.844	15			43.8	1153.9	M	1.270	88-115		R1	
WHITE CATFISH	Z	1988	8	2.492	15			43.8	1153.9	M	2.020	88-115		R2	
WHITE CATFISH	Z	1988	8	2.668	15			43.8	1153.9	M	1.645	88-115		MR	
WHITE CATFISH	Z	1988	10	5.244	17			48.5	1645.3	F	2.620	88-241	A	R1	
WHITE CATFISH	Z	1988	10	5.944	17			48.5	1645.3	F	2.440	88-241	A	R2	
WHITE CATFISH	Z	1988	10	5.594	17			48.5	1645.3	F	2.530	88-241	A	MR	
WHITE CATFISH	Z	1988	10	8.676	15			41.7	1097.5	M	3.420	88-242	B	R1	
WHITE CATFISH	Z	1988	10	6.825	15			41.7	1097.5	M	2.620	88-242	B	R2	
WHITE CATFISH	Z	1988	10	7.750	15			41.7	1097.5	M	3.020	88-242	B	MR	
WHITE PERCH	L	1984	8	1.270	3			22.7	200.8	F	6.700	082R028A		R	
WHITE PERCH	L	1984	8	1.920	3			22.7	200.8	F	5.900	081R028A		R	
WHITE PERCH	L	1984	8	1.595	3			22.7	200.8	F	6.300	081R028A		M	
WHITE PERCH	L	1984	8	1.830	4			25.5	261.6	M	2.800	084R028B		R	
WHITE PERCH	L	1984	8	2.150	4			25.5	261.6	M	2.900	083R028B		R	
WHITE PERCH	L	1984	8	1.990	4			25.5	261.6	M	2.850	083R028B		M	
WHITE PERCH	L	1984	8	2.710	3			23.7	219.1	M	5.100	086R028C		R	
WHITE PERCH	L	1984	8	2.050	3			23.7	219.1	M	4.500	085R028C		R	
WHITE PERCH	L	1984	8	2.380	3			23.7	219.1	M	4.800	085R028C		M	
WHITE PERCH	L	1984	5	2.690	4			25.3	214.7	F	3.000	149R050A		R	
WHITE PERCH	L	1984	5	2.630	4			25.3	214.7	F	3.400	148R050A		R	
WHITE PERCH	L	1984	5	2.660	4			25.3	214.7	F	3.200	148R050A		M	
YELLOW PERCH	B	1984	8	3.720	7			26.8	275.5	M	1.100	176R053A		R	
YELLOW PERCH	B	1984	8	2.910	7			26.8	275.5	M	1.200	175R053A		R	
YELLOW PERCH	B	1984	8	3.315	7			26.8	275.5	M	1.150	175R053A		M	
YELLOW PERCH	B	1984	8	0.980	5			27.8	292.9	F	0.680	339R056C		R	
YELLOW PERCH	B	1984	8	1.240	5			27.8	292.9	F	1.000	197R056C		R	
YELLOW PERCH	B	1984	8	1.110	5			27.8	292.9	F	0.840	197R056C		M	

SPECIES	STA	YEAR	MO	TPCB	AGE	ST	SAGE	TL	TW	S	LIPID	SN	IND	REP	CTPCB
YELLOW PERCH	B	1984	8	0.710	7			27.3	264.2	F	0.700	310R057B		R	
YELLOW PERCH	B	1984	8	1.440	7			27.3	264.2	F	1.100	204R057B		R	
YELLOW PERCH	B	1984	8	1.075	7			27.3	264.2	F	0.900	204R057B		M	
YELLOW PERCH	B	1986	8	0.850	4			25.2	290.9	F	3.800	86-18-50		R	
YELLOW PERCH	B	1986	8	1.390	4			25.2	290.9	F	1.900	86-18-50		R	
YELLOW PERCH	B	1986	8	1.120	4			25.2	290.9	F	2.850	86-18-50		M	
YELLOW PERCH	B	1986	8	0.330	4			27.6	324.1	F	0.390	86-22-61		R	
YELLOW PERCH	B	1986	8	0.380	4			27.6	324.1	F	0.350	86-22-61		R	
YELLOW PERCH	B	1986	8	0.350	4			27.6	324.1	F	0.370	86-22-61		M	
YELLOW PERCH	B	1986	8	1.290	4			28.5	367.3	F	1.400	86-24-66		R	
YELLOW PERCH	B	1986	8	1.660	4			28.5	367.3	F	2.000	86-24-66		R	
YELLOW PERCH	B	1986	8	1.480	4			28.5	367.3	F	1.700	86-24-66		M	
YELLOW PERCH	B	1988	8	0.572	10			29.5	346.8	F	0.830	88-184	G	R1	
YELLOW PERCH	B	1988	8	0.499	10			29.5	346.8	F	0.720	88-184	G	R2	
YELLOW PERCH	B	1988	8	0.536	10			29.5	346.8	F	0.775	88-184	G	MR	
YELLOW PERCH	B	1988	8	0.462	4			28.3	310.0	F	0.580	88-196	G	R1	
YELLOW PERCH	B	1988	8	0.490	4			28.3	310.0	F	0.680	88-196	G	R2	
YELLOW PERCH	B	1988	8	0.476	4			28.3	310.0	F	0.630	88-196	G	MR	
YELLOW PERCH	B	1992	8	0.421	2			23.9	210.7	F	1.29	GECT92-B0060			0.337
YELLOW PERCH	B	1992	8	0.388	2			23.9	210.7	F	1.17	GECT92-B0060			0.309
YELLOW PERCH	B	1992	8	0.354	2			23.9	210.7	F	1.05	GECT92-B0060			0.280
YELLOW PERCH	B	1992	8	0.501	2			19	97.1	F	1.15	GECT92-B0069			0.408
YELLOW PERCH	B	1992	8	0.542	2			19	97.1	F	1.31	GECT92-B0069			0.445
YELLOW PERCH	B	1992	8	0.583	2			19	97.1	F	1.48	GECT92-B0069			0.481
YELLOW PERCH	Z	1992	10	0.325	5			21	101.7	F	1.01	GECT92-Z0222			0.268
YELLOW PERCH	Z	1992	10	0.302	5			21	101.7	F	0.96	GECT92-Z0222			0.242
YELLOW PERCH	Z	1992	10	0.278	5			21	101.7	F	0.90	GECT92-Z0222			0.217