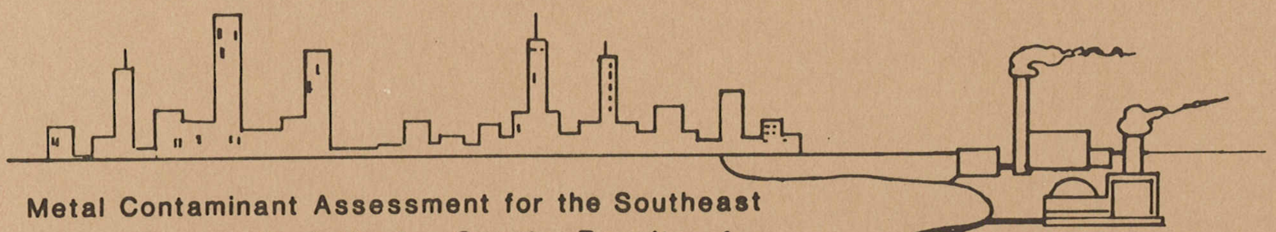
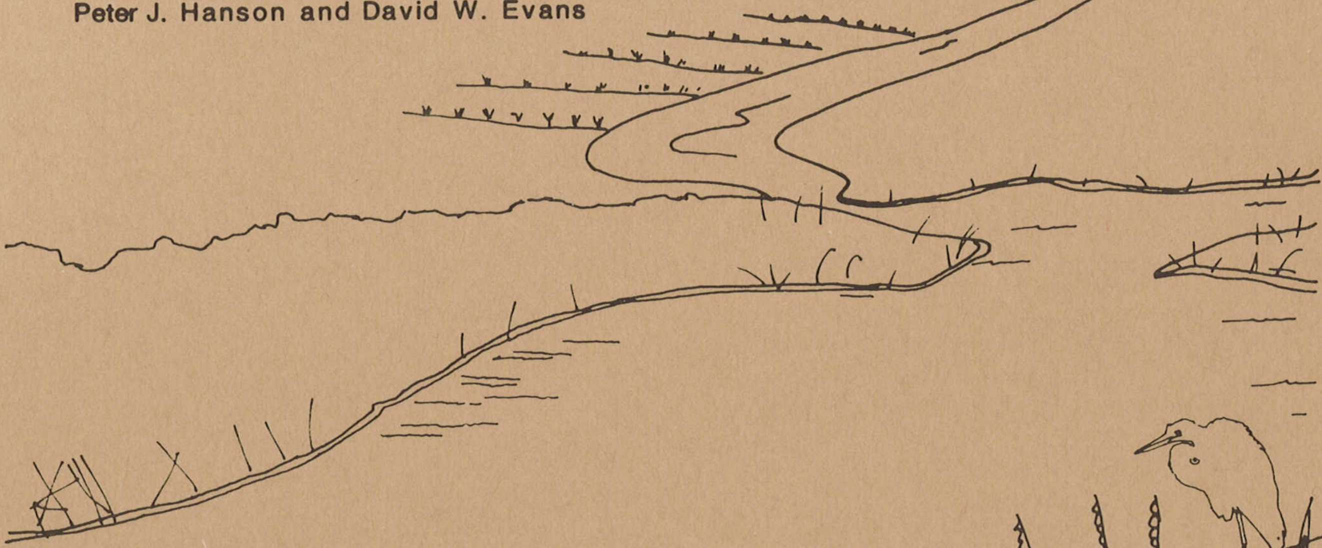
NOAA Technical Memorandum NMFS-SEFSC-284



Metal Contaminant Assessment for the Southeast Atlantic and Gulf of Mexico Coasts: Results of the National Benthic Surveillance Project Over the First Four Years 1984-87

Peter J. Hanson and David W. Evans



Beaufort, North Carolina
May 1991

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

National Marine Fisheries Service
Southeast Fisheries Science Center
Beaufort Laboratory

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Metal Contaminant Assessment for the Southeast Atlantic and Gulf of Mexico Coasts: Results of the National Benthic Surveillance Project Over the First Four Years 1984-87

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APPENDIX

FOREWORD

This technical memorandum presents trace metal data for the first four years of the National Benthic Surveillance Project, part of the NOAA's National Status and Trends Program (NS&T). It was originally produced as a project report in May 1990 and remains essentially unchanged. It contains data for samples collected in the eight coastal states: North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas which are collectively referred to as the Southeast region. It has two purposes: 1) to transfer four years of elemental data for both sediments and fish liver tissue to the NS&T data base, and 2) to summarize the major findings to date, understanding that a significant amount of data analysis remains. Manuscripts will be forthcoming in the open literature on these and future results.

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ABSTRACT

Sediment and fish tissue samples have been collected annually for contaminant analysis as part of NOAA's National Status and Trends Program, National Benthic Surveillance Project since 1984. The overall goals of the project are 1) to develop a nationally uniform, long-term data base for contaminants in U.S. coastal areas, 2) to establish the current status and future trends in contaminant levels in sediments and fish, 3) to establish and monitor indicators of harmful effects to fish from contaminants, and 4) to provide an information base for management action to control inputs, concentrations and harmful effects of contaminants. In this report, data are presented for the concentrations of 16 elements (Ag, Al, As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, Si, Sn, Tl and Zn) in fish livers and surficial sediments collected annually during 1984-87 along the southeastern Atlantic and Gulf of Mexico coasts at 17 locations. Locations represent major estuarine-coastal systems within the Southeast region (e.g., Galveston Bay, Pamlico Sound and Tampa Bay). Data from annual surveys (one site sampled per location) and intensive surveys (five and six sites sampled per location) are used to present spatial distributions and temporal trends among and within locations, respectively.

A method for reducing natural variability of metal concentrations in sediments that is based on linear regression of metals on aluminum is used to improve detection of spatial and temporal trends. The possibility for reduction in variability of metal concentrations in liver tissue based on consideration of fish size (age) is discussed. Based on four years of data, possible modifications to the overall sampling design are suggested.

Levels of trace metals in both liver tissue and surficial sediments, as measured at annual survey sites which are selected to represent average conditions at a location, indicate that contamination on a region-wide scale is generally low and near baseline in the southeast. However, although intensive studies indicate that annual sites are reasonably representative of locations, they also indicate the presence within larger locations of small or diffuse areas of elevated concentrations of some trace elements (i.e., "hot spots") in both fish liver and sediments. Contaminant concentrations, although low region-wide, nevertheless correlate with the level of urban-industrial activity adjacent to locations.

INTRODUCTION

Elemental analyses were conducted on bottom sediment and fish liver samples collected in near-coastal and estuarine waters of the southeastern U.S. as part of NOAA's National Benthic Surveillance Project (NBSP). The purpose is to provide a long-term database, national in scope, with which the present levels of contamination in our nation's waters and temporal trends in these levels can be assessed. Information of sufficient quality and continuity is sought to address important environmental questions. What are the pollution conditions in our coastal waters? Are they getting better or worse? What particular contaminants are the problem? Measurement of contaminant levels in the same sample types over long time periods provides the best change of addressing these questions. Measurement of contaminant levels in the environment not only provides indications of pollution, but also provides 1) a link between contaminant inputs and effects on biota, and 2) a basis for management action to control inputs and harmful effects. Effects from contamination can be controlled only through management of contaminant inputs which requires measurement of contaminant levels in the environment.

This report presents elemental data for sediments and liver tissue for the first 4 years of the NBSP project 1984 (Cycle I), 1985 (Cycle II), 1986 (Cycle III) and 1987 (Cycle IV) in the southeastern region. Data for 16 elements are included: Ag, Al, As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, Si, Sn, Tl, and Zn. Aluminum and silicon were measured in sediment alone. Silicon and thallium were analyzed in earlier cycles but later discontinued. Complete data are contained in the appendix. The data are used to assess the relative levels of elemental contamination in the region, to analyze for temporal trends, and to address the question of the representativeness of sampling sites with regard to the greater location they were proposed to represent.

Nineteen sampling locations were established along the southeast Atlantic and Gulf of Mexico coasts, referred to as the Southeast Region, during the 4 initial years of the project (Figure 1 and Table 1). Locations were selected to represent the expected range of contaminant conditions, from natural to impacted. Within each location, a site was selected for sediment collection by criteria established for the national program at its inception[1].

METHODS

Sampling

Fish and sediment samples were collected at 19 locations during 1984-87 over the same August to October period each year (Table 1). In 1984, samples were collected by the National Marine Fisheries Service (NMFS) and contracted state personnel coordinated through the NMFS Southeast Area Marine Assessment Program (SEAMAP) and the participating states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. 1985, 1986, and 1987 samples were collected by NMFS personnel aboard the NOAA Ship Ferrel with SEAMAP providing technical assistance.

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[1] NOAA Selection Criteria

Locations: Broad geographic coverage of the coastline is needed to establish a national baseline representative of the diversity of habitats and pollutant impacts present. The assemblage of locations should represent a range of anthropogenic impacts, from relatively pristine to urban-industrial.

Sites: A site is an area approximately 2 km in diameter. A site is selected to be subtidal, not intertidal; a depositional zone for sediments; integrative of contaminant accumulations within the location; an area that has not been or will not be dredged or scoured and will not undergo slumping; located outside the zone of initial dilution of a point source discharge and outside the zone of an authorized dumpsite.

Stations: Each site contains three stations which are selected to characterize the site. The site criteria discussed above restrict the choice of station positions to particular areas within a location (i.e., a site) which, by definition, have less parameter variability than throughout the entire location. The selection of stations is designed to characterize the site mean and variance for the measured parameters and is not intended to characterize parameter gradients within a more heterogeneous location, such as natural gradients within an estuary or dilution gradients around discharge point.

Fish Samples

Atlantic croaker (Micropogonias undulatus) and spot (Leiostomus xanthurus) were selected as target species. Atlantic croaker is the primary species principally because its relative abundance is generally greater than spot in the southeastern Atlantic and Gulf coastal waters. Collection of a single species from as many sites as possible is desirable in keeping with program objectives. Fish were collected each year during late summer and early fall to control for seasonal effects and to provide young-of-the-year specimens of maximum size prior to their movement from shallow estuarine waters into deeper waters which occurs with the onset of cooler weather. Young-of-the-year fish are sampled to maximize the probability that they were resident in the collection waters for all or a substantial fraction of their lives and thus have only been exposed to contaminants in those waters. Species collected each year are indicated in Table 1.

Fish were collected with bottom trawls equipped with untreated nets. In accordance with program protocol, fish were randomly selected from each trawl and assigned to analytical categories. In 1984, fish were iced immediately after capture. Dissection for histopathology proceeded immediately on the trawl boat or after transfer to another vessel or laboratory, as weather and logistics allowed. Fish for organic and trace metal analysis were returned whole on ice for processing in the field laboratory at the end of each sampling day. In 1985-87, samples were processed aboard the Ferrel in similar manner, except fish were held alive until processed. Fish were weighed, measured and necropsied. Tissues for trace metals and organics were frozen, those for histopathology were chemically preserved until analysis.

Sediment Samples

Sediments were sampled with a Smith-MacIntyre grab at three stations within each site. Three grabs were taken a few meters apart at each station for a total of nine grabs per site. Three cores and two scoop samples were taken from each grab. All samples were stored on ice until returned to the field laboratory (1984) or shipboard laboratory (1985-87) for processing. Cores for trace metal, total organic carbon and particle size analyses were frozen. Scoop samples for organic analysis were composited by station and frozen. Transfer of tissue and sediment samples to analytical laboratories followed "chain of custody" protocols to assure transfer in frozen (dry ice), refrigerated (blue ice), or chemically preserved condition as required.

Elemental Analysis of Liver Tissues

A pressurized, high temperature digestion with nitric acid is carried out in a closed teflon (PFA) vial inside a teflon (TFE) lined stainless steel bomb as reported by Okamato and Fuwa (1984). The procedure is designed to attain sufficient temperature and pressure to effect sample dissolution, minimize contamination, and prevent loss of volatile elements such as Hg and Se. Digestions are carried out in batches of 12 or 13 samples, 3 or 4 standard reference materials, and 2 process blanks. Samples from each location are randomized among batches to minimize systematic bias. A single diluted digest provides material for all analyses. Ag, As, Cd, Cr, Ni, Pb, Se, Sn, and Tl are analyzed by graphite furnace atomic absorption spectrophotometry (AAS) (PE model Z/3030, Zeeman background corrected). Fe, Mn, Cu, and Zn are analyzed by flame and Hg by cold vapor AAS (PE 603).

Preparation of Sediments for Analysis

Sediment cores are thawed at room temperature, the top 3 cm is extruded from the core tube, the outer 3 mm of the core sample is rejected, and the sample is placed in a polyethylene weigh boat for drying (60°). The sample is ground to uniform texture in an agate mortar after drying, and equal weight station composites are prepared from 5-7 grams of sediment from each of the three grabs at a station.

Elemental Analysis of Sediments

The digestion procedure is modified from methods originally reported by Rantala and Loring (1975). The procedure includes HF, HNO_3 and HCl digestion acids in the same digestion bombs described for tissue samples. Aqua Regia (HCl + HNO_3) is used to partially oxidize organic matter and to maintain oxidizing conditions which stabilizes such elements as Hg, Se and As.

Ag, As, Cd, Cu, Ni, Pb, Sn, and Tl are analyzed by graphite furnace atomic AAS (PE Z/3030); Si, Al, Fe, Mn, and Zn are analyzed by flame AAS (PE 603). Cr was analyzed by flame AAS in 1984 and 1985 and by graphite furnace AAS in 1986 and 1987. Hg is analyzed by cold vapor AAS (PE 603) and Se is measured by hydride generation AAS (PE 603 and PE MHS-10 hydride generator).

Quality Control and Assurance

To assure validity of analytical methods, a QC/QA program is conducted that consists of five parts: 1) use of good laboratory practices, 2) written documentation of methods used, 3) participation in Ocean Assessment Division (OAD) sponsored interlaboratory comparison exercises and QC/QA Workshops, 4) use of Certified Reference Materials (CRM's), and 5) use of quality control charts.

Analyses of certified reference materials provide estimates of accuracy and precision for analysis of sediment and tissue samples. Routine use of the following CRM's is our principal method for day-to-day quality control: for sediment analyses NBS 1646, MESS-1 and BCSS-1 which are all estuarine sediments; for tissue analyses NBS 1566 oyster tissue, NBS 1577 bovine liver and DOLT-1 dog fish liver[2].

Measured accuracy and precision varied among reference materials and years. We report median values as a robust measure of central tendency for the four years of analyses reported (Table 2). For most elements, accuracy is within 10% of certified values and precision is less than 10% coefficient of variation. Values substantially greater than 10% are usually associated with elements near the method detection limit. Instrument sensitivity is generally the limiting factor and more sensitive methods and instrumentation would be necessary to lower detection limits. This is the case for Sn, Se, and Tl analyses in sediments and Sn and Hg analyses in tissue. Sample contamination in the laboratory may be a factor for Cr and Ni analyses in biological materials because of low concentrations found in tissue reference materials and fish liver samples.

RESULTS AND DISCUSSION

Sediments

Sediment Models - The metal content of natural fine-grained, aluminosilicate-rich sediments, typical of the type most useful for contaminant monitoring, are well fit by a linear, two-component mixing model using quartz sand and aluminosilicates as the mixing end members. This model was developed and used in this project since 1985 and reported by others (Windom et al., 1989). Benefits of the model are its ability to account for that part of variability in observed metal concentrations associated with varying amounts of natural (i.e., baseline) sediment and to allow adjustment of observed concentrations to a common basis for direct intercomparison.

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[2] NBS 1646, NBS 1566 and NBS 1577 are available from National Institute of Standards and Technology, Washington, DC. MESS-1, BCSS-1 and DOLT-1 are available from National Research Council of Canada, Ottawa, Ontario.

To utilize this approach, a liner model is developed for each element using liner regression to fit element versus aluminum concentrations for an appropriate group of sediments known to represent natural or baseline sediments. Aluminum is used as a direct indicator of aluminosilicate mineral content and, therefore, of the natural trace-element rich component of the sediment. At the inception of the project, nine locations, about half the total number, were selected to represent areas likely to have little or no contaminant impact based on their remoteness from centers of human population and industry (Table 1). Linear models for each of 14 elements (Ag, As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, Sn, Tl, and Zn) were developed with data from these nine baseline locations for the years 1984-87 (Table 3 and Figures 5-18). The validity of these selected locations and of the subsequently derived models to represent baseline conditions is discussed below.

The fitted models were used to numerically adjust observed total concentrations (i.e., total=baseline + contaminant metal concentrations) to those expected with a baseline aluminum concentrations of 8.01% (equivalent to world average shale; Horn and Adams, 1966), thus providing a common basis for comparing sediment concentrations among locations and years. Adjustment is graphically equivalent to translating each measured datum parallel to the fitted line (i.e., slope) from the measured Al concentration to 8.01%. The metal concentration determined by this procedure, albeit done numerically in practice, is the adjusted metal concentration. Analysis for spatial and temporal relationships used only adjusted sediment data.

For most metals, linear models fit the baseline data well, as judged by the coefficients of determination (Table 3). Adequacy of the model and homogeneity of variance were further investigated with plots of residuals against the independent variable Al using a graphical approach (Neter et al., 1985). Also, the absolute magnitude of the residuals were ranked against Al concentration and subjected to correlation analysis. For 10 of 14 elements, significant (5% level) positive correlations were found. This implies the need for further refinement of the models, possibly using weighted least squares or data transformation approaches. With the present models, unbiased, although not minimum variance estimates, of regression coefficients are obtained which are suitable for the adjustment procedure.

Baseline models yield adjusted concentrations in general agreement with world average shale, and for several metals where agreement with the shale model is lacking (i.e., Cu, Pb, Ni, Cr, and Fe) there is close agreement with other large data bases from within the same region (Table 3). If sampling locations selected to represent baseline were in fact significantly contaminated, resulting models would tend to predict concentrations larger than world average shale. Since this is generally not the case, exceptions being Ag and Pb, the use of these models is supported for data adjustment and prediction of contamination in sediments.

Baseline locations show only a few scattered data points above the 95% upper confidence limit (UCL), with no consistent pattern among the metals and locations (Figures 5-18, Table 4). Four baseline locations Pamlico Sound (PAM), Barataria Bay (BAR), Round Island (ROU) and Apalachicola Bay (APA) show more frequent elevated concentrations above the 95% UCL for specific metals[3]. This probably reflects a low level of sediment contamination by Pb and Cd at PAM, by Ag at BAR, and by several metals at ROU. Fe, Mn and As are elevated at APA which is consistent with a regional pattern observed at Pensacola Bay (PEN) and Mobile Bay (MOB) and likely reflects natural regional enrichment of these metals.

For all elements and locations, 84% of station composites fall below the 95% UCL, 94% at baseline locations and 74% at other locations. This further supports the general conclusion derived from 1984-85 data that elemental contamination, as judged from sediment measurements, is generally low at the annual sampling sites in the Southeastern region. Annual sampling sites were selected by criteria (p. 3) designed to provide sediments reflective of average, integrative contaminant accumulations. Data from intensive surveys (i.e., multiple sites) at St. Johns River (SJR, Fig. 2), Sapelo Sound (SAP, Fig. 3), and Galveston Bay (GAL, Fig. 4) in 1987, discussed later, support both the above general conclusion regarding contamination levels in the Southeastern region and the apparent success in meeting site selection criteria.

Even though elemental contamination is generally low in sediments at annual sites in the southeast, comparison of overall four-year mean concentrations at baseline (i.e., rural) and non-baseline (i.e., urban-industrial) locations indicates clear differentiation based on these classes for most elements (Table 5). Analysis of variance shows non-baseline sediments are significantly greater ($p \leq 0.05$) than baseline sediments for all metals except As, Mn, Se and Sn. Metal contamination is clearly evident in sediments at urban-industrial sites based on four-year mean data. It is also evident that many non-baseline sites have metal concentrations at baseline levels. These results suggest that Ag and Cd followed by Pb, Hg, Cu and Zn are the more useful indicators of sediment contamination.

<u>Four-Year Temporal Trends</u> - Analysis of variance (ANOVA) was used to test for differences among annual mean concentrations at each location for each element using adjusted concentrations.

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[3] The positions, names and designation codes for the sampling locations are shown in Figure 1 and Table 1.

Temporal trends were detected using ANOVA with orthogonal polynomials and $p \leq 0.05$. Forty significant differences were detected ($p \leq 0.05$) from a possible 238 metal-by-location combinations (Table 6). Twenty-two occurred where all of the individual data points (i.e., station composite samples) were below the 95% UCL and thus represent "baseline" concentrations. These differences are of little environmental importance. Analysis for temporal trends was restricted to the remaining 18 significant differences where one or more station composites had concentrations above the 95% UCL. Formal analysis of monotonic temporal trends were restricted for reasons of statistical interpretation to locations where four years of data are available. Locations with three years of data and an indication of a developing monotonic trend are noted. At the five locations with 4 years of data (CHS, GAL, MRD, SAP, and SJR) none of the significant among-year differences show significant ($p \leq 0.05$) monotonic temporal trends. At three locations with three years of data, positive, monotonic temporal trends are evident and bear watching as additional data becomes available: Cd at CCB, Cu and MOB, Cr at PEN and Ni and PEN.

<u>1987 Intensive Survey</u> - The intensive surveys at SJR, SAP and GAL in 1987 provide data for five sites at each location, the annual site sampled in 1984-86 plus four additional sites (Fig. 2-4). Multiple sites were selected to characterize the range of contaminant levels in sediments at each location, to look for systematic variation in contaminant levels, to determine how representative the annual site is at each location, and to investigate short-term variability at a baseline location (SAP) spanning the seasonal period (August-October) during which sampling operations are conducted each year. Sites were thus selected in areas known or suspected of having elevated contaminant levels as well as those expected to be relatively uncontaminated. SJR and GAL were selected for intensive study based on 1984-86 data as examples of impacted locations, SJR with a relative large number of station composites indicating contamination, and GAL with a small number. SAP is a baseline location with among the fewest elevated station composites.

The three locations also exhibit different hydrologic and geographic characteristics: SAP (Fig. 3) is a coastal system with a maze of barrier islands and low lying marsh separating a complex of coastal stream drainage from the Atlantic Ocean; SJR (Fig. 2) is a linear, river-dominated estuarine system with major urban-industrial development and dredged channel in its middle to lower reaches; GAL (Fig. 4) is a broad, shallow, nearly enclosed embayment with episodic river inputs and substantial urban-industrial development at both upstream (Houston Ship Channel) and bay marginal (Texas City) areas.

Differences among sites for each location and element were explored by analysis of variance. Also, the annual site at each location was compared pairwise with each of the other four sites using Dunnett's T test to characterize those sites that were significantly different from the annual site. Ten significant differences ($p \leq 0.05$) were detected (Table 7). Eight of these were at GAL and only one each at SJR and SAP. The results at GAL and SAP are not unexpected. Higher spatial variability among sites at impacted locations than at baseline locations could result from heterogeneous contaminant inputs superimposed on the natural heterogeneity of sediments, especially in estuarine sedimentary environments.

SJR is the location with the highest concentrations of important contaminant elements (i.e., Ag, Cd, Cu, Hg, Pb, Sn, and Zn) and is among those with the highest frequency of station composites above the 95% UCL. A larger number of significant differences among sites might be expected at SJR, but this is not so. The obvious reason is the greater magnitude of within-site variability compared to the other two locations (Table 8).

Dunnett's T test (Table 7) shows GAL site C (Morgans Point near the confluence of the upper, channelized section of the Houston Ship Channel and Galveston Bay, Fig. 4) to have concentrations of Ag, Cd, Cu, Pb, and Zn significantly above levels at the annual site D (Eagle Point/Dickinson Bay in Galveston Bay proper). GAL site B (adjacent to Texas City) has significantly elevated Ag, Se, and Sn concentrations. Results of GAL sites B and C reflect their proximity to industrial activities and population centers. The other two sites A (East Bay) and E (Trinity Bay) are in more remote areas of Galveston Bay and have elemental concentrations similar to the annual site D.

Differences in metal concentrations among SJR sites (Fig. 2) are not significant but do follow a pattern consistent with our knowledge of contaminant inputs and population centers. Site D (West Mill Cove), the annual site, is generally intermediate between the two sites C (Cedar-Ortega Rivers) and B (Trout River) and the two sites E (Piney Point) and A (Orange Pt.-Orange Park) for the important contaminant elements Ag, Cd, Cu, Hg, Pb, Sn, and Zn. Sites C and B are located on tributaries of the St. Johns River which flow through industrial and population areas of the city of Jacksonville. Sites E and A are located on the St. Johns River upstream of and therefore more remote from Jacksonville.

The distributions of mean elemental concentrations, as indicated by measures of variance, are generally more uniform at SAP (Fig. 3) compared to GAL and SJR (Table 8). Within-site variability at SAP is much less than at GAL or SJR for most elements. Annual-site means (Table 9), overall location means (Table 8), and expected adjusted values computed from baseline models (Table 3) agree closely at SAP for all elements except Mn and Hg. The significant difference for Cd between annual site A (Sapelo Sound-High Pt.) and intensive site C (Sapelo Sound-Inlet), appears real, as the error levels are homogeneous among the five sites. Sites B (Sapelo River-Dog Hammock), A and C are located in a seaward progression along the longitudinal axis of Sapelo estuary. Cd concentrations in sediments increase along this progression in parallel with increasing average salinity. Sites D (Barbour Island River) and E (South Newport River) both located on tributaries of Sapelo Sound, have Cd concentrations most like the lower salinity sites B and A. Reasons for this trend are not apparent.

Comparison of annual-site means (Table 9) and location means (Table 8) suggests annual sites are representative of overall locations for most elements, in so far as intensive survey samples are representative of location sediments. Assurance of truly representative samples requires a more extensive sampling program using random, probability based and, possibly, stratified designs. The annual site at SJR appears to underestimate location concentrations for Cr and Se. The comparatively large mean and variance for Mn at the SAP annual site and the apparent lack of representativeness of the annual site for this element is noted.

Analysis of variance was used to investigate short-term variability at SAP to determine if metal concentrations in baseline sediments changed significantly over the three month seasonal sampling period used each year. Analysis of data for collections of the annual site A (Sapelo Sound-High Pt., Fig. 3) in July, August and October indicated no significant differences ($p \leq 0.05$) in concentration for all metals except Mn. The apparent lack of representativeness of this site for Mn at SAP compared to the other four sites was noted above. Sample collection can proceed anytime within this period without concern for significant effects on variability of baseline levels.

The distributions of elemental concentrations and their variability in sediments within locations can be described by one of four qualitative models based on relative characteristics of site means and within-site variance (Table 10). Model 1 (i.e., uniform baseline levels) and model 4 (i.e., patchy concentrations) represent boundary conditions into which fit most of the 1987 intensive survey data. Large, well defined "hot spots" (model 2) and/or wide spread contamination throughout locations (model 3) are not characteristic of conditions between North Carolina and Texas. Patterns of contaminant metal distributions and their correspondence to the models are illustrated by Ag, Cd, Cu, and Zn data (Table 11). Uniform site means at baseline levels and low, uniform variances characteristic of model 1 are observed at SAP and are typical of unimpacted locations. Data for Ag, Cu and Zn at SAP fit model 1 while Cd shows a tendency toward model 2. Random contamination in an otherwise natural location or variation inherent in surveys with limited sample size may be the cause.

Variable site means and high, variable variances characteristic of model 4 are observed at SJR. This pattern is typical of locations having widespread contamination but with both unimpacted sites and small areas of elevated concentrations (i.e., "hot spots"). Ag, Cd, Cu, and Zn data at SJR show model 4 characteristics. Site A (Orange Pt.-Orange Park) is at or near baseline levels while site C (Cedar-Ortega Rivers) has elevated concentrations for all four metals. Sites B (Trout River), D (West Mill Cove, the annual site) and E (Piney Pt.) have site means elevated above baseline and variances less than site C but greater than site A.

GAL has characteristics intermediate to SAP and SJR. Cu, Ag, and Zn data fit model 4, but the overall levels of contamination, intensity of diffuse "hot spots", and levels of variance are less than at SJR. Cd data fit between models 1 and 2 and indicate an area of contamination at site C (Morgans Pt.).

Sampling Design - Results of intensive surveys at GAL, SJR, and SAP imply direction in future sampling design. Location and annual-site means show agreement for almost all metal-site combinations (Tables 8 and 9) even at SJR where high levels of within-site and among-site variance make it the least likely location of the three to show such agreement. Based on existing data, no other locations in the Southeast region should have variance levels higher than SJR. Thus, current annual sites selected by existing criteria (p. 3) appear to provide estimates of metal levels in sediments that are comparable to multiple site samplings and are representative of the whole location to the extent that the criteria provide selection of representative sites.

The existing annual sampling design (i.e., one site per location selected with criteria that are arbitrary from a statistical viewpoint) does not significantly bias estimates of mean metal concentration in sediments at the sites sampled intensively in 1987; whether a single annual-site mean is truly representative of each location is not addressed by the present sampling design. An appropriate design would be based on random sampling of a uniform grid designed for each location based on current estimates of variability and incorporating concepts of probability sampling and stratification (Cochran, 1963 and Hansen et al., 1953). Estimates of the areal distribution of contaminant levels at a resolution commensurate with the proportion of sampling units sampled would result along with the assurance of statistically valid and representative estimates of location means. This would benefit not only sampling design and optimization but also assessment of location wide contamination which is needed for effective environmental management.

With multiple locations and a national project scope to maintain, the effort at individual locations must be limited.

Based on available data, sampling effort can be redistributed from the current design of equal effort per location to one of more effort at locations with elevated contaminant levels and variance (i.e., contaminated or impacted locations). At the least, the present criteria for site selection (p. 3) could be retained and sampling frequency altered based on conditions at each location (e.g., baseline locations sampled less frequently than impacted locations). Alternately, more extensive surveys could be considered using random sampling design, with the exact design tailored to the location. Design changes need not produce incompatible data or interfere with temporal trend analysis.

Liver Tissues

<u>Spatial Variability (1987 Intensive Survey)</u> - Atlantic croaker were collected during the 1987 intensive surveys at SJR, SAP and GAL (Fig. 2-4) to test the assumption that annual survey sites adequately represent the location for temporal trends analysis and comparisons to other locations. Information was sought on the levels of within-location variability of element concentrations in livers for both natural (i.e., baseline) and impacted locations. Additional sampling sites for fish collection (four at SAP, four at SJR and five at GAL) were spaced throughout the larger locations both nearer and further from possible contaminant sources, as discussed in the sediment section.

In general, ten or twenty fish were sampled at each site within a location at the same sites where sediments were collected. In a few instances, trawlable fish habitat providing sufficient numbers of fish did not coincide with sediment sites meeting the selection criteria. At GAL, fish were sampled over a wider range of sizes than usual to assess the influence of size and age on trace element concentrations, a phenomenon we observed previously at another location.

The degree of variability in trace element concentrations among sites within each location can be shown in several ways. Table 12 ranks the different elements according to the ratio of mean concentration at the site with highest mean to that with lowest mean. Large ratios indicate a large range in mean concentrations among sites for that element, hence spatial heterogeneity within the location. Chromium was excluded from this and other analyses because it was generally less than our analytical detection limit in livers. Mercury analyses were still underway and are not reported.

Two patterns stand out. First, the elements Pb, Cd, Ag, and Sn generally have higher ratios. These elements are not essential to most organisms and also are considered important pollutants. They are more heterogeneously distributed within each location than are the essential elements Zn, Se, Fe, Mn, and Cu. It is not known whether As and Ni are essential. This pattern may reflect the greater spatial heterogeneity of environmental exposure of fish to pollutant, non-essential elements or the ability of fish to homeostatically regulate their internal concentrations of essential elements within relatively narrow bounds. The second pattern is the generally lower ratios observed at the rural location SAP compared to the urban locations SJR and GAL. This is especially evident for the non-essential elements Pb, Cd, Ag, and Sn. Again, spatial heterogeneity is likely to be greater where localized inputs of contaminants result in spatial heterogeneity of exposure of fish to elements they cannot regulate internally.

Among the urban locations, GAL shows generally larger ratios than SJR. For example, both patterns can be seen in Zn and Pb data for each site at SAP, SJR, and GAL locations. For the essential element Zn, little variability in mean concentration among sites is seen within each location (Figures 19, 20, and 21). The exceptions are found at sites C and D in GAL (Fig. 4) which show higher mean concentrations (Figure 21). This is the influence of larger sized fish at these sites which elevates the mean concentrations. The nonessential element Pb has a more complex pattern. At SAP, mean Pb concentrations are always low and relatively uniformally distributed (Figure 22). This rural location probably lacks localized Pb sources and represents Pb concentrations in fish at concentrations near the baseline we might expect in southeastern Atlantic croaker. At SJR site C (Cedar-Ortega Rivers, Fig. 2) which is located on a tributary to the St. Johns River, Pb concentrations are higher than in the main channel of the St. Johns River (Figure 23). The remaining four sites have similar Pb concentrations that are somewhat elevated above the presumed baseline observed at Sapelo Sound, suggesting detectable system-wide Pb contamination. In GAL (Fig. 4), three of six sites show significantly elevated mean Pb concentrations in livers (Figure 24). The elevated sites are located near the industrial complex at Texas City (site B) and at the mouth of and within the confines of the Houston Ship Channel (sites C and F). Multiple local sources of Pb exist in Galveston Bay. However, the annual site D at Eagle Point is relatively low in Pb. It is only slightly elevated in Pb concentration in livers compared to the more rural sites A (East Bay) and E (Trinity Bay). The annual site appears to be a representative, integrative site for Pb in Galveston Bay, at least in so far as its mean Pb concentration is intermediate among the concentrations found at both rural and urban-industrial sites.

A pattern of interaction between certain essential and non-essential elements was observed at GAL and SJR which suggests that particularly low concentrations of essential elements in livers at polluted sites may be evidence for physiological deficiency. The deficiency in essential elements is paralleled by reduced concentrations of some non-essential elements. For example, mean

Ag concentrations at GAL site F (Houston Ship Channel) and SJR site C (Cedar-Oretaga Rivers), among others, are significantly lower than their respective location means and the SAP location mean. SAP appears to be a good indicator of expected baseline levels. Cu and Zn concentrations also are reduced below expected baseline at GAL site F and SJR site C, indicating deficiency. Fe is well below baseline at GAL site F and equal to baseline at SJR site C. However, these two sites have among the highest Sn and Pb concentrations in livers; sediment data also supports their classification as contaminated sites. This pattern of interrelation may be associated with organic contamination and its effect on liver function. Organic data for the intensive survey is not yet available.

A more formal analysis of spatial heterogeneity (ANOVA) was conducted at GAL (Fig. 4), SJR (Fig. 2) and SAP (Fig. 3) to address the representativeness of the annual site for the whole location. ANOVA detected significant ($p \leq 0.05$) within-location (i.e., among-site) differences for a large number of elements with GAL showing the most spatial heterogeneity of the three locations (Table 13). Two properties, at least, should characterize an annual site if it is to be representative of a location and therefore useful in distinguishing that location from others and in detecting temporal trends. First, the mean concentration at an annual site should be near the overall mean for all sites at the location. Second, the variability about the mean at the annual site should be less than the variability about the overall mean at the location. This is desirable in order to have minimum variance estimates for detection of significant statistical time-trends and differences among locations. Ratios of the mean element concentrations in fish livers at the annual site to the mean for all sites is an indicator of representativeness of the annual site to the overall location. The ratio of the standard deviations of these concentrations are a measure of the relative variability at the annual site compared to the overall location (Table 14).

At Sapelo Sound, Cd is the only element with mean concentration at the annual site significantly ($p \leq 0.05$) different from the location as a whole. It is interesting to note that at SAP, Cd in sediment and liver show the same pattern of increasing concentration in a seaward direction along the estuary and that for most of the remaining elements the annual site and overall location means agree for both sediments and tissue. At St. Johns River mean concentrations of Ag, Mn and Pb at the annual site are significantly different from those for the location as a whole. At Galveston Bay the annual site differs from the location as a whole for most elements. This pattern among locations is consistent with earlier patterns. Sapelo Sound is relatively homogeneous in its trace metal concentrations in fish livers and sediments; the annual site is representative of the location as a whole. St. Johns River is more heterogeneous, and it is more difficult for the annual site to be representative of the whole location. This is certainly the case for Galveston Bay. Neither the annual site nor any other sampled site can adequately represent this location. Trace element distributions are too complex.

A similar pattern exists for ratios of standard deviations (Table 14). At Sapelo Sound, the variability at the annual site does not differ from the location as a whole, except for Sn. At St. Johns River, Pb and Sn are significantly less variable at the annual site than in the location as a whole. Local sources of Sn and Pb to fish at other sites elevate location-wide variability. At Galveston Bay, localized sources of many trace elements elevate location variability in comparison to that at the annual site. However, for Ag, Cu and Zn the opposite is true. The annual site D has greater variability than the location as a whole. This is the result of the greater range in fish size collected at this site and also sites C and F in Galveston Bay and the positive influence of size on the concentration of these three elements in fish livers; see, for example, Figure 25 for the relation between size and Zn concentration. This influence also elevates the annual site mean for these three elements above that for Galveston Bay as a whole.

In general, the chosen annual survey sites at SAP, SJR and GAL are good, integrative representatives of the locations as a whole. They succeed least well in this role at Galveston Bay where spatial heterogeneity in element concentrations in liver is greatest due to local contamination inputs. More than one annual survey site may be useful at GAL. The pollutant, non-essential elements Ag, Cd, Pb and Sn show greatest heterogeneity in mean concentrations and are better indicator elements for contamination in fish livers.

<u>Short-term Variability</u> - Annual survey sampling is conducted during August through October to control variability derived from seasonal effects. However, it is possible neither to always sample each site at the same time nor to be assurred that fish have the same growth histories from year to year. As a result, fish of different age, size, sexual maturity or contaminant exposure history may be caught in different years. Observed differences in element concentrations in livers may not reflect only changes in environmental contamination.

Fish were collected at SAP three times between July and October (Fig. 3) during the 1987 intensive survey to investigate short-term variability. Anthropogenic sources of trace elements were expected to be minor at SAP, and therefore observed differences in element concentrations in livers were expected to reflect natural processes of fish growth, maturation, feeding, and movement within the location.

Atlantic croaker were sampled at site B (Dog Hammock) during July and August and at the annual site C (Sapelo Sound Inlet), a few miles downstream, during August and October (Fig. 3). Mean fish length was similar each time at each site but differed between sites: 151 mm (site B, July), 153 mm (site B, August), 170 mm (site C, August) and 171 mm (site C, October). Therefore, size effects which influence element concentrations in Atlantic croaker livers should not be important in the temporal comparisons at each site.

Analyses of variance indicated few statistically significant ($p \leq 0.05$) temporal differences at either site. The most striking differences in mean concentrations are for Sn at site B which dropped sharply from July to August and for Cu, Mn, and Zn at site C which dropped between August and October (Table 15). Elevated Sn at site B suggests exposure to Sn contamination, perhaps from boat paints, but local sources of contamination in the Sapelo Sound location are rare. Decline in concentrations of essential elements Cu, Mn, and Zn at site C probably is a natural phenomenon, although certainly not a consequence of differences in fish size. This points to the need for a better understanding of natural processes that influence trace element levels in fish.

<u>Four-year Temporal Trends</u> - Four years of data at five locations CHS, GAL, MRD, SAP, and SJR and three years data at other locations allows an initial attempt at detecting temporal trends in element concentrations in southeastern fish. The analysis is complicated by a shift in the species from spot to Atlantic croaker after 1984 at ROU, SAP, and SJR. Spot were collected consistently at LOT. Atlantic croaker were consistently sampled at all other locations (Table 1).

Analysis of variance with orthogonal contrasts was used to test for differences among years and for linear temporal trends (Table 16). Among the 11 elements Ag, As, Cd, Cu, Fe, Mn, Ni, Pb, Se, Sn, and Zn and the 16 locations APA, BAR, CCB, CHS, GAL, HER, LLM, LOT, MRD, MOB, PAM, PEN, ROU, SAB, SAP, and SJR for which adequate data exist, there are 176 possible element-location pairings. Seventy-nine significant year-to-year differences ($p \leq 0.05$) were found or 44% of those possible. Among the significant differences, 9 have significant linear increasing temporal trends (4 at urban locations, 5 at rural locations) and 13 have linearly decreasing trends (5 at urban locations and 8 at rural locations). The four year patterns of Cd and Fe concentrations at MRD are good examples (Figures 26 and 27). Cd shows a pattern of significantly declining concentrations while Fe shows a pattern of significant year to year differences without trend.

Approximately equal frequencies of increasing and decreasing linear trends are observed for the essential elements Cu, Fe, Mn, Se, and Zn which are homeostatically regulated by fish. These trends are probably chance occurrences and do not reflect changes in environmental contamination. The non-essential elements Ag, Cd, Sn, and especially Pb show declines more often than increases.

These observations are consistent with the widely observed decline in Pb inputs to coastal environments over the past 20 years. However, we observe declining trends in Pb concentrations more often at rural locations than at urban ones. This might be unexpected given the generally higher Pb concentrations and more direct inputs at urban compared to rural locations. However, the response at rural locations to the continuous decline since 1972 in Pb consumption in gasoline (Bureau of Mines, 1990) may be more readily detectable for these same reasons.

Two things are needed before a clear picture of contaminant trends can emerge. First, more years of data collection are needed to increase statistical power. Second, a better understanding is needed of the processes and biological influences that determine trace element concentrations in fish. Gradually this information is accumulating through studies of species differences and the effect of age, size, maturity, gender, reproductive condition, body condition, and feeding habits. These are probably dominant contributors to the high frequency of significant year to year differences in trace element concentrations we observe at most sites.

There is no clear baseline level of trace elements for fish livers in the Southeastern region against which to judge contaminant levels. This is in contrast to the developing baseline for sediments. The only previous measurements of elements in livers of spot and Atlantic croaker are from our laboratory for the essential elements Cu, Fe, Mn, and Zn (Cross et al., 1973) and they are similar to the levels we found. A broader perspective can be had by comparing the following measurements of element concentrations in fish livers: the range in location means for southeastern Atlantic croaker over all four years; the range in location means for all species for the first year of the Benthic Surveillance Project on all coasts; and the range of concentrations reported in the literature for many species (Table 17). For the essential elements Cu, Fe, Mn, Se, and Zn, the observed range in southeastern Atlantic croaker is in the middle of the two comparison ranges, as might be expected for homeostatically regulated elements. For non-essential elements, the southeastern range tends to be in the lower ends of the other ranges, suggesting largely uncontaminated sites in the Southeast region.

Four-year mean concentrations of elements in Atlantic croaker livers, when classified into rural and urban-industrial sites, do not show a clear differentiation, although overall four-year means at urban-industrial sites tend to be higher than at rural sites for some elements (Table 18). Differences in overall four-year mean concentrations rarely exceed 30% except for the pollutant elements Pb and Sn. This emphasizes the relatively low levels of trace element contamination in the Southeast region, although there exist sites within some locations where significant contamination occurs. Analysis of variance indicates few significant differences in liver concentrations between rural and urban-industrial fish. Only Pb, Se, Sn and Mn are significant ($p \leq 0.05$). These results point to the complex and poorly understood relationship among many probable factors contributing to observed trace element concentrations in fish livers. We have noted fish size (i.e., age) and the physiological interaction of essential and non-essential elements and organic contaminants as important factors apparent in our data.

SUMMARY

Four years (1984-87) of trace element data for fish liver tissue and bottom sediments have been completed for the southeast Atlantic and Gulf of Mexico coasts. Samples were collected for annual surveys during August through October each year at one site per location. In 1987 (Cycle 4), intensive surveys were conducted with multiple sites at Sapelo Sound (SAP), St. Johns River (SJR), and Galveston Bay (GAL) to investigate smaller scale spatial variability and short-term temporal variability of elemental concentration in livers and sediments. The data base resulting from annual and intensive surveys was used to address the principal questions asked by the program: What are the present levels of elemental contaminants at important coastal-estuarine locations and are these levels increasing or decreasing with time? Proper interpretation of the data requires ancillary information, such as effects of fish species and size on liver burdens as well as extensive data manipulation, such as correction of sediment data for variable levels of naturally occurring (i.e., non-anthropogenic) elements. After four years of annual and intensive surveys, some, but not all, information required to address these program objectives is available.

At the rural Sapelo Sound location, spatial and short-term temporal variability of trace elements in both sediments and fish livers are minor. The annual site well represents the location. The intensive surveys at SAP provides a relatively large sample size from a single, homogeneous location that represents natural conditions and can therefore serve as an interim baseline. At the urban-industrial St. Johns River (SJR) and Galveston Bay (GAL) locations, spatial heterogeneity of trace elements are greater in both sediments and liver than at rural Sapelo Sound. Nevertheless, the annual site is a good representative of the location at SJR for trace elements in livers, but less so at GAL; SJR and GAL show an opposite pattern for sediments. Multiple localized contaminant sources (i.e., diffuse "hot spots") create heterogeneity in sediments and livers.

Annual survey sites were selected with criteria designed to provide both sediment and fish samples that represent average conditions at the various locations. Results from intensive surveys indicate this condition was generally met. Annual survey

data show that trace element concentrations in the Southeast region are generally low and near baseline for sediments and fish livers. Even annual sites at urban-industrial locations have relatively low concentrations, only slightly elevated above baseline estimates. Intensive sampling at two such locations, SJR and GAL, has identified sites with much higher levels of some pollutant trace elements in both sediments and fish which indicate the presence of small or diffuse "hot spots" within the larger location when overall levels are low or slightly elevated.

In addition to providing data directly addressing project objectives, the four-year data base has produced new information useful to this and other survey projects. The concept of modeling sediments over a restricted regional area for determining baseline levels has been shown valid over an extended regional area, i.e., southeastern Atlantic and Gulf of Mexico coasts. Elemental levels in Atlantic croaker livers have been shown to be a function of fish size principally with data (not reported here) from fish collected especially for this purpose in North Carolina. Project data confirm this effect which is important for comparison of contaminant levels in different sized fish. Intensive survey data suggests a pattern of interaction between certain essential and non-essential elements at polluted sites. Low levels of some essential elements and very low levels of some non-essential elements are observed at sites which are expected to have high organic contamination.

During 1984-87, significant ($p \leq 0.05$) year to year variability was detected at annual sites for many elements and locations. However, detection of significant linear trends, either positive or negative, was much less common. This is to be expected at locations in a region where contaminant levels are generally low and often near baseline, and in consideration of national efforts to control and reduce pollution in coastal waters. As the data base increases annually so will both our understanding of non-pollutant sources of observed variability in trace element levels and our ability to detect and explain real, even if subtle, trends.

Sampling frequency and spatial coverage might be modified to better resolve variable contaminant conditions at the several locations sampled. Rural, unimpacted locations could be sampled less frequently. Urban-industrial locations could be sampled more frequently with supplemental sites to account for their spatial heterogeneity. Alternately, statistically more rigorous surveys could be designed which build upon the concentration and variance data developed to date. The concepts of random, probability and stratified sampling could be incorporated without interfering with ongoing spatial and temporal trend analysis.

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Table 1. Locations sampled in the Southeast Region: Cycles I-IV.

	LOCATION	CYCLE-YEAR I-84	II-85	III-86	IV-87	Notes
1.	PAM Pamlico Sound, NC	A,C	A,C	A,C	D	1
2.	CHS Charleston Harbor, SC	A,C	A,C	A,C	A,C	
3.	SAP Sapelo Sound, GA	A,S	A,C	A,C	I,C	1
4.	SJR St. Johns River, FL	A,S	A,C	A,C	I,C	
5.	BIS Biscayne Bay, FL	N	N	P	D	
6.	LOT Charlotte Harbor, FL	A,S	A,S	A,Z	D	1
7.	TAM Tampa Bay, FL	A,Z	A,Z	D	D	
8.	APA Apalachicola Bay, FL	A,C	A,C	A,C	D	1
9.	PEN Pensacola Bay, FL	N	A,C	A,C	A,C	
10.	MOB Mobile Bay, AL	A,C	A,C	A,C	D	
11.	ROU Round Island, MS	A,S	A,C	D	A	1,2
12.	PAS Pascagoula River, MS	N	N	N	A,C	2
13.	HER Heron Bay, MS	A,C	A,C	A,C	D	1,3
14.	MRD Miss. River Delta, LA	A,C	A,C	A,C	A,C	
15.	BAR Barataria Bay, LA	A,C	A,C	D	A,C	1
16.	GAL Galveston Bay, TX	A,C	A,C	A,C	I,C	
17.	SAB San Antonio Bay, TX	A,C	A,C	A,C	D	1
18.	CCB Corpus Christi Bay, TX	A,C	A,C	A,C	D	
19.	LLM Lower Laguna Madre, TX	A,C	A,C	A,C	D	1

A Annual survey, sediment and fish data for one annual site
I Intensive survey, sediment and fish data for one annual plus additional sites
C Atlantic croaker data
S Spot data
N Not sampled (not an established location)
P Sampled for pathobiology only
Z No Atlantic croaker or spot available for collection
D Sampling deferred

NOTES:
1. Baseline location
2. In IV-87 ROU was phased out and PAS phased in. In IV-87 fish were collected at PAS and sediments at both ROU and PAS.
3. Sediments were not collected in I-84 because of weather.

Table 2. Accuracy and precision in the analysis of certified reference materials (CRM) during 1984-87. Accuracy reported as median percentage absolute deviation from certified values. Precision reported as median coefficient of variation.

Element	TISSUE CRM's Accuracy (Median % deviation)	TISSUE CRM's Precision (Median CV)	SEDIMENT CRM's Accuracy (Median % deviation)	SEDIMENT CRM's Precision (Median CV)
Ag	3	3	no CRM	14
As	6	5	4	8
Cd	3	3	6	7
Cr	25	14	5	10
Cu	3	2	7	7
Fe	4	3	3	3
Hg	11	16	11	10
Mn	4	4	11	5
Ni	14	12	10	9
Pb	6	8	3	7
Se	9	10	4	25
Sn	no CRM	32	2	15
Tl	no CRM	<DL	no CRM	14
Zn	2	3	3	4
Al	NA	NA	1	3
Si	NA	NA	2	3

NA, not analyzed
DL, detection limit

Table 3. Baseline models for sediment metals.

Metal	Data[a] Source	N	Regression Coefficient	Intercept(B_o)	R^2	Prob: B_o=0	Metal Concentration At 8.01% Al	Metal Concentration In World[c] Average Shale
Ag (ppm)	1	103	.00676	.0235	.278	.0001	.078	.07
As (ppm)	1	103	1.65	.111	.698	.8367	13	13
	3	103	7.5	-.7	.77	--	59	
Cd (ppm)	1	103	.0143	.0581	.177	.0002	.17	.3
Cr (ppm)	1	103	7.62	11.1	.646	.0001	72	90
	3	103	9.5	4.0	.81	--	80	
Cu (ppm)	1	103	1.95	-.306	.863	.4271	15	45
	2	340	1.8	-1.4	.64	--	13	
	3	103	2.5	2.2	.61	--	22	
Fe (%)	1	103	.502	-.121	.904	.1380	3.9	4.7
	2	340	.47	-.08	.91	--	3.7	
	3	103	.48	.07	.88	--	3.9	
Hg (ppm)	1	103	.0125	-.00898	.273	.3750	.091	.4
Mn (ppm)	1	103	94.6	-95.5	.711	.0018	662	850
	2	340	55	57	.61	--	498	
	3	78	46	27	.50	--	395	
Ni (ppm)	1	103	2.88	.0830	.838	.8946	23	68
	2	340	4.4	-3	.53	--	32	
	3	103	2.9	2	.68	--	25	
Pb (ppm)	1	103	3.02	2.61	.851	.0001	27	20
	2	340	3.5	1.5	.62	--	30	
	3	103	3.2	2.3	.69	--	28	

Table 3. (Contd)

Metal	Data[a] Source	N	Regression Coefficient	Intercept(B_o)	R^2	Prob: B_o=0	Metal Concentration At 8.01% Al	Metal Concentration In World[c] Average Shale
Se (ppm)	1	103	.0576	.0314	.479	.2923	.49	.6
Sn (ppm)	1	102	.343	.290	.507	.0871	3.0	6.0
Tl (ppm)	1	54	00621	.120	.486	.0155	.62	1.4
Zn (ppm)	1	103	11.2	.453	.785	.8763	90	95
	2	340	12	-8	.70	--	88	
	3	103	12	1	.83	--	97	

[a] Date Source: 1 1984-7 National Benthic Surveillance Project, southeast region data for baseline locations (PAM, SAP, LOT, APA, ROU, HER, BAR, SAB and LLM)
2 Windom et al., 1989, Georgia and South Carolina data
3 Windom et al., 1989, Florida data

[b] 8.01 weight percent Al is representative of world average shale (Horn and Adams, 1966).

[b] Turekian and Wedepohl, 1961

Table 4. Mean and upper confidence limits for adjusted baseline sediment data. Units: ppm(dry) except percent(dry) for Fe.

Element	Overall Mean	Upper Confidence Limit 95%	99%	99.9%
Ag	.078	.126	.146	.170
As	13.3	18.1	20.2	22.5
Cd	.173	.310	.368	.434
Cr	72	97	108	120
Cu	15.3	18.7	20.2	21.9
Fe	3.90	4.62	4.93	5.28
Hg	.091	.181	.220	.263
Mn	662	929	1042	1172
Ni	23.1	28.7	31.1	33.8
Pb	26.8	32.4	34.7	37.5
Se	.49	.76	.87	1.00
Sn	3.04	4.54	5.17	5.91
Tl	.62	.92	1.05	1.21
Zn	90	117	128	140

Table 5. Mean concentrations of trace elements in sediments (adjusted data) at annual survey sites for 1984-87. Units: ppm (dry) except percent (dry) for Fe.

Location		Element												
		Ag	As	Cd	Cu	Hg	Fe	Cr	Mn	Ni	Pb	Se	Sn	Zn
Baseline or Rural Locations	APA	.05	17	.06	17	.07	4.6	71	852	23	26	9	1.9	84
	BAR	.11	11	.21	16	.09	3.5	69	570	26	25	10	2.6	93
	HER	.11	11	.22	16	.11	3.5	65	672	23	25	18	2.1	86
	LLM	.09	14	.15	14	.08	3.5	53	625	18	26	10	2.6	82
	LOT	.06	13	.19	16	.11	4.2	77	728	24	26	12	3.1	90
	PAM	.08	13	.29	16	.12	3.8	84	589	25	33	11	3.1	102
	ROU	.09	14	.14	15	.12	4.0	75	712	26	28	18	2.3	105
	SAB	.10	12	.17	15	.09	3.9	68	590	23	25	12	2.5	87
	SAP	.06	14	.17	14	.08	3.9	75	642	21	27	6	2.6	84
Overall group mean		.08	13	.17	15	.10	3.9	71	662	23	27	11	2.5	90
Non-Baseline or Urban-Industrial Locations	CCB	.10	10	.39	17	.10	3.9	67	549	23	28	10	2.6	133
	CHS	.13	17	.20	20	.09	4.2	88	679	24	31	8	2.5	95
	GAL	.11	12	.13	17	.11	3.6	71	602	24	29	9	3.0	95
	MOB	.09	16	.10	18	.11	4.7	95	957	33	30	10	2.9	144
	MRD	.17	12	.45	22	.07	3.5	76	780	33	26	9	2.4	106
	PAS	.17	12	.28	21	.11	4.0	85	606	27	35	1	3.8	134
	PEN	.17	19	.19	20	.18	5.5	124	402	27	39	9	2.3	121
	SJR	.26	11	.41	24	.19	4.1	79	660	24	50	10	3.9	148
	TAM	.13	13	.29	19	.14	4.1	74	717	25	28	18	3.0	95
Overall group mean		.15	14	.27	20	.12	4.1	84	666	26	33	10	2.9	118
ANOVA[1]		S	NS	S	S	S	S	S	NS	S	S	NS	NS	S

[1] Significant difference between baseline and non-baseline overall means, $p \leq 0.05$; NS, no significant difference.

Table 6. Analysis of variance for differences among annual-site means using adjusted sediment data for 1984-87.

Location	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
APA														
BAR	*			x						x				
CCB	*	x	*	x	*			x			x			
CHS		*					x				*			x
GAL						x		x	*		x			
HER		x		x										
LLM								x	x					
LOT				x			x			x				
MOB					*	*								
MRD														
PAM														
PEN				*					*					
ROU		x												
SAB														
SAP			x		*					x				x
SJR	*		*	*		*			*			*		
TAM														

x significant difference ($p \leq 0.05$), all data below the 95% upper confidence level
* significant difference ($p \leq 0.05$), at least one data point (i.e., station composite) above the 95% upper confidence level

Table 7. Analysis of variance and Dunnett's T-test for differences among site means using adjusted sediment data for the 1987 intensive surveys.

Location		Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl[a]	Zn
GAL		*		*	*	*					*	*	*		*
Site	A														
	B	x										x	x		
	C	x		x		x					x				x
	D[b]														
	E														
SJR												*			
Site	A														
	B														
	C														
	D[b]														
	E														
SAP				*											
Site	A[b]														
	B														
	C			x											
	D														
	E														

* significant difference ($p \leq 0.05$) among sites - ANOVA
x significant difference ($p \leq 0.05$) between annual site and intensive survey sites - Dunnett's T-test.

[a] Thallium not determined after 1985.
[b] annual survey site

Table 8. Location means and standard errors for adjusted sediment data for 1987 intensive surveys. Five sites at each location. Mean (std. error). Units: ppm (dry) except percent (dry) for Fe.

Location	Ag	As	Cd	Cr	Cu	Fe	Hg
GAL	.166	11.1	.17	77.0	19.0	3.56	.097
	(.014)	(.2)	(.02)	(2.6)	(.8)	(.03)	(.019)
SJR	.301	10.4	.49	92.1	30.0	4.62	.274
	(.075)	(.4)	(.11)	(4.3)	(5.3)	(.11)	(.066)
SAP	.063	13.7	.16	78.9	15.1	4.10	.067
	(.003)	(.3)	(.01)	(2.1)	(.2)	(.03)	(.019)

Location	Mn	Ni	Pb	Se	Sn	Zn
GAL	433	28.3	31.8	.42	3.39	102
	(28)	(.8)	(2.2)	(.02)	(.22)	(3)
SJR	670	27.4	56.7	1.31	4.48	150
	(22)	(.8)	(9.8)	(.15)	(.42)	(22)
SAP	689	23.1	26.9	.48	3.02	91
	(26)	(.4)	(.3)	(.02)	(.05)	(1)

Table 9. Annual-site means and standard errors for adjusted sediment data for 1987 intensive surveys. Mean (std. error). Units: ppm (dry) except percent (dry) for Fe.

Location	Ag	As	Cd	Cr	Cu	Fe	Hg
GAL (site D)	.127 (.014)	11.1 (.8)	.13 (.01)	73.5 (3.2)	18.6 (.7)	3.53 (.05)	.126 (.025)
SJR (site D)	.251 (.129)	11.7 (.3)	.44 (.15)	76.4 (8.9)	26.3 (8.0)	4.32 (.16)	.235 (.080)
SAP (site A)	.056 (.012)	13.9 (.3)	.16 (.03)	82.5 (8.1)	16.2 (.4)	4.14 (.07)	.108 (.056)

Location	Mn	Ni	Pb	Se	Sn	Zn
GAL (site D)	451 (63)	26.5 (1.4)	27.7 (4.2)	.49 (.03)	3.06 (.21)	97 (3)
SJR (site D)	677 (36)	26.4 (1.6)	49.3 (12.9)	.78 (.22)	4.17 (.76)	146 (38)
SAP (site A)	814 (83)	24.2 (1.4)	28.0 (1.0)	.51 (.07)	2.96 (.10)	92 (4)

Table 10. Descriptive models of elemental distributions.

Model	Site means	Within-site variance	Description
1.	Uniform, low if at baseline levels	Low and uniform across location	Uniform distribution of contaminant across location or baseline levels throughout location result in uniform site means and low variance.
2.	Variable	Low and variable across location	Well defined contaminant gradient or large "hot spot" results in variable site means and low variance. Sampling scale is smaller than spatial scale of element distribution.
3.	Uniform and high	High and uniform across location	Heterogeneous distribution of contaminant across location such that sampling scale is larger than spatial scale of element distribution. This results in relatively uniform site means and high within-site variance.
4.	Variable	High and variable across location	Poorly defined contaminant gradient or small, diffuse "hot spot" results in variable site means and high variance. Sampling scale is larger than spatial scale of element distribution.

Table 11. Cu, Cd, Ag and Zn adjusted sediment data for 1987 intensive surveys at Galveston Bay, St. Johns River and Sapelo Sound. ** significantly different (p≤ 0.05) from annual site.

Copper

Location	Site	Mean	Std. dev.	Std. error	Station data		
GAL	A	15	1.2	.7	16	14	15
	B	21	1.4	.8	22	21	19
	C	23**	3.5	2.0	23	26	20
	D(annual)	19	1.2	.7	19	17	20
	E	17	.5	.3	17	18	17
	overall	19	3.1	.8			
SJR	A	16	.7	.4	16	15	15
	B	31	17	10	50	26	17
	C	54	29	17	82	23	57
	D(annual)	26	14	8	25	41	13
	E	23	16	9	14	41	14
	overall	30	19	5			
SAP	A(annual)	16	.7	.4	17	16	16
	B	15	1.0	.6	15	16	14
	C	15	.7	.4	16	15	14
	D	15	.3	.2	15	14	14
	E	15	.9	.5	14	15	15
	overall	15	.8	.2			

Cadmium

Location	Site	Mean	Std. dev.	Std. error	Station data		
GAL	A	.12	.02	.01	.13	.13	.11
	B	.12	.02	.01	.12	.13	.11
	C	.28**	.12	.07	.39	.29	.16
	D(annual)	.13	.02	.01	.12	.12	.15
	E	.19	.02	.01	.20	.21	.17
	overall	.17	.08	.02			
SJR	A	.20	.02	.01	.21	.21	.19
	B	.39	.21	.12	.63	.33	.22
	C	1.03	.68	.39	1.61	.29	1.20
	D(annual)	.44	.26	.15	.60	.59	.13
	E	.38	.28	.16	.22	.70	.22
	overall	.49	.43	.11			
SAP	A(annual)	.16	.05	.03	.11	.14	.22
	B	.14	.02	.01	.15	.12	.13
	C	.24**	.03	.02	.20	.24	.27
	D	.14	.02	.01	.14	.16	.12
	E	.15	.02	.01	.17	.15	.13
	overall	.16	.04	.01			

Table 11 Cont.

Silver

Location	Site	Mean	Std. dev.	St. error	Station data		
GAL	A	.13	.016	.009	.12	.14	.11
	B	.23**	.003	.002	.23	.24	.23
	C	.21**	.061	.035	.27	.18	.16
	D(annual)	.13	.024	.014	.11	.11	.16
	E	.14	.003	.002	.14	.14	.14
	overall	.16	.054	.014			
SJR	A	.09	.01	.01	.10	.09	.08
	B	.25	.15	.09	.42	.20	.13
	C	.64	.43	.25	.93	.16	.84
	D(annual)	.25	.23	.13	.21	.49	.05
	E	.27	.29	.17	.11	.61	.09
	overall	.30	.29	.08			
SAP	A(annual)	.056	.021	.012	.043	.046	.080
	B	.062	.012	.007	.071	.066	.047
	C	.071	.003	.002	.073	.067	.073
	D	.061	.003	.002	.064	.058	.060
	E	.064	.003	.002	.067	.061	.062
	overall	.063	.012	.003			
GAL	A	93	5	3	96	88	96
	B	109	3	2	111	104	111
	C	116**	12	7	131	112	107
	D(annual)	97	5	3	94	94	102
	E	97	3	2	99	100	93
	overall	102	12	3			
SJR	A	86	7	4	95	83	81
	B	148	33	19	175	158	110
	C	246	140	81	400	123	214
	D(annual)	146	66	38	134	217	86
	E	124	71	41	86	206	79
	overall	150	85	22			
SAP	A(annual)	92	7	4	84	93	100
	B	94	9	5	95	101	85
	C	93	3	2	91	98	91
	D	86	2	1	87	85	85
	E	92	2	1	91	95	90
	overall	91	4	1			

Table 12. Ratios of mean trace element concentrations in livers at the site of highest concentration to that of lowest concentration for three locations: Sapelo Sound (SAP), St. Johns River (SJR) and Galveston Bay (GAL). Locations were analyzed separately.

Location					
SAP		SJR		GAL	
Element	Ratio	Element	Ratio	Element	Ratio
Zn	1.1	Zn	1.1	Se	1.5
As	1.1	Cd*	1.4	Zn	2.2
Se	1.5	Fe	1.5	As	2.6
Fe	1.5	Mn	1.6	Mn	3.0
Mn	1.6	Se	1.8	Fe	3.5
Cu	1.8	As	1.9	Pb*	4.6
Pb*	1.9	Cu	2.1	Ni	5.2
Ni	2.2	Pb*	2.8	Cd*	6.4
Cd*	2.6	Ag*	5.0	Sn*	8.1
Ag*	3.5	Sn*	7.0	Cu	8.6
Sn*	4.7	Ni	8.9	Ag*	29.6

* Non-essential "pollutant" elements

Table 13. Test results of analysis of variance for trace elements in livers showing significant ($p \leq 0.05$) among-site differences within three locations; Sapelo Sound (SAP), St. Johns River (SJR) and Galveston Bay (GAL).

	Location							
	SAP		SJR			GAL		
Elements showing significant differences among sites	Ag Cd Sn	Fe Mn Se	Ag Pb Sn	Ni		As Cd Pb Sn	Cu Fe Mn	Zn Ni Se
Elements not showing significant differences among sites	Pb As	Cu Ni Zn	As Cd	Se Zn	Cu Fe Mn	Ag		

Table 14. Measures of the representativeness of the annual site to the overall location. Ratios of annual site to overall location means and standard deviations for elements in Atlantic croaker livers in 1987.

	Ratio of annual site mean to overall location mean			Ratio of annual site std. deviation to overall location std. deviation		
Element	SAP	SJR	GAL	SAP	SJR	GAL
Ag	1.03	1.45*	1.25*	1.37	1.64	1.45
As	0.93	1.01	0.80*	1.35	1.12	0.53*
Cd	1.41*	0.79	0.65*	1.11	0.69	0.55*
Cu	0.93	1.14	1.32*	1.52	1.49	1.22
Fe	0.79	0.91	1.14	1.00	1.12	1.11
Mn	1.04	1.25*	0.68	1.37	1.00	0.19*
Ni	0.80	1.00	0.56*	0.88	0.75	0.34*
Pb	0.64	0.69*	0.69*	1.11	0.26*	0.30*
Se	1.05	0.95	0.92	1.52	1.32	1.32
Sn	0.65	0.70	0.60*	0.13*	0.44*	0.32*
Zn	1.00	0.99	1.49*	1.28	1.23	1.59

* indicates ratios significantly different ($p \le 0.05$) from 1. Significant difference implies the mean or standard deviation are not the same at the annual site as for the overall location.

Table 15. Mean trace element concentrations at two sites in Sapelo Sound sampled during July through October 1987.

Element	Mean Concentration (µg/g)					
	Site A			Site D		
	July		August	August		October
Ag	0.12		0.19	0.18		0.18
As	7.59		7.92	6.82		7.43
Cd	0.12	*	0.16	0.17		0.21
Cr	0.02		0.02	0.00		0.02
Cu	26.8		22.1	42.1	*	17.6
Fe	355		398	360		356
Mn	4.96	*	6.46	6.65	*	3.82
Ni	0.12		0.13	0.08		0.08
Pb	0.06		0.07	0.03		0.03
Se	18.4		18.4	19.8		23.0
Sn	1.47	*	0.19	0.25		0.22
Zn	115	*	105	130	*	96

* indicates significant difference ($p \leq 0.05$) in means at each site over time.

Table 16. Locations where trace elements showed significant ($p \leq 0.05$) year to year differences (*) in mean concentrations in fish livers for 1984-87. Significant increasing (+) or decreasing (-) trends. A species shift from spot to Atlantic croaker after 1984 occurred at SJR, SAP and ROU.

	Element										
Location	Ag	As	Cd	Cu	Fe	Mn	Ni	Pb	Se	Sn	Zn
APA		*				*					
BAR					*		*		*		*+
CCB							*		*		
CHS	*	*	*		*-		*	*	*-		
GAL		*+	*	*+		*	*			*	*+
HER		*	*-			*-		*-	*		
LLM	*	*	*	*	*+		*				
LOT					*+			*-	*-	*	*
MOB						*	*				*-
MRD			*-		*	*	*	*-	*	*	
PAM					*-	*-		*	*+		*-
PEN		*	*	*			*	*+	*		*
ROU		*		*		*	*				
SAB		*+									
SAP	*	*	*	*	*	*		*	*	*	*
SJR		*	*			*		*			

Table 17. Ranges of trace metal concentrations measured in fish livers. Concentration in μg/g dry weight.

Source	Ag		As		Cd	
	max	min	max	min	max	min
Southeast[a]	0.29	0.05	10.4	1.0	1.25	0.07
Nationwide[b]	2.07	0.02	32.7	0.6	19.57	0.07
Worldwide[c]	3.2	<0.4	2000	0.7	100	0.03

Source	Cu		Fe		Mn	
	max	min	max	min	max	min
Southeast	59	11	1154	326	14.8	3.6
Nationwide	118	6	--	--	--	--
Worldwide	440	2	4600	12	27	0.4

Source	Ni		Pb		Se	
	max	min	max	min	max	min
Southeast	0.74	0.10	0.15	0.03	35	7
Nationwide	2.8	0.04	7.4	0.04	36	1
Worldwide	12	0.4	13	0.16	22	2.4

Source	Sn		Zn	
	max	min	max	min
Southeast	1.02	0.23	147	78
Nationwide	7.33	0.05	287	71
Worldwide	8	<0.4	4800	7

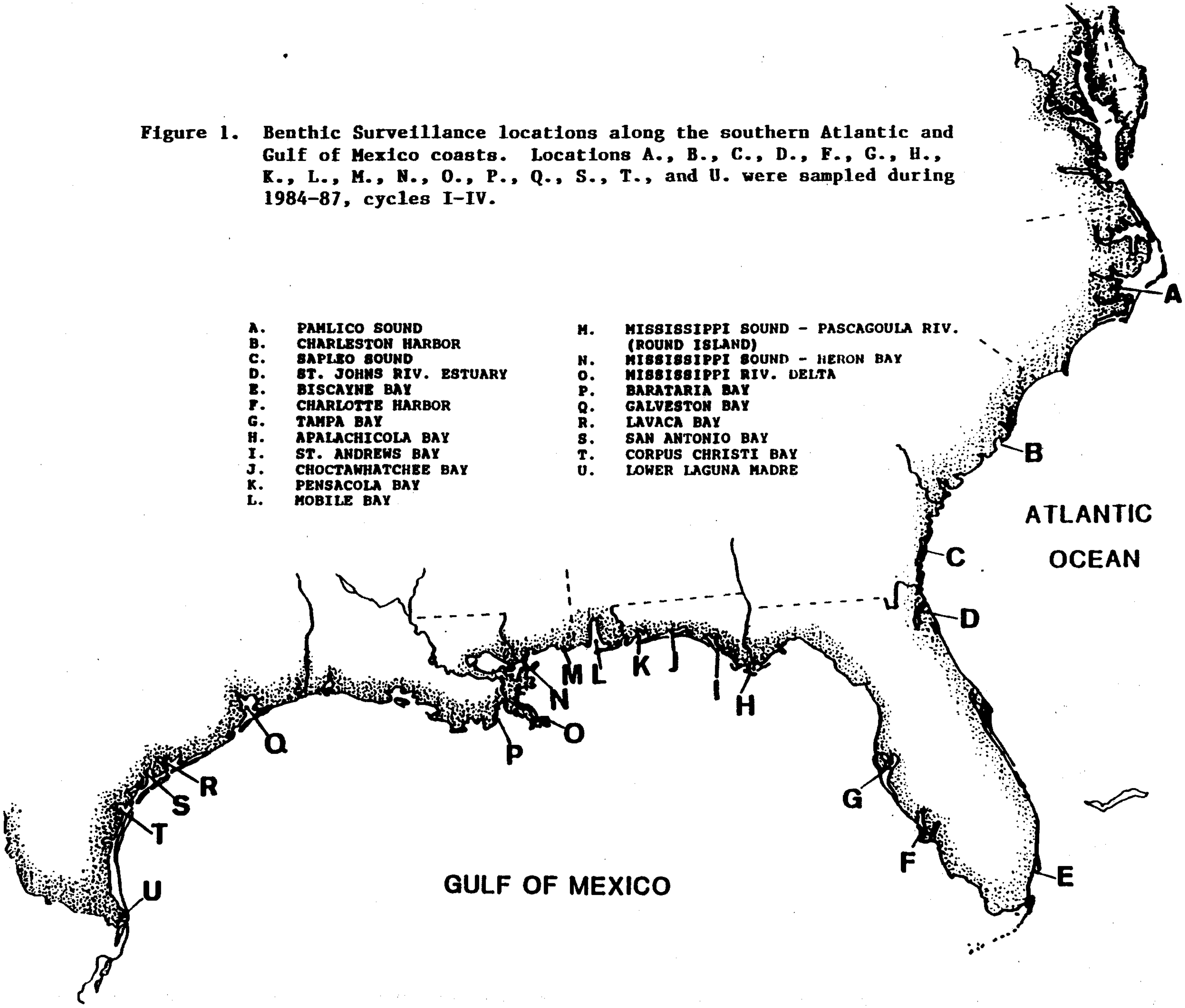
(a) National Benthic Surveillance Project Atlantic croaker, four-year site mean concentrations from southeastern sites for 1984-87.
(b) National Benthic Surveillance Project, Multiple species, Single-year site mean concentrations from all sites nationwide in 1984 (NOAA, 1987).
(c) Values reported in the literature for multiple species: Eisler, 1981; Hall et al., 1978; and Denton and Burdon-Jones, 1986.

Table 18. Mean concentrations (µg/g) of trace elements in Atlantic croaker livers at annual survey sites for 1984-87.

Location		Element										
		Ag	As	Cd	Cu	Fe	Mn	Ni	Pb	Se	Sn	Zn
Rural Locations	APA	.25	8.6	.74	28	753	5.3	.39	.07	28	.27	150
	BAR	.08	3.6	.24	30	728	4.9	.45	.07	10	.28	133
	HER	.14	5.9	.92	28	521	8.8	.35	.05	14	.37	104
	LLM	.11	9.9	.63	34	560	3.6	.70	.09	17	.78	128
	PAM	.12	4.4	.14	11	488	6.2	.34	.06	18	.27	93
	ROU	.16	3.7	.31	34	495	3.5	.19	.04	13	.29	120
	SAB	.07	4.2	.29	20	326	6.2	.44	.04	19	.29	114
	SAP	.28	8.1	.21	45	429	5.8	.13	.03	19	.23	132
	Overall group mean	.15	6.3	.45	28	541	5.7	.39	.06	18	.35	122
Urban-Industrial Locations	CCB	.29	9.1	1.25	59	422	5.3	.47	.12	27	.69	128
	CHS	.27	10.3	.19	34	570	4.6	.21	.06	25	.39	124
	GAL	.17	5.3	.27	39	451	8.1	.58	.15	21	.97	152
	MOB	.14	6.2	.13	21	403	8.1	.44	.07	17	.43	110
	MRD	.04	3.4	.53	16	453	14.8	.74	.08	20	.67	102
	PAS	.15	4.7	.65	30	398	4.9	.26	.05	11	.33	133
	PEN	.19	7.0	.24	24	1160	5.1	.53	.07	35	.32	112
	SJR	.15	1.0	.07	21	386	4.1	.10	.12	8	.54	77
	Overall group mean	.17	6.0	.38	31	533	7.3	.45	.10	21	.59	118
	ANOVA[1]	NS	NS	NS	NS	NS	S	NS	S	S	S	NS

[1] Significant difference between rural and urban-industrial overall means, $p \le 0.05$; NS, no significant difference.

Figure 1. Benthic Surveillance locations along the southern Atlantic and Gulf of Mexico coasts. Locations A., B., C., D., F., G., H., K., L., M., N., O., P., Q., S., T., and U. were sampled during 1984-87, cycles I-IV.



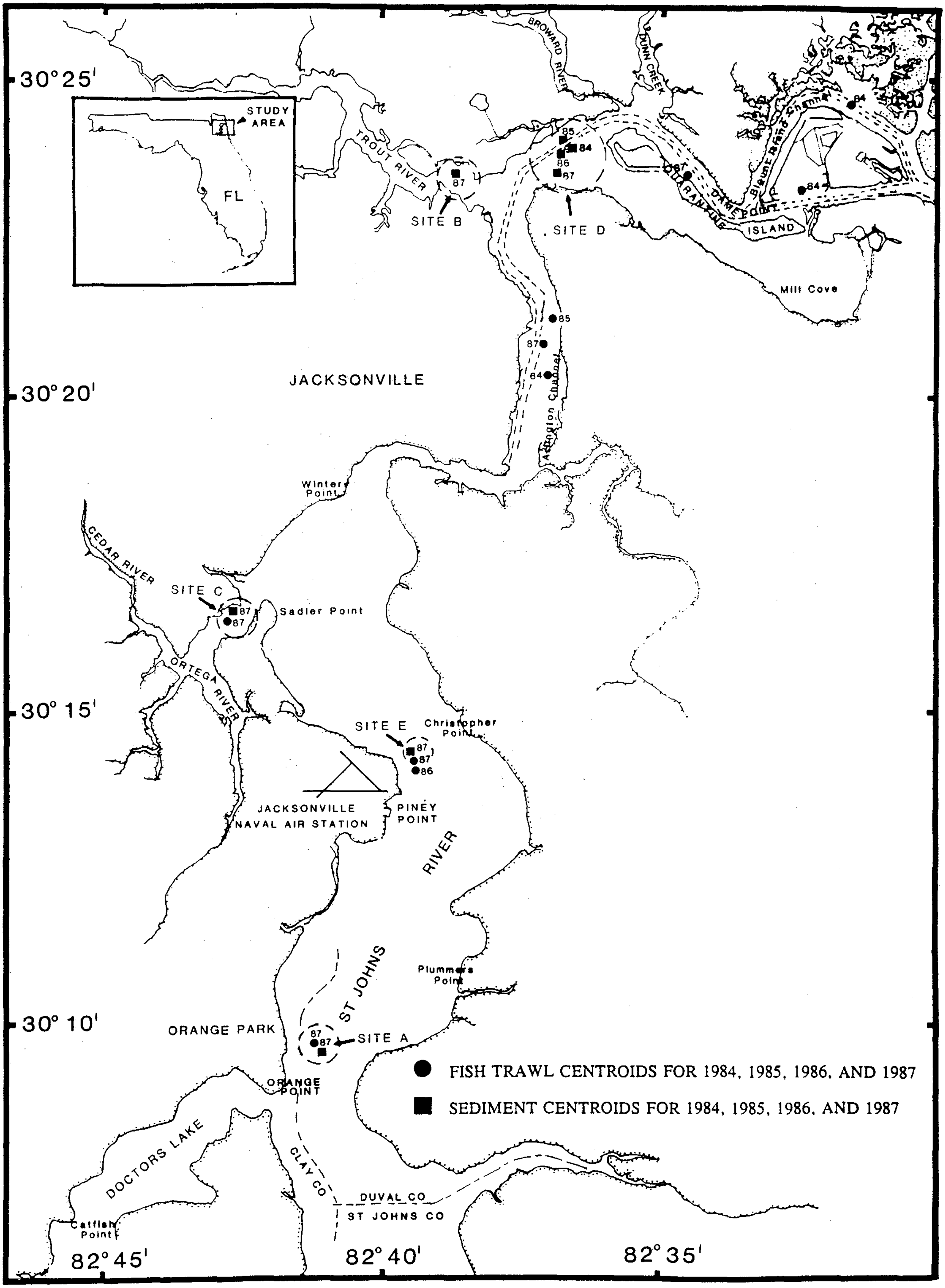


Figure 2. St. Johns River fish and sediment centroids for 1984-1987.

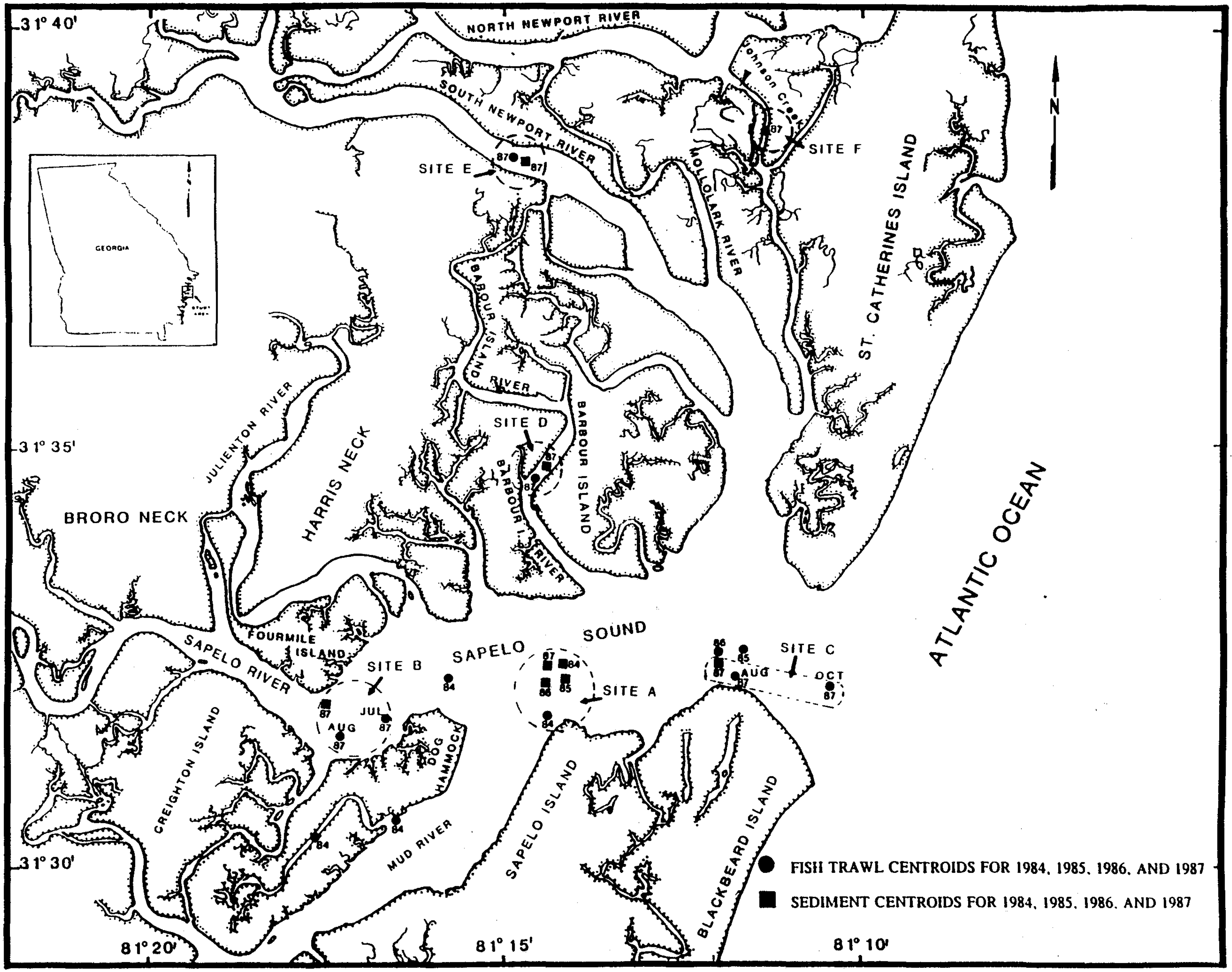


Figure. 3 Sapelo Sound fish and sediment centroids for 1984–1987.

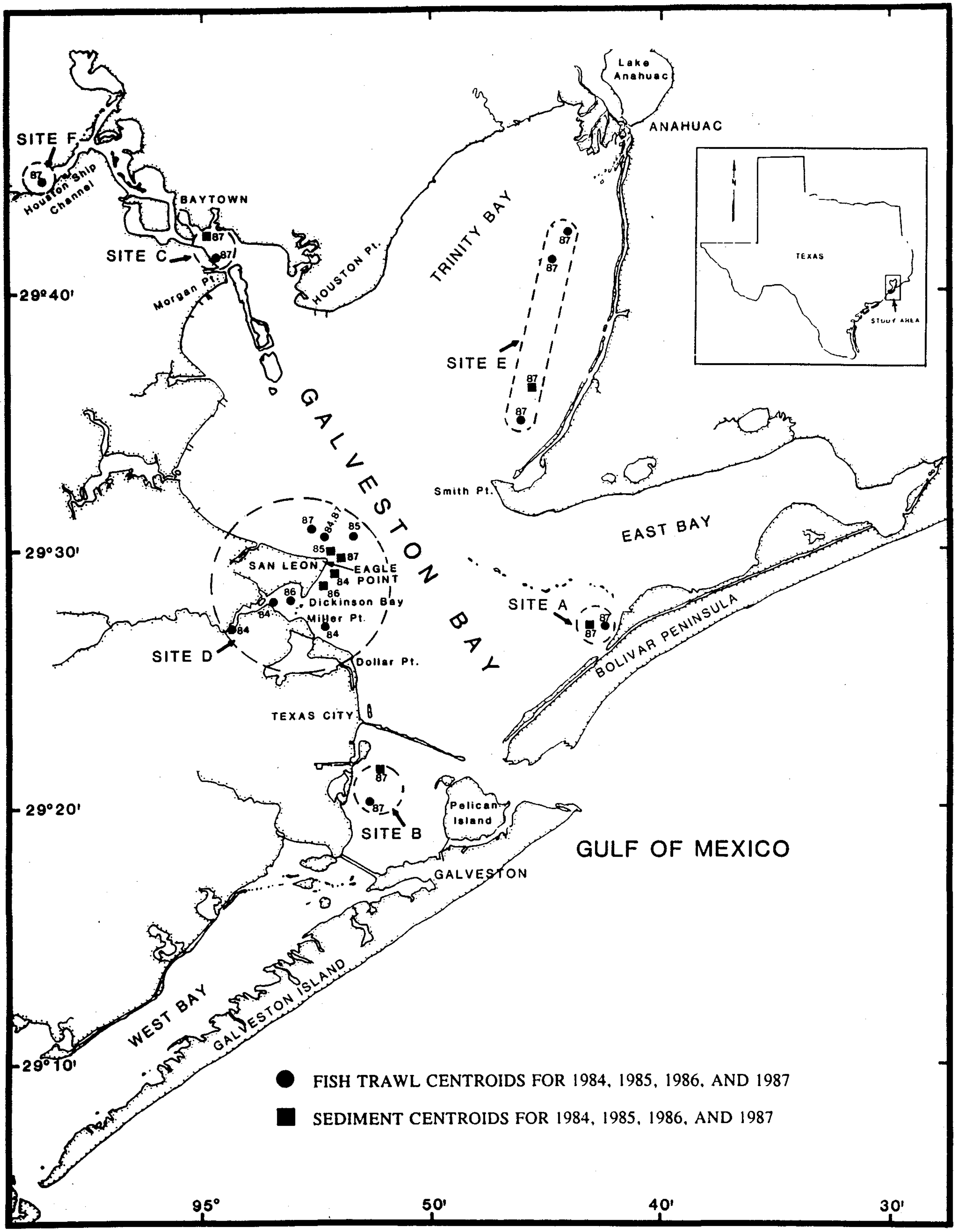


Figure 4. Galveston Bay fish and sediment centroids for 1984-1987.

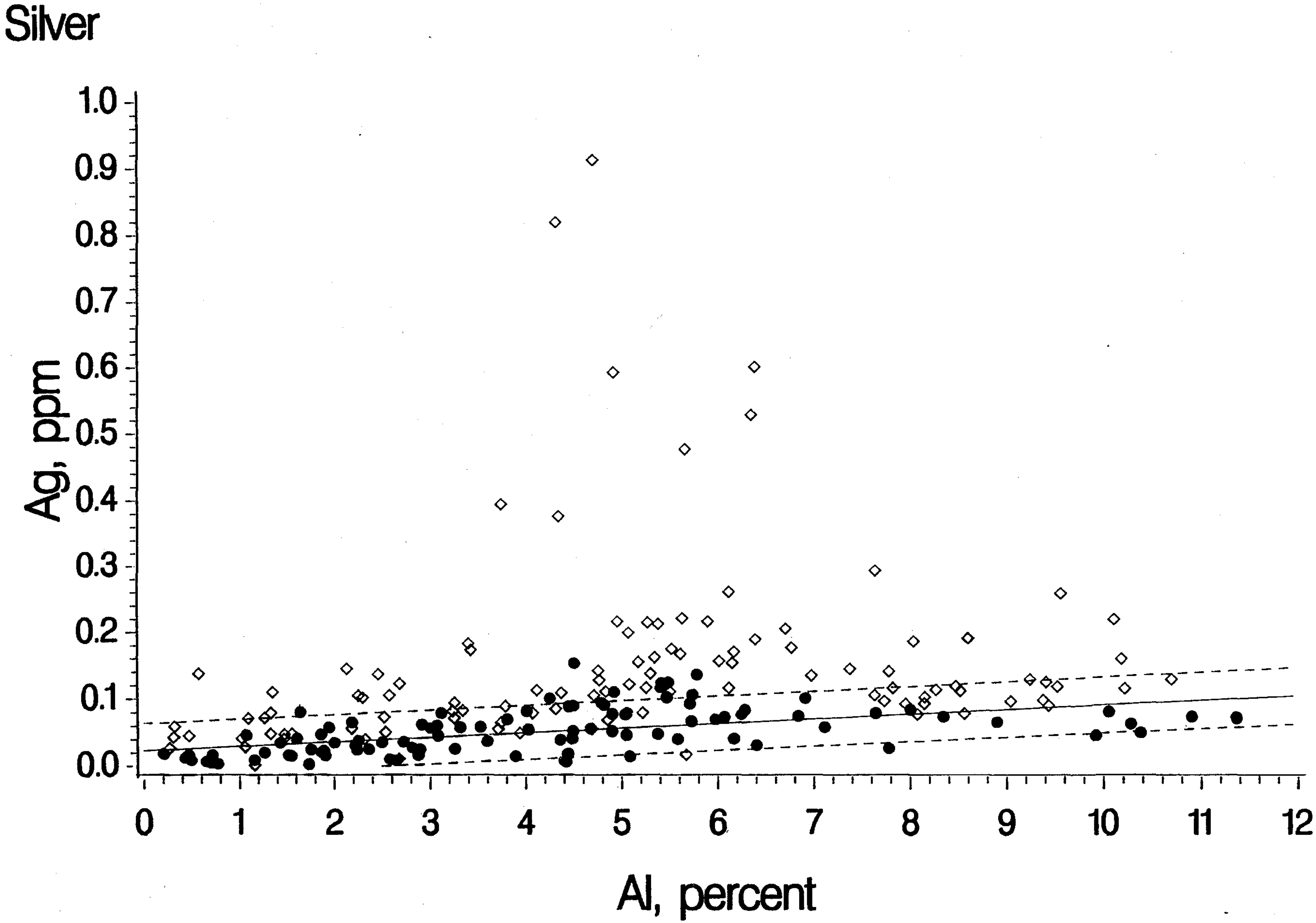


Figure 5. Silver vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

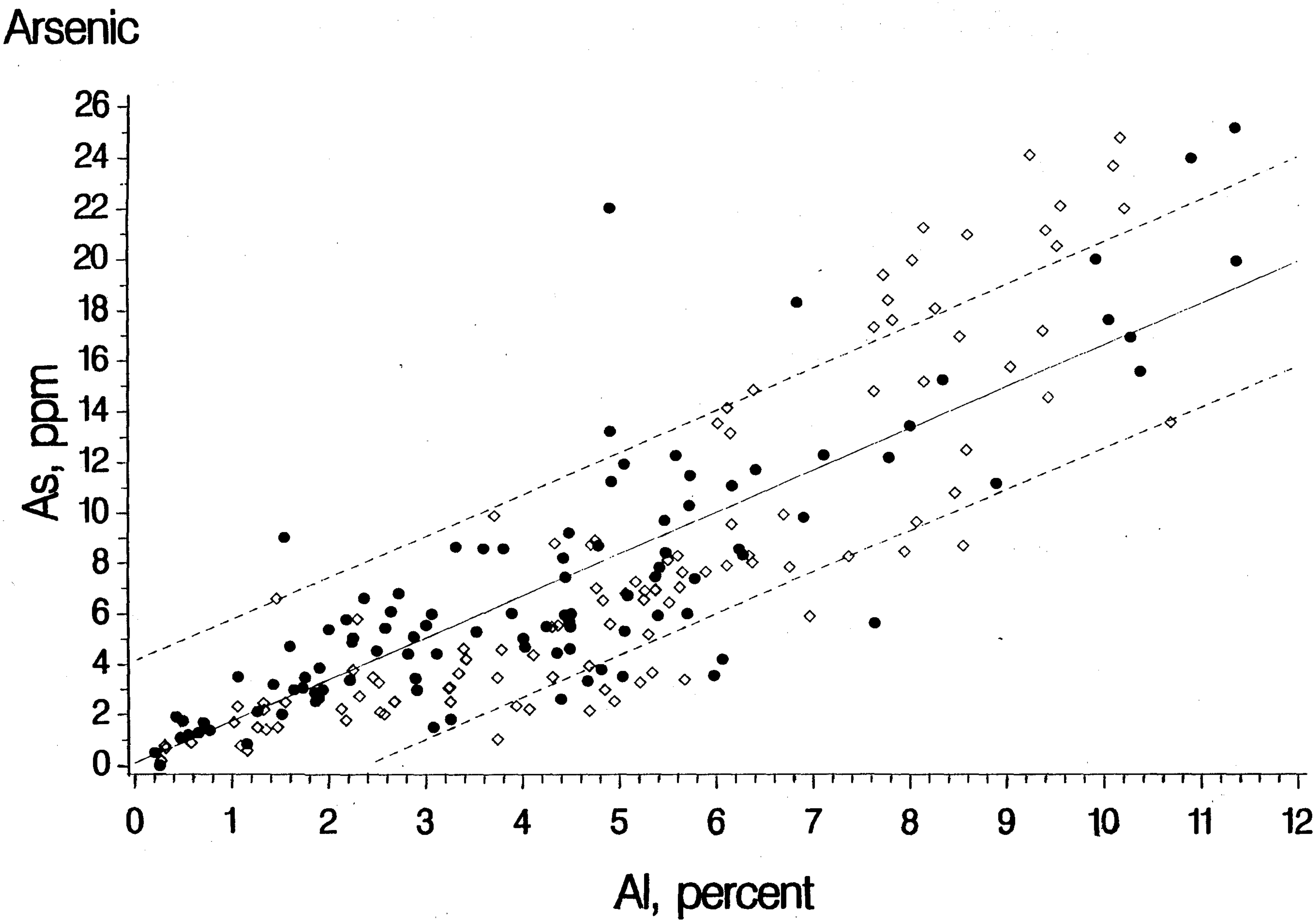


Figure 6. Arsenic vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

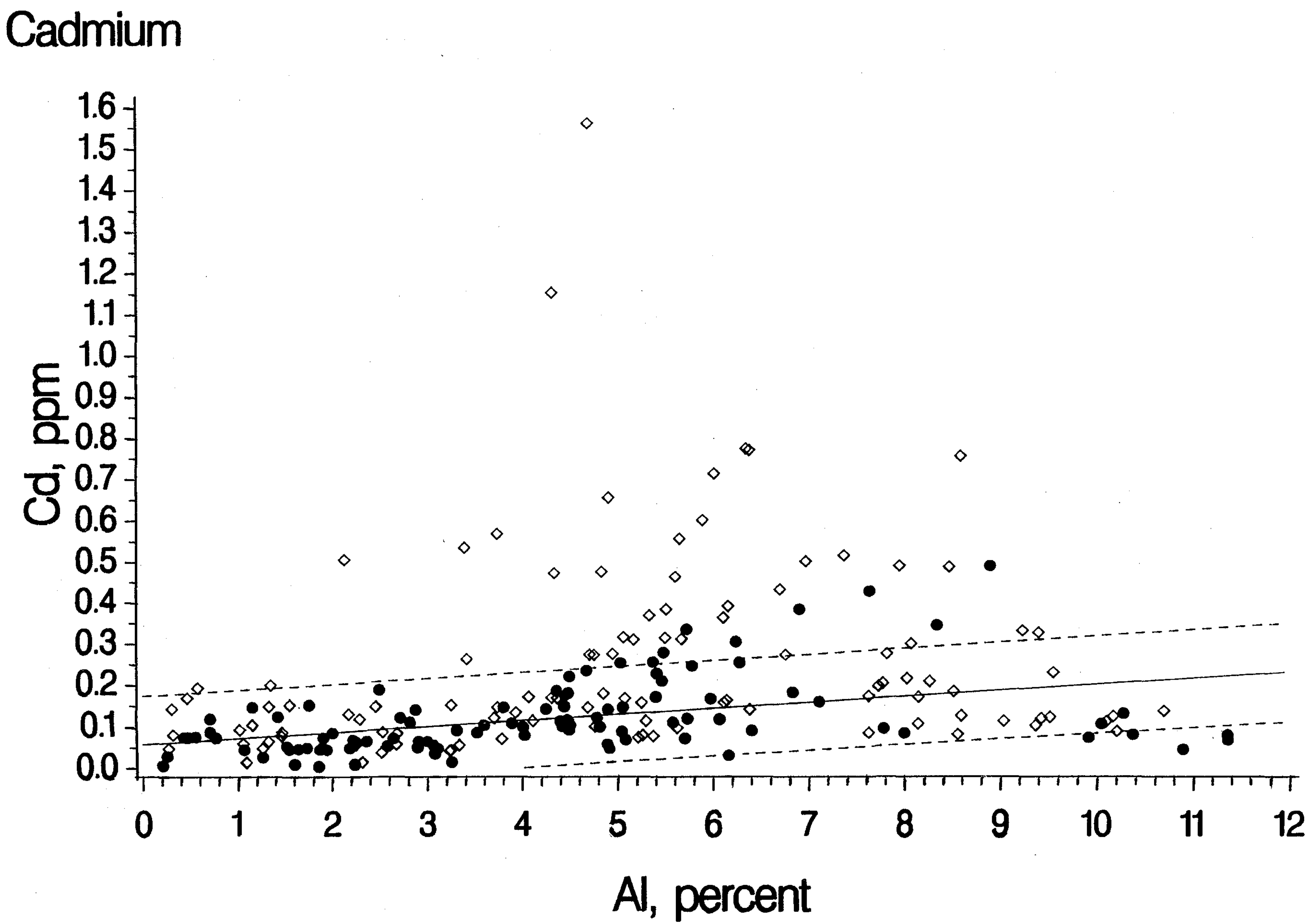


Figure 7. Cadmium vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

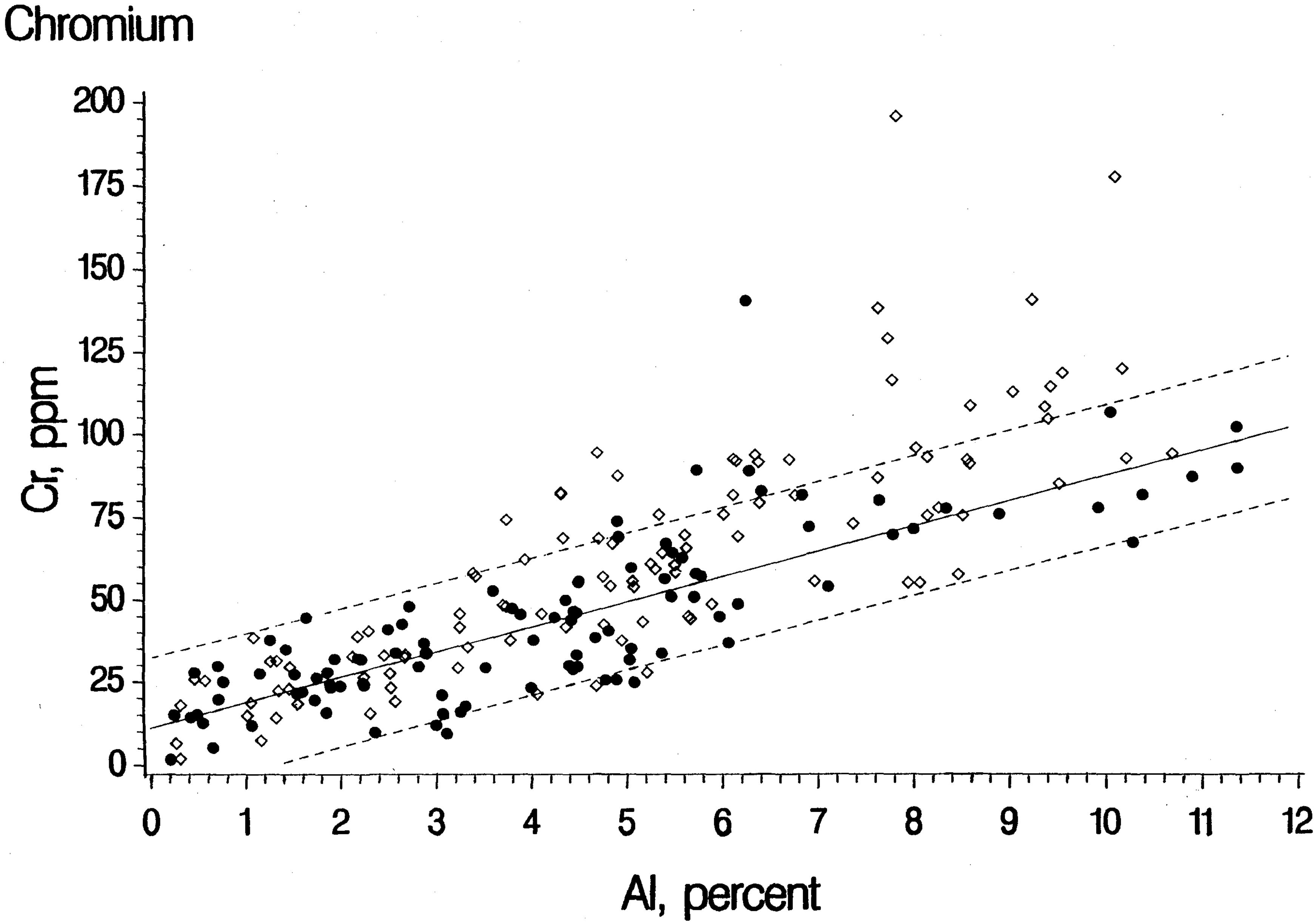


Figure 8. Chromium vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

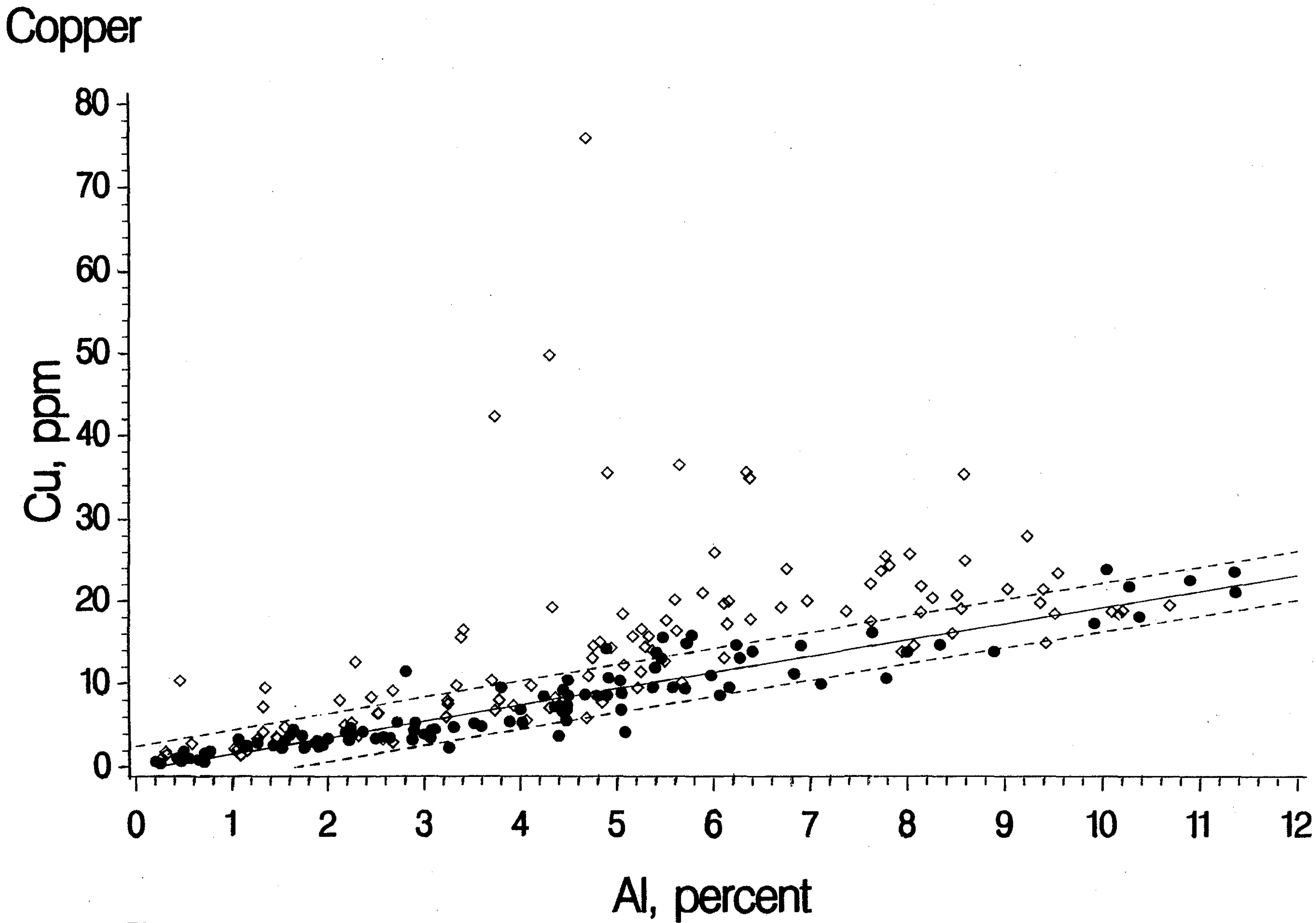


Figure 9. Copper vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

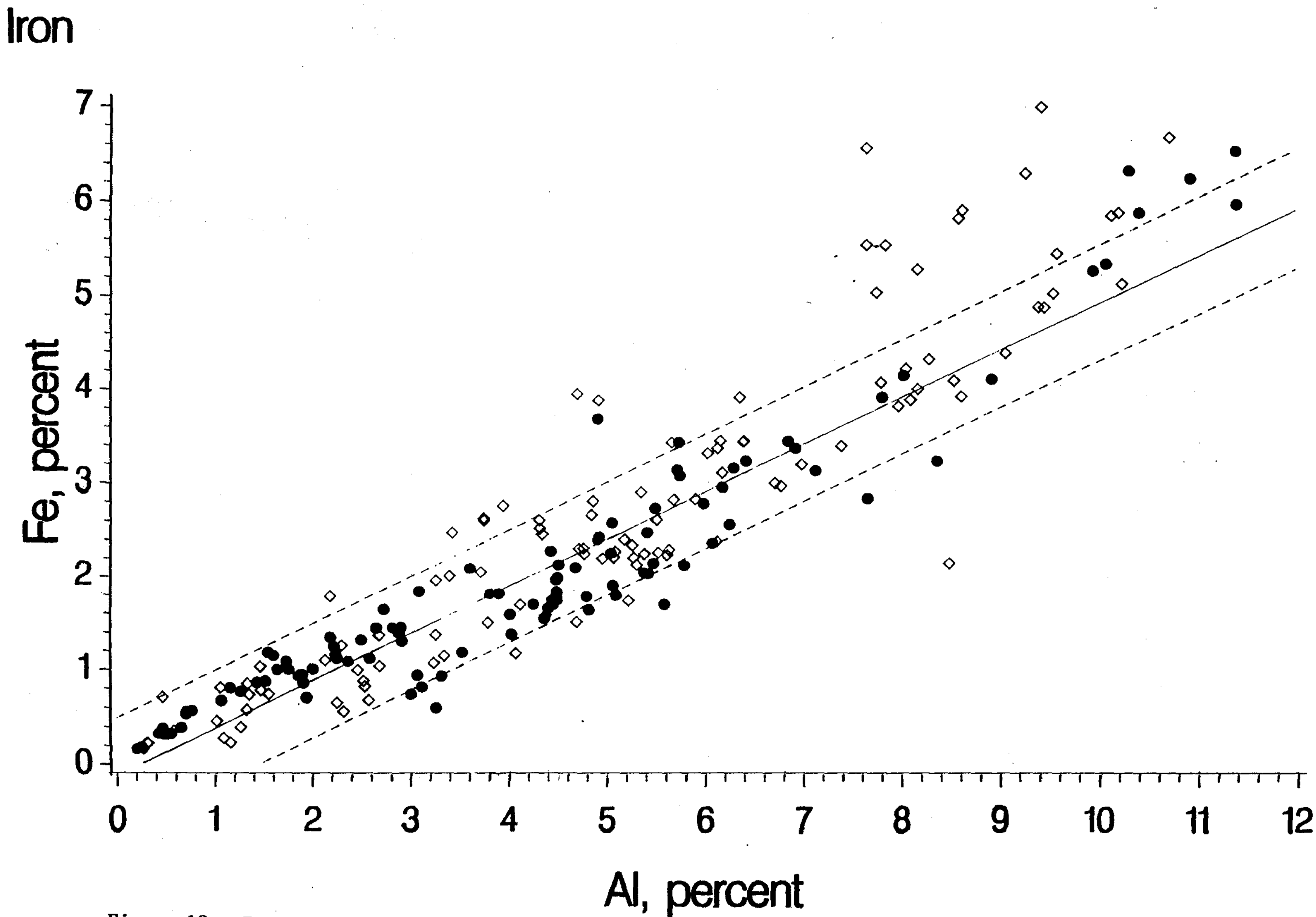


Figure 10. Iron vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

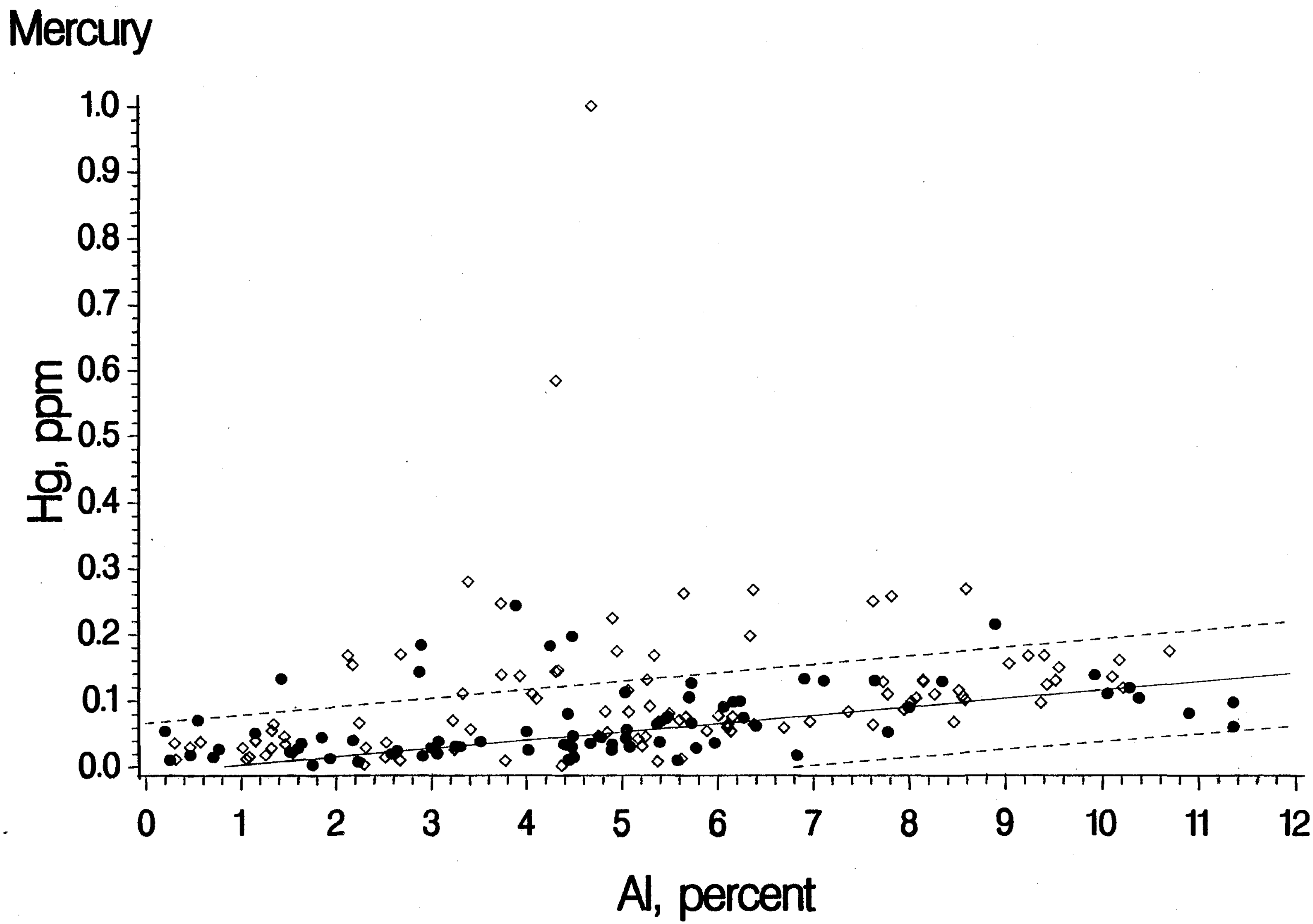


Figure 11. Mercury vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

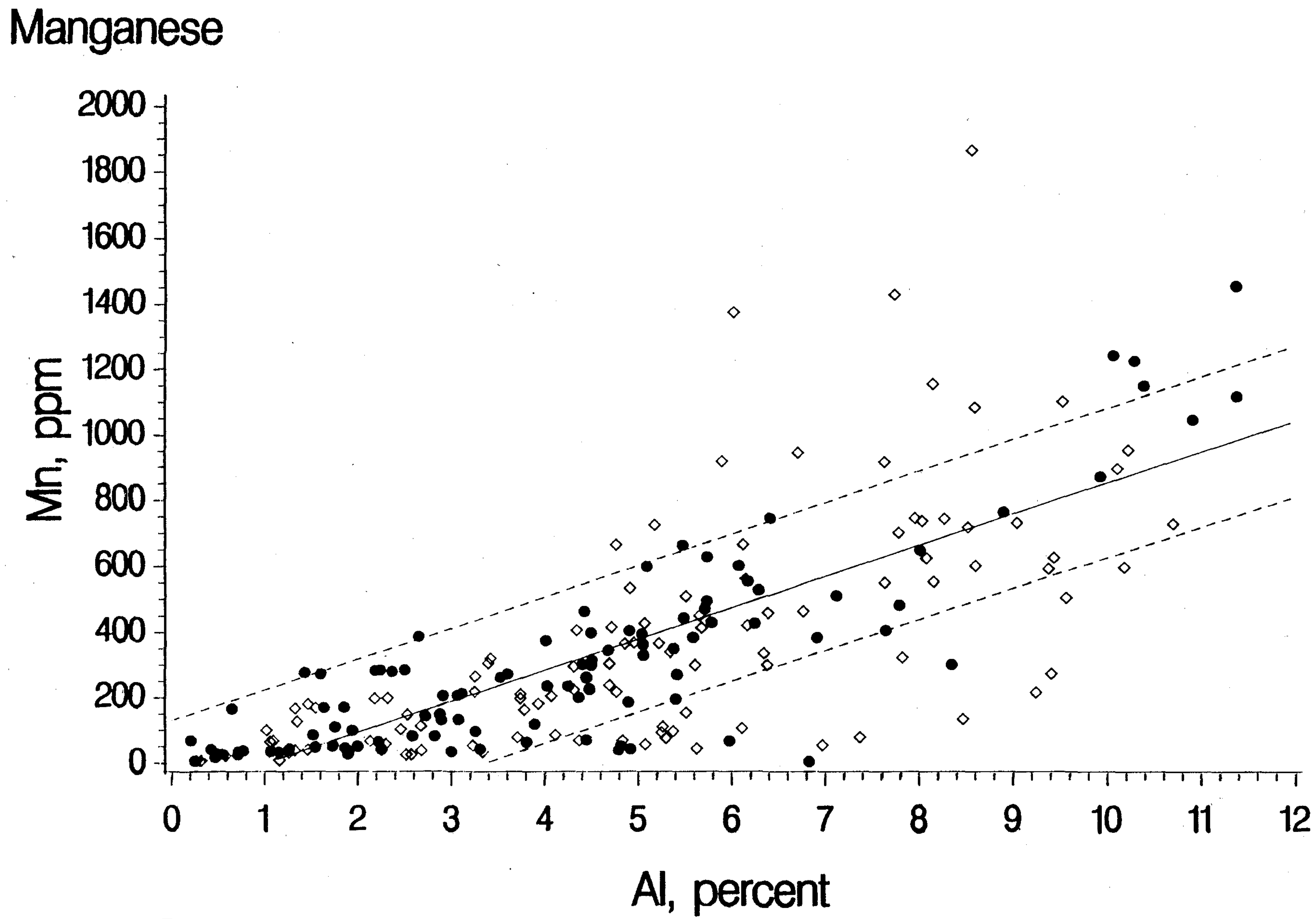


Figure 12. Manganese vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

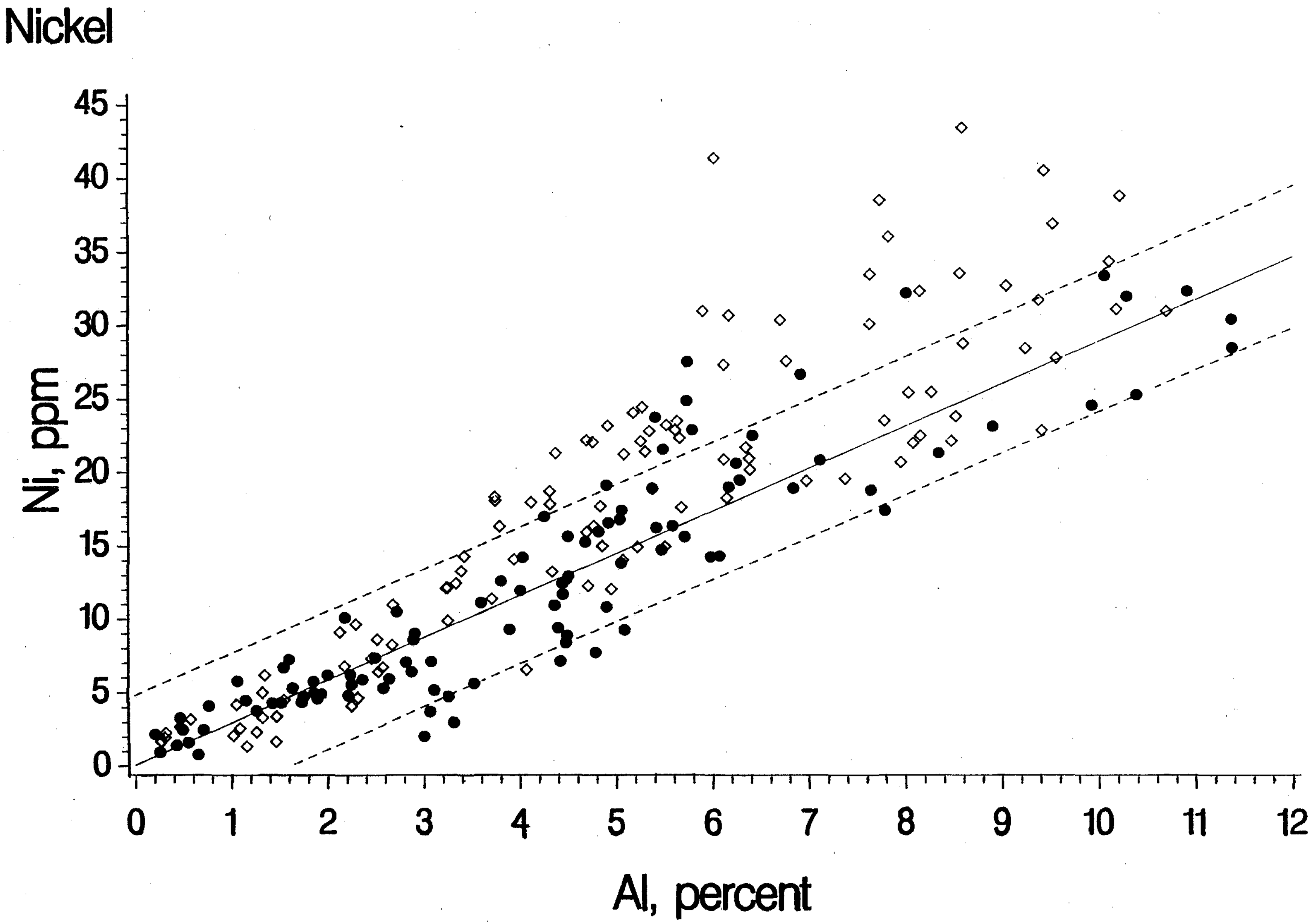


Figure 13. Nickel vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

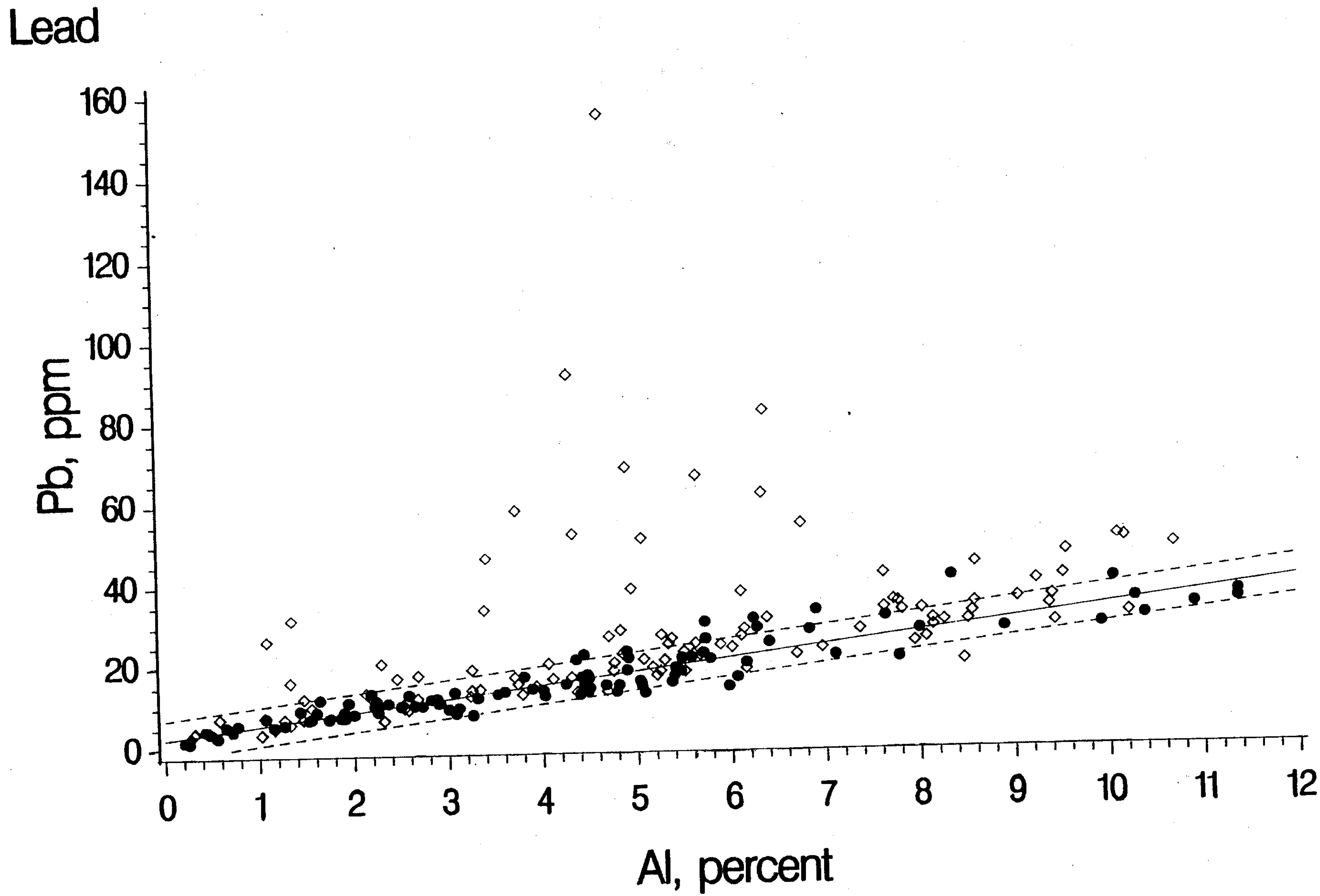


Figure 14. Lead vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

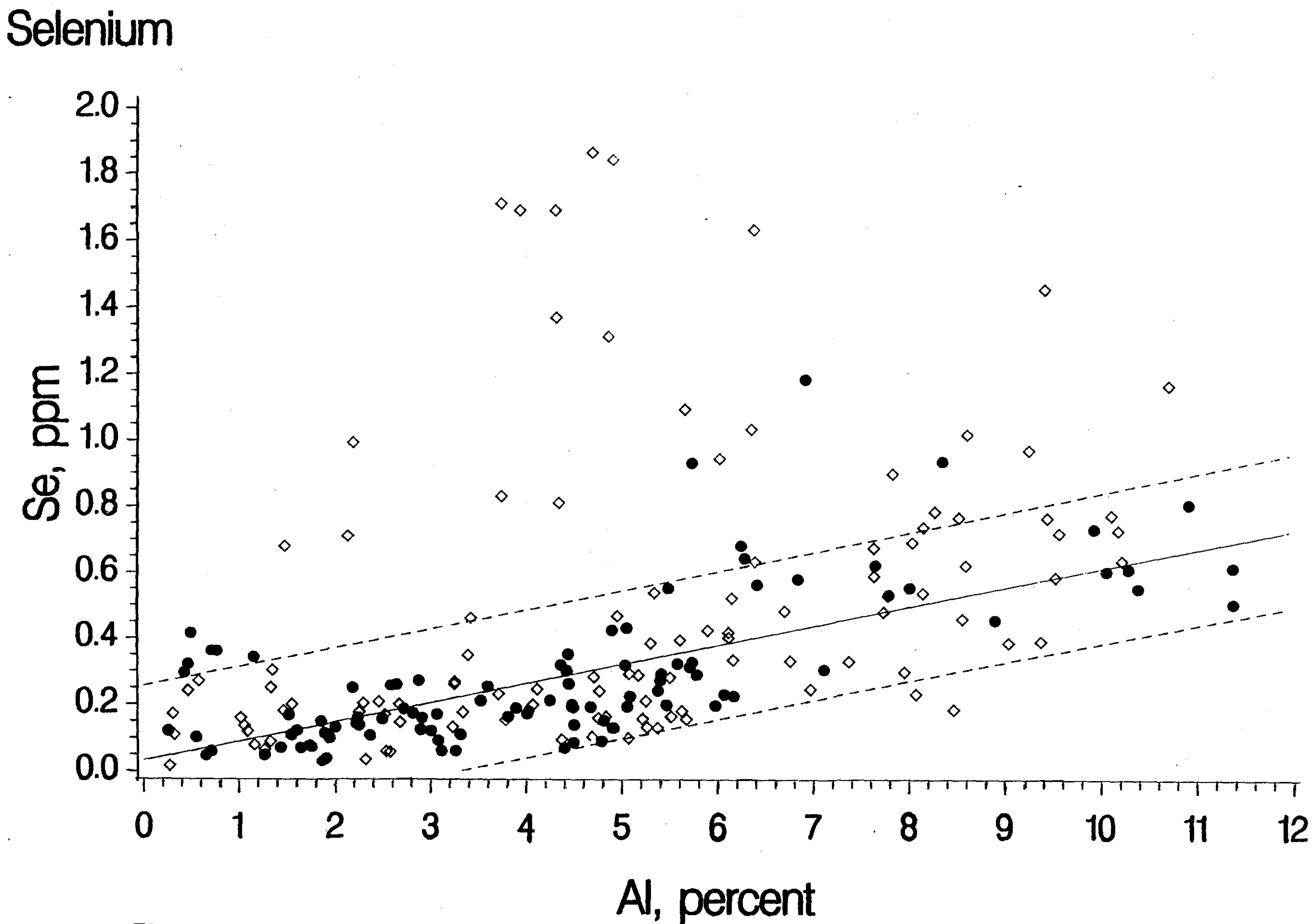


Figure 15. Selenium vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

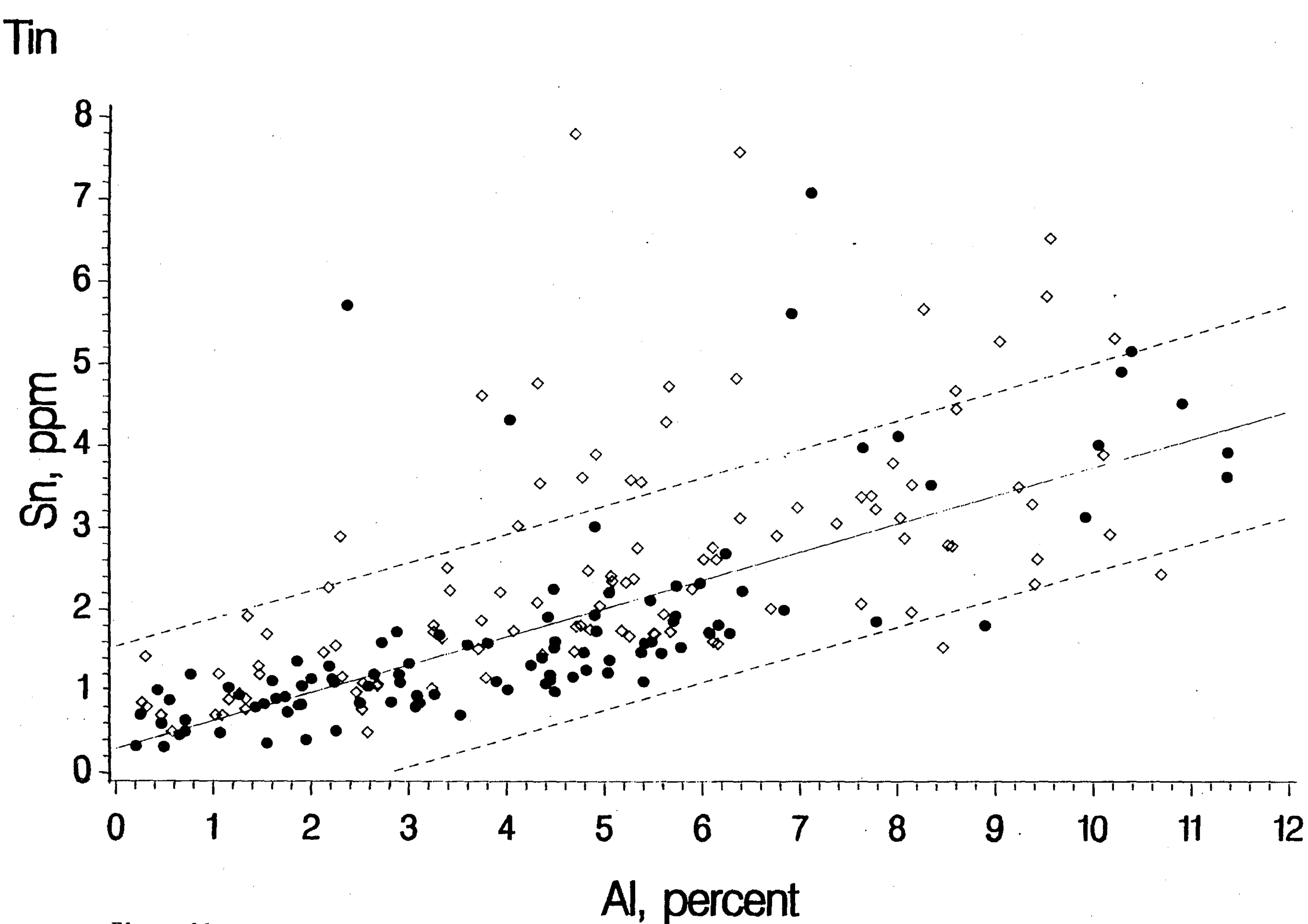


Figure 16. Tin vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

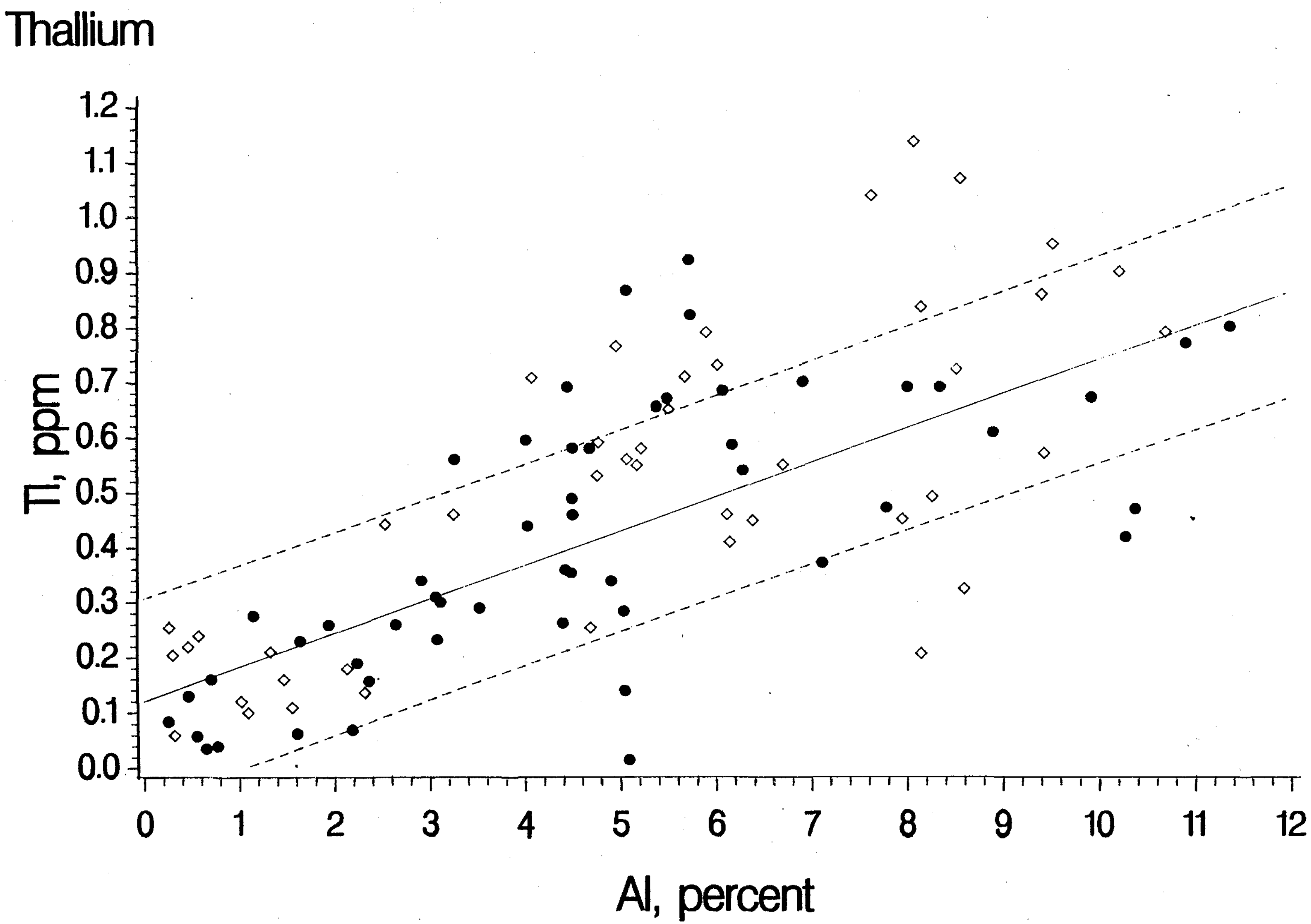


Figure 17. Thallium vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

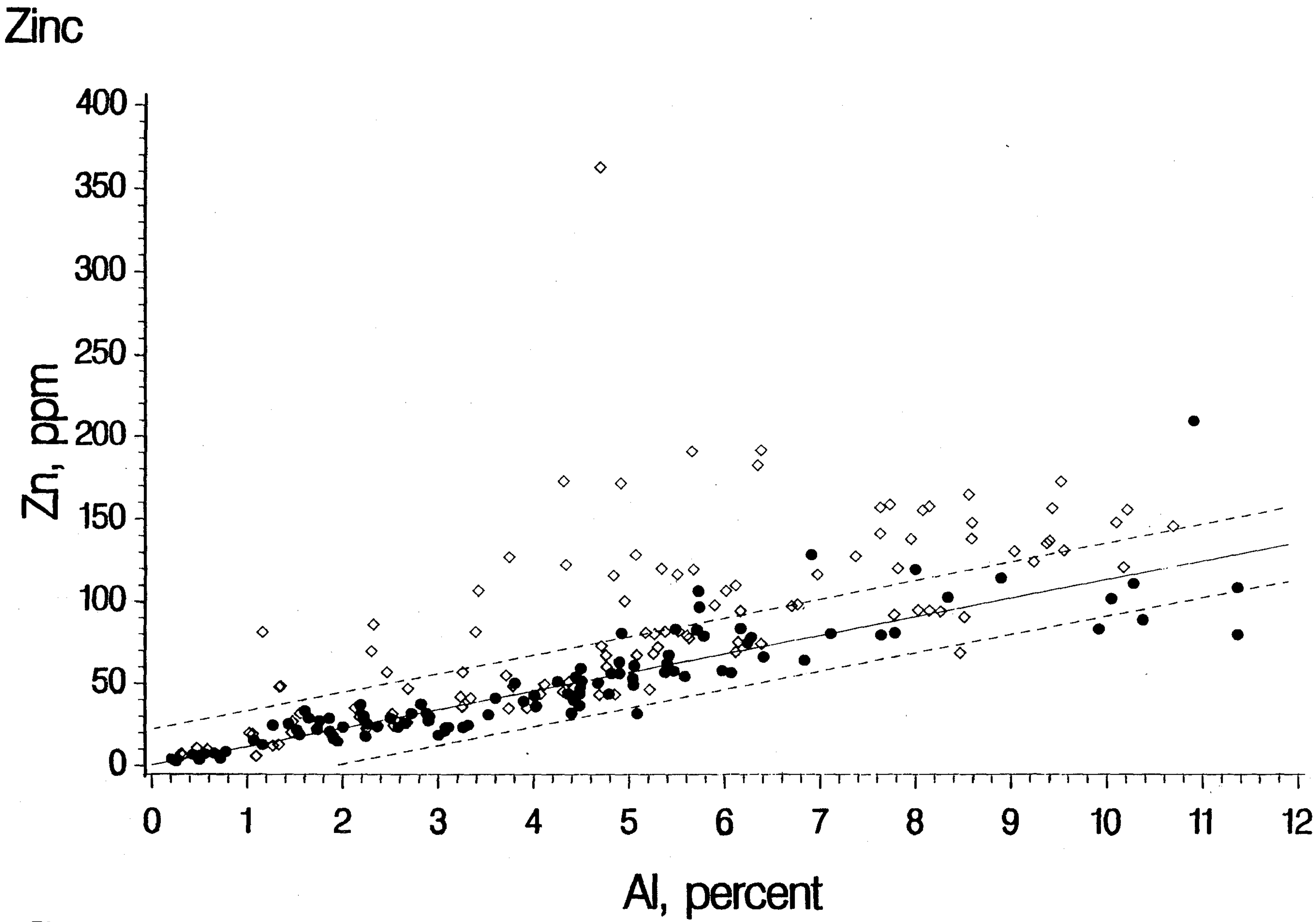


Figure 18. Zinc vs. aluminum plot for 1984-87 sediment data (dots and diamonds) with regression model (solid line) and 95% confidence limits (dashed lines) for individual predicted values derived from baseline locations (dots).

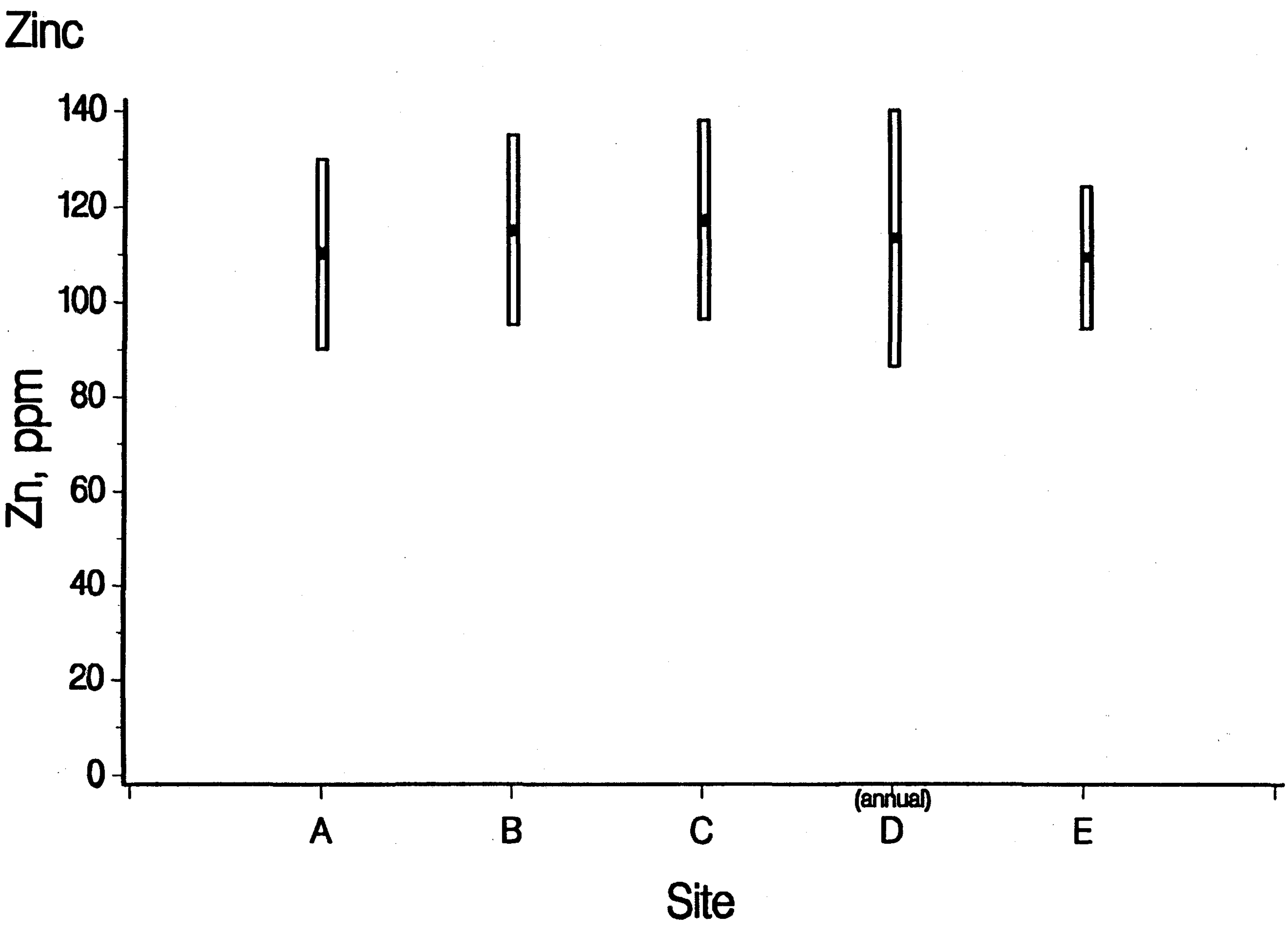


Figure 19. Concentrations of zinc (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at Sapelo Sound (SAP). Shown are mean concentrations ± one standard deviation.

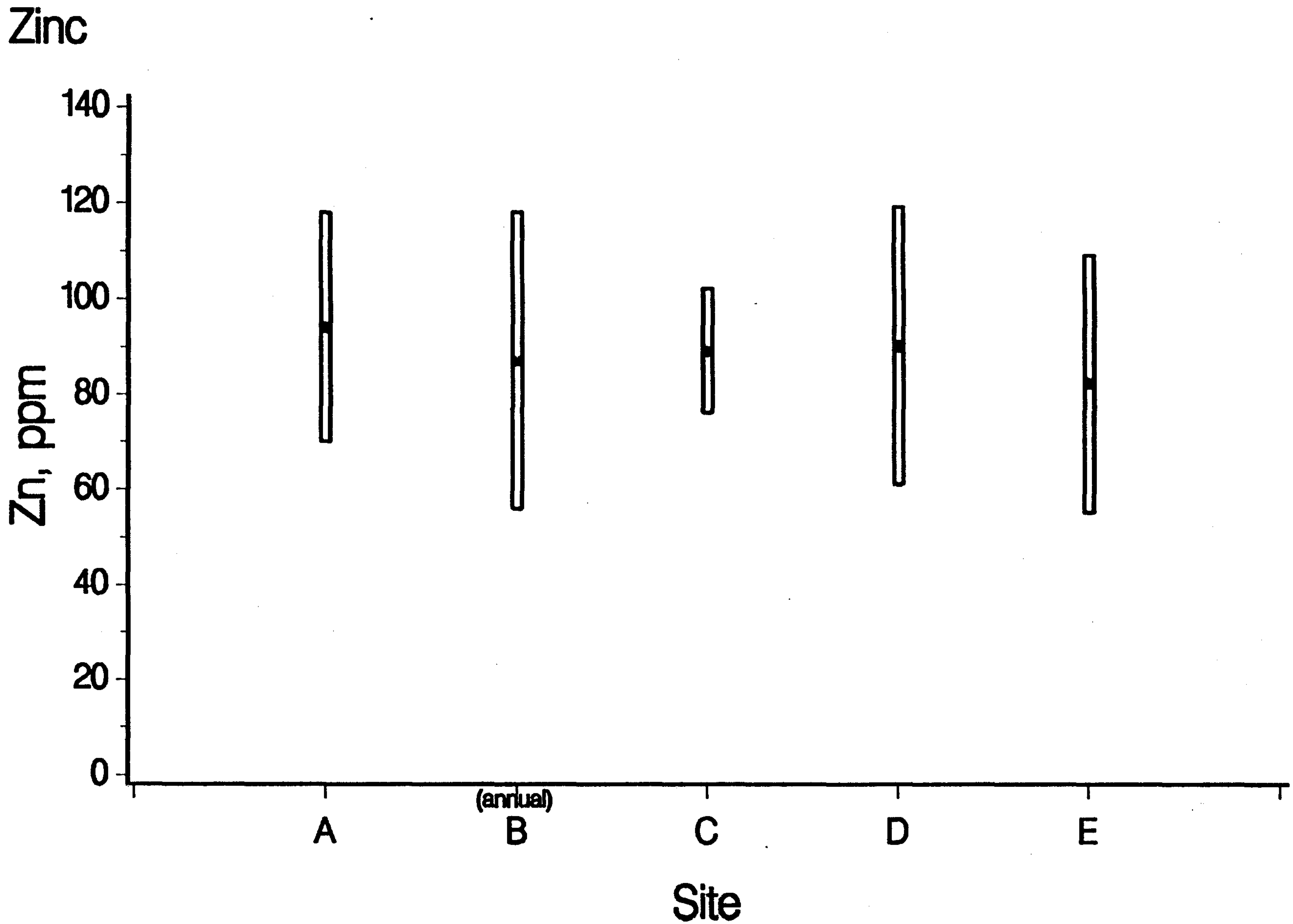


Figure 20. Concentrations of zinc (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at St. Johns River (SJR). Shown are mean concentrations ± one standard deviation.

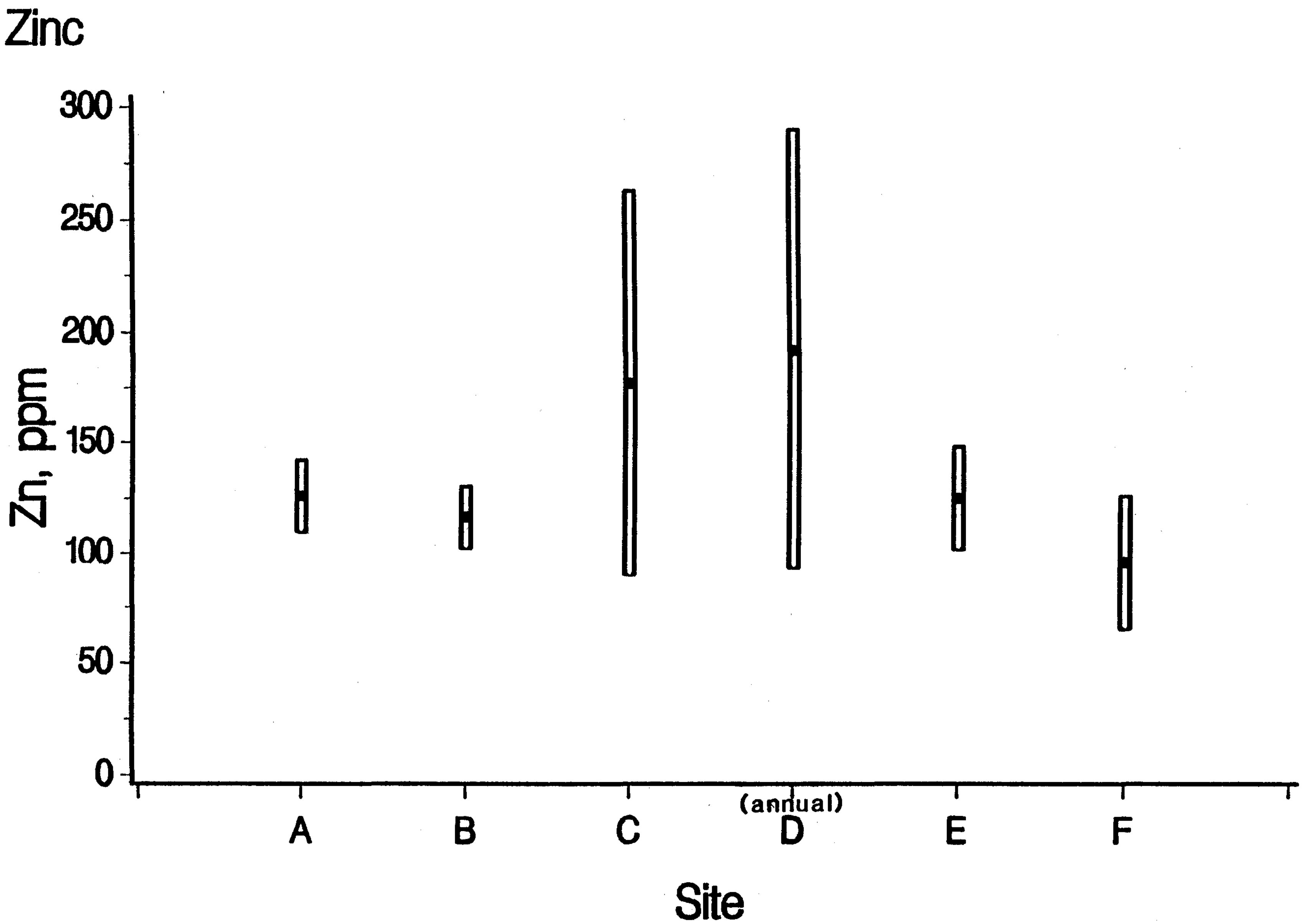


Figure 21. Concentrations of zinc (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at Galveston Bay (GAL). Shown are mean concentrations ± one standard deviation.

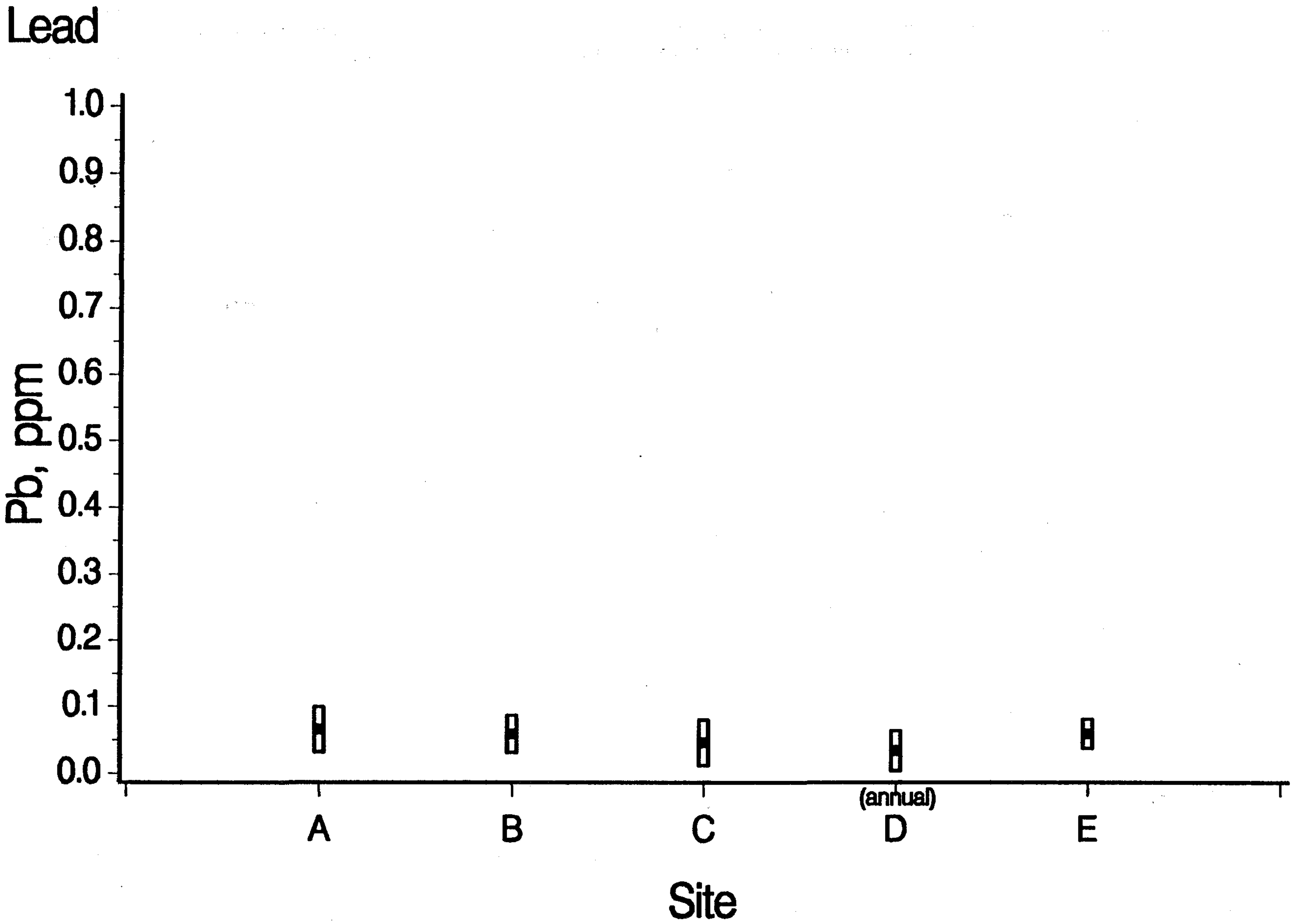


Figure 22. Concentrations of lead (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at Sapelo Sound (SAP). Shown are mean concentrations ± one standard deviation.

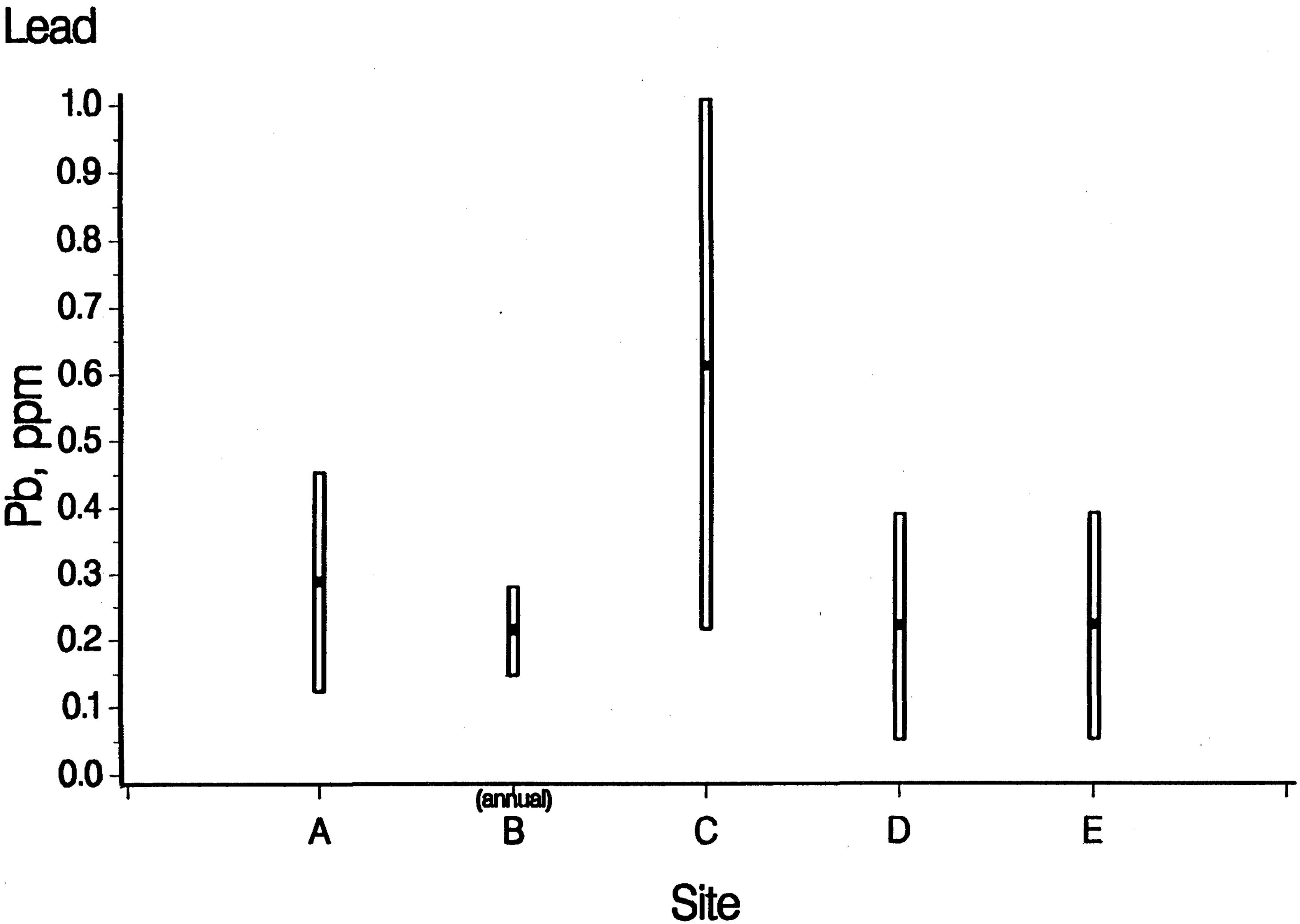


Figure 23. Concentrations of lead (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at St. Johns River (SJR). Shown are mean concentrations ± one standard deviation.

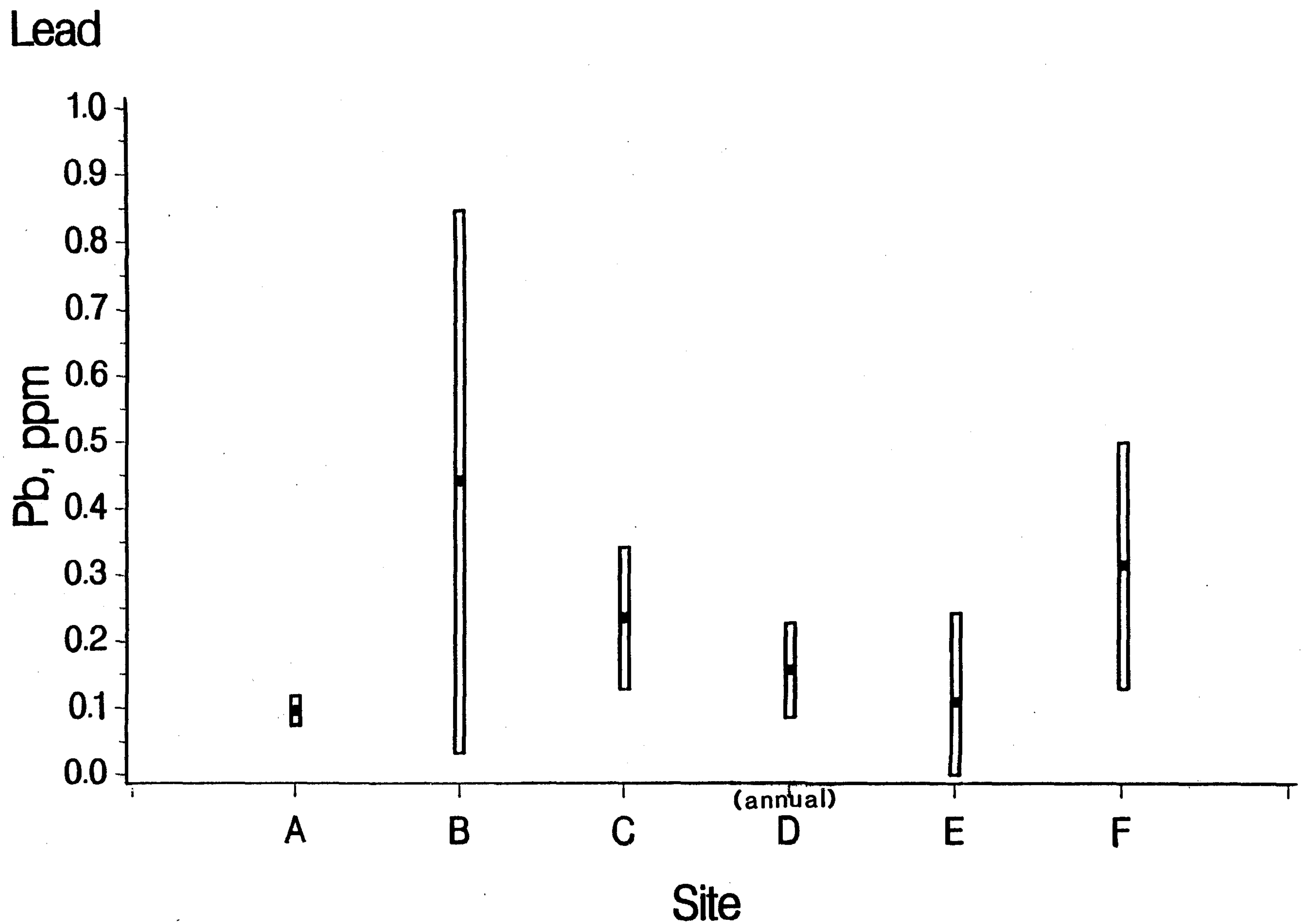


Figure 24. Concentrations of lead (ppm, dry wt.) in Atlantic croaker livers at intensive survey and annual survey sites at Galveston Bay (GAL). Shown are mean concentrations ± one standard deviation.

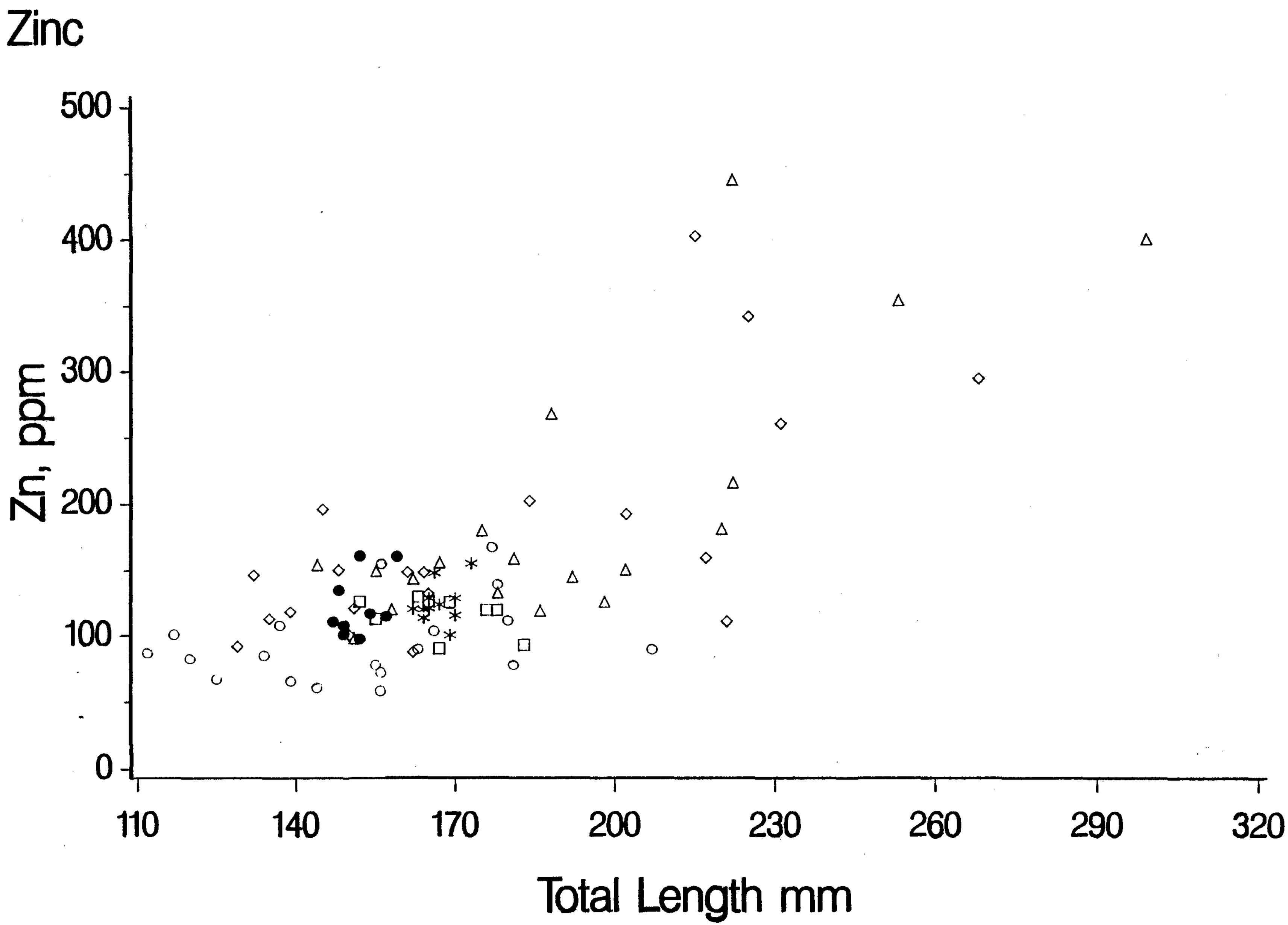


Figure 25. Zinc concentration (ppm, dry wt.) in individual Atlantic croaker livers in Galveston Bay as a function of fish total length. Data from separate sites are distinguished by different symbols: Site A (star), Site B (square), Site C (diamond), Site D (triangle), Site E (filled circle), and Site F (open circle).

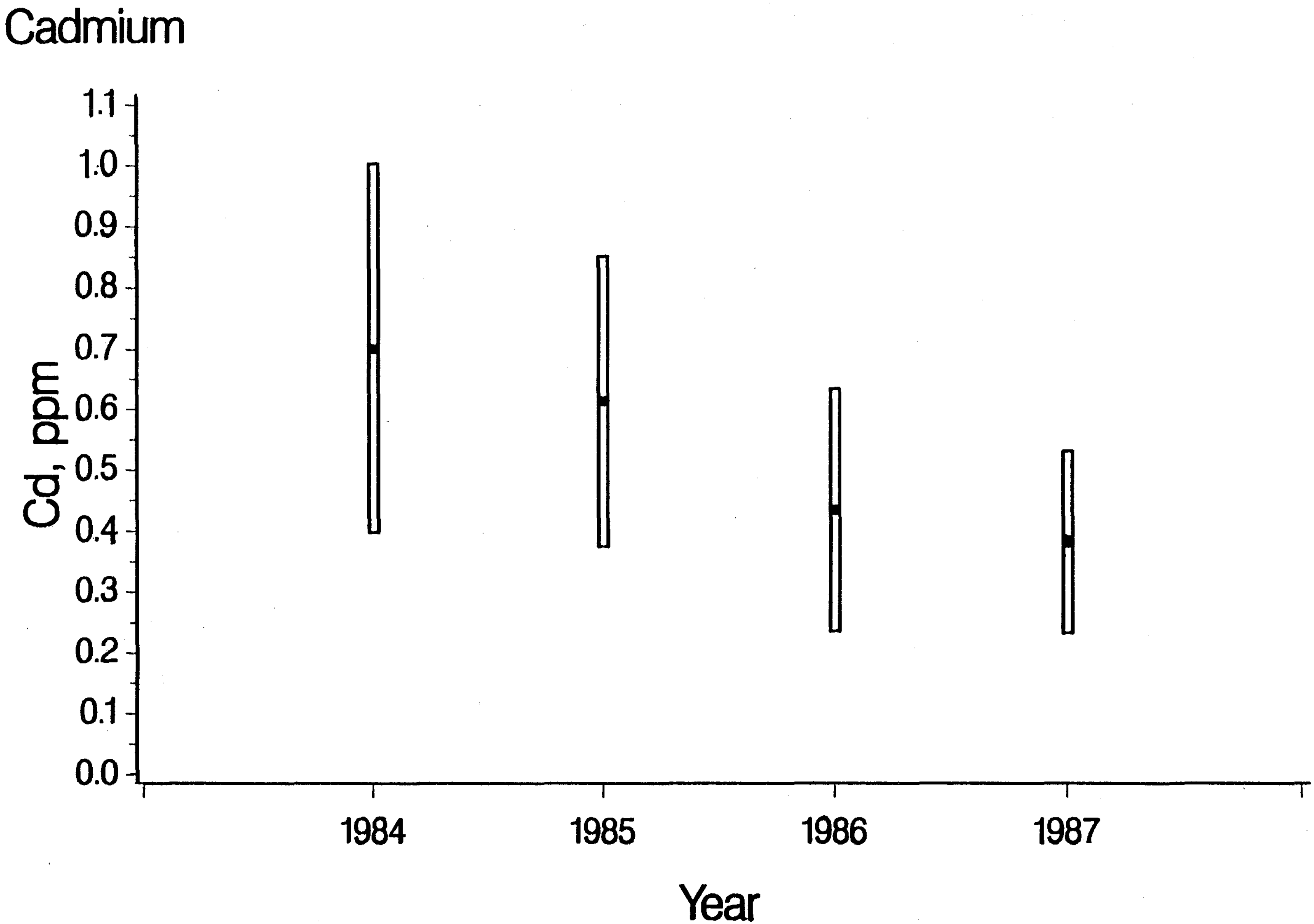


Figure 26. Temporal trend in the concentration of cadmium (ppm, dry wt.) in livers of Atlantic croaker at the Mississippi River Delta (MRD) annual survey site. Shown are mean concentrations and their 95% confidence intervals of estimate.

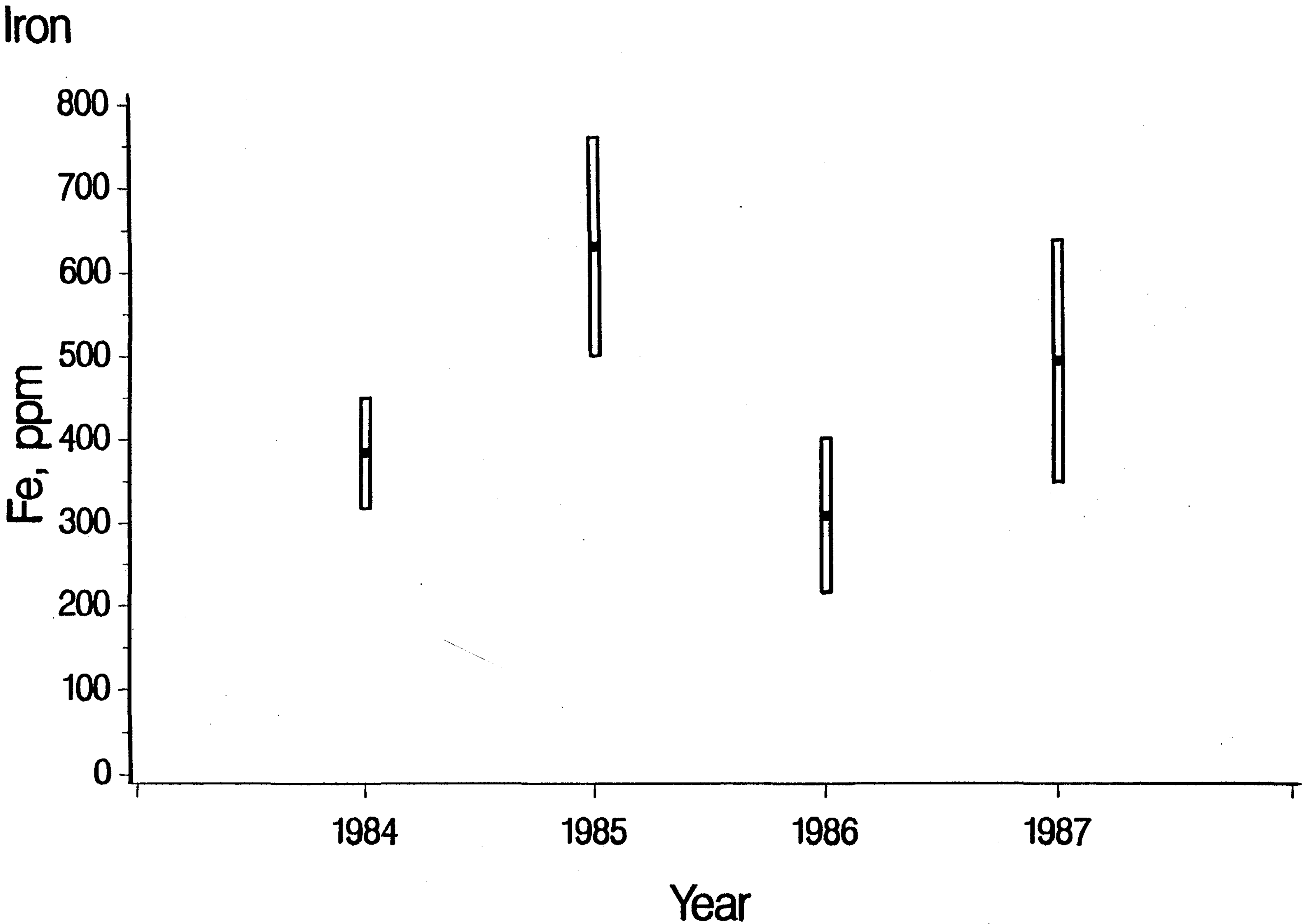


Figure 27. Temporal trend in the concentration of iron (ppm, dry wt.) in livers of Atlantic croaker at Mississippi River Delta (MRD) annual survey site. Shown are mean concentrations and their 95% confidence intervals of estimate.

APPENDIX

Table A-1. Cycle I 1984 Locations and Sites of Fish Collection

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Pamlico Sound, NC	PAM	35°13.57' 76°32.82'	Jones Bay	N of Maiden Pt.	11548 (29th ed., 5/1/82)
		35°12.15' 76°30.05'	Jones Bay-Inlet	E of Boar Pt. S of Sow Island Pt.	"
Charleston Harbor, SC	CHS	32°45.60' 79°54.56'	South Channel	NW of Ft. Johnson S of Shutes Folly Island	11524 (35th ed.,10/20/84)
Sapelo Sound, GA	SAP	31°32.30' 81°15.77'	Sapelo Sound	N of Dog Hammock	"
		31°31.78' 81°14.38'	Sapelo Sound	N of High Pt. E of Dog Hammock	11510 (11th ed.,11/15/80)
		31°30.51' 81°16.41'	Mud River	S of Dog Hammock SW of High Pt.	"
		31°30.38' 81°17.71'	Eagle Creek	W of Mud River E of Front River	"

Table A-1 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date
St. Johns River, FL	SJR	30°24.46' 81°31.00'	St. Johns River-Blount Island Channel	W of Clapboard Creek N of Back River	11491 (16th ed., 4/21/79
		30°23.20' 81°32.26'	St. Johns River-Fulton-Dame Pt. Cut-off Range	N of Mill Cove SW of beacon "42"	"
		30°20.37' 81°36.63'	St. Johns River-Arlington Channel	W of Floral Bluff SE of beacon "75"	"
Charlotte Harbor, FL	LOT	26°45.60' 82°09.40'	Charlotte Harbor	S of Cape Haze N of Pine Island	11426 (19th ed., 8/7/76)
Apalachicola Bay, FL	APA	29°37.44' 84°58.50'	Apalachicola Bay	N of Little St. George Island	11404 (14th ed., 9/1/84)
		29°44.18' 84°55.06'	East Bay	W of East Pt. E of Apalachicola River	"
Mobile Bay, AL	MOB	30°17.46' 88°06.00'	Mobile Bay	SE of Cedar Pt. N of Dauphin Island	11376 (35th ed., 9/12/81
Round Island, MS	ROU	30°17.74' 88°35.95'	Mississippi Sound	W of Round Island	11374 (19th ed.,11/5/83)
		30°19.28' 88°36.65'	Mississippi Sound	NW of Round Island S of West Pascagoula River	"

Table A-1 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterways Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Heron Bay, MS	HER	30°11.26' 89°28.75'	Heron Bay	SW of Heron Bay Bayou NW of Heron Bay Pt.	11371 (23rd ed., 5/21/81)
		30°11.40' 89°30.05'	Pipeline Canal	W of Heron Bay S intersection Campbell Outside Bayou	"
		30°10.87' 89°31.40'	Mouth of Pearl River	S of beacon "8"	"
Mississippi River Delta, LA	MRD	29°08.18' 89°02.67'	Northeast Pass	S of Blind Bay NE of Red Fish Bay	11361 (45th ed., 1/9/82)
		29°06.70' 89°04.11'	Southeast Pass	E of Red Fish Bay	"
		29°05.71' 89°07.57'	Loomis Pass	W of Red Fish Bay N of Garden Island Bay	"
		29°04.90' 89°03.70'	Southeast Pass	E of Red Fish Bay NE of Garden Island Bay	"
		29°02.73' 89°08.47'	Garden Island Bay	N of Port Eads SW of Redfish Bay	"

Table A-1 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Barataria Bay, LA	BAR	29°26.83' 89°58.25'	Barataria Bay	S of Camp Dewey NW of St. Marys Pt.	11358 (31st., 8/29/81)
		29°25.61' 89°57.49'	Barataria Bay	W of St. Marys Pt. E of Manilla	"
		29°21.30' 89°59.09'	Barataria Bay	E of Bassa Bassa Bay W of Pelican Pt.	"
		29°16.85' 89°56.80'	Barataria Bay	N of Barataria Pass E of Beauregard Island	"
Galveston Bay, TX	GAL	29°30.60' 94°54.57'	Galveston Bay Eagle Pt.- Dickinson Bay	N of Eagle Pt. W of Red Fish Island	11326 (21st ed., 4/7/84)
		29°28.10' 94°57.02'	Dickinson Bay	E of beacon "27"	"
		29°27.47' 94°54.80'	Galveston Bay Eagle Pt.- Dickinson Bay	SE of April Fool Pt. E of beacon "14"	"
		29°27.00' 94°58.84'	Dickinson Bayou	W of Hwy. ST 146 S of San Leon Station	"

Table A-2. Cycle II 1985 Locations and Sites for Fish Collection.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Pamlico Sound, NC	PAM	35°13.12' 76°31.80'	Jones Bay	NW of Boar Pt. SW of Minktrap Pt.	11548 (31st ed., 3/23/85)
Charleston Harbor, SC	CHS	32°50.13' 79°40.15'	Coastal Atlantic Ocean	1.5 naut mile SE of Capers Island	11531 (15th ed.,7/21/84)
Sapelo Sound, GA	SAP	31°32.60' 81°11.60'	Sapelo Sound-Inlet	N of Flag Pond	11510 (13th ed.,10/24/84)
St. Johns River, FL	SJR	30°21.02' 81°36.77'	St. Johns River-Arlington Channel	NW of Floral Bluff NE of beacon "75"	11491 (21st ed.,7/7/84)
Charlotte Harbor, FL	LOT	26°45.44' 82°09.27'	Charlotte Harbor	S of Cape Haze N of Pine Island	11426 (19th ed., 8/7/76)
Apalachicola Bay, FL	APA	29°37.50' 85°04.00	Apalachicola Bay	E of Sand Island W of St. Vincent Bar	11402 (14th ed., 8/11/84)
Pensacola Bay, FL	PEN	30°29.83' 87°08.25'	Pensacola Bay-Escambia Bay	E of Devil Pt.	11378 (20th ed.,12/15/84)
Mobile Bay, FL	MOB	30°17.90' 88°01.95'	Mobile Bay	N of Mobile Pt. N of beacon "25"	11376 (35th ed., 9/12/81)
	MOB	30°17.15' 88°05.40'	Mobile Bay	SE of Cedar Pt. N of beacon "C-3" NE of North Pt.	"

Table A-2 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Round Island, MS	ROU	30°23.24' 88°33.90'	Pascagoula River	E of Marsh Lake SW of beacon "6"	11374 (20th ed.,12/29/84)
Heron Bay, LA	HER	30°11.71' 89°32.10'	Pearl River	SW of Baldwin Lodge NE of R.R. Swing Bridge	11367 (18th ed., 7/28/84)
		30°11.76' 89°29.96'	Pipeline Canal	E of Campbell Lagoon W of Heron Bay	"
Mississippi River Delta, LA	MRD	29°05.60' 89°05.40'	Redfish Bay	W of Southeast Pass SE of North Shore Bay	11361 (45th ed., 1/9/82)
Barataria Bay, LA	BAR	29°17.04' 89°56.06'	Pipeline Canal	N side of Grand Terre Island between Barataria Pass & Pass Abel	11358 (31st ed., 8/29/81)
Galveston Bay, TX	GAL	29°31.91' 94°52.38'	Galveston Bay	NE of Eagle Pt. NE of Redfish Island	11326 (21st ed., 4/7/84)

Table A-2 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
San Antonio Bay, TX	SAB	28°14.55' 96°46.44'	San Antonio Bay	E of Mustang Lake SE of Live Oak Pt. in I.C.W.	11315 (17th ed., 3/3/84)
		28°11.00' 96°45.00'	Cottonwood Bayou	NE of Bray Cove SW of Panther Pt.	"
Corpus Christi Bay, TX	CCB	27°49.56' 97°17.09'	Corpus Christi Bay	SE of Indian Pt. SW of Long Reef	11309 (25th ed.,12/19/81)
Lower Laguna Madre Bay, TX	LLM	26°05.09' 97°15.17'	Laguna Madre	N of Laguna Heights	11302 (15th ed., 5/12/84)

[1] Trawl area within 1 km (.54 naut. mile) radius of position.

Table A-3. Cycle III 1986 Locations and Sites of Fish Collection.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Pamlico Sound, NC	PAM	35°12.52' 76°30.60'	Jones Bay	NE of Boar Pt. SW of Sow Is. Pt.	11548 (31st ed., 3/23/85)
Charleston Harbor, SC	CHS	32°45.41' 79°53.10'	South Channel	E of Ft. Johnson W of Ft. Sumter	11524 (35th ed.,10/24/84)
Sapelo Sound, GA	SAP	31°32.62' 81°11.91'	Sapelo Sound-Inlet	N of Flag Pond	11510 (13th ed., 3/8/86)
St. Johns River, FL	SJR	30°14.14' 81°39.30'	St. Johns River	NE of Piney Pt.	11492 (15th ed., 1/24/87)
Biscayne Bay, FL	BIS[2]	25°53.35' 80°08.46'	Biscayne Bay	W of Bay Harbor Islands N of Broad Causeway	11467 (24th ed.,11/30/85)
		25°51.89' 80°08.95'	Biscayne Bay	N of Treasure Island NW of Normandy Isle	"
		25°50.46' 80°09.04'	Biscayne Bay	S of Treasure Island SW of Normandy Isle	"
		25°47.58' 80°10.08'	Biscayne Bay	N of San Marco Island S of Julia Tuttle Causeway	"

Table A-3 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Biscayne Bay, FL	BIS	25°45.41' 80°08.80'	Biscayne Bay	NE of Virginia Key SW of Fisher Island	11467 (24th ed.,11/30/85)
Charlotte Harbor, FL	LOT	26°39.35' 82°05.72'	Charlotte Harbor	E of Indian Field W of Buzzard Bay	11426 (19th ed., 8/7/76)
		26°47.70' 82°05.80'	Charlotte Harbor	E of Cape Haze W of Key Pt.	"
		26°45.60' 82°09.95'	Charlotte Harbor	S of Cape Haze	"
Apalachicola Bay, FL	APA	29°37.50' 84°58.25'	Apalachicola Bay	N of Little St. George Island NW of Government Cut	11402 (14th ed., 9/1/84)
		29°37.00' 85°03.70'	Apalachicola Bay	N of Little St. George Island W of St. Vincent Bar	"
Pensacola Bay, FL	PEN	30°22.61' 87°09.00'	Pensacola Bay	W of Butcherpen Pt.	11378 (20th ed.,12/15/84)
		30°29.61' 87°08.15'	Escambia Bay	E of Devil Pt.	"
Mobile Bay, AL	MOB	30°18.89' 88°01.80'	Mobile Bay	E of Cedar Pt.	11376 (35th ed.,9/12/81)
Heron Bay, MS	HER	30°11.33' 89°31.68'	Pearl River	S of R.R. Swing Bridge	11367 (18th ed.,7/28/84)

Table A-3 Cont.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Heron Bay, MS	HER	30°11.76' 89°29.96'	Pipeline Canal	E of Campbell Lagoon W of Heron Bay	11367 (18th ed.,7/28/84)
Mississippi River Delta, LA	MRD	29°05.60' 89°05.40'	Redfish Bay	W of Southeast Pass	11361 (45th ed., 1/9/82)
		29°02.81' 89°06.75'	Garden Island Bay	NE of Port Eads	11361 (45th ed., 1/9/82)
Galveston Bay, TX	GAL-D	29°27.74' 94°56.03'	Galveston Bay- Eagle Pt.- Dickinson Bay	SW of April Fool Pt.	11326 (21st ed., 4/7/84)
Galveston Bay, TX	GAL[2]	29°43.94' 95°02.84'	Galveston Bay- Houston Ship Channel	N of Barnes Island	11329 (25th ed.,6/27/87)
San Antonio Bay, TX	SAB	28°13.37' 96°48.10'	San Antonio Bay	SE of Jones Lake NE of beacon "67"	11315 (17th ed., 3/3/84)
Corpus Christi Bay, TX	CCB	27°48.63' 97°18.88'	Corpus Christi Bay	SE of Indian Pt. W of beacon "61"	11309 (25th ed.,12/19/81)
Lower Laguna Madre Bay, TX	LLM	26°04.93' 97°14.19'	Laguna Madre	NE of Laguna Heights	11302 (15th ed., 5/12/84)

1 Trawl area within 1 km (.54 naut. mile) radius of position.
2 Only fish for histopathology were collected at this location.

Table A-4. Cycle IV 1987 Locations and Sites for Fish Collection.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Charleston Harbor, SC	CHS	32°45.37' 79°54.86'	South Channel	S of Middle Ground W of Ft. Johnson	11524 (35th ed., 10/24/84)
		32°45.40' 79°52.74'	South Channel	NW of Ft. Sumter	"
Sapelo Sound, GA	SAP-B (July)	30°31.74' 81°16.61'	Sapelo River- Dog Hammock	W of Dog Hammock	11510 (11th ed., 11/15/80)
	SAP-B (Aug.)	31°31.50' 81°17.27'	Sapelo River- Dog Hammock	SW of Dog Hammock SE of Four Mile	"
	SAP-C (Aug.)	31°32.30' 81°11.75'	Sapelo Sound- Inlet	N of Blackbeard Island	"
	SAP-C (Oct.)	31°32.20' 81°10.30'	Sapelo Sound- Inlet	N of Concord Shoal S of St. Catherine Island	"
	SAP-D	31°34.50' 81°14.26'	Barbour Island River	W of Oldnor Island N of Cedar Hammock Island	"
	SAP-E	31°38.50' 81°15.00'	South Newport River	E of Thomas Landing	"
	SAP-F	31°38.87' 81°11.36'	Johnson Creek	S of ICW beacon "126" N of ICW beacon "127"	"
St. Johns River, FL	SJR-A	30°09.76' 81°41.12'	St. Johns River- Orange Pt. Orange Park	SE of Orange Park NE of beacon "10"	11492 (15th ed., 1/24/87)

Table A-4 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
St. Johns River, FL	SJR-B	30°20.65' 81°36.85'	St. Johns River Arlington Channel	W of Floral Bluff	11491 (21st ed., 7/7/84)
	SJR-C	30°16.64' 81°42.63'	Cedar-Ortega River	NW of Ortega NE of Bascule RR Bridge	11492 (15th ed., 1/24/87)
	SJR-D	30°23.50' 81°34.10'	St. Johns River-Quarantine Island Upper Range	NE of Quarantine Island	11491 (21st ed., 7/7/84)
	SJR-E	30°14.15' 81°39.31'	St. Johns River-Piney Pt.	NE of Piney Pt. SW of Christopher Pt.	11492 (15th ed., 1/24/89)
Pensacola Bay, FL	PEN	30°22.60' 87°08.97'	Pensacola Bay	N of Butcherpen Cove	11378 (20th ed.,12/15/84)
		30°23.46' 87°12.49'	Pensacola Bay	East Channel N of beacon "27"	"
		30°22.00' 87°12.68'	Pensacola Bay	N of Fair Pt. W of Town Pt.	"
		30°21.00' 87°11.88'	Pensacola Bay	NW of Deer Pt. SE of Fair Pt.	"
		30°20.26' 87°10.50'	Pensacola Bay	SE of Deer Pt. S of English Navy Cove	"

Table A-4 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Pascagoula River, MS	PAS	30°21.47' 88°33.95'	Pasagoula River	N of beacon "4" E of Grain Elevator	11374 (20th ed., 12/29/84)
		30°22.97' 88°34.09'	Pasagoula River	E of beacon "5" W of Krebs Lake	"
Mississippi River Delta, LA	MRD	29°09.74' 89°03.02'	Blind Bay	N of Northeast Pass W of South Mud Lumps	11361 (45th ed., 1/9/82)
		29°04.33' 89°04.65'	Redfish Bay	SW of Southeast Pass	"
		29°05.97' 89°06.42'	Redfish Bay	SW of Southeast Pass	"
Barataria Bay, LA	BAR	29°17.04' 89°56.06'	Pipeline Canal	N side of Grand Terre Island between Barataria Pass & Pass Abel	11358 (31st ed., 8/29/81)
Galveston Bay, TX	GAL-A	29°27.20' 94°42.60'	East Bay	NW of Bolivar Beach SW of Elmgrove Pt.	11326 (23rd ed., 7/18/87)
	GAL-B	29°19.70' 94°52.80'	Galveston Bay-Texas City	SE of Swan Lake S of Texas City	"
	GAL-C	29°41.36' 94°59.44'	Houston Ship Channel-Morgans Pt.	W of beacon "94" in Houston Ship Channel N of Morgans Pt.	"

Table A-4 Contd.

Location Name	Location Designation	Area of Trawl Operations[1]	Chart Description: Waterway Name	Chart Description: Landmarks & Other Locaters	Chart No. (Edition, Date)
Galveston Bay, TX	GAL-D	29°30.60' 94°53.57'	Galveston Bay Eagle Pt.-Dickinson Bay	West Pass	11326 (23rd ed., 7/18/87)
		29°30.91' 94°55.25'	Galveston Bay Eagle Pt.-Dickinson Bay	N of San Leon	"
	GAL-E	29°42.38' 94°43.87'	Trinity Bay	Anahuac Channel	"
		29°41.30' 94°44.48'	Trinity Bay	SW of Anahuac Channel W of Black Pt.	"
		29°35.00' 94°46.00'	Trinity Bay	S of Double Bayou Channel NE of Smith Pt.	"
	GAL-F	29°44.38' 95°06.78'	Houston Ship Channel	NE of beacon "139" N of Patrick Bayou	11329 (25th ed., 6/27/87)

[1] Trawl area within 1 km (.54 naut. mile) radius of position.

Table A-5. Sediment Stations:Annual Surveys 1984 Cycle I and 1985 Cycle II.

LOCATION	Station	1984 Cycle I Latitude (N)	1984 Cycle I Longitude (W)	1985 Cycle II Latitude (N)	1985 Cycle II Longitude (W)
Pamlico Sound (PAM)	1	35°13.90'	76°33.60'	35°13.90'	76°33.60'
	2	35°13.00'	76°30.80'	35°13.00'	76°30.80'
	3	35°13.50'	76°32.10'	35°13.50'	76°32.10'
Charleston Harbor (CHS)	1	32°45.43'	79°55.07'	32°45.43'	79°55.05'
	2	32°45.42'	79°54.45'	32°45.42'	79°54.47'
	3	32°45.45'	79°54.15'	32°45.44'	79°54.25'
Sapelo Sound (SAP)	1	31°31.67'	81°14.45'	31°31.68'	81°14.53'
	2	31°32.17'	81°13.62'	31°32.18'	81°13.66'
	3	31°32.67'	81°14.83'	31°32.64'	81°14.91'
St. Johns River Estury (SJR)	1	30°23.95'	81°36.25'	30°23.97'	81°36.29'
	2	30°22.68'	81°32.33'	30°22.57'	81°32.48'
	3	30°22.53'	81°37.20'	30°22.49'	81°36.95'
Charlotte Harbor (LOT)	1	26°45.70'	82°09.30'	26°45.69'	82°09.33'
	2	26°49.80'	82°06.30'	26°49.76'	82°06.28'
	3	26°52.33'	82°07.70'	26°52.34'	82°07.70'
Tampa Bay (TAM)	1	27°47.01'	82°32.50'	27°47.01'	82°32.50'
	2	27°46.06'	82°35.47'	27°46.06'	82°35.47'
	3	27°47.03'	82°35.94'	27°47.03'	82°35.94'
Apalachicola Bay (APA)	1	29°37.78'	84°58.10'	29°37.78'	84°58.10'
	2	29°38.30'	84°58.50'	29°38.30'	84°58.50'
	3	29°39.87'	84°58.50'	29°39.87'	84°58.50'
Pensacola Bay (PEN)	1	not established		30°22.35'	87°14.63'
	2			30°25.47'	87°09.25'
	3			30°33.00'	87°09.50'
Mobile Bay (MOB)	1	30°16.60'	88°04.40'	30°16.61'	88°04.38'
	2	30°17.80'	88°05.89'	30°17.91'	88°05.90'
	3	30°19.00'	88°04.40'	30°18.98'	88°04.40'
Round Island (ROU)	1	30°17.67'	88°35.83'	30°17.67'	88°35.83'
	2	30°18.33'	88°36.83'	30°18.33'	88°36.83'
	3	30°19.25'	88°37.00'	30°19.25'	88°37.00'
Pascagoula River (PAS)	1	not established		not established	
	2				
	3				

Table A-5 Contd.

LOCATION	Station	1984 Cycle I Latitude (N)	1984 Cycle I Longitude (W)	1985 Cycle II Latitude (N)	1985 Cycle II Longitude (W)
Heron Bay (HER)	1	no sample (weather)		30°11.08'	89°27.92'
	2			30°11.20'	89°28.93'
	3			30°10.60'	89°28.80'
Mississippi River Delta (MRD)	1	29°06.70'	89°04.20'	29°07.17'	89°04.11'
	2	29°04.80'	89°03.60'	29°05.51'	89°04.06'
	3	29°08.10'	89°01.70'	29°08.16'	89°02.41'
Barataria Bay (BAR)	1	29°26.90'	89°58.70'	29°26.90'	89°58.70'
	2	29°20.50'	89°56.70'	29°20.50'	89°56.70'
	3	29°17.50'	89°56.00'	29°17.24'	89°56.04'
Galveston Bay (GAL)	1	29°28.28'	94°56.17'	29°28.28'	94°56.25'
	2	29°29.00'	94°54.33'	29°29.00'	94°54.33'
	3	29°30.50'	94°53.92'	29°30.70'	94°54.70'
San Antonio Bay (SAB)	1	28°14.17'	96°46.17'	28°14.17'	96°46.17'
	2	28°13.17'	96°46.67'	28°13.17'	96°46.67'
	3	28°12.33'	96°46.17'	28°12.33'	96°46.17'
Corpus Christi Bay (CCB)	1	27°49.42'	97°16.45'	27°49.42'	97°16.45'
	2	27°49.60'	97°17.42'	27°49.60'	97°17.42'
	3	27°49.75'	97°18.23'	27°49.75'	97°18.23'
Lower Laguna Madre (LLM)	1	26°05.08'	97°14.75'	26°05.08'	97°14.75'
	2	26°06.45'	97°15.43'	26°06.45'	97°15.43'
	3	26°08.48'	97°15.90'	26°08.48'	97°15.90'

Table A-6. **Sediment** Stations: Annual Surveys 1986 Cycle III and 1987 Cycle IV.

LOCATION	Station	1986 Cycle III Latitude (N)	1986 Cycle III Longitude (W)	1987 Cycle IV Latitude (N)	1987 Cycle IV Longitude (W)
Pamlico Sound (PAM)	1	35°13.90'	76°33.60'	no sample (deferred)	
	2	35°13.00'	76°31.50'		
	3	35°12.70'	76°30.80		
Charleston Harbor (CHS)	1	32°45.32'	79°55.09'	32°45.32'	79°53.14'
	2	32°45.41'	79°54.48'	32°45.41'	79°54.51'
	3	32°45.45'	79°54.28'	32°45.44'	79°54.29'
Sapelo Sound (SAP)	1	31°31.67'	81°14.48'	31°31.54'	81°14.49'
	2	31°32.16'	81°13.67'	31°32.13'	81°13.68'
	3	31°32.62'	81°14.85'	31°32.66'	81°14.87'
St. Johns River Estuary (SJR)	1	30°23.99'	81°36.28'	30°23.92'	81°36.42'
	2	30°22.10'	81°31.52'	30°23.53'	81°36.25'
	3	30°23.42'	81°38.15'	30°23.42'	81°35.82'
Charlotte Harbor (LOT)	1	26°45.93'	82°09.17'	no sample (deferred)	
	2	26°49.95'	82°06.20'		
	3	26°52.63'	82°07.47'		
Tampa Bay (TAM)	1	no sample (deferred)		no sample (deferred)	
	2				
	3				
Apalachicola Bay (APA)	1	29°37.78'	84°58.09'	no sample (deferred)	
	2	29°38.31'	84°58.50'		
	3	29°39.85'	84°58.45		
Pensacola Bay (PEN)	1	30°22.37'	84°14.70'	30°22.33'	87°14.72'
	2	30°25.42'	87°09.29'	30°25.47'	87°09.25'
	3	30°32.93'	87°09.54'	30°32.93'	87°09.54'
Mobile Bay (MOB)	1	30°16.54'	88°04.36'	no sample (deferred)	
	2	30°17.74'	88°05.89'		
	3	30°19.00'	88°04.40'		
Round Island (ROU)	1	no sample (deferred)		30°17.63'	88°35.66'
	2			30°18.28'	88°36.37'
	3			30°19.29'	88°36.51'
Pascagoula River (PAS)	1	not established		30°23.11'	88°33.96'
	2			30°22.75'	88°34.05'
	3			30°22.37'	88°33.78'

Table A-6 Contd.

LOCATION	Station	1986 Cycle III Latitude (N)	1986 Cycle III Longitude (W)	1987 Cycle IV Latitude (N)	1987 Cycle IV Longitude (W)
Heron Bay (HER)	1	30°11.08'	89°27.92'	no sample (deferred)	
	2	30°11.20'	89°28.93'		
	3	30°10.60'	89°28.80'		
Mississippi River Delta (MRD)	1	29°07.17'	89°04.19'	29°07.16'	89°04.17'
	2	29°05.51'	89°04.06'	29°05.46'	89°04.08'
	3	29°08.16'	89°02.41'	29°08.11'	89°02.44'
Barataria Bay (BAR)	1	no sample (deferred)		29°26.78'	89°59.03'
	2			29°20.52'	89°56.64'
	3			29°17.26'	89°56.06'
	4			29°19.98'	89°56.57'
Galveston Bay (GAL)	1	29°28.31'	94°56.07'	29°30.84'	94°54.24'
	2	29°29.04'	94°54.42'	29°29.05'	94°54.00'
	3	29°30.39'	94°53.83'	29°28.50'	94°56.20'
San Antonio Bay (SAB)	1	28°14.38'	96°46.33'	no sample (deferred)	
	2	28°13.23'	96°46.61'		
	3	28°12.33'	96°46.24'		
Corpus Christi Bay (CCB)	1	27°49.54'	97°16.54'	no sample (deferred)	
	2	27°49.65'	97°17.44'		
	3	27°49.79'	97°18.14'		
Lower Laguna Madre (LLM)	1	26°05.08'	97°14.75'	no sample (deferred)	
	2	26°06.45'	97°15.43'		
	3	26°08.48'	97°15.90'		

Table A-7. Sediment Stations: Intensive Survey 1987 Cycle IV.

Location	Site	Station	Latitude (N)	Longitude (W)
Galveston Bay (GAL)	A	1	29° 27.08'	94° 43.05'
		2	29° 27.21'	94° 42.73'
		3	29° 27.49'	94° 42.79'
	B	1	29° 21.69'	94° 52.37'
		2	29° 21.43'	94° 52.54'
		3	29° 21.53'	94° 52.19'
	C	1	29° 42.62'	95° 00.21'
		2	29° 42.46'	95° 00.30'
		3	29° 42.13'	95° 00.11'
	D	1	29° 30.84'	94° 54.24'
		2	29° 29.05'	94° 54.00'
		3	29° 28.50'	94° 56.20'
	E	1	29° 37.02'	94° 45.55'
		2	29° 36.45'	94° 45.45'
		3	29° 35.85'	94° 45.40'
St. Johns River Estuary (SJR)	A	1	30° 09.47'	81° 41.03'
		2	30° 09.66'	81° 40.94'
		3	30° 09.84'	81° 40.85'
	B	1	30° 23.75'	81° 38.37'
		2	30° 23.75'	81° 38.70'
		3	30° 23.68'	81° 38.97'
	C	1	30° 16.24'	81° 43.15'
		2	30° 16.74'	81° 42.63'
		3	30° 16.85'	81° 42.27'
	D	1	30° 23.92'	81° 36.42'
		2	30° 23.53'	81° 36.25'
		3	30° 23.42'	81° 35.82'
	E	1	30° 14.61'	81° 39.48'
		2	30° 14.40'	81° 39.36'
		3	30° 14.26'	81° 39.18'

Table A-7 Contd.

Location	Site	Station	Latitude (N)	Longitude (W)
Sapelo Sound (SAP)	A	1	31°31.54'	81°14.49'
		2	31°32.13'	81°13.68'
		3	31°32.66'	81°14.87'
	B	1	31°31.50'	81°17.43'
		2	31°31.92'	81°17.82'
		3	31°32.28'	81°17.23'
	C	1	31°32.20'	81°12.40'
		2	31°32.58'	81°11.15'
		3	31°32.69'	81°11.99'
	D	1	31°34.66'	81°14.55'
		2	31°34.72'	81°14.39'
		3	31°34.72'	81°14.54'
	E	1	31°38.75'	81°15.49'
		2	31°38.57'	81°15.35'
		3	31°38.29'	81°14.56'
SAP October 1987	A	1	31°31.67'	81°14.48'
		2	31°32.16'	81°13.67'
		3	31°32.60'	81°14.80'
SAP July 1987	A	1	31°31.68'	81°14.53'
		2	31°32.18'	81°13.66'
		3	31°32.64'	81°14.91'

Table A-8. Elemental Concentrations for 1984-87 Sediments in the Southeast. Units: ppm (dry) except Al, Fe, and Si percent (dry).

Computer listing of sediment data, 5 pages, 211 observations.

Table A-8 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	Ag	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Si	Sn	Tl	Zn
APA	84	10	A	1	A	0.025	2.240	4.900	0.009	24.500	4.800	1.150	0.008	284.000	6.200	11.300	0.160	37.420	1.100	0.190	18.000
APA	84	10	A	2	A	0.074	10.890	24.000	0.046	86.800	22.500	6.200	0.082	1041.000	32.200	32.300	0.800	19.180	4.500	0.770	209.000
APA	84	10	A	3	A	0.073	11.350	25.200	0.080	102.000	23.500	6.490	0.098	1450.000	30.300	33.500	0.610	21.750	3.600	0.800	108.000
APA	85	10	A	1	A	0.046	9.905	19.979	0.074	77.556	17.278	5.224	0.138	866.946	24.459	27.836	0.726	26.067	3.108	0.671	82.957
APA	85	10	A	2	A	0.050	10.365	15.523	0.081	81.422	18.072	5.843	0.104	1144.441	25.160	29.763	0.547	27.643	5.137	0.470	88.565
APA	85	10	A	3	A	0.063	10.264	16.895	0.132	67.129	21.712	6.280	0.119	1220.651	31.859	33.970	0.604	24.867	4.887	0.419	110.462
APA	86	10	A	1	A	0.053	4.892	22.028	0.058	73.627	14.230	3.657	0.026	186.644	19.078	22.565	0.423	27.653	1.926	.	62.879
APA	86	10	A	2	A	0.071	11.356	19.902	0.068	89.542	21.031	5.931	0.062	1112.472	28.348	35.124	0.501	25.005	3.902	.	79.694
APA	86	10	A	3	A	0.081	10.035	17.589	0.107	106.214	23.780	5.299	0.111	1237.149	33.264	38.962	0.597	23.181	3.994	.	101.299
BAR	84	9	A	1	A	0.125	5.480	8.400	0.278	64.200	15.600	2.710	0.076	441.000	21.500	20.700	0.550	30.770	1.600	0.670	83.000
BAR	84	9	A	2	A	0.090	4.490	5.500	0.220	55.100	10.500	1.970	0.048	298.000	15.600	16.100	0.190	31.130	1.600	0.580	59.000
BAR	84	9	A	3	A	0.055	4.020	4.700	0.080	37.700	5.400	1.370	0.026	235.000	14.200	12.000	0.180	35.300	4.300	0.440	36.000
BAR	85	9	A	1	A	0.079	5.052	5.329	0.146	35.061	8.877	1.887	0.057	327.764	17.376	13.965	0.194	32.628	1.374	0.867	60.730
BAR	85	9	A	2	A	0.048	5.370	7.439	0.255	33.601	9.579	2.028	0.066	348.498	18.849	14.866	0.241	35.666	1.469	0.657	56.678
BAR	85	9	A	3	A	0.026	3.253	1.844	0.015	16.030	2.423	0.598	0.032	97.920	4.710	7.546	0.061	30.390	0.951	0.559	23.522
BAR	87	10	A	1	A	0.136	5.779	7.353	0.246	57.042	15.861	2.105	0.029	426.937	22.829	20.380	0.288	.	1.530	.	78.716
BAR	87	10	A	2	A	0.118	5.398	5.917	0.171	56.216	11.951	2.457	0.038	194.411	23.696	16.402	0.271	.	1.107	.	62.007
BAR	87	10	A	3	A	0.101	4.244	5.502	0.143	44.571	8.522	1.690	0.182	235.570	16.942	14.785	0.211	.	1.310	.	51.054
BAR	87	10	A	4	A	0.091	4.810	3.805	0.100	40.563	8.568	1.630	-0.046	53.433	15.942	14.295	0.152	.	1.252	.	55.956
CCB	84	9	A	1	A	0.049	1.550	2.500	0.152	18.400	4.900	0.740	0.022	169.000	4.500	9.900	0.200	22.830	1.700	0.110	32.000
CCB	84	9	A	2	A	0.042	1.020	1.700	0.093	14.900	2.300	0.460	0.030	100.000	2.100	3.500	0.160	32.280	0.700	0.120	20.000
CCB	84	9	A	3	A	0.111	5.500	8.100	0.314	60.400	12.700	2.590	0.081	506.000	14.900	22.200	0.280	23.170	1.700	0.650	116.000
CCB	85	9	A	1	A	0.018	5.670	3.386	0.311	44.109	10.174	2.800	0.076	410.960	17.555	21.262	0.157	29.665	1.721	0.709	119.169
CCB	85	9	A	2	A	0.077	8.066	9.618	0.299	54.746	14.590	3.854	0.104	620.172	21.880	24.969	0.230	30.179	2.854	1.136	154.812
CCB	85	9	A	3	A	0.092	7.944	8.414	0.489	54.825	13.838	3.787	0.087	743.342	20.572	24.034	0.295	30.879	3.773	0.452	137.645
CCB	86	9	A	1	A	0.144	7.367	8.226	0.514	72.792	18.704	3.360	0.084	78.123	19.488	27.218	0.327	29.914	3.035	.	127.010
CCB	86	9	A	2	A	0.134	6.966	5.885	0.500	55.389	19.978	3.166	0.070	54.945	19.343	22.797	0.245	29.289	3.228	.	115.987
CCB	86	9	A	3	A	0.111	4.827	6.518	0.475	54.048	15.057	2.644	0.084	69.622	17.659	27.781	0.164	30.197	2.465	.	115.642
CHS	84	8	A	1	A	0.189	6.380	14.800	0.141	79.100	17.800	3.420	0.065	455.000	20.100	30.300	0.630	27.930	3.100	0.450	74.000
CHS	84	8	A	2	A	0.153	6.140	13.100	0.163	91.600	17.200	3.420	0.055	558.000	18.200	27.700	0.520	26.000	2.600	0.410	75.000
CHS	84	8	A	3	A	0.116	6.110	14.100	0.158	92.200	13.100	3.340	0.065	662.000	20.800	25.900	0.400	26.420	1.600	0.460	69.000
CHS	85	8	A	1	A	0.102	8.140	15.135	0.171	75.191	21.744	3.969	0.129	549.100	22.382	27.864	0.732	29.613	3.502	0.207	94.039
CHS	85	8	A	2	A	0.113	8.257	18.039	0.208	77.473	20.290	4.287	0.110	740.083	25.355	29.115	0.779	29.126	5.649	0.491	93.628
CHS	85	8	A	3	A	0.112	8.508	16.932	0.184	75.239	20.634	4.057	0.116	713.849	23.719	29.155	0.762	27.504	2.771	0.722	90.194
CHS	86	8	A	1	A	0.041	1.462	6.607	0.078	22.848	3.729	1.029	0.047	40.744	1.693	7.180	0.181	40.874	1.306	.	20.274
CHS	86	8	A	2	A	0.141	7.771	18.358	0.203	115.949	25.423	4.036	0.110	697.689	23.429	33.884	0.526	27.657	3.210	.	91.703
CHS	86	8	A	3	A	0.186	8.021	19.932	0.215	95.442	25.670	4.182	0.099	733.684	25.324	32.121	0.687	26.501	3.104	.	94.350
CHS	87	8	A	1	A	0.029	1.056	2.342	0.060	18.732	2.260	0.808	0.013	64.518	4.199	7.637	0.136	.	1.206	.	19.477
CHS	87	8	A	2	A	0.105	4.709	8.731	0.273	68.490	10.923	2.286	-0.029	413.189	12.226	26.332	0.281	.	1.782	.	72.784
CHS	87	8	A	3	A	0.056	3.705	9.886	0.121	48.368	10.418	2.039	-0.056	78.222	11.363	16.598	0.230	.	1.514	.	54.846
GAL	84	9	D	1	A	0.128	4.760	7.000	0.101	42.500	14.600	2.230	0.047	216.000	16.300	19.800	0.240	35.270	3.600	0.590	60.000
GAL	84	9	D	2	A	0.072	1.090	0.800	0.014	38.500	1.500	0.280	0.016	68.000	2.600	26.400	0.120	40.420	0.700	0.100	5.900
GAL	84	9	D	3	A	0.072	3.250	3.100	0.044	41.700	8.000	1.370	0.027	218.000	12.100	13.600	0.260	37.800	1.800	0.460	36.000
GAL	85	9	D	1	A	0.051	2.528	2.131	0.087	23.176	6.516	0.821	0.037	147.349	6.393	9.511	0.059	38.031	1.095	0.442	24.471
GAL	85	9	D	2	A	0.041	2.314	2.753	0.015	15.487	3.850	0.557	0.029	198.532	4.645	6.531	0.034	30.142	1.170	0.136	86.030
GAL	85	9	D	3	A	0.080	5.215	3.281	0.074	27.718	9.517	1.728	0.032	363.967	14.887	16.543	0.157	38.708	2.321	0.579	46.220
GAL	86	9	D	1	A	0.073	1.262	1.505	0.048	31.191	3.458	0.395	0.019	30.174	2.341	7.132	0.065	44.965	0.963	.	12.316

Table A-8 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	Ag	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Si	Sn	Tl	Zn
GAL	86	9	D	2	A	0.105	2.252	3.790	0.057	26.354	5.405	0.650	0.067	41.022	4.108	10.019	0.177	45.135	1.557	.	22.771
GAL	86	9	D	3	A	0.049	1.326	2.465	0.065	14.190	4.322	0.575	0.029	38.922	3.327	5.909	0.090	34.202	0.772	.	12.956
GAL	87	9	A	1	I	0.090	3.782	4.582	0.071	37.587	8.058	1.496	0.010	163.218	16.302	12.418	0.153	.	1.154	.	48.184
GAL	87	9	A	2	I	0.105	2.570	2.036	0.052	19.060	3.341	0.675	-0.055	25.403	6.682	9.074	0.057	.	0.492	.	26.528
GAL	87	9	A	3	I	0.082	3.228	3.084	0.043	29.229	6.083	1.064	0.071	54.368	12.067	12.206	0.133	.	1.028	.	41.774
GAL	87	9	B	1	I	0.214	5.264	6.887	0.080	.	16.622	2.187	0.131	110.075	24.380	26.483	0.132	.	3.567	.	79.977
GAL	87	9	B	2	I	0.221	5.623	7.021	0.098	65.550	16.393	2.272	0.013	43.641	23.435	24.254	0.181	.	4.272	.	77.538
GAL	87	9	B	3	I	0.212	5.373	6.913	0.077	64.036	14.048	2.228	0.008	95.625	18.819	25.560	0.130	.	3.541	.	81.517
GAL	87	9	C	1	I	0.260	6.107	7.868	0.362	81.372	19.680	2.360	0.061	106.007	27.251	36.853	0.415	.	2.747	.	109.242
GAL	87	9	C	2	I	0.176	6.756	7.807	0.272	81.300	23.885	2.938	-0.075	460.514	27.486	53.409	0.329	.	2.884	.	97.893
GAL	87	9	C	3	I	0.123	2.678	2.537	0.084	33.215	9.175	1.033	0.169	37.770	10.954	17.415	0.147	.	1.081	.	46.811
GAL	87	9	D	1	A	0.083	3.333	3.654	0.056	35.546	9.821	1.144	0.111	34.472	12.400	13.767	0.177	.	1.643	.	41.153
GAL	87	9	D	2	A	0.074	2.516	3.278	0.038	27.513	6.517	0.878	0.015	25.738	8.601	10.375	0.169	.	0.769	.	31.731
GAL	87	9	D	3	A	0.137	5.297	5.181	0.114	59.179	14.448	2.111	0.092	75.333	21.342	20.205	0.384	.	2.365	.	71.948
GAL	87	9	E	1	I	0.116	5.250	6.541	0.157	60.788	11.439	2.321	0.046	92.768	22.048	17.576	0.210	.	1.667	.	67.966
GAL	87	9	E	2	I	0.122	5.076	6.759	0.168	53.666	12.233	2.252	0.084	56.810	21.164	20.504	0.291	.	2.337	.	67.115
GAL	87	9	E	3	I	0.113	4.110	4.373	0.115	45.711	9.785	1.690	0.103	85.676	17.908	16.095	0.245	.	3.011	.	49.375
HER	85	9	A	1	A	0.077	5.030	3.521	0.252	31.578	10.384	2.238	0.112	392.617	16.748	15.343	0.318	37.972	1.220	0.285	52.898
HER	85	9	A	2	A	0.082	4.001	5.039	0.100	23.205	6.957	1.584	0.054	373.361	11.923	13.327	0.173	32.488	1.009	0.594	42.579
HER	85	9	A	3	A	0.073	6.065	4.185	0.118	36.777	8.630	2.343	0.091	597.974	14.282	15.784	0.229	36.814	1.710	0.684	56.420
HER	86	9	A	1	A	0.124	5.409	7.811	0.227	66.916	13.811	2.018	0.070	269.117	16.190	18.334	0.290	36.660	1.581	.	67.167
HER	86	9	A	2	A	0.089	4.441	7.430	0.176	46.516	9.263	1.688	0.012	70.888	11.648	14.632	0.261	40.262	1.126	.	42.501
HER	86	9	A	3	A	0.103	5.465	9.693	0.210	50.848	13.077	2.124	0.074	660.138	14.683	17.424	0.199	35.229	2.103	.	57.501
LLM	84	10	A	1	A	0.078	4.900	13.200	0.141	25.600	8.600	2.380	0.035	404.000	10.800	17.900	0.130	27.300	3.000	0.340	56.000
LLM	84	10	A	2	A	0.061	3.060	6.000	0.056	21.000	3.600	0.940	0.021	207.000	3.700	13.200	0.170	33.280	0.800	0.310	21.000
LLM	84	10	A	3	A	0.059	3.520	5.300	0.086	29.200	5.300	1.180	0.039	262.000	5.600	12.600	0.210	27.050	0.700	0.290	31.000
LLM	85	9	A	1	A	0.053	4.491	4.615	0.093	29.528	7.442	1.740	0.047	397.064	8.854	13.756	0.086	32.256	0.986	0.489	46.749
LLM	85	9	A	2	A	0.026	2.360	6.621	0.065	9.804	4.336	1.083	-0.005	279.686	5.884	10.719	0.107	26.132	5.704	0.157	23.840
LLM	85	9	A	3	A	0.080	3.113	4.427	0.048	9.516	4.604	0.815	-0.002	212.996	5.135	9.322	0.062	29.467	0.848	0.301	23.486
LLM	86	9	A	1	A	0.094	4.787	8.688	0.122	25.583	8.643	1.773	0.045	41.466	7.707	12.665	0.091	31.075	1.470	.	43.355
LLM	86	9	A	2	A	0.058	3.307	8.646	0.092	17.722	4.878	0.929	0.032	43.107	2.980	11.728	0.110	35.743	1.682	.	24.788
LLM	86	9	A	3	A	0.058	2.997	5.565	0.065	12.026	4.019	0.738	0.030	35.587	2.038	9.078	0.121	32.187	1.336	.	18.969
LOT	84	10	A	1	A	0.004	0.770	1.400	0.074	25.000	2.000	0.570	0.028	37.800	4.100	5.800	0.360	28.870	1.200	0.040	8.600
LOT	84	10	A	2	A	0.017	0.470	1.100	0.075	27.800	0.800	0.380	0.019	19.000	3.300	4.100	0.320	34.060	0.600	0.130	6.400
LOT	84	10	A	3	A	0.005	0.710	1.700	0.087	29.800	0.700	0.540	0.016	26.000	2.500	4.800	0.060	39.070	0.500	0.160	6.600
LOT	85	10	A	1	A	-0.015	0.554	1.211	0.077	12.672	1.125	0.331	0.072	28.013	1.624	2.930	0.102	30.874	0.881	0.059	7.265
LOT	85	10	A	2	A	-0.004	0.255	0.006	0.029	15.124	0.522	0.187	0.011	5.440	0.960	1.739	0.122	36.272	0.708	0.085	3.081
LOT	85	10	A	3	A	0.010	1.158	0.870	0.147	27.510	2.679	0.805	0.052	34.210	4.481	5.376	0.342	32.101	1.039	0.276	12.899
LOT	86	10	A	1	A	0.013	0.429	1.932	0.075	14.425	1.173	0.331	-0.025	42.795	1.432	4.613	0.295	44.352	1.008	.	6.786
LOT	86	10	A	2	A	0.009	0.496	1.770	0.075	15.185	1.951	0.315	-0.021	30.988	2.503	3.823	0.414	37.948	0.313	.	3.893
LOT	86	10	A	3	A	0.017	0.715	1.502	0.119	19.771	1.810	0.561	-0.004	35.228	2.510	4.383	0.361	44.718	0.639	.	4.551
MOB	84	9	A	1	A	0.115	10.200	22.000	0.089	92.300	18.800	5.090	0.119	948.000	38.700	30.500	0.630	23.720	5.300	0.900	155.000
MOB	84	9	A	2	A	0.118	9.510	20.500	0.123	84.700	18.400	4.990	0.130	1096.000	36.800	39.900	0.580	25.010	5.800	0.950	172.000
MOB	84	9	A	3	A	0.090	9.420	14.500	0.120	114.000	14.900	4.840	0.124	621.000	40.400	28.400	0.760	24.470	2.600	0.570	156.000
MOB	85	8	A	1	A	0.093	8.136	21.237	0.107	92.702	18.601	5.243	0.131	1150.178	32.225	29.537	0.532	28.175	1.953	0.836	157.104
MOB	85	8	A	2	A	0.078	8.551	8.651	0.082	91.978	19.045	5.784	0.107	1860.923	33.438	31.136	0.455	28.663	2.758	1.069	164.217
MOB	85	8	A	3	A	0.105	7.620	14.760	0.085	86.373	17.480	5.507	0.064	912.219	29.990	32.536	0.585	27.930	2.059	1.038	156.515

Table A-8 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	Ag	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Si	Sn	Tl	Zn
MOB	86	9	A	1	A	0.096	9.031	15.701	0.114	112.398	21.418	4.348	0.155	727.698	32.598	34.487	0.383	29.502	5.257	.	130.128
MOB	86	9	A	2	A	0.097	7.720	19.355	0.197	128.824	23.624	5.001	0.128	1423.415	38.424	34.229	0.476	27.069	3.374	.	158.143
MOB	86	9	A	3	A	0.098	9.365	17.143	0.103	107.901	19.733	4.846	0.097	587.479	31.616	32.628	0.387	27.794	3.269	.	134.848
MRD	84	9	A	1	A	0.205	6.690	9.900	0.431	92.000	19.200	2.970	0.060	941.000	30.300	21.200	0.480	33.490	2.000	0.550	97.000
MRD	84	9	A	2	A	0.142	4.750	8.900	0.272	56.900	13.100	2.290	0.048	662.000	22.000	17.800	0.160	31.190	1.800	0.530	67.000
MRD	84	9	A	3	A	0.156	6.010	13.500	0.711	75.600	25.900	3.290	0.078	1370.000	41.300	23.100	0.940	29.660	2.600	0.730	106.000
MRD	85	9	A	1	A	0.056	4.684	3.954	0.146	23.869	5.947	1.500	-0.006	301.812	15.902	12.881	0.103	36.302	1.484	0.255	43.041
MRD	85	9	A	2	A	0.155	5.167	7.247	0.309	43.295	15.738	2.385	0.043	722.185	24.005	18.527	0.286	32.798	1.738	0.549	80.873
MRD	85	9	A	3	A	0.216	5.888	7.634	0.600	48.580	20.966	2.805	0.055	914.939	30.905	23.786	0.423	33.433	2.240	0.790	97.540
MRD	86	9	A	1	A	0.119	8.459	10.757	0.486	57.443	16.073	2.119	0.069	133.675	22.001	19.364	0.184	56.380	1.530	.	68.170
MRD	86	9	A	2	A	0.190	8.576	12.439	0.753	90.697	35.174	3.889	0.101	1078.767	43.354	33.439	0.616	31.068	4.654	.	137.621
MRD	86	9	A	3	A	0.167	5.598	8.271	0.462	69.513	20.139	2.216	0.072	296.736	22.818	21.625	0.393	37.359	1.932	.	79.143
MRD	87	10	A	1	A	0.109	4.365	5.556	0.168	41.663	8.315	1.577	0.002	69.354	21.230	12.783	0.096	.	1.443	.	50.991
MRD	87	10	A	2	A	0.175	5.512	6.432	0.383	58.119	17.644	2.240	-0.037	153.147	23.163	17.404	0.164	.	1.695	.	81.703
MRD	87	10	A	3	A	0.170	6.158	9.529	0.390	68.962	19.952	3.078	0.077	417.781	30.626	17.872	0.333	.	1.573	.	94.094
PAM	84	10	A	1	A	0.074	8.330	15.200	0.344	77.300	14.700	3.200	0.129	299.000	21.200	40.000	0.930	26.710	3.500	0.690	102.000
PAM	84	10	A	2	A	0.084	6.270	8.300	0.253	88.700	13.100	3.130	0.075	524.000	19.400	27.900	0.640	29.680	1.700	0.540	78.000
PAM	84	10	A	3	A	0.101	6.900	9.800	0.383	71.800	14.600	3.340	0.133	381.000	26.600	32.100	1.180	29.040	5.600	0.700	128.000
PAM	85	10	A	1	A	0.019	4.435	5.957	0.149	28.774	6.719	1.738	0.081	260.740	12.396	21.893	0.350	33.002	1.187	0.691	53.918
PAM	85	10	A	2	A	0.007	0.652	1.298	-0.008	5.406	0.995	0.391	-0.003	166.097	0.807	5.453	0.047	32.392	0.461	0.036	7.594
PAM	85	10	A	3	A	0.067	5.722	10.264	0.334	57.832	14.918	3.403	0.126	491.293	24.812	29.543	0.928	27.831	1.913	0.823	105.893
PAM	86	10	A	1	A	0.016	1.544	9.035	0.046	21.513	3.247	1.184	-0.023	48.934	6.694	7.213	0.109	38.117	0.362	.	19.113
PAM	86	10	A	2	A	0.079	7.635	5.623	0.426	79.669	16.133	2.809	0.130	403.040	18.699	30.377	0.617	28.857	3.959	.	79.301
PAM	86	10	A	3	A	0.078	6.232	8.531	0.304	140.374	14.671	2.541	0.100	424.249	20.554	30.183	0.679	31.013	2.672	.	74.532
PAS	87	9	A	1	A	0.137	2.456	3.501	0.148	32.860	8.395	0.991	-0.012	102.816	7.303	16.830	0.208	.	0.980	.	56.715
PAS	87	9	A	2	A	0.162	5.336	3.662	0.367	75.614	15.737	2.881	0.167	338.945	22.748	24.210	0.536	.	2.739	.	119.528
PAS	87	9	A	3	A	0.102	2.293	5.810	0.119	40.458	12.643	1.253	0.004	58.330	9.645	20.482	0.203	.	2.887	.	69.729
PEN	85	8	A	1	A	0.190	8.587	20.951	0.126	108.261	24.885	5.869	0.267	597.295	28.656	43.241	1.012	27.220	4.425	0.325	147.276
PEN	85	8	A	2	A	0.129	10.679	13.518	0.138	93.889	19.441	6.634	0.174	724.509	30.849	47.123	1.159	24.571	2.414	0.790	145.068
PEN	85	8	A	3	A	0.125	9.392	21.118	0.326	104.210	21.350	6.958	0.168	270.487	22.748	34.853	1.450	27.095	2.298	0.859	136.365
PEN	86	9	A	1	A	0.258	9.547	22.101	0.229	118.188	23.350	5.410	0.149	501.120	27.650	45.790	0.713	23.618	6.511	.	130.622
PEN	86	9	A	2	A	0.159	10.161	24.784	0.125	119.406	18.321	5.844	0.160	592.531	30.991	48.842	0.722	22.925	2.896	.	120.304
PEN	86	9	A	3	A	0.129	9.227	24.100	0.331	140.509	27.850	6.252	0.167	214.361	28.314	38.796	0.963	25.243	3.475	.	123.494
PEN	87	9	A	1	A	0.292	7.622	17.307	0.173	137.888	22.010	6.519	0.249	545.964	33.356	40.908	0.670	.	3.358	.	140.739
PEN	87	9	A	2	A	0.219	10.088	23.661	0.112	177.498	18.673	5.815	0.135	891.815	34.238	49.313	0.768	.	3.870	.	147.430
PEN	87	9	A	3	A	0.116	7.807	17.568	0.274	195.760	24.270	5.499	0.256	320.481	35.942	31.782	0.893	.	.	.	119.633
ROU	84	9	A	1	A	0.084	7.990	13.400	0.085	71.100	13.800	4.110	0.090	644.000	32.100	27.100	0.550	27.840	4.100	0.690	119.000
ROU	84	9	A	2	A	0.066	2.180	5.800	0.049	32.200	4.300	1.340	0.041	283.000	10.100	13.200	0.250	39.740	1.300	0.070	37.000
ROU	84	9	A	3	A	0.081	1.640	3.000	0.047	44.600	4.600	1.000	0.037	169.000	5.300	11.800	0.070	37.920	0.900	0.230	29.000
ROU	85	9	A	1	A	0.066	8.890	11.129	0.488	75.638	13.845	4.073	0.214	759.409	23.034	27.213	0.451	33.981	1.795	0.608	113.653
ROU	85	9	A	2	A	0.048	1.854	2.902	0.004	15.789	3.014	0.934	0.046	170.811	5.734	7.688	0.150	32.277	1.366	-0.090	28.895
ROU	85	9	A	3	A	0.093	5.703	5.991	0.072	50.656	9.409	3.108	0.105	468.291	15.574	21.817	0.312	34.025	1.851	0.922	82.509
ROU	85	10	A	1	A	0.041	6.161	11.054	0.031	48.539	9.567	2.927	0.098	551.307	18.948	19.353	0.224	36.476	1.803	0.586	83.486
ROU	85	10	A	2	A	0.042	1.601	4.723	0.010	21.963	3.946	1.149	0.029	272.478	7.246	8.723	0.122	31.659	1.123	0.063	33.409
ROU	85	10	A	3	A	0.059	7.106	12.242	0.160	53.759	10.019	3.101	0.130	507.479	20.744	20.930	0.304	37.945	7.061	0.373	80.221
ROU	87	9	A	1	A	0.110	4.914	11.224	0.048	68.968	10.693	2.409	-0.036	44.142	16.528	20.899	0.130	.	1.727	.	80.604
ROU	87	9	A	2	A	0.019	0.207	0.518	0.007	1.940	0.758	0.167	0.055	68.807	2.194	1.943	-0.101	.	0.327	.	4.235

Table A-8 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	Ag	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Si	Sn	Tl	Zn
ROU	87	9	A	3	A	0.106	5.730	11.442	0.120	88.858	14.925	3.048	0.067	624.312	27.462	25.305	0.326	.	2.279	.	96.304
SAB	84	9	A	1	A	0.153	4.500	6.000	0.104	55.700	8.600	2.110	0.015	312.000	12.900	13.700	0.140	29.980	1.600	0.460	51.000
SAB	84	9	A	2	A	0.058	1.940	3.000	0.045	31.900	2.700	0.700	0.014	100.000	4.900	11.000	0.100	37.780	0.400	0.260	15.000
SAB	84	9	A	3	A	0.063	2.910	3.000	0.065	33.700	5.400	1.300	0.017	206.000	9.000	10.600	0.160	34.340	1.100	0.340	30.000
SAB	85	9	A	1	A	0.041	4.483	5.700	0.116	33.135	6.930	1.814	0.197	298.719	12.651	12.804	0.198	38.105	1.522	0.354	43.677
SAB	85	9	A	2	A	0.046	3.074	1.524	0.035	15.317	4.493	1.830	0.040	132.741	7.065	8.025	0.093	32.014	0.937	0.233	23.184
SAB	85	9	A	3	A	0.057	4.674	3.340	0.234	38.455	8.717	2.080	0.036	343.018	15.246	14.378	0.192	33.899	1.166	0.579	50.310
SAB	86	9	A	1	A	0.070	5.973	3.551	0.167	44.833	11.016	2.761	0.037	67.154	14.229	13.556	0.197	29.080	2.310	.	57.691
SAB	86	9	A	2	A	0.047	1.066	3.529	0.045	11.967	3.435	0.672	-0.003	34.817	5.777	7.488	-0.008	41.624	0.486	.	15.576
SAB	86	9	A	3	A	0.070	3.804	8.570	0.146	47.352	9.583	1.803	-0.009	62.876	12.583	16.729	0.164	32.147	1.585	.	50.019
SAP	84	10	A	1	A	0.047	5.040	11.900	0.088	59.600	6.900	2.560	0.044	361.000	13.800	14.800	0.430	32.930	2.200	0.140	49.000
SAP	84	10	A	2	A	0.009	2.640	6.100	0.072	42.600	3.600	1.440	0.025	386.000	5.900	10.100	0.260	35.730	1.200	0.260	26.000
SAP	84	10	A	3	A	0.007	4.420	8.200	0.102	43.800	7.300	2.260	0.034	462.000	7.100	16.400	0.300	30.000	1.900	0.360	40.000
SAP	85	8	A	1	A	0.027	7.778	12.137	0.096	69.461	10.667	3.880	0.054	478.684	17.322	20.182	0.529	29.848	1.842	0.472	80.718
SAP	85	8	A	2	A	0.015	5.081	6.716	0.069	24.724	4.308	1.784	0.031	596.255	9.237	12.356	0.223	38.287	.	0.017	31.590
SAP	85	8	A	3	A	0.009	4.393	2.633	0.113	29.905	3.792	1.653	0.035	300.732	9.372	12.205	0.071	37.396	1.083	0.264	31.952
SAP	86	8	A	1	A	0.075	6.829	18.269	0.182	81.399	11.211	3.414	0.018	5.071	18.844	27.257	0.577	39.607	1.985	.	63.896
SAP	86	8	A	2	A	0.040	4.355	4.461	0.186	49.815	7.248	1.542	-0.012	200.487	10.905	20.734	0.318	43.580	1.405	.	43.772
SAP	86	8	A	3	A	0.042	4.474	9.201	0.180	45.986	5.683	1.950	0.031	224.549	8.367	16.930	0.193	36.057	2.239	.	36.495
SAP	87	7	A	1	A	0.028	2.813	4.421	0.112	29.494	11.527	1.439	-0.015	82.929	7.041	11.496	0.173	.	0.858	.	37.567
SAP	87	7	A	2	A	0.039	2.251	5.062	0.062	23.941	4.033	1.118	-0.063	42.963	5.538	8.740	0.138	.	0.512	.	25.643
SAP	87	7	A	3	A	0.017	2.877	5.108	0.141	36.657	3.397	1.389	0.143	148.717	6.387	11.733	0.271	.	1.720	.	31.975
SAP	87	8	A	1	A	0.032	6.402	11.666	0.091	82.669	13.917	3.204	0.063	742.798	22.443	24.247	0.561	.	2.214	.	66.175
SAP	87	8	A	2	A	0.003	1.729	3.069	0.050	19.473	3.893	1.083	-0.053	52.733	4.365	7.057	0.078	.	0.922	.	22.177
SAP	87	8	A	3	A	0.036	1.428	3.223	0.124	34.962	2.712	0.863	0.133	276.545	4.311	9.162	0.070	.	0.797	.	25.551
SAP	87	8	B	1	I	0.032	2.217	3.397	0.068	31.818	3.367	1.239	-0.061	65.418	4.797	10.004	0.144	.	1.142	.	30.237
SAP	87	8	B	2	I	0.021	1.262	2.137	0.027	37.831	3.013	0.769	-0.071	43.446	3.788	5.748	0.049	.	0.944	.	24.865
SAP	87	8	B	3	I	0.011	2.584	5.455	0.054	33.756	3.709	1.116	0.020	82.143	5.285	12.684	0.258	.	1.052	.	23.593
SAP	87	8	C	1	I	0.037	2.723	6.802	0.121	47.905	5.485	1.639	-0.055	143.976	10.482	9.937	0.186	.	1.594	.	31.757
SAP	87	8	C	2	I	0.025	1.755	3.492	0.152	26.185	2.423	1.001	0.004	111.095	4.740	7.383	0.074	.	0.740	.	27.417
SAP	87	8	C	3	I	0.036	2.498	4.544	0.188	41.043	3.580	1.314	-0.031	283.842	7.355	9.960	0.156	.	0.849	.	28.953
SAP	87	8	D	1	I	0.023	1.895	2.675	0.049	24.203	3.290	0.941	-0.055	28.472	4.602	8.693	0.115	.	0.826	.	18.387
SAP	87	8	D	2	I	0.017	1.905	3.883	0.074	23.308	2.580	0.859	-0.064	37.538	4.852	7.342	0.037	.	1.057	.	16.425
SAP	87	8	D	3	I	0.026	2.897	3.471	0.051	33.540	4.482	1.447	0.184	131.417	8.567	10.488	0.125	.	1.199	.	27.318
SAP	87	8	E	1	I	0.038	3.597	8.586	0.104	52.475	4.979	2.076	-0.033	271.351	11.113	13.156	0.254	.	1.564	.	41.160
SAP	87	8	E	2	I	0.017	1.517	2.030	0.053	27.346	2.373	0.875	0.023	85.998	4.319	6.917	0.169	.	0.837	.	21.664
SAP	87	8	E	3	I	0.021	1.862	2.552	0.045	27.852	2.966	0.942	-0.045	46.799	4.951	7.242	0.030	.	0.819	.	20.905
SAP	87	10	A	1	A	0.041	5.576	12.245	0.111	62.615	9.577	1.688	0.011	381.655	16.308	20.818	0.321	.	1.459	.	54.189
SAP	87	10	A	2	A	0.036	2.002	5.398	0.086	23.685	3.574	1.006	-0.083	51.013	6.162	8.171	0.131	.	1.143	.	23.736
SAP	87	10	A	3	A	0.015	3.892	6.019	0.108	45.540	5.540	1.805	0.243	119.039	9.274	13.723	0.189	.	1.114	.	39.184
SJR	84	10	D	1	A	0.199	5.060	6.800	0.315	55.400	18.400	2.190	0.115	425.000	14.000	50.400	0.100	31.620	2.400	0.560	128.000
SJR	84	10	D	2	A	0.048	1.470	1.500	0.087	29.500	3.600	0.780	0.035	180.000	3.400	12.100	0.680	40.390	1.200	0.160	27.000
SJR	84	10	D	3	A	0.080	1.330	2.200	0.148	31.400	7.300	0.850	0.056	167.000	5.000	16.100	0.250	41.180	0.900	0.210	48.000
SJR	85	8	D	1	A	0.216	4.944	2.539	0.274	37.513	14.334	2.181	0.174	366.739	12.005	38.015	0.465	31.857	2.039	0.765	99.992
SJR	85	8	D	2	A	0.079	4.064	2.236	0.172	21.250	5.675	1.166	0.110	203.971	6.517	19.857	0.199	37.902	1.734	0.708	43.587
SJR	85	8	D	3	A	0.002	1.158	0.596	0.104	7.491	2.024	0.230	0.040	8.691	1.366	4.901	0.079	36.520	0.890	-0.060	81.302
SJR	86	8	D	1	A	0.375	4.331	8.786	0.471	68.534	19.220	2.442	0.145	405.577	13.200	51.755	0.809	37.485	3.529	.	122.241

Table A-8 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	Ag	Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Si	Sn	Tl	Zn
SJR	86	8	D	2	A	0.527	6.338	8.265	0.771	93.498	35.465	3.881	0.197	332.805	21.617	60.906	1.029	26.494	4.808	.	181.785
SJR	86	8	D	3	A	0.599	6.372	7.992	0.768	91.324	34.747	3.410	0.266	297.178	20.862	81.188	1.628	26.299	7.553	.	190.911
SJR	87	8	A	1	I	0.057	2.176	1.805	0.130	38.909	5.126	1.777	0.153	197.391	6.791	12.291	0.991	.	2.264	.	29.685
SJR	87	8	A	2	I	0.066	3.737	1.057	0.146	47.936	6.825	2.590	0.138	209.630	18.044	14.987	1.707	.	1.860	.	34.825
SJR	87	8	A	3	I	0.050	3.929	2.349	0.134	62.126	7.424	2.743	0.137	181.206	14.058	14.394	1.687	.	2.205	.	35.100
SJR	87	8	B	1	I	0.394	3.737	3.480	0.567	74.151	42.219	2.614	0.246	196.743	18.304	57.735	0.828	.	4.598	.	126.827
SJR	87	8	B	2	I	0.173	3.414	4.215	0.262	56.927	16.555	2.461	0.058	319.227	14.265	46.147	0.459	.	2.228	.	106.414
SJR	87	8	B	3	I	0.095	3.248	2.535	0.152	45.791	7.612	1.950	-0.040	265.092	9.853	18.634	0.267	.	1.723	.	56.696
SJR	87	8	C	1	I	0.912	4.690	2.175	1.560	94.202	75.830	3.923	1.000	236.684	22.133	154.521	1.861	.	7.773	.	362.474
SJR	87	8	C	2	I	0.110	1.350	1.413	0.199	22.292	9.562	0.735	0.066	127.239	6.179	31.606	0.302	.	1.918	.	48.270
SJR	87	8	C	3	I	0.819	4.305	5.489	1.152	82.208	49.618	2.592	0.583	294.023	18.651	90.761	1.687	.	4.752	.	172.410
SJR	87	8	D	1	A	0.183	3.388	4.637	0.534	58.055	15.602	1.996	0.279	304.641	13.255	33.425	0.348	.	2.503	.	81.530
SJR	87	8	D	2	A	0.475	5.648	7.612	0.555	44.919	36.349	3.404	0.261	448.036	22.270	65.433	1.092	.	4.714	.	190.453
SJR	87	8	D	3	A	0.011	2.671	2.535	0.057	32.360	3.042	1.363	0.010	112.557	8.220	11.856	0.200	.	1.056	.	26.104
SJR	87	8	E	1	I	0.085	4.309	3.498	0.170	81.708	7.119	2.504	0.143	224.203	17.780	16.428	1.367	.	2.079	.	44.672
SJR	87	8	E	2	I	0.591	4.903	5.594	0.654	87.266	35.395	3.856	0.224	531.779	23.125	67.756	1.839	.	3.881	.	171.281
SJR	87	8	E	3	I	0.069	4.852	2.992	0.179	66.904	7.784	2.787	0.053	364.037	14.955	21.934	1.309	.	1.746	.	43.218
TAM	84	10	A	1	A	0.046	0.470	1.100	0.169	25.800	10.400	0.710	0.031	31.000	2.700	4.300	0.240	28.810	0.700	0.220	11.000
TAM	84	10	A	2	A	0.060	0.320	0.700	0.081	18.000	1.600	0.230	0.012	8.000	2.300	4.200	0.110	43.090	0.800	0.060	6.300
TAM	84	10	A	3	A	0.138	0.580	0.900	0.193	25.300	2.900	0.360	0.039	23.000	3.200	7.400	0.270	39.470	0.500	0.240	10.000
TAM	85	10	A	1	A	0.145	2.132	2.261	0.505	32.779	8.076	1.095	0.168	67.787	9.110	13.243	0.709	31.298	1.470	0.180	35.206
TAM	85	10	A	2	A	0.028	0.272	0.201	0.048	6.666	1.175	0.169	-0.008	7.367	1.687	2.998	0.016	36.200	0.854	0.255	4.536
TAM	85	10	A	3	A	0.044	0.309	0.799	0.143	2.068	1.938	0.231	0.037	3.969	1.965	3.942	0.172	37.600	1.425	0.205	7.632

Table A-9. Adjusted Elemental Concentrations for 1984-87 Sediments in the Southeast. Units: ppm (dry) except Al and Fe percent (dry). Al not adjusted.

Adjustment by linear models in Table 2 to 8.01 percent Al.

Computer listing of adjusted sediment data, 5 pages, 211 observations.

Table A-9 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	AG	AL	AS	CD	CR	CU	FE	HG	MN	NI	PB	SE	SN	TL	ZN
APA	84	10	A	1	A	0.06402	2.2400	14.4137	0.09166	68.464	16.0326	4.04550	0.08013	829.70	22.7900	28.7158	0.49260	3.07822	0.54806	82.898
APA	84	10	A	2	A	0.05452	10.8900	19.2514	0.00474	64.856	16.8934	4.75476	0.04600	768.62	23.9194	23.6072	0.63399	3.51261	0.59128	176.607
APA	84	10	A	3	A	0.05041	11.3500	19.6930	0.03215	76.551	16.9980	4.81392	0.05625	1134.12	20.6968	23.4188	0.41747	2.45490	0.59274	70.434
APA	85	10	A	1	A	0.03341	9.9049	16.8548	0.04675	63.118	13.5894	4.27357	0.11471	687.74	19.0114	22.1164	0.61720	2.45827	0.55360	61.645
APA	85	10	A	2	A	0.03444	10.3650	11.6396	0.04746	63.478	13.4871	4.66125	0.07471	921.72	18.3886	22.6549	0.41150	4.32967	0.32353	62.077
APA	85	10	A	3	A	0.04802	10.2639	13.1791	0.09927	49.955	17.3247	5.14918	0.09087	1007.49	25.3780	27.1669	0.47405	4.11438	0.27890	85.112
APA	86	10	A	1	A	0.07378	4.8918	27.1691	0.10220	97.386	20.3002	5.22165	0.06534	481.55	28.0432	31.9769	0.60225	2.99509	.	97.951
APA	86	10	A	2	A	0.04790	11.3559	14.3852	0.02031	64.048	14.5178	4.25175	0.02015	796.04	18.7280	25.0246	0.30824	2.75441	.	42.062
APA	86	10	A	3	A	0.06733	10.0349	14.2501	0.07814	90.785	19.8384	4.28239	0.08531	1045.64	27.4423	32.8505	0.48077	3.29937	.	78.524
BAR	84	9	A	1	A	0.14211	5.4800	12.5715	0.31424	83.477	20.5252	3.97960	0.10763	680.28	28.7743	28.3364	0.69584	2.46740	0.82700	111.456
BAR	84	9	A	2	A	0.11381	4.4900	11.3038	0.27042	81.921	17.3525	3.73640	0.09200	630.90	25.7208	26.7245	0.39290	2.80681	0.79843	98.591
BAR	84	9	A	3	A	0.08198	4.0200	11.2788	0.13716	68.102	13.1674	3.37226	0.07588	612.35	25.6721	24.0431	0.41000	5.66795	0.68760	80.877
BAR	85	9	A	1	A	0.09946	5.0525	10.2050	0.18859	57.595	14.6348	3.37097	0.09427	607.47	25.8800	22.8917	0.36400	2.38826	1.05039	93.995
BAR	85	9	A	2	A	0.06627	5.3704	11.7915	0.29298	53.713	14.7178	3.35247	0.09851	598.14	26.4382	22.8334	0.39269	2.37396	0.82041	86.366
BAR	85	9	A	3	A	0.05841	3.2529	9.6877	0.08314	52.276	11.6835	2.98499	0.09152	547.82	18.3878	21.9045	0.33504	2.58168	0.85459	77.026
BAR	87	10	A	1	A	0.15120	5.7787	11.0323	0.27749	74.044	20.2042	3.22509	0.05723	637.96	29.2446	27.1149	0.41702	2.29508	.	103.813
BAR	87	10	A	2	A	0.13564	5.3976	10.2246	0.20856	76.121	17.0364	3.76840	0.07048	441.48	31.2068	24.2869	0.42161	2.00254	.	91.389
BAR	87	10	A	3	A	0.12643	4.2437	11.7121	0.19679	73.269	15.8536	3.58035	0.22877	591.77	27.7709	26.1528	0.42795	2.60116	.	93.415
BAR	87	10	A	4	A	0.11302	4.8104	9.0808	0.14608	64.942	14.7964	3.23581	-0.00576	356.03	25.1414	23.9522	0.33684	2.34933	.	91.942
CCB	84	9	A	1	A	0.09269	1.5500	13.1513	0.24454	67.622	17.4758	3.98175	0.10276	779.96	23.0739	29.3984	0.57237	3.91478	0.51088	104.658
CCB	84	9	A	2	A	0.08927	1.0200	13.2252	0.19313	68.160	15.9076	3.96771	0.11738	761.08	22.1978	24.5981	0.56292	3.09649	0.55376	98.619
CCB	84	9	A	3	A	0.12798	5.5000	12.2385	0.34996	79.525	17.5863	3.84957	0.11238	743.38	22.1168	29.7760	0.42468	2.56054	0.80576	144.231
CCB	85	9	A	1	A	0.03340	5.6695	7.2446	0.34438	61.942	14.7306	3.97447	0.10533	632.31	24.2848	28.3269	0.29214	2.52386	0.85412	145.494
CCB	85	9	A	2	A	0.07703	8.0664	9.5248	0.29820	54.316	14.4800	3.82573	0.10335	614.84	21.7175	24.7982	0.22627	2.83501	1.13263	154.178
CCB	85	9	A	3	A	0.09265	7.9440	8.5227	0.48965	55.328	13.9667	3.81996	0.08777	749.59	20.7621	24.2338	0.29894	3.79528	0.45580	138.387
CCB	86	9	A	1	A	0.14882	7.3675	9.2856	0.52306	77.688	19.9546	3.68281	0.09227	138.89	21.3353	29.1576	0.36443	3.25575	.	134.237
CCB	86	9	A	2	A	0.14146	6.9658	7.6064	0.51480	63.345	22.0109	3.68999	0.08265	153.70	22.3453	25.9490	0.30475	3.58621	.	127.731
CCB	86	9	A	3	A	0.13252	4.8267	11.7666	0.52027	78.303	21.2542	4.24097	0.12399	370.68	26.8115	37.3891	0.34703	3.55652	.	151.445
CHS	84	8	A	1	A	0.20002	6.3800	17.4876	0.16435	91.520	20.9732	4.23796	0.08538	609.16	24.7866	35.2199	0.72396	3.65884	0.55115	92.333
CHS	84	8	A	2	A	0.16565	6.1400	16.1833	0.18979	105.848	20.8404	4.35840	0.07838	734.86	23.5767	33.3443	0.62779	3.24112	0.52604	96.033
CHS	84	8	A	3	A	0.12885	6.1100	17.2327	0.18522	106.677	16.7988	4.29346	0.08875	841.69	26.2629	31.6348	0.50952	2.25141	0.57790	90.370
CHS	85	8	A	1	A	0.10160	8.1404	14.9202	0.16888	74.197	21.4903	3.90309	0.12734	536.77	22.0073	27.4703	0.72455	3.45739	0.19930	92.573
CHS	85	8	A	2	A	0.11178	8.2571	17.6321	0.20448	75.590	19.8089	4.16271	0.10666	716.72	24.6450	28.3688	0.76516	5.56420	0.47599	90.849
CHS	85	8	A	3	A	0.10827	8.5081	16.1107	0.17677	71.444	19.6645	3.80744	0.10936	666.74	22.2868	27.6519	0.73313	2.60019	0.69073	84.591
CHS	86	8	A	1	A	0.08520	1.4622	17.4029	0.17225	72.738	16.4754	4.31485	0.12890	660.00	20.5188	26.9434	0.55813	3.55043	.	93.919
CHS	86	8	A	2	A	0.14219	7.7706	18.7530	0.20666	117.773	25.8885	4.15597	0.11275	720.33	24.1177	34.6065	0.53992	3.29233	.	94.395
CHS	86	8	A	3	A	0.18575	8.0206	19.9150	0.21458	95.361	25.6495	4.17662	0.09867	732.68	25.2934	32.0895	0.68642	3.09990	.	94.231
CHS	87	8	A	1	A	0.07625	1.0560	13.8081	0.15926	71.718	15.7972	4.29809	0.09973	722.19	24.1934	28.6267	0.53720	3.58971	.	97.692
CHS	87	8	A	2	A	0.12765	4.7087	14.1741	0.32009	93.644	17.3502	3.94273	0.01242	725.41	21.7180	36.2965	0.47179	2.91397	.	109.915
CHS	87	8	A	3	A	0.08518	3.7047	16.9846	0.18258	81.172	18.7991	4.19928	-0.00168	485.40	23.7419	29.5932	0.47836	2.98966	.	103.270
GAL	84	9	D	1	A	0.14998	4.7600	12.3586	0.14756	67.263	20.9268	3.86091	0.08763	523.37	25.6445	29.6096	0.42734	4.71425	0.79168	96.554
GAL	84	9	D	2	A	0.11880	1.0900	12.2098	0.11313	91.227	14.9713	3.75259	0.10251	722.46	22.4965	47.2869	0.51889	3.07249	0.52942	83.732
GAL	84	9	D	3	A	0.10419	3.2500	10.9483	0.11219	77.969	17.2664	3.75866	0.08650	668.18	25.7861	27.9673	0.53438	3.43194	0.75538	89.538
GAL	85	9	D	1	A	0.08824	2.5281	11.1692	0.16570	64.945	17.1880	3.57158	0.10592	665.80	22.1542	26.0566	0.37545	2.97424	0.78252	86.128
GAL	85	9	D	2	A	0.07946	2.3143	12.1438	0.09669	58.885	14.9377	3.41544	0.10064	737.21	21.0210	23.7226	0.36234	3.12272	0.48983	150.092

Table A-9 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	AG	AL	AS	CD	CR	CU	FE	HG	MN	NI	PB	SE	SN	TL	ZN
GAL	85	9	D	3	A	0.09855	5.2151	7.8890	0.11416	49.014	14.9582	3.13075	0.06675	628.29	22.9231	24.9787	0.31852	3.27948	0.75237	77.655
GAL	86	9	D	1	A	0.11836	1.2621	12.6307	0.14503	82.607	16.5946	3.78072	0.10295	668.36	21.7422	27.4995	0.45418	3.27608	.	88.212
GAL	86	9	D	2	A	0.14418	2.2519	13.2843	0.13983	70.228	16.6148	3.53948	0.13912	585.59	20.6642	27.3984	0.50876	3.53147	.	87.535
GAL	86	9	D	3	A	0.09427	1.3256	13.4859	0.16073	65.121	17.3345	3.92897	0.11283	671.10	22.5456	26.0849	0.47482	3.06399	.	88.138
GAL	87	9	A	1	I	0.11828	3.7819	11.5537	0.13127	69.803	16.2889	3.61756	0.06254	563.09	28.4581	25.1797	0.39644	2.60384	.	95.739
GAL	87	9	A	2	I	0.14227	2.5705	11.0051	0.13021	60.507	13.9307	3.40434	0.01298	539.85	22.3218	25.4921	0.37075	2.35710	.	87.709
GAL	87	9	A	3	I	0.11478	3.2280	10.9681	0.11140	65.665	15.3924	3.46347	0.13078	506.62	25.8160	26.6399	0.40824	2.66745	.	95.559
GAL	87	9	B	1	I	0.23297	5.2637	11.4148	0.11892	.	21.9684	3.56492	0.16527	369.80	32.2760	34.7722	0.29075	4.50853	.	110.866
GAL	87	9	B	2	I	0.23706	5.6231	10.9561	0.13182	83.736	21.0400	3.46930	0.04307	269.38	30.2974	31.4580	0.31882	5.09069	.	104.384
GAL	87	9	B	3	I	0.22996	5.3726	11.2613	0.11480	84.132	19.1819	3.55170	0.04145	345.06	26.4025	33.5207	0.28201	4.44527	.	111.181
GAL	87	9	C	1	I	0.27286	6.1073	11.0048	0.38966	95.869	23.3842	3.31476	0.08432	285.95	32.7215	42.5958	0.52498	3.39918	.	130.642
GAL	87	9	C	2	I	0.18455	6.7563	9.8736	0.29030	90.852	26.3254	3.56719	-0.05970	579.08	31.0904	57.1933	0.40165	3.31405	.	111.994
GAL	87	9	C	3	I	0.15869	2.6785	11.3281	0.16027	73.838	19.5541	3.70881	0.23582	542.00	26.2829	33.5073	0.45426	2.90929	.	106.776
GAL	87	9	D	1	A	0.11481	3.3327	11.3656	0.12281	71.185	18.9264	3.49142	0.16918	476.83	25.8483	27.8850	0.44662	3.24667	.	93.760
GAL	87	9	D	2	A	0.11070	2.5160	12.3365	0.11623	69.375	17.2126	3.63466	0.08357	545.34	24.3977	26.9574	0.48533	2.65243	.	93.524
GAL	87	9	D	3	A	0.15572	5.2969	9.6548	0.15262	79.852	19.7293	3.47227	0.12574	331.93	29.1424	28.3937	0.53995	3.29515	.	102.464
GAL	87	9	E	1	I	0.13513	5.2504	11.0909	0.19664	81.815	16.8109	3.70572	0.08088	353.75	29.9824	25.9057	0.36940	2.61290	.	99.004
GAL	87	9	E	2	I	0.14143	5.0765	11.5958	0.20953	76.018	17.9434	3.72458	0.12018	334.25	29.5981	29.3585	0.46024	3.34231	.	100.110
GAL	87	9	E	3	I	0.13933	4.1098	10.8040	0.17047	75.429	17.3772	3.64688	0.15189	454.54	29.1223	27.8669	0.46968	4.34817	.	93.242
HER	85	9	A	1	A	0.09749	5.0298	8.4345	0.29513	54.285	16.1858	3.73374	0.14963	674.47	25.3162	24.3384	0.48966	2.24161	0.46988	86.417
HER	85	9	A	2	A	0.10947	4.0015	11.6480	0.15715	53.748	14.7607	3.59594	0.10441	752.47	23.4482	25.4258	0.40359	2.38297	0.84319	87.664
HER	85	9	A	3	A	0.08655	6.0648	7.3926	0.14552	51.598	12.4168	3.31913	0.11546	781.94	19.8748	21.6556	0.34099	2.37676	0.80471	78.299
HER	86	9	A	1	A	0.14169	5.4086	12.1003	0.26457	86.737	18.8749	3.32388	0.10233	515.14	23.6693	26.1859	0.44017	2.47311	.	96.425
HER	86	9	A	2	A	0.11295	4.4413	13.3145	0.22674	73.707	16.2102	3.47924	0.05617	408.40	21.9090	25.4033	0.46673	2.34924	.	82.640
HER	86	9	A	3	A	0.11994	5.4647	13.8899	0.24613	70.242	18.0320	3.40164	0.10554	900.86	22.0018	25.1068	0.34527	2.97575	.	86.129
LLM	84	10	A	1	A	0.09903	4.9000	18.3278	0.18555	49.297	14.6543	3.94066	0.07388	698.13	19.7419	27.2870	0.30927	4.06625	0.53299	90.979
LLM	84	10	A	2	A	0.09448	3.0600	14.1616	0.12691	58.716	13.2363	3.42400	0.08288	675.15	17.9324	28.1407	0.45533	2.49708	0.61717	76.675
LLM	84	10	A	3	A	0.08937	3.5200	12.7032	0.15032	63.411	14.0408	3.43317	0.09513	686.64	18.5098	26.1523	0.46882	2.23937	0.56863	81.501
LLM	85	9	A	1	A	0.07639	4.4912	10.4166	0.14319	56.339	14.2927	3.50558	0.09112	729.86	18.9714	24.3775	0.28911	2.19230	0.70746	86.327
LLM	85	9	A	2	A	0.06391	2.3598	15.9371	0.14634	52.855	15.3355	3.91799	0.06523	814.05	22.1298	27.7730	0.43305	7.64156	0.50767	87.390
LLM	85	9	A	3	A	0.11276	3.1126	12.5021	0.11821	46.831	14.1377	3.27270	0.05951	676.17	19.2166	24.1043	0.34419	2.52699	0.60447	78.570
LLM	86	9	A	1	A	0.11629	4.7865	14.0024	0.16808	50.144	14.9186	3.39068	0.08555	346.33	16.9753	22.3944	0.27643	2.57507	.	79.611
LLM	86	9	A	2	A	0.09024	3.3071	16.4001	0.15892	53.555	14.0329	3.28928	0.09042	487.88	16.5019	25.9227	0.38071	3.29436	.	77.683
LLM	86	9	A	3	A	0.09155	2.9971	13.8306	0.13683	50.222	13.7780	3.25321	0.09227	509.68	16.4508	24.2081	0.41024	3.05476	.	75.351
LOT	84	10	A	1	A	0.05296	0.7700	13.3374	0.17771	80.165	16.0943	4.20317	0.11851	722.52	24.9166	27.6527	0.77734	3.68220	0.48928	90.031
LOT	84	10	A	2	A	0.06799	0.4700	13.5321	0.18301	85.251	15.4783	4.16372	0.11326	732.10	24.9792	26.8582	0.75463	3.18505	0.59789	91.205
LOT	84	10	A	3	A	0.05437	0.7100	13.7363	0.19157	85.422	14.9111	4.20328	0.10726	716.40	23.4891	26.8338	0.48079	3.00277	0.61300	88.706
LOT	85	10	A	1	A	0.03584	0.5541	13.5040	0.18351	69.482	15.6398	4.07245	0.16521	733.15	23.0614	25.4344	0.53212	3.43720	0.52144	91.125
LOT	85	10	A	2	A	0.04845	0.2548	12.7931	0.14056	74.215	15.6193	4.07829	0.10801	738.89	23.2579	25.1471	0.56894	3.36643	0.56600	90.306
LOT	85	10	A	3	A	0.05602	1.1580	12.1674	0.24471	79.718	16.0178	4.24307	0.13795	682.24	24.1826	26.0576	0.73697	3.38798	0.70095	89.967
LOT	86	10	A	1	A	0.06417	0.4289	14.4315	0.18397	72.189	15.9317	4.13580	0.07027	759.78	23.2297	27.4950	0.73175	3.60747	.	92.055
LOT	86	10	A	2	A	0.06023	0.4958	14.1599	0.18232	72.439	16.5789	4.08585	0.07301	741.64	24.1083	26.5031	0.84751	2.88943	.	88.408
LOT	86	10	A	3	A	0.06618	0.7151	13.5304	0.22366	75.354	16.0113	4.22219	0.08746	725.15	23.4843	26.4013	0.78151	3.14011	.	86.600
MOB	84	9	A	1	A	0.10019	10.2000	18.3891	0.05763	75.613	14.5367	3.99102	0.09162	740.88	32.4033	23.8899	0.50376	4.54917	0.76410	130.368
MOB	84	9	A	2	A	0.10786	9.5100	18.0268	0.10151	73.271	15.4799	4.23727	0.11125	954.14	32.4872	35.3725	0.49354	5.28573	0.85692	155.129

Table A-9 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	AG	AL	AS	CD	CR	CU	FE	HG	MN	NI	PB	SE	SN	TL	ZN
MOB	84	9	A	3	A	0.08046	9.4200	12.1752	0.09980	103.257	12.1551	4.13244	0.10637	487.65	36.3459	24.1442	0.67872	2.11659	0.48250	140.141
MOB	85	8	A	1	A	0.09208	8.1364	21.0281	0.10523	91.739	18.3547	5.17951	0.12943	1138.22	31.8616	29.1556	0.52520	1.90986	0.82827	155.683
MOB	85	8	A	2	A	0.07461	8.5513	7.7583	0.07389	87.853	17.9914	5.51268	0.09988	1809.73	31.8820	29.5023	0.42404	2.57205	1.03555	158.128
MOB	85	8	A	3	A	0.10804	7.6199	15.4035	0.09085	89.346	18.2395	5.70263	0.06936	949.11	31.1114	33.7139	0.60739	2.19275	1.06266	160.903
MOB	86	9	A	1	A	0.08926	9.0307	14.0184	0.09902	104.621	19.4314	3.83542	0.14220	631.17	29.6630	31.4065	0.32440	4.90682	.	118.648
MOB	86	9	A	2	A	0.09867	7.7197	19.8335	0.20067	131.036	24.1893	5.14629	0.13144	1450.87	39.2583	35.1053	0.49232	3.47347	.	161.408
MOB	86	9	A	3	A	0.08891	9.3650	14.9085	0.08388	97.577	17.0954	4.16626	0.07990	459.33	27.7200	28.5386	0.30869	2.80444	.	119.608
MRD	84	9	A	1	A	0.21393	6.6900	12.0764	0.44991	102.058	21.7697	3.63240	0.07650	1065.84	34.0953	25.1842	0.55609	2.45256	0.63191	111.847
MRD	84	9	A	2	A	0.16405	4.7500	14.2751	0.31870	81.739	19.4463	3.92593	0.08875	970.31	31.3732	27.6398	0.34792	2.91767	0.73230	103.667
MRD	84	9	A	3	A	0.16953	6.0100	16.7976	0.73965	90.839	29.7934	4.29364	0.10300	1559.15	47.0504	29.1367	1.05529	3.28569	0.85411	128.495
MRD	85	9	A	1	A	0.07884	4.6840	9.4379	0.19376	49.211	12.4217	3.16938	0.03581	616.37	25.4652	22.9205	0.29488	2.62463	0.46153	80.451
MRD	85	9	A	2	A	0.17390	5.1668	11.9345	0.34984	64.959	21.2734	3.81198	0.07892	991.08	32.1804	27.1087	0.45022	2.71271	0.72520	112.852
MRD	85	9	A	3	A	0.23023	5.8875	11.1334	0.63028	64.752	25.0981	3.87036	0.08182	1115.67	37.0077	30.1924	0.54508	2.96797	0.92204	121.412
MRD	86	9	A	1	A	0.11564	8.4587	10.0174	0.47921	54.024	15.1990	1.89408	0.06299	91.24	20.7111	18.0098	0.15828	1.37580	.	63.123
MRD	86	9	A	2	A	0.18650	8.5758	11.5058	0.74444	86.386	34.0722	3.60471	0.09407	1025.26	41.7274	31.7308	0.58383	4.46034	.	131.258
MRD	86	9	A	3	A	0.18327	5.5979	12.2485	0.49678	87.892	24.8345	3.42615	0.10179	524.86	29.7530	28.9053	0.53173	2.75862	.	106.273
MRD	87	10	A	1	A	0.13362	4.3649	11.5664	0.22069	69.436	15.4108	3.40627	0.04761	414.09	31.7106	23.7854	0.30578	2.69311	.	91.989
MRD	87	10	A	2	A	0.19151	5.5121	10.5502	0.41857	77.151	22.5063	3.49346	-0.00617	389.39	30.3454	24.9435	0.30821	2.55184	.	109.798
MRD	87	10	A	3	A	0.18228	6.1579	12.5829	0.41666	83.074	23.5576	4.00767	0.09968	592.94	35.9511	23.4624	0.43988	2.20826	.	114.925
PAM	84	10	A	1	A	0.07184	8.3300	14.6724	0.33942	74.862	14.0770	3.03942	0.12500	268.74	20.2799	39.0341	0.91155	3.39029	0.67014	98.401
PAM	84	10	A	2	A	0.09577	6.2700	11.1689	0.27793	101.958	16.4873	4.00317	0.09675	688.56	24.4029	33.1519	0.74030	2.29655	0.64798	97.570
PAM	84	10	A	3	A	0.10851	6.9000	11.6302	0.39890	80.258	16.7609	3.89702	0.14688	485.98	29.7915	35.4503	1.24398	5.98056	0.76888	140.485
PAM	85	10	A	1	A	0.04288	4.4351	11.8513	0.19984	56.013	13.6783	3.53145	0.12575	598.835	22.6749	32.6835	0.55621	2.41298	0.91253	94.126
PAM	85	10	A	2	A	0.05706	0.6517	13.4303	0.09752	61.472	15.3198	4.08391	0.08862	862.012	21.9638	27.6627	0.47165	2.98415	0.49276	90.356
PAM	85	10	A	3	A	0.08269	5.7219	14.0362	0.36686	75.266	19.3721	4.55147	0.15471	707.690	31.3912	36.4490	1.05952	2.69729	0.96452	131.628
PAM	86	10	A	1	A	0.05937	1.5440	19.6965	0.13899	70.780	15.8339	4.42843	0.05809	660.452	25.2850	26.7293	0.48196	2.57923	.	91.838
PAM	86	10	A	2	A	0.08160	7.6348	6.2421	0.43121	82.528	16.8635	2.99769	0.13446	438.528	19.7776	31.5100	0.63897	4.08716	.	83.521
PAM	86	10	A	3	A	0.09014	6.2319	11.4626	0.32978	153.922	18.1329	3.43285	0.12184	592.411	25.6660	35.5496	0.78140	3.28156	.	94.531
PAS	87	9	A	1	A	0.17431	2.4561	12.6586	0.22769	75.178	19.2067	3.77851	0.05769	628.073	23.2712	33.5937	0.52780	2.88444	.	119.181
PAS	87	9	A	2	A	0.17982	5.3360	8.0707	0.40579	95.988	20.9423	4.22314	0.20092	591.843	30.4360	32.2809	0.68967	3.65533	.	149.604
PAS	87	9	A	3	A	0.14088	2.2934	15.2352	0.20043	84.015	23.7717	4.12193	0.07518	598.977	26.0812	37.7370	0.53238	4.84697	.	134.026
PEN	85	8	A	1	A	0.18616	8.5870	19.9998	0.11773	103.864	23.7613	5.57922	0.25953	542.721	26.9966	41.4990	0.97883	4.22728	0.28907	140.785
PEN	85	8	A	2	A	0.11071	10.6790	9.1169	0.09948	73.552	14.2450	5.29501	0.14113	472.084	23.1753	39.0669	1.00518	1.49878	0.62486	115.049
PEN	85	8	A	3	A	0.11528	9.3917	18.8400	0.30613	93.682	18.6607	6.26446	0.15038	139.813	18.7753	30.6830	1.37034	1.82404	0.77369	120.825
PEN	86	9	A	1	A	0.24733	9.5474	19.5659	0.20722	106.474	20.3569	4.63870	0.13008	355.722	23.2301	41.1495	0.62486	5.98431	.	113.331
PEN	86	9	A	2	A	0.14463	10.1612	21.2368	0.09384	103.015	14.1331	4.76456	0.13337	389.080	24.8057	42.3494	0.59807	2.15826	.	96.109
PEN	86	9	A	3	A	0.12040	9.2274	22.0928	0.31353	131.233	25.4798	5.64110	0.15129	99.223	24.8133	35.1214	0.89324	3.05803	.	109.801
PEN	87	9	A	1	A	0.29508	7.6218	17.9475	0.17825	140.846	22.7658	6.71407	0.25369	582.677	34.4722	42.0793	0.69262	3.49095	.	145.105
PEN	87	9	A	2	A	0.20477	10.0885	20.2342	0.08221	161.661	14.6266	4.77223	0.10927	695.243	28.2623	43.0398	0.64807	3.15705	.	124.053
PEN	87	9	A	3	A	0.11715	7.8074	17.9021	0.27727	197.304	24.6649	5.60092	0.25872	339.644	36.5246	32.3931	0.90508	.	.	121.912
ROU	84	9	A	1	A	0.08414	7.9900	13.4330	0.08529	71.252	13.8389	4.12004	0.09025	645.892	32.1575	27.1604	0.55115	4.10686	0.69124	119.225
ROU	84	9	A	2	A	0.10543	2.1800	15.4126	0.13251	76.622	15.6494	4.26560	0.11388	834.373	26.8626	30.7969	0.58606	3.29879	0.43178	102.572
ROU	84	9	A	3	A	0.12408	1.6400	13.5029	0.13825	93.136	17.0006	4.19659	0.11663	771.444	23.6152	31.0268	0.43719	3.08392	0.62529	100.646

Table A-9 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	AG	AL	AS	CD	CR	CU	FE	HG	MN	NI	PB	SE	SN	TL	ZN
ROU	85	9	A	1	A	0.06015	8.8900	9.6779	0.47540	68.933	12.1321	3.63147	0.20336	676.181	20.5042	24.5564	0.39998	1.49293	0.55318	103.755
ROU	85	10	A	1	A	0.05373	6.1614	14.1023	0.05758	62.624	13.1662	3.85474	0.12136	726.139	24.2628	24.9331	0.33052	2.43656	0.70059	104.278
ROU	85	9	A	2	A	0.08941	1.8541	13.0523	0.09251	62.694	14.9980	4.02312	0.12323	753.006	23.4334	26.2687	0.50444	3.47617	0.29240	98.133
ROU	85	10	A	2	A	0.08504	1.6013	15.2897	0.10166	70.794	16.4220	4.36533	0.10916	878.578	25.6721	28.0667	0.49183	3.32027	0.46118	105.490
ROU	85	9	A	3	A	0.10890	5.7030	9.7950	0.10526	68.234	13.9001	4.26575	0.13408	686.477	22.2067	28.7805	0.44474	2.64165	1.06504	108.457
ROU	85	10	A	3	A	0.06500	7.1062	13.7323	0.17280	60.646	11.7785	3.55417	0.14096	592.955	23.3428	23.6581	0.35587	7.37115	0.42861	90.386
ROU	87	9	A	1	A	0.13129	4.9141	16.3283	0.09209	92.557	16.7198	3.96245	0.00238	336.936	25.4295	30.2436	0.30884	2.78877	.	115.425
ROU	87	9	A	2	A	0.07177	0.2069	13.3836	0.11856	61.396	15.9485	4.08293	0.15293	806.787	24.6301	25.4950	0.34878	3.00206	.	91.999
ROU	87	9	A	3	A	0.12147	5.7298	15.2018	0.15224	106.232	19.3641	4.19231	0.09564	839.963	34.0180	32.1870	0.45712	3.06028	.	121.951
SAB	84	9	A	1	A	0.17674	4.5000	11.7873	0.15428	82.444	15.4330	3.87138	0.05888	643.959	22.9920	24.2943	0.34233	2.80339	0.67781	90.478
SAB	84	9	A	2	A	0.09905	1.9400	13.0083	0.13195	78.150	14.5166	3.74604	0.08988	674.071	22.3526	29.3213	0.44989	2.48107	0.63667	83.272
SAB	84	9	A	3	A	0.09749	2.9100	11.4089	0.13806	72.559	15.3283	3.85928	0.08076	688.333	23.6636	25.9935	0.45398	2.84851	0.65648	87.362
SAB	85	9	A	1	A	0.06526	4.4825	11.5158	0.16609	60.013	13.7971	3.58430	0.24072	632.331	22.7931	23.4509	0.40142	2.73143	0.57336	83.352
SAB	85	9	A	2	A	0.07950	3.0744	9.6615	0.10619	52.924	14.1010	4.30710	0.10134	599.530	21.2560	22.9229	0.37713	2.62911	0.53904	78.697
SAB	85	9	A	3	A	0.07941	4.6740	8.8407	0.28161	63.874	15.2113	3.75426	0.07818	658.525	24.8384	24.4471	0.38405	2.30927	0.78633	87.832
SAB	86	9	A	1	A	0.08383	5.9728	6.9103	0.19605	60.356	14.9818	3.78362	0.06237	259.825	20.0868	19.7053	0.31421	3.00849	.	80.604
SAB	86	9	A	2	A	0.09391	1.0659	14.9784	0.14468	64.878	16.9533	4.15669	0.08419	691.560	25.7432	28.4482	0.39197	2.86686	.	93.679
SAB	86	9	A	3	A	0.09887	3.8042	15.5046	0.20635	79.399	17.7704	3.91404	0.04358	460.645	24.6755	29.4239	0.40627	3.02741	.	97.324
SAP	84	10	A	1	A	0.06709	5.0400	16.7970	0.13055	82.230	12.6818	4.05040	0.08113	641.888	22.3394	23.7644	0.60120	3.21825	0.32430	82.405
SAP	84	10	A	2	A	0.04532	2.6400	14.9541	0.14893	83.517	14.0539	4.13477	0.09213	893.868	21.3399	26.3084	0.56954	3.04108	0.59324	86.399
SAP	84	10	A	3	A	0.03128	4.4200	14.1192	0.15343	71.154	14.2887	4.06153	0.07888	801.525	17.4221	27.2358	0.50694	3.13081	0.58278	80.378
SAP	85	8	A	1	A	0.02849	7.7784	12.5187	0.09921	71.225	11.1179	3.99573	0.05661	500.583	17.9875	20.8810	0.54190	1.92175	0.48654	83.322
SAP	85	8	A	2	A	0.03455	5.0813	11.5453	0.11087	47.039	10.0097	3.25361	0.06776	873.232	17.6574	21.1952	0.39219	.	0.19824	64.530
SAP	85	8	A	3	A	0.03315	4.3928	8.5975	0.16447	57.466	10.8331	3.46786	0.08029	642.826	19.7726	23.1224	0.27903	2.32310	0.48803	72.636
SAP	86	8	A	1	A	0.08287	6.8294	20.2155	0.19879	90.395	13.5097	4.00689	0.03270	116.725	22.2380	30.8208	0.64540	2.38976	.	77.174
SAP	86	8	A	2	A	0.06439	4.3546	10.4884	0.23807	77.667	14.3645	3.37652	0.03405	546.196	21.4151	31.7667	0.52825	2.65804	.	84.886
SAP	86	8	A	3	A	0.06611	4.4738	15.0314	0.23059	72.930	12.5666	3.72473	0.07518	558.986	18.5340	27.6037	0.39635	3.45177	.	76.269
SAP	87	7	A	1	A	0.06319	2.8128	12.9904	0.18631	69.094	21.6442	4.04708	0.04975	574.452	21.9837	27.1828	0.47262	2.63994	.	96.021
SAP	87	8	A	1	A	0.04279	6.4018	14.3175	0.11394	94.922	17.0475	4.01114	0.08289	894.892	27.0669	29.1010	0.65333	2.76521	.	84.263
SAP	87	10	A	1	A	0.05764	5.5757	16.2589	0.14554	81.163	14.3155	2.90945	0.04115	611.878	23.3067	28.1650	0.46126	2.29329	.	81.568
SAP	87	7	A	2	A	0.07771	2.2513	14.5575	0.14486	67.819	15.2438	4.00816	0.00910	587.596	22.0956	26.1216	0.46997	2.48624	.	90.414
SAP	87	8	A	2	A	0.04556	1.7292	13.4250	0.13985	67.330	16.1202	4.23490	0.02561	646.741	22.4241	26.0149	0.44038	3.07573	.	92.820
SAP	87	10	A	2	A	0.07662	2.0015	15.3050	0.17170	69.467	15.2708	4.02143	-0.00809	619.263	23.4374	26.3067	0.47782	3.20338	.	91.316
SAP	87	7	A	3	A	0.05213	2.8773	13.5710	0.21403	75.766	13.3893	3.96512	0.20690	634.144	21.1443	27.2248	0.56736	3.47947	.	89.705
SAP	87	8	A	3	A	0.08019	1.4279	14.0759	0.21851	85.113	15.5252	4.16560	0.21532	899.044	23.2361	29.0284	0.44978	3.05377	.	99.582
SAP	87	10	A	3	A	0.04316	3.8924	12.8080	0.16715	76.914	13.5558	3.87161	0.29413	508.461	21.1133	26.152	0.42619	2.52524	.	85.497
SAP	87	8	B	1	I	0.07070	2.2165	12.9494	0.15128	75.961	14.6455	4.14660	0.01184	613.330	21.4539	27.491	0.47762	3.12795	.	95.398
SAP	87	8	B	2	I	0.06645	1.2619	13.2637	0.12325	89.248	16.1494	4.15496	0.01379	681.642	23.1904	26.116	0.43799	3.25706	.	100.763
SAP	87	8	B	3	I	0.04739	2.5835	14.4022	0.13170	75.103	14.2727	3.83874	0.08790	595.350	20.8873	29.063	0.57039	2.91262	.	84.627
SAP	87	8	C	1	I	0.07260	2.7233	15.5190	0.19700	88.187	15.7766	4.29156	0.01067	643.967	25.6825	25.894	0.49091	3.40626	.	91.219
SAP	87	8	C	2	I	0.06730	1.7554	13.8050	0.24167	73.841	14.5992	4.13922	0.08228	702.625	22.7233	26.261	0.43438	2.88432	.	97.765
SAP	87	8	C	3	I	0.07332	2.4979	13.6326	0.26681	83.041	14.3104	4.07971	0.03808	805.143	23.2038	26.597	0.47408	2.73922	.	90.949
SAP	87	8	D	1	I	0.06437	1.8949	12.7581	0.13673	70.797	15.1945	4.00931	0.02096	606.808	22.1844	27.151	0.46712	2.92292	.	87.166
SAP	87	8	D	2	I	0.05791	1.9048	13.9493	0.16162	69.826	14.4652	3.92237	0.01204	614.936	22.4062	25.769	0.38868	3.14990	.	85.093

Table A-9 Contd.

LOC	YR	MTH	SITE	STA	SURVEY	AG	AL	AS	CD	CR	CU	FE	HG	MN	NI	PB	SE	SN	TL	ZN
SAP	87	8	D	3	I	0.06035	2.89715	11.9011	0.12393	72.498	14.4358	4.01241	0.24746	614.966	23.2680	25.920	0.41943	2.95152	.	84.824
SAP	87	8	E	1	I	0.06753	3.59749	15.8617	0.16712	86.096	13.5685	4.28992	0.02216	688.665	23.8004	26.475	0.50807	3.07713	.	90.789
SAP	87	8	E	2	I	0.06073	1.51696	12.7361	0.14593	76.820	15.0134	4.13316	0.10451	700.078	22.9882	26.515	0.54301	3.06287	.	94.694
SAP	87	8	E	3	I	0.06242	1.86243	12.6886	0.13355	74.693	14.9332	4.02656	0.03164	628.206	22.6262	25.797	0.38473	2.92626	.	90.050
SJR	84	10	D	1	A	0.21895	5.06000	11.6640	0.35726	77.877	24.1428	3.67037	0.15188	703.997	22.4819	59.304	0.27005	3.41139	0.74306	161.180
SJR	84	10	D	2	A	0.09223	1.47000	12.2832	0.18069	79.331	16.3315	4.06190	0.11676	798.521	22.2040	31.840	1.05699	3.44221	0.56584	100.558
SJR	84	10	D	3	A	0.12518	1.33000	13.2141	0.24369	82.298	20.3041	4.20215	0.13951	798.762	24.2065	36.262	0.63506	3.19020	0.62453	123.133
SJR	85	8	D	1	A	0.23678	4.94370	7.5952	0.31828	60.877	20.3030	3.71944	0.21215	656.734	20.8213	47.270	0.64178	3.08980	0.95549	134.480
SJR	85	8	D	2	A	0.10617	4.06370	8.7432	0.22822	51.319	13.3568	3.14595	0.15932	577.193	17.8633	31.768	0.42621	3.08662	0.95248	87.973
SJR	85	8	D	3	A	0.04825	1.15784	11.8937	0.20245	59.701	15.3635	3.66897	0.12600	656.735	21.0680	25.583	0.47360	3.23894	0.36507	158.371
SJR	86	8	D	1	A	0.40028	4.33118	14.8521	0.52420	96.564	26.3815	4.28831	0.19122	753.502	23.7774	62.859	1.02068	4.79005	.	163.618
SJR	86	8	D	2	A	0.53837	6.33764	11.0220	0.79531	106.241	38.7209	4.72057	0.21789	490.969	26.4253	65.954	1.12550	5.38144	.	200.595
SJR	86	8	D	3	A	0.60999	6.37172	10.6929	0.79151	103.807	37.9359	4.23189	0.28621	452.119	25.5723	86.133	1.72277	8.11429	.	209.337
SJR	87	8	A	1	I	0.09664	2.17640	11.4237	0.21374	83.358	16.4824	4.70466	0.22642	749.105	23.5640	29.899	1.32736	4.26359	.	95.298
SJR	87	8	A	2	I	0.09465	3.73737	8.1015	0.20731	80.491	15.1422	4.73399	0.19185	613.715	30.3290	27.884	1.95345	3.32447	.	82.881
SJR	87	8	A	3	I	0.07744	3.92916	9.0775	0.19202	93.220	15.3681	4.79059	0.18761	567.153	25.7910	26.711	1.92214	3.60367	.	80.999
SJR	87	8	B	1	I	0.42284	3.73721	10.5255	0.62818	106.707	50.5367	4.75838	0.29894	600.843	30.5895	70.632	1.07404	6.06326	.	174.885
SJR	87	8	B	2	I	0.20418	3.41364	11.7933	0.32804	91.948	25.5027	4.76715	0.11502	753.928	27.4810	60.020	0.72443	3.80409	.	158.111
SJR	87	8	B	3	I	0.12675	3.24826	10.3860	0.22005	82.073	16.8815	4.33930	0.01935	715.434	23.5439	33.006	0.54143	3.35506	.	110.253
SJR	87	8	C	1	I	0.93446	4.69000	7.6491	1.60787	119.498	82.2928	5.58911	1.04141	550.673	31.6791	164.542	2.05213	8.91104	.	399.816
SJR	87	8	C	2	I	0.15546	1.34996	12.3937	0.29480	73.038	22.5275	4.07665	0.14894	757.113	25.3284	51.708	0.68597	4.20112	.	123.178
SJR	87	8	C	3	I	0.84367	4.30484	11.5979	1.20491	110.439	56.8307	4.45171	0.62941	644.439	29.3043	101.944	1.90073	6.02213	.	214.083
SJR	87	8	D	1	A	0.21410	3.38808	12.2574	0.59986	93.272	24.5995	4.31546	0.33669	741.759	26.5440	47.376	0.61402	4.08802	.	133.514
SJR	87	8	D	2	A	0.49127	5.64829	11.5056	0.58884	62.914	40.9461	4.58892	0.29009	671.395	29.0603	72.561	1.22774	5.52336	.	217.016
SJR	87	8	D	3	A	0.04709	2.67055	11.3383	0.13380	73.044	13.4364	4.04203	0.07704	617.537	23.5720	27.972	0.50801	2.88644	.	86.159
SJR	87	8	E	1	I	0.11046	4.30889	9.6004	0.22265	109.908	14.3241	4.36131	0.18970	574.236	28.4217	27.599	1.58083	3.34788	.	86.300
SJR	87	8	E	2	I	0.61202	4.90275	10.7173	0.69847	110.942	41.4438	5.41549	0.26261	825.648	32.0590	77.135	2.01764	4.94602	.	206.230
SJR	87	8	E	3	I	0.09053	4.85162	8.1998	0.22401	90.969	13.9329	4.37227	0.09263	662.741	24.0356	31.467	1.49155	2.82888	.	78.741
TAM	84	10	A	1	A	0.09699	0.47000	13.5321	0.27701	83.251	25.0783	4.49372	0.12526	744.096	24.3792	27.058	0.67463	3.28505	0.68789	95.805
TAM	84	10	A	2	A	0.11201	0.32000	13.3794	0.19116	76.594	16.5703	4.08899	0.10813	735.283	24.4105	27.411	0.55327	3.43648	0.53720	92.793
TAM	84	10	A	3	A	0.18825	0.58000	13.1507	0.29943	81.913	17.3641	4.08852	0.13188	725.693	24.5629	29.826	0.69829	3.04734	0.70107	93.568
TAM	85	10	A	1	A	0.18498	2.13163	11.9532	0.58938	77.569	19.5196	4.04497	0.24138	623.734	26.0119	30.986	1.04780	3.48564	0.54444	101.323
TAM	85	10	A	2	A	0.07983	0.27193	12.9594	0.15884	65.626	16.2390	4.05242	0.08861	739.196	23.9353	26.354	0.46247	3.50652	0.73506	91.569
TAM	85	10	A	3	A	0.09618	0.30881	13.4973	0.25357	60.747	16.9296	4.09543	0.13303	732.310	24.1073	27.186	0.61638	4.06537	0.68246	94.250

Table A-10. Elemental Concentrations for 1984-87 Liver Tissue in the Southeast. Units: ppm (dry).

Computer listing of liver data, 16 pages, 720 observations.

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
APA	84	9	A	A	0.116	7.599	0.562	0.032	21.358	634.812	0.528	9.887	0.260	0.098	32.734	1.642	137.223
APA	84	9	A	A	0.071	3.250	0.462	-0.006	14.794	389.534	0.714	5.395	0.221	0.025	16.355	0.335	110.138
APA	84	9	A	A	0.035	4.070	0.506	0.025	12.976	502.940	0.395	13.918	0.362	0.076	25.118	0.473	131.163
APA	84	9	A	A	0.183	8.501	0.603	0.032	23.096	679.122	0.483	6.515	0.357	0.155	39.913	0.370	186.453
APA	84	9	A	A	0.023	3.778	0.319	0.155	12.253	840.740	0.566	5.028	0.805	0.097	42.118	0.150	108.130
APA	84	9	A	A	0.059	5.070	0.295	0.040	12.791	475.475	0.356	5.911	0.607	0.001	16.725	0.083	115.795
APA	84	9	A	A	0.327	7.657	0.461	-0.001	34.784	542.252	0.537	5.673	0.462	0.090	22.023	.	157.908
APA	84	9	A	A	0.295	9.789	0.524	0.017	33.246	593.668	0.355	5.378	0.661	0.146	35.654	.	132.743
APA	84	9	A	A	0.037	7.239	0.330	0.118	11.274	491.414	0.423	6.214	0.281	0.068	25.398	.	122.148
APA	84	9	A	A	0.127	7.610	0.823	0.032	18.025	800.049	0.572	3.435	0.294	0.093	28.033	0.068	116.629
APA	85	10	A	A	0.007	3.099	0.900	0.031	6.181	560.193	0.208	4.673	0.133	0.210	32.565	0.135	158.421
APA	85	10	A	A	0.527	5.699	0.222	0.010	62.515	678.461	0.666	3.653	0.184	0.064	16.785	0.212	334.505
APA	85	10	A	A	0.343	4.941	0.169	0.016	33.748	391.603	0.498	2.664	0.178	0.050	13.947	0.278	162.180
APA	85	10	A	A	0.116	2.919	4.930	0.046	16.373	4479.334	1.572	4.342	0.407	0.078	34.011	0.095	107.229
APA	85	10	A	A	0.341	11.193	0.159	0.250	20.203	818.784	0.241	3.744	1.687	0.055	41.840	0.195	109.775
APA	85	10	A	A	0.921	6.555	0.289	0.033	80.882	346.495	0.811	4.380	0.803	0.045	23.766	0.082	246.475
APA	85	10	A	A	0.048	4.603	0.153	0.010	18.771	619.351	0.773	2.490	0.180	0.094	19.881	0.211	107.544
APA	85	10	A	A	0.206	6.442	0.178	0.021	40.629	402.368	0.437	3.811	0.309	0.045	27.784	0.319	219.943
APA	85	10	A	A	0.532	6.447	0.238	0.004	47.696	487.521	0.626	3.946	0.252	0.079	23.740	0.256	133.008
APA	85	10	A	A	0.370	9.993	0.293	-0.023	42.547	837.590	0.544	3.913	0.246	0.040	21.687	0.122	134.673
APA	86	10	A	A	0.198	10.127	0.401	-0.005	26.552	530.513	0.688	5.559	0.228	0.024	28.306	0.345	144.885
APA	86	10	A	A	0.758	13.194	1.417	0.006	52.724	731.067	0.662	6.067	0.216	0.115	39.337	0.376	150.904
APA	86	10	A	A	0.364	16.033	1.462	0.011	30.740	694.351	0.636	5.538	0.220	0.066	39.042	0.233	147.147
APA	86	10	A	A	0.232	12.092	1.285	0.091	23.620	912.169	0.597	5.442	0.338	0.019	36.545	0.318	136.129
APA	86	10	A	A	0.176	11.234	0.846	0.016	21.968	415.069	1.187	4.906	0.191	0.001	0.045	0.205	132.278
APA	86	10	A	A	0.043	8.134	0.474	0.052	16.351	821.745	0.906	5.286	0.467	-0.010	31.497	0.163	136.560
APA	86	10	A	A	0.286	13.893	0.965	0.061	28.999	697.973	0.373	7.664	0.523	0.052	31.975	0.137	143.408
APA	86	10	A	A	0.241	12.902	1.384	-0.001	27.903	817.698	0.328	4.022	0.236	0.049	27.040	0.122	144.031
APA	86	10	A	A	0.244	15.103	0.644	0.018	27.518	698.217	1.572	4.904	0.413	0.060	29.128	0.179	160.066
APA	86	10	A	A	0.251	18.632	0.835	-0.006	28.113	702.574	0.851	5.821	0.253	0.043	28.882	0.121	168.407
BAR	84	9	A	A	0.028	0.760	0.159	0.027	18.751	572.215	0.103	3.792	0.107	0.086	7.760	0.869	77.874
BAR	84	9	A	A	0.023	5.802	0.143	0.086	11.692	913.169	0.200	4.394	0.470	0.001	12.046	0.350	70.797
BAR	84	9	A	A	0.047	1.329	0.236	0.163	14.936	706.236	0.303	8.663	0.351	0.057	8.677	0.257	100.661
BAR	84	9	A	A	0.009	3.329	0.086	0.137	12.155	673.072	0.080	8.660	0.415	0.108	14.099	0.405	173.750
BAR	84	9	A	A	0.204	2.120	0.214	0.101	128.785	541.274	0.075	3.058	0.151	0.117	10.532	-0.081	113.355
BAR	84	9	A	A	0.024	1.403	0.132	0.133	8.351	515.318	0.053	6.219	0.139	-0.020	5.204	0.122	67.161
BAR	84	9	A	A	0.042	5.341	0.146	0.083	25.799	1001.595	0.133	5.760	0.699	0.142	12.632	.	129.471
BAR	84	9	A	A	0.019	3.162	0.086	0.012	6.453	817.677	0.041	3.470	0.760	0.043	11.188	.	87.023
BAR	84	9	A	A	0.015	4.343	0.060	0.039	11.261	487.160	0.081	1.876	0.584	0.087	8.174	.	81.886
BAR	84	9	A	A	0.022	2.369	0.094	0.079	15.706	810.236	0.143	4.602	0.210	0.035	8.238	0.037	144.762
BAR	85	9	A	A	0.033	4.002	0.059	0.036	23.495	1714.608	0.173	4.530	0.304	0.063	9.724	0.452	143.583
BAR	85	9	A	A	0.236	5.274	0.160	0.064	50.895	1811.510	0.302	4.914	0.520	0.166	14.107	0.106	113.927
BAR	85	9	A	A	0.137	6.919	1.605	0.017	51.030	1133.605	0.870	3.861	0.970	0.063	13.083	0.212	131.570
BAR	85	9	A	A	0.074	4.406	0.216	0.369	35.519	691.207	0.226	5.606	2.017	0.105	15.943	0.133	122.279
BAR	85	9	A	A	0.036	2.110	0.015	0.128	15.253	274.613	0.112	4.764	0.214	0.055	7.081	0.021	77.362
BAR	85	9	A	A	0.048	4.977	0.422	0.212	23.590	700.685	0.192	5.409	0.486	0.094	16.566	0.196	106.830
BAR	85	9	A	A	0.019	2.860	0.029	-0.026	18.203	551.603	0.081	4.471	0.276	0.026	11.619	0.766	78.498

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
BAR	85	9	A	A	0.104	3.193	0.307	0.625	24.856	590.092	0.138	5.513	1.015	0.047	7.208	1.002	126.901
BAR	85	9	A	A	0.311	3.011	0.520	0.077	62.211	1042.659	0.196	3.276	0.468	0.046	10.636	0.196	131.746
BAR	85	9	A	A	0.079	4.743	0.123	0.046	41.743	857.583	0.189	3.270	0.823	0.012	16.248	0.199	127.065
BAR	87	10	A	A	0.056	4.235	0.075	0.019	19.247	432.255	0.074	5.272	0.193	0.146	7.963	0.039	186.629
BAR	87	10	A	A	0.037	2.350	0.040	0.005	9.446	670.104	0.040	6.599	0.389	0.112	10.132	0.058	139.221
BAR	87	10	A	A	0.074	2.201	0.056	0.001	25.644	627.696	0.141	3.923	0.143	0.087	9.763	0.305	170.210
BAR	87	10	A	A	0.039	1.808	0.384	0.002	27.744	338.830	0.120	3.225	0.098	0.052	6.939	0.149	165.529
BAR	87	10	A	A	0.038	3.384	0.464	-0.000	13.655	672.015	0.119	6.390	0.189	0.075	7.096	0.149	68.077
BAR	87	10	A	A	0.146	4.965	0.030	-0.009	38.467	404.617	0.046	4.061	0.233	0.054	5.152	0.097	269.070
BAR	87	10	A	A	0.052	3.032	0.243	-0.005	14.869	360.824	0.089	3.274	0.185	0.054	7.189	0.121	174.301
BAR	87	10	A	A	0.007	3.058	0.157	-0.015	12.614	540.230	0.178	5.193	0.375	0.116	8.944	0.987	86.918
BAR	87	10	A	A	0.404	6.005	0.106	-0.014	116.682	542.960	0.238	5.954	0.196	0.125	12.236	0.150	282.085
BAR	87	10	A	A	0.098	5.590	0.869	0.003	20.888	839.586	0.299	6.266	0.509	0.096	11.217	0.168	231.973
CCB	84	9	A	A	0.073	13.230	0.178	0.030	38.950	482.169	0.855	5.237	0.130	0.166	42.483	3.909	115.953
CCB	84	9	A	A	0.070	9.701	0.286	-0.013	36.786	335.855	0.481	4.314	-0.095	0.060	43.814	0.698	134.399
CCB	84	9	A	A	0.187	8.062	0.687	0.017	67.292	464.719	0.467	3.789	.	0.122	20.375	1.578	148.877
CCB	84	9	A	A	0.117	10.105	0.183	0.046	26.590	312.900	1.704	6.408	0.280	0.088	30.608	0.254	124.010
CCB	84	9	A	A	0.132	11.239	0.217	0.015	35.684	253.270	0.341	8.423	0.013	0.018	25.205	0.553	114.397
CCB	84	9	A	A	0.102	2.490	0.106	0.013	40.448	345.251	0.538	6.062	0.161	0.022	39.047	0.140	126.157
CCB	84	9	A	A	0.291	11.051	0.264	-0.034	57.438	356.669	0.950	2.524	0.084	0.111	36.293	0.263	138.374
CCB	84	9	A	A	0.097	12.440	0.172	-0.003	32.626	159.550	0.840	6.901	0.089	0.085	28.286	0.582	106.300
CCB	84	9	A	A	0.329	12.366	0.311	0.015	99.651	609.970	0.595	3.656	0.230	0.052	41.231	.	143.494
CCB	84	9	A	A	0.227	14.558	0.371	0.075	48.301	327.492	0.990	7.208	0.252	0.265	41.302	.	147.444
CCB	85	9	A	A	0.045	6.844	0.419	0.141	21.683	472.994	0.482	18.951	0.982	0.137	24.466	0.936	108.356
CCB	85	9	A	A	0.110	10.471	0.974	0.118	30.309	605.552	0.370	5.098	1.010	0.199	23.357	0.942	113.568
CCB	85	9	A	A	0.366	13.085	0.870	0.017	84.263	359.218	0.252	2.612	0.612	0.139	17.009	0.499	132.546
CCB	85	9	A	A	0.431	9.551	0.937	0.035	91.141	578.510	0.462	3.711	0.491	0.067	23.774	0.349	132.654
CCB	85	9	A	A	0.091	4.515	0.229	-0.000	26.942	333.582	0.284	3.227	0.437	0.058	16.867	0.287	92.743
CCB	85	9	A	A	0.394	10.329	0.737	0.004	94.524	471.404	0.278	3.609	0.746	0.172	21.392	0.696	144.550
CCB	85	9	A	A	0.095	4.176	0.482	0.036	26.837	416.191	0.540	2.260	0.618	0.034	19.734	0.353	135.376
CCB	85	9	A	A	0.042	5.694	2.085	0.071	22.298	313.255	1.278	7.555	0.842	0.137	16.134	0.352	124.837
CCB	85	9	A	A	0.267	9.501	1.534	0.017	61.365	436.236	0.253	4.112	0.421	0.316	19.793	0.452	109.292
CCB	85	9	A	A	0.236	13.742	0.727	0.039	48.477	562.631	0.313	4.474	0.454	0.201	18.062	0.538	107.339
CCB	86	9	A	A	0.836	7.306	4.653	-0.052	157.194	262.101	0.596	4.983	0.274	0.106	18.896	0.623	152.019
CCB	86	9	A	A	0.064	9.257	1.927	-0.081	61.390	500.227	0.425	4.844	0.338	0.102	29.063	0.846	112.510
CCB	86	9	A	A	0.297	12.624	1.611	-0.077	75.170	386.636	0.347	4.744	0.462	0.133	27.179	0.715	126.219
CCB	86	9	A	A	2.177	15.381	13.206	-0.062	218.705	271.584	1.015	12.486	0.649	0.304	20.674	0.724	204.869
CCB	86	9	A	A	0.044	3.947	1.346	-0.024	35.236	559.883	0.475	5.517	0.583	0.048	20.737	0.444	117.616
CCB	86	9	A	A	0.229	7.836	0.327	-0.046	52.795	710.391	0.439	3.922	1.675	0.092	39.406	1.054	159.570
CCB	86	9	A	A	0.061	4.649	0.227	-0.068	19.376	218.598	0.155	1.819	0.128	-0.024	14.954	0.516	95.184
CCB	86	9	A	A	0.120	5.143	0.863	-0.019	22.880	874.471	0.321	4.236	0.848	0.118	30.762	0.245	105.355
CCB	86	9	A	A	0.120	4.752	0.534	-0.103	21.745	370.282	0.234	2.952	0.268	0.128	24.059	0.377	102.667
CCB	86	9	A	A	1.073	9.878	1.050	-0.059	128.024	309.866	0.588	4.485	0.520	0.148	25.858	0.524	161.455
CHS	84	8	A	A	0.036	8.179	0.029	0.038	13.992	330.480	0.200	5.428	0.141	0.003	14.889	.	94.989
CHS	84	8	A	A	0.135	6.456	0.067	0.017	26.121	434.474	0.209	4.813	0.083	0.002	16.241	0.448	125.982
CHS	84	8	A	A	0.058	7.060	0.059	0.094	18.039	199.845	0.241	3.215	0.531	0.047	11.398	0.385	93.684
CHS	84	8	A	A	0.138	9.255	0.083	0.013	24.453	303.702	0.324	4.806	0.181	0.090	17.311	0.482	116.282

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
CHS	84	8	A	A	0.049	8.525	0.060	0.081	12.809	507.720	0.112	6.167	0.104	0.086	22.746	0.444	91.666
CHS	84	8	A	A	0.171	7.171	0.136	0.099	26.059	452.378	0.861	4.853	0.286	0.074	17.832	0.552	133.415
CHS	84	8	A	A	0.237	6.821	0.067	0.058	29.879	390.450	0.282	4.441	0.181	-0.008	20.969	0.446	129.933
CHS	84	8	A	A	0.405	7.096	0.035	0.015	42.267	402.437	0.337	3.978	0.040	0.023	16.332	0.246	153.759
CHS	84	8	A	A	0.143	8.202	0.047	0.009	26.783	758.246	0.189	3.932	0.146	0.070	19.685	0.259	118.783
CHS	84	8	A	A	0.084	8.623	0.068	0.135	17.169	625.417	0.293	4.503	0.036	0.004	20.630	0.368	99.957
CHS	85	8	A	A	0.197	11.829	0.253	0.015	41.385	666.920	0.469	3.403	0.148	0.092	44.614	0.397	132.600
CHS	85	8	A	A	0.055	12.957	0.413	0.593	24.395	848.967	0.758	3.658	0.437	0.044	41.949	0.364	126.508
CHS	85	8	A	A	0.091	21.267	0.427	0.208	21.983	734.587	0.787	4.719	0.510	0.350	38.996	0.516	135.134
CHS	85	8	A	A	0.313	28.517	0.603	0.096	88.747	2236.159	.	14.216	0.628	0.276	67.872	0.423	397.827
CHS	85	8	A	A	0.145	15.437	0.538	0.256	24.475	604.231	0.353	3.388	0.383	0.063	46.055	0.441	106.710
CHS	85	8	A	A	0.027	16.783	0.471	2.466	13.687	1750.650	0.687	3.732	0.351	0.127	54.907	0.188	128.096
CHS	85	8	A	A	0.127	15.566	0.597	-0.011	23.165	647.386	0.476	3.860	-0.030	0.050	50.910	0.525	120.692
CHS	85	8	A	A	0.232	16.978	0.409	0.167	31.460	723.201	0.628	4.561	0.385	0.378	70.405	0.454	115.445
CHS	85	8	A	A	0.159	16.007	0.195	0.060	28.035	733.021	0.286	4.450	0.252	0.062	37.585	0.477	126.571
CHS	85	8	A	A	0.097	10.087	0.426	0.021	25.622	756.098	0.970	5.665	0.266	0.030	42.993	0.271	140.373
CHS	86	8	A	A	0.087	9.580	0.065	-0.066	14.653	352.366	0.119	5.433	0.290	0.003	14.979	0.203	96.077
CHS	86	8	A	A	0.226	7.944	0.054	-0.048	29.516	312.113	0.105	5.568	0.018	-0.009	13.646	0.334	93.423
CHS	86	8	A	A	2.210	12.896	1.308	-0.053	142.118	726.261	0.470	2.463	0.069	0.008	19.851	0.340	168.043
CHS	86	8	A	A	0.288	11.266	0.053	-0.109	28.955	744.087	0.119	2.315	0.082	0.004	24.337	0.509	111.232
CHS	86	8	A	A	0.326	7.581	0.102	-0.034	65.163	309.801	0.083	2.117	0.049	0.003	10.314	0.358	142.082
CHS	86	8	A	A	0.433	6.147	0.044	0.007	29.583	279.717	0.127	2.772	0.149	-0.001	15.806	0.275	94.282
CHS	86	8	A	A	0.456	11.657	0.210	-0.063	48.554	151.878	0.223	3.427	0.045	0.036	12.692	0.169	97.404
CHS	86	8	A	A	0.157	10.524	0.095	-0.064	21.782	440.444	0.283	5.050	0.192	0.056	19.364	0.488	122.226
CHS	86	8	A	A	0.185	8.110	0.090	-0.064	29.489	460.547	0.287	7.241	0.093	0.071	17.708	0.318	137.999
CHS	86	8	A	A	1.026	7.116	0.056	-0.074	62.564	609.394	0.126	3.149	0.084	0.034	17.712	0.241	115.095
CHS	87	8	A	A	0.043	8.190	0.065	0.002	15.781	458.075	0.215	4.744	0.239	0.004	21.037	0.447	103.444
CHS	87	8	A	A	0.064	7.482	0.082	0.011	18.235	357.723	0.126	4.525	0.113	0.089	14.971	0.369	96.413
CHS	87	8	A	A	0.118	6.465	0.026	0.018	18.785	321.645	0.103	5.190	0.136	-0.007	13.280	0.285	90.633
CHS	87	8	A	A	0.633	7.173	0.041	0.005	67.078	401.391	0.143	5.840	0.322	0.047	16.836	0.448	128.838
CHS	87	8	A	A	0.441	9.458	0.094	-0.006	57.670	647.148	0.287	4.870	0.285	0.036	22.672	0.612	137.182
CHS	87	8	A	A	0.360	6.868	0.075	-0.011	44.668	549.662	0.420	3.525	0.175	0.051	15.510	0.356	108.828
CHS	87	8	A	A	0.052	6.539	0.129	0.014	21.975	547.832	0.641	5.290	0.102	0.066	16.049	0.420	119.838
CHS	87	8	A	A	0.359	7.014	0.051	0.021	31.491	247.584	0.109	4.431	0.318	0.002	10.399	0.349	96.260
CHS	87	8	A	A	0.108	6.482	0.052	0.001	23.623	398.447	0.159	5.275	0.135	-0.011	14.522	0.476	97.882
CHS	87	8	A	A	0.251	9.179	0.073	0.005	38.615	383.075	0.127	3.710	0.258	0.004	14.311	0.385	100.529
GAL	84	9	D	A	0.049	6.077	0.101	0.081	22.329	343.975	0.092	11.299	0.556	0.243	17.502	0.707	93.888
GAL	84	9	D	A	0.020	3.672	0.112	0.387	12.694	338.681	0.040	16.910	1.411	0.149	20.456	1.225	107.727
GAL	84	9	D	A	0.023	4.434	0.108	0.526	10.395	375.164	0.089	12.754	0.745	0.349	18.733	2.774	106.367
GAL	84	9	D	A	0.034	4.592	0.086	0.365	24.528	238.715	0.131	7.803	0.514	0.176	15.827	2.010	101.523
GAL	84	9	D	A	0.041	4.374	0.124	0.164	16.934	214.809	0.122	15.097	1.153	0.200	23.555	1.363	123.503
GAL	84	9	D	A	0.026	3.276	0.041	0.136	11.987	825.557	0.015	14.741	1.306	0.034	19.927	0.347	110.301
GAL	84	9	D	A	0.007	4.700	0.130	0.074	13.309	369.828	0.476	8.103	1.249	0.300	27.681	0.915	127.966
GAL	84	9	D	A	0.089	6.042	0.152	0.195	20.271	229.398	0.247	5.970	0.746	0.139	20.564	.	136.407
GAL	84	9	D	A	0.016	4.137	0.104	.	12.142	308.971	0.103	23.981	0.782	0.125	26.221	.	105.542
GAL	84	9	D	A	0.018	7.358	0.105	0.308	13.149	357.888	0.236	10.402	0.118	0.184	13.757	0.393	110.248
GAL	85	9	D	A	0.030	3.920	0.264	0.033	22.880	325.838	0.182	5.081	0.324	0.236	23.769	1.984	148.351

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
GAL	85	9	D	A	0.017	3.934	0.209	0.032	20.413	815.039	0.275	4.336	0.320	0.178	30.514	1.444	132.135
GAL	85	9	D	A	0.161	5.269	0.555	0.024	48.172	405.470	0.483	5.396	0.495	0.363	21.569	1.592	169.396
GAL	85	9	D	A	0.030	4.789	0.186	0.045	11.980	536.810	0.323	8.556	0.504	0.109	17.513	0.946	126.504
GAL	85	9	D	A	0.019	4.330	0.151	0.101	11.366	598.228	0.128	7.936	0.469	0.070	15.135	0.655	105.677
GAL	85	9	D	A	0.024	3.427	0.184	0.184	14.662	508.016	0.310	7.149	0.476	0.164	25.309	1.552	124.870
GAL	85	9	D	A	0.049	2.959	0.217	-0.015	28.849	500.345	0.412	5.250	0.178	0.171	25.949	1.145	150.798
GAL	85	9	D	A	0.034	4.217	0.158	0.632	16.765	304.671	0.200	9.680	0.415	0.181	16.198	1.538	136.348
GAL	85	9	D	A	0.016	3.743	0.203	0.175	6.538	316.343	0.260	3.077	1.197	0.027	22.304	2.372	74.700
GAL	85	9	D	A	0.009	3.853	0.056	0.060	16.588	405.423	0.071	2.851	0.645	0.109	12.996	1.114	96.611
GAL	86	9	D	A	0.276	12.633	0.548	-0.003	38.930	378.566	0.779	4.285	0.471	0.120	36.921	0.660	127.379
GAL	86	9	D	A	0.023	5.486	0.158	0.010	19.050	459.769	0.245	4.953	0.444	-0.020	18.288	0.962	123.170
GAL	86	9	D	A	0.114	5.401	0.524	0.258	39.097	324.864	0.341	5.569	0.555	0.080	17.411	0.744	143.519
GAL	86	9	D	A	0.131	9.814	0.667	-0.003	31.840	493.151	0.267	5.739	0.625	0.060	31.279	0.583	122.339
GAL	86	9	D	A	0.476	32.736	0.653	0.011	72.912	1367.599	0.648	9.873	1.244	0.146	40.697	1.113	228.091
GAL	86	9	D	A	0.173	4.607	0.166	-0.000	48.144	166.591	0.148	4.812	0.260	0.033	11.119	0.407	140.990
GAL	86	9	D	A	0.227	4.642	0.501	0.021	39.295	341.884	0.229	4.530	0.887	0.129	24.717	0.664	148.977
GAL	86	9	D	A	0.076	4.547	0.099	0.010	28.886	414.320	0.113	4.508	0.722	0.131	18.069	0.612	126.150
GAL	86	9	D	A	0.136	11.104	0.727	0.015	23.526	343.412	0.193	3.837	1.329	0.175	25.122	0.465	97.480
GAL	86	9	D	A	0.107	4.017	0.636	0.008	48.516	394.536	0.252	4.973	0.681	0.110	18.897	0.573	134.098
GAL	87	9	A	I	0.053	5.138	0.206	0.037	22.997	276.017	0.127	18.877	0.910	0.096	17.281	0.452	128.737
GAL	87	9	A	I	0.639	15.975	0.868	0.067	62.178	788.268	0.193	10.852	0.708	0.080	22.746	0.273	148.282
GAL	87	9	A	I	0.036	6.390	0.131	0.031	16.873	435.122	0.128	12.394	0.882	0.078	16.584	0.213	121.082
GAL	87	9	A	I	0.216	10.216	0.591	0.177	41.478	338.108	0.110	24.222	0.516	0.128	16.541	0.455	123.887
GAL	87	9	A	I	0.067	5.979	0.288	0.004	20.146	699.430	0.191	15.363	0.662	0.131	18.750	0.209	115.365
GAL	87	9	A	I	0.370	5.317	0.200	-0.019	41.080	271.699	0.125	8.928	0.336	0.104	10.910	0.255	100.631
GAL	87	9	A	I	0.105	8.036	0.652	0.034	25.648	325.363	0.097	10.807	0.462	0.084	14.797	0.195	120.658
GAL	87	9	A	I	0.051	6.134	0.406	0.225	27.065	421.723	0.139	10.313	0.500	0.066	16.268	0.390	120.061
GAL	87	9	A	I	0.040	6.420	0.452	0.003	19.825	664.183	0.178	15.961	0.830	0.108	20.859	0.213	128.697
GAL	87	9	A	I	0.057	3.323	0.085	-0.017	28.667	192.229	0.090	2.497	0.391	0.080	11.510	1.713	155.153
GAL	87	9	B	I	0.199	5.484	2.186	0.065	18.930	443.794	0.212	9.703	0.324	0.839	17.707	0.822	113.762
GAL	87	9	B	I	0.695	5.482	1.006	0.018	45.187	352.345	0.389	16.181	2.065	0.331	19.171	0.595	126.083
GAL	87	9	B	I	0.132	5.219	0.985	0.048	20.210	616.907	0.499	20.678	4.709	0.231	21.478	1.080	119.263
GAL	87	9	B	I	0.465	8.544	1.135	0.034	39.020	275.322	0.257	8.537	0.262	1.269	23.921	0.440	112.762
GAL	87	9	B	I	0.045	4.492	1.026	0.011	10.984	459.324	0.200	7.230	0.383	0.275	15.825	0.117	90.794
GAL	87	9	B	I	0.346	4.604	0.175	0.004	33.180	474.713	0.483	27.380	4.134	0.200	15.795	0.853	126.330
GAL	87	9	B	I	1.155	4.298	0.727	-0.003	76.025	364.265	0.550	4.517	0.737	0.186	21.485	0.470	125.708
GAL	87	9	B	I	0.123	5.018	0.404	-0.002	19.725	363.857	0.328	4.591	2.860	0.055	15.823	0.556	93.205
GAL	87	9	B	I	0.084	4.836	0.232	-0.010	18.884	471.749	0.558	9.037	2.335	0.130	19.966	0.880	119.524
GAL	87	9	B	I	0.300	4.926	0.905	0.032	26.732	661.132	0.189	11.688	1.075	0.885	24.271	0.182	130.077
GAL	87	9	C	I	0.130	7.795	0.101	0.049	41.894	556.897	0.214	10.434	0.297	0.323	23.321	4.169	118.207
GAL	87	9	C	I	0.145	2.846	0.111	0.011	37.480	209.586	0.247	7.131	0.381	0.149	20.941	2.474	120.833
GAL	87	9	C	I	0.627	4.292	0.207	0.036	154.167	724.865	0.443	9.101	0.832	0.188	18.970	1.373	260.053
GAL	87	9	C	I	0.492	5.922	0.162	0.003	106.787	185.197	0.325	3.136	0.276	0.187	12.117	1.259	159.309
GAL	87	9	C	I	0.134	9.099	0.056	-0.028	30.096	239.031	0.367	5.089	0.267	0.260	12.505	1.853	100.453
GAL	87	9	C	I	0.568	3.661	0.102	-0.007	111.925	176.018	0.438	6.474	0.138	0.218	17.173	2.467	202.008
GAL	87	9	C	I	2.140	27.457	0.207	-0.009	161.219	1521.858	0.853	8.184	0.463	0.492	24.390	5.284	195.782
GAL	87	9	C	I	0.076	6.012	0.373	0.025	82.993	261.474	0.482	5.542	0.270	0.300	25.272	3.934	148.724

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
GAL	87	9	C	I	0.502	7.988	0.096	0.033	64.073	261.197	0.175	5.801	0.301	0.238	21.616	2.085	132.457
GAL	87	9	C	I	0.554	13.123	0.113	0.005	76.576	618.536	0.333	6.242	0.358	0.281	31.351	4.110	150.037
GAL	87	9	C	I	1.147	2.520	0.189	0.006	462.907	217.931	0.405	4.987	0.135	0.440	11.937	1.395	402.591
GAL	87	9	C	I	0.071	5.373	0.310	-0.013	33.173	441.855	0.375	6.368	0.373	0.234	30.877	3.785	148.767
GAL	87	9	C	I	0.016	2.609	0.059	0.017	11.198	925.140	0.164	7.214	0.615	0.190	13.868	0.537	87.901
GAL	87	9	C	I	0.785	2.698	0.324	0.013	136.913	294.173	0.277	3.183	0.114	0.153	7.422	0.266	293.973
GAL	87	9	C	I	0.217	3.003	0.556	0.019	36.361	446.240	.	7.926	0.615	0.285	19.686	2.011	191.979
GAL	87	9	C	I	0.067	6.405	0.099	0.285	28.993	942.552	0.228	15.683	0.435	0.255	20.525	2.516	146.436
GAL	87	9	C	I	0.150	3.549	0.183	0.004	45.114	304.208	0.294	3.641	0.245	0.137	15.791	0.891	110.932
GAL	87	9	C	I	0.024	2.561	0.093	-0.010	15.610	208.974	0.093	6.020	0.858	-0.004	24.159	4.007	92.117
GAL	87	9	C	I	0.834	2.761	0.200	0.017	287.496	174.774	0.278	8.806	0.319	0.209	11.463	1.744	341.398
GAL	87	9	C	I	0.021	3.932	0.192	0.051	19.336	226.574	0.095	4.858	0.630	0.168	29.361	5.769	112.858
GAL	87	9	D	A	1.674	6.678	0.166	0.025	270.943	29.725	0.214	9.663	0.191	0.062	10.571	0.609	445.064
GAL	87	9	D	A	0.080	3.383	0.286	0.006	32.496	419.291	0.755	9.327	0.488	0.206	18.818	0.743	156.094
GAL	87	9	D	A	0.018	5.258	0.785	0.106	22.688	797.061	0.214	25.897	0.709	0.206	19.315	0.659	154.206
GAL	87	9	D	A	0.349	6.489	0.069	0.028	51.997	177.415	0.187	3.954	0.308	0.128	17.043	0.231	132.710
GAL	87	9	D	A	0.121	1.514	0.084	0.001	52.347	169.646	0.250	6.594	0.076	0.103	10.829	0.449	180.813
GAL	87	9	D	A	0.055	3.368	0.046	-0.007	26.327	466.868	0.490	10.371	0.529	0.180	24.865	0.695	158.857
GAL	87	9	D	A	0.074	3.831	0.270	-0.000	32.025	545.561	0.393	5.925	0.242	0.232	18.036	1.049	144.851
GAL	87	9	D	A	0.019	3.498	0.269	-0.008	21.773	455.384	0.263	6.164	0.435	0.191	22.803	1.683	125.855
GAL	87	9	D	A	0.080	3.003	0.182	0.010	37.636	539.029	0.441	7.184	0.465	0.299	18.203	0.722	179.747
GAL	87	9	D	A	0.042	2.314	0.145	-0.003	28.390	367.179	0.321	4.282	0.247	0.064	17.035	0.730	118.893
GAL	87	9	D	A	0.486	2.363	0.148	-0.005	85.341	331.405	0.271	11.703	0.187	0.110	10.572	0.359	353.452
GAL	87	9	D	A	0.967	7.896	0.049	-0.004	91.768	201.195	0.141	6.293	0.105	0.159	12.249	1.294	267.570
GAL	87	9	D	A	0.079	4.529	0.861	-0.023	16.907	999.710	0.149	9.626	1.470	0.245	28.381	0.303	132.083
GAL	87	9	D	A	0.071	3.273	0.102	-0.006	23.493	178.865	0.170	5.641	0.471	0.038	17.890	0.540	120.101
GAL	87	9	D	A	0.029	4.713	0.442	-0.016	29.772	587.947	0.511	7.461	0.430	0.205	30.193	1.168	149.546
GAL	87	9	D	A	0.060	3.860	0.294	-0.009	23.428	833.184	0.289	7.919	0.286	0.218	36.085	0.774	150.454
GAL	87	9	D	A	0.720	2.426	0.516	0.001	181.930	360.209	0.598	5.880	0.602	0.134	7.586	0.061	400.016
GAL	87	9	D	A	1.015	7.051	0.377	0.053	135.174	1010.002	0.213	10.170	0.272	0.149	17.274	0.633	215.659
GAL	87	9	D	A	0.046	3.602	0.163	0.032	14.330	560.006	0.179	4.558	0.212	0.120	17.894	1.532	98.291
GAL	87	9	D	A	0.092	3.042	0.190	0.015	38.212	534.355	0.256	6.412	0.319	0.069	16.328	1.239	143.721
GAL	87	9	E	I	0.383	3.897	0.517	0.019	58.145	460.735	0.104	7.896	0.241	0.074	28.426	0.345	107.935
GAL	87	9	E	I	0.260	5.681	0.925	0.010	42.245	560.551	0.174	128.476	1.242	0.019	18.310	0.194	134.810
GAL	87	9	E	I	0.133	4.032	0.072	0.050	19.018	481.687	0.138	6.498	0.449	0.105	20.330	0.198	111.094
GAL	87	9	E	I	0.464	9.926	1.308	-0.022	62.306	694.058	0.281	10.656	0.447	0.460	20.713	0.372	160.992
GAL	87	9	E	I	0.567	5.642	0.500	-0.006	43.716	560.536	0.126	31.655	0.459	0.063	18.371	-0.049	97.903
GAL	87	9	E	I	0.466	5.806	1.019	1.351	85.543	532.861	0.179	9.341	1.774	0.155	16.128	0.606	160.516
GAL	87	9	E	I	0.087	3.844	0.633	0.001	22.406	536.503	0.148	6.629	0.667	0.079	20.382	0.397	114.849
GAL	87	9	E	I	0.190	3.743	0.330	0.011	20.905	437.419	0.061	69.039	0.584	0.017	15.119	0.308	101.145
GAL	87	9	E	I	0.056	3.584	0.417	0.009	30.102	686.308	0.099	8.715	0.497	0.007	24.163	0.878	116.845
GAL	87	9	E	I	0.097	5.379	0.734	-0.000	22.841	636.160	0.212	7.454	0.418	0.109	18.960	0.368	134.232
GAL	87	10	F	I	0.012	2.891	0.111	0.002	8.734	147.748	0.440	5.185	0.250	0.241	15.830	4.686	100.997
GAL	87	10	F	I	0.008	1.921	0.160	0.005	11.074	111.388	0.231	4.707	0.169	0.834	12.520	2.928	78.189
GAL	87	10	F	I	-0.004	3.122	0.220	0.297	11.364	170.402	0.453	5.691	0.643	0.133	22.160	3.919	87.243
GAL	87	10	F	I	0.004	2.657	0.026	-0.009	8.159	85.809	0.127	2.693	0.168	0.159	11.632	2.857	58.178
GAL	87	10	F	I	0.050	2.702	0.271	0.023	17.618	170.592	0.554	5.169	0.577	0.261	14.490	3.094	139.382

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
GAL	87	10	F	I	0.003	1.815	0.047	0.021	8.036	204.569	0.109	4.157	0.259	0.194	13.362	0.766	60.697
GAL	87	10	F	I	0.007	2.024	0.070	0.003	11.124	105.832	0.336	3.332	0.133	0.516	9.791	1.500	111.373
GAL	87	10	F	I	0.131	4.545	0.097	-0.007	52.812	159.186	0.235	3.820	0.246	0.485	17.550	2.638	103.786
GAL	87	10	F	I	0.007	3.304	0.051	-0.007	8.136	123.002	0.130	3.478	0.342	0.156	15.093	2.112	65.786
GAL	87	10	F	I	0.039	2.868	0.211	0.016	33.909	236.410	0.797	4.078	0.293	0.522	12.426	3.314	167.318
GAL	87	10	F	I	0.035	3.248	0.104	-0.030	10.460	172.731	0.193	3.801	0.400	0.097	16.824	3.330	67.224
GAL	87	10	F	I	0.010	1.760	0.075	0.010	11.117	191.039	0.296	4.966	0.114	0.437	10.300	1.509	89.982
GAL	87	10	F	I	0.071	2.572	0.302	0.046	21.439	271.510	0.571	8.779	1.083	0.135	20.983	3.717	154.980
GAL	87	10	F	I	0.017	3.817	0.069	-0.020	11.475	137.116	0.339	5.212	0.393	0.217	13.460	4.617	85.343
GAL	87	10	F	I	0.016	2.053	0.039	-0.011	12.417	75.776	0.265	3.646	0.124	0.411	8.135	2.205	78.035
GAL	87	10	F	I	0.024	2.681	0.197	0.026	11.112	131.592	0.347	3.637	0.582	0.283	11.420	2.075	89.927
GAL	87	10	F	I	0.012	4.139	0.184	-0.004	16.973	190.409	0.375	4.473	0.339	0.180	16.719	3.172	82.942
GAL	87	10	F	I	0.014	2.232	0.067	0.004	38.894	118.867	0.272	3.060	0.180	0.246	12.861	1.791	72.060
GAL	87	10	F	I	0.012	3.159	0.383	0.066	15.612	202.675	0.758	3.010	0.702	0.450	18.639	5.228	107.873
GAL	87	10	F	I	0.010	3.378	0.054	-0.004	17.790	144.825	0.285	4.117	0.278	0.298	18.570	2.938	94.282
HER	84	9	A	A	0.009	5.322	1.155	0.325	7.733	296.836	0.085	6.098	0.205	0.144	10.929	0.494	66.379
HER	84	9	A	A	0.185	7.266	1.966	0.313	24.467	352.580	0.738	8.931	0.327	0.160	20.972	2.436	102.058
HER	84	9	A	A	0.118	6.090	2.395	0.493	21.045	430.013	0.276	7.394	0.282	-0.020	16.687	0.369	19.148
HER	84	9	A	A	1.324	10.418	1.200	0.639	109.800	230.136	0.286	14.454	0.066	0.030	20.013	0.290	148.696
HER	84	9	A	A	0.077	32.318	1.479	0.064	15.310	508.961	0.100	14.117	0.529	0.151	26.684	0.944	159.521
HER	84	9	A	A	0.141	7.341	0.804	0.746	17.389	546.641	0.128	19.785	1.027	0.144	21.152	0.510	138.057
HER	84	9	A	A	0.041	4.944	1.509	0.392	14.864	483.547	0.029	18.006	0.654	0.098	26.937	0.007	75.637
HER	84	9	A	A	0.678	9.397	1.046	0.134	72.659	500.845	0.303	12.937	0.425	0.066	22.503	0.172	150.804
HER	84	9	A	A	0.052	3.888	4.376	0.622	13.047	469.631	0.829	18.054	1.067	0.153	22.355	.	93.896
HER	84	9	A	A	0.054	3.550	2.405	0.155	11.325	448.095	0.427	4.436	0.194	0.031	21.943	0.216	94.409
HER	85	9	A	A	0.113	3.667	1.229	0.027	45.967	445.463	0.258	6.033	0.266	0.016	8.925	0.224	155.578
HER	85	9	A	A	0.023	3.341	0.045	0.010	17.941	568.104	0.301	13.467	0.176	0.022	10.888	0.295	92.031
HER	85	9	A	A	0.010	2.807	0.018	0.072	8.400	511.599	0.335	9.630	0.206	-0.008	9.737	0.159	64.588
HER	85	9	A	A	0.088	2.285	0.804	0.042	31.204	1031.738	0.185	7.623	0.178	0.034	6.348	0.122	101.151
HER	85	9	A	A	0.002	3.730	0.094	0.036	11.625	760.473	-0.041	9.860	0.208	0.012	9.851	0.192	111.528
HER	85	9	A	A	0.035	3.768	0.047	0.417	13.916	550.860	0.318	10.588	0.405	0.025	10.323	0.315	101.008
HER	85	9	A	A	0.043	2.581	0.944	0.015	18.394	428.597	0.369	5.801	0.233	0.050	9.015	0.041	106.713
HER	85	9	A	A	0.272	4.466	1.450	0.006	50.912	413.827	0.274	5.120	0.183	0.070	8.690	0.130	86.080
HER	85	9	A	A	0.032	3.234	0.097	0.458	19.979	518.372	0.405	9.990	0.394	0.092	12.907	0.233	112.615
HER	85	9	A	A	0.016	2.790	0.042	-0.004	16.176	623.454	0.467	6.078	0.231	0.016	10.948	0.434	93.052
HER	86	9	A	A	0.139	9.440	1.080	0.016	43.088	654.313	1.228	5.944	0.617	0.068	18.719	0.270	111.352
HER	86	9	A	A	0.011	3.345	0.046	0.006	13.277	504.851	0.150	4.737	0.238	0.077	9.517	0.900	93.137
HER	86	9	A	A	0.231	6.366	0.725	-0.002	50.045	436.777	0.543	2.853	0.347	0.047	14.721	0.339	119.882
HER	86	9	A	A	0.047	5.813	0.619	0.001	22.269	361.594	0.454	5.156	0.451	0.031	11.438	0.252	106.598
HER	86	9	A	A	0.246	7.132	1.883	0.037	42.422	407.701	0.213	7.293	0.437	0.011	16.501	0.233	99.866
HER	86	9	A	A	0.061	5.134	0.047	-0.011	30.848	530.083	0.159	8.567	0.113	0.011	10.923	0.185	120.783
HER	86	9	A	A	0.037	4.964	0.039	0.014	24.134	607.502	0.133	7.309	0.339	0.012	10.122	0.295	102.215
HER	86	9	A	A	0.030	4.984	0.042	0.002	20.009	538.321	0.161	4.169	0.219	0.031	9.068	0.242	77.021
HER	86	9	A	A	0.074	3.992	0.023	-0.016	34.991	809.361	0.220	5.013	0.289	-0.018	10.615	0.171	104.035
HER	86	9	A	A	0.013	3.630	0.042	-0.007	13.549	663.405	0.089	4.680	0.252	0.008	10.954	0.217	98.280
LLM	84	10	A	A	0.032	9.489	0.595	0.034	14.471	454.633	0.158	8.260	0.478	0.108	29.089	1.684	95.303
LLM	84	10	A	A	0.022	7.417	0.251	0.001	20.622	229.837	0.161	2.399	0.100	0.032	12.359	0.779	120.885

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
LLM	84	10	A	A	0.038	9.155	0.478	0.013	16.840	323.207	0.125	3.592	0.243	0.057	12.284	0.371	101.271
LLM	84	10	A	A	0.045	8.971	0.154	0.120	22.529	231.886	0.105	2.624	0.118	0.100	8.801	0.737	106.118
LLM	84	10	A	A	0.015	6.858	0.119	-0.001	11.629	277.610	0.093	3.649	0.109	0.048	11.792	0.512	90.653
LLM	84	10	A	A	0.075	7.982	0.185	0.021	31.216	353.005	0.147	4.586	0.362	0.132	13.690	0.460	132.099
LLM	84	10	A	A	0.076	5.677	0.396	0.109	24.123	373.031	0.124	4.568	0.307	0.084	12.780	0.395	109.010
LLM	84	10	A	A	0.021	6.115	0.189	0.008	8.613	238.188	0.114	3.244	0.299	0.066	10.832	.	74.702
LLM	84	10	A	A	0.027	9.774	0.145	0.010	12.484	417.667	0.152	3.631	0.450	0.053	18.582	0.485	101.045
LLM	84	10	A	A	0.063	9.681	0.473	0.020	24.342	420.245	0.217	4.432	0.756	0.112	25.702	0.243	123.089
LLM	85	9	A	A	0.287	14.690	1.993	0.002	42.858	441.835	0.209	2.551	0.344	0.067	11.765	0.742	89.460
LLM	85	9	A	A	0.048	10.072	0.935	-0.006	29.447	750.483	0.547	3.026	0.714	0.127	28.499	1.468	126.243
LLM	85	9	A	A	0.071	9.885	0.592	0.029	28.949	1292.530	0.299	2.670	0.662	0.085	29.761	0.692	109.707
LLM	85	9	A	A	0.073	11.572	0.601	0.030	28.279	404.323	0.175	3.847	2.585	0.062	10.579	0.493	88.891
LLM	85	9	A	A	0.463	13.654	1.333	0.037	74.219	987.376	0.560	4.488	1.835	0.105	19.275	0.967	152.158
LLM	85	9	A	A	0.303	10.276	0.933	0.008	116.164	491.409	0.441	2.862	1.570	0.080	20.966	0.841	213.882
LLM	85	9	A	A	0.198	11.603	1.136	0.066	63.951	547.496	0.318	3.903	1.481	0.096	15.639	0.700	159.402
LLM	85	9	A	A	0.489	7.838	1.009	0.035	98.999	497.525	0.277	1.582	0.335	0.065	7.215	0.525	268.295
LLM	85	9	A	A	0.128	9.585	0.535	0.017	49.377	576.983	0.309	2.255	1.202	0.048	20.297	0.510	130.390
LLM	85	9	A	A	0.016	11.387	0.659	0.031	16.482	555.737	0.174	2.791	0.465	0.150	16.355	0.997	84.345
LLM	86	9	A	A	0.023	8.582	0.647	-0.072	23.440	838.910	0.630	3.472	0.804	0.103	19.930	1.139	139.549
LLM	86	9	A	A	0.229	11.806	0.819	-0.055	59.575	782.679	0.446	3.902	0.545	0.147	21.446	0.869	161.852
LLM	86	9	A	A	0.064	9.565	0.458	-0.057	14.496	514.720	0.278	1.401	0.547	0.076	16.111	0.829	98.656
LLM	86	9	A	A	0.039	13.546	0.726	-0.111	26.583	596.284	0.624	3.843	0.348	0.097	19.347	0.689	131.618
LLM	86	9	A	A	0.013	8.888	0.279	-0.057	13.571	471.932	0.318	3.001	0.506	0.113	14.470	0.722	97.712
LLM	86	9	A	A	0.038	12.581	0.403	-0.001	30.041	675.051	0.417	7.185	0.871	0.158	18.958	1.124	152.570
LLM	86	9	A	A	0.049	7.923	0.582	-0.016	22.904	526.777	0.458	2.824	0.612	0.058	17.829	0.795	136.502
LLM	86	9	A	A	0.049	8.984	0.811	-0.071	23.258	677.010	0.487	2.882	0.809	0.101	20.081	1.160	128.601
LLM	86	9	A	A	0.045	11.446	0.677	-0.082	30.477	903.393	0.514	4.041	0.821	0.118	22.061	1.018	142.023
LLM	86	9	A	A	0.193	11.673	0.747	-0.082	56.364	933.977	0.712	4.597	0.608	0.177	11.419	0.550	171.478
LOT	84	10	A	A	0.512	6.633	0.784	0.008	49.936	413.991	0.489	1.685	0.200	0.125	9.067	0.396	106.680
LOT	84	10	A	A	0.102	6.803	0.493	0.073	19.002	300.752	0.539	2.712	0.196	0.141	7.046	0.669	97.310
LOT	84	10	A	A	0.208	6.042	0.609	0.023	23.582	358.073	0.322	1.996	0.202	0.105	7.842	0.923	86.569
LOT	84	10	A	A	0.113	6.448	0.396	0.022	19.088	216.067	0.519	2.254	0.271	0.054	6.941	0.651	88.647
LOT	84	10	A	A	0.184	6.666	0.273	0.006	24.271	282.665	0.365	2.322	0.178	0.090	8.031	0.109	93.077
LOT	84	10	A	A	0.092	7.894	0.544	0.067	13.560	400.487	0.466	2.682	0.267	0.106	8.942	0.103	86.060
LOT	84	10	A	A	0.218	5.907	0.418	0.016	23.901	444.583	0.322	3.065	0.301	0.073	9.440	.	104.055
LOT	84	10	A	A	0.159	6.341	0.814	0.036	27.606	459.967	0.364	3.090	0.387	0.039	9.259	.	119.260
LOT	84	10	A	A	0.145	6.800	0.577	0.013	21.058	287.715	0.486	2.692	0.169	0.103	8.313	.	96.412
LOT	84	10	A	A	0.053	6.232	0.472	0.016	10.335	318.472	0.297	2.478	0.154	0.081	8.978	0.628	66.178
LOT	85	10	A	A	0.102	10.992	0.377	0.020	24.202	402.913	0.828	2.404	0.155	0.050	9.084	0.170	112.948
LOT	85	10	A	A	0.194	11.685	0.633	0.007	39.234	427.553	0.581	2.598	0.156	0.056	10.735	0.139	140.860
LOT	85	10	A	A	0.167	6.480	0.413	0.014	31.033	379.262	0.696	1.810	0.177	0.050	6.620	0.039	104.371
LOT	85	10	A	A	0.106	10.429	0.537	0.009	24.750	415.949	1.024	2.813	0.232	0.099	8.172	0.168	114.437
LOT	85	10	A	A	0.076	3.424	0.542	0.010	12.021	302.690	0.268	2.126	0.065	0.076	4.183	0.082	86.820
LOT	85	10	A	A	0.093	14.081	0.441	0.095	24.394	386.157	0.718	3.392	0.563	0.061	8.882	0.100	121.628
LOT	85	10	A	A	0.074	12.029	0.693	0.008	11.641	333.003	0.792	2.415	0.231	0.044	7.011	0.186	78.201
LOT	85	10	A	A	0.126	10.166	0.407	0.015	14.394	336.606	0.448	1.677	0.085	0.063	6.294	0.118	100.550
LOT	85	10	A	A	0.291	10.336	0.899	0.051	37.818	432.614	0.682	2.626	0.089	0.064	8.162	0.139	103.484

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
LOT	85	10	A	A	0.060	9.604	0.815	0.029	12.778	655.468	0.724	2.593	0.243	0.051	7.848	0.123	134.634
LOT	86	10	A	A	0.074	6.250	0.215	-0.047	13.813	359.778	0.182	2.328	-0.023	0.009	5.786	0.153	63.747
LOT	86	10	A	A	0.043	4.686	0.567	-0.059	14.061	786.860	0.450	3.008	0.147	0.015	5.614	0.216	93.119
LOT	86	10	A	A	0.041	5.245	0.377	-0.048	11.973	592.829	0.513	2.646	0.021	0.033	6.451	0.106	92.134
MOB	84	9	A	A	0.079	5.996	0.169	0.112	18.645	347.813	0.186	14.706	0.929	0.144	20.859	1.435	139.569
MOB	84	9	A	A	0.033	3.818	0.152	0.006	6.382	320.481	0.240	9.152	0.653	0.063	19.610	1.026	121.127
MOB	84	9	A	A	0.053	5.339	0.331	0.115	10.698	680.461	0.317	16.991	0.763	0.084	17.278	0.495	114.505
MOB	84	9	A	A	0.111	7.883	0.166	0.133	24.347	322.564	0.191	8.353	0.707	0.067	19.230	0.309	115.661
MOB	84	9	A	A	0.080	5.132	0.085	-0.002	20.478	371.531	0.162	5.792	0.563	0.009	21.149	0.273	116.923
MOB	84	9	A	A	0.234	5.449	0.170	0.095	17.775	286.696	0.413	8.820	0.490	-0.018	16.929	0.265	135.127
MOB	84	9	A	A	0.187	4.063	0.109	0.100	19.346	296.755	0.170	6.494	1.061	1.085	12.898	0.255	155.847
MOB	84	9	A	A	0.081	5.602	0.047	0.105	14.230	495.207	0.275	24.747	0.885	0.125	19.524	.	123.267
MOB	84	9	A	A	0.091	5.517	0.179	0.150	10.531	470.112	0.209	12.042	0.970	0.050	20.770	.	103.125
MOB	84	9	A	A	0.118	6.032	0.115	0.075	18.780	339.390	0.180	10.050	0.337	-0.005	18.922	0.076	108.278
MOB	85	8	A	A	0.053	4.357	0.059	0.077	9.522	473.831	0.277	6.300	.	-0.023	11.932	0.572	83.616
MOB	85	8	A	A	0.254	6.767	0.204	0.108	31.715	484.197	0.586	7.017	0.354	0.053	21.660	0.618	125.916
MOB	85	8	A	A	0.102	4.574	0.078	0.137	12.295	365.675	0.208	5.395	0.348	0.007	20.077	0.294	95.877
MOB	85	8	A	A	0.063	5.763	0.055	0.201	13.182	376.981	0.286	4.970	0.366	-0.012	15.263	0.199	94.289
MOB	85	8	A	A	0.135	7.698	0.218	0.272	25.423	481.954	0.626	4.373	0.217	0.033	21.553	0.539	120.473
MOB	85	8	A	A	0.365	5.664	0.117	0.287	62.048	450.426	0.839	5.504	0.403	0.028	17.896	0.261	124.878
MOB	85	8	A	A	0.245	5.478	0.076	0.228	42.239	340.326	0.581	6.658	0.222	0.029	19.412	0.192	112.744
MOB	85	8	A	A	0.073	10.382	0.146	0.026	20.465	428.198	0.364	5.456	0.209	0.152	11.215	0.402	116.325
MOB	85	8	A	A	0.021	5.151	0.090	0.410	11.697	306.107	0.408	6.963	0.188	0.013	12.355	0.344	85.968
MOB	85	8	A	A	0.092	7.341	0.189	0.079	21.464	516.950	0.896	7.729	0.220	0.082	17.250	0.330	110.260
MOB	86	9	A	A	0.135	4.933	0.101	0.011	14.122	313.462	0.467	4.607	0.220	0.005	15.351	0.519	94.207
MOB	86	9	A	A	0.068	5.888	0.151	0.027	14.515	571.986	0.333	7.257	0.378	-0.026	20.433	0.464	104.993
MOB	86	9	A	A	0.036	5.007	0.039	-0.006	8.372	325.926	0.140	6.275	0.162	0.030	15.504	0.363	85.644
MOB	86	9	A	A	0.041	8.020	0.092	-0.008	9.774	450.110	0.620	7.633	0.324	0.039	22.193	0.566	92.723
MOB	86	9	A	A	0.125	7.144	0.110	0.007	13.947	336.724	0.542	3.151	0.177	-0.003	17.372	0.279	101.823
MOB	86	9	A	A	0.327	5.717	0.078	-0.004	27.168	348.728	0.444	5.074	0.214	-0.021	16.402	0.327	90.144
MOB	86	9	A	A	0.281	5.252	0.043	0.001	26.478	260.337	0.770	5.190	0.224	-0.022	14.368	0.234	108.176
MOB	86	9	A	A	0.057	7.310	0.107	-0.005	16.406	418.134	0.342	7.006	0.432	0.004	14.469	0.293	101.482
MOB	86	9	A	A	0.623	12.795	0.214	0.020	76.217	350.696	0.182	10.074	0.325	0.047	10.961	0.856	115.423
MOB	86	9	A	A	0.033	6.645	0.117	-0.014	10.554	549.613	0.274	8.866	0.410	-0.002	17.551	0.188	114.052
MRD	84	9	A	A	0.015	4.485	1.606	.	17.667	295.477	0.300	39.244	1.600	0.138	24.833	2.263	112.243
MRD	84	9	A	A	0.011	2.802	0.481	0.009	9.319	390.847	0.111	24.885	1.515	0.156	20.457	1.522	83.094
MRD	84	9	A	A	0.054	4.603	0.414	0.037	18.707	362.730	0.134	14.039	0.408	0.013	24.516	1.063	106.505
MRD	84	9	A	A	0.036	5.119	0.420	0.048	10.294	308.263	0.143	15.717	1.145	0.089	14.935	0.517	72.345
MRD	84	9	A	A	0.041	3.187	0.681	0.053	22.143	368.652	0.118	20.101	0.838	0.136	25.374	1.174	116.801
MRD	84	9	A	A	0.006	3.694	0.684	-0.012	16.079	464.926	0.164	19.097	1.274	0.123	32.307	1.164	98.955
MRD	84	9	A	A	0.028	3.487	1.036	0.064	14.980	253.097	0.114	40.680	1.803	0.062	24.495	0.925	96.048
MRD	84	9	A	A	0.029	3.486	0.256	0.037	25.291	525.940	0.029	26.259	0.925	0.061	22.043	0.693	111.660
MRD	84	9	A	A	0.025	2.012	0.679	0.010	12.996	445.910	0.131	69.872	0.871	0.150	26.180	.	97.387
MRD	84	9	A	A	0.008	3.447	0.747	0.098	11.975	421.964	0.092	19.951	1.100	0.104	23.214	0.977	86.725
MRD	85	9	A	A	0.008	2.399	0.786	0.044	11.282	615.461	0.284	15.890	0.908	0.033	21.513	0.684	101.116
MRD	85	9	A	A	0.126	3.998	0.329	0.028	22.313	663.246	0.144	13.951	0.613	0.049	16.607	0.394	104.379
MRD	85	9	A	A	0.030	3.180	0.627	0.242	19.453	851.850	0.235	5.965	1.024	0.134	22.073	0.763	121.847

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
MRD	85	9	A	A	0.017	2.294	0.286	0.157	8.531	778.363	0.056	4.867	0.733	0.077	17.944	0.279	84.101
MRD	85	9	A	A	0.002	1.723	1.069	0.056	17.560	637.028	0.674	9.584	0.429	0.124	14.312	0.624	110.223
MRD	85	9	A	A	-0.010	2.742	1.067	0.039	12.487	529.520	0.227	25.117	0.872	0.109	21.835	0.507	106.049
MRD	85	9	A	A	0.119	6.358	0.742	0.035	31.693	841.718	0.305	9.276	0.592	0.116	19.842	0.330	118.872
MRD	85	9	A	A	0.023	2.813	0.386	0.067	10.797	324.017	0.056	6.141	0.596	0.070	17.971	0.750	71.847
MRD	85	9	A	A	0.037	2.777	0.573	0.018	18.829	466.448	0.124	14.998	0.946	0.039	21.202	0.590	104.843
MRD	85	9	A	A	0.085	4.564	0.260	-0.006	29.053	592.087	0.167	22.026	0.870	0.082	14.269	0.476	116.404
MRD	86	9	A	A	-0.009	2.736	0.179	-0.007	9.843	366.510	0.026	6.209	0.502	0.012	19.440	0.471	87.732
MRD	86	9	A	A	0.026	2.117	0.205	0.008	7.964	373.804	0.048	4.266	0.407	0.030	16.907	0.400	66.134
MRD	86	9	A	A	0.034	2.438	0.669	-0.017	12.768	557.922	0.360	6.453	0.147	0.049	20.613	1.278	90.759
MRD	86	9	A	A	0.019	4.345	0.578	-0.011	10.882	109.520	0.239	9.022	0.341	0.038	14.611	0.862	77.012
MRD	86	9	A	A	0.004	2.312	0.231	-0.010	8.486	283.300	0.152	8.678	0.462	0.066	16.693	0.572	65.344
MRD	86	9	A	A	0.020	2.631	0.211	0.008	7.915	311.166	0.027	6.173	0.494	0.015	15.949	0.377	68.556
MRD	86	9	A	A	0.054	4.302	0.837	-0.003	23.863	283.354	0.086	8.602	0.862	0.087	24.187	0.483	109.901
MRD	86	9	A	A	0.167	8.714	0.743	0.056	30.167	232.810	0.077	12.276	0.625	0.127	17.673	0.979	120.240
MRD	86	9	A	A	0.047	2.011	0.255	-0.004	14.829	338.297	0.084	5.676	0.563	0.002	16.751	0.300	88.157
MRD	86	9	A	A	0.056	4.640	0.420	-0.028	19.371	226.086	0.046	12.202	0.837	0.076	27.492	0.444	107.761
MRD	87	10	A	A	0.020	2.510	0.409	0.006	12.793	283.211	0.049	6.862	0.441	0.065	16.822	0.303	144.762
MRD	87	10	A	A	0.053	2.884	0.612	-0.000	13.782	800.531	0.041	5.663	0.680	0.164	29.795	0.534	125.083
MRD	87	10	A	A	0.036	2.398	0.200	0.006	12.339	293.684	0.161	6.301	0.649	0.071	14.181	0.224	126.302
MRD	87	10	A	A	0.007	4.381	0.358	0.036	15.361	334.549	0.063	17.245	0.862	0.096	26.725	0.685	117.175
MRD	87	10	A	A	0.013	1.915	0.181	-0.001	8.079	610.537	0.025	3.526	0.569	0.071	12.560	0.231	87.241
MRD	87	10	A	A	0.063	3.052	0.450	-0.007	16.065	461.408	0.036	11.440	0.345	0.062	16.675	0.367	77.677
MRD	87	10	A	A	0.136	3.463	0.364	-0.004	24.999	370.708	0.102	14.862	0.508	0.128	22.322	0.492	220.919
MRD	87	10	A	A	0.013	2.266	0.181	-0.004	7.993	434.932	0.027	9.527	0.426	0.082	27.462	0.329	78.263
MRD	87	10	A	A	0.024	3.036	0.782	-0.005	17.016	596.723	0.119	13.787	0.381	0.088	19.169	0.936	96.722
MRD	87	10	A	A	0.005	2.814	0.268	-0.009	7.432	737.419	0.041	3.658	0.447	0.104	16.345	0.282	93.730
PAM	84	10	A	A	0.070	4.083	1.426	0.223	11.418	498.580	0.115	6.671	0.791	0.118	13.300	0.400	103.242
PAM	84	10	A	A	0.054	4.362	0.045	-0.029	11.617	607.016	0.057	8.564	0.020	0.067	13.596	2.509	108.163
PAM	84	10	A	A	0.155	5.619	0.081	0.084	10.963	726.172	0.084	4.670	0.290	0.142	17.279	0.187	105.628
PAM	84	10	A	A	0.078	3.479	0.061	0.051	11.291	748.498	0.030	6.756	0.373	0.093	14.523	0.141	96.993
PAM	84	10	A	A	0.020	3.358	0.090	0.023	9.354	499.003	0.039	6.630	0.235	0.085	14.008	0.165	88.747
PAM	84	10	A	A	0.055	4.194	0.260	0.190	11.302	570.114	0.023	15.703	0.609	0.068	13.967	0.187	109.223
PAM	84	10	A	A	0.022	3.363	0.143	0.020	8.070	362.773	0.085	6.075	0.065	0.026	11.690	0.112	90.600
PAM	84	10	A	A	0.090	4.176	0.431	0.100	9.192	1126.348	0.123	7.016	0.694	0.125	13.117	0.040	105.767
PAM	84	10	A	A	0.231	5.874	0.125	0.171	17.637	923.983	0.119	7.893	1.120	0.199	21.153	.	125.120
PAM	84	10	A	A	0.292	7.671	0.122	0.001	12.242	323.223	0.069	3.478	0.405	0.052	21.725	.	106.990
PAM	85	10	A	A	0.056	3.479	0.036	0.048	11.005	552.025	0.077	9.869	.	-0.054	20.294	0.497	99.075
PAM	85	10	A	A	0.094	4.515	0.147	0.084	10.857	317.623	0.074	5.964	0.276	0.056	19.143	0.113	95.605
PAM	85	10	A	A	0.103	5.220	0.098	0.019	10.211	232.879	0.071	5.023	0.394	0.011	15.570	0.180	88.435
PAM	85	10	A	A	0.034	3.268	0.034	0.106	8.087	550.033	0.032	5.165	0.447	0.074	13.968	0.254	93.078
PAM	85	10	A	A	0.071	2.365	0.017	0.150	7.059	482.667	0.042	7.462	0.243	0.034	20.868	0.313	74.733
PAM	85	10	A	A	0.114	5.255	0.072	0.360	13.254	402.551	0.103	6.138	0.660	0.148	12.477	0.243	82.219
PAM	85	10	A	A	0.119	3.173	0.025	0.042	10.027	477.743	0.076	6.062	0.205	0.063	15.759	0.114	94.372
PAM	85	10	A	A	0.028	3.702	0.029	0.115	7.633	426.110	0.012	6.330	0.403	0.067	16.398	0.033	84.059
PAM	85	10	A	A	0.219	4.327	0.047	0.039	15.556	427.026	0.035	5.017	0.192	0.056	13.561	0.211	100.318
PAM	85	10	A	A	0.121	3.261	0.050	0.117	11.671	379.612	0.042	8.389	0.420	0.042	18.041	0.272	101.835

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
PAM	86	10	A	A	0.063	3.746	0.058	-0.055	4.969	344.345	0.035	3.843	0.227	0.040	20.670	0.077	77.985
PAM	86	10	A	A	0.405	6.353	0.190	-0.028	19.396	300.936	0.061	6.474	0.040	0.073	14.084	0.332	90.403
PAM	86	10	A	A	0.447	4.585	0.120	-0.066	23.777	532.035	0.099	3.978	0.165	0.056	24.162	0.277	86.894
PAM	86	10	A	A	0.042	3.185	0.078	-0.016	5.877	388.971	0.037	4.587	0.504	0.034	24.708	0.210	57.858
PAM	86	10	A	A	0.030	3.156	0.042	-0.045	8.936	334.645	0.022	5.052	0.137	0.001	15.616	0.114	80.571
PAM	86	10	A	A	0.076	4.275	0.086	-0.041	7.372	477.039	0.116	4.744	0.261	0.029	35.990	0.125	93.931
PAM	86	10	A	A	0.043	3.611	0.039	-0.026	7.772	347.480	0.035	4.236	0.308	0.039	17.557	0.254	72.732
PAM	86	10	A	A	0.049	4.854	0.086	-0.060	8.192	479.699	0.053	4.281	0.087	0.070	25.450	0.058	85.268
PAM	86	10	A	A	0.100	6.981	0.062	-0.057	10.362	444.622	0.095	7.528	0.427	0.053	23.515	0.083	94.727
PAM	86	10	A	A	0.219	6.322	0.106	-0.063	12.886	356.288	0.036	3.502	-0.127	0.025	13.506	0.119	93.906
PAS	87	9	A	A	0.303	3.937	1.175	0.056	34.287	456.407	0.165	5.189	0.345	0.071	10.131	0.168	185.228
PAS	87	9	A	A	0.229	4.052	1.274	0.008	36.545	285.802	0.150	4.642	0.282	0.071	11.415	0.188	123.123
PAS	87	9	A	A	0.066	3.603	0.100	0.009	12.749	339.737	0.104	4.265	0.252	0.061	8.350	0.118	76.279
PAS	87	9	A	A	0.153	3.274	0.049	0.015	30.306	311.171	0.236	4.612	0.215	0.042	8.036	0.152	176.150
PAS	87	9	A	A	0.182	3.261	0.212	0.014	56.347	562.255	0.349	5.403	0.259	0.037	10.938	0.376	173.414
PAS	87	9	A	A	0.030	7.165	0.615	0.010	29.170	599.665	0.339	3.957	0.281	0.039	12.996	0.428	97.396
PAS	87	9	A	A	0.063	2.940	0.174	-0.004	9.888	290.139	0.206	4.435	0.295	0.028	9.172	0.227	143.840
PAS	87	9	A	A	0.117	5.870	0.683	0.003	27.833	298.828	0.628	7.204	0.281	0.021	11.477	0.454	98.580
PAS	87	9	A	A	0.211	6.342	1.854	-0.005	29.036	431.212	0.340	5.679	0.249	0.050	15.629	0.361	128.787
PAS	87	9	A	A	0.141	6.509	0.318	-0.005	36.525	407.366	0.635	3.484	0.164	0.115	12.881	0.780	122.261
PEN	85	8	A	A	0.166	4.918	0.127	0.605	15.279	1213.893	1.092	5.440	0.359	-0.021	25.097	0.587	125.839
PEN	85	8	A	A	0.068	4.255	0.095	0.324	8.126	2407.064	0.618	6.379	0.990	0.025	25.127	0.275	92.465
PEN	85	8	A	A	0.096	5.939	0.138	0.645	10.003	973.114	0.426	5.294	0.603	0.034	18.924	0.132	104.574
PEN	85	8	A	A	0.223	5.464	0.145	0.365	25.135	970.037	0.456	3.841	0.561	0.077	28.915	0.057	123.604
PEN	85	8	A	A	0.046	3.143	0.085	0.059	6.846	685.306	0.408	2.515	0.541	-0.002	14.735	0.182	69.795
PEN	85	8	A	A	0.049	4.726	0.151	0.130	10.980	1358.456	0.681	3.667	0.968	0.004	29.448	0.291	98.674
PEN	85	8	A	A	0.052	3.979	0.127	2.509	12.102	1341.370	0.705	5.042	0.828	0.122	20.776	0.149	96.384
PEN	85	8	A	A	0.032	3.446	0.080	0.241	8.490	1120.806	0.611	5.794	0.737	0.036	20.547	0.444	86.678
PEN	85	8	A	A	0.109	3.828	0.074	0.356	8.176	1249.507	0.426	3.761	0.298	0.036	15.960	0.066	83.201
PEN	85	8	A	A	0.067	3.324	0.156	0.071	8.775	3209.641	0.643	5.704	1.367	-0.023	24.013	0.415	91.131
PEN	86	8	A	A	0.133	7.656	0.517	0.010	12.759	717.150	0.174	5.015	0.584	0.154	111.729	0.497	98.155
PEN	86	8	A	A	1.129	11.200	0.370	-0.003	63.421	1250.844	0.204	3.059	0.423	0.119	52.223	0.360	134.723
PEN	86	8	A	A	0.648	10.508	0.597	-0.004	64.053	629.815	0.122	4.854	0.272	0.119	46.425	0.379	140.947
PEN	86	8	A	A	0.024	8.412	0.677	-0.007	22.458	660.995	0.678	4.183	0.376	0.040	55.134	0.458	126.309
PEN	86	8	A	A	0.227	10.371	0.300	0.028	37.175	824.637	0.275	4.889	0.483	-0.009	79.809	0.360	124.631
PEN	86	8	A	A	0.390	9.048	0.250	0.021	40.288	1300.020	0.349	4.384	0.491	0.051	58.556	0.506	130.052
PEN	86	8	A	A	0.162	8.593	0.415	-0.019	37.974	542.897	0.234	4.628	0.463	0.080	83.992	0.259	112.995
PEN	86	8	A	A	0.144	8.839	0.242	-0.012	36.199	577.913	0.646	3.960	0.355	0.056	36.089	0.369	134.551
PEN	86	8	A	A	0.236	9.450	0.384	0.021	37.822	990.541	0.323	4.399	0.374	0.088	39.635	0.476	128.945
PEN	86	8	A	A	0.106	10.415	0.251	0.024	25.769	508.952	0.175	4.550	0.285	0.122	33.520	0.210	117.845
PEN	87	9	A	A	0.196	7.879	0.195	0.132	20.624	1059.198	0.654	5.361	0.661	0.065	30.891	0.368	113.239
PEN	87	9	A	A	0.233	9.180	0.123	0.034	32.481	1057.514	0.927	4.288	0.259	0.112	24.769	0.433	123.969
PEN	87	9	A	A	0.074	10.759	0.203	0.041	21.088	652.664	0.533	6.720	0.401	0.089	16.806	0.268	140.949
PEN	87	9	A	A	0.569	11.876	0.244	-0.016	28.312	850.682	0.417	12.275	0.521	0.187	42.388	0.374	129.090
PEN	87	9	A	A	0.011	4.342	0.112	0.041	19.486	1492.745	0.950	6.193	0.460	0.124	16.365	0.253	120.059
PEN	87	9	A	A	0.106	7.094	0.224	0.001	12.987	508.976	0.332	4.604	0.324	0.038	22.671	0.358	93.520
PEN	87	9	A	A	0.340	7.516	0.369	0.003	34.517	1043.901	0.815	3.372	0.190	0.128	25.392	0.268	114.815

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
PEN	87	9	A	A	0.000	3.435	0.087	-0.005	15.282	1189.622	0.606	3.975	0.426	0.005	13.999	0.237	81.972
PEN	87	9	A	A	0.146	8.020	0.154	0.004	21.925	1124.670	0.666	10.786	0.438	0.169	24.544	0.306	77.277
PEN	87	9	A	A	0.029	3.773	0.200	0.146	29.050	3299.688	1.197	5.234	0.770	0.074	21.598	0.301	152.289
ROU	84	9	A	A	0.057	6.812	0.311	0.034	13.385	398.129	0.192	16.542	0.250	0.007	11.170	0.779	86.183
ROU	84	9	A	A	0.109	7.050	0.362	0.007	17.799	539.283	0.235	35.006	0.274	0.101	15.472	0.341	115.041
ROU	84	9	A	A	0.025	4.084	0.233	0.061	10.462	502.437	0.214	15.218	0.250	0.091	15.868	0.883	79.336
ROU	84	9	A	A	0.347	8.997	0.395	0.019	26.886	701.500	0.404	12.296	0.284	0.007	15.485	0.301	107.745
ROU	84	9	A	A	0.341	10.121	0.276	0.035	31.468	461.428	0.311	16.950	0.359	0.068	16.641	0.285	111.149
ROU	84	9	A	A	0.158	11.855	0.403	0.163	19.073	653.102	0.371	15.948	0.363	0.229	9.220	0.161	100.217
ROU	84	9	A	A	0.195	9.322	0.354	0.036	23.376	470.230	0.371	22.899	0.363	0.191	12.528	.	125.520
ROU	84	9	A	A	0.090	5.919	0.261	0.033	13.563	411.452	0.294	10.848	0.174	0.088	10.532	.	89.053
ROU	84	9	A	A	0.084	7.678	0.237	-0.010	14.761	680.993	0.210	15.141	0.435	0.067	13.156	0.146	100.031
ROU	84	9	A	A	0.193	9.764	0.334	-0.012	20.433	428.443	0.294	15.659	0.263	0.064	10.093	0.280	96.527
ROU	85	9	A	A	0.122	3.576	0.312	0.028	40.554	260.192	0.268	3.550	0.132	0.029	8.755	0.514	168.915
ROU	85	9	A	A	0.527	5.363	0.200	0.034	68.410	356.458	0.224	4.714	0.174	0.043	9.465	0.253	148.697
ROU	85	9	A	A	0.067	2.182	0.195	0.022	16.662	386.636	0.212	5.385	0.238	0.029	6.483	0.210	148.509
ROU	85	9	A	A	0.036	2.569	0.379	0.025	30.777	436.625	0.312	2.121	0.106	0.015	7.584	0.289	101.047
ROU	85	9	A	A	0.061	4.052	0.185	0.014	16.571	997.827	0.508	4.127	0.260	0.037	11.058	0.332	85.916
ROU	85	9	A	A	0.101	2.977	0.204	0.009	39.823	179.213	0.303	2.842	0.093	0.065	5.355	0.335	160.126
ROU	85	9	A	A	0.114	2.644	0.109	0.034	28.934	623.374	0.062	2.464	0.227	0.052	38.093	0.162	94.316
ROU	85	9	A	A	0.216	3.646	0.902	0.035	22.311	561.171	0.343	3.081	0.216	0.049	13.868	0.180	89.892
ROU	85	9	A	A	0.077	6.432	0.309	0.033	26.436	833.422	0.339	3.082	0.307	0.058	15.165	0.486	117.606
ROU	85	9	A	A	0.235	3.933	0.350	0.027	51.891	317.709	0.125	3.468	0.162	0.069	10.620	0.188	84.429
SAB	84	9	A	A	0.040	6.035	0.433	0.071	18.537	312.101	0.126	13.921	0.832	0.070	21.755	1.278	131.974
SAB	84	9	A	A	0.057	3.158	0.239	0.088	16.650	388.823	0.066	8.595	0.601	0.066	17.293	0.289	112.576
SAB	84	9	A	A	0.119	3.056	0.242	0.054	20.032	333.606	0.082	4.057	0.268	0.040	11.491	1.230	88.841
SAB	84	9	A	A	0.071	4.278	0.274	0.039	14.504	137.806	0.107	8.652	0.434	0.029	17.859	0.257	130.979
SAB	84	9	A	A	0.066	3.220	0.235	0.081	12.144	345.217	0.047	7.716	0.349	0.011	21.362	0.170	118.832
SAB	84	9	A	A	0.044	3.182	0.204	0.014	10.843	366.823	0.084	6.171	0.124	-0.004	20.388	0.002	108.920
SAB	84	9	A	A	0.026	2.431	0.129	0.010	6.770	300.362	0.059	7.006	0.516	0.256	19.197	0.058	89.357
SAB	84	9	A	A	0.355	4.766	0.180	0.041	71.539	307.420	0.109	4.096	0.223	0.028	17.897	0.152	155.620
SAB	84	9	A	A	0.031	2.763	0.328	0.091	15.042	261.260	-0.002	14.392	0.916	0.027	17.759	0.326	125.973
SAB	84	9	A	A	0.027	3.014	0.127	0.069	10.212	367.799	0.043	3.709	0.335	0.090	18.879	0.232	95.519
SAB	85	9	A	A	0.052	2.864	0.086	0.014	18.000	264.390	0.240	12.181	0.035	0.026	12.941	0.285	134.954
SAB	85	9	A	A	0.011	3.215	0.377	0.389	12.100	235.174	0.062	8.256	0.621	0.086	13.163	0.234	94.901
SAB	85	9	A	A	0.051	3.418	0.136	0.057	19.309	218.213	0.399	4.602	0.127	-0.014	13.560	0.255	102.971
SAB	85	9	A	A	0.135	2.876	0.108	0.246	26.464	263.140	0.194	3.203	0.305	0.051	16.603	0.246	126.758
SAB	85	9	A	A	0.076	5.457	0.138	0.362	24.248	391.842	0.152	6.058	0.338	0.092	15.252	0.083	110.687
SAB	85	9	A	A	0.033	4.124	0.168	0.192	16.584	383.038	0.227	4.505	0.501	-0.006	24.648	0.155	92.483
SAB	85	9	A	A	0.049	2.400	0.251	0.753	19.384	454.963	0.093	4.944	0.496	-0.005	16.426	-0.021	100.920
SAB	85	9	A	A	0.040	3.696	0.113	0.061	20.425	280.039	0.335	3.099	0.272	0.037	12.693	0.075	91.276
SAB	85	9	A	A	0.051	3.087	0.685	0.238	23.556	219.028	0.144	8.011	0.643	0.100	11.176	0.252	111.337
SAB	85	9	A	A	0.202	4.857	0.180	0.218	43.500	292.467	0.342	3.336	0.106	0.054	13.003	0.084	180.714
SAB	86	9	A	A	0.037	5.403	0.182	-0.007	16.536	300.538	0.120	3.254	0.496	-0.005	21.235	0.487	92.629
SAB	86	9	A	A	0.089	7.941	1.039	0.088	21.223	446.083	0.122	5.871	0.913	0.053	26.548	0.201	133.682
SAB	86	9	A	A	0.061	4.201	0.495	-0.008	22.542	439.091	0.309	5.234	0.390	0.050	23.986	0.297	124.312
SAB	86	9	A	A	0.075	6.059	1.049	0.040	19.602	357.243	0.237	6.580	0.530	0.036	28.436	0.889	108.584

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
SAB	86	9	A	A	0.038	4.484	0.150	-0.029	14.271	376.802	0.155	4.691	0.495	-0.012	24.473	0.395	101.295
SAB	86	9	A	A	0.189	4.583	0.212	0.017	26.407	334.164	0.134	3.383	0.359	0.042	19.541	0.194	120.386
SAB	86	9	A	A	0.013	3.466	0.285	0.024	9.040	201.033	0.114	5.016	0.507	0.071	21.913	0.111	90.717
SAB	86	9	A	A	0.090	8.689	0.387	0.060	17.495	445.540	0.126	5.299	0.573	0.023	31.015	0.080	126.447
SAB	86	9	A	A	0.072	4.509	0.165	-0.007	18.415	403.295	0.156	3.059	0.353	0.025	21.278	0.376	127.995
SAB	86	9	A	A	0.018	4.014	0.232	0.076	13.638	337.911	0.143	6.679	0.482	0.020	23.187	0.088	101.783
SAP	84	10	A	A	0.012	6.672	0.141	0.100	10.859	349.567	0.090	8.582	0.443	0.140	9.948	.	91.388
SAP	84	10	A	A	0.028	8.261	0.101	0.022	11.074	318.683	0.163	8.764	-0.017	0.034	10.020	0.262	93.831
SAP	84	10	A	A	0.055	6.541	0.071	0.016	7.981	423.559	0.096	7.984	0.166	0.076	11.174	0.075	87.106
SAP	84	10	A	A	0.020	5.289	0.047	0.001	8.645	395.680	0.065	4.209	0.199	0.002	10.511	0.306	92.892
SAP	84	10	A	A	0.020	8.121	0.151	0.021	8.234	375.583	0.107	8.780	0.161	0.033	9.918	0.195	93.455
SAP	84	10	A	A	0.014	6.134	0.077	0.120	11.255	327.547	0.091	8.369	0.240	0.026	11.773	0.188	102.663
SAP	84	10	A	A	0.016	7.243	0.062	0.009	10.592	519.541	0.069	7.660	0.167	0.062	11.422	0.188	87.081
SAP	84	10	A	A	0.032	6.603	0.181	.	8.004	400.291	0.087	10.832	.	0.118	13.830	0.160	83.674
SAP	84	10	A	A	0.021	5.201	0.364	0.095	10.036	343.495	0.073	9.479	0.277	0.065	9.174	.	101.794
SAP	84	10	A	A	0.017	4.262	0.053	0.073	8.506	547.486	0.061	8.337	0.223	0.022	11.883	.	89.839
SAP	85	8	D	A	0.178	10.992	0.151	0.026	29.526	469.660	0.281	7.811	0.026	0.058	22.621	0.526	126.938
SAP	85	8	D	A	0.348	10.052	0.136	0.044	53.918	298.678	0.210	8.509	0.063	0.066	20.095	0.213	151.979
SAP	85	8	D	A	0.144	8.524	0.152	0.362	34.962	435.628	0.345	7.738	0.158	0.051	17.379	0.183	134.739
SAP	85	8	D	A	0.425	11.489	0.206	0.027	98.257	508.981	0.335	5.462	0.062	0.050	20.078	0.235	173.596
SAP	85	8	D	A	0.204	11.312	0.257	0.042	42.782	320.944	0.201	5.434	0.159	0.031	17.491	0.229	120.390
SAP	85	8	D	A	0.202	11.929	0.208	0.024	46.918	405.450	0.295	3.440	0.128	0.002	17.328	0.395	136.649
SAP	85	8	D	A	0.228	9.210	0.209	0.256	35.541	320.384	0.279	6.791	0.108	0.060	11.204	0.070	127.132
SAP	85	8	D	A	0.277	12.251	0.328	0.013	55.627	487.560	0.297	7.533	0.120	0.032	22.761	0.302	198.991
SAP	85	8	D	A	0.126	10.453	0.343	0.015	31.243	578.714	0.447	6.727	0.408	0.031	20.885	0.191	146.277
SAP	85	8	D	A	0.816	7.953	0.176	0.054	107.944	227.915	0.172	7.876	0.186	0.055	9.873	0.201	204.989
SAP	86	8	D	A	0.393	10.785	0.342	-0.046	45.616	568.903	0.239	4.586	0.061	0.020	16.452	0.193	119.604
SAP	86	8	D	A	0.547	6.719	0.237	-0.045	57.103	491.943	0.325	3.753	0.029	0.009	16.374	0.304	150.061
SAP	86	8	D	A	0.668	6.425	0.104	-0.075	50.742	628.299	0.250	2.764	0.109	0.003	17.970	0.388	120.017
SAP	86	8	D	A	0.112	6.282	0.219	-0.086	20.267	518.543	0.103	5.443	-0.003	0.063	18.470	0.197	95.231
SAP	86	8	D	A	0.135	8.284	0.355	-0.037	22.971	667.441	0.250	3.278	0.100	0.025	23.248	0.136	112.315
SAP	86	8	D	A	0.444	7.649	0.276	-0.044	44.366	620.613	0.172	4.451	0.001	0.035	23.360	0.112	133.113
SAP	86	8	D	A	0.547	6.905	0.206	-0.066	50.810	425.496	0.165	4.373	1.416	0.047	20.112	0.210	111.486
SAP	86	8	D	A	0.317	7.320	0.417	-0.057	40.334	559.756	0.110	3.387	-0.019	0.015	16.380	0.154	108.315
SAP	86	8	D	A	0.357	7.119	0.186	-0.030	41.128	327.148	0.131	5.371	0.009	0.012	18.702	0.155	116.089
SAP	86	8	D	A	0.205	4.260	0.121	-0.052	23.749	425.122	0.145	2.114	-0.018	0.035	20.118	0.104	75.567
SAP	87	7	A	I	0.606	7.499	0.177	-0.004	39.643	504.193	0.166	2.791	0.110	0.032	17.467	0.079	91.260
SAP	87	7	A	I	0.066	9.120	0.180	0.086	16.928	359.133	0.184	9.000	0.248	0.076	20.238	0.046	83.812
SAP	87	7	A	I	0.371	8.328	0.182	0.008	30.277	408.441	0.154	4.740	0.135	0.024	14.231	0.042	105.148
SAP	87	7	A	I	0.040	10.365	0.233	-0.005	16.308	746.096	0.339	4.500	0.194	0.020	27.645	0.398	119.612
SAP	87	7	A	I	0.270	6.368	0.188	-0.009	26.433	339.452	0.153	5.270	0.059	0.067	15.363	0.141	96.254
SAP	87	7	A	I	0.081	6.774	0.076	-0.008	16.863	309.519	0.173	4.377	0.046	0.049	14.368	0.187	81.163
SAP	87	7	A	I	0.159	15.254	0.443	-0.000	29.942	372.757	0.301	7.504	0.071	0.149	22.750	0.169	129.255
SAP	87	7	A	I	0.264	10.089	0.134	0.008	41.819	477.349	0.236	6.697	0.037	0.074	17.039	0.384	120.961
SAP	87	7	A	I	0.073	6.004	0.067	0.012	11.071	196.846	0.066	6.072	0.142	0.042	13.664	0.249	68.294
SAP	87	7	A	I	0.199	6.460	0.087	0.025	17.956	181.197	0.282	8.203	0.148	0.028	20.706	0.306	117.760
SAP	87	7	A	I	0.066	5.308	0.116	0.007	9.861	234.884	0.081	8.642	0.120	0.086	12.021	0.084	76.283

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
SAP	87	7	A	I	0.098	5.308	0.155	0.016	9.845	191.478	0.130	5.283	0.123	0.067	14.490	0.175	86.447
SAP	87	7	A	I	0.323	8.638	0.230	0.036	31.969	606.249	0.213	10.135	0.206	0.116	19.567	0.255	132.788
SAP	87	7	A	I	0.108	8.145	0.062	0.168	11.875	315.673	0.150	8.441	0.382	0.138	20.193	0.308	108.693
SAP	87	7	A	I	0.031	6.725	0.110	0.006	13.493	468.605	0.369	7.873	0.055	0.036	19.588	0.280	112.016
SAP	87	7	A	I	0.116	9.466	0.346	0.102	33.591	492.555	0.463	5.139	0.037	0.112	17.972	0.143	133.139
SAP	87	7	A	I	0.094	6.042	0.150	0.008	14.842	508.160	0.161	4.266	0.122	0.070	17.852	0.082	100.184
SAP	87	7	A	I	0.109	7.562	0.137	0.012	15.985	300.381	0.298	8.184	0.175	0.093	22.904	0.179	115.662
SAP	87	7	A	I	0.121	6.634	0.062	-0.018	12.593	320.541	0.232	8.155	0.050	0.050	19.833	0.132	92.524
SAP	87	7	A	I	0.593	8.385	0.129	-0.014	40.356	629.404	0.232	3.903	0.094	0.149	20.132	0.241	122.055
SAP	87	8	A	I	0.046	6.929	0.096	0.004	18.035	542.909	0.160	4.020	0.242	0.062	28.091	2.435	104.077
SAP	87	8	A	I	0.078	9.638	0.137	0.096	17.899	448.694	0.205	5.838	0.174	0.090	19.057	1.763	110.457
SAP	87	8	A	I	0.103	7.721	0.112	0.055	24.210	412.503	0.169	3.639	0.224	0.053	19.757	0.912	104.823
SAP	87	8	A	I	0.100	9.151	0.058	-0.011	32.487	426.679	0.153	3.939	0.041	0.032	20.856	1.509	117.650
SAP	87	8	A	I	0.042	8.732	0.060	0.033	19.105	304.394	0.156	4.508	0.132	0.022	18.070	1.276	127.896
SAP	87	8	A	I	0.090	6.523	0.155	0.003	24.873	207.705	0.219	5.354	0.154	0.055	21.297	2.379	117.362
SAP	87	8	A	I	0.044	6.603	0.046	0.023	14.934	331.510	0.121	6.357	0.015	0.059	20.618	0.339	95.980
SAP	87	8	A	I	0.130	6.890	0.073	-0.002	31.667	341.562	0.123	4.732	0.046	0.052	15.541	1.852	108.268
SAP	87	8	A	I	0.032	5.918	0.060	-0.007	11.713	327.411	0.116	3.252	0.055	0.037	17.359	1.995	84.513
SAP	87	8	A	I	0.452	10.938	0.243	0.009	69.001	314.946	0.253	5.120	0.195	0.050	18.716	1.477	152.198
SAP	87	8	A	I	0.255	6.684	0.211	-0.003	24.566	292.325	0.118	3.926	0.127	0.070	15.564	1.320	93.144
SAP	87	8	A	I	0.034	6.704	0.053	0.039	17.022	413.730	0.123	5.048	0.147	0.072	20.616	0.616	112.101
SAP	87	8	A	I	0.114	8.621	0.081	0.046	23.764	365.122	0.149	11.434	0.091	0.093	16.572	0.906	149.387
SAP	87	8	A	I	0.062	6.603	0.085	0.015	19.742	502.028	0.108	5.012	0.112	0.026	19.351	0.680	118.078
SAP	87	8	A	I	0.348	9.102	0.077	0.028	50.414	488.096	0.204	5.990	0.164	0.047	19.515	0.987	127.402
SAP	87	8	A	I	0.054	7.826	0.111	0.074	19.865	264.702	0.232	4.681	0.175	0.073	20.469	1.446	123.772
SAP	87	8	A	I	0.201	5.935	0.104	0.006	44.605	262.129	0.277	4.367	0.021	0.032	12.637	1.997	138.297
SAP	87	8	A	I	0.055	7.730	0.131	0.004	25.473	392.379	0.222	3.711	0.113	0.028	14.645	1.511	119.717
SAP	87	8	A	I	0.108	6.632	0.074	0.005	19.872	200.507	0.161	2.825	0.097	0.084	12.347	3.063	86.727
SAP	87	8	A	I	0.160	6.836	0.326	0.015	26.857	268.049	0.182	5.470	0.077	0.109	17.134	0.943	112.143
SAP	87	8	B	I	0.120	7.374	0.128	-0.005	27.414	549.535	0.119	5.588	0.174	0.071	17.008	0.235	97.922
SAP	87	8	B	I	0.083	6.569	0.146	-0.011	45.512	415.503	0.139	6.890	0.091	0.091	20.021	0.371	131.965
SAP	87	8	B	I	0.092	8.522	0.137	0.026	27.948	430.539	0.114	4.418	0.058	0.079	18.243	0.409	113.915
SAP	87	8	B	I	0.403	9.351	0.227	0.032	74.300	559.178	0.148	5.018	0.155	0.097	22.360	0.456	152.460
SAP	87	8	B	I	0.122	4.578	0.068	0.017	35.423	607.368	0.104	7.745	0.239	0.053	28.489	0.483	106.432
SAP	87	8	B	I	0.161	9.397	0.288	0.085	39.834	571.135	0.129	5.749	0.344	0.036	23.764	0.464	139.522
SAP	87	8	B	I	0.292	5.475	0.176	0.002	55.568	573.631	0.090	5.018	0.159	0.005	17.779	0.303	112.020
SAP	87	8	B	I	0.056	8.096	0.172	-0.003	16.558	363.045	0.119	2.066	0.104	0.055	13.820	0.110	97.665
SAP	87	8	B	I	0.086	6.533	0.186	0.012	23.346	355.527	0.220	8.773	0.133	0.038	18.683	0.242	113.315
SAP	87	8	B	I	0.062	11.624	0.158	0.036	17.172	269.868	0.101	9.016	0.209	0.064	15.718	0.087	87.261
SAP	87	8	C	I	0.050	5.783	0.074	0.019	17.032	642.856	0.161	5.273	0.172	0.060	17.542	0.379	101.614
SAP	87	8	C	I	0.256	6.137	0.114	0.005	37.477	521.446	0.110	5.877	0.146	0.037	12.670	0.419	101.829
SAP	87	8	C	I	0.319	7.495	0.073	0.015	50.811	549.479	0.136	3.664	0.085	0.032	14.950	0.338	136.550
SAP	87	8	C	I	0.348	8.727	0.162	0.005	50.136	438.139	0.113	4.914	0.105	0.059	19.526	0.414	128.231
SAP	87	8	C	I	0.066	7.284	0.045	0.009	18.956	396.937	0.094	3.372	0.212	0.046	17.478	0.107	87.357
SAP	87	8	C	I	0.874	9.580	0.149	0.042	86.210	697.522	0.225	4.891	0.141	0.051	20.353	0.244	125.840
SAP	87	8	C	I	0.449	7.689	0.102	0.009	65.481	636.242	0.192	4.162	0.281	0.073	17.756	0.303	144.791
SAP	87	8	C	I	0.141	9.320	0.058	-0.001	21.851	417.094	0.093	3.441	0.120	0.042	17.386	0.165	87.657

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
SAP	87	8	C	I	0.182	9.085	0.052	0.034	43.763	406.185	0.183	2.623	0.174	0.036	13.182	0.211	120.463
SAP	87	8	C	I	0.258	8.490	0.121	0.012	48.027	772.228	0.146	4.277	0.119	0.022	21.761	0.374	132.916
SAP	87	8	D	A	0.084	7.128	0.109	-0.000	19.822	497.838	0.089	9.977	0.193	0.094	20.872	0.270	88.392
SAP	87	8	D	A	0.130	7.087	0.128	-0.009	34.887	197.602	0.236	5.349	-0.027	-0.003	13.928	0.390	123.687
SAP	87	8	D	A	0.127	7.165	0.151	-0.002	31.899	211.845	0.127	3.244	0.018	0.033	12.023	0.242	114.130
SAP	87	8	D	A	0.097	6.400	0.168	-0.001	28.723	275.306	0.292	11.999	0.157	0.018	19.212	0.268	136.561
SAP	87	8	D	A	0.180	7.497	0.160	0.002	49.174	395.475	0.382	3.829	0.090	0.061	20.736	0.283	146.144
SAP	87	8	D	A	0.044	5.563	0.221	0.003	18.582	351.388	0.420	3.289	0.055	0.056	21.754	0.267	141.940
SAP	87	8	D	A	0.728	6.368	0.292	-0.012	145.498	244.336	0.342	3.016	0.020	-0.012	20.534	0.100	179.750
SAP	87	8	D	A	0.310	7.517	0.192	0.004	54.169	429.027	0.417	13.059	0.028	0.050	21.695	0.266	140.405
SAP	87	8	D	A	0.061	8.123	0.172	0.002	21.174	575.390	0.462	5.880	0.166	0.043	33.897	0.243	124.088
SAP	87	8	D	A	0.030	5.326	0.128	0.004	17.228	418.784	0.298	6.834	0.104	-0.004	13.392	0.213	105.254
SAP	87	8	E	I	0.114	6.550	0.088	-0.014	31.497	496.052	0.210	3.074	0.079	0.035	18.733	0.092	113.165
SAP	87	8	E	I	0.046	5.094	0.032	0.032	22.275	549.317	0.153	2.182	0.194	0.059	22.889	0.386	95.888
SAP	87	8	E	I	0.051	10.652	0.137	0.040	20.498	350.725	0.143	3.854	0.024	0.047	18.564	0.142	109.538
SAP	87	8	E	I	0.026	9.231	0.065	-0.017	11.349	518.726	0.091	5.587	0.064	0.043	25.124	0.115	83.688
SAP	87	8	E	I	0.054	6.626	0.033	0.009	16.745	697.708	0.152	4.227	0.421	0.076	45.112	0.176	110.144
SAP	87	8	E	I	0.148	7.525	0.083	-0.006	38.124	482.448	0.204	4.671	0.241	0.055	23.932	0.036	127.121
SAP	87	8	E	I	0.154	5.849	0.073	-0.003	38.344	400.795	0.200	2.765	0.174	0.100	24.368	0.302	122.356
SAP	87	10	D	A	0.094	3.823	0.104	-0.001	9.545	245.795	0.194	3.491	0.024	0.024	13.351	0.064	83.217
SAP	87	10	D	A	0.097	5.696	0.456	0.002	13.452	519.642	0.358	5.381	0.115	0.082	17.764	0.396	94.663
SAP	87	10	D	A	0.025	10.900	0.194	-0.009	10.346	395.813	0.445	3.415	0.023	0.038	27.141	0.296	95.547
SAP	87	10	D	A	0.086	6.107	0.147	0.005	9.287	107.029	0.126	2.571	0.047	-0.021	15.463	0.195	76.797
SAP	87	10	D	A	0.086	6.066	0.330	0.105	16.705	447.048	0.319	3.586	0.152	0.022	29.895	0.202	94.487
SAP	87	10	D	A	0.052	5.915	0.271	0.037	10.072	338.227	0.099	5.148	0.089	0.059	16.694	0.198	75.976
SAP	87	10	D	A	0.096	4.194	0.136	0.007	21.148	138.249	0.257	3.369	0.006	0.026	9.118	0.155	121.545
SAP	87	10	D	A	0.159	6.897	0.174	0.010	26.161	549.845	0.380	2.951	0.184	0.044	51.717	0.263	113.557
SAP	87	10	D	A	1.009	17.257	0.179	0.011	47.111	552.627	0.255	4.482	0.112	0.056	25.895	0.273	119.654
SAP	87	10	D	A	0.070	7.423	0.066	-0.007	11.837	264.561	0.114	3.796	0.021	0.011	22.807	0.172	84.915
SJR	84	10	B	A	0.012	1.315	0.194	0.013	8.147	330.360	0.074	2.789	0.042	0.382	7.438	1.058	68.193
SJR	84	10	B	A	0.015	2.123	0.073	0.011	5.977	121.857	0.179	2.133	0.013	0.095	1.701	0.131	46.851
SJR	84	10	B	A	0.084	3.765	0.100	0.060	18.428	504.803	0.104	8.486	0.422	0.379	14.637	.	116.580
SJR	84	10	B	A	0.033	1.271	0.181	0.033	11.216	350.594	0.139	2.384	0.059	0.115	8.547	0.121	69.635
SJR	84	10	B	A	0.012	1.241	0.151	0.010	6.846	190.271	0.096	2.946	0.033	0.223	5.753	0.150	56.593
SJR	84	10	B	A	0.020	1.905	0.263	-0.001	11.964	356.170	0.182	3.967	0.053	0.250	6.143	0.191	86.934
SJR	84	10	B	A	0.016	1.354	0.180	0.028	9.179	293.960	0.087	3.218	0.098	0.204	8.678	0.068	64.039
SJR	84	10	B	A	0.013	0.994	0.138	0.028	5.640	237.978	0.061	2.926	0.074	0.225	4.825	0.210	56.344
SJR	84	10	B	A	0.023	2.196	0.145	0.046	11.956	220.571	0.230	3.463	0.149	0.224	5.969	.	87.035
SJR	84	10	B	A	0.019	0.884	0.127	0.017	8.841	248.659	0.074	1.727	0.033	0.191	9.572	0.154	71.508
SJR	85	8	B	A	0.260	0.053	0.016	0.087	23.043	141.216	0.025	1.030	.	0.006	2.613	0.129	63.487
SJR	85	8	B	A	0.050	0.078	0.018	0.063	9.879	193.058	0.026	0.887	.	0.012	1.345	0.095	56.005
SJR	85	8	B	A	0.136	0.141	0.075	0.114	21.978	580.644	0.160	2.299	0.086	0.024	8.151	0.451	105.105
SJR	85	8	B	A	0.181	0.326	0.051	0.342	15.407	354.860	0.102	2.531	0.055	0.085	5.202	0.101	59.172
SJR	85	8	B	A	0.131	0.537	0.084	-0.002	26.390	386.995	0.056	3.028	0.229	0.102	5.704	0.225	83.203
SJR	85	8	B	A	0.010	0.493	0.061	1.051	10.520	447.409	0.113	2.628	0.425	0.031	4.851	0.103	65.560
SJR	85	8	B	A	0.167	0.758	0.039	0.583	50.842	573.746	0.226	3.967	0.147	0.073	9.035	0.115	140.186
SJR	85	8	B	A	0.069	0.904	0.068	1.805	17.291	537.338	0.125	2.163	0.063	0.122	9.755	0.009	76.132

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
SJR	85	8	B	A	0.144	0.128	0.022	0.014	24.405	88.807	0.023	0.856	0.003	0.023	1.521	0.002	51.237
SJR	85	8	B	A	0.043	0.165	0.083	0.099	17.791	714.976	0.093	4.069	-0.052	-0.006	9.053	0.173	90.439
SJR	86	8	E	A	0.020	0.416	0.079	-0.003	8.660	289.938	0.013	3.457	0.019	0.110	5.919	0.127	62.782
SJR	86	8	E	A	0.077	0.212	0.055	0.296	9.215	158.704	0.064	1.800	0.078	0.030	2.995	0.128	48.315
SJR	86	8	E	A	1.170	5.383	0.291	-0.003	54.531	549.809	.	5.842	0.180	0.239	15.021	1.473	112.282
SJR	86	8	E	A	0.170	0.661	0.035	-0.005	11.226	441.301	0.117	3.876	0.056	0.081	13.449	0.227	77.912
SJR	86	8	E	A	0.051	0.469	0.066	-0.000	9.395	586.901	0.083	5.723	0.032	0.091	13.912	0.169	71.822
SJR	86	8	E	A	0.089	0.260	0.034	0.014	14.580	494.930	0.065	4.495	0.085	0.124	17.314	0.146	90.363
SJR	86	8	E	A	0.277	0.117	0.037	-0.010	25.295	110.760	0.012	1.634	-0.012	0.039	1.635	0.060	47.155
SJR	86	8	E	A	0.060	0.207	0.023	-0.016	13.308	295.281	0.043	1.417	0.042	0.037	4.943	0.064	71.831
SJR	86	8	E	A	0.008	0.479	0.050	0.025	11.006	564.252	0.057	4.447	0.018	0.107	8.335	0.215	78.167
SJR	86	8	E	A	0.005	0.068	0.006	-0.000	1.063	38.854	0.006	0.286	-0.004	0.012	0.660	0.012	6.539
SJR	87	8	A	I	0.268	2.268	0.149	0.016	44.302	618.989	0.105	5.338	0.111	0.494	8.656	1.558	113.370
SJR	87	8	A	I	0.334	2.825	0.162	0.020	50.908	511.625	0.147	6.842	0.062	0.550	8.301	1.316	117.207
SJR	87	8	A	I	0.032	2.334	0.112	-0.005	11.882	227.165	0.128	4.090	0.000	0.273	7.312	1.239	78.933
SJR	87	8	A	I	0.114	2.557	0.157	-0.009	26.210	271.503	0.093	5.463	0.057	0.297	9.565	1.345	98.367
SJR	87	8	A	I	0.378	2.847	0.125	-0.012	58.821	368.233	0.097	4.517	0.055	0.279	8.712	1.336	130.582
SJR	87	8	A	I	0.030	2.193	0.207	-0.009	12.997	327.875	0.095	5.904	0.024	0.314	5.571	1.339	79.325
SJR	87	8	A	I	0.128	2.799	0.123	0.003	23.706	268.721	0.137	3.130	0.057	0.173	6.958	1.129	86.432
SJR	87	8	A	I	0.118	2.534	0.142	0.030	25.508	285.902	0.241	7.178	0.027	0.401	7.988	1.303	111.502
SJR	87	8	A	I	0.104	0.133	0.028	-0.003	23.457	436.635	0.046	2.443	0.007	0.077	5.446	0.124	53.081
SJR	87	8	A	I	0.112	0.208	0.030	-0.008	18.676	392.395	0.035	3.457	0.017	0.033	3.626	0.362	71.263
SJR	87	8	B	A	0.022	1.672	0.050	0.001	10.149	456.670	0.056	6.404	0.148	0.219	8.042	1.315	64.835
SJR	87	8	B	A	0.064	3.037	0.102	0.050	27.908	384.989	0.201	6.249	0.239	0.114	4.718	0.495	96.205
SJR	87	8	B	A	0.097	3.631	0.138	0.016	17.513	922.619	0.096	7.688	0.242	0.321	22.907	4.056	98.047
SJR	87	8	B	A	0.083	0.700	0.045	-0.001	17.335	146.226	0.015	3.404	0.080	0.168	1.983	0.118	50.013
SJR	87	8	B	A	0.044	2.447	0.078	-0.008	15.919	293.964	0.071	7.707	0.241	0.246	12.540	2.351	93.659
SJR	87	8	B	A	0.050	0.299	0.050	0.030	14.853	231.186	0.064	5.635	-0.004	0.119	3.140	0.495	81.881
SJR	87	8	B	A	0.019	1.288	0.105	-0.010	12.424	338.705	0.077	7.992	0.041	0.246	5.951	0.549	70.713
SJR	87	8	B	A	0.415	1.462	0.151	0.011	49.504	376.807	0.151	7.603	0.127	0.276	6.478	0.485	111.007
SJR	87	8	B	A	0.023	0.261	0.037	0.011	7.126	314.893	0.021	2.538	0.112	0.198	5.942	0.165	48.006
SJR	87	8	B	A	0.503	4.423	0.126	0.001	69.346	571.171	0.124	9.946	0.131	0.229	13.582	2.306	152.596
SJR	87	8	C	I	0.019	2.251	0.187	-0.002	14.076	602.273	0.117	6.885	0.245	0.370	9.316	3.209	97.815
SJR	87	8	C	I	0.046	0.343	0.026	-0.001	10.185	395.897	0.022	2.665	0.024	0.166	3.592	0.322	63.563
SJR	87	8	C	I	0.006	1.195	0.268	0.028	15.635	661.825	0.503	6.592	0.225	1.288	8.668	20.276	99.653
SJR	87	8	C	I	0.015	1.784	0.125	0.038	13.813	499.967	0.139	7.769	0.353	0.469	12.009	3.605	100.976
SJR	87	8	C	I	0.014	1.619	0.176	0.177	14.975	681.403	0.215	8.636	0.426	0.843	10.471	5.862	94.887
SJR	87	8	C	I	0.030	2.214	0.159	0.012	17.529	766.591	0.098	7.109	0.426	1.055	11.152	3.618	98.497
SJR	87	8	C	I	0.030	1.839	0.063	0.008	15.152	521.597	0.175	3.066	0.249	0.968	7.252	1.847	90.177
SJR	87	8	C	I	0.039	1.778	0.106	0.016	14.361	614.158	0.144	5.203	0.253	0.394	10.237	3.220	93.470
SJR	87	8	C	I	0.102	0.273	0.036	-0.011	16.984	446.579	0.034	2.121	-0.012	0.184	5.393	0.347	69.516
SJR	87	8	C	I	0.020	1.179	0.111	-0.001	10.673	355.167	0.100	6.557	0.211	0.374	11.124	2.664	85.332
SJR	87	8	D	I	0.030	1.991	0.094	-0.010	16.034	298.444	0.047	4.287	-0.019	0.138	8.330	0.728	59.152
SJR	87	8	D	I	0.012	3.185	0.121	0.076	12.837	684.298	0.134	6.320	-0.024	0.163	10.562	0.525	76.067
SJR	87	8	D	I	0.010	2.733	0.114	-0.006	13.238	764.341	0.106	3.907	0.098	0.186	17.199	1.810	89.961
SJR	87	8	D	I	0.072	0.705	0.057	-0.008	25.248	221.790	0.088	1.505	-0.018	0.102	3.529	0.534	70.653
SJR	87	8	D	I	0.111	5.700	0.170	0.006	43.272	267.147	0.135	7.354	0.154	0.227	19.800	1.408	136.269

Table A-10 Contd.

LOC	YR	MTH	SITE	SURVEY	Ag	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Zn
SJR	87	8	D	I	0.018	0.597	0.055	-0.004	8.218	269.841	0.025	2.538	-0.049	0.116	2.672	0.435	40.869
SJR	87	8	D	I	0.054	4.244	0.136	-0.015	30.056	240.840	0.093	5.334	-0.011	0.204	17.837	1.032	107.772
SJR	87	8	D	I	0.019	3.672	0.126	-0.002	13.839	817.394	0.157	5.890	0.230	0.176	15.783	1.537	111.576
SJR	87	8	D	I	0.025	3.157	0.242	-0.005	14.737	583.714	0.186	6.223	0.007	0.685	17.229	3.252	105.123
SJR	87	8	D	I	0.042	1.698	0.122	-0.009	13.512	543.424	0.093	8.965	0.013	0.206	14.168	1.736	105.381
SJR	87	8	E	I	0.086	2.262	0.150	-0.005	25.871	207.329	0.132	5.728	-0.018	0.328	7.957	1.500	80.321
SJR	87	8	E	I	0.126	0.149	0.033	-0.003	32.868	361.784	0.039	1.019	-0.074	0.049	3.849	0.079	74.666
SJR	87	8	E	I	0.189	0.332	0.021	-0.011	20.107	168.029	0.004	1.516	-0.069	0.045	2.471	0.189	49.481
SJR	87	8	E	I	0.066	1.073	0.119	-0.002	12.583	657.422	0.079	7.647	0.060	0.391	11.817	0.724	105.977
SJR	87	8	E	I	0.058	0.259	0.057	0.005	17.622	731.092	0.142	3.158	-0.019	0.130	6.687	0.098	71.116
SJR	87	8	E	I	0.039	0.612	0.041	0.014	9.019	175.533	0.035	2.060	0.069	0.133	2.108	0.188	52.042
SJR	87	8	E	I	0.050	0.497	0.022	-0.006	13.210	362.480	0.021	1.332	-0.007	0.037	3.752	0.079	51.707
SJR	87	8	E	I	0.089	2.094	0.132	0.003	24.040	433.660	0.212	5.915	0.042	0.521	8.325	1.406	123.139
SJR	87	8	E	I	0.069	2.070	0.179	0.013	16.779	547.240	0.127	7.094	0.192	0.255	14.391	1.680	103.978
SJR	87	8	E	I	0.139	3.318	0.172	0.021	20.235	638.424	0.180	4.105	0.099	0.326	11.233	0.513	108.538