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Geological Survey of Canada

GEOCHEMICAL DATA FOR THE BAY OF CHALEUR - MITE PROJECT # 1.2 (PHASE 2)

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INTRODUCTION

The Geological Survey of Canada's Metals in the Environment (MITE) initiative consists of multidisciplinary research studies that are examining metal distributions in the Canadian environment, and the extent to which natural metal levels have been affected by human activities. As part of the MITE Point Sources Subprogram, this project focuses on metal distributions in marine sediments near a coastal lead smelter in Belledune, New Brunswick. The purpose of this study is to assess the fluxes and dispersal patterns of metals released to the Bay of Chaleur from both natural and anthropogenic sources, and to characterize the processes that collect and redistribute metals in the marine environment.

The Bay of Chaleur receives metals from a variety of sources including a lead smelter, two thermal generating stations, a mercury-cell chlor-alkali plant, and numerous mined and unmined base metal deposits (Hildebrand, 1984; Parsons and Cranston, 2000). Previous marine environmental research in Belledune Harbour has documented contamination of sediment, water, and shellfish by cadmium and lead, which were introduced via air emissions and wastewater from the smelter (Uthe and Zitko, 1980; Ray et al., 1981; Bewers et al., 1987; Uthe et al., 1987; Bourgoin et al., 1991). In the present study, we have examined metal concentrations and pore water redox chemistry in modern and historical marine sediments throughout the Bay of Chaleur to determine the relative fluxes of metals from natural and anthropogenic sources, and to assess the dispersion of metals from the Belledune lead smelter.

This report includes the geochemical data collected during Phase 2 of the Geological Survey of Canada MITE Project #1.2. Geochemical data from a previous field program (Phase 1) in the Bay of Chaleur are provided in Cranston (2000).

FIELD OPERATIONS

A sediment sampling campaign was carried out from September 20 to October 1, 1999 (cruise 99046) aboard the CCGS *Opilio*, collecting 39 gravity cores and 43 surface sediment samples from the study area (Figure 1, Table 1). Sediment samples were also collected from six New Brunswick rivers to evaluate fluvial inputs

of metals to the Bay. A detailed description of the sampling program, including a trip narrative, is provided in Cranston et al. (1999). Grab samples were frozen on the ship and transported to GSC-Atlantic for processing. The gravity cores were kept upright and returned to a temporary field laboratory set up at the Noranda Bulk Handling Facility at Belledune. Cores were subsampled within 24 hours of collection into 7 dram polystyrene vials. The base of each vial had been pre-drilled with four 1-mm diameter holes and fitted with a 25-mm diameter, 8-µm pore size Whatman 540 filter paper. Each vial was inserted into a 50 mL centrifuge tube and centrifuged at approximately 1500 RPM for 15 minutes. Pore water was expelled through the filter paper, through the holes in the vials, and collected in the centrifuge tube. The sediment vials were removed from the centrifuge tubes, and the extracted pore waters (varying from 0.5 to 5 mL) were poured into pre-labelled 7 mL scintillation vials. Pore water analyses were carried out at the field lab to determine dissolved salinity, ammonium, and sulfate concentrations. Sediment subsamples were returned to the GSC-Atlantic Geochemistry Laboratory for metal and organic carbon analyses.

FIELD LABORATORY METHODS

Pore water salinity was determined by diluting 100 µL of sample with 6.5 mL of deionized water and measuring the conductivity with an Orion model 125 conductivity meter. Analyzing various dilutions of standard seawater produced a calibration curve. Precision and accuracy of the method were approximately ± 0.2 ppt.

Dissolved ammonium was determined using a colourimetric method revised from Solarzano (1969). One millilitre of deionized water was placed in a 15 mL test tube, along with 100 µL of sample or standard. A 500 µL addition of phenol-ethanol solution (0.8 g phenol dissolved in 100 mL of ethanol) was made along with 500 µL of sodium nitroprusside solution (0.075 g of sodium nitroprusside in 50 mL of deionized water). Finally, 1 mL of oxidizing solution (1 mL of sodium hypochlorite, 0.75 g trisodium citrate and 0.04 g sodium hydroxide in 50 mL of deionized water) was added to each sample. The test tubes were shaken and left to stand at room temperature for 2 hours in order for a blue colour, indicative of ammonium content, to fully develop. The colour absorbance was measured at 640 nm with a Brinkmann PC900 colourimeter. A calibration curve was acquired by measuring the absorbance of various ammonium chloride solutions of known concentration. Precision and accuracy were determined to be ± 0.2 mM.

Dissolved sulfate was measured in the pore water samples using a turbidimetric method. A 50 µL volume of sample or standard was placed in a sample cuvette. Barium chloride (50 µL of 300 mM solution) was added to precipitate the available sulfate. Four (4) mL of deionized water were added to dilute the sample. The turbidity of the resulting solution was measured using a Milton Roy Spectronic Mini-20 fitted with a turbidity attachment. A calibration curve was acquired by measuring

the turbidity of various dilutions of standard IAPSO seawater and magnesium sulfate solutions. Precision and accuracy limits were estimated to be ± 2 mM.

SAMPLE PROCESSING AND ANALYSES AT GSC-ATLANTIC

Wet sediment samples were shipped to the GSC-Atlantic Geochemistry Laboratory, where they were analyzed for organic carbon and metal concentrations. Subsamples for organic carbon and trace element analyses were immediately freeze-dried. Organic carbon was determined in 0.5 g of freeze-dried sediment using a Leco WR-112 carbon analyzer following removal of the inorganic carbon (carbonate) using 1 M hydrochloric acid. Precision and accuracy were estimated to be ± 0.03 wt.% based on replicate analyses of calibration standards.

Subsamples for trace element analysis were prepared by digesting 1.0 g of freeze-dried sediment in 5.0 mL of concentrated nitric acid for approximately 24 hours at 60°C. Flame atomic absorption analyses were carried out using a Varian 250+ spectrometer for copper, iron, manganese, nickel, and zinc. Flameless atomic absorption analyses of cadmium and lead were carried out using a Varian 975 spectrometer fitted with a Varian HGA95 graphite furnace. Relative precision and accuracy limits, estimated from replicate analyses of CANMET certified reference materials (STSDs 1 to 4), were determined to be ± 5% for copper, iron, manganese, and zinc, and ± 10% for cadmium and nickel.

Total mercury analyses were done by adding the following to a 300 mL glass stoppered bottle: 1 g of freeze-dried sediment, 0.1 g of potassium permanganate, 5 mL of conc. nitric acid, 5 mL of conc. sulfuric acid, 5 mL of 5% potassium per sulfate solution. The mixture was heated in a water bath at 80°C for 1.5 hours and cooled to room temperature. Hydroxylamine hydrochloride (10 mL of a 12% solution) was added, followed by 10 mL of 10% stannous chloride solution. A closed bubbler system was immediately attached and the volatilized mercury was passed through a Buck Scientific 400 A cold vapour mercury analyzer. A calibration curve was produced by analyzing various dilutions of certified mercury standard solution. Relative precision and accuracy were estimated to be ± 10% based on analyses of standard reference materials. Detection limit for the method was 0.01 ppm.

RESULTS

The locations of all sediment sampling stations are plotted in Figure 1; additional sampling details are listed in Table 1. Geochemical data for core and grab subsamples are included in Table 2. Column headings for Table 2 are defined as:

Cruise – cruise number
Stn – station number
Lab ID – individual GSC-A lab identifier for sub-sample
Sed. Depth – downcore depth of the sub-sample (cm)

Sal. – salinity of pore water (ppt)
Amm. – ammonium concentration in pore water (mM)
Sulfate – sulfate concentration in pore water (mM)
Organic Carb. – organic carbon (% dry weight)
Cd – cadmium (nitric acid leach) in sediment (ppm dry weight)
Cu – copper (nitric acid leach) in sediment (ppm dry weight basis)
Fe – iron (nitric acid leach) in sediment (% dry weight)
Hg – mercury (total analyses) in sediment (ppm dry weight)
Mn – manganese (nitric acid leach) in sediment (ppm dry weight)
Ni – nickel (nitric acid leach) in sediment (ppm dry weight)
Pb – lead (nitric acid leach) in sediment (ppm dry weight)
Zn – zinc (nitric acid leach) in sediment (ppm dry weight)

Geochemical data for sediment cores >20 cm in length are plotted versus sediment depth in Appendix A. To facilitate comparison between sampling stations, the vertical axis on all plots is fixed at 140 cm. On most graphs, the horizontal scale for each geochemical component was chosen to encompass its average concentration range in the gravity core subsamples, as shown in the following table:

Component	**Concentration range**
Organic carbon	0 – 3 wt. %
Sulfate	15 – 30 mM
Ammonium	0 – 1.5 mM
Iron	1 – 3 wt. %
Manganese	100 – 400 ppm
Copper	5 – 25 ppm
Zinc	20 – 100 ppm
Lead	0 – 20 ppm
Cadmium	0 – 0.4 ppm
Mercury	0 – 0.09 ppm

Individual data points that fall within these concentration ranges are shown as solid circles on the plots in Appendix A. Analytical data for samples that fall outside of these average ranges are plotted using a larger horizontal scale, which varies between the sample stations. Gravity core profiles containing subsamples with anomalously high or low concentrations (i.e. concentrations that fall outside of the ranges given above) have been emphasized by plotting the data as open circles, and by showing the name of the anomalous component on each plot.

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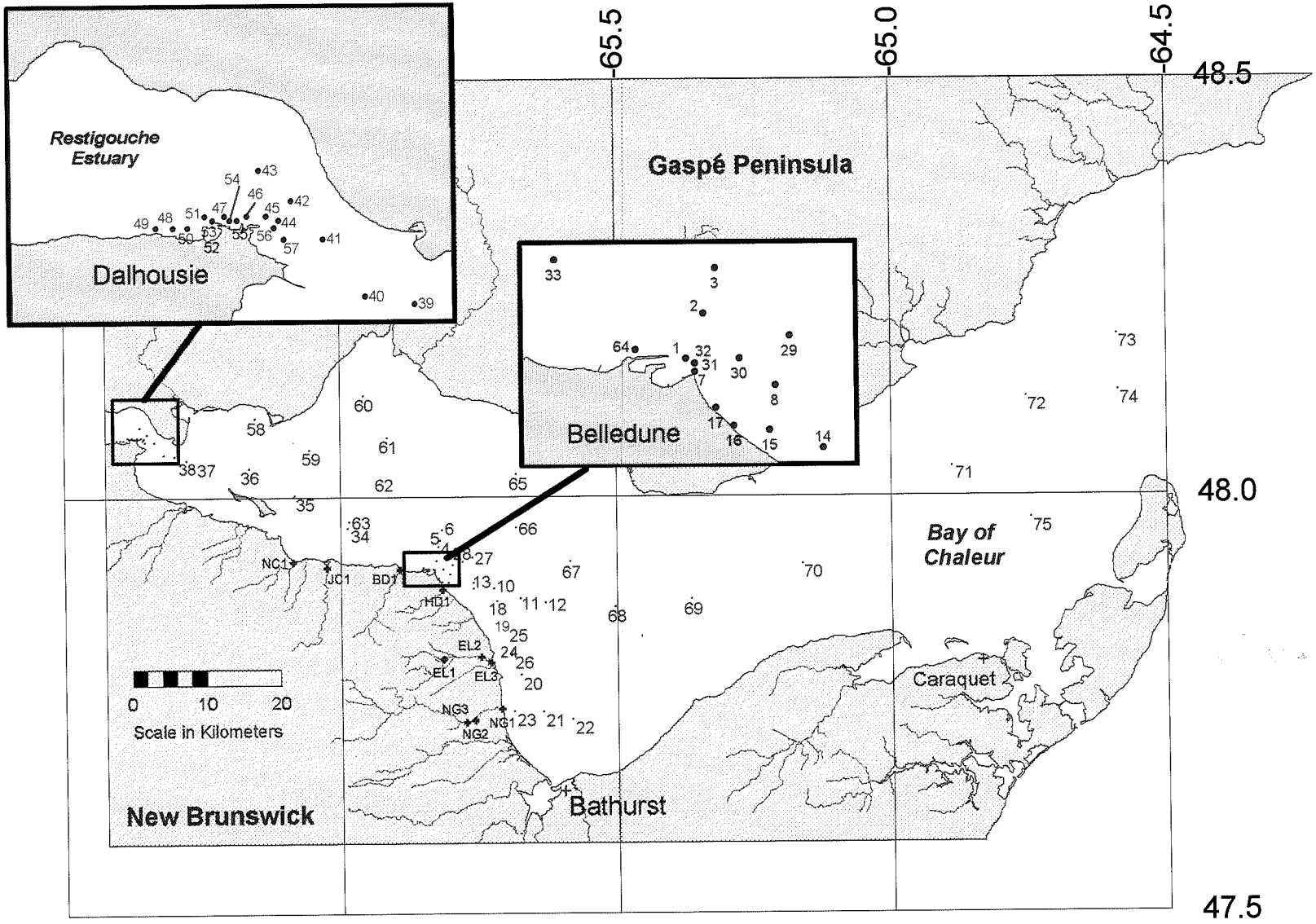


Figure 1 Station Locations for Cruise 99046 - Bay of Chaleur, N.B.

Table 1 Sampling Summary

Cruise	Station no.	Longitude (dec. deg.)	Latitude (dec. deg.)	Water Depth (m)	Core Length (cm)	Date (yr mo da)	Time (ADT)
99046	1	-65.833	47.913	18	Grab	990924	9:25
99046	2	-65.827	47.923	18	Grab	990924	12:10
99046	3	-65.823	47.933	27	Grab	990924	11:53
99046	4	-65.823	47.940	30	Grab	990924	11:45
99046	5	-65.820	47.947	33	Grab	990924	11:35
99046	6	-65.817	47.960	35	128	990924	10:55
99046	7	-65.830	47.910	6	18	990924	13:20
99046	8	-65.803	47.907	13	No sample	990924	13:35
99046	9	-65.760	47.897	17	No sample	990924	13:55
99046	10	-65.723	47.890	24	Grab	990924	15:40
99046	11	-65.675	47.878	35	56	990924	14:25
99046	12	-65.630	47.873	42	54	990924	15:06
99046	13	-65.760	47.890	17	Grab	990924	15:57
99046	14	-65.787	47.893	6	Grab	990924	16:10
99046	15	-65.805	47.897	5	Grab	990924	16:20
99046	16	-65.817	47.898	8	Grab	990924	16:30
99046	17	-65.823	47.902	7	Grab	990924	16:36
99046	18	-65.718	47.875	22	Grab	990925	9:00
99046	19	-65.702	47.843	22	Grab	990925	9:20
99046	20	-65.675	47.787	21	Grab	990925	9:55
99046	21	-65.635	47.742	20	Grab	990925	10:10
99046	22	-65.583	47.733	25	Grab	990925	10:35
99046	23	-65.688	47.743	5	No sample	990925	11:10
99046	24	-65.692	47.810	21	Grab	990925	11:50
99046	25	-65.702	47.843	22	25	990925	13:05
99046	26	-65.692	47.810	21	43	990925	11:58
99046	27	-65.762	47.927	32	15	990925	14:15
99046	28	-65.780	47.922	28	Grab	990925	14:28
99046	29	-65.798	47.918	23	Grab	990925	14:40
99046	30	-65.815	47.913	19	Grab	990925	14:50
99046	31	-65.830	47.912	16	Grab	990925	15:00
99046	32	-65.830	47.912	16	67	990925	15:20
99046	33	-65.877	47.935	23	Grab	990926	8:45
99046	34	-65.987	47.963	24	Grab	990926	9:33
99046	35	-66.085	48.000	16	86	990926	10:25
99046	36	-66.165	48.035	20	127	990926	11:15
99046	37	-66.267	48.037	19	110	990926	13:20
99046	38	-66.278	48.045	14	138	990926	13:40
99046	39	-66.300	48.050	20	18	990926	13:55
99046	40	-66.320	48.052	26	Grab	990926	14:20
99046	41	-66.337	48.067	28	25	990926	14:50
99046	42	-66.350	48.077	32	36	990927	9:57
99046	43	-66.363	48.085	9	31	990927	10:10
99046	44	-66.355	48.072	15	40	990927	10:35
99046	45	-66.360	48.073	5	70	990927	10:52
99046	46	-66.368	48.073	5	42	990927	11:05
99046	47	-66.377	48.073	11	72	990927	11:20

Table 1 Sampling Summary

Cruise	Station no.	Longitude (dec. deg.)	Latitude (dec. deg.)	Water Depth (m)	Core Length (cm)	Date (yr mo da)	Time (ADT)
99046	48	-66.398	48.070	5	106	990927	11:35
99046	49	-66.405	48.070	6	82	990927	11:45
99046	50	-66.392	48.070	4	Grab	990927	12:05
99046	51	-66.385	48.073	6	138	990927	12:50
99046	52	-66.382	48.072	2	Grab	990927	13:10
99046	53	-66.382	48.072	12	Grab	990927	13:18
99046	54	-66.375	48.072	11	Grab	990927	13:25
99046	55	-66.372	48.072	2	Grab	990927	13:30
99046	56	-66.357	48.070	5	Grab	990927	13:45
99046	57	-66.353	48.067	6	Grab	990927	13:50
99046	58	-66.153	48.095	13	137	990928	10:20
99046	59	-66.055	48.057	24	91	990928	11:45
99046	60	-65.957	48.122	26	140	990928	11:10
99046	61	-65.915	48.072	27	147	990928	13:00
99046	62	-66.083	48.002	30	110	990928	13:40
99046	63	-65.985	47.970	26	24	990928	14:40
99046	64	-65.850	47.915	16	22	990928	14:50
99046	65	-65.682	48.027	39	65	990929	9:15
99046	66	-65.683	47.963	39	93	990929	9:58
99046	67	-65.585	47.922	42	Grab	990929	10:55
99046	68	-65.503	47.868	59	113	990929	11:35
99046	69	-65.365	47.877	64	121	990929	14:00
99046	70	-65.163	47.918	75	135	990929	15:13
99046	71	-64.890	48.035	78	45	990929	17:00
99046	72	-64.755	48.118	91	141	990929	18:15
99046	73	-64.590	48.192	95	134	990929	19:20
99046	74	-64.588	48.125	88	81	990929	19:55
99046	75	-64.747	47.973	49	Grab	990929	21:50
99046	NG1	-65.710	47.746	River	Grab	990922	10:00
99046	NG2	-65.759	47.732	River	Grab	990922	10:45
99046	NG3	-65.774	47.729	River	Grab	990922	11:00
99046	EL1	-65.815	47.805	River	Grab	990922	12:30
99046	EL2	-65.747	47.808	River	Grab	990922	13:15
99046	EL3	-65.729	47.801	River	Grab	990922	13:40
99046	HD1	-65.816	47.888	River	Grab	990922	14:15
99046	BD1	-65.893	47.912	River	Grab	990922	14:40
99046	JC1	-66.025	47.915	River	Grab	990922	15:30
99046	NC1	-66.086	47.922	River	Grab	990922	15:50

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	1	990964	0-5				0.43	0.55	11	1.10	0.1	177	30	100	81
99046	2	990965	0-5				0.52	0.13	10	1.17	0.06	145	28	18	47
99046	3	990966	0-5				0.78	0.10	8	0.97	0.01	110	28	21	42
99046	4	990967	0-5				0.76	0.24	11	1.54	0.01	128	41	29	61
99046	5	990968	0-5				0.91	0.10	12	1.63	0.01	141	41	10	48
99046	6	990317	0	32.6	0.23	26	1.50	0.13	17	1.79	0.01	151	43	23	72
99046	6	990318	2.5	32.3	0.21	26	1.35	0.12	13	1.43	0.02	126	30	16	54
99046	6	990319	5	32.5	0.20	26	1.29	0.08	14	1.62	0.01	134	37	6	51
99046	6	990320	7.5	32.0	0.24	26	1.36	0.10	15	1.93	0.01	154	43	7	60
99046	6	990321	10	32.2	0.24	26	1.37	0.11	17	1.71	0.01	144	45	6	58
99046	6	990322	20	32.2	0.28	26	1.18	0.10	16	2.01	0.01	162	53	6	62
99046	6	990323	30	32.5	0.22	26	0.95	0.13	13	2.29	0.01	174	49	6	62
99046	6	990324	40	32.8	0.25	26	0.70	0.16	11	2.02	0.01	176	47	5	59
99046	6	990325	50	32.8	0.28	26	0.73	0.10	12	1.41	0.01	167	43	6	50
99046	6	990326	60	32.6	0.30	26	0.53	0.09	10	1.85	0.01	177	43	4	47
99046	6	990327	70	32.5	0.35	26	1.20	0.14	13	2.39	0.01	296	38	5	57
99046	6	990328	80	32.3	0.32	26	1.26	0.15	18	2.56	0.01	306	50	6	69
99046	6	990329	90	32.1	0.40	26	1.22	0.14	16	2.77	0.02	299	54	5	70
99046	6	990330	100	32.4	0.39	26	1.23	0.13	14	2.52	0.02	275	53	5	70
99046	6	990331	110	32.2	0.44	26	1.10	0.14	17	2.50	0.02	314	50	6	74
99046	6	990332	120	32.4	0.46	26	1.14	0.14	14	2.53	0.01	342	49	5	67
99046	7	990288	0	30.4	0.52	26	0.59	1.83	22	0.78	0.04	145	17	165	275
99046	7	990289	2.5	30.3	0.42	26	0.75	2.13	23	0.97	0.09	155	27	160	228
99046	7	990290	5	30.0	0.31	26	0.86	2.35	31	1.14	0.37	173	26	181	250
99046	7	990291	7.5	30.1	0.56	26	0.80	3.15	36	0.89	0.26	147	22	218	361
99046	7	990292	10	30.2	0.86	26	0.54	4.46	41	1.16	0.17	197	37	276	529
99046	7	990293	12.5	30.2	1.06	24	0.87	3.71	38	1.11	0.26	193	35	285	482
99046	7	990294	15	30.2	1.35	23	0.94	4.00	38	1.15	0.31	171	34	273	423
99046	7	990295	17.5	30.3	1.59	22	0.72	5.22	49	1.10	0.41	167	27	381	555
99046	10	990970	0-5				0.47	0.07	7	1.27	0.01	179	37	20	46
99046	11	990296	0	32.6	0.25	26	0.96	0.24	11	1.22	0.01	122	25	24	55
99046	11	990297	2.5	32.3	0.21	26	0.94	0.11	11	1.50	0.01	160	32	12	49
99046	11	990298	5	32.6	0.20	27	1.04	0.11	11	1.58	0.01	148	31	11	49
99046	11	990299	7.5	32.9	0.22	25	0.93	0.13	12	1.84	0.01	165	36	6	50
99046	11	990300	10	32.6	0.20	26	0.97	0.08	11	1.70	0.01	157	34	5	46
99046	11	990301	12.5	32.5	0.20	26	0.65	0.10	8	1.43	0.01	166	26	7	40
99046	11	990302	15	32.5	0.18	25	0.56	0.08	7	1.70	0.01	171	24	6	37
99046	11	990303	17.5	32.5	0.19	25	0.44	0.08	6	1.38	0.01	162	15	4	28
99046	11	990304	20	32.9	0.18	26	0.63	0.08	7	1.36	0.01	156	29	5	38
99046	11	990305	30	32.6	0.17	27	0.31	0.09	7	1.28	0.01	220	21	5	36
99046	11	990306	40	32.7	0.22	27	0.77	0.18	14	2.45	0.01	251	42	6	58
99046	11	990307	50	32.7	0.24	27	0.80	0.12	15	2.41	0.01	268	61	5	70
99046	12	990308	0	32.7	0.16	26	1.11	0.17	14	1.70	0.01	158	35	16	71
99046	12	990309	2.5	32.8	0.16	28	1.09	0.18	15	1.48	0.01	153	27	19	72
99046	12	990310	5	32.5	0.19	25	1.14	0.14	12	1.66	0.01	180	28	12	65
99046	12	990311	7.5	32.6	0.15	26	1.02	0.20	13	1.55	0.01	141	41	9	61
99046	12	990312	10	32.8	0.20	26	1.13	0.14	14	1.72	0.01	179	37	18	73
99046	12	990313	20	32.9	0.28	26	0.87	0.10	12	1.70	0.01	171	38	6	103
99046	12	990314	30	32.6	0.24	26	0.43	0.13	11	2.00	0.01	210	42	4	60
99046	12	990315	40	32.5	0.25	26	1.25	0.16	22	2.30	0.01	185	46	4	69
99046	12	990316	50	32.9	0.23	26	0.91	0.16	16	2.29	0.01	189	45	4	62

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	13	990971	0-5				0.45	0.13	8	1.13	0.01	146	29	27	52
99046	14	990972	0-5				0.24	0.10	8	1.01	0.01	148	20	91	75
99046	15	990973	0-5				0.10	0.17	7	0.76	0.01	137	18	89	65
99046	16	990974	0-5				0.19	0.98	11	0.73	0.06	137	19	133	101
99046	17	990975	0-5				0.32	0.61	8	0.84	0.02	132	21	36	101
99046	18	990976	0-5				0.69	0.18	12	1.30	0.06	162	33	37	64
99046	19	990977	0-5				0.84	0.35	13	1.39	0.09	158	29	41	78
99046	20	990978	0-5				0.54	0.17	9	1.16	0.04	158	22	25	53
99046	21	990979	0-5				0.14	0.10	4	1.63	0.01	197	13	15	51
99046	22	990980	0-5				0.29	0.31	5	0.96	0.01	134	8	9	32
99046	24	990981	0-5				0.86	0.54	13	1.35	0.09	155	28	40	77
99046	25	990333	0	31.0	0.15	26	1.09	0.58	15	1.58	0.08	180	42	37	93
99046	25	990334	2.5	31.1	0.17	26	0.67	0.46	10	1.03	0.03	136	31	27	59
99046	25	990335	5	31.4	0.17	26	0.43	0.28	7	1.01	0.02	128	32	14	44
99046	25	990336	10	31.0	0.21	26	0.72	0.19	10	1.36	0.01	169	38	6	44
99046	25	990337	20	30.9	0.19	26	0.71	0.15	10	1.63	0.02	181	36	4	43
99046	26	990338	0	30.6	0.14	26	1.15	0.54	16	1.78	0.06	208	38	40	91
99046	26	990339	2.5	30.8	0.20	26	1.17	0.63	15	1.71	0.07	183	39	33	89
99046	26	990340	5	30.6	0.22	26	0.92	0.40	14	1.66	0.05	198	42	25	81
99046	26	990341	7.5	30.6	0.25	26	1.00	0.33	11	1.31	0.05	149	32	21	57
99046	26	990342	10	30.4	0.35	26	1.12	0.38	14	1.51	0.04	170	34	17	69
99046	26	990343	20	30.6	0.47	26	0.87	0.13	11	1.71	0.01	177	39	6	48
99046	26	990344	30	30.7	0.43	26	0.58	0.15	8	1.46	0.01	172	38	5	44
99046	26	990345	40	30.8	0.45	26	0.80	0.15	10	1.74	0.01	191	37	4	46
99046	27	990346	0	31.8	0.08	26	1.02	0.22	11	1.43	0.03	147	35	27	61
99046	27	990347	2.5	31.5	0.16	26	0.79	0.17	9	1.43	0.03	141	37	21	54
99046	27	990348	5	32.0	0.20	26	0.90	0.15	9	1.18	0.02	102	26	19	47
99046	27	990349	7.5	31.9	0.19	26	0.65	0.08	8	1.30	0.01	121	27	10	41
99046	27	990350	10	32.0	0.24	26	0.71	0.10	8	1.29	0.01	128	30	4	36
99046	28	990982	0-5				0.61	0.14	7	1.22	0.05	132	22	23	48
99046	29	990983	0-5				0.44	0.10	6	0.81	0.02	113	17	21	40
99046	30	990984	0-5				0.48	0.28	8	0.95	0.06	129	22	46	72
99046	31	990985	0-5				0.73	1.94	23	0.91	0.17	145	24	165	218
99046	32	990351	0	30.2	1.16	23	1.29	2.21	32	1.37	0.23	188	36	231	285
99046	32	990352	2.5	30.3	1.20	23	1.72	2.23	32	1.55	0.26	189	30	228	287
99046	32	990353	5	30.4	1.28	22	1.33	2.32	33	1.50	0.2	164	28	335	323
99046	32	990354	7.5	30.1	1.43	22	1.08	2.33	33	1.41	0.19	178	27	326	320
99046	32	990355	10	29.9	1.59	19	1.18	2.47	39	1.38	0.19	185	27	394	365
99046	32	990356	20	29.9	1.94	19	0.77	2.38	28	1.21	0.28	179	26	244	251
99046	32	990357	30	30.3	1.85	17	0.62	2.10	21	1.27	0.34	222	27	190	247
99046	32	990358	40	30.5	1.54	18	0.30	0.28	9	1.30	0.01	259	31	5	48

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	32	990359	50	30.7	1.24	21	0.32	0.17	7	1.19	0.01	249	22	4	35
99046	32	990360	60	30.6	0.99	22	0.60	0.17	7	1.30	0.01	263	19	5	34
99046	33	990986	0-5				0.60	0.30	8	1.02	0.02	115	24	22	50
99046	34	990987	0-5				0.86	0.23	11	1.35	0.02	127	31	20	60
99046	35	990361	0	30.6	0.26	25	0.86	0.27	9	1.86	0.01	214	29	3	45
99046	35	990362	2.5	30.3	0.26	25	0.47	0.11	6	1.26	0.01	126	27	2	31
99046	35	990363	5	30.7	0.28	25	0.57	0.18	7	1.54	0.01	150	32	2	37
99046	35	990364	7.5	30.3	0.25	25	0.59	0.17	8	1.50	0.02	256	35	2	38
99046	35	990365	10	30.3	0.27	23	0.51	0.17	8	1.73	0.01	210	29	2	41
99046	35	990366	20	30.8	0.31	22	0.38	0.16	7	1.44	0.01	206	26	2	35
99046	35	990367	30	30.6	0.29	23	0.41	0.20	6	1.27	0.01	194	27	2	32
99046	35	990368	40	30.7	0.29	23	0.61	0.20	8	1.57	0.01	233	28	3	34
99046	35	990369	50	30.3	0.30	22	1.27	0.28	12	2.29	0.02	256	36	4	45
99046	35	990370	60	30.3	0.33	22	1.42	0.16	7	1.49	0.02	205	28	2	34
99046	36	990371	0	30.6	0.24	25	1.63	0.35	15	2.56	0.07	310	39	6	56
99046	36	990372	2.5	30.5	0.21	25	1.52	0.14	16	2.02	0.07	147	36	7	66
99046	36	990373	5	30.3	0.19	25	1.48	0.17	16	2.05	0.07	147	46	8	69
99046	36	990374	7.5	30.5	0.24	25	1.54	0.09	15	1.88	0.06	145	39	7	62
99046	36	990375	10	30.6	0.25	25	1.44	0.14	14	1.72	0.03	124	34	7	59
99046	36	990376	20	30.3	0.31	25	1.20	0.18	12	1.78	0.03	144	29	5	67
99046	36	990377	30	30.5	0.31	24	1.09	0.10	12	1.71	0.01	129	32	3	50
99046	36	990378	40	31.0	0.41	23	1.13	0.11	12	1.88	0.01	144	37	4	54
99046	36	990379	50	30.9	0.51	23	1.15	0.14	12	1.78	0.01	139	32	4	50
99046	36	990380	60	30.6	0.55	23	0.99	0.16	12	1.94	0.01	157	38	4	56
99046	36	990381	70	30.8	0.59	23	0.94	0.17	11	1.80	0.01	123	37	4	49
99046	36	990382	80	30.9	0.63	22	0.63	0.12	9	1.31	0.01	138	29	3	40
99046	36	990383	90	30.9	0.72	22	0.63	0.09	10	1.51	0.02	162	35	4	45
99046	36	990384	100	31.1	0.73	21	1.17	0.18	13	1.95	0.02	167	39	5	54
99046	36	990385	110	31.0	0.77	20	1.10	0.16	13	2.10	0.01	177	47	4	61
99046	36	990386	120	31.0	0.79	20	1.12	0.20	13	2.14	0.01	185	42	4	61
99046	37	990387	0	30.5	0.52	25	1.53	0.23	16	1.79	0.05	159	39	17	113
99046	37	990388	2.5	30.5	0.50	25	1.60	0.38	17	1.98	0.08	143	41	14	125
99046	37	990389	5	30.6	0.49	25	1.43	0.22	15	1.82	0.1	133	41	12	101
99046	37	990390	7.5	30.6	0.47	24	1.07	0.09	11	1.49	0.05	168	39	8	60
99046	37	990391	10	30.4	0.49	23	1.13	0.15	14	2.05	0.1	153	46	7	68
99046	37	990392	20	30.5	0.75	23	0.96	0.13	12	1.78	0.02	211	44	5	54
99046	37	990393	30	30.7	0.88	23	1.00	0.18	13	2.17	0.01	185	52	4	60
99046	37	990394	40	30.7	1.06	20	1.09	0.14	14	2.38	0.02	164	44	5	61
99046	37	990395	50	30.9	1.22	19	1.14	0.14	14	2.23	0.02	176	51	5	64
99046	37	990396	60	30.8	1.32	19	1.09	0.15	13	1.87	0.02	181	44	6	55
99046	37	990397	70	30.9	1.37	19	1.06	0.13	12	2.16	0.02	164	42	5	54
99046	37	990398	80	30.9	1.57	19	1.07	0.12	13	2.22	0.02	171	47	5	59
99046	37	990399	90	30.7	1.71	19	1.05	0.12	14	2.35	0.02	173	46	5	63
99046	37	990400	100	31.1	1.78	18	1.13	0.14	15	2.52	0.02	175	57	3	62
99046	38	990401	0	30.5	0.23	25	1.37	0.16	18	2.23	0.1	192	52	11	106
99046	38	990402	2.5	29.8	0.42	25	1.41	0.21	18	2.18	0.12	154	54	10	101
99046	38	990403	5	29.5	0.45	23	1.51	0.23	18	1.84	0.22	130	51	11	119
99046	38	990404	7.5	29.6	0.43	26	1.29	0.14	14	1.85	0.05	118	45	6	65
99046	38	990405	10	29.7	0.51	27	1.48	0.17	14	1.56	0.11	113	36	9	85
99046	38	990406	20	29.9	0.62	23	1.46	0.14	17	2.02	0.09	145	49	7	64
99046	38	990407	30	29.9	0.84	21	1.14	0.10	12	2.16	0.02	165	49	4	53
99046	38	990408	40	30.2	0.93	21	1.06	0.10	11	2.08	0.02	158	52	3	51
99046	38	990409	50	30.3	1.05	18	1.07	0.11	13	2.07	0.02	131	44	3	55
99046	38	990410	60	30.2	1.21	18	1.19	0.13	12	2.14	0.02	145	44	4	51

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	38	990411	70	30.0	1.37	16	1.06	0.23	11	1.80	0.02	123	38	3	46
99046	38	990412	80	29.5	1.51	16	1.10	0.10	11	1.94	0.02	131	43	3	47
99046	38	990413	90	29.3	1.63	15	1.04	0.16	11	1.92	0.02	119	42	3	48
99046	38	990414	100	29.8	1.74	15	1.08	0.13	12	2.11	0.02	135	41	3	52
99046	38	990415	110	29.1	1.76	12	1.01	0.08	12	1.87	0.02	124	45	2	51
99046	38	990416	120	29.3	1.91	11	1.22	0.12	12	1.96	0.02	137	40	4	48
99046	39	990417	0	29.1	0.18	24	0.99	0.23	12	1.64	0.06	138	35	13	105
99046	39	990418	2.5	28.3	0.31	24	1.11	0.26	14	1.83	0.09	133	44	13	133
99046	39	990419	5	28.4	0.27	23	0.96	0.27	14	1.83	0.09	146	41	12	128
99046	39	990420	7.5	30.5	0.25	23	0.80	0.12	12	1.88	0.09	133	42	8	89
99046	39	990421	10	30.2	0.42	23	0.47	0.09	7	1.56	0.05	116	32	6	61
99046	40	990988	0-5				0.83	0.29	14	2.27	0.04	163	42	11	106
99046	41	990422	0	30.6	0.23	22	0.65	0.10	10	2.30	0.05	163	37	12	84
99046	41	990423	2.5	30.1	0.35	22	0.97	0.14	15	2.24	0.09	161	43	15	126
99046	41	990424	5	30.1	0.33	23	0.71	0.05	9	1.99	0.06	209	35	6	54
99046	41	990425	7.5	29.5	0.32	24	0.45	0.05	8	2.18	0.02	183	39	6	54
99046	41	990426	10	29.4	0.31	24	0.65	0.09	9	2.60	0.02	184	58	5	69
99046	41	990427	20	30.0	0.13	24	0.47	0.06	10	2.98	0.02	239	52	5	67
99046	42	990428	0	30.5	0.28	25	1.05	0.09	10	2.33	0.07	283	40	12	85
99046	42	990429	2.5	30.5	0.29	24	1.17	0.08	14	2.22	0.09	170	45	14	94
99046	42	990430	5	30.7	0.27	25	0.95	0.08	10	2.16	0.05	153	46	7	58
99046	42	990431	7.5	30.5	0.32	22	1.14	0.06	14	2.15	0.06	158	50	7	67
99046	42	990432	10	30.3	0.33	23	0.96	0.05	11	2.48	0.03	193	47	4	61
99046	42	990433	20	30.1	0.32	23	0.92	0.06	10	2.60	0.02	190	50	5	62
99046	42	990434	30	30.1	0.31	23	0.84	0.09	12	2.75	0.02	245	56	5	66
99046	43	990435	0	29.1	0.18	24	1.44	0.10	16	2.38	0.08	184	52	15	109
99046	43	990436	2.5	28.7	0.30	23	1.43	0.12	15	2.26	0.08	168	42	14	101
99046	43	990437	5	28.9	0.39	24	1.24	0.15	13	2.14	0.07	166	45	12	80
99046	43	990438	7.5	29.0	0.33	22	1.22	0.08	13	2.08	0.06	162	41	9	73
99046	43	990439	10	29.5	0.29	23	1.03	0.10	15	2.20	0.03	169	46	6	58
99046	43	990440	20	29.2	0.29	22	0.93	0.09	12	2.36	0.02	182	47	4	59
99046	44	990441	0	29.8	0.21	23	1.41	0.70	15	2.11	0.04	187	37	14	160
99046	44	990442	2.5	29.4	0.26	23	1.45	0.72	17	2.08	0.06	203	34	20	191
99046	44	990443	5	29.1	0.32	23	1.20	0.38	13	2.47	0.04	175	41	7	105
99046	44	990444	7.5	29.8	0.29	24	1.29	0.54	11	1.91	0.05	177	40	10	121
99046	44	990445	10	29.1	0.25	25	1.20	0.43	13	2.06	0.05	157	37	10	128
99046	44	990446	20	29.7	0.49	23	0.79	0.12	12	2.27	0.01	199	59	5	59
99046	44	990447	30	29.5	0.60	21	1.09	0.14	14	2.27	0.01	189	49	5	60
99046	45	990448	0	29.2	0.75	23	2.51	0.62	19	1.65	0.11	150	38	18	222
99046	45	990449	2.5	29.4	0.45	22	2.46	0.58	16	1.26	0.09	127	33	17	170
99046	45	990450	5	29.4	0.55	22	3.91	0.54	18	1.49	0.12	150	32	16	215
99046	45	990451	7.5	28.9	0.80	18	2.59	0.41	18	1.17	0.14	126	31	13	152
99046	45	990452	10	28.9	0.98	16	2.34	0.30	20	1.72	0.19	154	38	9	95
99046	45	990453	20	27.8	1.84	7	2.17	0.23	16	2.44	0.04	181	47	6	69
99046	45	990454	30	26.7	2.33	0	1.94	0.33	14	2.07	0.02	172	46	6	65
99046	45	990455	40	25.7	2.50	0	1.88	0.33	14	2.42	0.02	175	46	4	62
99046	45	990456	50	24.6	2.59	0	1.58	0.15	12	1.59	0.02	152	43	4	53
99046	45	990457	60	23.8	2.70	0	1.63	0.24	11	1.90	0.02	168	47	5	54
99046	46	990458	0	29.8	0.19	25	2.23	0.50	16	2.40	0.1	168	57	14	124
99046	46	990459	2.5	28.9	0.28	23	4.86	0.29	21	2.79	0.2	199	50	7	91
99046	46	990460	5	29.0	0.66	23	2.23	0.27	21	2.62	0.13	190	55	9	106
99046	46	990461	7.5	28.8	0.40	22	2.47	0.20	21	2.61	0.15	190	53	9	90

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	46	990462	10	28.6	0.37	20	2.74	0.25	20	2.44	0.09	160	50	7	71
99046	46	990463	20	28.5	0.64	20	1.37	0.21	11	2.56	0.02	255	42	4	57
99046	46	990464	30	27.7	0.95	16	1.53	0.22	12	2.54	0.02	166	45	3	56
99046	46	990465	40	26.8	1.56	8	1.57	0.27	13	2.45	0.02	151	47	4	60
99046	47	990466	0	28.3	1.28	15	2.93	0.72	22	2.60	0.11	208	63	31	54
99046	47	990467	2.5	28.4	1.69	11	2.68	0.84	23	2.59	0.16	230	60	19	53
99046	47	990468	5	28.5	1.75	10	2.24	0.69	22	2.53	0.15	214	66	18	187
99046	47	990469	7.5	28.7	1.92	7	2.62	0.64	22	2.54	0.14	229	57	17	198
99046	47	990470	10	28.8	1.99	4	2.11	0.68	20	2.26	0.14	207	54	17	221
99046	47	990471	20	28.9	2.71	1	3.08	0.77	21	2.50	0.16	198	52	23	56
99046	47	990472	30	28.9	2.84	0	3.69	0.86	24	2.34	0.16	187	55	25	68
99046	47	990473	40	28.9	3.26	0	3.36	0.47	22	2.42	0.24	185	57	15	200
99046	47	990474	50	28.9	3.23	0	2.21	0.27	20	2.77	0.11	176	51	7	86
99046	47	990475	60	28.6	3.08	0	2.90	0.40	18	2.31	0.14	158	55	12	128
99046	48	990476	0	27.2	0.45	22	2.27	0.80	23	2.26	0.15	154	57	18	53
99046	48	990477	2.5	27.7	0.56	22	1.93	0.77	20	2.15	0.13	149	58	17	50
99046	48	990478	5	27.4	0.59	19	2.20	0.90	21	2.38	0.17	154	57	21	57
99046	48	990479	7.5	27.0	0.74	17	2.30	0.90	23	2.52	0.16	143	60	22	64
99046	48	990480	10	26.8	0.81	16	2.45	1.12	25	2.33	0.21	171	54	25	80
99046	48	990481	20	26.6	1.57	9	2.52	1.00	24	2.25	0.21	156	61	22	70
99046	48	990482	30	26.3	2.03	0	2.32	0.73	23	2.40	0.18	175	60	14	46
99046	48	990483	40	26.9	2.39	0	2.56	0.88	29	2.49	1.01	167	61	24	61
99046	48	990484	50	26.6	2.56	0	2.32	0.51	36	2.47	0.31	180	62	20	202
99046	48	990485	60	26.8	2.59	0	2.36	0.26	21	2.59	0.24	169	46	7	77
99046	48	990486	70	26.7	2.55	0	2.50	0.83	12	2.63	0.46	195	44	17	59
99046	48	990487	80	26.8	2.56	0	1.34	0.18	13	2.76	0.04	197	45	4	59
99046	48	990488	90	26.7	2.27	0	1.49	0.21	11	2.58	0.03	170	41	4	54
99046	48	990489	100	26.9	2.18	0	1.26	0.17	10	2.50	0.03	167	40	3	54
99046	48	990490	110	27.1	1.96	3	0.94	0.21	12	2.55	0.03	194	45	3	56
99046	49	990491	0	27.0	0.27	22	1.82	0.69	17	2.33	0.12	154	41	17	205
99046	49	990492	2.5	26.8	0.33	23	1.76	0.63	19	2.41	0.12	153	40	14	185
99046	49	990493	5	26.9	0.54	21	1.93	0.68	17	2.35	0.12	147	40	15	215
99046	49	990494	7.5	26.9	0.79	16	2.00	0.68	16	2.19	0.11	148	38	14	191
99046	49	990495	10	26.7	0.86	15	2.16	0.72	21	2.37	0.13	144	39	15	41
99046	49	990496	20	26.4	1.32	12	2.08	0.70	22	2.45	0.14	159	39	19	218
99046	49	990497	30	25.9	1.65	8	2.38	0.82	31	2.36	0.49	167	46	25	43
99046	49	990498	40	26.3	1.89	0	2.15	0.33	38	2.42	0.28	160	46	12	99
99046	49	990499	50	26.5	2.10	0	2.15	0.23	19	2.34	0.17	152	42	7	68
99046	49	990500	60	26.2	2.18	0	2.14	0.22	19	2.31	0.12	151	42	7	68
99046	49	990501	70	25.8	2.27	0	0.82	0.16	10	2.39	0.04	163	41	3	54
99046	49	990502	80	26.4	2.18	0	1.18	0.17	12	2.89	0.04	180	38	3	54
99046	50	990989	0-5				1.20	0.51	16	1.82	0.11	141	42	21	145
99046	51	990503	0	29.2	0.76	22	2.16	0.64	25	2.70	0.15	191	52	19	51
99046	51	990504	2.5	29.1	0.94	19	1.93	0.87	21	2.16	0.28	181	48	25	64
99046	51	990505	5	29.0	1.84	12	1.97	1.21	24	2.62	0.43	197	55	24	82
99046	51	990506	7.5	28.4	1.98	11	2.30	1.41	28	2.51	0.22	179	54	41	98
99046	51	990507	10	28.5	2.06	12	1.95	1.02	24	2.37	0.14	175	52	27	70
99046	51	990508	20	29.5	3.28	0	2.92	0.95	25	2.96	0.19	180	54	20	55
99046	51	990509	30	29.1	4.03	0	2.17	1.58	23	2.14	0.24	164	48	25	88
99046	51	990510	40	29.5	4.79	0	2.33	2.12	32	2.02	0.29	152	51	36	370
99046	51	990511	50	29.8	5.43	0	2.23	1.73	26	2.59	0.22	186	57	26	129
99046	51	990512	60	29.9	5.59	0	3.00	1.31	32	3.10	0.38	222	63	28	83
99046	51	990513	70	30.6	5.68	0	2.40	1.20	45	3.08	0.58	205	58	37	68
99046	51	990514	80	30.0	5.77	0	2.29	2.62	36	2.37	0.66	186	54	55	123
99046	51	990515	90	30.4	5.73	0	2.19	0.93	32	2.44	0.5	165	51	37	68

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	51	990516	100	30.0	5.82	0	2.44	0.73	39	2.92	0.62	177	49	34	55
99046	51	990517	110	30.5	5.76	1	2.11	0.40	29	2.38	0.4	171	53	14	117
99046	51	990518	120	30.7	5.76	1	2.69	0.78	38	2.99	0.94	206	55	43	62
99046	51	990519	130	30.2	5.76	1	2.54	0.50	34	2.79	0.65	222	56	30	191
99046	52	990990	0-5				1.60	1.00	21	2.14	0.39	156	49	40	255
99046	53	990991	0-5				2.04	0.68	21	2.44	1.27	207	41	24	145
99046	54	990992	0-5				1.64	0.62	19	2.18	0.13	231	38	27	159
99046	55	990993	0-5				1.65	0.47	18	2.09	0.16	158	40	30	164
99046	56	990994	0-5				1.74	0.49	20	2.15	0.17	150	42	25	158
99046	57	990995	0-5				1.81	0.41	47	2.39	0.28	179	44	20	100
99046	58	990520	0	31.1	0.27	25	1.54	0.28	18	2.41	0.09	207	56	13	89
99046	58	990521	2.5	30.6	0.27	25	1.72	0.26	17	2.27	0.05	191	51	9	78
99046	58	990522	5	30.6	0.30	25	1.65	0.28	15	2.06	0.06	183	45	10	73
99046	58	990523	7.5	30.6	0.35	23	1.62	0.22	15	2.15	0.06	180	43	7	63
99046	58	990524	10	30.2	0.38	25	1.38	0.17	14	2.07	0.05	171	44	5	56
99046	58	990525	20	30.2	0.68	22	1.37	0.22	14	1.97	0.03	182	42	7	62
99046	58	990526	30	30.4	0.82	23	1.26	0.21	14	2.13	0.02	184	41	5	53
99046	58	990527	40	30.3	0.93	19	0.80	0.19	10	1.73	0.02	165	37	4	43
99046	58	990528	50	30.3	1.11	19	1.19	0.27	13	2.09	0.02	172	36	4	49
99046	58	990529	60	30.5	1.22	18	1.32	0.30	15	2.58	0.03	212	46	4	61
99046	58	990530	70	30.4	1.26	19	1.15	0.21	13	2.22	0.02	211	46	4	53
99046	58	990531	80	30.7	1.48	17	1.35	0.25	14	2.45	0.03	195	39	5	57
99046	58	990532	90	30.4	1.61	15	1.10	0.19	12	2.24	0.03	203	40	4	51
99046	58	990533	100	30.3	1.70	16	1.19	0.27	13	2.35	0.03	194	37	3	53
99046	58	990534	110	30.3	1.75	14	1.29	0.31	15	2.62	0.03	210	41	3	61
99046	58	990535	120	30.5	1.89	13	1.24	0.42	14	2.62	0.02	224	38	4	60
99046	58	990536	130	30.2	1.99	12	1.16	0.36	13	2.14	0.02	194	34	6	53
99046	59	990537	0	31.5	0.43	25	1.66	0.21	18	2.04	0.04	168	39	24	78
99046	59	990538	2.5	31.9	0.35	25	1.69	0.19	18	2.09	0.03	161	37	20	76
99046	59	990539	5	31.5	0.33	25	1.71	0.16	17	2.11	0.01	167	37	12	67
99046	59	990540	7.5	31.5	0.35	25	1.60	0.16	16	2.40	0.01	167	40	8	65
99046	59	990541	10	31.9	0.37	25	1.56	0.16	18	2.30	0.01	178	45	13	75
99046	59	990542	20	31.7	0.41	25	1.29	0.15	14	2.21	0.01	158	40	5	54
99046	59	990543	30	31.7	0.40	24	1.48	0.15	15	2.36	0.01	180	46	5	59
99046	59	990544	40	32.1	0.50	24	1.25	0.20	15	2.49	0.01	180	49	5	60
99046	59	990545	50	32.2	0.54	24	1.16	0.17	16	2.64	0.01	202	51	5	64
99046	59	990546	60	32.1	0.56	25	1.23	0.14	16	2.57	0.01	195	49	4	64
99046	59	990547	70	32.2	0.61	25	1.25	0.17	16	2.53	0.01	189	51	4	63
99046	59	990548	80	32.2	0.64	24	1.19	0.16	15	2.50	0.01	175	43	4	57
99046	59	990549	90	31.9	0.64	24	1.43	0.23	16	2.79	0.01	184	43	4	62
99046	60	990550	0	31.8	0.29	25	1.66	0.16	18	2.31	0.04	189	43	13	77
99046	60	990551	2.5	32.0	0.28	25	1.57	0.13	18	2.29	0.04	180	48	8	72
99046	60	990552	5	31.7	0.35	24	1.51	0.15	16	2.35	0.04	165	48	4	62
99046	60	990553	7.5	31.7	0.28	25	1.49	0.13	15	2.26	0.01	173	41	4	58
99046	60	990554	10	31.6	0.30	25	1.51	0.12	15	2.24	0.01	170	40	4	59
99046	60	990555	20	32.0	0.40	25	1.46	0.11	14	2.02	0.01	168	47	4	54
99046	60	990556	30	32.1	0.39	25	1.22	0.11	16	2.30	0.01	171	42	3	58
99046	60	990557	40	32.2	0.44	25	1.35	0.15	16	2.37	0.01	176	45	4	61
99046	60	990558	50	32.2	0.56	25	0.91	0.14	10	1.95	0.01	169	47	3	51
99046	60	990559	60	32.1	0.47	25	1.27	0.17	16	2.66	0.01	200	49	3	67
99046	60	990560	70	32.3	0.54	25	1.24	0.16	17	2.96	0.01	213	61	4	72

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	60	990561	80	32.0	0.54	25	1.24	0.10	16	2.76	0.01	202	57	4	68
99046	60	990562	90	32.6	0.54	25	0.82	0.09	12	1.91	0.01	173	46	4	53
99046	60	990563	100	32.4	0.50	25	1.22	0.12	14	2.43	0.01	177	52	4	59
99046	60	990564	110	31.8	0.54	25	1.21	0.11	15	2.54	0.01	191	53	4	63
99046	60	990565	120	32.0	0.63	25	1.20	0.15	16	2.58	0.01	206	56	4	67
99046	60	990566	130	32.0	0.60	25	1.20	0.10	16	2.69	0.01	201	55	4	67
99046	61	990567	0	31.9	0.38	25	1.64	0.18	17	2.27	0.04	179	53	16	77
99046	61	990568	2.5	31.1	0.50	25	1.63	0.15	15	1.82	0.05	190	47	14	72
99046	61	990569	5	31.9	0.34	25	1.61	0.12	15	2.14	0.04	175	48	7	62
99046	61	990570	7.5	31.8	0.35	26	1.55	0.13	15	2.41	0.02	193	39	6	60
99046	61	990571	10	31.8	0.47	25	1.32	0.11	15	2.46	0.02	191	41	4	61
99046	61	990572	20	31.9	0.45	25	0.53	0.15	11	2.24	0.01	231	45	4	57
99046	61	990573	30	31.7	0.50	25	0.89	0.16	11	1.83	0.02	151	33	4	48
99046	61	990574	40	31.9	0.53	24	1.17	0.14	12	2.09	0.01	159	34	4	49
99046	61	990575	50	31.8	0.51	25	1.02	0.17	15	2.57	0.01	200	43	4	62
99046	61	990576	60	31.8	0.61	25	1.00	0.16	16	2.74	0.01	212	47	6	64
99046	61	990577	70	31.7	0.65	26	1.07	0.19	15	2.48	0.01	203	42	6	61
99046	61	990578	80	31.8	0.78	25	1.09	0.14	15	2.70	0.01	187	41	4	59
99046	61	990579	90	31.6	0.74	25	1.15	0.14	18	3.00	0.01	219	43	4	69
99046	61	990580	100	31.5	0.83	25	1.15	0.11	16	2.81	0.01	198	40	4	59
99046	61	990581	110	31.4	0.79	23	1.10	0.12	17	3.23	0.01	241	53	5	73
99046	61	990582	120	31.3	0.85	24	1.12	0.12	18	3.13	0.01	238	45	5	74
99046	61	990583	130	31.5	0.88	22	1.00	0.12	15	3.00	0.01	258	47	4	69
99046	61	990584	140	31.3	0.94	24	1.14	0.14	16	2.90	0.01	234	43	5	67
99046	62	990585	0	32.2	0.24	25	1.45	0.16	16	2.30	0.01	170	34	7	65
99046	62	990586	2.5	32.3	0.13	25	1.58	0.19	18	2.03	0.04	169	37	18	83
99046	62	990587	5	32.0	0.24	25	1.65	0.16	20	2.28	0.04	179	41	16	90
99046	62	990588	7.5	32.1	0.27	25	1.65	0.19	19	2.29	0.05	199	43	15	90
99046	62	990589	10	32.1	0.22	25	1.64	0.16	20	2.54	0.05	196	38	13	89
99046	62	990590	20	32.1	0.26	25	1.61	0.14	18	2.66	0.02	199	44	7	77
99046	62	990591	30	32.2	0.18	25	1.39	0.11	18	2.70	0.01	173	42	4	67
99046	62	990592	40	32.0	0.30	25	1.33	0.16	16	2.63	0.01	187	42	4	63
99046	62	990593	50	32.3	0.39	25	1.27	0.17	15	2.31	0.01	171	38	4	58
99046	62	990594	60	32.1	0.37	25	1.09	0.16	16	2.10	0.01	181	36	5	55
99046	62	990595	70	32.6	0.45	25	1.17	0.15	15	2.36	0.01	192	46	4	63
99046	62	990596	80	32.7	0.43	25	1.21	0.18	15	2.59	0.01	196	46	5	66
99046	62	990597	90	32.5	0.45	25	1.14	0.15	14	2.53	0.01	193	42	4	62
99046	62	990598	100	32.4	0.52	25	1.08	0.14	16	2.18	0.01	183	42	6	63
99046	63	990600	0	31.3	0.45	25	1.47	0.14	12	2.21	0.04	179	50	4	57
99046	63	990601	2.5	31.4	0.45	25	1.27	0.17	14	1.73	0.04	133	42	18	70
99046	63	990602	5	31.1	0.36	25	1.34	0.13	13	1.79	0.03	138	47	6	53
99046	63	990603	7.5	31.2	0.40	25	0.66	0.11	12	1.67	0.01	161	43	11	57
99046	63	990604	10	31.5	0.38	25	0.99	0.11	8	1.47	0.01	149	36	5	40
99046	63	990605	20	31.2	0.40	25	0.89	0.14	9	1.49	0.01	134	28	3	39
99046	64	990606	0	30.0	0.18	25	1.24	0.12	9	1.76	1.61	161	38	4	45
99046	64	990607	2.5	29.5	0.33	25	1.21	2.21	27	1.25	1.94	159	41	223	224
99046	64	990608	5	29.8	0.39	25	1.58	2.22	29	1.30	1.68	173	38	126	254
99046	64	990609	7.5	30.0	0.55	25	0.91	1.14	15	1.23	0.43	166	34	47	135
99046	64	990610	10	30.2	0.66	25	0.79	1.12	16	1.19	0.25	161	33	42	95
99046	64	990611	20	30.5	0.67	25	0.68	0.14	8	1.07	0.01	147	32	4	35
99046	65	990612	0	33.8	0.45	25	1.24	0.15	12	1.91	0.03	156	39	15	60
99046	65	990613	2.5	32.5	0.37	25	1.06	0.05	10	1.65	0.02	143	32	12	51
99046	65	990614	5	31.8	0.45	25	1.07	0.02	11	1.74	0.02	147	37	6	50
99046	65	990615	7.5	32.3	0.43	25	1.19	0.05	11	1.69	0.02	144	39	5	48
99046	65	990616	10	32.5	0.49	25	0.97	0.05	10	1.53	0.01	140	38	4	46

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	65	990617	20	32.2	0.42	25	0.61	0.09	9	1.69	0.01	144	36	3	41
99046	65	990618	30	32.4	0.46	25	1.08	0.19	20	3.32	0.02	271	57	4	66
99046	65	990619	40	32.5	0.62	25	1.08	0.36	20	2.78	0.02	259	51	4	64
99046	65	990620	50	32.5	0.73	25	1.16	0.16	22	2.97	0.02	267	55	5	66
99046	65	990621	60	32.2	0.82	25	1.15	0.14	22	3.05	0.02	265	51	5	65
99046	66	990622	0	32.6	0.52	25	1.51	0.20	14	2.00	0.03	169	29	19	68
99046	66	990623	2.5	32.0	0.47	25	1.27	0.14	12	1.83	0.02	152	33	9	54
99046	66	990624	5	32.6	0.36	25	1.37	0.07	12	1.85	0.02	148	28	5	49
99046	66	990625	7.5	33.1	0.45	25	1.18	0.05	11	1.81	0.01	144	30	5	48
99046	66	990626	10	32.5	0.44	25	1.13	0.14	13	1.76	0.02	141	36	5	57
99046	66	990627	20	32.1	0.44	25	0.84	0.12	10	1.63	0.01	134	30	3	49
99046	66	990628	30	32.3	0.27	25	0.79	0.14	8	1.91	0.01	160	33	3	44
99046	66	990629	40	32.4	0.31	25	0.74	0.16	21	2.55	0.02	269	58	4	62
99046	66	990630	50	32.8	0.34	25	1.07	0.21	18	2.52	0.02	272	50	4	56
99046	66	990631	60	33.1	0.33	25	1.00	0.21	17	2.44	0.02	285	54	5	54
99046	66	990632	70	33.0	0.36	25	0.79	0.19	17	2.49	0.02	282	49	5	53
99046	66	990633	80	32.7	0.30	25	1.05	0.17	19	2.76	0.02	276	58	5	58
99046	66	990634	90	32.9	0.31	25	0.69	0.16	14	2.56	0.01	235	61	4	55
99046	67	990996	0-5				0.84	0.16	13	1.94	0.05	181	34	17	60
99046	68	990635	0	33.8	0.46	25	1.43	0.12	15	2.03	0.04	170	40	10	58
99046	68	990636	2.5	33.7	0.33	25	1.34	0.09	15	1.91	0.02	175	46	10	60
99046	68	990637	5	32.9	0.39	25	1.40	0.10	15	1.97	0.01	174	38	9	58
99046	68	990638	7.5	33.3	0.30	25	1.28	0.09	18	1.79	0.01	170	41	8	67
99046	68	990639	10	33.2	0.42	25	1.46	0.10	16	2.08	0.01	200	39	5	60
99046	68	990640	20	33.2	0.42	25	1.36	0.10	15	1.80	0.01	163	32	5	52
99046	68	990641	30	33.0	0.49	25	1.25	0.11	14	1.86	0.01	168	32	5	52
99046	68	990642	40	33.4	0.41	25	1.15	0.14	14	2.09	0.01	172	35	5	53
99046	68	990643	50	33.3	0.62	25	1.22	0.15	14	2.11	0.01	177	40	5	56
99046	68	990644	60	33.0	0.71	25	1.28	0.26	14	2.22	0.01	184	37	5	56
99046	68	990645	70	33.6	0.73	25	1.40	0.16	14	2.20	0.01	185	40	5	57
99046	68	990646	80	33.3	0.89	25	1.17	0.18	19	2.46	0.01	190	41	5	71
99046	68	990647	90	33.4	1.02	25	1.37	0.14	19	2.00	0.01	167	44	5	69
99046	68	990648	100	32.9	1.35	25	1.16	0.11	14	1.87	0.01	185	28	5	63
99046	69	990649	0	34.2	0.31	26	1.45	0.15	17	2.16	0.05	210	37	23	77
99046	69	990650	2.5	33.9	0.39	26	1.59	0.13	17	2.23	0.04	230	38	21	74
99046	69	990651	5	33.4	0.35	26	1.46	0.15	18	2.27	0.05	230	39	22	76
99046	69	990652	7.5	33.4	0.38	26	1.77	0.14	18	2.29	0.04	231	39	23	74
99046	69	990653	10	33.2	0.38	25	1.43	0.11	16	2.30	0.02	222	34	12	68
99046	69	990654	20	33.4	0.34	25	1.75	0.13	15	2.19	0.01	217	36	7	60
99046	69	990655	30	33.1	0.35	25	1.75	0.11	14	2.00	0.01	210	35	7	57
99046	69	990656	40	32.8	0.41	25	1.61	0.13	14	1.89	0.01	187	33	5	54
99046	69	990657	50	32.5	0.51	25	1.48	0.11	16	2.12	0.01	198	33	4	53
99046	69	990658	60	32.1	0.71	25	1.32	0.10	16	2.12	0.01	197	31	5	55
99046	69	990659	70	32.7	0.82	25	1.44	0.14	15	2.15	0.01	192	33	6	56
99046	69	990660	80	33.0	0.97	23	1.59	0.15	15	2.35	0.01	205	32	5	56
99046	69	990661	90	33.4	1.22	18	1.30	0.15	15	2.10	0.01	194	36	6	63
99046	69	990662	100	32.7	1.38	18	1.46	0.15	16	2.18	0.01	193	30	6	45
99046	69	990663	110	33.2	1.66	17	1.38	0.12	15	2.10	0.01	188	30	6	41
99046	69	990664	120	32.6	1.90	14	1.48	0.10	16	1.95	0.01	186	30	6	42
99046	70	990665	0	33.6	0.21	26	1.76	0.12	18	1.97	0.05	214	27	21	60
99046	70	990666	2.5	33.7	0.21	26	1.55	0.11	19	1.98	0.04	206	30	15	55
99046	70	990667	5	33.9	0.22	26	1.63	0.11	16	2.03	0.02	216	35	12	49
99046	70	990668	7.5	33.9	0.07	26	1.58	0.10	15	2.14	0.02	211	34	7	47
99046	70	990669	10	33.9	0.15	26	1.50	0.09	15	2.11	0.02	202	36	6	52
99046	70	990670	20	33.8	0.35	26	1.54	0.12	14	2.13	0.01	207	34	5	49

Table 2 Geochemical Data

Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	70	990671	30	33.4	0.45	26	1.38	0.12	14	1.95	0.01	199	33	5	49
99046	70	990672	40	33.8	0.56	26	1.26	0.07	17	1.94	0.01	191	38	5	54
99046	70	990673	50	33.8	0.67	26	1.61	0.09	16	2.16	0.01	198	34	5	50
99046	70	990674	60	33.2	0.78	26	1.46	0.14	16	2.21	0.01	213	36	4	52
99046	70	990675	70	32.9	0.87	26	1.32	0.12	15	2.25	0.01	213	33	4	49
99046	70	990676	80	33.2	0.98	26	1.23	0.11	17	2.47	0.02	280	41	5	58
99046	70	990677	90	32.5	1.05	26	1.17	0.14	15	2.12	0.04	208	32	4	55
99046	70	990678	100	32.2	1.17	26	1.43	0.12	15	2.05	0.01	218	33	6	63
99046	70	990679	110	32.6	1.22	26	1.44	0.14	15	2.29	0.02	216	37	4	47
99046	70	990680	120	33.7	1.26	26	1.32	0.10	15	2.10	0.01	195	38	5	45
99046	71	990681	0	34.4	0.21	26	1.52	0.09	17	2.12	0.04	222	35	12	56
99046	71	990682	2.5	33.4	0.23	26	1.36	0.08	17	2.12	0.03	215	34	12	55
99046	71	990683	5	33.4	0.20	26	1.32	0.11	17	2.33	0.01	231	37	4	46
99046	71	990684	7.5	33.6	0.22	26	1.02	0.05	11	1.80	0.01	186	27	4	39
99046	71	990685	10	34.0	0.21	26	1.13	0.07	13	1.92	0.01	205	27	4	45
99046	71	990686	20	33.8	0.20	26	0.95	0.11	12	2.04	0.02	222	31	4	41
99046	71	990687	30	33.8	0.22	26	0.69	0.11	10	1.76	0.01	214	30	4	44
99046	71	990688	40	34.1	0.26	26	0.37	0.10	12	1.86	0.01	264	28	4	56
99046	72	990689	0	34.1	0.24	26	1.58	0.15	19	1.95	0.02	185	46	10	83
99046	72	990690	2.5	33.9	0.23	26	1.63	0.15	19	1.97	0.01	182	51	6	69
99046	72	990691	5	33.6	0.23	26	1.61	0.17	19	2.04	0.01	199	53	5	68
99046	72	990692	7.5	33.0	0.21	26	1.53	0.23	19	1.93	0.01	184	53	5	69
99046	72	990693	10	32.8	0.20	26	1.69	0.32	19	1.94	0.01	199	53	5	69
99046	72	990694	20	33.0	0.25	26	1.83	0.22	18	1.95	0.01	173	49	5	63
99046	72	990695	30	33.3	0.30	26	1.71	0.21	18	1.98	0.01	193	41	5	64
99046	72	990696	40	33.1	0.27	26	1.51	0.24	16	1.65	0.01	171	38	6	54
99046	72	990697	50	32.9	0.35	26	1.27	0.19	16	1.74	0.01	196	41	5	58
99046	72	990698	60	33.0	0.38	26	1.41	0.21	17	1.87	0.01	183	43	6	59
99046	72	990699	70	33.5	0.40	26	1.69	0.16	22	1.79	0.01	162	41	6	59
99046	72	990700	80	33.4	0.40	26	1.60	0.19	17	1.89	0.01	182	44	5	61
99046	72	990701	90	33.3	0.37	26	1.66	0.19	19	1.97	0.01	188	46	6	65
99046	72	990702	100	33.4	0.43	26	1.33	0.13	18	1.87	0.01	201	43	6	66
99046	72	990703	110	33.5	0.44	26	1.42	0.23	17	1.87	0.01	173	40	5	63
99046	72	990704	120	33.6	0.45	26	1.28	0.15	15	1.80	0.01	187	37	6	58
99046	72	990705	130	33.8	0.44	26	1.29	0.14	13	1.62	0.01	197	31	6	53
99046	73	990706	0	34.6	0.21	26	1.81	0.16	22	2.07	0.08	209	39	16	85
99046	73	990707	2.5	34.5	0.20	26	1.77	0.13	21	2.05	0.07	212	39	19	85
99046	73	990708	5	34.5	0.22	26	1.49	0.14	22	2.05	0.05	218	41	12	81
99046	73	990709	7.5	34.4	0.18	26	1.55	0.13	19	2.15	0.02	203	39	7	71
99046	73	990710	10	34.5	0.20	26	1.52	0.19	19	2.12	0.02	206	37	6	70
99046	73	990711	20	34.0	0.21	26	1.69	0.23	18	1.94	0.02	188	38	5	65
99046	73	990712	30	33.7	0.21	26	1.45	0.30	19	2.03	0.01	193	40	5	67
99046	73	990713	40	33.8	0.24	26	0.95	0.22	16	2.06	0.01	206	36	5	63
99046	73	990714	50	33.8	0.24	26	1.23	0.40	16	1.64	0.01	320	35	6	62
99046	73	990715	60	33.7	0.29	26	1.11	0.14	19	2.10	0.01	236	43	6	69
99046	73	990716	70	33.7	0.30	26	0.93	0.13	22	2.27	0.01	270	45	7	75
99046	73	990717	80	33.7	0.29	26	0.84	0.08	29	2.64	0.01	295	46	7	89
99046	73	990718	90	33.9	0.32	26	0.68	0.07	34	2.97	0.02	301	52	7	95
99046	73	990719	100	34.0	0.33	26	0.65	0.07	33	2.86	0.01	311	48	8	95
99046	73	990720	110	34.0	0.34	26	0.58	0.05	31	2.46	0.02	292	44	9	84
99046	73	990721	120	34.1	0.37	26	0.60	0.04	34	2.80	0.02	348	45	8	95
99046	73	990722	130	34.1	0.38	26	0.58	0.05	33	2.76	0.02	325	48	8	92
99046	74	990723	0	34.3	0.21	26	1.62	0.07	19	2.07	0.03	210	36	15	75
99046	74	990724	2.5	34.2	0.19	26	1.48	0.07	17	1.84	0.02	182	33	8	65
99046	74	990725	5	34.1	0.20	26	1.33	0.09	16	1.77	0.01	176	29	6	61
99046	74	990726	7.5	34.3	0.22	26	1.37	0.08	16	1.82	0.01	174	27	5	61

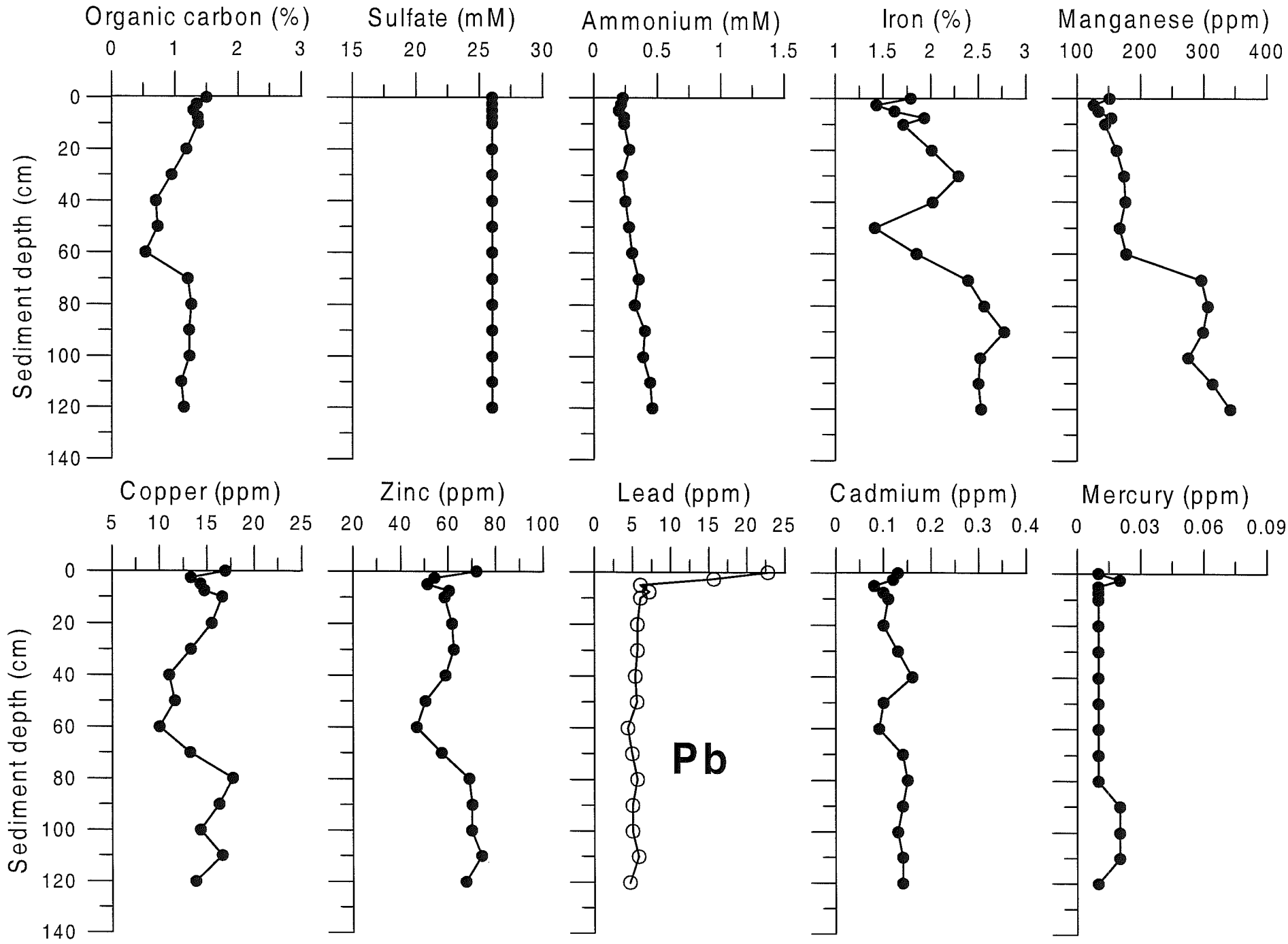
Table 2 Geochemical Data

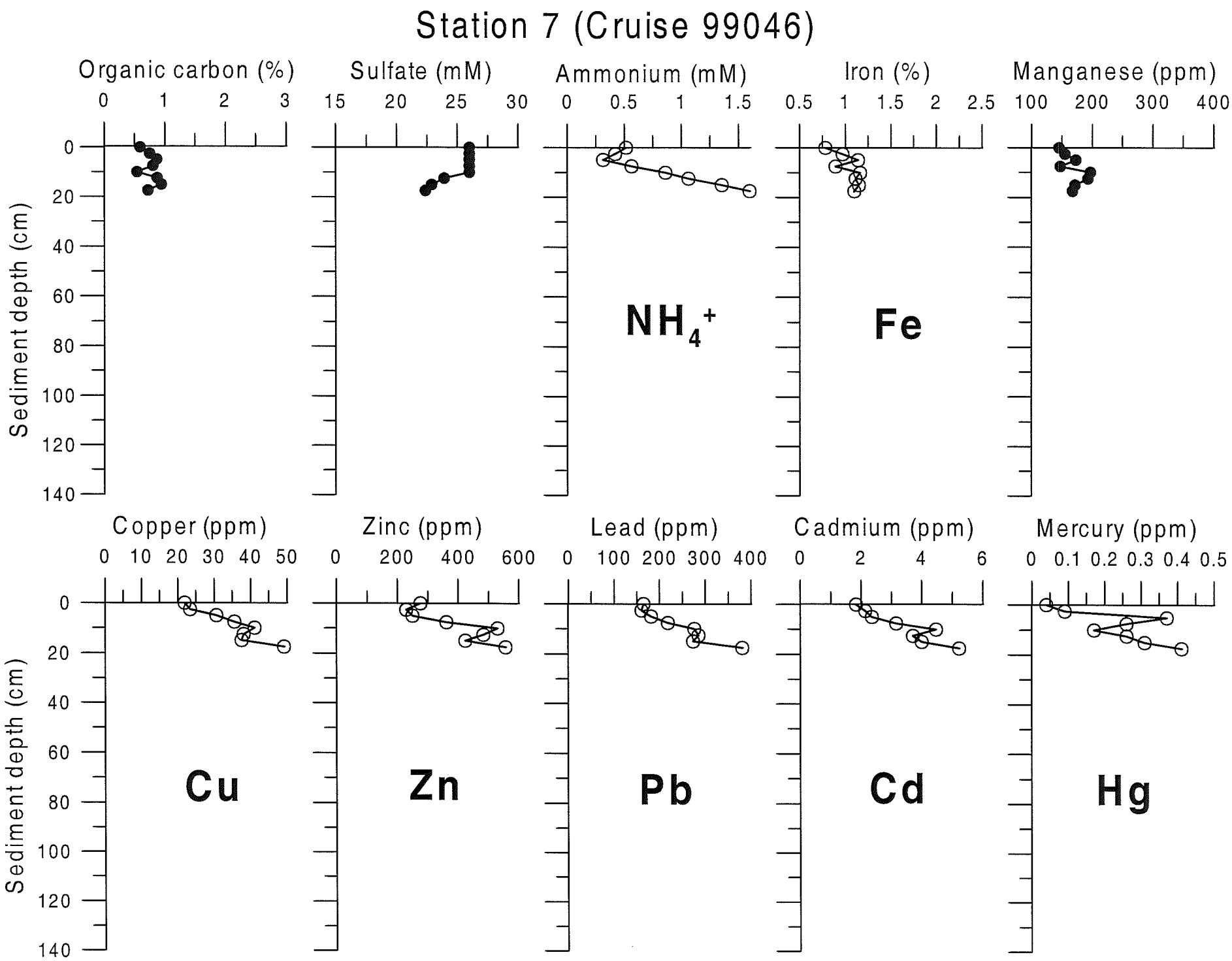
Cruise	Stn	Lab ID	Sed. Depth (cm)	Sal. (ppt)	Amm. (mM)	Sulfate (mM)	Organic Carb. (wt. %)	Cd (ppm)	Cu (ppm)	Fe (wt. %)	Hg (ppm)	Mn (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
99046	74	990727	10	34.4	0.18	26	1.39	0.09	16	1.79	0.01	186	29	5	61
99046	74	990728	20	34.3	0.18	26	0.85	0.10	12	1.27	0.01	149	34	4	44
99046	74	990729	30	34.2	0.19	26	1.02	0.18	16	2.16	0.01	216	41	5	63
99046	74	990730	40	34.2	0.19	26	1.10	0.14	18	2.14	0.01	218	45	5	68
99046	74	990731	50	34.0	0.23	26	0.99	0.16	17	2.05	0.01	226	41	6	65
99046	74	990732	60	34.1	0.27	26	1.02	0.08	15	1.88	0.01	214	43	6	63
99046	74	990733	70	34.0	0.29	26	0.94	0.10	17	2.13	0.01	225	40	21	69
99046	75	990997	0-5				0.19	0.16	3	0.72	0.01	129	10	5	22
99046	NG1	990962	0-5				2.24	4.76	37	2.34	0.04	288	44	208	349
99046	NG2	990961	0-5				0.27	1.83	26	3.12	0.01	1015	41	37	217
99046	NG3	990963	0-5				0.59	1.84	22	3.28	0.01	946	45	28	239
99046	EL1	990960	0-5				0.49	3.19	749	7.76	0.04	1359	105	7700	565
99046	EL2	990959	0-5				0.35	2.95	35	3.35	0.01	1786	44	236	316
99046	EL3	990958	0-5				1.45	2.77	46	2.86	0.06	934	53	193	250
99046	HD1	990956	0-5				2.36	8.55	24	1.85	0.07	764	42	181	561
99046	BD1	990955	0-5				1.00	2.33	49	2.64	0.01	1744	39	223	408
99046	JC1	990957	0-5				2.09	1.06	18	2.18	0.21	332	38	37	162
99046	NC1	990954	0-5				0.32	0.17	7	1.97	0.11	338	43	28	116

APPENDIX A

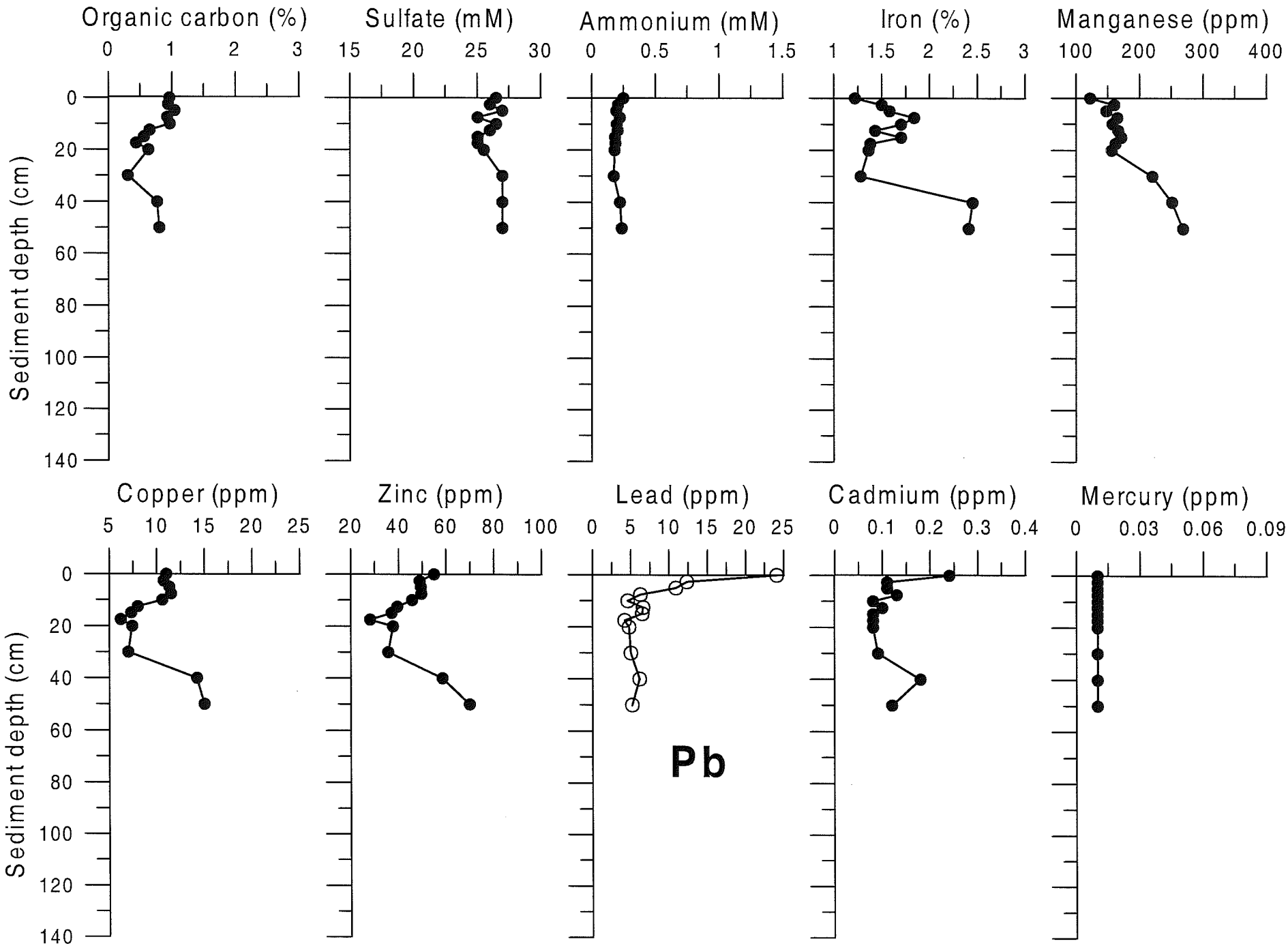
Geochemical Profiles of Gravity Cores from the Bay of Chaleur

Station 6 (Cruise 99046)

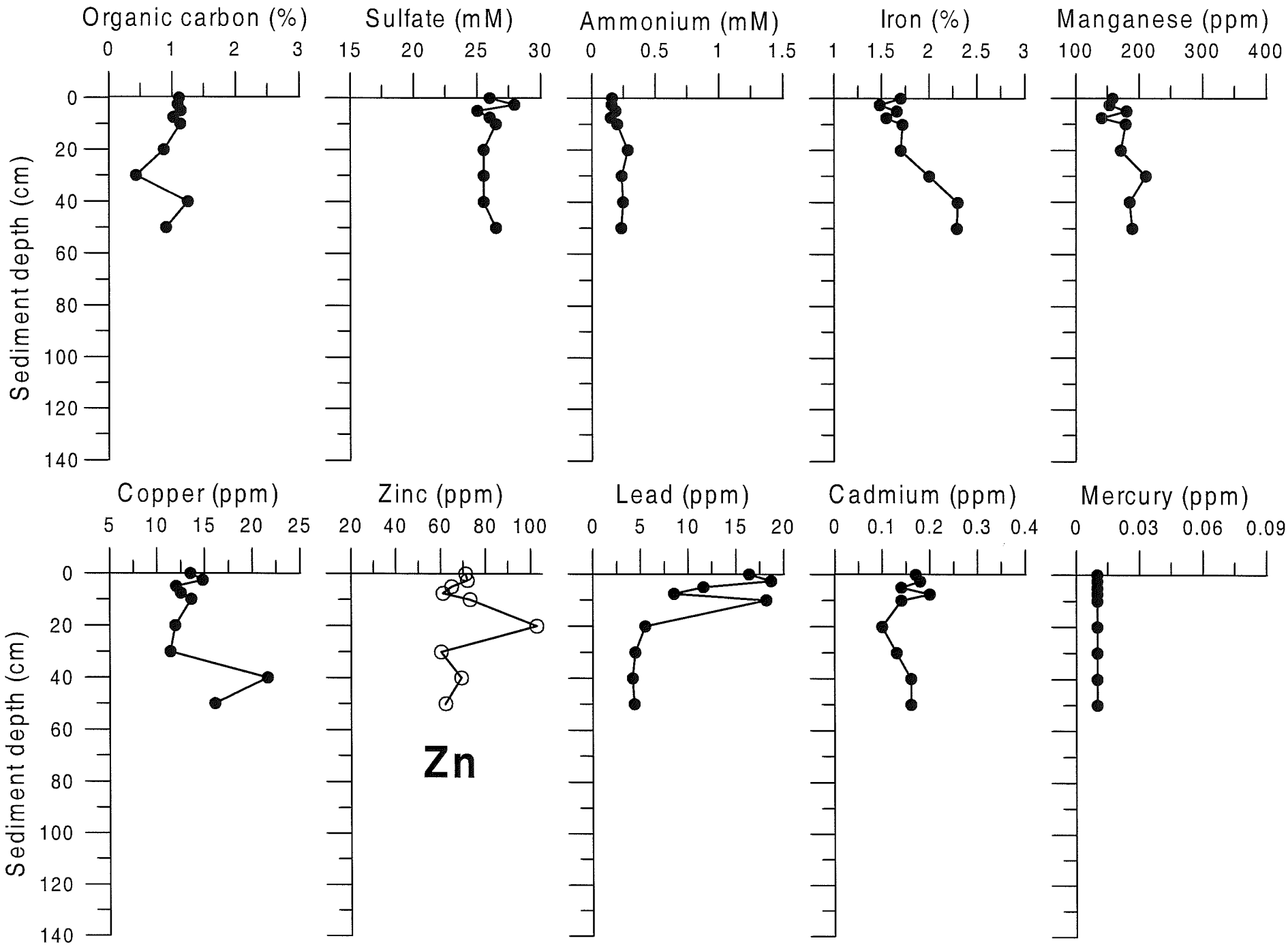



Station 7 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Sediment depth (cm)
NH4+
Fe
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Cu
Zn
Pb
Cd
Hg

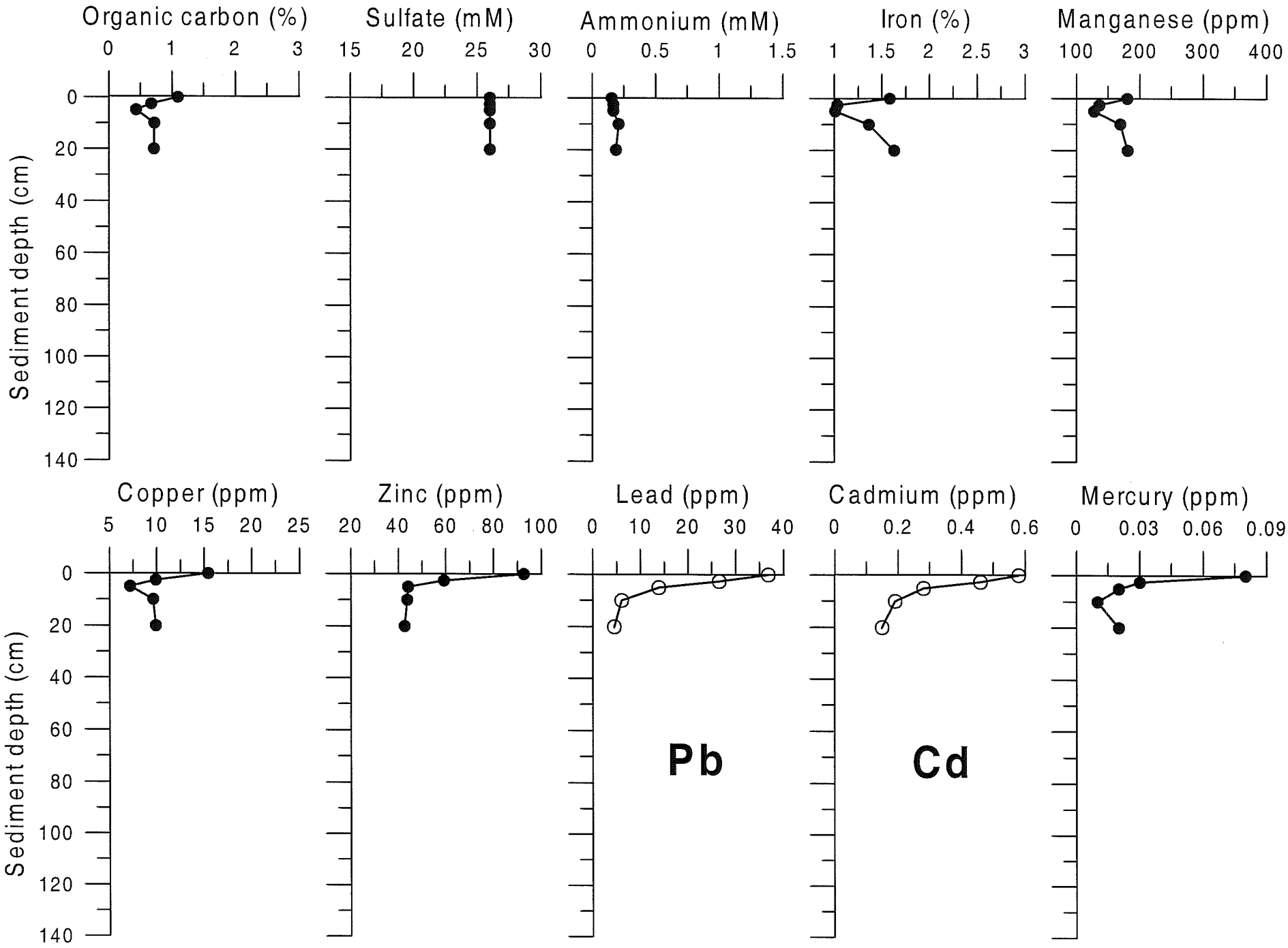
Station 11 (Cruise 99046)

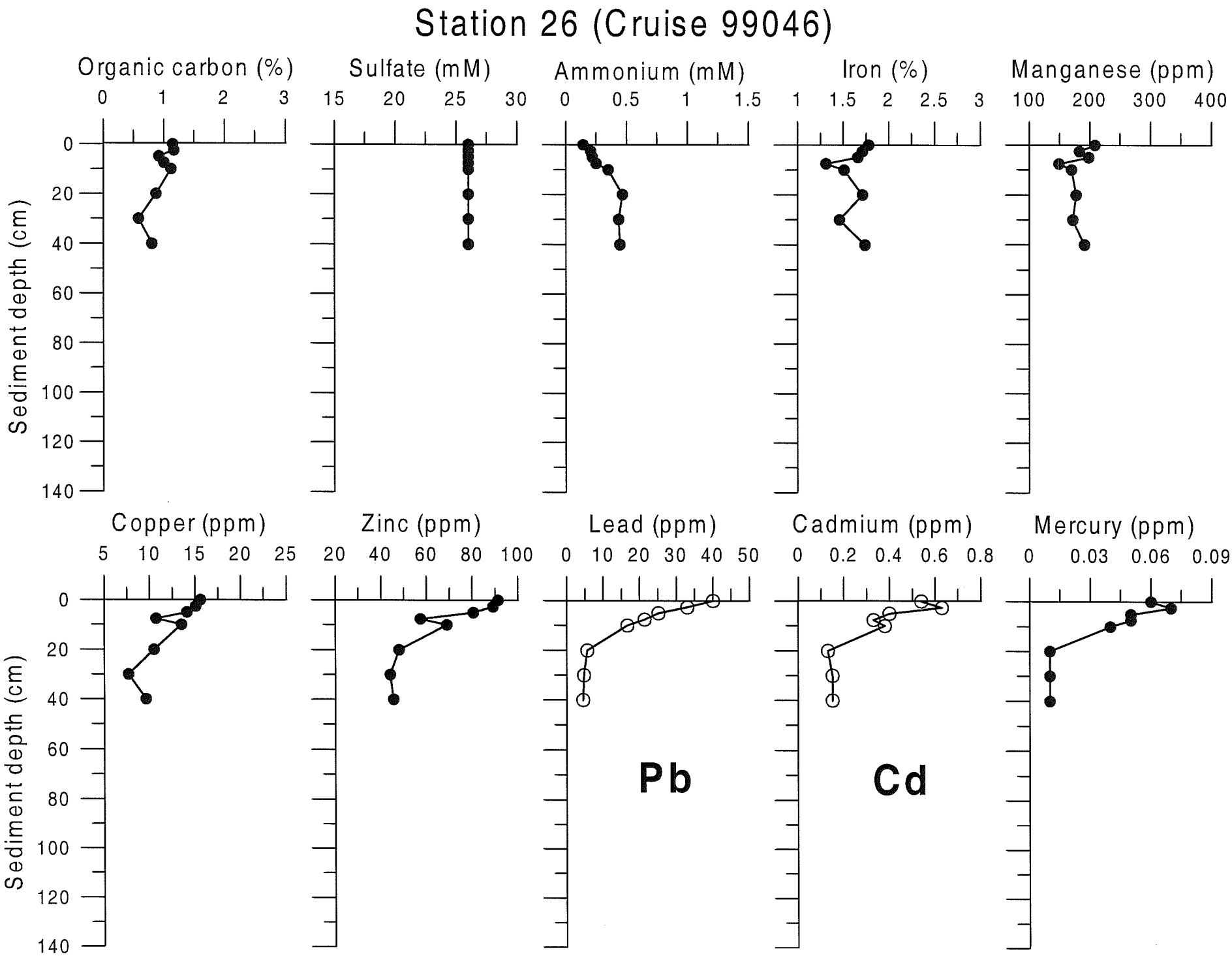


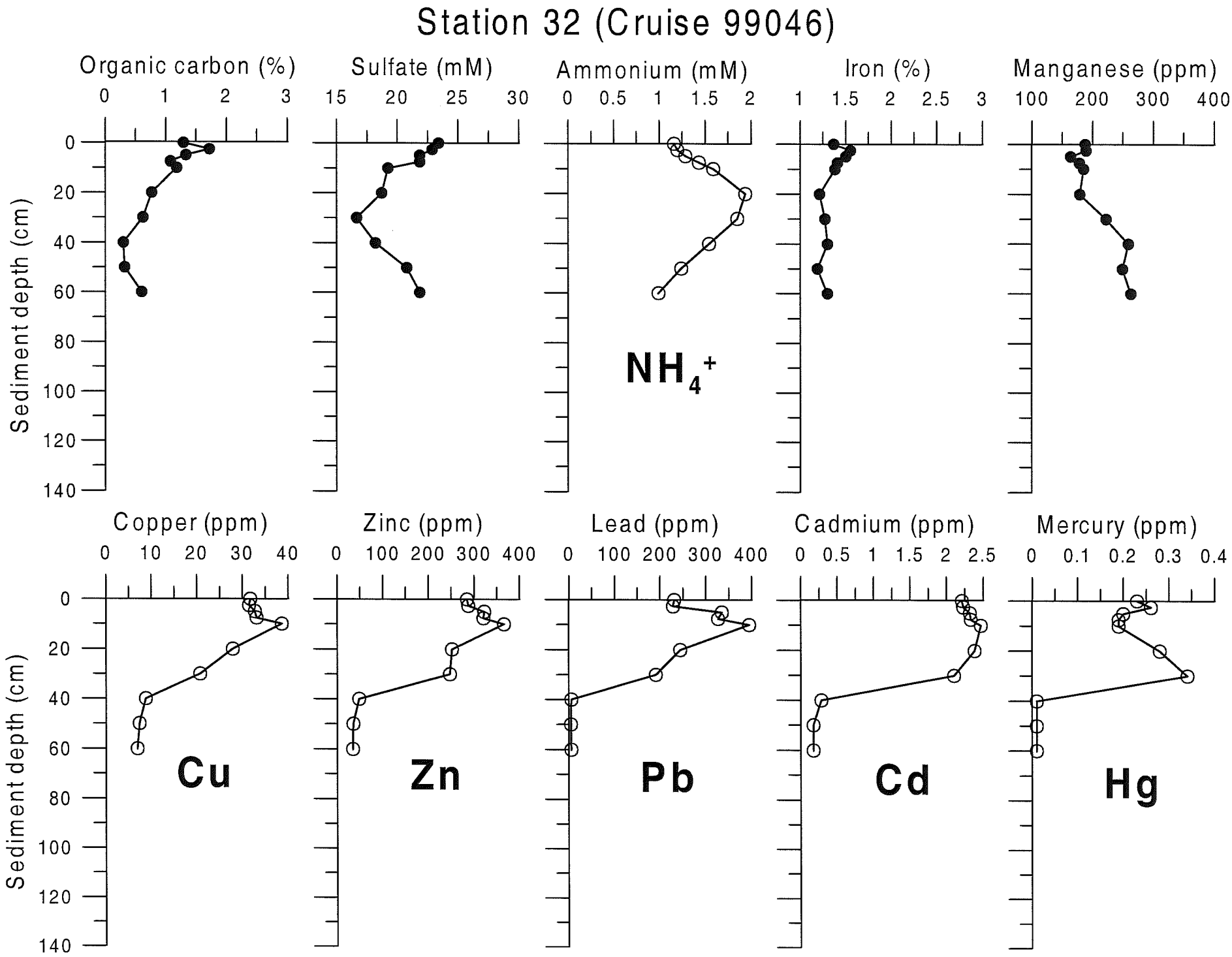
Station 12 (Cruise 99046)



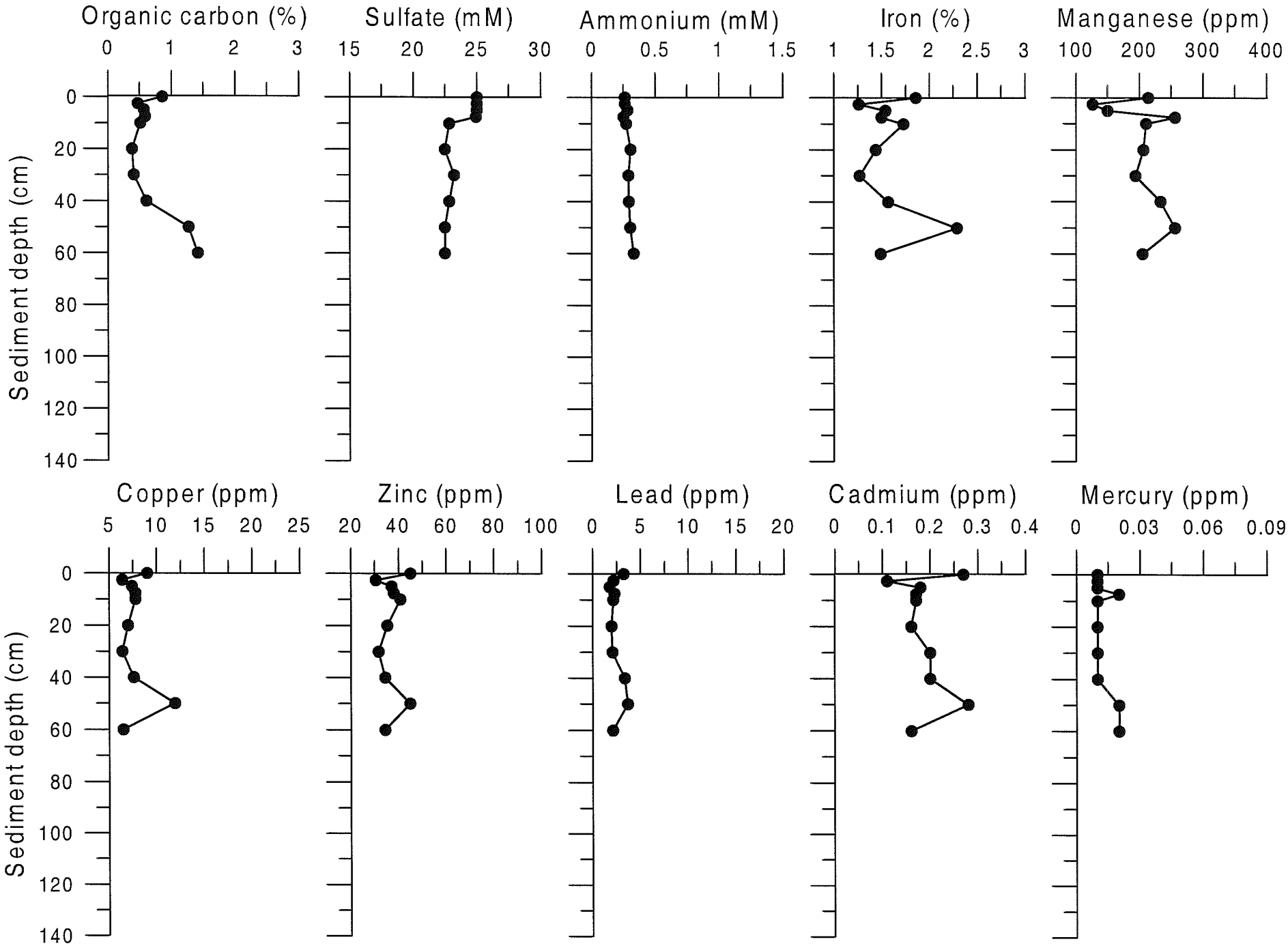
Station 25 (Cruise 99046)



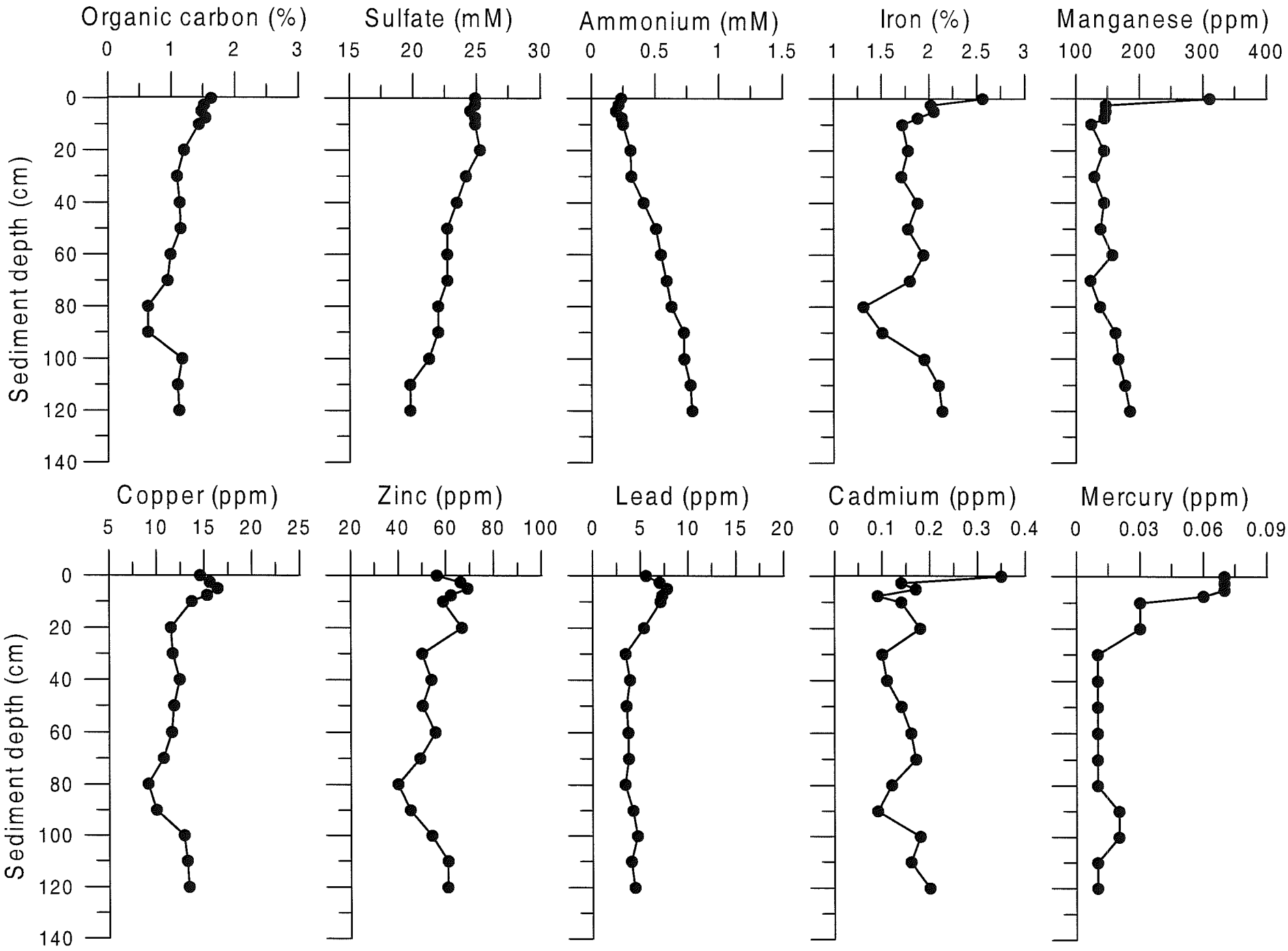

Station 26 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Pb
Cd
Sediment depth (cm)

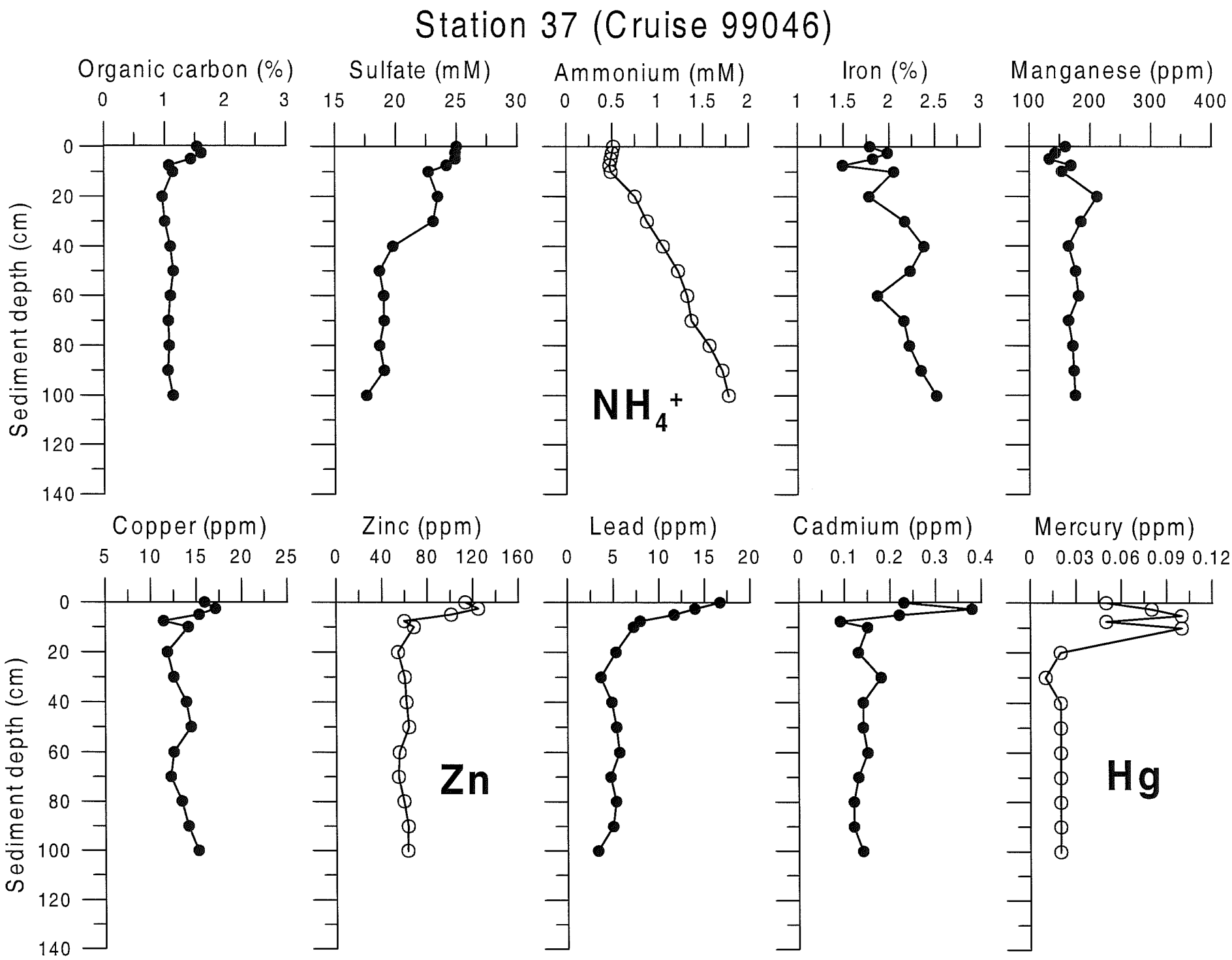

Station 32 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Sediment depth (cm)
NH4+
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Cu
Zn
Pb
Cd
Hg

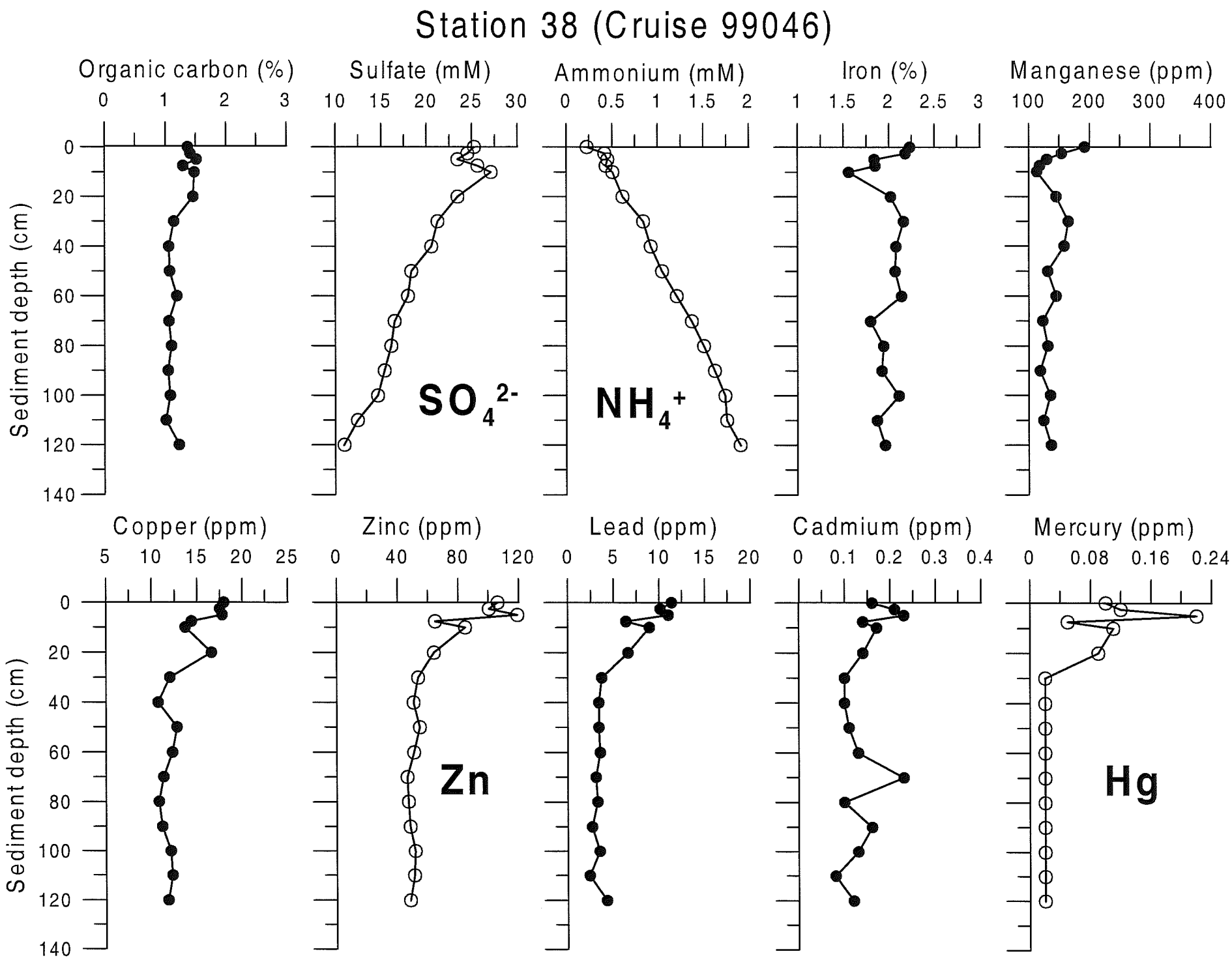
Station 35 (Cruise 99046)



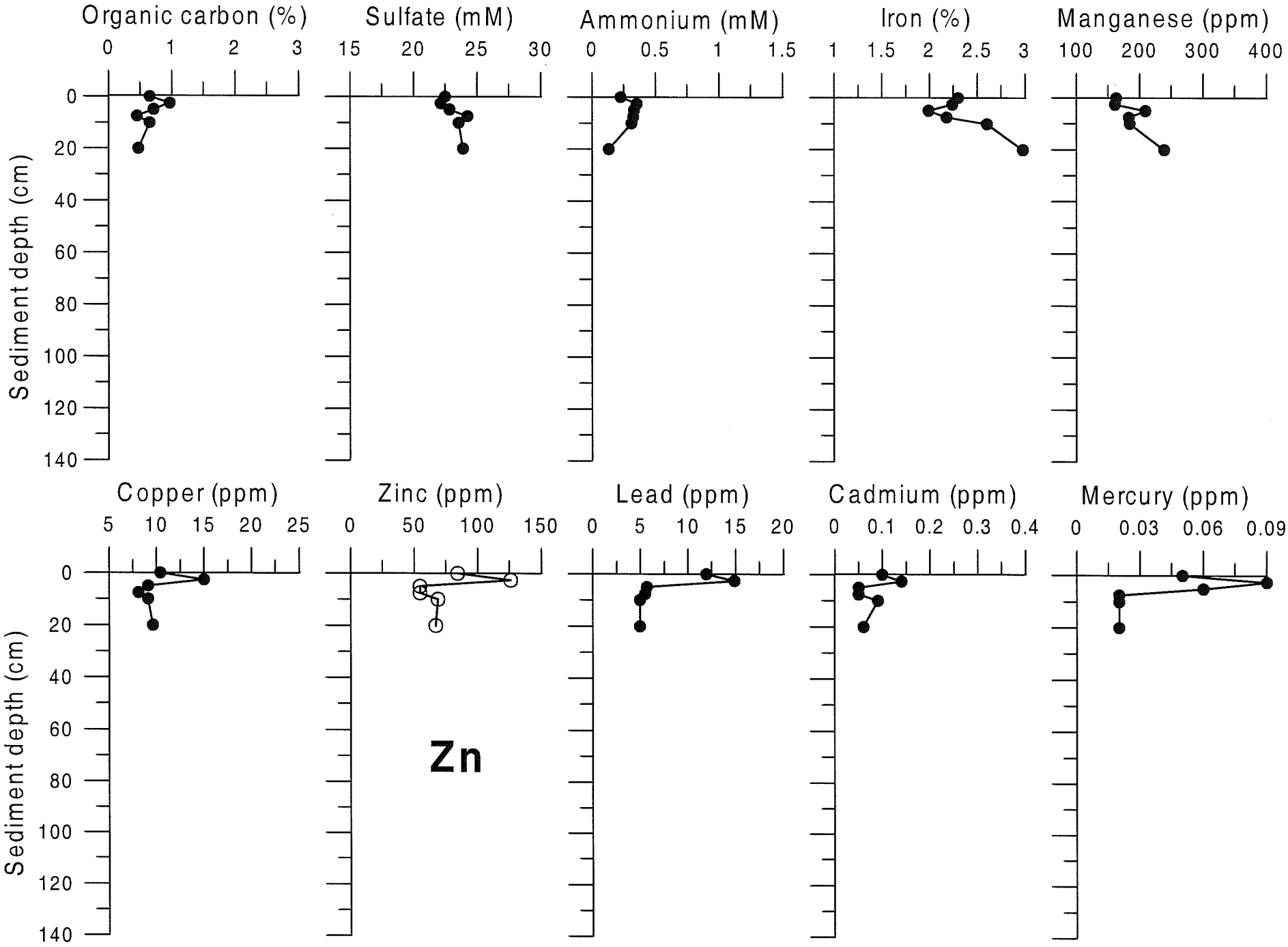
Station 36 (Cruise 99046)



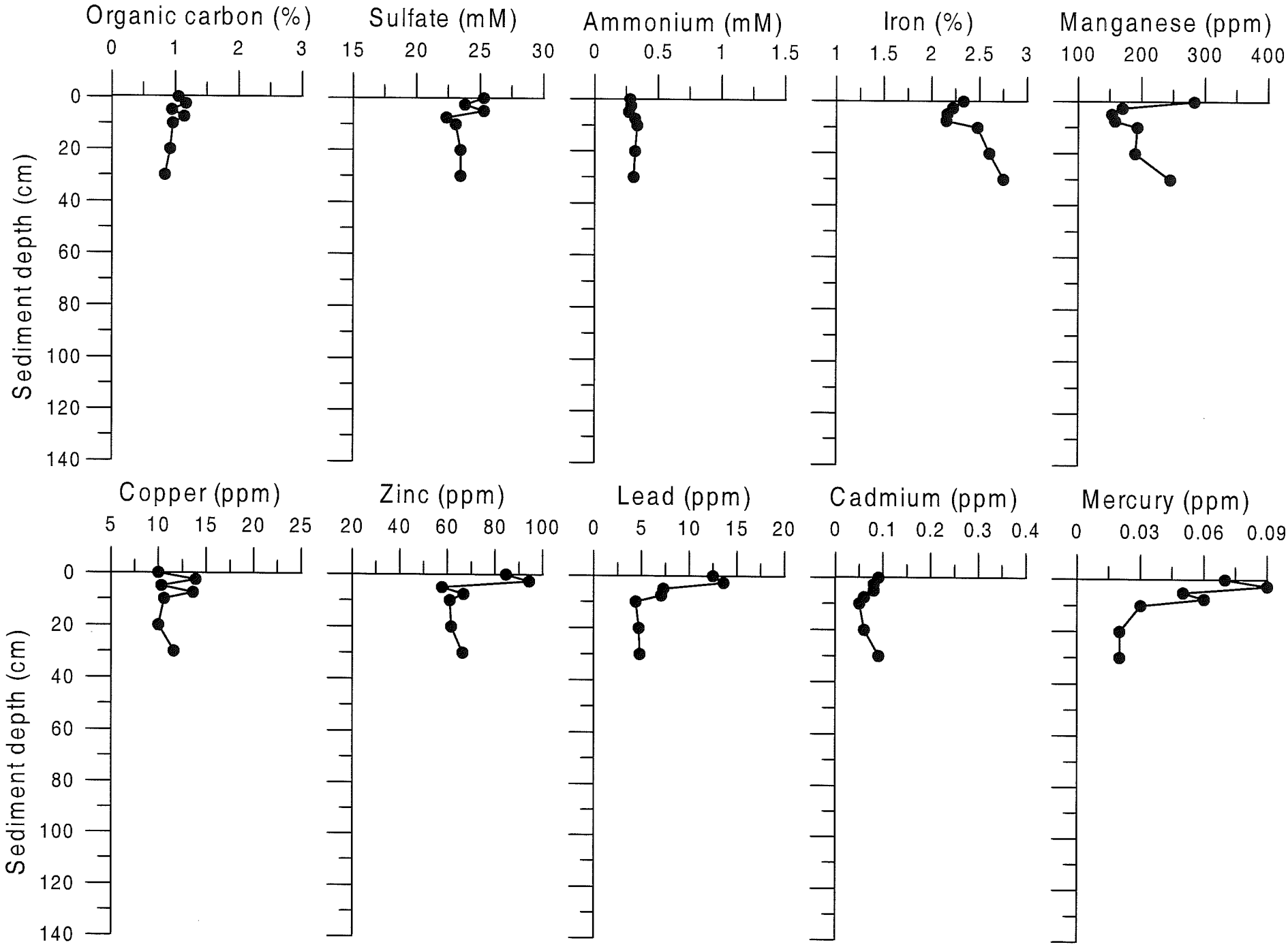

Station 37 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Sediment depth (cm)
NH4+
Zn
Hg


Station 38 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Zn
Hg

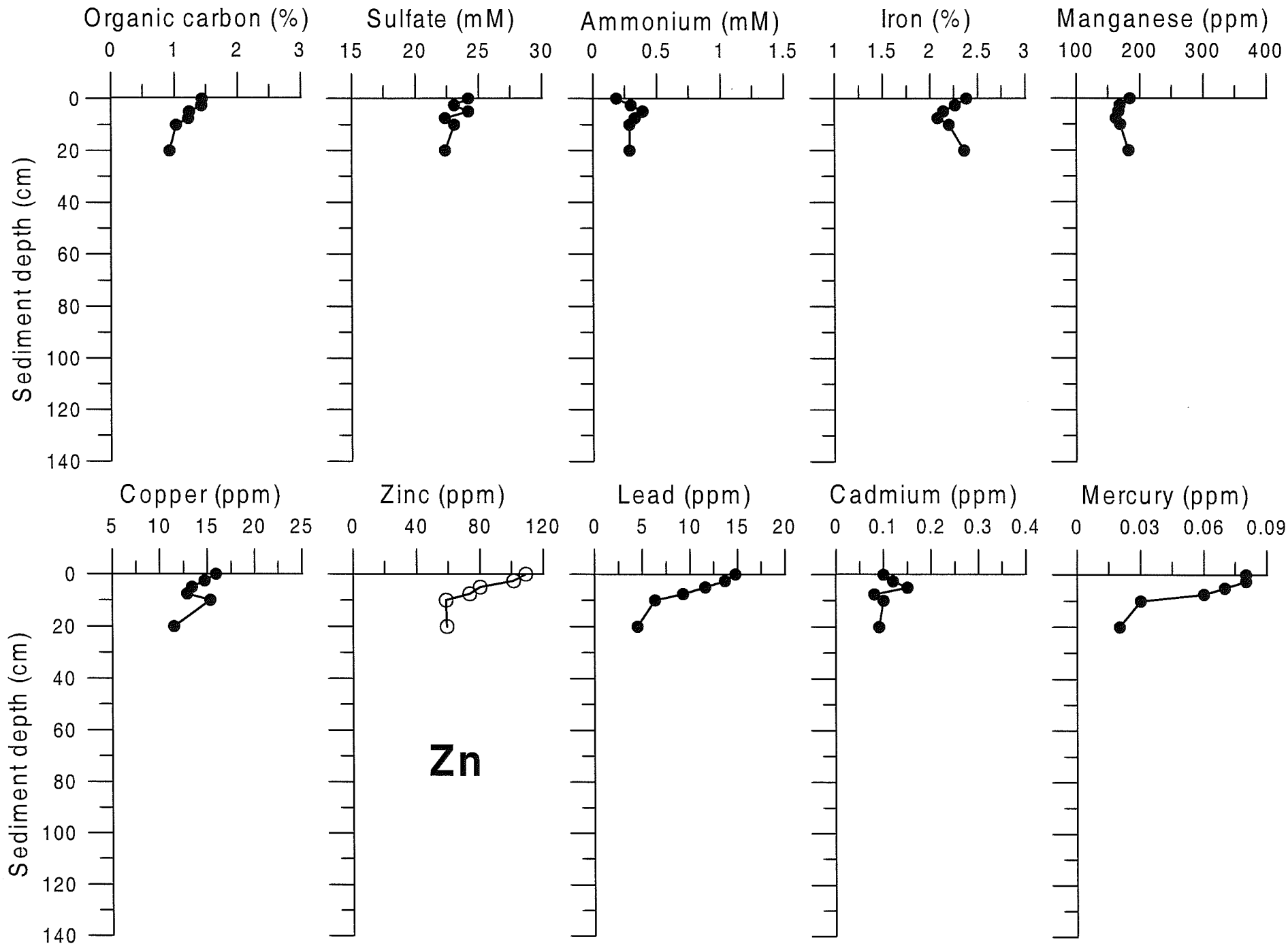
Station 41 (Cruise 99046)



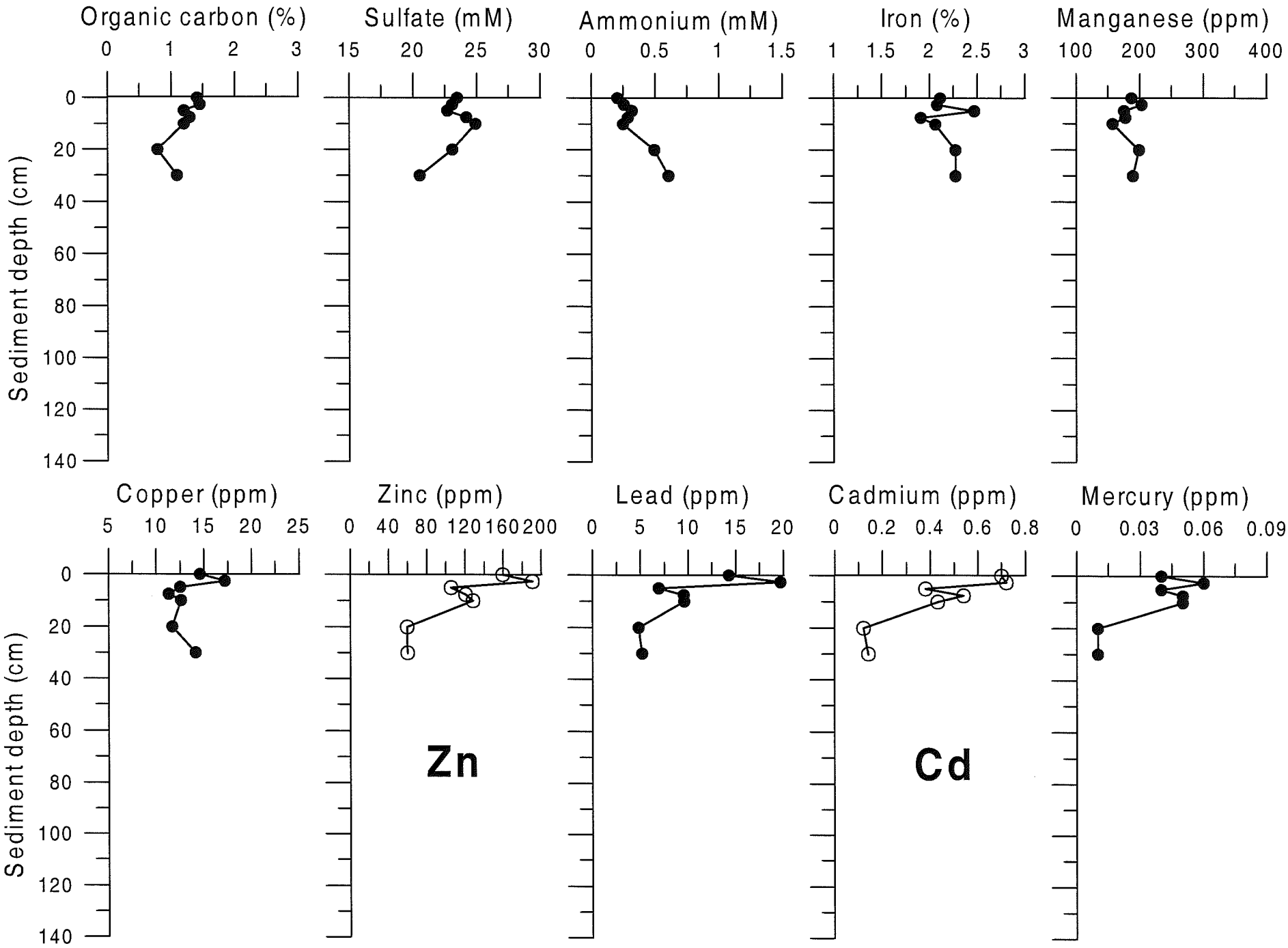
Station 42 (Cruise 99046)

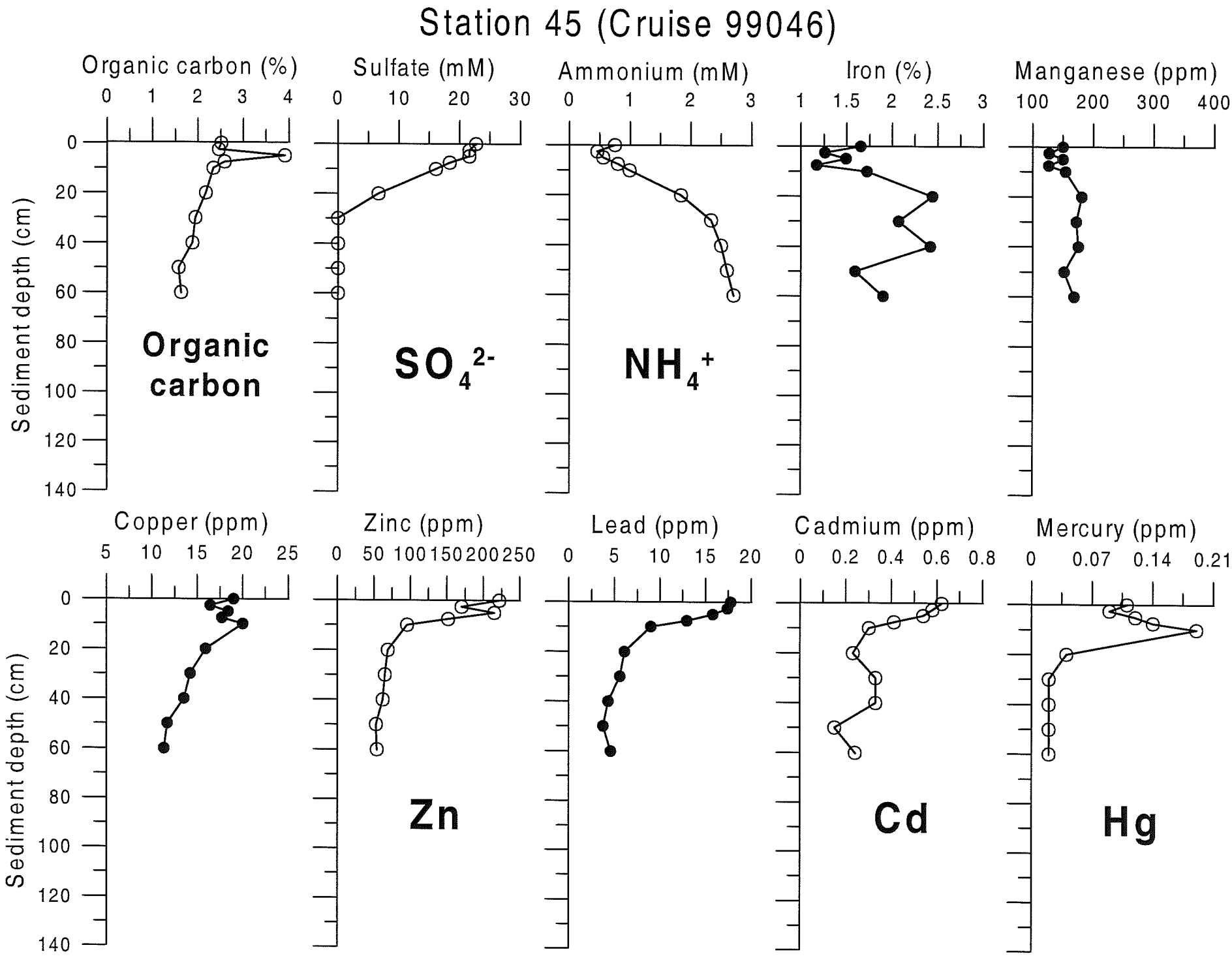


Station 43 (Cruise 99046)

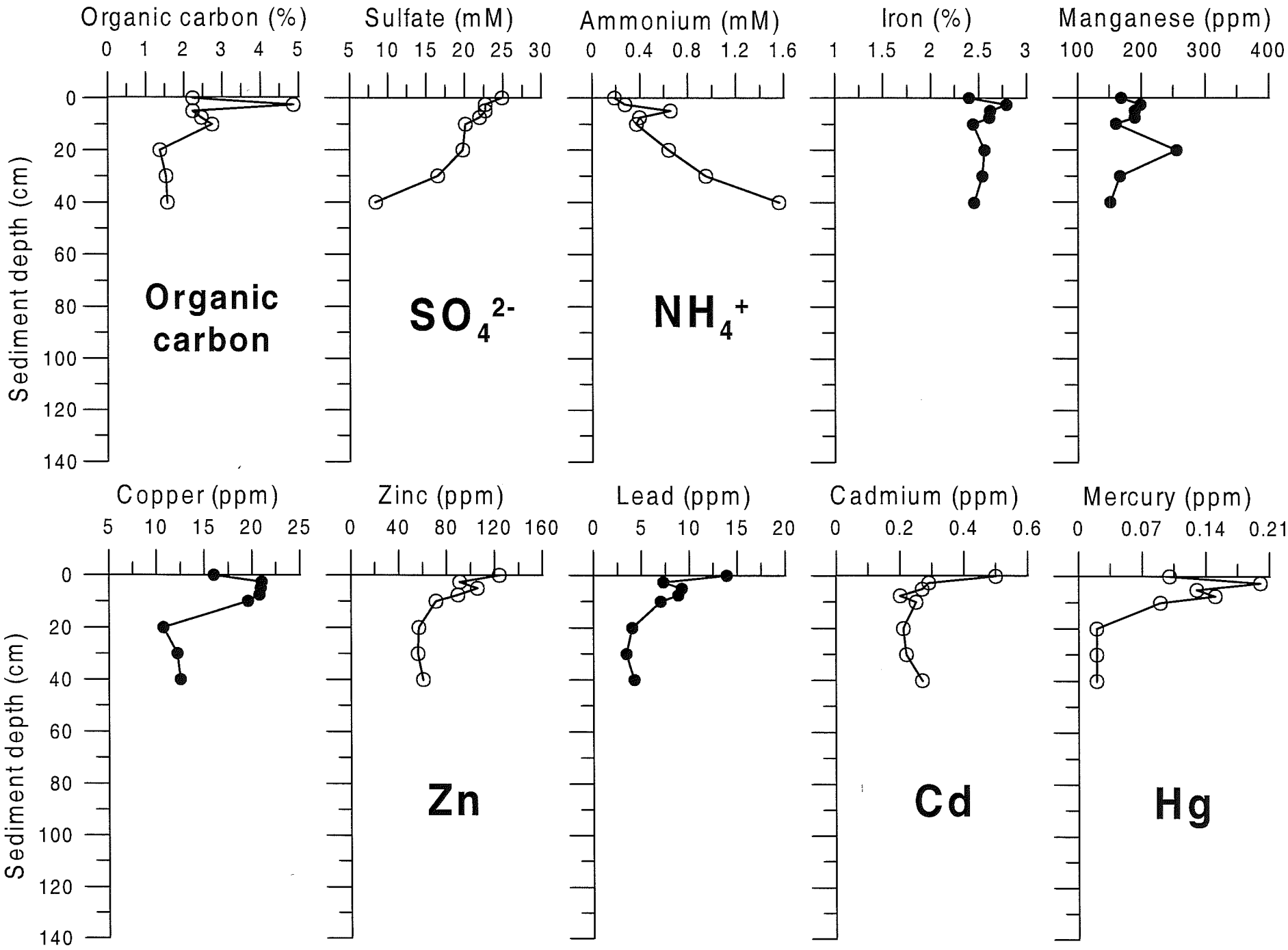


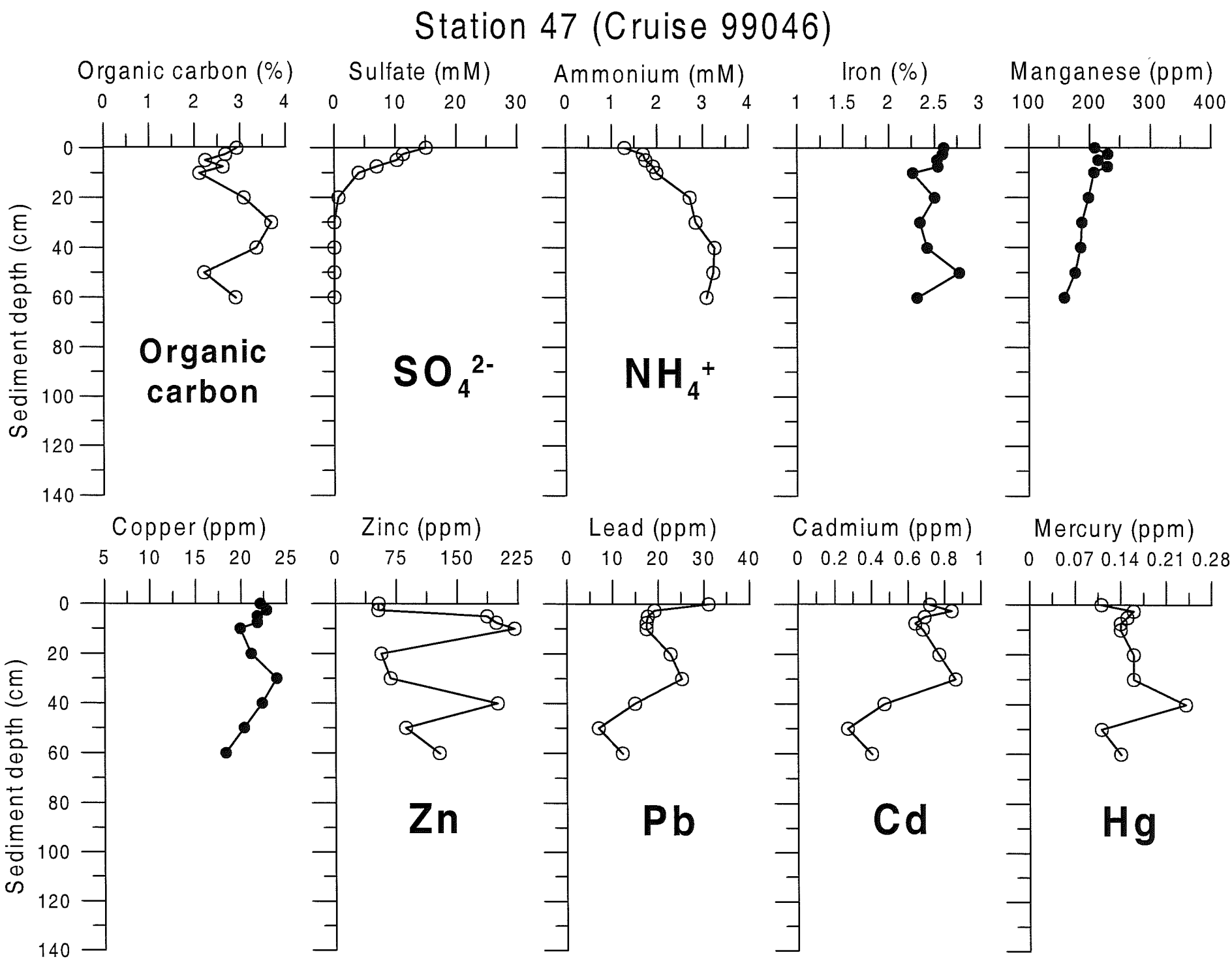
Station 44 (Cruise 99046)

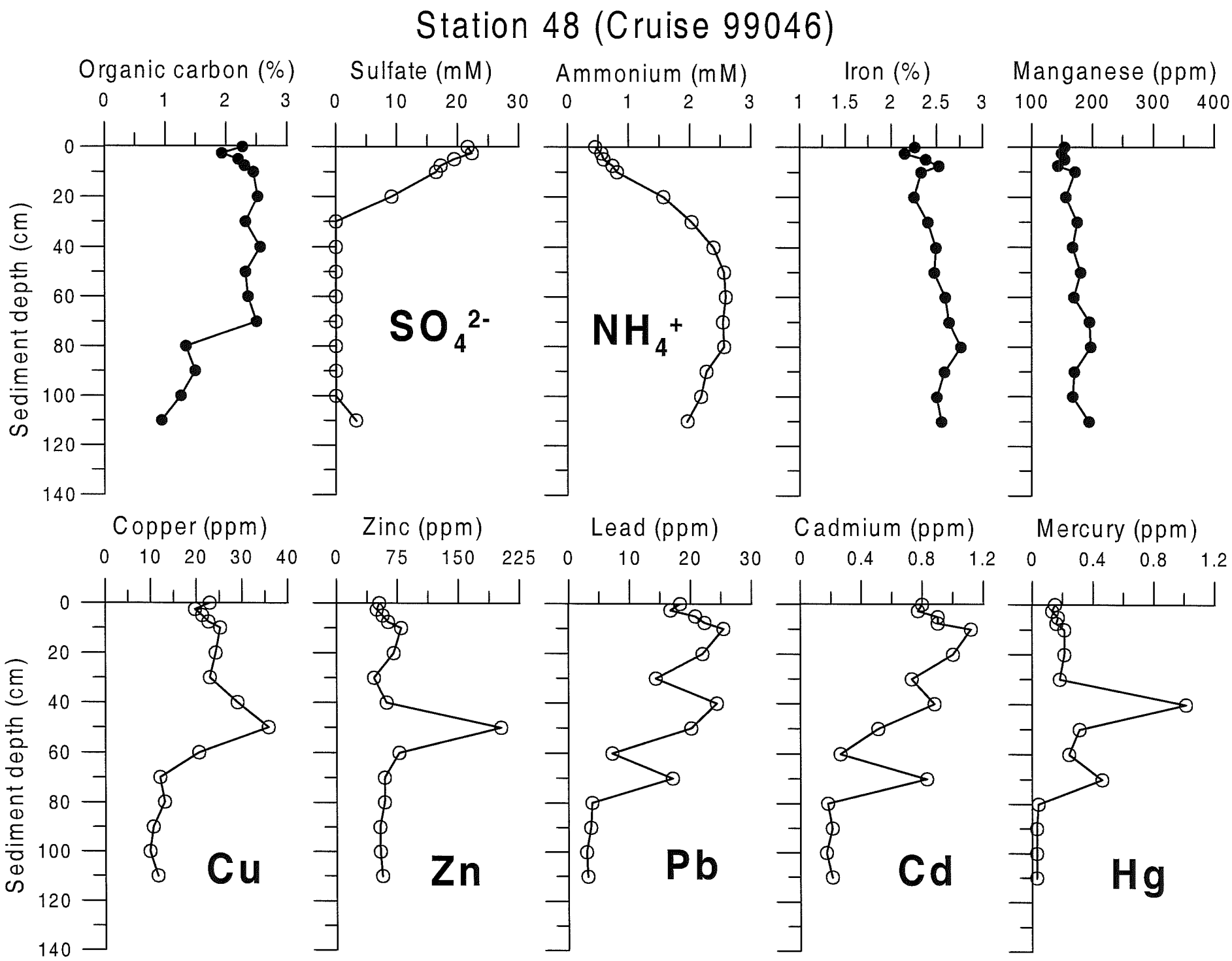


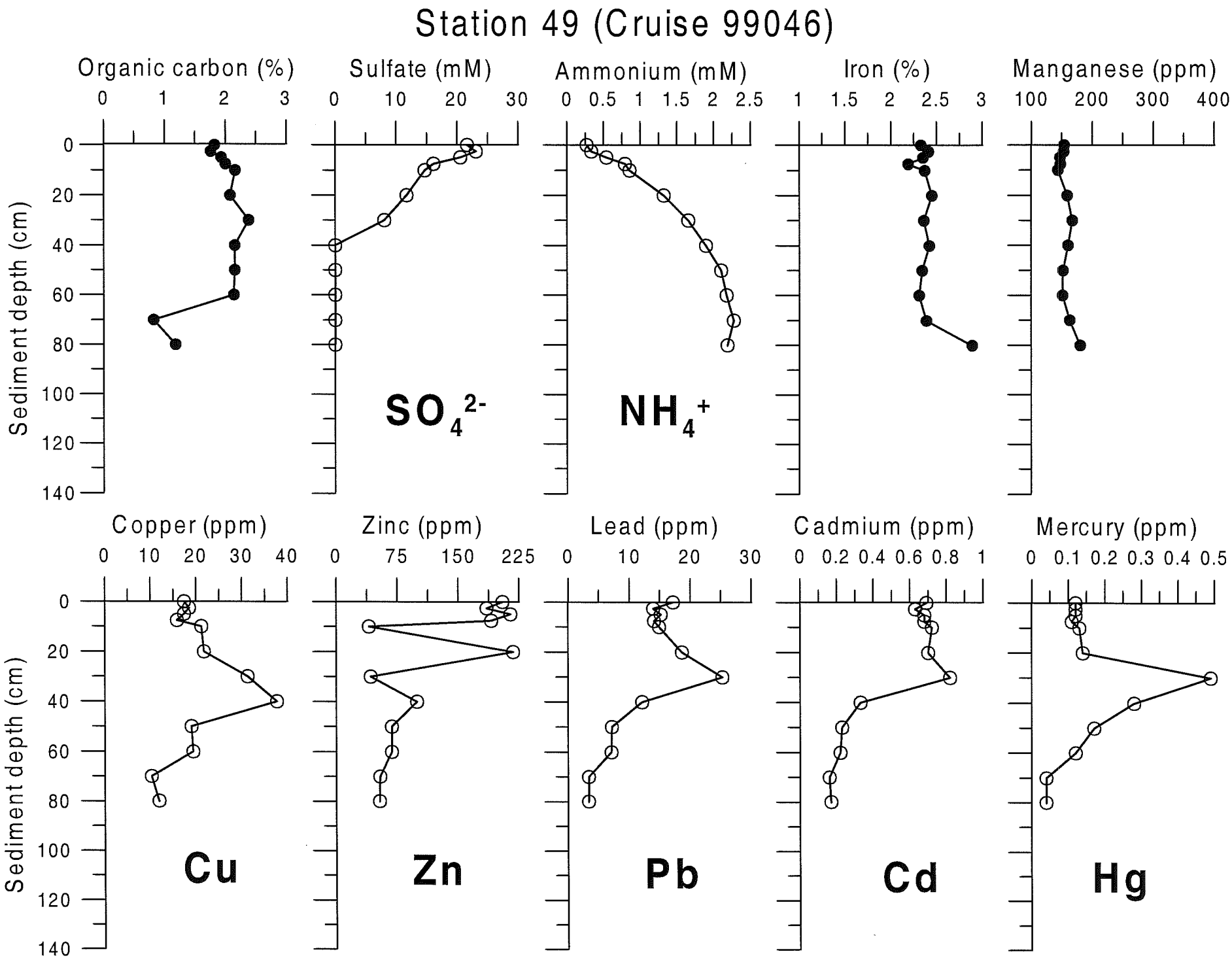

Station 45 (Cruise 99046)
Organic carbon (%)
0 1 2 3 4
Sulfate (mM)
0 10 20 30
Ammonium (mM)
0 1 2 3
Iron (%)
1 1.5 2 2.5 3
Manganese (ppm)
100 200 300 400
Sediment depth (cm)
0 20 40 60 80 100 120 140
Organic carbon
SO_4^{2-}
NH_4^+
Copper (ppm)
5 10 15 20 25
Zinc (ppm)
0 50 100 150 200 250
Lead (ppm)
0 5 10 15 20
Cadmium (ppm)
0 0.2 0.4 0.6 0.8
Mercury (ppm)
0 0.07 0.14 0.21
Zn
Cd
Hg

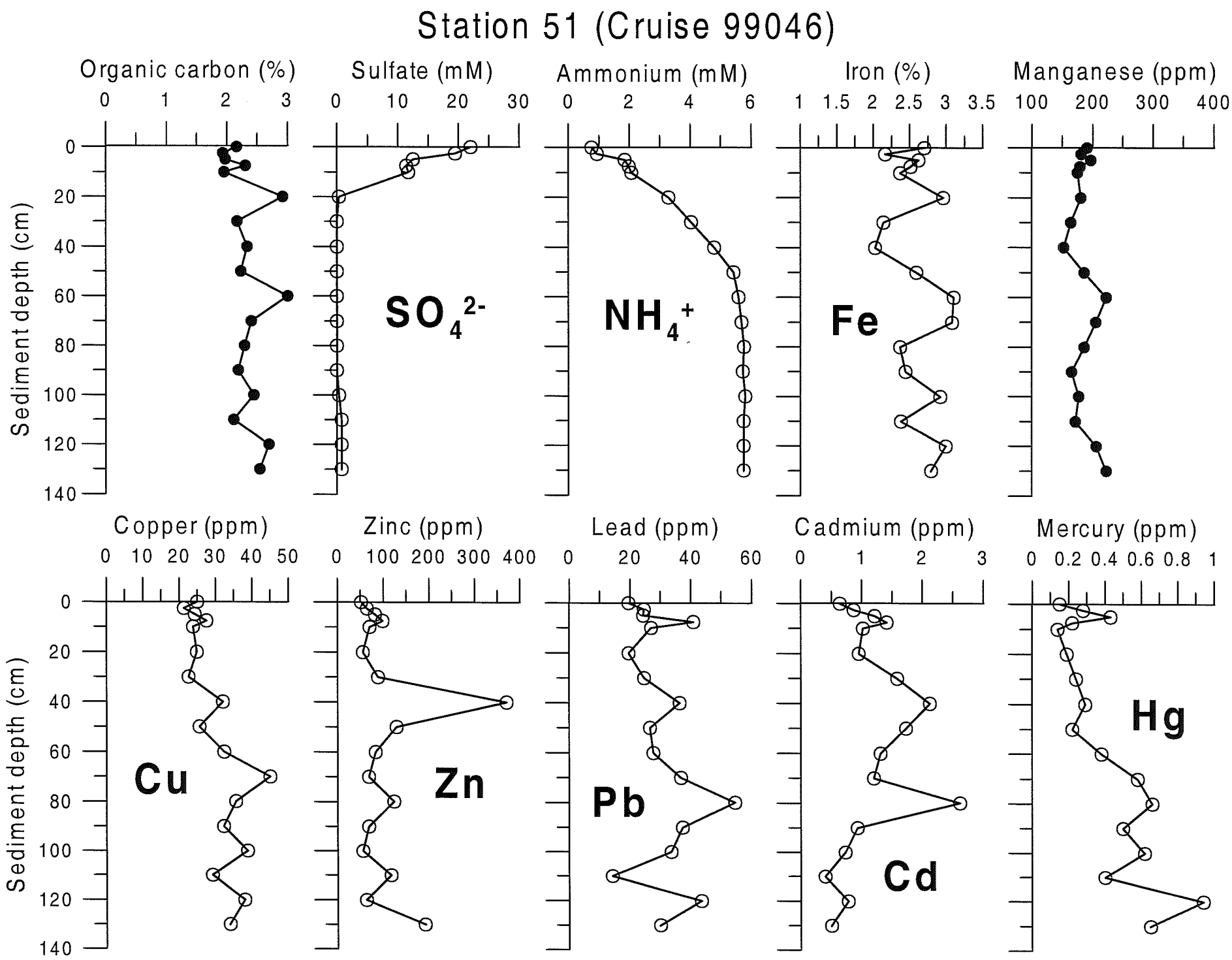
Station 46 (Cruise 99046)

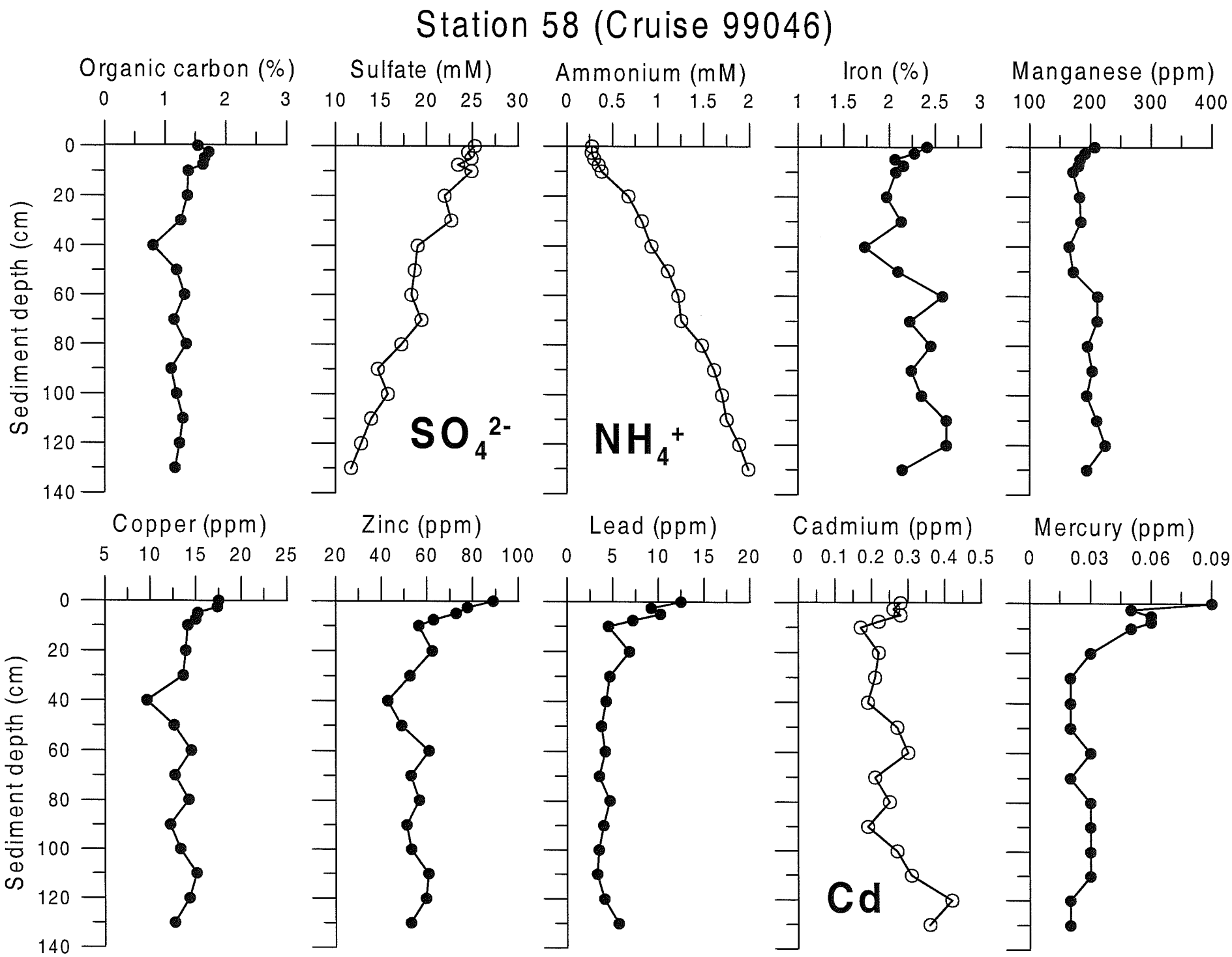


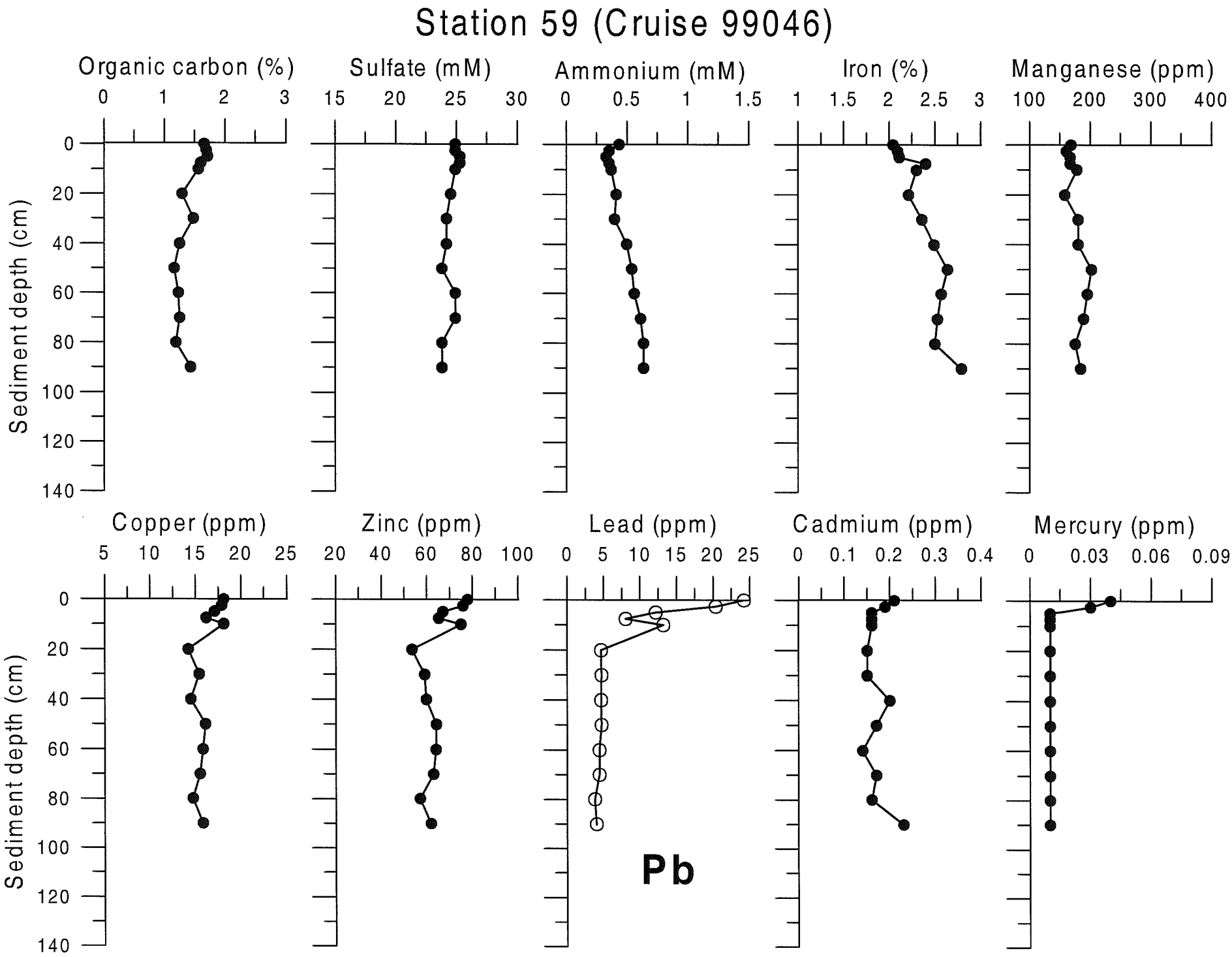

Station 47 (Cruise 99046)
Organic carbon (%)
0 1 2 3 4
Sulfate (mM)
0 10 20 30
Ammonium (mM)
0 1 2 3 4
Iron (%)
1 1.5 2 2.5 3
Manganese (ppm)
100 200 300 400
Sediment depth (cm)
0 20 40 60 80 100 120 140
Organic carbon
SO_4^{2-}
NH_4^+
Copper (ppm)
5 10 15 20 25
Zinc (ppm)
0 75 150 225
Lead (ppm)
0 10 20 30 40
Cadmium (ppm)
0 0.2 0.4 0.6 0.8 1
Mercury (ppm)
0 0.07 0.14 0.21 0.28
Zn
Pb
Cd
Hg


Station 48 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Cu
Zn
Pb
Cd
Hg

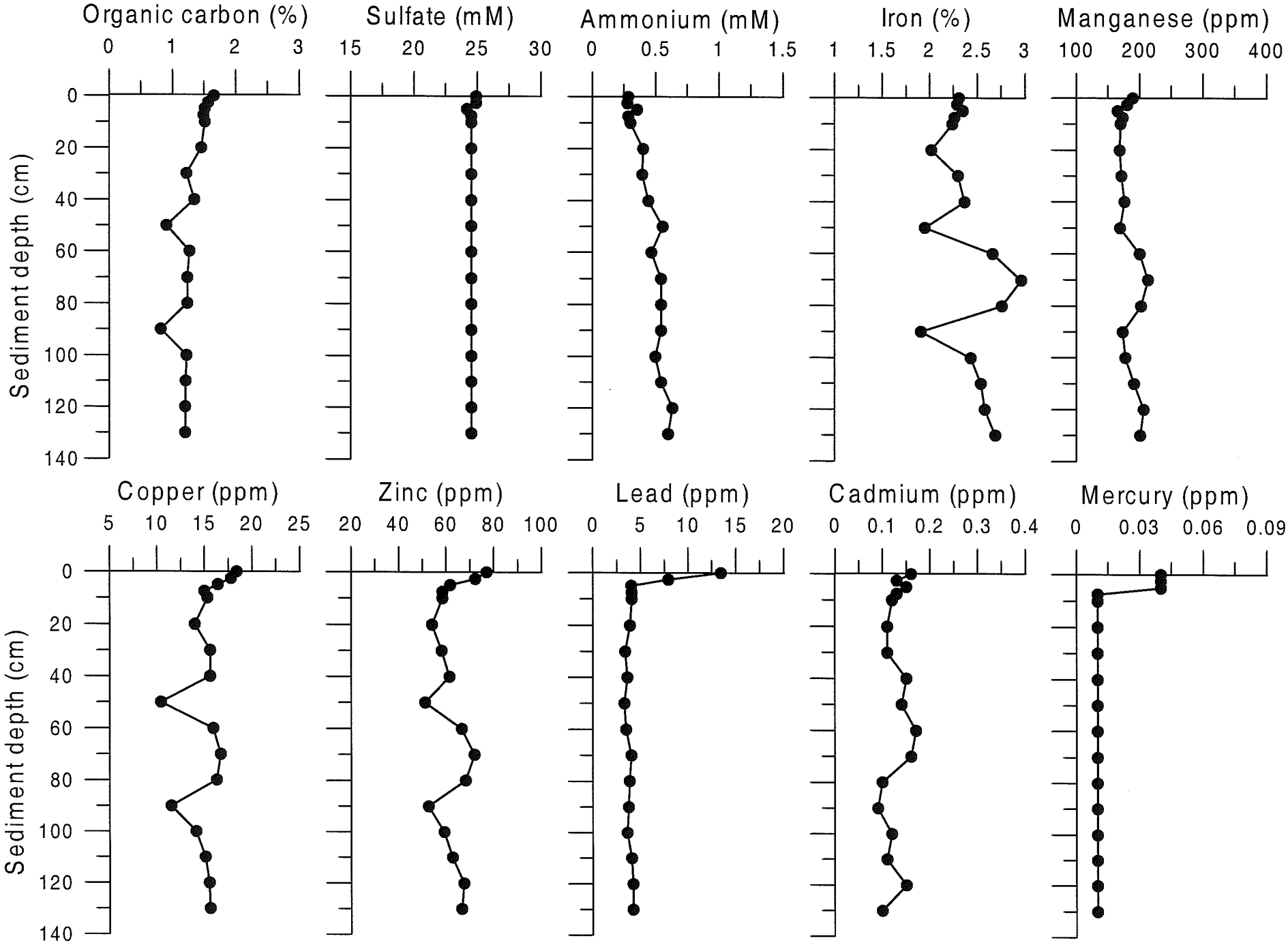

Station 49 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Cu
Zn
Pb
Cd
Hg


Station 51 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Fe
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Cu
Zn
Pb
Cd
Hg

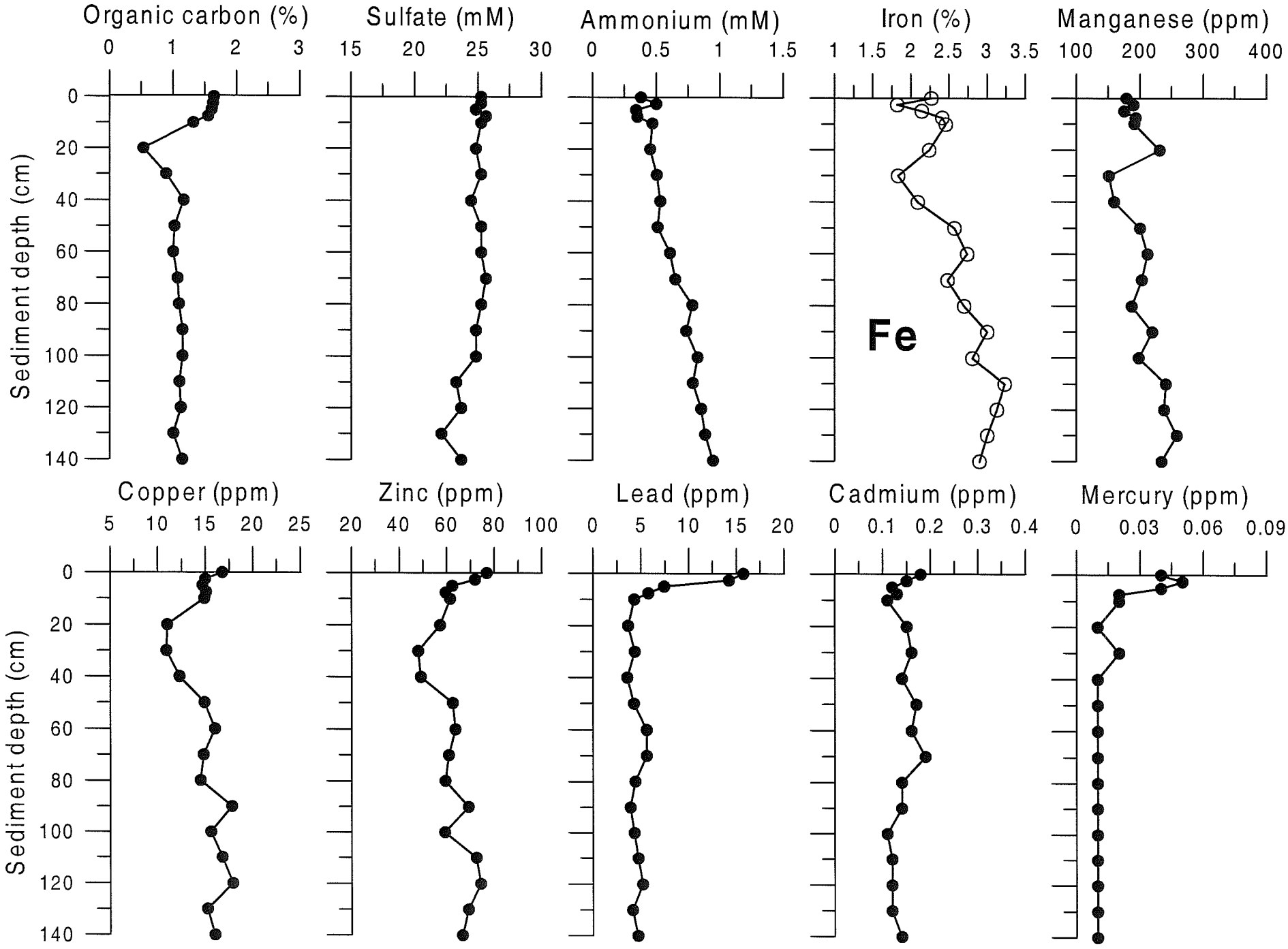

Station 58 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Cd


Station 59 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Sediment depth (cm)
Pb

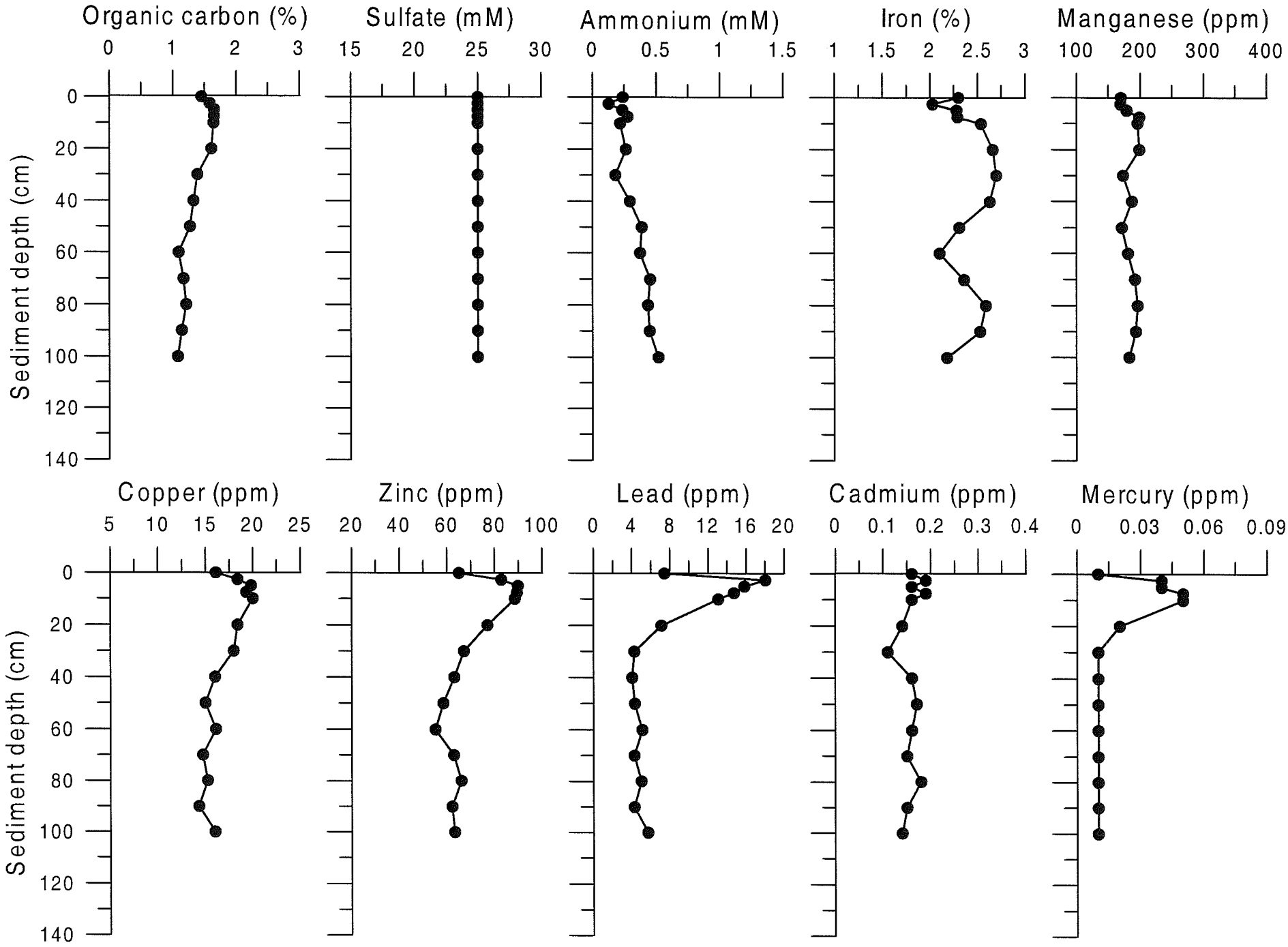
Station 60 (Cruise 99046)



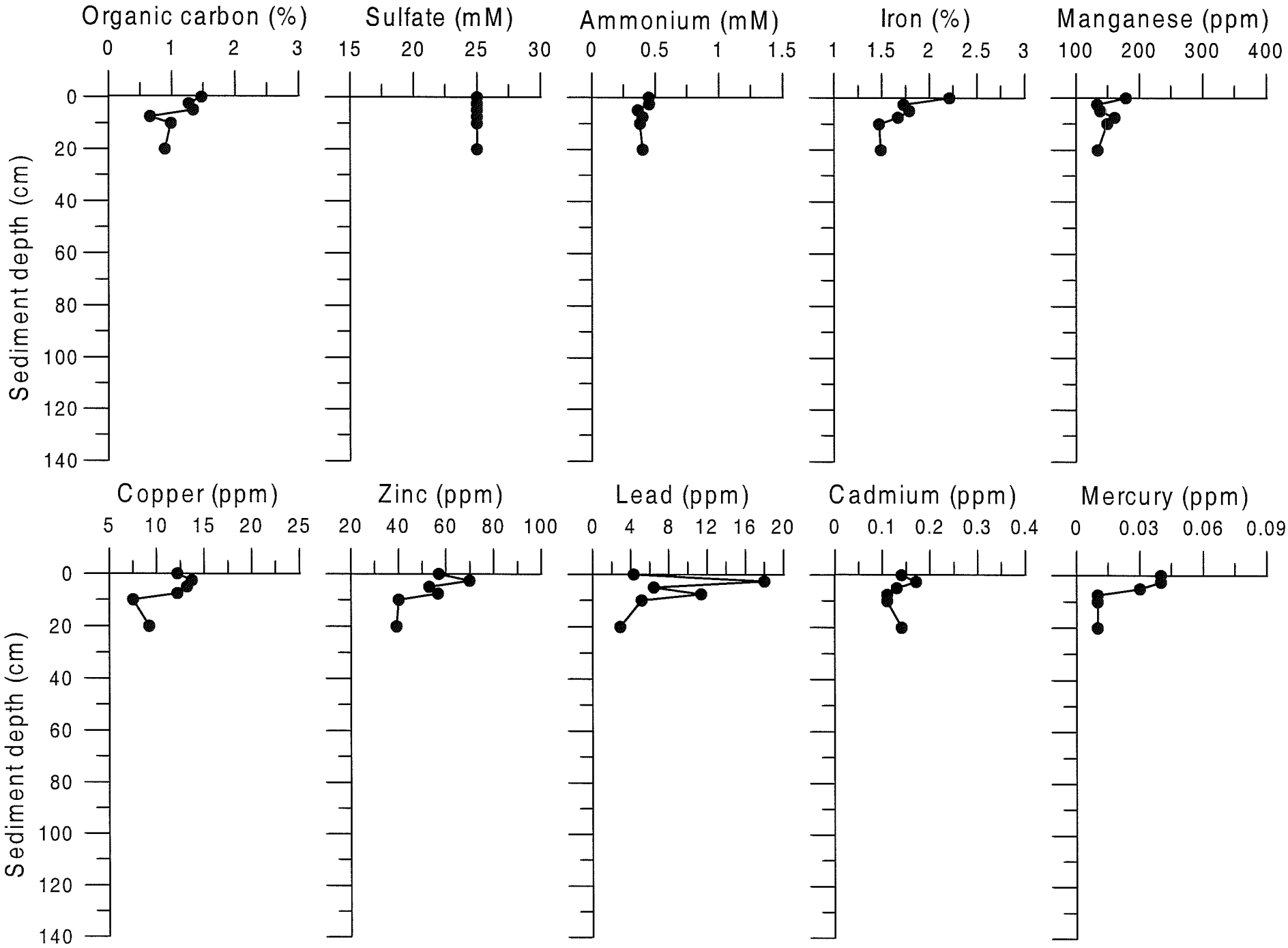
Station 61 (Cruise 99046)



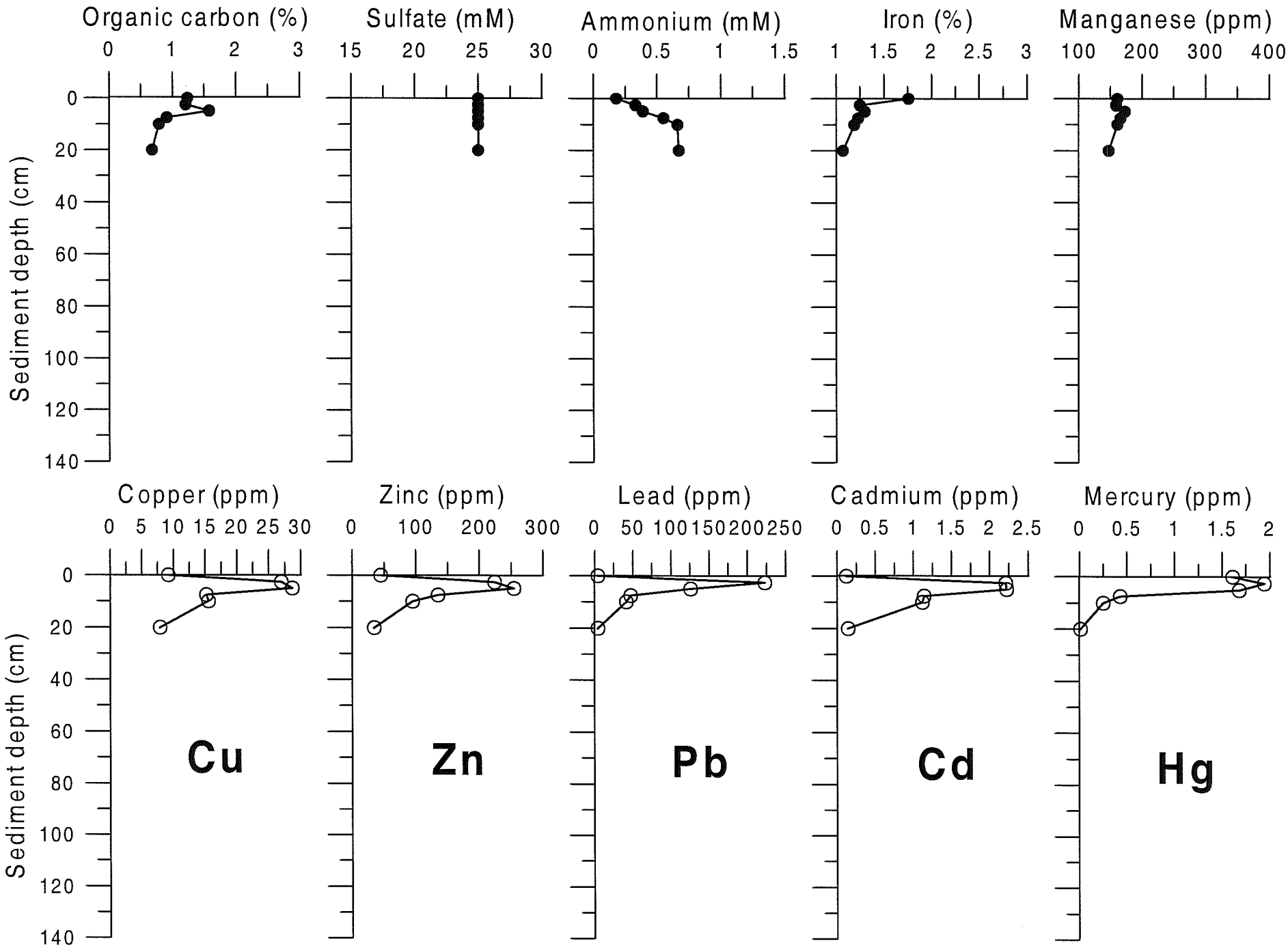
Station 62 (Cruise 99046)



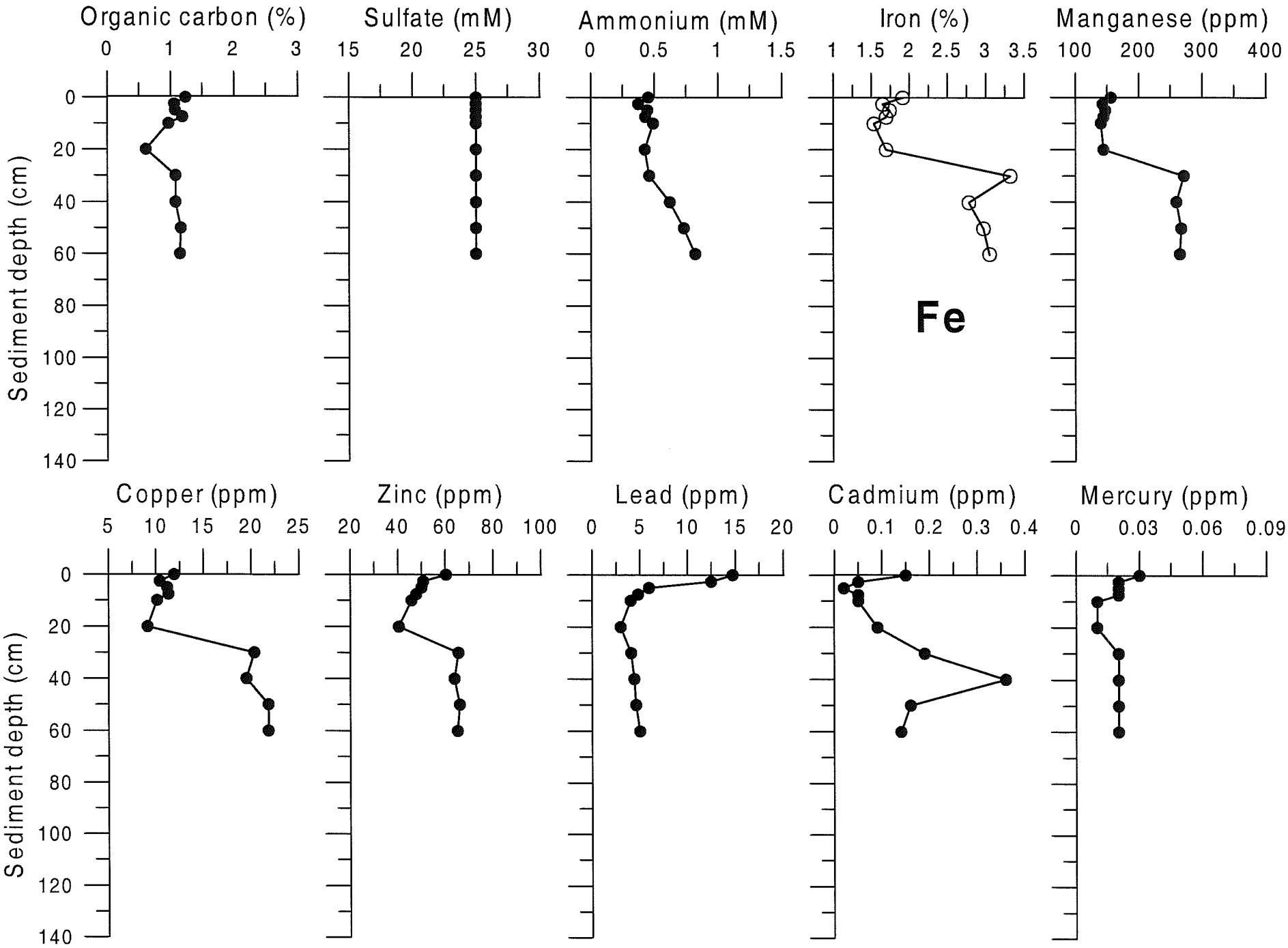
Station 63 (Cruise 99046)



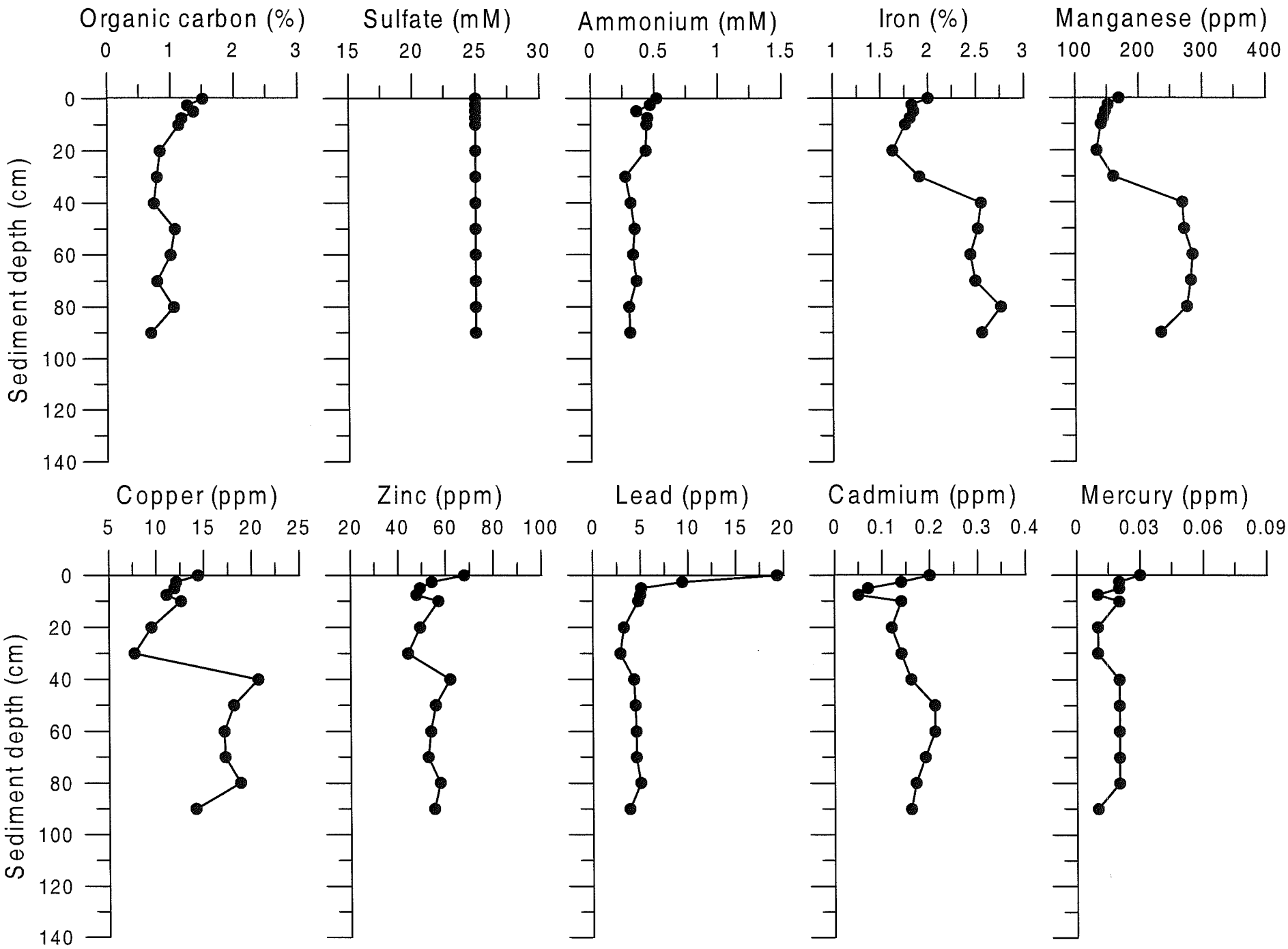
Station 64 (Cruise 99046)



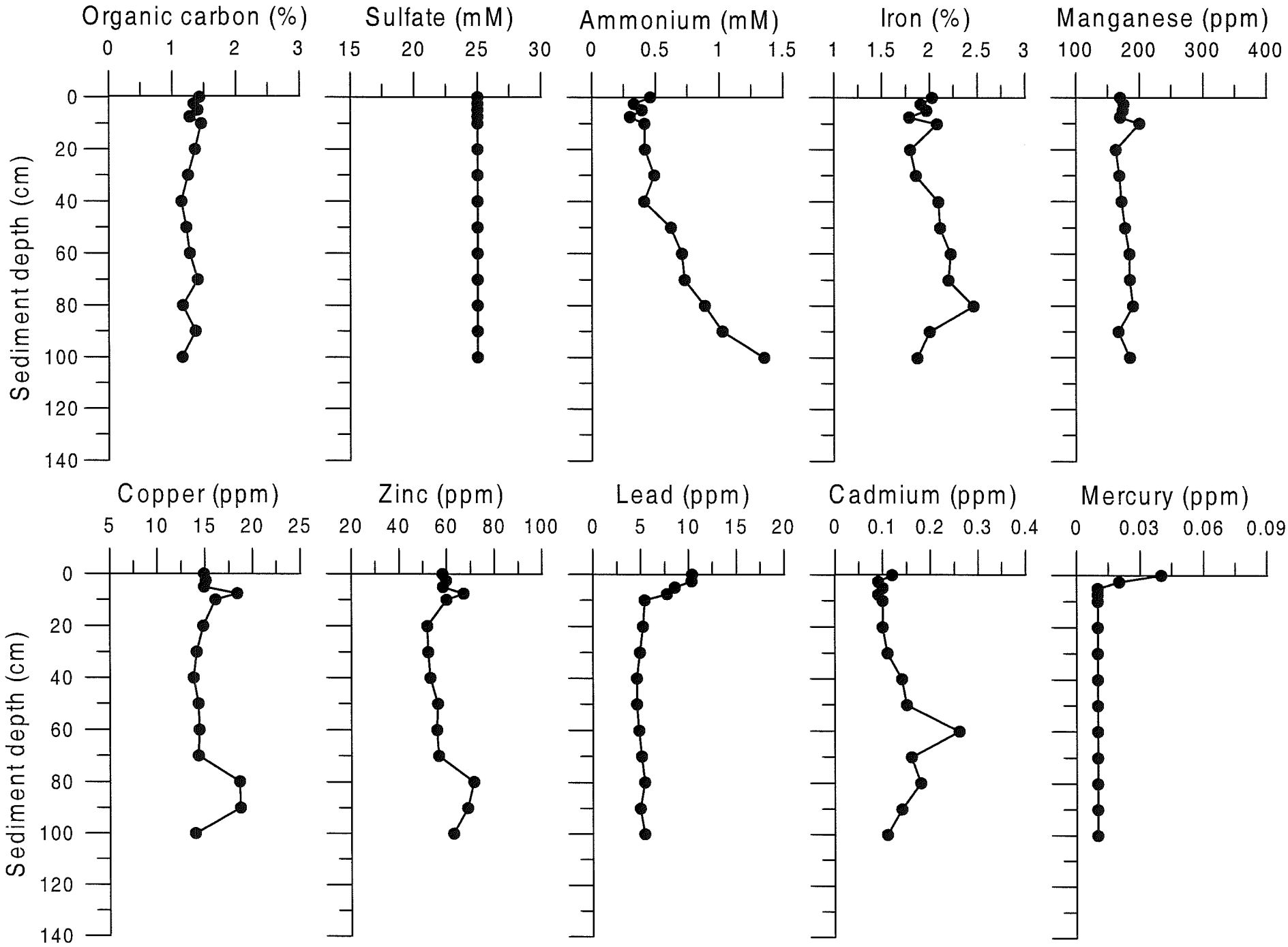
Station 65 (Cruise 99046)

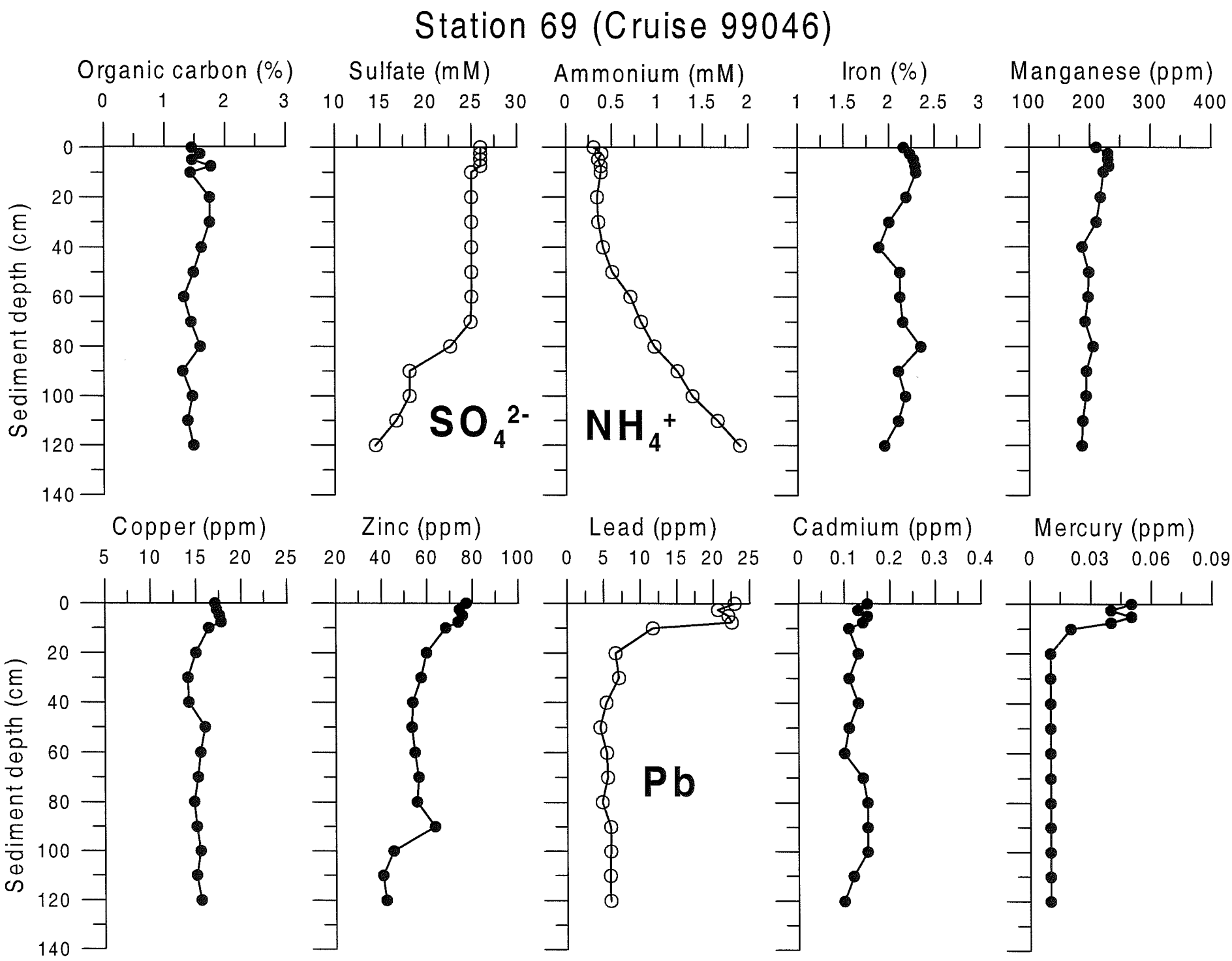


Station 66 (Cruise 99046)

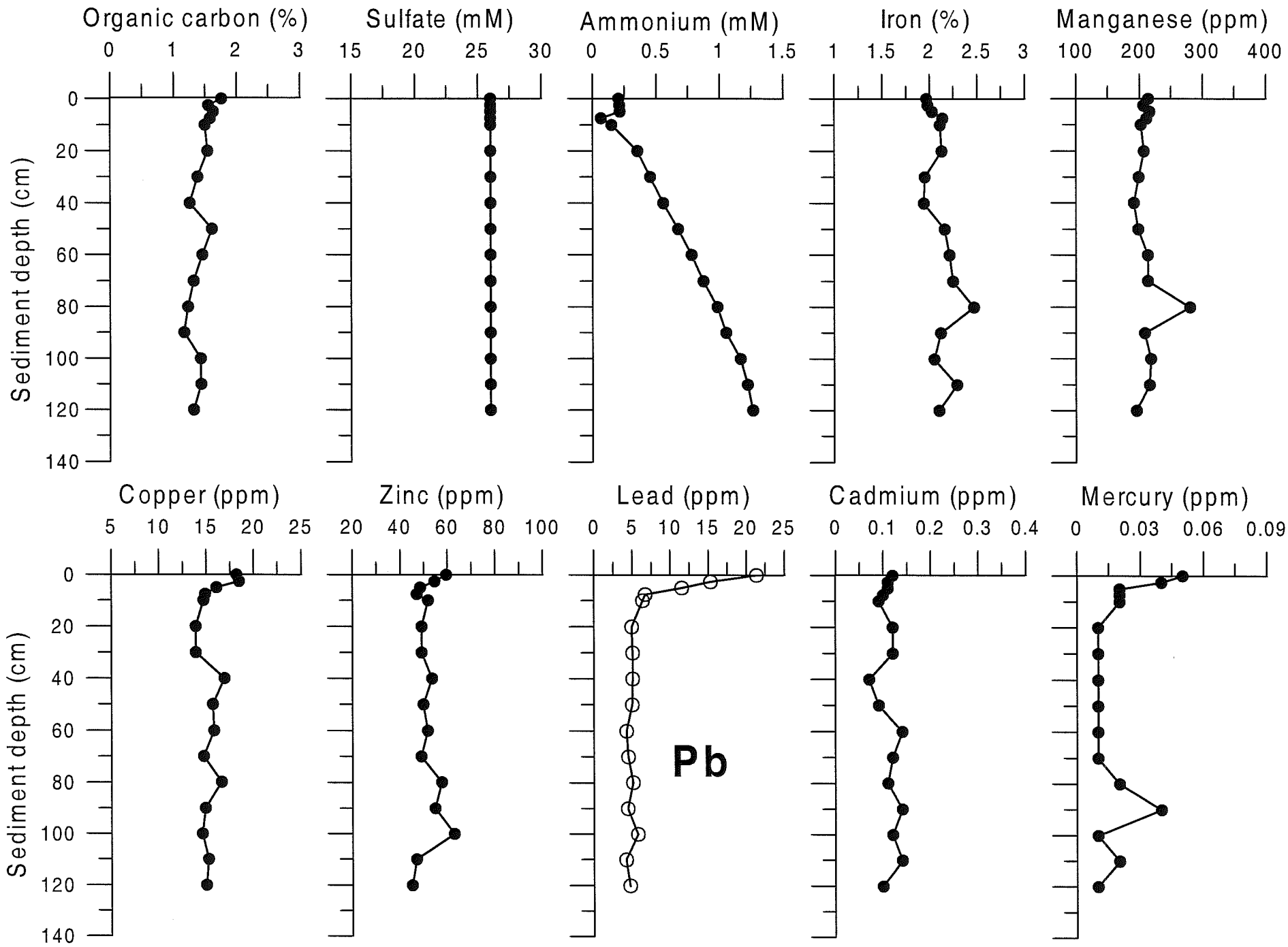


Station 68 (Cruise 99046)

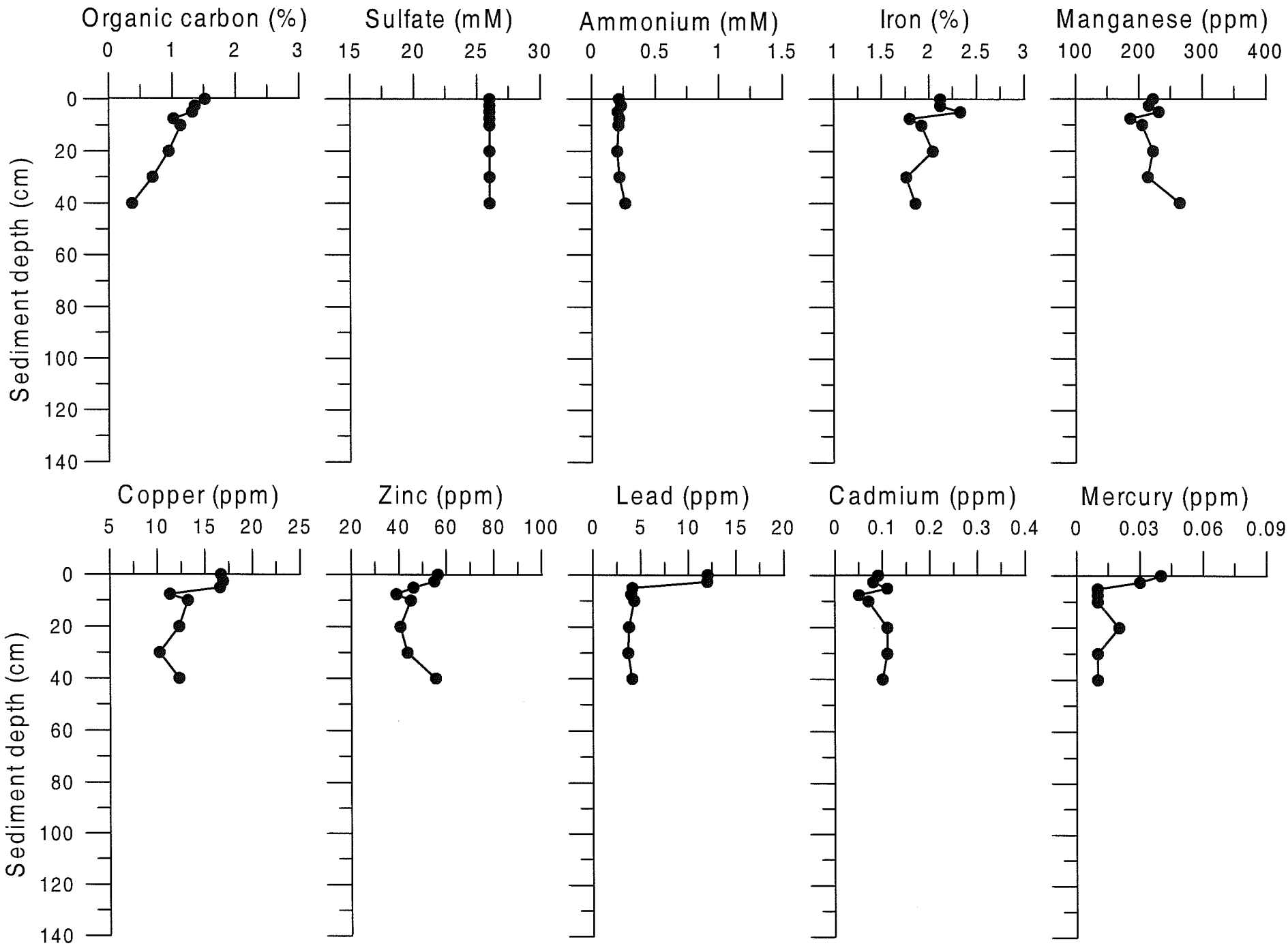



Station 69 (Cruise 99046)
Organic carbon (%)
Sulfate (mM)
Ammonium (mM)
Iron (%)
Manganese (ppm)
Copper (ppm)
Zinc (ppm)
Lead (ppm)
Cadmium (ppm)
Mercury (ppm)
Sediment depth (cm)
SO_4^{2-}
NH_4^+
Pb

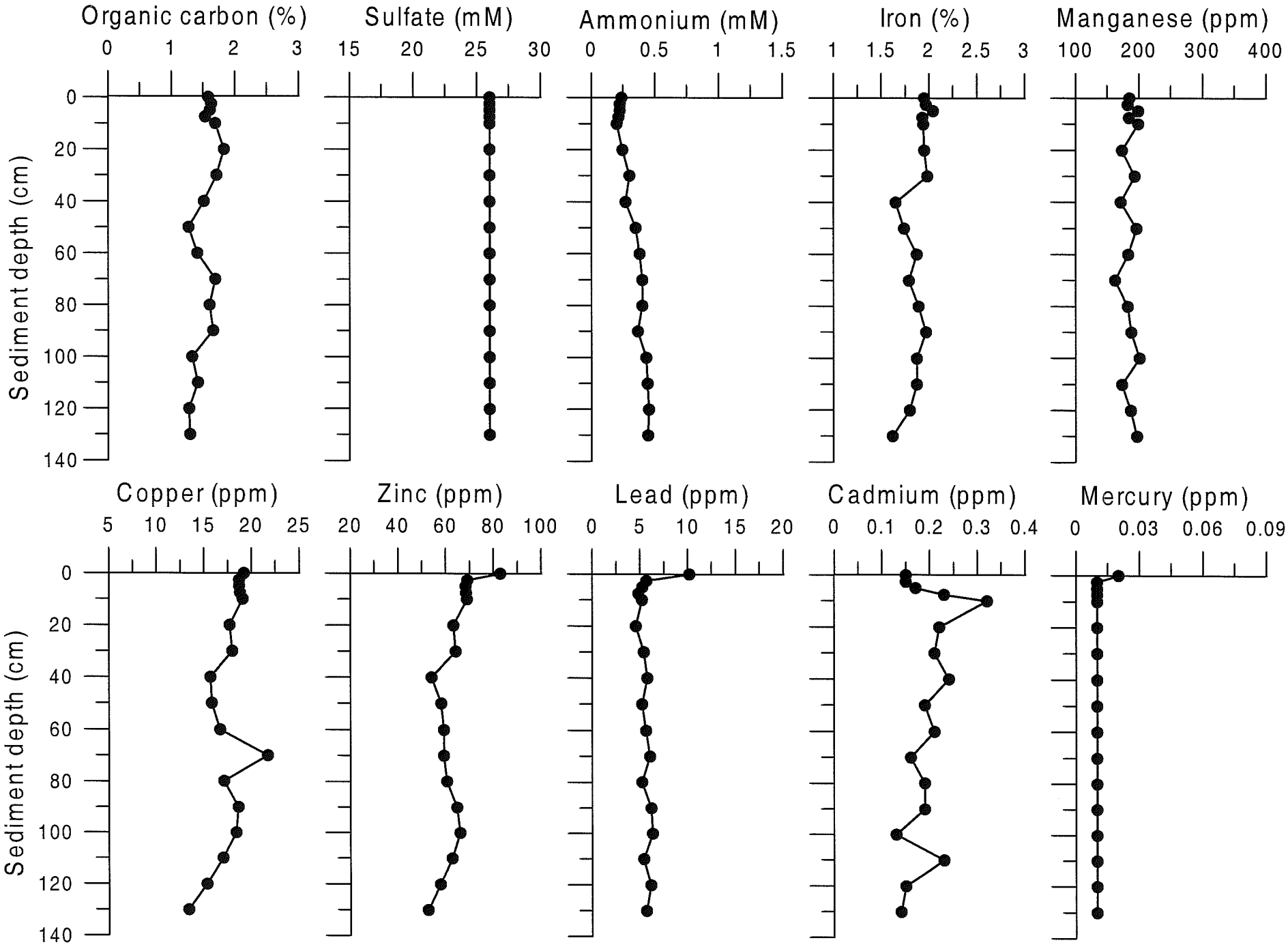
Station 70 (Cruise 99046)



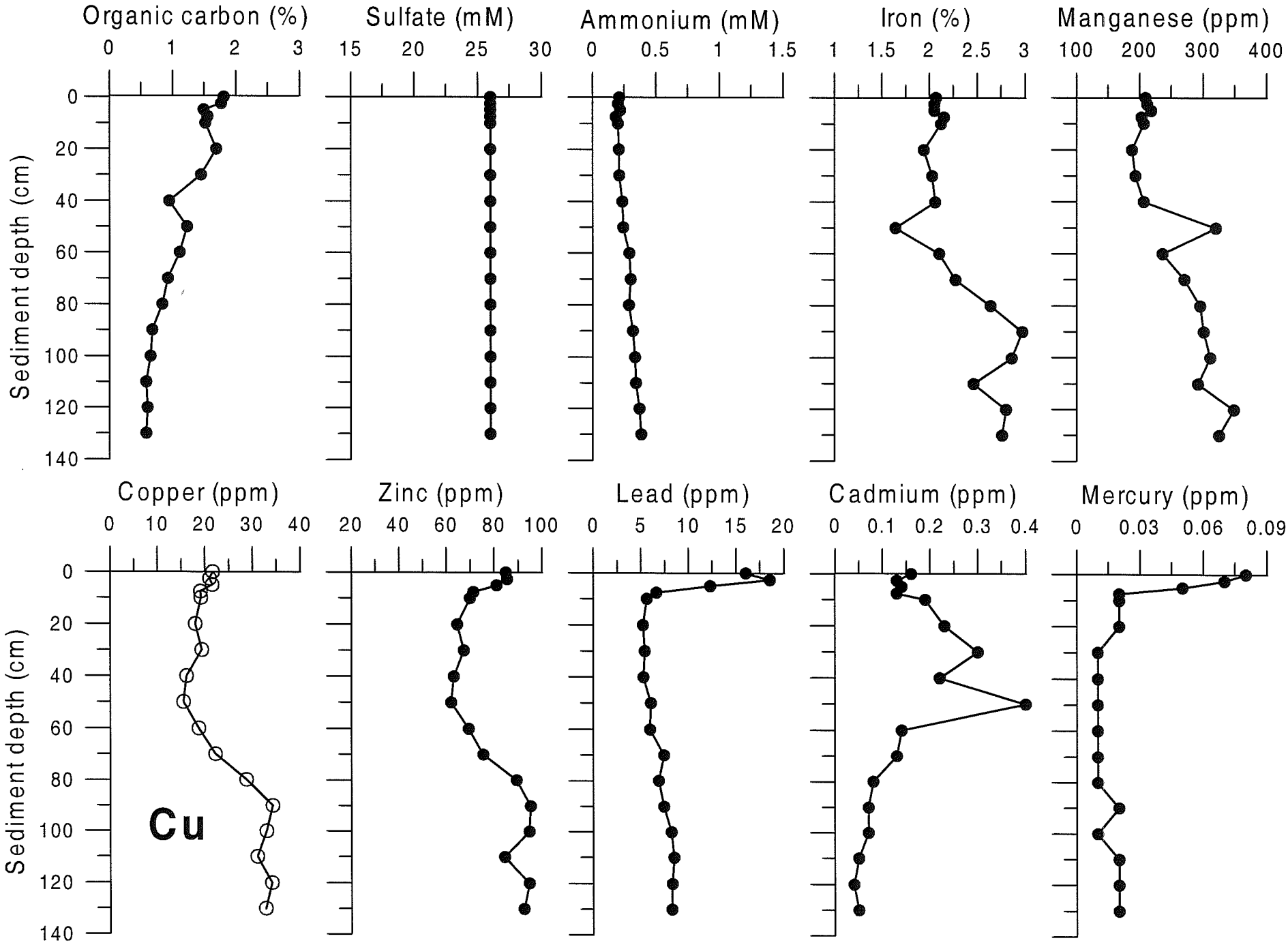
Station 71 (Cruise 99046)



Station 72 (Cruise 99046)



Station 73 (Cruise 99046)



Station 74 (Cruise 99046)