SAN FRANCISCO BAY, CALIFORNIA BENTHIC COMMUNITY ASSESSMENT, AUGUST 2000

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
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INTRODUCTION

The San Francisco Bay in California was sampled during August 2000 to assess benthic habitat conditions. One aspect of this evaluation was benthic community characterization, which was accomplished via sample collection by National Oceanic and Atmospheric Administration (NOAA) personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA).

The 2000 San Francisco Bay sampling stations are indicated in Figure 1; location data for the stations are given in Table 1.

METHODS

Sample Collection And Handling

A Young-modified Van Veen grab (area = 0.04 m^2) was used to collect a bottom sample at 86 stations in San Francisco Bay, California. Macroinfaunal samples were sieved through a 0.5-mm mesh screen and preserved with 10% formalin on ship. Macroinfaunal samples were transported to the BVA laboratory in Mobile, Alabama.

Macroinfaunal Sample Analysis

In the BVA laboratory, benthic samples were inventoried, rinsed gently through a 0.5-mm mesh sieve to remove preservatives and sediment, stained with Rose Bengal, and stored in 70% isopropanol solution until processing. Sample material (sediment, detritus, organisms) was placed in white enamel trays for sorting under Wild M-5A dissecting microscopes. All macroinvertebrates were carefully removed with forceps and placed in labelled glass vials containing 70% isopropanol. Each vial represented a major taxonomic group (*e.g*. Polychaeta, Mollusca, Arthropoda). All sorted macroinvertebrates were identified to the lowest practical identification level (LPIL), which in most cases was to species level unless the specimen was a juvenile, damaged, or otherwise unidentifiable. The number of individuals of each taxon, excluding fragments, was recorded. A voucher collection was prepared, composed of representative individuals of each species not previously encountered in samples from the region.

DATA ANALYSIS

All data generated as a result of laboratory analysis of macroinfauna samples were first coded on data sheets. Enumeration data were entered for each species according to station and replicate. These data were reduced to a data summary report for each station, which included a taxonomic species list and benthic community parameters information. Archive data files of species identification and enumeration were prepared.

The Quality Assurance/Quality Control (QA/QC) reports for the San Francisco Bay 2000 samples are given in the Appendix.

Assemblage Structure

Several numerical indices were chosen for analysis and interpretation of the macroinfaunal data. Infaunal abundance is reported as the total number of individuals per station and the total number of individuals per square meter (= density). Taxa richness is reported as the total number of taxa represented in a given station collection.

Taxa diversity, which is often related to the ecological stability and environmental "quality" of the benthos, was estimated by the Shannon-Weaver Index (Pielou, 1966), according to the following formula:

$$H' = -\sum_{i=1}^{S} p_i(\ln p_i)$$

where, S = the total number of taxa identified in the sample (including LPILs),

i = the i'th taxa in the sample, and

p_i = the number of individuals of the i'th taxa divided by the total number of individuals in the sample.

Taxa diversity was calculated using ln; however, diversity may also be calculated using $\log_2$. Both methods of calculating diversity are common in the scientific literature. The taxa diversity calculated in this report using ln, can be converted to $\log_2$ diversity by multiplying the ln taxa diversity by 1.4427. Taxa diversity within a given community is dependent upon the number of taxa present (taxa richness) and the distribution of all individuals among those taxa (equitability or evenness). In order to quantify and compare the equitability in the fauna to the taxa diversity for a given area, Pielou's Index J' (Pielou, 1966) was calculated as $J' = H'/\ln S$, where $\ln S = H'_{max}$, or the maximum possible diversity, when all taxa are represented by the same number of individuals; thus, $J' = H'/H'_{max}$.

HABITAT CHARACTERISTICS

Water quality data for the 86 stations are given in Table 1 and Figure 2. Bottom salinities ranged from < 1.0 at stations 1-2 and 2-2 in the low reaches of the Sacramento River to >30 ppt at at numerous stations in San Francisco Bay proper (Figure 2). Sediment data for the 86 stations is given in Table 2 and Figures 3, 4 and 5. The sediment at most stations was dominated by the silt + clay fraction; however, stations 1-2, 2-2, 12-1, 22-1, 22-3, 22-6, 24-2, 28-1 and 28-4 were dominated by the gravel + sand fraction (Table 2, Figure 3). Sediment percent total organic carbon (TOC) data is given in Table 2 and Figure 4. Percent TOC was uniformly low and was less than 4% at all stations (Figure 4). Mean sediment particle size is given in Table 2 and Figure 4. In general, particle size was inversely related to the proportion of the gravel + sand fraction in the sediment (Table 2).

BENTHIC COMMUNITY CHARACTERIZATION

Faunal Composition, Abundance, and Community Structure

A total of 61,139 organisms, representing 169 taxa, was identified from the 86 stations (Table 3). Malacostracans were the most numerous organisms present and represented 69.1% of the total assemblage, followed in abundance by polychaetes (12.69%) and bivalves (11.6%). Polychaetes represented 59.8% of the total number of taxa followed by malacostracans (21.9%) and bivalves (7.1%) (Table 3). The percent abundance of the major taxa at the 86 stations is given in Table 4 and Figure 6.

The dominant taxon collected from the 86 San Francisco Bay stations was the amphipod, *Ampelisca abdita*, representing 32.54 of the total number of individuals identified (Table 5). The amphipod, *Monocorophium acherusicum* (19.62%), the bivalve, *Mya arenaria* (9.95%), and the oligochaete family, Tubificidae (5.39%) were the only other taxa representing greater that 5% of the total number of organisms identified (Table 5). *Ampelisca abdita*, *M. acherusicum*, tubificids, and the amphipod, *Nippoleucon himumensis* were the most widely distributed taxa being found at more than 70% of the stations. The distribution of taxa representing >10% of the total assemblage at each station is given in Table 6.

Taxa richness (mean number of taxa per station) and density data are given in Table 7 and Figures 7, 8, 9 and 10. Taxa richness was extremely variable (2 taxa at station 5-1 to 41 taxa at station 21-1), but was generally correlated with bottom salinities (Figure 8). Densities were also variable and ranged from 175 organisms·m^{-2} at station 5-1 to 171,750 organisms·m^{-2} at station 20-1 (Table 7, Figure 9). Taxa diversity and evenness data are given in Table 7 and Figures 11 and 12. Taxa diversity (H') ranged from 0.22 at station 10-1 to 2.98 at station 28-5. Taxa evenness (J) ranged from 0.11 at station 10-1 to 0.93 at station 28-1. Nonparametric correlations between selected biological and physical variables is given in Table 8. Station taxa richness, density, and diversity were significantly correlated with bottom salinity; neither variable was correlated with sediment particle size.

LITERATURE CITED

Pielou, E.C. 1966. The measurement of diversity in different types of biological collections. Journal of Theoretical Biology 13:131-144.

Table 1. Station locations and water quality data for the San Francisco Bay stations, August 2000.

Station	Latitude	Longitude	Sample Location	Depth (m)	Temp (˚C)	Salinity (ppt)	DO (mg/l)
1-2	38˚ 02.273	121˚ 49.985	bottom	6.7	21.3	0.4	8.64
2-2	38˚ 03.760	121˚ 51.516	bottom	19.8	20.7	0.8	8.80
3-1	38˚ 04.283	121˚ 58.185	bottom	6.7	20.1	2.5	8.95
3-3	38˚ 03.825	121˚ 55.455	bottom	1.4	19.2	3.8	7.96
4-2	38˚ 08.112	122˚ 02.451	bottom	1.5	20.9	6.2	8.96
5-1	38˚ 04.371	122˚ 06.260	bottom	4.5	19.3	11.5	8.31
5-2	38˚ 05.488	122˚ 03.259	bottom	2.6	20.2	7.3	8.52
5-5	38˚ 03.055	121˚ 59.078	bottom	–	20.0	3.4	7.70
6-1	38˚ 05.862	121˚ 01.767	bottom	7.3	19.6	6.5	9.29
6-4	38˚ 03.220	121˚ 04.150	bottom	–	20.0	6.0	7.65
7-1	38˚ 09.546	122˚ 02.838	bottom	1.8	21.7	5.7	8.33
7-4	38˚ 08.188	122˚ 04.938	bottom	2.3	20.7	6.3	8.14
7-6	38˚ 02.491	121˚ 05.425	bottom	2.0	20.6	7.9	7.22
8-1	38˚ 04.184	122˚ 14.515	bottom	1.8	19.4	17.3	8.20
8-3	38˚ 03.164	122˚ 10.288	bottom	1.4	19.6	14.7	7.76
9-2	38˚ 06.362	122˚ 16.142	bottom	2.2	20.2	14.1	8.05
10-1	38˚ 08.401	122˚ 16.939	bottom	4.6	20.3	15.7	7.72
10-3	38˚ 07.580	122˚ 17.036	bottom	3.0	19.9	14.8	7.84
11-1	38˚ 05.183	122˚ 23.758	bottom	1.7	19.7	21.5	8.19
11-3	38˚ 05.676	122˚ 21.123	surface	0.9	19.6	21.5	8.02
11-6	38˚ 00.314	122˚ 26.683	bottom	4.0	20.1	21.0	7.20
12-1	38˚ 02.477	122˚ 20.494	bottom	10.1	18.6	25.7	7.93
13-1	38˚ 0 1.648	122˚ 19.986	bottom	4.3	18.9	23.8	7.75
14-1	38˚ 0 8.760	122˚ 31.363	bottom	3.0	20.9	21.8	6.21
15-1	37˚ 57.745	122˚ 28.054	bottom	1.8	19.5	24.3	7.90
15-3	37˚ 54.303	122˚ 27.949	bottom	4.6	17.9	27.7	7.27
16-1	37˚ 55.183	122˚ 26.993	bottom	11.9	17.4	28.7	8.50
17-1	37˚ 57.141	122˚ 25.375	bottom	1.8	18.4	28.0	8.10
17-2	37˚ 56.041	122˚ 25.249	bottom	2.4	17.9	27.2	7.70
18-1	37˚ 54.450	122˚ 23.595	bottom	7.9	17.8	28.1	7.80
19-2*	37˚ 54.823	122˚ 21.868	bottom	12.2	18.3	29.6	7.40
19-3*	37˚ 54.561	122˚ 21.674	bottom	11.6	17.8	29.5	6.60
20-1	37˚ 52.762	122˚ 23.213	bottom	2.4	16.6	29.9	8.00
20-5	37˚ 51.264	122˚ 20.291	bottom	2.4	17.7	29.4	8.20
20-6	37˚ 48.797	122˚ 20.497	bottom	4.3	17.7	29.8	8.00
21-1*	37˚ 49.994	122˚ 21.429	bottom	11.6	17.5	29.9	7.20
21-3*	37˚ 48.644	122˚ 20.860	bottom	12.2	17.9	29.4	5.83
22-1*	37˚ 50.792	122˚ 28.130	bottom	21.3	17.2	28.9	7.92
22-3*	37˚ 50.270	122˚ 26.980	bottom	21.3	17.0	29.9	7.95
22-6	37˚ 48.532	122˚ 23.060	surface	27.4	17.5	29.5	8.70
23-2	37˚ 52.580	122˚ 28.683	bottom	1.5	20.2	30.5	11.72
24-2*	37˚ 48.620	122˚ 26.000	bottom	11.0	16.2	30.7	8.45
25-1	37˚ 48.299	122˚ 24.009	bottom	7.9	16.5	30.0	3.93
25-3	37˚ 48.000	122˚ 23.780	bottom	3.4	16.5	30.3	2.33

Table 1 continued:

Station	Latitude	Longitude	Sample Location	Depth (m)	Temp (˚C)	Salinity (ppt)	DO (mg/l)
26-1	37˚ 47.258	122˚ 23.211	bottom	4.6	17.3	30.0	3.69
26-2*	37˚ 46.105	122˚ 22.894	bottom	7.9	17.3	29.9	5.88
27-1	37˚ 42.943	122˚ 22.111	bottom	2.4	18.8	29.5	7.77
28-1*	37˚ 47.892	122˚ 22.018	bottom	18.0	18.2	29.5	4.58
28-4*	37˚ 45.890	122˚ 21.626	bottom	19.5	17.6	29.7	5.12
28-5	37˚ 44.205	122˚ 20.497	surface	18.3	18.2	–	–
29-2	37˚ 46.629	122˚ 17.971	bottom	6.4	–	–	–
30-1	37˚ 47.792	122˚ 20.336	bottom	6.7	18.7	29.5	7.75
30-3	37˚ 44.176	122˚ 17.419	bottom	4.3	19.6	28.9	5.84
31-2*	37˚ 48.853	122˚ 19.343	bottom	14.3	18.8	29.6	6.01
31-4*	37˚ 48.098	122˚ 20.709	bottom	14.0	18.6	29.5	3.20
31-6*	37˚ 47.754	122˚ 19.417	bottom	12.2	20.1	29.4	4.53
32-2	37˚ 47.245	122˚ 15.143	bottom	3.5	21.1	29.1	6.59
32-3	37˚ 46.758	122˚ 14.634	bottom	3.8	21.0	29.1	6.37
32-6	37˚ 45.142	122˚ 13.055	surface	1.2	22.5	29.1	7.20
33-5	37˚ 42.136	122˚ 22.630	bottom	2.1	19.1	29.6	9.05
34-1	37˚ 39.385	122˚ 21.379	bottom	6.4	18.4	29.5	7.08
34-3	37˚ 37.175	122˚ 19.919	bottom	5.2	18.8	29.3	6.06
35-2*	37˚ 41.356	122˚ 21.155	bottom	9.4	18.1	29.5	3.74
35-3*	37˚ 41.309	122˚ 18.562	bottom	9.4	19.1	29.0	5.95
36-1	37˚ 41.304	122˚ 14.549	bottom	4.3	21.3	28.8	6.04
36-2	37˚ 40.276	122˚ 15.446	bottom	5.2	20.3	28.5	6.68
36-3	37˚ 39.467	122˚ 11.632	bottom	1.5	19.7	27.6	7.10
38-1*	37˚ 35.018	122˚ 14.436	bottom	14.6	20.8	27.6	5.59
38-3	37˚ 31.235	122˚ 08.374	bottom	12.5	–	–	–
39-1	37˚ 35.649	122˚ 10.383	bottom	2.5	19.7	27.5	6.9
40-2	37˚ 31.619	122˚ 11.855	bottom	9.1	–	–	–
40-3	37˚ 30.723	122˚ 12.763	bottom	10.1	–	–	–
42-1	37˚ 29.822	122˚ 06.090	bottom	6.4	22.4	24.9	6.04
42-3	37˚ 28.353	122˚ 03.961	bottom	4.5	22.5	25.3	5.64
43-3	37˚ 27.779	122˚ 02.034	bottom	5.1	22.4	25.2	5.23
44-1	37˚ 27.775	122˚ 01.576	bottom	1.1	23.4	25.1	5.21
44-2	37˚ 27.090	122˚ 01.210	bottom	2.5	21.0	21.9	5.5
46-1	37˚ 58.034	122˚ 30.342	bottom	1.8	22.9	26.8	6.04
46-3	38˚ 08.736	122˚ 23.902	surface	2.1	23.2	22.4	6.90
46-4	37˚ 57.157	122˚ 23.023	surface	0.6	21.7	24.8	7.02
47-3	37˚ 51.893	122˚ 29.568	bottom	4.6	16.3	31.1	6.81
47-4	37˚ 52.066	122˚ 19.056	bottom	2.1	18.7	29.5	6.40
BA-21	37˚ 29.650	122˚ 05.245	bottom	2.5	22.3	25.2	5.16
BB-70	37˚ 44.822	122˚ 19.363	bottom	9.1	20.4	28.9	6.29
BD-22	38˚ 02.966	122˚ 25.236	bottom	–	19.2	22.1	8.1
BF-21	38˚ 06.965	122˚ 02.346	bottom	2.1	20.0	6.9	8.76

* readings from less than 7.6m (25 ft.)

\- no measurements taken

Table 2. Sediment data for the San Francisco Bay stations, August 2000.

Station	% TOC	% Gravel	% Sand	% Silt	% Clay	% Gravel+Sand	% Silt+Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficent
1-2	0.30	3.70	93.99	–	–	97.69	2.31	Sand	2.689	0.811
2-2	0.27	0.15	65.02	11.17	23.66	65.17	34.83	Clayey Sand	2.363	4.624
3-1	1.49	0.00	1.61	35.09	63.31	1.61	98.40	Clay	8.977	1.925
3-3	0.92	5.30	21.57	38.77	34.35	26.87	73.12	–	5.708	4.013
4-2	1.21	0.00	9.54	50.80	39.66	9.54	90.46	Silty Clay	7.125	2.303
5-1	1.37	0.00	1.17	47.19	51.64	1.17	98.83	Clay	8.058	1.756
5-2	0.67	0.00	38.70	27.43	33.87	38.70	61.30	Sandy Clay	6.226	3.164
5-5	1.52	0.00	1.42	27.14	71.44	1.42	98.58	Clay	9.389	1.780
6-1	1.33	0.00	28.54	35.02	36.45	28.54	71.47	Silty Clay	6.930	3.161
6-4	1.36	0.00	8.47	43.56	47.97	8.47	91.53	Silty Clay	7.449	2.670
7-1	1.61	0.00	0.84	43.25	55.90	0.84	99.15	Clay	8.534	1.939
7-4	1.64	0.00	0.36	34.13	65.51	0.36	99.64	Clay	9.066	1.811
7-6	1.26	0.00	10.97	43.52	45.51	10.97	89.03	Silty Clay	7.401	7.422
8-1	1.06	0.00	0.55	55.81	43.63	0.55	99.44	Silty Clay	7.267	7.549
8-3	0.97	0.00	31.94	35.89	32.16	31.94	68.05	Sandy Clay	5.779	2.966
9-2	1.80	0.00	5.03	40.7	54.27	5.03	94.97	Clay	8.425	2.112
10-1	1.72	0.00	25.24	38.64	36.12	25.24	74.76	Silty Clay	6.614	3.100
10-3	1.53	0.00	18.07	21.25	60.68	18.07	81.93	Clay	9.135	3.362
11-1	1.24	0.00	6.19	42.67	51.14	6.19	93.81	Clay	8.030	2.066
11-3	1.42	0.00	3.36	44.19	52.45	3.36	96.64	Clay	8.148	2.224
11-6	1.37	0.00	6.55	36.60	56.86	6.55	93.46	Clay	8.754	2.424
12-1	0.61	0.00	65.19	11.86	22.95	65.19	34.81	Clayey Sand	2.799	3.660
13-1	1.39	0.00	4.63	39.31	56.06	4.63	95.37	Clay	8.338	2.109
14-1	1.52	0.00	2.68	32.83	64.49	2.68	97.32	Clay	9.334	1.727
15-1	1.54	0.00	3.62	40.88	55.50	3.62	96.38	Clay	9.069	8.325
15-3	1.47	0.00	7.75	44.33	47.92	7.75	92.25	Silty Clay	7.436	2.686
16-1	1.18	0.00	35.12	22.93	41.94	35.12	64.87	Sandy Clay	6.872	3.574
17-1	1.29	0.00	44.38	18.73	36.89	44.38	55.62	Sandy Clay	4.923	4.255
17-2	1.50	0.00	34.09	28.30	37.62	34.09	65.92	Sandy Clay	5.779	3.651
18-1	1.70	0.00	0.42	28.46	71.12	0.42	99.58	Clay	9.268	1.618
19-2	1.42	0.00	1.75	33.21	65.04	1.75	98.25	Clay	9.058	2.109
19-3	1.48	0.00	2.96	37.61	59.42	2.96	97.03	Clay	8.597	2.033
20-1	1.16	0.00	16.43	44.86	38.71	16.43	83.57	Silty Clay	6.786	2.696
20-5	1.14	0.00	13.72	41.79	44.49	13.72	86.28	Silty Clay	7.393	2.503
20-6	1.21	0.00	12.93	36.40	50.67	12.93	87.07	Clay	8.017	2.228
21-1	1.29	0.03	19.66	29.11	51.19	19.69	80.30	Clay	8.042	3.102
21-3	1.47	0.00	10.93	43.33	45.74	10.93	89.07	Silty Clay	7.536	1.972
22-1	0.78	1.63	96.26	–	–	97.89	2.11	Sand	1.546	0.862
22-3	0.43	21.94	77.63	–	–	99.57	0.43	–	0.048	1.751
22-6	0.48	6.97	92.53	–	–	99.50	0.50	–	1.499	0.910
23-2	1.27	0.00	1.55	38.54	59.91	1.55	98.45	Clay	8.983	1.706
24-2	0.99	0.00	96.45	–	–	96.45	3.55	Sand	2.449	0.658
25-1	1.61	0.00	23.8	45.45	30.75	23.80	76.20	Silty Clay	6.010	2.643
25-3	1.67	0.00	14.16	54.98	30.86	14.16	85.84	Silty Clay	5.442	2.708
26-1	1.38	0.00	10.56	50.83	38.61	10.56	89.44	Silty Clay	5.982	3.166
26-2	1.15	0.00	18.73	40.84	40.43	18.73	81.27	Silty Clay	6.017	2.85
27-1	1.48	0.00	1.91	31.18	66.91	1.91	98.09	Clay	9.108	1.57
28-1	0.10	1.17	98.43	–	–	99.60	0.40	Sand	1.503	0.344
28-4	0.94	4.69	46.66	17.25	31.41	51.35	48.66	Sandy Clay	3.822	4.328
28-5	0.88	0.00	45.75	21.58	32.66	45.75	54.24	Sandy Clay	5.616	3.736
29-2	2.03	0.00	7.66	41.29	51.04	7.66	92.33	Clay	8.031	2.236
30-1	1.01	0.00	25.32	25.17	49.51	25.32	74.68	Silty Clay	7.939	3.353
30-3	1.12	0.16	27.39	25.34	47.11	27.55	72.45	Silty Clay	7.668	3.574
31-2	1.14	0.00	17.73	36.02	46.25	17.73	82.27	Silty Clay	7.564	3.065
31-4	0.72	0.00	44.91	14.19	40.90	44.91	55.09	Sandy Clay	5.521	4.436
31-6	1.20	0.09	3.48	46.08	50.34	3.57	96.42	Clay	7.997	1.889
32-2	2.18	0.72	3.33	28.28	67.67	4.05	95.95	Clay	9.011	1.791
32-3	3.64	0.00	8.91	34.61	56.48	8.91	91.09	Clay	8.808	2.577
32-6	2.13	0.00	15.12	42.71	42.17	15.12	84.88	Silty Clay	7.048	2.900
33-5	1.55	0.00	1.61	37.75	60.64	1.61	98.39	Clay	9.115	1.771
34-1	1.28	0.00	4.94	50.57	44.49	4.94	95.06	Silty Clay	7.279	2.331

Table 2 continued:

Station	TOC	% Gravel	% Sand	% Silt	% Clay	% Gravel+Sand	% Silt+Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficent
34-3	1.65	0.00	9.76	46.14	44.10	9.76	90.24	Silty Clay	7.304	2.492
35-2	1.22	0.00	13.14	28.99	57.88	13.14	86.87	Clay	8.561	2.551
35-3	1.24	0.00	12.22	29.85	57.93	12.22	87.78	Clay	8.822	3.154
36-1	1.50	0.00	4.52	46.1	49.37	4.52	95.47	Silty Clay	7.849	2.717
36-3	2.03	1.03	9.73	34.53	54.71	10.76	89.24	Clay	8.439	2.907
36-2	1.32	0.00	19.90	41.94	38.16	19.90	80.10	Silty Clay	6.739	2.940
38-1	1.44	0.64	5.28	32.36	61.72	5.92	94.08	Clay	9.112	2.395
38-3	1.60	0.00	3.74	44.05	52.21	3.74	96.26	Clay	8.171	2.150
39-1	1.05	0.00	34.65	22.82	42.53	34.65	65.35	Sandy Clay	6.637	3.831
40-2	1.60	0.00	2.62	38.34	59.05	2.62	97.39	Clay	8.554	1.827
40-3	1.35	0.00	3.26	37.65	59.09	3.26	96.74	Clay	8.565	1.740
42-1	1.52	0.00	4.30	46.26	49.44	4.30	95.70	Silty Clay	7.896	2.064
42-3	1.55	0.00	4.05	42.45	53.50	4.05	95.95	Clay	8.375	1.905
43-3	1.49	0.00	3.33	21.07	75.61	3.33	96.68	Clay	9.712	1.780
44-1	1.57	0.00	4.10	45.52	50.38	4.10	95.90	Clay	8.000	1.846
44-2	1.70	0.00	7.53	34.53	57.94	7.53	92.47	Clay	8.584	2.241
46-1	1.38	0.00	10.46	44.47	45.07	10.46	89.54	Silty Clay	7.555	2.464
46-3	1.26	0.00	1.84	42.63	55.53	1.84	98.16	Clay	8.449	1.553
46-4	1.49	0.00	8.88	42.64	48.48	8.88	91.12	Silty Clay	7.841	2.350
47-3	1.67	0.00	2.11	41.90	55.99	2.11	97.89	Clay	8.448	2.032
47-4	1.54	0.00	2.87	28.34	68.79	2.87	97.13	Clay	8.817	1.556
BA-21	1.47	0.41	3.46	28.18	67.95	3.87	96.13	Clay	9.004	1.715
BB-70	1.01	0.00	26.66	29.47	43.87	26.66	73.34	Silty Clay	7.504	3.305
BD-22	1.29	0.96	9.72	39.41	49.92	10.68	89.33	Silty Clay	7.957	3.022
BF-21	1.29	0.00	6.23	39.41	54.35	6.23	93.76	Clay	8.229	2.245

Table 3. Summary of overall abundance of major benthic macroinfauna taxonomic groups for the San Francisco Bay project August 2000.

Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
Annelida				
Oligochaeta	2	1.2	3,300	5.4
Polychaeta	101	59.8	7,677	12.6
Mollusca				
Bivalvia	12	7.1	7,093	11.6
Gastropoda	6	3.6	27	0.0
Arthropoda				
Malacostraca	37	21.9	42,248	69.1
Echinodermata				
Holothuroidea	1	0.6	3	0.0
Ophiuroidea	1	0.6	5	0.0
Other Taxa	9	5.3	786	1.3
Total	**169**		**61,139**	

Table 4. Summary of abundance of major benthic macroinfauna taxonomic groups by station for San Francisco Bay, August 2000.

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
1-2	Annelida	4	44.4	224	74.4
	Mollusca	2	22.2	70	23.3
	Arthropoda	3	33.3	7	2.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**9**		**301**	
2-2	Annelida	2	66.7	4	57.1
	Mollusca	1	33.3	3	42.9
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**3**		**7**	
3-1	Annelida	6	50.0	216	64.5
	Mollusca	4	33.3	114	34.0
	Arthropoda	2	16.7	5	1.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**335**	
3-3	Annelida	3	42.9	19	61.3
	Mollusca	3	42.9	8	25.8
	Arthropoda	1	14.3	4	12.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**7**		**31**	
4-2	Annelida	2	40.0	12	29.3
	Mollusca	2	40.0	28	68.3
	Arthropoda	1	20.0	1	2.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**5**		**41**	
5-1	Annelida	0	0.0	0	0.0
	Mollusca	1	50.0	10	90.9
	Arthropoda	1	50.0	1	9.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**2**		**11**	
5-2	Annelida	2	50.0	46	32.9
	Mollusca	1	25.0	93	66.4
	Arthropoda	1	25.0	1	0.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**4**		**140**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
5-5	Annelida	2	40.0	8	47.1
	Mollusca	2	40.0	7	41.2
	Arthropoda	1	20.0	2	11.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**5**		**17**	
6-1	Annelida	1	25.0	5	17.9
	Mollusca	2	50.0	22	78.6
	Arthropoda	1	25.0	1	3.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**4**		**28**	
6-4	Annelida	1	25.0	50	15.1
	Mollusca	2	50.0	277	83.4
	Arthropoda	1	25.0	5	1.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**4**		**332**	
7-1	Annelida	2	40.0	17	54.8
	Mollusca	2	40.0	5	16.1
	Arthropoda	1	20.0	9	29.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**5**		**31**	
7-4	Annelida	2	40.0	10	58.8
	Mollusca	2	40.0	6	35.3
	Arthropoda	1	20.0	1	5.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**5**		**17**	
7-6	Annelida	4	57.1	385	86.1
	Mollusca	2	28.6	27	6.0
	Arthropoda	1	14.3	35	7.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**7**		**447**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
8-1	Annelida	4	40.0	65	9.2
	Mollusca	3	30.0	43	6.1
	Arthropoda	3	30.0	602	84.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**10**		**710**	
8-3	Annelida	2	33.3	31	19.1
	Mollusca	1	16.7	118	72.8
	Arthropoda	3	50.0	13	8.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**6**		**162**	
9-2	Annelida	6	50.0	62	3.4
	Mollusca	2	16.7	1702	93.1
	Arthropoda	4	33.3	64	3.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**1828**	
10-1	Annelida	2	28.6	3	0.5
	Mollusca	3	42.9	620	98.6
	Arthropoda	2	28.6	6	1.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**7**		**629**	
10-3	Annelida	3	50.0	5	6.4
	Mollusca	1	16.7	71	91.0
	Arthropoda	2	33.3	2	2.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**6**		**78**	
11-1	Annelida	5	45.5	33	2.9
	Mollusca	1	9.1	908	80.3
	Arthropoda	4	36.4	189	16.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	9.1	1	0.1
	Total	**11**		**1131**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per $0.04m^2$)	% of Total
11-3	Annelida	5	50.0	29	9.4
	Mollusca	2	20.0	263	85.4
	Arthropoda	3	30.0	16	5.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**10**		**308**	
11-6	Annelida	5	41.7	11	0.7
	Mollusca	2	16.7	440	27.8
	Arthropoda	5	41.7	1134	71.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**1585**	
12-1	Annelida	0	0.0	0	0.0
	Mollusca	2	50.0	2	25.0
	Arthropoda	2	50.0	6	75.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**4**		**8**	
13-1	Annelida	7	53.8	28	8.1
	Mollusca	3	23.1	115	33.3
	Arthropoda	3	23.1	202	58.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**13**		**345**	
14-1	Annelida	3	37.5	22	8.9
	Mollusca	3	37.5	211	85.4
	Arthropoda	2	25.0	14	5.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**8**		**247**	
15-1	Annelida	6	54.5	24	13.7
	Mollusca	1	9.1	62	35.4
	Arthropoda	4	36.4	89	50.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**11**		**175**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
15-3	Annelida	18	64.3	121	7.0
	Arthropoda	7	25.0	1584	91.9
	Mollusca	2	7.1	16	0.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	3.6	2	0.1
	Total	**28**		**1723**	
16-1	Annelida	15	46.9	99	5.9
	Mollusca	3	9.4	6	0.4
	Arthropoda	12	37.5	1574	93.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	6.3	8	0.5
	Total	**32**		**1687**	
17-1	Annelida	11	52.4	291	6.6
	Mollusca	2	9.5	12	0.3
	Arthropoda	8	38.1	4124	93.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**21**		**4427**	
17-2	Annelida	15	57.7	379	20.4
	Mollusca	2	7.7	10	0.5
	Arthropoda	8	30.8	1468	79.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	3.8	2	0.1
	Total	**26**		**1859**	
18-1	Annelida	15	62.5	94	5.3
	Mollusca	1	4.2	3	0.2
	Arthropoda	8	33.3	1679	94.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**24**		**1776**	
19-2	Annelida	20	76.9	352	59.9
	Mollusca	1	3.8	2	0.3
	Arthropoda	5	19.2	234	39.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**26**		**588**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
19-3	Annelida	19	70.4	149	12.1
	Mollusca	1	3.7	30	2.4
	Arthropoda	6	22.2	1052	85.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	3.7	1	0.1
	Total	**27**		**1232**	
20-1	Annelida	23	63.9	174	2.5
	Mollusca	2	5.6	9	0.1
	Arthropoda	10	27.8	6682	97.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	2.8	5	0.1
	Total	**36**		**6870**	
20-5	Annelida	15	50.0	235	18.0
	Mollusca	3	10.0	4	0.3
	Arthropoda	8	26.7	1055	80.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	4	13.3	13	1.0
	Total	**30**		**1307**	
20-6	Annelida	17	54.8	93	12.0
	Mollusca	2	6.5	2	0.3
	Arthropoda	9	29.0	673	87.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	9.7	5	0.6
	Total	**31**		**773**	
21-1	Annelida	29	70.7	133	18.2
	Mollusca	2	4.9	9	1.2
	Arthropoda	8	19.5	581	79.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	4.9	9	1.2
	Total	**41**		**732**	
21-3	Annelida	23	63.9	87	10.5
	Mollusca	2	5.6	5	0.6
	Arthropoda	9	25.0	727	87.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	5.6	13	1.6
	Total	**36**		**832**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m²)	% of Total
22-1	Annelida	5	38.5	85	85.0
	Mollusca	3	23.1	5	5.0
	Arthropoda	5	38.5	10	10.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**13**		**100**	
22-3	Annelida	23	69.7	244	89.7
	Mollusca	5	15.2	17	6.3
	Arthropoda	2	6.1	5	1.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	9.1	6	2.2
	Total	**33**		**272**	
22-6	Annelida	8	47.1	25	46.3
	Mollusca	3	17.6	8	14.8
	Arthropoda	3	17.6	12	22.2
	Echinodermata	1	5.9	3	5.6
	Other Taxa	2	11.8	6	11.1
	Total	**17**		**54**	
23-2	Annelida	11	61.1	320	19.4
	Mollusca	0	0.0	0	0.0
	Arthropoda	7	38.9	1326	80.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**18**		**1646**	
24-2	Annelida	22	71.0	155	62.2
	Mollusca	1	3.2	72	28.9
	Arthropoda	6	19.4	14	5.6
	Echinodermata	1	3.2	2	0.8
	Other Taxa	1	3.2	6	2.4
	Total	**31**		**249**	
25-1	Annelida	27	67.5	343	23.1
	Mollusca	2	5.0	23	1.6
	Arthropoda	6	15.0	1098	74.0
	Echinodermata	1	2.5	1	0.1
	Other Taxa	4	10.0	18	1.2
	Total	**40**		**1483**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m²)	% of Total
25-3	Annelida	20	69.0	82	20.7
	Mollusca	2	6.9	10	2.5
	Arthropoda	5	17.2	301	76.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	6.9	3	0.8
	Total	**29**		**396**	
26-1	Annelida	19	59.4	902	71.6
	Mollusca	2	6.3	24	1.9
	Arthropoda	8	25.0	324	25.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	9.4	9	0.7
	Total	**32**		**1259**	
26-2	Annelida	22	64.7	163	38.9
	Mollusca	2	5.9	16	3.8
	Arthropoda	7	20.6	230	54.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	8.8	10	2.4
	Total	**34**		**419**	
27-1	Annelida	13	56.5	106	58.2
	Mollusca	1	4.3	4	2.2
	Arthropoda	8	34.8	70	38.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.3	2	1.1
	Total	**23**		**182**	
28-1	Annelida	2	25.0	8	29.6
	Mollusca	1	12.5	5	18.5
	Arthropoda	5	62.5	14	51.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**8**		**27**	
28-4	Annelida	17	53.1	58	30.9
	Mollusca	2	6.3	8	4.3
	Arthropoda	10	31.3	108	57.4
	Echinodermata	1	3.1	1	0.5
	Other Taxa	2	6.3	13	6.9
	Total	**32**		**188**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
28-5	Annelida	23	57.5	78	36.8
	Mollusca	3	7.5	8	3.8
	Arthropoda	9	22.5	108	50.9
	Echinodermata	1	2.5	1	0.5
	Other Taxa	4	10.0	17	8.0
	Total	**40**		**212**	
29-2	Annelida	14	66.7	83	48.5
	Mollusca	1	4.8	8	4.7
	Arthropoda	6	28.6	80	46.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**21**		**171**	
30-1	Annelida	10	47.6	28	4.4
	Mollusca	2	9.5	2	0.3
	Arthropoda	8	38.1	602	95.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.8	1	0.2
	Total	**21**		**633**	
30-3	Annelida	12	54.5	79	66.4
	Mollusca	4	18.2	6	5.0
	Arthropoda	5	22.7	29	24.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.5	5	4.2
	Total	**22**		**119**	
31-2	Annelida	8	72.7	20	60.6
	Mollusca	0	0.0	0	0.0
	Arthropoda	3	27.3	13	39.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**11**		**33**	
31-4	Annelida	12	52.2	48	14.2
	Mollusca	2	8.7	2	0.6
	Arthropoda	6	26.1	284	83.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	13.0	5	1.5
	Total	**23**		**339**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
31-6	Annelida	7	53.8	40	53.3
	Mollusca	2	15.4	3	4.0
	Arthropoda	4	30.8	32	42.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**13**		**75**	
32-2	Annelida	14	73.7	143	93.5
	Mollusca	1	5.3	4	2.6
	Arthropoda	4	21.1	6	3.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**19**		**153**	
32-3	Annelida	14	73.7	280	61.3
	Mollusca	1	5.3	12	2.6
	Arthropoda	4	21.1	165	36.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**19**		**457**	
32-6	Annelida	13	61.9	113	86.3
	Mollusca	4	19.0	5	3.8
	Arthropoda	4	19.0	13	9.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**21**		**131**	
33-5	Annelida	13	68.4	139	25.4
	Mollusca	0	0.0	0	0.0
	Arthropoda	6	31.6	409	74.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**19**		**548**	
34-1	Annelida	16	72.7	112	29.8
	Mollusca	1	4.5	16	4.3
	Arthropoda	5	22.7	248	66.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**22**		**376**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
34-3	Annelida	13	54.2	681	40.9
	Mollusca	4	16.7	37	2.2
	Arthropoda	6	25.0	913	54.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.2	33	2.0
	Total	**24**		**1664**	
35-2	Annelida	22	66.7	261	16.9
	Mollusca	1	3.0	4	0.3
	Arthropoda	7	21.2	1008	65.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	9.1	271	17.6
	Total	**33**		**1544**	
35-3	Annelida	19	67.9	232	35.2
	Mollusca	2	7.1	11	1.7
	Arthropoda	5	17.9	261	39.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	7.1	155	23.5
	Total	**28**		**659**	
36-1	Annelida	4	36.4	11	2.2
	Mollusca	2	18.2	2	0.4
	Arthropoda	5	45.5	490	97.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**11**		**503**	
36-2	Annelida	13	54.2	58	21.6
	Mollusca	4	16.7	10	3.7
	Arthropoda	5	20.8	165	61.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	8.3	36	13.4
	Total	**24**		**269**	
36-3	Annelida	15	55.6	130	3.6
	Mollusca	5	18.5	22	0.6
	Arthropoda	6	22.2	3465	95.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	3.7	1	0.0
	Total	**27**		**3618**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
38-1	Annelida	7	58.3	11	19.6
	Mollusca	3	25.0	28	50.0
	Arthropoda	2	16.7	17	30.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**56**	
38-3	Annelida	5	41.7	108	43.4
	Mollusca	3	25.0	131	52.6
	Arthropoda	4	33.3	10	4.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**249**	
39-1	Annelida	16	61.5	263	13.4
	Mollusca	3	11.5	60	3.0
	Arthropoda	7	26.9	1646	83.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**26**		**1969**	
40-2	Annelida	7	58.3	33	24.6
	Mollusca	1	8.3	77	57.5
	Arthropoda	4	33.3	24	17.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**134**	
40-3	Annelida	6	42.9	33	24.6
	Mollusca	3	21.4	44	32.8
	Arthropoda	4	28.6	56	41.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	7.1	1	0.7
	Total	**14**		**134**	
42-1	Annelida	8	53.3	130	19.2
	Mollusca	3	20.0	15	2.2
	Arthropoda	4	26.7	532	78.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**15**		**677**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
42-3	Annelida	5	50.0	32	21.8
	Mollusca	2	20.0	101	68.7
	Arthropoda	3	30.0	14	9.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**10**		**147**	
43-3	Annelida	5	50.0	23	8.9
	Mollusca	1	10.0	225	86.9
	Arthropoda	4	40.0	11	4.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**10**		**259**	
44-1	Annelida	6	60.0	293	80.5
	Mollusca	3	30.0	67	18.4
	Arthropoda	1	10.0	4	1.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**10**		**364**	
44-2	Annelida	4	50.0	121	82.3
	Mollusca	2	25.0	21	14.3
	Arthropoda	2	25.0	5	3.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**8**		**147**	
46-1	Annelida	9	45.0	304	16.1
	Mollusca	4	20.0	69	3.7
	Arthropoda	7	35.0	1511	80.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**20**		**1884**	
46-3	Annelida	2	50.0	3	4.9
	Mollusca	1	25.0	56	91.8
	Arthropoda	1	25.0	2	3.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**4**		**61**	

Table 4 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals (per 0.04m^2)	% of Total
46-4	Annelida	8	50.0	129	20.2
	Mollusca	3	18.8	60	9.4
	Arthropoda	5	31.3	451	70.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**16**		**640**	
47-3	Annelida	14	56.0	466	84.6
	Mollusca	2	8.0	3	0.5
	Arthropoda	8	32.0	81	14.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.0	1	0.2
	Total	**25**		**551**	
47-4	Annelida	15	62.5	225	29.1
	Mollusca	0	0.0	0	0.0
	Arthropoda	7	29.2	543	70.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	8.3	4	0.5
	Total	**24**		**772**	
BA-21	Annelida	7	58.3	100	19.3
	Mollusca	2	16.7	381	73.6
	Arthropoda	3	25.0	37	7.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**12**		**518**	
BB-70	Annelida	20	62.5	131	7.2
	Mollusca	2	6.3	4	0.2
	Arthropoda	8	25.0	1565	85.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	6.3	124	6.8
	Total	**32**		**1824**	
BD-22	Annelida	7	43.8	31	15.2
	Mollusca	3	18.8	83	40.7
	Arthropoda	6	37.5	90	44.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**16**		**204**	
BF-21	Annelida	2	28.6	17	33.3
	Mollusca	3	42.9	26	51.0
	Arthropoda	2	28.6	8	15.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	**7**		**51**	

Table 5. Distribution and abundance of taxa for the San Francisco Bay stations, August 2000.

Taxon Name	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	Station % Occurrence
Ampelisca abdita	Art	Mala	19897	32.54	32.54	66	76.7
Monocorophium acherusicum	Art	Mala	11993	19.62	52.16	61	70.9
Mya arenaria	Mol	Biva	6084	9.95	62.11	41	47.7
Tubificidae (LPIL)	Ann	Olig	3297	5.39	67.50	66	76.7
Nippoleucon himumensis	Art	Mala	3052	4.99	72.50	65	75.6
Sinocorophium alienense	Art	Mala	2433	3.98	76.47	41	47.7
Grandidierella japonica	Art	Mala	1352	2.21	78.69	25	29.1
Eudorella pacifica	Art	Mala	1288	2.11	80.79	17	19.8
Photis brevipes	Art	Mala	1128	1.84	82.64	16	18.6
Pseudopolydora paucibranchiata	Ann	Poly	938	1.53	84.17	20	23.3
Bivalvia (LPIL)	Mol	Biva	664	1.09	85.26	62	72.1
Leptochelia dubia	Art	Mala	640	1.05	86.30	27	31.4
Exogone lourei	Ann	Poly	616	1.01	87.31	26	30.2
Streblospio benedicti	Ann	Poly	534	0.87	88.19	30	34.9
Ascidiacea (LPIL)	Cho	Asci	521	0.85	89.04	8	9.3
Sphaerosyllis californiensis	Ann	Poly	473	0.77	89.81	27	31.4
Schistomeringos annulata	Ann	Poly	431	0.70	90.52	33	38.4
Sabaco americanus	Ann	Poly	367	0.60	91.12	26	30.2
Cirratulidae (LPIL)	Ann	Poly	363	0.59	91.71	26	30.2
Mediomastus (LPIL)	Ann	Poly	360	0.59	92.30	27	31.4
Marenzellaria viridis	Ann	Poly	342	0.56	92.86	17	19.8
Glycinde armigera	Ann	Poly	331	0.54	93.40	48	55.8
Heteromastus filiformis	Ann	Poly	270	0.44	93.84	27	31.4
Harmothoe imbricata	Ann	Poly	263	0.43	94.27	41	47.7
Caprella californica	Art	Mala	257	0.42	94.69	21	24.4
Cossura (LPIL)	Ann	Poly	218	0.36	95.05	19	22.1
Typosyllis nipponica	Ann	Poly	198	0.32	95.37	19	22.1
Capitella capitata	Ann	Poly	189	0.31	95.68	29	33.7
Actiniaria (LPIL)	Cni	Anth	161	0.26	95.95	18	20.9
Nereis succinea	Ann	Poly	161	0.26	96.21	26	30.2
Armandia brevis	Ann	Poly	126	0.21	96.41	18	20.9
Dipolydora caulleryi	Ann	Poly	126	0.21	96.62	6	7.0
Euchone limnicola	Ann	Poly	117	0.19	96.81	19	22.1
Cirriformia spirabrancha	Ann	Poly	107	0.18	96.99	23	26.7
Heteropodarke heteromorpha	Ann	Poly	106	0.17	97.16	4	4.7
Nephtys cornuta	Ann	Poly	103	0.17	97.33	21	24.4
Amaeana occidentalis	Ann	Poly	102	0.17	97.50	19	22.1
Gemma gemma	Mol	Biva	98	0.16	97.66	3	3.5
Macoma balthica	Mol	Biva	86	0.14	97.80	11	12.8
Heteromastus (LPIL)	Ann	Poly	84	0.14	97.93	6	7.0
Rhynchocoela (LPIL)	Rhy	–	76	0.12	98.06	22	25.6
Mediomastus californiensis	Ann	Poly	71	0.12	98.17	15	17.4
Leitoscoloplos pugettensis	Ann	Poly	67	0.11	98.28	16	18.6
Glycinde picta	Ann	Poly	64	0.10	98.39	18	20.9
Synidotea laticauda	Art	Mala	57	0.09	98.48	13	15.1
Spiophanes berkeleyorum	Ann	Poly	54	0.09	98.57	15	17.4
Terebellidae (LPIL)	Ann	Poly	48	0.08	98.65	9	10.5
Polydora cornuta	Ann	Poly	47	0.08	98.73	15	17.4
Paranthura elegans	Art	Mala	45	0.07	98.80	11	12.8
Mytilidae (LPIL)	Mol	Biva	42	0.07	98.87	18	20.9
Pseudopolydora diopatra	Ann	Poly	40	0.07	98.93	3	3.5
Venerupsis philippinarum	Mol	Biva	37	0.06	98.99	6	7.0
Nereis (LPIL)	Ann	Poly	32	0.05	99.05	10	11.6
Potamocorbula amurensis	Mol	Biva	32	0.05	99.10	3	3.5
Maldanidae (LPIL)	Ann	Poly	31	0.05	99.15	10	11.6
Musculista senhousia	Mol	Biva	22	0.04	99.19	12	14.0
Hesionura coineaui	Ann	Poly	21	0.03	99.22	1	1.2
Lumbrineridae (LPIL)	Ann	Poly	21	0.03	99.25	2	2.3
Scoletoma tetraura	Ann	Poly	18	0.03	99.28	4	4.7
Theora lubrica	Mol	Biva	17	0.03	99.31	3	3.5

Table 5 continued:

Taxon Name	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	Station % Occurrence
Ampithoe valida	Art	Mala	16	0.03	99.34	3	3.5
Pholoe glabra	Ann	Poly	16	0.03	99.36	5	5.8
Pseudopolydora (LPIL)	Ann	Poly	14	0.02	99.39	6	7.0
Gnorimosphaeroma oregonense	Art	Mala	13	0.02	99.41	2	2.3
Lineidae (LPIL)	Rhy	Anop	13	0.02	99.43	6	7.0
Melita dentata	Art	Mala	13	0.02	99.45	2	2.3
Phyllodocidae (LPIL)	Ann	Poly	12	0.02	99.47	7	8.1
Gastropoda (LPIL)	Mol	Gast	11	0.02	99.49	8	9.3
Polynoidae (LPIL)	Ann	Poly	11	0.02	99.51	5	5.8
Autolytus (LPIL)	Ann	Poly	10	0.02	99.52	1	1.2
Crepidula fornicata	Mol	Gast	9	0.01	99.54	1	1.2
Exogone (LPIL)	Ann	Poly	9	0.01	99.55	3	3.5
Polycirrus californicus	Ann	Poly	9	0.01	99.57	1	1.2
Syllidae (LPIL)	Ann	Poly	9	0.01	99.58	7	8.1
Ampharetidae (LPIL)	Ann	Poly	8	0.01	99.59	7	8.1
Dipolydora socialis	Ann	Poly	8	0.01	99.61	4	4.7
Foxiphalus obtusidens	Art	Mala	8	0.01	99.62	1	1.2
Anthozoa (LPIL)	Cni	Anth	7	0.01	99.63	1	1.2
Parapleustes pugettensis	Art	Mala	7	0.01	99.64	3	3.5
Sabellidae (LPIL)	Ann	Poly	7	0.01	99.65	4	4.7
Marphysa sanguinea	Ann	Poly	6	0.01	99.66	2	2.3
Nereididae (LPIL)	Ann	Poly	6	0.01	99.67	3	3.5
Tellina nuculoides	Mol	Biva	6	0.01	99.68	2	2.3
Glycinde (LPIL)	Ann	Poly	5	0.01	99.69	4	4.7
Hydrozoa (LPIL)	Cni	Hydr	5	0.01	99.70	5	5.8
Lagunogammarus setosus	Art	Mala	5	0.01	99.71	1	1.2
Ophiuroidea (LPIL)	Ech	Ophi	5	0.01	99.72	4	4.7
Paraphoxus milleri	Art	Mala	5	0.01	99.73	1	1.2
Prionospio (LPIL)	Ann	Poly	5	0.01	99.73	3	3.5
Spionidae (LPIL)	Ann	Poly	5	0.01	99.74	2	2.3
Corophium (LPIL)	Art	Mala	4	0.01	99.75	2	2.3
Hypereteone lighti	Ann	Poly	4	0.01	99.75	3	3.5
Lamprops quadriplicata	Art	Mala	4	0.01	99.76	3	3.5
Lasaeidae (LPIL)	Mol	Biva	4	0.01	99.77	2	2.3
Ophelia assimilis	Ann	Poly	4	0.01	99.77	1	1.2
Pholoides aspera	Ann	Poly	4	0.01	99.78	2	2.3
Phyllodoce longipes	Ann	Poly	4	0.01	99.79	4	4.7
Sabellaria vulgaris	Ann	Poly	4	0.01	99.79	3	3.5
Xanthidae (LPIL)	Art	Mala	4	0.01	99.80	1	1.2
Aphelochaeta monilaris	Ann	Poly	3	0.00	99.81	1	1.2
Callianassa californiensis	Art	Mala	3	0.00	99.81	2	2.3
Capitellidae (LPIL)	Ann	Poly	3	0.00	99.82	3	3.5
Crangon alaskensis	Art	Mala	3	0.00	99.82	2	2.3
Dyopedos monacanthus	Art	Mala	3	0.00	99.82	1	1.2
Enchytraeidae (LPIL)	Ann	Olig	3	0.00	99.83	2	2.3
Glycera (LPIL)	Ann	Poly	3	0.00	99.83	2	2.3
Holothuroidea (LPIL)	Ech	Holo	3	0.00	99.84	1	1.2
Nephtys caecoides	Ann	Poly	3	0.00	99.84	2	2.3
Pectinaria californiensis	Ann	Poly	3	0.00	99.85	2	2.3
Philine polystrigma	Mol	Gast	3	0.00	99.85	2	2.3
Poecilochaetus johnsoni	Ann	Poly	3	0.00	99.86	2	2.3
Polycirrus (LPIL)	Ann	Poly	3	0.00	99.86	3	3.5
Prionospio lighti	Ann	Poly	3	0.00	99.87	2	2.3
Spiophanes bombyx	Ann	Poly	3	0.00	99.87	1	1.2
Synelmis (LPIL)	Ann	Poly	3	0.00	99.88	3	3.5
Tenonia priops	Ann	Poly	3	0.00	99.88	2	2.3
Aoridae (LPIL)	Art	Mala	2	0.00	99.89	1	1.2
Cossuridae (LPIL)	Ann	Poly	2	0.00	99.89	1	1.2
Cumella vulgaris	Art	Mala	2	0.00	99.89	1	1.2
Eumida (LPIL)	Ann	Poly	2	0.00	99.90	1	1.2
Lophopanopeus bellus	Art	Mala	2	0.00	99.90	1	1.2

Table 5 continued:

Taxon Name	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	Station % Occurrence
Lumbrinerides acuta	Ann	Poly	2	0.00	99.90	1	1.2
Melita (LPIL)	Art	Mala	2	0.00	99.91	1	1.2
Melitidae (LPIL)	Art	Mala	2	0.00	99.91	1	1.2
Microphthalmus (LPIL)	Ann	Poly	2	0.00	99.91	1	1.2
Monticellina (LPIL)	Ann	Poly	2	0.00	99.92	2	2.3
Owenia collaris	Ann	Poly	2	0.00	99.92	1	1.2
Pettiboneia sanmatiensis	Ann	Poly	2	0.00	99.92	2	2.3
Pista moorei	Ann	Poly	2	0.00	99.93	2	2.3
Pleurobranchaea californica	Mol	Gast	2	0.00	99.93	1	1.2
Sphaerosyllis (LPIL)	Ann	Poly	2	0.00	99.93	1	1.2
Spiophanes (LPIL)	Ann	Poly	2	0.00	99.94	1	1.2
Synelmis sp. G	Ann	Poly	2	0.00	99.94	2	2.3
Typosyllis alternata	Ann	Poly	2	0.00	99.94	1	1.2
Ampelisca (LPIL)	Art	Mala	1	0.00	99.94	1	1.2
Ancistrosyllis groenlandica	Ann	Poly	1	0.00	99.95	1	1.2
Apoprionospio pygmaea	Ann	Poly	1	0.00	99.95	1	1.2
Calyptraeidae (LPIL)	Mol	Gast	1	0.00	99.95	1	1.2
Chrysopetalidae (LPIL)	Ann	Poly	1	0.00	99.95	1	1.2
Crangonidae (LPIL)	Art	Mala	1	0.00	99.95	1	1.2
Cumella californica	Art	Mala	1	0.00	99.95	1	1.2
Dorvilleidae (LPIL)	Ann	Poly	1	0.00	99.96	1	1.2
Eudorella (LPIL)	Art	Mala	1	0.00	99.96	1	1.2
Eumida longicornuta	Ann	Poly	1	0.00	99.96	1	1.2
Eunicidae (LPIL)	Ann	Poly	1	0.00	99.96	1	1.2
Glycera nana	Ann	Poly	1	0.00	99.96	1	1.2
Hesionidae (LPIL)	Ann	Poly	1	0.00	99.96	1	1.2
Heteromastus filobranchus	Ann	Poly	1	0.00	99.97	1	1.2
Leptostraca (LPIL)	Art	Mala	1	0.00	99.97	1	1.2
Maldane sarsi	Ann	Poly	1	0.00	99.97	1	1.2
Malmgreniella macginitiei	Ann	Poly	1	0.00	99.97	1	1.2
Muricidae (LPIL)	Mol	Gast	1	0.00	99.97	1	1.2
Nebalia pugettensis	Art	Mala	1	0.00	99.97	1	1.2
Nephtys ferruginea	Ann	Poly	1	0.00	99.98	1	1.2
Nereis diversicolor	Ann	Poly	1	0.00	99.98	1	1.2
Notomastus (LPIL)	Ann	Poly	1	0.00	99.98	1	1.2
Oedicerotidae (LPIL)	Art	Mala	1	0.00	99.98	1	1.2
Opheliidae (LPIL)	Ann	Poly	1	0.00	99.98	1	1.2
Paraprionospio pinnata	Ann	Poly	1	0.00	99.98	1	1.2
Pholoidae (LPIL)	Ann	Poly	1	0.00	99.99	1	1.2
Phoronis (LPIL)	Pho	–	1	0.00	99.99	1	1.2
Pilargis berkeleyae	Ann	Poly	1	0.00	99.99	1	1.2
Platynereis bicanaliculata	Ann	Poly	1	0.00	99.99	1	1.2
Polycirrus sp. P	Ann	Poly	1	0.00	99.99	1	1.2
Sigambra tentaculata	Ann	Poly	1	0.00	99.99	1	1.2
Sipuncula (LPIL)	Sip	–	1	0.00	100.00	1	1.2
Synchelidium shoemakeri	Art	Mala	1	0.00	100.00	1	1.2
Tubulanus (LPIL)	Rhy	Anop	1	0.00	100.00	1	1.2
Veneridae (LPIL)	Mol	Biva	1	0.00	100.00	1	1.2

Taxa Key

Ann = Annelida
- Olig = Oligochaeta
- Poly = Polychaeta

Art = Arthropoda
- Mala = Malacostraca

Cho = Chordata
- Asci = Ascidiacea

Cni = Cnidaria
- Anth = Anthozoa
- Hydr = Hydrozoa

Ech = Echinodermata
- Holo = Holothuroidea
- Ophi = Ophiuroidea

Mol = Mollusca
- Biva = Bivalvia
- Gast = Gastropoda

Pho = Phoronida

Rhy = Rhynchocoela
- Anop = Anopla

Sip = Sipuncula

Table 6. Percentage abundance of dominant taxa (> 10% of the total assemblage) for the San Francisco Bay stations, August 2000.

Taxa	**1-2**	**2-2**	**3-1**	**4-2**	**5-1**	**5-2**	**5-5**	**6-1**	**6-4**	**7-1**	**7-4**	**7-6**	**8-1**	**8-3**	**9-2**	**10-1**	**10-3**	**11-1**	**11-3**	**11-6**	**12-1**	**13-1**	**14-1**	**15-1**
Annelida																								
Oligochaeta																								
Tubificidae (LPIL)	58.1		10.7				17.6			51.6	52.9	85.5												
Polychaeta																								
Armandia brevis																								
Cirratulidae (LPIL)																								
Cossura (LPIL)																								
Dipolydora caulleryi																								
Euchone limnicola																								
Exogone lourei																								
Harmothoe imbricata																								
Hesionura coineaui																								
Heteromastus (LPIL)																								
Heteromastus filiformis														14.2										
Heteropodarke heteromorpha																								
Leitoscoloplos pugettensis																								
Lumbrineridae (LPIL)																								
Marenzellaria viridis	14.3	42.9	47.8	53.7		30.7	29.4	17.9	15.1															
Mediomastus (LPIL)																								
Mediomastus californiensis																								
Nereis succinea																								
Pseudopolydora paucibranchiata																								
Sabaco americanus																								
Streblospio benedicti																								
Synelmis sp. G		14.3																						
Terebellidae (LPIL)																								
Typosyllis nipponica																								
Arthropoda																								
Malacostraca																								
Ampelisca (LPIL)																					12.5			
Ampelisca abdita													81.3					15.6		24.4		47.8		47.4
Eudorella pacifica																								
Foxiphalus obtusidens																								
Grandidierella japonica																								
Leptochelia dubia																								
Monocorophium acherusicum																								
Nippoleucon himumensis							11.8			29.0										46.5				
Paraphoxus milleri																					62.5			
Photis brevipes																								
Sinocorophium alienense																								
Chordata																								
Ascidiacea																								
Ascidiacea (LPIL)																								
Mollusca																								
Bivalvia																								
Bivalvia (LPIL)	10.6	42.9																			12.5			
Macoma balthica																								
Mya arenaria			31.6	131.7	90.9	66.4	35.3	75.0	82.2	12.9	29.4			72.8	91.7	96.0	91.0	80.3	84.7	27.6	12.5	29.9	83.0	35.4
Tellina nuculoides																								

Table 6 continued:

Taxa	15-3	16-1	17-1	17-2	18-1	19-2	19-3	20-1	20-5	20-6	21-1	21-3	22-1	22-3	22-6	23-2	24-2	25-1	25-3	26-1	26-2	27-1	28-1	28-4
Annelida																								
Oligochaeta																								
Tubificidae (LPIL)						36.9											14.9			53.5			11.1	
Polychaeta																								
Armandia brevis														11.8										
Cirratulidae (LPIL)																								
Cossura (LPIL)																								
Dipolydora caulleryi														30.9										
Euchone limnicola																								
Exogone lourei																11.5								
Harmothoe imbricata																								
Hesionura coineaui													21.0											
Heteromastus (LPIL)																								
Heteromastus filiformis																								
Heteropodarke heteromorpha													58.0	10.3	27.8								18.5	
Leitoscoloplos pugettensis																								
Lumbrineridae (LPIL)																								
Marenzellaria viridis																								
Mediomastus (LPIL)														15.1			12.9							
Mediomastus californiensis																	11.2							
Nereis succinea																								
Pseudopolydora paucibranchiata																								
Sabaco americanus																								
Streblospio benedicti																								
Synelmis sp. G																								
Terebellidae (LPIL)																						17.6		
Typosyllis nipponica																								
Arthropoda																								
Malacostraca																								
Ampelisca (LPIL)																								
Ampelisca abdita	54.7	45.8	20.3	11.8	79.3	32.8	69.3	51.0	27.1	41.7						48.9						23.6		
Eudorella pacifica																		41.4	63.1	10.0	47.3		22.2	
Foxiphalus obtusidens															14.8									
Grandidierella japonica																								
Leptochelia dubia																								
Monocorophium acherusicum	20.4	34.8	67.8					39.6	49.1	11.9						13.9							11.1	
Nippoleucon himumensis	11.1			56.2																				
Paraphoxus milleri																								
Photis brevipes												61.4												30.9
Sinocorophium alienense										27.0	64.9							25.2					11.1	
Chordata																								
Ascidiacea																								
Ascidiacea (LPIL)																								
Mollusca																								
Bivalvia																								
Bivalvia (LPIL)																	28.9							
Macoma balthica																								
Mya arenaria																								
Tellina nuculoides																							18.5	

Table 6 continued:

Taxa	28-5	29-2	30-1	30-3	31-2	31-4	31-6	32-2	32-3	32-6	33-5	34-1	34-3	35-2	35-3	36-1	36-2	36-3	38-1	38-3	39-1	40-2	40-3	42-1
Annelida																								
Oligochaeta																								
Tubificidae (LPIL)							21.3		31.5											31.3			13.4	
Polychaeta																								
Armandia brevis																								
Cirratulidae (LPIL)								39.2																
Cossura (LPIL)							14.7																	
Dipolydora caulleryi																								
Euchone limnicola		12.9																						
Exogone lourei															22.6									
Harmothoe imbricata				10.1																				
Hesionura coineaui																								
Heteromastus (LPIL)										51.9														
Heteromastus filiformis									16.8															
Heteropodarke heteromorpha																								
Leitoscoloplos pugettensis								19.6																
Lumbrineridae (LPIL)								12.4																
Marenzellaria viridis																								
Mediomastus (LPIL)					30.3																			
Mediomastus californiensis																								
Nereis succinea																								
Pseudopolydora paucibranchiata		10.5										12.2	31.8											
Sabaco americanus				15.1																				
Streblospio benedicti																								
Synelmis sp. G																								
Terebellidae (LPIL)																								
Typosyllis nipponica				10.9							14.6													
Arthropoda																								
Malacostraca																								
Ampelisca (LPIL)																								
Ampelisca abdita		11.7	58.6	11.8	18.2	50.7	17.3								14.3	56.5	28.3	77.6	26.8		44.7		20.1	73.4
Eudorella pacifica																								
Foxiphalus obtusidens																								
Grandidierella japonica									15.8		12.0										13.3			
Leptochelia dubia														15.5										
Monocorophium acherusicum	25.5										46.5	39.4	48.4	47.1	21.2	39.4	25.7	11.8			18.9			
Nippoleucon himumensis									13.8		10.4											15.7		
Paraphoxus milleri																								
Photis brevipes						21.8																		
Sinocorophium alienense		23.4	23.1		18.2		16.0					20.2											14.9	
Chordata																								
Ascidiacea																								
Ascidiacea (LPIL)														14.6	22.2									
Mollusca																								
Bivalvia																								
Bivalvia (LPIL)																			46.4			57.5	28.4	
Macoma balthica																								
Mya arenaria																				49.4				
Tellina nuculoides																								

Table 6 continued:

Taxa	42-3	43-3	44-1	44-2	46-1	46-3	46-4	47-3	47-4	BA-21	BB-70	BD-22	BF-21
Annelida													
Oligochaeta													
Tubificidae (LPIL)	10.2		73.9	69.4				21.6					27.5
Polychaeta													
Armandia brevis													
Cirratulidae (LPIL)								36.1					
Cossura (LPIL)								13.6					
Dipolydora caulleryi													
Euchone limnicola													
Exogone lourei													
Harmothoe imbricata													
Hesionura coineaui													
Heteromastus (LPIL)													
Heteromastus filiformis													
Heteropodarke heteromorpha													
Leitoscoloplos pugettensis													
Lumbrineridae (LPIL)													
Marenzellaria viridis													
Mediomastus (LPIL)													
Mediomastus californiensis													
Nereis succinea				10.2									
Pseudopolydora paucibranchiata													
Sabaco americanus													
Streblospio benedicti							14.7		12.3	10.8			
Synelmis sp. G													
Terebellidae (LPIL)													
Typosyllis nipponica													
Arthropoda													
Malacostraca													
Ampelisca (LPIL)													
Ampelisca abdita					71.0				10.4		58.3	35.3	
Eudorella pacifica													
Foxiphalus obtusidens													
Grandidierella japonica							47.2		35.9				
Leptochelia dubia													
Monocorophium acherusicum							12.0		16.3		19.5		13.7
Nippoleucon himumensis													
Paraphoxus milleri													
Photis brevipes													
Sinocorophium alienense													
Chordata													
Ascidiacea													
Ascidiacea (LPIL)													
Mollusca													
Bivalvia													
Bivalvia (LPIL)													
Macoma balthica			11.5	13.6									
Mya arenaria	68.0	86.9				91.8				72.6		39.7	45.1
Tellina nuculoides													

Table 7. Summary of benthic macroinfaunal data for the San Francisco Bay stations, August 2000.

Station	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
1-2	9	301	7525	9.0	0.0	7525.0	0.0	10	301	1.35	0.61
2-2	3	7	175	3.0	0.0	175.0	0.0	3	7	1.00	0.91
3-1	5	304	7600	5.0	0.0	7600.0	0.0	5	304	1.00	0.62
3-3	7	31	775	7.0	0.0	775.0	0.0	8	31	1.57	0.81
4-2	5	41	1025	5.0	0.0	1025.0	0.0	5	41	0.90	0.56
5-1	2	11	275	2.0	0.0	275.0	0.0	2	11	0.30	0.44
5-2	4	140	3500	4.0	0.0	3500.0	0.0	4	140	0.75	0.54
5-5	5	17	425	5.0	0.0	425.0	0.0	5	17	1.45	0.90
6-1	4	28	700	4.0	0.0	700.0	0.0	4	28	0.76	0.55
6-4	4	332	8300	4.0	0.0	8300.0	0.0	4	332	0.56	0.41
7-1	5	31	775	5.0	0.0	775.0	0.0	5	31	1.19	0.74
7-4	5	17	425	5.0	0.0	425.0	0.0	5	17	1.20	0.74
7-6	7	447	11175	7.0	0.0	11175.0	0.0	7	447	0.59	0.30
8-1	10	710	17750	10.0	0.0	17750.0	0.0	10	710	0.83	0.36
8-3	6	162	4050	6.0	0.0	4050.0	0.0	6	162	0.92	0.51
9-2	12	1828	45700	12.0	0.0	45700.0	0.0	12	1828	0.44	0.18
10-1	7	629	15725	7.0	0.0	15725.0	0.0	7	629	0.22	0.11
10-3	6	78	1950	6.0	0.0	1950.0	0.0	6	78	0.43	0.24
11-1	11	1131	28275	11.0	0.0	28275.0	0.0	11	1131	0.68	0.28
11-3	10	308	7700	10.0	0.0	7700.0	0.0	10	308	0.71	0.31
11-6	12	1585	39625	12.0	0.0	39625.0	0.0	12	1585	1.15	0.46
12-1	4	8	200	4.0	0.0	200.0	0.0	4	8	1.07	0.77
13-1	13	345	8625	13.0	0.0	8625.0	0.0	13	345	1.47	0.57
14-1	8	247	6175	8.0	0.0	6175.0	0.0	8	247	0.75	0.36
15-1	11	175	4375	11.0	0.0	4375.0	0.0	11	175	1.38	0.57
15-3	28	1723	43075	28.0	0.0	43075.0	0.0	29	1723	1.52	0.46
16-1	32	1687	42175	32.0	0.0	42175.0	0.0	32	1687	1.52	0.44
17-1	21	4427	110675	21.0	0.0	110675.0	0.0	21	4427	1.11	0.36
17-2	26	1859	46475	26.0	0.0	46475.0	0.0	26	1859	1.59	0.49
18-1	24	1776	44400	24.0	0.0	44400.0	0.0	24	1776	0.97	0.31

Table 7 continued:

Station	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
19-2	26	588	14700	26.0	0.0	14700.0	0.0	26	588	1.83	0.56
19-3	27	1232	30800	27.0	0.0	30800.0	0.0	27	1232	1.34	0.41
20-1	36	6870	171750	36.0	0.0	171750.0	0.0	36	6870	1.14	0.32
20-5	30	1307	32675	30.0	0.0	32675.0	0.0	30	1307	1.57	0.46
20-6	31	773	19325	31.0	0.0	19325.0	0.0	31	773	1.84	0.53
21-1	41	732	18300	41.0	0.0	18300.0	0.0	41	732	1.73	0.47
21-3	36	832	20800	36.0	0.0	20800.0	0.0	36	832	1.66	0.46
22-1	13	100	2500	13.0	0.0	2500.0	0.0	14	100	1.45	0.56
22-3	33	272	6800	33.0	0.0	6800.0	0.0	33	272	2.44	0.70
22-6	17	54	1350	17.0	0.0	1350.0	0.0	17	54	2.43	0.86
23-2	18	1646	41150	18.0	0.0	41150.0	0.0	18	1646	1.65	0.57
24-2	31	249	6225	31.0	0.0	6225.0	0.0	31	249	2.44	0.71
25-1	40	1483	37075	40.0	0.0	37075.0	0.0	40	1483	1.99	0.54
25-3	29	396	9900	29.0	0.0	9900.0	0.0	29	396	1.71	0.51
26-1	32	1259	31475	32.0	0.0	31475.0	0.0	32	1259	1.92	0.55
26-2	34	419	10475	34.0	0.0	10475.0	0.0	35	419	2.26	0.64
27-1	23	182	4550	23.0	0.0	4550.0	0.0	23	182	2.48	0.79
28-1	8	27	675	8.0	0.0	675.0	0.0	8	27	1.94	0.93
28-4	32	188	4700	32.0	0.0	4700.0	0.0	32	188	2.76	0.80
28-5	40	212	5300	40.0	0.0	5300.0	0.0	40	212	2.98	0.81
29-2	21	171	4275	21.0	0.0	4275.0	0.0	21	171	2.50	0.82
30-1	21	633	15825	21.0	0.0	15825.0	0.0	21	633	1.30	0.43
30-3	22	119	2975	22.0	0.0	2975.0	0.0	22	119	2.67	0.86
31-2	11	33	825	11.0	0.0	825.0	0.0	11	33	2.02	0.84
31-4	23	339	8475	23.0	0.0	8475.0	0.0	23	339	1.75	0.56
31-6	13	75	1875	13.0	0.0	1875.0	0.0	13	75	2.17	0.85
32-2	19	153	3825	19.0	0.0	3825.0	0.0	19	153	2.02	0.69
32-3	19	457	11425	19.0	0.0	11425.0	0.0	19	457	2.10	0.71
32-6	21	131	3275	21.0	0.0	3275.0	0.0	21	131	1.94	0.64
33-5	19	548	13700	19.0	0.0	13700.0	0.0	19	548	1.77	0.60
34-1	22	376	9400	22.0	0.0	9400.0	0.0	22	376	2.04	0.66

Table 7 continued:

Station	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
34-3	24	1664	41600	24.0	0.0	41600.0	0.0	24	1664	1.46	0.46
35-2	33	1544	38600	33.0	0.0	38600.0	0.0	34	1544	1.84	0.53
35-3	28	659	16475	28.0	0.0	16475.0	0.0	28	659	2.12	0.64
36-1	11	503	12575	11.0	0.0	12575.0	0.0	11	503	0.91	0.38
36-2	24	269	6725	24.0	0.0	6725.0	0.0	24	269	2.26	0.71
36-3	27	3618	90450	27.0	0.0	90450.0	0.0	27	3618	0.91	0.28
38-1	12	56	1400	12.0	0.0	1400.0	0.0	12	56	1.65	0.67
38-3	12	249	6225	12.0	0.0	6225.0	0.0	12	249	1.40	0.56
39-1	26	1969	49225	26.0	0.0	49225.0	0.0	26	1969	1.77	0.54
40-2	12	134	3350	12.0	0.0	3350.0	0.0	12	134	1.47	0.59
40-3	14	134	3350	14.0	0.0	3350.0	0.0	14	134	2.06	0.78
42-1	15	677	16925	15.0	0.0	16925.0	0.0	15	677	1.10	0.40
42-3	10	147	3675	10.0	0.0	3675.0	0.0	10	147	1.20	0.52
43-3	10	259	6475	10.0	0.0	6475.0	0.0	10	259	0.61	0.27
44-1	10	364	9100	10.0	0.0	9100.0	0.0	10	364	1.02	0.44
44-2	8	147	3675	8.0	0.0	3675.0	0.0	8	147	1.04	0.50
46-1	20	1884	47100	20.0	0.0	47100.0	0.0	20	1884	1.20	0.40
46-3	4	61	1525	4.0	0.0	1525.0	0.0	4	61	0.37	0.27
46-4	16	640	16000	16.0	0.0	16000.0	0.0	16	640	1.75	0.63
47-3	25	551	13775	25.0	0.0	13775.0	0.0	25	551	2.02	0.63
47-4	24	772	19300	24.0	0.0	19300.0	0.0	24	772	2.07	0.65
BA-21	12	518	12950	12.0	0.0	12950.0	0.0	13	518	1.02	0.41
BB-70	32	1824	45600	32.0	0.0	45600.0	0.0	32	1824	1.47	0.42
BD-22	16	204	5100	16.0	0.0	5100.0	0.0	16	204	1.61	0.58
BF-21	7	51	1275	7.0	0.0	1275.0	0.0	7	51	1.43	0.74

Table 8. Nonparametric correlations (Spearman's Rho) for selected biological and physical variables for the San Francisco Bay stations, August 2000.

Variable	**by Variable**	**Correlation**	**Significance Probability**	
Taxa	Salinity	0.8113	<0.0001	********
Taxa	Particle Size	-0.1759	0.1052	**ns**
Taxa	Density	0.6317	<0.0001	********
Taxa	Diversity	0.6566	<0.0001	********
Density	Salinity	0.3566	0.0011	*******
Density	Particle Size	-0.0215	0.8444	**ns**
Density	Diversity	-0.0061	0.9554	**ns**
Diversity	Salinity	0.7203	<0.0001	********
Diversity	Particle Size	-0.1309	0.2295	**ns**

Figure 1. Station locations for the San Francisco Bay stations, August 2000.

Figure 2. Bottom salinity at the San Francisco Bay stations, August 2000.

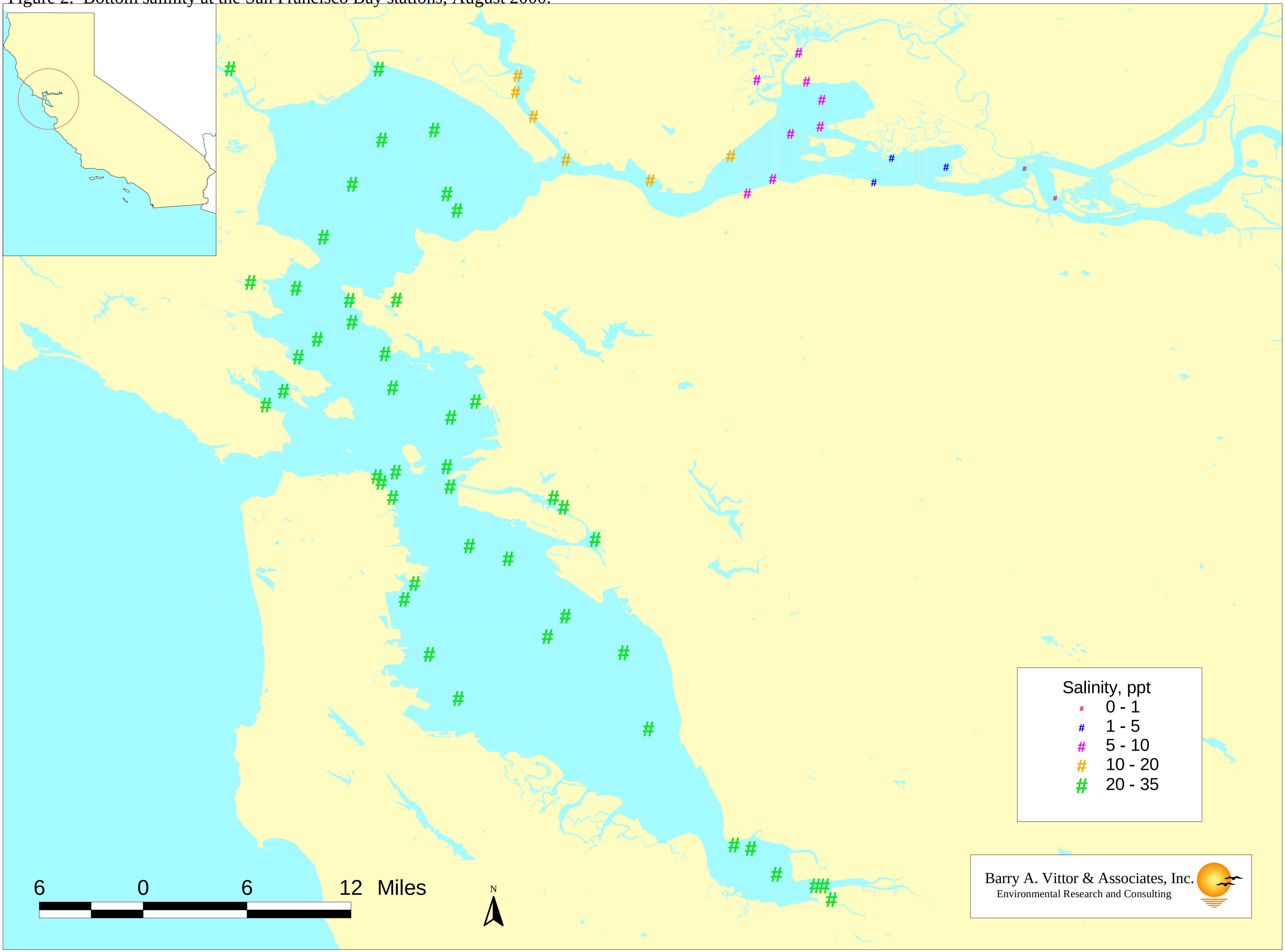


Figure 3. Sediment composition at the San Francisco Bay stations, August 2000.

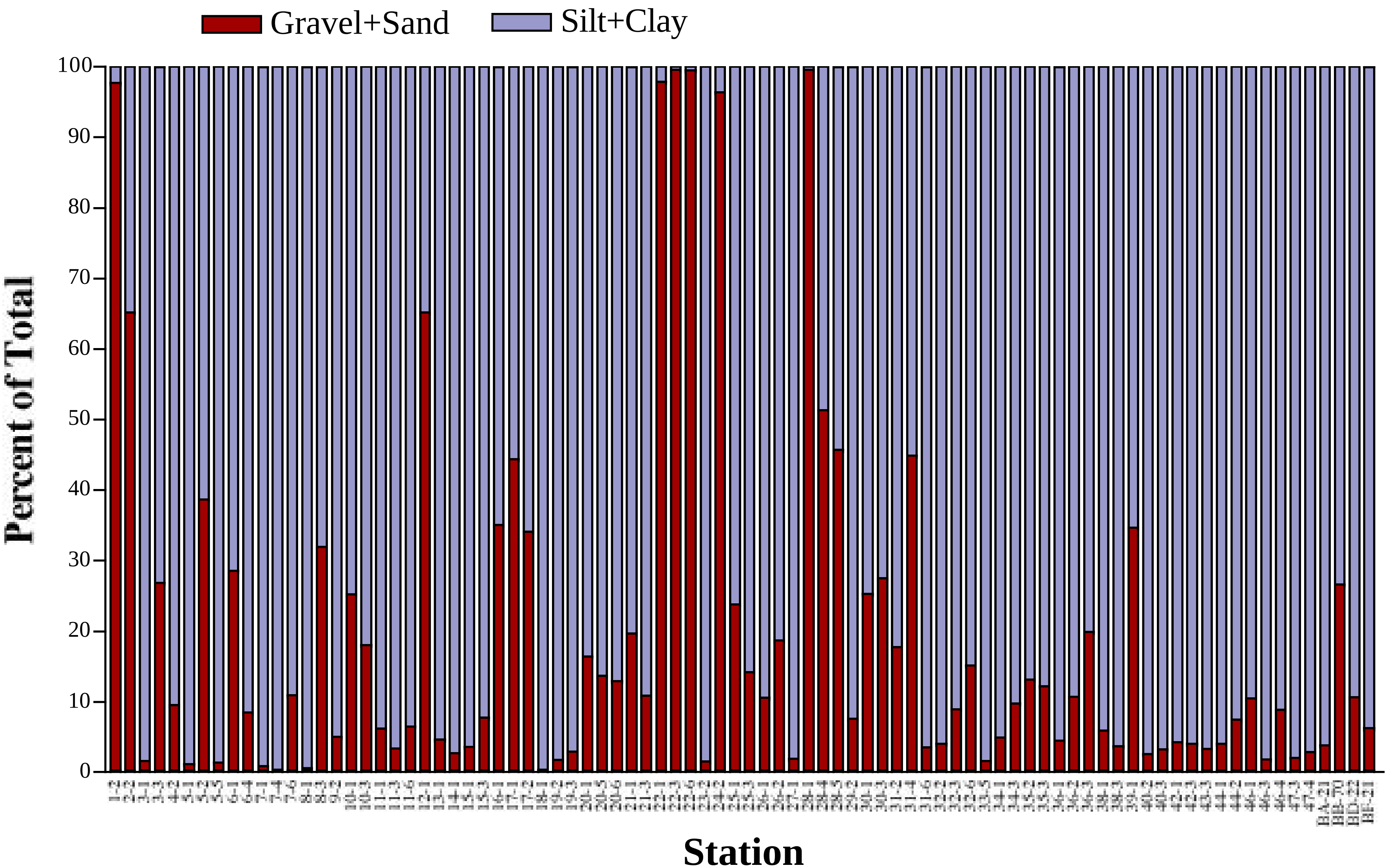


Figure 4. Percent Total Organic Carbon (TOC) in the sediments for the San Francisco Bay stations, August 2000.

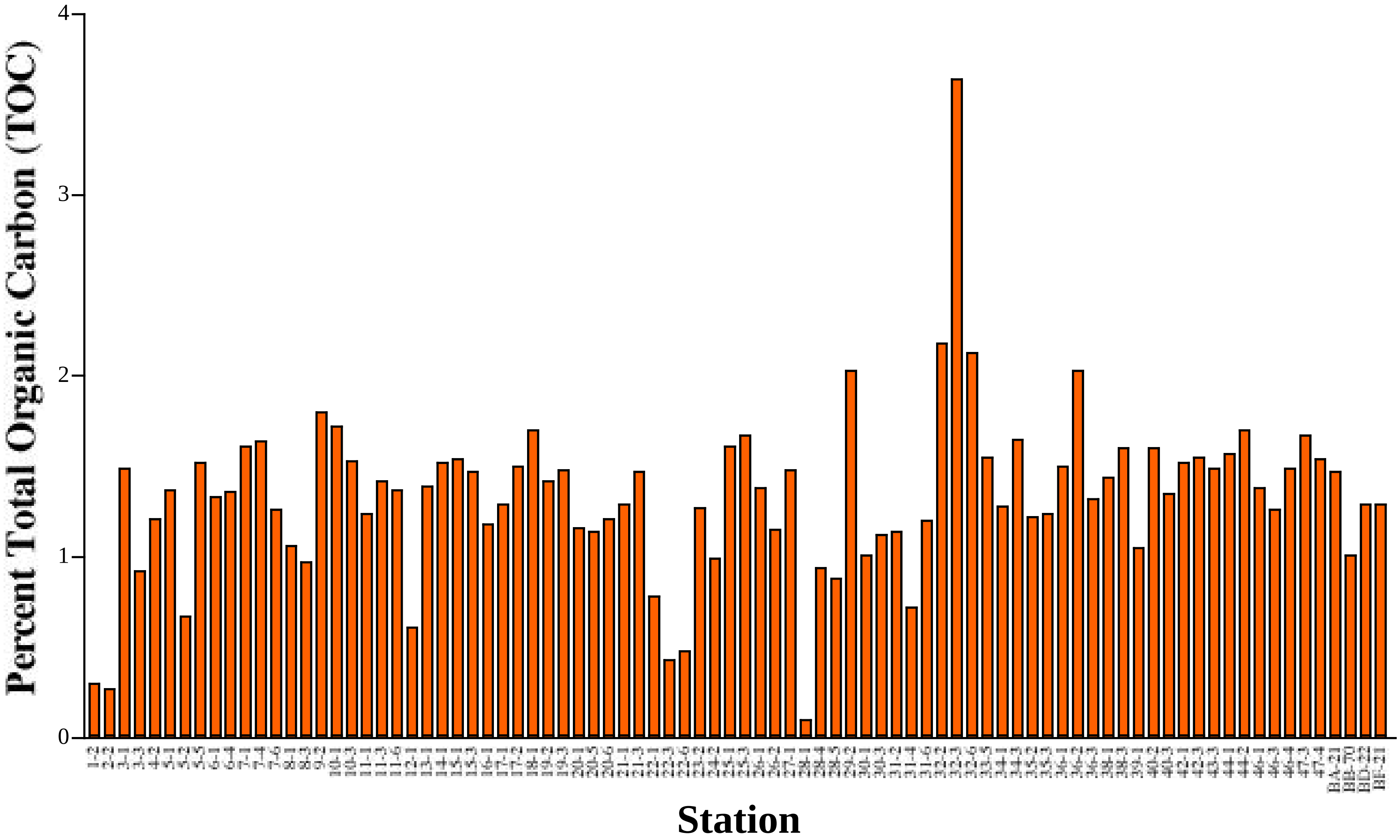


Figure 5. Mean particle size (phi) of the sediments for the San Francisco Bay stations, August 2000.

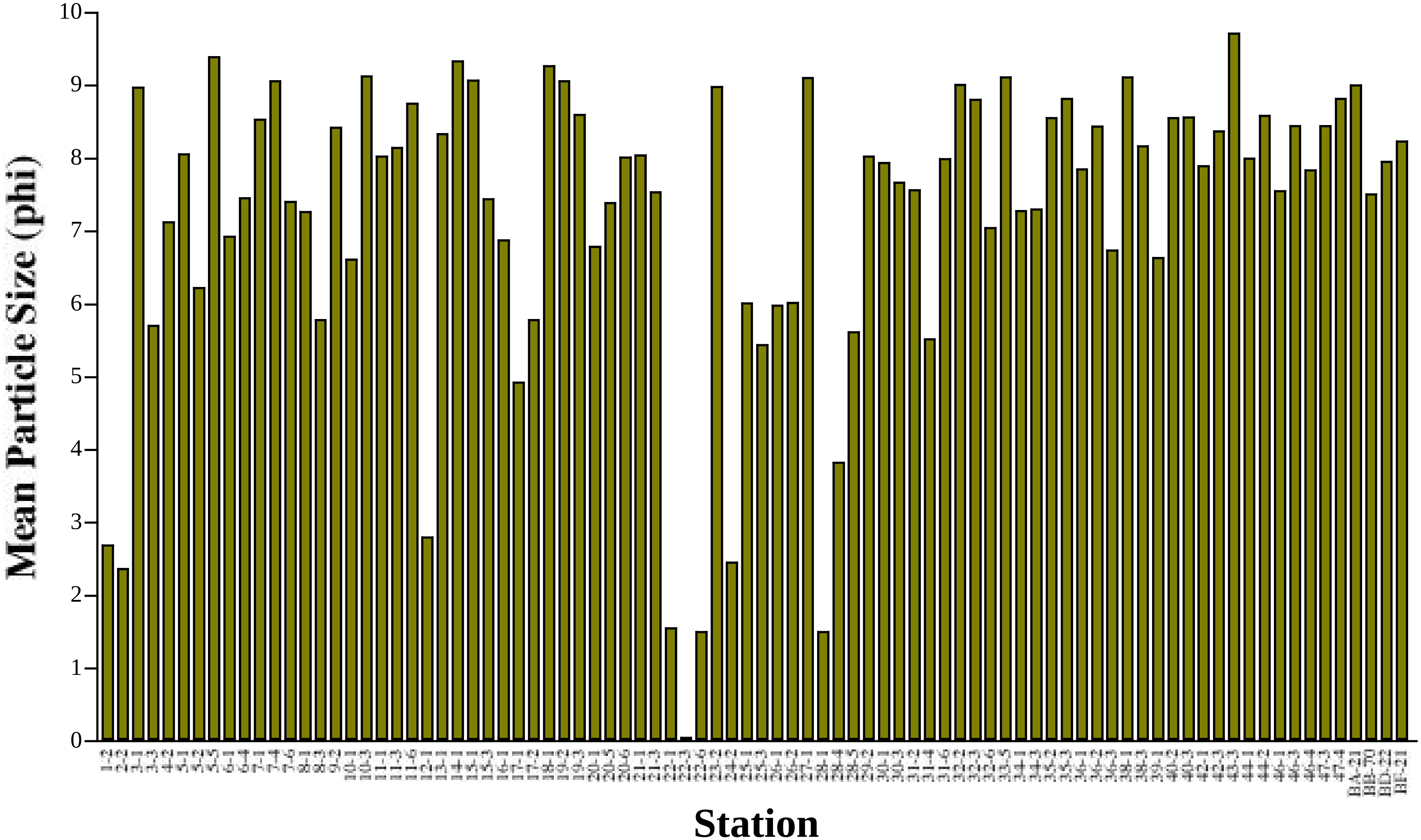


Figure 6. Distribution and abundance of dominant taxa for the San Francisco Bay stations, August 2000.

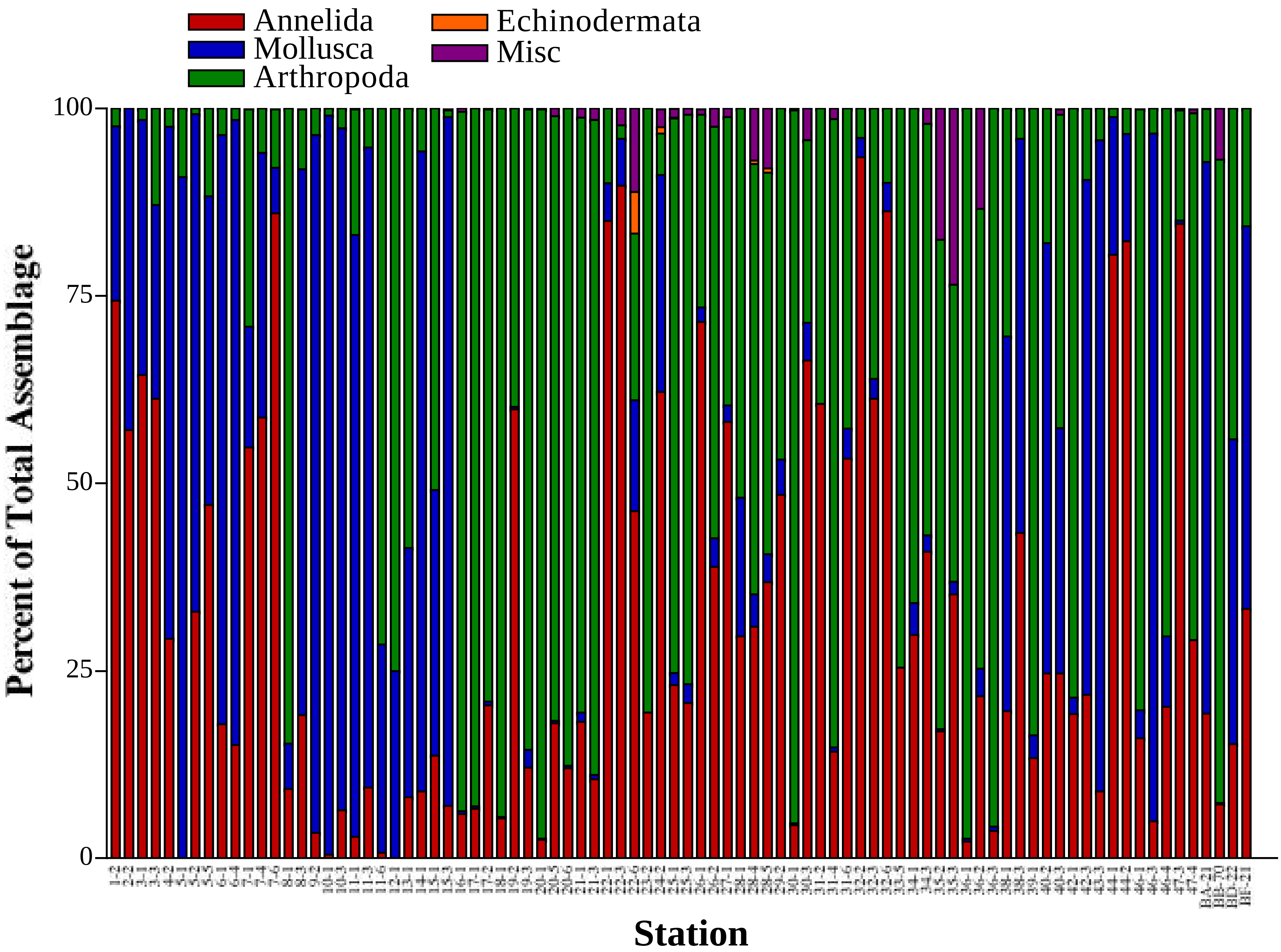


Figure 7. Taxa richness for the San Francisco Bay stations, August 2000.

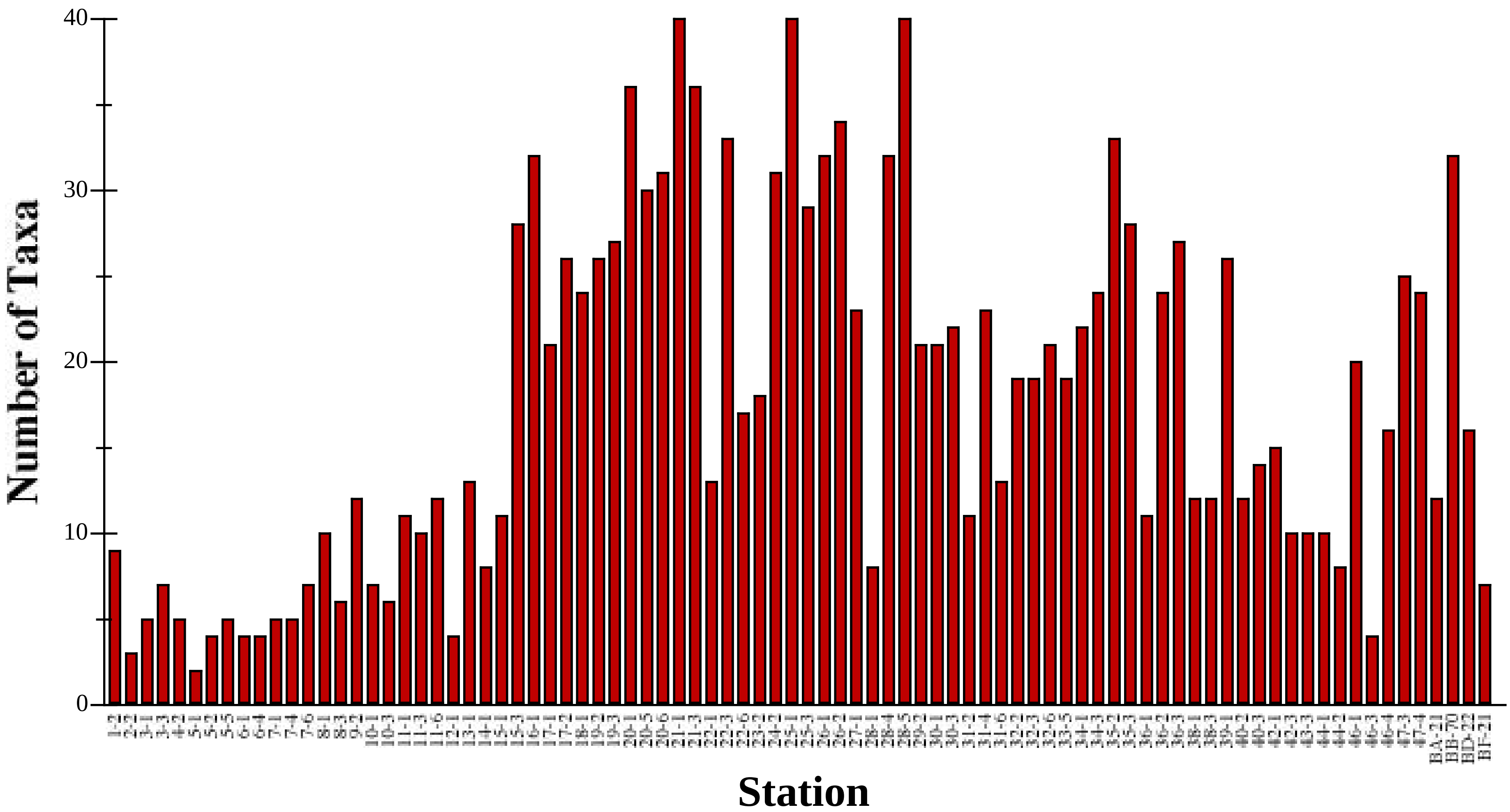


Figure 8. Taxa richness for the San Francisco Bay stations, August 2000.

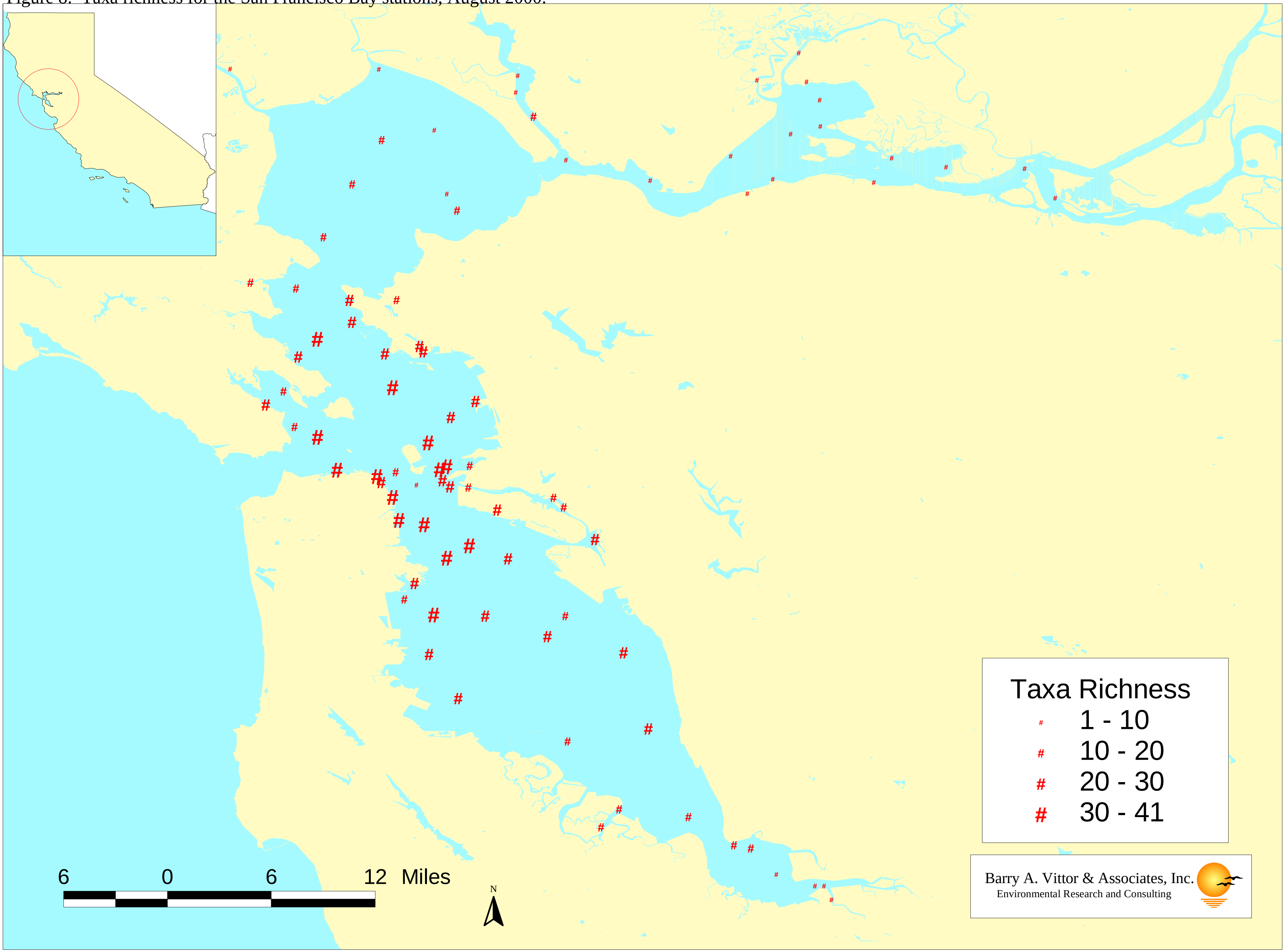


Figure 9. Taxa density data for the San Francisco Bay stations, August 2000.

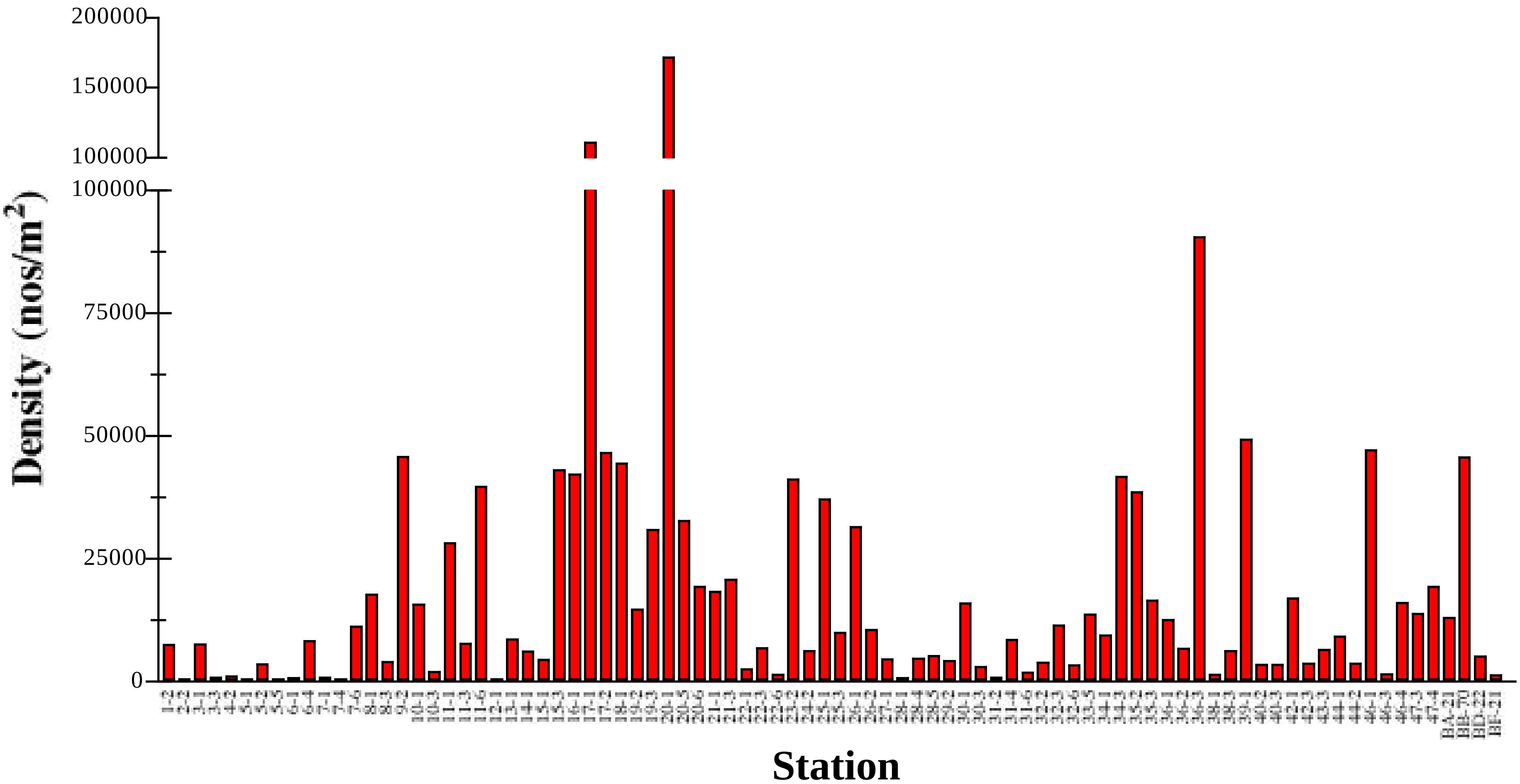


Figure 10. Macroinfaunal density for the San Francisco Bay stations, August 2000.

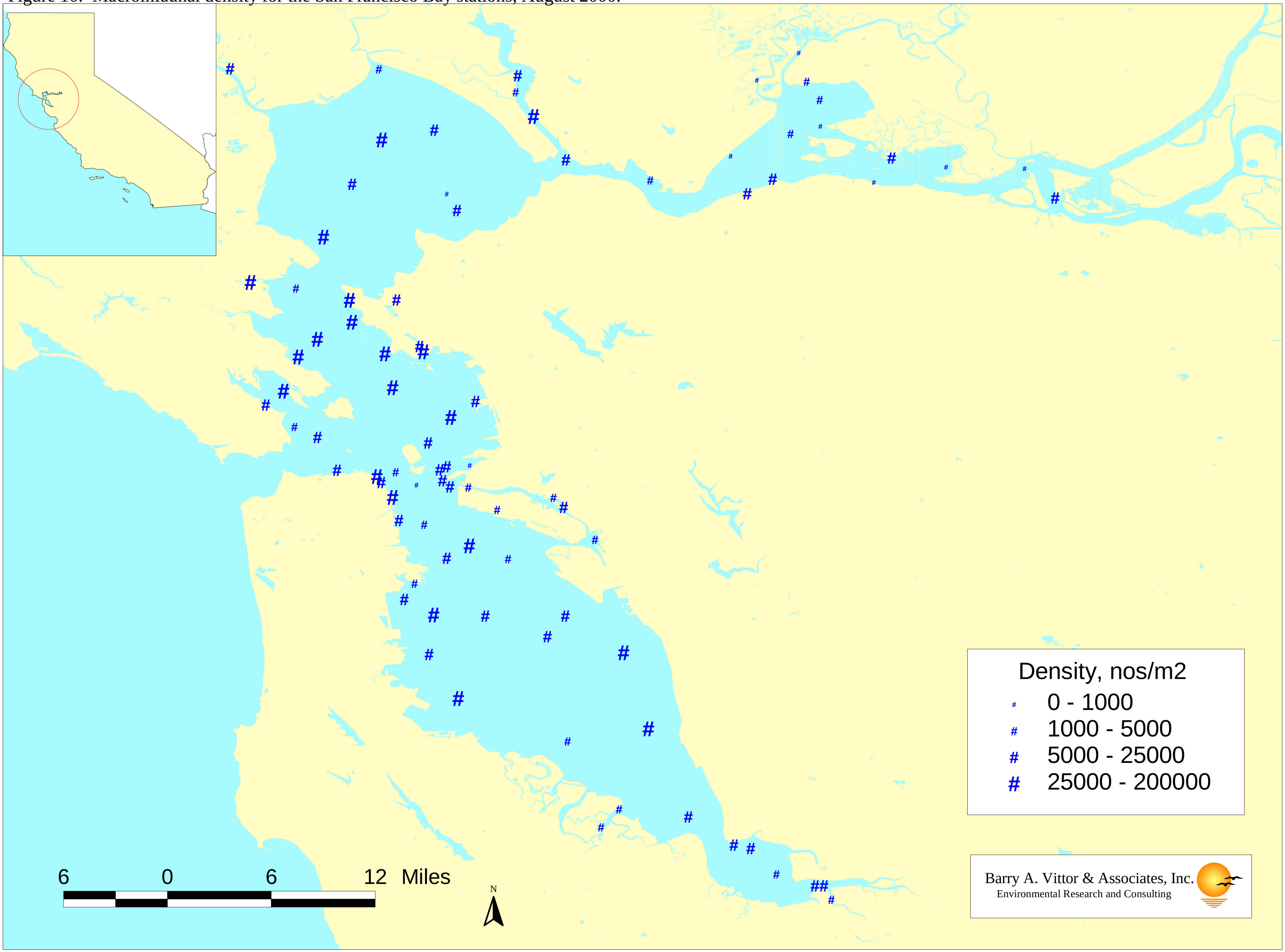


Figure 11. Taxa diversity (H') data for the San Francisco Bay stations, August 2000.

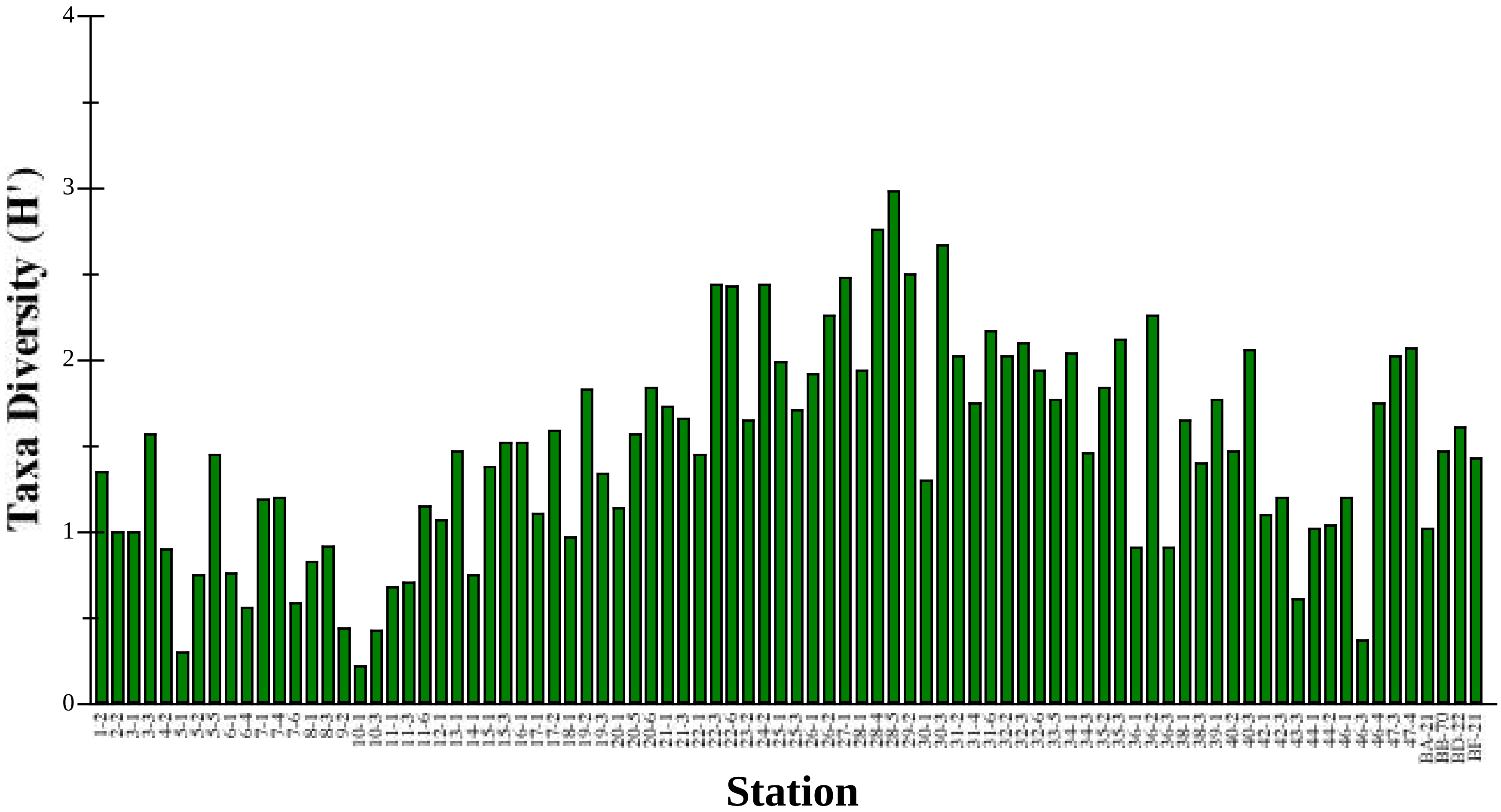
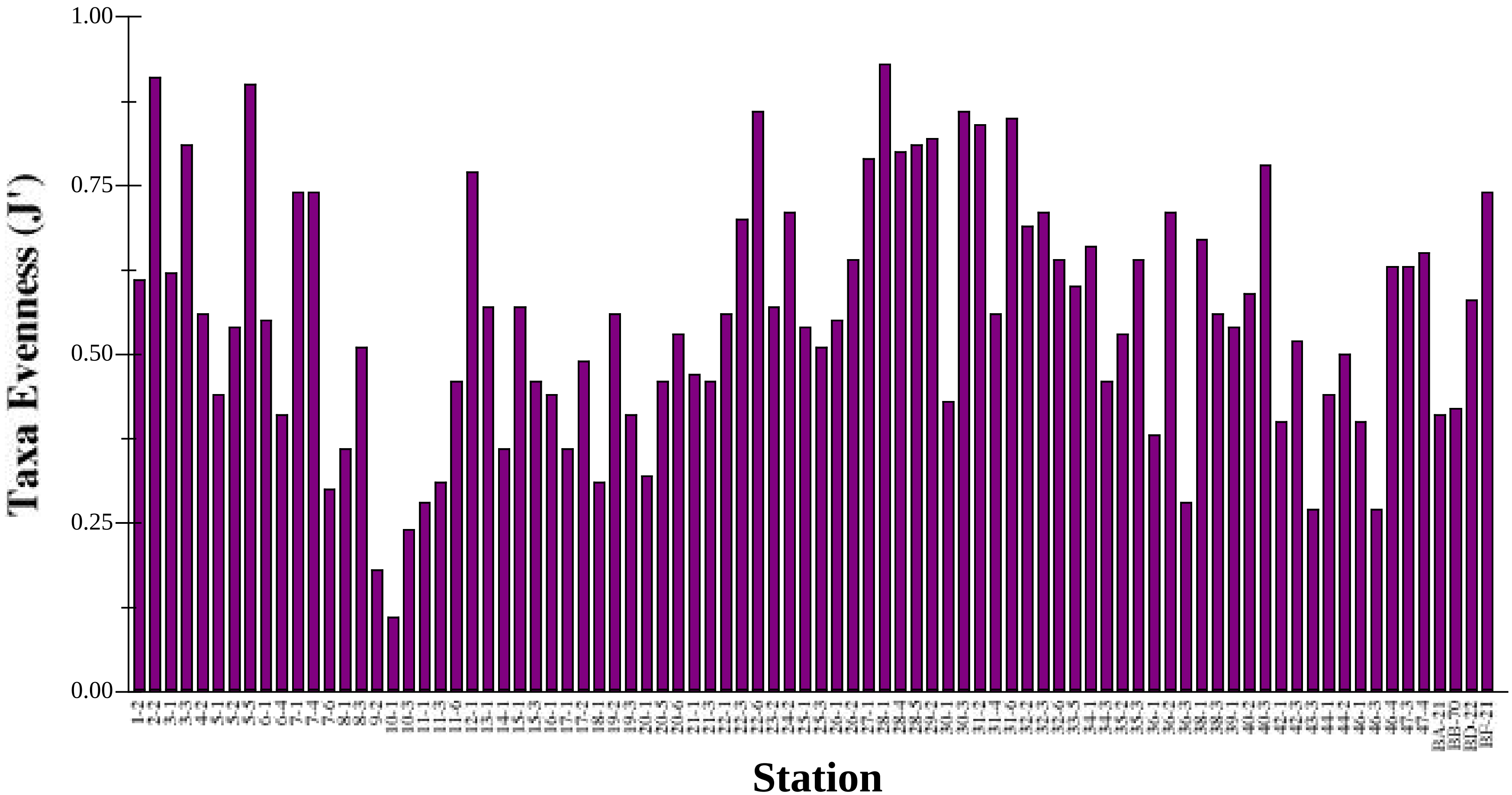


Figure 12. Taxa evenness (J') data for the San Francisco Bay stations, August 2000.



APPENDICES

QUALITY ASSURANCE STATEMENT

Client/Project NOAA

Work Assignment Title San Francisco Bay- 2000

Work Assignment Number Task Number: DO Opt.1-2

Description of Data Set or Deliverable: 86 Benthic macroinvertebrate samples collected July-August, 2000; Young Dredge grabs.

Description of audit and review activities: Judged accuracy rates were well above standard levels for sorting and taxonomy. Laboratory QC reports were completed. Copies of QC results follow (see attachment.) All taxonomic data were entered into computer and printed. This list was checked for accuracy against original taxonomic data sheets.

Description of outstanding issues or deficiencies which may affect data quality: None

Signature of QA Officer or Reviewer Date

Signature of Project Manager Date

QUALITY CONTROL REWORKS

Client/Project: NOAA-San Francisco Bay 2000
Task Number: DO Opt 1-2

Sorting Results:	Sample #	% Accuracy
	12-1	100%
	38-1	100%
	3-3	100%
	10-3	100%
	31-2	100%
	46-3	100%
	11-3	100%
	42-3	100%

Taxonomy Results:	Sample #	Taxa	% Accuracy
	36-2	Crust./Moll.	99%
	47-4	Crust./Moll.	98%
	20-5	Crust./Moll.	99%
	BA-21	Crust./Moll.	99%
	6-1	Crust./Moll.	100%
	13-1	Crust./Moll.	98%
	15-3	Crust./Moll.	98%
	25-1	Crust./Moll.	98%
	31-6	Crust./Moll.	100%
	21-1	Poly./Misc.	98%
	26-2	Poly./Misc.	98%
	25-1	Poly./Misc.	98%
	19-3	Poly./Misc.	97%
	34-1	Poly./Misc.	99%
	21-3	Poly./Misc.	96%
	17-2	Poly./Misc.	98%
	25-3	Poly./Misc.	99%
	32-2	Poly./Misc.	99%
	46-1	Poly./Misc.	98%

Description of outstanding issues or deficiencies which may affect data quality: None

Signature of QA Officer or Reviewer Date