Appendices

Appendix A

Summary of Stations

Appendix A.1

Summary of station locations and type of sampling conducted at each station in San Diego Bay during 1998.

Station	Latitude	Longitude	Sed Chem	Benthics	Trawl	Fish Tissue[b]	Comments[c]
2221	32° 43.671'	117° 12.307'	x	x			
2222	32° 43.127'	117° 13.551'	x	x			
2223	32° 42.925'	117° 13.831'	x	x	ns	RF	Station abandoned for trawls; obstruction
2224	32° 42.785'	117° 14.046'	x	x			
2225	32° 42.804'	117° 13.812'	x	x	ns	RF	Station abandoned for trawls; obstruction
2226	32° 42.667'	117° 13.899'	x	x			
2227	32° 43.424'	117° 12.482'	x	x			
2228	32° 43.444'	117° 10.690'	x	x			
2229	32° 42.537'	117° 10.562'	x	x	ns	RF	Station abandoned for trawls; obstruction
2230	33° 42.152'	117° 10.719'	x	x	x	ns	Station sampled by SPAWAR. Insufficient fish for TB
2231	32° 41.679'	117° 09.393'	x	x	x	ns	Insufficient fish for TB
2232	32° 41.541'	117° 09.839'	ns	ns	ns	ns	Station sampled by SPAWAR. Station abandoned; <3 m.
2233	32° 41.149'	117° 09.110'	x	x	x	x	
2234	32° 40.874'	117° 09.336'	ns	ns			Station abandoned; <3 m
2235	32° 38.448'	117° 08.216'	x	x	ns	RF	Station abandoned for trawls; obstruction
2236	32° 37.814'	117° 07.069'	ns	ns	ns	RF	Station abandoned (except TB); <3 m
2237	32° 37.595'	117° 07.379'	ns	ns			Station abandoned; <3 m
2238	32° 37.525'	117° 07.719'	x	x	ns	RF	Station abandoned for trawls; obstruction
2239	32° 40.944'	117° 08.406'	x	x	x	ns	
2240	32° 40.052'	117° 09.245'	x	x	ns	RF	Station abandoned for trawls; too shallow
2241	32° 40.216'	117° 08.189'	x	x	x	ns	Insufficient fish for TB
2242	32° 39.898'	117° 08.985'	x	x	x	x	
2243	32° 39.870'	117° 08.559'	x	x	x	ns	Insufficient fish for TB
2244	32° 39.583'	117° 07.909'	x	x	x	x	
2245	32° 39.050'	117° 08.562'	x	x	ns	RF	Station abandoned for trawls; obstruction
2246	32° 38.713'	117° 07.150'	ns	ns	ns	ns	Station abandoned; <3 m
2247	32° 38.540'	117° 07.484'	x	x	ns	RF	Station abandoned for trawls; too shallow
2248	32° 38.013'	117° 07.796'	ns	ns	ns	ns	Station abandoned; <3 m
2249	32° 37.280'	117° 07.687'	x	x	x	ns	Insufficient fish for TB

a) station not in Bight'98 field manual, added as extra trawl only stations due to lack of sampling success
b) RF = sampled for fish muscle by rig fishing because not trawlable
c) unless otherwise indicated, samples were collected by the City

Appendix A.1 (continued)

Station	Latitude	Longitude	Sed Chem	Benthics	Trawl	TB[b]	Comments[c]
2250	32° 37.132'	117° 07.014'	ns	ns	ns	ns	Station abandoned; <3 m
2251	32° 42.138'	117° 09.724'	x	x			
2252	32° 41.512'	117° 09.171'	x	x			
2253	32° 41.288'	117° 08.286'	x	x			Station sampled by SPAWAR.
2254	32° 40.635'	117° 09.794'	x	x	x	x	Station sampled by SPAWAR.
2255	32° 40.678'	117° 07.764'	x	x			
2256	32° 40.611'	117° 08.152'	x	x	x	x	
2257	32° 40.610'	117° 08.045'	x	x			
2258	32° 40.555'	117° 07.928'	x	x	x	ns	Insufficient fish for TB
2259	32° 40.209'	117° 07.486'	x	x	ns	RF	Station abandoned for trawls; obstruction
2260	32° 40.031'	117° 07.799'	x	x			
2261	32° 39.049'	117° 07.590'	x	x	ns	RF	Station abandoned for trawls; obstruction
2262	32° 39.090'	117° 07.376'	x	x	x	x	
2263	32° 42.963'	117° 10.559'	x	x			
2264	32° 41.123'	117° 07.969'	x	x			Station sampled by SPAWAR.
2265	32° 41.033'	117° 08.418'	x	x			
2433	32° 43.341'	117° 12.553'	x	x			
2434	32° 43.494'	117° 11.018'	x	x	ns	RF	Station abandoned for trawls; obstruction
2435	32° 42.692'	117° 13.375'	x	x	x	ns	Insufficient fish for TB
2436	32° 42.902'	117° 10.987'	x	x	x	x	
2437	32° 40.879'	117° 10.298'	ns	ns			Station abandoned; obstructions.
2438	32° 37.338'	117° 06.102'	x	x	ns	RF	Station abandoned for trawls; obstruction
2439	32° 43.566'	117° 11.371'	x	x	ns	RF	Station abandoned for trawls; obstruction
2440	32° 43.109'	117° 10.489'	x	x			
2441	32° 41.469'	117° 14.281'	x	x			Station sampled by SPAWAR.
2442	32° 41.352'	117° 14.225'	x	x			Station sampled by SPAWAR.
2571[a]	na	na			x	ns	Insufficient fish for TB
2573[a]	na	na			x	ns	Insufficient fish for TB

a) station not in Bight'98 field manual, added as extra trawl only stations due to lack of sampling success
b) RF = sampled for fish muscle by rig fishing because not trawlable
c) unless otherwise indicated, samples were collected by the City

Appendix B

Supporting Data

1998 San Diego Bay Stations

Sediment Quality

Appendix B.1

Sediment chemistry constituents analyzed for San Diego Bay during 1998. Method detection limits (MDL) are listed in parentheses.

Organic Indicators (%)	
Total Nitrogen (NA)	Total Organic Carbon (NA)

Metals (ppm)			
Aluminum (5)	Cadmium (0.5)	Manganese (0.48)	Thallium (10)
Antimony (5)	Chromium (3)	Mercury (0.03)	Tin (12)
Arsenic (0.08)	Copper (2)	Nickel (3)	Zinc (4)
Barium (0.042)	Iron (3)	Selenium (0.11)	
Beryllium (0.2)	Lead (5)	Silver (3)	

Polycylic Aromatic Hydrocarbons (ppb)			
1-methylnaphthalene (39)	Acenaphthene (42)	Benzo(e)pyrene (18)	Fluorene (46)
1-methylphenanthrene (29)	Acenaphthylene (25)	Benzo(G,H,I)perylene (25)	Indeno(1,2,3-CD)
2,3,5-trimethylnaphthalene (39)	Anthracene (35)	Benzo(K)fluoranthene (20)	pyrene (22)
2,6-dimethylnaphthalene (43)	Benzo(A)anthracene (23)	Biphenyl (42)	Naphthalene (36)
2-methylnaphthalene (39)	Dibenzo(A,H)anthracene (23)	Chrysene (21)	Perylene (18)
3,4-benzo(B)fluoranthene (27)	Benzo(A)pyrene (18)	Fluoranthene (39)	Phenanthrene (37)

Polychlorinated Biphenyl Compounds (PCB Congeners) (ppb)			
PCB 18 (1000)	PCB 81 (4700)	PCB 126 (1100)	PCB 169 (1700)
PCB 28 (960)	PCB 87 (1800)	PCB 128 (8900)	PCB 170 (1600)
PCB 37 (1700)	PCB 99 (4100)	PCB 138 (1900)	PCB 177 (2300)
PCB 44 (980)	PCB 101(1200)	PCB 149 (1700)	PCB 180 (2700)
PCB 49 (1300)	PCB 105 (930)	PCB 151 (1100)	PCB 183 (1400)
PCB 52 (1600)	PCB 110 (990)	PCB 153/168 (1200, 1400)	PCB 187 (1300)
PCB 66 (1000)	PCB 114 (1000)	PCB 156 (1800)	PCB 189 (1600)
PCB 70 (1000)	PCB 118 (1100)	PCB 157 (5600)	PCB 194 (1800)
PCB 74 (7900)	PCB 119 (1200)	PCB 158 (1100)	PCB 201 (2300)
PCB 77 (3700)	PCB 123 (9600)	PCB 167 (5000)	PCB 206 (5800)

Chlorinated Pesticides (ppt)			
Aldrin (1400)	BHC, Beta isomer (140)	Endosulfan Sulfate (430)	o,p-DDT (390)
Alpha (cis) Chlordane (550)	BHC, Delta isomer (1300)	Endrin aldehyde (ND)	p,p-DDD (910)
Alpha Chlordene (160)	BHC, Gamma isomer (240)	Heptachlor epoxide (240)	p,p-DDE (440)
Gamma (trans) Chlordane (640)		Cis Nonachlor (270)	Methoxychlor (3800)
	p,p-DDT (940)		
Alpha Endosulfan (340)	Dieldrin (420)	Mirex (1800)	Oxychlordane (1900)
Beta Endosulfan (1400)	Endrin (470)	o,p-DDD (260)	Trans Nonachlor (190)
BHC, Alpha isomer (320)	Heptachlor (410)	o,p-DDE (390)	Toxaphene (ND)

Biocides (ppt)
Tributyltin (ND)

Appendix B.2

Summary of organic loading indicators and particle size parameters for San Diego Bay during 1998. Data include depth; total nitrogen (TN); total organic carbon (TOC); fine sediment particles (Fines); median, mean, and standard deviation (SD) of phi size. "Sediment composition" reflects field observations.

	Depth	TN	TOC	Fines	Phi Size			
Station	m	%	%	%	Median	Mean	SD	Sediment Composition
2221	3.8	0.080	0.859	69.0	4.7	5.1	1.7	olive green silt
2222	4.8	0.112	0.985	72.0	5.4	5.6	1.9	olive green silt
2223	3.6	0.129	1.113	77.0	5.6	5.6	1.8	olive green silt
2224	4.5	0.078	0.645	40.0	3.4	4.0	2.0	olive green silt
2225	3.6	0.095	1.029	55.0	4.0	4.4	2.2	gray silt with shell hash
2226	4.8	0.210	1.727	91.0	6.0	6.1	1.6	gray and brown silt, sulfides
2227	8.8	0.101	0.932	50.0	4.1	4.6	2.0	olive green silt with shell hash
2228	5.2	0.084	0.730	45.0	3.9	4.3	1.5	olive green silt
2229	11.5	0.102	0.925	41.0	3.1	4.0	2.4	olive green silt with shell hash
2230	3.5	0.031	0.201	10.0	2.6	2.5	1.2	olive green fine sand
2231	13.1	0.076	0.639	29.0	2.8	3.6	2.7	olive green silt/ fine sand with shell hash
2233	8.8	0.056	0.450	34.0	3.2	4.0	1.9	olive green silt/clay with shell hash
2235	3.6	0.074	0.640	45.0	3.5	4.3	2.3	gray silt
2238	3.3	0.113	0.958	57.0	4.5	5.0	2.2	gray silt
2239	11.2	0.069	0.715	34.0	3.1	4.0	2.2	olive green silt/clay with shell hash
2240	3.3	0.058	0.547	42.0	3.1	4.0	2.3	olive green silt with shell hash
2241	3.9	0.067	0.517	18.0	2.9	3.4	1.8	olive green silt/fine sand
2242	3.7	0.077	0.742	31.0	3.0	4.0	2.1	olive green silt
2243	3.9	0.076	0.487	35.0	3.1	4.0	2.2	olive green silt
2244	3.3	0.039	0.297	20.0	3.0	3.4	1.4	olive green silt
2245	3.9	0.098	0.784	58.0	4.4	4.7	2.4	olive green silt/clay
2247	3.3	0.067	0.582	44.0	3.5	4.4	2.3	olive green silt
2249	3.0	0.147	1.349	72.0	5.4	5.6	2.1	gray silt
2251	8.5	0.138	1.994	72.0	5.4	5.5	2.1	olive green silt
2252	10.9	0.032	0.593	16.0	2.3	2.9	2.2	red/brown/black mixed sed & shell hash
2253	7.4	0.142	1.567	66.0	5.0	5.2	2.1	olive green silt/clay
2254	4.5	0.065	0.662	33.0	unavailable			olive green fine sand/silt/clay
2255	10.6	0.085	1.176	59.0	4.7	4.9	2.3	olive green silt with shell hash
2256	8.2	0.150	1.261	67.0	5.0	5.3	2.1	olive green silt/clay
2257	8.5	0.137	1.632	77.0	5.8	5.8	2.0	olive green silt/clay
2258	11.2	0.127	1.443	71.0	5.6	5.5	2.2	olive green silt/clay with shell hash
2259	10.9	0.113	1.242	66.0	5.1	5.1	2.4	olive green silt/clay
2260	3.6	0.061	0.513	27.0	3.0	3.8	1.9	olive green silt
2262	10.3	0.152	1.644	74.0	5.7	5.7	2.1	olive green silt
2263	13.1	0.127	1.248	73.0	5.5	5.5	2.0	olive green silt
2264	10.1	0.170	2.007	73.0	5.5	5.6	2.0	olive green silt/clay
2265	11.2	0.061	0.354	13.0	2.3	2.5	1.6	olive green silt with shell hash
2433	9.1	0.121	1.168	71.0	5.2	5.4	1.9	olive green and gray silt
2434	3.3	0.083	0.714	45.0	5.4	5.5	2.0	olive green silt with shell hash
2435	12.1	0.073	0.548	49.0	4.0	4.3	2.0	olive green silt
2436	11.0	0.140	1.361	53.0	4.3	4.5	2.4	olive green silt with shell hash
2438	3.4	0.102	0.921	64.0	4.9	5.1	2.3	gray silt/clay
2439	3.0	0.100	1.026	53.0	3.8	4.3	1.6	olive green silt
2440	10.0	0.054	0.496	38.0	3.2	3.9	2.1	olive green silt
2441	15.6	0.191	1.974	79.0	5.5	5.6	1.7	olive green and black silt/clay
2442	13.3	0.239	1.987	79.0	5.5	5.6	1.8	olive green and black silt/clay, sulfides
Mean	7.2	0.10	0.99	51.9	4.2	4.6	2.0	

Appendix B.3

Concentrations (ppm) and detection rates (% Detect) of metals at each San Diego Bay station sampled during 1998. Values below method detection limits are indicated with “nd.” Missing data is indicated with “N/A.”

Station	Al	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Se	Ag	Ti	Sn	Zn
2221	39700	7.9	8.1	127.0	0.64	0.07	57.2	130.0	38200	39.2	254.0	0.472	18.6	0.14	0.51	nd	nd	197.0
2222	36100	13.1	7.9	91.9	0.70	0.19	44.8	171.0	37900	36.8	220.0	1.690	16.8	0.22	0.39	nd	nd	180.0
2223	28400	7.3	8.3	76.3	0.47	0.06	39.2	128.0	29200	36.7	184.0	1.030	13.8	0.11	0.35	nd	nd	153.0
2224	14600	8.6	4.1	43.8	0.25	0.08	18.2	58.3	16300	12.9	128.0	0.402	7.9	nd	0.30	nd	nd	82.6
2225	18300	10.4	4.2	47.0	0.33	0.05	24.7	127.0	19400	22.1	136.0	0.692	9.1	nd	0.30	nd	nd	130.0
2226	38200	10.8	7.0	106.0	0.72	0.13	51.7	220.0	36400	47.1	241.0	1.030	18.3	0.31	0.61	nd	nd	216.0
2227	23500	5.0	5.7	73.7	0.36	0.20	27.4	53.9	23800	17.9	186.0	0.234	11.1	0.18	0.46	nd	nd	112.0
2228	23100	nd	5.6	76.7	0.30	0.23	42.8	68.8	23100	36.7	185.0	0.455	11.5	0.13	0.79	nd	nd	131.0
2229	20700	nd	5.4	52.4	0.37	0.09	31.6	58.9	20000	24.5	162.0	0.316	9.3	0.17	0.41	nd	nd	99.3
2230	5720	nd	2.3	13.8	nd	N/A	11.3	16.1	6380	10.8	53.0	0.379	nd	0.12	N/A	18.0	nd	38.3
2231	16100	nd	4.7	39.6	0.31	0.04	26.7	58.1	16500	21.6	130.0	0.224	8.0	0.13	0.30	nd	nd	92.5
2233	16200	nd	4.3	39.0	0.32	0.01	28.5	52.0	15900	26.8	121.0	0.316	7.9	nd	nd	nd	nd	106.0
2235	27800	nd	6.4	63.9	0.50	0.10	37.5	58.2	25400	21.3	174.0	0.239	10.7	0.31	0.48	11.0	nd	136.0
2238	28200	nd	5.9	60.4	0.51	0.17	33.1	55.1	25700	18.1	175.0	0.169	12.2	0.30	0.43	nd	nd	143.0
2239	21900	nd	4.8	55.9	0.44	0.08	35.5	75.1	21400	34.0	157.0	0.422	10.1	0.13	0.51	nd	nd	121.0
2240	17900	nd	4.3	40.3	0.29	0.08	29.5	47.4	18200	22.5	115.0	0.263	8.1	0.19	0.51	15.0	nd	103.0
2241	22000	7.0	6.0	45.0	0.32	0.09	34.2	73.5	20300	32.1	198.0	0.268	9.2	0.21	0.54	nd	nd	126.0
2242	16600	nd	4.3	35.9	0.29	0.10	25.4	42.0	15100	17.8	114.0	0.300	6.8	0.15	0.49	nd	nd	89.8
2243	11200	nd	3.7	25.0	0.24	0.10	20.8	38.8	11600	19.9	80.2	0.239	5.1	0.15	0.50	nd	nd	81.2
2244	14100	10.0	4.2	33.4	0.25	0.10	21.2	41.8	13600	15.4	112.0	0.177	5.7	nd	0.39	nd	nd	82.4
2245	29500	13.5	7.0	64.6	0.45	0.13	40.8	69.0	26900	24.6	168.0	0.331	11.8	0.21	0.71	6.5	nd	146.0
2247	23700	nd	6.2	47.7	0.43	0.11	28.3	53.4	20400	17.4	170.0	0.157	8.5	0.34	0.41	10.0	nd	103.0
2249	41900	24.3	8.0	82.5	0.53	0.21	47.1	84.3	34600	29.1	230.0	0.220	16.8	0.42	0.52	nd	nd	197.0
2251	33700	nd	10.4	103.0	0.69	0.22	62.4	196.0	35000	82.5	218.0	0.569	17.4	0.30	1.03	nd	nd	259.0
2252	8720	nd	4.3	22.0	nd	0.04	14.8	31.1	11600	13.8	108.0	0.113	4.2	nd	0.20	nd	nd	64.2
2253	35400	nd	10.6	121.0	0.63	N/A	53.8	252.0	32900	68.7	235.0	0.786	16.2	0.46	N/A	11.0	nd	314.0
2254	11700	9.3	6.2	25.9	0.20	N/A	23.3	74.9	13100	24.9	81.7	0.359	5.6	0.22	N/A	12.0	nd	113.0
2255	26400	8.9	5.6	79.3	0.49	0.17	51.2	146.0	25100	52.8	149.0	0.696	13.4	0.15	1.04	nd	nd	206.0
2256	29000	nd	7.5	82.2	0.54	0.20	54.3	128.0	30300	54.1	193.0	0.632	14.3	0.20	1.29	nd	nd	197.0
2257	44300	nd	9.1	105.0	0.77	0.18	66.7	157.0	38200	64.1	238.0	0.511	18.7	0.28	1.25	nd	nd	233.0
2258	39100	nd	7.8	94.3	4.93	0.16	60.0	143.0	35200	53.0	244.0	0.664	16.4	0.27	0.95	nd	nd	211.0
2259	35900	nd	5.6	99.9	0.64	0.14	50.4	145.0	33000	44.4	219.0	0.403	15.0	0.13	0.75	10.0	nd	180.0
2260	14200	5.8	4.1	33.1	0.25	0.09	23.9	50.8	14400	20.4	112.0	0.216	7.1	nd	0.45	nd	nd	87.5
2262	45800	nd	10.3	102.0	0.80	0.16	59.8	200.0	40600	45.6	334.0	0.321	19.0	0.25	0.69	17.0	nd	232.0
2263	28500	nd	7.3	83.0	0.56	0.21	57.4	118.0	29200	41.6	189.0	0.688	16.4	0.23	0.91	nd	nd	180.0
2264	42900	nd	15.6	123.0	0.79	N/A	69.2	247.0	39100	193.0	237.0	0.621	21.2	0.47	N/A	15.0	nd	420.0
2265	6240	nd	2.5	20.0	1.52	0.07	nd	18.0	8190	12.0	62.3	0.065	nd	nd	0.19	nd	nd	43.2
2433	30800	13.5	8.3	91.1	0.54	0.25	34.5	71.6	30900	21.0	236.0	0.263	14.9	0.22	0.50	nd	nd	126.0
2434	23400	8.8	6.2	75.5	0.38	0.17	49.8	68.9	23100	31.6	215.0	nd	11.6	0.16	0.64	nd	nd	132.0
2435	21000	nd	5.1	75.1	0.20	0.14	20.6	28.4	21400	7.1	170.0	0.123	9.9	nd	0.19	nd	nd	64.4
2436	35000	11.2	10.6	103.0	0.65	0.21	53.1	94.7	34300	37.2	296.0	0.458	17.0	0.27	0.62	12.5	nd	157.0
2438	36400	nd	7.0	85.4	0.67	0.18	42.5	101.0	32200	20.2	216.0	0.099	14.0	0.34	0.64	10.0	nd	163.0
2439	29800	nd	5.6	89.8	0.56	0.16	74.1	133.0	28300	45.2	202.0	0.468	14.3	0.18	0.56	nd	nd	203.0
2440	14700	14.5	4.8	46.2	0.30	0.04	24.3	41.8	15800	20.6	127.0	0.235	7.2	0.14	nd	nd	nd	81.1
2441	35100	20.4	12.4	101.0	0.66	N/A	43.9	71.8	33100	21.9	247.0	0.191	16.6	0.64	N/A	nd	nd	123.0
2442	32000	nd	8.6	94.8	0.58	N/A	41.9	77.7	30800	21.1	233.0	0.176	16.0	0.61	N/A	13.0	nd	139.0
Mean	25989	4.6	6.6	69.5	0.57	0.13	38.9	95.1	25045	34.4	179.5	0.406	11.8	0.21	0.55	3.5	0	147.7
N	46	46	46	46	46	40	46	46	46	46	46	46	46	46	40	46	46	46
% Detect	100	41	100	100	96	100	98	100	100	100	100	98	96	83	95	28	0	100

Appendix B.4

Concentrations (ppb) of detected polycyclic aromatic hydrocarbons (PAH) in San Diego Bay during 1998. Values below method detection limits are designated as "nd."

Station	Total PAH	2,6-dimethyl-naphthalene	3,4-benzo(B)-fluoranthene	Acenaph-thylene	Anthracene	Benzo(A)-anthracene	Benzo(A)-pyrene
2221	99	nd	14.9	nd	nd	9.3	14.6
2222	249	nd	60.0	nd	nd	16.7	35.7
2223	139	nd	32.8	nd	nd	11.8	22.2
2224	nd	nd	nd	nd	nd	nd	0.0
2225	193	nd	27.5	nd	nd	17.6	28.7
2226	735	nd	148.0	nd	nd	68.3	107.0
2227	524	nd	87.4	nd	nd	53.3	66.9
2228	716	nd	131.0	nd	nd	63.5	100.0
2229	1285	nd	88.2	39.5	60.8	99.5	106.0
2230	nd	nd	nd	nd	nd	nd	0.0
2231	493	nd	66.7	nd	nd	33.9	65.9
2233	17	nd	nd	nd	nd	nd	0.0
2235	nd	nd	nd	nd	nd	nd	0.0
2238	nd	nd	nd	nd	nd	nd	0.0
2239	605	nd	95.5	nd	nd	47.6	82.0
2240	137	nd	41.0	nd	nd	12.2	28.8
2241	nd	nd	nd	nd	nd	nd	0.0
2242	197	nd	37.4	nd	nd	nd	33.0
2243	nd	nd	nd	nd	nd	nd	0.0
2244	nd	nd	nd	nd	nd	nd	0.0
2245	70	nd	29.9	nd	nd	nd	20.8
2247	38	nd	28.0	nd	nd	nd	18.9
2249	209	nd	nd	nd	nd	25.8	24.4
2251	4710	nd	760.0	98.3	164.0	366.0	567.0
2252	16	nd	nd	nd	nd	nd	0.0
2253	1571	nd	306.0	24.3	32.9	125.0	223.0
2254	10768	nd	2010.0	241.0	368.0	1000.0	1150.0
2255	1944	nd	384.0	23.9	38.5	193.0	272.0
2256	247	nd	42.7	nd	nd	19.9	34.8
2257	326	nd	56.0	nd	nd	27.4	46.9
2258	312	nd	49.0	nd	nd	20.2	51.3
2259	2347	nd	480.0	69.7	104.0	165.0	372.0
2260	nd	nd	nd	nd	nd	nd	0.0
2262	457	nd	83.8	nd	nd	43.4	64.0
2263	2615	nd	424.0	52.1	207.0	178.0	334.0
2264	3003	25.1	515.0	59.5	102.0	240.0	371.0
2265	nd	nd	nd	nd	nd	nd	0.0
2433	426	nd	73.7	nd	nd	51.1	53.1
2434	972	nd	189.0	nd	nd	78.5	128.0
2435	nd	nd	nd	nd	nd	nd	0.0
2436	398	nd	56.9	nd	nd	37.0	51.9
2438	nd	nd	nd	nd	nd	nd	0.0
2439	542	nd	100.0	nd	nd	40.7	66.4
2440	nd	nd	nd	nd	nd	nd	0.0
2441	1367	24.6	152.0	12.8	75.7	129.0	110.0
2442	5925	28.9	510.0	58.8	512.0	575.0	398.0
Mean	949	1.7	153.9	14.8	36.2	81.5	109.7

Appendix B.4 (continued)

Station	Benzo(E)-pyrene	Benzo(G,H,I)-perylene	Benzo(K)-fluoranthene	Chrysene	Dibenzo(A,H)-anthracene	Fluoranthene	Fluorene
2221	12.3	12.7	14.4	9.5	nd	nd	nd
2222	30.3	25.2	36.8	20.2	nd	23.3	nd
2223	20.2	13.5	21.6	16.6	nd	nd	nd
2224	nd	nd	nd	nd	nd	nd	nd
2225	18.4	nd	34.5	46.0	nd	nd	nd
2226	91.7	50.1	103.0	93.0	nd	59.3	nd
2227	55.4	36.3	56.3	71.1	nd	62.3	nd
2228	84.4	63.6	77.4	79.4	nd	72.3	nd
2229	80.4	54.7	104.0	121.0	nd	142.0	nd
2230	nd	nd	nd	nd	nd	nd	nd
2231	60.1	49.0	66.9	50.9	nd	41.9	nd
2233	nd	nd	nd	nd	nd	nd	nd
2235	nd	nd	nd	nd	nd	nd	nd
2238	nd	nd	nd	nd	nd	nd	nd
2239	74.6	49.7	80.5	70.1	nd	55.9	nd
2240	27.5	26.1	10.4	nd	nd	nd	nd
2241	nd	nd	nd	nd	nd	nd	nd
2242	29.0	29.9	30.6	21.3	nd	nd	nd
2243	nd	nd	nd	nd	nd	nd	nd
2244	nd	nd	nd	nd	nd	nd	nd
2245	21.6	nd	nd	nd	nd	nd	nd
2247	18.8	nd	nd	nd	nd	nd	nd
2249	21.8	nd	22.6	25.4	nd	43.9	nd
2251	499.0	282.0	329.0	536.0	97.6	503.0	nd
2252	nd	nd	nd	nd	nd	nd	nd
2253	200.0	87.0	188.0	134.0	43.3	143.0	nd
2254	1180.0	289.0	1160.0	1330.0	193.0	1500.0	54.0
2255	205.0	91.0	195.0	227.0	48.9	220.0	nd
2256	32.1	22.7	30.9	26.0	nd	20.2	nd
2257	43.9	27.2	46.7	38.1	nd	25.7	nd
2258	47.8	21.3	40.0	37.6	nd	19.7	nd
2259	304.0	123.0	277.0	279.0	65.6	94.6	nd
2260	nd	nd	nd	nd	nd	nd	nd
2262	60.9	35.4	65.1	58.2	nd	39.3	nd
2263	263.0	122.0	305.0	357.0	59.4	146.0	27.6
2264	306.0	54.0	350.0	436.0	37.3	251.0	nd
2265	nd	nd	nd	nd	nd	nd	nd
2433	48.0	30.4	49.4	63.7	nd	46.3	nd
2434	122.0	73.7	124.0	100.0	28.6	98.6	nd
2435	nd	nd	nd	nd	nd	nd	nd
2436	42.1	33.7	51.2	48.9	nd	48.4	nd
2438	nd	nd	nd	nd	nd	nd	nd
2439	72.0	42.9	73.6	73.4	nd	48.3	nd
2440	nd	nd	nd	nd	nd	nd	nd
2441	86.7	29.0	107.0	192.0	nd	220.0	nd
2442	284.0	73.2	388.0	808.0	49.1	1340.0	nd
Mean	96.6	40.2	96.5	116.7	13.5	114.5	1.8

Appendix B.4 (continued)

Station	Indeno(1,2,3-CD)-pyrene	Perylene	Phenanthrene	Pyrene
2221	9.7	nd	nd	16.8
2222	23.8	11.0	nd	25.5
2223	13.5	nd	nd	19.7
2224	nd	nd	nd	nd
2225	11.2	nd	nd	36.8
2226	50.5	29.1	nd	83.1
2227	33.1	18.9	nd	70.1
2228	54.8	27.6	nd	92.9
2229	48.3	27.9	211.0	190.0
2230	nd	nd	nd	nd
2231	39.6	19.6	nd	65.5
2233	nd	nd	nd	16.6
2235	nd	nd	nd	nd
2238	nd	nd	nd	nd
2239	45.4	28.9	nd	70.2
2240	nd	nd	nd	32.2
2241	nd	nd	nd	nd
2242	23.9	nd	nd	29.0
2243	nd	nd	nd	nd
2244	nd	nd	nd	nd
2245	nd	nd	nd	27.2
2247	nd	nd	nd	nd
2249	nd	nd	nd	45.0
2251	254.0	131.0	218.0	665.0
2252	nd	nd	nd	16.0
2253	94.2	58.3	41.6	176.0
2254	361.0	291.0	311.0	1340.0
2255	99.0	68.5	41.2	221.0
2256	19.7	11.4	nd	29.0
2257	25.0	11.5	nd	33.3
2258	20.8	12.6	nd	41.1
2259	138.0	111.0	49.2	195.0
2260	nd	nd	nd	nd
2262	35.9	nd	nd	54.5
2263	124.0	96.5	75.0	268.0
2264	76.5	95.0	60.0	540.0
2265	nd	nd	nd	nd
2433	27.3	nd	nd	56.4
2434	72.8	35.0	nd	111.0
2435	nd	nd	nd	nd
2436	29.9	nd	nd	54.6
2438	nd	nd	nd	nd
2439	39.3	19.2	nd	66.0
2440	nd	nd	nd	nd
2441	34.1	37.4	86.1	223.0
2442	89.0	114.0	207.0	1000.0
Mean	41.2	27.3	28.3	128.5

Appendix B.5

Concentrations (ppt: parts per trillion) of polychlorinated biphenyl compounds (PCBs) in San Diego Bay during 1998. Values below method detection limits are designated as “nd.”

Station	Total PCB	PCB101	PCB105	PCB110	PCB118	PCB138	PCB149	PCB151	PCB153
2221	nd	nd	nd	nd	nd	nd	nd	nd	nd
2222	nd	nd	nd	nd	nd	nd	nd	nd	nd
2223	nd	nd	nd	nd	nd	nd	nd	nd	nd
2224	nd	nd	nd	nd	nd	nd	nd	nd	nd
2225	nd	nd	nd	nd	nd	nd	nd	nd	nd
2226	nd	nd	nd	nd	nd	nd	nd	nd	nd
2227	nd	nd	nd	nd	nd	nd	nd	nd	nd
2228	16200	nd	nd	1900	5100	nd	nd	nd	3300
2229	nd	nd	nd	nd	nd	nd	nd	nd	nd
2230	nd	nd	nd	nd	nd	nd	nd	nd	nd
2231	1500	nd	nd	nd	nd	nd	nd	nd	1500
2233	nd	nd	nd	nd	nd	nd	nd	nd	nd
2235	nd	nd	nd	nd	nd	nd	nd	nd	nd
2238	nd	nd	nd	nd	nd	nd	nd	nd	nd
2239	nd	nd	nd	nd	nd	nd	nd	nd	nd
2240	nd	nd	nd	nd	nd	nd	nd	nd	nd
2241	nd	nd	nd	nd	nd	nd	nd	nd	nd
2242	nd	nd	nd	nd	nd	nd	nd	nd	nd
2243	nd	nd	nd	nd	nd	nd	nd	nd	nd
2244	nd	nd	nd	nd	nd	nd	nd	nd	nd
2245	nd	nd	nd	nd	nd	nd	nd	nd	nd
2247	nd	nd	nd	nd	nd	nd	nd	nd	nd
2249	nd	nd	nd	nd	nd	nd	nd	nd	nd
2251	17700	nd	nd	1700	6500	nd	nd	nd	4700
2252	nd	nd	nd	nd	nd	nd	nd	nd	nd
2253	123800	23000	6100	6400	18000	15000	nd	5100	9900
2254	2900	nd	nd	nd	1200	nd	nd	nd	1700
2255	16500	5500	nd	1400	2900	nd	2600	nd	4100
2256	nd	nd	nd	nd	nd	nd	nd	nd	nd
2257	1700	nd	nd	nd	nd	nd	nd	nd	1700
2258	nd	nd	nd	nd	nd	nd	nd	nd	nd
2259	9900	nd	nd	1300	4900	nd	nd	nd	3700
2260	nd	nd	nd	nd	nd	nd	nd	nd	nd
2262	nd	nd	nd	nd	nd	nd	nd	nd	nd
2263	10300	nd	nd	1800	5000	nd	nd	nd	3500
2264	24200	10000	nd	2800	3600	nd	3100	nd	4700
2265	nd	nd	nd	nd	nd	nd	nd	nd	nd
2433	nd	nd	nd	nd	nd	nd	nd	nd	nd
2434	7100	nd	nd	1100	3500	nd	nd	nd	2500
2435	nd	nd	nd	nd	nd	nd	nd	nd	nd
2436	nd	nd	nd	nd	nd	nd	nd	nd	nd
2438	nd	nd	nd	nd	nd	nd	nd	nd	nd
2439	49800	7600	3300	3300	10000	8400	nd	nd	5900
2440	nd	nd	nd	nd	nd	nd	nd	nd	nd
2441	nd	nd	nd	nd	nd	nd	nd	nd	nd
2442	nd	nd	nd	nd	nd	nd	nd	nd	nd
Mean	6122	1002	204	472	1320	509	124	111	1026

Appendix B.5 (continued)

Station	PCB187	PCB44	PCB52	PCB66	PCB70	PCB87	PCB99
2221	nd	nd	nd	nd	nd	nd	nd
2222	nd	nd	nd	nd	nd	nd	nd
2223	nd	nd	nd	nd	nd	nd	nd
2224	nd	nd	nd	nd	nd	nd	nd
2225	nd	nd	nd	nd	nd	nd	nd
2226	nd	nd	nd	nd	nd	nd	nd
2227	nd	nd	nd	nd	nd	nd	nd
2228	nd	nd	nd	nd	5900	nd	nd
2229	nd	nd	nd	nd	nd	nd	nd
2230	nd	nd	nd	nd	nd	nd	nd
2231	nd	nd	nd	nd	nd	nd	nd
2233	nd	nd	nd	nd	nd	nd	nd
2235	nd	nd	nd	nd	nd	nd	nd
2238	nd	nd	nd	nd	nd	nd	nd
2239	nd	nd	nd	nd	nd	nd	nd
2240	nd	nd	nd	nd	nd	nd	nd
2241	nd	nd	nd	nd	nd	nd	nd
2242	nd	nd	nd	nd	nd	nd	nd
2243	nd	nd	nd	nd	nd	nd	nd
2244	nd	nd	nd	nd	nd	nd	nd
2245	nd	nd	nd	nd	nd	nd	nd
2247	nd	nd	nd	nd	nd	nd	nd
2249	nd	nd	nd	nd	nd	nd	nd
2251	nd	nd	nd	nd	4800	nd	nd
2252	nd	nd	nd	nd	nd	nd	nd
2253	2800	3500	8200	nd	12000	7100	6700
2254	nd	nd	nd	nd	nd	nd	nd
2255	nd	nd	nd	nd	nd	nd	nd
2256	nd	nd	nd	nd	nd	nd	nd
2257	nd	nd	nd	nd	nd	nd	nd
2258	nd	nd	nd	nd	nd	nd	nd
2259	nd	nd	nd	nd	nd	nd	nd
2260	nd	nd	nd	nd	nd	nd	nd
2262	nd	nd	nd	nd	nd	nd	nd
2263	nd	nd	nd	nd	nd	nd	nd
2264	nd	nd	nd	nd	nd	nd	nd
2265	nd	nd	nd	nd	nd	nd	nd
2433	nd	nd	nd	nd	nd	nd	nd
2434	nd	nd	nd	nd	nd	nd	nd
2435	nd	nd	nd	nd	nd	nd	nd
2436	nd	nd	nd	nd	nd	nd	nd
2438	nd	nd	nd	nd	nd	nd	nd
2439	nd	nd	nd	2300	9000	nd	nd
2440	nd	nd	nd	nd	nd	nd	nd
2441	nd	nd	nd	nd	nd	nd	nd
2442	nd	nd	nd	nd	nd	nd	nd
Mean	61	76	178	50	689	154	146

Appendix B.6

Concentrations (ppt: parts per trillion) of total DDT and the detected DDT derivatives for San Diego Bay during 1998.

Station	Total DDT	p,p-DDD	p,p-DDE	p,p-DDT
2221	nd	nd	nd	nd
2222	nd	nd	nd	nd
2223	nd	nd	nd	nd
2224	nd	nd	nd	nd
2225	nd	nd	nd	nd
2226	780	nd	780	nd
2227	nd	nd	nd	nd
2228	nd	nd	nd	nd
2229	nd	nd	nd	nd
2230	nd	nd	nd	nd
2231	nd	nd	nd	nd
2233	nd	nd	nd	nd
2235	nd	nd	nd	nd
2238	nd	nd	nd	nd
2239	nd	nd	nd	nd
2240	nd	nd	nd	nd
2241	nd	nd	nd	nd
2242	2100	nd	nd	2100
2243	nd	nd	nd	nd
2244	nd	nd	nd	nd
2245	nd	nd	nd	nd
2247	1000	nd	1000	nd
2249	910	nd	910	nd
2251	nd	nd	nd	nd
2252	nd	nd	nd	nd
2253	3200	nd	3200	nd
2254	nd	nd	nd	nd
2255	2060	660	1400	nd
2256	nd	nd	nd	nd
2257	nd	nd	nd	nd
2258	nd	nd	nd	nd
2259	nd	nd	nd	nd
2260	nd	nd	nd	nd
2262	nd	nd	nd	nd
2263	nd	nd	nd	nd
2264	7300	nd	2900	4400
2265	nd	nd	nd	nd
2433	nd	nd	nd	nd
2434	nd	nd	nd	nd
2435	nd	nd	nd	nd
2436	nd	nd	nd	nd
2438	nd	nd	nd	nd
2439	nd	nd	nd	nd
2440	nd	nd	nd	nd
2441	nd	nd	nd	nd
2442	nd	nd	nd	nd
Mean	377	14	222	141

Appendix B.7

Summary of various sediment quality parameters for the nine bays and harbors sampled during the Bight'98 regional survey. LA/LB Harbor = Los Angeles/Long Beach Harbor.

	Ventura Harbor	Channel Is. Harbor	Marina Del Rey	LA/LB Harbor	Anaheim Bay	Newport Harbor	Dana Pnt Harbor	Mission Bay	San Diego Bay
N	1	3	7	36	3	11	3	3	46
Metals (ppm)									
Aluminum									
%Detect	100	100	100	100	100	100	100	100	100
Mean	17300	26533	19990	25878	16437	37973	17100	19097	25989
95%CI	—	5066	6532	2428	6690	8979	10931	18157	3074
Antimony									
%Detect	100	33	100	42	100	100	100	33	41
Mean	0.2	—	0.2	1.4	0.2	0.6	0.2	—	11.1
95%CI	—	—	0.1	1.2	0.1	0.1	0.2	—	2.2
Arsenic									
%Detect	100	100	100	100	100	100	100	100	100
Mean	9.7	10.5	7.7	11.6	6.0	8.6	6.0	4.2	6.6
95%CI	—	2.3	2.0	1.7	2.8	1.7	3.4	3.3	0.8
Barium									
%Detect	100	100	100	100	100	100	100	100	100
Mean	97.0	132.4	94.1	203.4	95.3	131.3	122.6	60.3	69.5
95%CI	—	25.2	26.0	34.6	61.0	25.3	13.7	51.1	8.8
Beryllium									
%Detect	100	67	100	94	100	100	100	67	96
Mean	0.690	1.061	0.509	0.869	0.541	0.639	0.384	0.410	0.599
95%CI	—	0.469	0.140	0.120	0.231	0.219	0.156	0.196	0.209
Cadmium									
%Detect	100	100	100	92	100	100	100	100	95
Mean	0.650	0.891	0.545	0.654	0.626	1.130	0.197	0.068	0.129
95%CI	—	0.098	0.273	0.155	0.548	0.292	0.001	0.053	0.019
Iron									
%Detect	100	100	100	100	100	100	100	100	100
Mean	36500	34767	29030	35633	25500	34582	17967	18687	25045
95%CI	—	4250	8520	2906	11001	6620	7889	15914	2665
Lead									
%Detect	100	67	100	92	100	100	100	33	100
Mean	24.9	26.2	88.2	42.5	47.8	28.2	13.2	—	34.4
95%CI	—	26.9	23.4	8.4	40.6	15.3	9.8	—	8.4
Nickel									
%Detect	100	100	86	100	100	100	100	67	96
Mean	44.0	33.7	30.7	30.1	18.8	22.1	10.5	11.6	12.4
95%CI	—	4.6	4.9	4.2	11.3	3.4	3.0	9.8	1.3
Selenium									
%Detect	100	67	86	47	100	100	100	100	83
Mean	2.00	1.18	1.50	1.43	1.47	0.95	0.70	0.37	0.25
95%CI	—	0.34	0.44	0.41	1.05	0.29	0.11	0.26	0.04
Silver									
%Detect	100	67	100	89	67	73	33	100	90
Mean	0.130	0.548	1.131	1.271	0.445	0.131	—	0.185	0.574
95%CI	—	0.885	0.443	0.518	0.186	0.064	—	0.249	0.086

Appendix B.7 continued

	Ventura Harbor	Channel Is. Harbor	Marina Del Rey	LA/LB Harbor	Anaheim Bay	Newport Harbor	Dana Pnt Harbor	Mission Bay	San Diego Bay
N	1	3	7	36	3	11	3	3	46
Pesticides (ppt)									
Total Chlordane									
%Detect	100	100	86	33	100	100	100	0	0
Mean	4.6	7.8	8.1	5.7	3.9	4.8	0.8	—	—
95%CI	—	7.5	4.9	4.1	2.7	1.6	0.7	—	—
Total DDT									
%Detect	100	100	100	97	100	100	100	0	15
Mean	236.9	198.9	35.2	64.8	60.3	69.6	7.8	—	2.5
95%CI	—	203.7	10.7	21.7	36.6	16.2	5.6	—	1.7

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Appendix C

Supporting Data

1998 San Diego Bay Stations

Macrobenthic Communities

Appendix C.1

Summary of major benthic community parameters at station station sampled in San Diego Bay during 1998. Data for each station are per 0.1m^2 grab for: SR= Species Richness (number of species); Abun=Abundance (number of individuals); H'=Diversity; J'=Evenness; Dom=Swartz Dominance (number of species composing 75% of a community by abundance).

	Stations	SR	Abun	H'	J'	Dom
Cluster Group A	2439	35	536	2.4	0.7	6
	2233	44	395	2.7	0.7	9
	2255	31	391	2.1	0.6	5
	Mean	36.7	440.7	2.4	0.7	6.7
Cluster Group B	2264	30	237	2.7	0.8	8
	2259	25	102	2.6	0.8	8
	Mean	27.5	169.5	2.7	0.8	8.0
Cluster Group C	2249	40	600	2.3	0.6	4
	2238	42	760	2.5	0.7	6
	2247	37	900	2.1	0.6	5
	2438	38	384	2.6	0.7	6
	2235	30	551	2.1	0.6	4
	2242	30	1117	1.8	0.5	3
	2243	50	966	2.7	0.7	8
	2245	28	487	2.2	0.7	5
	2262	30	542	2.1	0.6	4
	Mean	36.1	700.8	2.3	0.6	5.0
Cluster Group D	2240	42	1201	2.2	0.6	4
	2244	52	1376	2.7	0.7	8
	2434	54	576	3.3	0.8	15
	2230	76	1372	2.7	0.6	9
	2260	54	2263	1.8	0.5	3
	2241	50	1526	2.3	0.6	5
	2254	36	684	2.2	0.6	6
	2253	36	465	2.3	0.6	5
	2256	31	237	2.7	0.8	8
	2251	38	1194	1.9	0.5	3
	2257	38	503	2.3	0.6	6
	2440	65	651	3.2	0.8	13
	2239	28	1030	1.7	0.5	3
	2258	42	826	2.3	0.6	5
	2265	50	1543	2.4	0.6	7
	Mean	46.1	1029.8	2.4	0.6	6.7
Cluster Group E	2223	40	816	2.7	0.7	8
	2225	79	3149	2.3	0.5	5
	2221	40	824	2.6	0.7	8
	2224	44	383	2.9	0.8	10
	2222	40	693	1.8	0.5	3
	2226	64	1012	2.6	0.6	8
	Mean	51.2	1146.2	2.5	0.6	7.0
Cluster Group F	2252	38	327	2.8	0.8	9
	2436	54	599	3.1	0.8	11
	2229	71	705	3.1	0.7	14
	2231	78	1502	2.8	0.6	8
	Mean	60.3	783.3	2.9	0.7	10.5
Cluster Group G	2228	44	251	3.1	0.8	12
	2227	55	933	2.9	0.7	10
	2433	64	709	3.1	0.7	11
	2435	65	466	3.4	0.8	16
	2263	49	343	3.2	0.8	14
	2442	58	388	2.9	0.7	9
	2441	96	1672	3.2	0.7	12
	Mean	61.6	680.3	3.1	0.8	12.0

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Appendix D

Supporting Data

1998 San Diego Bay Stations

Demersal Fishes and Megabenthic Invertebrates

Appendix D.1

Marine debris collected each trawl station sampled in San Diego Bay during 1998.

Date	Station	Type	Number	Weight
13-Aug-98	2230	Marine Veg.	L	T
13-Aug-98	2231	Marine Veg	H	M
14-Aug-98	2233	Benthic debris	M	L
	2239	none recorded		
	2241	none recorded		
13-Aug-98	2242	Marine Veg.	P	T
24-Aug-98	2243	Marine Veg.	L	L
18-Aug-98	2244	Marine Veg.	M	L
		Benthic Debris	M	M
18-Aug-98	2249	Marine Veg.	L	T
		Benthic Debris	L	L
13-Aug-98	2254	Marine Veg.	M	M
17-Aug-98	2256	Benthic Debris	M	M
17-Aug-98	2258**	Rock	L	M
		Marine Veg.	P	T
		Benthic Debris	M (oyster/shell hash)	M
18-Aug-98	2262	Marine Veg.	L	L
		Benthic Debris	L	L
14-Aug-98	2436	Marine Veg.	L	L
24-Aug-98	2571	Marine Veg.	P	T
24-Aug-98	2573	Marine Veg.	L	L

** metal, cans, plastic present.

Number Codes:			Weight Codes:
Present	P=1	Trace	T=0.0-0.1 Kg
Low	L=2-10	Low	L=0.2-1.0 Kg
Moderate	M=11-100	Moderate	M=1.1-10 Kg
High	H=>100	High	H=>10 Kg

Appendix D.2

Summary of demersal fish species captured in San Diego Bay during 1998. Data are number of fish collected (N) and minimum, maximum, and mean length.

Taxon/Species[1]	Common Name	N	LENGTH		
			Min	Max	Mean
RAJIFORMES					
Rhinobatidae					
Rhinobatos productus	shovelnose guitarfish	1	27	27	27
Dasyatidae					
Dasyatis dipterura	diamond stingray	2	43	79	61
Gymnuridae					
Gymnura marmorata	California butterfly ray	1	36	36	36
Urolophidae					
Urolophus halleri	round stingray	86	15	36	25
CLUPEIFORMES					
Engraulidae					
Anchoa delicatissima	slough anchovy	15	6	7	7
AULOPIFORMES					
Synodontidae					
Synodus lucioceps	California lizardfish	4	12	16	14
BATRACHOIDIFORMES					
Batrachoididae					
Porichthys myriaster	specklefin midshipman	9	18	30	24
GASTEROSTEIFORMES					
Hippocampinae					
Hippocampus ingens	Pacific seahorse	2	17	23	20
PERCIFORMES					
Serranidae					
Paralabrax maculatofasciatus	spotted sand bass	63	11	29	21
Paralabrax nebulifer	barred sand bass	51	12	21	14
Sciaenidae					
Cheilotrema saturnum	black croaker	13	16	25	21
Genyonemus lineatus	white croaker	6	15	20	17
PLEURONECTIFORMES					
Paralichthyidae					
Paralichthys californicus	California halibut	47	4	45	14
Pleuronectidae					
Hypsopsetta guttulata	diamond turbot	13	13	23	19
Pleuronichthys ritteri	spotted turbot	18	7	16	12
Cynoglossidae					
Symphurus atricauda	California tonguefish	18	8	12	10

[1]Taxonomic arrangement from Nelson 1994.

Appendix D.3

Demersal fish abundance and biomass by station

ABUNDANCE	2230	2231	2233	2239	2241	2242	2243	2244	2249	2254	2256	2258	2262	2436	2571	2573	Overall
Barred sand bass	3	4	3	6	4	4	2		2	2	9	5	1	5		1	51
Black croaker		5	2	2							1			2	1		13
California butterfly ray											1						1
California halibut			3	3	4	3	3	2		2	3	3	13	5	3		47
California lizardfish														1	1	2	4
California tonguefish														7	10	1	18
Diamond stingray				1							1						2
Diamond turbot		1		1	1	1			2				1	3	3		13
Pacific seahorse			1			1											2
Round stingray		1	7	4	31	12	12	7		5	5			1	1		86
Shovelnose guitarfish							1										1
Slough anchovy														13	2		15
Specklefin midshipman											1				8		9
Spotted sand bass	1	5	7	5	7	2	13	4	1	6	3	5	2		2		63
Spotted turbot	3	4	1			1	1							6		2	18
White croaker												2				4	6
Overall:	7	20	24	22	47	24	32	13	5	15	24	15	17	43	31	10	349

BIOMASS	2230	2231	2233	2239	2241	2242	2243	2244	2249	2254	2256	2258	2262	2436	2571	2573	Overall
Barred sand bass	0.2	0.3	0.1	0.3	0.4	0.4	1.0		0.1	0.1	0.9	0.4	0.1	0.7		0.1	5.1
Black croaker		1.1	0.7	0.6							0.3			0.5	0.3		3.5
California butterfly ray											1.8						1.8
California halibut			0.2	0.4	0.3	0.1	0.1	0.1		0.1	0.3	0.2	0.4	0.7	2.8		5.7
California lizardfish														0.1	0.1	0.1	0.3
California tonguefish														0.1	0.1	0.1	0.3
Diamond stingray				9.0							3.0						12.0
Diamond turbot		0.3		0.4	0.1	0.1			0.1				0.1	0.8	0.5		2.4
Pacific seahorse			0.1			0.1											0.2
Round stingray		0.3	1.4	1.0	10.5	2.0	2.0	1.5		0.8	1.2			0.1	0.3		21.1
Shovelnose guitarfish							0.1										0.1
Slough anchovy														0.1	0.1		0.2
Specklefin midshipman											0.1				2.0		2.1
Spotted sand bass	0.2	1.6	2.9	1.9	1.5	0.6	2.0	0.9	0.1	0.5	1.5	2.4	0.3		1.0		17.4
Spotted turbot	0.2	0.3	0.1			0.1	0.1							0.2		0.1	1.1
White croaker												0.1				0.6	0.7
Overall:	0.6	3.9	5.5	13.6	12.8	3.4	5.3	2.5	0.3	1.5	9.1	3.1	0.9	3.3	7.2	1.0	74.0

Appendix D.4

Taxonomic listing of invertebrates and total abundance for each species collected in San Diego Bay during 1998.

Taxon[1]	Species	N
PORIFERA		5
	Leucilla nuttingi	1
	Porifera sp SD 1	1
	Porifera sp SD 2	2
	Porifera sp SD 4	8
	Porifera sp SD 5	5
	Porifera sp SD 6	1
	Porifera sp SD 7	1
	Porifera sp SD 8	1
	Porifera sp SD 10	1
CNIDARIA		
Anthozoa		
	Acanthoptilum sp	1
	Actinaria sp SD 1	15
MOLLUSCA		
Gastropoda		
	Bulla gouldiana	68
	Crepidula onyx	77
	Crucibulum spinosum	62
	Diaulula sandiegensis	3
	Doriopsilla albopunctata	1
	Haminoea vesicula	1
	Nassarius tiarula	69
	Navanax inermis	1
	Pteropurpura festiva	10
Bivalvia		
	Argopecten ventricosus	7
	Leptopecten latiauratus	1
	Limaria hemphilli	2
	Musculista senhousia	498
	Ostrea sp	79
Cephalopoda		
	Loligo opalescens	2
ARTHROPODA		
Crustacea		
Malacostraca		
Isopoda		
	Synidotea harfordi	1
Decapoda		
	Crangon nigromaculata	1
	Lophopanopeus frontalis	5
	Lophopanopeus bellus	1
	Loxorhynchus sp	1
	Panulirus interruptus	1
	Penaeus californiensis	10
	Pugettia producta	1
	Pyromaia tuberculata	5
	Synalpheus lockingtoni	3
ECHINODERMATA		
Asteroidea		
	Asterina miniata	1
CHORDATA		
Ascidiacea		4
	Ciona sp	3
	Microcosmus squamiger	190
	Styela montereyensis	3
	Styela plicata	19

[1]Taxonomic arrangement from SCAMIT listing 2001.

Appendix D.5

Megabenthic invertebrate abundance by station.

	2233	2239	2262	2436	2258	2231	2573	2571	2249	2241	2244	2254	2243	2242	2230	2256	survey:
Acanthoptilum sp				1													1
Actiniaria sp SD 1													15				15
Argopecten ventricosus	1	1	1							1					1	2	7
ASCIDIACEA										1	1	1	1				4
Asterina miniata				1													1
Bulla gouldiana									1	57			1	9			68
Ciona sp	2					1											3
Crangon nigromaculata							1										1
Crepidula onyx	4				68	1						3				1	77
Crucibulum spinosum				2	60												62
Diaulula sandiegensis	1					2											3
Doriopsilla albopunctata						1											1
Haminoea vesicula												1					1
Leptopecten latiauratus				1													1
Leucilla nuttingi												1					1
Limaria hemphilli						2											2
Loligo opalescens												2					2
Lophopanopeus bellus												1					1
Lophopanopeus frontalis		3		2													5
Loxorhynchus sp	1																1
Microcosmus squamiger	3		1		160	1			1							24	190
Musculista senhousia	1	52	30		36					107		9	8	10	9	236	498
Nassarius tiarula			36	31	1										1		69
Navanax inermis												1					1
Ostrea sp	1				52							1				25	79
Panulirus interruptus								1									1
Penaeus californiensis								9								1	10
Porifera sp SD 1*											1						1
Porifera sp SD 2*													1	1			2
Porifera sp SD 4*	1	1		1	1	2				1			1				8
Porifera sp SD 5*		1	1	1		1										1	5
Porifera sp SD 6*					1												1
Porifera sp SD 7*			1														1
Porifera sp SD 8*						1											1
Porifera sp SD 10*									1								1
Porifera*											1	4					5
Pteropurpura festiva	1			2		5					2						10
Pugettia producta							1										1
Pyromaia tuberculata	1			4													5
Styela montereyensis						1										2	3
Styela plicata	2				8				4				5				19
Synalpheus lockingtoni	1															2	3
Synidotea harfordi							1										1
by survey:	20	58	70	46	387	18	3	10	7	167	5	24	32	20	11	294	1172

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Appendix E

Supporting Data

1998 San Diego Bay Stations

Bioaccumulation of Contaminants in Fish Tissues

Appendix E.1

Lengths and weights of individual fish collected for fish tissue analysis from San Diego Bay during 1998.

STATION	Species	n	SL (cm) min	SL (cm) max	SL (cm) avg	Weight (g) min	Weight (g) max	Weight (g) avg
Muscle samples								
2223	Spotted sand bass	3	23	26	25	291	378	335
2225	Spotted sand bass	3	21	25	23	194	395	282
2229	Barred sand bass	3	14	15	14	74	84	77
2235	Spotted sand bass	3	19	23	21	161	272	218
2236	Spotted sand bass	3	17	28	23	117	455	288
2238	Spotted sand bass	3	21	24	22	206	303	245
2240	Spotted sand bass	3	17	30	23	126	615	339
2245	Yellowfin croaker	3	20	25	23	148	279	218
2247	Spotted sand bass	3	19	25	22	161	361	246
2259	Barred sand bass	3	14	22	19	76	215	166
2261	Spotted sand bass	3	15	27	19	69	408	182
2434	Calico bass	3	18	19	18	123	171	150
2438	Spotted sand bass	3	16	17	17	88	109	100
2439	Spotted sand bass	3	18	25	21	159	391	252
LA1	California halibut	3	21	24	22	150	225	185
LA2	Spotted sand bass	3	18	23	21	172	310	257
LA3	Spotted sand bass	3	11	19	14	35	138	75
Whole fish								
2233	California halibut	6	10	21	14	13	143	51
2242	California halibut	6	10	20	12	13	117	36
2244	California halibut	6	9	11	10	13	21	17
2254	California halibut	6	10	14	12	16	50	32
2256	California halibut	6	10	18	13	14	87	37
2262	California halibut	6	10	13	12	13	33	23
2436	California halibut	4	15	20	18	48	130	97

Appendix E.2

Analyzed constituents with MDLs for whole fish samples collected from San Diego Bay during 1998; na = not available.

Chlorinated Pesticides (ppb)					
Alpha (cis) Chlordane	2.3	o,p-DDD	4.7	p,p-DDD	4.4
Gamma (trans) Chlordane	na	o,p-DDE	2.1	p,p-DDE	4.2
		o,p-DDT	2.5	p,p-DDT	11.3

PCB Congeners (ppb)					
PCB 18	5.0	PCB 101	7.1	PCB 157	6.1
PCB 28	8.8	PCB 105	6.5	PCB 158	6.0
PCB 37	7.2	PCB 110	6.6	PCB 167	6.1
PCB 44	9.6	PCB 114	6.1	PCB 169	6.1
PCB 49	8.9	PCB 118	6.5	PCB 170	5.9
PCB 52	6.8	PCB 119	6.8	PCB 177	6.0
PCB 65	8.4	PCB 123	6.7	PCB 180	5.6
PCB 66	6.2	PCB 126	6.6	PCB 183	5.7
PCB 70	6.4	PCB 128	6.3	PCB 187	5.8
PCB 74	6.7	PCB 138	6.6	PCB 189	5.6
PCB 77	7.1	PCB 149	6.5	PCB 194	5.2
PCB 81	6.5	PCB 151	6.3	PCB 201	5.5
PCB 87	6.5	PCB 153/168	na	PCB 206	4.9
PCB 99	6.7	PCB 156	6.1		

Appendix E.3

Analyzed constituents with MDLs for fish muscle tissue samples collected from San Diego Bay during 1998; na = not available.

Metals (ppm)

Aluminum	2.60	Copper	0.76	Silver	0.62
Antimony	3.70	Iron	1.30	Thallium	5.70
Arsenic	1.40	Lead	2.50	Tin	4.60
Beryllium	0.04	Manganese	0.23	Zinc	0.58
Cadmium	0.34	Mercury	0.01	Nickel	0.79
Chromium	0.33	Selenium	0.13		

Chlorinated Pesticides (ppb)

Aldrin	0.84	Endrin	0.80	o,p-DDD	0.86
Alpha (cis) Chlordane	0.79	Endrin aldehyde	0.72	o,p-DDE	1.02
Alpha Chlordene	0.88	Gamma (trans) Chlordane	0.96	o,p-DDT	1.19
Alpha Endosulfan	1.56	Heptachlor	2.31	p,p-DDD	2.37
Beta Endosulfan	2.42	Heptachlor epoxide	0.90	p,p-DDE	1.23
BHC, Alpha isomer	3.15	Hexachlorobenzene	1.91	p,p-DDT	1.65
BHC, Beta isomer	4.54	Methoxychlor	4.66		
BHC, Delta isomer	1.74	Mirex	0.96		
BHC, Gamma isomer	0.86	Oxychlordane	1.19		
Cis Nonachlor	0.92	Toxaphene	na		
Dieldrin	0.86	Trans Nonachlor	2.81		
Endosulfan Sulfate	1.98				

PCB Congeners (ppb)

PCB 18	6.6	PCB 101	6.7	PCB 157	5.6
PCB 28	7.4	PCB 105	5.8	PCB 158	5.9
PCB 37	6.3	PCB 110	6.3	PCB 167	6.2
PCB 44	6.1	PCB 114	5.9	PCB 169	5.7
PCB 49	6.4	PCB 118	6.3	PCB 170	5.4
PCB 52	6.2	PCB 119	6.8	PCB 177	5.8
PCB 65	6.4	PCB 123	6.5	PCB 180	5.7
PCB 66	6.3	PCB 126	5.7	PCB 183	6.0
PCB 70	6.8	PCB 128	5.6	PCB 187	6.0
PCB 74	7.1	PCB 138	6.1	PCB 189	5.6
PCB 77	6.0	PCB 149	6.3	PCB 194	5.2
PCB 81	6.3	PCB 151	6.5	PCB 200	5.9
PCB 87	6.0	PCB 153/168	6.3	PCB 201	na
PCB 99	6.7	PCB 156	5.7	PCB 206	5.5