

Watershed Summary Information

Accounting Unit Name: Santa Ana
State(s): CA
Political Boundaries: Los Angeles, Orange
Major Waterways:
Number of Stations in Watershed: Tier1 - 63
Tier2 - 339
Tier3 - 40



Figure 185. Watershed Location Map

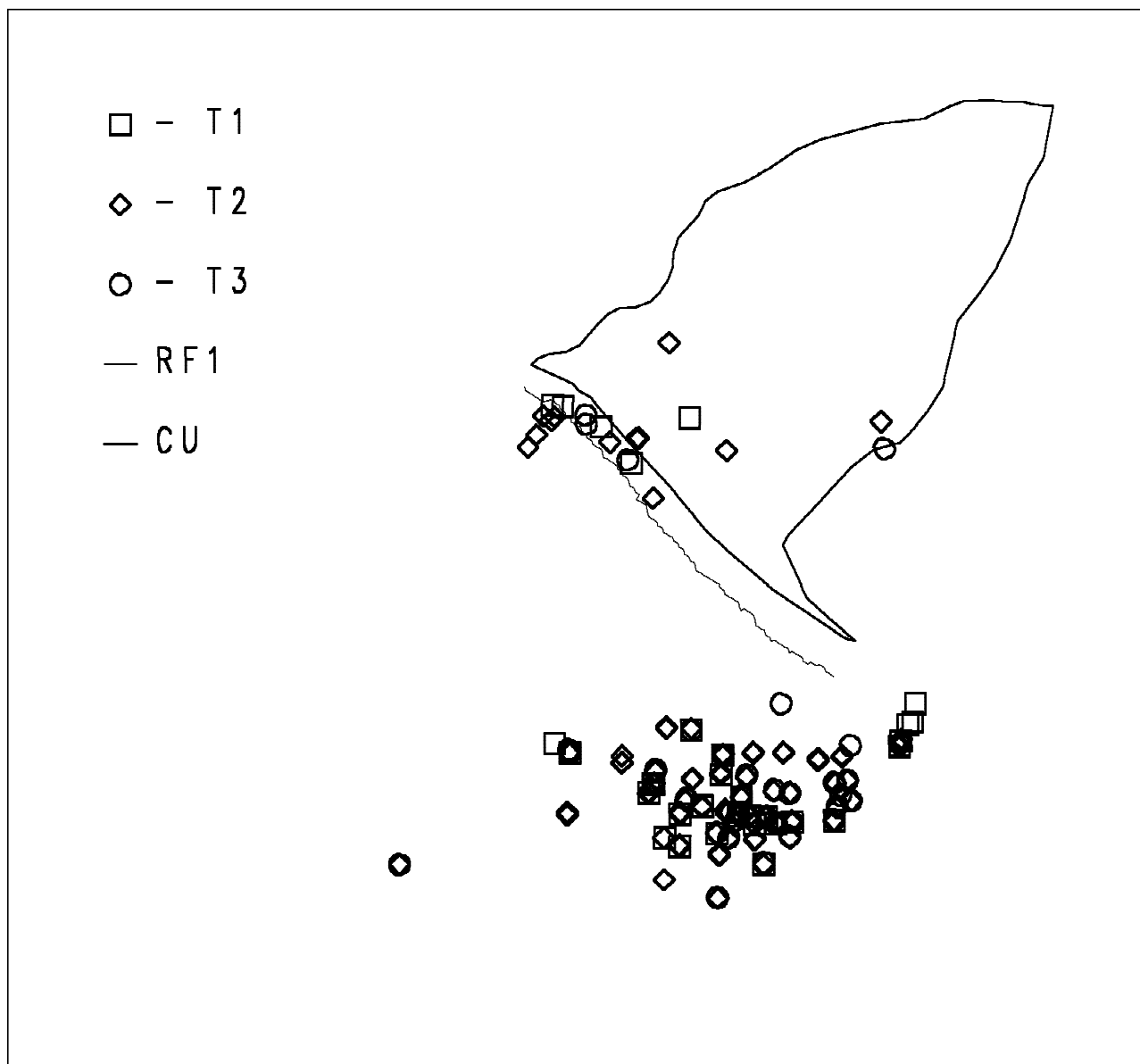


Figure 186. Major Waterways and Location of Sampling Stations

Data Source(s) Used in Evaluation

Source: **DMATS** Agency: **R9**

Monitoring Program: **EPA Region 9 Dredged Material Program**

Num. of Stations: 13 Date Range: 1982-87

Source: **DMATS** Agency: **09**

Monitoring Program: **EPA Region 9 Dredged Material Program**

Num. of Stations: 2 Date Range: 1991

Source: **ODES** Agency: **OC**

Monitoring Program: **Orange County 301(h)**

Num. of Stations: 414 Date Range: 1985-91

Source: **SEACOE** Agency: **SCCWRP87**

Monitoring Program: **Toxicity of sediments from Southern CA**

Num. of Stations: 1 Date Range: 1987

Source: **STORET** Agency: **21CAOCFC**

Monitoring Program: **Orange County (Ca) Environ Mgmt Generl Water Quality & Sediment Data**

Num. of Stations: 12 Date Range: 1980-92

Chemicals Responsible for Sampling Station Classification as Tier 1 or Tier 2

Classifying Parameter	Number of Stations							
	All Parameters				Aquatic Life		Human Health	
	Total	T.1&2	Tier1	Tier2	Tier1	Tier2	Tier1	Tier2
DDT	422	278	23	255	23	255	.	92
Bis(2-ethylhexyl)phthalate	304	206	32	174	32	174	.	75
Copper	442	163	.	163	.	163	.	.
Polychlorinated biphenyls	424	150	8	142	4	64	4	146
Cadmium	430	126	.	126	.	126	.	.
BHC	415	95	.	95	.	95	.	12
Arsenic	417	67	.	67	.	63	.	4
Silver	413	60	.	60	.	60	.	.
Mercury	432	43	5	38	5	38	.	.
Nickel	430	31	.	31	.	31	.	.
Phenol	373	23	.	23	.	23	.	.
Aldrin	410	22	.	22	.	.	.	22
Lead	442	21	.	21	.	21	.	.
Dieldrin	389	20	.	20	.	4	.	19
Zinc	438	14	.	14	.	14	.	.
Benzo(a)pyrene	389	13	1	12	1	3	.	13
Benzoic acid	88	11	.	11	.	11	.	.
Methylnaphthalene, 2-	135	11	.	11	.	11	.	.
Fluoranthene	389	10	.	10	.	10	.	.
Phenanthrene	383	8	1	7	1	7	.	.
Naphthalene	394	6	.	6	.	6	.	.
Pyrene	387	6	.	6	.	6	.	.
Endosulfan, beta-	400	5	.	5	.	5	.	.
Benzo(a)anthracene	398	4	2	2	2	2	.	3
Chlordane	367	4	.	4	.	4	.	3
Chromium	437	4	.	4	.	4	.	.
Benzo(b)fluoranthene	396	3	.	3	.	.	.	3
Chrysene	398	3	.	3	.	3	.	.
Diethyl phthalate	391	3	.	3	.	3	.	.
Dibenzo(a,h)anthracene	398	2	1	1	1	1	.	2
Acenaphthene	391	2	.	2	.	2	.	.
Anthracene	397	2	.	2	.	2	.	.
Indeno(1,2,3-cd)pyrene	397	2	.	2	.	2	.	2
Benzo(ghi)perylene	385	1	.	1	.	1	.	.

Classifying Parameter	Number of Stations							
	All Parameters				Aquatic Life		Human Health	
	Total	T.1&2	Tier1	Tier2	Tier1	Tier2	Tier1	Tier2
Benzo(k)fluoranthene	389	1	.	1	.	.	.	1
Cresol, p-	90	1	.	1	.	1	.	.
Dimethylphenol, 2,4-	392	1	.	1	.	1	.	.
Fluorene	398	1	.	1	.	1	.	.
Heptachlor epoxide	406	1	.	1	.	.	.	1
Nitrosodi-n-propylamine, N-	14	1	.	1	.	.	.	1
Pentachlorophenol	386	1	.	1	.	1	.	.
Trichloroethane, 1,1,1-	398	1	.	1	.	1	.	.

Sediment Chemistry Data: Chemical Summary

Sediment Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Acenaphthene	837	0.27	0.00	2	190.00	33.00
Acenaphthylene	869	0.00	0.00	0	.	.
Acetone	317	0.42	0.00	2	66.00	66.00
Acrylonitrile	181	0.00	0.00	0	.	.
Aldrin	974	0.08	0.00	41	18.00	0.00
Anthracene	866	1.36	0.00	10	700.00	8.00
Antimony	929	15.16	0.00	37	481.00	225.00
Arsenic	987	4763.81	3480.00	986	32000.00	250.00
Benzene	531	0.02	0.00	1	11.50	11.50
Benzo(a)anthracene	866	6.71	0.00	26	2700.00	5.20
Benzo(a)pyrene	818	5.32	0.00	20	2200.00	8.50
Benzo(b)fluoranthene	864	4.84	0.00	21	2200.00	7.00
Benzo(ghi)perylene	869	3.34	0.00	6	2200.00	5.80
Benzo(k)fluoranthene	823	5.46	0.00	16	2400.00	5.70
Benzoic acid	243	246.98	0.00	103	4200.00	8.90
Benzyl alcohol	325	0.00	0.00	0	.	.
Bis(2-ethylhexyl)phthalate	594	1089.49	504.50	483	60800.00	11.00
Bromophenyl phenyl ether, 4-	710	0.00	0.00	0	.	.
Butyl benzyl phthalate	818	4.97	0.00	67	374.75	7.70
BHC	3808	0.08	0.00	192	15.00	0.01
Cadmium	1024	649.44	459.50	987	6770.00	49.00
Chlordane	827	0.89	0.00	71	270.00	0.25
Chlorobenzene	574	0.00	0.00	0	.	.
Chromium	1051	20681.10	19900.00	1051	110000.0	310.00
Chrysene	866	6.10	0.00	28	2500.00	6.40
Copper	1066	27653.83	16350.00	1065	2000000	380.00
Cresol, m-	1	0.15	0.15	1	0.15	0.15
Cresol, o	324	0.74	0.00	2	240.00	0.15
Cresol, p-	248	27.31	0.00	22	5100.00	12.00
Di-n-butyl phthalate	722	17.16	0.00	114	962.00	8.00

Sediment Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Di-n-octyl phthalate	848	15.82	0.00	160	970.00	7.60
Dibenzo(a,h)anthracene	870	0.99	0.00	2	680.00	180.00
Dibenzofuran	837	0.25	0.00	2	190.00	22.40
Dibromochloromethane	575	0.00	0.00	0	.	.
Dichlorobenzene, 1,2-	859	0.00	0.00	0	.	.
Dichlorobenzene, 1,3-	837	0.00	0.00	0	.	.
Dichlorobenzene, 1,4-	837	0.06	0.00	1	50.20	50.20
Dichloroethane 1,1-	571	0.00	0.00	0	.	.
Dichloroethane 1,2-	574	0.00	0.00	0	.	.
Dichloroethene, trans-1,2-	173	0.00	0.00	0	.	.
Dichloromethane	438	28.74	0.00	125	1460.00	1.10
Dichloropropane, 1,2-	567	0.00	0.00	0	.	.
Dieldrin	842	0.09	0.00	76	6.70	0.21
Diethyl phthalate	859	4.22	0.00	77	620.00	5.10
Dimethyl phthalate	857	0.13	0.00	4	39.00	12.00
Dimethylphenol, 2,4-	861	0.08	0.00	1	69.00	69.00
Dioxins	176	0.00	0.00	0	.	.
DDT	2609	2.38	0.00	1005	110.00	0.01
Endosulfan mixed isomers	217	0.02	0.00	2	3.40	1.90
Endosulfan, alpha-	670	0.00	0.00	7	0.44	0.00
Endosulfan, beta-	900	0.45	0.00	63	93.00	0.17
Endrin	925	0.21	0.00	52	35.00	0.40
Ethylbenzene	573	0.01	0.00	1	7.54	7.54
Fluoranthene	840	11.79	0.00	93	3000.00	8.70
Fluorene	869	0.43	0.00	1	370.00	370.00
Heptachlor	97	0.00	0.00	0	.	.
Heptachlor epoxide	958	0.02	0.00	14	4.10	0.17
Hexachlorobenzene	860	0.00	0.00	0	.	.
Hexachlorobutadiene	830	0.00	0.00	0	.	.
Hexachloroethane	859	0.00	0.00	0	.	.
HMW_PAHs	1	0.00	0.00	0	.	.
Indeno(1,2,3-cd)pyrene	868	3.72	0.00	5	2400.00	10.00
Isophorone	832	0.00	0.00	0	.	.
Lead	1046	16437.77	9390.00	1044	320000.0	690.00
LMW_PAHs	1	20.00	20.00	1	20.00	20.00
Malathion	76	0.00	0.00	0	.	.
Mercury	1021	216.14	52.00	973	29000.00	1.00
Methoxychlor	85	0.00	0.00	0	.	.
Methyl ethyl ketone	315	0.03	0.00	1	11.00	11.00
Methylnaphthalene, 2-	323	3.64	0.00	38	96.00	7.30
Naphthalene	850	1.07	0.00	34	96.60	4.40
Nickel	947	9076.95	8280.00	945	36000.00	3840.00
Nitrosodiphenylamine, N-	859	0.00	0.00	0	.	.
Pentachlorophenol	836	1.54	0.00	8	790.00	15.00

Sediment Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Phenanthrene	864	8.21	0.00	58	3600.00	8.00
Phenol	780	83.29	0.00	284	5160.00	3.50
Polychlorinated biphenyls	6493	1.69	0.00	337	860.00	2.60
Pyrene	829	10.22	0.00	88	2200.00	7.52
Silver	916	469.14	443.00	907	1750.00	40.70
Tetrachloroethane, 1,1,2,2-	257	0.00	0.00	0	.	.
Tetrachloroethene	573	0.00	0.00	0	.	.
Tetrachloromethane	568	0.10	0.00	4	21.70	5.69
Toluene	530	0.32	0.00	5	78.10	4.39
Toxaphene	972	0.00	0.00	0	.	.
Tribromomethane/Bromoform	574	0.00	0.00	0	.	.
Trichlorobenzene, 1,2,4-	859	0.00	0.00	0	.	.
Trichloroethane, 1,1,1-	563	0.17	0.00	2	77.90	19.20
Trichloroethane, 1,1,2-	575	0.00	0.00	0	.	.
Trichloroethene	561	0.22	0.00	11	46.40	3.20
Trichlorofluoromethane	2	0.00	0.00	0	.	.
Trichloromethane/Chloroform	518	0.00	0.00	0	.	.
Xylenes	317	0.00	0.00	0	.	.
Zinc	1055	59058.48	47000.00	1055	915000.0	320.00

Tissue Residue Data: Chemical Summary

Tissue Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Acenaphthene	7	4.81	0.00	1	33.67	33.67
Acetone	1	0.00	0.00	0	.	.
Acrolein	1	0.00	0.00	0	.	.
Acrylonitrile	1	0.00	0.00	0	.	.
Aldrin	7	0.39	0.00	2	1.90	0.83
Aniline	1	0.00	0.00	0	.	.
Anthracene	7	0.00	0.00	0	.	.
Antimony	7	0.00	0.00	0	.	.
Arsenic	6	919.00	888.50	5	1640.00	517.00
Benzene	7	0.00	0.00	0	.	.
Benzidine	2	0.00	0.00	0	.	.
Benzo(a)anthracene	7	0.00	0.00	0	.	.
Benzo(a)pyrene	7	0.00	0.00	0	.	.
Benzo(b)fluoranthene	7	0.00	0.00	0	.	.
Benzo(k)fluoranthene	7	0.00	0.00	0	.	.
Benzoic acid	1	1340.00	1340.00	1	1340.00	1340.00
Benzyl alcohol	1	0.00	0.00	0	.	.
Beryllium	7	0.00	0.00	0	.	.
Bis(2-chloroethyl)ether	7	0.00	0.00	0	.	.

Tissue Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Bis(2-chloroisopropyl)ether	7	0.00	0.00	0	.	.
Bis(2-ethylhexyl)phthalate	4	1031.67	928.33	3	2270.00	796.67
Bromodichloromethane	7	0.00	0.00	0	.	.
Bromomethane	7	0.00	0.00	0	.	.
Bromophenyl phenyl ether, 4-	7	0.00	0.00	0	.	.
Butyl benzyl phthalate	7	0.00	0.00	0	.	.
BHC	25	0.74	0.00	3	16.00	0.63
Cadmium	6	0.80	0.00	1	4.82	4.82
Carbon disulfide	1	0.00	0.00	0	.	.
Chlordane	4	0.00	0.00	0	.	.
Chlorobenzene	7	0.00	0.00	0	.	.
Chloroethane	1	0.00	0.00	0	.	.
Chloroethene	7	0.00	0.00	0	.	.
Chloroethylvinyl ether, 2-	1	0.00	0.00	0	.	.
Chloromethane	7	0.00	0.00	0	.	.
Chloronaphthalene, 2-	7	0.00	0.00	0	.	.
Chromium	7	5.60	0.00	3	18.10	10.00
Chrysene	7	0.00	0.00	0	.	.
Copper	7	171.64	157.50	7	235.00	100.00
Cresol, o	1	0.00	0.00	0	.	.
Cresol, p-	1	0.00	0.00	0	.	.
Di-n-butyl phthalate	7	43.29	0.00	2	250.00	53.00
Di-n-octyl phthalate	7	0.00	0.00	0	.	.
Dibenzo(a,h)anthracene	7	0.00	0.00	0	.	.
Dibenzofuran	7	0.00	0.00	0	.	.
Dibromochloromethane	7	0.00	0.00	0	.	.
Dichlorobenzene, 1,2-	7	0.00	0.00	0	.	.
Dichlorobenzene, 1,3-	7	6.33	0.00	1	44.33	44.33
Dichlorobenzene, 1,4-	7	0.00	0.00	0	.	.
Dichlorobenzidine, 3,3'-	7	0.00	0.00	0	.	.
Dichloroethane 1,1-	7	0.00	0.00	0	.	.
Dichloroethane 1,2-	7	0.00	0.00	0	.	.
Dichloroethene, trans-1,2-	7	0.00	0.00	0	.	.
Dichloroethene, 1,1-	7	0.00	0.00	0	.	.
Dichloromethane	7	275.13	33.00	6	1722.50	18.00
Dichlorophenol, 2,4-	14	6.43	0.00	1	90.00	90.00
Dichloropropane, 1,2-	7	0.00	0.00	0	.	.
Dichloropropene, 1,3-	7	0.00	0.00	0	.	.
Dieldrin	6	0.00	0.00	0	.	.
Diethyl phthalate	7	0.00	0.00	0	.	.
Dimethyl phthalate	7	0.00	0.00	0	.	.
Dimethylphenol, 2,4-	7	0.00	0.00	0	.	.
Dinitrophenol, 2,4-	2	0.00	0.00	0	.	.
Dinitrotoluene, 2,4-	7	10.86	0.00	1	76.00	76.00

Tissue Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Dinitrotoluene, 2,6-	7	0.00	0.00	0	.	.
Dioxins	1	0.00	0.00	0	.	.
DDT	14	30.38	0.00	6	240.00	0.94
Endosulfan mixed isomers	1	0.00	0.00	0	.	.
Endosulfan, alpha-	6	0.00	0.00	0	.	.
Endosulfan, beta-	5	0.44	0.00	1	2.20	2.20
Endrin	5	0.70	0.00	1	3.48	3.48
Ethylbenzene	7	0.00	0.00	0	.	.
Fluoranthene	7	0.00	0.00	0	.	.
Fluorene	7	0.00	0.00	0	.	.
Heptachlor	7	0.37	0.00	2	2.10	0.46
Heptachlor epoxide	7	0.00	0.00	0	.	.
Hexachlorobenzene	7	0.00	0.00	0	.	.
Hexachlorobutadiene	7	0.00	0.00	0	.	.
Hexachloroethane	7	0.00	0.00	0	.	.
Indeno(1,2,3-cd)pyrene	7	0.00	0.00	0	.	.
Isophorone	7	0.00	0.00	0	.	.
Lead	7	4.53	0.00	1	31.70	31.70
Mercury	7	346.80	197.00	7	849.00	33.10
Methyl ethyl ketone	1	0.00	0.00	0	.	.
Methyl isobutyl ketone	1	0.00	0.00	0	.	.
Naphthalene	7	0.00	0.00	0	.	.
Nickel	7	6.86	0.00	1	48.00	48.00
Nitrobenzene	7	0.00	0.00	0	.	.
Nitrophenol, 4	2	25.00	25.00	1	50.00	50.00
Nitrosodi-n-propylamine, N-	7	10.43	0.00	1	73.00	73.00
Nitrosodiphenylamine, N-	7	0.00	0.00	0	.	.
Pentachlorophenol	7	13.00	0.00	1	91.00	91.00
Phenol	7	33.33	0.00	2	140.00	93.33
Polychlorinated biphenyls	44	14.58	0.00	6	186.67	28.47
Pyrene	7	3.71	0.00	1	26.00	26.00
Selenium	6	199.83	199.50	4	424.00	137.00
Silver	7	1.14	0.00	1	8.00	8.00
Styrene	1	0.00	0.00	0	.	.
Tetrachloroethane, 1,1,2,2-	6	0.00	0.00	0	.	.
Tetrachloroethene	7	0.00	0.00	0	.	.
Tetrachloromethane	7	0.00	0.00	0	.	.
Toluene	7	0.56	0.00	1	3.90	3.90
Toxaphene	7	0.00	0.00	0	.	.
Tribromomethane/Bromoform	7	0.00	0.00	0	.	.
Trichlorobenzene, 1,2,4-	7	7.71	0.00	1	54.00	54.00
Trichloroethane, 1,1,1-	7	34.21	0.00	1	239.44	239.44
Trichloroethane, 1,1,2-	7	0.00	0.00	0	.	.
Trichloroethene	7	4.40	0.00	1	30.81	30.81

Tissue Parameter	Total Observations			Detected Observations		
	Num.	Mean (ppb)	Median (ppb)	Num.	Max (ppb)	Min (ppb)
Trichloromethane/Chloroform	7	0.00	0.00	0	.	.
Trichlorophenol, 2,4,5-	7	0.00	0.00	0	.	.
Trichlorophenol, 2,4,6-	7	0.00	0.00	0	.	.
Vinyl acetate	1	0.00	0.00	0	.	.
Xylenes	1	0.00	0.00	0	.	.
Zinc	7	3055.71	2890.00	7	3510.00	2700.00

Biotoxicity Data

Lat.	Long.	Date	Species Name	Phase	% Mortality		Sign.
					Test	Control	
Monitoring Program: EPA Region 9 Dredged Material Program							
33.6103	117.9283	82-06-27	Macoma Nasuta	S	1.00	1.00	no
			Neanthes Arenacedonta	S	6.00	2.00	no
33.7139	118.0611	86-05-01	Macoma Nasuta	S	0.00	0.00	no
33.7189	118.1083	87-06-01	Macoma Nasuta	S	3.00	3.00	no
			Neanthes Arenacedonta	S	14.00	12.00	no
33.7208	118.0694	86-05-01	Macoma Nasuta	S	2.00	0.00	no
33.7222	118.0569	86-05-01	Macoma Nasuta	S	1.00	0.00	no
33.7236	118.1042	87-06-01	Macoma Nasuta	S	5.00	3.00	no
			Neanthes Arenacedonta	S	32.00	12.00	no
33.7278	118.0806	86-05-01	Macoma Nasuta	S	2.00	0.00	no
33.7292	118.0972	87-06-01	Macoma Nasuta	S	2.00	3.00	no
			Neanthes Arenacedonta	S	14.00	12.00	no
33.7306	118.0953	87-06-01	Macoma Nasuta	S	1.00	3.00	no
			Neanthes Arenacedonta	S	28.00	12.00	no
33.7311	118.1008	87-06-01	Macoma Nasuta	S	7.00	3.00	no
			Neanthes Arenacedonta	S	26.00	12.00	no
33.7347	118.0917	87-06-01	Macoma Nasuta	S	3.00	3.00	no
			Neanthes Arenacedonta	S	30.00	12.00	no
33.7353	118.0967	87-06-01	Macoma Nasuta	S	5.00	3.00	no
			Neanthes Arenacedonta	S	27.00	12.00	no