

**Alaska Department of Environmental
Conservation Fish Monitoring Project**

Average Heavy Metal Concentration (ppm)

SPECIES		Number of Samples Analyzed	Number of Non-Detects	Minimum Value	Maximum Value	Mean Value	Std. Deviation
Cod	Arsenic (ppm)	41	0	2.9600	31.6000	11.3393	6.6043
	Cadmium (ppm)	41	18	<0.0020	0.0150	0.0029	0.0027
	Chromium (ppm)	41	23	<0.0060	0.3200	0.0167	0.0500
	Lead (ppm)	41	15	<0.0200	0.0400	0.0222	0.0106
	Nickel (ppm)	41	34	<0.0200	0.1500	0.0178	0.0284
	Selenium (ppm)	41	0	0.1000	0.4900	0.2068	0.0816
	Methyl Mercury (ppm)	34	1	<0.0120	0.3680	0.0887	0.0830
Halibut	Arsenic (ppm)	60	0	0.2000	5.3000	1.5692	0.9860
	Cadmium (ppm)	60	38	<0.0020	0.0050	0.0017	0.0011
	Chromium (ppm)	60	49	<0.0060	0.0260	0.0046	0.0042
	Lead (ppm)	60	5	<0.0200	0.0500	0.0307	0.0086
	Nickel (ppm)	60	60	<0.0200	0.0100	0.0100	0.0000
	Selenium (ppm)	60	0	0.1000	0.6100	0.2607	0.1193
	Methyl Mercury (ppm)	60	0	0.0400	0.8830	0.2174	0.1838
Lingcod	Arsenic (ppm)	12	0	0.3400	1.0900	0.5442	0.1990
	Cadmium (ppm)	12	9	<0.0020	0.0040	0.0015	0.0010
	Chromium (ppm)	12	11	<0.0060	0.0060	0.0033	0.0009
	Lead (ppm)	12	3	<0.0200	0.0300	0.0217	0.0083
	Nickel (ppm)	12	12	<0.0200	0.0100	0.0100	0.0000
	Selenium (ppm)	12	0	0.1700	0.8800	0.2858	0.1928
	Methyl Mercury (ppm)	12	0	0.0180	0.4390	0.1243	0.1169
Pike	Arsenic (ppm)	60	43	<0.2000	3.3200	0.1288	0.4337
	Cadmium (ppm)	60	49	<0.0020	0.0040	0.0013	0.0007
	Chromium (ppm)	60	11	<0.0060	0.1500	0.0248	0.0321
	Lead (ppm)	60	32	<0.0200	0.0400	0.0182	0.0095
	Nickel (ppm)	60	53	<0.0200	0.0500	0.0127	0.0084
	Selenium (ppm)	60	10	<0.0500	0.4500	0.1715	0.1217
	Methyl Mercury (ppm)	60	0	0.0170	0.6490	0.1519	0.1716
Pollock	Arsenic (ppm)	66	0	0.6100	37.6000	6.0891	6.9510
	Cadmium (ppm)	66	25	<0.0020	0.0080	0.0025	0.0016
	Chromium (ppm)	66	15	<0.0060	0.1710	0.0236	0.0300
	Lead (ppm)	66	42	<0.0200	0.0400	0.0173	0.0107
	Nickel (ppm)	66	56	<0.0200	0.3700	0.0195	0.0452
	Selenium (ppm)	66	3	<0.0500	0.2900	0.1481	0.0560
	Methyl Mercury (ppm)	32	9	<0.0120	0.2060	0.0445	0.0430

SPECIES		Number of Samples Analyzed	Number of Non-Detects	Minimum Value	Maximum Value	Mean Value	Std. Deviation
Rockfish	Arsenic (ppm)	29	0	0.2800	3.7400	1.4693	0.9797
	Cadmium (ppm)	29	3	<0.0020	0.0560	0.0067	0.0100
	Chromium (ppm)	29	16	<0.0060	0.0650	0.0098	0.0141
	Lead (ppm)	29	3	<0.0200	0.0600	0.0269	0.0100
	Nickel (ppm)	29	28	<0.0200	0.0600	0.0117	0.0093
	Selenium (ppm)	29	0	0.1900	0.6000	0.3672	0.1060
	Methyl Mercury (ppm)	29	0	0.0230	0.7250	0.1591	0.1436
Sablefish	Arsenic (ppm)	45	2	<0.2000	1.5600	0.6316	0.3427
	Cadmium (ppm)	45	10	<0.0020	0.0500	0.0050	0.0076
	Chromium (ppm)	45	31	<0.0060	0.1370	0.0096	0.0213
	Lead (ppm)	45	21	<0.0200	0.0400	0.0187	0.0099
	Nickel (ppm)	45	44	<0.0200	0.0700	0.0113	0.0089
	Selenium (ppm)	45	1	<0.0500	0.3000	0.1639	0.0584
	Methyl Mercury (ppm)	40	0	0.0130	0.2130	0.0797	0.0535
Salmon	Arsenic (ppm)	256	49	<0.200	1.0200	0.3103	0.1993
	Cadmium (ppm)	256	19	<0.0020	0.0700	0.0048	0.0049
	Chromium (ppm)	256	175	<0.0060	2.3100	0.0182	0.1468
	Lead (ppm)	256	99	<0.0200	0.2400	0.0212	0.0168
	Nickel (ppm)	256	242	<0.0200	3.3200	0.0273	0.2101
	Selenium (ppm)	256	2	<0.0500	0.2900	0.1532	0.0453
	Methyl Mercury (ppm)	245	12	<0.0120	0.0940	0.0269	0.0128
Sheefish	Arsenic (ppm)	8	0	3.1000	12.1000	8.5063	3.1582
	Cadmium (ppm)	8	7	<0.0020	0.0030	0.0013	0.0007
	Chromium (ppm)	8	2	<0.0060	0.0370	0.0150	0.0122
	Lead (ppm)	8	3	<0.0200	0.0500	0.0250	0.0151
	Nickel (ppm)	8	6	<0.0200	0.0500	0.0163	0.0141
	Selenium (ppm)	8	0	0.1400	0.3000	0.2093	0.0504
	Methyl Mercury (ppm)	8	0	0.0380	0.1890	0.0836	0.0567

Average Heavy Metal Concentration (ppm) For Salmon Species

SPECIES		Number of Samples Analyzed	Number of Non-Detects	Minimum Value	Maximum Value	Mean Value	Std. Deviation
Chum	Arsenic (ppm)	55	14	<0.2000	0.6200	0.2567	0.1721
	Cadmium (ppm)	55	0	0.0020	0.0190	0.0047	0.0024
	Chromium (ppm)	55	33	<0.0060	0.0620	0.0080	0.0100
	Lead (ppm)	55	11	<0.0200	0.0300	0.0240	0.0081
	Nickel (ppm)	55	54	<0.0200	0.0300	0.0104	0.0027
	Selenium (ppm)	55	0	0.0900	0.2900	0.1958	0.0461
	Methyl Mercury (ppm)	55	0	0.0170	0.0510	0.0308	0.0076
Chinook	Arsenic (ppm)	37	2	<0.2000	1.0200	0.4497	0.2266
	Cadmium (ppm)	37	8	<0.0020	0.0110	0.0045	0.0028
	Chromium (ppm)	37	28	<0.0060	0.1160	0.0072	0.0186
	Lead (ppm)	37	11	<0.0200	0.0600	0.0219	0.0105
	Nickel (ppm)	37	36	<0.0200	0.0500	0.0111	0.0066
	Selenium (ppm)	37	0	0.0700	0.2600	0.1449	0.0391
	Methyl Mercury (ppm)	37	4	<0.0120	0.0940	0.0337	0.0230
Pink	Arsenic (ppm)	49	15	<0.2000	0.5600	0.2173	0.1651
	Cadmium (ppm)	49	3	<0.0020	0.0120	0.0038	0.0020
	Chromium (ppm)	49	22	<0.0060	0.2100	0.0150	0.0334
	Lead (ppm)	49	16	<0.0200	0.0500	0.0218	0.0101
	Nickel (ppm)	49	45	<0.0200	0.1500	0.0171	0.0272
	Selenium (ppm)	49	0	0.0900	0.2200	0.1514	0.0343
	Methyl Mercury (ppm)	43	5	<0.0120	0.0280	0.0163	0.0054
Sockeye	Arsenic (ppm)	53	10	<0.2000	0.9500	0.3223	0.2102
	Cadmium (ppm)	53	2	<0.0020	0.0700	0.0068	0.0092
	Chromium (ppm)	53	40	<0.0060	0.0200	0.0046	0.0035
	Lead (ppm)	53	13	<0.0200	0.0300	0.0215	0.0079
	Nickel (ppm)	53	49	<0.0200	0.0900	0.0121	0.0112
	Selenium (ppm)	53	0	0.0900	0.2200	0.1464	0.0381
	Methyl Mercury (ppm)	53	1	<0.0120	0.0460	0.0271	0.0097
Coho	Arsenic (ppm)	62	8	<0.2000	0.7300	0.3377	0.1680
	Cadmium (ppm)	62	6	<0.0020	0.0190	0.0044	0.0029
	Chromium (ppm)	62	52	<0.0060	2.3100	0.0481	0.2960
	Lead (ppm)	62	48	<0.0200	0.2400	0.0174	0.0299
	Nickel (ppm)	62	58	<0.0200	3.3200	0.0732	0.4253
	Selenium (ppm)	62	2	<0.0500	0.1900	0.1277	0.0354
	Methyl Mercury (ppm)	57	2	<0.0120	0.0470	0.0265	0.0086

	<u>Analytical Methods</u>	<u>Detection limits (ppm)</u>
Arsenic (ppm)	AOAC 999.10	0.2000
Cadmium (ppm)	AOAC 999.10	0.0020
Chromium (ppm)	AOAC 999.10	0.0060
Lead (ppm)	AOAC 999.10	0.0200
Nickel (ppm)	AOAC 999.10	0.0200
Selenium (ppm)	AOAC 999.10	0.0500
Methyl Mercury (ppm)	AOAC 988.11	0.0120

NOTE: AOAC = International Association of Analytical (Chemists) Communities and determines the standard analytical methods

For Statistical Calculations: Samples that registered below the detection limit of the test were listed as one half the detection limit

According to the Alaska Division of Public Health, the concentrations of heavy metals detected in these samples are not a public health concern. The data support the Division's recommendation that all Alaskans, including pregnant women, women of childbearing age, and young children, continue unrestricted consumption of fish from Alaska waters.