

**Cruise MF-03-10 Report, NOAA Ship *Miller Freeman***  
**18 July-9 August 2003**  
**OCC/GLOBEC Northeast Pacific, Gulf of Alaska**  
**E. D. Cokelet and J. Moss**

**Chief Scientist**

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**Port of Embarkation:** Kodiak, Alaska  
**Port of Debarkation:** Juneau, Alaska

**Cruise Goals/Scientific Purpose**

The purpose of this July–August 2003 OCC/GLOBEC (Ocean Carrying Capacity/Global Ocean Ecosystem Dynamics) cruise was to investigate the relationships between physical and biological oceanographic processes that affect the distribution of juvenile salmon in the coastal Gulf of Alaska. Measurements focused on oceanographic properties and the distribution of zooplankton and salmon (*Oncorhynchus* spp) along 10 transects covering the continental shelf and slope. The cruise sampling began at Kodiak Island, Alaska, along the Cape Chiniak transect and ended near Yakutat, Alaska, on the Ocean Cape transect (Fig.1). The primary participating laboratories were NOAA’s Pacific Marine Environmental Laboratory (PMEL) and the Alaska Fisheries Science Center’s (AFSC) Auke Bay Laboratory (ABL).

**Cruise Objectives**

1. Determine the continuous distribution of surface temperature, salinity, fluorescence and dissolved nitrate along the cruise track (Fig. 1).
2. Measure vertical profiles of ocean current velocity continuously along the cruise track.
3. Measure vertical profiles of temperature, salinity and fluorescence at discrete sampling stations along 10 transects.
4. Determine the distribution of zooplankton within the study area.
5. Determine the distribution of juvenile salmon within the study area.

**Cruise Participants**

Edward D. Cokelet	Oceanographer/PMEL
Jamal Moss	Biologist/ AFSC/ABL
Christine Kondzela	Geneticist/ AFSC/ABL
Angela Middleton	Biologist/ AFSC/ABL
William Floering	Oceanographer/ PMEL

Antonio Jenkins  
Daniel Badger  
Rhys Smoker  
Kimberly Meline

Oceanographer/ UW/JISAO  
Student/ University of Washington  
Student/ Humboldt State University  
Teacher at Sea

## Sampling Activities

The OCC/GLOBEC survey in the coastal waters of the Gulf of Alaska was conducted 18 July-9 August 2003 aboard the NOAA research vessel *Miller Freeman* (66 m). Transects sampled during the survey were perpendicular to shore and extended from nearshore across the continental shelf and slope to oceanic waters beyond the 2000-m depth contour (Fig. 1). Sampling stations along each transect were generally spaced 18.5 km (10 nm) apart and numbered sequentially seaward. Each transect included a nearshore station less than 4 km from shore.

At each station sampling usually began with a CTD (conductivity-temperature-depth) cast to near bottom or 1500 m, whichever was shallower (Fig. 1, Table 1). Depth profiles of temperature, salinity, fluorescence and photosynthetically-available-radiation (PAR) were collected using a Sea-Bird SBE 911+ CTD profiler, a WETLabs WETStar fluorometer and a Biospherical PAR sensor<sup>1</sup>. On each cast, Niskin bottles collected discrete water samples for salinity, fluorescence and nutrient calibration against the CTD and flow-through systems.

Plankton samples were collected using a 1-m<sup>2</sup> Tucker trawl fitted with a 505- $\mu$ m mesh net towed near surface at approximately 1 knot for 5 minutes (Table 1). On some occasions tows at 20-m depth were conducted to determine how potential salmon prey distributions changed with depth. The volume of water filtered by the net was measured using a flow meter, and the plankton samples were preserved in 5% formalin.

Fish samples were collected with a 198-m-long mid-water rope trawl with hexagonal mesh wings and body, and a 1.2-cm mesh liner in the codend (Fig. 2, Table 1). The rope trawl was towed at 3.5 to 5 kt, at or near surface, and had a typical spread of 40-m horizontally and 14-m vertically. All tows lasted 30 minutes and covered 1.5 to 2.8 nautical miles. All fish sampling was done during daylight hours. Sometimes this meant that salmon trawls preceded CTD casts. For reference, sunrise occurred at 06:04 ADT and sunset at 22:27 ADT on 1 August 2003 at 58° N. Alaska Daylight Time (ADT) is 8 hours earlier than Greenwich Mean Time (GMT).

Salmon and other fishes were sorted by species and counted. Standard biological measurements including fork length, body weight and sex. Scale samples from a preferred area (to document age and growth) were taken from subsamples of all salmon species. Subsamples of juvenile pink (*Oncorhynchus gorbuscha*), chum (*O. keta*), and sockeye (*O. nerka*) salmon were frozen whole for laboratory analyses of food habits, otolith hatchery thermal marks (pink and chum salmon), and genetic analysis (chum salmon). Tissues and otoliths were also saved from immature and maturing chum salmon to determine stock distribution and migration of these salmon. All other fish species

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<sup>1</sup> Reference to trade names does not imply endorsement by NOAA.

were counted; juvenile rockfish (*Sebastes* spp.) and sablefish (*Anoplopoma fimbria*) were frozen whole for laboratory analyses.

Several parameters were measured from the ship's flow-through system pumping sea water from the sea chest at keel depth (~ 5m). A thermosalinograph, fluorometer and nutrient sensor provided continuous measurements of near-surface temperature, salinity, fluorescence and dissolved nitrate.

The current beneath the ship was measured continuously with a 150-kHz RDI acoustic Doppler current profiler (ADCP). A differential Global Positioning System (DGPS) receiver and a TSS POS/MV GPS-based attitude-determination-unit provided associated position and heading measurements.

Satellite-tracked drifting buoys drogued at 40-m were deployed at designated trawl stations to measure the strength and direction of the current along the continental shelf.

## **Daily Cruise Summary**

### **18 July – 29 July ADT**

The ship departed Kodiak, Alaska, on July 18 and performed gear trials near Cape Chiniak (Figs. 1 and 2). The cruise proceeded to the nearshore station along the Cape Chiniak transect on the evening of July 18, and work on this transect began on the morning of July 19. Standard work at each station included vertical CTD cast, a surface tow for zooplankton using a Tucker trawl, and a surface tow for salmon and other marine fishes using the rope trawl. The cruise continued sampling along the Cape Chiniak (July 19-20), Cape Kaguyak (July 21-22), Cape Kekurnoi (July 22-23), Cape Nukshak (July 23-24), Gore Point (July 24-26), and Seward Lines (July 27-29). A PMEL current meter mooring, 03-SSP-3A, was recovered on the Cape Kekurnoi transect on 23 July. Satellite-tracked drifters were deployed on the Seward Line at stations GAK2, GAK4 and GAK6.

### **30 July – 31 July ADT**

The ship joined the R/V *Alpha Helix* in Blying Sound near the Seward Line to observe how juvenile salmon are distributed relative to surface salinity. We conducted a series of CTD casts, Tucker hauls and salmon trawls within and seaward of the brackish sea-surface signature of the Alaska Coastal Current (ACC). *Alpha Helix* followed us conducting vertically stratified MOCNESS trawls for zooplankton and CTDs at the same sites. Our strategy was to use the ship's thermosalinograph to locate sampling sites. Often a front visible at the sea surface separated brackish water at 27 psu, assumed to be the ACC, from high-salinity water to seaward at 31 psu. On 30 July we sampled four sites - two in the ACC and two in the salty water seaward of it. They were as follows (Fig. 3): GAK1i at 27 psu surface salinity - presumably in the ACC, GAK3 and BS3 (Blying Sound 3) at 31 psu seaward of the ACC, and BS2 at 27 psu. On 31 July we sampled four more sites – one each on either side of the salinity front and two within it (Fig. 3). They were CF2 (Cape Fairfield 2) at 27 psu, CF12 at 31 psu, CF8 within the front at 28.2 psu and AC1 (Aialik Cape 1) within the front at 29 psu. (Note that *Alpha Helix* used the station names "BS1" and "GAK2" for our stations BS2 and AC1, respectively.)

The near-surface salinity from the thermosalinograph is plotted along the cruise track along with the CPUE for juvenile pink, chum, coho and sockeye salmon in Figures 3-6. The juvenile chinook salmon catch is not plotted; only 3 were caught in this region (Table 2). The trackline salinity shows saltier water (>31 psu) generally to seaward in red-to-orange colors. Fresher water (<27 psu) in the ACC is shown as green, and the front between (~29 psu) is in shades of yellow. At the start of this series it was postulated that juvenile salmon would be caught in the less-salty ACC water and not in the saltier water to seaward. The results plotted in Figures 3-6 refute that hypothesis. Juvenile pink and chum were found in both the fresher and saltier water, but not always within the transition zone between. Coho and sockeye juveniles were located in the saltier water.

### **1 August – 9 August ADT**

*Miller Freeman* broke off from *Alpha Helix* late on 31 July and resumed standard sampling along the Cape Cleare (1-2 Aug), Cape St. Elias (August 3), Cape Yakataga (August 4-5) and Ocean Cape (August 6-7) lines. A satellite-tracked drifter was deployed at station CSE2 along the Cape St. Elias transect. After standard sampling was completed on 7 August, the ship transited to Glacier Bay, Alaska. There we ran thermosalinograph and ADCP transects along the bay's West and East Arms on 8 August. The cruise concluded in Juneau, Alaska, at 09:00 9 August 2003.

### **Summary of Salmon Sampling Results**

During the survey, 86 trawl stations were sampled (Fig. 2), and a total of 15,442 salmon were captured (Table 2). The largest component of the catch was juvenile salmon including pink (52.7% of total catch), chum (16.5%), sockeye (8.9%), coho (*O. kisutch*; 8.8%), and chinook (*O. tshawytscha*; <0.1%). Immature salmon in our catch included chum (4.0%), sockeye (1.2%), and chinook (0.3%). Maturing salmon in our catch included pink (5.7%), chum (1.1%), sockeye (1.2%), coho (0.4%) and chinook (<0.1%) salmon. Other species captured during the survey are listed in Table 3.

Salmon distribution as detected by the survey varied by life history stage (Table 2). Juvenile salmon were mainly distributed along the shelf with the highest catch per unit effort (CPUE = number of salmon caught during a 30-minute trawl) of juvenile pink (Fig. 7) and chum salmon (Fig. 8) occurring west of Prince William Sound (PWS). The highest CPUE of juvenile coho salmon occurred east of PWS (Fig. 9), and the highest CPUE for juvenile sockeye occurred West of PWS and within Shelikof Strait (Fig. 10). The highest CPUE for juvenile chinook salmon occurred along the Cape Cleare transect (Fig. 11). Immature chum salmon were found along all transects sampled with the largest CPUE generally occurring at offshore locations beyond the 200-m contour. Immature sockeye salmon were most commonly distributed along transects on the Gulf of Alaska side of Kodiak Island. Immature chinook salmon were mainly distributed west of PWS, however, the station with the highest CPUE was located along the Cape Cleare transect. Mature pink and chum salmon were found along all transects sampled.

Results from the oceanographic and fisheries measurements await calibrations, laboratory analyses and data processing.

## **Acknowledgments**

We thank Dr. Gary Stauffer, AFSC, for help in obtaining ship time aboard NOAA Ship *Miller Freeman*. We also thank CMDR Tim Clancy and the officers and crew for their assistance with many aspects of our field survey. It was a pleasure sailing on *Miller Freeman* with her good accommodations, meals, laboratory space, computer facilities and deck-crew support.

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Table 3. Catch per unit effort (CPUE = number of fish per 30-minute trawl) of marine fishes from *Miller Freeman* cruise MF-03-10 in the Gulf of Alaska, 18 July-9 August 2003. Life history stages denoted by juvenile (J), young-of-year (YOY) and adult (A). Dash (-) indicates no fish caught.

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Figure 6. Near-surface salinity and juvenile sockeye salmon CPUE on the Seward Line and in Blying Sound.

Figure 7. Juvenile pink salmon CPUE from *Miller Freeman* cruise MF-03-10.

Figure 8. Juvenile chum salmon CPUE from Miller Freeman cruise MF-03-10.

Figure 9. Juvenile coho salmon CPUE from Miller Freeman cruise MF-03-10.

Figure 10. Juvenile sockeye salmon CPUE from Miller Freeman cruise MF-03-10.

Figure 11. Juvenile chinook salmon CPUE from Miller Freeman cruise MF-03-10.

**Table 1. Cruise MF-03-10 Event Log. CTD times and positions correspond to the CTD at its greatest depth. Haul and trawl times and positions correspond to their mid-points.**

Station Name	Cast/Haul/Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
CCH1	1	✓			19 Jul 2003 20:34	57.5688	152.1173	66	63
CCH1	1		✓		19 Jul 2003 20:56	57.5678	152.1310	72	0
CCH1	1			✓	19 Jul 2003 21:59	57.5423	152.1301	72	0
CCH2	2	✓			20 Jul 2003 00:06	57.3710	151.9397	70	65
CCH2	2		✓		20 Jul 2003 00:28	57.3721	151.9419	71	0
CCH2	2			✓	20 Jul 2003 01:39	57.4079	151.9351	71	0
CCH3	3	✓			20 Jul 2003 04:03	57.1443	151.7325	82	76
CCH2	3		✓		20 Jul 2003 04:15	57.1528	151.7259	83	0
CCH3	3			✓	20 Jul 2003 05:16	57.1466	151.7314	83	0
CCH4	4	✓			20 Jul 2003 14:22	56.9245	151.5072	373	371
CCH4	4		✓		20 Jul 2003 14:39	56.9248	151.5127	373	0
CCH4	4			✓	20 Jul 2003 16:09	56.8842	151.5413	373	0
CCH5	5	✓			20 Jul 2003 19:44	56.7040	151.2882	1450	1421
CCH5	5		✓		20 Jul 2003 20:25	56.6980	151.2843	1450	0
CCH5	5			✓	20 Jul 2003 21:38	56.7132	151.2772	1450	0
CCH6	6	✓			21 Jul 2003 00:50	56.4813	151.0655	2200	1524
CCH6	6		✓		21 Jul 2003 01:31	56.4754	151.0571	2200	0
CCH6	6			✓	21 Jul 2003 02:32	56.4928	151.0546	2200	0
CCH7	7		✓		21 Jul 2003 04:42	56.2786	150.8534	4000	0
CCH7	7			✓	21 Jul 2003 05:38	56.2736	150.8597	4000	0
CCH7	7	✓			21 Jul 2003 07:28	56.2805	150.8487	4000	1523
CKAG6	8	✓			21 Jul 2003 15:23	55.6750	152.9068	4500	1521
CKAG6	8		✓		21 Jul 2003 16:07	55.6818	152.9087	4500	0
CKAG6	8			✓	21 Jul 2003 17:09	55.6787	152.9111	4500	0
CKAG5	9	✓			21 Jul 2003 19:45	55.8978	153.1343	3111	1522
CKAG5	9		✓		21 Jul 2003 20:25	55.8984	153.1413	3111	0
CKAG5	9			✓	21 Jul 2003 21:29	55.8940	153.1384	3111	0
CKAG4	10	✓			21 Jul 2003 23:59	56.1130	153.3390	985	982
CKAG4	11	✓			22 Jul 2003 00:28	56.1147	153.3435	985	60
CKAG4	10		✓		22 Jul 2003 00:37	56.1166	153.3437	975	0
CKAG4	10			✓	22 Jul 2003 01:39	56.1154	153.3325	975	0
CKAG3	12	✓			22 Jul 2003 03:12	56.2652	153.4958	88	83
CKAG3	11		✓		22 Jul 2003 03:22	56.2699	153.4939	87	0
CKAG3	11			✓	22 Jul 2003 04:19	56.2681	153.4969	87	0
CKAG2	13	✓			22 Jul 2003 13:47	56.4795	153.7068	98	93
CKAG2	12		✓		22 Jul 2003 14:03	56.4790	153.7201	92	0
CKAG2	12			✓	22 Jul 2003 15:02	56.4890	153.7211	92	0
CKAG1	14	✓			22 Jul 2003 16:57	56.6990	153.9272	27	21
CKAG1	13		✓		22 Jul 2003 17:05	56.6977	153.9267	29	0
CKAG1	13			✓	22 Jul 2003 18:00	56.6991	153.8900	29	0
CK3	15	✓			23 Jul 2003 03:44	57.4332	154.7635	81	75
CK3	14		✓		23 Jul 2003 03:54	57.4304	154.7632	76	0
03-SSP-3A	16	✓			23 Jul 2003 05:11	57.4845	154.8117	201	198
CK3	14			✓	23 Jul 2003 06:26	57.4368	154.7654	76	0
CK2	17	✓			23 Jul 2003 14:05	57.5863	155.0462	236	233
CK2	15		✓		23 Jul 2003 14:21	57.5840	155.0506	236	0
CK2	15			✓	23 Jul 2003 15:22	57.5804	155.0434	236	0
CK1	18	✓			23 Jul 2003 17:31	57.7023	155.2890	227	223
CK1	16		✓		23 Jul 2003 17:46	57.7007	155.2914	201	0
CK1	16			✓	23 Jul 2003 18:43	57.6780	155.2592	201	0

Table 1. Con'd.

Station Name	Cast/Haul/ Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
CN1	19	✓			24 Jul 2003 01:20	58.3678	153.9288	81	76
CN1	17		✓		24 Jul 2003 01:33	58.3650	153.9282	84	0
CN1	17			✓	24 Jul 2003 02:31	58.3629	153.9327	84	0
CN2	20	✓			24 Jul 2003 04:28	58.1805	153.6832	193	189
CN2	18		✓		24 Jul 2003 04:42	58.1825	153.6856	193	0
CN2	18			✓	24 Jul 2003 05:32	58.1742	153.6652	193	0
CN3	21	✓			24 Jul 2003 14:42	58.0518	153.4533	75	71
CN3	19		✓		24 Jul 2003 14:53	58.0499	153.4551	91	0
CN3	19			✓	24 Jul 2003 15:48	58.0468	153.5040	91	0
GP1	22	✓			25 Jul 2003 02:06	59.1630	150.9392	72	67
GP1	20		✓		25 Jul 2003 02:22	59.1562	150.9416	74	0
GP1	21		✓		25 Jul 2003 02:39	59.1480	150.9478	78	20
GP1	20			✓	25 Jul 2003 03:51	59.1637	150.9239	74	0
GP2	22		✓		25 Jul 2003 05:11	59.0302	150.8576	164	0
GP2	21			✓	25 Jul 2003 05:59	59.0303	150.8397	164	0
GP2	23	✓			25 Jul 2003 07:08	59.0323	150.8587	164	160
GP3	24	✓			25 Jul 2003 13:58	58.8867	150.7327	125	121
GP3	23		✓		25 Jul 2003 14:09	58.8838	150.7326	126	0
GP3	22			✓	25 Jul 2003 15:04	58.8818	150.7291	126	0
GP4	25	✓			25 Jul 2003 16:38	58.7288	150.6315	190	187
GP4	24		✓		25 Jul 2003 16:52	58.7262	150.6294	198	0
GP4	23			✓	25 Jul 2003 17:44	58.7277	150.6137	198	0
GP5	26	✓			25 Jul 2003 19:18	58.5860	150.4877	183	180
GP5	25		✓		25 Jul 2003 19:29	58.5857	150.4844	182	0
GP5	24			✓	25 Jul 2003 20:30	58.5830	150.4829	182	0
GP6	27	✓			25 Jul 2003 22:17	58.4188	150.3630	74	68
GP6	26		✓		25 Jul 2003 22:31	58.4200	150.3524	74	0
GP6	27		✓		25 Jul 2003 22:52	58.4241	150.3313	72	20
GP6	25			✓	26 Jul 2003 00:00	58.4191	150.3363	74	0
GP7	28	✓			26 Jul 2003 01:32	58.2687	150.2668	61	56
GP7	28		✓		26 Jul 2003 01:49	58.2663	150.2568	61	0
GP7	26			✓	26 Jul 2003 02:48	58.2679	150.2545	61	0
GP8	29	✓			26 Jul 2003 04:33	58.1145	150.1468	263	259
GP8	29		✓		26 Jul 2003 04:49	58.1115	150.1457	268	0
GP8	27			✓	26 Jul 2003 05:36	58.1169	150.1357	268	0
GP9	30	✓			26 Jul 2003 14:09	57.9643	150.0422	250	247
GP9	31	✓			26 Jul 2003 14:22	57.9603	150.0420	250	60
GP9	30		✓		26 Jul 2003 14:30	57.9569	150.0412	250	0
GP9	28			✓	26 Jul 2003 15:28	57.9656	150.0261	250	0
GP10	32	✓			26 Jul 2003 17:03	57.8328	149.9272	255	252
GP10	31		✓		26 Jul 2003 17:18	57.8329	149.9209	255	0
GP10	29			✓	26 Jul 2003 18:08	57.8234	149.9229	255	0
GP11	33	✓			26 Jul 2003 19:55	57.6483	149.8197	527	523
GP11	32		✓		26 Jul 2003 20:20	57.6500	149.8255	512	0
GP11	33		✓		26 Jul 2003 20:38	57.6508	149.8178	547	20
GP11	30			✓	26 Jul 2003 21:32	57.6376	149.7999	512	0



Table 1. Con'd.

Station Name	Cast/Haul/ Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
GP12	34	✓			26 Jul 2003 23:33	57.4847	149.6983	1492	1492
GP12	34		✓		27 Jul 2003 00:15	57.4799	149.6996	1492	0
GP12	31			✓	27 Jul 2003 01:21	57.4710	149.6613	1492	0
GP13	35	✓			27 Jul 2003 03:13	57.3388	149.5560	2000	1521
GP13	35		✓		27 Jul 2003 03:50	57.3427	149.5678	2000	0
GP13	32			✓	27 Jul 2003 04:33	57.3214	149.5433	2000	0
GP14	36		✓		27 Jul 2003 05:46	57.1891	149.4349	3000	0
GP14	37		✓		27 Jul 2003 06:00	57.1877	149.4259	3000	20
GP14	33			✓	27 Jul 2003 06:48	57.1860	149.4600	3000	0
GP14	36	✓			27 Jul 2003 08:31	57.1890	149.4538	3000	1521
GAK13	37	✓			27 Jul 2003 16:31	58.1247	147.7818	1926	1524
GAK13	38		✓		27 Jul 2003 17:28	58.0988	147.7943	1926	0
GAK13	39		✓		27 Jul 2003 17:44	58.0994	147.7923	1926	20
GAK13	34			✓	27 Jul 2003 19:04	58.0950	147.7852	1926	20
GAK12	38	✓			27 Jul 2003 21:24	58.2427	147.9440	2067	1522
GAK12	40		✓		27 Jul 2003 22:06	58.2403	147.9618	2067	0
GAK12	35			✓	27 Jul 2003 23:03	58.2291	147.9403	2067	0
GAK11	39	✓			28 Jul 2003 01:31	58.3893	148.0800	1398	1398
GAK11	41		✓		28 Jul 2003 02:13	58.3865	148.0848	1396	0
GAK11	36			✓	28 Jul 2003 03:10	58.3720	148.0577	1396	0
GAK10	42		✓		28 Jul 2003 05:10	58.5437	148.2077	1426	20
GAK10	43		✓		28 Jul 2003 05:26	58.5395	148.2007	1481	0
GAK10	37			✓	28 Jul 2003 06:15	58.5341	148.1974	1481	0
GAK10	40	✓			28 Jul 2003 07:58	58.5350	148.2063	1493	1483
GAK9	41	✓			28 Jul 2003 14:06	58.6830	148.3412	278	275
GAK9	44		✓		28 Jul 2003 14:33	58.6746	148.3408	275	0
GAK9	38			✓	28 Jul 2003 15:38	58.6541	148.3321	275	0
GAK8	42	✓			28 Jul 2003 17:51	58.7838	148.5023	280	275
GAK8	45		✓		28 Jul 2003 18:06	58.7785	148.5103	278	0
GAK8	39			✓	28 Jul 2003 19:07	58.7749	148.4765	278	0
GAK7	43	✓			28 Jul 2003 21:22	58.9728	148.6460	242	238
GAK7	46		✓		28 Jul 2003 21:40	58.9741	148.6593	243	0
GAK7	40			✓	28 Jul 2003 22:34	58.9692	148.6099	243	0
GAK6	44	✓			29 Jul 2003 00:22	59.1165	148.7723	150	147
GAK6	47		✓		29 Jul 2003 00:34	59.1156	148.7784	150	0
GAK6	48		✓		29 Jul 2003 00:46	59.1151	148.7874	149	20
GAK6	41			✓	29 Jul 2003 01:43	59.1274	148.7801	149	20
GAK5	45	✓			29 Jul 2003 03:16	59.2615	148.9188	168	164
GAK5	49		✓		29 Jul 2003 03:28	59.2601	148.9266	170	0
GAK5	42			✓	29 Jul 2003 04:17	59.2763	148.9206	170	0
GAK4	50		✓		29 Jul 2003 05:30	59.4097	149.0455	199	0
GAK4	43			✓	29 Jul 2003 06:20	59.4191	149.0347	199	0
GAK4	46	✓			29 Jul 2003 07:34	59.4095	149.0548	200	198
GAK3	47	✓			29 Jul 2003 13:38	59.5520	149.1835	210	207
GAK3	51		✓		29 Jul 2003 13:52	59.5478	149.1862	211	0
GAK3	44			✓	29 Jul 2003 14:46	59.5630	149.2016	211	0
GAK2	48	✓			29 Jul 2003 16:22	59.6973	149.3342	266	224
GAK2	52		✓		29 Jul 2003 16:33	59.6964	149.3308	226	0
GAK2	45			✓	29 Jul 2003 17:17	59.7289	149.3649	226	0
GAK1	49	✓			29 Jul 2003 18:37	59.8452	149.4690	265	263
GAK1	53		✓		29 Jul 2003 18:51	59.8449	149.4688	267	0
GAK1	54		✓		29 Jul 2003 19:03	59.8400	149.4720	268	20
GAK1	46			✓	29 Jul 2003 20:01	59.8713	149.4524	265	0

Table 1. Con'd.

Station Name	Cast/Haul/ Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
GAK1i	50	✓			Cast Aborted				
GAK1i	51	✓			30 Jul 2003 15:46	59.7932	149.4237	270	267
GAK1i	47			✓	30 Jul 2003 16:35	59.7531	149.3888	270	0
GAK1i	52	✓			30 Jul 2003 17:36	59.7028	149.3610	241	236
GAK3	53	✓			30 Jul 2003 19:16	59.5218	149.1607	208	204
GAK3	48			✓	30 Jul 2003 20:03	59.4884	149.1290	208	0
GAK3	54	✓			30 Jul 2003 21:00	59.4573	149.1010	202	199
BS3	55	✓			30 Jul 2003 22:22	59.5888	149.0093	180	177
BS3	49			✓	30 Jul 2003 23:11	59.5529	148.9973	180	0
BS3	56	✓			31 Jul 2003 00:05	59.5190	148.9753	183	179
BS2	57	✓			31 Jul 2003 02:19	59.8565	149.2458	100	95
BS2	50			✓	31 Jul 2003 03:14	59.8741	149.1758	100	0
BS2	58	✓			31 Jul 2003 04:11	59.8905	149.1130	213	210
CF2	59	✓			31 Jul 2003 15:18	59.8802	148.9288	133	128
CF2	51			✓	31 Jul 2003 16:04	59.8841	148.8477	133	0
CF2	60	✓			31 Jul 2003 17:01	59.8842	148.7827	159	156
CF12	61	✓			31 Jul 2003 19:04	59.5493	148.8640	177	175
CF12	52			✓	31 Jul 2003 19:49	59.5638	148.7978	177	0
CF12	62	✓			31 Jul 2003 20:42	59.5792	148.7360	94	91
CF8	63	✓			31 Jul 2003 21:37	59.6780	148.8680	179	176
CF8	53			✓	31 Jul 2003 22:36	59.6500	148.9482	179	0
CF8	64	✓			31 Jul 2003 23:27	59.6393	149.0297	177	174
AC1	65	✓			01 Aug 2003 01:19	59.7238	149.3975	252	250
AC1	54			✓	01 Aug 2003 02:07	59.6785	149.3903	252	0
AC1	66	✓			01 Aug 2003 03:06	59.6377	149.3817	231	229
CC1	67	✓			01 Aug 2003 13:56	59.7405	147.8195	65	60
CC1	55		✓		01 Aug 2003 14:07	59.7386	147.8259	67	0
CC1	56		✓		01 Aug 2003 14:23	59.7343	147.8393	68	20
CC1	55			✓	01 Aug 2003 15:30	59.7127	147.7838	68	0
CC2	68	✓			01 Aug 2003 16:37	59.6700	147.7355	111	108
CC2	57		✓		01 Aug 2003 16:49	59.6717	147.7397	110	0
CC2	56			✓	01 Aug 2003 17:41	59.6663	147.7175	110	0
CC3	69	✓			01 Aug 2003 18:48	59.5685	147.6163	109	105
CC3	58		✓		01 Aug 2003 19:08	59.5674	147.6224	110	0
CC3	57			✓	01 Aug 2003 20:02	59.5626	147.5977	110	0
CC4	70	✓			01 Aug 2003 21:26	59.4773	147.4827	117	113
CC4	59		✓		01 Aug 2003 21:41	59.4814	147.4820	118	0
CC4	58			✓	01 Aug 2003 23:01	59.4800	147.4151	118	0
CC5	71	✓			02 Aug 2003 00:41	59.3562	147.3530	137	134
CC5	60		✓		02 Aug 2003 00:55	59.3569	147.3496	139	0
CC5	59			✓	02 Aug 2003 01:48	59.3673	147.3395	139	0
CC6	72	✓			02 Aug 2003 14:02	59.2317	147.1593	200	198
CC6	61		✓		02 Aug 2003 14:12	59.2300	147.1653	201	0
CC6	62		✓		02 Aug 2003 14:26	59.2270	147.1753	199	20
CC6	60			✓	02 Aug 2003 15:33	59.2145	147.1365	199	0
CC7	73	✓			02 Aug 2003 17:40	59.0592	146.9738	2100	1521
CC7	63		✓		02 Aug 2003 18:14	59.0620	146.9815	2100	0
CC7	61			✓	02 Aug 2003 19:08	59.0481	146.9528	2100	0
CC8	74	✓			02 Aug 2003 21:26	58.8792	146.7193	2800	1521
CC8	64		✓		02 Aug 2003 22:03	58.8795	146.7258	2800	0
CC8	65		✓		02 Aug 2003 22:14	58.8788	146.7337	2800	20
CC8	62			✓	02 Aug 2003 23:09	58.8869	146.7026	2800	0

Table 1. Con'd.

Station Name	Cast/Haul/ Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
CSE5	75	✓			03 Aug 2003 13:21	59.1518	144.6080	3660	1521
CSE5	66		✓		03 Aug 2003 13:45	59.1509	144.6217	3660	0
CSE5	63			✓	03 Aug 2003 14:45	59.1687	144.6037	3660	0
CSE4	76	✓			03 Aug 2003 16:41	59.3197	144.6105	3100	1522
CSE4	67		✓		03 Aug 2003 17:21	59.3176	144.6160	3100	0
CSE4	64			✓	03 Aug 2003 18:13	59.3303	144.6213	3100	0
CSE3	77	✓			03 Aug 2003 20:10	59.4802	144.6083	960	953
CSE3	68		✓		03 Aug 2003 20:36	59.4812	144.6168	960	0
CSE3	65			✓	03 Aug 2003 21:37	59.4883	144.6329	960	0
CSE2	78	✓			03 Aug 2003 23:03	59.6317	144.6048	146	142
CSE2	69		✓		03 Aug 2003 23:16	59.6312	144.6079	146	0
CSE2	66			✓	04 Aug 2003 00:10	59.6440	144.6134	146	0
CSE1	79	✓			04 Aug 2003 01:38	59.7842	144.6928	53	49
CSE1	70		✓		04 Aug 2003 01:49	59.7819	144.6950	53	0
CSE1	67			✓	04 Aug 2003 02:47	59.7679	144.7112	53	0
CY1	80	✓			04 Aug 2003 13:56	60.0378	142.4510	45	40
CY1	71		✓		04 Aug 2003 14:06	60.0371	142.4444	45	0
CY1	68			✓	04 Aug 2003 15:05	60.0310	142.4190	45	0
CY2	81	✓			04 Aug 2003 17:09	59.8982	142.4940	107	102
CY2	72		✓		04 Aug 2003 17:19	59.8965	142.4971	107	0
CY2	69			✓	04 Aug 2003 18:14	59.8927	142.5378	107	0
CY3	82	✓			04 Aug 2003 19:56	59.7377	142.5340	205	201
CY3	73		✓		04 Aug 2003 20:08	59.7351	142.5345	215	0
CY3	70			✓	04 Aug 2003 21:02	59.7392	142.5108	215	0
CY4	83	✓			04 Aug 2003 23:14	59.5700	142.5643	155	152
CY4	74		✓		04 Aug 2003 23:23	59.5689	142.5585	154	0
CY4	71			✓	05 Aug 2003 00:24	59.5487	142.5729	154	0
CY5	84	✓			05 Aug 2003 02:04	59.4633	142.5820	1289	1291
CY5	75		✓		05 Aug 2003 02:32	59.4597	142.5752	1285	0
CY5	72			✓	05 Aug 2003 03:33	59.4420	142.5942	1285	0
CY6	85	✓			05 Aug 2003 13:08	59.3045	142.6442	2010	1521
CY6	76		✓		05 Aug 2003 13:45	59.3089	142.6523	2010	0
CY6	73			✓	05 Aug 2003 14:44	59.2766	142.6432	2010	0
CY7	86	✓			05 Aug 2003 16:39	59.1263	142.6843	2860	1520
CY7	77		✓		05 Aug 2003 17:17	59.1274	142.6910	2860	0
CY7	74			✓	05 Aug 2003 18:27	59.0971	142.6751	2860	0
CY8	87	✓			05 Aug 2003 20:13	58.9618	142.7265	3200	1521
CY8	78		✓		05 Aug 2003 20:50	58.9643	142.7277	3200	0
CY8	75			✓	05 Aug 2003 21:55	58.9373	142.7001	3200	0
CY9	88	✓			05 Aug 2003 23:54	58.8010	142.7493	3100	1519
CY9	79		✓		06 Aug 2003 00:38	58.8059	142.7379	3100	0
CY9	76			✓	06 Aug 2003 01:40	58.7963	142.7913	3100	0
OC10	89	✓			06 Aug 2003 13:13	58.0213	140.4287	3400	1521
OC10	80		✓		06 Aug 2003 13:56	58.0252	140.4388	3400	0
OC10	77			✓	06 Aug 2003 15:07	58.0342	140.4701	3400	0
OC9	90	✓			06 Aug 2003 17:14	58.1732	140.3573	3400	1520
OC9	81		✓		06 Aug 2003 17:52	58.1668	140.3500	3400	0
OC9	78			✓	06 Aug 2003 18:50	58.1899	140.3882	3400	0
OC8	91	✓			06 Aug 2003 20:58	58.3412	140.3100	3200	1523
OC8	82		✓		06 Aug 2003 21:33	58.3431	140.3104	3200	0
OC8	79			✓	06 Aug 2003 22:50	58.3474	140.3293	3200	0
OC7	92	✓			07 Aug 2003 01:07	58.4995	140.2437	2400	1521
OC7	83		✓		07 Aug 2003 01:48	58.5032	140.2323	2400	0
OC7	80			✓	07 Aug 2003 02:41	58.5064	140.2729	2400	0

Table 1. Con'd.

Station Name	Cast/Haul/ Trawl No.	CTD Cast	Tucker Haul	Trawl	Time (GMT=ADT+8)	Lat. (deg. N)	Lon. (deg. W)	Bottom Depth (m)	Sampling Depth (m)
OC6	93	✓			07 Aug 2003 04:22	58.6698	140.1892	217	213
OC6	84		✓		07 Aug 2003 04:33	58.6700	140.1819	219	0
OC6	81			✓	07 Aug 2003 05:19	58.6758	140.2121	219	0
OC5	94	✓			07 Aug 2003 13:10	58.8885	140.1085	169	166
OC5	85		✓		07 Aug 2003 13:23	58.8902	140.1113	170	0
OC5	82			✓	07 Aug 2003 14:26	58.9022	140.1483	170	0
OC4	95	✓			07 Aug 2003 16:01	59.0517	140.0487	128	124
OC4	86		✓		07 Aug 2003 16:11	59.0513	140.0456	128	0
OC4	83			✓	07 Aug 2003 17:02	59.0663	140.0452	128	0
OC3	96	✓			07 Aug 2003 18:30	59.2203	139.9912	126	123
OC3	87		✓		07 Aug 2003 18:41	59.2202	139.9876	126	0
OC3	84			✓	07 Aug 2003 19:27	59.2310	140.0055	126	0
OC2	97	✓			07 Aug 2003 20:58	59.3827	139.9303	182	179
OC2	88		✓		07 Aug 2003 21:10	59.3856	139.9320	182	0
OC2	85			✓	07 Aug 2003 22:03	59.3836	139.9538	182	0
OC1	98	✓			07 Aug 2003 23:28	59.4928	139.8853	77	73
OC1	89		✓		07 Aug 2003 23:40	59.4936	139.8850	76	0
OC1	86			✓	08 Aug 2003 00:36	59.4991	139.9110	76	0

**Table 2. Catch per unit effort (CPUE = number of fish per 30-minute trawl) of juvenile (J), immature (I) and adult (A) salmon from Miller Freeman cruise MF-03-10 in the Gulf of Alaska, 18 July-9 August 2003. Dash (-) indicates no fish caught.**

Station Name	Trawl No.	J	A	J	I	A	J	I	A	J	A	J	I	A	J	I	A
CCH1	1	-	10	-	-	8	-	-	-	4	-	-	-	-	-	-	-
CCH2	2	-	12	-	3	-	-	-	-	2	-	-	-	-	-	-	-
CCH3	3	-	28	-	-	1	-	-	-	-	-	1	-	-	-	-	-
CCH4	4	7	17	-	1	-	-	-	29	24	-	-	6	-	-	-	4
CCH5	5	-	3	-	20	3	-	-	-	9	-	-	-	-	-	-	2
CCH6	6	-	15	-	-	38	-	-	-	26	-	-	-	-	1	-	6
CCH7	7	-	1	-	-	14	-	-	-	23	-	-	-	-	-	-	-
CKAG6	8	-	11	-	-	5	-	2	-	20	-	-	-	-	-	-	-
CKAG5	9	-	2	-	-	20	-	3	-	6	-	-	-	-	-	-	-
CKAG4	10	-	11	-	-	13	-	3	-	1	-	6	-	3	-	-	-
CKAG3	11	-	42	-	-	10	-	-	-	7	-	7	-	3	-	1	-
CKAG2	12	-	23	-	-	2	-	1	-	40	-	2	-	2	-	2	-
CKAG1	13	-	23	-	-	-	-	-	1	2	-	3	-	1	-	-	-
CK3	14	105	20	-	10	-	-	4	-	1	-	2	-	-	-	-	-
CK2	15	121	9	-	7	5	-	4	-	60	-	10	-	4	-	-	-
CK1	16	364	7	-	85	1	-	1	-	171	-	22	-	1	-	-	-
CN1	17	-	12	-	-	-	-	1	-	22	-	65	-	5	-	-	-
CN2	18	85	5	-	-	2	-	-	-	-	-	6	-	2	-	-	-
CN3	19	579	-	-	26	-	-	4	-	4	-	4	-	2	-	-	-
GP1	20	10	5	-	-	4	-	1	-	10	-	8	-	1	-	-	-
GP2	21	1	4	-	-	5	-	4	-	4	-	1	-	1	-	-	-
GP3	22	40	1	-	10	-	26	-	22	-	10	-	-	9	-	-	-
GP4	23	519	1	-	23	10	-	-	23	-	14	-	1	-	-	-	-
GP5	24	250	-	-	5	7	-	-	14	-	8	-	-	-	-	-	-
GP6	25	3	3	-	-	1	-	2	-	-	-	2	-	2	-	-	-
GP7	26	-	12	-	-	1	-	-	-	-	-	-	-	-	-	-	-
GP8	27	-	35	-	-	8	-	3	-	-	-	-	-	-	-	-	-
GP9	28	103	9	-	3	9	-	-	3	-	-	-	-	1	-	-	-
GP10	29	197	17	-	7	4	-	-	-	-	-	-	-	1	-	-	-
GP11	30	-	7	-	-	12	-	-	-	1	-	-	-	1	-	-	-
GP12	31	-	29	-	-	-	-	-	-	3	-	-	-	1	-	-	-
GP13	32	-	-	-	-	13	-	1	-	-	-	-	-	-	-	-	2
GP14	33	-	5	-	-	16	-	1	-	-	-	-	-	-	-	-	-
GAK13	34	-	1	-	-	53	-	-	-	-	-	-	-	-	-	-	-
GAK12	35	-	4	-	-	62	-	10	-	-	-	-	-	-	-	-	1
GAK11	36	-	-	-	-	29	-	-	-	-	-	2	-	-	-	-	-
GAK10	37	11	6	-	1	15	-	1	-	-	-	3	-	-	-	-	2
GAK9	38	198	17	-	14	20	-	5	-	10	-	7	-	-	-	-	-
GAK8	39	12	1	-	1	2	-	-	-	1	-	1	-	-	-	-	-
GAK7	40	1	5	-	-	18	-	-	4	-	-	8	-	-	-	-	-
GAK6	41	148	29	-	22	7	-	-	35	-	-	12	-	-	-	-	-
GAK5	42	153	15	-	58	-	-	-	41	-	-	22	-	-	-	-	-
GAK4	43	465	27	-	30	-	-	-	112	-	-	55	-	-	-	-	-
GAK3	44	114	4	-	49	2	-	-	47	-	-	9	-	2	-	-	-
GAK2	45	57	-	-	12	-	-	-	2	-	-	-	-	-	-	-	-
GAK1	46	76	-	-	13	-	-	-	1	-	-	5	-	-	-	-	-

Table 2. Cont'd.

Station Name	Trawl No.	Pink		Chum		Chum		Sockeye		Sockeye		Coho		Chinook		Chinook		Steelhead		Steelhead	
		J	A	J	I	J	A	J	I	J	A	J	A	J	I	J	A	J	I	J	A
GAK11	47	372	3	142	-	-	-	-	9	-	1	-	3	-	-	-	-	-	-	-	-
GAK3	48	260	73	73	13	-	-	54	-	-	-	40	-	-	-	-	-	-	-	-	-
BS3	49	146	8	123	3	-	-	108	-	-	-	20	1	-	-	-	-	-	-	-	-
BS2	50	482	2	129	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CF2	51	94	5	22	1	-	-	2	-	-	-	23	3	-	-	-	-	-	-	-	-
CF12	52	160	2	279	1	-	-	106	-	-	-	13	-	-	-	-	-	-	-	-	-
CF8	53	1	8	4	7	-	-	3	-	-	-	21	-	-	-	-	-	-	-	-	-
AC1	54	189	39	133	1	-	-	26	-	-	-	2	-	-	-	-	-	-	-	-	-
CC1	55	-	-	4	-	-	-	8	-	-	-	41	-	3	-	-	-	-	-	-	-
CC2	56	10	3	31	-	-	-	21	-	-	-	20	1	-	-	-	-	-	-	-	-
CC3	57	1156	8	623	9	-	-	155	-	-	-	10	-	-	-	-	-	-	-	-	-
CC4	58	205	7	60	2	-	-	38	-	-	-	21	-	-	-	-	-	-	-	-	-
CC5	59	67	32	72	1	-	-	30	-	-	-	42	1	-	-	-	-	-	-	-	-
CC6	60	-	4	-	6	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
CC7	61	-	8	-	53	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
CC8	62	-	-	-	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSE5	63	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSE4	64	-	48	-	6	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-
CSE3	65	2	31	2	8	-	-	4	-	-	-	81	-	-	-	-	-	-	-	-	-
CSE2	66	6	5	5	-	-	-	2	-	-	-	38	-	1	-	-	-	-	-	-	-
CSE1	67	149	-	57	-	-	-	46	-	-	-	3	1	-	-	-	-	-	-	-	-
CY1	68	2	-	7	-	-	-	-	-	-	-	48	3	-	-	-	-	-	-	-	-
CY2	69	438	8	112	1	-	-	64	-	-	-	9	1	-	-	-	-	-	-	-	-
CY3	70	-	12	-	1	-	-	4	-	-	-	116	2	-	-	-	-	-	-	-	-
CY4	71	-	15	-	1	-	-	1	-	-	-	39	1	-	-	-	-	-	-	-	-
CY5	72	-	5	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-
CY6	73	-	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY7	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY8	75	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY9	76	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC10	77	-	5	-	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
OC9	78	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC8	79	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC7	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC6	81	-	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC5	82	-	1	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-
OC4	83	24	4	6	4	-	-	13	-	-	-	22	2	-	-	-	-	-	-	-	-
OC3	84	434	4	90	7	-	-	49	-	-	-	358	6	1	-	-	-	-	-	-	-
OC2	85	266	3	132	-	-	-	18	-	-	-	28	3	1	-	-	-	-	-	-	-
OC1	86	58	4	48	-	-	-	-	-	-	-	64	2	-	-	-	-	-	-	-	-

Table 3. Catch per unit effort (CPUE = number of fish per 30-minute trawl) of marine fishes from Miller Freeman cruise MF-03-10 in the Gulf of Alaska, 18 July-9 August 2003. Life history stages denoted by juvenile (J), young-of-year (YOY) and adult (A). Dash (-) indicates no fish caught.

Station Name	Trawl No.	Pollock J	Pollock YOY	Pollock A	Herring	Capelin	Sand-lance	Wolf Eel	Dagger-tooth fish	Prow-Sable Fish	Rock Fish J	Dog Fish	Sand Squid	Salmon Shark	Lump-sucker
CCH1	1	1	-	-	-	-	-	-	-	4	-	-	-	-	1
CCH2	2	40	-	-	-	-	-	-	-	2	-	-	-	-	2
CCH3	3	17	-	1	-	-	-	-	-	3	-	-	-	-	-
CCH4	4	-	-	-	-	-	-	-	-	6	1	-	-	-	-
CCH5	5	-	-	-	-	-	-	-	-	19	2	-	-	-	-
CCH6	6	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CCH7	7	-	-	-	-	-	-	1	1	-	-	-	5	-	-
CKAG6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG5	9	-	-	-	-	-	-	-	-	-	10	-	-	-	-
CKAG4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG3	11	1	-	1	-	-	-	-	-	4	-	-	-	-	1
CKAG2	12	21	-	-	2	-	-	-	-	3	-	1	22	-	2
CKAG1	13	30	-	-	-	-	-	-	-	9	-	-	-	-	-
CK3	14	1000	-	1	2	-	100	-	-	-	-	-	-	1	2
CK2	15	16	-	-	3	-	3	-	-	-	-	-	-	1	-
CK1	16	8	-	-	1	-	-	-	-	2	-	-	-	-	-
CN1	17	3	-	-	-	-	28	-	1	6	1	-	-	-	-
CN2	18	-	-	-	-	-	1	-	-	6	-	-	-	-	-
CN3	19	1	-	-	-	-	-	-	-	1	-	-	1	-	-
GP1	20	3	-	1	-	-	-	-	-	1	-	-	-	-	-
GP2	21	1	-	-	-	-	-	-	-	-	-	6	-	-	-
GP3	22	-	-	-	1	-	-	-	-	-	-	2	-	-	-
GP4	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP5	24	-	-	-	-	-	-	-	-	17	-	-	-	-	-
GP6	25	-	-	-	-	27	3	-	-	-	2	-	-	-	-
GP7	26	-	-	-	-	84	-	-	-	-	-	-	-	-	-
GP8	27	-	-	-	-	7	-	-	-	1	-	-	-	-	2
GP9	28	-	-	-	-	-	-	-	-	2	-	-	-	-	-
GP10	29	-	-	-	-	-	-	-	-	1	-	-	-	-	-
GP11	30	-	-	-	-	-	-	-	-	-	30	-	-	-	1
GP12	31	-	-	-	-	-	-	-	-	-	144	-	-	-	-
GP13	32	-	-	-	-	-	-	1	-	-	61	-	-	-	-
GP14	33	-	-	-	-	-	-	-	-	-	1	-	4	-	-
GAK13	34	-	-	-	-	-	-	-	-	-	6	-	-	-	-
GAK12	35	-	-	-	-	-	-	-	-	1	-	-	-	-	-
GAK11	36	-	-	-	-	-	-	-	-	1	30	-	-	-	-
GAK10	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK9	38	-	-	-	-	-	-	-	-	-	2	-	-	-	-
GAK8	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK7	40	-	-	-	-	-	-	-	-	-	5	-	-	-	-
GAK6	41	-	-	-	-	-	-	-	-	-	-	10	-	-	-
GAK5	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK4	43	-	-	-	1	-	-	-	-	-	-	-	-	-	-
GAK3	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK2	45	-	-	-	-	-	-	-	-	1	-	-	-	-	-
GAK1	46	-	-	-	11	-	-	-	-	-	-	-	-	-	-

Table 3. Cont'd.

Station Name	Trawl No.	Stickleback	Gadids	P. Cod	T. Cod	Cod	Crested Sculpin	Dall's Porpoise	Atka Mac.	Smelt	Dolly Vardem	Pomfret	P. Armor-head	Tadpole Sculpin	Blue Shark	Snail-fish
CCH1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH5	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCH7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG5	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG4	10	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG2	12	-	21	-	-	-	-	-	-	-	-	-	-	-	-	-
CKAG1	13	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
CK3	14	-	-	-	-	500	5	-	-	-	-	-	-	-	-	-
CK2	15	-	-	5	-	-	-	1	-	-	-	-	-	-	-	-
CK1	16	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
CN1	17	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-
CN2	18	-	-	3	4	-	-	-	-	-	-	-	-	-	-	-
CN3	19	-	-	4	7	-	-	-	-	-	-	-	-	-	-	-
GP1	20	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-
GP2	21	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
GP3	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP4	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP5	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP6	25	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
GP7	26	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
GP8	27	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
GP9	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP10	29	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
GP11	30	-	3	-	-	-	-	-	1	-	-	-	-	-	-	-
GP12	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP13	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GP14	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK13	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK12	35	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
GAK11	36	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
GAK10	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK9	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK8	39	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
GAK7	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK6	41	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
GAK5	42	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
GAK4	43	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
GAK3	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK2	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
GAK1	46	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-



Table 3. Con'd.

Station Name	Trawl No.	Pollock J	Pollock YOY	Pollock A	Herring	Capelin	Sand-lance	Wolf Eel	Dagger-tooth fish	Prow-fish	Sable Fish	Rock J Fish	Dog Fish	Sand Fish	Squid	Salmon	Lump-Sucker
GAK1	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GAK3	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS3	49	-	-	1	-	-	-	-	-	3	-	-	-	-	-	-	-
BS2	50	-	-	-	1	-	-	-	-	13	-	-	-	-	-	-	-
CF12	51	-	-	-	1	-	-	1	-	-	5	-	-	-	-	-	-
CF8	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF8	53	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
AC1	54	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
CC1	55	-	-	-	2	82	3	-	-	5	1	-	109	-	-	-	-
CC2	56	-	-	-	-	-	-	-	-	5	-	-	2	-	-	-	-
CC3	57	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
CC4	58	-	-	-	-	3	-	-	-	1	1	-	19	-	12	-	-
CC5	59	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CC6	60	-	-	-	-	-	-	-	-	1	-	5	1	-	150	-	-
CC7	61	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CC8	62	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CSE5	63	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-
CSE4	64	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CSE3	65	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CSE2	66	-	-	-	-	-	-	-	-	-	-	-	61	-	-	-	-
CSE1	67	-	-	-	20	-	-	-	-	-	-	-	1	-	-	-	-
CY1	68	-	-	-	3991	-	-	1	-	-	-	-	14	-	-	-	-
CY2	69	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
CY3	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY4	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY5	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY6	73	-	-	-	-	-	-	1	-	-	-	22	-	-	-	-	-
CY7	74	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-
CY8	75	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-
CY9	76	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-	-
OC10	77	-	-	-	-	-	-	-	1	-	-	-	-	-	150	-	-
OC9	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC8	79	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-
OC7	80	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-
OC6	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC5	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC4	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC3	84	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
OC2	85	-	-	-	-	1	-	1	-	-	2	-	-	-	-	-	-
OC1	86	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-

Table 3. Con'd.

Station Name	Trawl No.	Stickel back	Gadids J	P. Cod J	T. Cod J	Cod J	Crested Sculpin	Dall's Porpoise	Atka Mac.	Smelt	Dolly Vardem	Pomfret	P. Armor-head	Tadpole Sculpin	Blue Shark	Snail-fish
GAK1i	47	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
GAK3	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS3	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BS2	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF2	51	-	-	-	64	-	-	-	-	-	-	-	-	-	-	-
CF12	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CF8	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC1	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC1	55	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-
CC2	56	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
CC3	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC4	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC5	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC6	60	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CC7	61	9753	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CC8	62	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
CSE5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSE4	64	-	-	-	-	-	-	2	-	-	-	21	-	-	-	-
CSE3	65	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-
CSE2	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CSE1	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY1	68	-	-	-	-	-	-	-	-	867	1	-	-	-	-	-
CY2	69	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
CY3	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CY4	71	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-
CY5	72	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
CY6	73	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
CY7	74	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-
CY8	75	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-
CY9	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC10	77	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
OC9	78	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
OC8	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC7	80	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
OC6	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC5	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC4	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC3	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC2	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OC1	86	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-

Table 4. Juvenile Pink Salmon Stomach Contents. Seward Line and Blying Sound Stations, 30 July 2003 ADT.  
Analyzed by Angela Middleton, Cruise MF-03-10.

Station Name	Trawl No.	Control No.	FL mm	Weight g	% full	Digestion 1,2,3	% Barnacle cypris	% Barnacle nauplius	% Bivalve veliger	% Cladocera Podon	% gastropod veliger	% Ostracod	Limacina	Calanoid Copepod	larval fish
GAK1i	47	1259	92	6	30	2	-	-	-	-	-	-	10	-	-
GAK1i	47	1260	100	10	30	2	10	-	35	35	20	-	-	-	-
GAK1i	47	1261	105	9	30	2	5	-	15	60	-	5	10	-	-
GAK1i	47	1262	169	48	10	3	-	-	-	-	-	-	100	-	-
GAK1i	47	1263	141	25	0	0	-	-	-	-	-	-	-	-	-
GAK1i	47	1264	117	13	20	2	-	-	-	-	-	-	-	40	60
GAK1i	47	1265	131	19	50	2	-	-	-	-	5	-	20	20	-
GAK1i	47	1266	146	27	40	2	-	-	-	-	-	-	-	20	-
GAK1i	47	1267	126	17	30	2	-	-	-	5	5	-	-	60	-
GAK1i	47	1268	114	12	5	2	-	-	-	-	-	-	-	100	-
GAK3	48	1340	166	40	20	2	-	-	-	-	-	-	-	50	-
GAK3	48	1341	135	20	60	2	-	-	-	-	-	-	-	50	-
GAK3	48	1342	159	38	50	2	-	-	-	-	-	-	5	25	50
GAK3	48	1343	155	34	90	2	-	-	-	-	-	-	-	95	-
GAK3	48	1344	139	24	100	1	-	-	-	-	-	-	-	1	99
GAK3	48	1345	130	18	40	2	-	-	-	-	-	-	5	60	-
GAK3	48	1346	167	40	35	2	-	-	-	-	-	-	-	-	95
GAK3	48	1347	162	36	20	2	-	-	-	-	-	-	-	1	-
GAK3	48	1348	160	40	85	2/3	-	-	-	-	-	-	5	-	50
GAK3	48	1349	178	50	15	2/3	-	-	-	-	-	-	-	-	-
BS3	49	1400	155	34	5	2	-	-	-	-	-	-	-	100	-
BS3	49	1401	138	23	50	3	-	-	-	-	-	-	-	50	30
BS3	49	1402	130	18	50	2	-	-	-	-	-	-	-	100	-
BS3	49	1403	167	41	40	2	-	-	-	-	-	-	5	20	10
BS3	49	1404	135	19	50	2	-	-	-	-	-	-	5	95	-
BS3	49	1405	126	18	50	2	-	-	-	-	-	-	2	98	-
BS3	49	1406	146	27	50	2	-	-	-	-	-	-	6	90	-
BS3	49	1407	140	24	60	2	-	-	-	-	-	-	-	100	-
BS3	49	1408	149	27	0	0	-	-	-	-	-	-	-	-	-
BS3	49	1409	157	34	70	2	-	-	-	-	-	-	-	100	-
BS2	50	1470	152	32	10	2	-	-	-	-	-	-	90	-	10
BS2	50	1471	113	14	15	2	-	-	-	-	-	-	20	60	20
BS2	50	1472	113	14	15	2	-	-	-	-	-	-	45	80	-
BS2	50	1473	122	14	10	2	-	-	-	-	-	-	20	50	-
BS2	50	1474	143	28	50	2	-	-	-	-	-	-	100	-	-
BS2	50	1475	117	14	70	2	-	-	-	-	1	-	5	89	-
BS2	50	1476	151	32	90	3	-	-	-	-	-	-	50	30	-
BS2	50	1477	116	14	0	0	-	-	-	-	-	-	-	-	-
BS2	50	1478	161	34	5	2	-	-	-	-	-	-	-	100	-
BS2	50	1479	141	28	90	2	-	-	-	-	-	-	80	-	20

Table 4. Cont'd.

Station Name	Trawl No.	Control No.	Crab Larvae	Crab Zoea	Crab Megalopa	Crab	Euphausiid	Amphipod Grammarid	Amphipod Hyperid	Chaetognath	UNIDENT.
GAK1i	47	1259	-	-	-	-	-	-	-	-	-
GAK1i	47	1260	-	-	-	-	-	-	-	-	-
GAK1i	47	1261	-	-	-	-	-	-	-	-	-
GAK1i	47	1262	-	-	-	-	-	-	-	-	-
GAK1i	47	1263	-	-	-	-	-	-	-	-	-
GAK1i	47	1264	-	-	-	-	-	-	-	-	-
GAK1i	47	1265	-	50	-	-	-	-	-	-	5
GAK1i	47	1266	-	-	-	30	-	30	20	-	-
GAK1i	47	1267	-	-	-	-	-	-	-	10	-
GAK1i	47	1268	-	-	-	-	-	-	-	-	20
GAK3	48	1340	-	50	-	-	-	-	-	-	-
GAK3	48	1341	-	45	-	-	-	-	-	-	-
GAK3	48	1342	-	20	-	-	-	-	-	-	-
GAK3	48	1343	-	5	-	-	-	-	-	-	-
GAK3	48	1344	-	-	-	-	-	-	-	-	-
GAK3	48	1345	-	35	-	-	-	-	-	-	-
GAK3	48	1346	-	-	-	-	-	-	5	-	-
GAK3	48	1347	-	5	-	84	-	5	5	-	-
GAK3	48	1348	-	-	-	45	-	-	-	-	-
GAK3	48	1349	-	80	-	10	-	-	10	-	-
BS3	49	1400	-	-	-	-	-	-	-	-	-
BS3	49	1401	-	-	-	-	-	-	-	10	-
BS3	49	1402	-	-	-	-	-	-	-	-	10
BS3	49	1403	-	-	-	40	-	-	15	-	-
BS3	49	1404	-	-	-	-	-	-	-	10	-
BS3	49	1405	-	-	-	-	-	-	-	-	-
BS3	49	1406	2	-	-	-	-	-	2	-	-
BS3	49	1407	-	-	-	-	-	-	-	-	-
BS3	49	1408	-	-	-	-	-	-	-	-	-
BS3	49	1409	-	-	-	-	-	-	-	-	-
BS2	50	1470	-	-	-	-	-	-	-	-	-
BS2	50	1471	-	-	-	-	-	-	-	-	-
BS2	50	1472	-	-	-	-	-	-	5	-	-
BS2	50	1473	-	-	-	-	-	-	-	-	-
BS2	50	1474	-	-	-	-	-	-	-	-	-
BS2	50	1475	-	5	-	-	-	-	-	-	20
BS2	50	1476	-	-	-	-	-	-	-	-	-
BS2	50	1477	-	-	-	-	-	-	-	-	-
BS2	50	1478	-	-	-	-	-	-	-	-	-
BS2	50	1479	-	-	-	-	-	-	-	-	-

OCC/GLOBEC Cruise MF-03-10 Trackline and CTD Cast Locations, 18 July-9 Aug 2003  
Depth contours at 0, 100, 200, 500, 1000, 2000 m

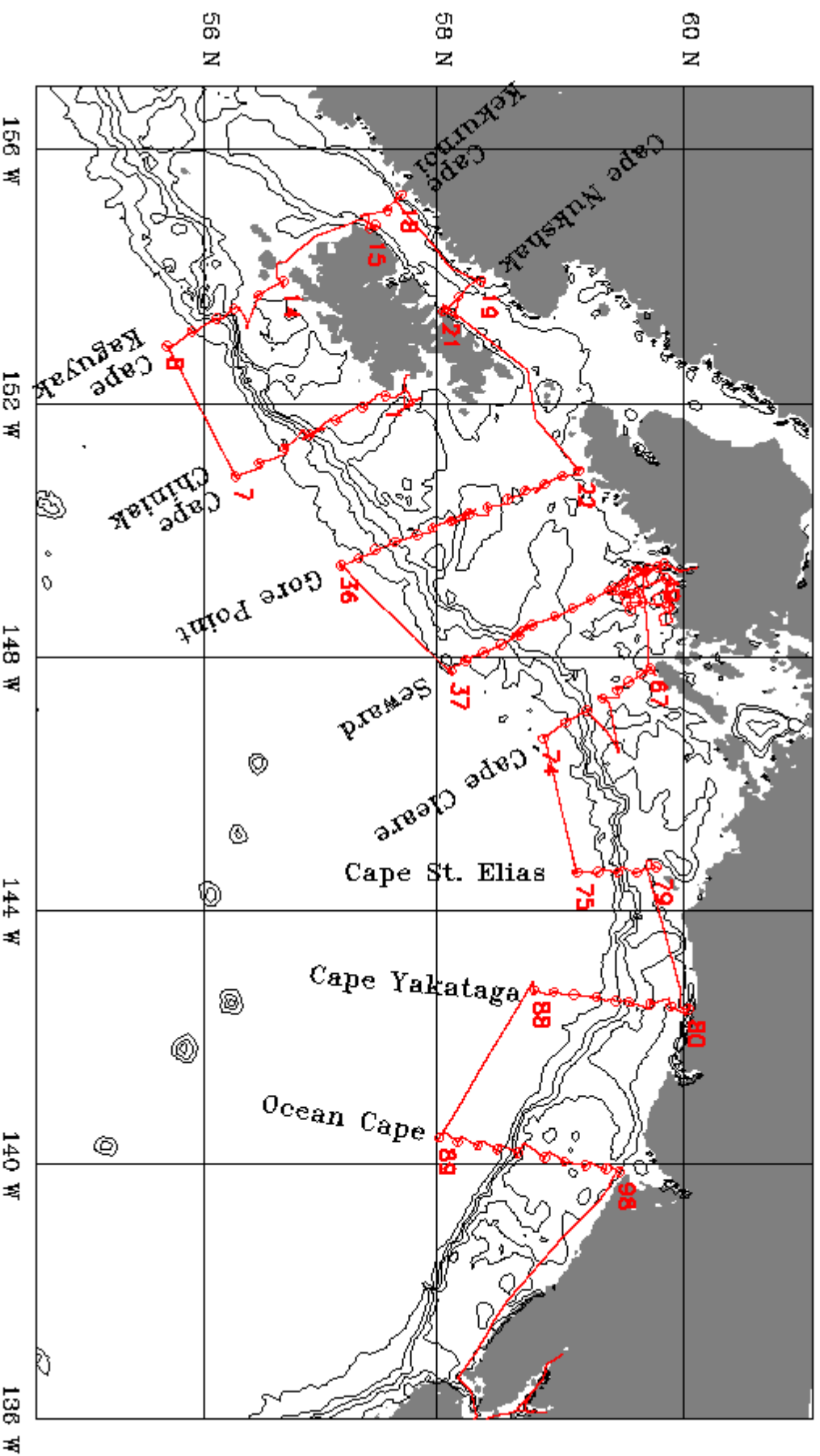


Figure 1. Cruise MF-03-10 transects, trackline and CTD cast locations.

OCC/GLOBEC Cruise MF-03-10 Trawl Locations, 18 July-9 Aug 2003  
Depth contours at 0, 100, 200, 500, 1000, 2000 m

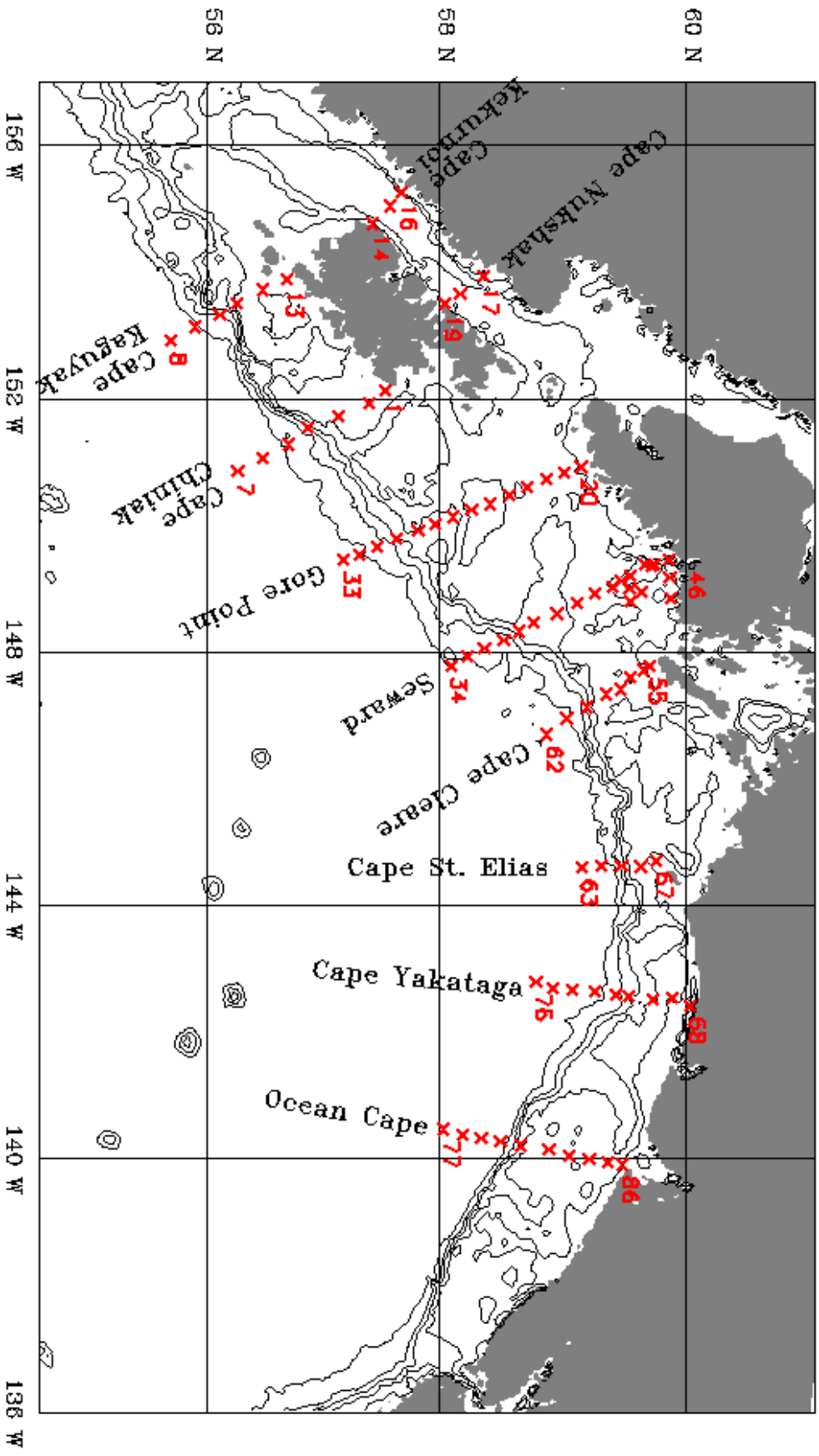


Figure 2. Cruise MF-03-10 transects and trawl locations.

Salinity & Juv. Pink Salmon CPUE, Miller Freeman MF-03-10, 29 Jul-1 Aug 2003

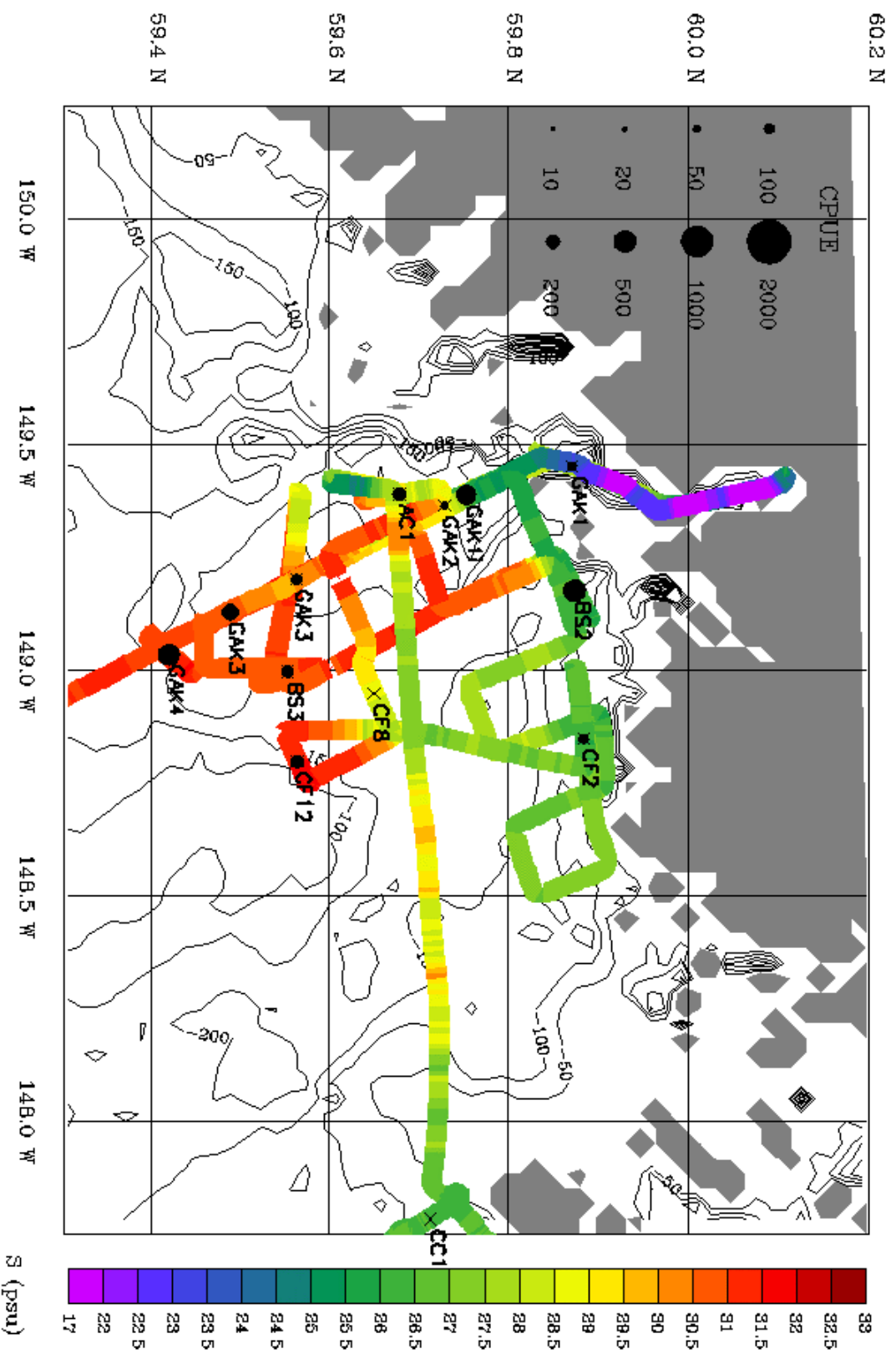


Figure 3. Near-surface salinity and juvenile pink salmon CPUE on the Seward Line and in Blyling Sound.

Salinity & Juv. Chum Salmon CPUE, Miller Freeman MF-03-10, 29 Jul-1 Aug 2003

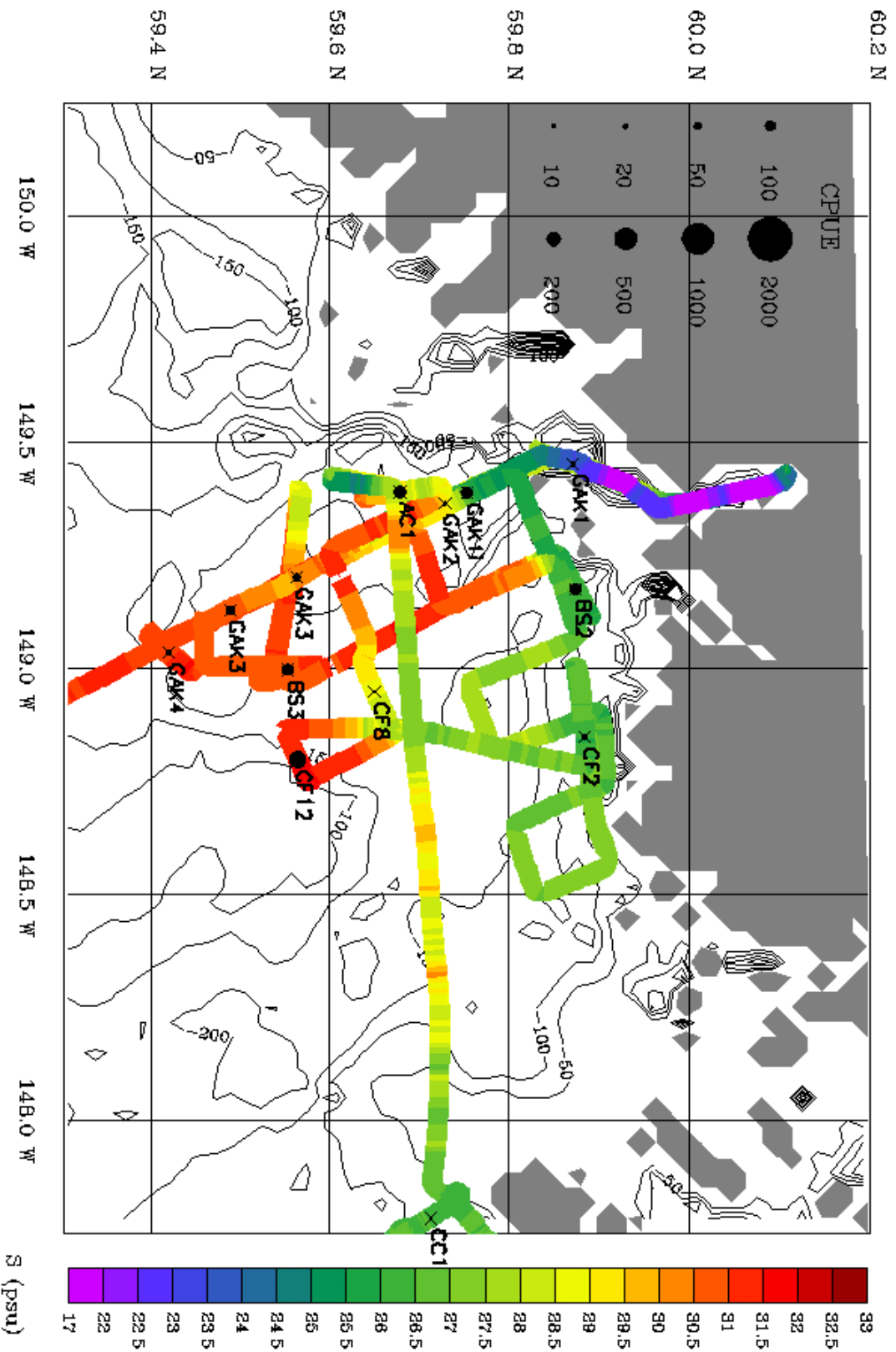


Figure 4. Near-surface salinity and juvenile chum salmon CPUE on the Seward Line and in Blyling Sound.



Salinity & Juv. Coho Salmon CPUE, *Miller Freeman MF-03-10*, 29 Jul-1 Aug 2003

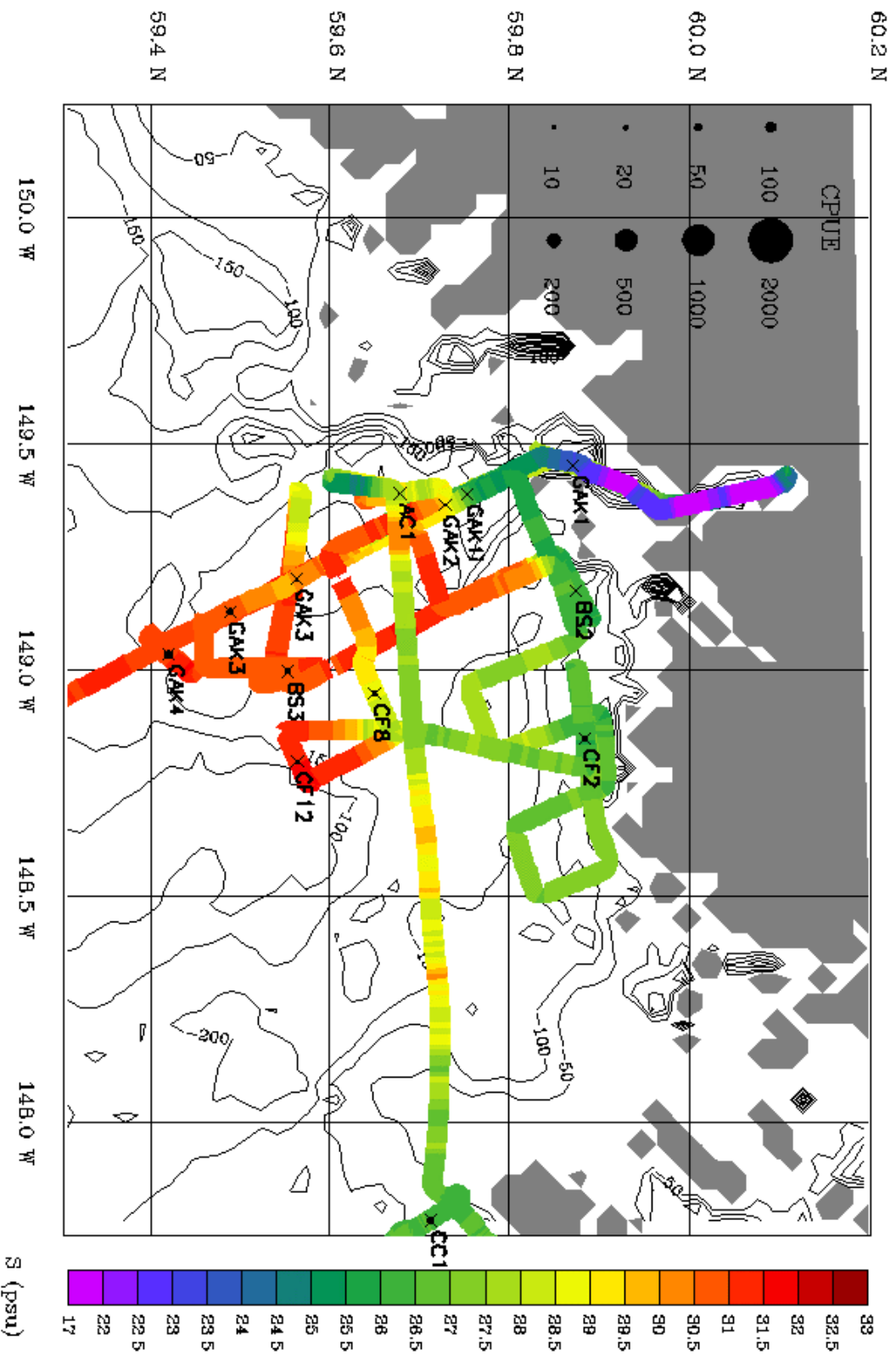


Figure 5. Near-surface salinity and juvenile coho salmon CPUE on the Seward Line and in Blyling Sound.

Salinity & Juv. Sockeye Salmon CPUE, *Miller Freeman MF-03-10*, 29 Jul-1 Aug 2003

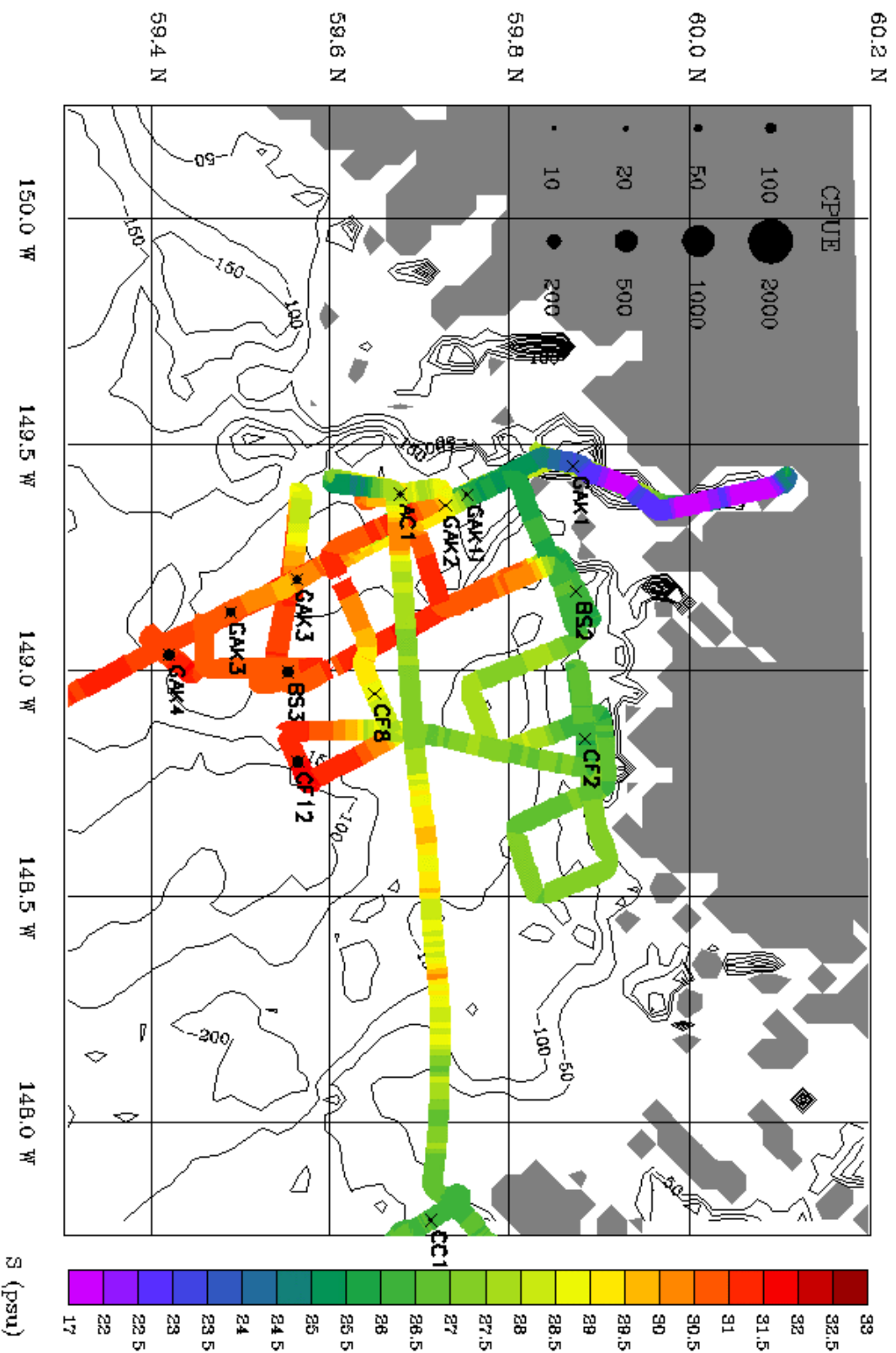


Figure 6. Near-surface salinity and juvenile sockeye salmon CPUE on the Seward Line and in Blyling Sound.

Juvenile Pink Salmon CPUE, OCC/GLOBEC Cruise MF-03-10, 18 July-9 Aug 2003  
 Depth contours at 0, 100, 200, 500, 1000, 2000 m

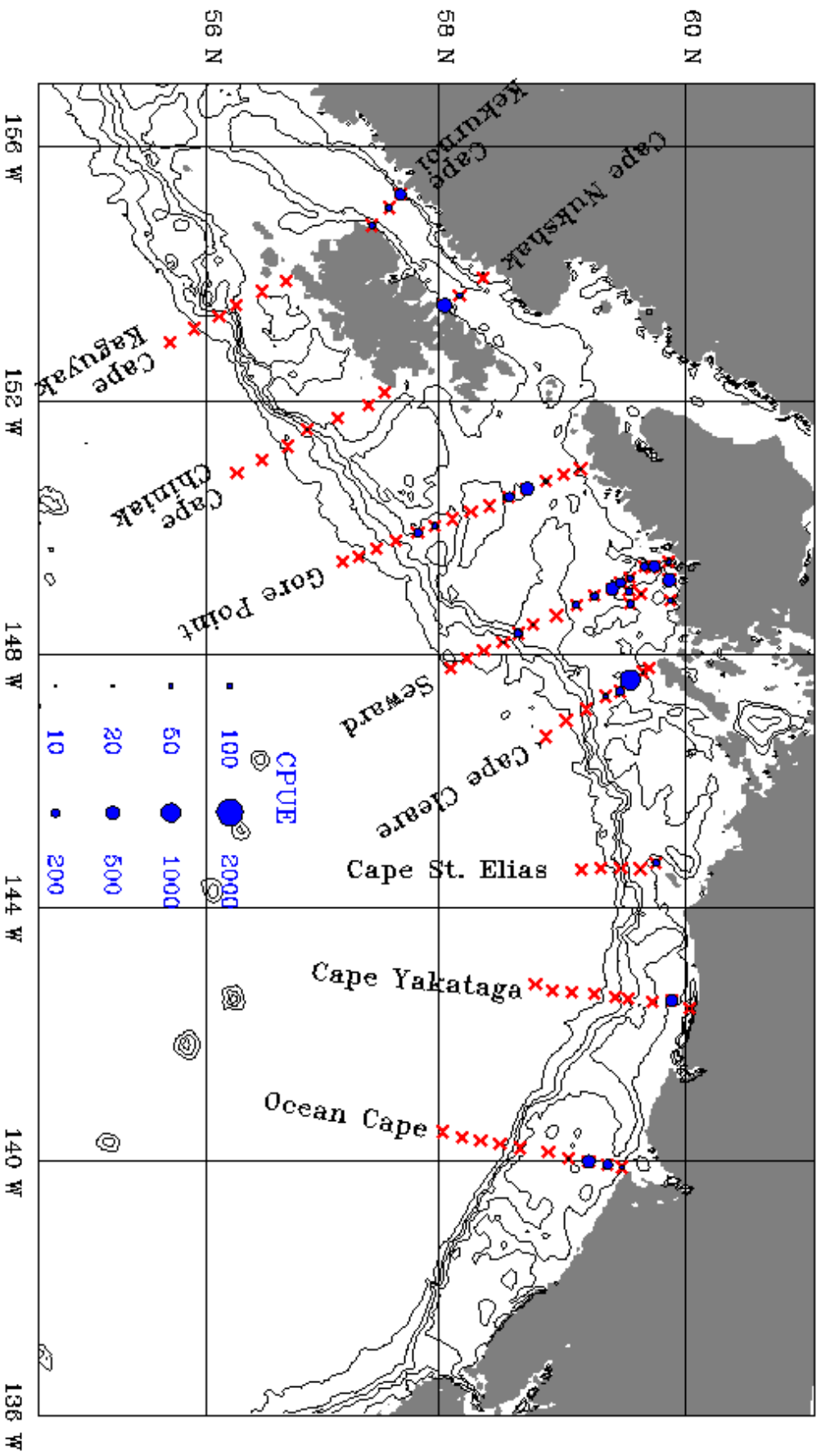


Figure 7. Juvenile pink salmon CPUE from Miller Freeman cruise MF-03-10.

Juvenile Chum Salmon CPUE, OCC/GLOBEC Cruise MF-03-10, 18 July-9 Aug 2003  
 Depth contours at 0, 100, 200, 500, 1000, 2000 m

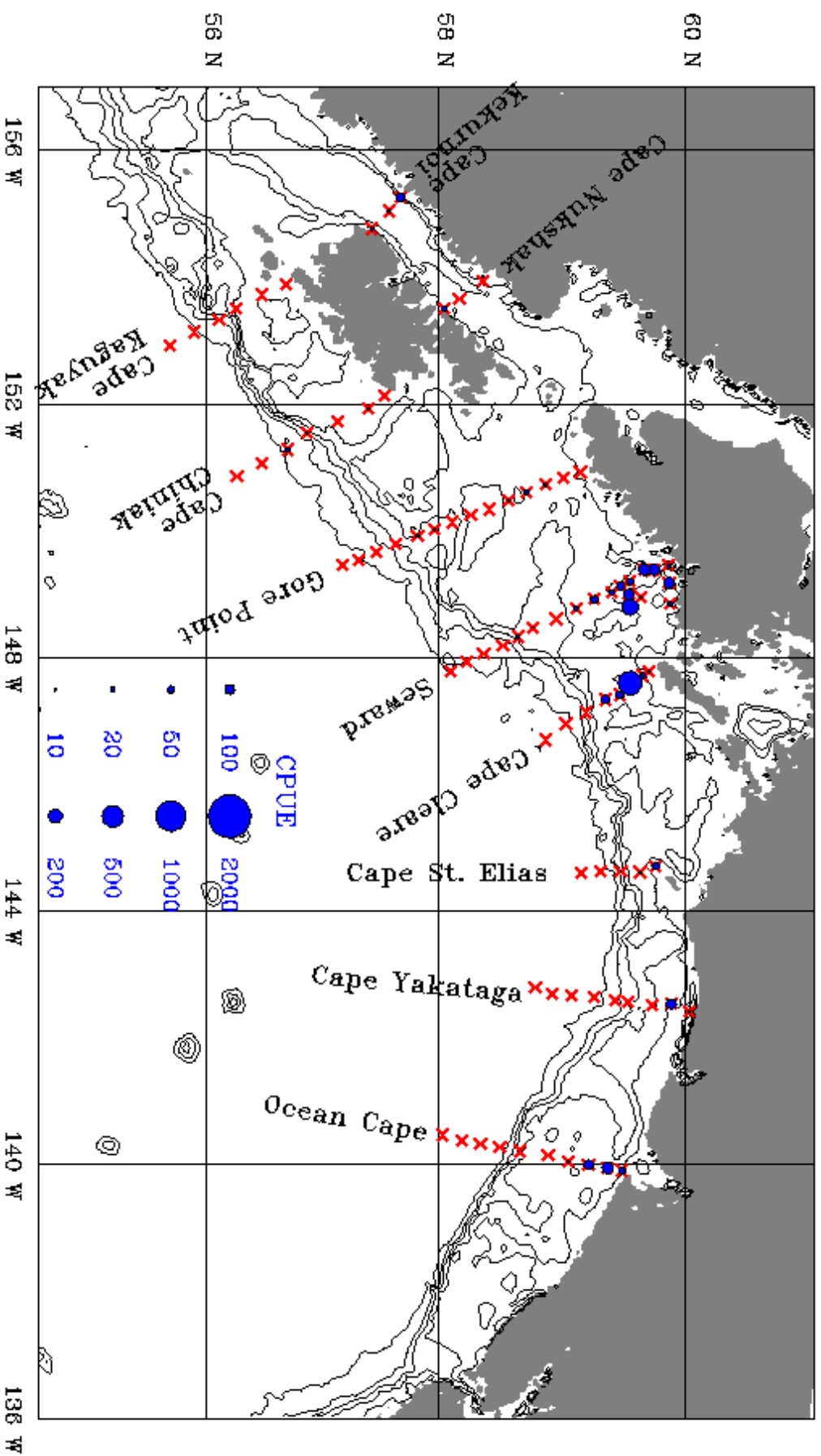


Figure 8. Juvenile chum salmon CPUE from Miller Freeman cruise MF-03-10.

Juvenile Coho Salmon CPUE, OCC/GLOBEC Cruise MF-03-10, 18 July-9 Aug 2003  
 Depth contours at 0, 100, 200, 500, 1000, 2000 m

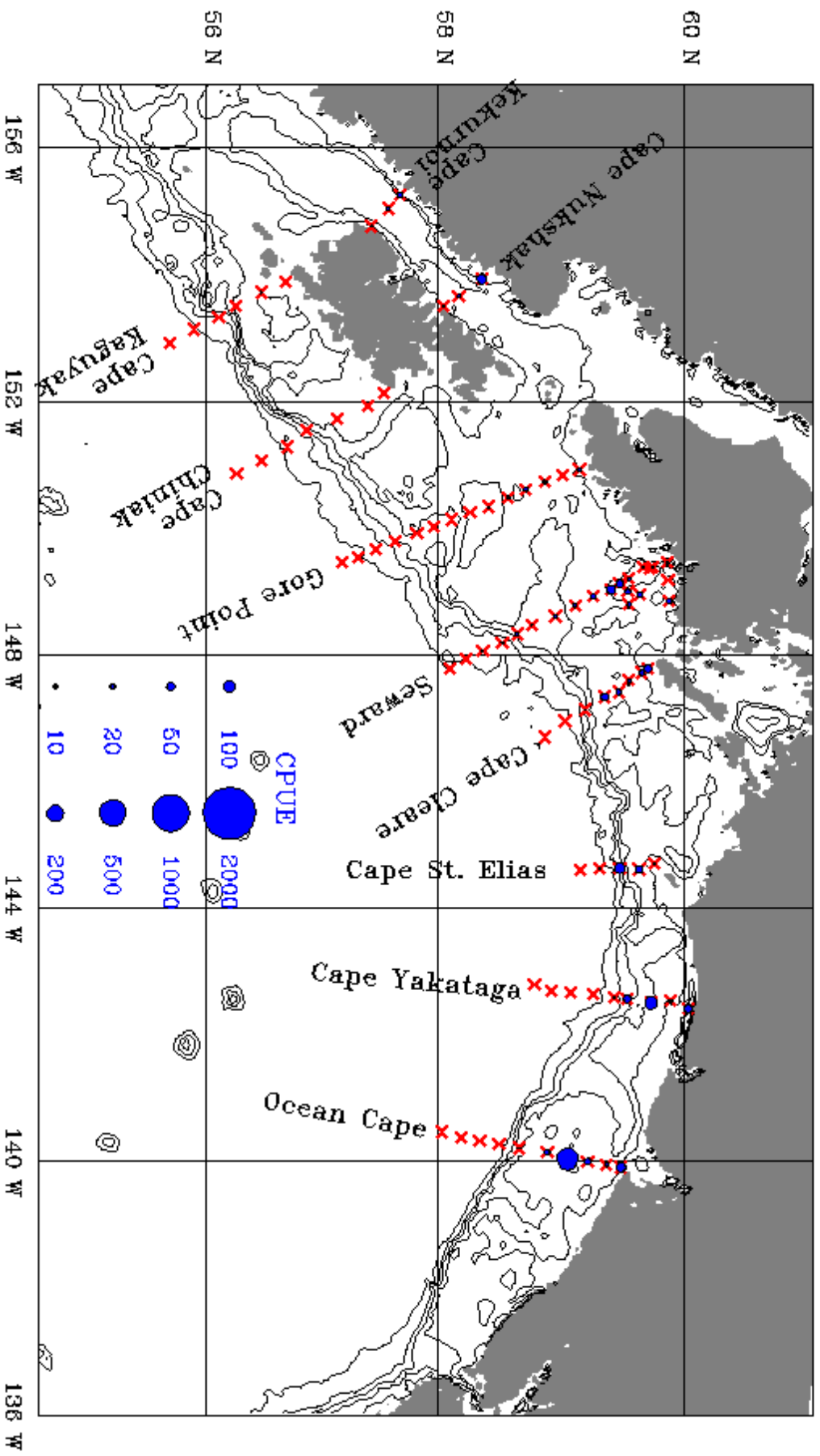


Figure 9. Juvenile coho salmon CPUE from Miller Freeman cruise MF-03-10.

Juvenile Sockeye Salmon CPUE, OCC/GLOBEC Cruise MF-03-10, 18 July-9 Aug 2003  
 Depth contours at 0, 100, 200, 500, 1000, 2000 m

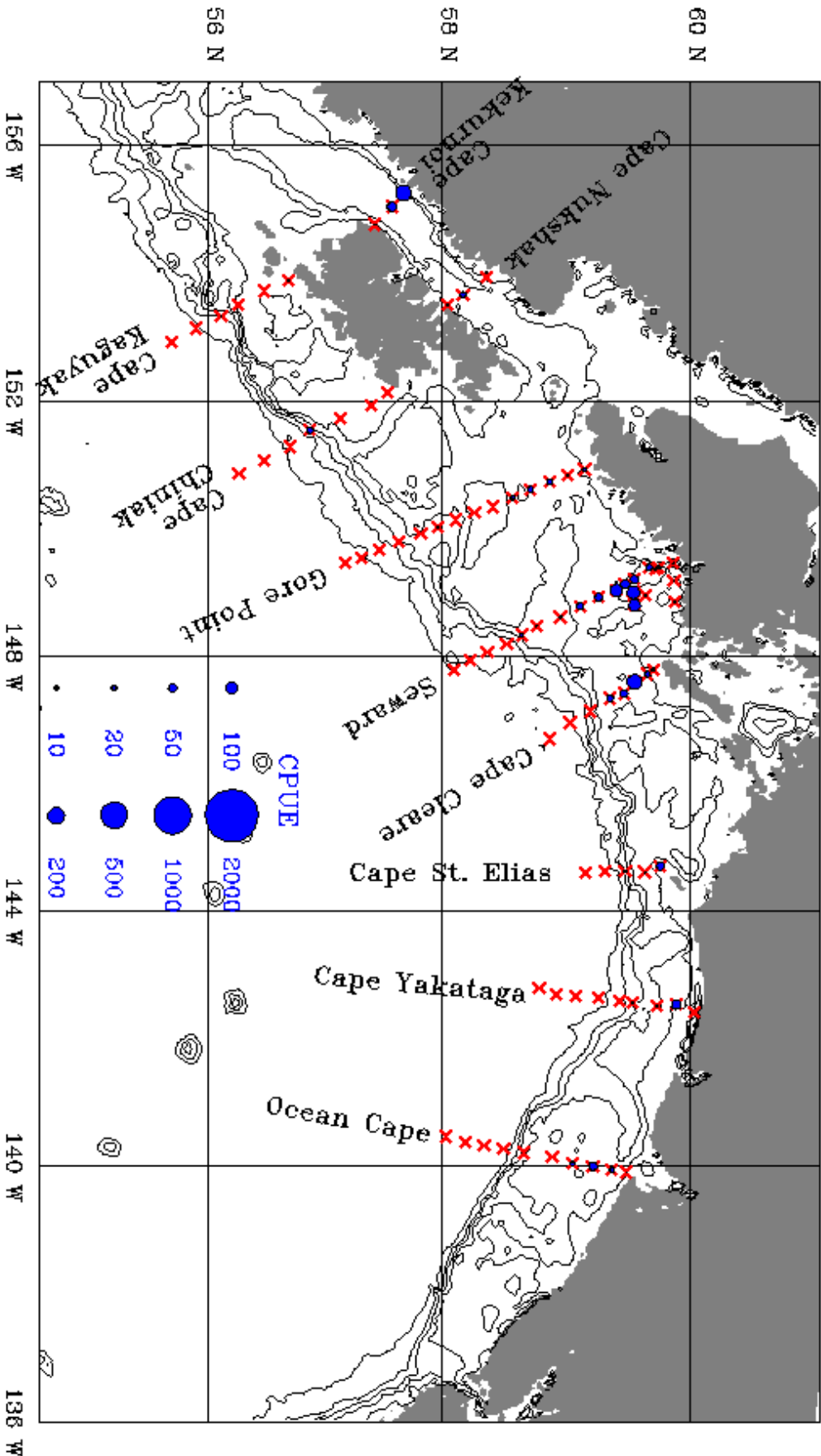


Figure 10. Juvenile sockeye salmon CPUE from Miller-Freeman cruise MF-03-10.

Juvenile Chinook Salmon CPUE, OCC/GLOBEC Cruise MF-03-10, 18 July-9 Aug 2003  
 Depth contours at 0, 100, 200, 500, 1000, 2000 m

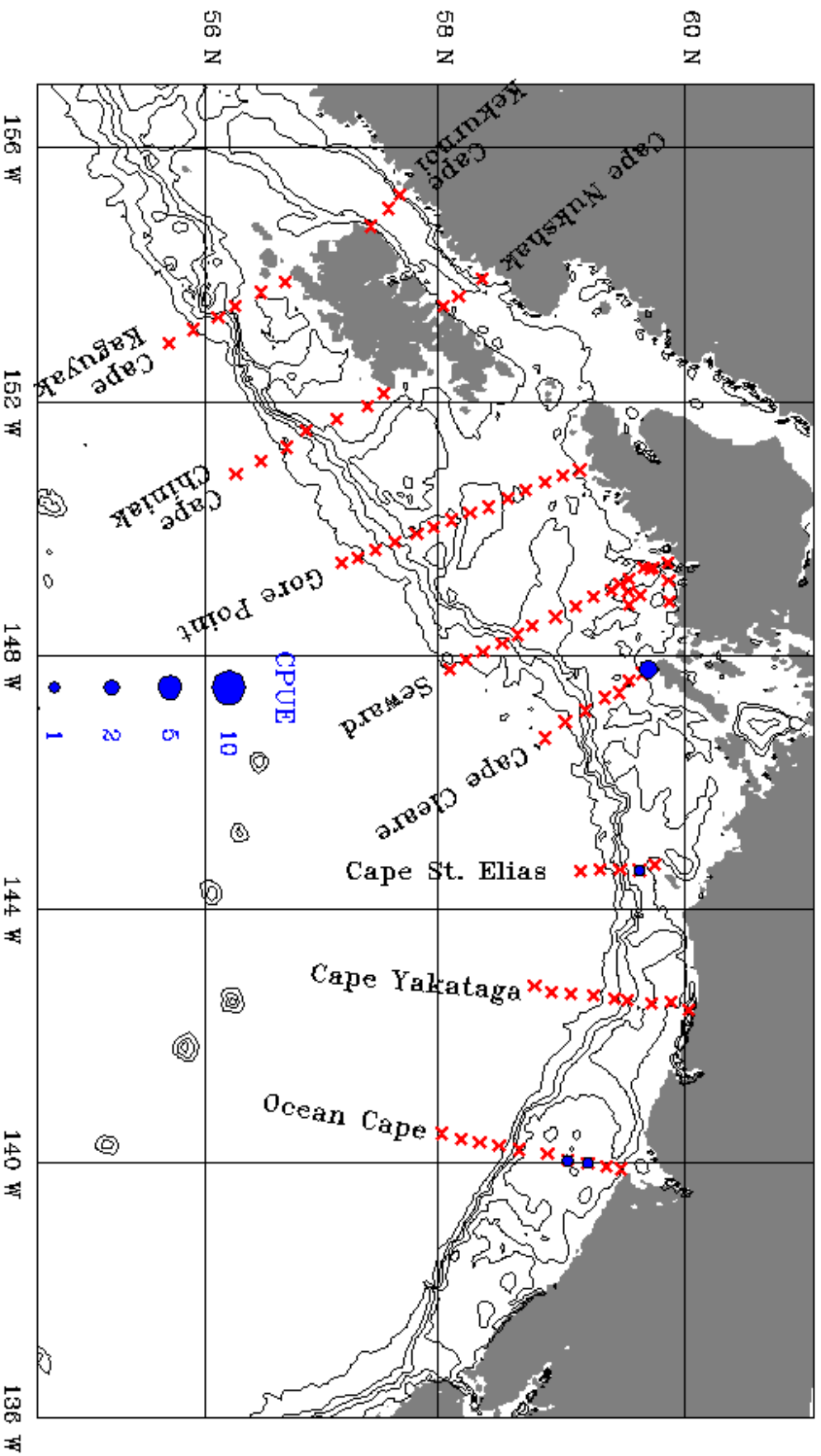


Figure 11. Juvenile chinook salmon CPUE from Miller Freeman cruise MF-03-10.