NGA-LTER

Northern Gulf of Alaska Long-Term Ecological Research

Cruise Report May 2020

Cruise ID: SKQ2020-06S (SKQ-S20)

Funding Sources: NSF, NPRB, AOOS, EVOS/GWA

Purpose:

The NGA is a highly productive subarctic Pacific marine biome where intense environmental variability has profound impacts on lower trophic level organisms and community dynamics that, directly or indirectly, support the iconic fish, crabs, seabirds and marine mammals of Alaska. In the NGA, a pronounced spring bloom and regions of sustained summer production support a stable base of energy-rich zooplankton grazers that efficiently transfers primary production up the food chain and a substantial sinking flux of organic matter that exports carbon to the sea bottom communities. The LTER research cruises examine features, mechanisms and processes that drive this productivity and system-wide resilience to understand how short- and long-term climate variability propagates through the environment to influence organisms.

This cruise represents a continuation of sampling begun in fall 1997 under the NSF/NOAA NE Pacific GLOBEC program, and subsequently a consortium of the North Pacific Research Board (NPRB), the Alaska Ocean Observing System (AOOS), and the Exxon Valdez Oil Spill Trustee Council's (EVOSTC) Gulf Watch. This is the third year with expanded domain, measurements and investigators under the NSF's Northern Gulf of Alaska Long-term Ecological Program (NGA-LTER). This cruise marks the 23nd consecutive spring cruise for the Seward Line in the NGA, including Prince William Sound (PWS), and the 50th year of observations at GAK1.

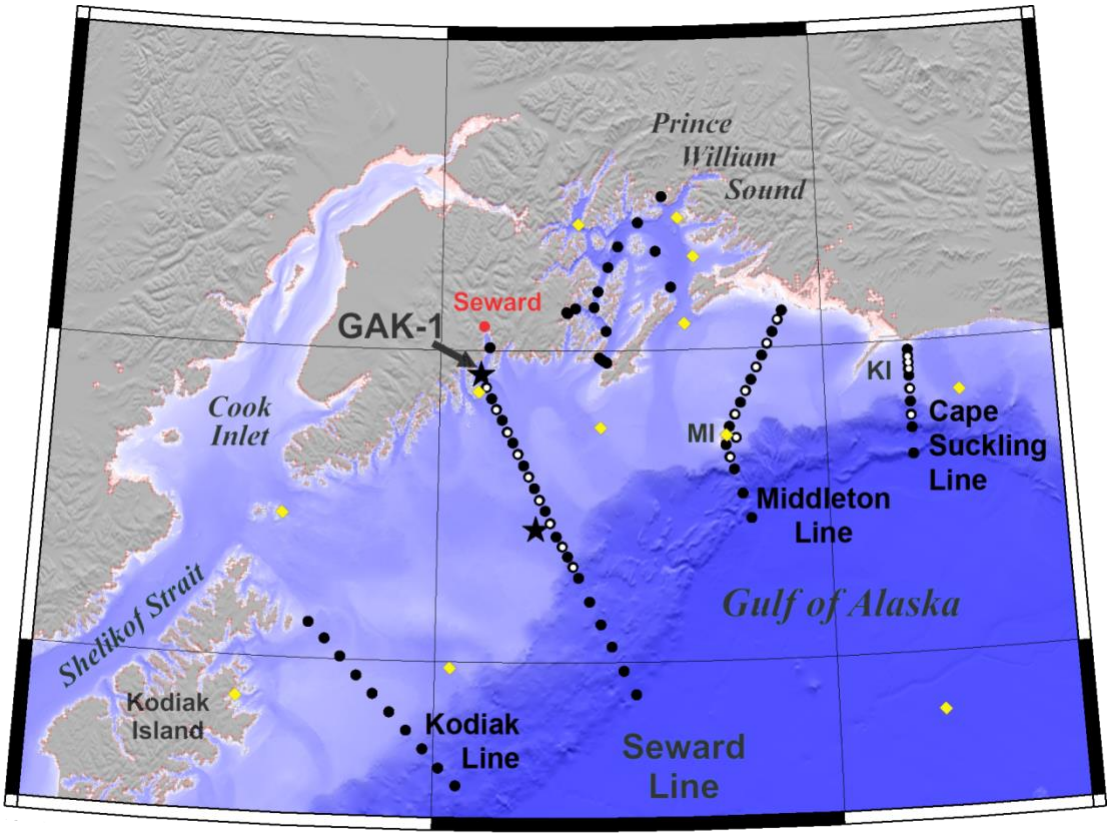

Figure 1. The LTER sampling stations. CTD casts without water sampling as open symbols. Yellow diamonds represent locations of meteorological data from NOAA buoys or ground stations. Star shows position of LTER mooring. Cape Suckling is low priority.

Daily summary

Saturday May 2 – departed Fairbanks at 8am – arrived Seward at 5pm and spent evening organizing items in warehouse.

Sunday May 3 – Day 1 – loaded ship and setup, including checks on SUNA calibration – plans to depart at 18:00 were postponed due to problem with bow thruster that rendered it non-operational.

Monday May 4 – Day 2 – Bow thruster repaired. Got underway at 6:30am. Sampled RES 2.5 @ ~7:10 with CTD and Calvet, then GAK1 @10:15 with CTD and 2 Calvets. Winds and seas were much higher than expected, so after conducting GAK1i CTD and based on the weather forecast, we transited to the outer portion of the Seward Line to start night sampling at 22:00 at GAK8. Multinets were conducted at GAK8-11 (a recast was required at GAK11), ending at 05:30 (near dawn). We repositioned for Day work.

Tuesday May 5 – Day 3 – CTD at GAK8 began at ~09:00 – we worked outward with CTD and Calvets (2 CV at GAK9) ending GAK11 at 19:00. To accommodate 1000 m depth limitation of PAR sensors, a shallow and deep cast were required at GAK10 & GAK11. Nightwork began at 22:15 at GAK12, and we worked Multinets out to GAK15 ending at 5:15.

Wednesday May 6 – Day 4 – CTDs at GAK15 began at ~06:30. We worked inward with CTD and Calvets (2 CV at GAK15) ending GAK12 at 19:00, again with a shallow and deep cast at each station. We spend the evening running to PWS to avoid an incoming storm.

Thursday May 7 – Day 5 – CTDs started ~09:00 at KIP2, and we worked northward with CTD and Calvets (2 CV at GAK9) ending PWS3 at ~16:00. We did bathymetric mapping until beginning nightwork at 22:00 working southward from PWS3 to KIP2 ending ~05:00. We conducted some mapping east of the Pleiades, then headed to KIP0.

Friday May 8 – Day 6 – CTDs started ~08:30 at KIP0, then we headed to Montague Strait, conducting CTDs at all four stations, with a Calvet at only MS2, ending at ~13:30. We started transiting back to the Seward Line in high seas, arriving GAK7 at 22:00. Multinets were conducted northward GAK7-5, ending at 04:20. The GAK6 multinet was recast due to a winch glitch that resulted in bottom contact.

Saturday May 9 – Day 7 – CTDs began 08:00 at GAK4i and worked southward with CTDs and Calvets (2 CV at GAK5) ending GAK7i at ~16:00, the GEO1 mooring was redeployed at 17:40 followed by a CTD calibration cast. We arrived GAK4 at ~21:00 to conduct a Calvet and CTD, then began Multinets at 22:15 heading northward to GAK1, ending at 04:30. We transited to GAK 3i

Sunday May 10 – Day 8 – CTDs began ~07:00 at GAK3i and worked southward with CTDs and Calvets. We ended at GAK1 at ~15:00 with 2 Calvets. The GAK1 mooring was recovered at 16:30 and redeployed by 18:30. We reached Seward at ~21:00 to layoff wait for pier slip to become available.

Monday May 11 – Science party read final chlorophylls, packed up and started travel to Fairbanks at ~11:00

Weather this cruise was marginal until the last 2 working days. The Spring Bloom was underway throughout the region with 2 large mesoscale eddies on either side of the outer line disturbing normal cross-shelf gradients.

Physics Report:

PI: Seth Danielson

On this cruise we conducted 43 casts for water column hydrography at 36 stations (Fig. 1) using a 24 x 12 liter bottle rosette. Bottle trips were made at standard depths: 0, 10, 20, 30, 40, 50, 75, 100, 125, 150, 200, 250, 500, 750, and 1000 m and within 5 m of the bottom when the bottom depth was less than 1000 m. The SBE9-11 CTD was outfitted with pressure, dual temperature, dual conductivity and dual oxygen sensors. Ancillary sensors included a WetLabs fluorometer, a WetLabs C-Star transmissometer, a Biospherical PAR sensor, and a Benthos altimeter. One channel provided power to a self-logging SUNA nitrate sensor. Due to depth limitations of the CTD's PAR sensor, at GAK10-15 a shallow cast was undertaken for the light profile, followed immediately with a regular cast to 1500m.

The CTD stations were occupied along the Seward Line transect plus stations in western Prince William Sound, including stations across Montague Strait and along Knight Island Passage (Fig. 2).

Ocean velocity data was collected using Teledyne RDI 75 kHz and 150 kHz Ocean Surveyor instruments. The 75 kHz instrument collected data using a 16 m bin thickness and the 150 kHz instrument collected data in 8 and 4 meter bins at different times through the cruise. The associated trackline is shown in Figure 3. Due to hull depth and bubble sweep along the hull, the first good bin of the 150 kHz ADCP was typically at 18 m below the surface or deeper, so we generally failed to capture near-surface currents.

We ran the ADCPs triggered from the K-sync system so as to provide an interference-free time interval for the EK-60 fisheries acoustics pings. Over shallow waters (< 1000 m depth) all acoustic instruments could be run simultaneously. In deep water (>1000 m depth) the time for the return acoustic pings become exceedingly long so we ran in one of two modes in deeper water. In "night operations mode" we would secure the EM302 mulitbeam during night station work and operate only the ADCP and EK-60 so as to have concurrent acoustics data alongside the nighttime trawl operations. In the "day operations mode" we would secure the EK-60 and run the EM-302 so as to map the seafloor along our trackline.

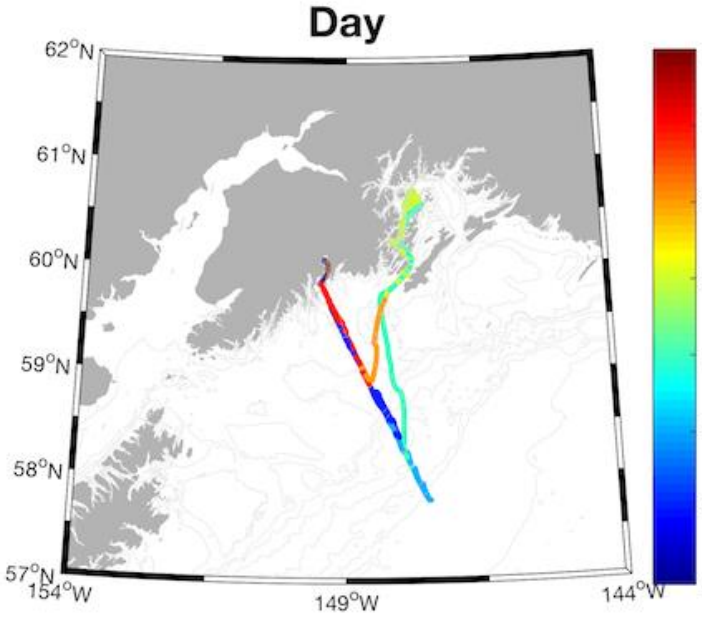

Figure 2. Cruise track for NGA-LTER May 4-10, 2020

Regions previously unmapped by multibeam acoustics were

preferentially selected for ship routes in order to map uncharted areas of the seafloor. Many portions of the cruise occurred in previously unmapped regions, including especially portions of Prince William Sound. Future cruises will continue to fill in mapping coverage gaps.

Other underway data collected include the ship's operational data, meteorological data and ocean surface data. Operational data of ships equipment (e.g., navigation and winch payout and tensions) were also logged. Navigation data parameters include GMT date time, latitude, longitude and water depth. Atmospheric data parameters included atmospheric pressure, wind speed/direction, air temperature, humidity, CO_2, short- and long-wave downwelling irradiance, and PAR. Surface seawater underway data samples included temperature, salinity, chlorophyll a fluorescence, phycoerytherin, partial pressure of CO_2, and nitrate.

Two nitrate dataloggers were used on the cruise. An ISUS instrument was plumbed into the underway uncontaminated seawater throughflow system that feeds the thermosalinograph sensors. This instrument was set to take three samples every five minutes, the bulb on this instrument failed during the cruise (May 7), but replacement was not possible because the spare bulb had not arrived prior to cruise departure. The second nitrate sensor was a SUNA instrument strapped to the CTD frame. The SUNA was powered by a stand-alone battery pack that was energized when the CTD sent power to the bulkhead connectors. This dataset was stored internally to the SUNA and its full data will require a matching of dataset time stamps to align the nitrate profile with the rest of the CTD profile, however a simple analog signal provides preliminary estimates.

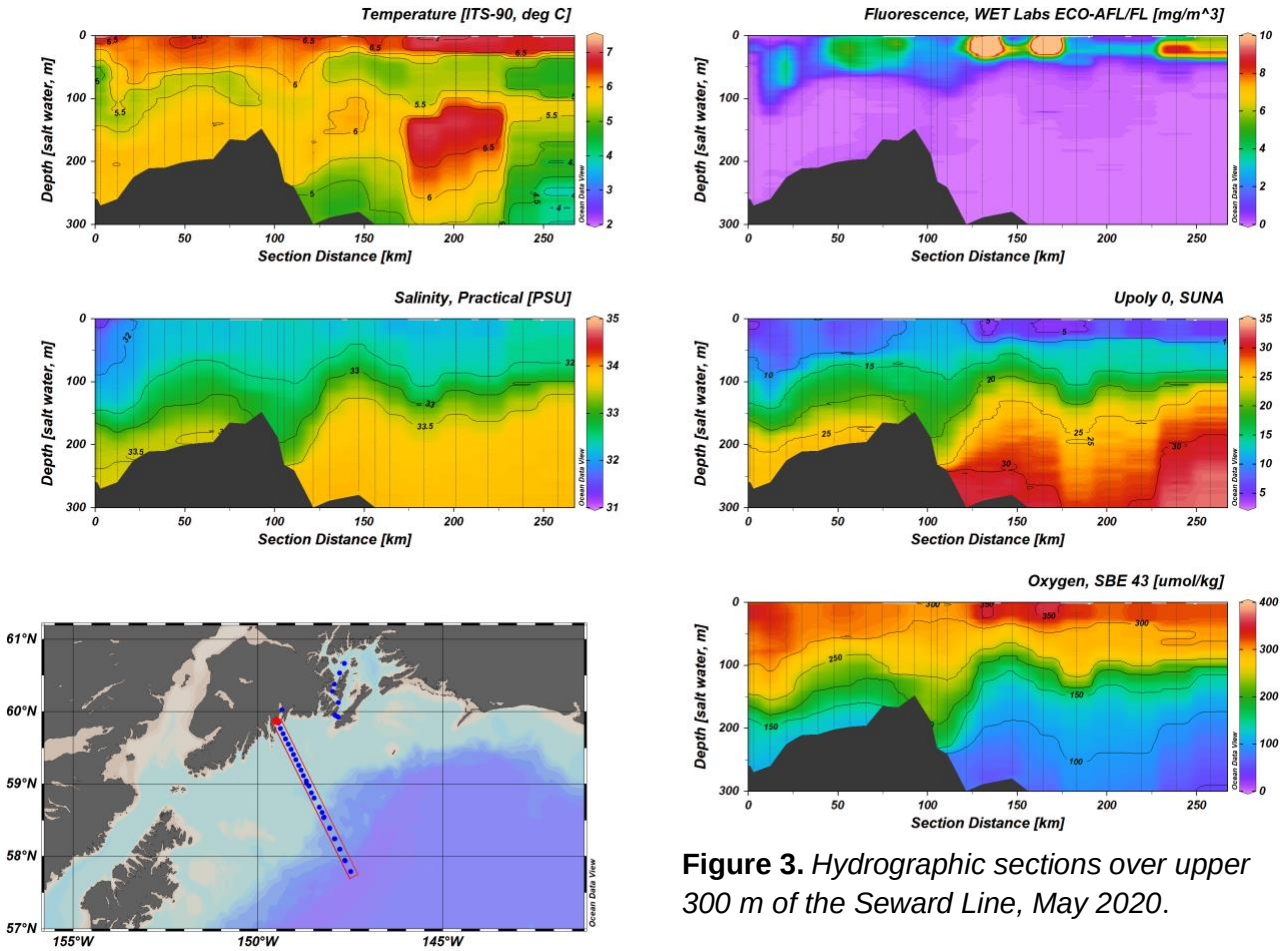

Figure 3. *Hydrographic sections over upper 300 m of the Seward Line, May 2020*.

Hydrographic data showed the water column had begun to stratify along the Seward Line (Fig.3), with a bloom underway in at the shelf break and far offshore, and less so at the mid-shelf, that was drawing down nitrate toward limiting levels in surface waters. Depression of temperatures from GAK11-13 reflects sampling through the edge of a mesoscale eddy located at the shelf-break. Differences in stratification intensity on the inner line (GAK1-7i) reflect a break in time, with the inner line completed immediately after passage of a gale-force storm. As is typical, dissolved oxygen declined rapidly below 100m in oceanic waters.

Compared to the 23-year record along the Seward Line, temperatures averaged across the upper 100 m of the line were at the long-term mean (Fig.4). Hydrographic anomalies along the oldest parts of the line (GAK1-13) showed above average temperatures at depth associated with the shelf-break eddy, and positive salinity anomalies at depth outside the eddy (Fig 5).

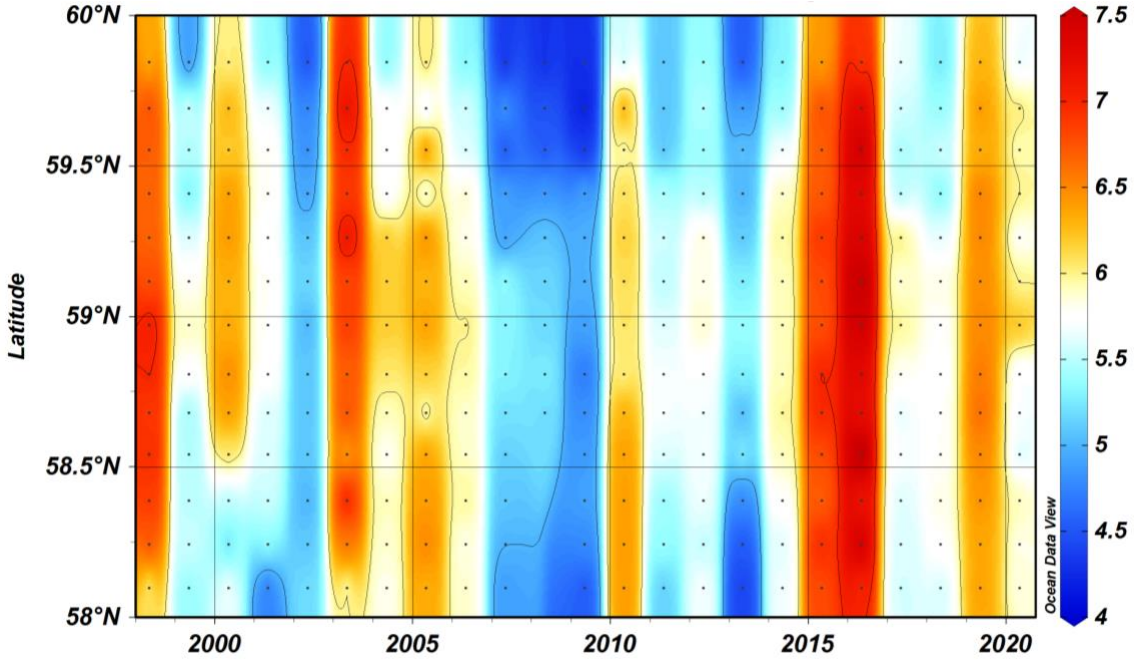

Figure 4. Average temperature of the upper 100m along the Seward Line during early May

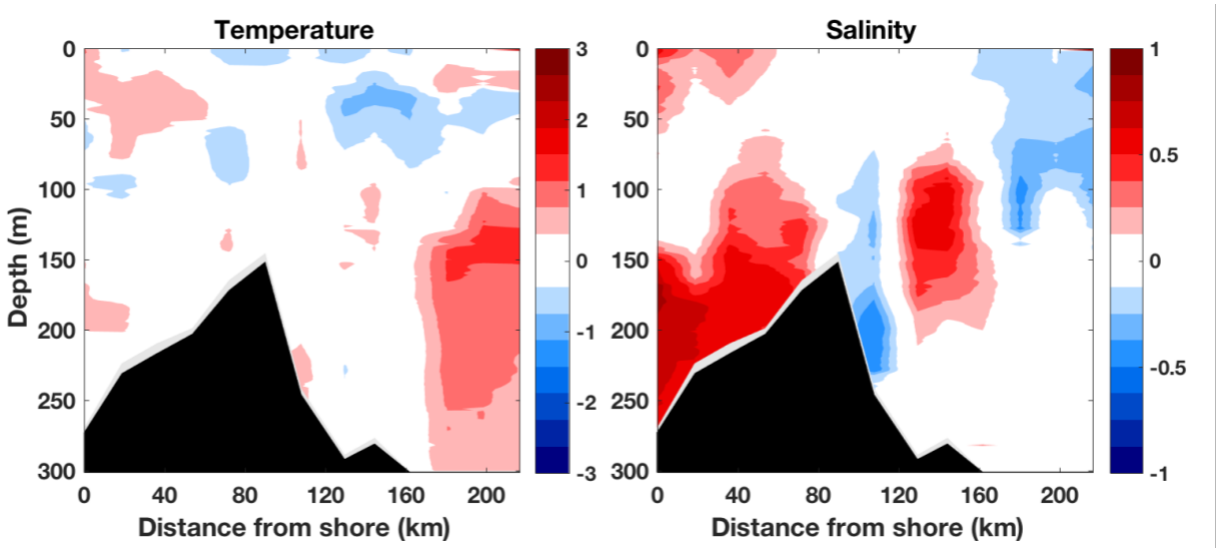

Figure 5. Temperature and salinity anomalies along the Seward Line, May, 2020.

Satellite data from just before and just after the cruise show the rapid increase in surface temperatures as stratification was being established (Fig. 6). Sea surface height revealed 4 active mesoscale eddies present in the Gulf with two moving slowly along the shelf break and flanking the outer Seward Line. These feature contributed to a complex patchwork of blooms and non-blooms across the NGA shelf.

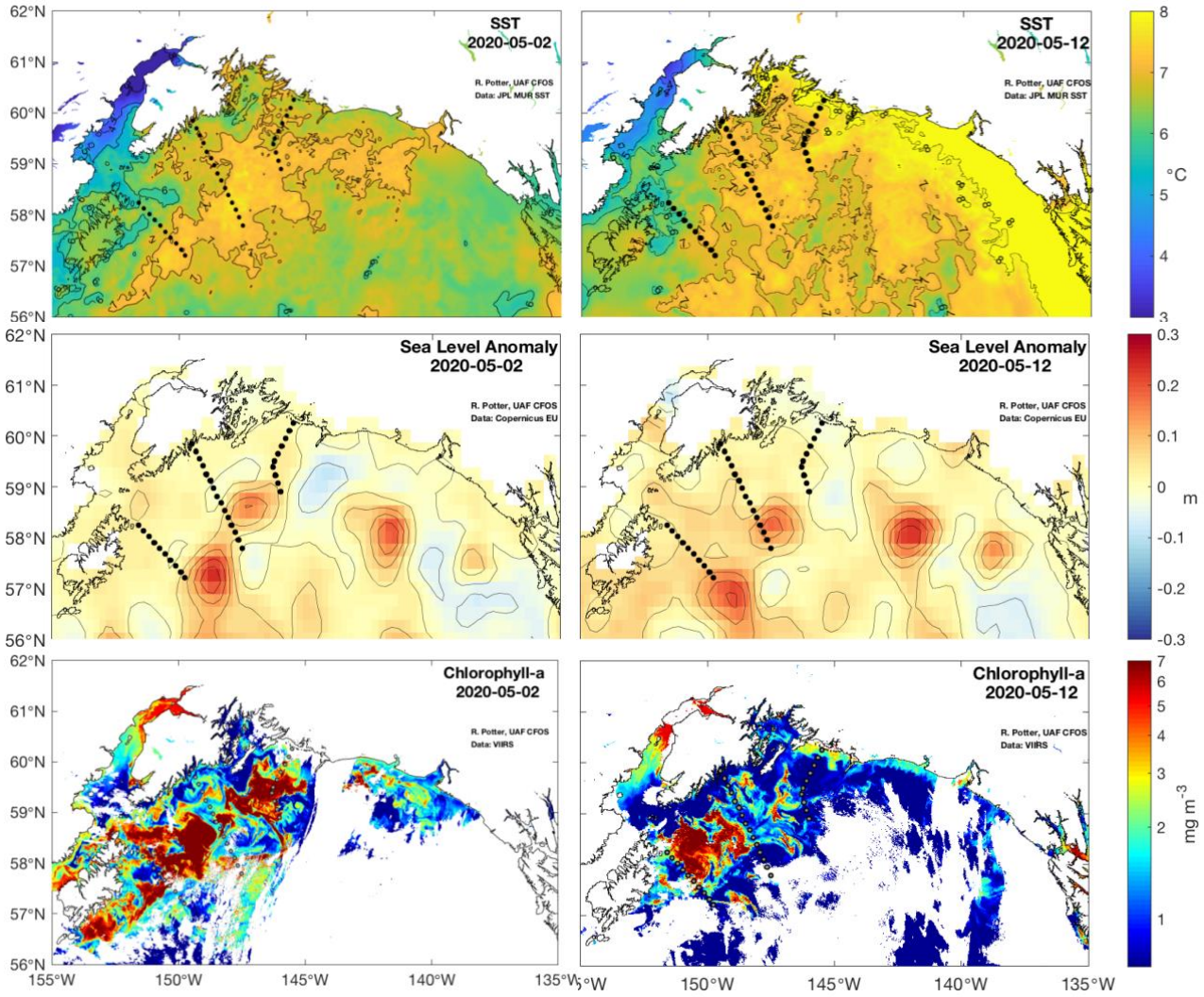

Figure 6. Remote sensing images from the cruise period

Underway data recorded the generally cloudy nature of the cruise and the passage of storms at the beginning of the cruise as well as May 7 when we sought shelter in PWS (Fig.7). Underway Sea surface temperature was consistent with satellites, generally around 7-8 °C, and the depression of salinity within Prince William Sound and the ACC (Fig.8). Air temperatures were typically between 6 and 9 °C during the cruise.

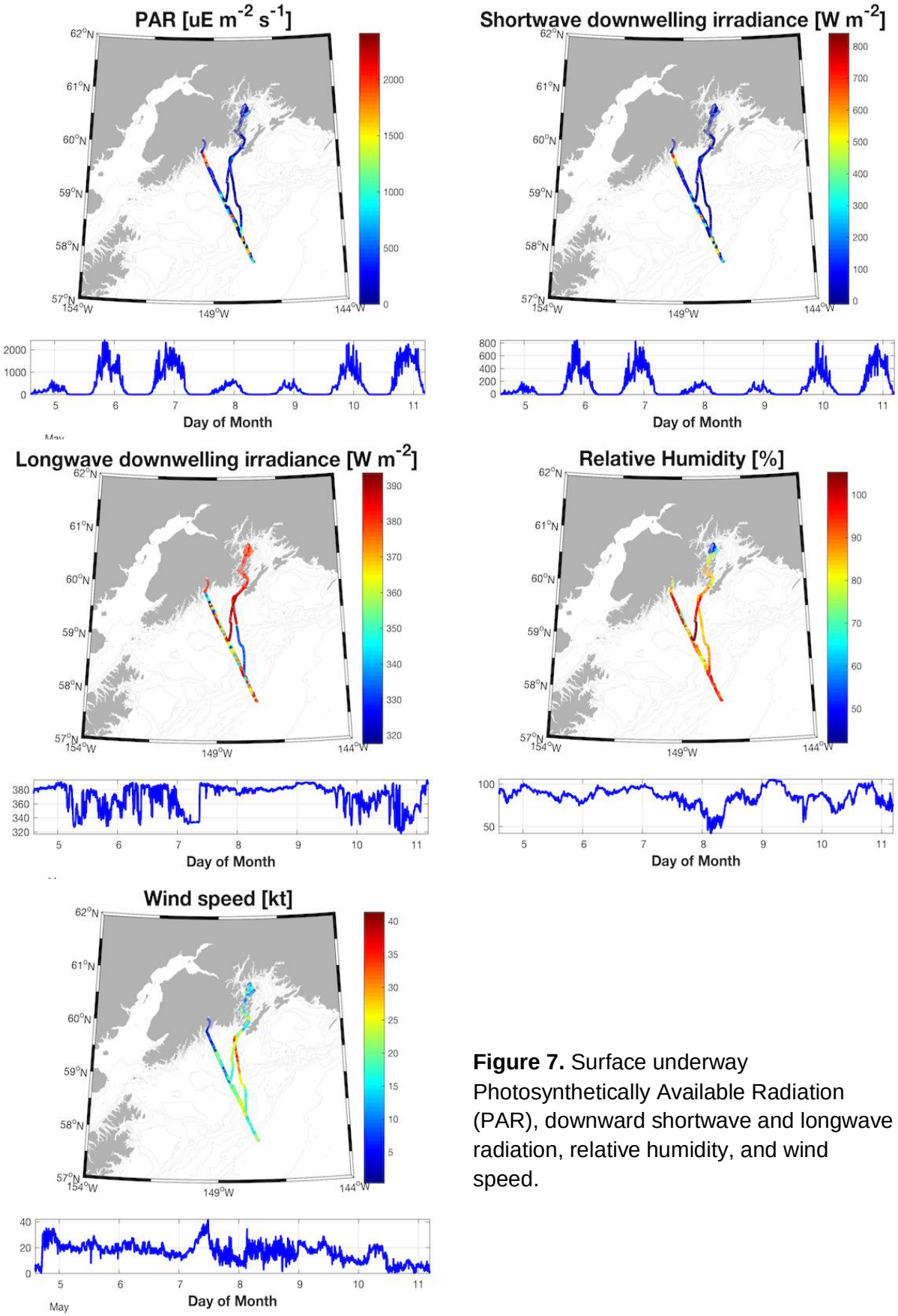

Figure 7. Surface underway Photosynthetically Available Radiation (PAR), downward shortwave and longwave radiation, relative humidity, and wind speed.

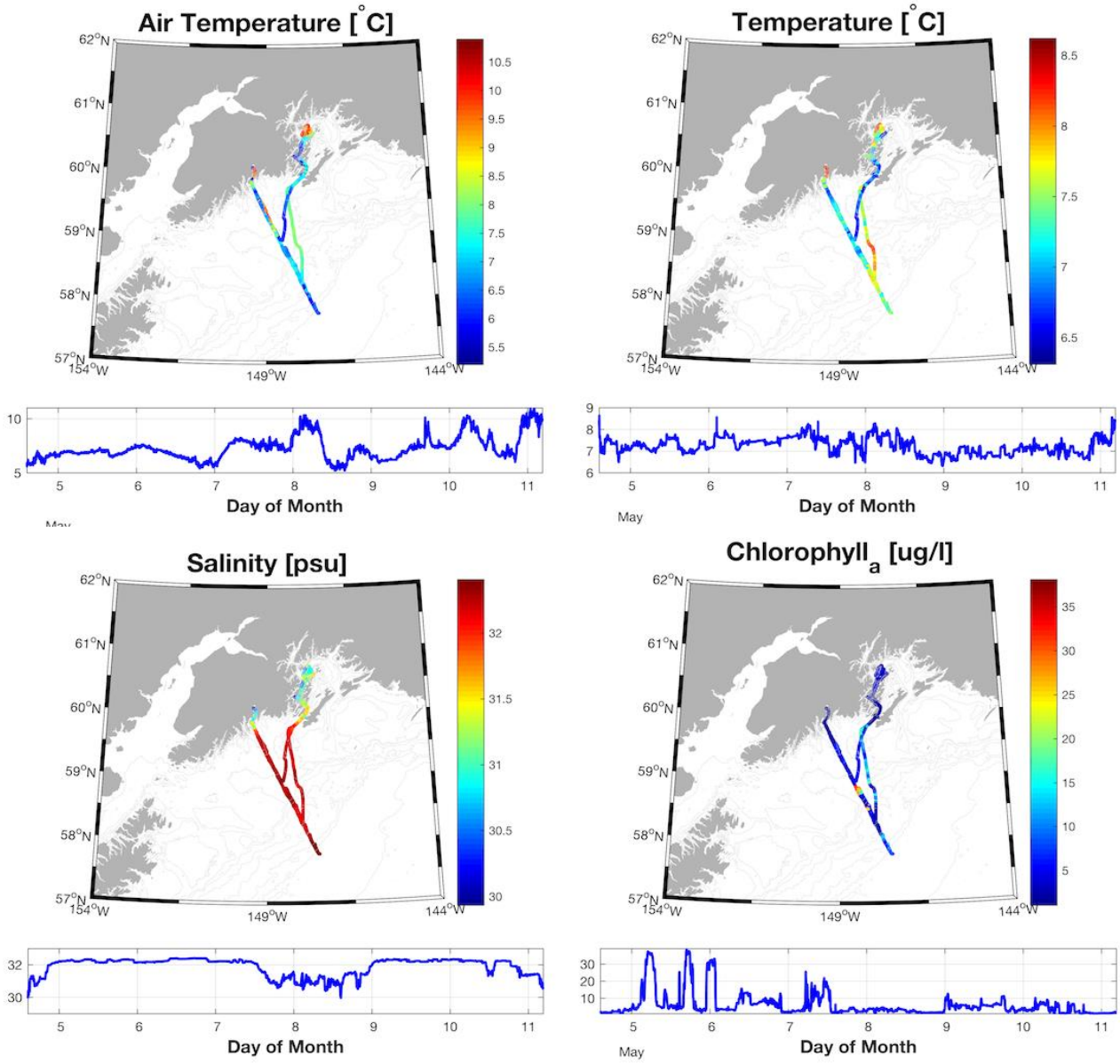

Figure 8. Surface underway air and water temperature, salinity, and atmospheric pressure.

Mooring operations.

During SKQ202006S, we recovered and re-deployed mooring GAK1 and we deployed mooring GEO1. This was the 21st deployment of mooring GAK1 since 1998. The mooring monitors the temperature and salinity of the Alaska Coastal Current at 6-7 depths from 20 m below the surface to just above the seafloor at 250 m depth. This was the 2nd deployment of mooring GEO1. The new configuration of GEO1 is based on a subsurface taut-wire mooring scheme to avoid wire strum and motion caused by the previous surface float.

Mooring deployments:

Station	Latitude	Longitude	Date/Time
GAK1-20 stern position	59 51.1992' N	149 30.0660' W	10-May-2020 18:10 Local 11-May-2020 02:10 GMT
GEO1 stern position	59 00.8253' N	148 41.4079' W	09-May-2020 17:33 Local 10-May-2020 01:33 GMT

Based on the 2019 deployment, we expect a 20 m fallback of the anchor after the anchor is dropped. The final target GEO1 location is 59 0.8358' N, 148 41.412' W.

Mooring GEO1 prepared for deployment.

Mooring GAK1-2020 prepared for deployment.

Mooring GAK1-2019 recovered instrumentation.

Macro- and Micronutrient sample collection and processing

PI: Ana M. Aguilar-Islas

The goal of this field effort was to determine ambient distribution of dissolved inorganic macronutrients (nitrate, nitrite ammonium, phosphate, and silicic acid). Sampling for the micronutrient iron was not undertaken due to insufficient personnel and shifting effort to accomplish sampling of core biological parameters for the phytoplankton and microzooplankton component (see below). Nutrient distributions in conjunction with hydrography are used to determine resource variability to the phytoplankton community in space and time and to identify the relative importance of various processes in supplying nutrients to surface waters. A subset of samples for dissolved oxygen for sensor calibration analysis was also collected during this field effort.

Sample collection and processing for macronutrient analysis:

Filtered seawater samples were collected from surface to a depth of 1500 m from 23 vertical profiles using the Sikuliaq CTD rosette bottles (see Table 1). Samples were filtered through 0.45 um cellulose acetate filter disks using a syringe, and were kept frozen (-80 ^{o}C) following collection. In total, 307 samples were collected for nutrient analysis.

Table 1 Nutrient Sample Collection

Intensive stations are in bold. Stations are listed in the order in which they were sampled

STATION	# samples	STATION	# samples
RES 2.5-a	13	**PWS2**	14
GAK1-a	13	PWS3	14
GAK8	13	MS2	11
GAK9	14	**GAK5**	11
GAK10	16	GAK6	10
GAK11	16	GAK7	12
GAK15	16	GEO	12
GAK14	16	GAK4	11
GAK13	16	GAK3	11
GAK12	16	GAK2	12
KIP2	14	**GAk1-b**	13
PWS1	13		
		GRAND TOTAL	**307**

Preliminary nutrient results from GAK5 to GAK15 show lower nutrient levels in surface waters compared to 2019 (Figure 12) that reflect the further progression of the spring bloom sampled later in the season during 2020.

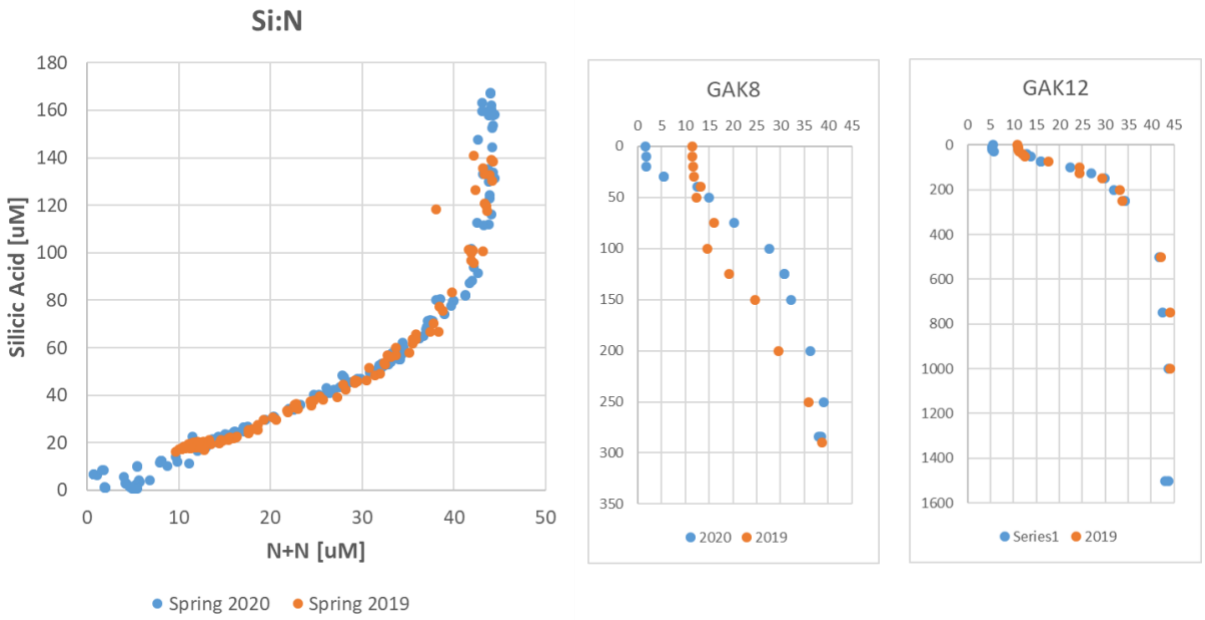

Figure 12. Relationship between Si and N along GAK 5 to GAK 15 showing further drawdown of these nutrients in surface waters during 2020. Examples of N+N profile at GAK 8 and GAK 12 showing further drawdown at surface in 2020 as well as differences in subsurface N+N at the midshelf (GAK 8) influenced by differences in hydrography.

Sample collection for dissolved oxygen analysis:

Unfiltered seawater samples for the analysis of dissolved oxygen were collected in an alternating fashion from the surface and the bottom depths from CTD casts. These samples will be analyzed at the Ocean Acidification Research Center (OARC) in Fairbanks, and will be used to calibrate the CTD oxygen sensor and sensors on moorings. A total of 23 samples were taken during the cruise.

General Notes

We had a successful cruise. The deck crew provided excellent support and their help ensure the success of our operations. The marine technicians also provided excellent support throughout the cruise. The crew was always helpful responding promptly to requests in a happy and professional manner. Laboratory spaces were adequate, the ship's deck gear, -80 ^{o}C freezer and refrigerator were in good working condition. Internet access was a challenge at times. The quality of the food was excellent.

Carbonate Chemistry

PI: Claudine Hauri, Participant: None

Particles

PI: Andrew McDonnell, Participant: None

Phytoplankton and Microzooplankton

PI: Suzanne Strom
Participants: None

Phytoplankton biomass: Phytoplankton biomass was characterized by size-fractionated chlorophyll at all non-intermediate shelf stations and most PWS stations (total = 22 vertical profiles). Samples were analyzed fluorimetrically on board (7 depths per station). Note that GAK-1 was sampled twice, at the beginning and end of the cruise

Community characterization: Photosynthetic organisms and other protists were sampled at every shelf station, generally at 10 m depth only, as well as at all stations in PWS. Samples were fixed in acid Lugol's for standard microzooplankton biomass and composition estimates, and in borate-buffered formalin for characterization of diatoms. At intensive stations a 4-depth vertical profile of acid Lugol's microzooplankton samples was also collected.

Preliminary observations: There was a complex eddy field present in early May 2020 that seemed to have influenced the Seward Line, resulting in a mosaic of small and large-cell dominated communities as well as near-surface high chlorophyll patches (e.g. GAK-8, with almost 6 µg L_{-1}) and large masses of deeper Chl-a that likely represent earlier blooms that had sunk to depth (e.g. GAK-2). Curiously, most of the Chl-a on the shelf was in the small size fraction even where total concentrations were high, typically a signature of warm springs. Only the outer Seward Line (stations 9-15) showed a high proportion of large cells. Preliminary data from the SUNA indicate that the shelf was not yet nitrate-depleted, suggesting that other nutrient anomalies might have been present in spring 2020. PWS appeared to be post-bloom with uniformly low integrated Chl-a mainly in small cells.

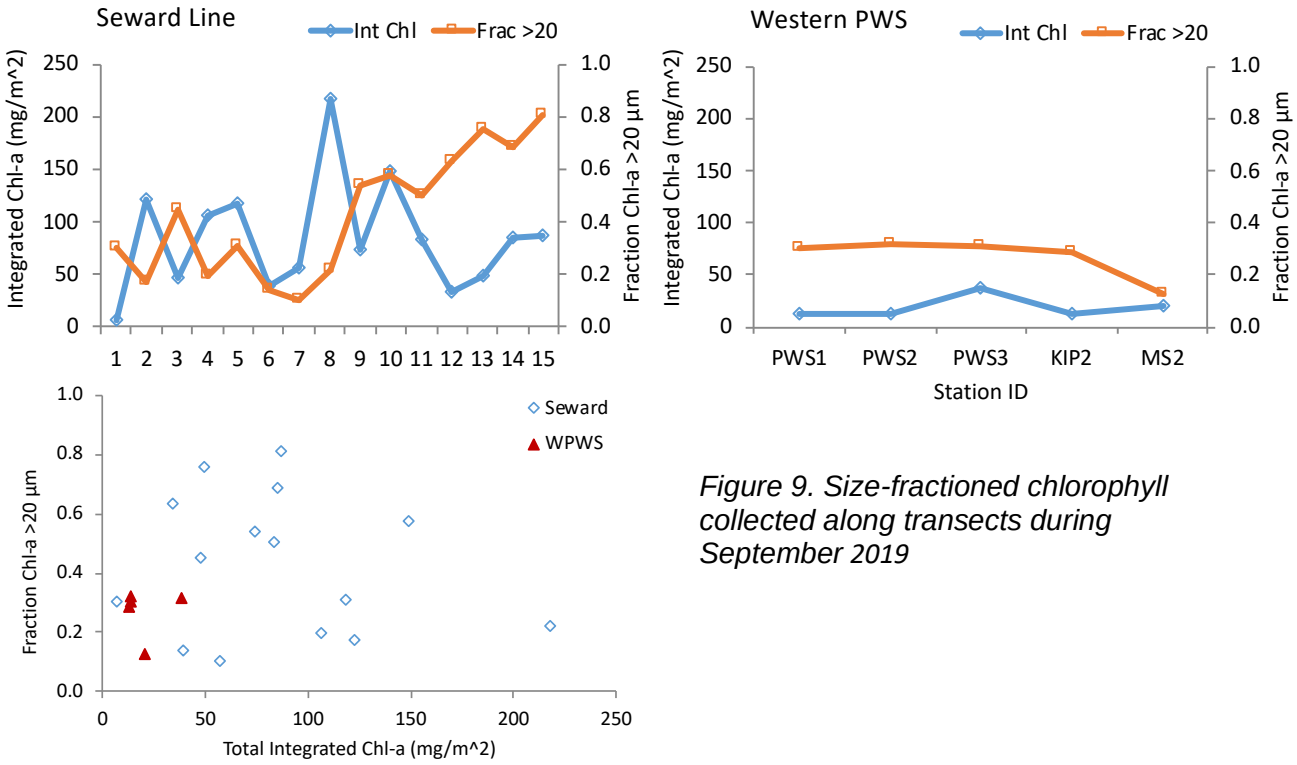

Figure 9. Size-fractioned chlorophyll collected along transects during September 2019

Table 2. Sampling effort for Strom component, by station. Intensive stations are highlighted.

Station	Chl SF	Chl Tot	Lugols uzoo Prof	10m	Diatom
RES2.5	x			x	x
GAK1	x		x	x	x
GAK2	x			x	x
GAK3	x			x	x
GAK4	x			x	x
GAK5	x		x	x	x
GAK6	x			x	x
GAK7	x			x	x
GAK8	x			x	x
GAK9	x		x	x	x
GAK10	x			x	x
GAK11	x			x	x
GAK12	x			x	x
GAK13	x			x	x
GAK14	x			x	x
GAK15	x		x	x	x
PWS1	x			x	x
PWS2	x		x	x	x
PWS3	x			x	x
KIP2	x			x	x
MS2	x			x	x
GAK1	x		x	x	x
TOTAL					

Table Key:

SF Chl: size-fractionated chlorophyll-a; water sample filtered in series through a 20 µm pre-size filter followed by a glass fiber filter (effective pore size 0.7 µm)

Tot Chl: total chlorophyll-a; water sample filtered through glass fiber filter only

Lugol's 10m: water sample preserved in acid Lugol's iodine solution (final concentration 5%) for microscopy analysis of size and composition of ciliate and dinoflagellate microzooplankton (cells ≥15 µm). Sample collected from 10 m.

Lugol's profile: Same as above but samples collected from 4 depths to yield a vertical profile.

Diatom: water sample preserved in borate-buffered formalin (final concentration 2%) for microscopy analysis of diatom community.

Meso/Macro Zooplankton

PI: Hopcroft,

Zooplankton sampling operations were divided into distinct day and night activities. During daytime, Quadnets (Quad frame has 4 nets, 2 of 150 µm mesh and 2 of 53 µm mesh) casts were conducted at all stations (except "i" stations) to 100 m depth, or within 5 m of the bottom at shallower stations. At intensive stations, and additional Quadnet cast was taken, with the 150 µm net preserved in ethanol for molecular studies and the 53µm nets used for live sorting. Daywork was executed by Danielson with assistance from Marine tech Ethan Roth.

During night-time, Hopcroft deployed a multinet equipped with 505 µm-mesh nets obliquely to 200 m depth (or 5 m above the bottom) dividing strata at 100, 60, 40, and 20 m. The drouge net was supplied to NOAA for analysis of ichthyoplankton in lieu of the Bongo nets that would have been conducted during typical cruise operations. Night operations were assisted by Marine tech Steve Hartz.

Each morning, the additional 53 µm sample at intensive stations was live-sorted for Neocalanus. Images were taken on up to 60 animals for each species and stage to establish size and lipid content.

Observations: The shelf stations appeared to have higher than normal abundances of the copepod *Calanus marshallae*. Many stations, particularly the outer shelf, had high abundances of the larvacean *Oikopleura vanhoeffeni*. The cross-shelf patterns of lipid storage appeared atypical with the most lipid-rich community occurring at GAK15, likely related to the mesoscale eddies stalled along the shelf break.

Table 4. Sampling effort for Zooplankton. Intensive stations highlighted. *samples taken for bulk genetics, sorting or imaging.

Station	Calvet-Quad	Multi Vert.	Multi Tow	Bongo	Methot
RES2.5	x				
GAK1	X*		x		
GAK2	x		x		
GAK3	x		x		
GAK4	x		x		
GAK5	X*		x		
GAK6	x		x		
GAK7	x		x		
GAK8	x		x		
GAK9	X*		x		
GAK10	x		x		
GAK11	x		x		
GAK12	x		x		
GAK13	x		x		
GAK14	x		x		
GAK15	X*		x		
MS2	x				
KIP2	x		x		
PWS1	x		x		
PWS2	X*		x		
PWS3	x		x		
TOTAL	**21**	**0**	**19**	**0**	**0**

PI: Petra Lenz & Russ Hopcroft.

Project Goals: *Neocalanus* emergence from diapause (NSF project - UHM & UAF; PIs: Lenz, Hopcroft, Christie and Hartline) – transcriptional profiling of individuals in the genus *Neocalanus* in the adult stage. 2019 marks the 5th year of fall collection of Neocalanus flemingeri from our PWS2 station.

Research Activities:

- *N. flemingeri* CV were sorted and preserved for RNA sequencing at all intensive stations.
- Imaging of all Neocalanus species for lipid accumulation was completed at all intensive stations

Marine bird and marine mammal surveys (USFWS)

PI: Dr. Kathy Kuletz, U.S. Fish and Wildlife Service

Participant: none

Outreach

The teacher-at-sea program was cancelled for the 2020 season. Nonetheless the cruise attracted significant media attention as the only cruise to operate during the shut-down of the Academic Fleet.

Appendix. STANDARD STATIONS (intensive stations highlighted)

Latitude N (degrees, minutes)		Longitude W (degrees, minutes)		Station Name	Depth
Resurrection Bay Station					
60	1.5	149	21.5	RES2.5	298
Seward Line					
59	50.7	149	28	GAK1	269
59	46	149	23.8	GAK1I	
59	41.5	149	19.6	GAK2	228
59	37.6	149	15.5	GAK2I	
59	33.2	149	11.3	GAK3	213
59	28.9	149	7.1	GAK3I	
59	24.5	149	2.9	GAK4	201
59	20.1	148	58.7	GAK4I	
59	15.7	148	54.5	GAK5	167
59	11.4	148	50.3	GAK5I	
59	7	148	46.2	GAK6	151
59	2.7	148	42	GAK6I	
58	58.3	148	37.8	GAK7	243
58	52.9	148	33.6	GAK7I	
58	48.5	148	29.4	GAK8	288
58	44.6	148	25.2	GAK8I	
58	40.8	148	21	GAK9	276
58	36.7	148	16.7	GAK9I	
58	32.5	148	12.7	GAK10	1459
58	23.3	148	4.3	GAK11	1410
58	14.6	147	56	GAK12	2134
58	5.9	147	47.6	GAK13	2058
57	*56.6*	*147*	*39*	*GAK14*	*3518*
57	*47.5*	*147*	*30*	*GAK15*	*4543*
Prince William Sound Stations					
60	7.5	147	50	KIP0	
60	16.7	147	59.2	KIP2	588
60	22.78	147	56.17	PWS1	248
60	32.1	147	48.2	PWS2	798
60	40	147	40	PWS3	742
60	49..25	147	24	PWSA	472
60	45	147	14	PWSB	
60	38.1	147	10	PWSC	245
60	31.5	147	7.6	PWSD	
60	24.3	147	58.3	PWSE	291
60	24	146	45	PWSF	
Columbia Glacier					
61	7.4	147	3.8	CG0	
60	59.5	147	4.2	CG1	192
60	57.6	147	5.9	CG2	
Icy Bay					
60	16.3	148	21.7	IB0	
60	15.5	148	20.1	IB1	172
60	16.3	148	14	IB2	157
Montague Strait Line					
59	57.257	147	55.602	MS1	
59	56.6	147	53.7	MS2	194
59	55.9	147	51.4	MS3	169
59	55.2	147	49.7	MS4	119

Latitude N (degrees, minutes)		Longitude W (degrees, minutes)		Station Name	Depth
Kodiak Line					
58	14.7	151	35.4	KOD1	71
58	7.8	151	23.07	KOD2	127
58	0.9	151	10.74	KOD3	84
57	54	150	58.17	KOD4	78
57	47.1	150	45.6	KOD5	87
57	40.26	150	32.97	KOD6	102
57	33.42	150	20.34	KOD7	178
57	26.37	150	7.95	KOD8	708
57	19.32	149	55.56	KOD9	1310
57	12.27	149	43.17	KOD10	2503
Cape Suckling Line					
59	56.35	143	53.5	CS1	63
59	53.85	143	53.5	CS1.25	85
59	51.35	143	53.5	CS1i	104
59	48.85	143	53.5	CS1.75	116
59	46.35	143	53.5	CS2	124
59	41.35	143	53.5	CS2i	134
59	36.35	143	53.5	CS3	193
59	31.35	143	53.5	CS3i	1316
59	26.35	143	53.5	CS4	2010
59	16.35	143	53.5	CS5	2810
Middleton Island Line					
60	15	145	30	MID1	35
60	10.5	145	34.5	MID1i	100
60	6	145	39	MID2	116
60	1.5	145	43.5	MID2i	98
59	57	145	48	MID3	87
59	52.5	145	52.5	MID3i	100
59	48	145	57	MID4	90
59	43.5	146	1.5	MID4i	72
59	39	146	6	MID5	97
59	34.5	146	10.5	MID5i	114
59	30	146	15	MID6	41
59	25.7	146	10	MID6i	65
59	23	146	18	MID7	65
59	18.267	146	15	MID7i	420
59	13.534	146	12	MID8	611
59	4.067	146	6	MID9	2900
58	54.6	146	0	MID10	4444

Event.ID	Date & Time (UTC)	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
1	5/4/2020 3:29:54	Ship	other	NaN	NaN	NaN	60.0984	-149.4425		eRoth	departure delayed due to bow thruster i
2	5/4/2020 14:26:49	Ship	startCruise	NaN	NaN	NaN	60.0771	-149.4128		eRoth	departing Seward, AK
3	5/4/2020 15:09:41	CTD911	deploy	NaN	RES2.5	1	60.0250	-149.3581	292	sDanielson	The Great 2020 Coronavirus Cruise
4	5/4/2020 15:47:20	CTD911	recover	NaN	RES2.5	1	60.0250	-149.3581	292	sDanielson	
5	5/4/2020 15:53:13	CalVet net	deploy	NaN	RES2.5	1	60.0250	-149.3581	292	rHopcroft	
6	5/4/2020 15:58:11	CalVet net	recover	NaN	RES2.5	1	60.0250	-149.3581	292	rHopcroft	
7	5/4/2020 18:13:08	CTD911	deploy	Seward Line	GAK1	2	59.8452	-149.4703	270	sDanielson	
8	5/4/2020 18:53:42	CTD911	recover	Seward Line	GAK1	2	59.8489	-149.4707	270	sDanielson	
238	5/11/2020 6:31:05	CalVet net	deploy	Seward Line	GAK1	2a	59.8506	-149.4710	271	rHopcroft	
10	5/4/2020 19:12:52	CalVet net	recover	Seward Line	GAK1	2a	59.8516	-149.4711	271	rHopcroft	live/ethanol - missed line mark - probab
11	5/4/2020 19:28:44	CalVet net	deploy	Seward Line	GAK1	2	59.8539	-149.4714	271	rHopcroft	
12	5/4/2020 19:48:05	CalVet net	deploy	Seward Line	GAK1	2	59.8539	-149.4714	271	rHopcroft	
13	5/4/2020 20:31:35	ADCP WH300	service	NaN	NaN	NaN	59.7692	-149.4006		eRoth	applied new cal offset of 44.13 deg
14	5/4/2020 20:50:08	CTD911	deploy	Seward Line	GAK1I	3	59.7680	-149.3980	260	sDanielson	
15	5/4/2020 21:07:13	CTD911	recover	Seward Line	GAK1I	3	59.7682	-149.4000	260	sDanielson	
16	5/5/2020 6:09:59	multinet	deploy	Seward Line	GAK8	1	58.8087	-148.4851	290	rHopcroft	
17	5/5/2020 6:19:10	multinet	maxDepth	Seward Line	GAK8	1	58.8086	-148.4791	290	rHopcroft	
18	5/5/2020 6:55:17	multinet	recover	Seward Line	GAK8	1	58.8095	-148.4551	290	rHopcroft	MAX OUT 251M
19	5/5/2020 8:15:27	multinet	deploy	Seward Line	GAK9	2	58.6804	-148.3501	280	rHopcroft	
20	5/5/2020 8:25:16	multinet	maxDepth	Seward Line	GAK9	2	58.6813	-148.3415	280	rHopcroft	
21	5/5/2020 8:58:06	multinet	recover	Seward Line	GAK9	2	58.6843	-148.3107	280	rHopcroft	MAX OUT 272M
22	5/5/2020 10:13:05	multinet	deploy	Seward Line	GAK10	2	58.5420	-148.2099	1444	rHopcroft	
23	5/5/2020 10:24:13	multinet	maxDepth	Seward Line	GAK10	2	58.5450	-148.1941	1444	rHopcroft	
24	5/5/2020 10:53:45	multinet	recover	Seward Line	GAK10	3	58.5545	-148.1538	1444	rHopcroft	MAX OUT 320M
25	5/5/2020 12:12:16	multinet	deploy	Seward Line	GAK11	4	58.3881	-148.0742	1408	rHopcroft	
26	5/5/2020 12:21:54	multinet	maxDepth	Seward Line	GAK11	4	58.3896	-148.0642	1408	rHopcroft	
27	5/5/2020 12:26:49	multinet	abort	Seward Line	GAK11	4	58.3903	-148.0584	1408	rHopcroft	missed net trip at bottom
28	5/5/2020 12:58:37	multinet	deploy	Seward Line	GAK11	4	58.3881	-148.0761	1408	rHopcroft	REDO
29	5/5/2020 13:08:19	multinet	maxDepth	Seward Line	GAK11	4	58.3888	-148.0650	1408	rHopcroft	
30	5/5/2020 14:16:50	multinet	recover	Seward Line	GAK11	4	58.3918	-148.0335	1408	rHopcroft	WIRE OUT 271M
31	5/5/2020 17:04:27	CTD911	deploy	Seward Line	GAK8	4	58.8086	-148.4922	289	sDanielson	
32	5/5/2020 17:41:55	CTD911	recover	Seward Line	GAK8	4	58.8058	-148.5095	289	sDanielson	
34	5/5/2020 18:05:33	CalVet net	deploy	Seward Line	GAK8	3	58.8081	-148.4955	285	sDanielson	
35	5/5/2020 18:10:49	CalVet net	recover	Seward Line	GAK8	3	58.8082	-148.4983	285	sDanielson	
36	5/5/2020 19:27:34	CalVet net	deploy	Seward Line	gak9	4a	58.6806	-148.3557	285	rHopcroft	live/ethanol
37	5/5/2020 19:36:28	CalVet net	recover	Seward Line	gak9	4a	58.6806	-148.3557	285	rHopcroft	
38	5/5/2020 20:16:19	CTD911	deploy	Seward Line	GAK9	5	58.6814	-148.3510	279	sDanielson	

Event.ID	Date	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
39	5/5/2020 20:44:35	CTD911	recover	Seward Line	GAK9	5	58.6821	-148.3547	279	sDanielson	
40	5/5/2020 20:52:06	CalVet net	deploy	Seward Line	gak9	4	58.6824	-148.3558	279	rHopcroft	
41	5/5/2020 20:52:09	CalVet net	deploy	Seward Line	gak9	4	58.6824	-148.3558	279	rHopcroft	
43	5/5/2020 21:47:11	CTD911	deploy	Seward Line	GAK9I	6	58.6095	-148.2753	705	sDanielson	
44	5/5/2020 22:21:36	CTD911	recover	Seward Line	GAK9I	6	58.6100	-148.2761	705	sDanielson	
45	5/5/2020 23:06:21	CTD911	deploy	Seward Line	GAK10	7	58.5404	-148.2149	1445	sDanielson	
46	5/5/2020 23:16:30	CTD911	recover	Seward Line	GAK10	7	58.5415	-148.2121	1445	sDanielson	CTD FOR PAR
47	5/5/2020 23:21:09	CalVet net	deploy	Seward Line	GAK10	5	58.5423	-148.2104	1445	rHopcroft	
48	5/5/2020 23:27:56	CalVet net	recover	Seward Line	GAK10	5	58.5435	-148.2070	1445	rHopcroft	
51	5/5/2020 23:50:47	CTD911	deploy	Seward Line	GAK10	8	58.5384	-148.2249	1405	eRoth	
52	5/6/2020 1:16:56	CTD911	recover	Seward Line	GAK10	8	58.5387	-148.2137	1459	sDanielson	
54	5/6/2020 2:42:11	CTD911	deploy	Seward Line	GAK11	9	58.3897	-148.0711	1410	sDanielson	
55	5/6/2020 2:49:39	CTD911	deploy	Seward Line	GAK11	9	58.3907	-148.0716	1410	sDanielson	FOR PAR PROFILE
56	5/6/2020 2:53:59	CalVet net	deploy	Seward Line	GAK11	6	58.3912	-148.0719	1409	rHopcroft	
57	5/6/2020 2:58:16	CalVet net	recover	Seward Line	GAK11	6	58.3918	-148.0721	1409	rHopcroft	
58	5/6/2020 3:25:02	CTD911	deploy	Seward Line	GAK11	10	58.3916	-148.0722	1409	sDanielson	
59	5/6/2020 3:38:14	EM302	stop	NaN	NaN	NaN	58.3929	-148.0727		eRoth	
60	5/6/2020 4:37:23	CTD911	deploy	Seward Line	GAK11	10	58.3916	-148.0722	1409	sDanielson	
61	5/6/2020 6:13:07	multinet	deploy	Seward Line	GAK12	5	58.2437	-147.9366	2113	rHopcroft	
62	5/6/2020 6:23:41	multinet	maxDepth	Seward Line	GAK12	5	58.2453	-147.9272	2113	rHopcroft	
63	5/6/2020 6:54:46	multinet	recover	Seward Line	GAK12	5	58.2483	-147.9001	2113	rHopcroft	WIRE OUT 320M
64	5/6/2020 8:23:12	multinet	deploy	Seward Line	GAK13	6	58.0986	-147.7951	2060	rHopcroft	
65	5/6/2020 8:36:43	multinet	maxDepth	Seward Line	GAK13	6	58.0980	-147.7880	2060	rHopcroft	
66	5/6/2020 9:04:51	multinet	recover	Seward Line	GAK13	6	58.0961	-147.7700	2060	rHopcroft	WIRE OUT 288M
67	5/6/2020 10:31:39	multinet	deploy	Seward Line	GAK14	7	57.9434	-147.6509	3039	rHopcroft	
68	5/6/2020 10:42:17	multinet	maxDepth	Seward Line	GAK14	7	57.9439	-147.6424	3039	rHopcroft	
69	5/6/2020 11:12:38	multinet	recover	Seward Line	GAK14	7	57.9449	-147.6189	3039	rHopcroft	WIRE OUT 295M
70	5/6/2020 12:34:12	multinet	deploy	Seward Line	GAK15	8	57.7912	-147.5164	4100	rHopcroft	
71	5/6/2020 12:45:28	multinet	maxDepth	Seward Line	GAK15	8	57.7913	-147.5046	4400	rHopcroft	
72	5/6/2020 13:15:32	multinet	recover	Seward Line	GAK15	8	57.7923	-147.4742	4400	rHopcroft	WIRE OUT 314M
73	5/6/2020 14:23:25	CTD911	deploy	Seward Line	GAK15	11	57.7919	-147.4973	4588	sDanielson	FOR PAR PROFILE
74	5/6/2020 14:31:43	CTD911	recover	Seward Line	GAK15	11	57.7920	-147.4985	4588	sDanielson	
76	5/6/2020 14:39:58	CalVet net	deploy	Seward Line	GAK15	7	57.7919	-147.4994	4500	sDanielson	
77	5/6/2020 14:44:24	CalVet net	recover	Seward Line	GAK15	7	57.7918	-147.5002	4500	sDanielson	
78	5/6/2020 15:06:49	CTD911	deploy	Seward Line	GAK15	12	57.7914	-147.5003	4530	sDanielson	
79	5/6/2020 16:44:53	CalVet net	deploy	Seward Line	GAK15	7a	57.7895	-147.5059	4500	sDanielson	
239	5/11/2020 6:32:45	CalVet net	recover	Seward Line	GAK15	7a	57.7891	-147.5071	4500	sDanielson	

Event.ID	Date	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
80	5/6/2020 18:26:52	CTD911	deploy	Seward Line	GAK14	13	57.9445	-147.6565	3025	sDanielson	
81	5/6/2020 18:37:06	CTD911	recover	Seward Line	GAK14	13	57.9451	-147.6622	3025	sDanielson	FOR PAR PROFILE
82	5/6/2020 18:56:38	CalVet net	deploy	Seward Line	GAK14	8	57.9443	-147.6552	3025	sDanielson	
83	5/6/2020 19:02:40	CalVet net	recover	Seward Line	GAK14	8	57.9447	-147.6591	3025	sDanielson	
84	5/6/2020 19:25:12	CTD911	deploy	Seward Line	GAK14	14	57.9438	-147.6556	3045	sDanielson	
85	5/6/2020 20:57:28	CTD911	recover	Seward Line	GAK14	14	57.9435	-147.6731	3045	sDanielson	
86	5/6/2020 22:04:40	CTD911	deploy	Seward Line	GAK13	15	58.0987	-147.7902	2068	sDanielson	FOR PAR PROFILE
86.5	5/6/2020 22:15:40	CTD911	recover	Seward Line	GAK13	15			2068	sDanielson	
87	5/6/2020 22:18:00	CalVet net	deploy	Seward Line	GAK13	9	58.0991	-147.7945	2068	sDanielson	
88	5/6/2020 22:21:44	CalVet net	recover	Seward Line	GAK13	9	58.0992	-147.7960	2068	sDanielson	
89	5/6/2020 22:29:08	CTD911	deploy	Seward Line	GAK13	16	58.0993	-147.7971	2058	sDanielson	
90	5/7/2020 0:01:52	CTD911	recover	Seward Line	GAK13	16	58.0984	-147.8107	2058	sDanielson	
90.5	5/7/2020 1:03:27	CTD911	deploy	Seward Line	GAK12	17	58.2425	-147.9298	2137	sDanielson	
91	5/7/2020 1:11:36	CTD911	recover	Seward Line	GAK12	17	58.2435	-147.9330	2137	sDanielson	
92	5/7/2020 1:16:44	CalVet net	deploy	Seward Line	GAK12	10	58.2440	-147.9343	2165	sDanielson	
95	5/7/2020 1:19:49	CalVet net	recover	Seward Line	GAK12	10	58.2444	-147.9352	2165	sDanielson	
96	5/7/2020 1:27:16	CTD911	deploy	Seward Line	GAK12	18	58.2450	-147.9366	2139	sDanielson	
97	5/7/2020 2:50:25	CTD911	recover	Seward Line	GAK12	18	58.2462	-147.9395	2139	sDanielson	
98	5/7/2020 3:19:12	EM302	start	NaN	NaN	NaN	58.2908	-147.9463		eRoth	
99	5/7/2020 16:53:24	CTD911	deploy	PWS	KIP2	19	60.2783	-147.9872	586	sDanielson	
100	5/7/2020 17:47:40	CTD911	recover	PWS	KIP2	19	60.2769	-147.9858	586	sDanielson	
101	5/7/2020 17:52:59	CalVet net	deploy	Seward Line	KIP2	11	60.2769	-147.9858	584	sDanielson	
102	5/7/2020 17:57:23	CalVet net	recover	Seward Line	KIP2	11	60.2769	-147.9858	584	sDanielson	
103	5/7/2020 19:17:11	CTD911	deploy	PWS	PWS1	20	60.3802	-147.9366	347	sDanielson	
104	5/7/2020 19:45:38	CTD911	recover	PWS	PWS1	20	60.3802	-147.9366	347	sDanielson	
105	5/7/2020 19:49:11	CalVet net	deploy	PWS	PWS1	12	60.3802	-147.9366	347	sDanielson	
106	5/7/2020 19:52:36	CalVet net	recover	PWS	PWS1	12	60.3802	-147.9366	347	sDanielson	
107	5/7/2020 21:22:58	CTD911	deploy	PWS	PWS2	21	60.5348	-147.8024	730	sDanielson	
108	5/7/2020 22:14:37	Science Seawater	other	NaN	NaN	NaN	60.5348	-147.8024		eRoth	ISUS secured due to insufficient lamp li
109	5/7/2020 22:18:29	CTD911	recover	PWS	PWS2	21	60.5348	-147.8024	730	sDanielson	
110	5/7/2020 22:23:52	CalVet net	deploy	PWS	PWS2	13a	60.5348	-147.8024	730	sDanielson	live/Ethanol
113	5/7/2020 22:36:41	CalVet net	recover	PWS	PWS2	13a	60.5351	-147.8020	730	sDanielson	
116	5/7/2020 22:37:10	CalVet net	deploy	PWS	PWS2	13	60.5351	-147.8019	730	sDanielson	
117	5/7/2020 22:40:11	CalVet net	recover	PWS	PWS2	13	60.5352	-147.8018	730	sDanielson	
120	5/8/2020 0:47:05	CTD911	deploy	PWS	PWS3	22	60.6676	-147.6681	740	eRoth	
122	5/8/2020 1:41:39	CTD911	recover	PWS	PWS3	22	60.6674	-147.6672	731	sDanielson	
123	5/8/2020 1:46:31	CalVet net	deploy	PWS	PWS3	14	60.6674	-147.6672	730	sDanielson	

Event.ID	Date	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
124	5/8/2020 1:49:34	CalVet net	recover	PWS	PWS3	14	60.6674	-147.6670	730	sDanielson	
126	5/8/2020 6:05:50	multinet	deploy	PWS	PWS3	9	60.6673	-147.6652	710	rHopcroft	
127	5/8/2020 6:13:19	multinet	maxDepth	PWS	PWS3	9	60.6701	-147.6579	710	rHopcroft	
128	5/8/2020 6:40:35	multinet	recover	PWS	PWS3	9	60.6792	-147.6326	710	rHopcroft	WIRE OUT 286M
129	5/8/2020 8:16:37	multinet	deploy	PWS	PWS2	10	60.5322	-147.8201	710	rHopcroft	
130	5/8/2020 8:24:40	multinet	maxDepth	PWS	PWS2	10	60.5339	-147.8126	727	rHopcroft	
131	5/8/2020 8:53:20	multinet	recover	PWS	PWS2	10	60.5384	-147.7841	727	rHopcroft	WIRE OUT 242M
132	5/8/2020 10:37:12	multinet	deploy	PWS	PWS1	11	60.3764	-147.9395	354	rHopcroft	
133	5/8/2020 10:45:25	multinet	maxDepth	PWS	PWS1	11	60.3801	-147.9369	354	rHopcroft	
134	5/8/2020 11:11:54	multinet	recover	PWS	PWS1	11	60.3905	-147.9271	354	rHopcroft	WIRE OUT 240M
135	5/8/2020 12:27:41	multinet	deploy	PWS	KIP2	12	60.2710	-147.9932	577	rHopcroft	
136	5/8/2020 12:36:26	multinet	maxDepth	PWS	KIP2	12	60.2750	-147.9895	577	rHopcroft	
137	5/8/2020 13:04:44	multinet	recover	PWS	KIP2	12	60.2892	-147.9779	577	rHopcroft	WIRE OUT 271M
138	5/8/2020 16:24:19	CTD911	recover	Seward Line	KIP0	23	60.1253	-147.8330	293	sDanielson	
139	5/8/2020 16:24:56	CTD911	deploy	Seward Line	KIP0	23	60.1254	-147.8330	293	sDanielson	
140	5/8/2020 18:13:38	CTD911	deploy	MS	MS1	24	59.9534	-147.9263	167	sDanielson	
141	5/8/2020 18:27:23	CTD911	recover	MS	MS1	24	59.9534	-147.9263	167	sDanielson	
142	5/8/2020 19:04:13	CTD911	deploy	MS	MS3	25	59.9345	-147.8551	167	sDanielson	
143	5/8/2020 19:16:41	CTD911	recover	MS	MS3	25	59.9362	-147.8509	167	sDanielson	
144	5/8/2020 19:55:43	CTD911	deploy	MS	MS4	26	59.9235	-147.8317	123	eRoth	
145	5/8/2020 20:07:31	CTD911	recover	MS	MS4	26	59.9234	-147.8317	123	sDanielson	
146	5/8/2020 21:21:18	CTD911	recover	MS	MS2	27	59.9436	-147.8871	196	sDanielson	
147	5/8/2020 21:22:10	CTD911	deploy	MS	MS2	27	59.9432	-147.8922	196	sDanielson	
148	5/8/2020 21:30:06	CalVet net	deploy	MS	MS2	15	59.9423	-147.8942	196	sDanielson	
149	5/8/2020 21:33:35	CalVet net	recover	MS	MS2	15	59.9428	-147.8932	196	sDanielson	
152	5/9/2020 6:03:35	multinet	deploy	Seward Line	GAK7	13	58.9653	-148.6353	249	rHopcroft	
153	5/9/2020 6:16:43	multinet	maxDepth	Seward Line	GAK7	13	58.9624	-148.6253	249	rHopcroft	
154	5/9/2020 6:50:58	multinet	recover	Seward Line	GAK7	13	58.9537	-148.6058	249	rHopcroft	WIRE OUT 371M
155	5/9/2020 8:47:39	multinet	deploy	Seward Line	GAK6	14	59.1253	-148.7698	150	rHopcroft	
156	5/9/2020 8:56:35	multinet	maxDepth	Seward Line	GAK6	14	59.1213	-148.7662	150	rHopcroft	
157	5/9/2020 9:05:44	multinet	abort	Seward Line	GAK6	14	59.1213	-148.7662	150	rHopcroft	WINCH FROOZE GEAR ON BOTTOM
158	5/9/2020 9:33:05	multinet	deploy	Seward Line	GAK6	14	59.1180	-148.7805	150	rHopcroft	REPEAT
159	5/9/2020 9:40:59	multinet	maxDepth	Seward Line	GAK6	14	59.1151	-148.7784	150	rHopcroft	
160	5/9/2020 10:09:39	multinet	recover	Seward Line	GAK6	14	59.1042	-148.7747	150	rHopcroft	WIRE OUT 221M, 142M DEPTH
161	5/9/2020 11:44:02	multinet	deploy	Seward Line	GAK5	15	59.2693	-148.9116	169	rHopcroft	
162	5/9/2020 11:53:00	multinet	maxDepth	Seward Line	GAK5	15	59.2643	-148.9098	170	rHopcroft	
163	5/9/2020 12:20:02	multinet	recover	Seward Line	GAK5	15	59.2495	-148.8998	170	rHopcroft	WIRE OUT 244, MAX DEPTH 162M

Event.ID	Date	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
164	5/9/2020 14:02:50	CTD911	deploy	Seward Line	GAK4I	28	59.3348	-148.9799	196	sDanielson	
166	5/9/2020 14:16:20	CTD911	recover	Seward Line	GAK4I	28	59.3346	-148.9792	196	sDanielson	
167	5/9/2020 15:06:28	CalVet net	deploy	Seward Line	GAK5	16	59.2613	-148.9093	167	sDanielson	
168	5/9/2020 15:11:58	CalVet net	recover	Seward Line	GAK5	16	59.2613	-148.9078	167	sDanielson	
169	5/9/2020 15:36:30	CalVet net	deploy	Seward Line	GAK5	16a	59.2623	-148.9071	166	sDanielson	live/ethanol
170	5/9/2020 15:42:16	CalVet net	recover	Seward Line	GAK5	16a	59.2623	-148.9071	166	sDanielson	
171	5/9/2020 16:08:22	CTD911	deploy	Seward Line	GAK5	29	59.2622	-148.9057	165	sDanielson	
172	5/9/2020 16:39:50	CTD911	recover	Seward Line	GAK5	29	59.2628	-148.9074	165	sDanielson	
173	5/9/2020 17:42:34	CTD911	deploy	Seward Line	GAK5I	30	59.1916	-148.8419	167	sDanielson	
174	5/9/2020 17:56:54	CTD911	recover	Seward Line	GAK5I	30	59.1916	-148.8419	167	sDanielson	
175	5/9/2020 18:53:48	CalVet net	deploy	Seward Line	GAK6	17	59.1167	-148.7727	147	sDanielson	
176	5/9/2020 18:57:49	CalVet net	recover	Seward Line	GAK6	17	59.1166	-148.7729	147	sDanielson	
177	5/9/2020 19:21:39	CTD911	deploy	Seward Line	GAK6	31	59.1165	-148.7733	148	sDanielson	
178	5/9/2020 19:48:59	CTD911	recover	Seward Line	GAK6	31	59.1195	-148.7771	148	sDanielson	
179	5/9/2020 20:40:46	CTD911	deploy	Seward Line	GAK6I	32	59.0449	-148.7031	189	sDanielson	
180	5/9/2020 20:54:48	CTD911	recover	Seward Line	GAK6I	32	59.0455	-148.7063	189	sDanielson	
181	5/9/2020 21:38:27	CalVet net	deploy	Seward Line	GAK7	18	58.9721	-148.6297	241	sDanielson	
182	5/9/2020 21:43:03	CalVet net	recover	Seward Line	GAK7	18	58.9728	-148.6319	241	sDanielson	
183	5/9/2020 22:02:24	CTD911	deploy	Seward Line	GAK7	33	58.9725	-148.6298	241	sDanielson	
184	5/9/2020 22:35:19	CTD911	recover	Seward Line	GAK7	33	58.9745	-148.6373	241	sDanielson	
185	5/9/2020 23:35:20	CTD911	deploy	Seward Line	GAK7I	34	58.8821	-148.5615	301	sDanielson	
186	5/9/2020 23:49:44	CTD911	recover	Seward Line	GAK7I	34	58.8821	-148.5616	301	sDanielson	
187	5/10/2020 1:39:00	Mooring	deploy	GEO	GEO1	NaN	59.0136	-148.6900	230	sDanielson	
188	5/10/2020 1:44:49	CTD911	deploy	GEO	GEO1	35	59.0127	-148.6892	232	sDanielson	
189	5/10/2020 2:13:52	CTD911	recover	GEO	GEO1	35	59.0127	-148.6893	232	sDanielson	
190	5/10/2020 4:51:03	CalVet net	deploy	Seward Line	GAK4	19	59.4087	-149.0492	198	sDanielson	
191	5/10/2020 4:56:29	CalVet net	recover	Seward Line	GAK4	19	59.4091	-149.0497	198	sDanielson	
194	5/10/2020 5:17:19	CTD911	deploy	Seward Line	GAK4	36	59.4099	-149.0504	198	sDanielson	
195	5/10/2020 5:47:15	CTD911	recover	Seward Line	GAK4	36	59.4099	-149.0504	198	sDanielson	
196	5/10/2020 6:15:53	multinet	deploy	Seward Line	GAK4	16	59.4109	-149.0532	200	rHopcroft	
197	5/10/2020 6:26:18	multinet	maxDepth	Seward Line	GAK4	16	59.4078	-149.0428	200	rHopcroft	
198	5/10/2020 6:55:58	multinet	recover	Seward Line	GAK4	16	59.3998	-149.0141	200	rHopcroft	WIRE OUT 300, MAX DEPTH 190
199	5/10/2020 8:11:21	multinet	deploy	Seward Line	GAK3	17	59.5572	-149.2027	217	rHopcroft	
200	5/10/2020 8:21:28	multinet	maxDepth	Seward Line	GAK3	17	59.5540	-149.1943	217	rHopcroft	
201	5/10/2020 8:49:59	multinet	recover	Seward Line	GAK3	17	59.5540	-149.1943	217	rHopcroft	WIRE OUT 295M
202	5/10/2020 10:06:16	multinet	deploy	Seward Line	GAK2	18	59.6963	-149.3411	217	rHopcroft	
203	5/10/2020 10:14:50	multinet	maxDepth	Seward Line	GAK2	18	59.6945	-149.3357	236	rHopcroft	

Event.ID	Date	Instrument	Action	Transect	Station	Cast	Latitude	Longitude	Seafloor	Author	Comment
204	5/10/2020 10:40:55	multinet	recover	Seward Line	GAK2	18	59.6904	-149.3173	236	rHopcroft	WIRE OUT 242M
205	5/10/2020 11:59:53	multinet	deploy	Seward Line	GAK1	19	59.8527	-149.4728	270	rHopcroft	
206	5/10/2020 12:08:24	multinet	maxDepth	Seward Line	GAK1	19	59.8489	-149.4704	270	rHopcroft	
207	5/10/2020 12:33:20	multinet	recover	Seward Line	GAK1	19	59.8390	-149.4603	270	rHopcroft	WIRE OUT 239M
208	5/10/2020 15:06:15	CTD911	deploy	Seward Line	GAK3I	37	59.4816	-149.1157	202	sDanielson	
209	5/10/2020 15:14:24	CTD911	recover	Seward Line	GAK3I	37	59.4816	-149.1157	202	sDanielson	
210	5/10/2020 15:54:45	CalVet net	deploy	Seward Line	GAK3	20	59.5537	-149.1858	211	sDanielson	
211	5/10/2020 15:57:48	CalVet net	recover	Seward Line	GAK3	20	59.5540	-149.1854	211	sDanielson	
212	5/10/2020 15:57:51	CalVet net	recover	Seward Line	GAK3	20	59.5540	-149.1854	211	sDanielson	
213	5/10/2020 16:24:02	CTD911	deploy	Seward Line	GAK3	38	59.5541	-149.1853	210	sDanielson	
214	5/10/2020 16:54:01	CTD911	recover	Seward Line	GAK3	38	59.5541	-149.1853	210	sDanielson	
215	5/10/2020 18:13:49	CTD911	recover	Seward Line	GAK2I	39	59.6268	-149.2587	211	sDanielson	
216	5/10/2020 18:14:36	CTD911	deploy	Seward Line	GAK2I	39	59.6268	-149.2587	211	sDanielson	
217	5/10/2020 18:56:29	CalVet net	deploy	Seward Line	GAK2	21	59.6934	-149.3286	221	sDanielson	
218	5/10/2020 19:01:48	CalVet net	recover	Seward Line	GAK2	21	59.6934	-149.3286	221	sDanielson	
219	5/10/2020 19:26:01	CTD911	deploy	Seward Line	GAK2	40	59.6934	-149.3286	225	eRoth	
220	5/10/2020 20:04:30	CTD911	recover	Seward Line	GAK2	40	59.6934	-149.3286	225	eRoth	
221	5/10/2020 20:51:49	CTD911	deploy	Seward Line	GAK1I	41	59.7668	-149.3971	258	sDanielson	
222	5/10/2020 21:07:35	CTD911	recover	Seward Line	GAK1I	41	59.7668	-149.3971	258	sDanielson	
223	5/10/2020 22:01:44	CTD911	deploy	Seward Line	GAK1	42	59.8445	-149.4678	270	sDanielson	
224	5/10/2020 22:41:37	CTD911	recover	Seward Line	GAK1	42	59.8445	-149.4677	270	sDanielson	
225	5/10/2020 22:50:57	CalVet net	recover	Seward Line	GAK1	22	59.8445	-149.4685	269	rHopcroft	
227	5/10/2020 23:07:00	CalVet net	deploy	Seward Line	GAK1	22	59.8445	-149.4677	269	rHopcroft	
226	5/10/2020 23:05:55	CalVet net	deploy	Seward Line	GAK1	22a	59.8445	-149.4689	269	rHopcroft	LIVE
228	5/10/2020 23:10:11	CalVet net	recover	Seward Line	GAK1	22a	59.8446	-149.4699	269	rHopcroft	
229	5/10/2020 23:41:55	CTD911	deploy	Seward Line	GAK1	43	59.8539	-149.5051	260	sDanielson	2019 GAK1 MOORING CAL CAST
230	5/10/2020 23:59:40	CTD911	recover	Seward Line	GAK1	43	59.8539	-149.5051	260	sDanielson	
231	5/11/2020 0:29:27	Mooring	recover	NaN	GAK1	NaN	59.8527	-149.5028	262	sDanielson	
232	5/11/2020 2:35:40	EK80	stop	NaN	NaN	NaN	59.8530	-149.4975		eRoth	
233	5/11/2020 2:49:36	centerBoard	recover	NaN	NaN	NaN	59.8530	-149.4975		eRoth	flush position
234	5/11/2020 2:51:37	ADCP WH300	stop	NaN	NaN	NaN	59.8530	-149.4940		eRoth	
235	5/11/2020 2:52:26	OS75	stop	NaN	NaN	NaN	59.8537	-149.4918		eRoth	
236	5/11/2020 4:34:33	Science Seawater	stop	NaN	NaN	NaN	60.0672	-149.3819		eRoth	
237	5/11/2020 4:35:52	EM302	stop	NaN	NaN	NaN	60.0700	-149.3835		eRoth	
240	5/11/2020 6:42:16	Ship	endCruise	NaN	NaN	NaN	60.0882	-149.3887		eRoth	sitting in Res Bay for the night