NGA-LTER Fall 2026 CRUISE PLAN
September 11-22 (23?), 2025

Funding Source: NSF, NPRB, EVOS, AOOS, UAF

Vessel: R/V *Tiglax* (USFWS)
Captain: Dan Puterbaugh

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Co-Chief Scientist: Alex Poje, zooplankton (night lead), apoje@alaska.edu (2)

Scientific Personnel:

Megan Smith	Zooplankton (days)	UHawaii	(3)
Lindsey Kim	Zooplankton (nights)	UAF	(4)
Cameron Shaw	Zooplankton (nights)	UAF	(5)
Dylan Fraioli	Zooplankton (nights)	UAF	(6)
Megan Brauner	Phytoplankton/Microzoop	UAF	(7)
Ruth Varner	Phytoplankton/Microzoop	UAF	(8)
Mette Kaufman	Nutrients	UAF	(9)
TBD	POM, DOM, O2	TBD	(10)
Will Kleiner	DIC	UAF	(11)
Pete Shipton	Physics	UAF	(12)
Calie Gesmundo	Seabirds/Mammals	USFWS	(13)
Kim McNett	Artist/Educator		(14)

Berthing:
2-person room, main deck: Ana Aguilar-Islas, Mette Kaufman
4-person room, main deck: Megan Smith, Ruth Varner, Megan Brauner, (TBDF)
Old Library: Calie Gestmundo, Kim McNett
4-person, below aft: Alex Poje, Lindsey Kim
4-person, below forward: Dylan Faioli, Will Kleiner, Pete Shipton, Cameron Shaw

Purpose of Cruise:
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 cruise contributes to Phase-II of the NSF's Northern Gulf of Alaska Long-term Ecological Site (NGA-LTER) (Fig.1) that began in 2018. The scientific purpose of the core Seward Line project is to develop an understanding of the response and resilience of this marine ecosystem to climate variability. This cruise marks the 30th consecutive late-summer/fall cruise for the Seward Line in the NGA, including Prince William Sound (PWS), and the 56th year of observations at GAK1.

Cruise Objectives:

- Determine thermohaline, velocity, light, and oxygen structure of the NGA shelf.
- Determine macro-nutrient structure of the NGA shelf.
- Determine organic matter structure of the NGA shelf.
- Determine phytoplankton and microzooplankton composition, biomass distribution, and productivity.
- Determine the vertical and horizontal distribution and abundance of zooplankton species (including macro-jellies).
- Conduct surveys of seabirds and marine mammals
- Conduct deep-water collections/lipid analysis for diapausing copepods at PWS2.
- Determine carbonate chemistry (i.e., Ocean Acidification) at selected intensive stations.
- Host an artist in residence to facilitate collaboration in the production of art-science products for the NGA
- Provide at-sea experience for students.

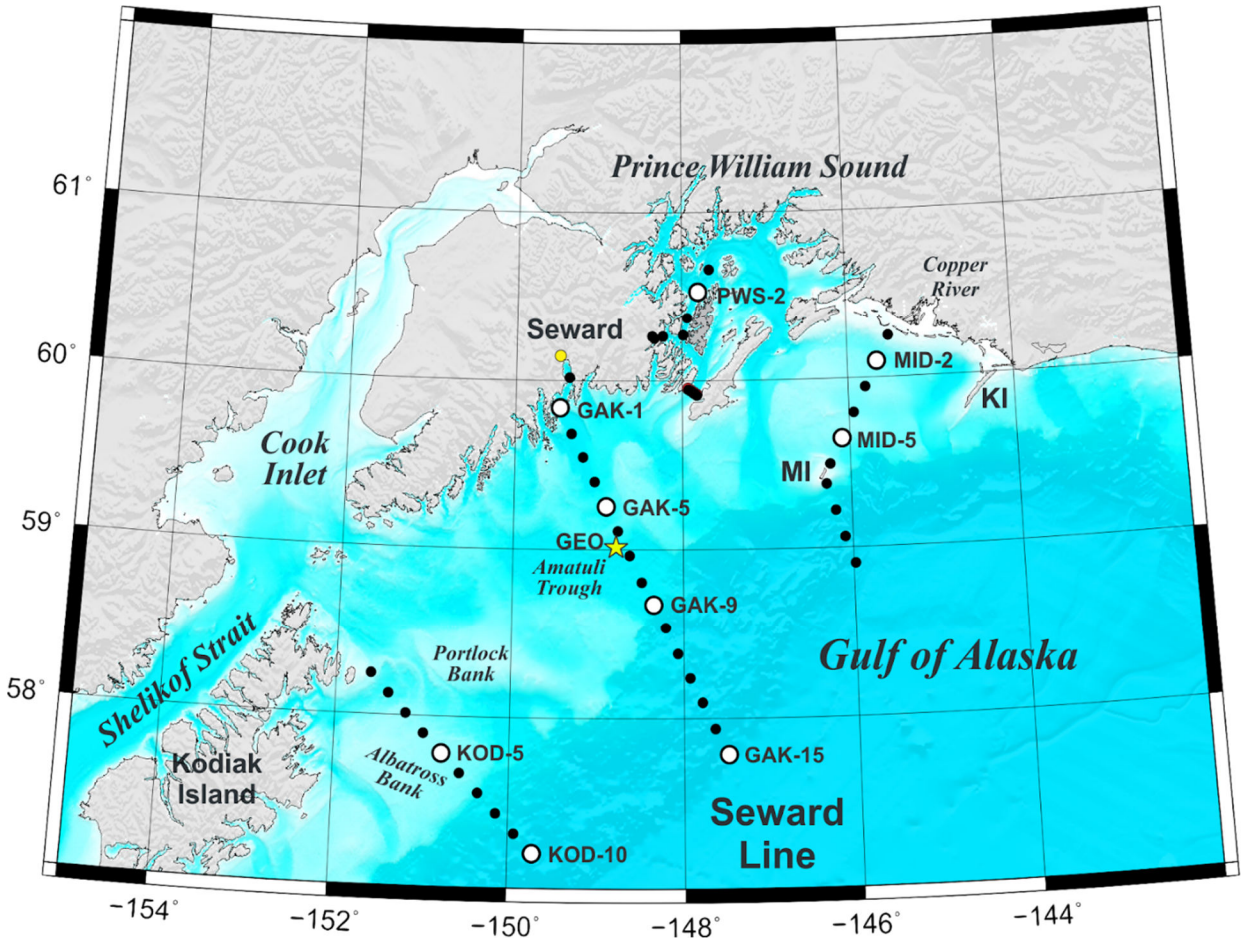


Figure 1. NGA-LTER sampling stations with transects line near Kodiak, Middleton Island and Cape Suckling. Stars indicate GAK1 and GEO mooring locations. Only Seward line and PWS stations are to be sampled during the fall cruise.

Cruise Activities:
The overall approach of the cruise is to occupy only the Seward Line transect line across the shelf and the stations within western Prince William Sound (Fig.1,Table 1). Operations are generally divided into distinct day and night activities, thus requiring each station to be occupied twice. This structure avoids each discipline needing to supply 2 shifts of scientists and ensures all organisms – especially larger diel-migrating zooplankton – are captured with minimal time-of-day bias. Typically during each morning a selected "intensive" station is occupied. Intensive stations involve a greater number and range of collections than other stations. Stations profiles are supplemented by underway measurements. Weather days built into the plan.

Daytime Activities:

1. Occupy the various hydrographic stations and collect vertical CTD-fluorescence-PAR and particle profiles (see Figures & Tables).
2. Collect underway data streams of temperature, salinity, air temperature, wind speed, and other metocean parameters.
3. Collect discrete bottle samples at these stations for nutrients, chlorophyll, DOM, and microzooplankton. Chlorophyll size fractionation (20 µm) will be done at all whole numbered Seward Line and most other stations. Macronutrients samples will be pre-filtered prior to freezing. Chlorophyll will be extracted from fresh filters without freezing and analyzed onboard. DOM samples will be pre-filter prior to fixation with HCl.
4. Collection of samples for oxygen sensor calibration at selected stations and depths. Samples will be fixed on board. Analysis will take place back on land at the SMC.
5. Collection of samples for the determination of dissolved carbonate chemistry along the Seward Line and within Prince William Sound from bottle casts at selected stations (tentatively GAK1-9, GAK15, PWS).
6. CalVet QuadNet casts will be done after most CTD casts to 100m.
7. At intensive stations an additional CTD cast will collect water to be used for primary production incubations, nutrients, and other parameters as needed.
8. At intensive stations there will be an extra Calvet Quad collection. Some of this material will be used for live sorting as well as post-cruise molecular analysis.
9. Completion of one shallow and one deep vertical Multinet at PWS2 (720m). This may happen at day or night as time permits (see #3 below).
10. Microzooplankton will be collected at 10m depth at most stations. At odd-numbers stations, plus PWS2 and KIP2, a CTD cast will be made for tintinnid ciliates across the upper 50m (3 CTD bottles each at 10, 20, 30, 40, & 50 m).

Nighttime Activities:

1. A towed 505-µm Multinet will be used to collected depth-stratified samples along the Seward Line, and at selected PWS Stations to 200m. A duplicate multinet is taken at intensive stations for molecular analysis.
2. A Methot Trawl will be deployed by forward crane for ~20 minutes while coming into or leaving stations. We are hoping to get every station with the Methot, but will reduce effort if needed or as weather dictates.
3. Deep-multinet tows may occur during the night shift as time permits (see #9 above).

Schedule:

9/10 – Pick-Up UAF truck. Load vehicles. Vehicles leave Fairbanks 10 am, arrive Anchorage around dinner time.
9/11 – Leave Anchorage ~7am. Begin setup at ~9 am SMC dock, Tiglax will begin at railway dock loading large items then return to SMC at ~10:00. Continue set up including acoustic calibration.
9/12 – Continue setup and sail once all the setup is finalized
9/13-9/22 – Occupy Seward Line and Prince William Sound Stations
9/22 – Return to Railway dock for offload by dinner time (worst case), hopefully earlier to offload all items and shuttle them to SMC and load UHaul.
9/23 – Finish loading any last minute items in vehicles. Science party departs for Fairbanks or flies out of ANC airport.

Travel:

See logistics on google drive:

Sampling Strategy:

In general, we estimate 2 days for PWS and 5-6 days for the Seward Line. Two strategies that ensure the efficient utilization of time are: 1) when conditions allow it, stations in PWS can be sampled during storms that prohibit working along the Seward Line, and 2) executing daytime stations and activities so that the ship is in position to commence night sampling as soon as it is sufficiently dark, as there is always a much greater period of light available than of darkness. For night operations, it is important that all Multinet collections be completed during darkness to allow comparison to prior years. Typically, 4-5 Multinets can be conducted per night: Sampling starts just after dusk and stops just before dawn, and sampling can be extended slightly when overcast. If weather conditions make it impossible to reach GAK15, the most southern station sampled (GAK12,13, or 14) could serve as the offshore "intensive" station.

Personnel and time requirements during operations:

- CTD: winch operator, 2-3 scientists (launch and recovery), 30m/min in upper 100m, 60m/min below 100m. Depending on schedule, casts may be limited to 1000m at deep-sea stations.
- Towed Multinet: winch operator, 2-3 scientists (launch, recovery, wash-down, re-cock) – Ship speed: 2 knots, Wire speed: ~1 m/sec down, 0.5-1m/sec up (typically 30-40min per deployment). Stern A-frame deployment. Maximum depth 200m. The multinet has a depth transducer to ensure we get close to, but not on the bottom when depths are less than 200m.
- Calvet Quad Nets: winch operator, 1-2 scientists (launch, recovery, wash-down) – Ship speed: station keeping, Wire speed: ~0.5 m/sec
- Methot Trawl: forward crane operator, 4 scientists, launch, recovery, wash-down) – Ship speed: ~2.5 knots, surface trawl only.
- Drifting Sediment Traps: will not be deployed this cruise.

Ship's Science Equipment Supplied:

- Underway sampling system (TSG, GPS) SBE21
- EK60
- Seawater system

Scientist's Equipment to bring onboard:

- CTD (with deep-SUNA, LISST for integration)
- MASH4k winch (UNOLS East Coast winch pool)
- Portable meteorological sensor station, GPS and datalogger
- -40 freezer for macro-nutrient and genetic samples (in hold)
- Dewar (65 L) (in hold)
- CalVet [nets, flow-meters, frames, swivels, weights, spares]
- 2 Multinet systems (coarse and fine nets, spare cod ends/nets)
- Event log computer and software
- Bongo nets (backup)
- Deckboard incubators (2) connected to ship's seawater system
- Filtration systems
- Fluorometers & Centrifuge
- Laptop computers
- 14 cases (24/cs) of 16-oz & 4 cases (12/cs) of 32-oz zooplankton sample bottles
- 2-3 cases of 24 Winkler bottles
- Several coolers with nutrient bottles
- Microscopes and supplies for sorting copepods
- Incubators: 4 cu ft. in wet lab
- Refrigerated Circulator
- Espresso Machine

Hazmat:

- 37% Formaldehyde – 2x20L carboy
- 95% Ethanol – 40L
- Acetone – 16L
- Lugol's solution (1L)
- Oxygen Fixation (Sodium hydroxide. Sulphuric acid, Manganous Chloride)
- Mercuric Chloride (for DIC fixation)
- 3N HCl (25% v/v) (1 L)
- Glutaraldehyde (10%) – 500 ml
- DAPI stain solution – 100 ml
- Liquid N2 – one 65-L dewar

Table 1. STANDARD STATIONS (intensive stations highlighted in green)
(The grey "i" stations will not be occupied during this cruise)

Latitude N (degrees, minutes)		Longitude W (degrees, minutes)		Station Name
Resurrection Bay Station				
60	1.5	149	21.5	RES2.5
Seward Line				
59	50.7	149	28	GAK1
59	46	149	23.8	GAK1i
59	41.5	149	19.6	GAK2
59	37.6	149	15.5	GAK2i
59	33.2	149	11.3	GAK3
59	28.9	149	7.1	GAK3i
59	24.5	149	2.9	GAK4
59	20.1	148	58.7	GAK4i
59	15.7	148	54.5	GAK5
59	11.4	148	50.3	GAK5i
59	7	148	46.2	GAK6
59	2.7	148	42	GAK6i
58	58.3	148	37.8	GAK7
58	52.9	148	33.6	GAK7i
58	48.5	148	29.4	GAK8
58	44.6	148	25.2	GAK8i
58	40.8	148	21	GAK9
58	36.7	148	16.7	GAK9i
58	32.5	148	12.7	GAK10
58	23.3	148	4.3	GAK11
58	14.6	147	56	GAK12
58	5.9	147	47.6	GAK13
57	56.6	147	39	GAK14
57	47.5	147	30	GAK15
Prince William Sound Stations				
60	7.5	147	50	KIP0
60	16.7	147	59.2	KIP2
60	22.78	147	56.17	PWS1
60	32.1	147	48.2	PWS2
60	40	147	40	PWS3
Icy Bay				
60	16.3	148	21.7	IB0
60	14.5	148	20.1	IB1
60	16.3	148	14	IB2
Montague Strait Line				
59	57.257	147	55.602	MS1
59	56.6	147	53.7	MS2
59	55.9	147	51.4	MS3
59	55.2	147	49.7	MS4