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Summary

The Geological Survey of Canada (GSC) undertook marine fieldwork from June 26th to July 10th, 2023, onboard the Canadian Coast Guard Ship (CCGS) *Tully* to retrieve ocean bottom seismometers (OBS) on the west coast of Vancouver Island, previously deployed by the Research Vessel (RV) SONNE (Riedel et al., 2022). This work was conducted under the Natural Resources Canada (NRCan)'s Public Safety Geoscience Program. Data recorded on these seismometers will help in the understanding of the "locked zone" of the Cascadia Subduction Zone and ultimately feed into the Building Code of Canada and to help communities along the west coast in their decision-making and understanding of geohazard risks.

Recovery of the 26 OBSs was the main goal of the expedition, but that could only be achieved during daylight hours due to crewing capacity and safe locating of the instruments. Overnight hours were used to collect echosounder and CHIRP data across lineaments in the bathymetric data to look for surface strike-slip fault activity around the subduction zone. These data will help contribute to a better understanding of the various tectonic processes occurring in the area.

Fog and wind presented some challenges but with a skillful crew, all of the OBSs were successfully recovered. Notes were kept with suggestions for improvements for future OBS recovery processes. The OBS data will be screened for security purposes prior to any analyses. Data will be made publicly available in a timely manner and will be available through the JAMSTEC Seismic Survey Database (https://doi.org/10.17596/0002069) and the PANGAEA® Data Publisher for Earth & Environmental Science (pangaea.de).

Following recovery of the OBSs, remaining ship days were used for additional science activities. Priority went to offshore coring, primarily in Winona Basin where many subsea landslides are found along a series of ridges. 12 cores were collected by the RV SONNE at four slides in this area during expedition SO294 in 2022. Coring on this expedition aimed to collect data at additional slides and collect one proximal core to stations 173 and 174 from SO294. Three cores were recovered in Winona Basin before weather limited further coring activity in the area for the duration of the expedition.

A strong northwesterly wind set in off Brooks Peninsula on July 3rd and forecasts limited offshore overside work for all west coast Vancouver Island shelf and slope areas. We transited to Juan de Fuca Strait and conducted contingency science work there that benefits the Marine Geoscience for Marine Spatial Planning program and Simon Fraser University sediment dynamics research. We collected cores and grabs from off Port Renfrew to Sooke along the Juan de Fuca Strait. The cores will help understand sediment distribution, dynamics and mobility along the Strait, and the grabs will help ground truth surficial geology mapping work in the area. Other contingency science work such as echosounder surveys were limited in the area due to the presence of whales.

The last two days of this expedition coincided with a good weather window in the south end of the Cascadia Slope. We planned for coring the slides along the subduction margin to understand timing and frequency of slide events thought to coincide with earthquake activity.

Work started with coring on the backside of Slipstream slide, known as "Antislipstream" for this expedition. Two cores were collected distal and proximal to the slide and two cores were collected in the periphery where sediments are thought to flow down the slope to the plunge pool on the west side of the slide complex.

The last day was spent at "Minke" and "Finn" slides coring proximal and distal to the slide in the flat areas of the debris field. We hope that comparing these results to Slipstream slide data will help us to understand the distribution and frequency of event activity along the margin.

In addition to NRCan staff and one University of Victoria student, this international expedition included participants and instrumentation from JAMSTEC, Nippon Marine Enterprises, and GEOMAR Helmholtz Centre for Ocean Research, Kiel.

1. Mobilization and Equipment

The expedition mobilized at the Institute of Ocean Sciences (IOS), in Sidney, BC, and departed on June 27th through Juan de Fuca Strait for the west coast of Vancouver Island. Coast Guard crew shortage resulted in only being able to do deck operations from 0700 to 1900, with occasional extended evenings with the Captain's approval.

Daytime operations were focused on the OBS retrieval, gravity coring and grab sampling at target locations. Evening surveys were conducted by two watchkeepers using Knudsen CHIRP 3.5 kHz, Simrad EK80 split-beam scientific echosounder and Kongsberg EA640 wide-band hydrographic single-beam echosounder to optimize time by mapping potential faults and cold seeps. The trackline of the vessel and stations where data were collected are shown in Figure 1.

Section 3 of this report documents the various science activities undertaken during the expedition and how the data can be accessed.

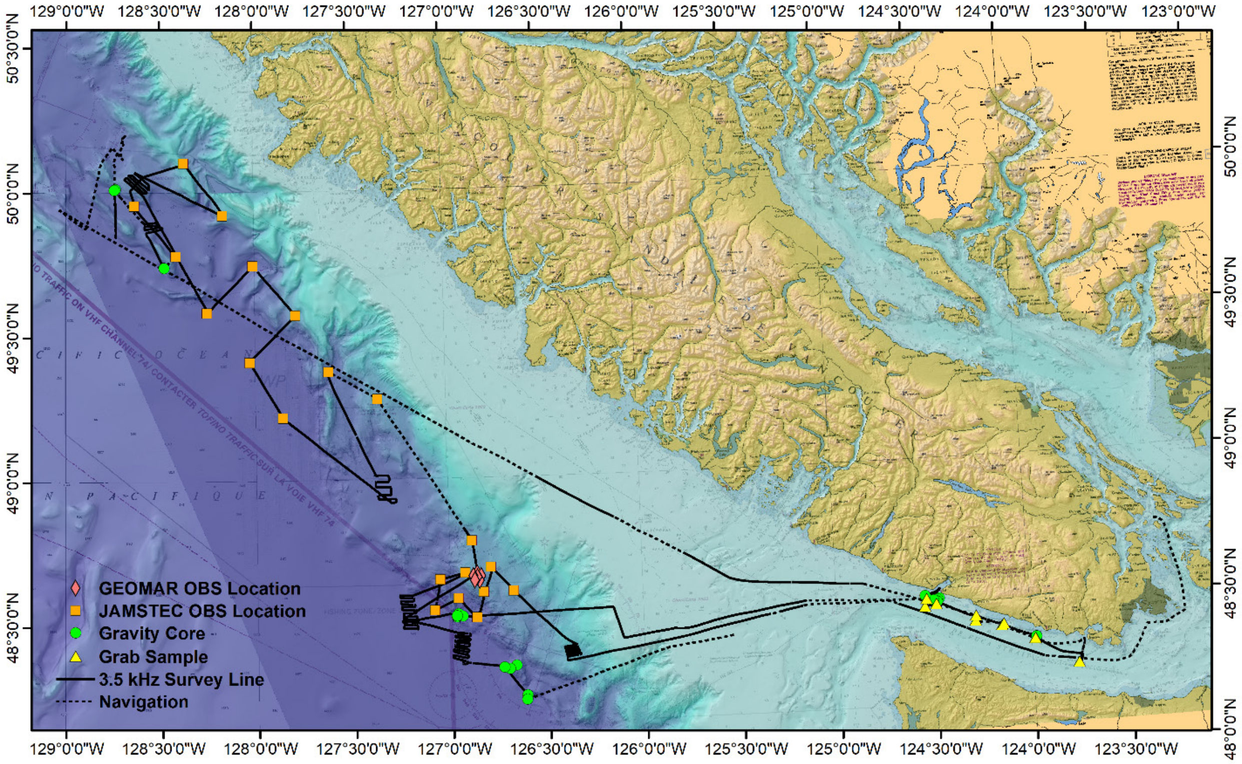

Figure 1. Track line of the vessel and locations where data were collected during 2023003PGC.

The equipment onboard included (Fig. 2):

- JAMSTEC Ocean Bottom Seismometers (20)
- GEOMAR Ocean Bottom Seismometers (6)
- Simrad EK80 Split-beam Scientific Echosounder
- Kongsberg EA640 Wide-band Single-beam echosounder
- Knudsen CHIRP 3.5 kHz Echosounder
- SEATEX motion reference unit (MRU-M-MB3)
- Smith-McIntyre Grab Sampler
- Gravity Corer
- 4K Drop Camera (for contingency; did not use during expedition)

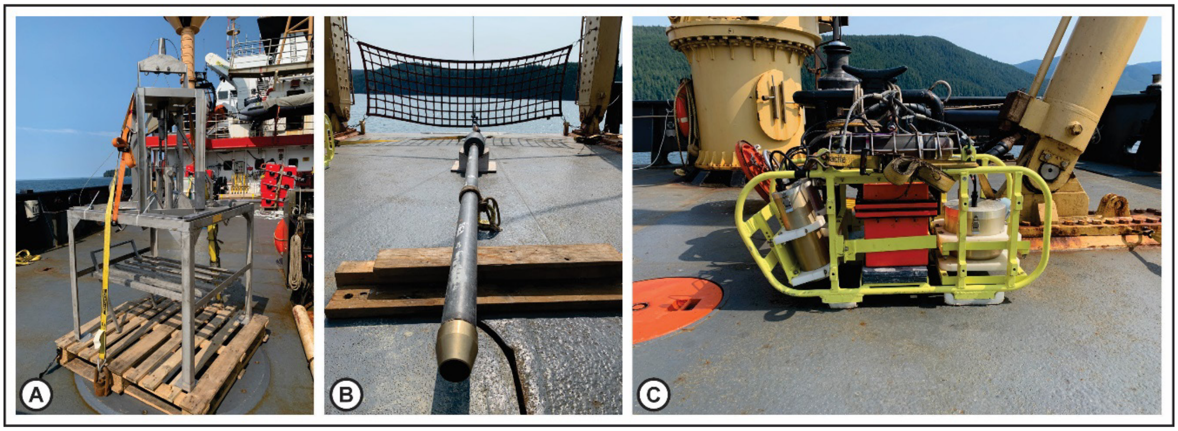

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Figure 2. Photograph of the Smith-McIntyre Grab Sampler (A, NRCan photo 2023-279), Gravity Corer (B, NRCan photo 2023-279), 4K Drop Camera (C, NRCan photo 2023-280) on the aft deck of the Tully. Photographs by M.M. Côté.

The scientific field team was made up of five NRCan-GSC employees with international participants from JAMSTEC, Nippon Marine Enterprises, and GEOMAR Helmholtz Centre for Ocean Research. One graduate student from the University of Victoria also joined the expedition (Table 1 and Fig. 3). The expedition was supported by the Canadian Coast Guard officers and crew of the vessel.

Table 1. Scientific field team for 2023003PGC - Northern Cascadia Subduction Zone International Research Expedition.

Name	Affiliation	Position on vessel
Michelle Côté	Natural Resources Canada (Geological Survey of Canada, Pacific)	Chief Scientist
Karen Douglas	Natural Resources Canada (Geological Survey of Canada, Pacific)	Chief Scientist
Tianhaozhe Sun	Natural Resources Canada (Geological Survey of Canada, Pacific)	Research Scientist
Tom Carson	Natural Resources Canada (Geological Survey of Canada, Pacific)	Marine Technician
Anna Podhorodeski	Natural Resources Canada (Geological Survey of Canada, Pacific)	Student, Echosounder Watchkeeper
Koichiro Obana	JAMSTEC	Principal Investigator
Michael Riedel	GEOMAR Helmholtz Centre for Ocean Research, Kiel	Principal Investigator
Wiebke Schäfer	GEOMAR Helmholtz Centre for Ocean Research, Kiel	Student
Takuyo Maekawa	Nippon Marine Enterprises	Technician
Taro Shirai	Nippon Marine Enterprises	Technician
Megan Davies	University of Victoria	Student, Echosounder Watchkeeper

Figure 3. 2023003PGC CCGS Tully scientific field party on the aft deck of the Tully. Photograph by F. Liberatore-Lloyd, courtesy of Canadian Coast Guard.

2. Narrative of Events

June 26 – Julian Day 177-178

- Mobilization of Scientific Equipment in morning at IOS
- Safety familiarization meeting
- Engineering maintenance work done by ship
- All equipment on board by evening

June 27 – Julian Day 178-179

- Science safety meeting
- Transit to west coast Vancouver Island via Juan de Fuca Strait
- Echosounder survey in transit and dedicated potential fault survey on slope – “Barkley Canyon strike-slip fault” (Lines 9-18)

June 28 – Julian Day 179-180

- Retrieval of OBSs: JSCS08, JSCS01, JSCS03, JSCS06, JSCS05, JSCS09, JSCS04, JSCS02 (STN1 through STN8)
- Echosounder survey along potential fault “Abyssal strike-slip 2” (Lines 28-36)

June 29 – Julian Day 180-181

- Retrieval of OBSs: BB05, BB04, BB06, BB03, BB02, BB01, JSCS07, JSCN09, JSCN10 (STN9 through STN17)
- Echosounder survey along potential fault “Hesquiat Slope fault” (Lines 43-49)

June 30 – Julian Day 181-182

- Retrieval of OBSs: JSCN11, JSCN08, JCSN07, JSCN05, JSCN06 (STN18 through STN22)
- Echosounder survey at “Twin Flares” (Lines 57-61)

July 1 – Julian Day 182-183

- Retrieval of OBSs: JSCN03, JSCN01, JSCN02, JSCN04 (STN23 through STN26)
- OBS retrieval program complete at 1511
- Gravity coring: Win173slide1 (STN27)
- Echosounder survey at “Winona Basin Survey 1” (Lines 70-72). Sea-state deteriorating, ended survey early as data were poor quality

July 2 – Julian Day 183-184

- Gravity coring: Winona4Dslide (STN28 and STN29 – no sediment recovered, moved to next location), Winona4Pslide (STN30), Winona4Dslide (STN31 - returned to this location)

July 3 – Julian Day 184-185

- All-day transit due to wind and sea state in northern portion of study area. Anchor in Port San Juan bay

July 4 – Julian Day 185-186

- Anchor in Port San Juan bay. Crew member needed to disembark. We are now constrained to putting instruments over-the-side to 1200 to 1900
- Familiarize/calibrate USBL until noon with assistance from Tully1 (RHIB)
- Gravity coring: CoreSanJuan8, CoreSanJuan10, CoreSanJuan11, CoreSanJuan12, CoreSanJuan13 (STN32 through STN37)
- Return to anchor in Port San Juan bay overnight

July 5 – Julian Day 186-187

- Familiarize/calibrate USBL until noon with the assistance of Tully1.
- Gravity coring: CoreJDF06 (STN38 and STN39)
- Grab sampling: GrabJDF18 (STN40), GrabJDF03 (STN41)

July 6 – Julian Day 187-188

- Familiarize/calibrate USBL until noon with the assistance of Tully1 (RHIB)
- New crew member arrived at 1130
- Grab sampling: GrabJDF05, GrabJDF10, GrabJDF11, GrabJDF06, CoreJDF02, SanJuan14, CoreJDF04 (too rough to use gravity core, so took grab) (STN42 through STN48)
- Begin transit to Antislipstream site; too rough to complete survey lines

July 7 – Julian Day 188-189

- Gravity coring: Antislipstream2, Antislipstream1, Antislipstream3_new, Antislipstream1_new, Antislipstream7 (STN49 through STN53)
- Echosounder surveys on Abyssal strike-slip faults

July 8 – Julian Day 189-190

- Gravity coring: Minke2, Minke1, Minke3, Finn2, Finn1 (STN54 through STN58)
- Begin transit to IOS at 1900

July 9 – Julian Day 190-191

- Arrive at IOS 1200. Begin demobilization.

July 10 – Julian Day 191

- Complete demobilization. All participants disembark

3. Data Collection

3.1. Navigation and Station Information

Navigation data for the expedition were collected from the vessel's GPS feed, with the antennas at the top of the mast located over the Bridge. Locations where data were collected are entered into the GSC cruise log as "stations". Figure 1 presents the trackline and station locations for this expedition.

Navigation and station information are publicly available through the Geological Survey of Canada's Expedition Database (ED): https://ed.gdr.nrcan.gc.ca/index_e.php.

3.2. Ocean Bottom Seismometers

The primary objective of this marine expedition was to retrieve ocean bottom seismometers (OBS) deployed in autumn 2022 during Expedition SO294 led by GEOMAR Helmholtz Centre for Ocean Research, Kiel on the Research Vessel (RV) SONNE. 26 long term OBSs and 6 long term pressure sensors (OBP) were deployed. Note that the OBPs will remain in place until 2024.

GEOMAR Broad-Band Seismometers

Six broad-band OBS instruments equipped with a hydrophone and seismometer were retrieved from the Clayoquot Slope (Fig. 4). The release transponder held the 60 kg untreated steel anchor. When the acoustic release command was sent, the OBS released from the anchor and the instrument floated to the surface at a rise rate of 41 m/min. To aid in recovery, the OBSs were equipped with a flashlight, VHF radio beacon, flag, and a swim-line (Fig. 5). Technical specifications for the instruments are available in Riedel et al. (2022). All six instruments were successfully retrieved. The OBS data were downloaded from the instruments during the expedition and sent to the Royal Canadian Navy for security screening prior to any analyses being conducted. Data will be made publicly available in a timely manner and will be available through the PANGAEA® Data Publisher for Earth & Environmental Science (pangaea.de).

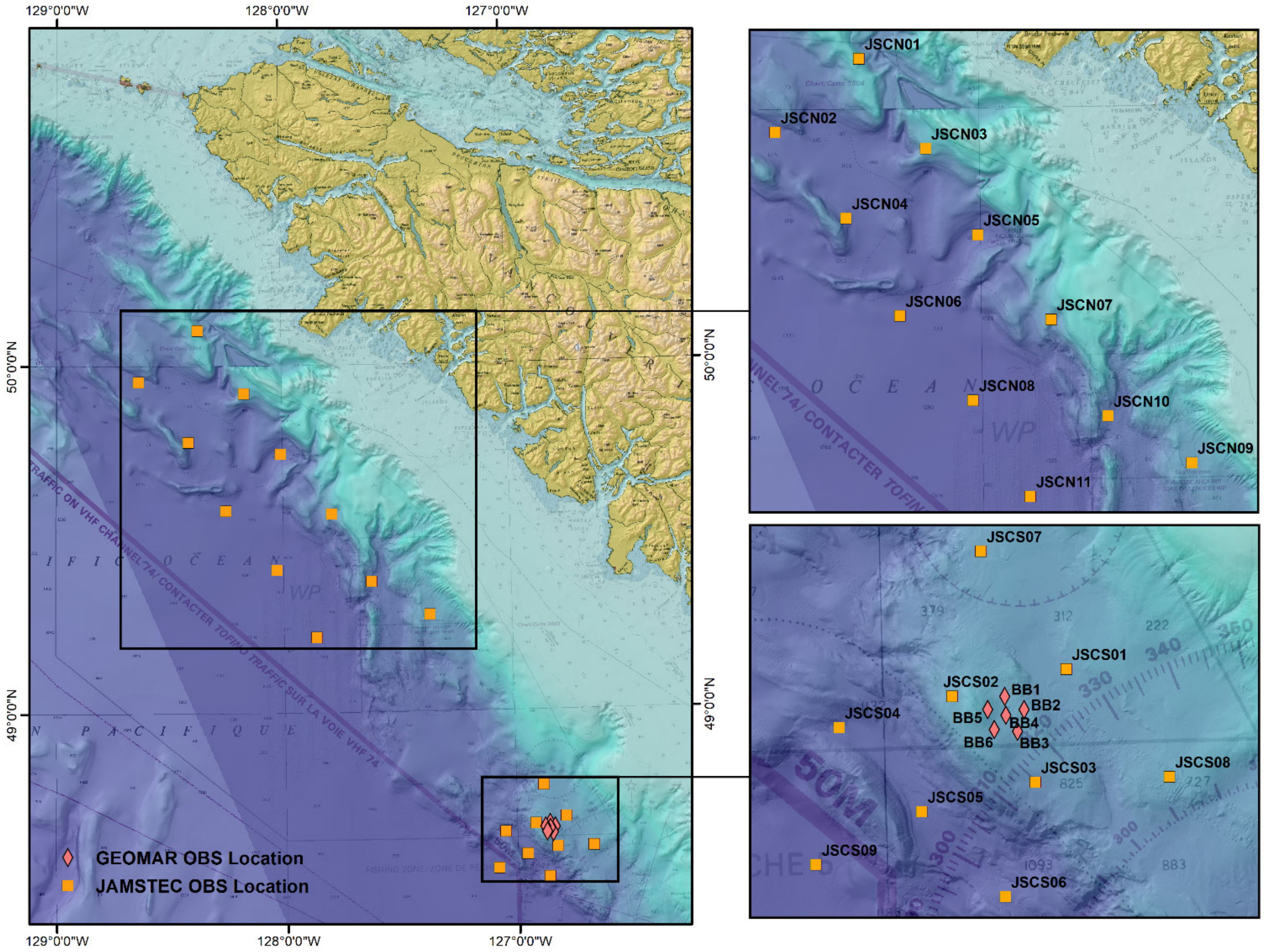

Figure 4. Map of GEOMAR and JAMSTEC OBS retrieval locations, shown in red and orange respectively, over Clayoquot Slope (bottom) and Winona Basin (top).

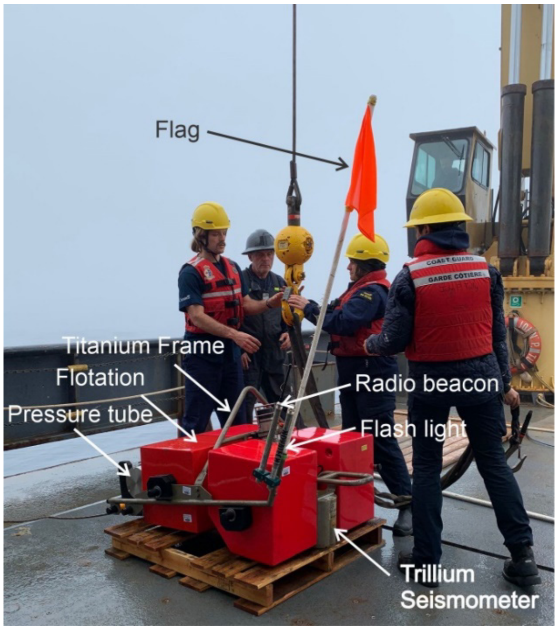

Figure. 5. Image showing a GEOMAR OBS upon recovery by Coast Guard personnel onboard Tully. Key components of the OBS are identified. Photograph by M.M. Côté. NRCan photo 2023-282.

JAMSTEC Short-period Ocean Bottom Seismometers

Twenty short-period OBSs were retrieved from the two study areas: the Juan de Fuca Plate and Explorer Plate (Fig. 4). Each yellow plastic sphere contained a three-component 4.5 Hz geophone and a hydrophone. When the acoustic release command was sent, the OBS released from the anchor and the instrument floated to the surface at a rise rate of 41 m/min. To aid in recovery, the OBSs were equipped with a VHF radio beacon and a strobe-light (Fig. 6). Technical specifications for the instruments are available in Riedel et al. (2022). All twenty instruments were successfully retrieved. The OBS data were downloaded from the instruments during the expedition and sent to the Royal Canadian Navy for security screening prior to any analyses being conducted. Data will be made publicly available in a timely manner and will be available through the JAMSTEC Seismic Survey Database (https://doi.org/10.17596/0002069).

Retrieval information for all OBSs is presented in Table 2.

Figure. 6. Image showing a JAMSTEC OBS being inspected upon recovery onboard Tully. Photograph by M.M. Côté. NRCan photo 2023-283.

Table 2. Retrieval information for JAMSTEC and GEOMAR OBSs. Information is noted for when the OBS was seen on the surface of the water.

GSC STN	OBS Name	Owner	Julian Day	OBS released UTC Time (hh:mm)	Latitude (N)	Longitude (W)	Water depth (m)
1	JSCS08	JAMSTEC	179	14:27	48°36.308′	126°40.281′	1348
2	JSCS01	JAMSTEC	179	16:50	48°41.463′	126°47.268′	1410
3	JSCS03	JAMSTEC	179	18:19	48°36.275′	126°49.729′	1539
4	JSCS06	JAMSTEC	179	19:55	48°31.093′	126°51.897′	2257
5	JSCS05	JAMSTEC	179	21:45	48°35.099′	126°57.589′	2269
6	JSCS09	JAMSTEC	179	23:36	48°32.815′	127°05.007′	2567
7	JSCS04	JAMSTEC	180	01:36	48°39.085′	127°03.095′	2120
8	JSCS02	JAMSTEC	180	03:18	48°40.357′	126°55.315′	1315
9	BB05	GEOMAR	180	13:49	48°39.649′	126°52.758′	1339
10	BB04	GEOMAR	180	14:42	48°39.405′	126°51.584′	1348
11	BB06	GEOMAR	180	15:57	48°38.714′	126°52.373′	1367
12	BB03	GEOMAR	180	16:51	48°38.648′	126°50.817′	1388

13	BB02	GEOMAR	180	17:40	48°39.656′	126°50.305′	1304
14	BB01	GEOMAR	180	19:13	48°40.318′	126°51.592′	1275
15	JSCS07	JAMSTEC	180	20:29	48°47.016′	126°52.969′	1385
16	JSCS09	JAMSTEC	181	00:23	49°16.764′	127°21.642′	1377
17	JSCS10	JAMSTEC	181	02:27	49°22.518′	127°37.009′	1777
18	JSCN11	JAMSTEC	181	13:43	49°12.981′	127°51.509′	2493
19	JSCN08	JAMSTEC	181	16:23	49°24.668′	128°01.840′	2431
20	JSCN07	JAMSTEC	181	19:01	49°34.262′	127°47.1407′	1344
21	JSCN05	JAMSTEC	181	21:19	49°44.662′	128°00.556′	2189
22	JSCN06	JAMSTEC	181	23:51	49°35.028′	128°15.180′	2290
23	JSCN03	JAMSTEC	182	13:47	49°55.214′	128°09.995′	1488
24	JSCN01	JAMSTEC	182	15:57	50°05.965′	128°22.388′	1288
25	JSCN02	JAMSTEC	182	18:54	49°57.168′	128°38.243′	2058
26	JSCN04	JAMSTEC	182	21:11	49°46.764′	128°25.101′	2104

3.3. Gravity Coring

Gravity coring was achieved using a 2.5 m corer barrel (3.4 m with end caps and weights) on 5/16” wire off the aft A-frame, descending at 1 m/s until 10 m above bottom when the winch was stopped to allow the wire to become vertical. The winch speed was then increased until the corer hit bottom, providing momentum into the seabed. The corer was recovered at 1m/s, hosed off, and brought onboard. The nose cone and core catcher were removed and the core liner cut to length and capped. Cores were stored upright at 4°C in the Tully’s cold storage room.

The cores were collected as a secondary science objective following OBS work. The cores in Winona Basin will be used to date landslide events. Those collected in Juan de Fuca Strait will be used to understand sediment dynamics in the area. The cores collected offshore will be used to date landslides occurring on the outer continental slope.

Locations and metadata for all gravity core collected during the expedition are presented in Figure 7 and Table 3. Gravity core metadata are available in ED. Gravity cores are stored at the Pacific Geoscience Centre in Sidney, BC, and are available for viewing by contacting the authors. Deck sheets for each gravity core are presented in Appendix A.

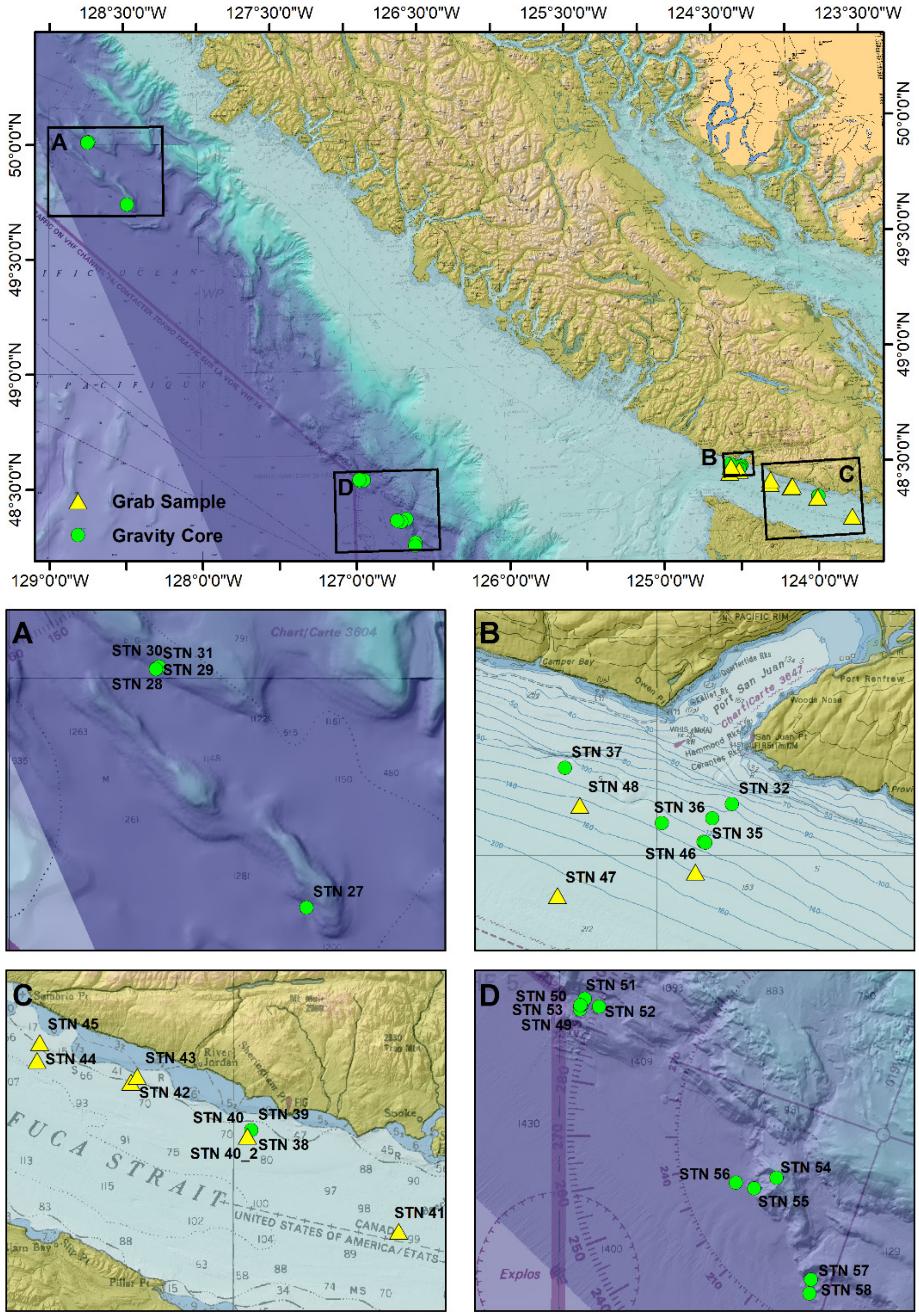

Figure. 7. Location of gravity cores (green dots) and grab samples (yellow triangles) collected during 2023003PGC.

Table 3. Gravity core collected during 2023003PGC. Information is noted for when the gravity core was on-bottom.

STN	Area	Julian Day	UTC Time (hh:mm)	Latitude (N)	Longitude (W)	Water depth (m)	Total length (cm)	Description
27	Winona Basin	183	00:12	49°37.000′	128°28.837′	2200	139	Landslide: Winona173Slide1, same slide sampled in Winona basin as Stations 173 and 174 from SO294/2022007PGC. Two apparent events with fining upwards sequences. Holocene – green mud in between. Coarser material mixed with mud at surface.
30	Winona Basin	183	18:43	50°00.746′	128°44.319′	2064	125	Landslide: Winona Basin, proximal, multibeam backscatter was high in the debris field suggesting it might be recent Grey mud with greener-brown mud at the top containing coarser grain material.
31	Winona Basin	183	21:00	50°00.586′	128°44.652′	2067	199	Landslide: Winona Basin, proximal, multibeam backscatter was high in the debris field suggesting it might be recent grey-green mud, water between liner and mud.
32	Port San Juan	185	23:08	48°30.906′	124°28.017′	94	103	Dark grey medium grain sand.
33	Port San Juan	185	23:47	48°30.658′	124°28.530′	111	72	Dark grey fine sand.
34	Port San Juan	186	00:41	48°30.244′	124°28.760′	135	20	Short, fine sand, unconsolidated, shell fragments.
35	Port San Juan	186	01:02	48°30.230′	124°28.716′	135	93	Fine grain sand with coarser layers. Short, fine sand, unconsolidated, shell fragments.
36	Port San Juan	186	01:30	48°30.573′	124°29.856′	132?	139	Fine sand with coarser events.
37	Port San Juan	186	19:04	48°31.539′	124°32.409′	111	128	Not noted
38	Juan de Fuca Strait	186	22:28	48°21.799′	123°58.564′	114	37	Silt with shell fragments on top of sand.
39	Juan de Fuca Strait	186	22:44	48°21.799′	123°58.554′	113	46	Shells in with silty sand.
49	Clayoquot Slope	188	15:29	48°31.202′	126°58.153′	2424	127	Landslide: Antislipstream Silty mud with at least one event/ coarser unit near top. Colour change to darker green-grey above from medium grey

50	Clayoquot Slope	188	17:47	48°31.474′	126°58.044′	2426	72	Landslide: Antislipstream Grey mud with sand event/unit at top.
51	Clayoquot Slope	188	19:57	48°31.862′	126°57.730′	2414	166	Landslide: Antislipstream Grey mud with multiple sand events/units, one large mixed unit near top.
52	Clayoquot Slope	188	21:57	48°31.383′	126°56.424′	2429	206	Landslide: Antislipstream Grey silty mud with interspersed sand units/events.
53	Clayoquot Slope	189	23:54	48°31.465′	126°58.149′	2427	0	Landslide: Antislipstream Core returned with mud dripping out bottom. ~10 cm of watery mud in base without structure maintained.
54	Abyssal Plain	189	15:02	48°20.890′	126°40.070′	2510	65	Landslide: Minke Uniform grey mud. Small stone in core catcher (in sampled vial).
55	Abyssal Plain	189	17:05	48°20.236′	126°42.141′	2485	37	Landslide: Minke Grey-green mud with sand unit near top. Core catcher sample fell out on deck and retrieved into sample container.
56	Abyssal Plain	189	19:12	48°20.591′	126°43.821′	2527	200	Landslide: Minke Grey mud with ~1 cm sand units interspersed (approx. 3).
57	Abyssal Plain	189	21:40	48°14.646′	126°36.916′	2440	115	Landslide: Finn Core appears to have penetrated Pleistocene grey mud with Holocene green-grey mud on top.
58	Abyssal Plain	189	23:33	48°13.785′	126°37.046′	2460	140	Landslide: Finn Depth discrepancy between EK80 (2460 m), existing MB Bathy at 2488 m and 3.5 kHz which is noisy but showing depths around 2490 m. Pleistocene grey mud in catcher transitions to Holocene green-grey mud somewhere before surface. Difficult to see due to water content.

3.4. Grab Sampling

Grab sampling was conducted using a Smith-McIntyre Grab Sampler on a 5/16” wire off the aft A-frame descending at 1 m/s. The sampler closes when the feet hit bottom. When back on deck, the sampler was emptied into a wash tub lined with plastic. The sample was photographed, sub-sampled into two containers for grainsize and described on deck sheets. The samples were kept in the fridge at 4°C.

Samples were collected for the purpose of determining grainsize and seabed characteristics in Juan de Fuca Strait. Results will contribute to the surficial geology map for NRCan's Marine Geoscience for Marine Spatial Planning program.

Locations and metadata for all grab samples collected during the expedition are presented in Figure 7 and Table 4. Grab sample metadata are also available in ED. Appendix A includes the deck sheets for the grab samples and Appendix B presents photos of each of the grab samples.

Table 4. Grab samples collected during 2023003PGC. Information is noted for when the grab sampler was on-bottom.

GSC STN	Name	Julian Day	UTC Time (hh:mm)	Latitude (N)	Longitude (W)	Water depth (m)	Description
40	GrabJDF18	187	00:41	48°21.450′	123°58.910′	126	Dark grey silty mud with shell fragments.
41	GrabJDF03	187	02:30	48°15.955′	123°45.811′	180	Mud to pebbles, most up to ~4 cm. One 5.5 cm pebble found. Poorly sorted. Juvenile mussels, clams, brittle stars and polychaetes interspersed.
42	GrabJDF05	187	21:36	48°24.562′	124°8.975′	101	Poorly sorted angular cobble ~>7 cm to mud with organisms attached to cobbles. Mud has high silt content (gritty).
43	GrabJDF10	187	22:13	48°24.893′	124°8.447′	66	Poorly sorted mud-cobble (7 cm max.) with more rounded cobbles than station 42. Small colony of feather duster tubes collected.
44	GrabJDF11	187	23:22	48°25.808′	124°17.099′	133	Dark grey uniform, well mixed.
45	GrabJDF06	187	23:50	48°26.829′	124°16.885′	52	Fine sand with mud. Some pebbles (up to 5 cm). Shell mash, some intact.
46	CoreJDF02	188	00:24	48°29.718′	124°28.975′	165	Dark grey sand-mud. Lots of annelids.
47	SanJuan14	188	01:08	48°29.306′	124°32.602′	215	Dark grey silty mud.
48	CoreJDF04	188	01:43	48°30.885′	124°32.014′	144	Dark grey silty mud.

3.5. Echosounder Data

Simrad EK80 Split-beam Scientific Echosounder and Kongsberg EA640 Wide-band Hydrographic Single-beam Echosounder data were collected during the expedition. The echosounder data were used to measure water column activity and water depth during surveys and at stations. The data were visually scanned for potential seafloor gas plumes. Images of plume data are provided in Appendix C.

The data, as .raw and .idx files, are available from the authors upon request. File sizes are large and a publicly assessable repository for these data has yet to be identified.

3.6 Sub-bottom Profiling Data

Sub-bottom profiling data were collected using a Knudsen 3260 Series 3.5 kHz CHIRP echosounder to map sediments and to look for surface strike-slip activity around the subduction zone. These data will help contribute to a better understanding of the various tectonic processes occurring in the area. Data quality varied due to sea state and survey speed (Fig. 8 and Table 5). Images of lines with high to medium quality data are provided in Appendix D.

3.5 kHz data files are publicly available through the Canadian National Marine Seismic Data Repository at https://open.canada.ca/data/en/dataset/e1fa0090-4b06-e476-5c71-e2326666a4d0.

Data are embedded with position navigation from the ship's GPS but not heave as this input was not available. The motion reference unit (MRU) is located in the Engineer's change room behind a stainless-steel panel labelled "Kongsberg DP Vertical Reference Sensor". The junction box unit is a SEATEX with model MRU-M-MB3. Serial number is 1B75. Access to heave via the science network requires further configuration as it is only currently setup directly to the dynamic positioning system.

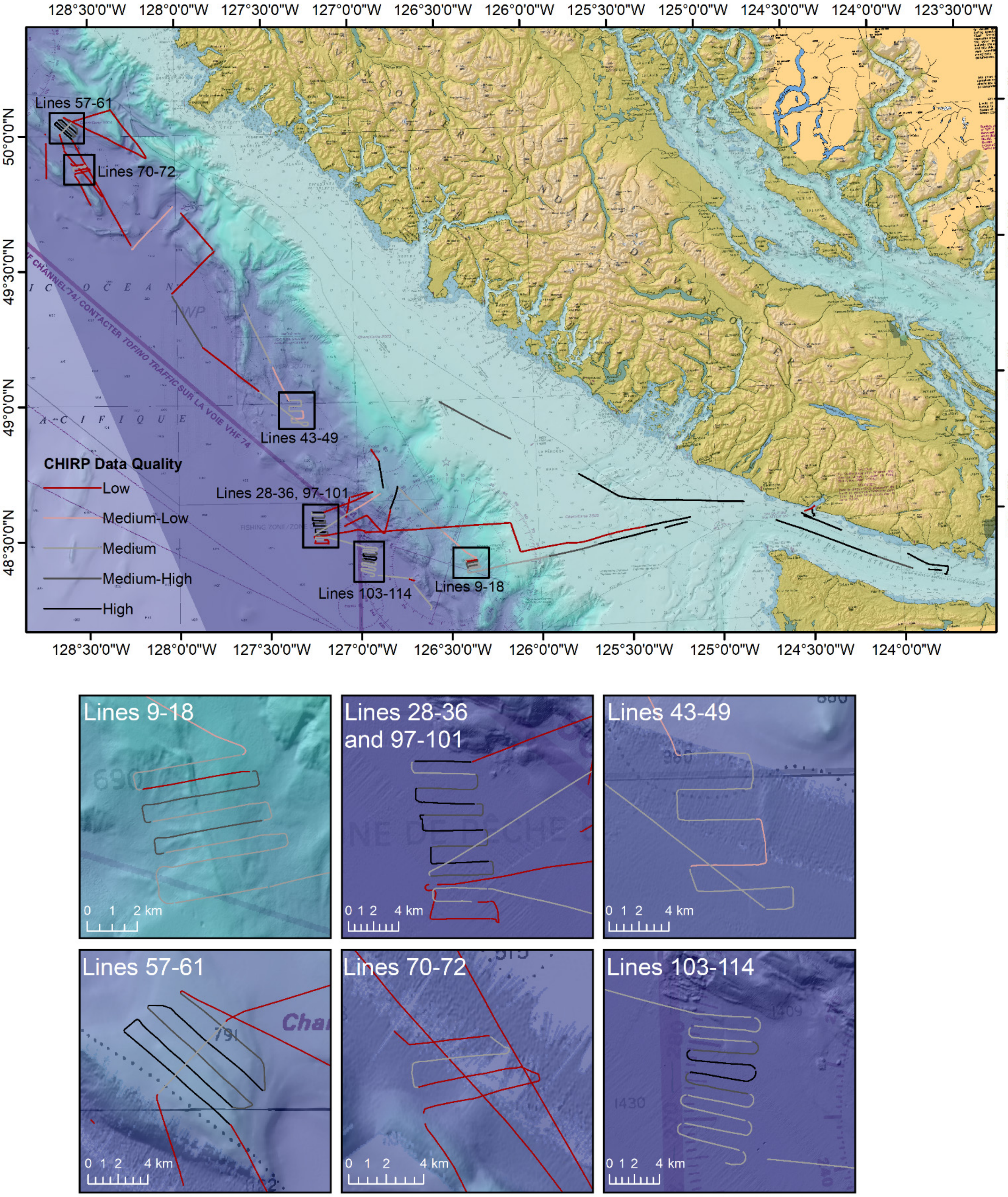

Figure 8. 3.5 kHz CHIRP survey lines in study area. Data quality is indicated with various line colours. Basemap from Pacific Coast Digital Elevation model (Kung, 2021) and Canadian Hydrographic Chart T30010 (for illustrative purposes only, not to be used for navigation).

Table 5. Echosounder and 3.5 kHz CHIRP sub-bottom profiler lines collected during 2023003PGC. Data quality for each line is indicated.

GSC Line	Name	Julian Day	UTC Time	Latitude (N)	Longitude (W)	Location	Water Depth (m)	Data Quality
Line 1	SOL 01	178	21:42:00	48°16.871′	123°47.288′	Juan de Fuca Strait	178	high
Line 1	EOL 01	178	21:52:19	48°17.115′	123°50.167′	Juan de Fuca Strait	175	
Line 2	SOL 02	178	22:16:03	48°17.736′	123°56.470′	Juan de Fuca Strait	177	high/med
Line 2	EOL 02	178	23:06:29	48°20.953′	124°08.341′	Juan de Fuca Strait	170	
Line 3	SOL 03	178	23:06:35	48°20.958′	124°08.360′	Juan de Fuca Strait	170	high
Line 3	EOL 03	178	23:59:25	48°24.520′	124°20.472′	Juan de Fuca Strait	192	
Line 4	SOL 04	178	23:59:30	48°24.525′	124°20.484′	Juan de Fuca Strait	192	high
Line 4	EOL 04	179	00:59:51	48°28.746′	124°35.274′	Juan de Fuca Strait	231	
Line 5	SOL 05	179	00:59:55	48°28.746′	124°35.292′	Juan de Fuca Strait	231	high
Line 5	EOL 05	179	01:22:10	48°30.226′	124°40.841′	Juan de Fuca Strait	243	
Line 6	SOL 06	179	03:20:57	48°30.800′	125°10.802′	Swiftsure Bank	133	high
Line 6	EOL 06	179	03:48:34	48°29.837′	125°17.848′	Swiftsure Bank	150	
Line 7	SOL 07	179	03:59:59	48°29.470′	125°20.808′	Swiftsure Bank	151	high
Line 7	EOL 07	179	05:16:08	48°26.826′	125°40.392′	Swiftsure Bank	113	
Line 8	SOL 08	179	05:16:22	48°26.817′	125°40.447′	Swiftsure Bank	112	high/med
Line 8	EOL 08	179	06:21:10	48°24.605′	125°57.092′	Swiftsure Bank	203	
Line 9	SOL 09	179	06:21:28	48°24.597′	125°57.163′	Barkley Canyon	215	med
Line 9	EOL 09	179	07:57:45	48°21.893′	126°20.675′	Barkley Canyon	1249	
Line 10	SOL 10	179	07:58:21	48°21.885′	126°20.755′	Barkley Canyon	1249	med
Line 10	EOL 10	179	08:18:35	48°21.615′	126°23.753′	Barkley Canyon	1182	
Line 11	SOL 11	179	08:19:11	48°21.609′	126°23.837′	Barkley Canyon	1182	med
Line 11	EOL 11	179	08:52:23	48°22.681′	126°20.715′	Barkley Canyon	1242	
Line 12	SOL 12	179	08:52:50	48°22.686′	126°20.654′	Barkley Canyon	1241	med
Line 12	EOL 12	179	09:27:27	48°22.712′	126°23.994′	Barkley Canyon	1265	
Line 13	SOL 13	179	09:28:06	48°22.701′	126°24.090′	Barkley Canyon	1265	high/med
Line 13	EOL 13	179	09:56:35	48°23.328′	126°20.918′	Barkley Canyon	1223	
Line 14	SOL 14	179	09:57:09	48°23.333′	126°20.835′	Barkley Canyon	1223	med
Line 14	EOL 14	179	10:28:31	48°23.393′	126°24.390′	Barkley Canyon	1271	
Line 15	SOL 15	179	10:29:10	48°23.384′	126°24.475′	Barkley Canyon	1272	high/med
Line 15	EOL 15	179	11:04:38	48°24.406′	126°21.107′	Barkley Canyon	1138	
Line 16	SOL 16	179	11:05:28	48°24.396′	126°21.206′	Barkley Canyon	1138	low
Line 16	EOL 16	179	11:28:16	48°24.099′	126°24.684′	Barkley Canyon	1221	

Line 17	SOL 17	179	11:28:50	48°24.094′	126°24.759′	Barkley Canyon	1222	med
Line 17	EOL 17	179	11:56:50	48°24.758′	126°21.555′	Barkley Canyon	1104	
Line 18	SOL 18	179	11:57:24	48°24.765′	126°21.472′	Barkley Canyon	1104	med/low
Line 18	EOL 18	179	12:56:13	48°30.762′	126°31.954′	Barkley Canyon	1486	
Line 19	SOL 19	179	12:56:57	48°30.837′	126°32.082′	Barkley Canyon	1486	med
Line 19	EOL 19	179	13:46:38	48°36.346′	126°40.255′	Clayoquot Slope	1341	
Line 20	SOL 20	179	15:18:00	48°36.214′	126°40.097′	Clayoquot Slope	1357	med
Line 20	EOL 20	179	16:06:07	48°40.938′	126°46.718′	Clayoquot Slope	1399	
Line 21	SOL 21	179	17:36:44	48°41.188′	126°47.020′	Clayoquot Slope	1405	high
Line 21	EOL 21	179	18:10:55	48°36.255′	126°49.648′	Clayoquot Slope	1538	
Line 22	SOL 22	179	19:09:21	48°36.087′	126°49.600′	Clayoquot Slope	1540	low
Line 22	EOL 22	179	19:49:00	48°31.104′	126°51.939′	Clayoquot Slope	2257	
Line 23	SOL 23	179	21:00:25	48°30.949′	126°52.015′	Clayoquot Slope	2265	low
Line 23	EOL 23	179	21:33:37	48°34.933′	126°57.320′	Clayoquot Slope	2269	
Line 24	SOL 24	179	22:51:01	48°35.046′	126°57.403′	Clayoquot Slope	2269	low
Line 24	EOL 24	179	23:26:34	48°32.745′	127°04.968′	Clayoquot Slope	2568	
Line 25	SOL 25	180	01:01:01	48°34.737′	127°04.396′	Abyssal Plain	2535	low
Line 25	EOL 25	180	01:30:00	48°39.099′	127°03.160′	Clayoquot Slope	2118	
Line 26	SOL 26	180	02:39:31	48°39.124′	127°02.579′	Clayoquot Slope	2122	low
Line 26	EOL 26	180	03:08:42	48°40.241′	126°55.304′	Clayoquot Slope	1311	
Line 27	SOL 27	180	03:59:42	48°40.238′	126°55.246′	Clayoquot Slope	1311	low
Line 27	EOL 27	180	05:11:46	48°35.873′	127°11.877′	Abyssal Plain	2570	
Line 28	SOL 28	180	05:12:34	48°35.853′	127°11.970′	Abyssal Plain	2570	high
Line 28	EOL 28	180	05:42:22	48°35.942′	127°15.608′	Abyssal Plain	2573	
Line 29	SOL 29	180	05:43:49	48°35.933′	127°15.776′	Abyssal Plain	2573	med
Line 29	EOL 29	180	06:22:07	48°35.322′	127°11.819′	Abyssal Plain	2570	
Line 30	SOL 30	180	06:22:55	48°35.317′	127°11.730′	Abyssal Plain	2570	high/med
Line 30	EOL 30	180	07:02:10	48°34.784′	127°15.411′	Abyssal Plain	2575	
Line 31	SOL 31	180	07:03:28	48°34.783′	127°15.553′	Abyssal Plain	2575	high
Line 31	EOL 31	180	07:40:27	48°34.038′	127°11.895′	Abyssal Plain	2574	
Line 32	SOL 32	180	07:41:46	48°34.035′	127°11.744′	Abyssal Plain	2574	high/med
Line 32	EOL 32	180	08:21:57	48°33.611′	127°15.028′	Abyssal Plain	2577	
Line 33	SOL 33	180	08:23:02	48°33.612′	127°15.138′	Abyssal Plain	2577	high
Line 33	EOL 33	180	09:20:46	48°32.908′	127°11.404′	Abyssal Plain	2577	
Line 34	SOL 34	180	09:22:00	48°32.910′	127°11.264′	Abyssal Plain	2577	high/med
Line 34	EOL 34	180	10:04:09	48°32.228′	127°14.571′	Abyssal Plain	2580	
Line 35	SOL 35	180	10:05:23	48°32.220′	127°14.693′	Abyssal Plain	2580	high
Line 35	EOL 35	180	10:43:41	48°31.536′	127°11.080′	Abyssal Plain	2581	
Line 36	SOL 36	180	10:44:41	48°31.538′	127°10.962′	Abyssal Plain	2581	high/med
Line 36	EOL 36	180	11:25:10	48°30.962′	127°14.709′	Abyssal Plain	2583	
Line 37	SOL 37	180	11:26:11	48°30.978′	127°14.827′	Abyssal Plain	2583	med
Line 37	EOL 37	180	12:25:27	48°36.124′	127°01.893′	Abyssal Plain	1992	
Line 38	SOL 38	180	12:26:28	48°36.219′	127°01.660′	Clayoquot Slope	1992	low/med

Line 38	EOL 38	180	13:15:16	48°39.705′	126°52.726′	Clayoquot Slope	1338	
Line 39	SOL 39	180	19:40:33	48°40.913′	126°51.703′	Clayoquot Slope	1250	high
Line 39	EOL 39	180	20:24:08	48°47.008′	126°52.977′	Clayoquot Slope	1385	
Line 40	SOL 40	180	21:14:23	48°47.088′	126°53.045′	Clayoquot Slope	1382	low
Line 40	EOL 40	180	21:32:39	48°49.598′	126°55.455′	Hesquiat Slope	1385	
Line 41	SOL 41	181	03:37:43	48°22.434′	127°37.436′	Hesquiat Slope	1765	med
Line 41	EOL 41	181	05:02:03	49°09.413′	127°28.718′	Hesquiat Slope	1750	
Line 42	SOL 42	181	05:09:22	49°08.229′	127°27.670′	Hesquiat Slope	1761	med/low
Line 42	EOL 42	181	05:56:24	49°00.859′	127°22.575′	Hesquiat Slope	2054	
Line 43	SOL 43	181	05:57:23	49°00.863′	127°22.454′	Hesquiat Slope	2054	med
Line 43	EOL 43	181	06:24:52	49°00.887′	127°19.036′	Hesquiat Slope	2001	
Line 44	SOL 44	181	06:25:43	49°00.881′	127°18.938′	Hesquiat Slope	2001	med
Line 44	EOL 44	181	07:16:17	48°59.611′	127°22.504′	Hesquiat Slope	2057	
Line 45	SOL 45	181	07:17:05	48°59.613′	127°22.587′	Hesquiat Slope	2057	med
Line 45	EOL 45	181	07:59:08	48°58.486′	127°18.614′	Hesquiat Slope	2053	
Line 46	SOL 46	181	07:59:56	48°58.487′	127°18.519′	Hesquiat Slope	2053	med/low
Line 46	EOL 46	181	08:47:32	48°56.862′	127°21.974′	Hesquiat Slope	2069	
Line 47	SOL 47	181	08:48:54	48°56.794′	127°22.098′	Hesquiat Slope	2069	med
Line 47	EOL 47	181	09:36:09	48°56.023′	127°16.790′	Hesquiat Slope	2059	
Line 48	SOL 48	181	09:37:05	48°56.027′	127°16.675′	Hesquiat Slope	2059	med
Line 48	EOL 48	181	09:57:13	48°55.228′	127°17.861′	Hesquiat Slope	2062	
Line 49	SOL 49	181	09:58:20	48°55.247′	127°18.006′	Hesquiat Slope	2062	med
Line 49	EOL 49	181	11:16:34	49°02.990′	127°32.610′	Hesquiat Slope	2043	
Line 50	SOL 50	181	11:17:20	49°03.060′	127°32.742′	Hesquiat Slope	2043	low
Line 50	EOL 50	181	12:34:19	49°10.765′	127°35.210′	Hesquiat Slope	2503	
Line 51	SOL 51	181	12:35:21	49°10.859′	127°47.472′	Hesquiat Slope	2503	low
Line 51	EOL 51	181	13:01:21	49°12.981′	127°51.546′	Nootka Fault	2509	
Line 52	SOL 52	181	14:53:39	49°13.212′	127°51.593′	Nootka Fault	2493	med/high
Line 52	EOL52	181	16:12:29	49°24.341′	128°01.581′	Explorer Plate	2433	
Line 53	SOL 53	181	17:30:48	49°24.926′	128°01.753′	Explorer Plate	2431	low
Line 53	EOL 53	181	18:55:42	49°34.253′	127°47.130′	Explorer Slope	1344	
Line 54	SOL 54	181	19:46:15	49°34.489′	127°47.364′	Explorer Slope	1346	low
Line 54	EOL 54	181	20:53:38	49°42.737′	127°58.148′	Winona Slope	2008	
Line 55	SOL 55	181	22:21:00	49°44.328′	128°01.018′	Winona Slope	2186	low/med
Line 55	EOL 55	181	23:41:20	49°35.028′	128°15.180′	Winona Basin	2178	
Line 56	SOL 56	182	01:17:11	49°35.755′	128°15.439′	Winona Basin	2285	low
Line 56	EOL 56	182	04:10:45	49°59.329′	128°35.389′	Winona Basin	1561	
Line 57	SOL 57	182	04:11:37	49°59.351′	128°35.409′	Winona Basin	1558	high
Line 57	EOL 57	182	05:25:52	50°02.730′	128°41.303′	Winona Basin	1700	
Line 58	SOL 58	182	05:26:34	50°02.759′	128°41.361′	Winona Basin	1700	high
Line 58	EOL 58	182	06:43:20	50°00.092′	128°35.442′	Winona Basin	1540	
Line 59	SOL 59	182	06:44:04	50°00.057′	128°35.390′	Winona Basin	1540	high/med
Line 59	EOL 59	182	08:03:49	50°03.602′	128°40.019′	Winona Basin	1692	

Line 60	SOL 60	182	08:04:31	50°03.638′	128°40.062′	Winona Basin	1692	high
Line 60	EOL 60	182	09:17:47	50°00.685′	128°33.742′	Winona Basin	1768	
Line 61	SOL 61	182	09:18:34	50°00.650′	128°33.679′	Winona Basin	1768	high/med
Line 61	EOL 61	182	10:28:48	50°04.116′	128°38.138′	Winona Basin	1657	
Line 62	SOL 62	182	10:29:30	50°04.142′	128°38.194′	Winona Basin	1657	low
Line 62	EOL 62	182	11:54:04	49°58.776′	128°21.329′	Winona Basin	1529	
Line 63	SOL 63	182	11:54:46	49°58.731′	128°21.211′	Winona Basin	1529	low
Line 63	EOL 63	182	12:55:07	49°55.122′	128°10.099′	Winona Basin	1501	
Line 64	SOL 64	182	14:27:38	49°55.186′	128°09.980′	Winona Basin	1480	low
Line 64	EOL 64	182	15:50:50	50°06.041′	128°22.342′	Winona Basin	1302	
Line 65	SOL 65	182	16:40:43	50°05.778′	128°22.570′	Winona Basin	1214	low
Line 65	EOL 65	182	17:34:10	50°03.187′	128°35.624′	Winona Basin	1610	
Line 66	SOL 66	182	17:34:12	50°03.187′	128°35.624′	Winona Basin	1555	med
Line 66	EOL 66	182	18:25:11	50°00.631′	128°39.387′	Winona Basin	1593	
Line 67	SOL 67	182	18:26:10	50°00.583′	128°39.463′	Winona Basin	1593	low
Line 67	EOL 67	182	18:46:32	49°57.338′	128°38.166′	Winona Basin	2057	
Line 68	SOL 68	182	19:49:31	49°56.967′	128°38.249′	Winona Basin	2070	low
Line 68	EOL 68	182	21:06:39	49°46.753′	128°25.034′	Winona Basin	2099	
Line 69	SOL 69	183	01:20:22	49°44.773′	128°29.038′	Winona Basin	2118	low
Line 69	EOL 69	183	02:08:21	49°51.308′	128°34.432′	Winona Basin	1631	
Line 70	SOL 70	183	02:12:58	49°51.698′	128°34.463′	Winona Basin	1803	low
Line 70	End Seg 1	183	02:54:45	49°52.520′	128°29.391′	Winona Basin	2109	
Line 70	Start Seg 2	183	03:06:03	49°52.922′	128°30.240′	Winona Basin	2108	
Line70	EOL 70	183	03:41:58	49°52.377′	128°34.693′	Winona Basin	2035	
Line 71	SOL 71	183	03:42:01	49°52.377′	128°34.693′	Winona Basin	2035	med
Line 71	EOL 71	183	04:37:48	49°53.804′	128°31.439′	Winona Basin	2084	
Line 72	SOL 72	183	04:38:52	49°53.847′	128°31.529′	Winona Basin	2085	low
Line 72	EOL 72	183	05:18:04	49°53.990′	128°35.765′	Winona Basin	2066	
Line 73	SOL 73	183	12:59:54	49°59.532′	128°43.156′	Winona Basin	2076	low
Line 73	EOL 73	183	13:05:14	49°59.595′	128°43.267′	Winona Basin	2076	
Line 74	SOL 74	183	14:08:11	50°00.051′	128°44.580′	Winona Basin	2076	low
Line 74	EOL 74	183	03:41:58	50°00.585′	128°44.651′	Winona Basin	2076	
Line 75	SOL 75	183	03:42:01	49°58.293′	128°44.394′	Winona Basin	2064	low
Line 75	EOL 75	183	04:37:48	49°50.917′	128°44.317′	Winona Basin	2299	
Line 76	SOL 76	185	00:27:59	48°59.797'	126°32.190'	La Perouse Bank	164	high/med
Line 76	EOL 76	185	02:39:16	48°51.007'	126°08.560'	La Perouse Bank	108	
Line 77	SOL 77	185	05:23:28	48°42.656'	125°46.205'	La Perouse Bank	182	high
Line 77	EOL 77	185	07:49:25	48°36.341'	125°25.318'	La Perouse Bank	129	
Line 78	SOL 78	185	07:50:12	48°36.333'	125°25.192'	La Perouse Bank	129	med/high
Line 78	EOL 78	185	08:56:03	48°35.863'	125°13.987'	La Perouse Bank	117	
Line 79	SOL 79	185	08:56:36	48°35.861'	125°13.901'	La Perouse Bank	117	med/high
Line 79	EOL 79	185	09:56:47	48°35.421'	125°04.608'	La Perouse Bank	107	

Line 80	SOL 80	185	09:57:11	48°35.416'	125°04.545'	La Perouse Bank	107	med
Line 80	EOL 80	185	10:52:04	48°34.949'	124°55.806'	La Perouse Bank	62	
Line 81	SOL 81	185	10:52:35	48°34.948'	124°55.727'	La Perouse Bank	62	med
Line 81	EOL 81	185	11:21:32	48°34.706'	124°51.315'	La Perouse Bank	65	
Line 82	SOL 82	185	22:21:24	48°32.390'	124°28.691'	Port San Juan	54	med
Line 82	EOL 82	185	22:58:45	48°30.909'	124°28.030'	Port San Juan	94	
Line 83	SOL 83	185	23:21:19	48°30.792'	124°27.918'	Port San Juan	100	med
Line 83	EOL 83	185	23:28:41	48°30.652'	124°28.489'	Port San Juan	111	
Line 84	SOL 84	186	01:13:24	48°30.000'	124°28.906'	Port San Juan	135	med
Line 84	EOL 84	186	01:22:02	48°30.575'	124°29.855'	Port San Juan	134	
Line 85	SOL 85	186	01:39:55	48°30.615'	124°29.984'	Port San Juan	134	high/med
Line 85	EOL 85	186	01:52:50	48°31.543'	124°32.418'	Port San Juan	111	
Line 86	SOL 86	186	02:18:39	48°31.793'	124°31.371'	Port San Juan	74	med/low
Line 86	EOL 86	186	02:39:02	48°32.844'	124°27.856'	Port San Juan	16	
Line 87	SOL 87	186	19:15:59	48°30.857'	124°31.719'	Port San Juan	144	med/high
Line 87	EOL 87	186	20:15:50	48°27.142'	124°19.448'	Port San Juan	116	
Line 88	SOL 88	187	00:55:50	48°21.013'	123°58.080'	Port San Juan	130	High
Line 88	EOL 88	187	02:22:23	48°16.009'	123°45.903'	Port San Juan	180	
Line 89	SOL 89	188	05:47:51	48°31.894'	125°09.267'	Juan de Fuca Strait	115	High
Line 89	EOL 89	188	06:51:17	48°30.311'	125°24.397'	Juan de Fuca Strait	120	
Line 90	SOL 90	188	06:51:37	48°30.302'	125°24.471'	Juan de Fuca Strait	120	low
Line 90	EOL 90	188	07:39:54	48°29.000'	125°36.170'	Juan de Fuca Strait	97	
Line 91	SOL 91	188	07:40:29	48°28.980'	125°36.318'	Juan de Fuca Strait	97	low
Line 91	EOL 91	188	08:37:42	48°27.397'	125°51.026'	Juan de Fuca Strait	131	
Line 92	SOL 92	188	08:38:04	48°27.387'	125°51.114'	Juan de Fuca Strait	131	low
Line 92	EOL 92	188	09:53:01	48°26.238'	126°06.686'	Juan de Fuca Strait	239	
Line 93	SOL 93	188	09:53:19	48°26.279'	126°06.705'	Juan de Fuca Strait	239	low
Line 93	EOL 93	188	10:38:03	48°32.353'	126°09.906'	Juan de Fuca Strait	205	
Line 94	SOL 94	188	10:38:44	48°32.346'	126°10.077'	Juan de Fuca Strait	205	low
Line 94	EOL 94	188	12:34:59	48°31.608'	126°40.120'	Juan de Fuca Strait	1539	
Line 95	SOL 95	188	12:35:32	48°31.603'	126°40.254'	Juan de Fuca Strait	1539	low
Line 95	EOL 95	188	14:35:42	48°31.202'	126°58.174'	Juan de Fuca Strait	2423	
Line 96	SOL 96	189	00:58:08	48°31.499'	126°58.000'	Clayoquot Slope	2430	low
Line 96	EOL 96	189	02:45:25	48°30.587'	127°14.294'	Clayoquot Slope	2570	
Line 97	SOL 97	189	02:49:35	48°30.592'	127°14.808'	Clayoquot Slope	2572	low
Line 97	EOL 97	189	03:10:20	48°29.139'	127°14.885'	Clayoquot Slope	2576	

Line 98	SOL 98	189	03:11:22	48°29.095'	127°14.812'	Clayoquot Slope	2577	low
Line 98	EOL 98	189	03:38:11	48°29.053'	127°11.044'	Clayoquot Slope	2576	
Line 99	SOL 99	189	03:38:59	48°29.050'	127°10.940'	Clayoquot Slope	2576	low
Line 99	EOL 99	189	04:11:04	48°29.803'	127°10.841'	Clayoquot Slope	2575	
Line 100	SOL 100	189	04:12:02	48°29.801'	127°10.985'	Clayoquot Slope	2575	low
Line 100	EOL 100	189	04:17:00	48°29.789'	127°11.679'	Clayoquot Slope	2574	
Line 101	SOL 101	189	04:20:08	48°29.808'	127°12.117'	Clayoquot Slope	2574	med
Line 101	EOL 101	189	05:04:47	48°30.356'	127°11.296'	Clayoquot Slope	2573	
Line 102	SOL 102	189	05:05:57	48°30.348'	127°11.122'	Clayoquot Slope	2573	med/low
Line 102	EOL 102	189	06:01:39	48°28.030'	126°58.524'	Clayoquot Slope	2550	
Line 103	SOL 103	189	06:02:05	48°28.017'	126°58.450'	Clayoquot Slope	2550	med
Line 103	EOL 103	189	06:26:02	48°27.800'	126°54.965'	Clayoquot Slope	2515	
Line 104	SOL 104	189	06:28:00	48°27.782'	126°54.683'	Clayoquot Slope	2515	med
Line 104	EOL 104	189	07:03:35	48°27.433'	126°58.473'	Clayoquot Slope	2597	
Line 105	SOL 105	189	07:05:46	48°27.441'	126°58.759'	Clayoquot Slope	2597	med
Line 105	EOL 105	189	07:37:19	48°26.739'	126°54.986'	Clayoquot Slope	2575	
Line 106	SOL 106	189	07:38:20	48°26.730'	126°54.849'	Clayoquot Slope	2575	high/med
Line 106	EOL 106	189	08:13:08	48°26.437'	126°58.576'	Clayoquot Slope	2604	
Line 107	SOL 107	189	08:14:45	48°26.450'	126°58.798'	Clayoquot Slope	2604	high
Line 107	EOL 107	189	08:49:42	48°25.603'	126°54.723'	Abyssal Plain	2578	
Line 108	SOL 108	189	08:50:47	48°25.513'	126°54.658'	Abyssal Plain	2578	high
Line 108	EOL 108	189	09:23:47	48°25.483'	126°58.817'	Abyssal Plain	2606	
Line 109	SOL 109	189	09:24:57	48°25.465'	126°58.969'	Abyssal Plain	2606	high/med
Line 109	EOL 109	189	09:57:18	48°24.500'	126°55.281'	Abyssal Plain	2590	
Line 110	SOL 110	189	09:58:32	48°24.482'	126°55.123'	Abyssal Plain	2590	med
Line 110	EOL 110	189	10:32:59	48°24.475'	126°58.978'	Abyssal Plain	2609	
Line 111	SOL 111	189	10:34:05	48°24.502'	126°59.121'	Abyssal Plain	2609	med
Line 111	EOL 111	189	11:08:53	48°23.353'	126°55.514'	Abyssal Plain	2598	
Line 112	SOL 112	189	11:10:34	48°23.310'	126°55.287'	Abyssal Plain	2598	med
Line 112	EOL 112	189	11:44:08	48°23.272'	126°59.245'	Abyssal Plain	2608	

Line 113	SOL 113	189	11:45:49	48°23.286'	126°59.496'	Abyssal Plain	2608	med
Line 113	EOL 113	189	12:17:56	48°22.073'	126°55.942'	Abyssal Plain	2599	
Line 114	SOL 114	189	12:19:50	48°22.009'	126°55.685'	Abyssal Plain	2599	med
Line 114	EOL 114	189	12:31:48	48°21.502'	126°56.664'	Abyssal Plain	2576	
Line 115	SOL 115	189	12:51:45	48°21.642'	126°54.201'	Abyssal Plain	2595	med
Line 115	EOL 115	189	13:39:55	48°20.875'	126°42.923'	Abyssal Plain	2466	
Line 116	SOL 116	189	18:00:56	48°20.236'	126°42.156'	Abyssal Plain	2488	low
Line 116	EOL 116	189	18:19:56	48°20.562'	126°43.838'	Abyssal Plain	2531	
Line 117	SOL 117	189	20:11:47	48°19.506'	126°42.571'	Abyssal Plain	2512	med
Line 117	EOL 117	189	23:49:17	48°13.803'	126°37.052'	Abyssal Plain	2469	

4. Daily Summary and Observations

2023-06-26 – Monday – Patricia Bay

We mobilized the CCGS Tully at the Institute for Ocean Sciences. Carson, Côté, Davies, Douglas, Maekawa, Obana, Podhorodeski, Riedel, Shaeffer, Shirai, and Sun boarded ~1100 PDT. All equipment was onboard by the evening. The ship stayed at the dock overnight for engine maintenance work with Science Party onboard ready to sail when possible.

2023-06-27 – Tuesday – Transit from Patricia Bay to west coast Vancouver Island

Weather was fair and sunny at departure. We left the dock at 0806 PDT and transited to West Coast Vancouver Island via Juan de Fuca Strait. Sounders were run on transit. We setup the Knudsen 3.5 kHz sounder underway. The EK80 and EA640 were recording from the start. The Knudsen started recording in Juan de Fuca Strait. As OBSs could not be recovered until daylight, we transited to the slope just west of Barkley Canyon where a lineament in the bathymetry data suggests that there could be a fault. There, we conducted a Knudsen 3.5 kHz echosounder survey with perpendicular lines across the potential fault. EK80 and EA640 were left running to look for any potential seep activity. None were observed.

2023-06-28 – Wednesday – west coast Vancouver Island, Clayoquot Slope

Heavy fog resulted in near-limit for visibility to retrieve OBSs. The decision was made by Koichiro Obana with the Chief Scientists and the Captain to proceed given that the sea state was very low. The Captain and officers used a spreadsheet to triangulate the position of the rising OBS based on EK80 depth, a rise rate of 41 m/min and relayed distances received on the acoustic release transponder with timestamp. They could then tell distance from ship and where to position the ship for nearest recovery. The RADAR system, in low sea state, provided an excellent tool for spotting the OBS at the surface at the approximate time of surfacing. This provided a direction to visually find the OBS and the recovery took place by grappling hook/rod and then by crane. Lessons learned on OBS recovery and the settings used for the RADAR are provided in Section 5.

We continued working into the daylight hours of the evening to recover OBSs while the weather held.

Overnight, we transited to a lineament in the bathymetry data west of Clayoquot Slope in the Abyssal Plains of Cascadia Basin. We ran east-west Knudsen CHIRP survey lines.

2023-06-29 – Thursday – west coast Vancouver Island, Clayoquot Slope

Heavy fog continued but the decision was made by Michael Riedel with the Chief Scientists and the Captain to proceed with GEOMAR OBS recovery given the good sea state. All southern OBSs were successfully recovered efficiently and we then proceeded to recover JSCN09 and JSCN10, the first of the northern OBSs, while weather held. The weather forecast suggests that wind and sea state will rise in the next days, especially in the southern portion of the study area.

Overnight, we transited to a newly multibeam bathymetry mapped N-S strike-slip fault by Riedel et al., 2022, on the plateau west of JSCS07. East-west lines were run perpendicular to the fault with the Knudsen CHIRP 3.5 kHz echosounder.

2023-06-30 – Friday – west coast Vancouver Island, SW Brooks Peninsula

Visibility was good with sunny skies. Sea state picked up as the wind speed increased with choppy conditions but without swell. The sunny conditions allowed for good visual spotting when the OBS reached the surface, but the choppy conditions limited RADAR usefulness as the chop was at same dimensions as the OBSs.

Four of the JAMSTEC OBS northern sites were recovered working south to north as weather was anticipated to be worse to the south in coming days.

2023-07-01 – Saturday – west coast Vancouver Island, SW Brooks Peninsula

A clear weather window in the area allowed for recovery of the remaining OBSs starting with JSCN03, followed by JSCN01, JSCN02, and JSCN04. Single-beam echosounder data and 3.5 kHz Knudsen CHIRP data were collected in transit between sites to map the seabed and look for water column activity.

With all OBSs on deck, we proceeded to additional science activities and transitioned to coring in Winona Basin at Win173Slide1, a proximal position to stations 173 and 174 from the RV Sonne SO294 Expedition. The A-frame required some repair by Coast Guard before coring could begin. We had a safety briefing with Coast Guard crew and GSC staff, and to ensure everyone was clear on deploying the gravity corer and had clear communication channels. We bump tested, then used the gas detectors. The deployment went well, but the winch was paid out with more cable than needed. Fortunately, the line came up untangled without issue. We established better communication for pay out for subsequent core sites. ~1.4 m of core was recovered. Two turbidite events were clearly visible. The core was stored upright in the cold storage room at 4°C.

At night, we surveyed across a potential fault in Winona Basin and ran four lines before calling off the survey due to the weather. The sea state was such that the data quality was not adequate to differentiate the reflectors in the 3.5 kHz data. We turned off echosounders and waited for weather to improve.

Following supper, we had a trivia night to celebrate Canada Day with those not on watch from both Coast Guard and the science team participating.

2023-07-02 – Sunday – west coast Vancouver Island, SW Brooks Peninsula

We were on station early morning to core at Win4DSlide. We assessed weather and sea state conditions with the Captain, Bosun and Science crew. We adjusted the plan so that only Coast Guard crew would handle the gravity corer as it was being deployed and recovered. The Science crew would handle core equipment only when the rail netting was in place before deployment and following recovery. During setup, some 3.5 kHz data were collected.

During coring activities, we used depths from the EK80 echosounder for our water depth, stopped 10 m above bottom to allow cable to settle and let out 10 m extra wire once on bottom. The first and second cores of the day came up empty. The core barrel was clean and there was no indication of having hit bottom. We noted a depth discrepancy between the EK80 and the 3.5 kHz sounder of ~20 m and thought perhaps we were missing bottom. We tried the proximal site with extra cable (~60-70 m) and coated the nose cone with butter with hopes that if we were hitting bottom, we would see some kind of imprint or material captured. The core was successful. We then returned to STN31 and successfully recovered 129 cm of core.

We transited to Win2DSlide, but while only 10 nmi to the south, the conditions were not safe for deployment due to increased sea state. We worked on documentation while waiting for weather to improve as was expected for the next morning.

2023-07-03 – Monday – Transit from SW Brooks Peninsula to Port San Juan (Juan de Fuca Strait)

Weather remained sunny, but strong northwest winds continued. Positioned on coring station Win1slide to start the day. Sea state has not changed from yesterday. Wind forecast for northern portion of study area is poor all week (until Friday). Forecast for southern portion is poor until late-Thursday. Discussed two potential plans with science team. Option 1) Shelter near Brooks Peninsula for the day, then pop out tomorrow morning to check on conditions for coring. Wind predictions on Windy strongly suggest that conditions will be the same or worse tomorrow morning (Fig. 9A). Option 2) Transit south today. Find calm location such as Broken Island Group or Port San Juan to test out new grab sampler and become familiar with and potentially calibrate USBL. JAMSTEC could start data download when anchored, and GEOMAR can finish packing their crates. Wednesday/Thursday weather conditions look good to work in Juan de Fuca Strait for coring and grabs (Fig. 9B). With the hopes to core on Clayoquot Slope on Friday and Saturday. Captain agreed that it is unlikely that wind/sea state conditions will allow for coring tomorrow morning. Strongly supported option 2. Began our transit southward at 0710.

Figure A: Wind gusts (knots)
Northern portion of Study Area

Figure B: Wind gusts (knots)
Southern portion of Study Area

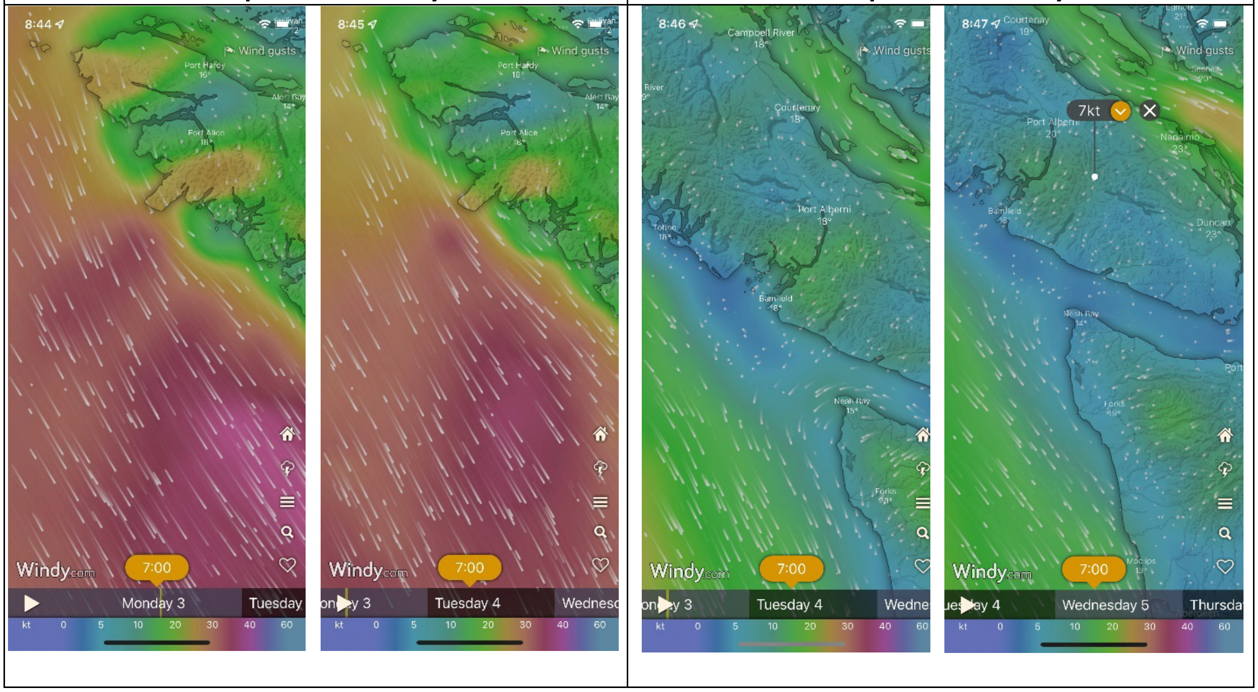

Figure 9. Predicted wind gusts (knots) from Windy for Tuesday July 4 and Wednesday July 5.

2023-07-04 – Tuesday – Port San Juan bay (Juan de Fuca Strait)

We anchored in Port San Juan bay at 0730. A deck crew member departed vessel, therefore we were constrained to undertaking deck operations from 1200 to 1900 going forward and while the remaining crew member that could operate the winch adjusted to the new schedule, we were limited to a 1600 start time for over-the-side work.

In the morning, we began to familiarize with the USBL system. We began by lowering the beacons individually over-the-side to learn how to connect with the beacons and use the various options in the software. Tully1 (RHIB) was then launched and the positioned at various distances from the vessel. The crew lowered the beacon to various depths, and we continued with the familiarization exercise. Options for conducting a calibration of the USBL were discussed.

We collected five cores in the afternoon off Port San Juan for Shahin Dashguard at Simon Fraser University. The cores were targeted at positions off the thalweg of a relic channel and aim to understand sediment mobility, Quaternary geology, and sediment dynamics in the area. With shallow waters around 100 m, the recovery was quick. We cored until just after 1900 and anchored in Port San Juan bay overnight. As we are near the zone of silence at Swiftsure Bank for whales, we avoided any overnight echosounding surveys.

2023-07-05 – Wednesday – Port San Juan bay (Juan de Fuca Strait)

The first part of the morning was spent attempting a calibration of the USBL system. As we did not have an acoustic release, the calibration design was an anchor system with a line and buoy for retrieval. This limited our water depth to ~100 m. With assistance from the crew, we designed and constructed an anchor on which to mount one USBL beacon (Fig. 10). The transceiver is lowered to the seafloor, then the ship takes positioning at various points around the transceiver for the calibration.

Figure 10. Preparations for attempt at USBL calibration. Photograph by M.M. Côté. NRCan photo 2023-284.

With the shallow depth and buoy, the calibration could not be completed using the pattern recommended in the USBL documentation (circular route around beacon at 50% of water depth). Instead, the calibration design was for the vessel to transit all four sides, crossing in one direction then turning to cross in the other direction. Location information would be logged by the Bridge and in the lab with the USBL software.

Once on site in Juan de Fuca Strait at 100 m, it was determined that the current was at 2 knots resulting in a large angle on-line (~45°), therefore ~120 m of line would be required. Tully would not be able to do the lines close enough to the beacon to provide a useful calibration. An acoustic release, deeper water and preferably a quieter/less current location are required to do a successful calibration. Saanich Inlet would be ideal. Captain suggested if Ocean Networks Canada (ONC) had any hydroacoustic beacons on their VENUS Cabled Observatory, we could use that. We contacted Gwyn Lintern who confirmed there is no beacon currently deployed at Venus. The attempt at the calibration was concluded. A calibration, with proper equipment/procedures, will be scheduled before the October OBS program on the Tully.

We were ready for coring at noon in western Juan de Fuca Strait but Coast Guard determined that the swell was too significant for safe coring operations. We proceeded eastwards to further sites, hoping for less swell to the east. We achieved two cores at one site and switched to grabs for the rest of the day. Notes on recovery at each site are on the deck sheets (Appendix A).

We anchored off Sooke for the night.

2023-07-06 – Thursday – Port San Juan (Juan de Fuca Strait)

The new Coast Guard crew member arrived in late morning and we slipped anchor at 1230 PST. We transited to the first grab sample site. We had some discussions about sea state and decided to proceed with grab sampling only (no coring). The grabs were successful. Occasionally, when sample contained pebbles, they became stuck in the opening and we lost some material. In most cases, enough sample remained in the bucket and we note this on the deck sheets.

2023-07-07 – Friday – Coring at the "Antislipstream" slide

We collected five cores on the backside of Slipstream Slide to understand the timing of failure. Recovery was very good with the exception of the last core, and we noted sand units/events amongst the mud. The last core came up with ~ 5 cm unconsolidated watery mud and we decided to put it all in the sample container with the core catcher sample.

2023-07-08 – Saturday – Coring at the "Minke" and "Finn" slides

We collected three cores at Minke Slide and two at Finn Slide to understand timing of slope failure across the outer slope slides down the Cascadia Margin.

Recovery was good. We were able to core down to 2500 m with ample wraps remaining on the drum.

With our final core recovered at 1730 PST, we started to head back to the Institute of Ocean Sciences in Sidney, BC. We aimed to collect echosounder data outside Barkley Canyon, but with numerous whales in the area, we decided to forego the survey.

5. Recommendations for Future OBS Recovery and RADAR Settings

The following section was written in collaboration with Captain Fred Hamilton.

The Bridge Officers' experience is that radio detection finders on the OBS are not working ~50% of the time, and unless the Direction Finder (DF) fitted on the ship is calibrated, it can give significant offsets. Basically, they are not very reliable, and shouldn't be leaned on too heavily when deciding whether to recover in low visibility.

If the OBS cannot be fitted with beacons that can be read by the ship's existing and calibrated DF, it might be a good idea to have spare beacons at the same frequencies as those used on OBSs so the DF provided by the science team can be calibrated before recovery work starts.

Fog is expected in July-August off our coast, so expect low visibility in those months, especially in the morning. It usually clears in mid-afternoon and then builds up overnight again.

RADAR can work well on ships for finding the OBSs in fog and low swell. Settings include: X-band Radar, 6 min true trail, gain set high, ACE auto clutter on, Echo Enhance on, short pulse S1, Range 0.75'. With these settings, the seismometer appears as a new yellow dot on the RADAR screen near the time of expected surface, and then a defined blue trail appears behind it as it drifts on the surface. The other clutter on the screen will not have this defined blue line, so it is then easy to determine which clutter is the

OBS. An EBL bearing line can then be set on the target, so lookouts know where to look. Radar Image Overlay (RIO) can be used on the ECDIS to see the OBS on the screen, and navigate towards it. This will only work in calm seas with minimal clutter (winds <15 kts, seas <2 m).

The Captain recommends to equip the OBSs with AIS beacons similar to what the fishing community is doing with their nets rather than RDF beacons. It would then appear on the navigation screen right away when surfaced, and can be coded to display the name/code of the OBS. Additionally, RADAR reflectivity tape, piping, or tubing with RADAR beacons would help make it more visible on the RADAR. This might increase the detection of the OBS on the RADAR system in conditions when the sea clutter is higher.

The new Radio Detection Finder on Tully uses beacons at frequencies 156.125 MHz, 157.075 MHz, and 157.125 MHz. If the OBS had these frequencies, then the ship could use its accurate and calibrated DF.

USBL could be useful for tracking beacons in future if the same frequencies can be read. This might allow range and bearing, but also allow the vessel to move with the pole deployed. The current setup of deploying transducers on wires requires the ship to be near stationary to avoid building a lead in the wire.

With the system currently in use, we only have detection of acoustic range. This means there can be bearing uncertainty if the ship doesn't position itself sufficiently downstream from the released OBS given the current. So, the ship must be above to the OBS to interrogate and release, but must then move downstream to a slightly greater distance than the estimated "pop-up" position assuming OBS drift as it rises. In this position (maybe 0.2 to 0.5' away for 1500 m depth), with the bow stemming the current and facing the mooring position, the bearing variable is reduced. Now, with ranging only, we can be confident the OBS ranges are ahead of the vessel, when 500 m from surface, the ship can start moving ahead and close the gap, depending on the range calculations. It is important for the ship to know the following so it can position itself in a way to reduce the uncertainty of bearing: Know the accurate depth of water (EK80), know the current as best as possible (use current models, and assess surface current affecting the ship), know the ascent rate. With this info, a spreadsheet can be used to track release time, ETA to surface, and estimated depth vs range and time to calculate surface distance of the OBS. If we do this every 5-10 mins, the ship will know roughly how far ahead the mooring will appear and reposition itself to be in a good spot to avoid fouling, and reduce delays in locating and recovering the OBS. A diagram to illustrate the above, and a pre-generated Excel to use for all ships could be developed for future expeditions.

6. Acknowledgements

We thank the Maa-nulth Treaty Nations, Nuu-chah-nulth Nations and Quatsino Nation whose traditional territory on which we conducted this work for their participation and support in planning and carrying out this expedition effectively.

We thank our colleagues who helped make the logistics of this expedition come together and who contributed to site selection for coring activities.

Lastly, we would like to thank Captain Fred Hamilton, Bosun John Gardner, and the crew of the CCGS Tully for their part in the safe and efficient operation of the ship without which this expedition could not have been a success.

Figure 8 was produced by NRCan and incorporates Canadian Hydrographic Service (CHS) data, pursuant to CHS MOU# 2022-0324-1260-NRCan for illustrative, non-navigational purposes only. The incorporation of data sourced from CHS in this product shall not be construed as constituting an endorsement by CHS of this product.

7. References

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Appendix A: Gravity Core Deck Sheet

Station Name : Wini73Slide1

CORES GEOLOGICAL SURVEY of CANADA (PACIFIC) **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	STN 27	TULLY		DOUGLAS / CATE

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 183	00:12	49°44.370"N	128°23.837"W
2 nd Try:			

* GEOREGION * * SUB-REGION *
eg : Gulf of St. Lawrence = Baie de Chaleur
eg : Scotian Shelf = Sable Basin

GEOREGION: WCVI
SUB-REGION: WINONA BASIN

Water Depth (m): 2200
Wire out (m): 2259
Elevation Reference :
[✓ Default: local water level]
Depth Method : EK60
Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None.. EK60

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:
Seismic instrument:
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.:
Total Length:
B
Cutter
Catcher / Cutter sample present ? Enter Y or N:

CORE
Piston
Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1
Total Length: 139cm
Catcher / Cutter present ? Enter Y or N: N

|	|	|	|	|	B sec 1/1 A

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

|	|	|	|	|	|

Core Comments: 139cm, 2 apparent events or fining upwards sequence Holocene - Green Mud in between. Coarser material mixed with mud at surface.

Corer Length: m
Apparent Penetration: cm
Scope Length (m): Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size: Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE
Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered
ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent
Please check for "YES"
CHATS data ☐ PALS data ☐

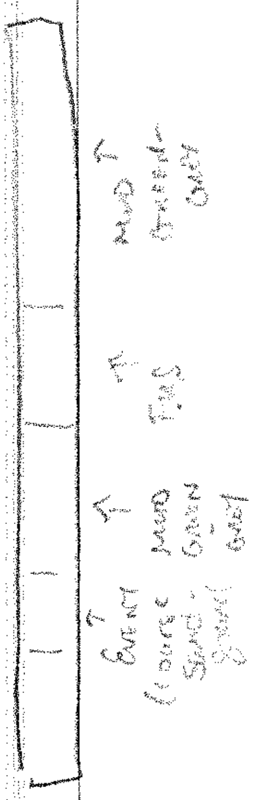
Performance Comments:

SUBSAMPLES
Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH



Station Name : Winona4Pslide

CORES *GEOLOGICAL SURVEY of CANADA (PACIFIC)* **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	30	Tully		Douglas/ [illegible]

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 183	18:43	50 0.74574	-128 44.318732
2 nd Try			

* GEOREGION * — eg : *Gulf of St. Lawrence* = *Scotian Shelf* — WCVI

* SUB-REGION * — *Baie de Chaleur* = *Sable Basin* — Winona Basin

→ use [illegible] ([illegible] OP [illegible]

Water Depth (m) 2064

Wire out (m) 2140

Elevation Reference : Default [✓ local water level]

Depth Method : EK60 ⇨ Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record Please complete below :

Seis Expedition Code
Seis Day / UTC Time

Seismic instrument ⇨ Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE App. Penn. Total Length
B Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE ~~Piston~~ [✓ Gravity]/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity] Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1 **Total Length** 125 cm
Catcher / Cutter present ? N Enter Y or N → too little to keep

L	K	J	I	H	G	F	E	D	C	B	A
										B sed 1	A

Bagged?

L ☐	K ☐	J ☐	I ☐	H ☐	G ☐	F ☐	E ☐	D ☐	C ☐	B ☐	A ☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

Core Comments: GREY MUD WITH GREENER - BROWN MUD AT TOP CONTAINING COARSER GRAIN MATERIAL EXTRA WIRE USED AFTER 2 ATTEMPTS W/ EMPTY CORE

Corer Length m
Apparent Penetration cm
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. ⇨ m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Winona4Dslide

CORES — **GEOLOGICAL SURVEY of CANADA (PACIFIC)** — **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PH	31	TULLY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time

	Day	UTC	LATITUDE	LONGITUDE
1 st Try	183	21:02	50 0.585855	-128 44.65193
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
WINONA BASIN

Water Depth (m) 2067

Wire out (m) 2135

Elevation Reference : [✓ Default: local water level]

Depth Method : EK60

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE App. Penn. Total Length

B

Catcher / Cutter sample present ? ☐ Cutter Enter Y or N

CORE Piston Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity] Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1 **Total Length** 199 **Catcher / Cutter present ?** N Enter Y or N

					B sec 1 A

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

Core Comments: 199cm, to be cut in lab.
GREY-GREEN MUD, WATER BETWEEN LINER + MUD

Corer Length
Apparent Penetration cm
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name : CoreSanJuan8

CORES GEOLOGICAL SURVEY of CANADA (PACIFIC) **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	32	TULLY		DOUGLAS, [illegible]

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 185	23:08	48.515098	-124.466954
2 nd Try			

* GEOREGION * — * SUB-REGION *
eg : Gulf of St. Lawrence = Baie de Chaleur
eg : Scotian Shelf = Sable Basin
JUAN DE FUCA STRAIT — PRT SAN JUAN

Water Depth (m): 94
Wire out (m): 106.6
Elevation Reference :
Default: local water level
Depth Method : 3.5 kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:
Seismic instrument:

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.:
Total Length:
B — Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE
Piston — AGC Large, Benthos, Alpine, Fixed Reference
Gravity/Vibro — [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1
Total Length: 103cm
Catcher / Cutter present ? N Enter Y or N

|	|	|	|	|	B 1 of 1 A

Bagged?
L ☐ K ☐ J ☐ I ☐ H ☐ G ☐ F ☐ E ☐ D ☐ C ☐ B ☐ A ☐
L' K' J' I' H' G' F' E' D' C' B' A'

|	|	|	|	|	|

Core Comments: WIRE PULLED BY [illegible].
DARK GREY MED GRAIN SAND.

Corer Length: m
Apparent Penetration: cm
Scope Length (m): Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size: Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES" CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name : CoreSanJuan10_1

CORES — GEOLOGICAL SURVEY of CANADA (PACIFIC) — CORES

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023008PGC	STN 33	THUY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 155	23:47	48.51096	-124.47553
2 nd Try:			

* GEOREGION *
eg : Gulf of St. Lawrence
eg : Scotian Shelf
JUAN DE FUCA STRAIT

* SUB-REGION *
Baie de Chaleur
Sable Basin
PORT SAN JUAN

Water Depth (m): 111

Wire out (m): 123.4

Elevation Reference :
Default: local water level

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz] 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.
Total Length
B
Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE

Piston
Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1
Total Length: 72cm
Catcher / Cutter present ? N Enter Y or N

B | A

Bagged?
L ☐ L'
K ☐ K'
J ☐ J'
I ☐ I'
H ☐ H'
G ☐ G'
F ☐ F'
E ☐ E'
D ☐ D'
C ☐ C'
B ☐ B'
A ☐ A'

Core Comments: CURRENT ADAPTER ON WIRE
dark grey fine sand

Corer Length
Apparent Penetration
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a 'T'.

6 June 2000 DH

Station Name: CoreSanJuan10-2

CORES — **GEOLOGICAL SURVEY of CANADA (PACIFIC)** — **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	34	TULLY.		Dougan / [illegible]

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	186	00:41	48.50407	-124.478992
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
JUAN DE FUCA ST

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
PORT SAN JUAN

Water Depth (m): 135

Wire out (m): 148

Elevation Reference : [✓ Default: local water level]

Depth Method : 3.5KHZ

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz] 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument:

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.:
Total Length:
B — Cutter
Catcher / Cutter sample present ? ☐ Enter **Y or N**

CORE

Piston
Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1
Total Length: 20 cm
Catcher / Cutter present ? N Enter **Y or N**

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

Core Comments: Short, fine sand, unconsolidated, shell fragments. Wire was out at angle. Core penetration not as expected. Try again w/ Station 35 with DP off for last 10m of wire.

Corer Length:
Apparent Penetration: cm
Scope Length (m): Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size: Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: CoreSanJuan11

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2017003PGC	35	TULLY		Douglas / [illegible]

Day of Year \ UTC time

	Day of Year	UTC time	LATITUDE	LONGITUDE
1st Try	156	01:02	48 30.230	-124 28.716
2nd Try				

* GEOREGION *	* SUB-REGION *
eg : Gulf of St. Lawrence	Baie de Chaleur
eg : Scotian Shelf	Sable Basin
JUAN DE FUCA STRAIT	PORT SAN JUAN

Water Depth (m) 135

Wire out (m) 149

Elevation Reference :

[✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz, 12 khz, 30 khz, 50 khz, 200 khz, Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :

Seis Expedition Code

Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTTV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.

Total Length

B

Catcher / Cutter sample present ? Enter Y or N

Cutter

CORE

Piston
Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
Gravity, Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1

Total Length 92cm

Catcher / Cutter present ? N Enter Y or N

	|		|		|		|		|		B Sed 1 A	
	L	K	J	I	H	G	F	E	D	C	B	A
Bagged?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'
	|		|		|		|		|		|	

Core Comments: FINE BRWN SAND WITH COARSER CLASTS.
REPEAT OF STATION 34

Corer Length

Apparent Penetration

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Core San Juan 12

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2003003PGC	36	TULLY		[illegible]

Day of Year \ UTC time			LATITUDE	LONGITUDE
1st Try	186	01:30	N 48 30 573	W 124 29.856
2nd Try				

*** GEOREGION ***
eg : *Gulf of St. Lawrence*
eg : *Scotian Shelf*
JUAN DE FUCA STRAIT

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
PORT SAN JUAN

Water Depth (m) 132

Wire out (m) 143

Elevation Reference :
[✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.

Total Length

B

Cutter

Catcher / Cutter sample present ? Enter Y or N

CORE

Piston
Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity,] Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1

Total Length 139cm

Catcher / Cutter present ? N Enter Y or N

|	|	|	|	|	B | A

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

|	|	|	|	|	|

Core Comments: fine sand with coarser events
v. nice core!

Corer Length

Apparent Penetration

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter *Barrel* *Catcher*

Is there Damage to the liner? what type ?
Cracked *Imploded* *Shattered*

ACOUSTIC TARGET (choose one)
Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, *Archeology*, *Biology*, *Biostratigraphy*
Carbon Content, *Grain Size*, *Index Properties*, *Inorganic Chemistry*
Isotopes, *Macropaleontology*, *Micropaleontology*, *Organic Chemistry*
Paleomagnetics, *Palynology*, *Petrology*, *XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a 'T'.

Station Name: Core San Juan 13

CORES GEOLOGICAL SURVEY of CANADA (PACIFIC) **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	37	TULLY		DOUGLAS/ COTE

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 186	19:04	48 31.539	-124 32.409
2 nd Try			

* GEOREGION * eg : Gulf of St. Lawrence eg : Scotian Shelf: JUAN DE FUCA ST.

* SUB-REGION * Baie de Chaleur Sable Basin: PORT SAN JUAN.

Water Depth (m): 109

Wire out (m): 118.4

Elevation Reference : Default: local water level

Depth Method : 3.5kHz

Choose From This List: EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List: 3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.:

Total Length:

B

Catcher / Cutter sample present ? ☐ Cutter Enter Y or N

CORE Piston Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
Gravity, Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1

Total Length: 128cm

Catcher / Cutter present ? N Enter Y or N

1	1	1	1	1	B 1 A

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

1	1	1	1	1	1

Core Comments:

Corer Length:

Apparent Penetration: cm

Scope Length (m): Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size: Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Core JDF6

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023002PGC	38	TULLY		DOUGLAS/ [illegible]

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 186	22:28	48 21.799	-123 58.564
2 nd Try			

* GEOREGION *	* SUB-REGION *
eg : Gulf of St. Lawrence	Baie de Chaleur
eg : Scotian Shelf	Sable Basin
SALISH SEA	JUAN DE FUCA STRAIT

Water Depth (m): 114

Wire out (m): 120

Elevation Reference : [✓ Default: local water level]

Depth Method : 3.5 kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.:

Total Length:

B

Catcher / Cutter sample present ? Cutter Enter Y or N

CORE

Piston Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1

Total Length: 37cm

Catcher / Cutter present ? N Enter Y or N

B | A

	L	K	J	I	H	G	F	E	D	C	B	A
Bagged?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

Core Comments: SILT W/ SHELL FRAGMENTS ON TOP OF SAND
WILL TRY AGAIN W/ STN 39. WIRE OUT WITH CURRENT,

Corer Length:

Apparent Penetration: cm

Scope Length (m): Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size: Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Core JDF06

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023002PGC	39	TULLY		DOUGLAS / [illegible]

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	186	22:44	48 21.799	-123 53.580
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
SALISH SEA

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
JDF STRAIT

Water Depth (m) 113

Wire out (m) 120

Elevation Reference : [✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
[✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.
Total Length

B
Cutter
Catcher / Cutter sample present ? N Enter Y or N

CORE
Piston — AGC Large, Benthos, Alpine, Fixed Reference
Gravity/Vibro — [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1
Total Length 46 cm
Catcher / Cutter present ? Enter Y or N

	|	|	|	|	|	B | A

Bagged?
L ☐ K ☐ J ☐ I ☐ H ☐ G ☐ F ☐ E ☐ D ☐ C ☐ B ☐ A ☐
L' K' J' I' H' G' F' E' D' C' B' A'

|	|	|	|	|	|

Core Comments: Shells in with silty sand
GIS Station Core - JDF 06

Corer Length
Apparent Penetration cm
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE
Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered
ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: GrabJDF18

GRABS **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	40_2	Tully		Douglas Cote

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	186	23:51	48 21.451	-123 58.888
2 nd Try	187	00:41	48 21.450	-123 58.910

* GEOREGION * / * SUB-REGION *
eg: Gulf of St. Lawrence = Baie de Chaleur
eg: Scotian Shelf = Sable Basin
Salish Sea / JDF Strait

Water Depth (m): 125
Wire out (m): 129
Elevation Reference :
Default: local water level
Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument:
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

Try 1 unsuccessful. Grab closed but no sample

GRAB SmithMac **Choose type of grab from the list below :**
VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: TRY 2! grabJDF18 DARK GREY SILTY MUD W/ SHELL FRAGMENTS

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below
BOXCORE Standard
IKU GRAB 1 cu (m)
IKU GRAB 0.5 cu (m)

Recovered core Length: cm

Subcores

Subcore Type :
Peel or Push ?

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Comments:

Subsamples

A B C D E F G H I AA BB CC DD EE FF

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

6 June 2000 DH

Station Name: GrabJDF03

GRABS **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	41	Tully		Douglas Côté

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	187	02:30	48 15.955	-123 45.811
2 nd Try				

* GEOREGION *		* SUB-REGION *
eg: Gulf of St. Lawrence	=	*Baie de Chaleur*
eg: Scotian Shelf	=	*Sable Basin*
SALISH SEA		JUAN DE FUCA STRAIT

Water Depth (m) 180

Wire out (m) 190

Elevation Reference :

Default: local water level

Depth Method : 3.5kHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :

Seis Expedition Code

Seis Day / UTC Time

Seismic instrument

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB

Choose type of grab from the list below :

[✓ SmithMac] VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: WIRE AT ANGLE DUE TO CURRENT. 1×5.5cm Pebble found, MUD to PEBBLES MOST UP N 4cm. ↑ POORLY SORTED. JUVENILE MUSSELS, CLAMS, BRITTLE STARS INTER-SPERSED

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below

BOXCORE Standard
IKU GRAB 1 cu (m)
IKU GRAB 0.5 cu (m)

Recovered core Length cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subcore Type :

Peel or Push ?

Comments:

Subsamples

A	B	C
D	E	F
G	H	I
AA	BB	CC
DD	EE	FF
GG	HH	II

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

6 June 2000 DH

GRABS **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023008PGC	42	Tully		Douglas Côté

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 187	21:36	48 24.462	-124 08.975
2 nd Try			

*** GEOREGION *** eg: Gulf of St. Lawrence = *** SUB-REGION *** Baie de Chaleur
eg: Scotian Shelf = Sable Basin

GEOREGION: SALISH SEA
SUB-REGION: JDF STRAIT

Water Depth (m): 101
Wire out (m): 104

Elevation Reference:
[✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
[✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument:
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV,
Bubblepulser, Chirp, Gravity, Gravity 2, Huntec,
Magnetics, Multibeam, OBS, Reflection, SAR,
Seaotter, Sidescan, Sleevegun, Sonobuoy,
Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB

[✓ Smithmac]

Choose type of grab from the list below :
VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: PEBBLES CAUGHT IN GRAB SAMPLER LET OUT SOME MUD ON WAY UP.

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below
BOXCORE Standard
IKU GRAB 1 cu (m)
IKU GRAB 0.5 cu (m)

Recovered core Length: cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subcore Type :
Peel or Push ?

Comments:

Subsamples

A ☐ B ☐ C ☐
D ☐ E ☐ F ☐
G ☐ H ☐ I ☐
AA ☐ BB ☐ CC ☐
DD ☐ EE ☐ FF ☐

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Comments:

6 June 2000 DH

Station Name - Grab JDF05

SAMPLE CONTAINS POORLY SORTED ANGULAR COBBLE >7cm to Mud with organisms attached to cobbles Mud has high silt content (gritty)

Station Name: Grab JDF10

GRABS **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	43	TULLY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 187	22:13	48 24.893	-124 08.447
2 nd Try:			

* GEOREGION * / * SUB-REGION *

eg: Gulf of St. Lawrence = Baie de Chaleur

eg: Scotian Shelf = Sable Basin

SALISH SEA = JUAN DE FUCA STRAIT

Water Depth (m): 66

Wire out (m): 70

Elevation Reference :

Default: local water level

Depth Method : 3.5 kHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB

Choose type of grab from the list below :

VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: ROCK STUCK IN GRAB CLOSURE, SOME SAMPLE LOST POORLY SORTED MUD - COBBLE (7 cm MAX) MORE WITH ROUNDED COBBLES THAN STN 42. POSSIBLE TUBE WORM LIKE ORGANISM KEPT IN SEAWATER (feather duster worms)

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below

BOXCORE Standard

IKU GRAB 1 cu (m)

IKU GRAB 0.5 cu (m)

Subcore Type :

Peel or Push ?

Comments:

Recovered core Length ____ cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subsamples

A ☐	B ☐	C ☐
D ☐	E ☐	F ☐
G ☐	H ☐	I ☐
AA ☐	BB ☐	CC ☐
DD ☐	EE ☐	FF ☐

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

6 June 2000 DH

Station Name: GrabJDF11

GRABS ## GEOLOGICAL SURVEY of CANADA (PACIFIC) **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	44	TULLY		DOUGLAS/ CÔTÉ

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	187	23:22	48 25.808	-124 17.099
2 nd Try				

* GEOREGION * — * SUB-REGION *
eg: Gulf of St. Lawrence = Baie de Chaleur
eg: Scotian Shelf = Sable Basin
SALISH SEA — JUAN DE FUCA STRAIT

Water Depth (m) 133
Wire out (m) 139
Elevation Reference :
[✓ Default: local water level]
Depth Method : 3.5kHz
Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz, 12 khz, 30 khz, 50 khz, 200 khz, Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB

Choose type of grab from the list below :
[✓ Smithmac] VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: DARK GREY SILTY MUD UNIFORM, WELL MIXED. FULL GRAB SAMPLER

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	Carbon Content	Isotopes	Paleomagnetics
Archeology	Grain Size	Macropaleontology	Palynology
Biology	Index Properties	Micropaleontology	Petrology
Biostratigraphy	Inorganic Chemistry	Organic Chemistry	XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below
BOXCORE Standard
IKU GRAB 1 cu (m)
IKU GRAB 0.5 cu (m)

Subcore Type :
Peel or Push ?

Comments:

Recovered core Length cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subsamples

A B C
D E F
G H I
AA BB CC
DD EE FF

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	Carbon Content	Isotopes	Paleomagnetics
Archeology	Grain Size	Macropaleontology	Palynology
Biology	Index Properties	Micropaleontology	Petrology
Biostratigraphy	Inorganic Chemistry	Organic Chemistry	XRD

Analysis Type	Top Interval	Bottom Interval	Comments:

Station Name: GrabJDF06

GRABS | **GEOLOGICAL SURVEY of CANADA (PACIFIC)** | **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	45	TULLY		DOUGLAS / CÔTÉ

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	187	23:50	48 26.829	-124 16.885
2 nd Try				

* GEOREGION *		* SUB-REGION *
eg: Gulf of St. Lawrence	=	Baie de Chaleur
eg: Scotian Shelf	=	Sable Basin
SALISH SEA		JUAN DE FUCA STRAIT

Water Depth (m): 52

Wire out (m): 55

Elevation Reference :

Default: local water level

Depth Method : 3.5KHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record

Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB [✓ Smithmac]

Choose type of grab from the list below :

VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: FINE SAND WITH MUD. SOME PEBBLES (UP to 5cm). SHELL HASH, SOME INTACT.

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below

BOXCORE Standard

IKU GRAB 1 cu (m)

IKU GRAB 0.5 cu (m)

Recovered core Length: cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subcore Type :

Peel or Push ?

Comments:

Subsamples

A ☐ B ☐ C ☐

D ☐ E ☐ F ☐

G ☐ H ☐ I ☐

AA ☐ BB ☐ CC ☐

DD ☐ EE ☐ FF ☐

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

6 June 2000 DH

Station Name: Core TDF02

GRABS — **GEOLOGICAL SURVEY of CANADA (PACIFIC)** — **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	46	TULLY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 188	00:24	48 29.718	-124 28.975
2 nd Try:			

* GEOREGION * — * SUB-REGION *

eg: Gulf of St. Lawrence = Baie de Chaleur

eg: Scotian Shelf = Sable Basin

SALISH SEA — JUAN DE FUCA STRAIT

Water Depth (m): 165

Wire out (m): 167

Elevation Reference :

[✓ Default: local water level]

Depth Method : 3.5 kHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz

Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB [✓ Smithmac] **Choose type of grab from the list below :**

VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: DARK GREY SAND-MUD. LOTS OF ANNELIDS.

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below

BOXCORE Standard

IKU GRAB 1 cu (m)

IKU GRAB 0.5 cu (m)

Recovered core Length cm

Subcores

Subcore Type :

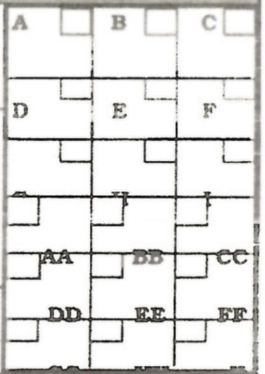
Peel or Push ?

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Comments:

Subsamples



SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

GRABS | *GEOLOGICAL SURVEY of CANADA (PACIFIC)* | **GRABS**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2002003PGC	47	TULLY		DOUGLAS/ COTE

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 188	01:08	48 29.306	-124 32.607
2 nd Try:			

*** GEOREGION *** eg: Gulf of St. Lawrence = *** SUB-REGION *** Baie de Chaleur
eg: Scotian Shelf = Sable Basin

GEOREGION: SALISH SEA
SUB-REGION: JUAN DE FUCA STRAIT

Station Name ↑ San Juan 11

Water Depth (m): 215
Wire out (m): 221
Elevation Reference :
[✓ Default: local water level]
Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz] 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None,.

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument:
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB [✓ SMITH MAC]

Choose type of grab from the list below :
VanVeen, Trowel, Shipek, Eckman, Ponar

Comments: DARK GRAY SILTY MUD

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below
BOXCORE Standard
IKU GRAB 1 cu (m)
IKU GRAB 0.5 cu (m)

Recovered core Length: cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subcore Type :
Peel or Push ?

Comments:

Subsamples

A ☐ B ☐ C ☐
D E F
G H I
AA BB CC
DD EE FF

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

GRABS **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **GRABS**

JOHNNY COY – Station Name

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	48	TULLY		DOUGLAS / CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try 188	01:43	48 30.885	-124 32.014
2 nd Try			

* GEOREGION * / * SUB-REGION *

eg: Gulf of St. Lawrence = Baie de Chaleur

eg: Scotian Shelf = Sable Basin

GEOREGION: SALISH SEA

SUB-REGION: JUAN DE FUCA STRAIT

Water Depth (m): 144

Wire out (m): 149

Elevation Reference:

[✓ Default: local water level]

Depth Method: 3.5KHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz, 12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record Please complete below:

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

GRAB

Choose type of grab from the list below :

SMITH MAC VanVeen, Trowel, Shipek, Eckman, Ponar

Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a subcore, please enter name of subcore. (e.g. A, B, C, etc.)

BOXCORE / IKU GRAB

Choose from below

BOXCORE Standard

IKU GRAB 1 cu (m)

IKU GRAB 0.5 cu (m)

Recovered core Length cm

Subcores

Lengths of subcores : In centimetres

A		D		G	
B		E		H	
C		F		I	

Subcore Type :

Peel or Push ?

Comments:

Subsamples

A ☐ B ☐ C ☐

D E F

G H I

AA BB CC

DD EE FF

SUBSAMPLES

Please choose analysis type for collection from list below.

Age	*Carbon Content*	*Isotopes*	*Paleomagnetics*
Archeology	*Grain Size*	*Macropaleontology*	*Palynology*
Biology	*Index Properties*	*Micropaleontology*	*Petrology*
Biostratigraphy	*Inorganic Chemistry*	*Organic Chemistry*	*XRD*

Analysis Type	Top Interval	Bottom Interval	Comments:

Station Name: CoreAntislioshcam2

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	49	TULLY		DOUGLAS / COTE

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	188	15:29	48° 31.202	126° 56.153
2 nd Try				

* GEOREGION *
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

* SUB-REGION *
Baie de Chaleur
Sable Basin
Cascadia Basin

Water Depth (m): 2424

Wire out (m): 2480

Elevation Reference :

Default: local water level

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV,
Bubblepulser, Chirp, Gravity, Gravity 2, Huntec,
Magnetics, Multibeam, OBS, Reflection, SAR,
Seaotter, Sidescan, Sleevegun, Sonobuoy,
Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE App. Penn.: Total Length:

B

Catcher / Cutter sample present ? Cutter Enter Y or N

CORE Piston Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1

Total Length: 127cm

Catcher / Cutter present ? Y Enter [✓ Y] or N

|	|	|	|	|	B sec 1 A

CATCHER IN SAMPLE CONTAINER

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

|	|	|	|	|	|

proximal Antislioshcam 2

Core Comments: SILTY MUD WITH AT LEAST ONE EVENT / COARSER UNIT NEAR TOP. COLOUR CHANGE TO DARKER GREENGREY ABOVE FROM MED GREY.

Corer Length:

Apparent Penetration:

Scope Length (m): Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size: Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Core Antislipstream 1

CORES | **GEOLOGICAL SURVEY of CANADA (PACIFIC)** | **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	50	TULLY		Douglas/ Côté

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1st Try	188	17:47	48°31.474	126°58.044
2nd Try				

* GEOREGION *	* SUB-REGION *
eg : Gulf of St. Lawrence	Baie de Chaleur
eg : Scotian Shelf	Sable Basin
WCVI	Cascadia Basin

Water Depth (m) 2426m

Wire out (m) 2448 m

Elevation Reference :

Default: local water level

Depth Method : 3.5kHz

Choose From This List

EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz, 12 khz, 30 khz, 50 khz, 200 khz, Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :

Seis Expedition Code

Seis Day / UTC Time

Seismic instrument

Choose From This List

3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE App. Penn. | Total Length

B | Cutter

Catcher / Cutter sample present ? ☐ Enter Y or N

CORE **Piston** **Gravity/Vibro**

AGC Large, Benthos, Alpine, Fixed Reference, [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1 **Total Length** 72cm **Catcher / Cutter present ?** N Enter Y or N

	L	K	J	I	H	G	F	E	D	C	B	A
Bagged?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

B sec 1 A

Core Comments: Anticlipstream 1 Distal.
GREY MUD WITH SAND EVENT/UNIT AT TOP,

Corer Length

Apparent Penetration cm

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?

Cutter *Barrel* *Catcher*

Is there Damage to the liner? what type ?

Cracked *Imploded* *Shattered*

ACOUSTIC TARGET (choose one)

Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*

Please check for "YES"

CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, *Archeology*, *Biology*, *Biostratigraphy*, *Carbon Content*, *Grain Size*, *Index Properties*, *Inorganic Chemistry*, *Isotopes*, *Macropaleontology*, *Micropaleontology*, *Organic Chemistry*, *Paleomagnetics*, *Palynology*, *Petrology*, *XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Core Antislipstream 3_new

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023008PGC	51	TULLY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	188	19:58	48° 31.862	126° 57.730
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
CASCADIA BASIN

Water Depth (m) 2414

Wire out (m) 2444

Elevation Reference : [✓ Default: local water level]

Depth Method : 3.5 kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.
Total Length
B
Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE
Piston
Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1

Total Length 166cm

Catcher / Cutter present ? Y Enter Y or N

L	K	J	I	H	G	F	E	D	C	B	A
1		1		1		1		1		B SEC 1 A	

→ IN SAMPLE CONTAINER

CONTAINER Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑

L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'
1		1		1		1		1		1	

Core Comments: CORE ANTISLIPSTREAM_3NEW COLLECTED FOR SEDIMENT DYNAMICS COMING OFF SLOPE TO BASIN.
GREY MUD WITH MULTIPLE SAND EVENTS/UNITS, ONE LARGE MASS EVENT NEAR TOP.

WILL CUT INTO SECTIONS IN LAB ASHORE

Corer Length

Apparent Penetration cm

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter *Barrel* *Catcher*

Is there Damage to the liner? what type ?
Cracked *Imploded* *Shattered*

ACOUSTIC TARGET (choose one)
Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, *Archeology*, *Biology*, *Biostratigraphy*, *Carbon Content*, *Grain Size*, *Index Properties*, *Inorganic Chemistry*, *Isotopes*, *Macropaleontology*, *Micropaleontology*, *Organic Chemistry*, *Paleomagnetics*, *Palynology*, *Petrology*, *XRD*

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Antislipstream 1 - new

CORES — **GEOLOGICAL SURVEY of CANADA (PACIFIC)** — **CORES**

CRUISE NUMBER: 2023003PGC
STATION NUMBER: 52
VESSEL NAME: TULLY
PROJECT NUMBER:
CHIEF SCIENTIST: DOUGLAS/ CÔTÉ

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	188	2157	48° 31.383	126° 56.424
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
CASCADIA BASIN

Water Depth (m): 2430
Wire out (m): 2534
Elevation Reference :
[✓ Default: local water level]
Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.
Total Length
B
Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE
Piston — AGC Large, Benthos, Alpine, Fixed Reference
Gravity/Vibro — [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 2
Total Length: 206cm
Catcher / Cutter present ? Y Enter Y or N

SECTION 1: C 56cm B
SECTION 2: B 150cm A

Bagged?
L ☐ K ☐ J ☐ I ☐ H ☐ G ☐ F ☐ E ☐ D ☐ C ☐ B ☐ A ☐
L' K' J' I' H' G' F' E' D' C' B' A'

Core Comments: SITE CORE - Antislipstream 1 - TZR in Waypoints.
Orig 1 siltymud with interspersed sand units/events

Corer Length
Apparent Penetration cm
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.
Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name: Antislipstream 7

CORES — GEOLOGICAL SURVEY of CANADA (PACIFIC) — CORES

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	53	TULLY		DOUGLAS/ CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1st Try: 189	23:54	48° 31.465	126°58.149
2nd Try:			

* GEOREGION *
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

* SUB-REGION *
Baie de Chaleur
Sable Basin
Cascadia Basin

Water Depth (m): 2427

Wire out (m): 2460m

Elevation Reference :
[✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz], 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code:
Seis Day / UTC Time:

Seismic instrument:

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.:

Total Length:

B — Cutter

Catcher / Cutter sample present ? ☐ Enter Y or N

CORE

Piston — AGC Large, Benthos, Alpine, Fixed Reference

Gravity/Vibro — [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 0

Total Length: 0

Catcher / Cutter present ? Y — Enter Y or N

Bagged?
L ☐ L' K ☐ K' J ☐ J' I ☐ I' H ☐ H' G ☐ G' F ☐ F' E ☐ E' D ☐ D' C ☐ C' B ☐ B' A ☐ A'

Core Comments: Waypoint antislipstream 7. Core returned with mud dripping out bottom. ~10cm of watery mud in base without structure maintained. Collected with catcher material in sample container

Corer Length:

Apparent Penetration: cm

Scope Length (m): Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size: Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. ⇨ m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy
Carbon Content, Grain Size, Index Properties, Inorganic Chemistry
Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry
Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

Station Name → Mike 2

CORES | **GEOLOGICAL SURVEY of CANADA (PACIFIC)** | **CORES**

CRUISE NUMBER 2023003PGC
STATION NUMBER 54
VESSEL NAME TULLY
PROJECT NUMBER
CHIEF SCIENTIST DOUG CASS/ CBW

Day of Year \ UTC time

	Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try	189	15:02	48° 20.890	126° 43.070
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
Cascadia Basin

Water Depth (m) 2510
Wire out (m) 2593
Elevation Reference :
Default: [✓ local water level]
Depth Method : 3.5
Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz,] 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time
Seismic instrument
Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE
App. Penn.
Total Length
B
Catcher / Cutter sample present ?
Cutter
Enter Y or N

CORE
Piston
Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity] Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1
Total Length 65 cm
Catcher / Cutter present ? N
Enter Y or N

	L	K	J	I	H	G	F	E	D	C	B	A
	|		|		|		|		|		B | A	
Bagged?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'
	|		|		|		|		|		|	

Core Comments:
uniform grey mud
small stone in core catcher (in sample vial)

Corer Length
Apparent Penetration cm
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment. m

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered
ACOUSTIC TARGET (choose one)
Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*
Please check for "YES"
CHATS data ☐ **PALS data** ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age
Archeology
Biology
Biostratigraphy
Carbon Content
Grain Size
Index Properties
Inorganic Chemistry
Isotopes
Macropaleontology
Micropaleontology
Organic Chemistry
Paleomagnetics
Palynology
Petrology
XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a 'T'.

6 June 2000 DH

Station Name → Mike

CORES | **GEOLOGICAL SURVEY of CANADA (PACIFIC)** | **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	55	Tully		Douglas/ Côté

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	189	17:05	48° 20.236	126° 42.141
2 nd Try				

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
Cascadia

Water Depth (m) 2485

Wire out (m) 2546

Elevation Reference :

Default: [✓ local water level]

Depth Method : 3.5

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, [✓ 3.5 khz,] 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.

Total Length

B

Cutter

Catcher / Cutter sample present ? ☐ Enter Y or N

CORE

Piston
Gravity/Vibro

AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity,] Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1

Total Length 37cm

Catcher / Cutter present ? Y Enter [✓ Y] or N

1	1	1	1	1	B 1 A

Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

1	1	1	1	1	1

Core Comments: GREY-GREEN MUD WITH SAND UNIT NEAR TOP. CORE CATCHER SAMPLE FELL OUT ON DECK AND RETRIEVED INTO SAMPLE CONTAINER.

Corer Length

Apparent Penetration cm

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent *Smooth Stratified* *Smooth Incoherent*
Rough Transparent *Rough Stratified* *Rough Incoherent*

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age
Archeology
Biology
Biostratigraphy
Carbon Content
Grain Size
Index Properties
Inorganic Chemistry
Isotopes
Macropaleontology
Micropaleontology
Organic Chemistry
Paleomagnetics
Palynology
Petrology
XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

Station Name → Minke 3

CORES GEOLOGICAL SURVEY of CANADA (PACIFIC) CORES

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	56	TULLY		Douglas / Côté

Day of Year \ UTC time			LATITUDE	LONGITUDE
1 st Try	189	19:12	48° 20.591	126° 43.821
2 nd Try				

* GEOREGION *
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

* SUB-REGION *
Baie de Chaleur
Sable Basin
Cascadia Basin

Water Depth (m) 2527

Wire out (m) 2600

Elevation Reference :
[✓ Default: local water level]

Depth Method : 3.5kHz

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS,
3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz
Lead Line, Other, None..

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.

Total Length

B

Cutter

Catcher / Cutter sample present ? Enter Y or N

CORE

Piston AGC Large, Benthos, Alpine, Fixed Reference

Gravity/Vibro [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 2

Total Length 200cm

Catcher / Cutter present ? N Enter Y or N

50cm: C SECTION 1 B
150cm: B SECTION 2 A

Bagged?
L ☐ L'
K ☐ K'
J ☐ J'
I ☐ I'
H ☐ H'
G ☐ G'
F ☐ F'
E ☐ E'
D ☐ D'
C ☐ C'
B ☐ B'
A ☐ A'

Core Comments: GREY MUD WITH ~1 cm sand units interspersed (approx 3)

Corer Length

Apparent Penetration

Scope Length (m) Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher

Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐
PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

Station Name Finn2

CORES **GEOLOGICAL SURVEY of CANADA (PACIFIC)** **CORES**

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	57	TULLY		DOUGLAS/ CÔTE

Day of Year \ UTC time		LATITUDE	LONGITUDE
1st Try 189	14:40	48° 14.646	126° 36.916
2nd Try			

*** GEOREGION ***
eg : Gulf of St. Lawrence
eg : Scotian Shelf
WCVI

*** SUB-REGION ***
Baie de Chaleur
Sable Basin
Cascadia Basin

Water Depth (m) 2440

Wire out (m) 2512.7

Elevation Reference :
Default: local water level

Depth Method : EK80

Choose From This List
EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None., EK80

If station is based on a Seismic Record
Please complete below :
Seis Expedition Code
Seis Day / UTC Time

Seismic instrument

Choose From This List
3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE App. Penn. Total Length

B Cutter
Catcher / Cutter sample present ? Enter Y or N

CORE
Piston
Gravity/Vibro
AGC Large, Benthos, Alpine, Fixed Reference
[✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections 1 **Total Length** 115cm **Catcher / Cutter present ?** Enter Y or N

B SEC 1 A

container Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

WAYPOINT:CORE_FINN2

Core Comments: CORE APPEARS TO HAVE PENETRATED PLEISTOCENE GREY MUD WITH HOLOCENE GREEN-GREY MUD ON TOP

Corer Length
Apparent Penetration
Scope Length (m) Default is 2.29 m
If Piston is a split piston, check if it split. ☐
Orifice Size Default is 0.41 cm
If Split piston split, Enter distance between piston and sediment.

PISTON CORE PERFORMANCE

Is there damage to any of the items below?
Cutter Barrel Catcher
Is there Damage to the liner? what type ?
Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)
Smooth Transparent Smooth Stratified Smooth Incoherent
Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES"
CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

6 June 2000 DH

CORES GEOLOGICAL SURVEY of CANADA (PACIFIC) **CORES**

Station Name → Finn1

CRUISE NUMBER	STATION NUMBER	VESSEL NAME	PROJECT NUMBER	CHIEF SCIENTIST
2023003PGC	58	TULLY		DOUGLAS / CÔTÉ

Day of Year \ UTC time		LATITUDE	LONGITUDE
1 st Try: 189	23:33	48°13.783	126° 37.033
2 nd Try:			

* GEOREGION * — eg : Gulf of St. Lawrence = Baie de Chaleur; eg : Scotian Shelf = Sable Basin — * SUB-REGION *

GEOREGION: WCVI

SUB-REGION: Cascadia Basin

Water Depth (m): 2460

Wire out (m): 2535

Elevation Reference : Default: local water level

Depth Method : EK80

Choose From This List: EM100, EM1000, EM3000, RTK-DGPS, 3.5 khz, 5khz ,12 khz, 30 khz, 50 khz, 200 khz Lead Line, Other, None.

If station is based on a Seismic Record Please complete below :

Seis Expedition Code:

Seis Day / UTC Time:

Seismic instrument:

Choose From This List: 3.5 khz, Airgun, Bathymetry, Boomer, BRUTIV, Bubblepulser, Chirp, Gravity, Gravity 2, Huntec, Magnetics, Multibeam, OBS, Reflection, SAR, Seaotter, Sidescan, Sleevegun, Sonobuoy, Sparker, Seabed2, Seamarc, Seistec, OTHER.

TRIGGER CORE

App. Penn.:

Total Length:

B — Cutter

Catcher / Cutter sample present ? Enter Y or N

CORE

Piston — AGC Large, Benthos, Alpine, Fixed Reference

Gravity/Vibro — [✓ Gravity], Dalhousie, Brook, AGC Small, Aimer MacLean, Concrete

Number of sections: 1

Total Length: 140cm

Catcher / Cutter present ?: Y — Enter [✓ Y] or N

B | Sec 1 | A

Container Bagged?

L	K	J	I	H	G	F	E	D	C	B	A
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
L'	K'	J'	I'	H'	G'	F'	E'	D'	C'	B'	A'

Core Comments: CORE-FINN1 AS WAYPOINT DEPTH DISCREPANCY BETWEEN EK80 (2460m), EXISTING MB BATHY AT 2485m and 3.5kHz which is noisy but showing depths around 2490m. Pleistocene grey mud in catcher transitions to Holocene Green-Grey somewhere below surface. Difficult to see due to water content

PISTON CORE PERFORMANCE

Corer Length: m

Apparent Penetration: cm

Scope Length (m): Default is 2.29 m

If Piston is a split piston, check if it split. ☐

Orifice Size: Default is 0.41 cm

If Split piston split, Enter distance between piston and sediment. m

Is there damage to any of the items below?

Cutter Barrel Catcher

Is there Damage to the liner? what type ?

Cracked Imploded Shattered

ACOUSTIC TARGET (choose one)

Smooth Transparent Smooth Stratified Smooth Incoherent

Rough Transparent Rough Stratified Rough Incoherent

Please check for "YES": CHATS data ☐ PALS data ☐

Performance Comments:

SUBSAMPLES

Please choose analysis type for collection from list below.

Age, Archeology, Biology, Biostratigraphy, Carbon Content, Grain Size, Index Properties, Inorganic Chemistry, Isotopes, Macropaleontology, Micropaleontology, Organic Chemistry, Paleomagnetics, Palynology, Petrology, XRD

Analysis Type	Top Interval	Bottom Interval	Subcore name	Comments:

If subsample is from a Trigger Weight Core, please enter a ' T '.

Appendix B: Grab Sample Photos

Figure B1. July 6, 2023 (JD187), Station 40. 48°21.450'N, 123°58.910'W, Juan de Fuca Straight. Depth 125 m. Photograph by M.M. Côté. NRCan photo 2023-285.

Figure B2. July 6, 2023 (JD187), Station 41. 48°15.955'N, 123°45.811'W, Juan de Fuca Straight. Depth 180 m. Photograph by M.M. Côté. NRCan photo 2023-286.

Figure B3. July 6, 2023 (JD187), Station 42. 48°24.562'N, 124°08.975'W, Juan de Fuca Straight. Depth 101 m. Photograph by K.L. Douglas. NRCan photo 2023-287.

Figure B4. July 6, 2023 (JD187), Station 43. 48°24.893'N, 124°08.447'W, Juan de Fuca Straight. Depth 66 m. Photograph by K.L. Douglas. NRCan photo 2023-288.

Figure B5. July 6, 2023 (JD187), Station 44. 48°25.808'N, 124°17.099'W, Juan de Fuca Straight. Depth 133 m. Photograph by K.L. Douglas. NRCan photo 2023-289.

Figure B6. July 6, 2023 (JD187), Station 45. 48°26.829'N, 124°16.885'W, Juan de Fuca Straight. Depth 52 m. Photograph by K.L. Douglas. NRCan photo 2023-290.

Figure B7. July 6, 2023 (JD188), Station 46. 48°29.718'N, 124°28.975'W, Juan de Fuca Straight. Depth 165 m. Photograph by K.L. Douglas. NRCan photo 2023-291.

Figure B8. July 6, 2023 (JD188), Station 47. 48°29.306'N, 124°32.602'W, Juan de Fuca Straight. Depth 215 m. Photograph by K.L. Douglas. NRCan photo 2023-292.

Figure B9. July 6, 2023 (JD188), Station 48. 48°30.885'W, 124°32.014'W, Juan de Fuca Straight. Depth 144 m. Photograph by K.L. Douglas. NRCan photo 2023-293.

Appendix C: Echosounder Plume Data.

Screen captures of gas plume or suspected gas plumes as identified with the EK80 echosounder. Time stamp is in UTC.

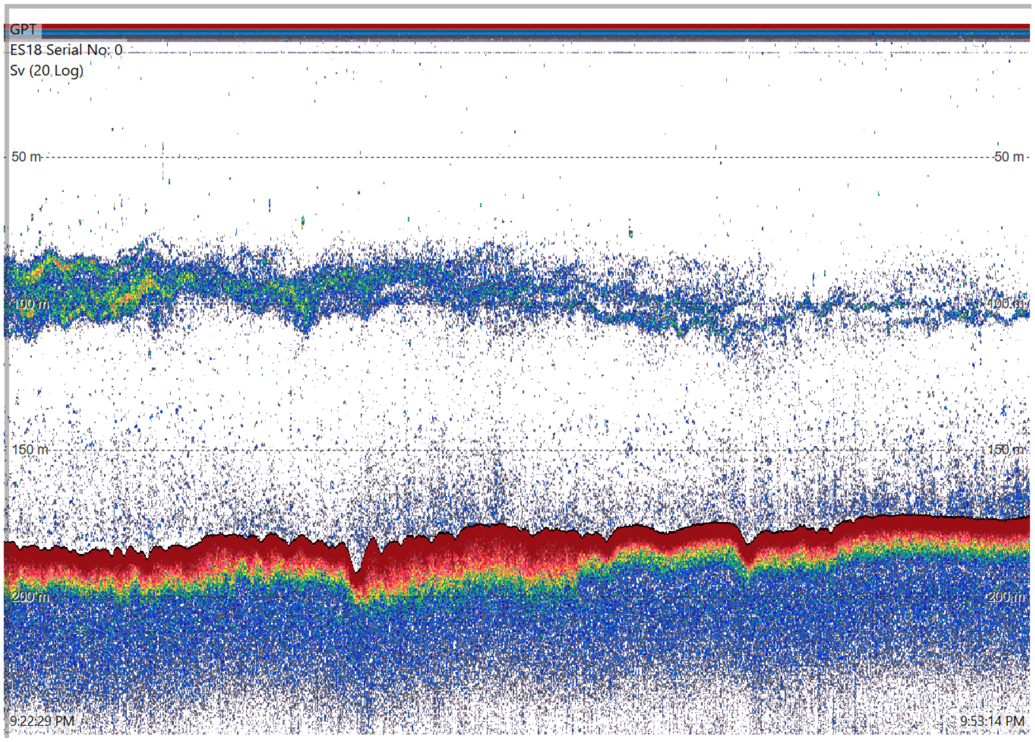


Figure C1. Juan de Fuca Strait, JD178, 21:02:38. File: D20230627-T210238.

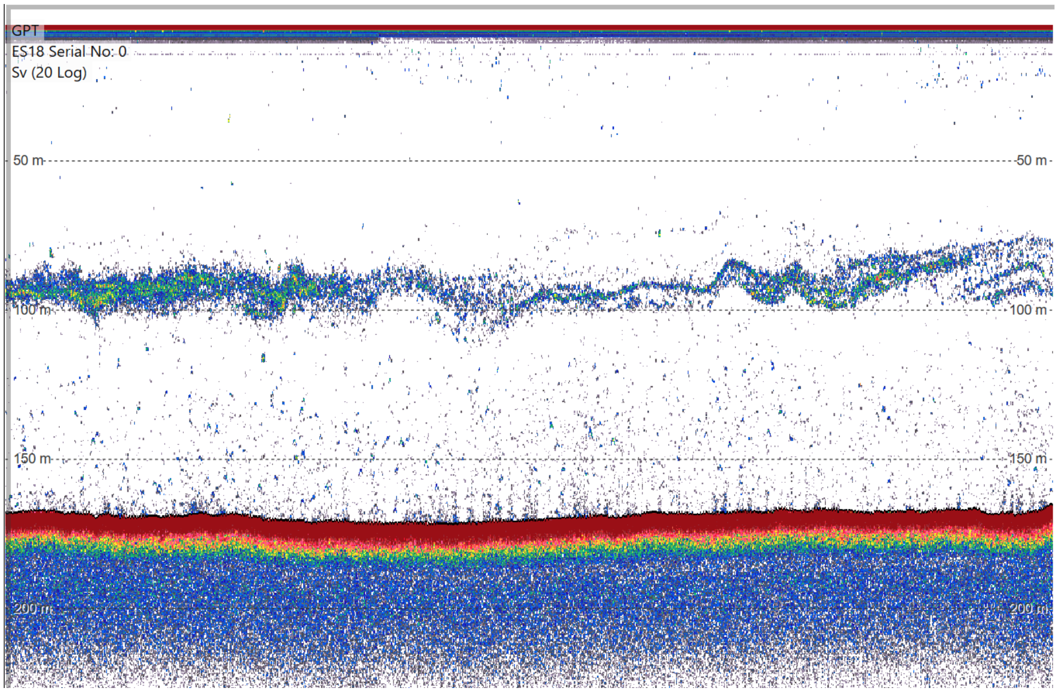
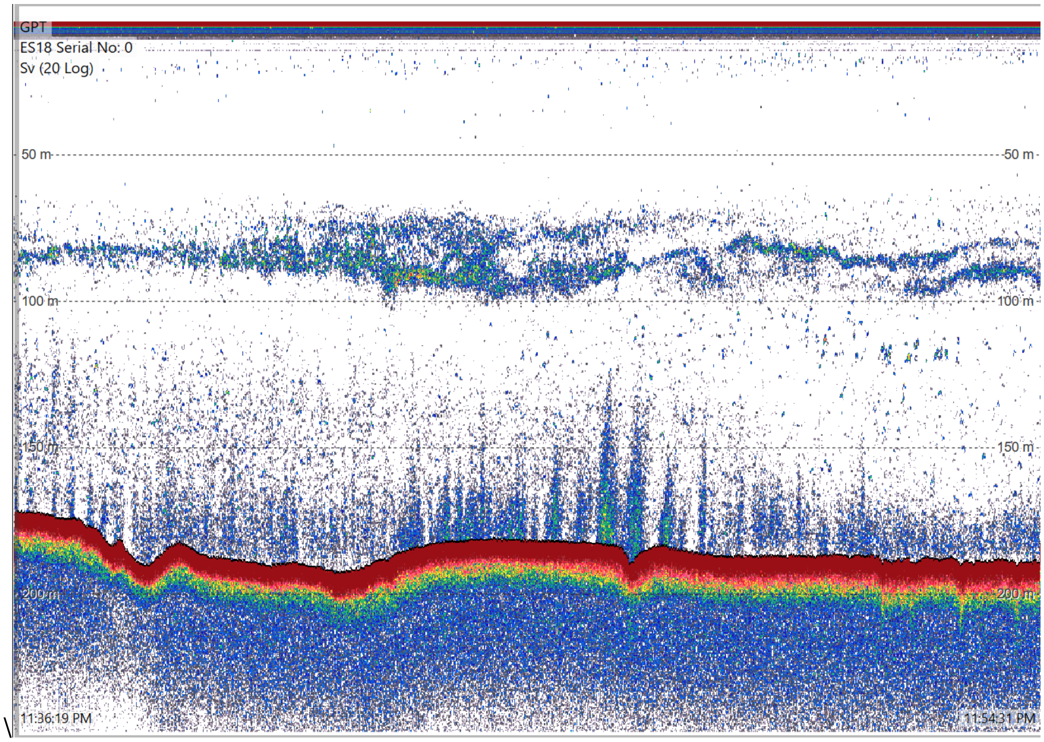


Figure C2. Juan de Fuca Strait, JD178, 22:15:36. File: D20230627-T221536.



\

Figure C3. Juan de Fuca Strait, JD178, 23:36:19. File: D20230627-T232346.

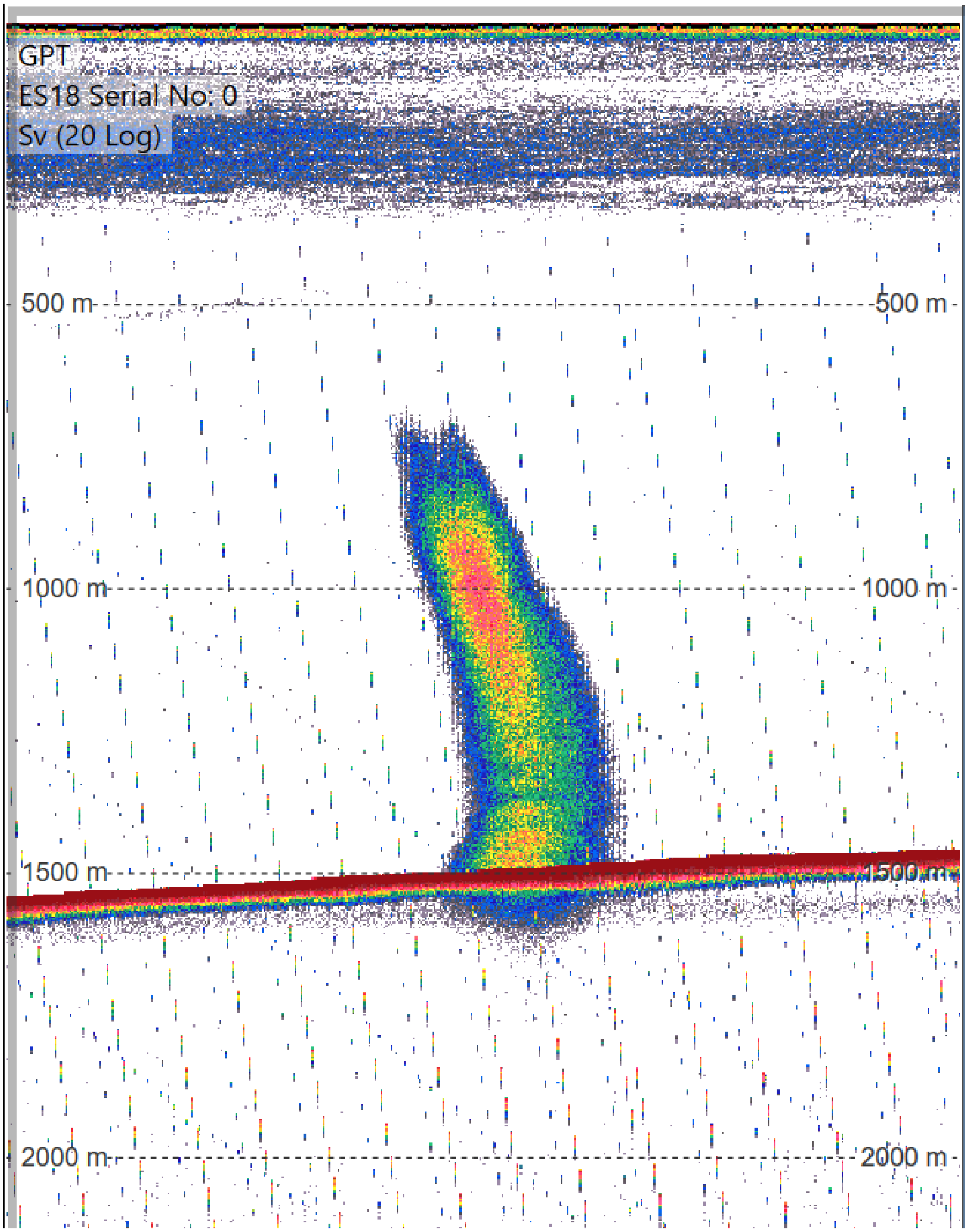


Figure C4. Winona Basin, JD182, 5:27:19, Plume at Twin Flare Site, file: D20230701-T052719.

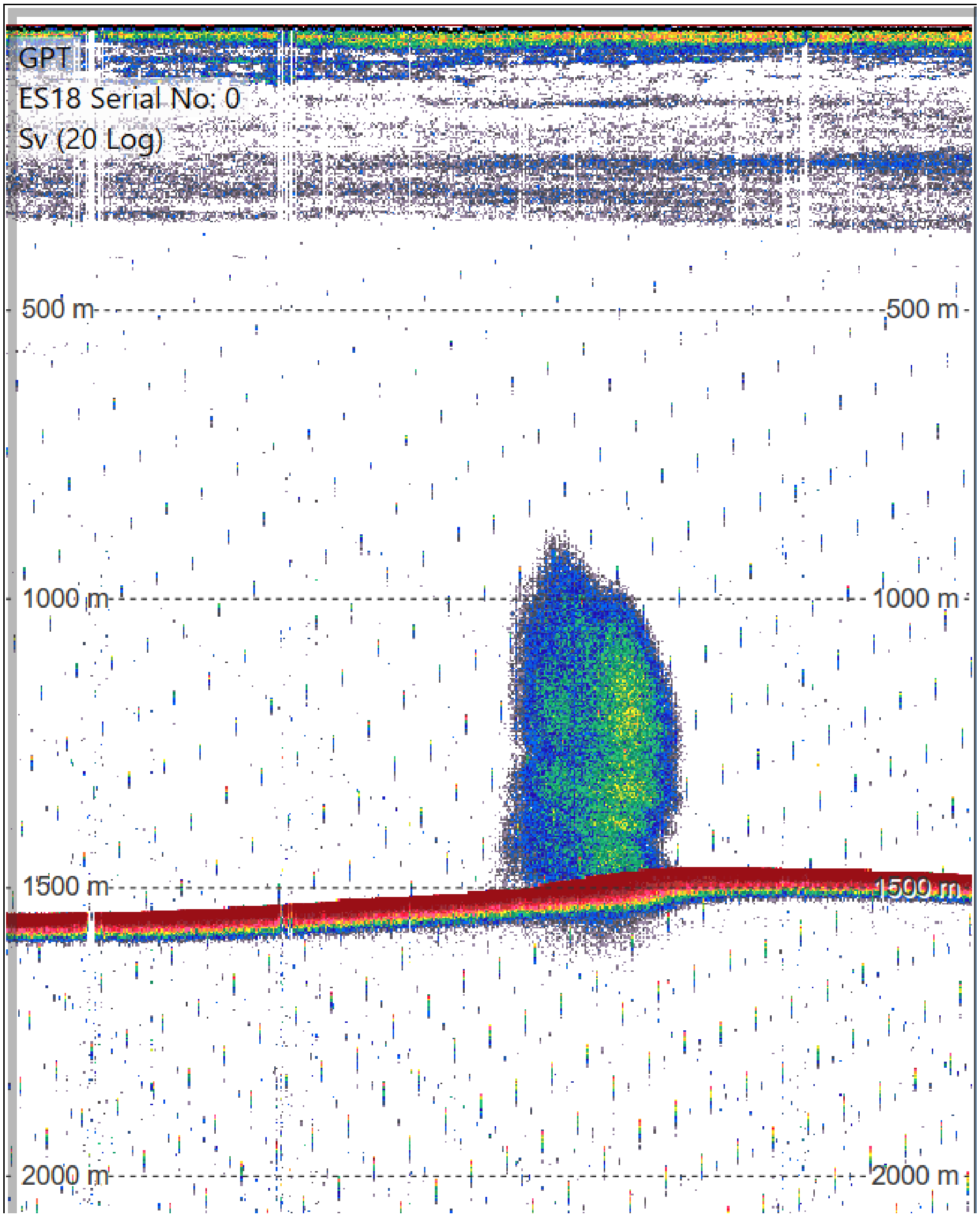


Figure C5. Winona Basin, JD182, 18:05:20. Plume at Twin Flare Site, file: D20230701-T164157.

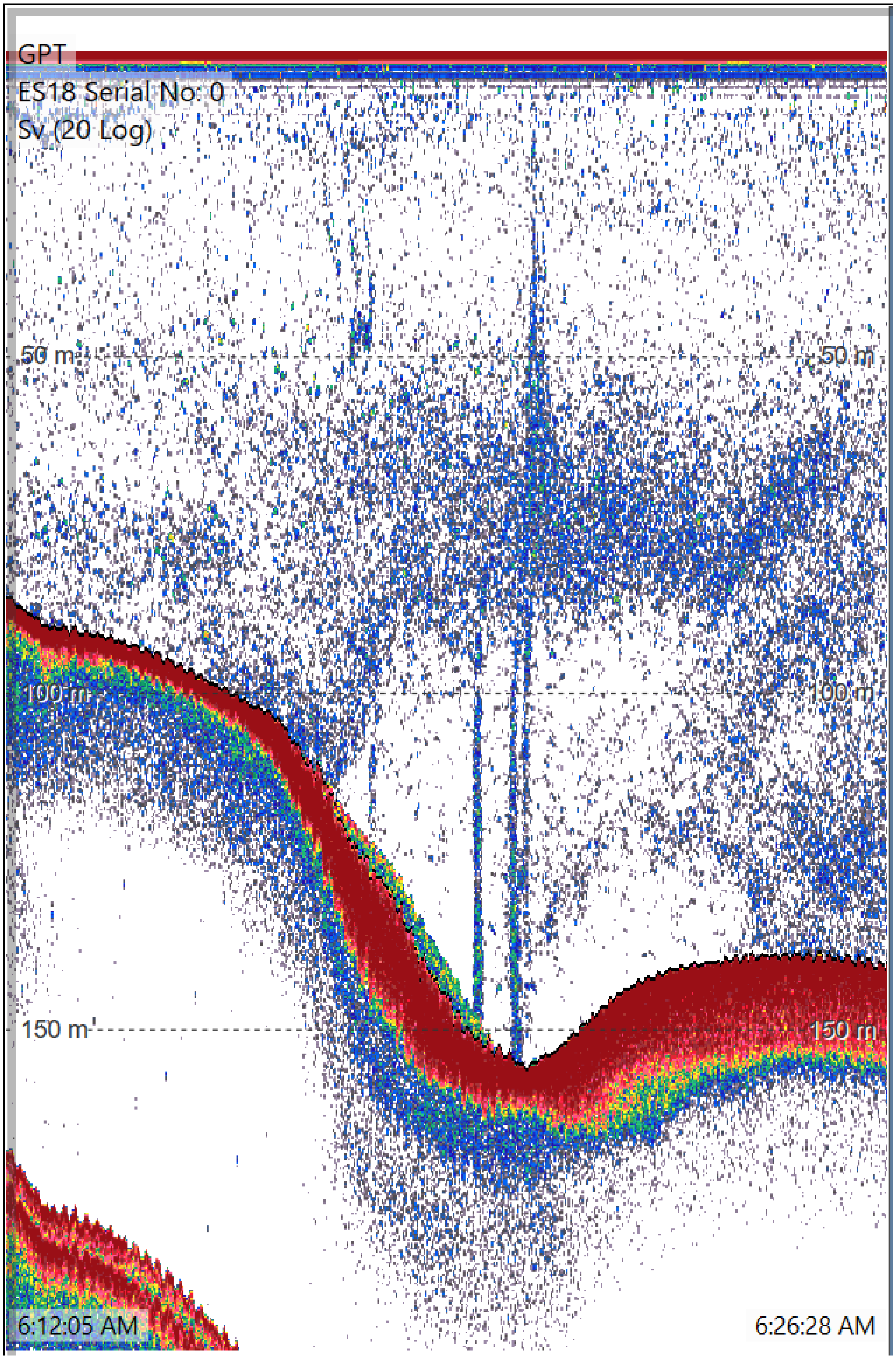


Figure C6. La Perouse Bank, JD185, 6:10:06. File: D20130704-T061006.

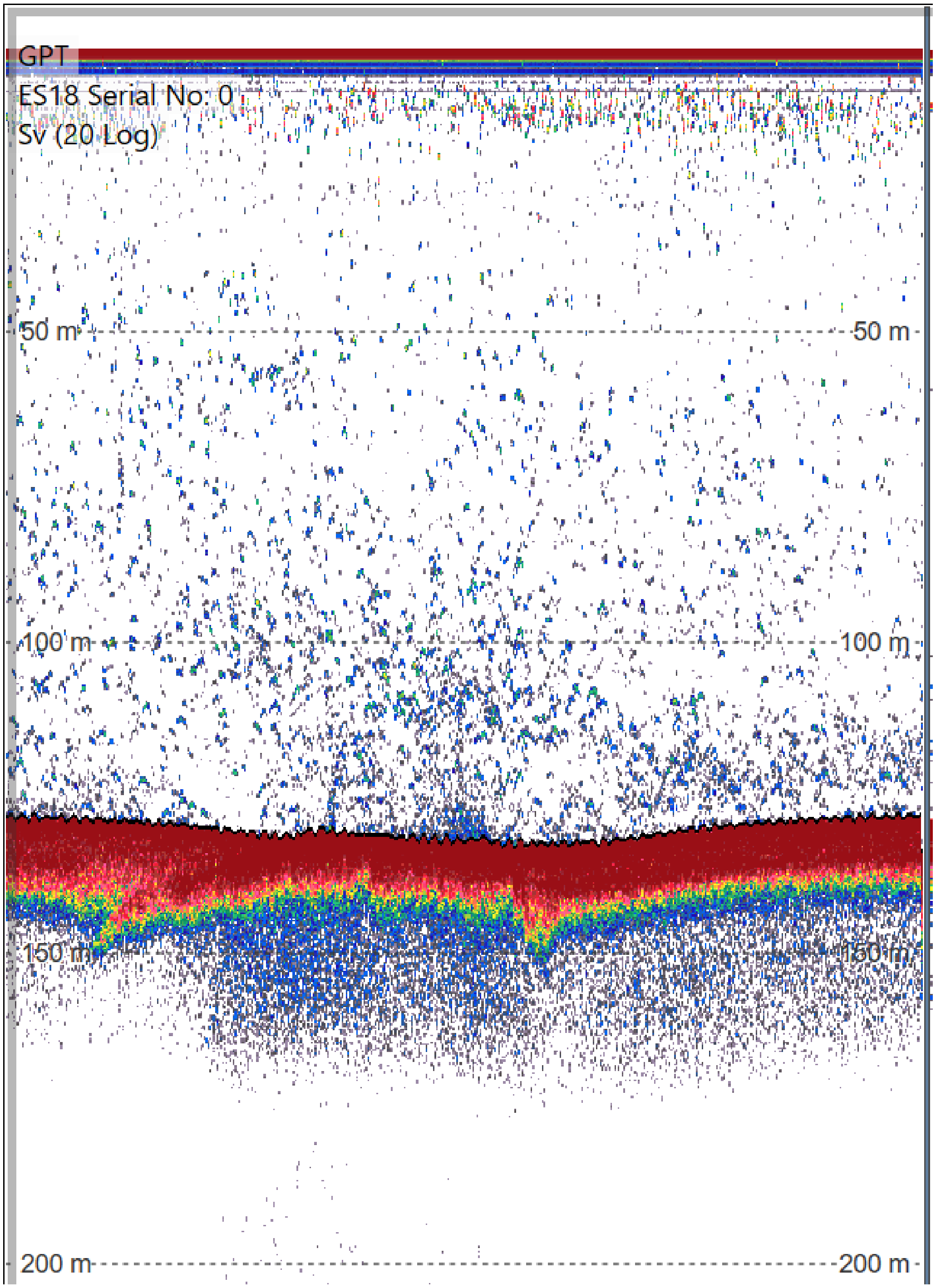


Figure C7. La Perouse Bank, JD185, 7:17:49. File: D20230704-T071749.

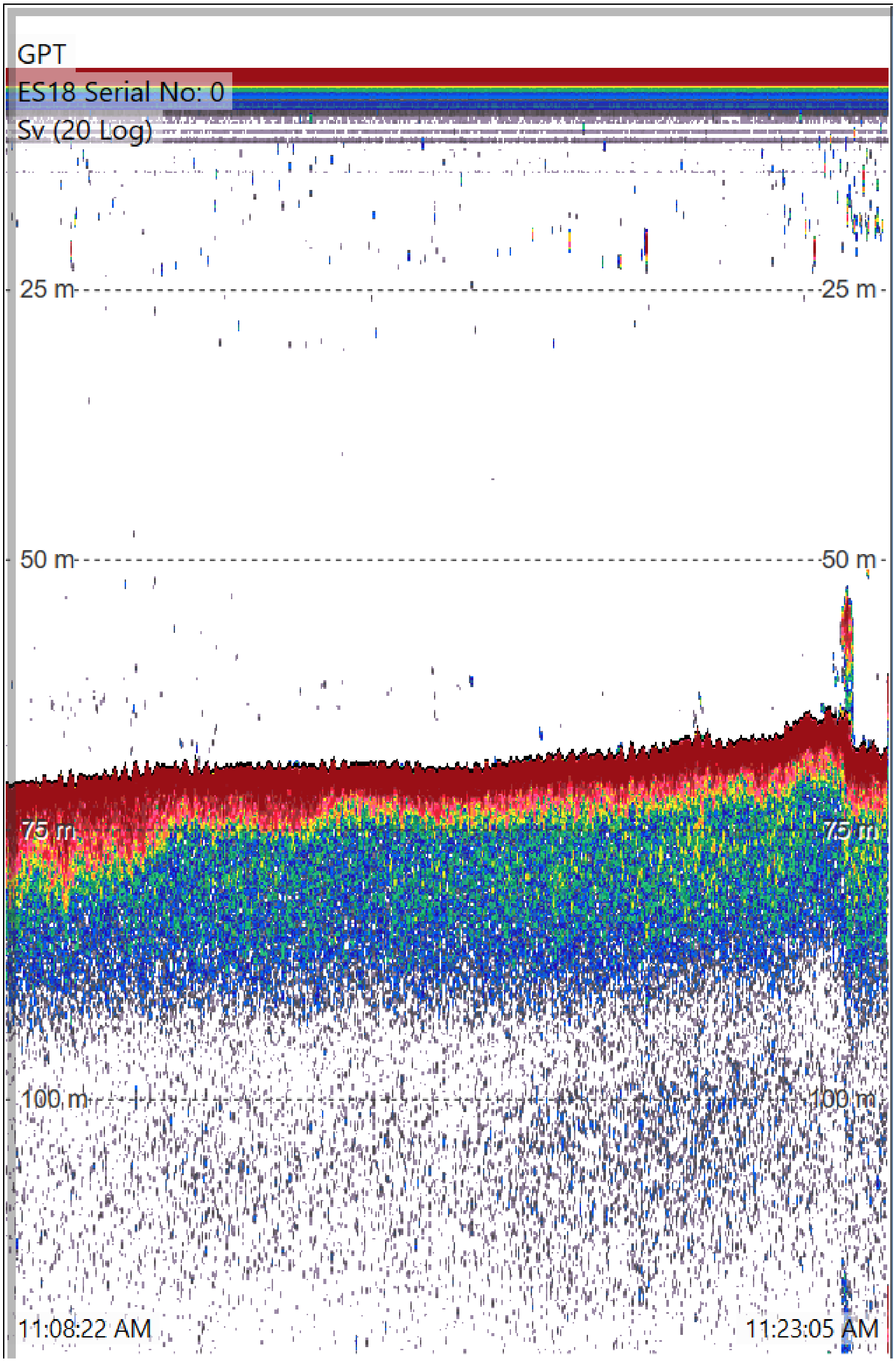


Figure C8. La Perouse Bank, JD185, 10:40:55. File: D20230704-T104055.

Appendix D: 3.5 kHz CHIRP Sub-bottom Profiler Lines

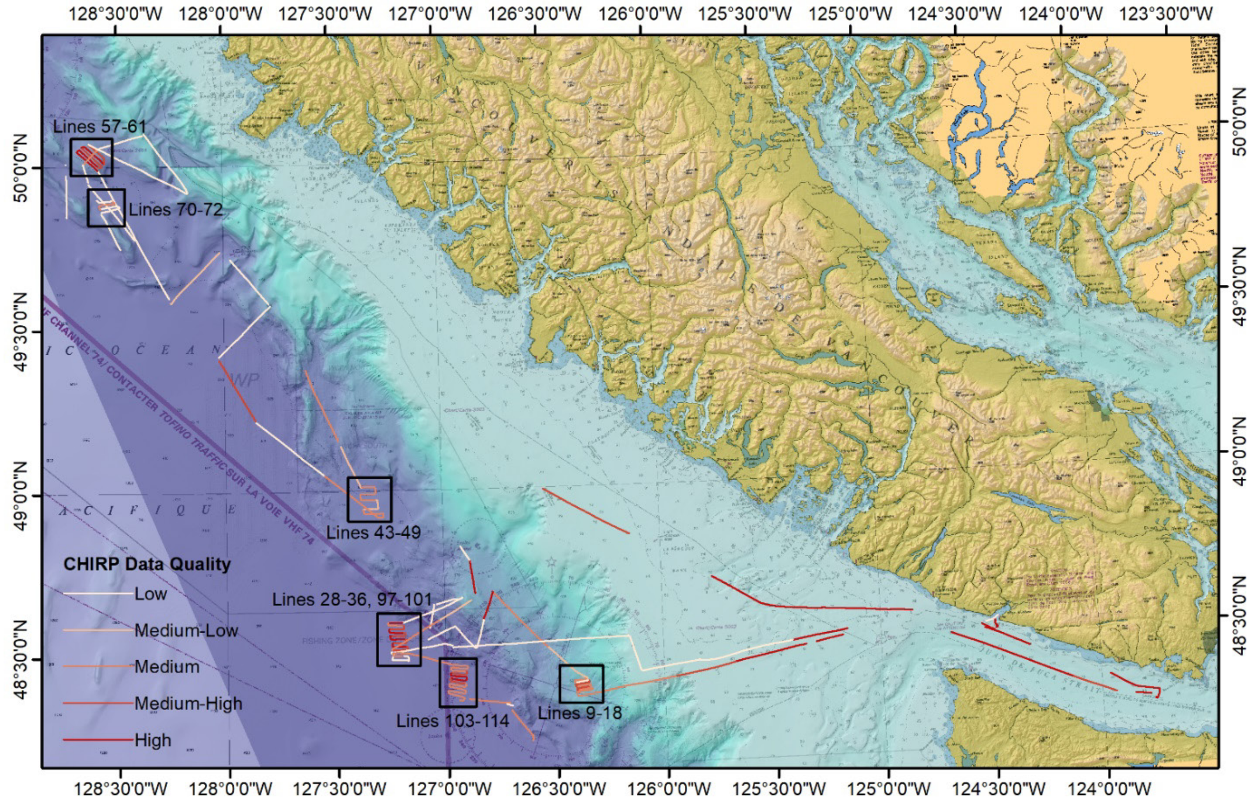


Figure D1. 3.5kHz CHIRP survey lines in study area. Basemap from Pacific Coast Digital Elevation model (Kung et al., 2021) and Canadian Hydrographic Chart T30010 (for illustrative purposes only, not to be used for navigation).

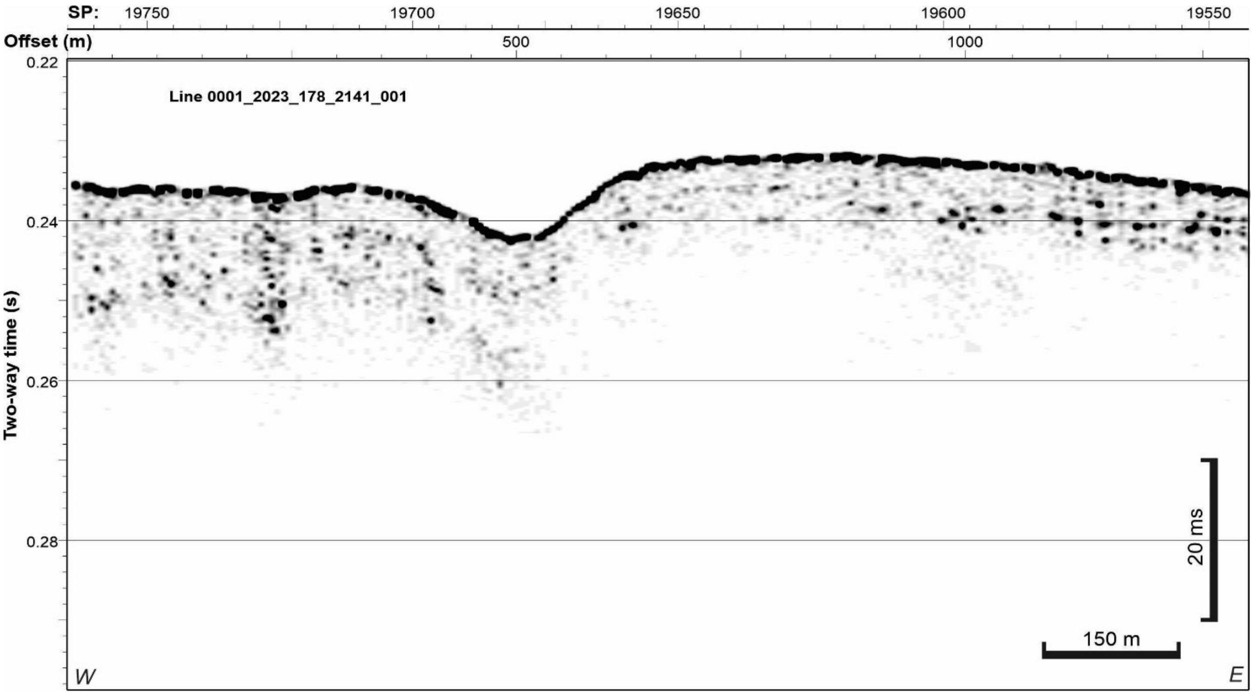


Figure D2. Line 0001_2023_178_2141_001, June 27 (JD178), Juan de Fuca Strait.

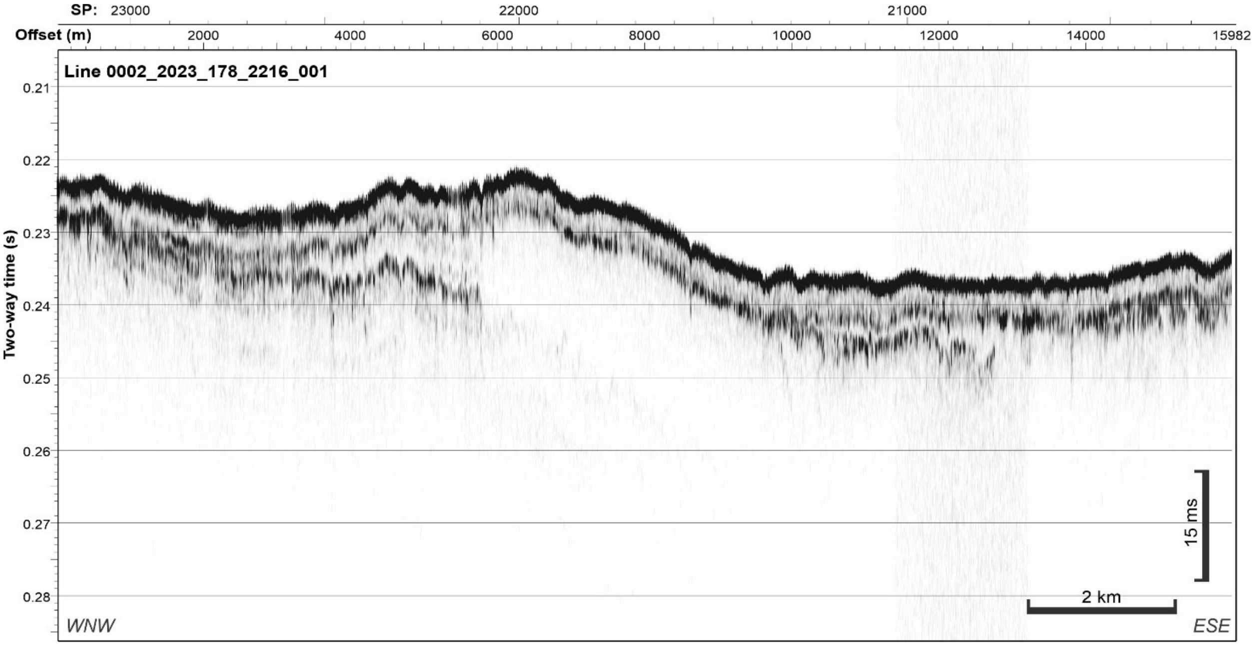


Figure D3. Line 0002_2023_178_2216_001, June 27 (JD178), Juan de Fuca Strait.

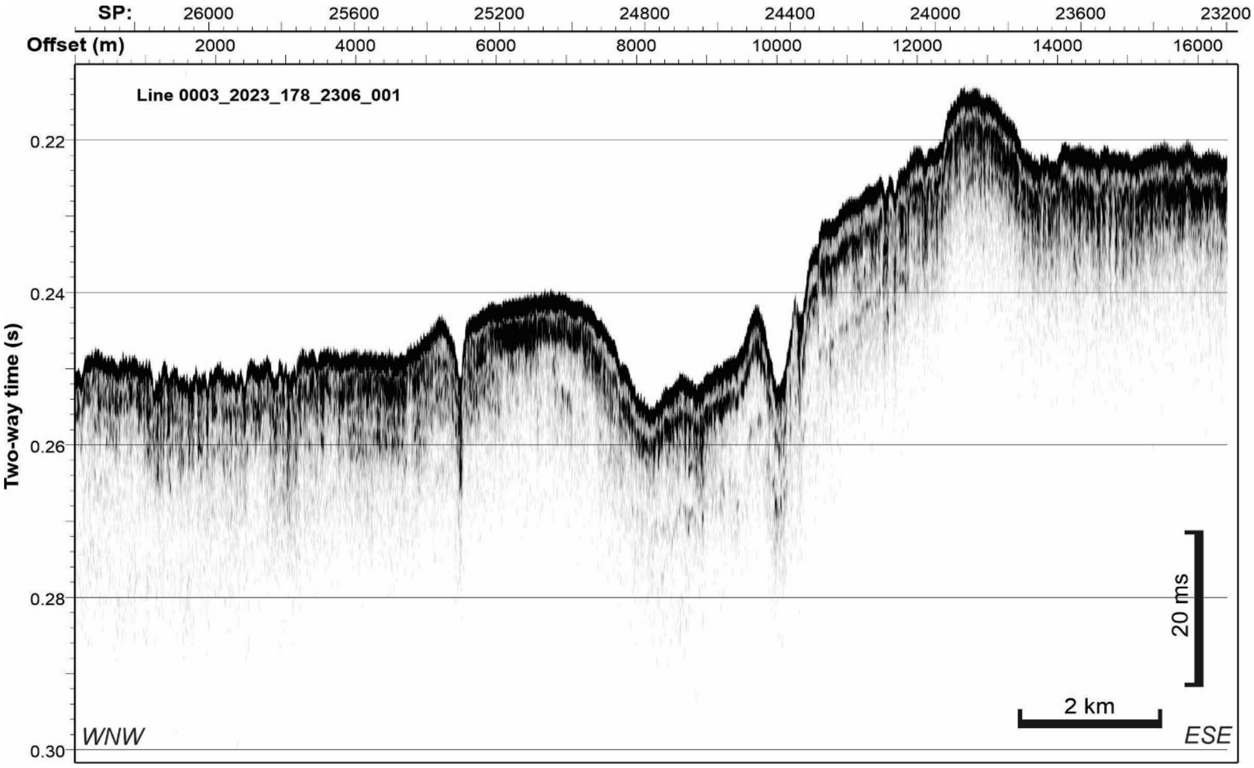


Figure D4. Line 0003_2023_178_2306_001, June 27 (JD178), Juan de Fuca Strait.

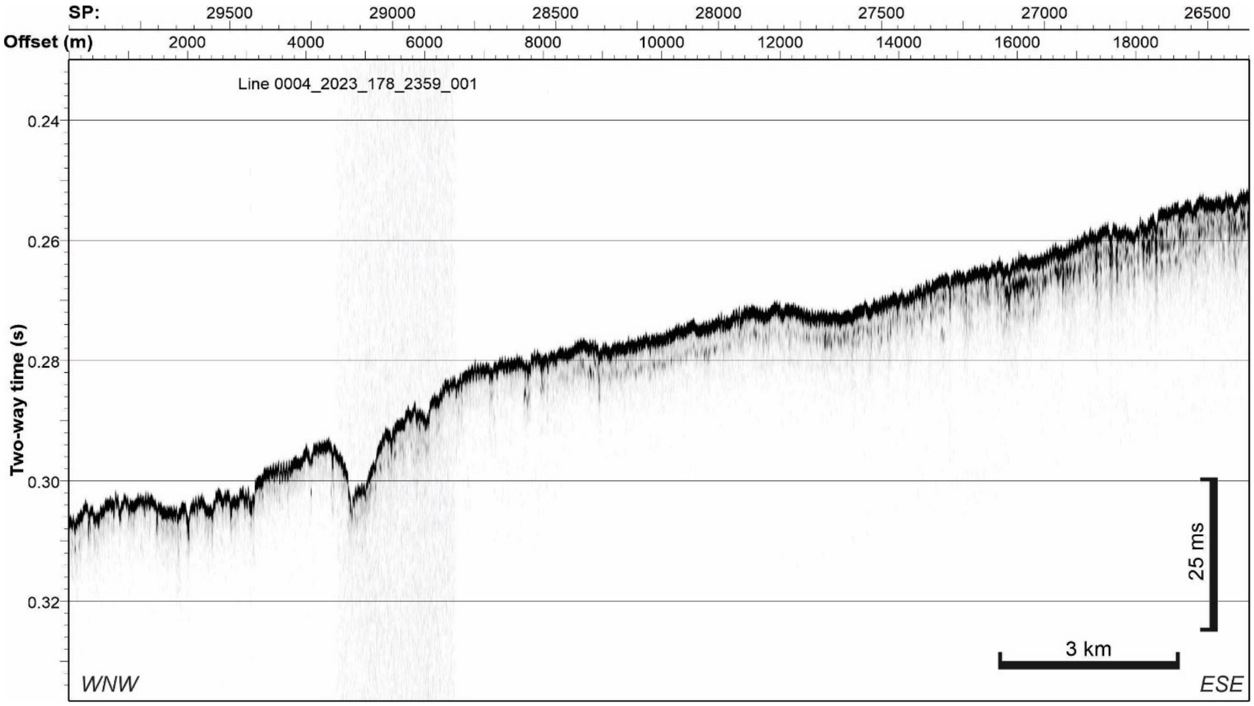


Figure D5. Line 0004_2023_178_2359_00, June 27 (JD178), Juan de Fuca Strait.

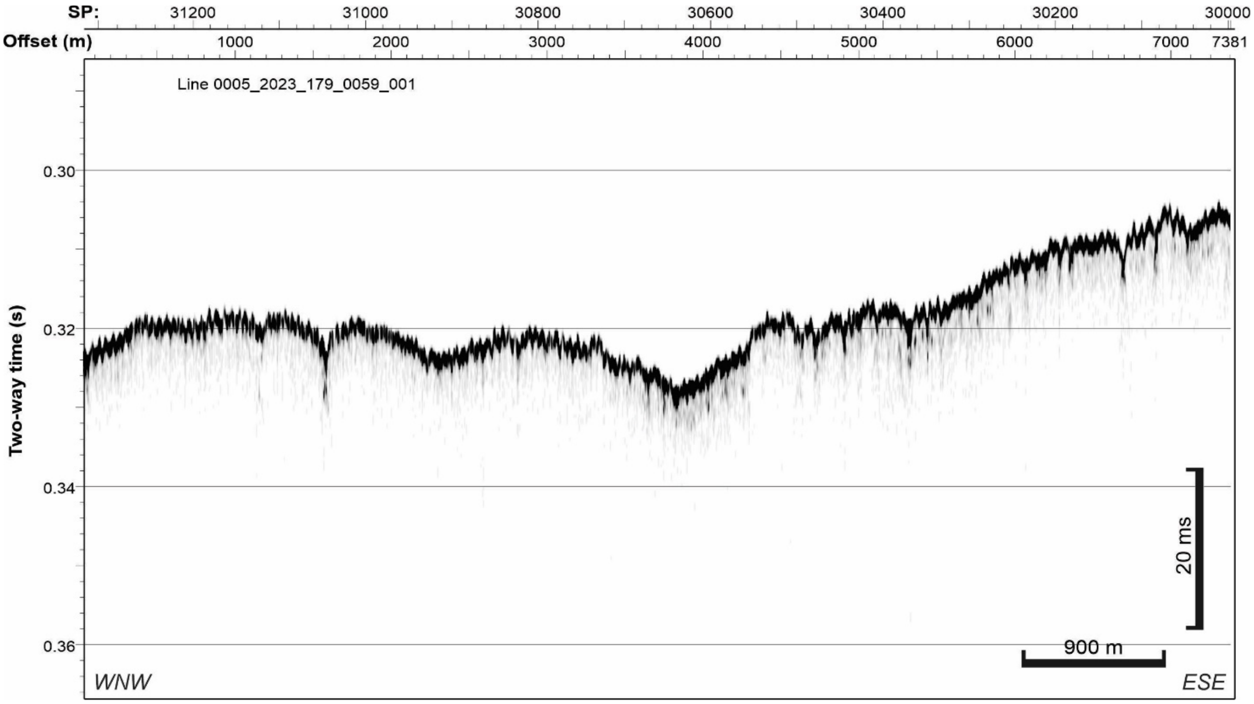


Figure D6. Line 0005_2023_179_0059_001, June 27 (JD179), Juan de Fuca Strait.

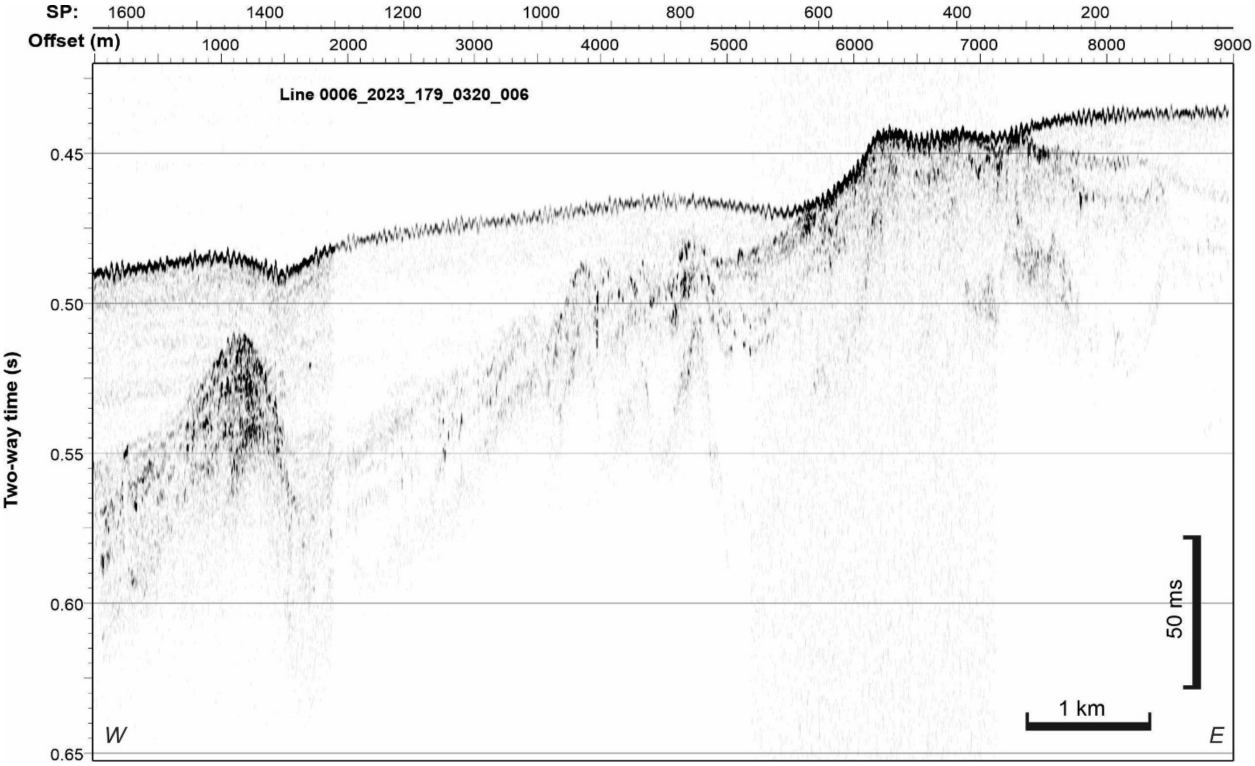


Figure D7. Line 0006_2023_179_0320_006, June 27 (JD179), Swiftsure Bank.

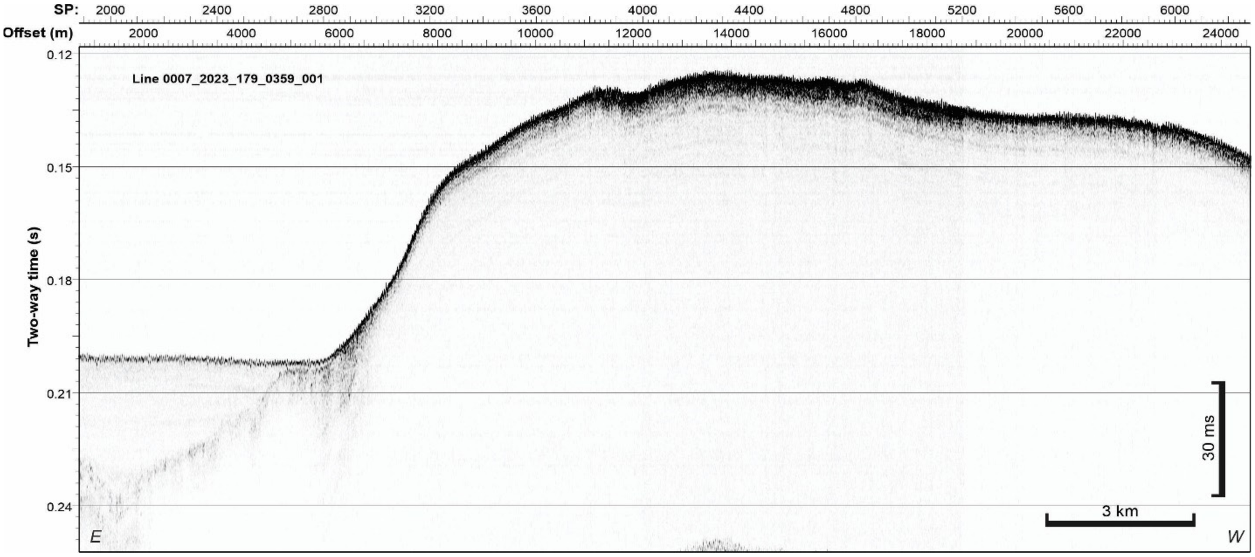


Figure D8. Line 0007_2023_179_0359_001, June 27 (JD179), Swiftsure Bank.

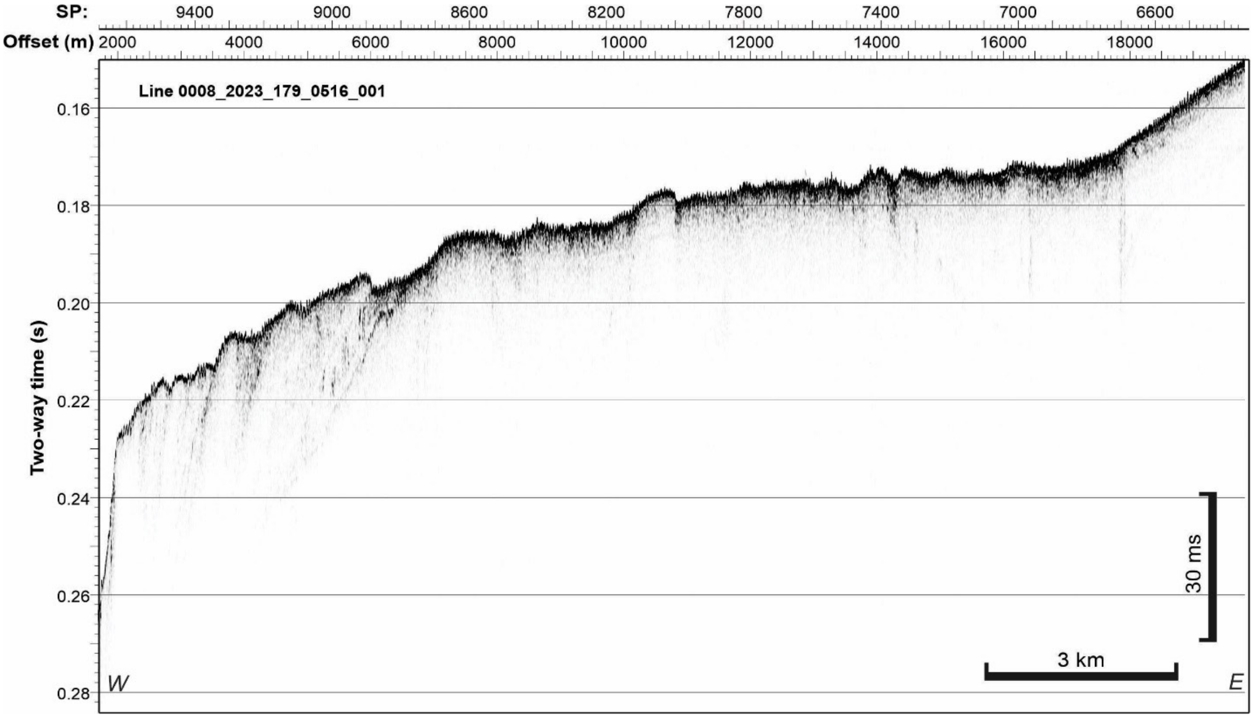


Figure D9. Line 0008_2023_179_0516_001, June 27 (JD179), Swiftsure Bank.

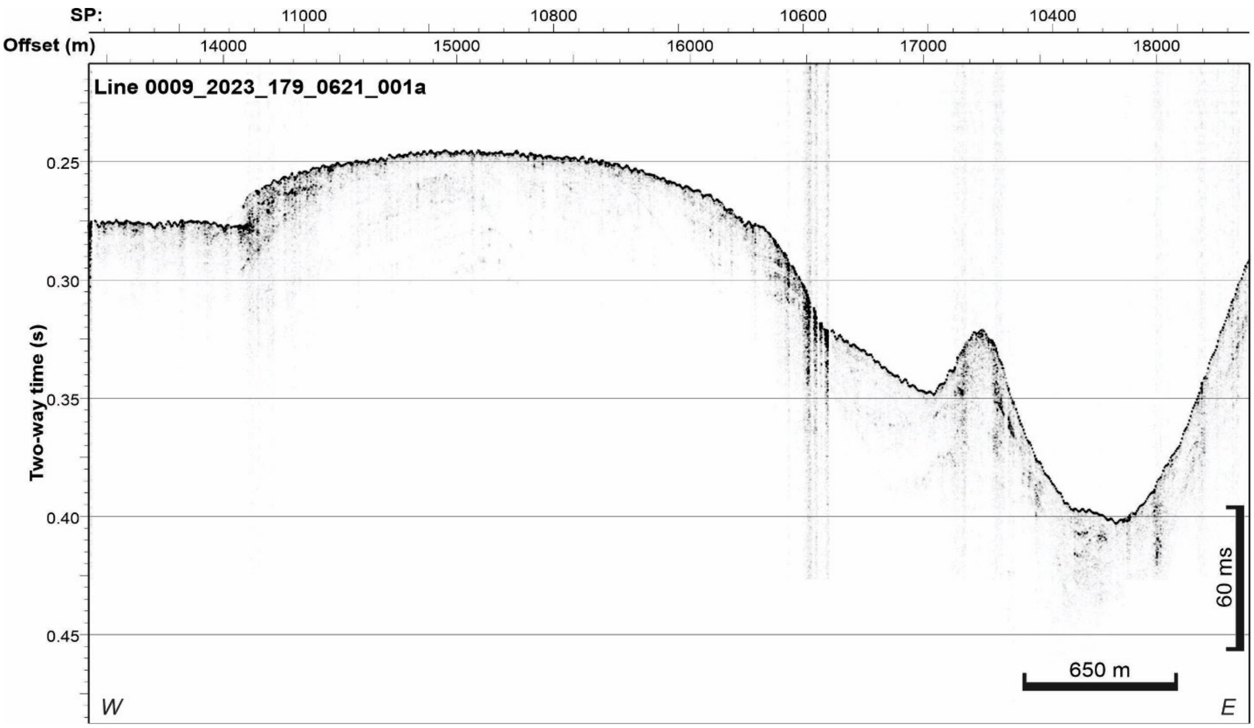


Figure D10. Line 0009_2023_179_0621_001a, June 27-28 (JD179), Barkley Canyon.

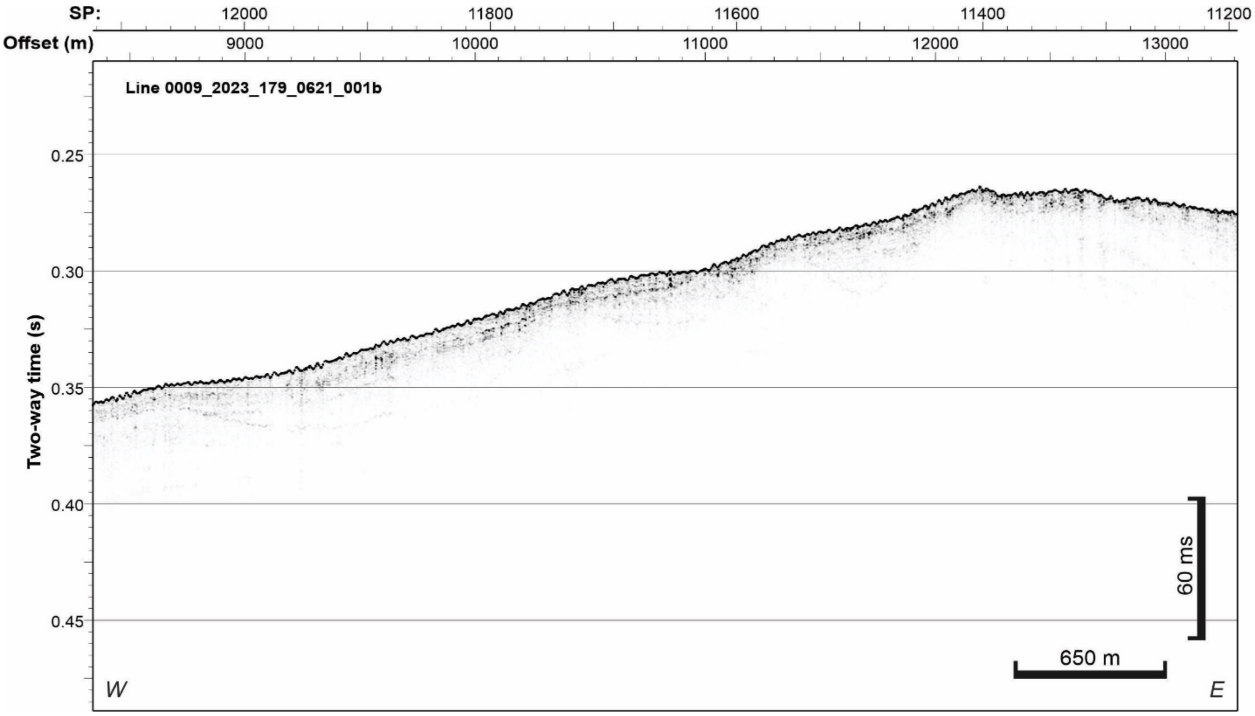


Figure D11. Line 0009_2023_179_0621_001b, June 27-28 (JD179), Barkley Canyon.

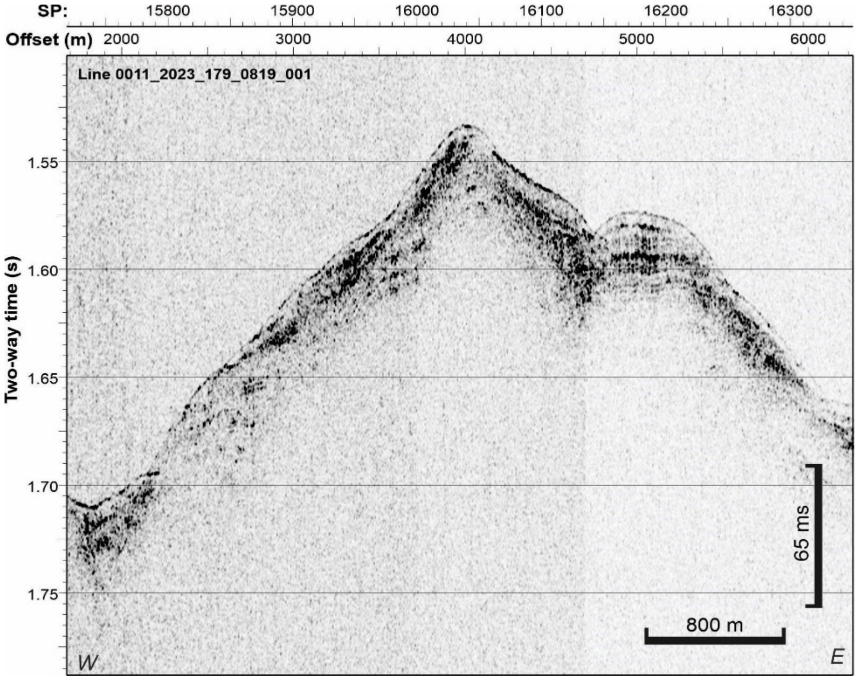


Figure D12. Line 0011_2023_179_0819_001, June 28 (JD179), Barkley Canyon.

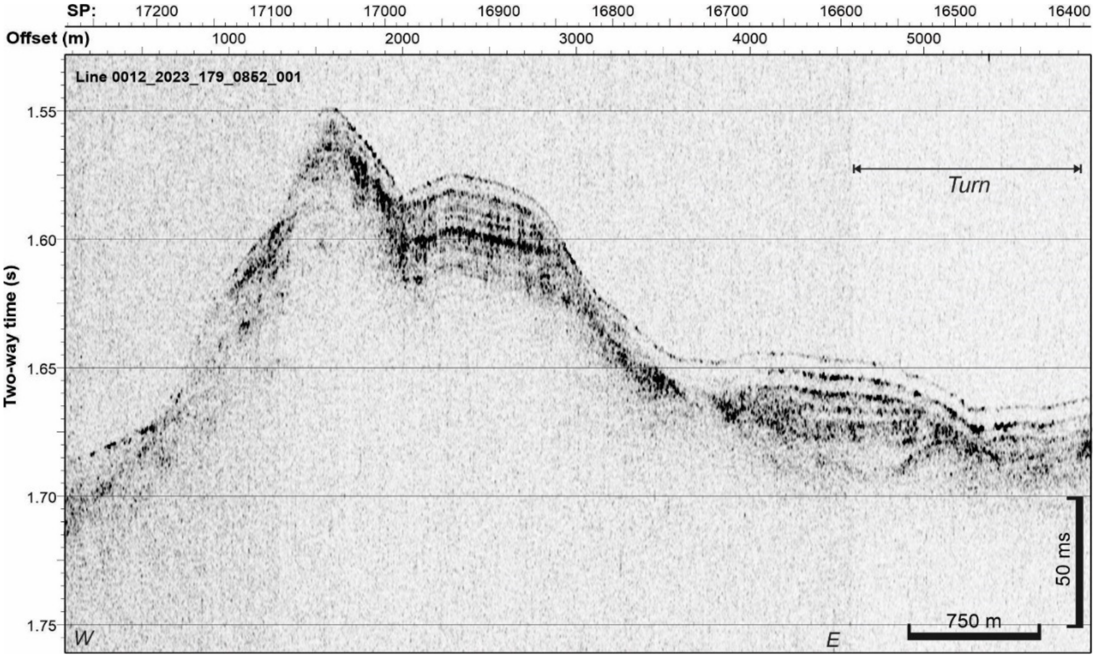


Figure D13. Line 0012_2023_179_0852_001, June 28 (JD179), Barkley Canyon.

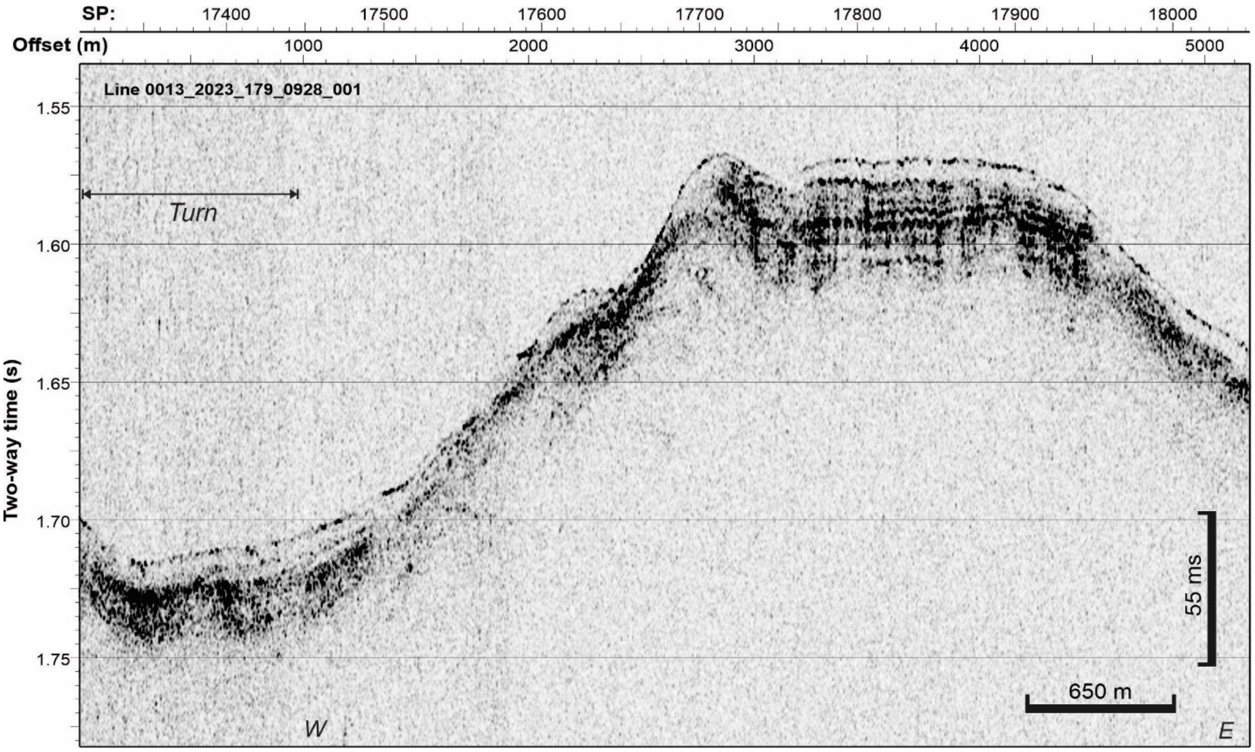


Figure D14. Line 0013_2023_179_0928_001, June 28 (JD179), Barkley Canyon.

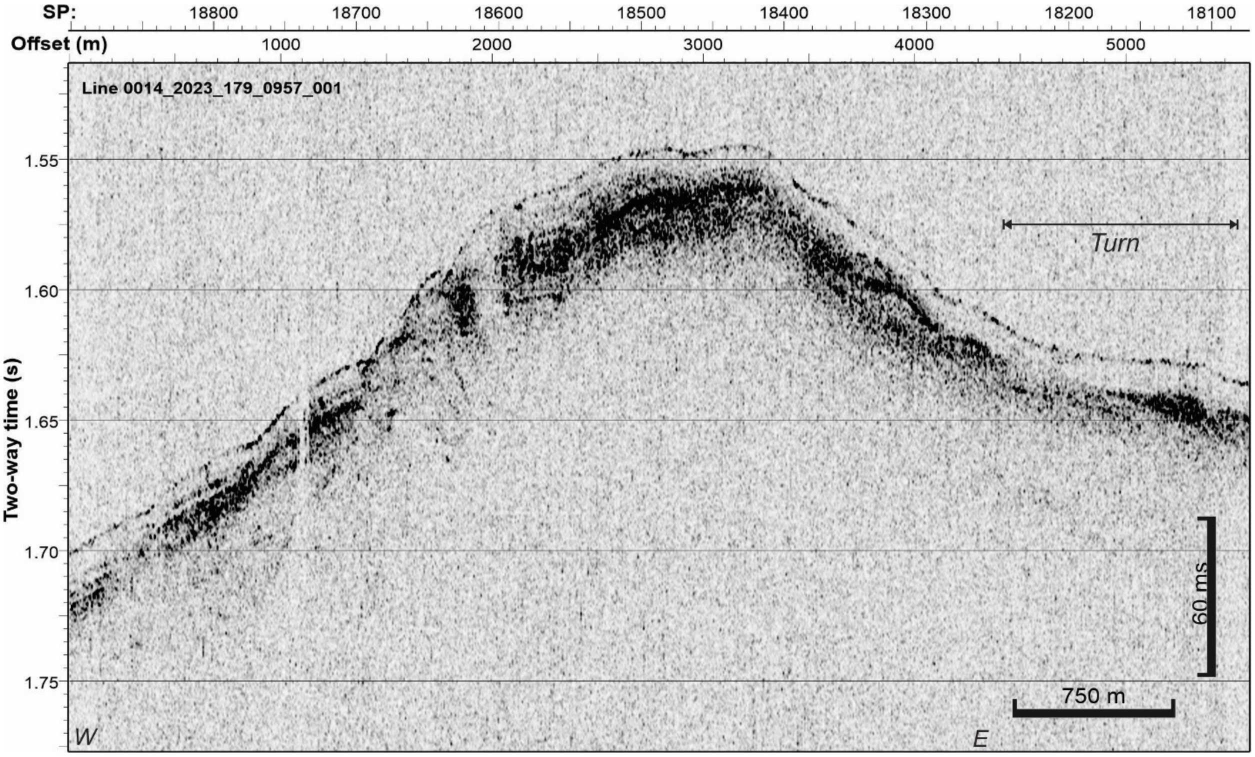


Figure D15. Line 0014_2023_179_0957_001, June 28 (JD179), Barkley Canyon.

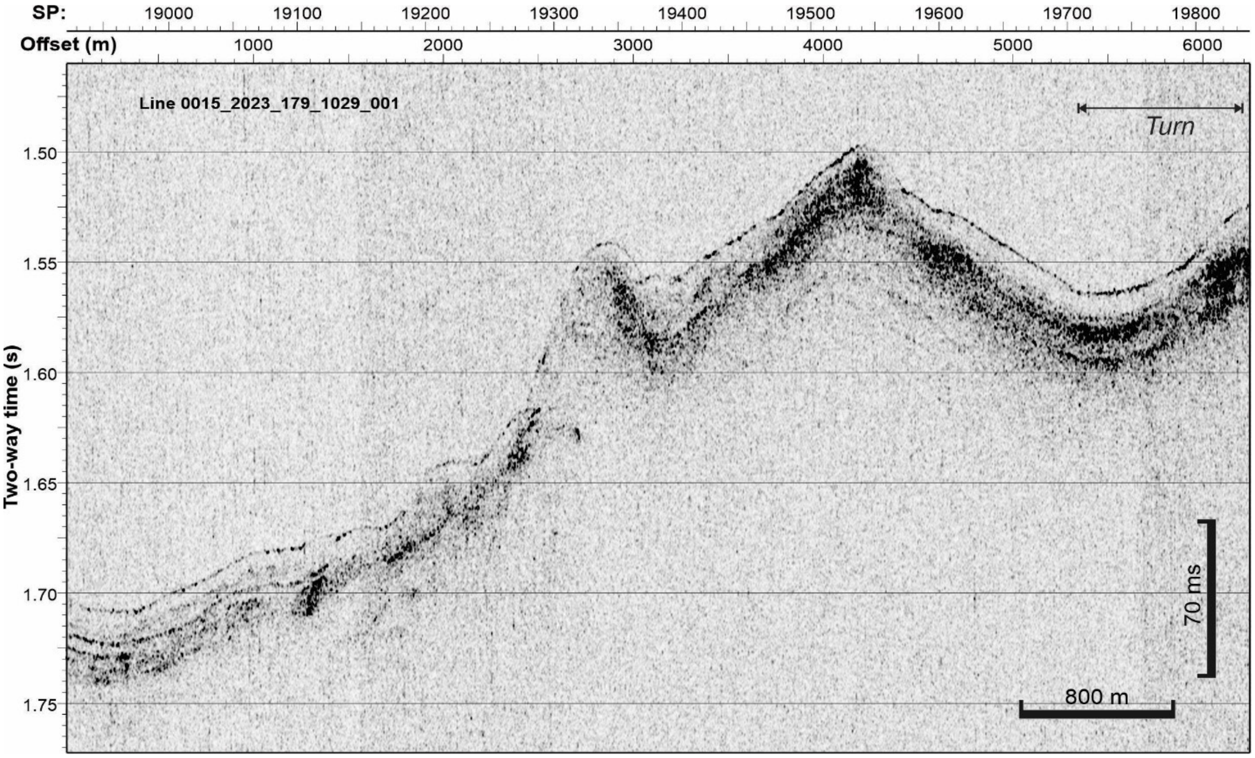


Figure D16. Line 0015_2023_179_1029_001, June 28 (JD179), Barkley Canyon.

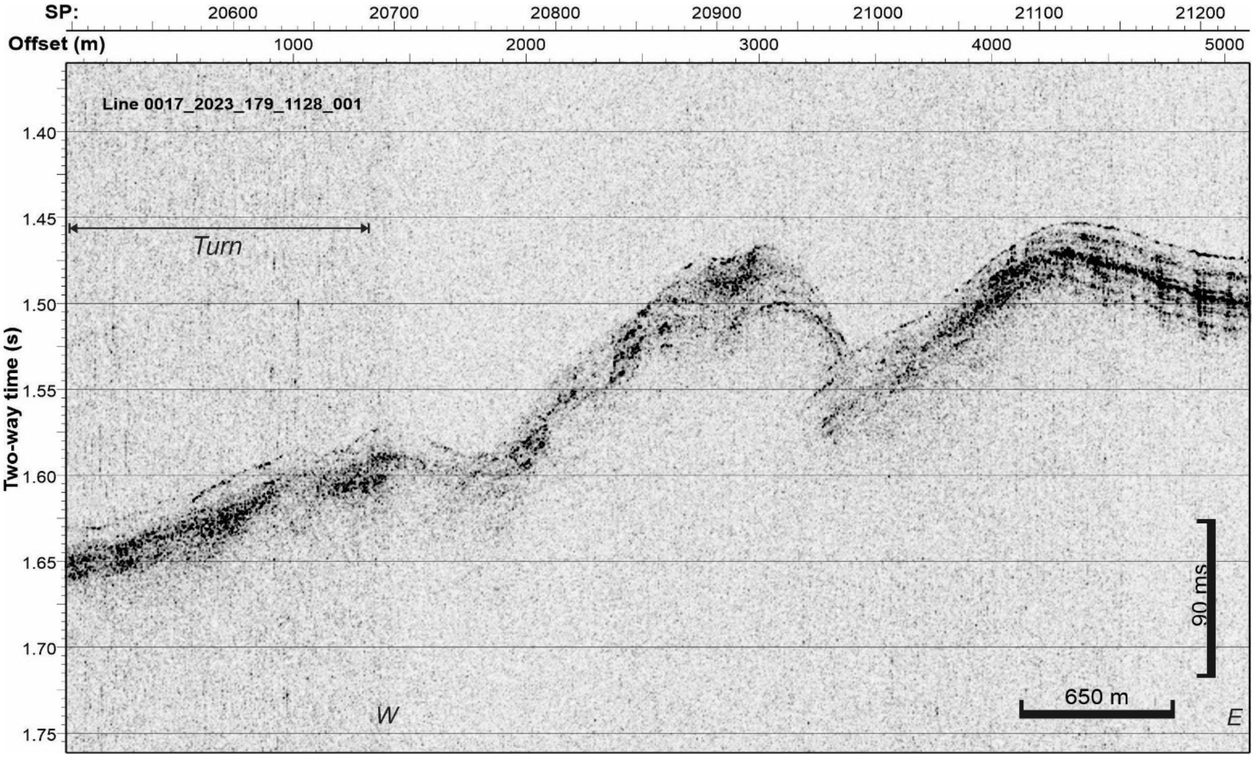


Figure D17. Line 0017_2023_179_1128_001, June 28 (JD179), Barkley Canyon.

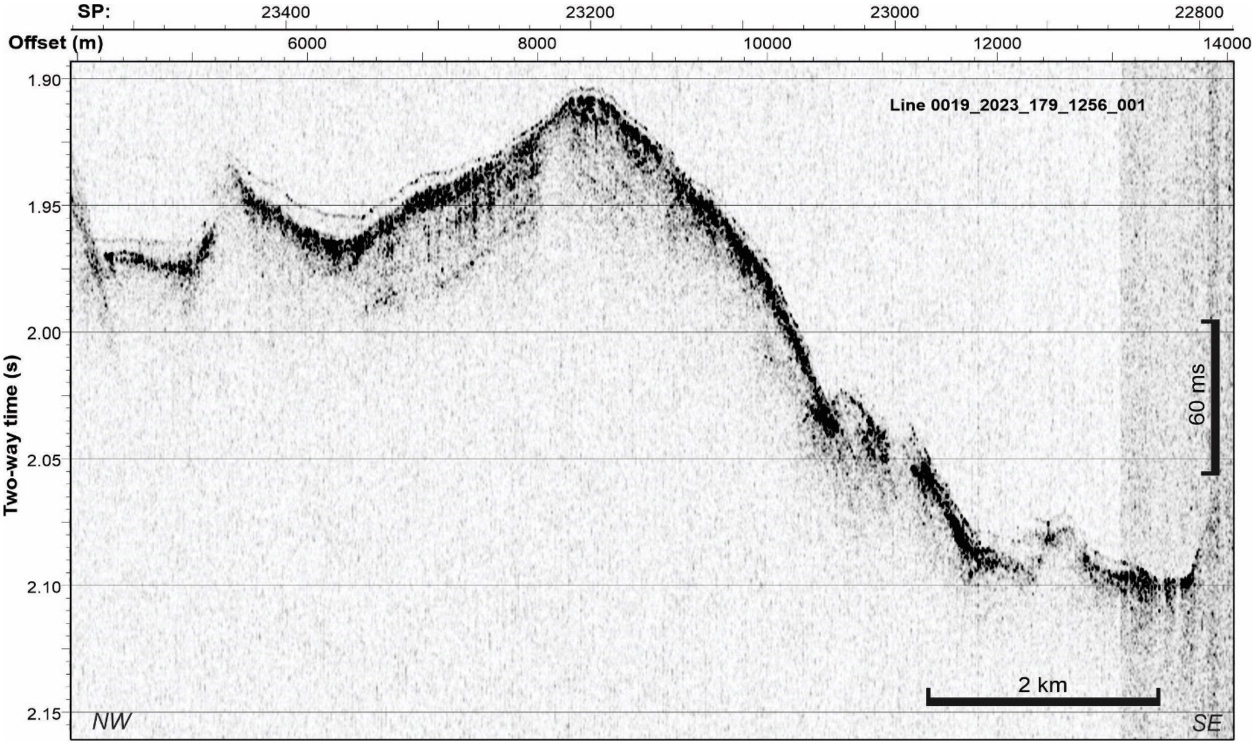


Figure D18. Line 0019_2023_179_1256_001, June 28 (JD179), Barkley Canyon/Clayoquot Slope.

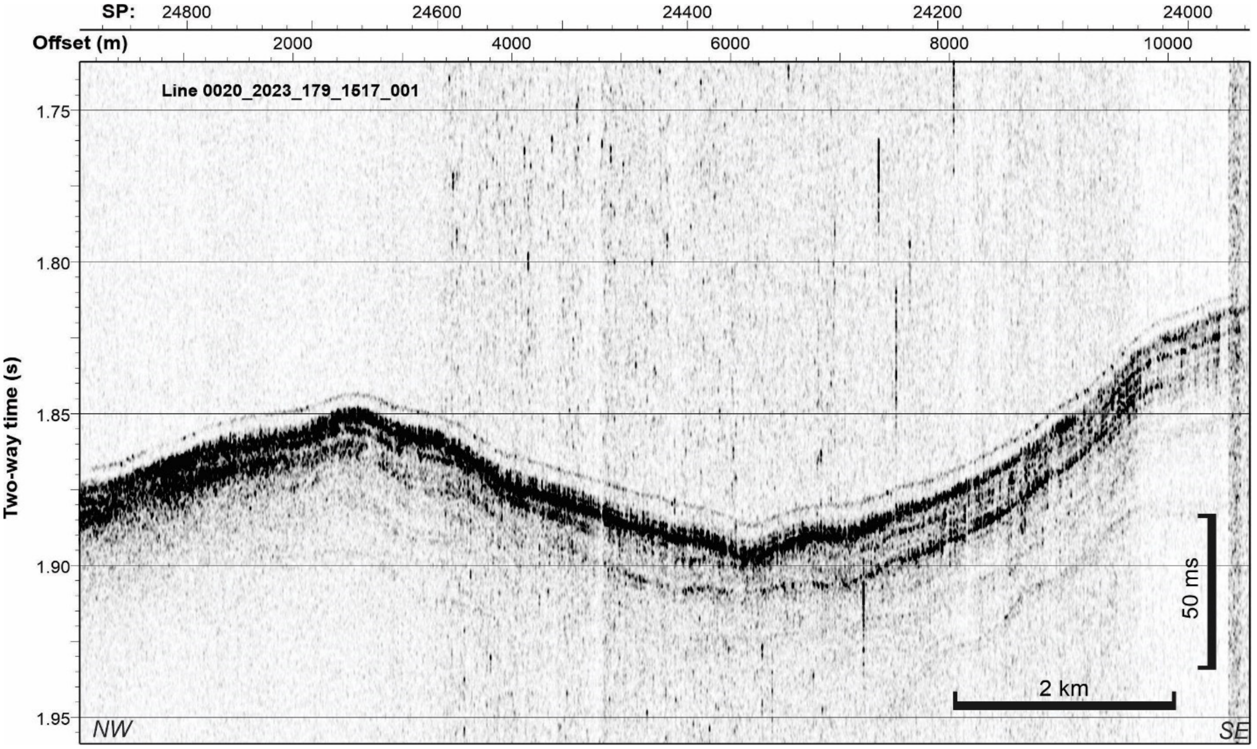


Figure D19. Line 0020_2023_179_1517_001, June 28 (JD179), Clayoquot Slope.

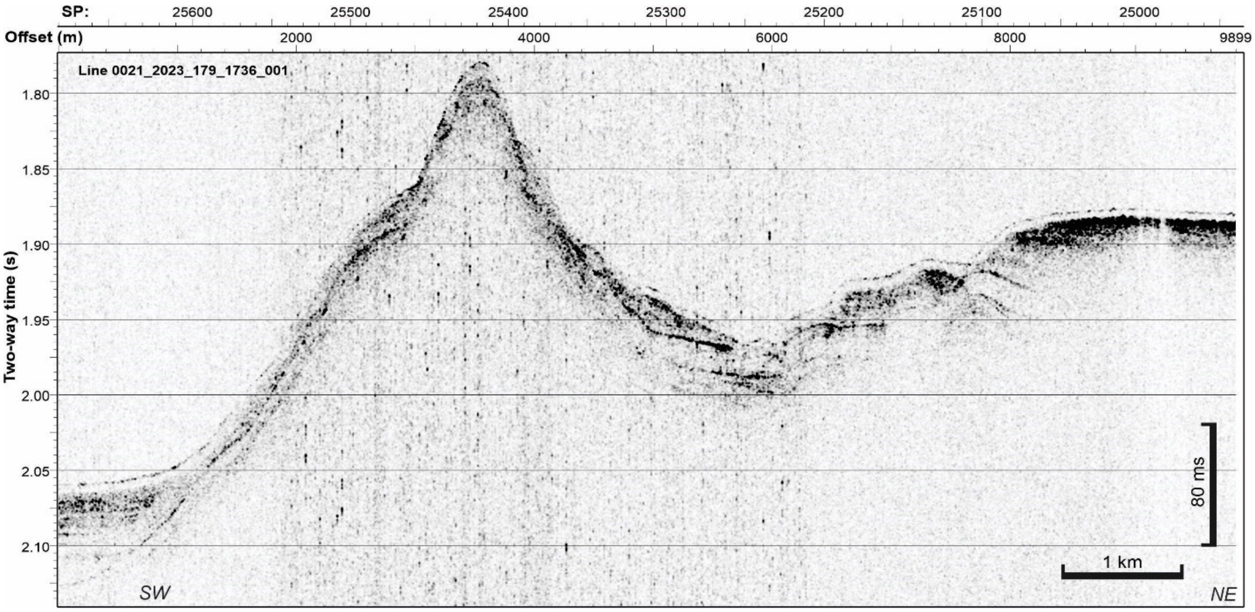


Figure D20. Line 0021_2023_179_1736_001, June 28 (JD179), Clayoquot Slope.

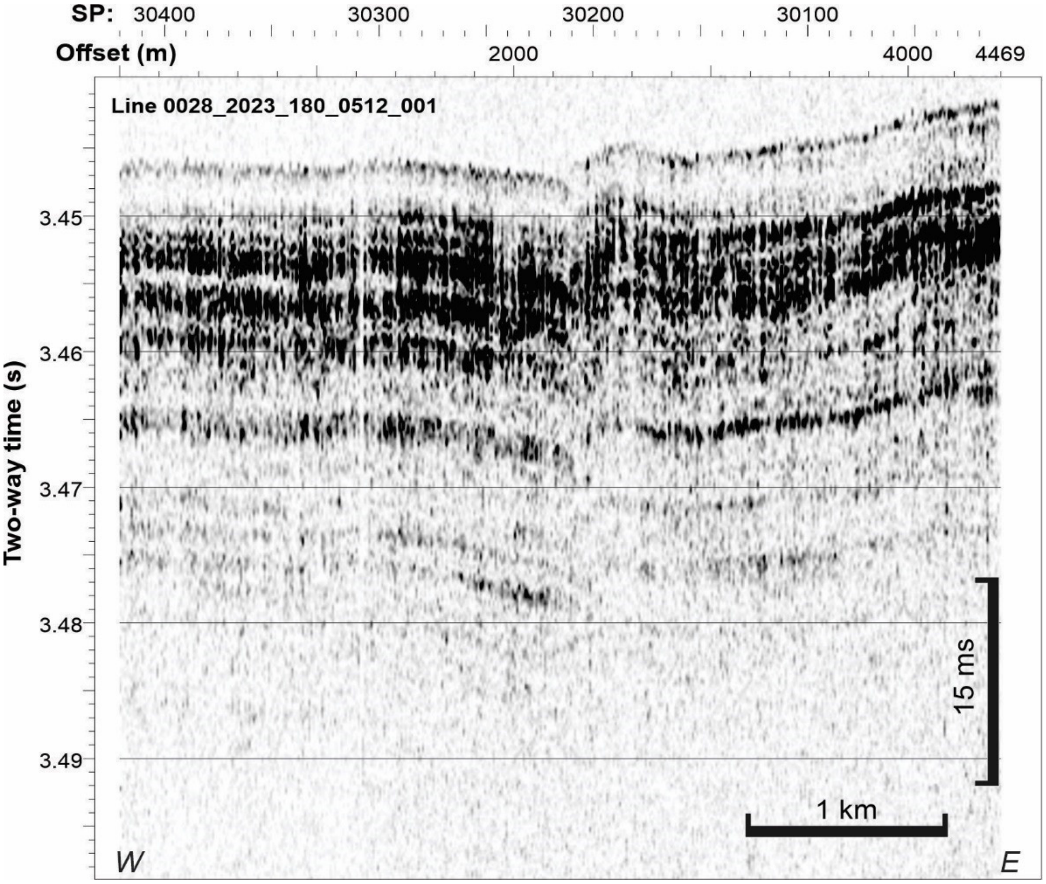


Figure D21. Line 0028_2023_180_0512_001, June 28 (JD180), Abyssal Plain.

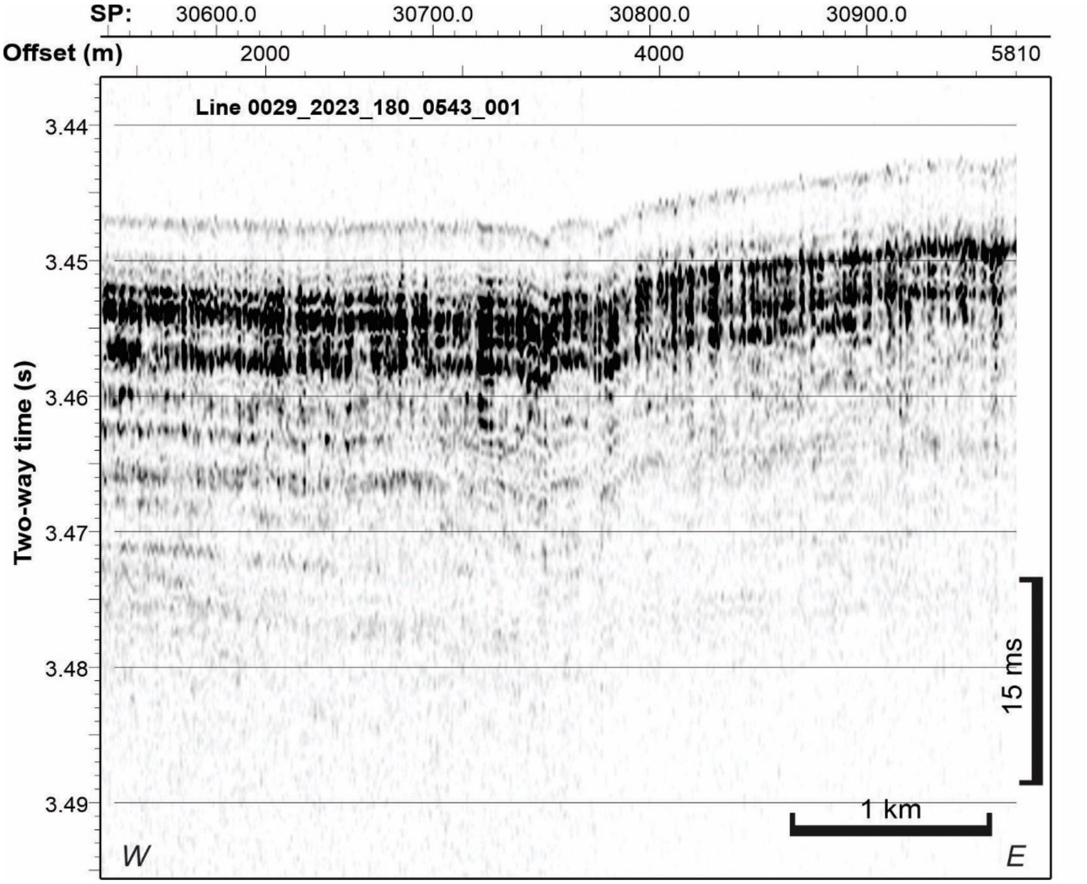


Figure D22. Line 0029_2023_180_0543_001, June 28 (JD180), Abyssal Plain.

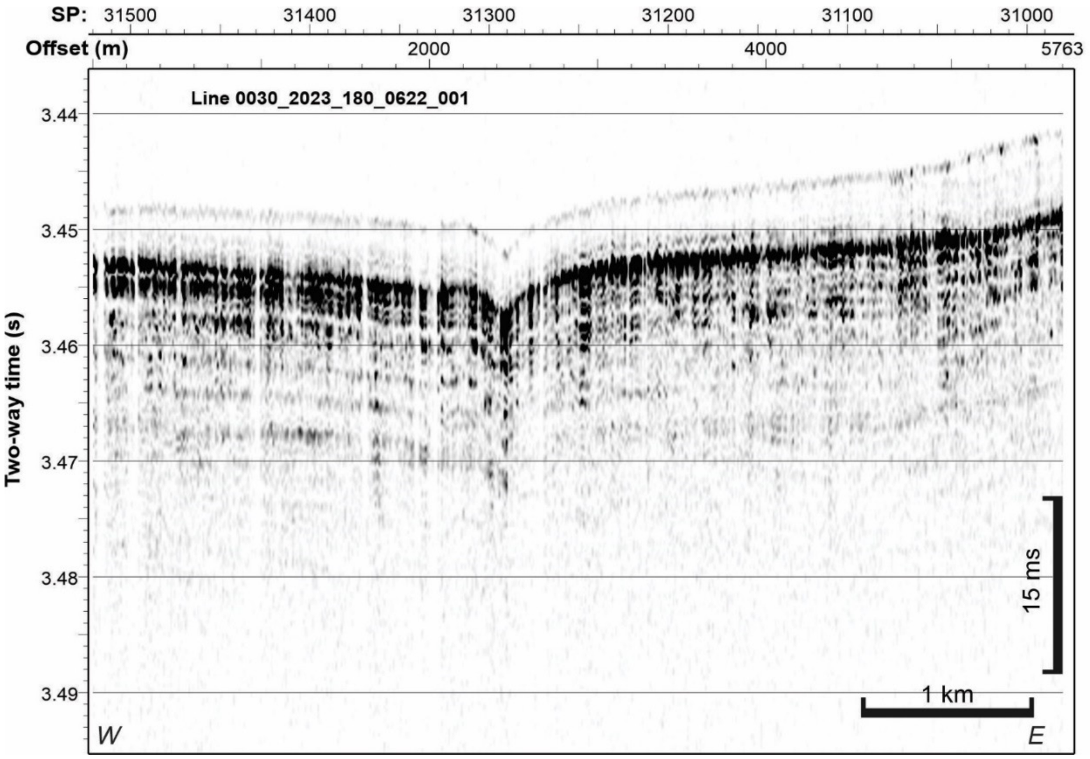


Figure D23. Line 0030_2023_180_0622_001, June 28-29 (JD180), Abyssal Plain.

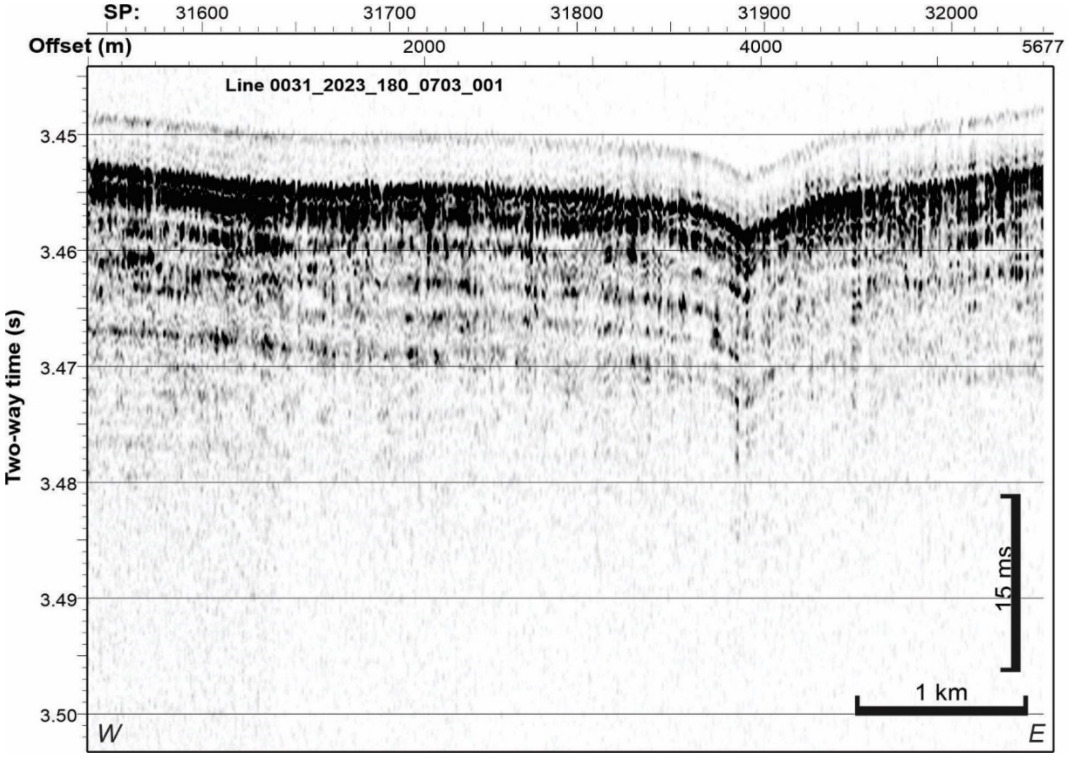


Figure D24. Line 0031_2023_180_0703_001, June 29 (JD180), Abyssal Plain.

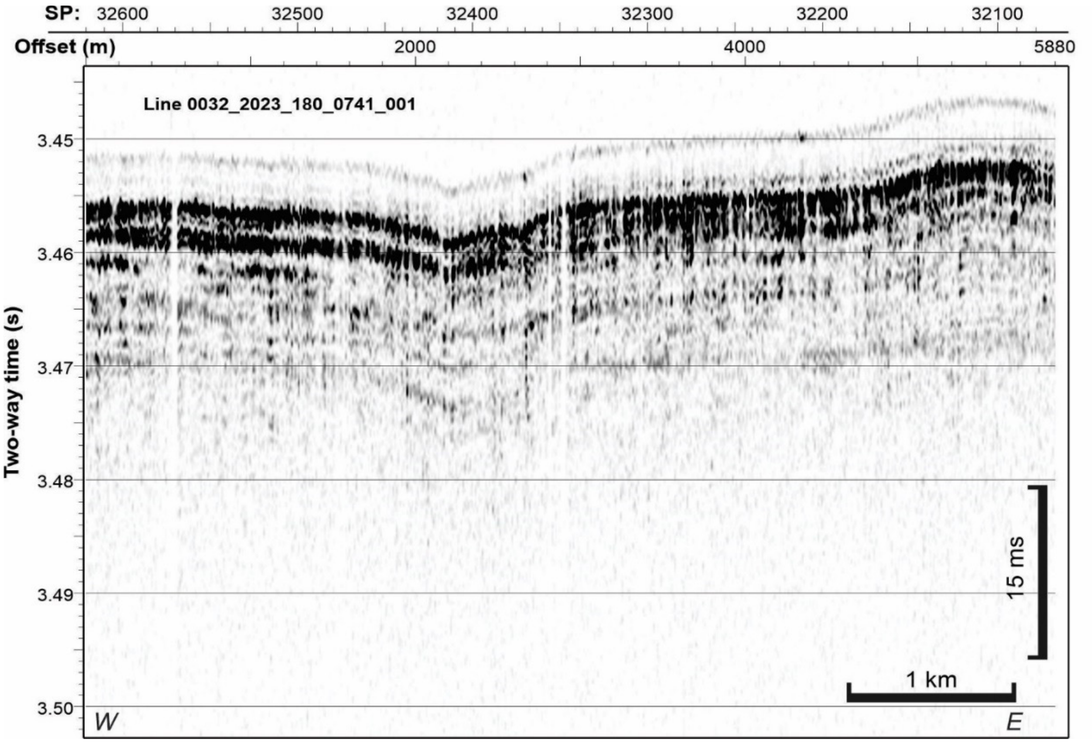


Figure D25. Line 0032_2023_180_0741_001. June 29 (JD180), Abyssal Plain.

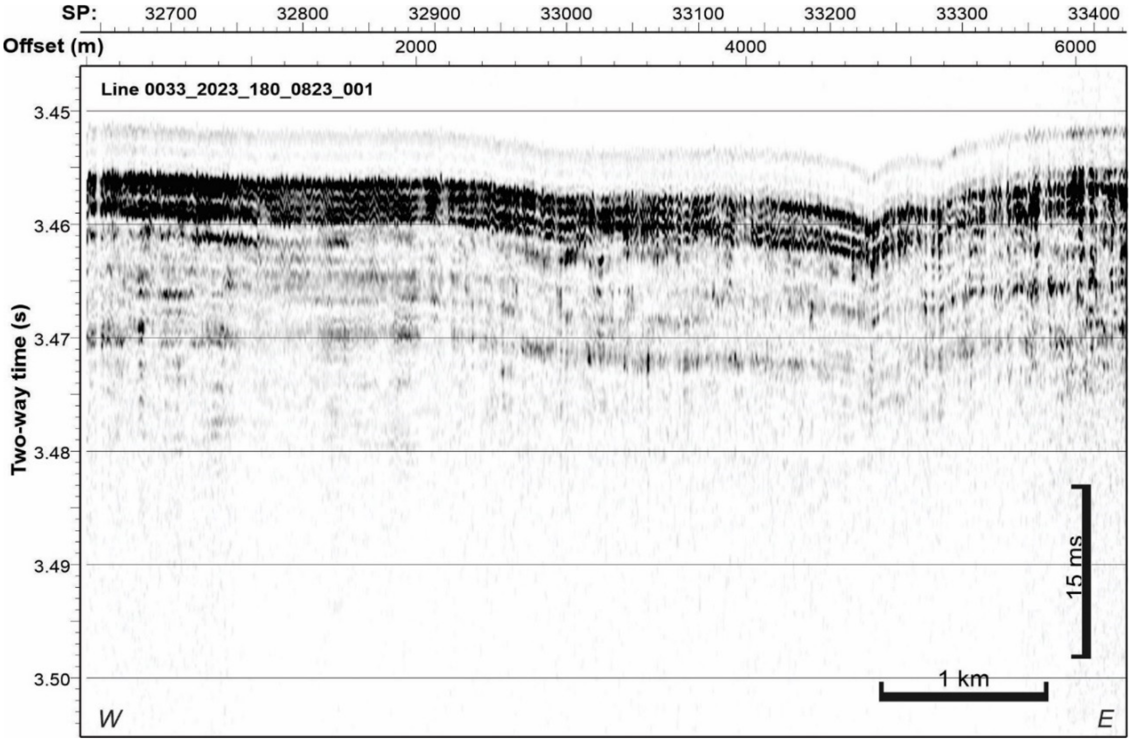


Figure D26. Line 0033_2023_180_0823_001, June 29 (JD180), Abyssal Plain.

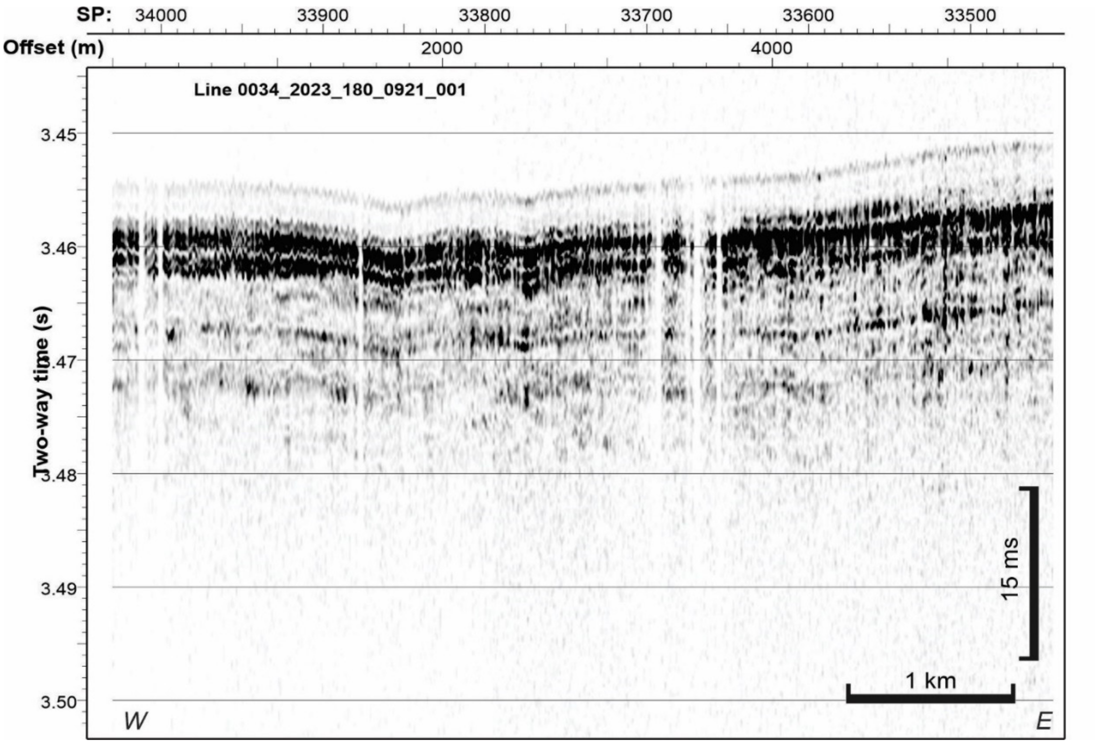


Figure D27. Line 0034_2023_180_0921_001, June 29 (JD180), Abyssal Plain.

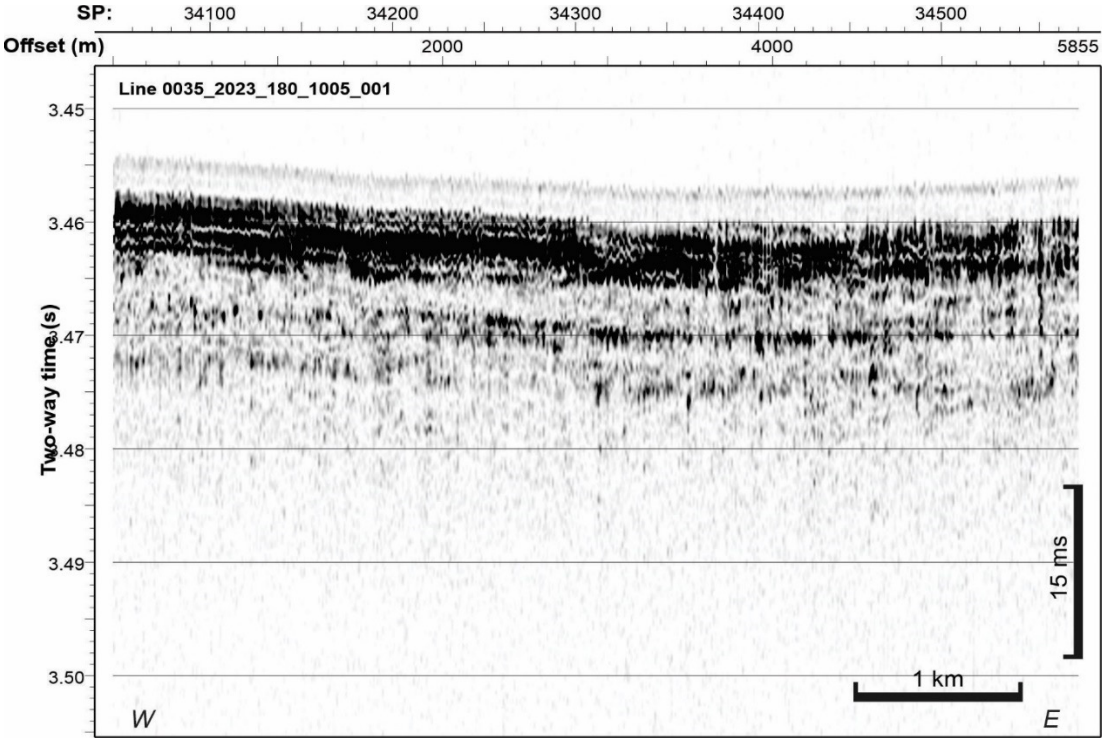


Figure D28. Line 0035_2023_180_1005_001, June 29 (JD180), Abyssal Plain.

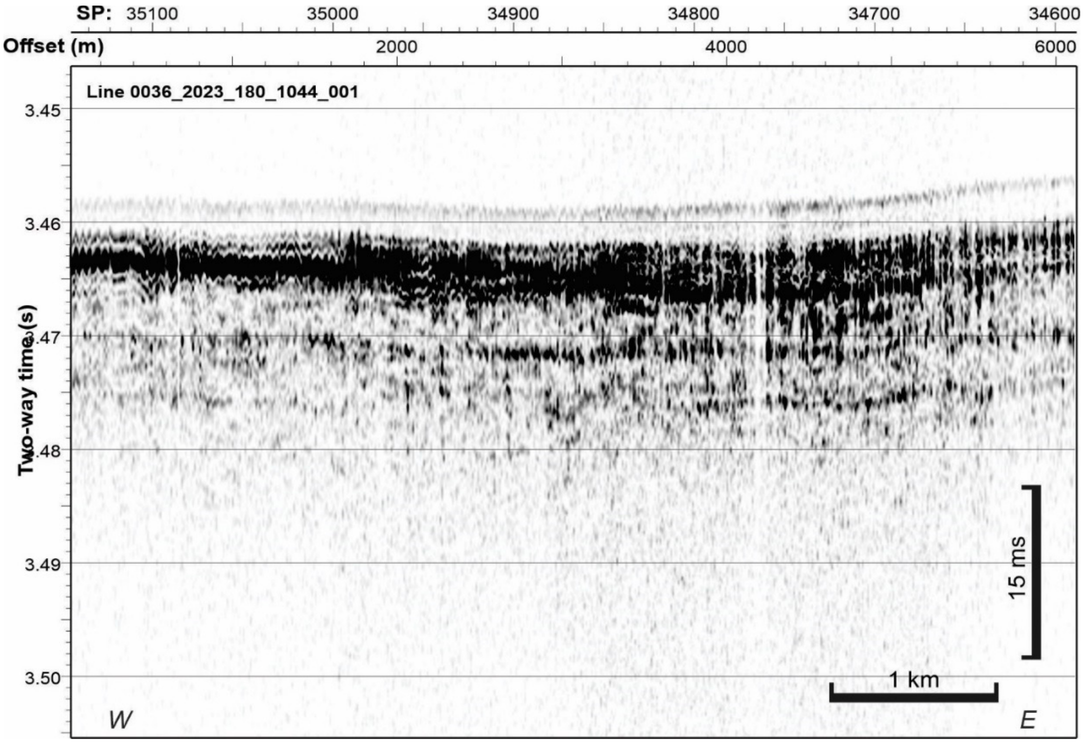


Figure D29. Line 0036_2023_180_1044_001, June 29 (JD180), Abyssal Plain.

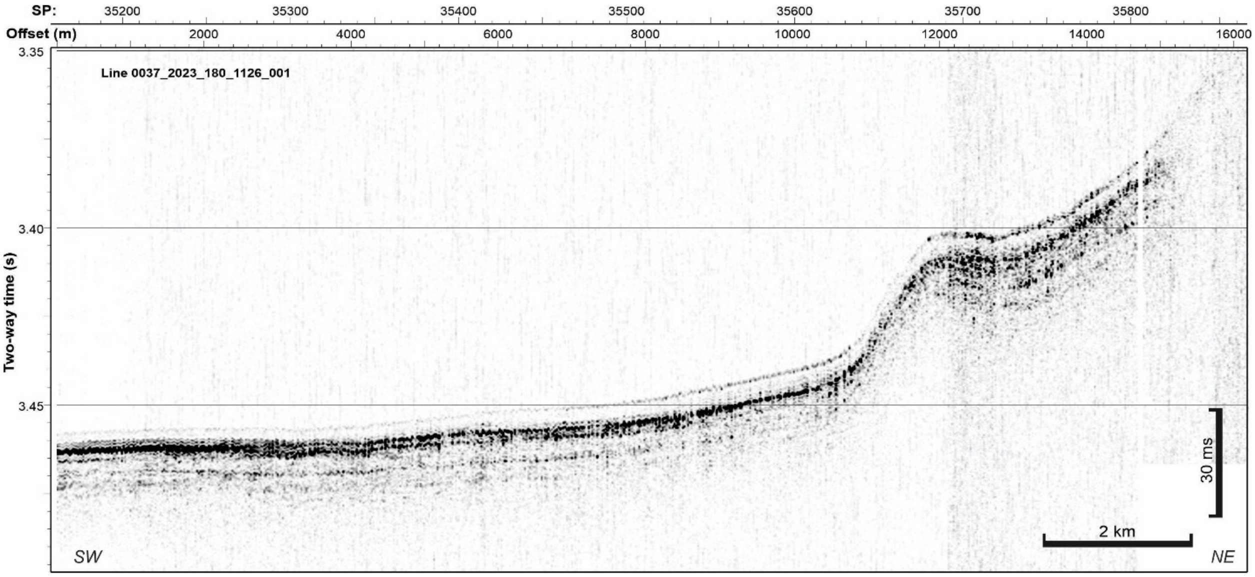


Figure D30. Line 0037_2023_180_1126_001, June 29 (JD180), Abyssal Plain.

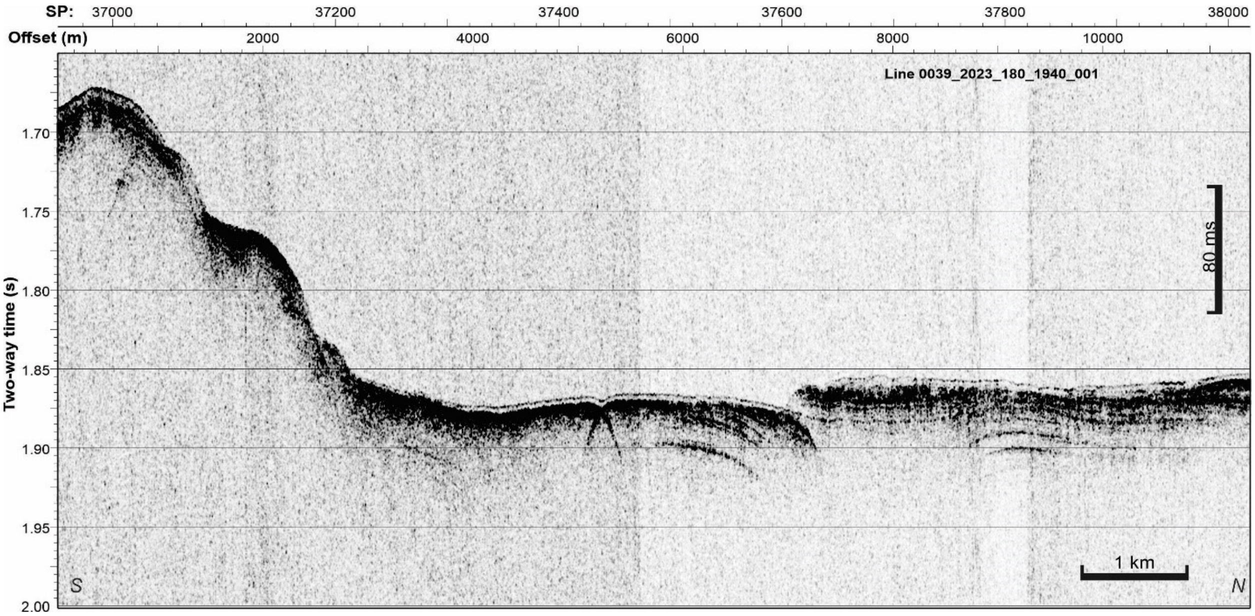


Figure D31. Line 0039_2023_180_1940_001, June 29 (JD 180), Clayoquot Slope.

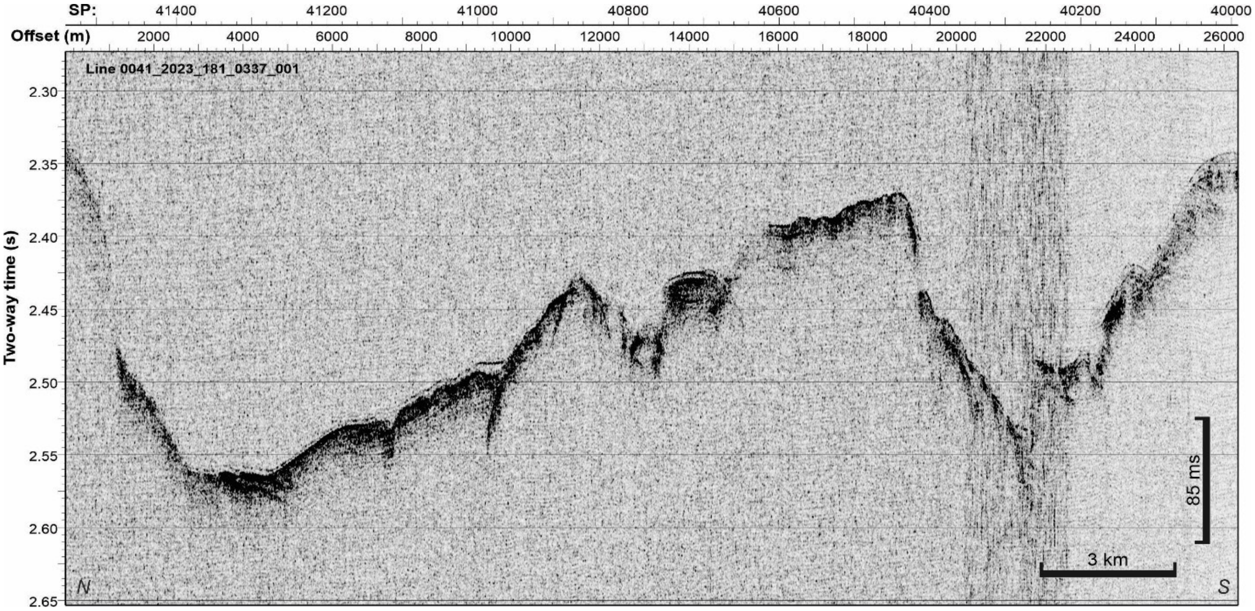


Figure D32. Line 0041_2023_181_0337_001, June 29 (JD181), Hesquiat Slope.

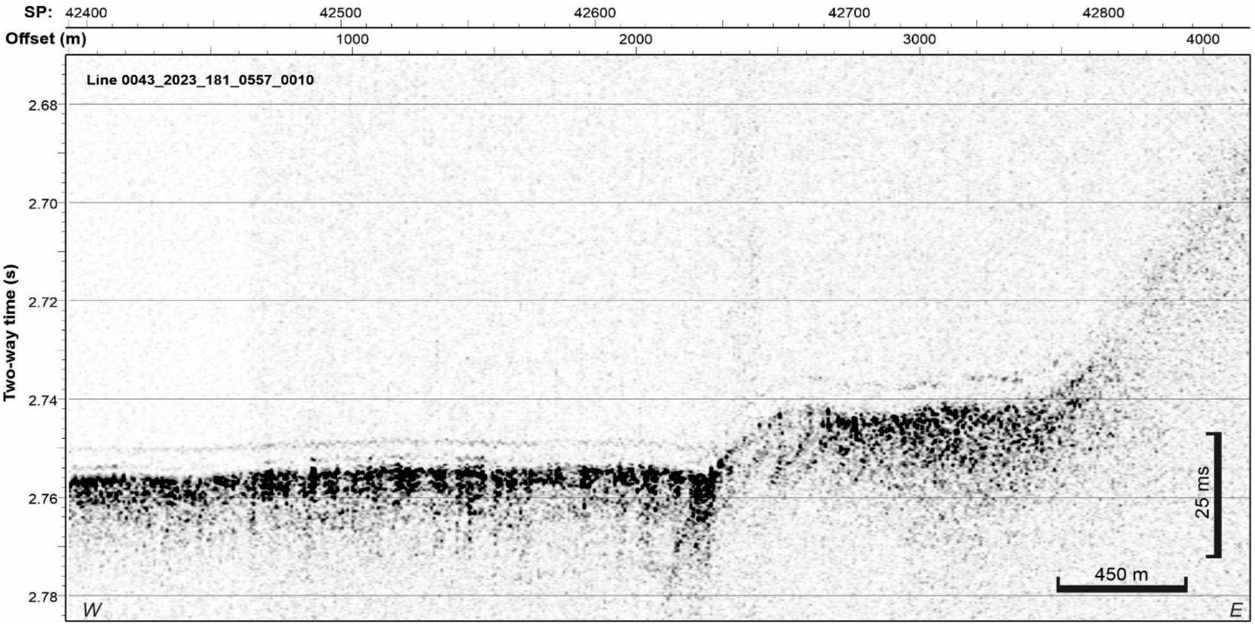


Figure D33. Line 0043_2023_181_0557_001, June 29 (JD181), Hesquiat Slope.

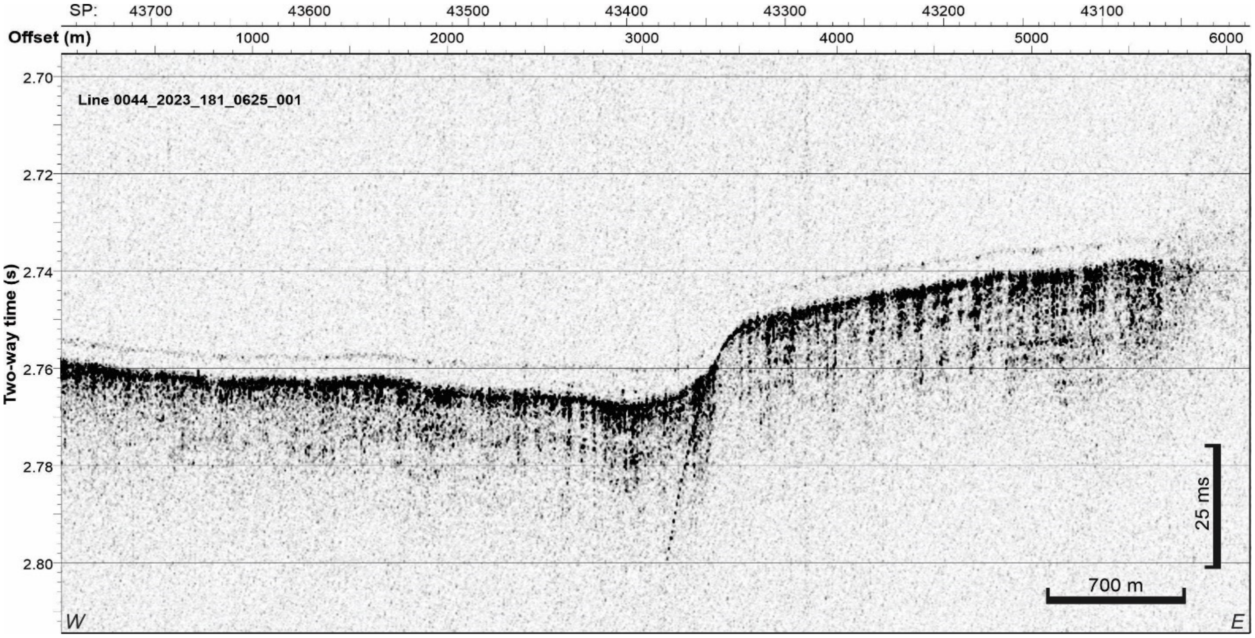


Figure D34. Line 0044_2023_181_0625_001, June 29-30 (JD181), Hesquiat Slope.

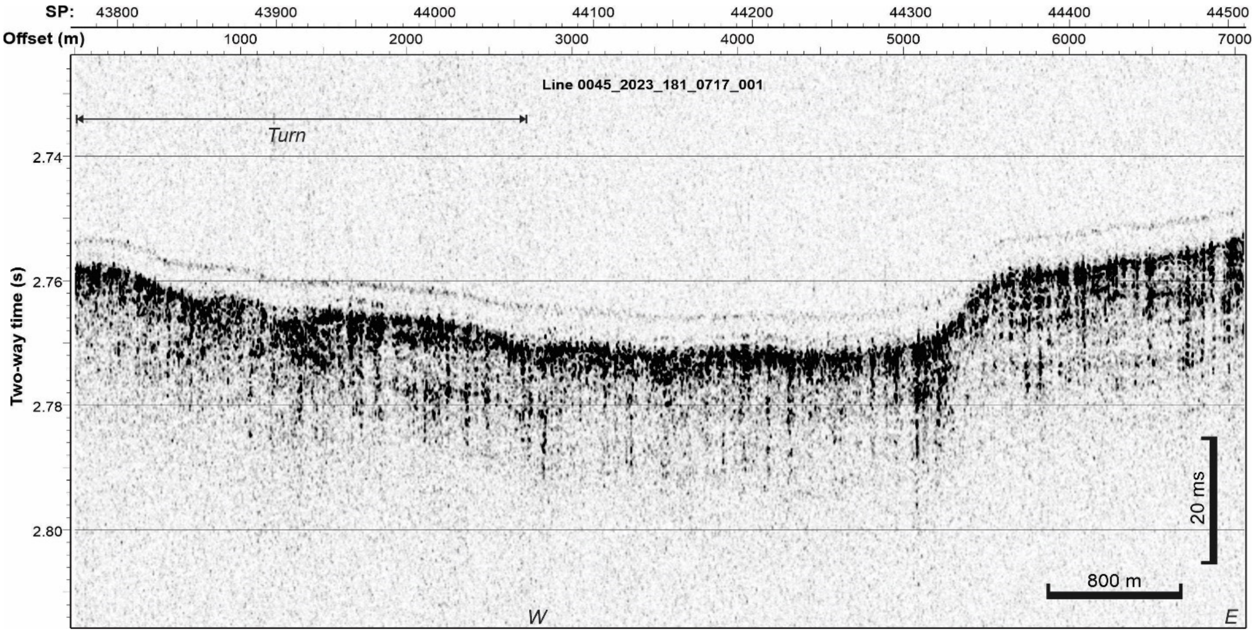


Figure D35. Line 0045_2023_181_0717_001, June 30 (JD181), Hesquiat Slope.

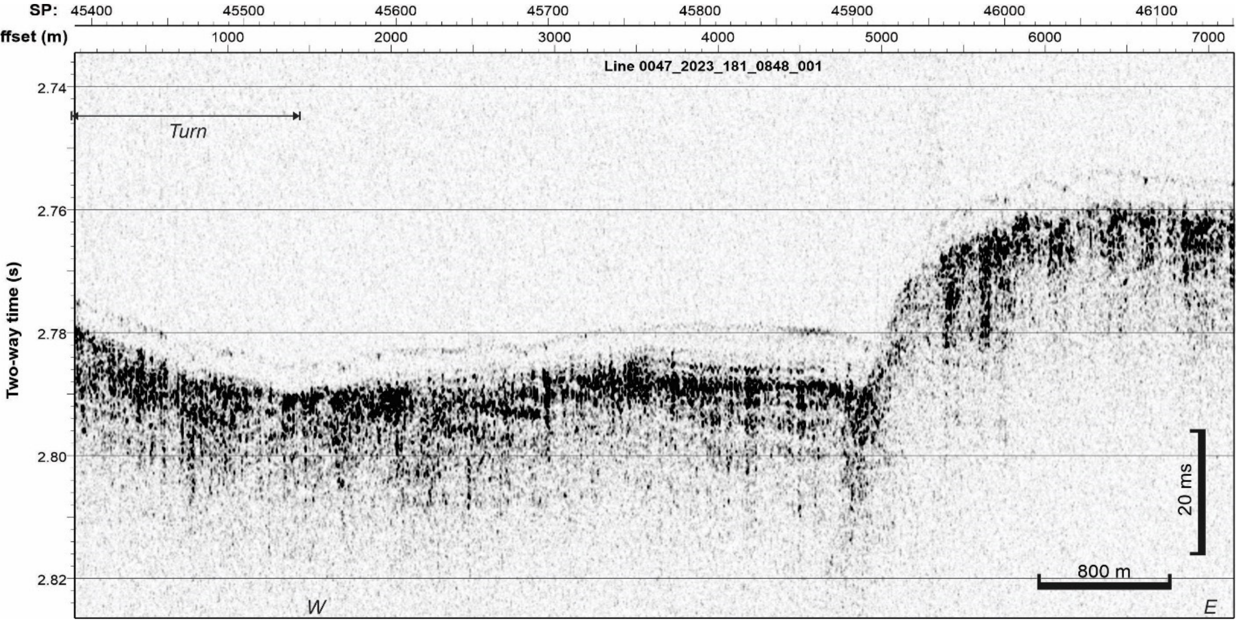


Figure D36. Line 0047_2023_181_0848_001, June 30 (JD181), Hesquiat Slope.

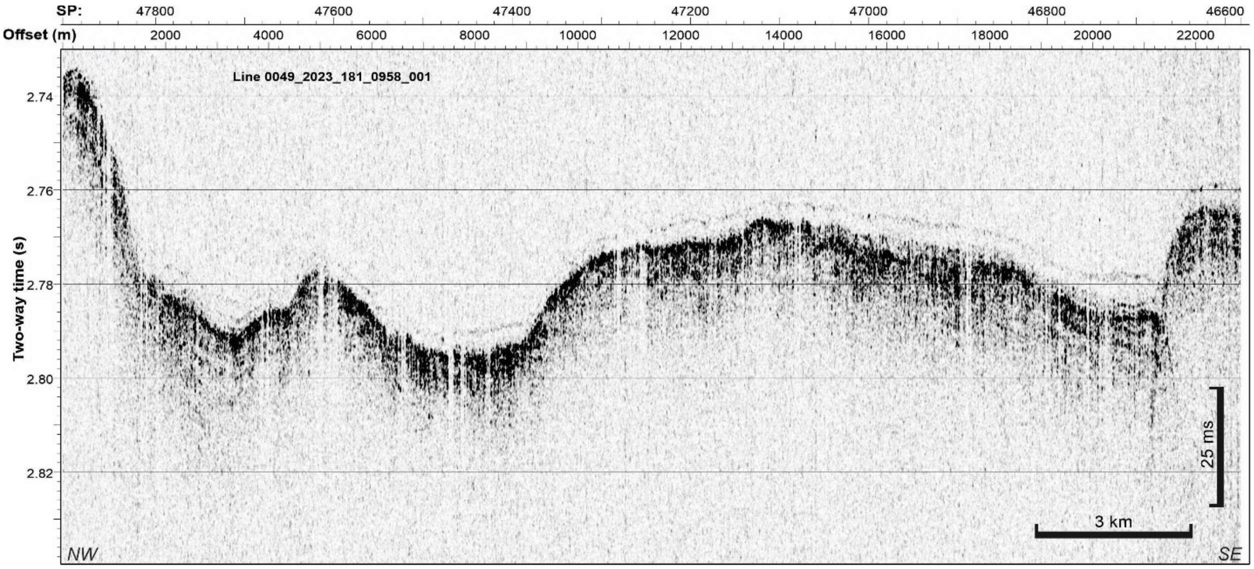


Figure D37. Line 0049_2023_181_0958_001, June 30 (JD181), Hesquiat Slope.

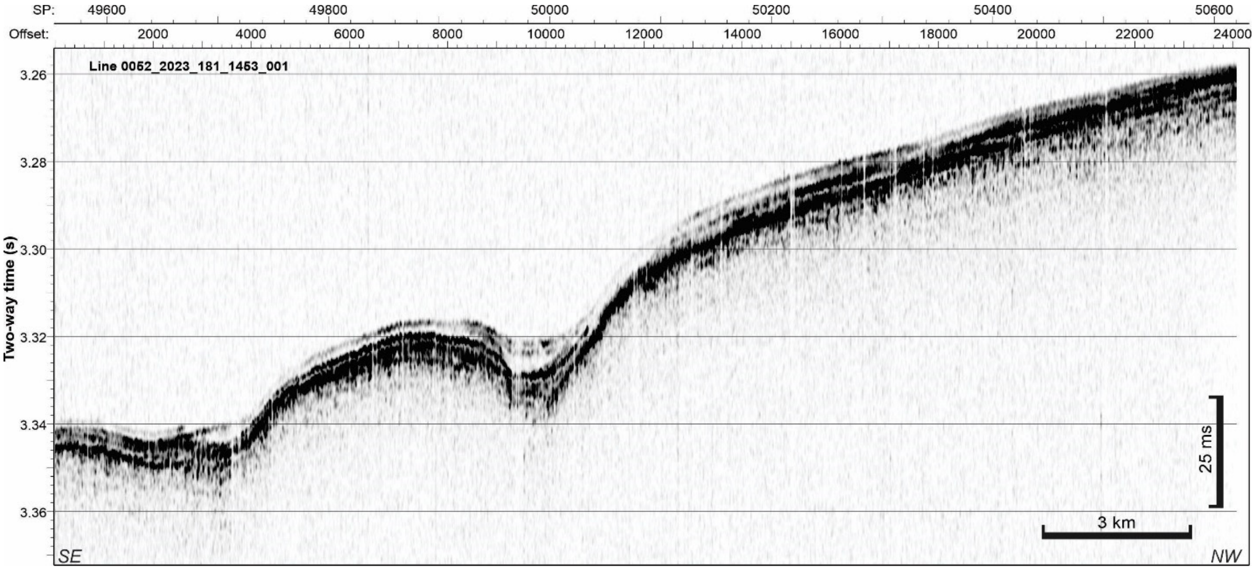


Figure D38. Line 0052_2023_181_1463_001, June 30 (JD181), Nootka Fault/Explorer Plate.

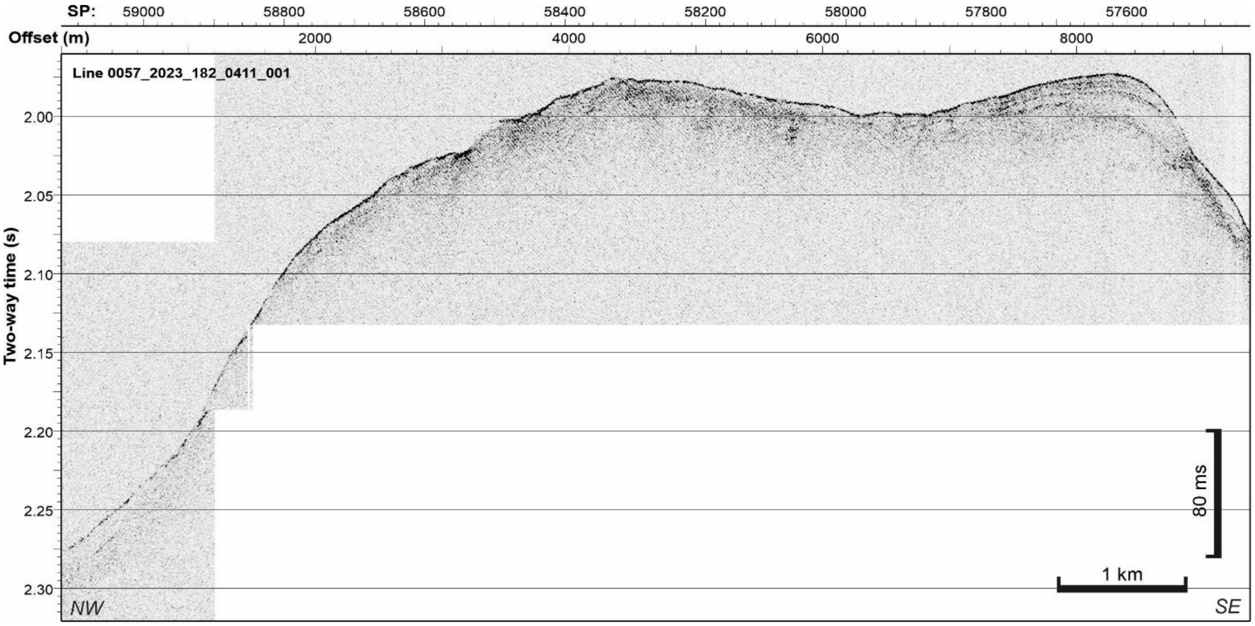


Figure D39. Line 0057_2023_182_0411_001, June 30 (JD182), Winona Basin.

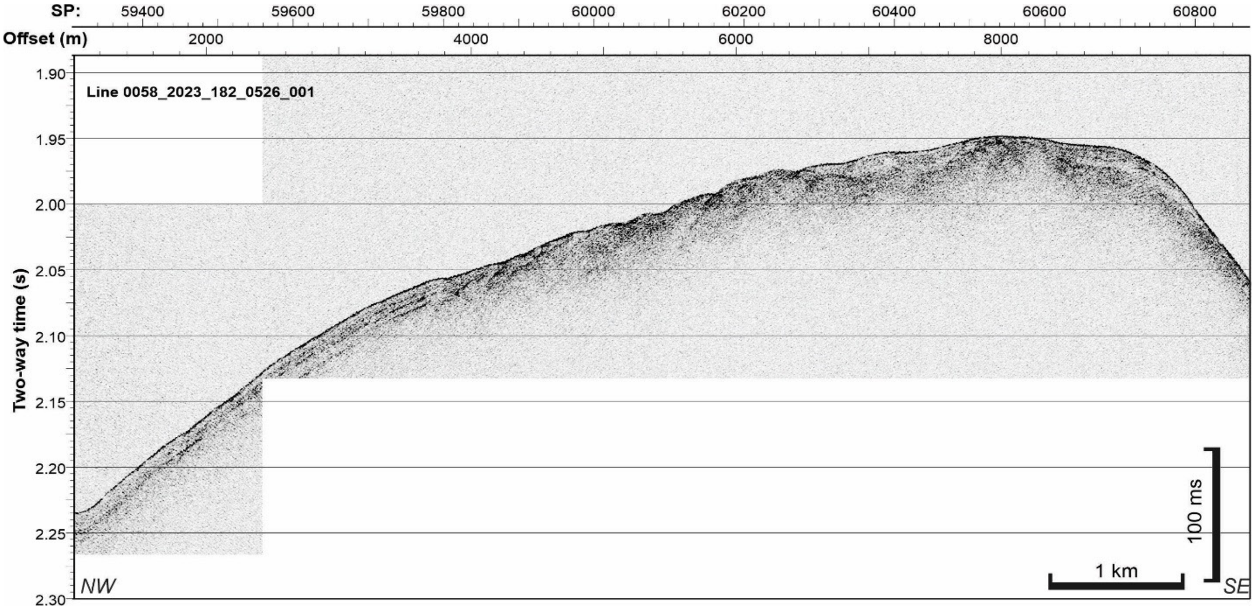


Figure D40. Line 0058_2023_182_0526_001, June 30 (JD182), Winona Basin.

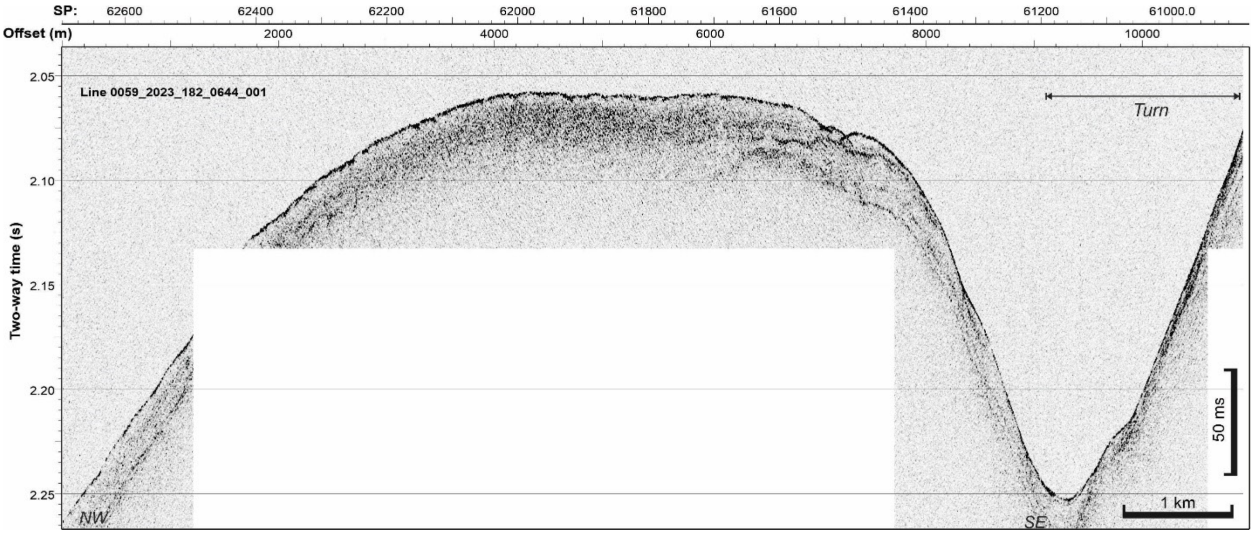


Figure D41. Line 0059_2023_182_0644_001, June 30- July1 (JD182), Winona Basin.

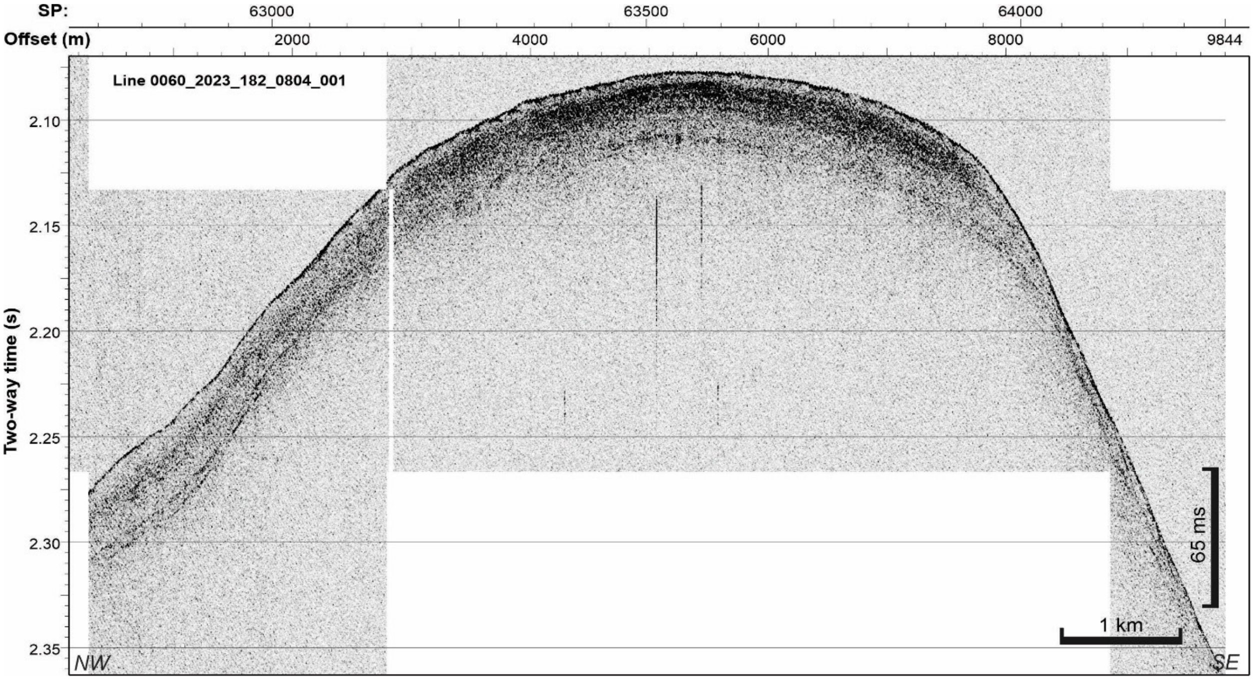


Figure D42. Line 0060_2023_182_0804_001, July 1 (JD182), Winona Basin.

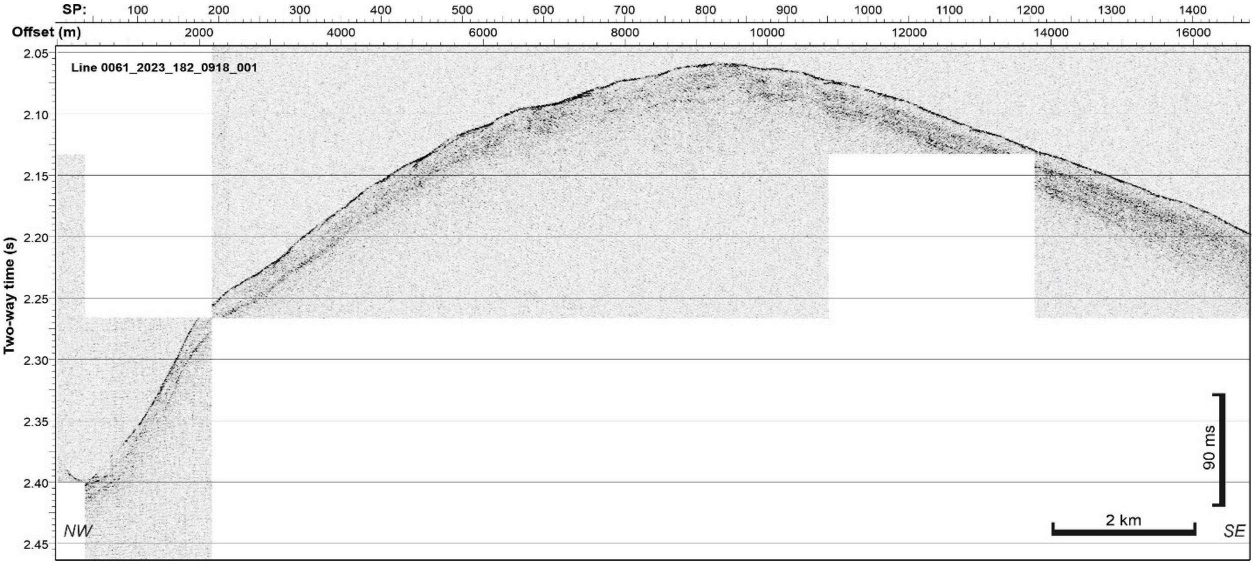


Figure D43. Line 0061_2023_182_0918_001, July 1 (JD182), Winona Basin.

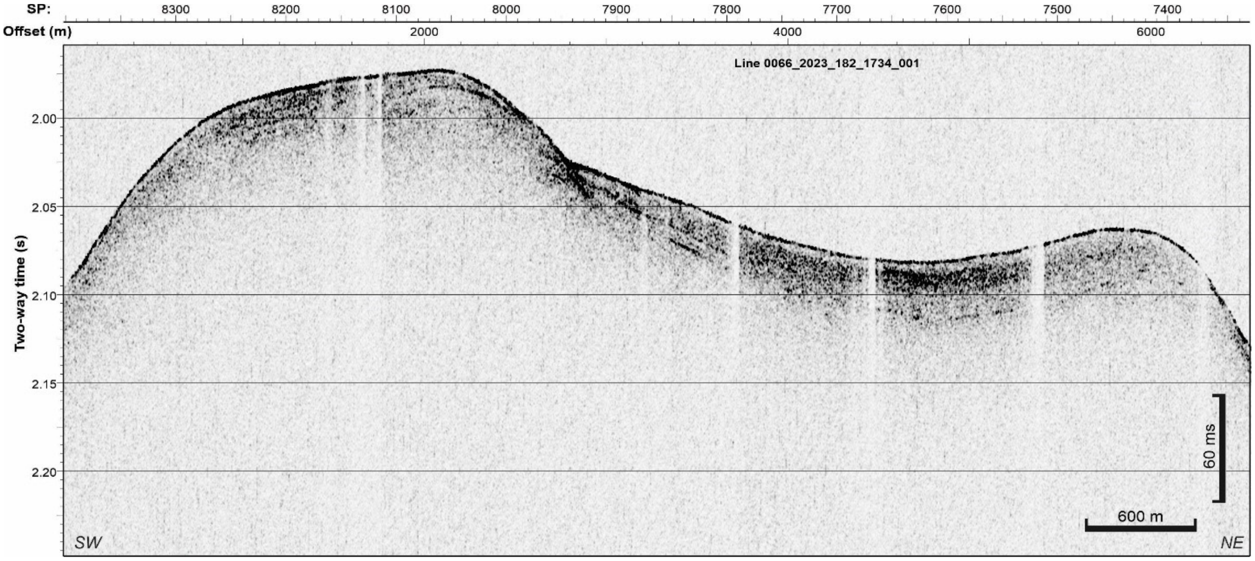


Figure D44. Line 0066_2023_182_1734_001, July 1 (JD182), Winona Basin.

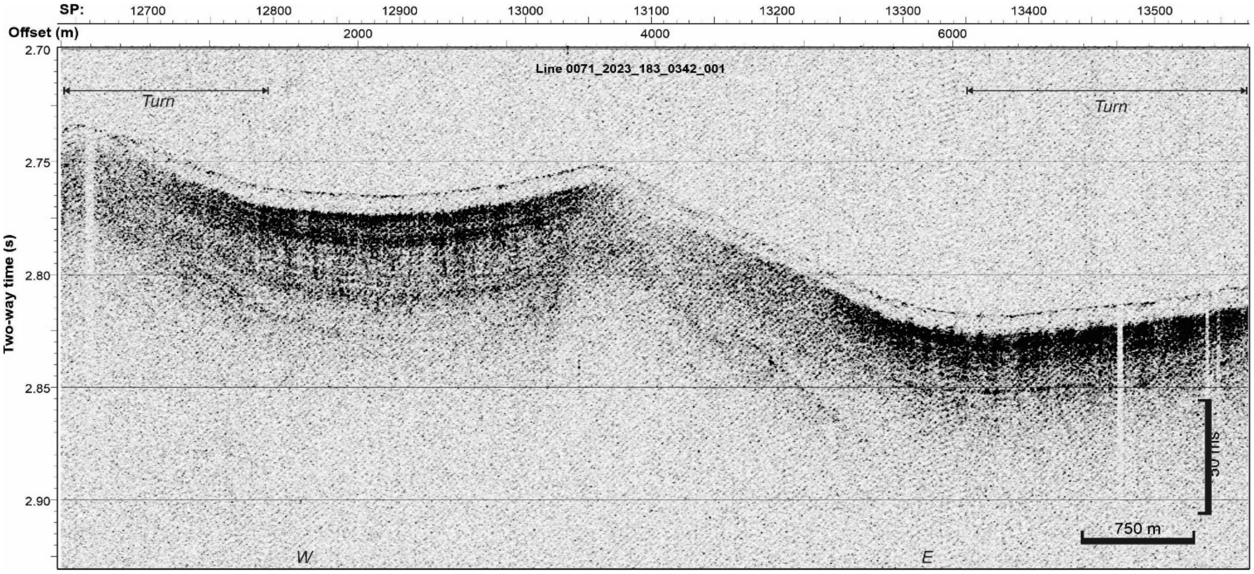


Figure D45. Line 0071_2023_183_0342_001, July 1 (JD183), Winona Basin.

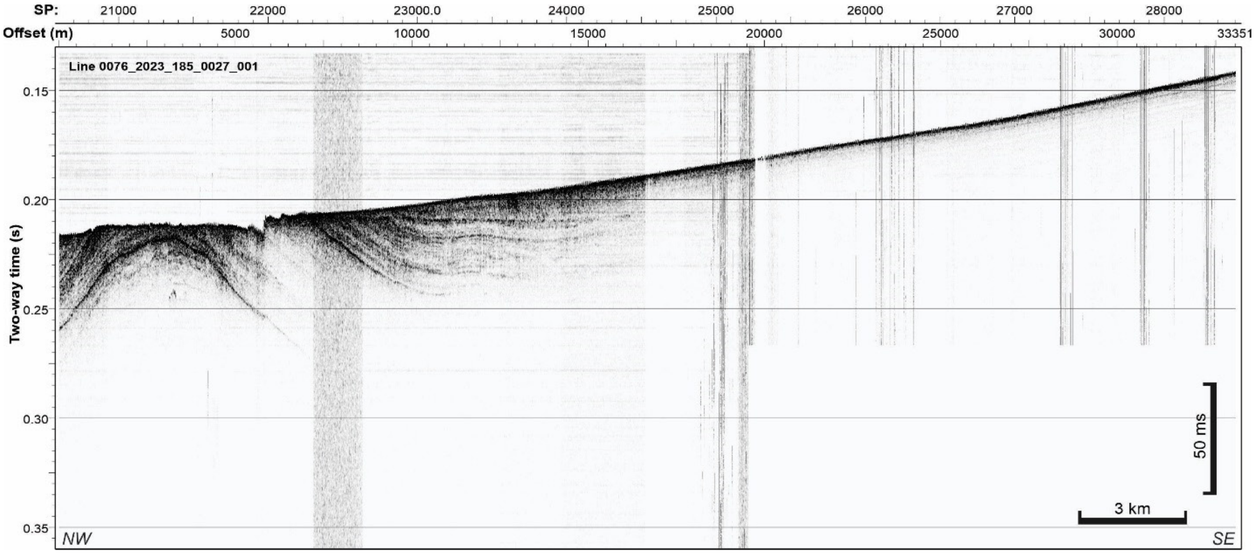


Figure D46. Line 0076_2023_185_0027_001, July 3 (JD185), La Perouse Bank.

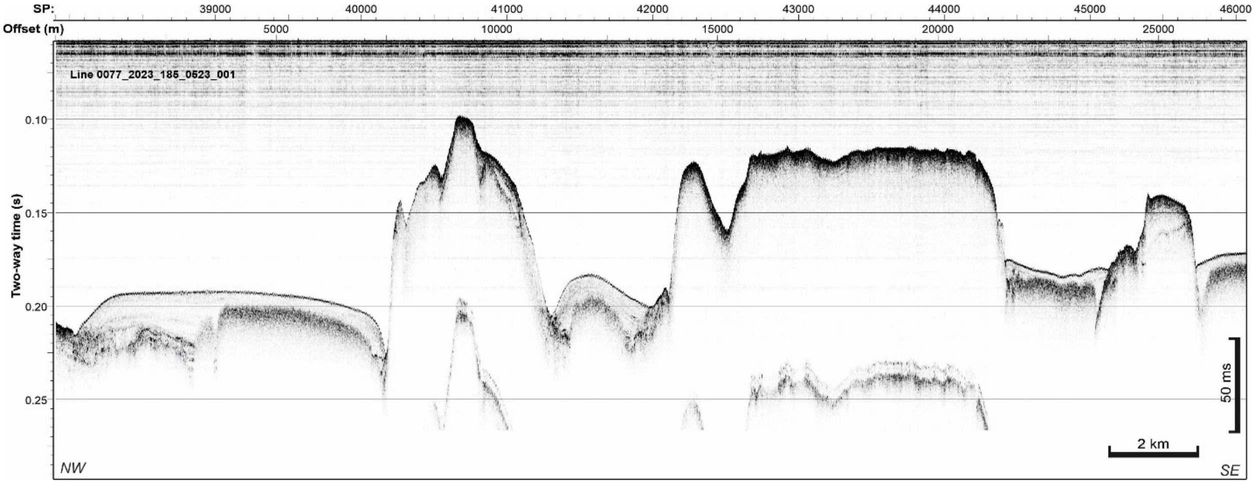


Figure D47. Line 0077_2023_185_0523_001, July 4 (JD185), La Perouse Bank.

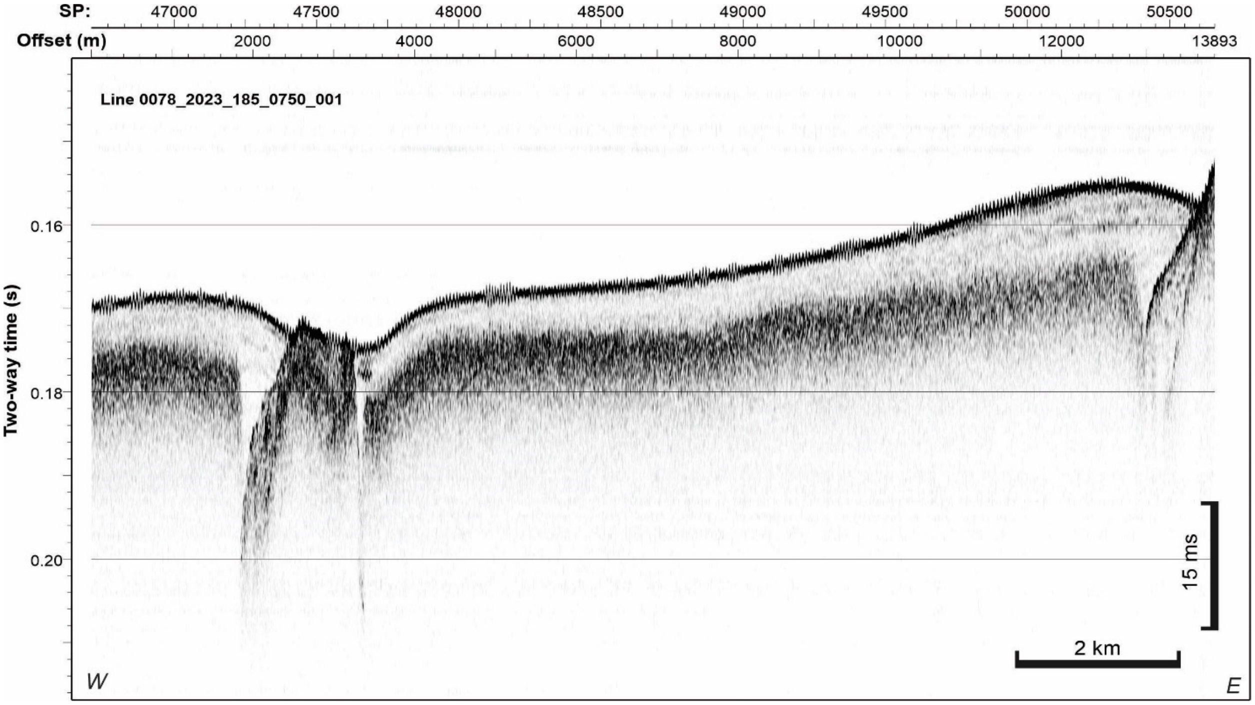


Figure D48. Line 0078_2023_185_0750_001, July 4 (JD185), La Perouse Bank.

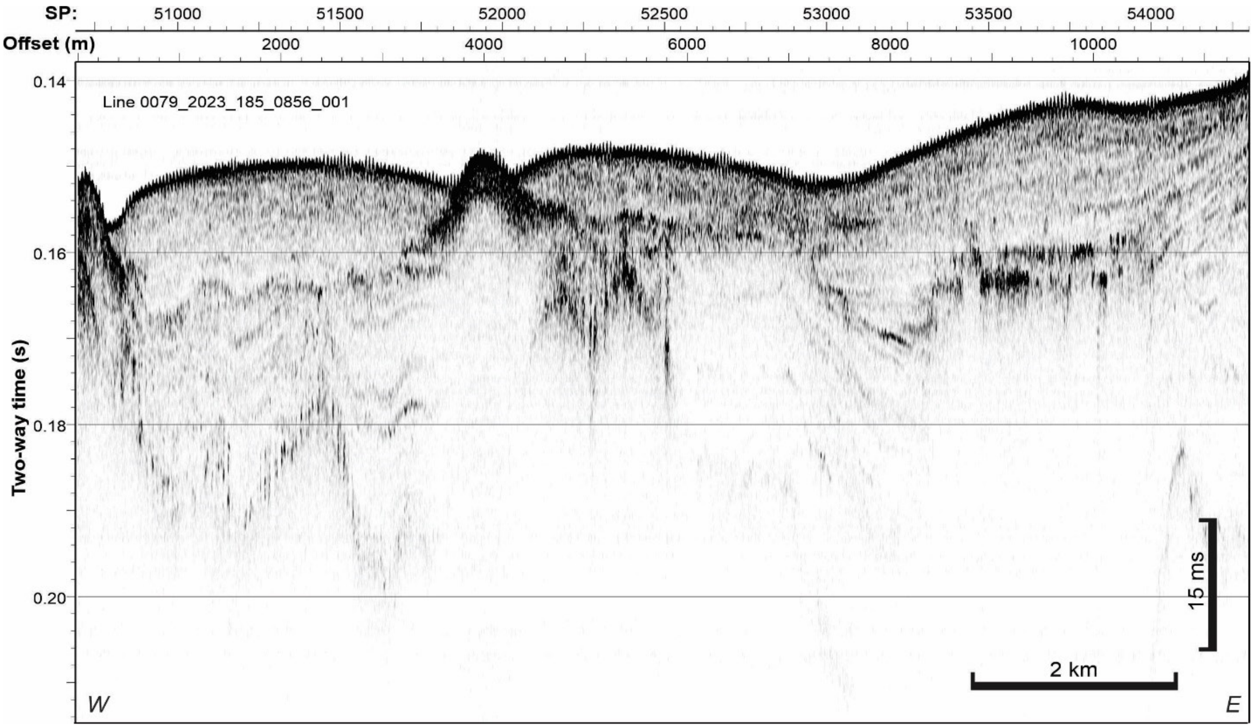


Figure D49. Line 0079_2023_185_0856_001, July 4 (JD185), La Perouse Bank.

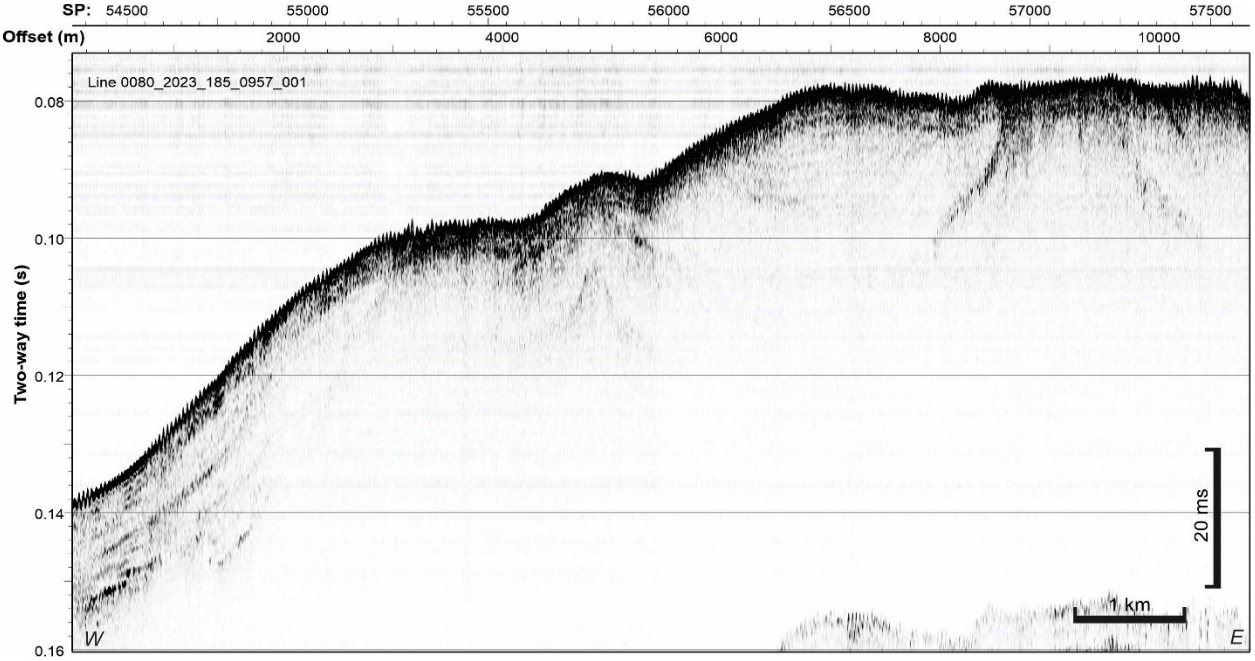


Figure D50. Line 0080_2023_185_0957_001, July 4 (JD185), La Perouse Bank.

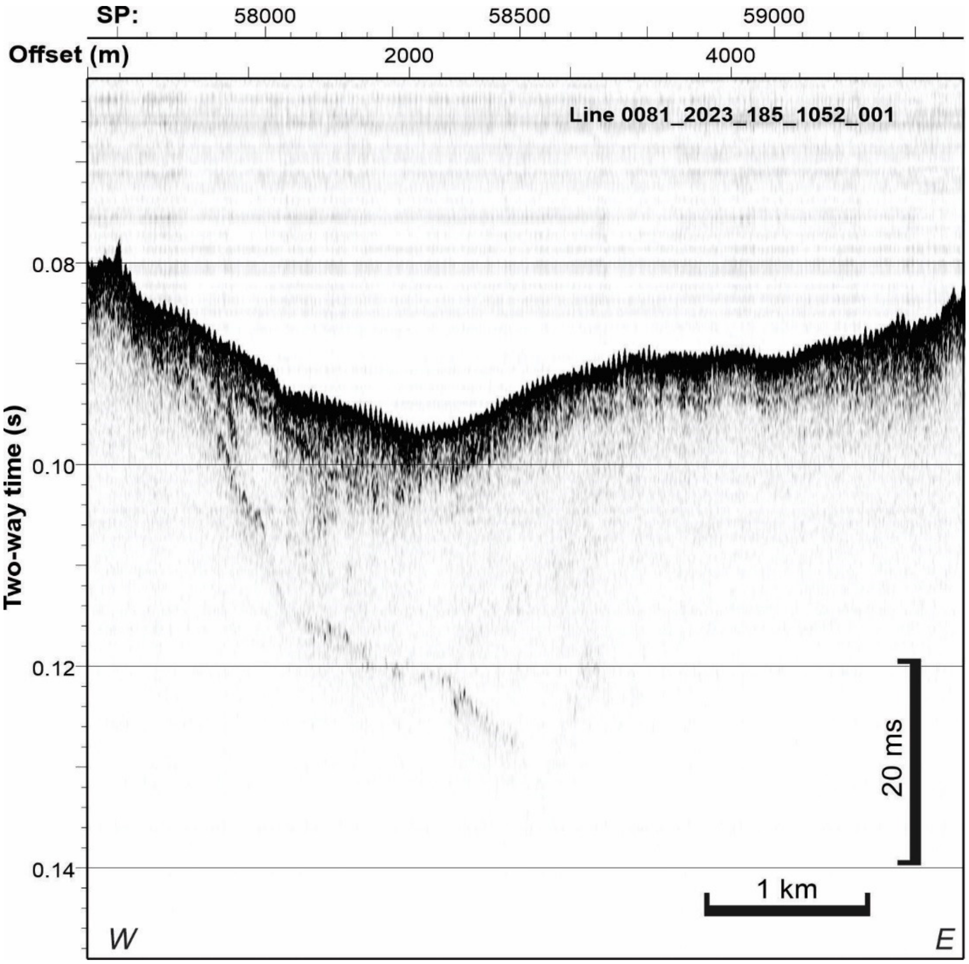


Figure D51. Line 0081_2023_185_1052_001, July 4 (JD185), La Perouse Bank.

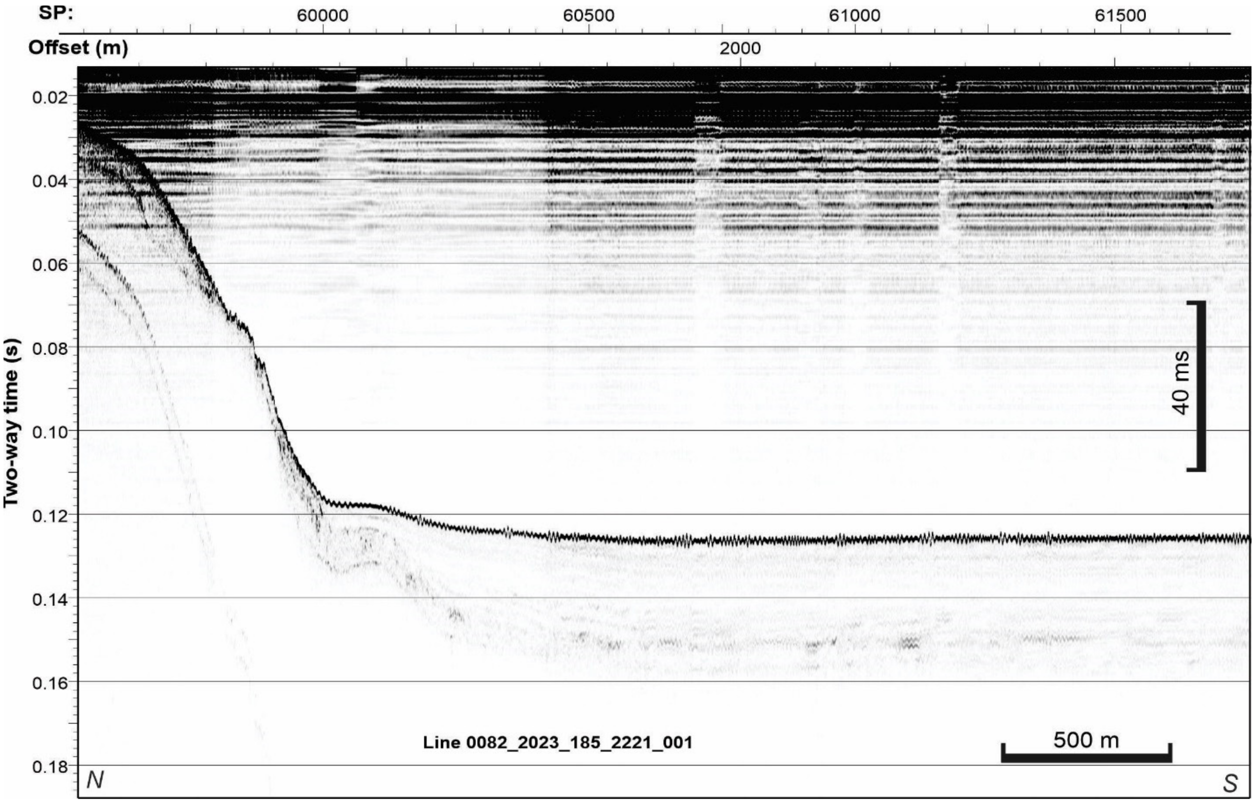


Figure D52. Line 0082_2023_185_2221_001, July 4 (JD185), Port San Juan.

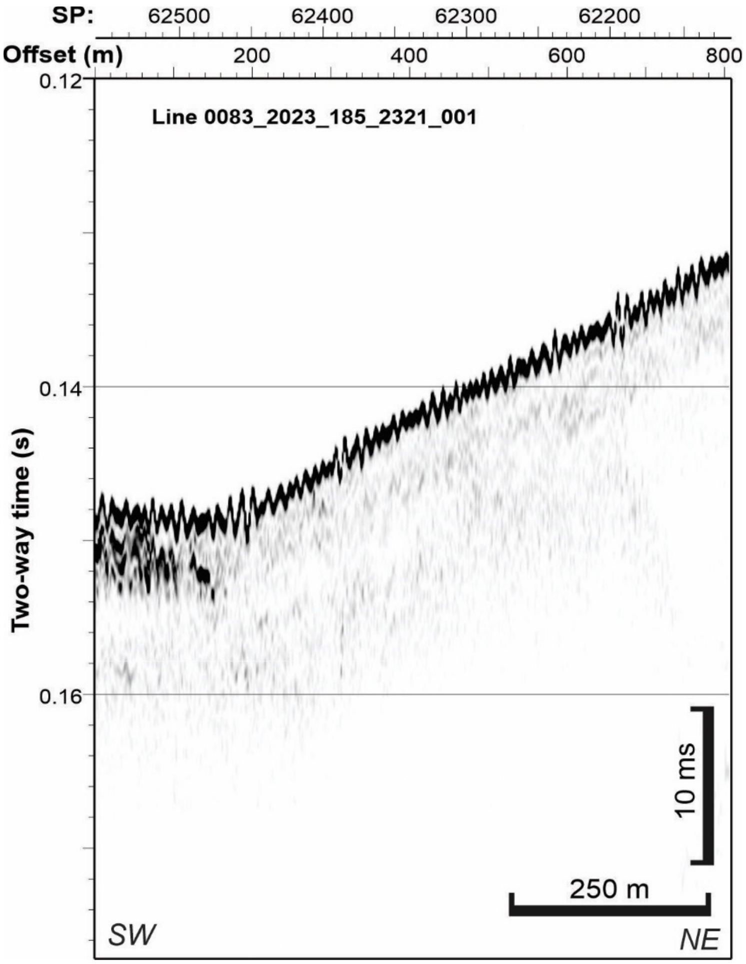


Figure D53. Line 0083_2023_185_2321_001, July 4 (JD185), Port San Juan.

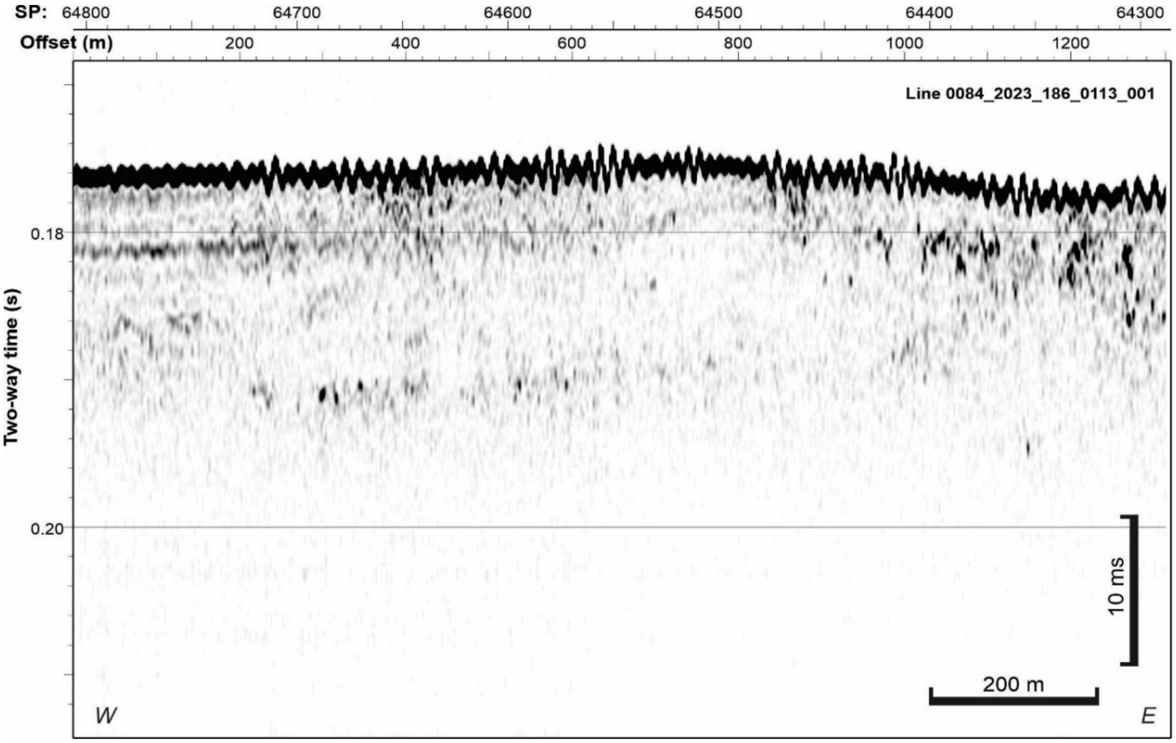


Figure D54. Line 0084_2023_186_0113_001, July 4 (JD186), Port San Juan.

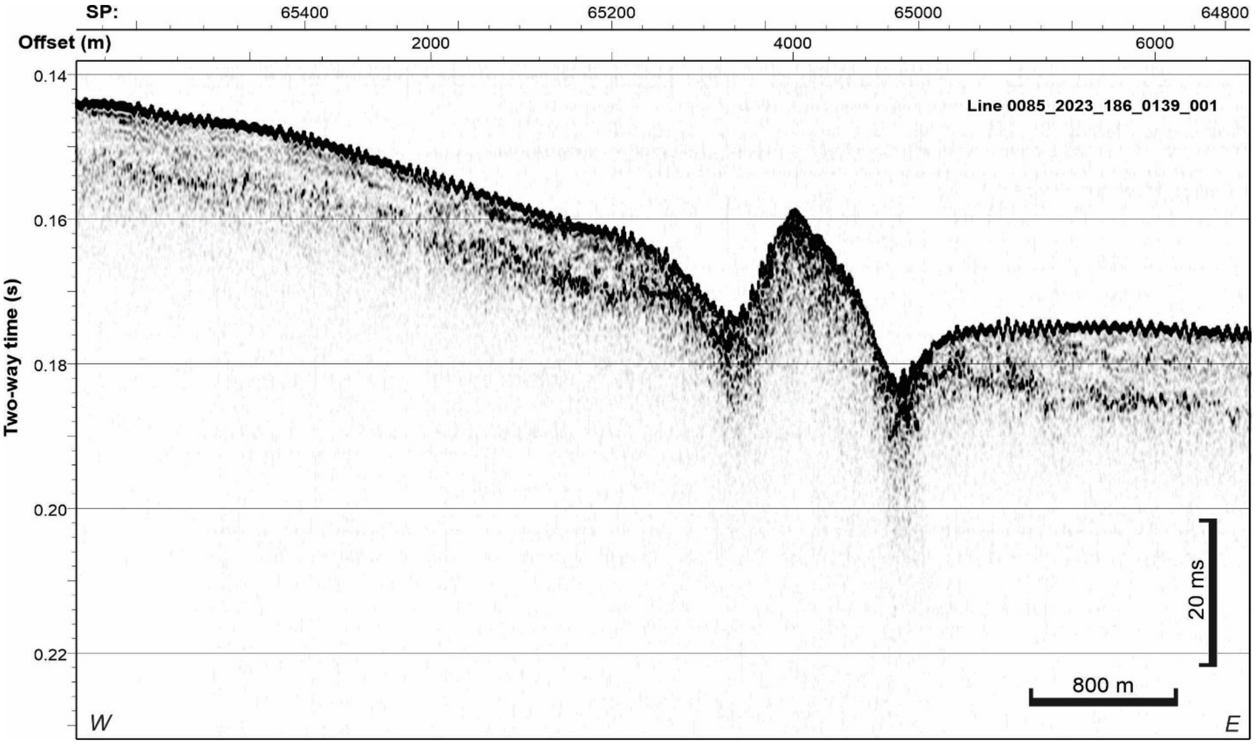


Figure D55. Line 0085_2023_186_0139_001, July 4 (JD186), Port San Juan.

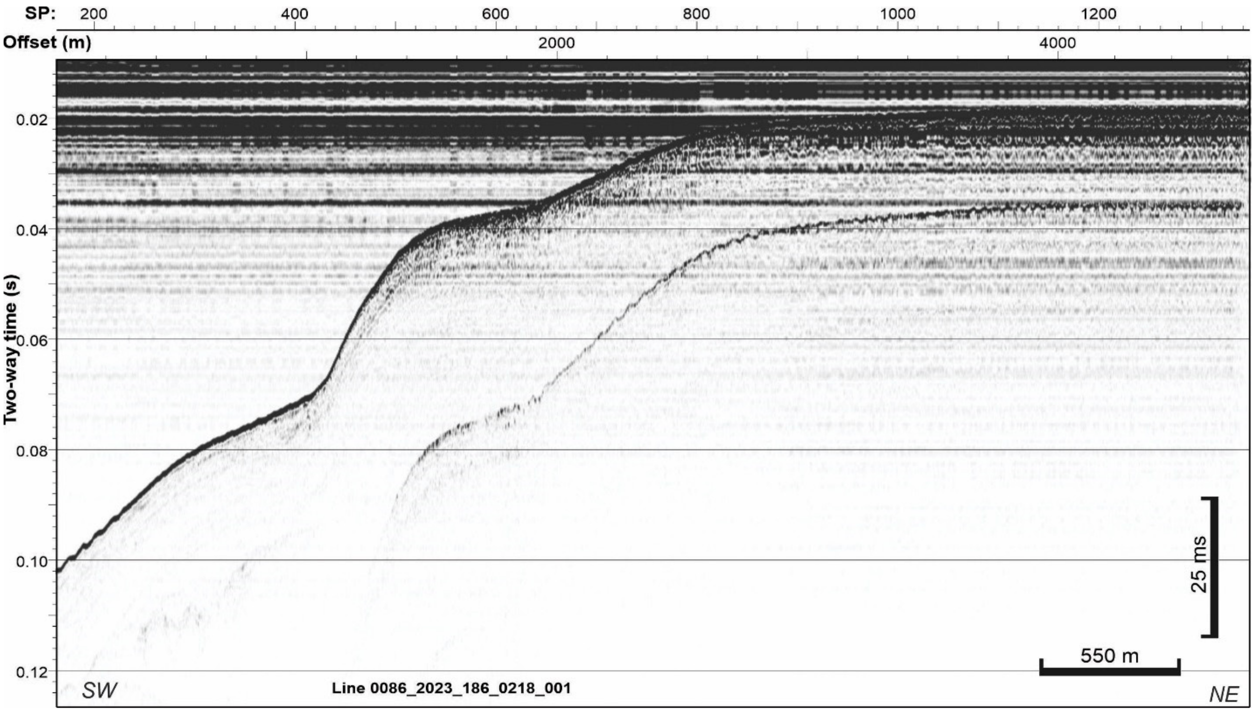


Figure D56. Line 0086_2023_186_0218_001, July 4 (JD186), Port San Juan.

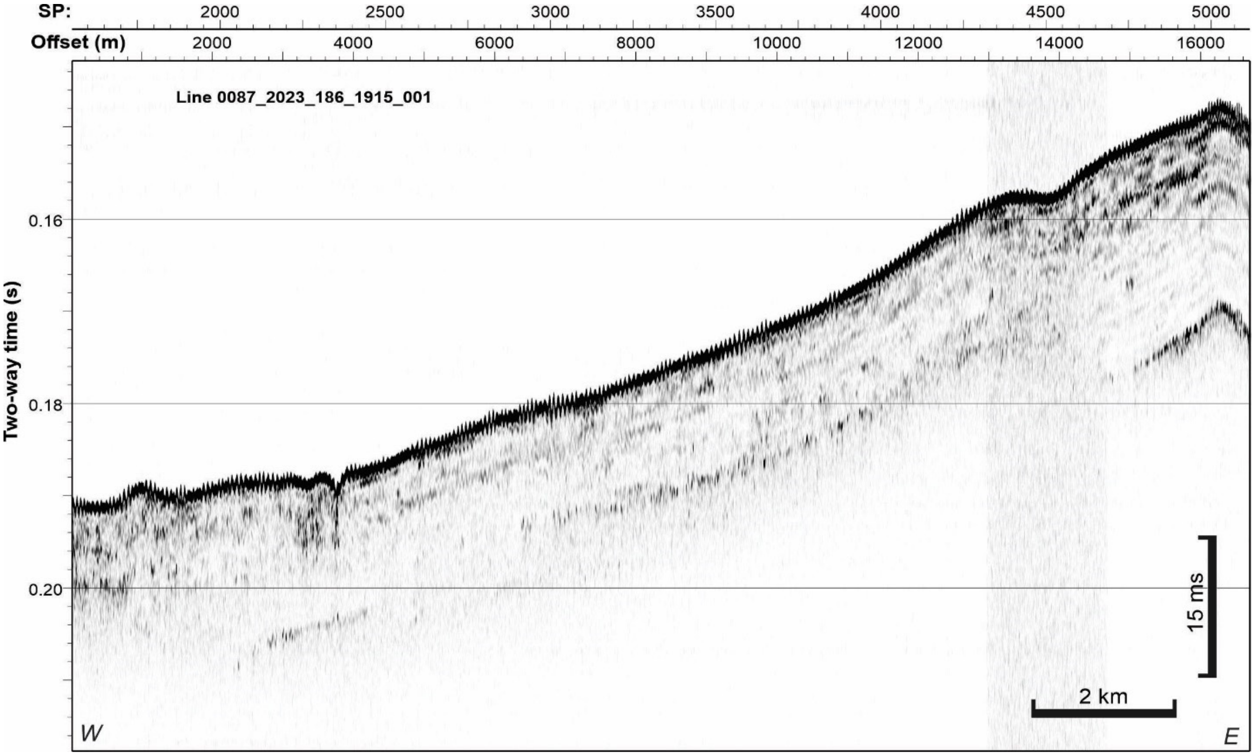


Figure D57. Line 0087_2023_186_1915_001, July 5 (JD186), Port San Juan.

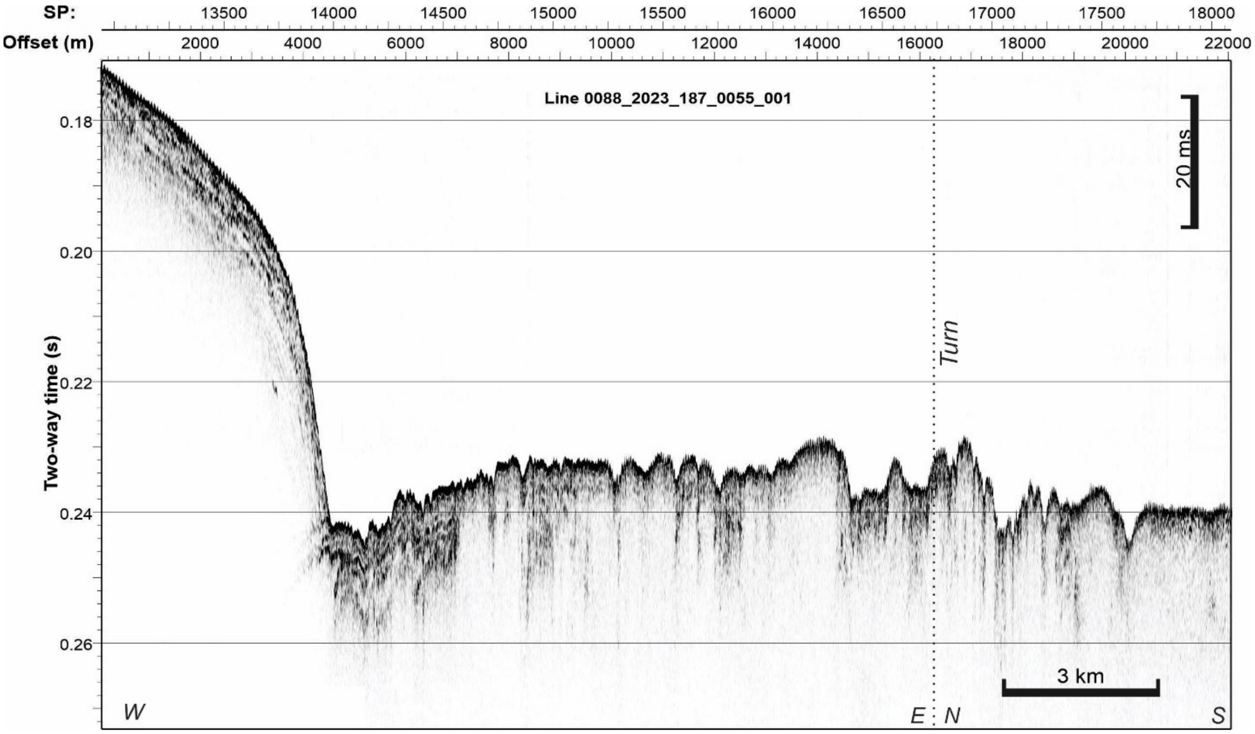


Figure D58. Line 0088_2023_187_0055_001, July 5 (JD187), Juan de Fuca Strait.

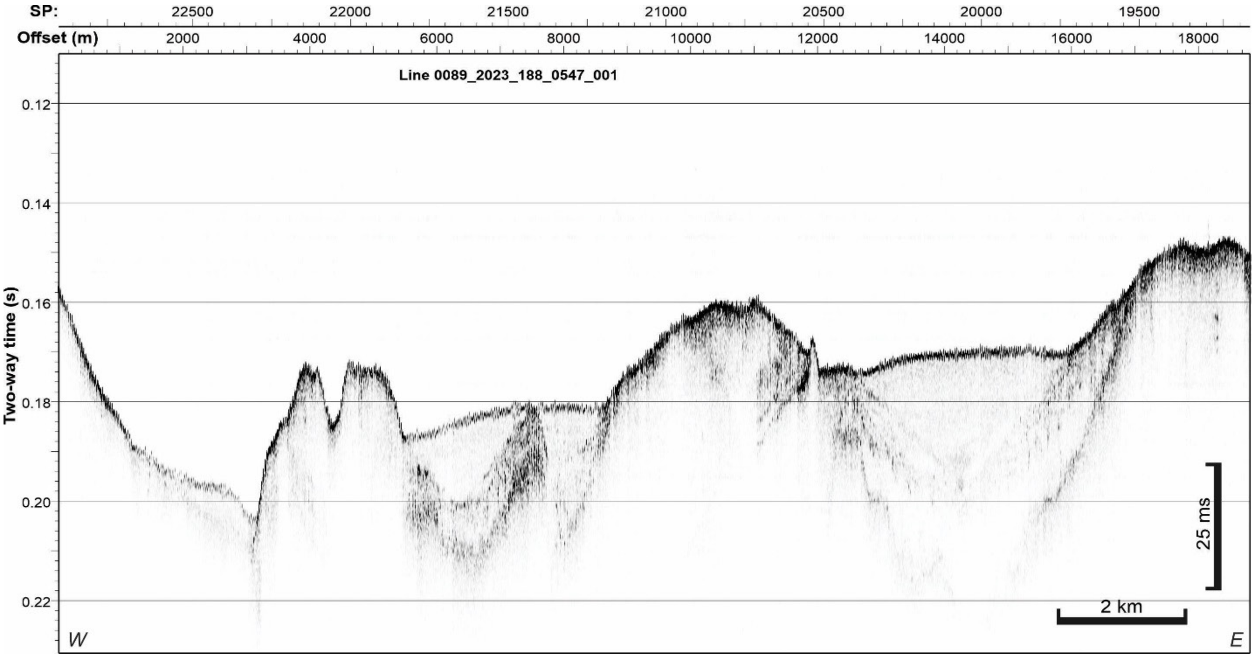


Figure D59. Line 0089_2023_188_0547_001, July 6 (JD188), Juan de Fuca Strait.

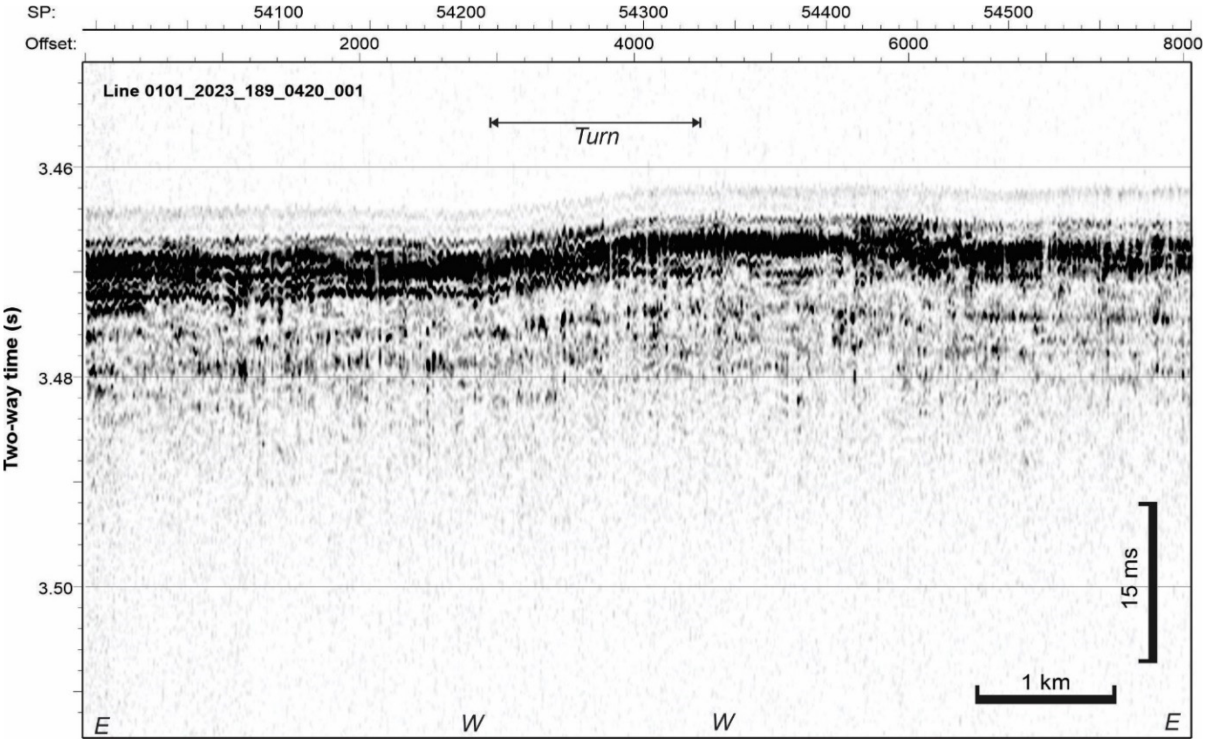


Figure D60. Line 0101_2023_189_0420_001, July 7 (JD189), Clayoquot Slope.

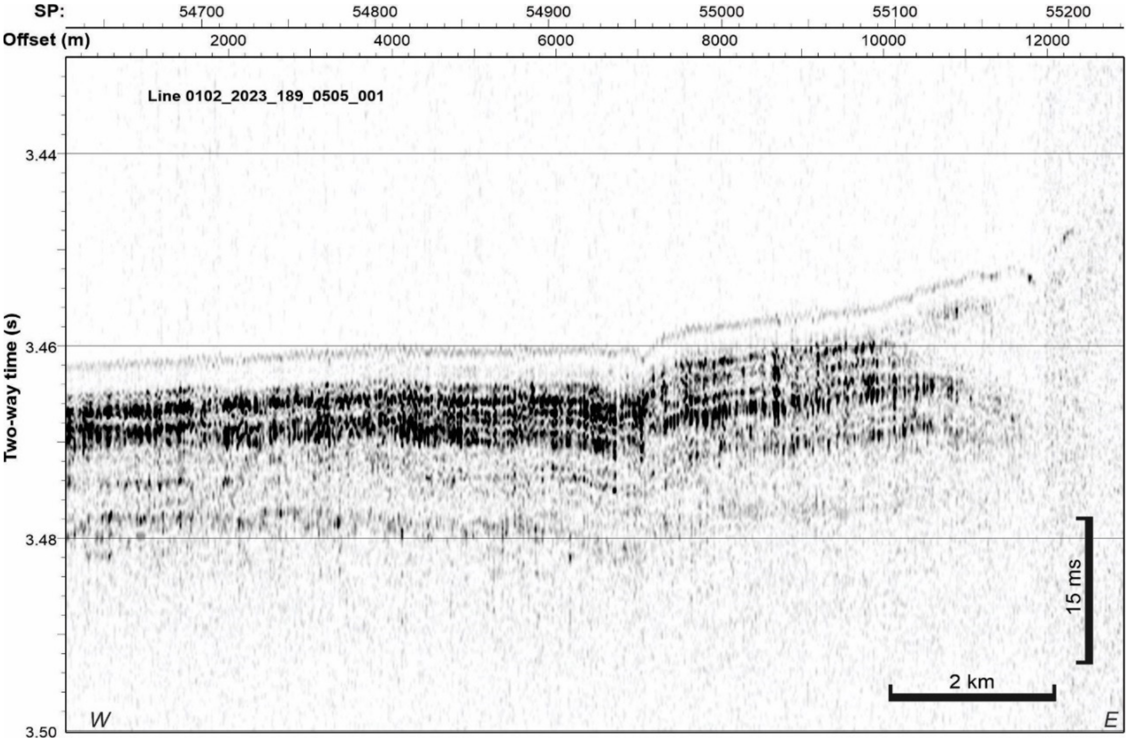


Figure D61. Line 0102_2023_189_0505_001, July 7 (JD189), Clayoquot Slope.

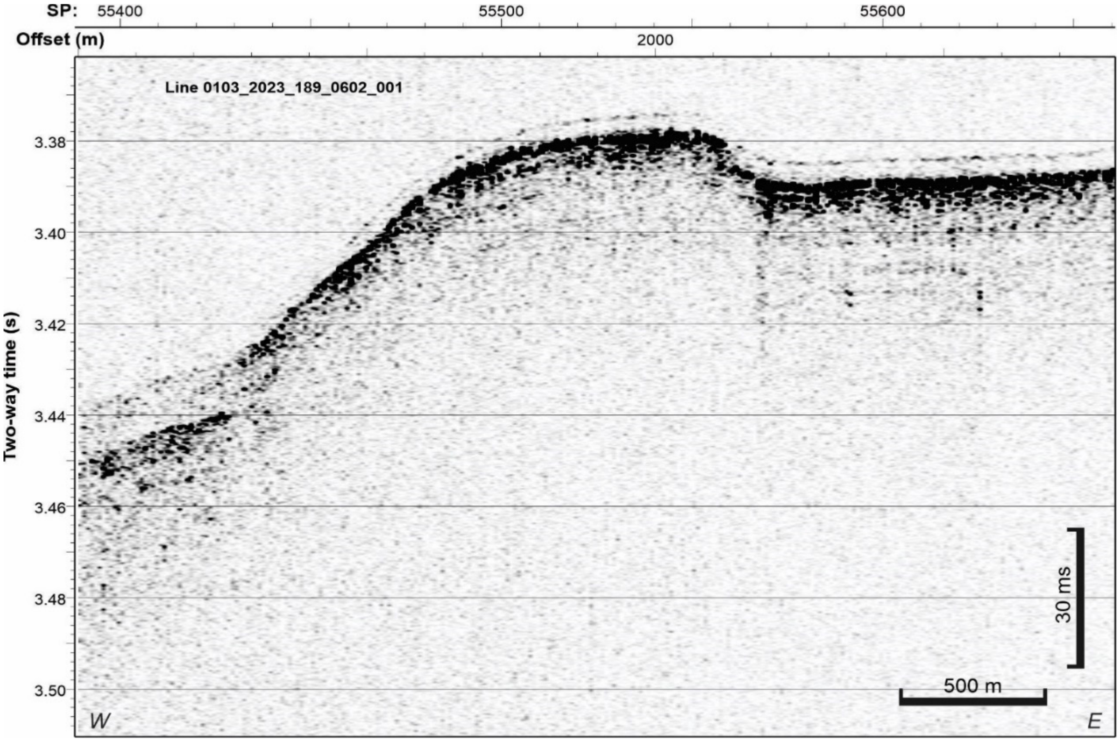


Figure D62. Line 0103_2023_189_0602_001, July 7 (JD189), Clayoquot Slope.

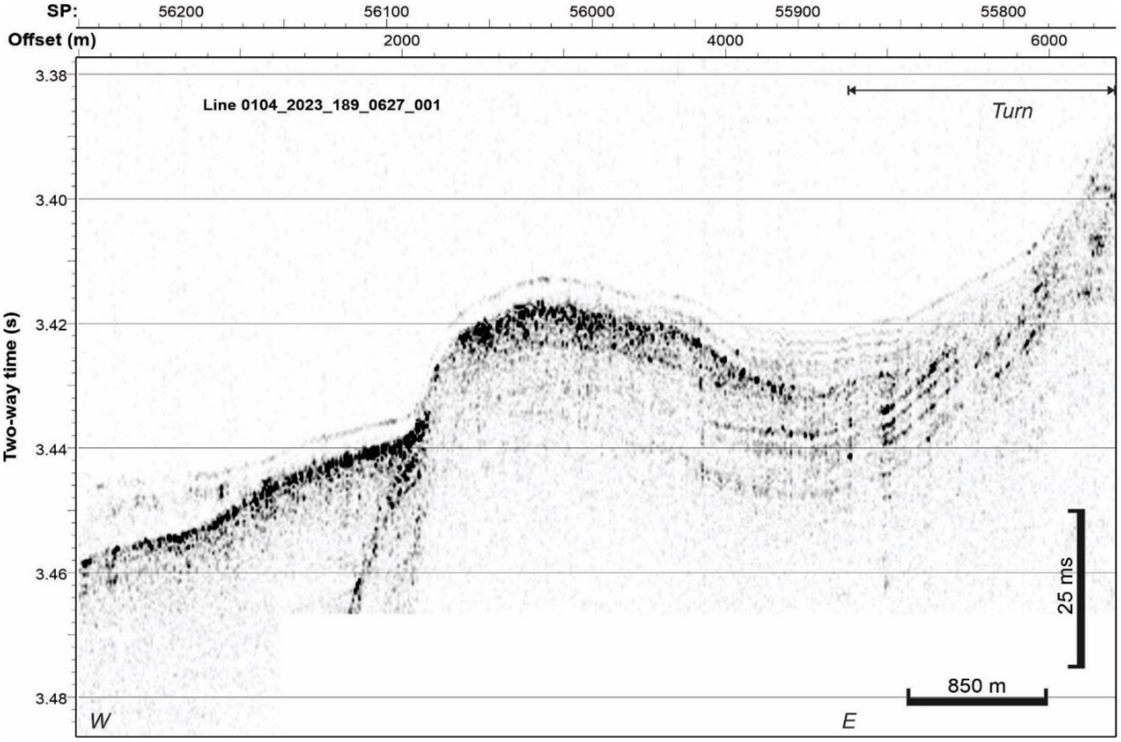


Figure D63. Line 0104_2023_189_0627_001, July 7 (JD189), Clayoquot Slope.

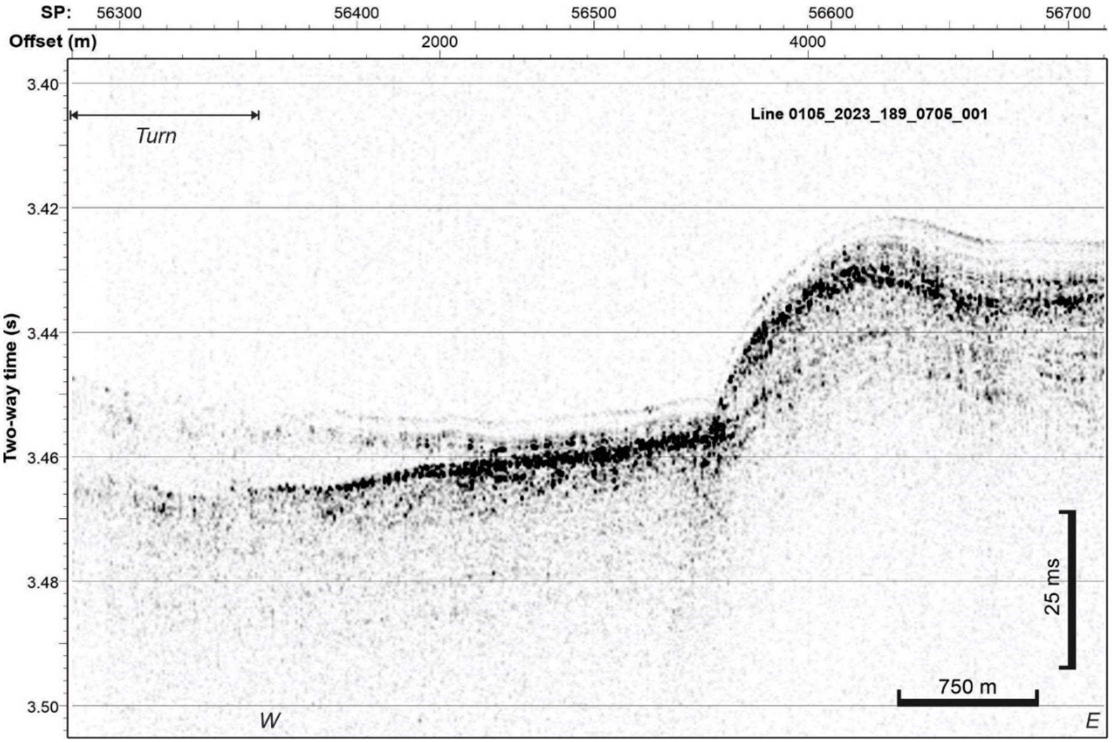


Figure D64. Line 0105_2023_189_0705_001, July 7 (JD189), Clayoquot Slope to Abyssal Plain.

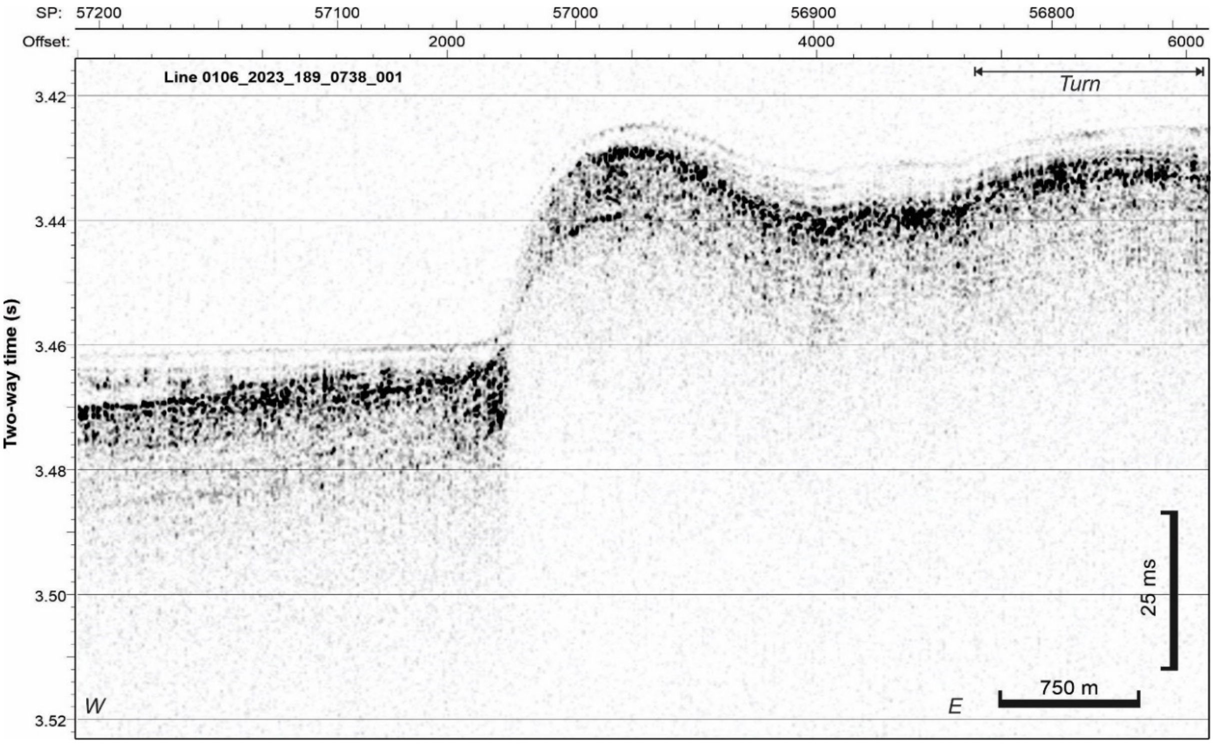


Figure D65. Line 0106_2023_189_0738_001, July 7 (JD189), Abyssal Plain.

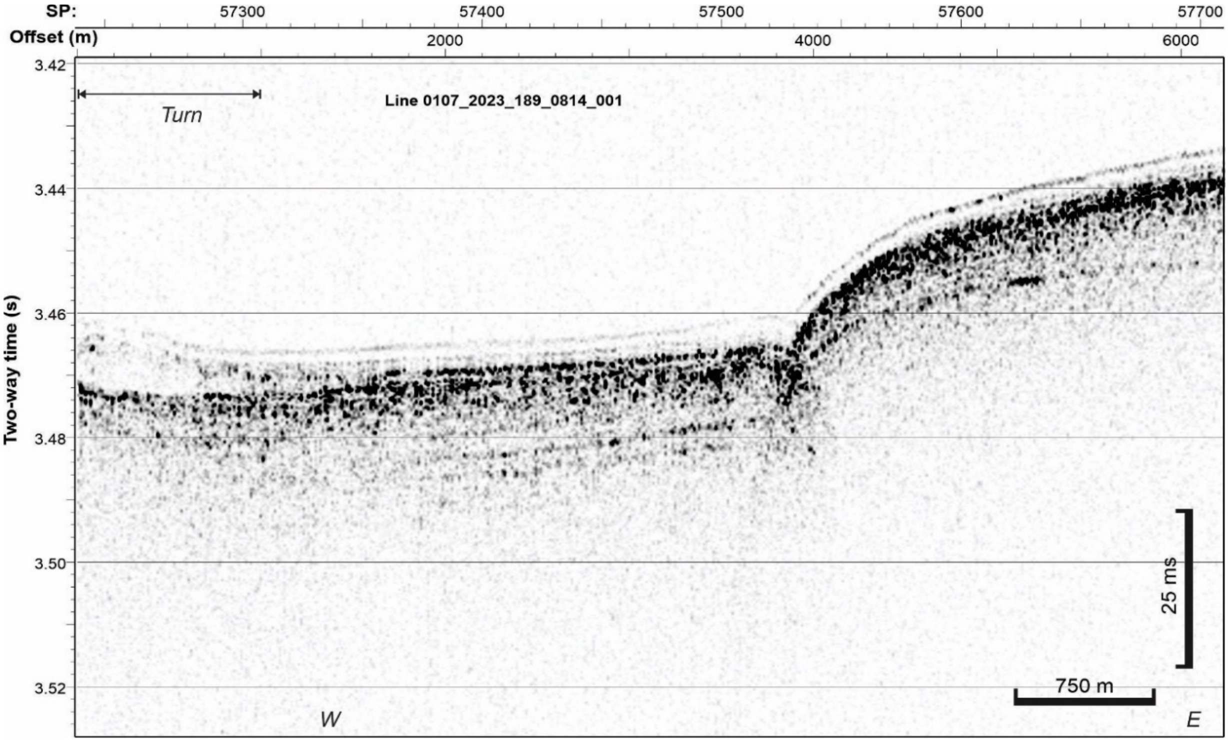


Figure D66. Line 0107_2023_189_0814_001, July 7 (JD189), Abyssal Plain.

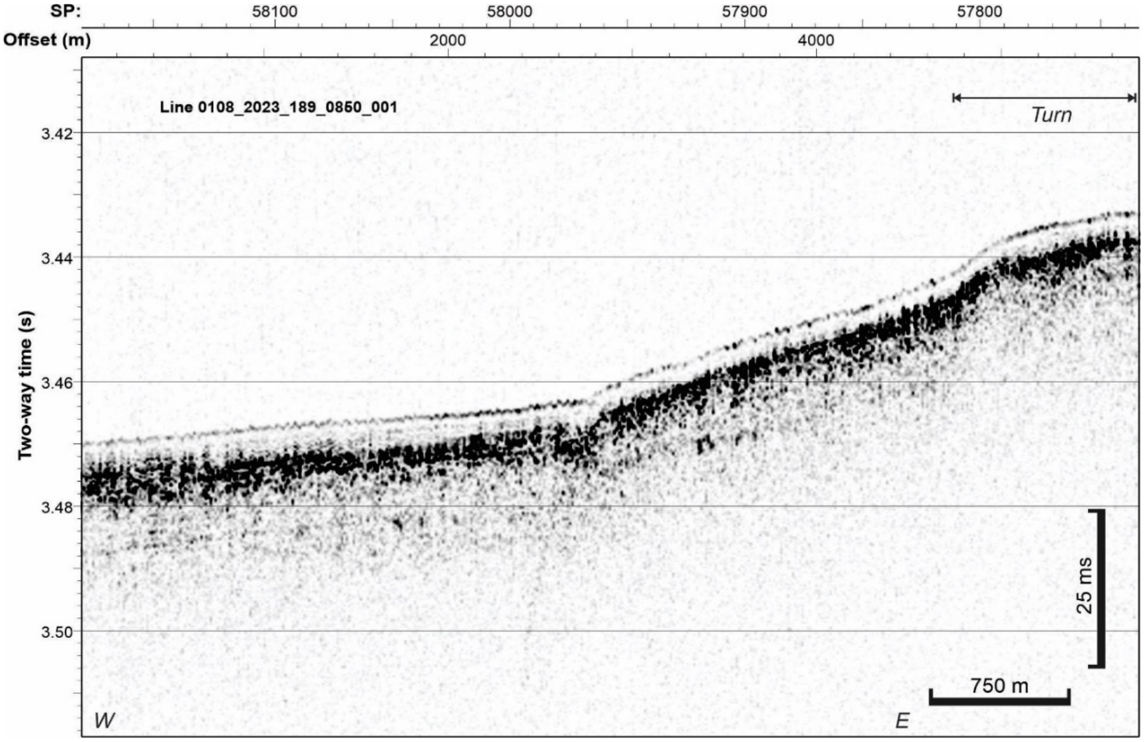


Figure D67. Line 0108_2023_189_0850_001, July 7 (JD189), Abyssal Plain.

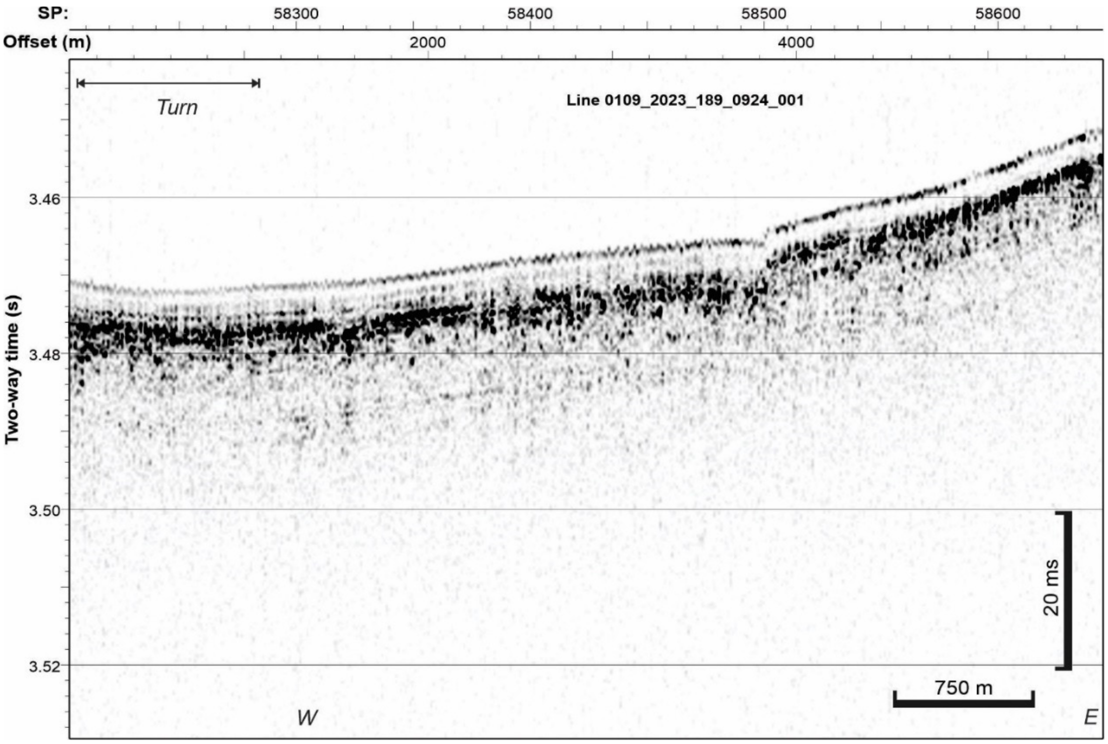


Figure D68. Line 0109_2023_189_0924_001, July 7 (JD189), Abyssal Plain.

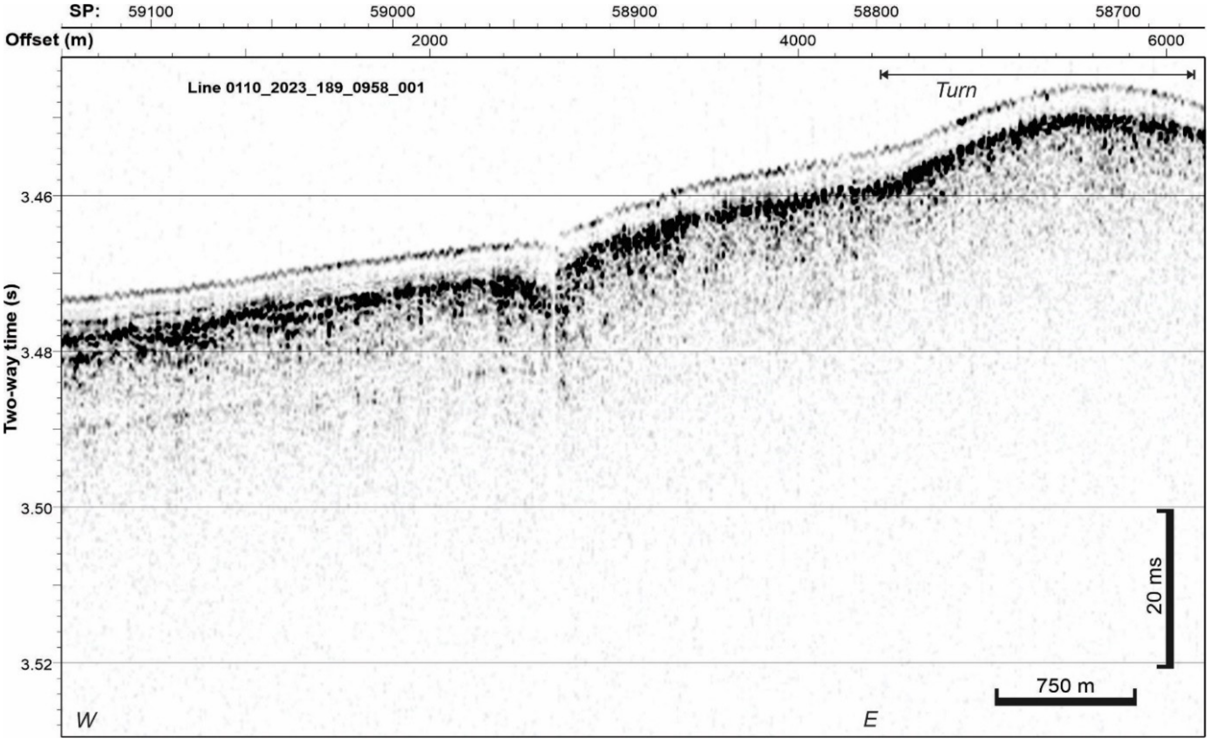


Figure D69. Line 0110_2023_189_0958_001, July 7 (JD189), Abyssal Plain.

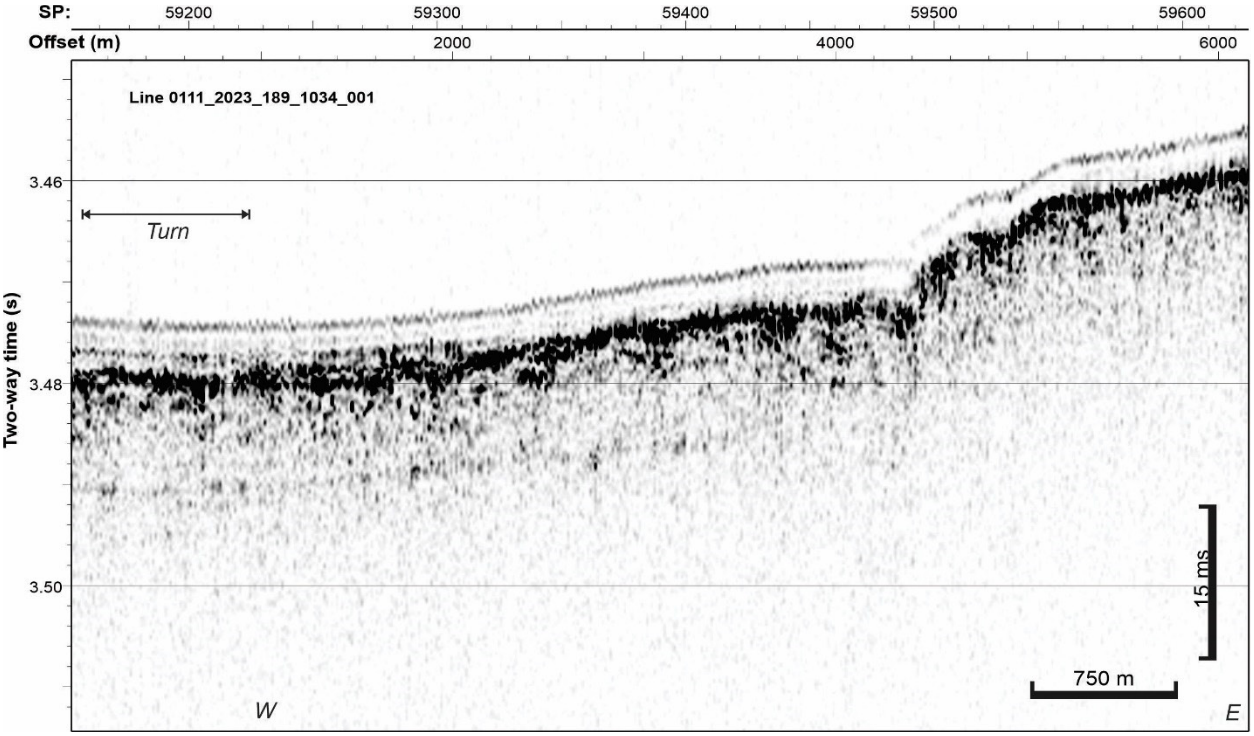


Figure D70. Line 0111_2023_189_1034_001, July 7 (JD189), Abyssal Plain.

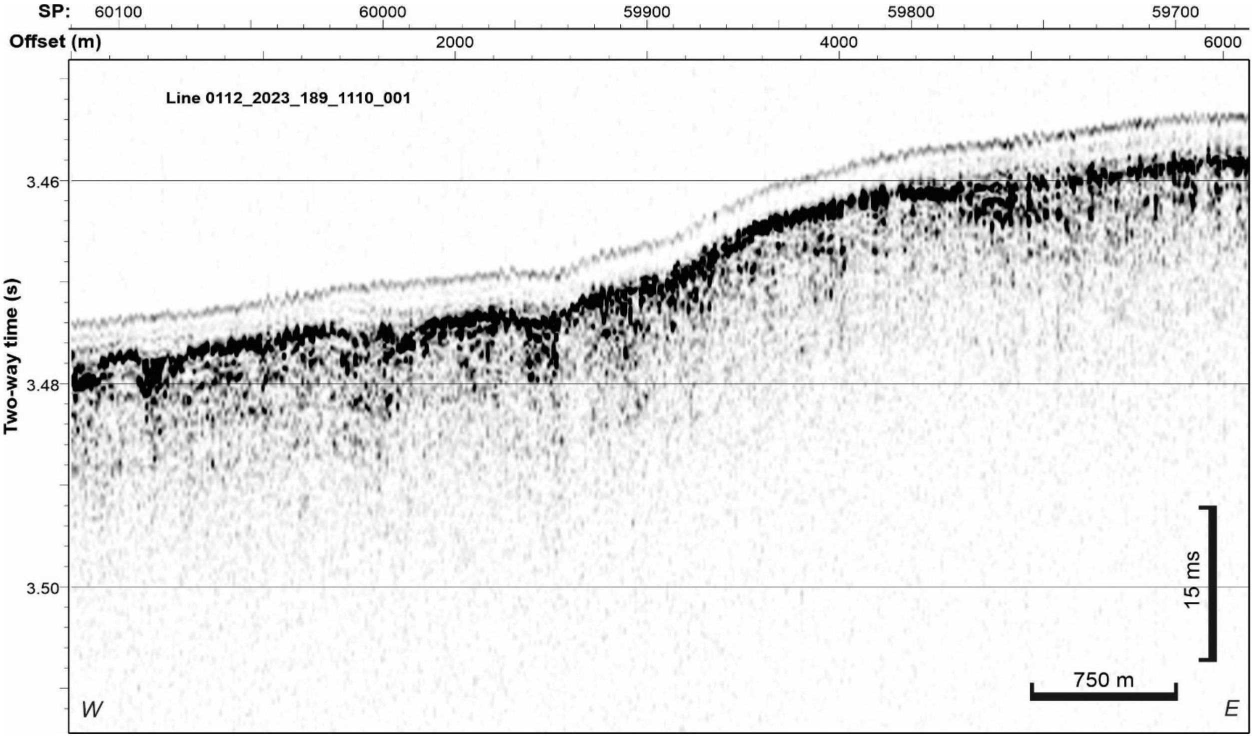


Figure D71. Line 0112_2023_189_1110_001, July 7 (JD189), Abyssal Plain.

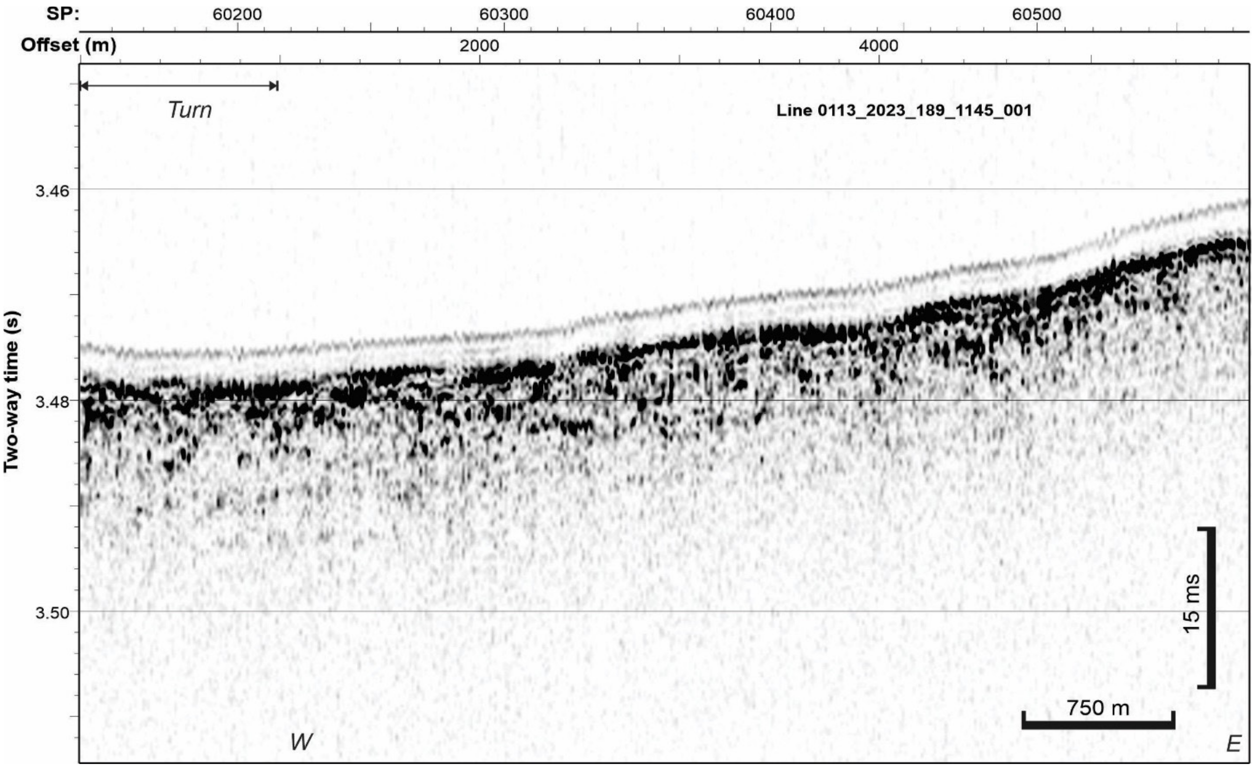


Figure D72. Line 0113_2023_189_1145_001, July 7 (JD189), Abyssal Plain.

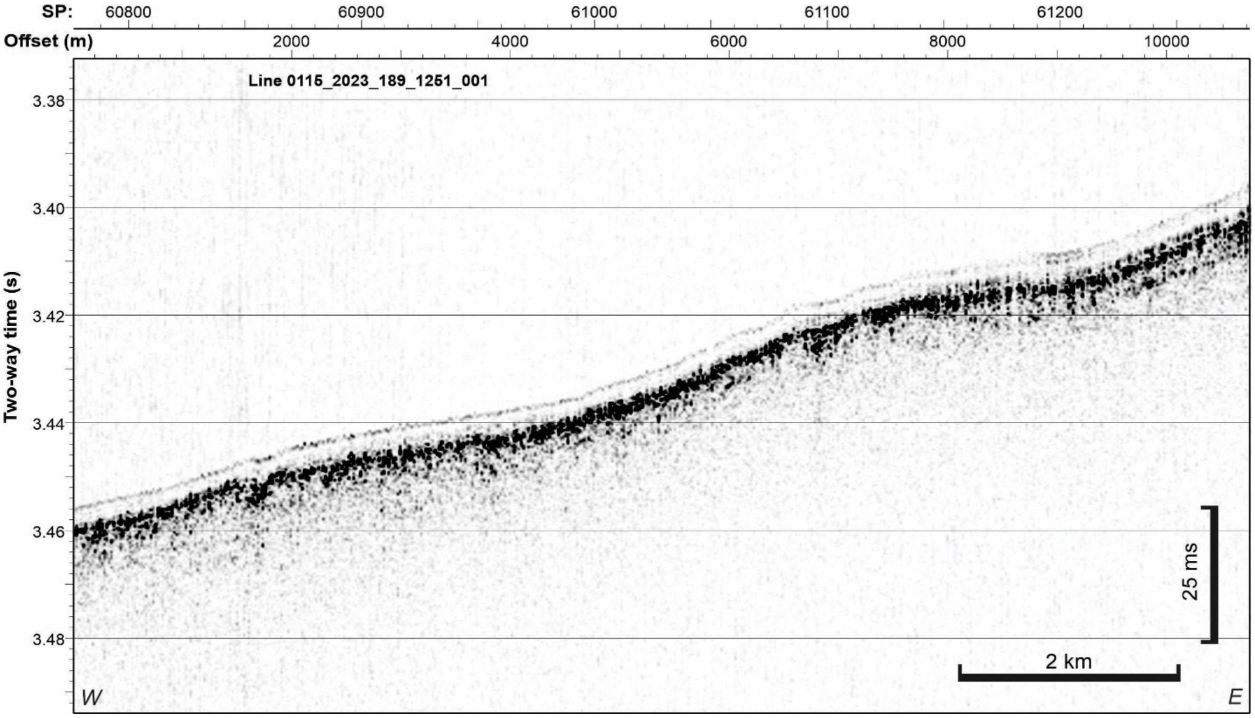


Figure D73. Line 0115_2023_189_1251_001, July 7 (JD189), Abyssal Plain.

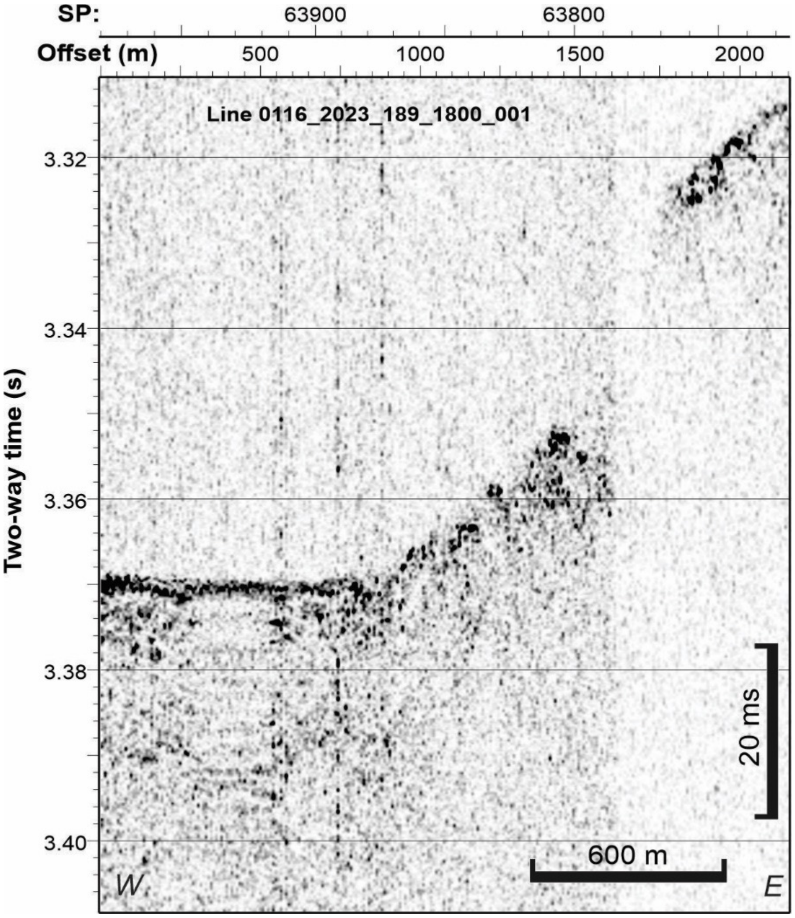


Figure D74. Line 0116_2023_189_1800_001, July 7 (JD189), Abyssal Plain.

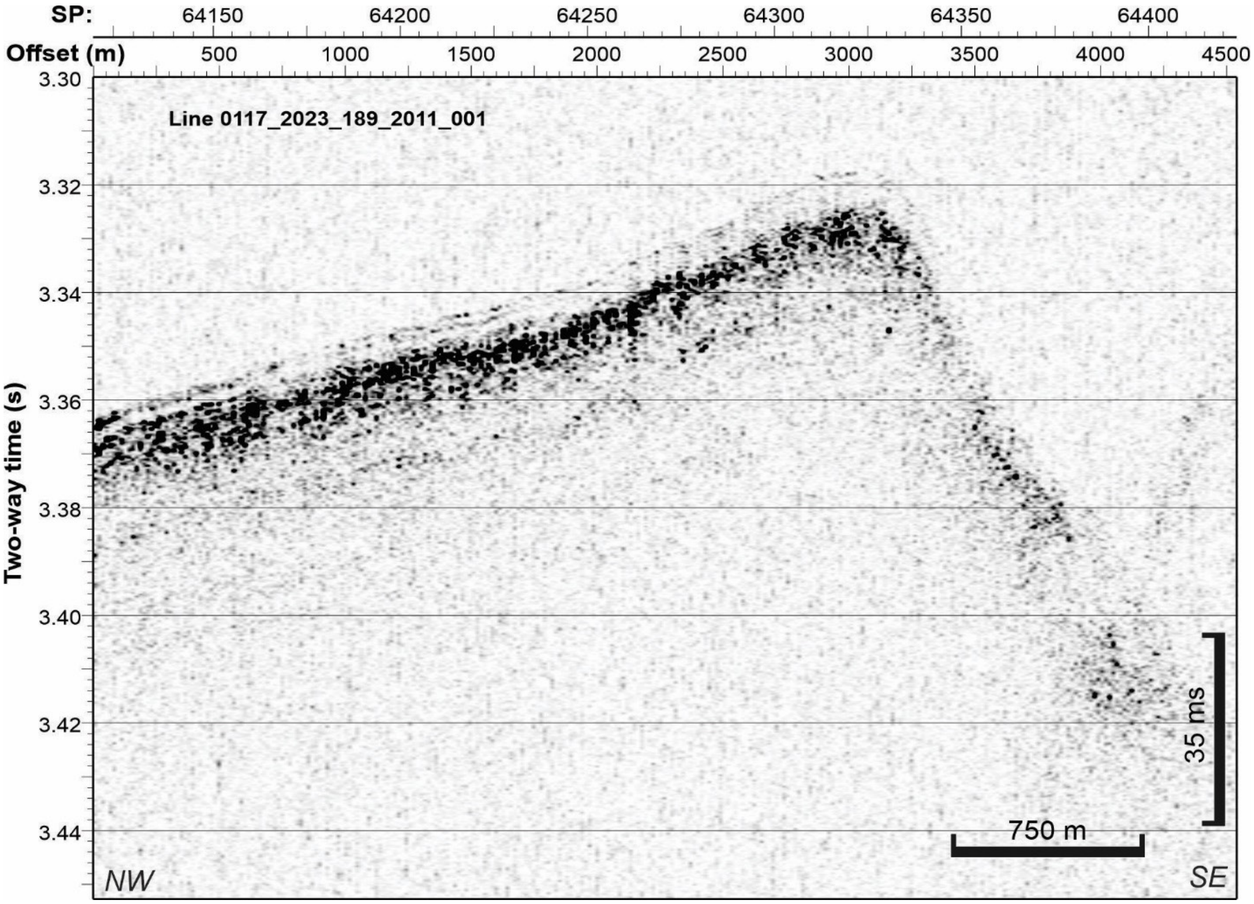


Figure D75. Line 0117_2023_189_2011_001, July 7 (JD189), Abyssal Plain.