

# CTD Summary

## EX2301, CTD 001, April 15, 2023

This form contains metadata information summarizing individual vessel CTD (conductivity, temperature, depth) casts in support of ocean exploration objectives. All CTD data are archived with the National Centers for Environmental Information (NCEI). For CTD-specific or expedition-specific inquiries, contact [ex.expeditioncoordinator@noaa.gov](mailto:ex.expeditioncoordinator@noaa.gov). For assistance with data access, contact [ncei.info@noaa.gov](mailto:ncei.info@noaa.gov).

### General Expedition and CTD Information

Expedition Name	Shakedown + EXPRESS West Coast Exploration
Project ID	EX2301
CTD Cast Date (UTC)	April 15, 2023
CTD Number	CTD001
Expedition Coordinator	Thomas Morrow, NOAA Ocean Exploration
CTD Operator	CST Charlie Wilkins
Science Lead	Alexis Weinnig, USGS
Science Lead	Paige Koenig, WWU
General Area Descriptor	Eastern Pacific Ocean, U.S. Pacific Northwest
Site Name	STN001
CTD Cast Purpose	<p>eDNA collections - comparison of filtration and preservation methodology:</p> <ol style="list-style-type: none"> <li>1. USGS methodology: Use Morison Lab pumps to filter 2 L of water through 0.22 <math>\mu\text{m}</math> and freeze filter</li> <li>2. Traditional methodology used aboard NOAA Ship <i>Okeanos Explorer</i> : Filter 1L of water through 0.45<math>\mu\text{m}</math> filter and preserve in DNA/RNA Shield</li> <li>3. Traditional methodology used aboard NOAA Ship <i>Okeanos Explorer</i> without DNA/RNA Shield: Filter 1L of water through 0.45<math>\mu\text{m}</math> filter and freeze filter</li> </ol>

## CTD Cast Location, Depth, and Time

Locations are the ship's position. Coordinates are referenced to the World Geographic System, 1984.

Deployment Latitude (decimal degrees)	45.6254813
Deployment Longitude (decimal degrees)	-124.9284313
Deployment Time (UTC)	04/15/2023 01:34:08
CTD Max Depth (meters)	1,000 m
Recovery Latitude (decimal degrees)	45.625479833
Recovery Longitude (decimal degrees)	-124.9284333
Recovery Time (UTC)	04/15/2023 02:37:11

## Environmental Sensor Information

Sensors are calibrated yearly or more frequently as required. Calibration information and files are stored with the sensor data.

Data Type	Sensor Name	Collected (Yes/No)	Data Issues/Notes
Depth	SBE-9plus (SN 0905)	Y	
Conductivity 1	SBE-4 (SN 3449)	Y	
Conductivity 2	SBE-4 (SN 3456)	Y	
Temperature 1	SBE-3 (SN 5001)	Y	
Temperature 2	SBE-3 (SN 5017)	Y	
Dissolved Oxygen	SBE-43 (SN2100)	Y	
Turbidity	ECO-FLNTU	N	Probe with with SeaBird for calibration
Oxygen Reduction Potential	PMEL (SN EX-02)	Y	Odd spikes in data around 330 m depth - likely due to issues with sensor

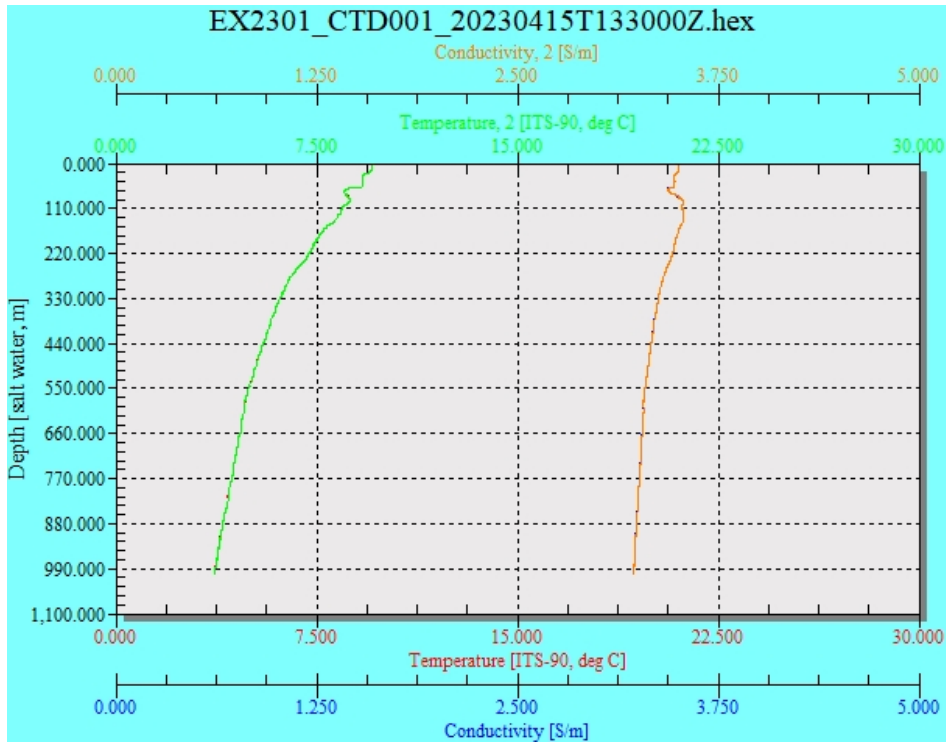


Figure 1: Temperature (°C)(green line) and conductivity (S/m)(orange line) profiles

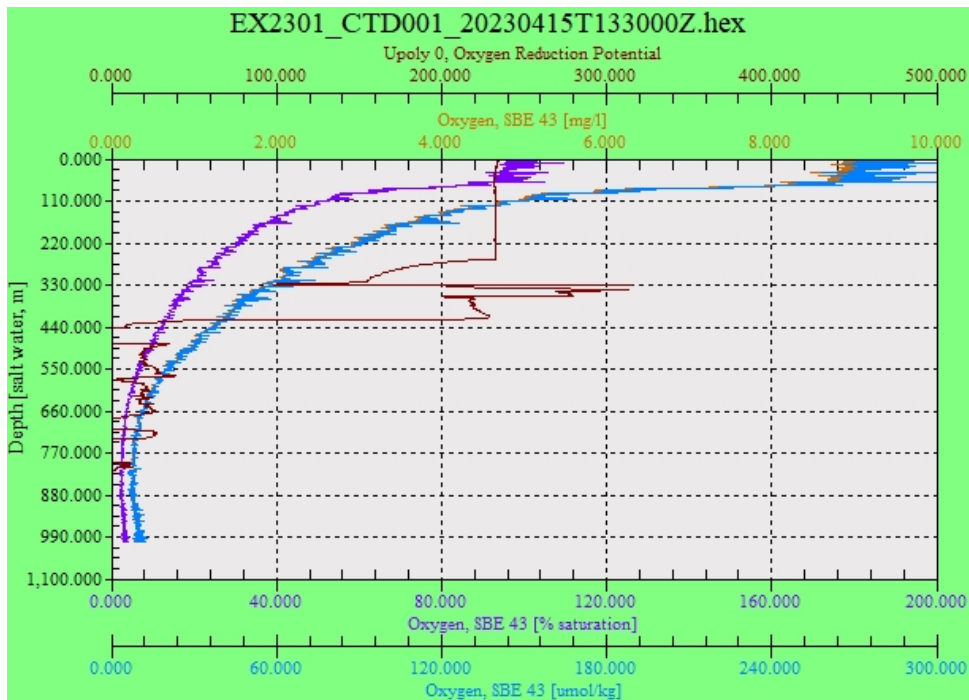


Figure 2: Oxygen saturation (% saturation) (purple line), oxygen concentration (umol/kg) (blue line), and oxygen reduction potential (brown line) profiles

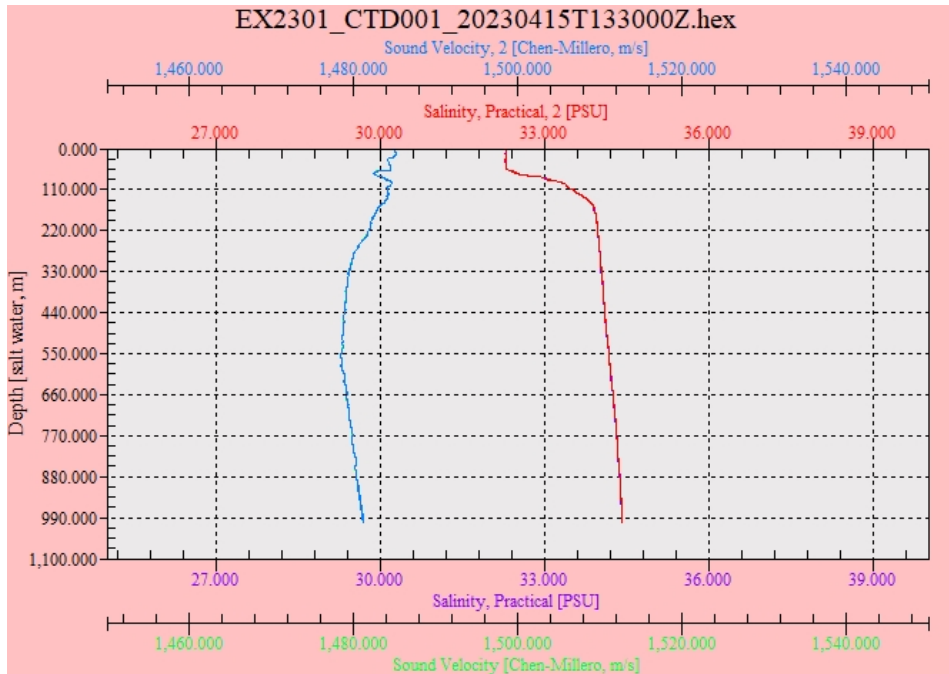


Figure 3: Sound velocity (Chen-Millero, m/s)(blue line) and salinity (PSU)(red line) profiles

## Water Sample Collections

<p>Purpose of Water Sample Collection</p>	<p>Water samples were collected for eDNA analysis using 3 comparative methods for filtration and preservation.</p>
---	--

Description of Processing/Analysis at Sea	<p>5 liters of seawater were collected in 12 Niskin bottles. Water was filtered for eDNA analyses using 3 different methodologies:</p> <ol style="list-style-type: none"> <li>1) USGS methodology: Use Morisson Lab pumps to filter 2 L of water through 0.22 <math>\mu</math>m and freeze filter (Samples EX2301_CTD001_B01 - EX2301_CTD001_B12)</li> <li>2) Traditional methodology used aboard NOAA Ship <i>Okeanos Explorer</i> : Filter 1L of water through 0.45<math>\mu</math>m filter and preserve in DNA/RNA Shield (Samples EX2301_CTD001_B01b - EX2301_CTD001_B12b)</li> <li>3) Traditional methodology used aboard NOAA Ship <i>Okeanos Explorer</i> without DNA/RNA Shield: Filter 1L of water through 0.45<math>\mu</math>m filter and freeze filter (Samples EX2301_CTD001_B01c - EX2301_CTD001_B12c)</li> </ol>
Description of At-Sea Storage	<p>Samples stored in freezer:</p> <ul style="list-style-type: none"> <li>● EX2301_CTD001_B01 - EX2301_CTD001_B12</li> <li>● EX2301_CTD001_B01_c - EX2301_CTD001_B12_c</li> </ul> <p>Samples stored in DNA/RNA Shield at room temperature:</p> <ul style="list-style-type: none"> <li>● EX2301_CTD001_B01_b - EX2301_CTD001_B12_b</li> </ul>

### Niskin Bottles Locations and Depths

Bottle Number	Time (UTC)	Longitude (DD)	Latitude (DD)	Depth (meters)	Notes
1	02:01:17.306	-124.9284167	45.62548	1000	maximum depth of CTD cast
2	02:01:24.306	-124.9284233	45.62548	1000	maximum depth of CTD cast
3	02:08:38.311	-124.9284233	45.6254795	801	
4	02:08:44.311	-124.9284205	45.6254795	801	

Bottle Number	Time (UTC)	Longitude (DD)	Latitude (DD)	Depth (meters)	Notes
5	02:21:29.319	-124.9284205	45.62547733	303	In DSL (DSL around 100 - 350 m)
6	02:21:35.319	-124.9284285	45.62547733	303	In DSL (DSL around 100 - 350 m)
7	02:27:21.322	-124.9284285	45.62548067	153	In DSL (DSL around 100 - 350 m)
8	02:27:29.323	-124.9292833	45.62548067	153	In DSL (DSL around 100 - 350 m)
9	02:31:55.325	-124.9292833	45.62548473	64	above DSL, lower oxygen concentration
10	02:32:01.325	-124.9284283	45.62548473	64	above DSL, lower oxygen concentration
11	02:35:50.328	-124.9284283	45.62547983	6	surface
12	02:35:50.328	-124.9284283	45.62547983	6	surface

## Water Sample Summary

Sample Name	Date/Time (UTC)	Depth (m)	Water Volume Filtered (L)	Filter Pore Size (µm)	Preservation Method
EX2301_CTD001_B01	04/15/2023 2:01:17	1000	2	0.22	Frozen
EX2301_CTD001_B02	04/15/2023 2:01:24	1000	2	0.22	Frozen
EX2301_CTD001_B03	04/15/2023 2:08:38	801	2	0.22	Frozen
EX2301_CTD001_B04	04/15/2023 2:08:44	801	2	0.22	Frozen
EX2301_CTD001_B05	04/15/2023 2:21:29	303	2	0.22	Frozen
EX2301_CTD001_B06	04/15/2023 2:21:35	303	2	0.22	Frozen
EX2301_CTD001_B07	04/15/2023 2:27:21	153	2	0.22	Frozen
EX2301_CTD001_B08	04/15/2023 2:27:29	153	2	0.22	Frozen
EX2301_CTD001_B09	04/15/2023 2:31:55	64	2	0.22	Frozen

EX2301_CTD001_B10	04/15/2023 2:32:01	64	2	0.22	Frozen
EX2301_CTD001_B11	04/15/2023 2:35:50	6	2	0.22	Frozen
EX2301_CTD001_B12	04/15/2023 2:35:50	6	2	0.22	Frozen
EX2301_CTD001_B01_b	04/15/2023 2:01:17	1000	1	0.45	DNA/RNA Shield
EX2301_CTD001_B02_b	04/15/2023 2:01:24	1000	1	0.45	DNA/RNA Shield
EX2301_CTD001_B03_b	04/15/2023 2:08:38	801	1	0.45	DNA/RNA Shield
EX2301_CTD001_B04_b	04/15/2023 2:08:44	801	1	0.45	DNA/RNA Shield
EX2301_CTD001_B05_b	04/15/2023 2:21:29	303	1	0.45	DNA/RNA Shield
EX2301_CTD001_B06_b	04/15/2023 2:21:35	303	1	0.45	DNA/RNA Shield
EX2301_CTD001_B07_b	04/15/2023 2:27:21	153	1	0.45	DNA/RNA Shield
EX2301_CTD001_B08_b	04/15/2023 2:27:29	153	1	0.45	DNA/RNA Shield
EX2301_CTD001_B09_b	04/15/2023 2:31:55	64	1	0.45	DNA/RNA Shield
EX2301_CTD001_B10_b	04/15/2023 2:32:01	64	1	0.45	DNA/RNA Shield
EX2301_CTD001_B11_b	04/15/2023 2:35:50	6	1	0.45	DNA/RNA Shield
EX2301_CTD001_B12_b	04/15/2023 2:35:50	6	1	0.45	DNA/RNA Shield
EX2301_CTD001_B01_c	04/15/2023 2:01:17	1000	1	0.45	Frozen
EX2301_CTD001_B02_c	04/15/2023 2:01:24	1000	1	0.45	Frozen
EX2301_CTD001_B03_c	04/15/2023 2:08:38	801	1	0.45	Frozen
EX2301_CTD001_B04_c	04/15/2023 2:08:44	801	1	0.45	Frozen
EX2301_CTD001_B05_c	04/15/2023 2:21:29	303	0.6*	0.45	Frozen
EX2301_CTD001_B06_c	04/15/2023 2:21:35	303	1	0.45	Frozen
EX2301_CTD001_B07_c	04/15/2023 2:27:21	153	1	0.45	Frozen
EX2301_CTD001_B08_c	04/15/2023 2:27:29	153	1	0.45	Frozen

EX2301_CTD001_B09_c	04/15/2023 2:31:55	64	1	0.45	Frozen
EX2301_CTD001_B10_c	04/15/2023 2:32:01	64	1	0.45	Frozen
EX2301_CTD001_B11_c	04/15/2023 2:35:50	6	0.5*	0.45	Frozen
EX2301_CTD001_B12_c	04/15/2023 2:35:50	6	1	0.45	Frozen

\*Insufficient volume of water in Niskins to filter a full 1L volume

**Direct inquiries to:**

NOAA Ocean Exploration

1315 East-West Highway (SSMC3 2nd Floor)

Silver Spring, MD 20910

[ex.expeditioncoordinator@noaa.gov](mailto:ex.expeditioncoordinator@noaa.gov)