# CTD casts collected at station Kahe and ALOHA between June 15 and June 24, 2019 onboard R/V Kilo Moana cruise KM1910.

**Website**: https://www.bco-dmo.org/dataset/854106
**Data Type**: Cruise Results
**Version**: 1
**Version Date**: 2022-01-12

**Project**
» EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)

| Contributors | Affiliation | Role |
|---|---|---|
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**Abstract**
CTD hydrocast data from KM1910. Dataset includes up- and down-cast vertical profiles of pressure, temperature, salinity, dissolved oxygen, chloropigment fluorescence, beam transmissometry, and photosynthetically active radiation from all CTD rosette casts conducted during the cruise (22 discrete casts).

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## Coverage

**Spatial Extent**: **N**:22.8327 **E**:-157.922 **S**:21.3433 **W**:-158.424
**Temporal Extent**: 2019-06-16 - 2019-06-24

### Acquisition Description

The CTD rosette package consisted of a 24-place carousel and an aluminum rosette frame equipped with 24 12-L PVC bottles. The CTD and rosette were deployed on a 3-conductor cable (0.322 cm) collecting data at 24 Hz. Raw data were stored on both a shipboard server and laptop computer.

The CTD rosette was equipped with: SeaBird CTD (conductivity, temperature, depth), SeaPoint chlorophyll fluorometer, SBE dissolved oxygen, beam tranmissometer (C-star) and PAR sensor.

### Processing Description

CTD data were processed and quality controlled following Hawaii Ocean Time-series protocols.

CTD data were quality controlled and screened for spikes when the CTD rosette speed was less than 0.25 m s-1 or its acceleration was greater than 0.25 m s. Data were averaged into 2 dbar pressure bins.

CTD-based dissolved oxygen measurements were calibrated to discrete oxygen samples measured on the ship by Winkler titration. Discrete bottle oxygen samples were collected and analyzed using a computer-controlled potentiometric end-point titration procedure. Precision of the Winkler titration method averages ~0.2%. The calibration procedure consists of fitting a non-linear equation to the CTD oxygen current and oxygen temperature.

Similarly, the SeaPoint fluorescence measurements were calibrated, post-cruise, to discrete bottle samples collected from selected hydrocasts. CTD sensor drift was corrected via calibration with bottle fluorometric chlorophyll a plus accessory pheopigments analyzed at the shore based laboratory using a Turner Designs Model 10-AU fluorometer. A linear relationship of the form, Vchl = b·Vfluor + a, was used to convert all fluorescence data to chloropigment.

BCO-DMO Processing Description:

* Merged all individual CTD files
* Combined CTD files with the eventlog, adding the latitude, longitude, times, cast number, station number and event number.
* Converted times to ISO format and Zulu times (HST to UTC time).
* Adjusted column names to comply with database requirements.

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## Related Publications

Karl, D., Winn, C., Hebel, D., and Letelier, R. HAWAII OCEAN TIME-SERIES PROGRAM FIELD AND LABORATORY PROTOCOLS. https://hahana.soest.hawaii.edu/hot/protocols/protocols.html#
*Methods*

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| event_id | Cruise number (KM1910), Station number, CTD Cast number | unitless |
| ctd_direction | Up or down cast | unitless |
| event_number | Cruise event number | unitless |
| station_number | Station 1 = Kahe, Station 2= ALOHA | unitless |
| cast_number | CTD cast number | unitless |
| latitude_in | Latitude at beginning of CTD cast, south is negative | decimal degrees |
| longitude_out | Longitude at end of CTD cast, west is negative | decimal degrees |
| ISO_DateTime_UTC_In | Date/Time (UTC) at beginning of CTD cast in ISO format (YYYY-MM-DDTHH:MMZ) | unitless |
| ISO_DateTime_UTC_Out | Date/Time (UTC) at end of CTD cast in ISO format (YYYY-MM-DDTHH:MMZ) | unitless |
| CHLPIG | Chloropigment | micrograms/L |
| CTDPRS | Pressure | decibar |
| CTDTMP | Temperature | ITS-90 |
| CTDSA | Salinity | PSS-78 |
| CTDOXY | Dissolved Oxygen | umole/L |
| PAR | Photosynthetically active radiation | Volts |
| BEAM_AT | Beam transmission | per meter |
| XMISS | Percent transmission | percentage (%) |
| NUMBER | Number of observations | unitless |
| QUALT1 | Quality flags | unitless |

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## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | Temperature Probe – SBE Model 3-02/F (dual) |
| **Generic Instrument Name** | Sea-Bird SBE-3 Temperature Sensor |
| **Dataset-specific Description** | Temperature Probe – SBE Model 3-02/F (dual) |
| **Generic Instrument Description** | The SBE-3 is a slow response, frequency output temperature sensor manufactured by Sea-Bird Electronics, Inc. (Bellevue, Washington, USA). It has an initial accuracy of +/- 0.001 degrees Celsius with a stability of +/- 0.002 degrees Celsius per year and measures seawater temperature in the range of -5.0 to +35 degrees Celsius. more information from Sea-Bird Electronics |

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|---|---|
| **Dataset-specific Instrument Name** | Conductivity Sensor - SBE Model 4-02/0 (dual) |
| **Generic Instrument Name** | Sea-Bird SBE-4 Conductivity Sensor |
| **Dataset-specific Description** | Conductivity Sensor - SBE Model 4-02/0 (dual) |
| **Generic Instrument Description** | The Sea-Bird SBE-4 conductivity sensor is a modular, self-contained instrument that measures conductivity from 0 to 7 Siemens/meter. The sensors (Version 2; S/N 2000 and higher) have electrically isolated power circuits and optically coupled outputs to eliminate any possibility of noise and corrosion caused by ground loops. The sensing element is a cylindrical, flow-through, borosilicate glass cell with three internal platinum electrodes. Because the outer electrodes are connected together, electric fields are confined inside the cell, making the measured resistance (and instrument calibration) independent of calibration bath size or proximity to protective cages or other objects. |

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| **Dataset-specific Instrument Name** | Conductivity Sensor - SBE Model 4-02/0 (dual) |
| **Generic Instrument Name** | Sea-Bird SBE 43 Dissolved Oxygen Sensor |
| **Dataset-specific Description** | Conductivity Sensor - SBE Model 4-02/0 (dual) |
| **Generic Instrument Description** | The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics |

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| **Dataset-specific Instrument Name** | Wetlabs C-Star 25cm |
| **Generic Instrument Name** | Wet Labs CSTAR Transmissometer |
| **Dataset-specific Description** | Wetlabs C-Star 25cm |
| **Generic Instrument Description** | A highly integrated opto-electronic design to provide a low cost, compact solution for underwater measurements of beam transmittance. The instrument is capable of either free space measurements, or through the use of an optical flow tube, flow-through sampling with a pump. It can be used in profiling, moored, or underway applications. more information from Wet Labs |

| | |
|---|---|
| **Dataset-specific Instrument Name** | Biospherical QSP-2300 Log Scalar PAR sensor |
| **Generic Instrument Name** | Biospherical PAR sensor |
| **Generic Instrument Description** | UnSpec Biospherical PAR.  An irradiance sensor, designed to measure Photosynthetically Active Radiation (PAR). |

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## Deployments

**KM1910**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/841636 |
| **Platform** | R/V Kilo Moana |
| **Report** | https://datadocs.bco-dmo.org/docs/305/Chief_Sci_KM1910/data_docs/matt_church_EAGER_cruise_plan_06_17_2019.pdf |
| **Start Date** | 2019-06-15 |
| **End Date** | 2019-06-24 |
| **Description** | NSF Chief Scientist Training Cruise. For more information, see Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/KM1910 (cruise DOI: 10.7284/908380) |

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## Project Information

**EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)**

**Coverage**: Station ALOHA (22.75N, 158W), North Pacific Ocean

*NSF Award Abstract:*

Intellectual Merit
The PIs request funds to provide training in leading and organizing research cruises to early career researchers in the areas of Biological and Chemical Oceanography. Participants in this training program would be introduced to pre-cruise planning and logistics, receive training in commonly used oceanographic sampling equipment, and conduct shipboard measurements during a 10-day oceanographic cruise to the North Pacific Subtropical Gyre (NPSG). The goal of this training program is to prepare early career scientists for leading and participating in interdisciplinary oceanographic research at sea.

Broader Impacts
The proposed program addresses the broader impacts criteria successfully. The research cruise and follow-up reports and publications focus on interdisciplinary questions important for advancing the field. Given the rapid changes that oceanic systems are undergoing, it is important to have a cadre of junior scientists who are adept at managing interdisciplinary collaborations and conducting research at sea. The PIs are considering ways to connect with diverse audiences in recruiting participants. The impact on early career oceanographers will be very strong. This will create an experience that will be a major impact on the careers of the trainees, especially if they stay in the oceanography field.

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## Funding

| Funding Source | Award |
|---|---|
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1911831 |

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