CTD Niskin bottle data from research cruises FKt230602 and Fkt231202 on R/V Falkor (too) in the Central Eastern Pacific Ocean, offshore Costa Rica from June to December 2023

Website: https://www.bco-dmo.org/dataset/995434
Data Type: Cruise Results
Version: 1
Version Date: 2026-03-27

Project
» Octopus Odyssey (OctoOdyssey)

Program
» Crustal Ocean Biosphere Research Accelerator (COBRA)

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Abstract
This dataset includes water sample data collected using a CTD Niskin Rosette during two Octopus Odyssey expeditions aboard R/V Falkor (too) in June and December 2023. The dataset covers sampling events at Dorado Outcrop and Pampa Submarina, a hydrothermally active area off Costa Rica's Pacific margin. The dataset includes parameters such as sample type, cruise number, station number, cast number, depth, sample code, temperature, salinity, and oxygen concentrations, along with associated observational notes. The data were collected using a CTD rosette with 24 Niskin bottles, which were descended to various depths to assess hydrographic conditions in the region, contributing to a better understanding of hydrography, ecology, and water column dynamics. The research was conducted by an international team in collaboration with Costa Rican institutions, and the dataset is instrumental in oceanographic studies related to seamount ecosystems and fluid circulation.

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Coverage

Location: Pampa Submarina off-shore Costa Rica

Spatial Extent: **N**:9.2406 **E**:-85.643 **S**:8.6202 **W**:-87.3238
Temporal Extent: 2023-06-03 - 2023-12-10

Methods & Sampling

The Schmidt Ocean Institute (SOI) CTD-Rosette sampler was used to conduct full-depth water column profiles. Water samples were taken from the Niskins for analysis of phytoplankton, carbonate chemistry, and nutrients. These data will be made available as separate datasets.

The system did not show any inconsistency except for some spikes in the Conductivity sensor 1, but this was seen only in one cast. Because of the depth range, the PAR sensor was not used. CTD data were processed according to the Ocean Best Practices protocol (CalCOFI, 2019, DOI: http://dx.doi.org/10.25607/OBP-1611), using the SBE Data Processing software (version 7.26.7) with the following steps:

1. Data Conversion
2. Window Filter
3. Filter
4. Derive TEOS-10

Water samples were taken from the Niskins for analysis of phytoplankton, carbonate chemistry, and nutrients. These data will be made available as separate datasets.

Data Processing Description

Original Sea-Bird .btl and instrument output files were processed with Sea-Bird SBE Data Processing software to convert raw sensor data into calibrated physical measurements. These were exported to .csv and then imported into Microsoft Excel, where data columns were labeled, QC-checked, consolidated into a single table with additional metadata associated to complementary analyses not in this dataset, and saved as the primary submission file. Supplemental Sea-Bird configuration .xmlcon and .bl files are included to document instrument setup.

BCO-DMO Processing Description

- Imported the original file named "CTD Niskin bottles water samples metadata collected from Fkt230602_Fkt231202 onboard Falkor (too) from June_December 2023_SCS.csv" into the BCO-DMO system.
- Replaced commas with periods (decimal separator fix) in fields: Depth, Lat, Long, T (ºC), Sal (g/kg), O2 (umol/kg), and O2 2 (umol/kg).
- Renamed fields to comply with BCO-DMO naming conventions.
- Replaced non-standard character "á" with "a" in the Responsible field.
- Converted positive Long values to negative to correct longitude sign.
- Saved the final file as "995434_v1_ctd_niskin_fkt_june_dec_2023.csv".

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Related Publications

CalCOFI (2019). CTD Data Processing Protocol. California Cooperative Oceanic Fisheries Investigation. https://doi.org/10.25607/OBP-1611
Methods

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Parameters

Parameter	Description	Units

Sample_Type	The type of sample being collected; "Rosette" = CTD Niskin Rosette	unitless
Cruise_Number	Identifier for the research cruise or expedition	unitless
Station	The specific station where the sample was collected	unitless
ISO_DateTime_UTC	Date and time (UTC) of sample collection in ISO 8601 format	unitless
Date	Date of sample collection	unitless
TimeUTC	Time (UTC) of sample collection	unitless
Cast	The specific event of lowering and raising of the CTD (Conductivity, Temperature, and Depth) instrument to gather data at different depths, known as a "cast."	unitless
Depth	The depth at which the sample was collected	meters (m)
Subsample	An identifier for any subset or portion of the original sample that is taken for further analysis or specific testing. DIC = Dissolved Inorganic Carbon; Fito=Phytoplankton; NUT=Nutrients; MBIO=Microbial metagenomics; MICP=Microplastics 1st expedition; MP=Microplastics 2nd expedition; TA=Total Alkalinity.	unitless
Sample_code	A unique code used to identify the sample for tracking and cataloging purposes in the lab or database	unitless
Observations	Treatment/handling descriptor	unitless
Responsible	The person or group in charge of taking or analyzing the sample	unitless
Bottle	The number associated with the specific bottle or container that holds the sample, used for identification	unitless
Lat	Latitude of the sampling location, indicating the geographic coordinate of where the sample was collected	decimal degrees
Long	Longitude of the sampling location, specifying the east-west position of the sampling point.	decimal degrees
T	The temperature of the sample	degrees Celsius

Sal	The salinity of the sample	grams per kilogram (g/kg)
O2	The concentration of dissolved oxygen in the sample	micromoles per kilogram (umol/kg)
O2_2	A secondary measurement of the oxygen concentration	micromoles per kilogram (umol/kg)

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Instruments

Dataset-specific Instrument Name	Altimeter
Generic Instrument Name	Altimeter
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
Generic Instrument Description	An instrument that measures height above a fixed surface. The data can be used to map ocean-surface topography and generate gridded surface height fields.

Dataset-specific Instrument Name	Sea-Bird Electronics 911plus CTD
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	SBE 3+
Generic Instrument Name	Sea-Bird SBE 3plus Temperature Sensor
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
Generic Instrument Description	The Sea-Bird SBE 3plus water temperature sensor is designed for use on the SBE 9plus CTD system. The sensor operates over the range -5 to +35 °C, a resolution of 0.0003 °C at 24 Hz and an initial accuracy of ± 0.001 °C. The typical sampling rate is 24 Hz, and the sensor has a depth rating of 6800 meters (aluminium housing) or 10500 meters (titanium housing).

Dataset-specific Instrument Name	SBE 43
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
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

Dataset-specific Instrument Name	SBE 4
Generic Instrument Name	Sea-Bird SBE-4 Conductivity Sensor
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
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.

Dataset-specific Instrument Name	WetLabs ECO FLNTUD
Generic Instrument Name	Sea-Bird WETLabs ECO FLNTU(RT)D combined fluorometer and turbidity sensor
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
Generic Instrument Description	This optical sensor is available in combinations of backscattering, turbidity, and fluorescence measurements. It records in real-time and does not store data. ECOs feature optional active anti-fouling and internal batteries for long-term deployments. This instrument has a user-selectable sample rate up to 8 Hz The fluorometer can typically measure pigment concentrations in the range 0-75 ug/l, with a sensitivity of 0.037 ug/l, at wavelengths of 470 or 695 nm. The turbidity sensor can measure within the range 0-200 NTU, with a sensitivity of 0.098 NTU, at a wavelength of 700 nm. The instrument is stable over a temperature range of 0-30 degC and is rated to a depth of 6000 m.

Dataset-specific Instrument Name	WetLabs C-star
Generic Instrument Name	WET Labs {Sea-Bird WETLabs} C-Star transmissometer
Dataset-specific Description	The system used was a Sea-Bird Electronics 911plus CTD system on a rosette carrying 24 twelve-liter Niskin Bottles with: Two temperature sensors (SBE 3+), Two conductivity sensors (SBE 4), Two dissolved oxygen sensors (SBE 43), Fluorometer (chlorophyll a)/Turbidity Meter (WetLabs ECO FLNTUD), Transmissometer (WetLabs C-star), Altimeter.
Generic Instrument Description	The C-Star transmissometer has a novel monolithic housing with a highly intgrated opto-electronic design to provide a low cost, compact solution for underwater measurements of beam transmittance. The C-Star is capable of free space measurements or flow-through sampling when used with a pump and optical flow tubes. The sensor can be used in profiling, moored, or underway applications. Available with a 6000 m depth rating. More information on Sea-Bird website: https://www.seabird.com/c-star-transmissometer/product?id=60762467717

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Deployments

FKt230602

Website	https://www.bco-dmo.org/deployment/935537
Platform	R/V Falkor (too)
Start Date	2023-06-01
End Date	2023-06-22
Description	Operator: Schmidt Ocean Institute Project Octopus Odyssey Start Port: Puntarenas, Costa Rica End Port: Puntarenas, Costa Rica See additional information at R2R: https://www.rvdata.us/search/cruise/FKt230602

FKt231202

Website	https://www.bco-dmo.org/deployment/935539
Platform	R/V Falkor (too)
Start Date	2023-12-02
End Date	2023-12-15
Description	Operator: Schmidt Ocean Institute Project: Octopus Odyssey (Too) Start Port: Balboa, Panama End Port: Golfito, Costa Rica See additional information at R2R: https://www.rvdata.us/search/cruise/FKt231202

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Project Information

Octopus Odyssey (OctoOdyssey)

Website: https://schmidtocean.org/cruise/octopus-odyssey/

Coverage: Central Eastern Pacific offshore Costa Rica

Brief Overview:
The first Octopus Odyssey expedition took place from June 2 to June 21, 2023 on R/V Falkor (too). The second expedition, Octopus Odyssey (too) took place from December 2 to December 15, 2023. Both expeditions explored The Dorado Outcrop, one of Costa Rica's "Off-Axis seamounts on the complex Cocos Plate. These two cruises featured early career training activities and international capacity-sharing elements that were integrated into the NSF-funded COBRA program. In addition to the NSF award, this project was also supported by Schmidt Ocean Institute, Blue Nature Alliance, and Bigelow Laboratory for Ocean Sciences.

More information is available from Schmidt Ocean Institute at:
https://schmidtocean.org/cruise/octopus-odyssey/
and
https://schmidtocean.org/cruise/octopus-odyssey-too/

Detailed Description:
Seamount ecosystems support highly diverse animal communities on the seafloor and the surrounding ocean, yet the diversity, connectivity and ecosystem services of these environments is poorly understood. The Pacific Ocean margin of Costa Rica contains a range of seamount habitats, from the rough terrain of the southwestern margin to the sparser terrain of the northwest margin. While the southwestern terrain has previously been surveyed (including by R/V Falkor in 2019) and some seamount areas are already protected, far less is known about the ecosystems of the northwestern terrain. In 2013/2014 unique animal behaviors and hydrothermal venting were discovered using ROV Jason and HOV Alvin on a small feature in the northwestern terrain. Namely, extensive aggregations of octopus were observed at a place called the Dorado Outcrop, located in areas of diffuse venting of slightly warmed hydrothermal fluids. At the time of discovery, it was unclear if these aggregations could be considered nurseries, since no viable eggs were observed with brooding mothers.

Two expeditions of the RV Falkor (too) were planned for 2023 to return to this region to ask new questions about the connection of life, rocks, and fluids around these seafloor features. The team wanted to answer questions, such as:

- Are there viable octopus nurseries hosted on seamounts offshore Costa Rica?
- If yes, are the octopus nurseries active at a different time of year?
- Do octopus brooding in hydrothermal springs have different microbiomes as compared to other octopus, and are those microbiomes connected to the microbes in the hydrothermal springs or surrounding rocks?
- Are the hydrothermal spring fluids unique, representing different trends in fluid-rock-life reactions, or do they represent a single altered fluid?
- Are there seasonal trends in biodiversity on the seafloor or in the water above?

In June of 2023, an international team traveled to this region aboard R/V Falkor (too) for the Octopus Odyssey Leg 1 expedition Fkt230602 with a major goal to determine if the eggs at the nursery were viable, as past expeditions to the outcrop had never seen evidence of developing embryos. From 2-21 June 2023, we conducted 14 dives with ROV SuBastian to explore six seafloor features (only one of which had ever been explored before), augmented by 13 full-water-column CTD Niskin Rosette casts and six multibeam surveys. We had roughly 229 hours of ROV operations in the water (172 hours on the seafloor + 57 hours of ascent/descent), resulting in 208 hours of video. The longest ROV dive was approximately 35 hours and the deepest depth of ROV exploration was 3178 m. We had 285 sampling events during the ROV dives: 150 primary biological specimens (plus associates), 66 sediment push cores, 28 ROV Niskin samples of bottom water, 13 squeezer fluid samples, 30 rock samples. This also included deployments of 22 different experiments planned for recovery in December 2023, and recovery of 2 experiments from the Dorado Outcrop deployed in 2014. We also conducted 31 video transects. Operations went very smoothly, although some transit between sites had to be diverted due to long line fishing in the area, and one medical evacuation required transit to port before returning to site. On the first ROV dive at the nursery in June, we witnessed baby octopus hatching, confirming our primary hypothesis that there are viable octopus nurseries in this region. We also found the fifth known octopus nursery in the world on a different seafloor feature 30 nautical miles away. Exploration of the six seafloor features on the expedition revealed an incredibly rich biodiversity and biogeography of life on ancient volcanoes offshore Costa Rica. We also documented additional evidence of the hydrogeology of the region – how water moves in, out, and through oceanic crust. This data can inform why volcanoes and earthquakes in Costa Rica vary as different types of seamounts and oceanic crust subducts beneath overriding plates.

In December 2023, the Octopus Odyssey (too) Leg 2 team returned to this region on RV Falkor (too) on expedition Fkt231202 to ask new questions about biodiversity in the region and to recover experiments to track the hydrogeology of the area. From 1-15 December 2023, Octopus Odyssey (too) conducted twelve full-ocean depth ROV dives with ROV SuBastian, augmented by five full-ocean depth CTD Niskin Rosette casts, and multibeam operations resulting in 7416 km2 of coverage in Costa Rican waters. We had roughly 104 hours of ROV operations (55 hours on the seafloor + 49 hours of ascent/descent). This has resulted in approximately 141 hours of video. The longest ROV dive was a little over 16 hours and the deepest depth of ROV exploration was 3179 mbsl. We had 241 sampling events with the ROV in the water: 93 primary biological specimens, 14 sediment push cores, 21 ROV Niskin samples, 20 rock samples, and 51 fluid samples collected with a third-party SUPR sampler. On the ship, we collected an additional 66 secondary associate biological samples from primary specimens, bringing the total number of samples to 307 (this does not include subsamples). We also conducted 23 video transects. For the most part, our operations went according to schedule. No ROV operations were ended early due to operational issues, although one dive was aborted on launch due to a ground fault in a third-party instrument; this was quickly resolved and the dive restarted. One dive ended early due to a fishing long-line drifting towards the vessel; we recovered early then re-dove on the site after the long-line passed by. Communications with fishing boats and the fisheries ministry, enabled by the Berth-of-Opportunity Observer from Instituto Costarricense de Pesca y Acuacultura (INCOPESCA), helped prevent further issues in the area. The biggest finding of the return expedition was confirmation that the octopus nurseries offshore Costa Rica support baby octopus throughout the year, not just in the summer rainy season. Scientists onboard witnessed spectacular scenes of the first moments of life, as baby octopus emerged from their eggs, including traveling with one hatchling for an epic journey over 150 m up into the water. Immature eggs were also observed to have tiny octopus embryos inside. Having two expeditions to the same region in one year was essential for confirming this finding. Moreover, the seamounts offshore Costa Rica support at least four new species of deep-sea octopuses, based on the collection of specimens from both Octopus Odyssey expeditions in June and December 2023. This is an unprecedented biodiversity of octopus in this small area especially at these depths.

Equally as important as achieving the scientific objectives was the objective to continue the theme of capacity sharing, early career development, and raising awareness of deep-sea heritage in Latin America. The international Octopus Odyssey and Octopus Odyssey (too) teams gathered to achieve collaborative co-production of knowledge and training with Costa Ricans, honoring the work in Costa Rica’s waters. Spanish-speaking scientists were given priority for dive lead watches to enable livestream narration in Spanish, and priority for leadership experience. Ship-to-shore engagements were also prioritized for Spanish-speaking audiences, particularly in Costa Rica. These efforts were intended to raise the profile of the deep-sea heritage in Costa Rica ahead of the 2024 UN Ocean Conference meeting taking place in Costa Rica in June 2024. Over 300 biological specimens collected on the two expeditions are archived at the Museum of Zoology at the University of Costa Rica, enabling current and future generations of students and researchers to develop expertise in regional deep-sea animals. It is likely that many of the specimens collected represent new species and new records of known species for the region. Rock and sediment samples collected on the expeditions are revolutionizing the understanding of the complex geological origins and processes occurring on this part of the seafloor. Surprisingly, initial analysis of microfossils in sediments reveals that seafloor sediments are millions-

of-years old, indicating strong currents, dissolution and scouring. In addition, fossils of beaked whales were found on numerous outcrops. All microfossils and macrofossils are archived in the Paleontology collection at the Central American School of Geology at the University of Costa Rica for continued study, with additional mineralogical samples shared with the Global Marine Minerals Program at the U.S. Geological Society. Finally, bathymetric and subbottom profile mapping data conducted on the OctoOdyssey expeditions was used to define the diverse seafloor features in this region to then propose official names to GEBCO. This naming effort is being led by Costa Rican scientists in consultation with the Costa Rican Committee on Nomenclature; the new proposed names were unanimously approved by the committee and will now be included on Costa Rican maps.

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Program Information

Crustal Ocean Biosphere Research Accelerator (COBRA)

Coverage: global

NSF Abstract:
The deep seafloor covers two-thirds of Earth’s surface area, but there is limited understanding of the deep-ocean ecosystems and resources and the ability of these ecosystems to withstand human impacts. Human uses such as deep-sea mining and carbon sequestration are poised to fundamentally alter physical, chemical, and biological conditions of the seafloor and surrounding environments. These activities have the potential to rival negative effects from bottom fishing and other human impacts to the deep sea, yet the science to inform and evaluate the impacts of these new industries is lacking. The Crustal Ocean Biosphere Research Accelerator (COBRA) project connects diverse stakeholders and experts – interdisciplinary academic and government scientists, private institutions, policy makers, industry experts and other stakeholders – through virtual meetings to coordinate efforts. The goal is to generate new knowledge and inform decision-making relating to emergent industrial uses of the deep ocean and decrease the likelihood of serious harm to the environment while maintaining the broad benefits that society currently enjoys.

The COBRA network of networks has nine key partners that bring access to international science and crustal ocean exploration assets (Ocean Exploration Trust, Schmidt Ocean Institute, Ocean Networks Canada, Cluster Ocean Floor at MARUM, and C-DeepSea), to experts that provide science-based recommendations to policy makers (Deep Ocean Stewardship Initiative working groups, including the Challenger 150 program), to governmental groups responsible for assessing crustal ocean resources (USGS Global Marine Minerals Group), and to experts in team science (CREDITS program). COBRA unites these partners in a common mission to accelerate research on the structure, function, resilience, and ecosystem services of the crustal ocean biosphere to inform decision making. COBRA will help to close knowledge gaps by facilitating dedicated and coordinated expedition and observatory efforts combined with emergent characterization approaches. In parallel, COBRA will train at least 50 globally distributed early-career researchers in ocean exploration, science, and policy through innovative virtual expedition leadership training and support two dozen international research exchanges that promote team science collaboration, diversity, equity, and inclusivity. COBRA will also establish a web-based search portal that points to all data types deposited in appropriate internationally accessible data repositories to promote data discovery and accelerate knowledge transfer and collaboration.

The Accelerating Research through International Network-to-Network Collaborations (AccelNet) program is designed to accelerate the process of scientific discovery and prepare the next generation of U.S. researchers for multiteam international collaborations. The AccelNet program supports strategic linkages among U.S. research networks and complementary networks abroad that will leverage research and educational resources to tackle grand scientific challenges that require significant coordinated international efforts.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

Description:

The mission of the Crustal Ocean Biosphere Research Accelerator (COBRA) is to accelerate research on the structure, function, resilience, and ecosystem services of the crustal ocean biosphere to inform decision

making. The goal is to generate new knowledge and inform decision-making relating to emergent industrial uses of the deep ocean, such as deep-sea mining and subseafloor carbon sequestration, and decrease the likelihood of serious harm to the environment while maintaining the broad benefits that society currently enjoys. COBRA will help to close knowledge gaps by facilitating dedicated and coordinated expedition and observatory efforts combined with emergent characterization approaches. In parallel, COBRA will train at least 50 globally distributed early-career researchers in ocean exploration, science, and policy through innovative virtual expedition leadership training and support two dozen international research exchanges that promote team science collaboration, diversity, equity, and inclusivity. COBRA will also establish a web-based search portal that points to all data types deposited in appropriate internationally accessible data repositories to promote data discovery and accelerate knowledge transfer and collaboration.

Affiliated Programs:
C-DEBI, IODP, OOI, DOSI, Schmidt Ocean Institute, Ocean Exploration Trust, Ocean Networks Trust

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Funding

Funding Source	Award
NSF Office of International Science and Engineering (NSF OISE)	OISE-2114593

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