Abundance of Operational Taxonomic Units (OTU's) from images collected by the ROV/SCINI along midwater transects under the McMurdo Ice Shelf, Dec. 2008

Website: https://www.bco-dmo.org/dataset/744693
Data Type: Other Field Results
Version: 1
Version Date: 2018-08-28

Project
» Development of a Remotely Operated Vehicle for Under Sea Ice Research in Polar Environments (SCINI)

Contributors	Affiliation	Role
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Abstract
Abundance of Operational Taxonomic Units (OTU's) from images collected by the ROV/SCINI along midwater transects under the McMurdo Ice Shelf, Dec. 2008

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Coverage

Spatial Extent: **N**:-78.2167 **E**:164.2433 **S**:-78.2233 **W**:164.225
Temporal Extent: 2008-12-02 - 2008-12-06

Dataset Description

This dataset includes abundances of taxa that were observed in images taken along midwater transects under the McMurdo Ice Shelf, Antarctica during December 2008. The imagery was collected with a Remotely Operated Vehicle called the 'Submersible Capable of under Ice Navigation and Imaging' (ROV/SCINI). Transects ranged in length from 10 to 45 meters and from a depth of 10 to 183 meters.

Acquisition Description

Sites are centered at 78° 13.2'S, 164° 14.1'E, from North 500 meters north of this location, and South 500 meters south of this location, within the center of the barranca. The bottom depth was 188 m.

Depths are in meters.

Animal densities are reported as number per meter. Transect imagery was collected with the ROV SCINI. Organisms were identified to the lowest possible taxon.

Processing Description

BCO-DMO Processing:
- transposed columns to rows
- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- re-formatted date from d-Mon-yy to yyyy-mm-dd
- converted latitude and longitude to decimal degrees

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Parameters

Parameter	Description	Units
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees
date	sampling date formatted as yyyy-mm-dd	unitless
depth_m	sampling depth range	meters
replicate	replicate number	unitless
transect_length_m	length of transect	meters
Mertensiidae	abundance of Mertensiidae along the transect as identified in SCINI images	number/meter along transect
white_streak	abundance of white streaks along the transect as identified in SCINI images	number/meter along transect
Medusazoa	abundance of Medusazoa along the transect as identified in SCINI images	number/meter along transect
white_dot	abundance of white dots along the transect as identified in SCINI images	number/meter along transect
Euphausia	abundance of Euphausia along the transect as identified in SCINI images	number/meter along transect
pink_dot	abundance of pink dots along the transect as identified in SCINI images	number/meter along transect

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Instruments

Dataset-specific Instrument Name	ROV/SCINI
Generic Instrument Name	Remotely Operated Vehicle
Dataset-specific Description	Submersible Capable of under Ice Navigation and Imaging (SCINI) is a small, slender vehicle that can fit through a 20 cm hole in the ice, allowing for deployment without heavy drilling equipment and with minimal logistical support. Its maximum depth capability is 300 m. SCINI is equipped with two video cameras, scaling lasers, and lights, with forward speeds of up to 4 knots. SCINI uses Ethernet over power on a 400 m long two-wire tether. A long baseline acoustic positioning system is used for navigation which uses a combination of two to four acoustic transducers hanging below the ice and a synchronized pinger on the vehicle for positional accuracy of better than 1 meter. [See Cazenave, F, R Zook, D Carroll, M Flagg, S Kim. 2011. Development of the ROV SCINI and deployment in McMurdo Sound, Antarctica. Journal of Ocean Technology 6(3):39-58.]
Generic Instrument Description	Remotely operated underwater vehicles (ROVs) are unoccupied, highly maneuverable underwater robots operated by a person aboard a surface vessel. They are linked to the ship by a group of cables that carry electrical signals back and forth between the operator and the vehicle. Most are equipped with at least a video camera and lights. Additional equipment is commonly added to expand the vehicle's capabilities. These may include a still camera, a manipulator or cutting arm, water samplers, and instruments that measure water clarity, light penetration, and temperature. More information.

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Deployments

McMurdo_SCINI_2008

Website	https://www.bco-dmo.org/deployment/745442
Platform	McMurdo Station
Start Date	2008-12-02
End Date	2008-12-06
Description	The ROV 'Submersible Capable of under Ice Navigation and Imaging' (SCINI) was deployed on the McMurdo Ice Shelf to collect images of under-ice fauna.

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Project Information

Development of a Remotely Operated Vehicle for Under Sea Ice Research in Polar Environments (SCINI)

Coverage: McMurdo Sound, McMurdo Ice Shelf

NSF Award Abstract: In marine habitats worldwide, the zone between scuba-diving depths (to 40 m) and surge-free depths (below 200 m) has been poorly studied. Under ice-covered seas, wave motion is minimal to nonexistent, and the zone between 40 and 200 m is accessible to ROVs. Polar marine research has the benefit of stable sea ice platforms for staging and deploying instruments like ROVs, but this requires a hole that is, fo rmost ROVs, a meter in diameter. This proposal develops an ROV that can be deployed through a 15 cm hole that can be drilled with a hand-held power head, requiring minimal logistical support and technical expertise. The new ROV provides access to regions that remain unstudied, expanding our scientific reach and ability to address new questions. We will develop, test, and modify the ROV while accomplishing several overlapping and interdependent science objectives, including (1) exploration and documentation of rates and patterns of ecological succession from one of the most extreme coastal habitats in the world, (2) a survey of two unique benthic habitats and communities beyond scuba diving depths (at 40-170 m), which are almost completely unknown to most researchers and assembly of individual photographs into high-resolution images of the seafloor and (3) testing of protocols for conducting sonar mapping and creating high resolution continuous bathymetric maps of the entire seafloor around McMurdo Station. The ROV will be constructed as modules; this allows flexibility to change the ROV capabilities to suit different missions. Some components can be purchased off the shelf (e.g. VideoRay high resolution and low light video cameras), but may require development of some custom integration software. Power is provided from the surface via a 2 conductor tether; bi-

directional high speed data is modulated on the tether as well, providing 84 mbs of data and unlimited dive duration. The topside controls consist of a laptop computer and joystick for the pilot. Many of the control functions and display screens could be accessed via the Internet for educational demonstrations and interactions. Two graduate students will participate fully in the project. Several other Antarctic scientists have indicated a strong interest in utilizing this tool in their research and it will be available to a pool of users on completion of the project.

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Funding

Funding Source	Award
NSF Office of Polar Programs (formerly NSF PLR) (NSF OPP)	PLR-0619622

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