HADES-M deployment log from R/V Falkor cruise FK141109 from the Mariana Trench adjacent to Guam: approximately 12 45 N and 144 50 E to 11 25 N and 144 25 E; 2014 (HADES project)

Website: https://www.bco-dmo.org/dataset/632704
Version: 15 January 2016
Version Date: 2016-01-15

Project
» Controls on Hadal Megafaunal Community Structure: a Systematic Examination of Pressure, Food Supply, and Topography (HADES)

Contributors	Affiliation	Role
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Dataset Description

List of individual HADES-M instrument deployments during FK141109

Location:
Mariana Trench adjacent to Guam: approximately 12 45 N and 144 50 E to 11 25 N and 144 25 E

Instrument Key
CR CORE RESPIROMETER
CTD CTD
LA ABYSSAL LANDER
LH HADAL LANDER
RG ROCK GRAB
TR FISH TRAP
W WATER - SURFACE BUCKET

WT WEE TRAP

Methods & Sampling

Generated by cruise personnel

Instrument Key
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WT WEE TRAP

CORING RESPIROMETER – A free vehicle lander equipped with 4 megacore tubes that are pushed into the sediments by a drive motor after the vehicle lands on the seafloor. Each tube is equipped with an oxygen optode and water mixing pump to measure sediment community oxygen consumption in each core. Each core is trapped by a standard megacore core catching device and returned to the surface with the lander. The instrument also includes an oxygen sensor for the ambient bottom water.

CTD – Conventional CTD rosette was used to take water samples to 5000m depth at several stations.

ABYSSAL LANDER – A free vehicle lander equipped with a still image camera and baited to attract scavengers. Images were taken once every minute. It is rated to 6000m.

HADAL LANDER – A free vehicle lander equipped with a digital video camera and baited to attract scavengers. One minute of video was recorded every 2.5 or every 5 minutes. It is rated to 11000m.

FISH TRAP – A large mesh trap with two smaller PVC tube shaped amphipod traps inside that were baited to capture megafauna. It was deployed as a free vehicle lander.

WEE TRAP – Another baited trap but smaller in size than the fish trap.

Data Processing Description

BCO-DMO Processing Notes
- Generated from original file: "HADES.M deployments and samples for BCO-DMO.xlsx" contributed by Jeff Drazen
- Parameter names edited to conform to BCO-DMO naming convention found at Choosing Parameter Name
- "nd" (no data) inserted into blank cells and cells with "-"
- Dates reformatted to YYYYMMDD
- Times reformatted to HHMM

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Data Files

File
HADESM_DeployLog.csv (Comma Separated Values (.csv), 5.88 KB) MD5:8ba1bca88952f103800ed29a51dc1adf Primary data file for dataset ID 632704

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Parameters

Parameter	Description	Units
STATION	Station Number	dimensionless
LANDER	Instrument/Lander Id CR CORE RESPIROMETER CTD CTD LA ABYSSAL LANDER LH HADAL LANDER RG ROCK GRAB TR FISH TRAP W WATER - SURFACE BUCKET WT WEE TRAP	text
DATE_DEPLOYED	Date Deployed	YYYYMMDD
TIME_DEPLOYED_LOCAL	Time Deployed (Local)	HHMM
DATE_RECOVERED	Date Recovered	YYYYMMDD
TIME_RECOVERED_LOCAL	Time Recovered (Local)	HHMM
LATITUDE	Latitude (South is negative)	decimal degrees
LONGITUDE	Longitude (West is negative)	decimal degrees
MULTIBEAM_DEPTH	Multibeam Depth	meters

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Deployments

FK141109

Website	https://www.bco-dmo.org/deployment/629311
Platform	R/V Falkor
Report	https://datadocs.bco-dmo.org/d3/data_docs/Mariana_Perspectives/FK141109_Cruise_Report_JDC_2015-01-12.pdf
Start Date	2014-11-09
End Date	2014-12-09
Description	The very deepest reaches of the sea are one of the planet's last true frontiers. That's mostly because a lack of support for needed technological advancements and vehicles has severely limited access to depths beyond 7,000 meters. But the situation is finally beginning to change, and SOI is helping push the process forward. In November, the institute collaborated with a group of biologists and geologists working aboard R/V Falkor to conduct a new study of one of the deepest places in the world. The team deployed SOI's new full-ocean-depth landers—frames equipped with cameras, sensors and sample collection devices that return to the surface automatically after a set time on the seafloor—as well as three other landers, in the Mariana Trench's Sirena Deep, near Guam. The work, at depths down to almost 11,000 meters, will help answer enduring questions about the biology of such alien zones, including who lives there and how they survive the massive pressure. The research should also improve understanding of the processes that control earthquake and tsunami formation, among others geological goals. Original cruise data are available from the NSF R2R data catalog (Cruise DOI: 10.7284/900733)

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Project Information

Controls on Hadal Megafaunal Community Structure: a Systematic Examination of Pressure, Food Supply, and Topography (HADES)

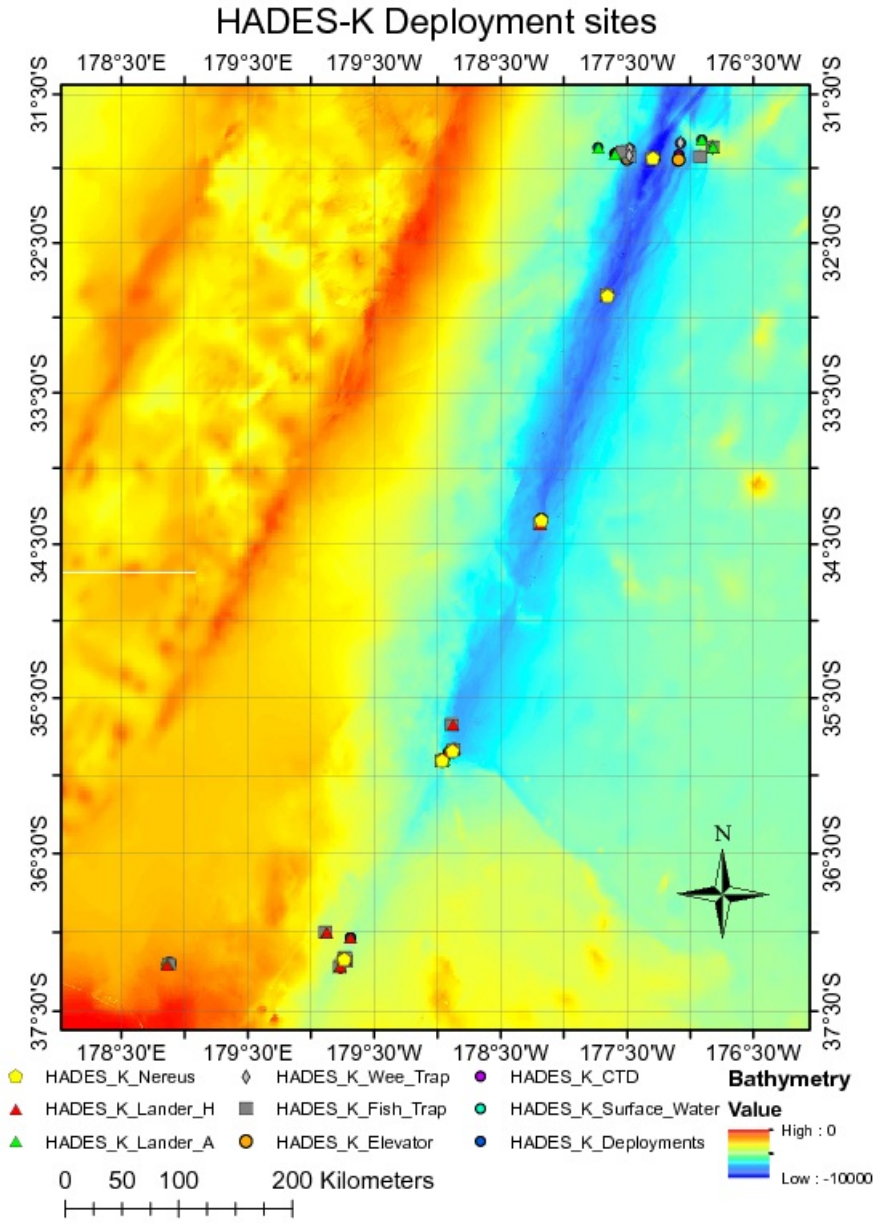
Website: http://www.whoi.edu/hades/

Coverage: Kermadec Trench adjacent to New Zealand: approximately 37 12.75 S and 178 51.43 E to 31 51.29 S and 176 49.07 W

Extracted from the NSF award abstract:

Severe technical challenges associated with the extremes of hydrostatic pressure have prevented major advances in hadal ecological studies, and relegated hadal systems to among the most poorly investigated habitats on Earth. Through this project, Hadal Ecosystems Studies (HADES) program, PIs will determine the composition and distribution of hadal species, the role of hadal pressures (piezolyte concentrations, enzyme function under pressure), food supply (distribution of POC with the abundance and biomass of trench organisms, and metabolic rates/energetic demand), and depth/topography (genetic divergence and spatial connectivity of populations) have on impacting deep-ocean community structure. This project will examine these factors using the world's first full-ocean depth hybrid remotely operated vehicle (HROV) in conjunction with the only full-ocean depth imaging lander (Hadal-Lander). This project will provide the first seafloor data and samples in one of the world's best, yet little known trenches- the Kermadec Trench (SW Pacific Ocean). Megafaunal community structure and the relationship between POC and benthic bacterial biomass will be examined as a function of depth and location by systematic high-definition imaging and sediment/faunal sampling transects from abyssal to full trench depths both along and perpendicular to the trench axis. Population genetic approaches will provide levels of genetic divergence and evolutionarily independent lineages to assess the role of depth and topography in trenches and their adjacent abyssal plain in promoting the formation of species. Physiological constraints will be investigated by examining in-situ respiration of selected fauna and tissue concentrations of such protein stabilizers as trimethylamine oxide (TMAO), and the structural adaptations of macromolecules.

Image of NEREUS Deployment Sites. [click on the image to view a larger version]



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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1131620
NSF Division of Ocean Sciences (NSF OCE)	OCE-1130712
NSF Division of Ocean Sciences (NSF OCE)	OCE-1130494
Schmidt Ocean Institute (SOI)	R/V Falkor SOI Hadal Ecosystems Studies Program

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