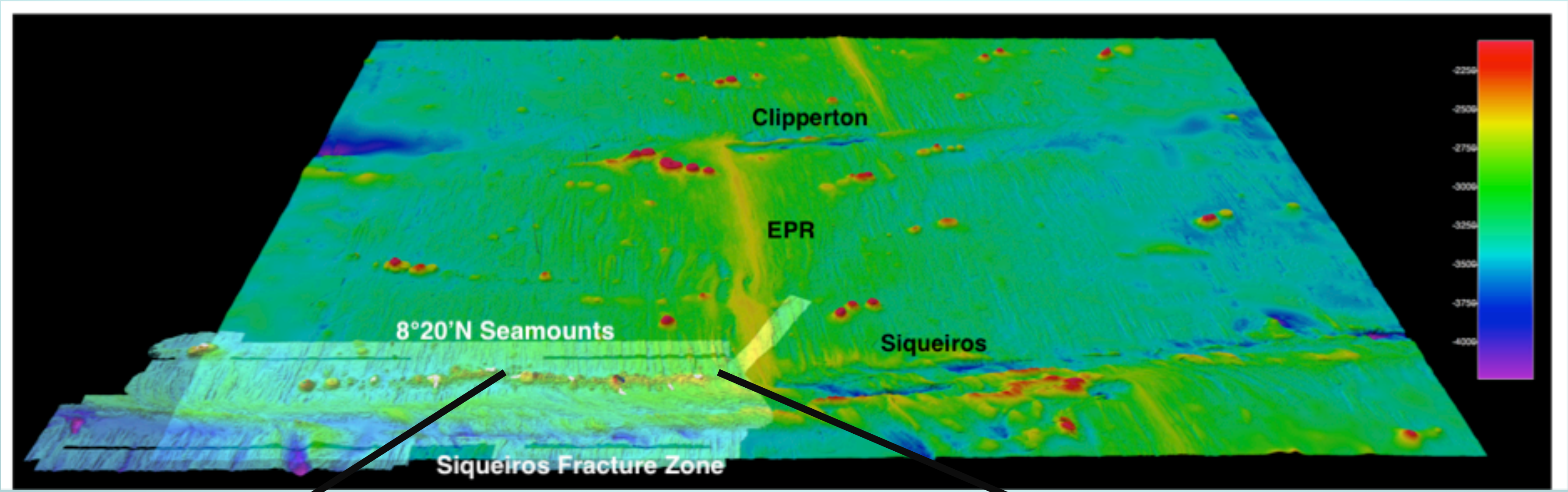
AT42-06- OASIS II
Off-Axis Seamount Investigations at Siqueiros (OASIS)

&

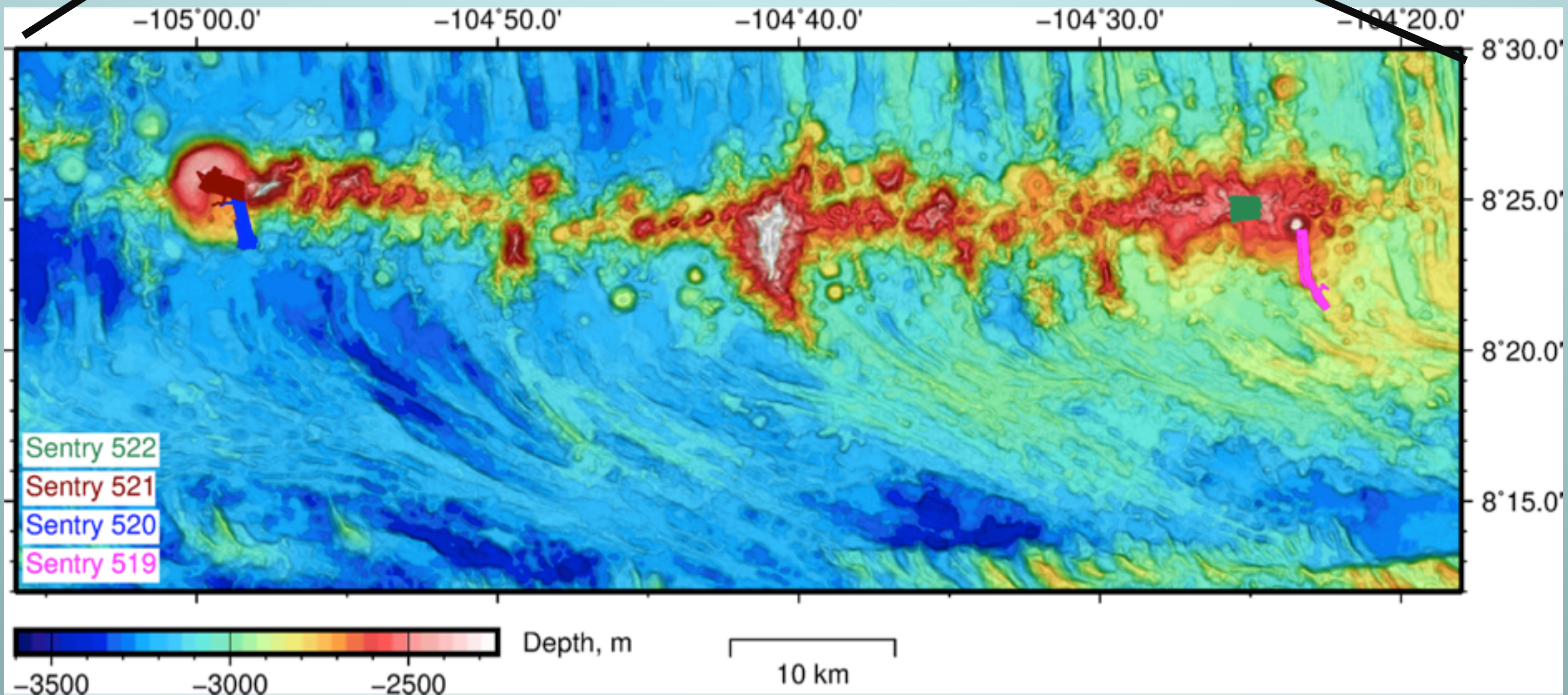
Early Career Scientist Training Cruise at EPR 9° 50′N

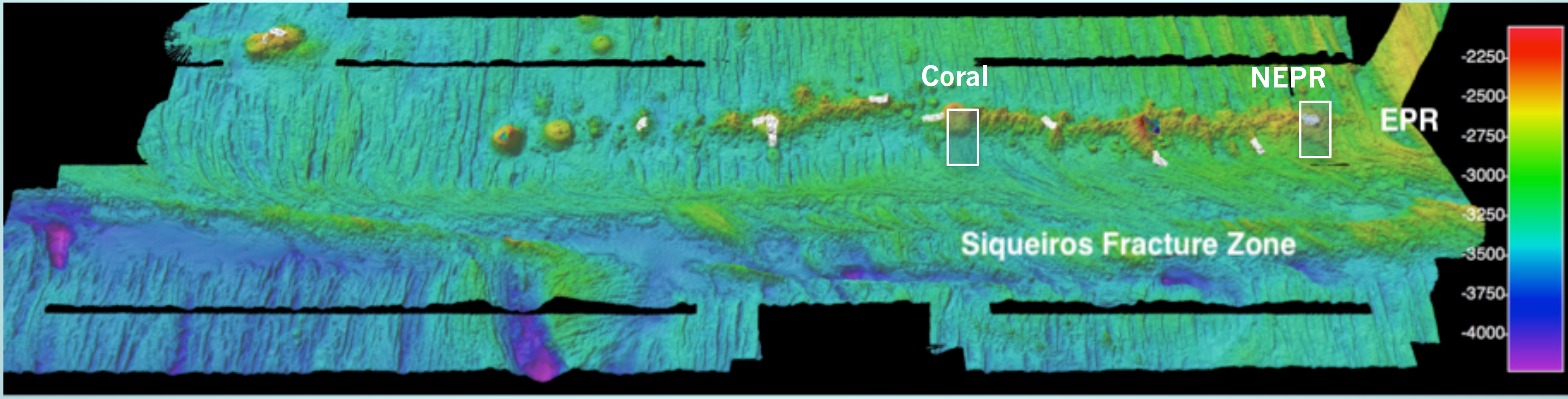
R/V Atlantis, HOV Alvin, AUV Sentry

December 3 to December 20, 2018



OASIS 2 DIVE SITES



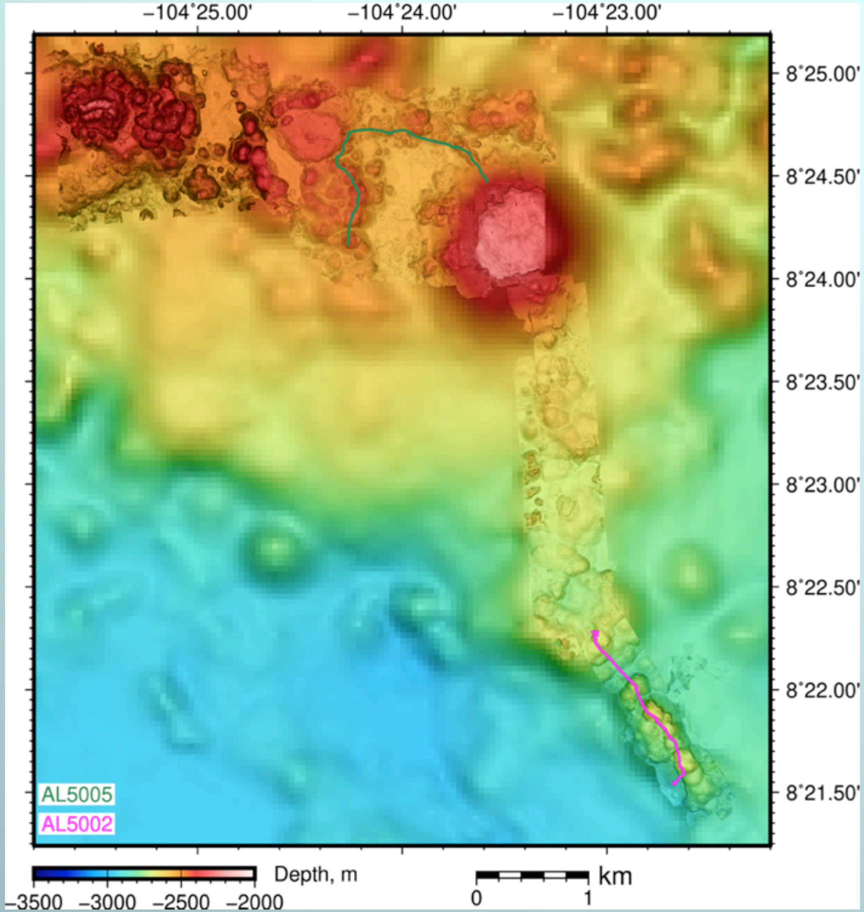


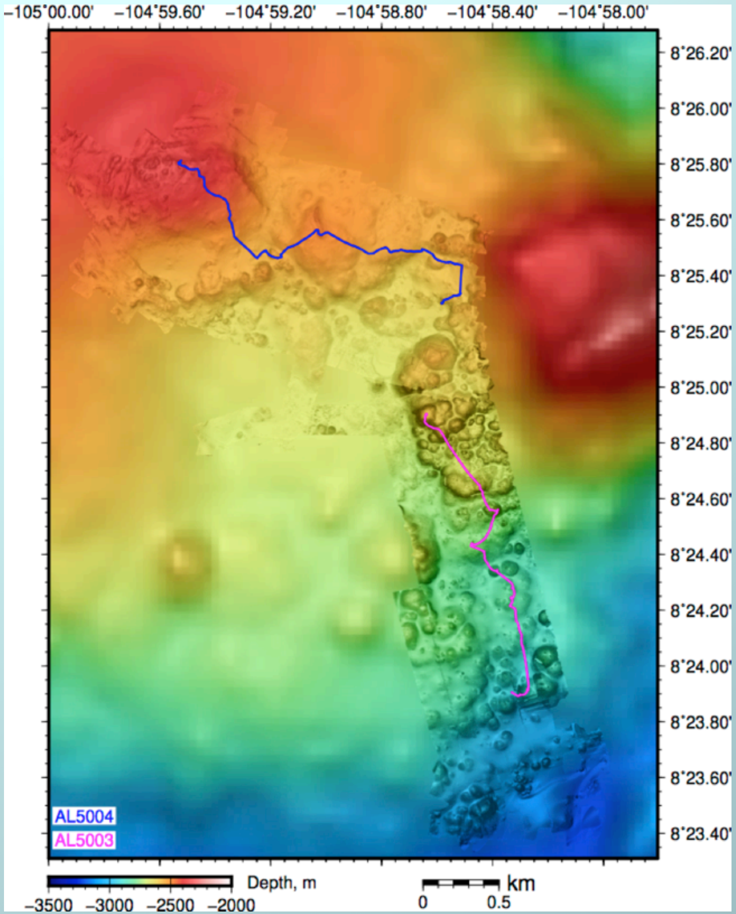
OASIS 1 DIVE SITES

OASIS 2 DIVE SITES

Dive (Site)	Start Time (UTC)	Start Location	Bottom Time	Speed (Avg)	Depth (Avg)	Alt (Avg)	Trackline Distance
Sentry519 (NEPR)	2018/12/06 04:12:18	Lat:08 22.045'N Lon:104 22.442'W	7.0hrs	0.95m/s	2616m	82m	24.37km
Sentry520 (Coral)	2018/12/07 03:08:54	Lat:08 24.808'N Lon:104 59.187'W	8.0hrs	0.95m/s	2763m	80m	27.64km
Sentry521 (Coral)	2018/12/08 01:39:59	Lat:08 24.808'N Lon:104 59.402'W	9.5hrs	0.90m/s	2455m	74m	31.18km
Sentry522 (NEPR)	2018/12/09 04:05:14	Lat:08 24.712'N Lon:104 25.480'W	7.5hrs	0.76m/s	2379m	85m	20.99km
Sentry523 (EPR)	2018/12/10 09:02:05	Lat:09 50.410'N Lon:104 17.909'W	2.9hrs	0.93m/s	2440m	67m	9.85km
Sentry524 (EPR)	2018/12/11 01:44:04	Lat:09 50.201'N Lon:104 17.805'W	10.2hrs	0.59m/s	2484m	23m	21.94km
Sentry525 (EPR)	2018/12/12 01:37:01	Lat:09 50.810'N Lon:104 17.957'W	10.3hrs	1.00m/s	2465m	67m	37.65km
Sentry526 (EPR)	2018/12/13 02:07:36	Lat:09 51.649'N Lon:104 17.203'W	9.9hrs	1.04m/s	2449m	66m	37.41km
TOTAL			**65.3hrs**				**211.03km**

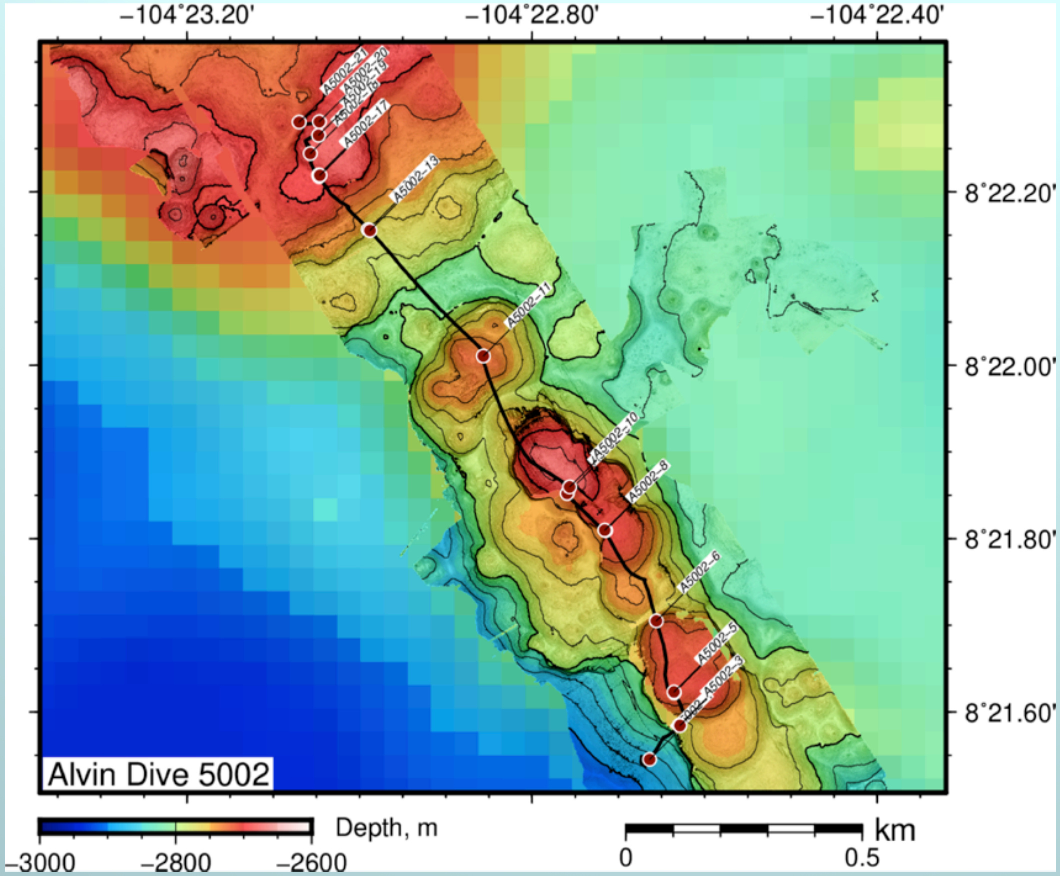
Alvin Dives – OASIS 2





Sentry maps overlaid on EM2000 bathymetry

Alvin Dive 5002 on flanks of NEPR Seamount



Sample

Summary of Rock Sampling for 8° 20'N Seamount Dives

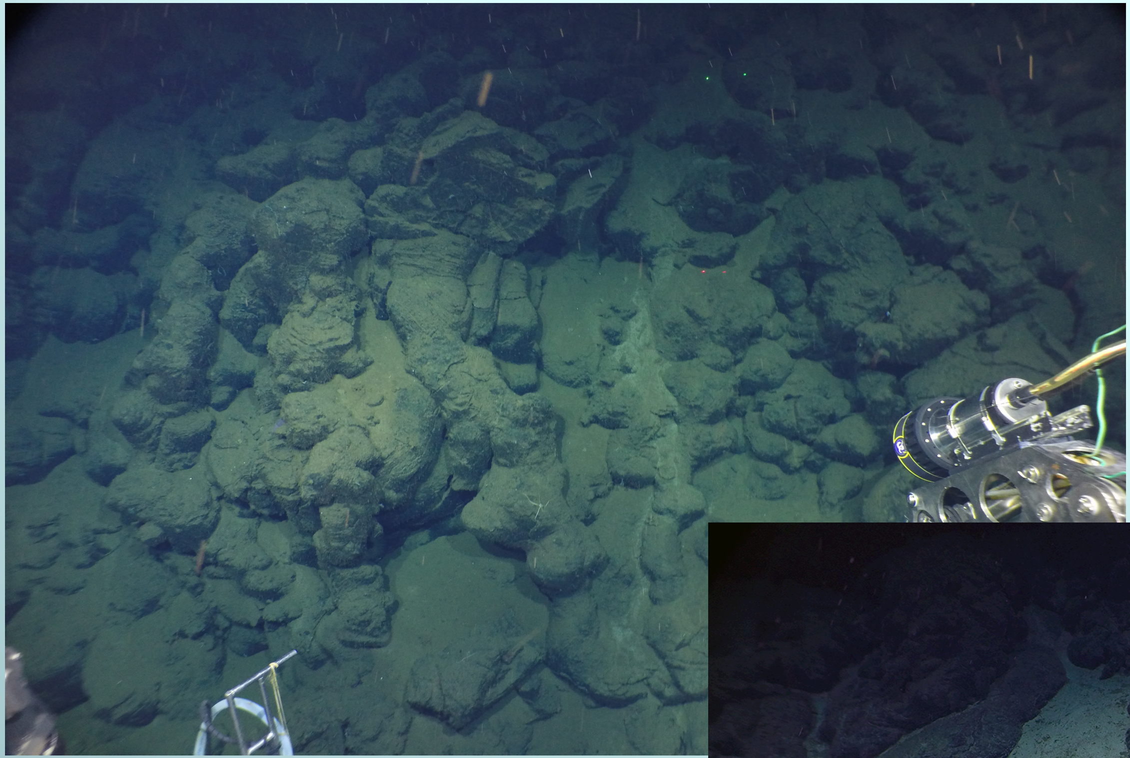
Dive 5002: 14 lava samples and 2 sediment push cores

Dive 5003: 17 lava samples, 2 push cores,1 Mn crust

Dive 5004: 7 lava samples, 2 push cores, 2 Mn pavement samples and 1 sulfide

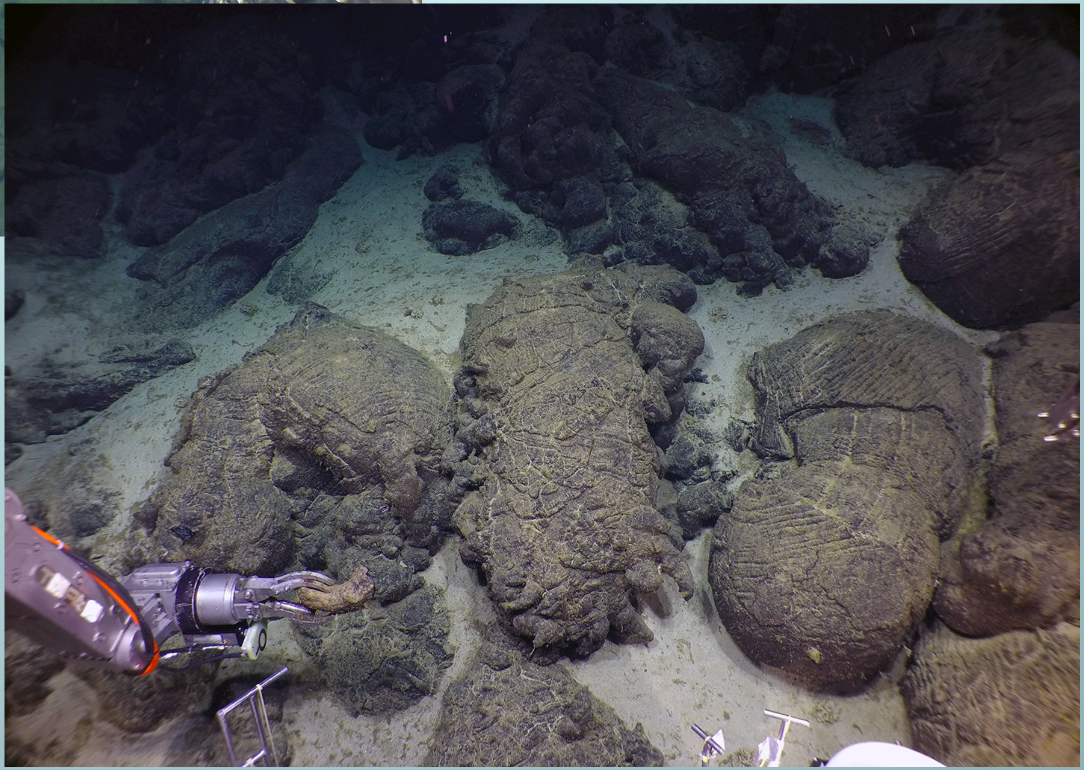
Dive 5005: 12 lava samples and 2 samples of Mn pavement.

NEPR Seamount Pillow Lavas



Base of NEPR

Summit of NEPR



GoProIMAGE

QUIESCENT IMAGING FOR DEEP-SEA SCIENCE: ADVANCES IN TECHNOLOGY AND PRODUCTIVITY

By Daniel J. Fornari – Woods Hole Oceanographic Institution
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Stacey Church – DeepSea Power & Light (DSPL)
Eli Perrone – EP Oceanographic, LLC & Ocean Imaging Systems

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Since its emergence in the 19th century, underwater imaging has been responsible for many of the discoveries and advancements in the oceanographic sciences. With over 80% of the ocean undiscovered according to the National Oceanic and Atmospheric Administration (NOAA),[1] the need for high quality underwater imaging remains true today. Mapping the seafloor, studying the geochemical processes taking place in the ocean, observing marine life, and the myriad of other research initiatives related to understanding the world's oceans all benefit from high-resolution, data-rich images. Photographic and direct observations of the ocean floor are intimately tied to understanding the dynamic and interactive physical, chemical and biological processes occurring there.

HISTORY AND TECHNOLOGICAL DEVELOPMENTS

Subsea imaging can be traced to the earliest days of underwater photography when French inventor Ernest Bazin took photographs from a diving bell in the 1860s. Nearly a century later, Harold Edgerton, an engineering professor at MIT, developed the deep-sea strobe light, providing the "sunlight" required to take photographs of the deep ocean and seafloor for the first time. That development, coupled with the engineering efforts at the Lamont Geological Observatory of Columbia University and the Woods Hole Oceanographic Institution (WHOI), led to the first generation of modern deep-sea cameras[2]. These systems were simple by today's standards, but they provided key photographic evidence of animals and seafloor features over small areas in the deep ocean.

» *Maurice "Doc" Ewing (top left) and Allyn Vine (top right) on the original RV Atlantis holding one of the first deep-sea 35 mm cameras developed in the late 1950s. (Bottom) David Owen deploying a deep-sea camera from the RV Vema in the late 1950s.*[3]

Subsea imaging capability leapt forward with the advent of digital imaging. Today, the ability to digitally image a large area and merge the constituent images together in a photomosaic provides a powerful tool for mapping and understanding the geological relationships between features of various dimensions – from centimeter scale to tens or hundreds of meters in size. Biological features on the seafloor, and the distribution of biota in different environments, also lend themselves to precision study using digital images and mosaics. Revisiting various deep-sea study areas is now common, and has been an important research theme within the US Ridge2000 Program.[4]

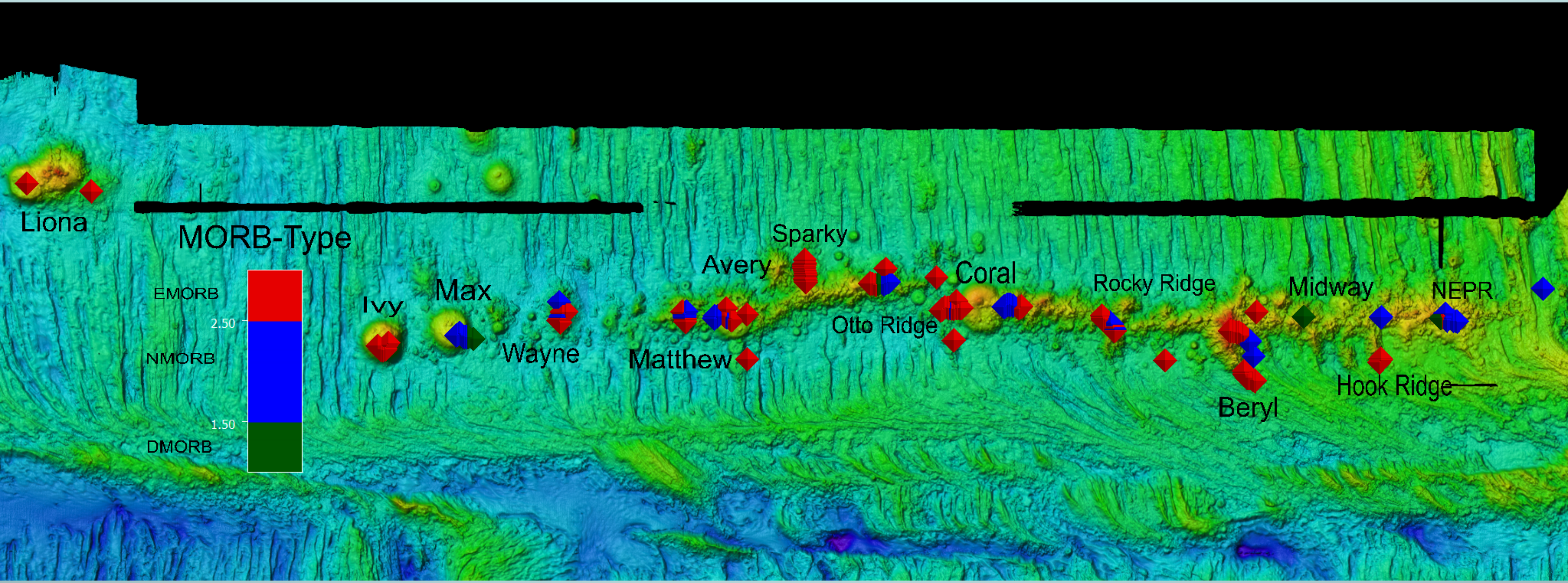
SUBSEA IMAGING AT WOODS HOLE OCEANOGRAPHIC INSTITUTION

High-resolution subsea imaging is at the core of the research performed at the Multidisciplinary Instrumentation in Support of Oceanography (MISO) Facility at the Woods Hole Oceanographic Institution (WHOI). MISO was developed with National Science Foundation – Ocean Sciences (OCE) Division funding to support US investigators requiring deep-sea digital imaging and sampling capabilities for seafloor experiments and surveys. MISO imaging systems have been used for a diverse suite of geological, biological, and biogeochemical investigations ranging from deep-sea coral studies; benthic biology traverses; hydrothermal vent research; and mid-ocean ridge and seamount volcanism, among others.

The WHOI-MISO Towed Digital Camera System (TowCam)[6] and related deep-sea imaging resources provide 6,000 m depth-

To watch 4k video clips that were acquired with both quiescent MISO GoPro and DSPL 4k systems on HOV Alvin, go to this link or scan the QR code.

media.dspl.com/quiescent-imaging-1



Liona
MORB-Type
EMORB
2.50
NMORB
1.50
DMORB
Ivy
Max
Wayne
Matthew
Avery
Sparky
Otto Ridge
Coral
Rocky Ridge
Midway
NEPR
Beryl
Hook Ridge