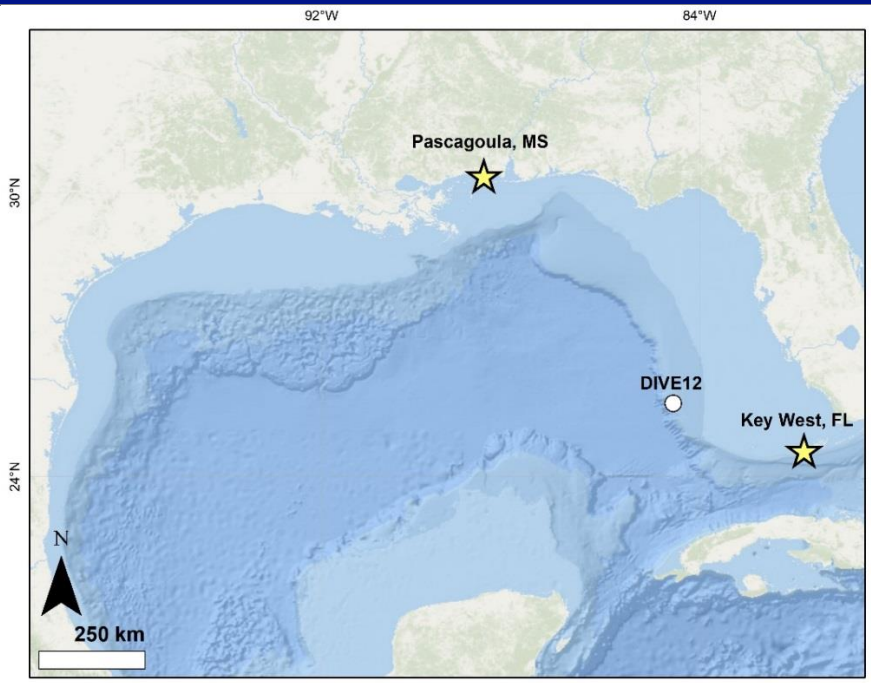
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location Map	
General Area Descriptor	Gulf of Mexico
Site Name	South of Okeanos Ridge
Science Team Leads	Daniel Wagner (Biology) Adam Skarke (Geology)
Expedition Coordinator	Nikolai Pawlenko
ROV Dive Supervisor	Karl McLetchie
Mapping Lead	Mike White
ROV Dive Name	
Cruise	EX1803
Dive Number	DIVE12
Equipment Deployed	
ROV	Deep Discoverer
Camera Platform	Seirios

ROV Measurements	☒ CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera 1
	☒ HD Camera 2	☒ Low Res Cam 1	☒ Low Res Cam 2
	☒ Low Res Cam 3	☒ Low Res Cam 4	☒ Low Res Cam 5
Equipment Malfunctions	None.		

ROV Dive Summary (from processed ROV data)	Dive Summary: EX1803_DIVE12 ^^^	
	In Water:	2018-04-29T13:23:48.352086 25°, 36.348' N ; 84°, 32.996' W
	On Bottom:	2018-04-29T14:13:38.537681 25°, 36.274' N ; 84°, 33.039' W
	Off Bottom:	2018-04-29T21:15:47.820645 25°, 36.507' N ; 84°, 32.951' W
	Out Water:	2018-04-29T21:43:08.913745 25°, 36.276' N ; 84°, 33.01' W
	Dive duration:	8:19:20
	Bottom Time:	7:2:9
	Max. depth:	515.0 m
Special Notes		

Scientists Involved (please provide name, location, affiliation, email)

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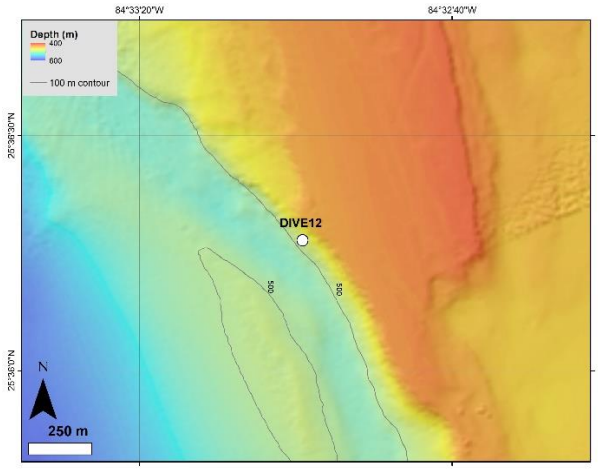
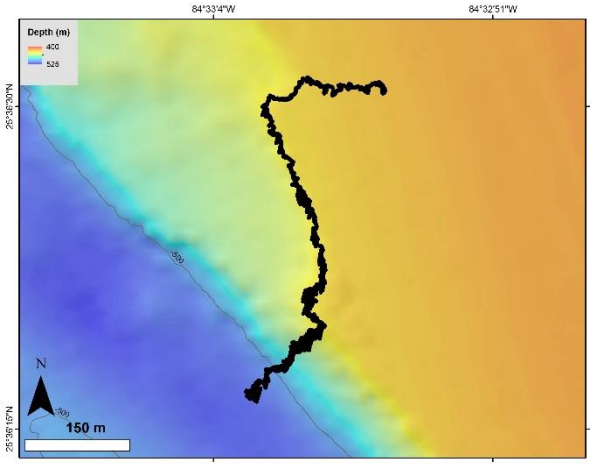
Purpose of the Dive	Dive 12 targeted an area located just south of Okeanos Ridge, a priority area identified by the Gulf of Mexico Fishery Management Council for the potential establishment of a habitat area of particular concern (HAPC) in the future. Four previous dives surveyed Okeanos Ridge with deep-sea submersibles, and documented extensive deep-sea coral habitat. However, all of those previous dives were conducted >5 km to the north. Thus, the target area of Dive 12 was completely unexplored. The purpose of Dive 12 was to survey the biology and geology of a ridge feature at depths between 400-525 m.			
Description of the Dive	The ROV landed on a heavily-sedimented, flat surface with exposed barren rocks at a depth of 509 m at 14:12 UTC. After reaching the seafloor, the ROV proceeded to the east, up a slope on the west side of a large ridge. The slope was characterized by large carbonate rock boulders intermixed with black nodular rocks interpreted to be weathered iron oxide crust. As the ROV moved up the slope, corals and sponges as well as fish became more abundant. At 15:50 the ROV approached the top of the slope and observed thick plates of black iron oxide crust on top of carbonate boulders. The flat top of the ridge was characterized by a continuous surface of black iron oxide crust, which was inhabited by abundant coral, sponge, and fish species. Primnoid corals were the dominant observed species. The ROV moved to the north along the ridge and observed continuous undercutting of the iron oxide ridge cap by dissolution and erosion of underlying carbonate rock. Inferred dissolution was evidenced by numerous voids and caverns in the carbonate rock face. In many locations, the undercut oxide crust formed overhanging ledges that extend over one meter out from the underlying vertical carbonate rock face. Corals and sponges were attached to the underside of the overhang but not in the same abundances as observed on top of the ridge. In multiple locations along the ridge, collapsed sections were observed, in which detached potions of iron oxide crust could clearly be aligned with the portion of the ridge top they detached from. At 20:24 UTC the ROV left the western edge of the ridge and moved across the ridge top to the east. During this transect, the seafloor was characterized by continuous iron oxide crust with minimal to no sediment cover. The abundance of coral and sponges remained relatively constant but the represented species changed, most notably from primnoid coral dominance to bamboo coral dominance. The dive concluded at 21:10 UTC. The most commonly observed animals were the primnoid coral *Candidella imbricata*, demosponges and glass sponges. Other species observed included various species of corals (*Paramuricea* sp., *Plumarella* sp., unbranched Plexauridae, *Acanthogorgia* spp., *Muriceaides* sp., *Anthomastus* sp., *Aquaumbra* sp., *Capnella* sp., Stolonifera, *Isidella* sp., *Cheliondonisis aurantiaca*, *Stylaster* sp., *Lophelia pertusa*, *Javania* sp., *Caryophyllia* sp., *Leiopathes* sp., *Bathypathes* spp., *Stichopathes* sp., *Heteropathes* cf. *americana*), sponges (*Aphrocalliestes beatrix*, *Farrea occa, Phakellia* sp., and various unidentified Hexactinellid and Demosponges), squat lobsters (*Eumunida picta*, *Gastroptychus* sp.), zoanthids			

	(unidentified Zoantharia), crabs (*Chaceon fenneri*, Homolidae), urchins (*Gracilechinus* sp.), crinoids (*Comatonia* sp., Atelocrinidae), seastars (*Tremaster* sp., Goniasteridae), tube-dwelling anemones (Ceriantharia), anemones (*Exocoelactis* sp.), and bryozoans (Cheilostomata). Fish observed during the dive included alfonsino (*Beryx decadactylus*), Western roughy (*Hoplostethus occidentalis*), cardinalfish (*Epigonus* sp.), cusk eels (*Benthocometes robustus*), toad fish (*Chaunax pictus*), blackbelly rosefish (*Helicolenus dactyloperis*), rattails (*Nezumia* sp.), cods (*Laemonema goodebeanorum, Laemonema barbatulum*), rockfish (*Trachyscorpia cristulata*), scorpionfish (*Pontius* sp.), *Anthias* sp., stout beardfish (*Polymixia* sp.), and a cut-throat eel (*Synapobranchus* sp.). The ROV left the bottom at 21:15 UTC at a final depth of 425 m.	
Notable Observations	Extensive aggregations of primnoid corals (likely *Candidella umbratica*) were seen along the edge of the wall.	
Community Presence/ Absence (*community is defined as more than two species*)	☒Corals and Sponges Present ☐Chemosynthetic Community Present ☒High biodiversity Community Present	☐Active Seep or Vent ☐Extinct Seep or Vent ☐Hydrates Present

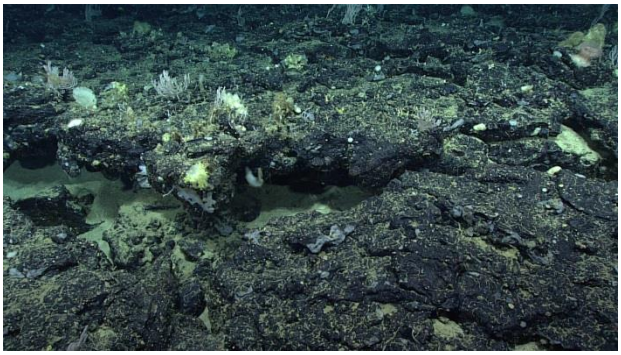
Overall Map of the ROV Dive Area



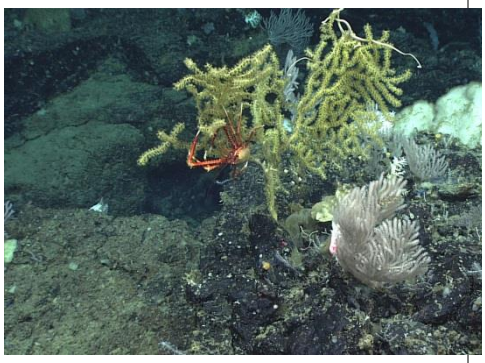
Close-up Map of Main Dive Site



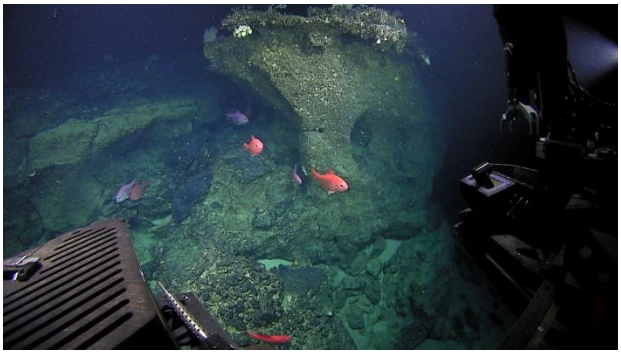
Representative Photos of the Dive



Primnoid corals.



Eumunida picta squat lobster perched on colony of *Paramurciea* sp. octocoral.



Group of slfonsinos *Beryx decadactylus*.

The fish *Trachyscorpia cristulata* next to a primnoid coral seafan.

Samples Collected

Sample

Sample ID	EX1803_20180429T143605_D2_DIVE12_SPEC01GEO
Date (UTC)	20180429
Time (UTC)	143605
Depth (m)	512.57
Temperature (°C)	7.63
Field ID(s)	Carbonate rock

Weight 8.45kg

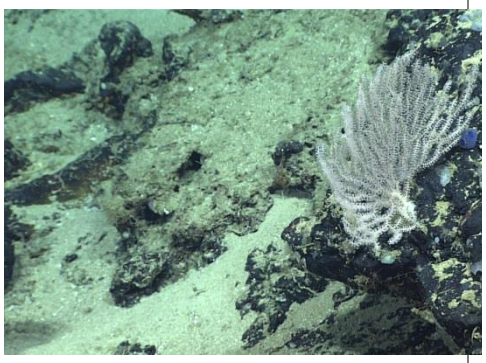
Commensals

Commensal ID	Field Identification	Notes
EX1803_20180429T143605_D2_DIVE12_SPEC01GEO_A01	Polychaeta	N=1
EX1803_20180429T143605_D2_DIVE12_SPEC01GEO_A02	Bryozoa	N=3
EX1803_20180429T143605_D2_DIVE12_SPEC01GEO_A03	Octocorallia	N=2
EX1803_20180429T143605_D2_DIVE12_SPEC01GEO_A04	Hexactinellida	N=1
EX1803_20180429T143605_D2_DIVE12_SPEC01GEO_A05	Echinoidea	N=1

Comments

Sample

Sample ID	EX1803_20180429T153100_D2_DIVE12_SPEC02BIO
Date (UTC)	20180429
Time (UTC)	153100
Depth (m)	467.24
Temperature (°C)	7.74
Field ID(s)	*Primnoidae*



Commensals

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Commensal ID	Field Identification	Notes
EX1803_20180429T153100_D2_DIVE12_SPEC02BIO_A01	Ophioridae	N=1

Comments

Sample

Sample ID	EX1803_20180429T181028_D2_DIVE12_SPEC03BIO
Date (UTC)	20180429
Time (UTC)	181028
Depth (m)	437.05
Tempera	8.62

ture (°C)	
Field ID(s)	Antipatharia

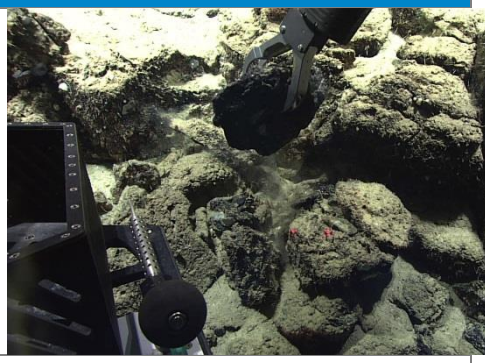
Commensals

Commensal ID	Field Identification	Notes
none		

Comments	

Sample

Sample ID	EX1803_20180429T185523_D2_DIVE12_SPEC04GEO
Date (UTC)	20180429
Time (UTC)	185523
Depth (m)	438.17
Temperature (°C)	8.64
Field ID(s)	Carbonate rock



Commensals

Weight 12.64kg

Commensal ID	Field Identification	Notes
EX1803_20180429T185523_D2_DIVE12_SPEC04GEO_A01	Hexactinellida	N=2
EX1803_20180429T185523_D2_DIVE12_SPEC04GEO_A02	Scleractinia	N=2
EX1803_20180429T185523_D2_DIVE12_SPEC04GEO_A03	Stylasteridae	N=2
EX1803_20180429T185523_D2_DIVE12_SPEC04GEO_A04	Branchiopoda	N=1
EX1803_20180429T185523_D2_DIVE12_SPEC04GEO_A05	Ophioridae	N=1

Comments	

Please direct inquiries to:

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