

Okeanos Explorer ROV Dive Summary



ROV V Uppth V Attitude Measurements - Scienting Some V USB Position - Heading V Pitch - Roll - HD Camera 1. V Low Res Cam 3. - Low Res Cam 4. - Low Res Cam 5. Equipment The joylock button did not work properly during ROV recevery the VSAT lost signal for a couple of minutes. In Water. 2018:11:00712:50:56:2014 Affect dive operations. During ROV recevery the VSAT lost signal for a couple of minutes. In Water. 2018:11:00712:50:56:2014 V Dive operations. During ROV recevery the VSAT lost signal for a couple of minutes. In Water. 2018:11:00712:50:56:2014 Stationary Data (from: 2018:11:00712:50:56:2004 T7: 36:431 N; 7: 16:391 W Off Bottom: 2018:11:00712:50:56:2004 T7: 36:431 N; 7: 51:53 W Out Water: 2018:11:00712:50:56:2301 T7: 36:431 N; 7: 16:391 W Out Water: 2018:11:00712:50:56:2301 Special Notes N/A NA Advo Matsumoto Advo Matsumoto Advo Matsumoto Advo Matsumoto Special Notes N/A NA Edital							
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Measurements // Pitch // Roll // HD Camera 1 // HD Camera 2 // Low Res Cam 3 // Low Res Cam 2 // Low Res Cam 3 // Low Res Cam 2 Equipment The joylock button did not work properly during ROV recevery the VSAT lost signal for a couple of minutes. // Intervent the joylock button did not work properly during ROV recevery the VSAT lost signal for a couple of minutes. In Water: 203 £11.09T12/36.05.82904 // 7.3.6412 Nr (57, 16.608 W) On Bottom: 201 £11.09T12/36.05.82904 // 7.3.6412 Nr (57, 16.608 W) On Bottom: 201 £11.09T12/36.05.82904 // 7.3.6412 Nr (57, 16.508 W) Off Bottom: 201 £11.09T12/38.36.523801 // 7.3.6412 Nr (57, 15.38 W) Out Water: 201 £11.09T12/38.36.523801 // 7.3.612 Nr (57, 15.38 W) Out Water: 203 £11.09T12 Nr (57, 15.71	ROV	 Scanning Sol 	har VUSBL Position	✓ Heading			
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NameAffiliationEnallAsako MatsumotoChiba Institute of Technologyamatsu@gorgonian.jpAshley PerezTenenbaum Puerto Rico Trench Expedition Teamshiley.perez@bahiapr.comChristopher MahNational Museum of Natural Historybrisinga@gmail.comDaniel WagnerNOAA/OERdebi.blaney@noaa.govGraciela Garcia-MolinerCaribean Fishery Management Councilgraciela_cfmc@yahoo.comElizabeth GugliottiNOAA/NCCOSgugliottief@g.cofc.eduJason ChaytorUS Geological Surveyjchaytor@usgs.govJim MastersonHarbor Branch Oceanographic Institutejmaster?@fau.eduWein RademacherNOAA/NMFSkevin.r.rademacher@noaa.govLauren WallingUniversity of Louisiana at Lafayettelauren.walling1@louisiana.eduMashkoor MalikNOAA/NCEImashkoor.malik@noaa.govMashkoor MalikNOAA/NCEImegan.cromwell@noaa.govNoaa TranceUniversity of South Carolinabarretthn@g.cofc.eduScient Yanda BarrettMedical University of South Carolinabarretthn@g.cofc.eduScient Yanda BarrettNedical University of South Carolinabarretthn@g.cofc.eduScient Yanda BarrettMedical Universityitxeen.auscavitch@temple.eduTara Harmer LukeStockton Universityluke@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologyitna@ccean.ruThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurr	Special Notes	N/A					
Name Affiliation Email Asako Matsumoto Chiba Institute of Technology amatsu@gorgonian.jp Ashley Perez Tenenbaum Puerto Rico Trench Expedition Team ashley.perez@bahiapr.com Christopher Mah National Museum of Natural History brisinga@gmail.com Daniel Wagner NOAA/OER daniel.wagner@noaa.gov Debi Blaney NOAA/OER debi.blaney@noaa.gov Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.com Elizabeth Gugliotti NOAA/NCCOS gugliottief@g.cofc.edu Jason Chaytor US Geological Survey ichaytor@usgs.gov Jim Masterson Harbor Branch Oceanographic Institute jmastre?@fau.edu Kevin.r.rademacher@noaa.gov Lauren Walling University of Louisiana at Lafayette lauren.walling1@oluisiana.edu Mashkoor Malik NOAA/OER mashkoor.malik@noaa.gov Moaa.gov Mashkoor Malik NOAA/OER mashkoor.malik@noaa.gov Moaa.gov Mashkoor Malik NOAA/NCEI megan.cromwell@noaa.gov Moaa.gov Noha Barrett Medical University of South Carolina barrettn/log.cofc.							
Scientists Asako Matsumoto Chiba Institute of Technology amatsu@gorgonian.jp Ashley Perez Tenenbaum Puerto Rico Trench Expedition Team ashley.perez@bahiapr.com Christopher Mah National Museum of Natural History brisinga@gmail.com Daniel Wagner NOAA/OER daniel.wagner@noaa.gov Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.com Elizabeth Gugliotti NOAA/NCCS gugliottie@g.cofc.edu Jason Chaytor US Geological Survey jchaytor@usg.gov Jim Masterson Harbor Branch Oceanographic Institute jmaster?@fau.edu Kevin Rademacher NOAA/NES kevin.r.rademacher@noaa.gov Lauren Walling University of Louisiana at Lafayette lauren.walling1@louisiana.edu Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnl@g.cofc.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University teven.auscavitch@temple.edu Tara Harmer Luke Stockton		Name	Affiliation	Email			
Ashley PerezTenenbaum Puerto Rico Trench Expedition Teamashley.perez@bahiapr.comChristopher MahNational Museum of Natural Historybrisinga@gmail.comDaniel WagnerNOAA/OERdaniel.wagner@noaa.govDebi BlaneyNOAA/OERdebi.blaney@noaa.govGraciela Garcia-MolinerCaribbean Fishery Management Councilgraciela_Cfmc@yahoo.comElizabeth GugiottiNOAA/NCCOSgugliottief@g.cofc.eduJason ChaytorUS Geological Surveyjchaytor@usgs.govJim MastersonHarbor Branch Oceanographic Institutejmaster7@fau.eduKevin RademacherNOAA/NKFSkevin.r.rademacher@noaa.govLauren WallingUniversity of Louisiana at Lafayettelauren.walling1@louisiana.eduMashkoor MalikNOAA/OERmashkoor.malik@noaa.govMegan CromwellNOAA/NCEImegan.cromwell@noaa.govMashkoor MalikNOAA/NCEImegan.cromwell@noaa.govNolan BarrettMedical University of South Carolinabarrettnh@g.cofc.eduStockt FranceUniversity of Louisiana at Lafayettefrance@louisiana.eduStacey WilliamsInstitute for Socio-Ecological Researchsterwilliams@gmail.comSteven AuscavitchTemple Universitysteven.auscavitch@temple.eduTara Harmer LukeStockton Universityluket@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologytina@ocean.ruDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also 		Asako Matsumoto	Chiba Institute of Technology	amatsu@gorgonian.jp			
Scientists Christopher Mah National Museum of Natural History brisinga@gmail.com Daniel Wagner NOAA/OER daniel.wagner@noaa.gov Debi Blaney NOAA/OER debi.blaney@noaa.gov Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.com Elizabeth Gugliotti NOAA/OER gugliottief@g.cofc.edu Jason Chaytor US Geological Survey jchaytor@usgs.gov Jim Masterson Harbor Branch Oceanographic Institute jmaster?@fau.edu Marcela Cañon Interamerican University marcela.canon@bahiapr.com Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/OER megan.cromwell@noaa.gov Marcela Cañon Interamerican University marcela.canon@bahiapr.com Maskoor Malik NOAA/OER mashkoor.malik@noaa.gov Megan Cromwell NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnh@g.cofc.edu Stacey Williams Institute for Socio-Ecological Research stcwmullings@gmail.com Steven Auscavitch Tem		Ashley Perez	Tenenbaum Puerto Rico Trench Expedition	Team ashley.perez@bahiapr.com			
Scientists Daniel Wagner NOAA/OER daniel.wagner@noaa.gov Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.com Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.com Elizabeth Gugliotti NOAA/NCCOS gugliottief@g.cofc.edu Jason Chaytor US Geological Survey jichaytor@usgs.gov Jim Masterson Harbor Branch Oceanographic Institute jmaster7@fau.edu Kevin Rademacher NOAA/NMFS kevin.r.rademacher@noaa.gov Lauren Walling University of Louisiana at Lafayette lauren.walling1@louisiana.edu Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/NEEI megan.cromwell@noaa.gov Molan Barrett Medical University of South Carolina barrettn/b@g.cofc.edu Scott France University of Louisiana at Lafayette france@louisiana.edu Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive		Christopher Mah	National Museum of Natural History	brisinga@gmail.com			
Scientists Debi Blaney NOAA/OER debi.blaney@noaa.gov Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_Cfmc@yahoo.com Elizabeth Gugliotti NOAA/NCCOS gugliottief@g.cofc.edu Jason Chaytor US Geological Survey jchaytor@usgs.gov Jim Masterson Harbor Branch Oceanographic Institute jmaster7@fau.edu Kevin Rademacher NOAA/NMFS kevin.r.rademacher@noaa.gov Lauren Walling University of Louisiana at Lafayette lauren.walling1@louisiana.edu Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnh@g.cofc.edu Stoct France University of Louisiana at Lafayette france@louisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to char		Daniel Wagner	NOAA/OER	daniel.wagner@noaa.gov			
Scientists Involved (provide name, affiliation, email)Graciela Garcia-Moliner Caribbean Fishery Management Council graciela_cfmc@yahoo.comScientists Involved (provide name, affiliation, email)US Geological Survey Us Geological Survey im Masterson Harbor Branch Oceanographic Institute kevin.r.rademacher@noaa.gov Lauren.Walling University of Louisiana at Lafayette Macked Cañon Mashkoor Malik NOAA/NCER Mashkoor.malik@noaa.gov Megan Cromwell NOAA/NCEI Moda/NCEI Megan Cromwell NOAA/NCEI Moda/NCEI Megan Cromwell@noaa.gov Megan Cromwell NOAA/NCEI Moda/NCEI Megan Cromwell@noaa.gov Megan Cromwell NOAA/NCEI Scott France University of South Carolina Steven Auscavitch Temple University Temple University tare tuke Stacey Williams Steven Auscavitch Temple University Temple University Uket@stockton.edu Tara Harmer Luke Stockton University Tina MolodtsovaInstitute of Oceanology tina@ocean.ruDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Debi Blaney	NOAA/OER	debi.blaney@noaa.gov			
Scientists Involved (provide name, affiliation, email)Elizabeth GugliottiNOAA/NCCOS (US Geological Survey (US Geological Survey) (Jim Masterson Harbor Branch Oceanographic Institute (provide name, affiliation, email)gugliottief@g.cofc.edu (kevin.r.rademacher@noaa.gov (Lauren Walling University of Louisiana at Lafayette Marcela Cañon Interamerican University Mashkoor.malik@noaa.govMacela Cañon Maga Cromwell NOAA/NCEI Nolan Barrett Scott France Scott France University of Louisiana at Lafayette Scott France University of Louisiana at Lafayette france@louisiana.eduDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Graciela Garcia-Moliner	Caribbean Fishery Management Council	graciela_cfmc@yahoo.com			
Scientists Involved (provide name, affiliation, email)Jason ChaytorUS Geological Survey US Geological Surveyjichaytor@usgs.govJim MastersonHarbor Branch Oceanographic Institutejmaster7@fau.eduKevin RademacherNOAA/NMFSkevin.r.r.ademacher@noaa.govLauren WallingUniversity of Louisiana at Lafayettelauren.walling1@louisiana.eduMasteor MalikNOAA/NCEImegan.cronwell@noaa.govMegan CromwellNOAA/NCEImegan.cromwell@noaa.govNolan BarrettMedical University of South Carolinabarrettnh@g.cofc.eduScott FranceUniversity of Louisiana at Lafayettefrance@louisiana.eduStacey WilliamsInstitute for Socio-Ecological Researchstcmwilliams@gmail.comSteven AuscavitchTemple Universitysteven.auscavitch@temple.eduTara Harmer LukeStockton Universityluket@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologytina@ocean.ruDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Elizabeth Gugliotti	NOAA/NCCOS	gugliottief@g.cofc.edu			
Involved Involved (provide name, affiliation, email)Jim MastersonHarbor Branch Oceanographic InstituteJimaster7@fau.eduKevin RademacherNOAA/NMFSkevin.r.rademacher@noaa.govLauren WallingUniversity of Louisiana at Lafayettelauren.walling1@louisiana.eduMarcela CañonInteramerican Universitymarcela.canon@bahiapr.comMashkoor MalikNOAA/NCEImegan.cromwell@noaa.govMegan CromwellNOAA/NCEImegan.cromwell@noaa.govNolan BarrettMedical University of South Carolinabarrettnh@g.cofc.eduScott FranceUniversity of Louisiana at Lafayettefrance@louisiana.eduStacey WilliamsInstitute for Socio-Ecological Researchstcmwilliams@gmail.comSteven AuscavitchTemple Universitysteven.auscavitch@temple.eduTara Harmer LukeStockton Universityluket@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologytina@ocean.ruDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.	Scientists	Jason Chaytor	US Geological Survey	jchaytor@usgs.gov			
Kevin RademacherNOAA/NMFSkevin.r.rademacher@noaa.govaffiliation, email)Lauren WallingUniversity of Louisiana at Lafayettelauren.walling1@louisiana.eduMarcela CañonInteramerican Universitymarcela.canon@bahiapr.comMashkoor MalikNOAA/OERmashkoor.malik@noaa.govMegan CromwellNOAA/NCEImegan.cromwell@noaa.govNolan BarrettMedical University of South Carolinabarrettnh@g.cofc.eduScott FranceUniversity of Louisiana at Lafayettefrance@louisiana.eduStacey WilliamsInstitute for Socio-Ecological Researchstcmwilliams@gmail.comSteven AuscavitchTemple Universitysteven.auscavitch@temple.eduTara Harmer LukeStockton Universityluket@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologytina@ocean.ruDive PurposeThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.	Involved	Jim Masterson	Harbor Branch Oceanographic Institute	jmaster7@fau.edu			
affiliation, email) Lauren Walling University of Louisiana at Lafayette Iauren.walling1@louisiana.edu Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/OER mashkoor.malik@noaa.gov Megan Cromwell NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnh@g.cofc.edu Scott France University of Louisiana at Lafayette france@louisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.	(provide name.	Kevin Rademacher	NOAA/NMFS	kevin.r.rademacher@noaa.gov			
email) Marcela Cañon Interamerican University marcela.canon@bahiapr.com Mashkoor Malik NOAA/OER mashkoor.malik@noaa.gov Megan Cromwell NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnh@g.cofc.edu Scott France University of Louisiana at Lafayette france@louisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.	affiliation, email)	Lauren Walling	University of Louisiana at Lafayette	lauren.walling1@louisiana.edu			
Mashkoor MalikNOAA/OERmashkoor.malik@noaa.govMegan CromwellNOAA/NCEImegan.cromwell@noaa.govNolan BarrettMedical University of South Carolinabarrettnh@g.cofc.eduScott FranceUniversity of Louisiana at Lafayettefrance@louisiana.eduStacey WilliamsInstitute for Socio-Ecological Researchstcmwilliams@gmail.comSteven AuscavitchTemple Universitysteven.auscavitch@temple.eduTara Harmer LukeStockton Universityluket@stockton.eduTina MolodtsovaP.P. Shirshov Institute of Oceanologytina@ocean.ruThe purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge 		Marcela Cañon	Interamerican University	marcela.canon@bahiapr.com			
Megan Cromwell NOAA/NCEI megan.cromwell@noaa.gov Nolan Barrett Medical University of South Carolina barrettnh@g.cofc.edu Scott France University of Louisiana at Lafayette france@louisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Mashkoor Malik	NOAA/OER	mashkoor.malik@noaa.gov			
Noian Barrett Medical University of South Carolina Darrettni@g.corc.edu Scott France University of Louisiana at Lafayette france@louisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Megan Cromwell		megan.cromwell@noaa.gov			
Scott France University of Louisiana at Larayette Irrance@iouisiana.edu Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Nolan Barrett	Medical University of South Carolina	barrettnh@g.cofc.edu			
Stacey Williams Institute for Socio-Ecological Research stcmwilliams@gmail.com Steven Auscavitch Temple University steven.auscavitch@temple.edu Tara Harmer Luke Stockton University luket@stockton.edu Tina Molodtsova P.P. Shirshov Institute of Oceanology tina@ocean.ru Dive Purpose The purpose of this dive was to characterize deep-sea coral and sponge communities in an unexplored ridge feature and slope off the southwest coast of Puerto Rico. The dive also sought to identify occurrences of deepwater demersal fish species, as well as their habitat preferences along the seafloor. The dive track was designed to explore a steeply sloped ridge between depths of 2,786 to 2,502 m.		Scott France	University of Louisiana at Latayette	france@iouisiana.edu			
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Dive Description	This dive started on a relative steep slope dominated by sediment. Two species of fish were observed on this habitat, <i>Ipnops murrayi</i> and an unknown ophidiform. There looked to be another ophidiform far in the distance when we started to climb the steep rocky wall. Most of the dive was spent climbing a very steep wall with occasional pinnacle structures jutting out of the slope. Debris, both organic and anthropogenic was common here and consisted of tree branches, seagrass, a toothpaste tube, a bottle, and plastic. A third species of fish, the tripod fish <i>Bathypterois</i> sp., was observed at the end of the dive which ended in soft sediment. Deep-sea corals were unknown from Jaguey Spur prior to this exploration. We observed nine different species from the Antipatharia, Scleractina, and octocoral families Coralliidae, Isididae, and Chrysogorgiidae. Isidida were by far the most abundant coral observed at this site. At least three different morphologies were observed, primarily from the J-clade, as well as one from the node-branching <i>"Isidella"</i> -clade. Chrysogorgiid occurrences were dominated by several observations of the large Iridogorgia magnispiralis with most colonies between 1-2 m in height. One of the largest fans observed on the dive was a colony of <i>Corallium</i> cf. <i>niobe</i> on a vertical wall above a sediment chute in the slope. One <i>Chrysogorgia</i> sp., more fan-shaped than bushy, was observed on three occasions. Only one black coral, <i>Heteropathes</i> cf. <i>americana</i> , was found on the builder substrate, and only one genus of stony coral was observed (Javania sp.) on the dive. Throughout the dive numerous thick bases and branch debris, thought to be from old coral colonies, was found covered in Fe-Mn crusts. Though many were observed dead, no live representatives were found alive in the area. On these old bases, small colonies of yellow and white stoloniferous octocorals were seen.				
Notable Observations	Large Fe-Min crusted bases of presumably dead corals and debris. Massive colonies of <i>Iridogorgia magnispiralis, Corallium</i> cf. <i>niobe</i> , and a Hexactinellid sponge. Rocky vertical landscape.				
Community Presence/	 ✓ Corals and Sponges □ Chemosynthetic Community 				
Absence	High biodiversity Community				
(community is					
defined as more	Active Seep or Vent				
than two	Extinct Seep or Vent				
than two					
species)	□ Hydrates				







Samples Co	llected		
Sample ID	EX1811_D09_01B		
Date (UTC)	20181109	Beneficial and a second	
Time (UTC)	164058		
Depth (m)	2706.942		
Temp. (°C)	4.141		
Field ID(s)	Isididae		
Commensals	No commensals		
Comments			
Sample ID	EX1811_D09_02G		
Date (UTC)	20181109	Here it 1913. Here it is a second second Here it is a second second Here it is a second second Here it is a second second Here it is a second se	9_036 90A 03/2007609 03/280324 10-000-500
Time (UTC)	183024	The Internet Park	43-2324/2638-71 See
Depth (m)	2638.711		
Temp. (°C)	4.142		1
Field ID(s)	Rock		*
Commensals	Commencel Sample ID	Field Identification	Count
	EX1811_D09_02G_A01	Sponge	1
	EX1811_D09_02G_A02	Glass Sponge	1
	EX1811_D09_02G_A03	Bryozoan	1
Commonte			
connents			



Please direct inquiries to:

NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10th Floor) Silver Spring, MD 20910 (301) 734-1014

