

Marine Geological Samples Laboratory



**Graduate School of Oceanography
University of Rhode Island
Narragansett, R.I. 02882
Curator: Dr. Steve Carey**



Marine Geological Samples Laboratory

Repository for collections of Marine Geology and
Geophysics faculty and staff

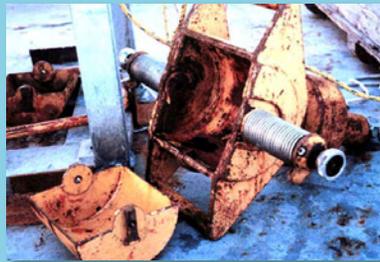
Sediment cores



Dredge rocks/ ROV



Sediment grabs



Volcanic island and
continental margin



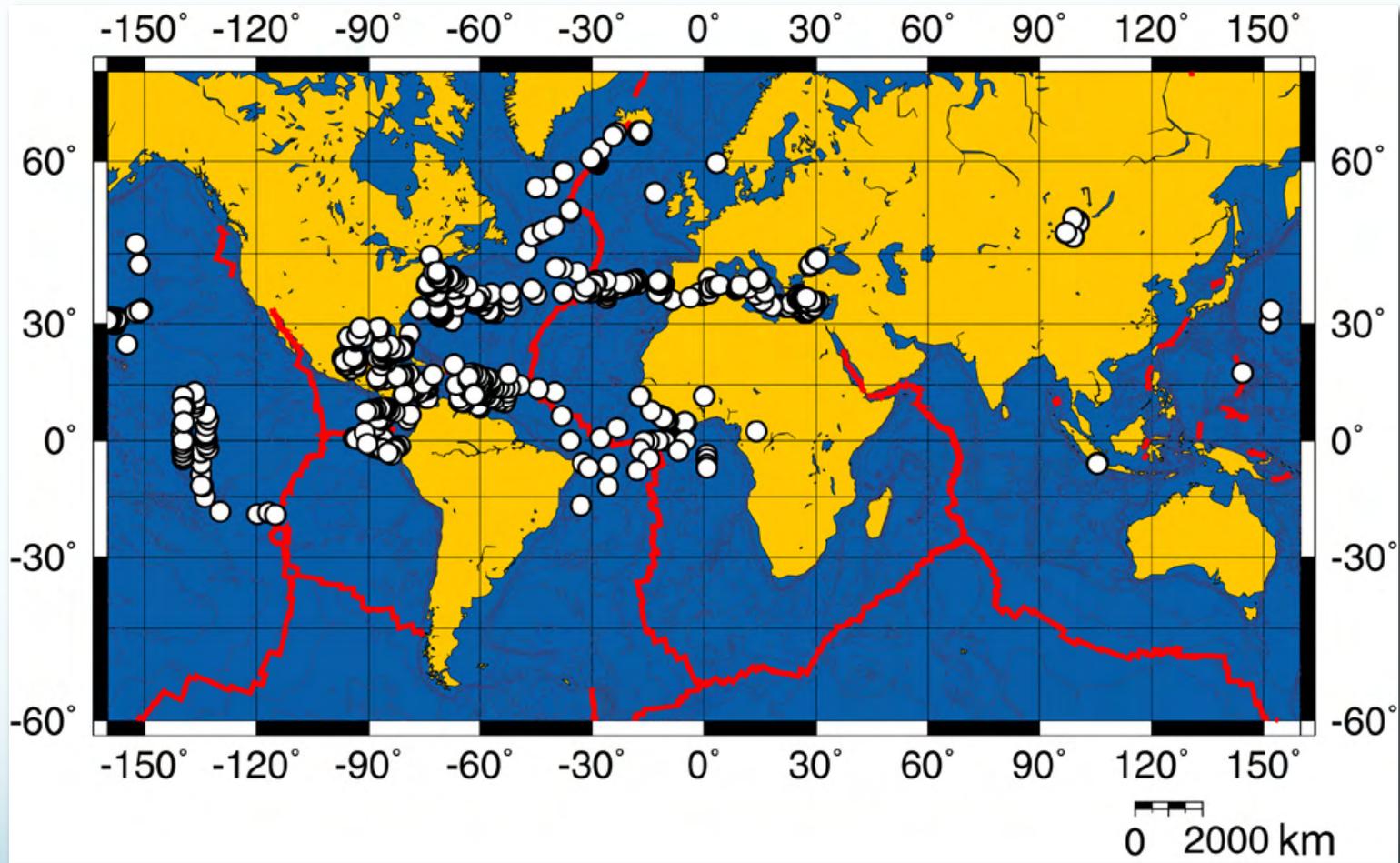
MGSL Sediment Core Collection

1813 piston, gravity and box cores

Majority stored under refrigerated conditions in d-tubes



MGSL Sediment Core Distribution





Sediment Core Storage at MGSL

Split cores are stored under refrigerated conditions in d-tubes

Core reefer capacity= 10,000 ft³

Currently about 95% full



Expansion of Core Storage at MGSL



Three 20' and one 40' refrigerated containers have been added outside of the MGSL and permanently connected to building power



Added 3400 ft³ of racked storage

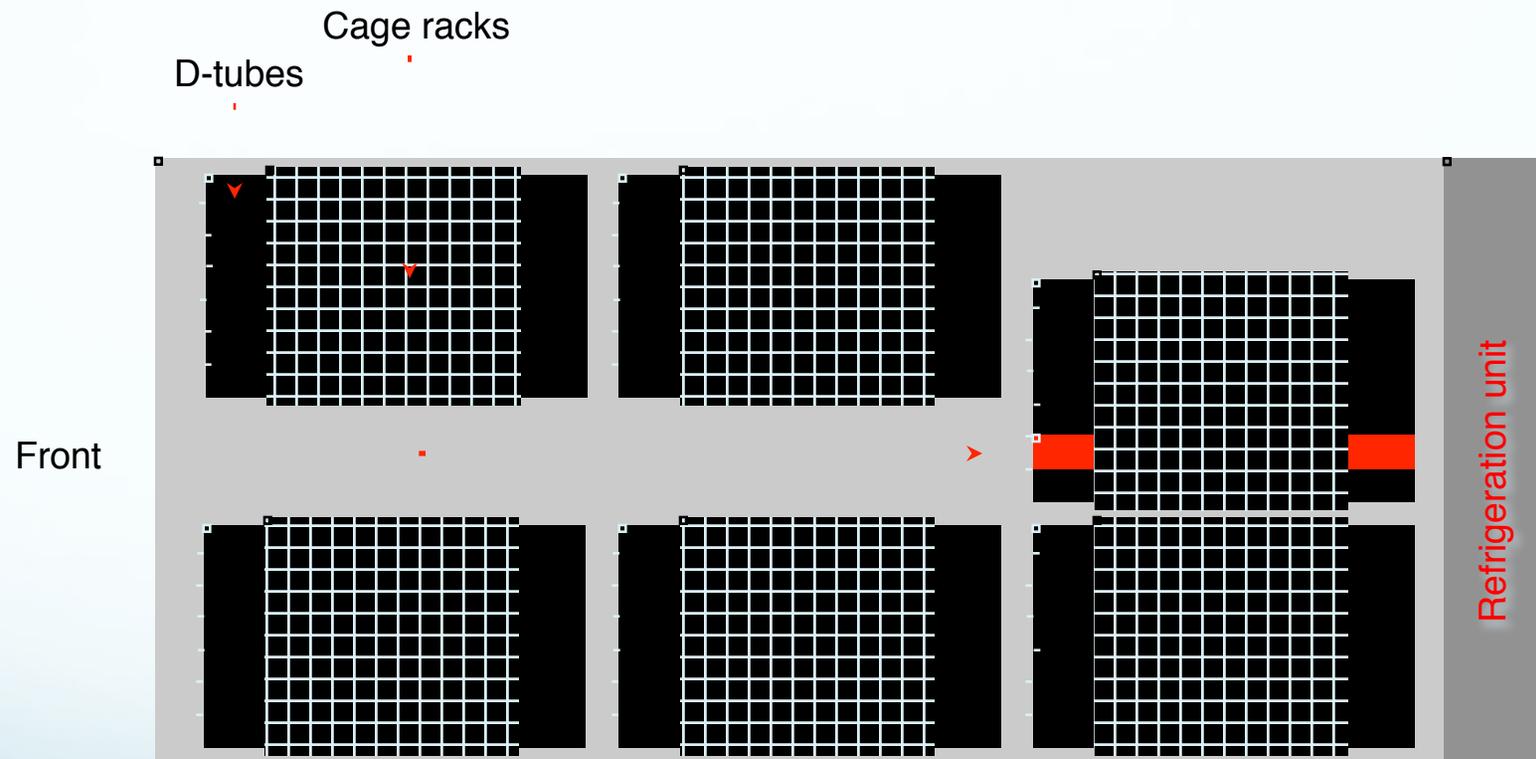
Expansion of Core Storage at MGSL



Refrigerated 20' core container



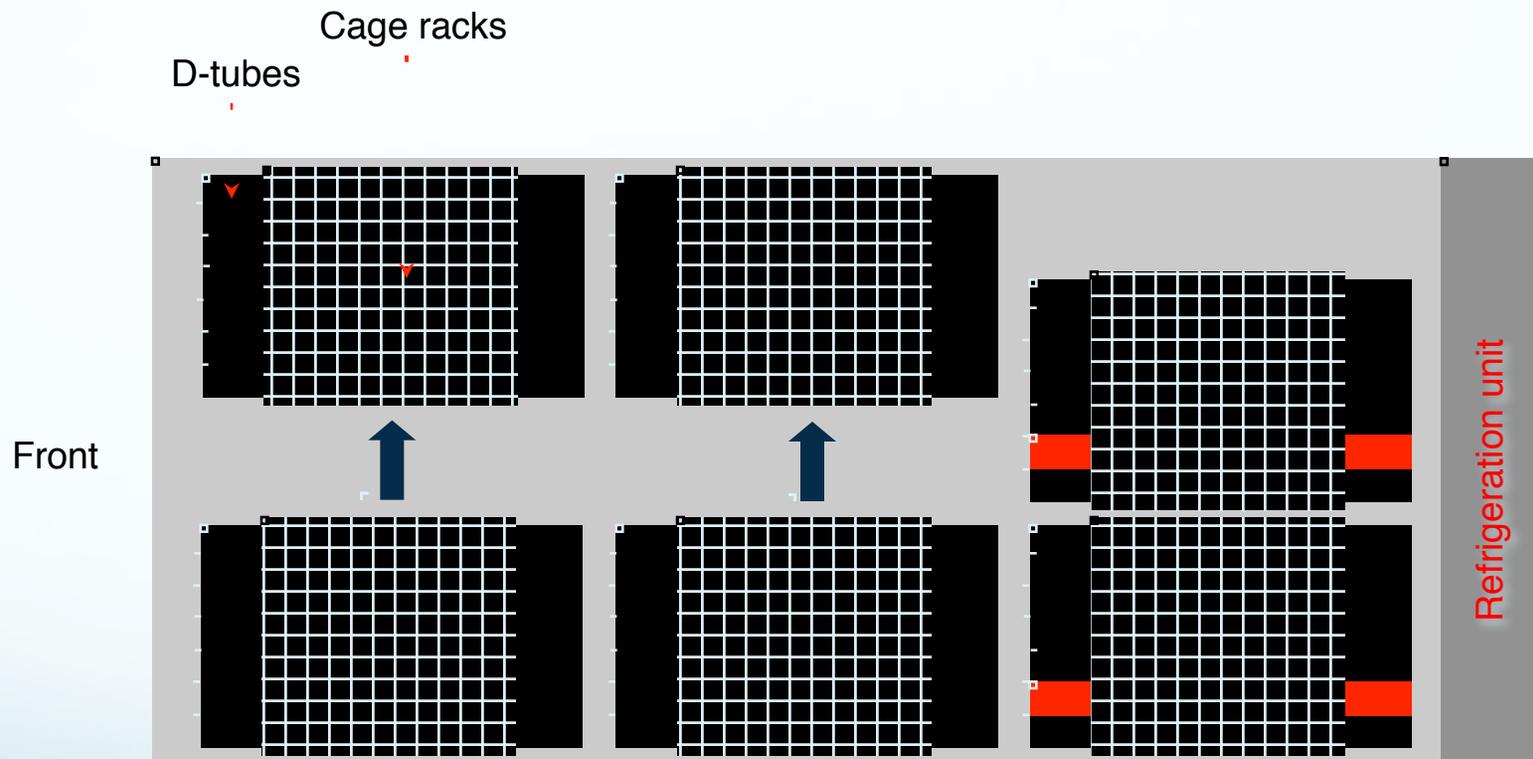
Expansion of Core Storage at MGSL



Refrigerated 20' core container



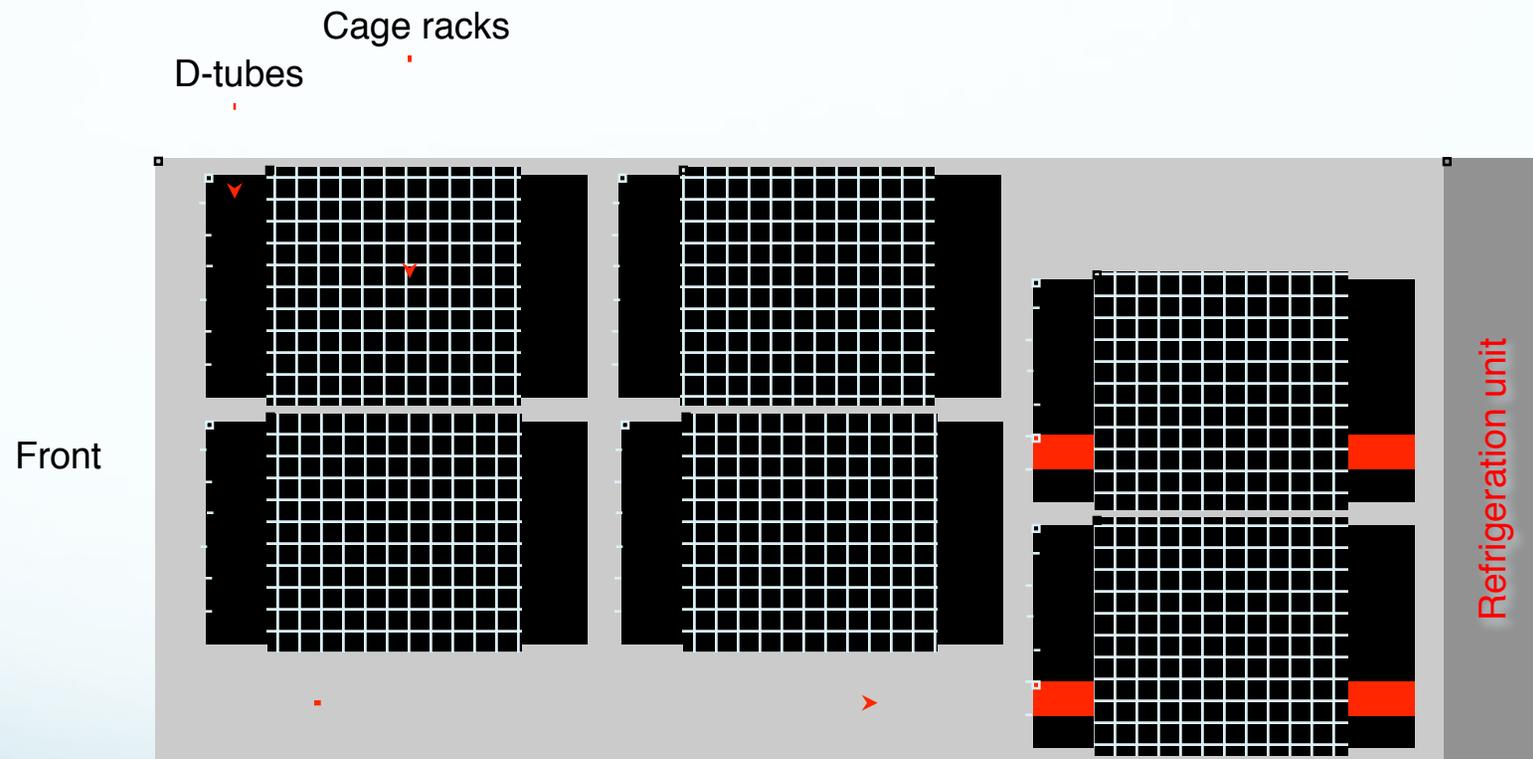
Expansion of Core Storage at MGSL



Refrigerated 20' core container



Expansion of Core Storage at MGSL



Refrigerated 20' core container



Expansion of Core Storage at MGSL



Interior view of external core storage vans with movable D-tube racks

MGSL Sediment Lab Facilities



Portable x-ray machine



Air-driven core splitter



New petrographic microscope
With digital camera and monitor



Other facilities: petrographic microscopes, core photography, sieving lab, description and sampling tables

Sediment core description database

Filemaker input format

Marine Geological Samples Lab: Core Description Form

Cruise RB-03-03 Core ID 100 - GC Section 1a of 1 Index # 100 - GC1a
 Latitude 12°29.778' N Longitude 061°55.980' W Water depth (m) 2873 Sediment Classification Granular Siliciclastic

Core Photo	Interval (cm)	Upper Contact	Lower Contact	Color	Sediment Type				Comments
					Major modifier	Major modifier	Principal name	Minor modifier	
	0-4.5		graded	10YR5/4		volcaniclastic	coarse silt	with clay	smear slide at 3 cm; crystals(amph,plg,px), scoria/glass, carbonate material, forams, sponge spicules, silicoflagellates, clay to fine sand - ave. coarse silt
	4.5-6	graded	graded	10YR4/3		volcaniclastic	silty clay	with bioclasts	interbedded with clay, smear slide at 5 cm; crystals(amph,px,plg, hematite, aragonite), glass/scoria, sponge spicules, forams, coccoliths, silicoflagellates, clay to coarse silt - ave. clay
	6-9	graded	graded	2.5Y4/3			clay		interbedded with clayey silt
	9-12	graded	graded	10YR4/3			clayey silt		interbedded with clay
	12-27	graded	sharp	2.5Y5/2			silty clay		
	27-34	sharp	sharp	2.5Y5/2		volcaniclastic	very fine sand	with bioclasts	interbedded with fine grained ash, bioturbated, smear slide at 27 cm; glass/scoria, crystals(amph,px,plg, aragonite), forams, sponge spicules, fine sand to silt - ave. v. fine sand.
	34-35.5	sharp	sharp	GLE Y1 2.5/10 GY		crystalline	ash	with bioclasts	discontinuous layer, smear slide at 34.5 cm; glass/scoria, crystals(amph,px,plg, aragonite), forams, sponge spicules, diatoms, coccoliths?, med. sand to clay - ave. v. fine sand
	35.5-40.5	sharp	sharp	2.5Y5/2			clayey silt		
	40.5-42.5	sharp	sharp	GLE Y1 2.5/10 GY		vitric	ash	with foraminifera	smear slide at 41.5 cm; scoria/glass, forams, crystals(amph,px,plg, lithics), sponge spicules, coarse sand to clay - ave. v. fine sand
	42.5-67.5	sharp	sharp	2.5Y5/2		nannofossil	coarse silt	with glass or pumice	bioturbated, smear slide at 55 cm; coccoliths, glass/scoria, forams, sponge spicules, crystals(aragonite, amph,px,plg), diatoms, fine sand to clay - ave. coarse silt

Figure 4. Example of the electronic core description form used by the Marine Geological Samples Laboratory at URI.



MGSL Dredge Rock Collection

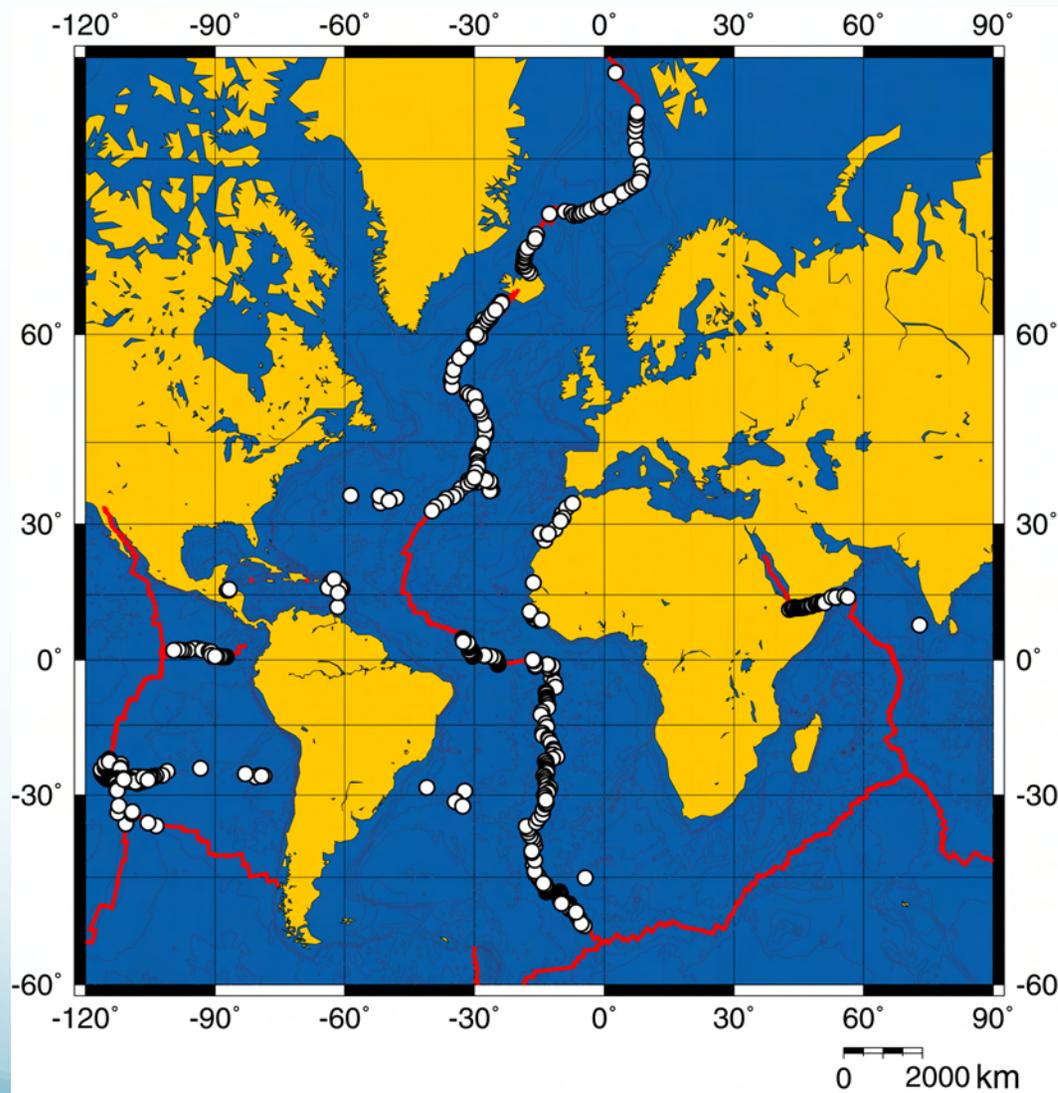
751 samples from 436 stations

One of the most extensive collections of volcanic rocks from the mid-ocean ridge

About 1/4 of ridge system has been sampled at an average interval of 40 km



MGSL Dredge Rock Distribution





Dredge Rock Storage at MGSL

Dredge hauls are stored in plastic and burlap bags

Database keeps track of drawer locations for easy retrieval

Current rack system is about 3/4 full



MGSL Dredge Rock Facilities



Small and large slab saws



Sample prep lab

Other facilities: petrographic microscopes, thin section prep
magnetic separator



Rock Description Database

Filemaker input format



ROV
Database

Marine Geological Samples Laboratory
Graduate School of Oceanography
University of Rhode Island

Cruise Number	RB-03-03	Sample Number	06-ROVG	Rock Number	
Collection Date	3/15/2003	Water Depth (m)	245	Marsden Square	
Latitude	12... 18.0936'	Longitude	61... 38.2580'	Weight	
Physiographic Province	Seamount	Principal Investigator	Carey		
Primary Lithology	Igneous-extrusive/volcanic				

Igneous Lithology

Intrusive	
Hypabyssal	
Extrusive	Basalt

Sedimentary Lithology

Pyroclastic	
Detrital Clastic	
Chemical	
Organic	

Metamorphic		Glass remarks	Mn/Fe oxide	
Sediments		Weathering /Metamorphism	Hydrothermal (orange/brown)	
Mineralogy	Plg+amph (amph up to 1cm)	Vesicularity	slight	



MGSL Sediment Grab Collection

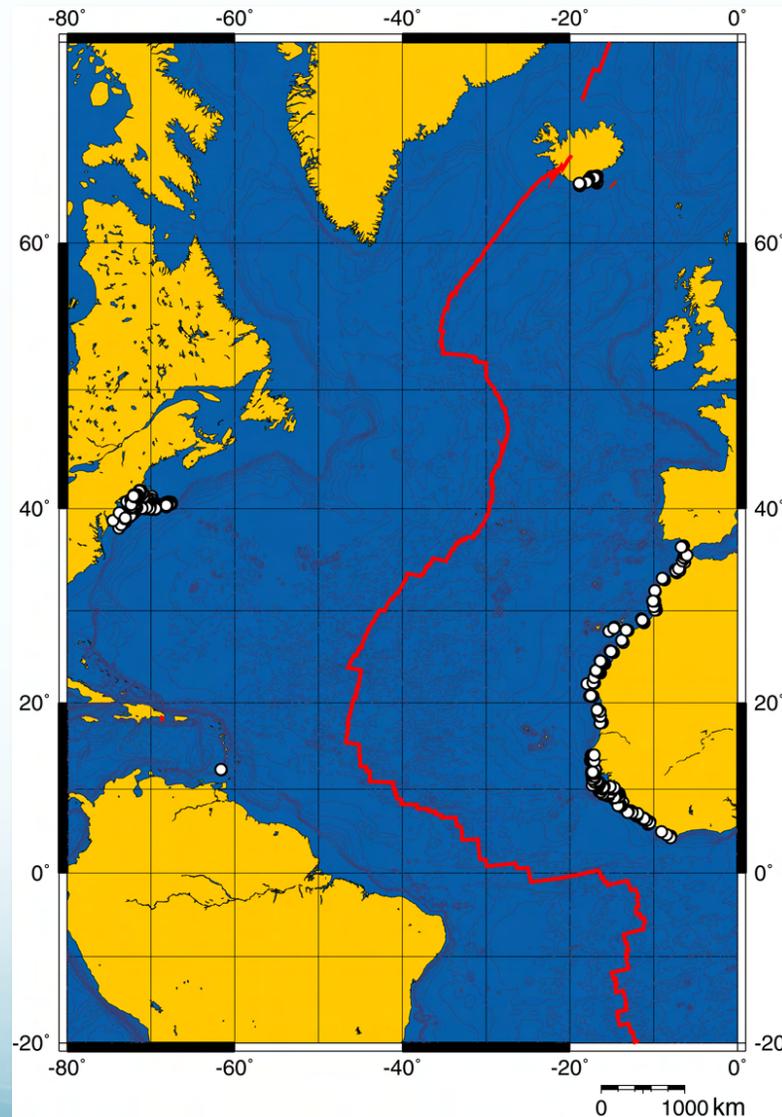
Current holdings:
693 grab samples

Majority from the northeast coast of the U.S., continental margin of Africa and some from the coastal zone in Iceland



MGSL Grab Sample Distribution

New England shelf



Iceland

African margin



New Technologies for Ocean Exploration



Dr. Robert Ballard, University of Rhode Island, discoverer of the RMS Titanic



E/V Nautilus- ship of exploration operated by Dr. Ballard and the Ocean Exploration Trust



E/V Nautilus Exploration Vehicles

2 Vehicle System



Hercules ROV



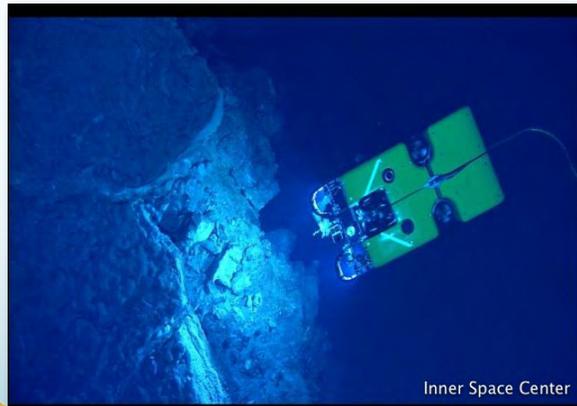
Argus ROV



“Telepresence” Exploration of the Ocean



Satellite
feed



ROV on the seafloor

Mission Control

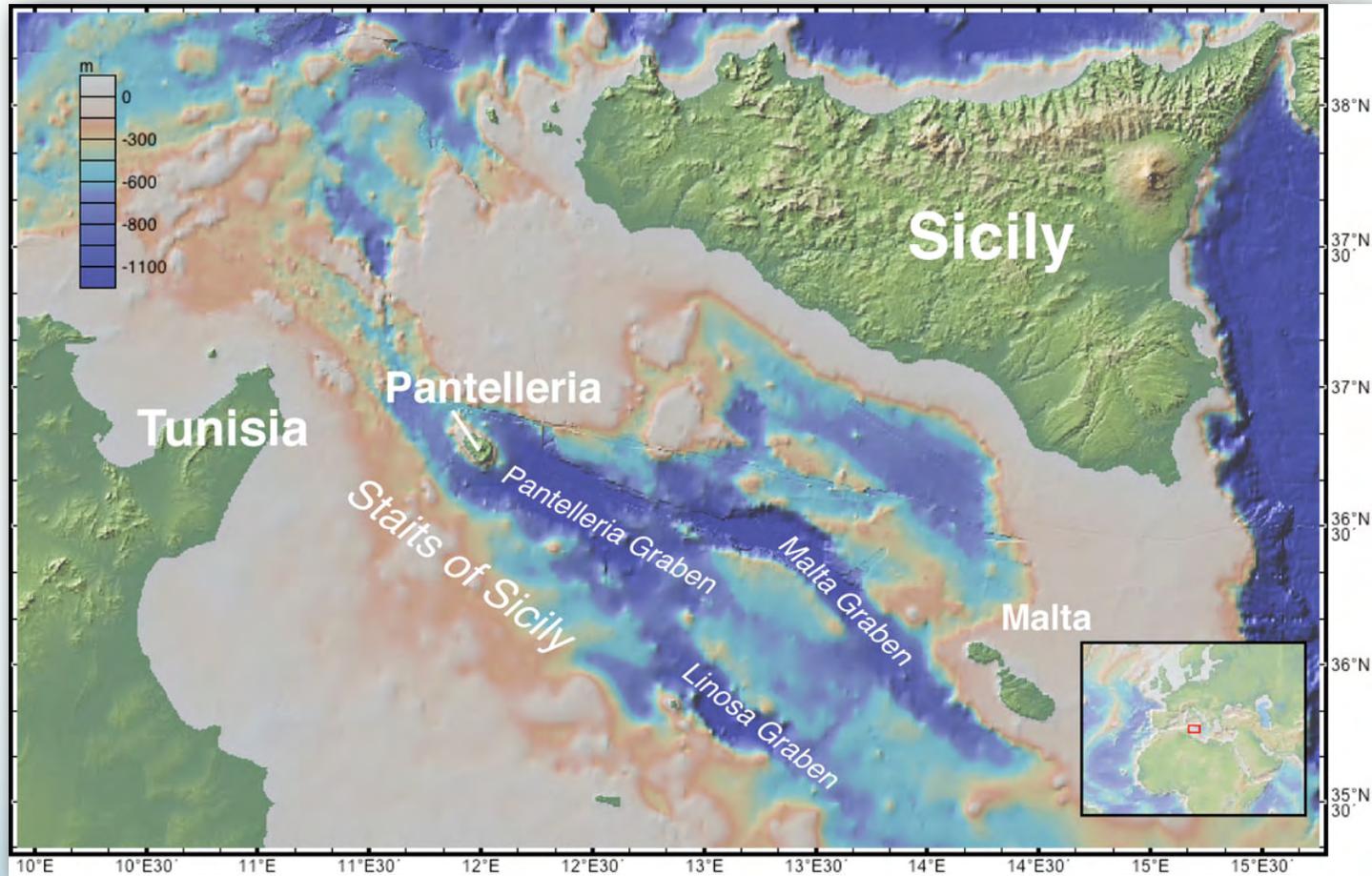
“Telepresence” Exploration of the Ocean

The screenshot shows the National Geographic website's 'Nautilus Live' section. At the top, the National Geographic logo is on the left, and a search bar and 'SUBSCRIPTIONS' link are on the right. Below this is a navigation menu with categories like HOME, VIDEO, PHOTOGRAPHY, ANIMALS, ENVIRONMENT, TRAVEL, ADVENTURE, NATGEOTV, KIDS, and SHOP. A secondary menu lists various content types: Daily News, The Magazine, Maps, Science, Education, Games, Events, Blogs, Movies, Explorers, Mobile, and Our Trips. The main header for 'THE OCEAN' includes sub-links for Ocean Life, Protecting the Ocean, and Underwater Exploration. The 'NAUTILUS LIVE' section features a sub-header: 'Follow Dr. Robert Ballard and his team as they explore the ocean on the E/V Nautilus.' Below this are links for About, Videos, Photos, Blog, Kids, Educators, and Nautilus Live Theater. A yellow banner states: 'The live video feeds from the E/V Nautilus have ended.' The 'CURRENT STATUS' section reports: 'The 2011 expedition has ended. The science team disembarked in Haifa, Israel. The crew is taking the Nautilus to Bodrum, Turkey for some testing and demobilization.' Below this is a map of the Mediterranean region with a yellow dotted line showing the expedition route. To the right, there are sections for 'LATEST VIDEOS' (listing Biology Summary, Shipwreck Summary, Expedition Summary, News Update, Deep Sea Coral Reef, and Meet the Team) and 'LATEST BLOGS' (listing Zen Masters Spread Upon The Winds, End of the season, Catch Those Rays!, Not "Live Down There" - Dap!r! (...and a brief geological history lesson), and Captain Pavel Guides the Way). At the bottom right, there is a 'JOIN OUR MAILING LIST' button.

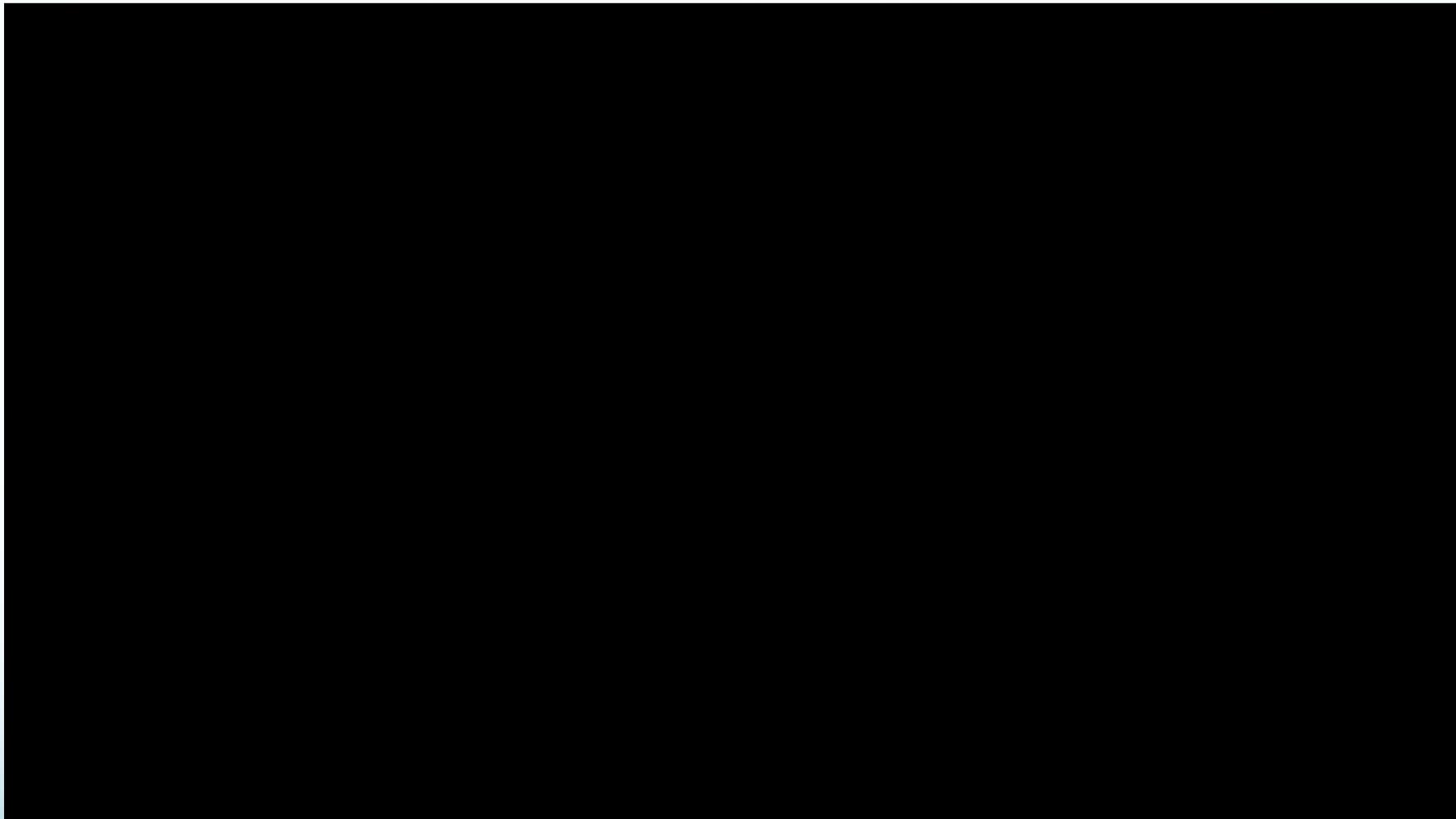


Nautilus Live website allows the public to follow along with the exploration

“Telepresence” Exploration of the Ocean



Halloween 2011 Surprise Discovery



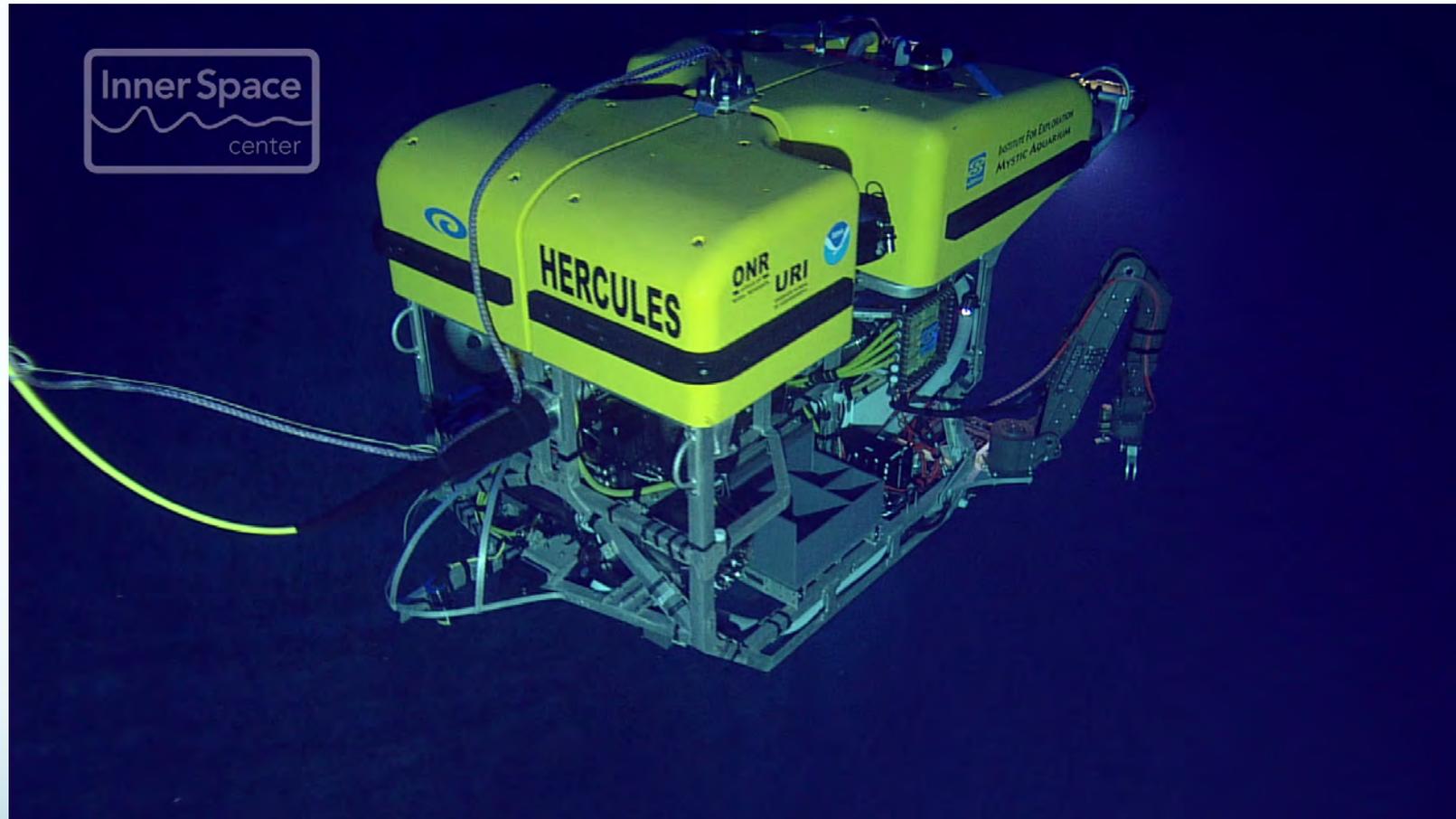
Nautilus Study Areas in the Mediterranean



310 ROV samples from Nautilus cruises in the Mediterranean Sea and eastern Atlantic Ocean

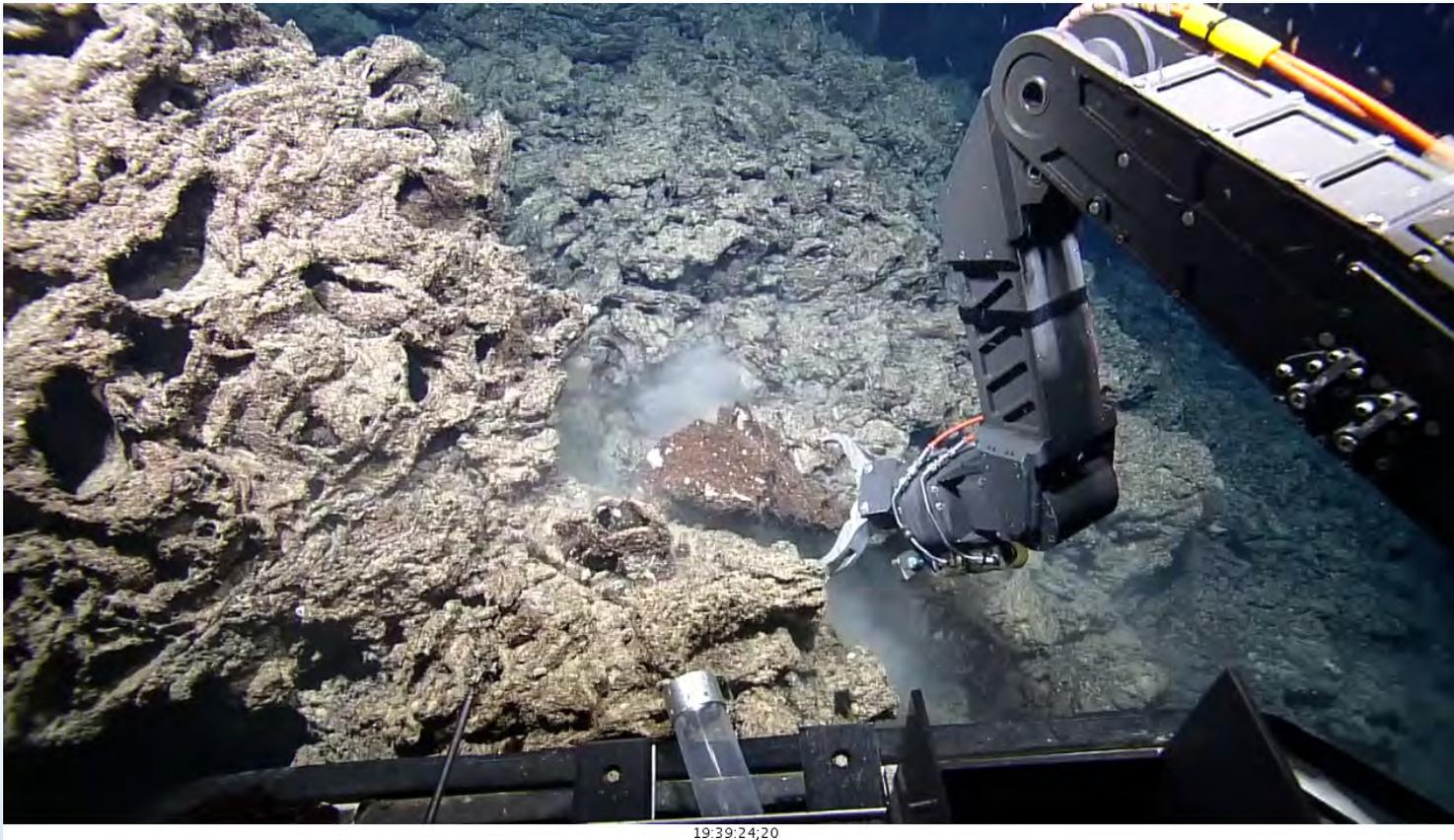


ROV Hercules in operation



High definition SONY video cameras

ROV Hercules sampling operation



Collecting sample of basaltic scoria from the
Straits of Sicily (NA-018)

MGSL Volcanic island and continental margin samples

6900 samples

Active volcanic areas in:
Western U.S.

Italy

Mexico

Chile

Lesser Antilles

Indonesia

Iceland

Greece



Recent Distribution Activity at MGSL

(Last three years)

Sediment core collection 2777

Dredge rock collection 10

Volcanic island and
continental margin 58

ROV grab collection 457



Recent Acquisitions at the MGSL

(Last 3 years)

- 86 Sediment cores
- 39 Dredge rocks
- 40 Volcanic island and continental margin samples
- 289 ROV samples



Educational and Outreach Activities

1. Used for laboratory exercises in the following graduate courses:
 - a. OCG540 Marine Geology and Geophysics
 - b. OGG545 Volcaniclastic Sedimentation
2. Public displays of posters and samples have been developed for:
 - a. Elementary and middle school classes
 - b. Special visitors to the Graduate School of Oceanography



Future Concerns for the MGSL

1. Lack of refrigerated core storage space (present repository is 95% full).
 - a. temporary storage adjacent to facility
 - b. construct an addition to present facility
 - c. begin to shift cores into ambient storage conditions
2. Updating of repository website
3. Continued support from the University for infrastructure maintenance and improvements

