Marine Geological Samples Laboratory

Primary repository for collections of GSO Marine Geology and Geophysics faculty/staff and E/V Nautilus

- Sediment cores
- Dredge rocks
- Sediment grabs
- ROV grabs
- Volcanic island and continental margin

Current staffing: 2 PI/Curators (Kelley, Robinson)
2 Full Time Graduate Student Assistants (1 NSF, 1 URI)
MGSL Sediment Core Collection

1865 piston, gravity and box cores

Majority stored under refrigerated conditions in D-tubes

Core reefer capacity= 10,000 ft³
Currently about 95% full
MGSL Sediment Core Distribution
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 ft$^3$ of racked storage.
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 and picking microscopes, core photography, sieving lab, grain size analyzer, description and sampling tables
MGSL Dredge Rock Collection

1039 dredge samples

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
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 7/8 full
MGSL Dredge Rock Facilities

Small and large slab saws

Sample prep lab

Other facilities: petrographic and picking microscopes, thin section prep, magnetic separator, jaw crusher, ball mill
MGSL Sediment Grab Collection

Current holdings:
767 grab samples

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

Nautilus

Satellite feed

URI Inner Space Center

ROV on the seafloor

Mission Control and Nautilus Live Website
Collecting sample of basaltic scoria from the Straits of Sicily (NA-018)
MGSL ROV Grab Collection

850 precisely-located ROV samples collected by the Hercules/Argus vehicles
(still and video imagery of sample collection)

Locations: Mediterranean, Aegean, Caribbean, Gulf of Mexico and eastern Pacific
MGSL ROV Grab Collection
Nautilus Study Areas 2017 Field Season
MGSL Volcanic island and continental margin samples

7200 samples

Active volcanic areas in:
Western U.S.
Italy
Mexico
Chile
Lesser Antilles
Indonesia
Iceland
Greece
Aleutians
# Rock & Core Description Database

Filemaker input (internal, not public)
Data periodically pushed to NCEI for discovery and IGSN
# Sample Stats at MGSL

<table>
<thead>
<tr>
<th></th>
<th>Current Collection</th>
<th>Samples Distributed (last 4 yrs)</th>
<th>New Acquisitions (last 4 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Cores</td>
<td>1865</td>
<td>8352</td>
<td>31</td>
</tr>
<tr>
<td>Dredges</td>
<td>1039</td>
<td>273</td>
<td>323</td>
</tr>
<tr>
<td>ROV Grabs</td>
<td>850</td>
<td>451</td>
<td>508</td>
</tr>
<tr>
<td>On-land samples</td>
<td>7200</td>
<td>74</td>
<td>340</td>
</tr>
</tbody>
</table>
Educational and Outreach Activities

1. Used for laboratory exercises in URI courses (80 students):
   a. Marine Geology and Geophysics core class
   b. Ocean Engineering undergraduate seminar

2. Facility tours and hands-on interactions at MGSL (200):
   a. Elementary/middle/high school groups
   b. Visitors to the Graduate School of Oceanography

3. Traveling booth to communicate our mission off site:
   a. GSO “Endeavor Day” open house
   b. America’s Cup and other boating events in RI
Future Concerns for the MGSL

1. Lack of refrigerated core storage space (present repository is 95% full).
   a. temporary storage adjacent to facility
   b. begin to shift cores into ambient storage conditions
   c. rock storage space is also filling up quickly

2. Updating of repository website

3. On-land samples - improving visibility and access

4. Continued support from the University for infrastructure maintenance and improvements: new campus master plan
   Includes construction of a new repository
PLAN
1. MAIN ENTRANCE + BUS STOP
2. NEW PARKING LOTS
3. PHOTOVOLTAIC PANELS
4. VEGETATED BUFFER
5. VEGETATED ROOF
6. PUBLIC BEACH ACCESS
7. EXPANDED DOCK
8. REINFORCED SHORELINE