

A yellow SLOCUM ROV (Remotely Operated Vehicle) is mounted on a metal frame on the deck of a boat. The ROV is cylindrical with a black nose cone and a single wheel at the rear. It has the text 'WRC SLOCUM ELECTRIC' and the phone number '732-570-1974' printed on its side. A person in a light blue shirt and shorts is standing on the boat behind the ROV. The background shows the ocean and a clear sky.

# An Intro to ROVs and Other Underwater Technologies

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# Ocean Observing Systems



# Why do we Observe the Oceans?

Can improve:

- The efficiency and safety of marine operations
- National and homeland security
- Predictions of natural hazards and their effects
- Predictions of climate change
- Public health
- Protection and restoration of healthy ecosystems, and
- The sustainability of living resources

# Why do we Observe the Oceans?

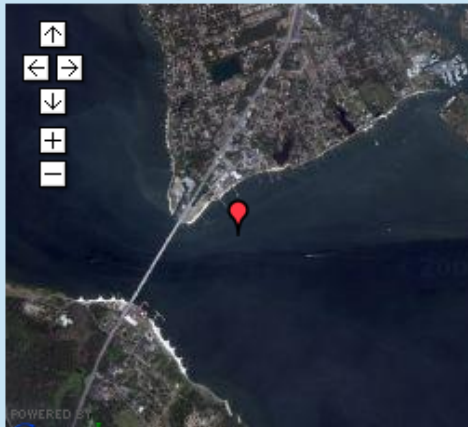
- Emergency management
- Search and Rescue
- Oil spill response
- Fishing and vacation/beach nowcasting
- Commercial shipping
- Better weather/storm prediction



## Stations

- ▼ VIMS Data Home
- ▼ Station: YRK000.00B
- ▼ Station: YRK000.00P
- ▼ Station: YRK005.67B
- ▼ Station: YRK005.67P
- ▼ CBNERR Archive
- ▼ CHSD Archive
- ▼ MUBBED

## Station Map



Latest data reported from this station

Location: 37.244°N, 76.5°W

Feb 5, 2008 1:47 PM EST (28 minute(s) ago):

<u>Water Turbidity</u>	6.1 Nephelometric Units
<u>Average Wind Speed</u>	15.2 Miles per Hour
<u>Water Temperature</u>	9.1 Celsius
<u>Air Temperature</u>	20.1 Celsius
<u>Maximum Wave Height</u>	0.05 Meters
<u>Water Current Speed</u>	0.37 Meters per Second
<u>Dissolved Oxygen</u>	10.9 Milligrams per Liter
<u>Peak Period</u>	2.1 Seconds
<u>Mean Water Depth</u>	6.54 Meters
<u>Peak Direction</u>	126 Degrees (Magnetic)
<u>Mean Wave Period</u>	2.6 Seconds
<u>Chlorophyll (Fluorescence)</u>	2.7 Micrograms per Liter
<u>Significant Wave Height</u>	0.04 Meters
<u>Maximum Wind Speed</u>	25.7 Miles per Hour
<u>Wind Direction</u>	232 Degrees (Magnetic)
<u>Water Salinity</u>	21.1 Parts per Thousand
<u>Water pH</u>	8.2 pH

[View YRK005.67B in Google Earth](#)

<http://www.vecos.org>



**Quick Links**

- Satellites
- CODAR
- Gliders
- Education
- Ocean Data
- LIVE Underwater**
- Cabled Observatory

- Presentations & Posters
- Papers
- Thesis Papers
- Video & Photos

**COOL News**

- People Directory*
- Faculty
- Staff
- Students
- Collaborators

- Partners & Sponsors
- Research Programs

- Calendar - coming soon!
- Evolving Projects
- COOL Gallery
- The COOL room

[About RU Cool](#) | [Visiting RU COOL](#) | [Collaborators](#) | [Lab News](#) ~

**Real-time and Archived Ocean Data**

<b>Satellites</b>	Real-time/Archived Satellite Imagery	<input type="button" value="Go"/>
<b>CODAR</b>	Surface Currents & Wave Data	<input type="button" value="Go"/>
<b>Underwater Gliders (AUV's)</b>	Glider Fleet Homepage	<input type="button" value="Go"/>
<b>Seafloor Cabled Observatory</b>	Wave & Tide Data	<input type="button" value="Go"/>
<b>Meteorological Forecasts</b>	NJ WRF Weather Report	<input type="button" value="Go"/>

**Lab Results**

- [Papers](#)
- [Thesis Talks & Papers](#)
- [Presentations & Posters](#)
- [Video & Photo Gallery](#)
- [Journal of Geophysical Research Special Issue Publications](#)
- [ORION Ocean Research Interactive Observing Network](#)

**Research Projects**

- [MARCOOS Project](#)
- [Offshore Wind Analysis](#)
- [Multidisciplinary University Research Initiative Program 2006 \(MURI\)](#)

- [COOL Photo Library on Flickr](#)
- [COOL Room Web Cam](#)
- [COOL YouTube Videos](#)
- [COOL in the News](#)

**This week in the COOL Room**



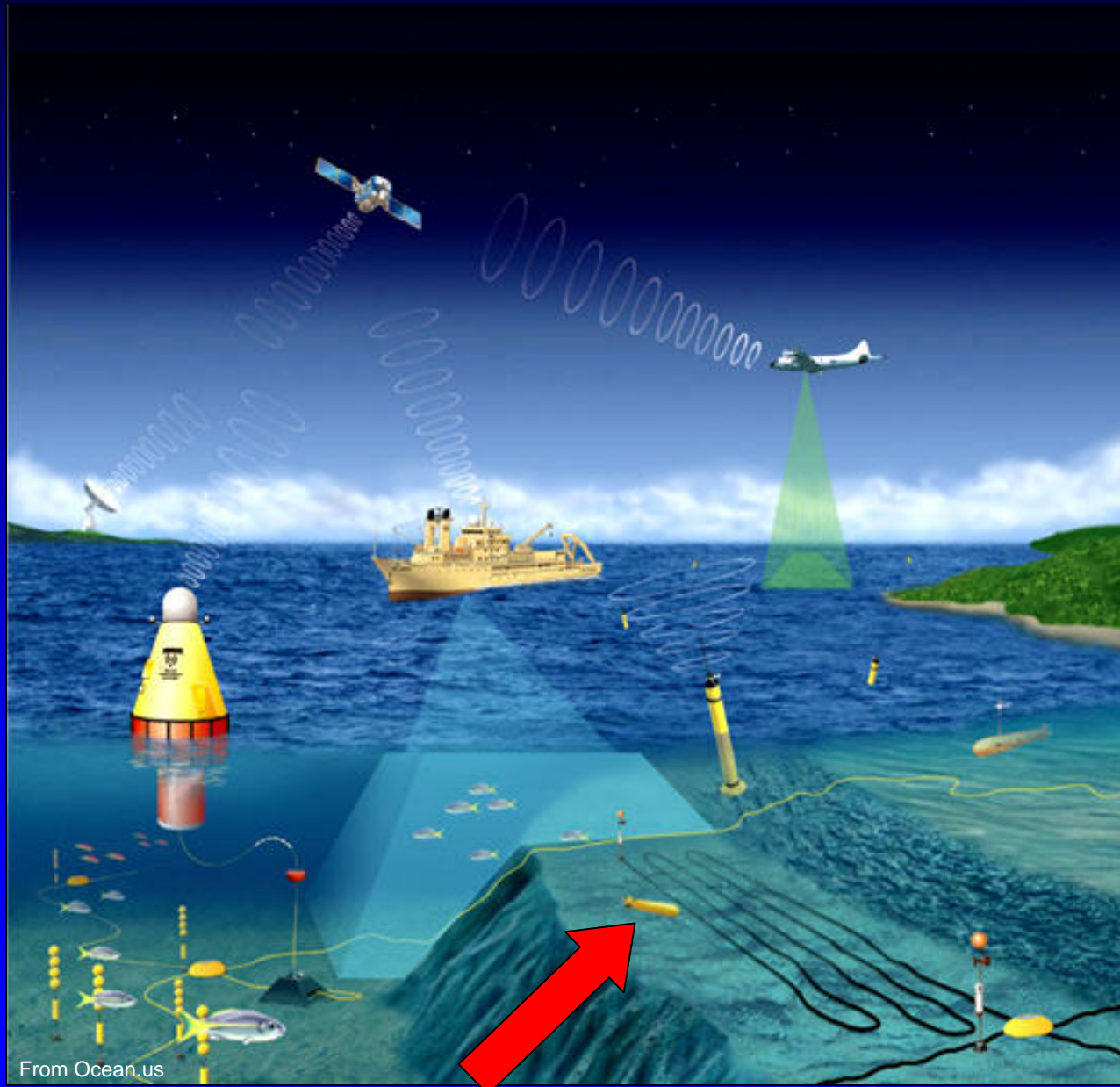
**Peter Chance** and **Jenny Buck** visited the COOL Room on January 28, 2008. Mr. Chance, President of Non-Invasive Technology, Inc., a private company which licenses fundamental patents to the diagnostic, non-invasive medical device area. [▶read more](#)  
 Click on photo for the whole set of pictures

<http://marine.rutgers.edu/cool>



<http://www.coseenow.net>

# Ocean Observing Systems





# A History Lesson

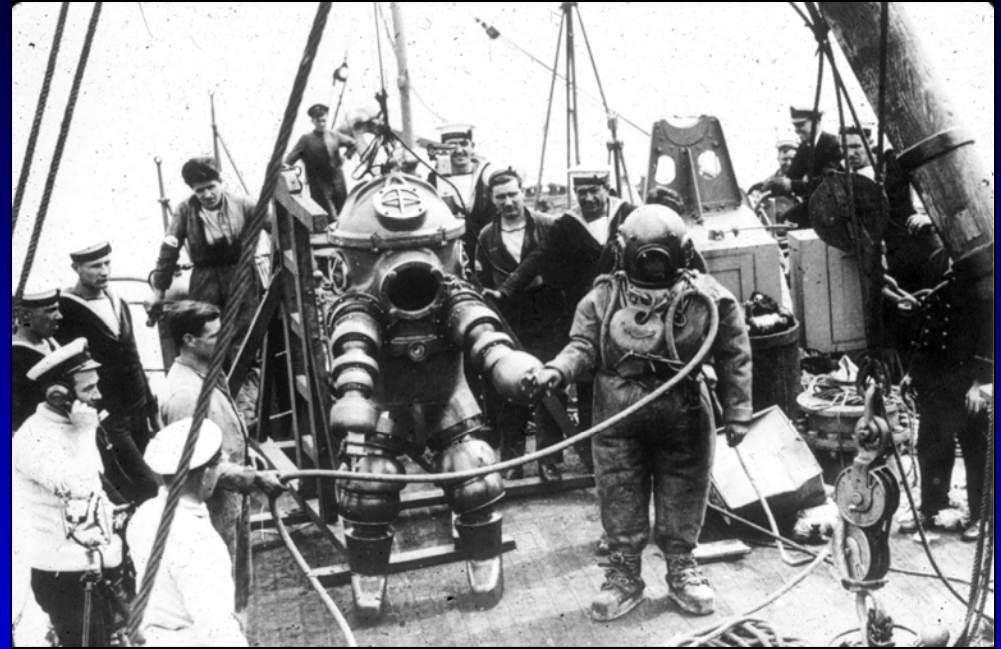
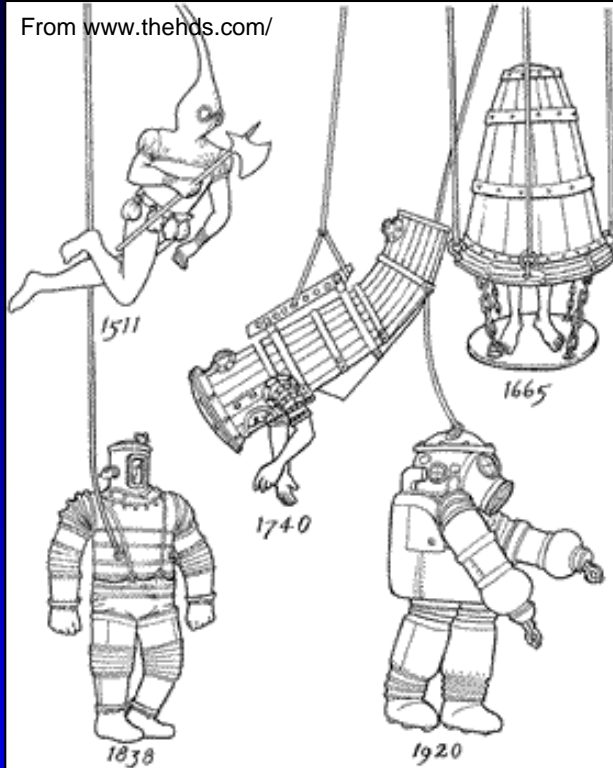
*How did we used to see underwater?*



From S. Glenn; J. Kohut, Rutgers Coastal Ocean Observation Lab (COOL)



# Underwater Diving / SCUBA Timeline



From [commons.wikimedia.org/wiki/Image:Tritonia\\_Lusitania\\_1935.jpg](https://commons.wikimedia.org/wiki/Image:Tritonia_Lusitania_1935.jpg)



Credit: S Lake



From [sioutdooradventures.com](http://sioutdooradventures.com)



From [www.aqualaboy.net/dvr6.jpg](http://www.aqualaboy.net/dvr6.jpg)

# Historical Underwater Vehicles



From Britannica online

## ***FNRS-2***

**First bathyscaphe; built by Auguste Piccard (Belgium) from 1945-1948.**



From [www.bathyscaphtriest.com](http://www.bathyscaphtriest.com)

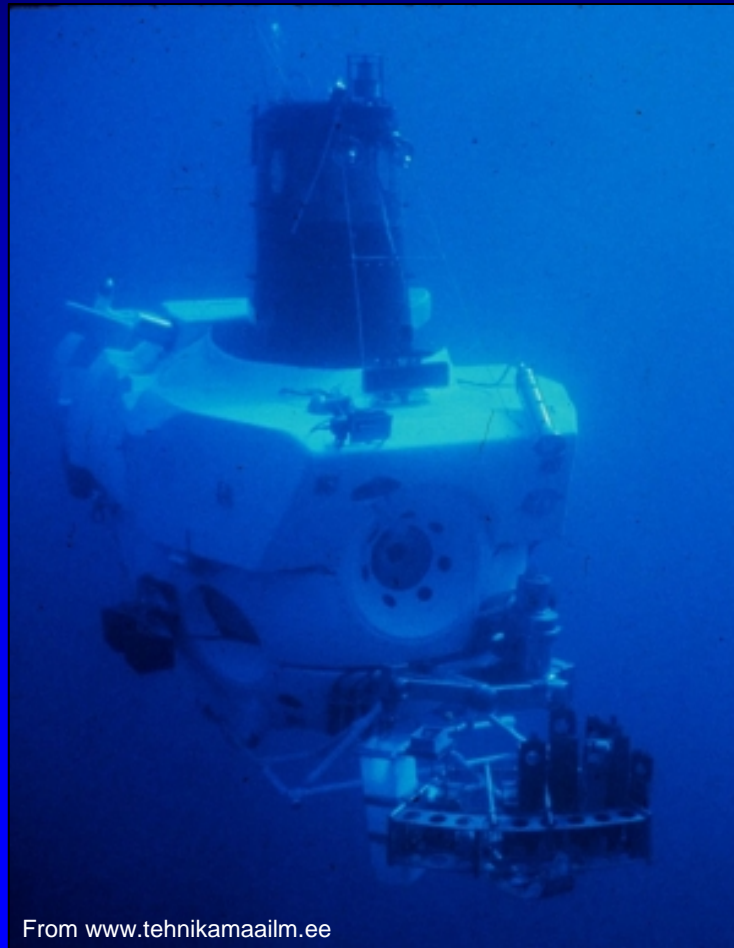
## ***Trieste***

**Built 1953.**

**1960 - Reaches the deepest point of the *Marianas Trench*, known as the *Challenger Deep*, which is the deepest point in the ocean, down 35,810 ft.**

# ABCs of Underwater Technology

## DSV?



From [www.tehnikamaailm.ee](http://www.tehnikamaailm.ee)



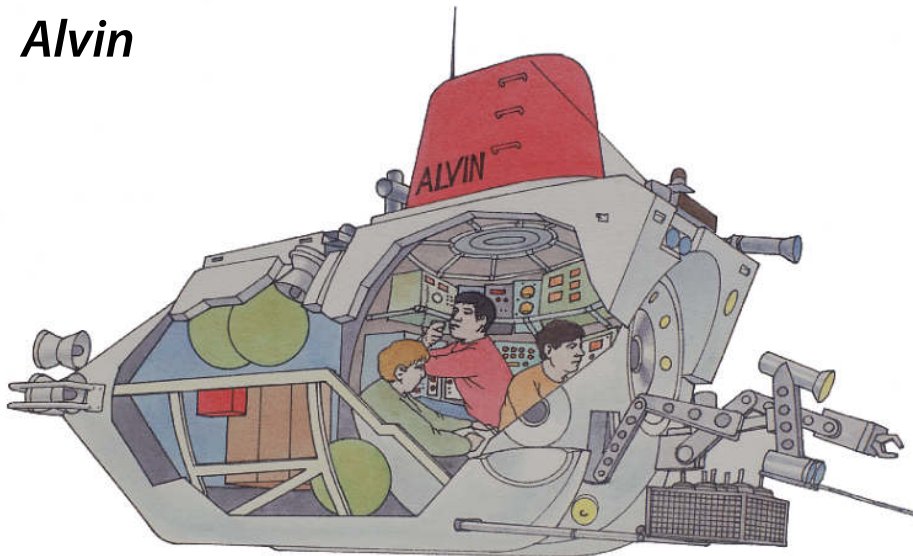
# ABCs of Underwater Technology

## Deep Submergence Vehicle



From [www.nicholas.duke.edu](http://www.nicholas.duke.edu)

*Alvin*



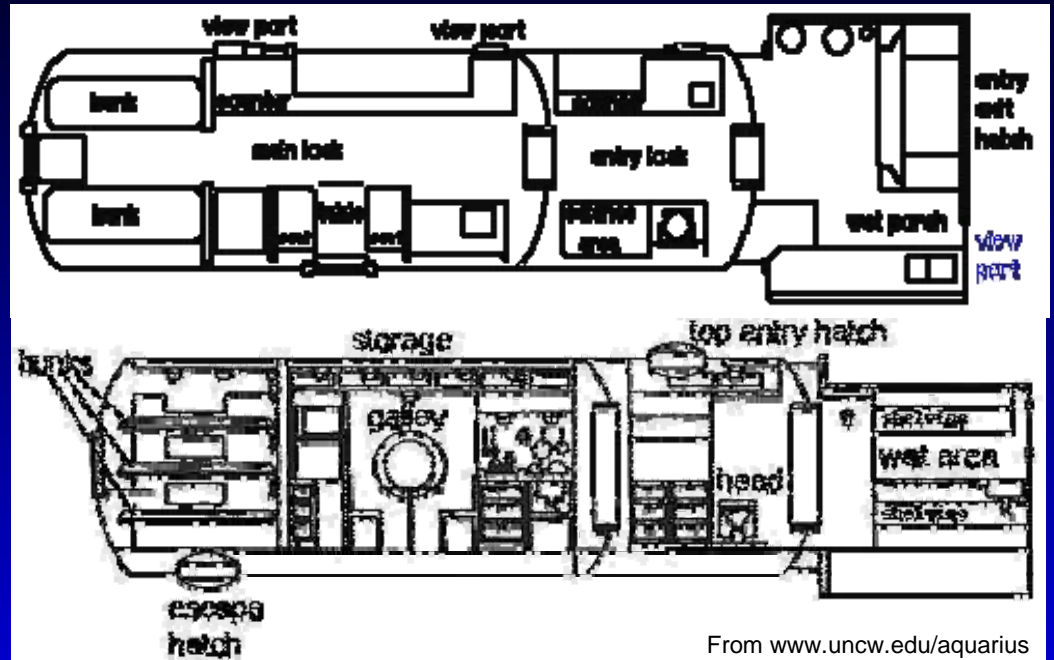
From <http://www.dkimages.com>



From [www.frc.ri.cmu.edu](http://www.frc.ri.cmu.edu)



# Aquarius Underwater Habitat



# Moving Forward

*How can we continue to sample the water without putting people in danger?*

# Underwater Sampling

Niskin bottles



From <http://oceanexplorer.noaa.gov>

CTD



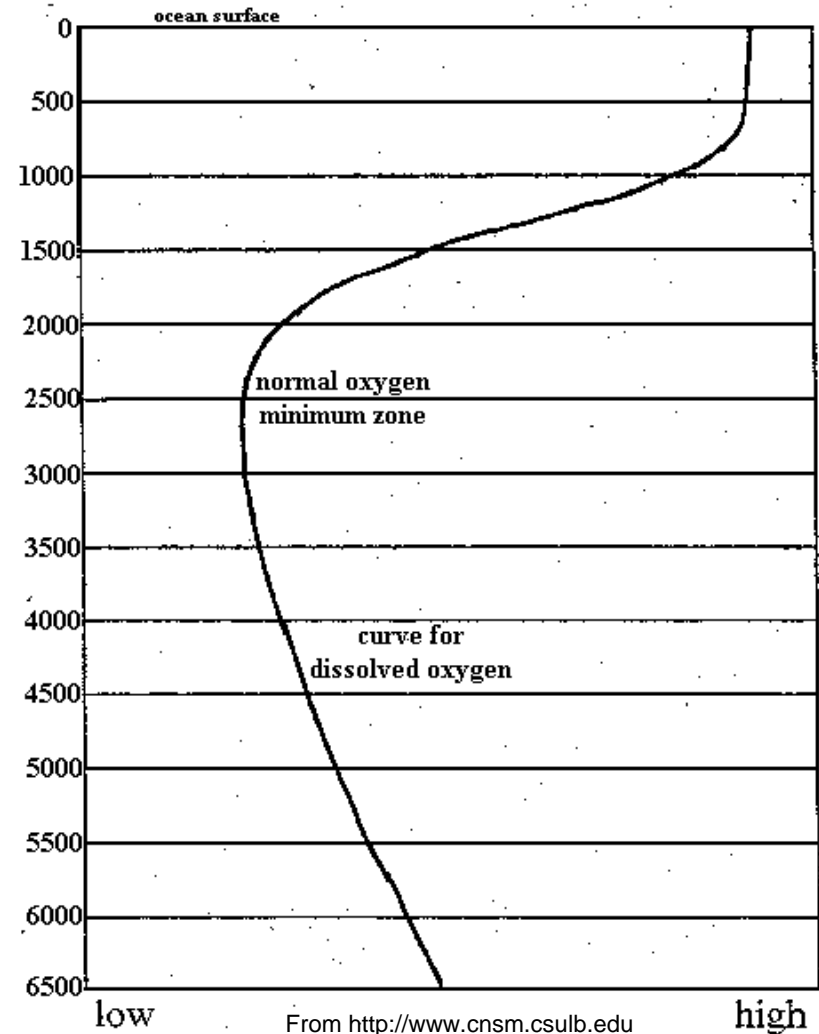
From [www.windows.ucar.edu](http://www.windows.ucar.edu)



# Underwater Sampling



concentration of dissolved oxygen within the ocean





# Underwater Sampling



From <http://uncw.edu/aquarius/education/lessons/aq%20auv.pdf>

# ABCs of Underwater Technology

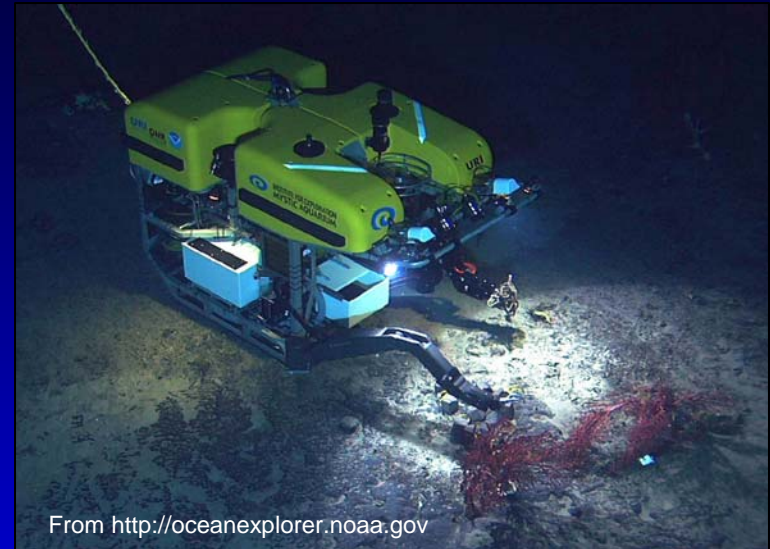
## ROV?



From [woodshole.er.usgs.gov](http://woodshole.er.usgs.gov)

# ABCs of Underwater Technology

## Remotely Operated Vehicle



# Anatomy of an ROV

Tether/Cable

Light Source

Camera

Claw

Propellers





# ABCs of Underwater Technology

## ROVs



<http://www.youtube.com/watch?v=LfnrJRx8XNs>

# ABCs of Underwater Technology

## AUV?

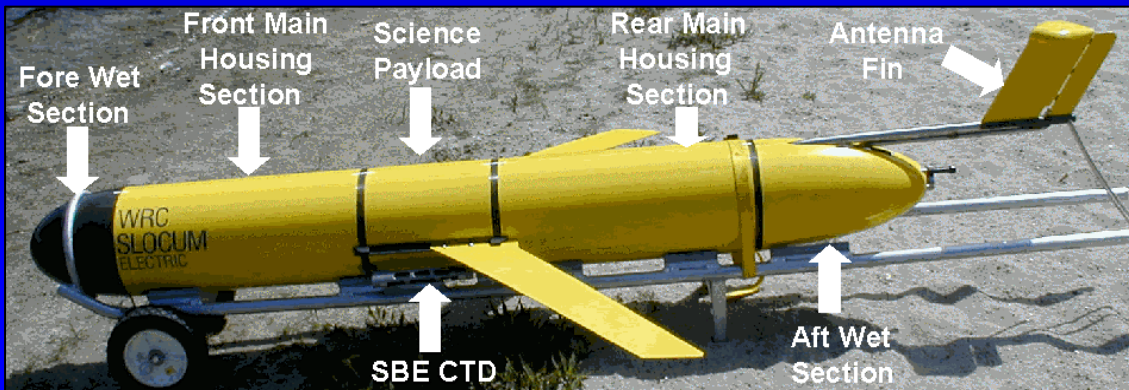


# ABCs of Underwater Technology

## Autonomous Underwater Vehicle



From S. Lichtenwalner; Rutgers Coastal Ocean Observation Lab (COOL)

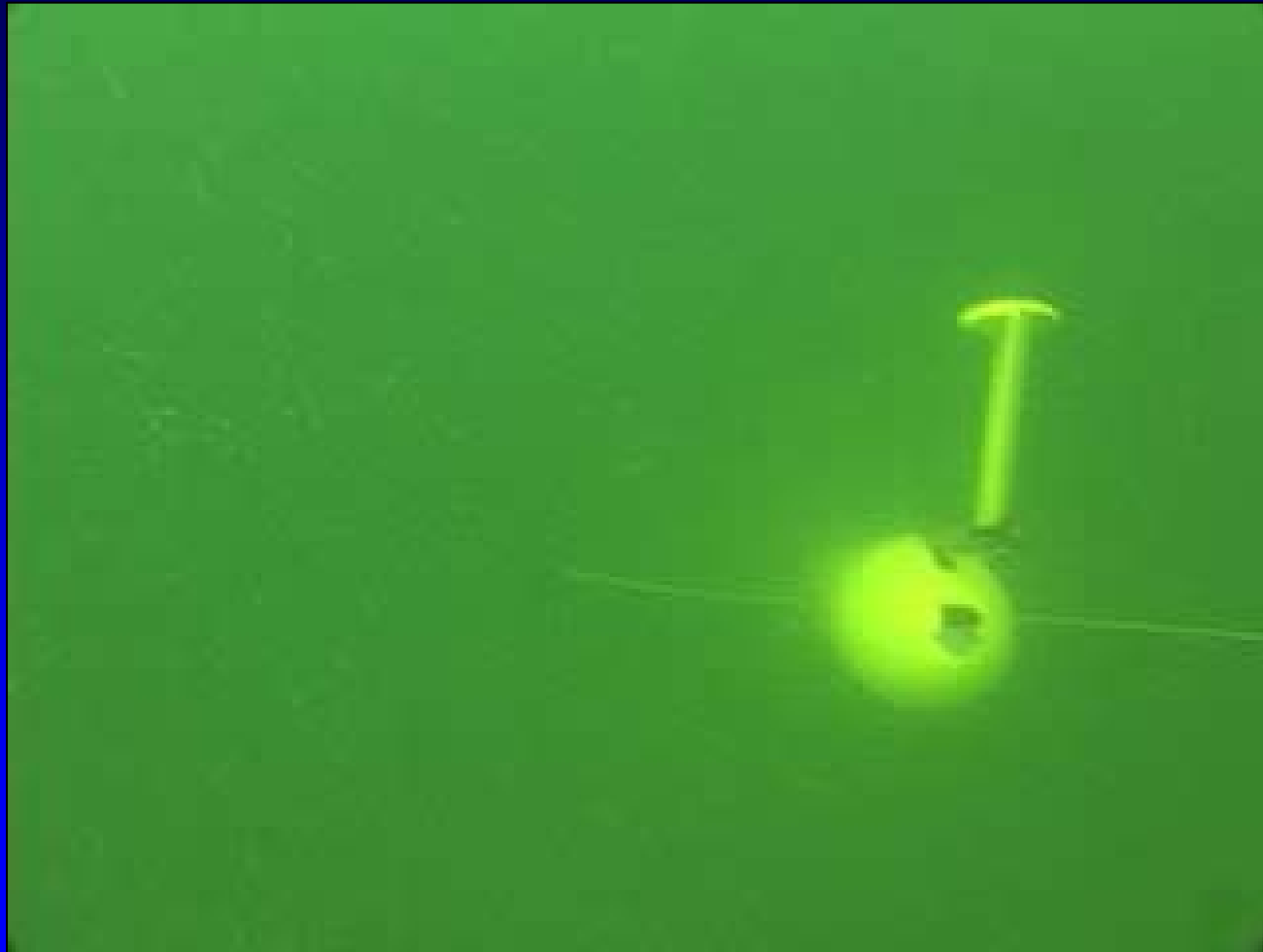


From J. Kohut, Rutgers Coastal Ocean Observation Lab (COOL)



# ABCs of Underwater Technology

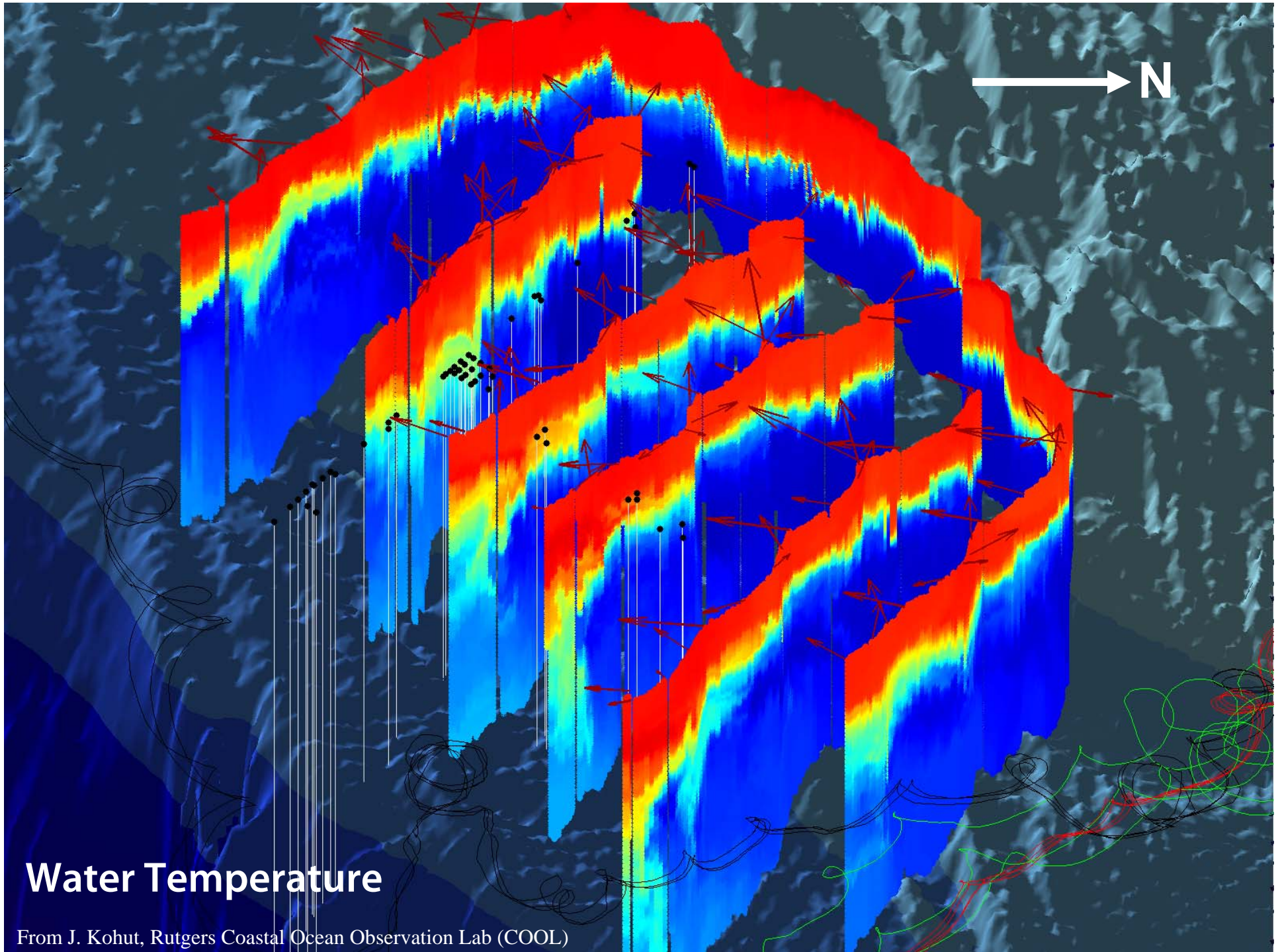
## *Slocum Glider*



From Webb Research Corporation

<http://www.youtube.com/watch?v=VO3pUVmwoX8>





# Water Temperature

From J. Kohut, Rutgers Coastal Ocean Observation Lab (COOL)

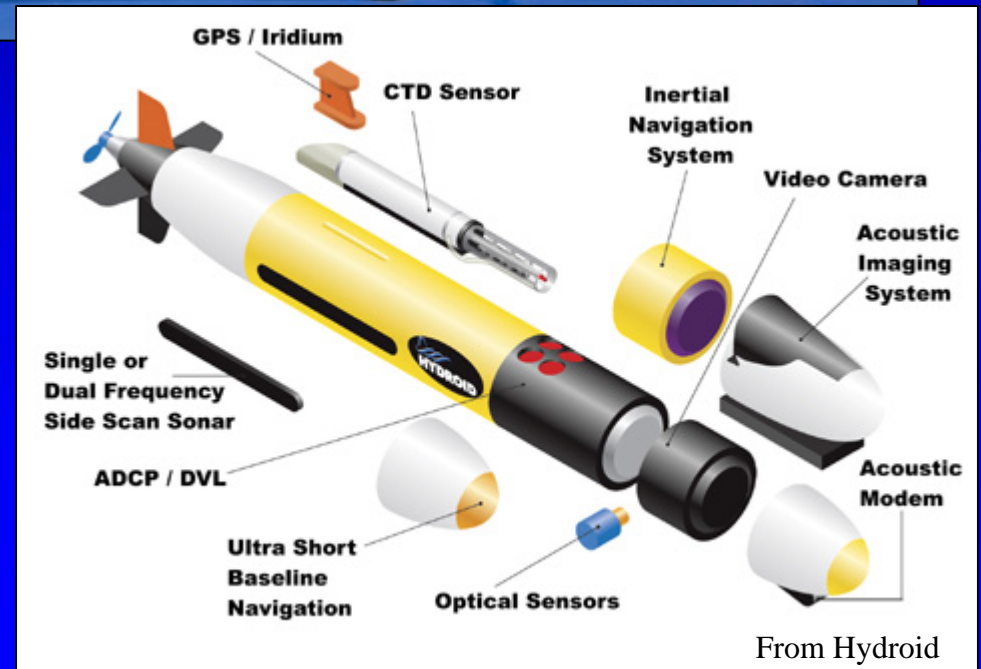
# ABCs of Underwater Technology

## REMUS – Remote Environmental Monitoring Units

From WHOI



From ONR



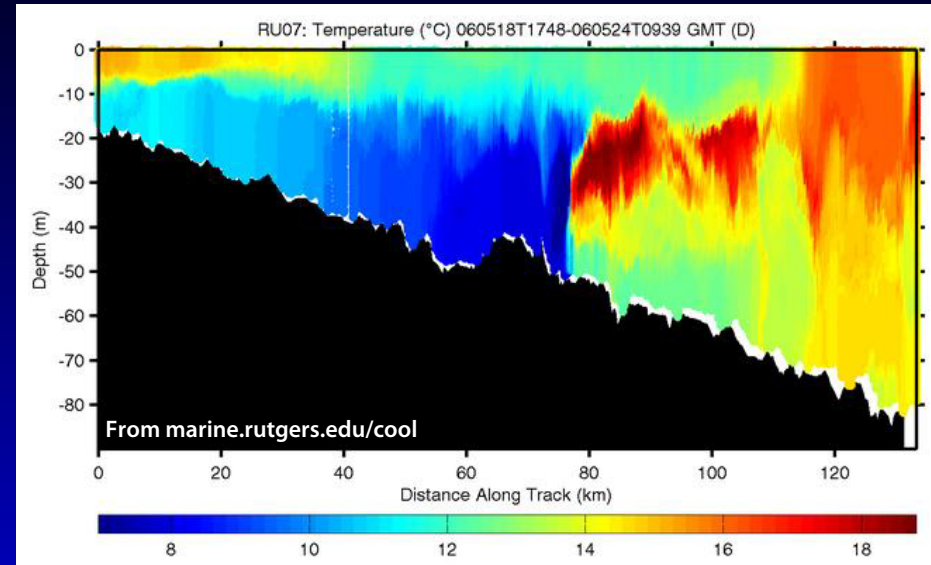
From Hydroid



# Why do we use ROVs/AUVs?



Hydrothermal Vent Research/Discovery



Water Quality Research

Oil Rig Inspection



Shipwreck Discovery/  
Investigation/Research



Dock/Dam Inspection



# Why do we use ROVs/AUVs?



Credit: YouTube: "Launch of ROV Niniane" by bariumstep  
<http://www.youtube.com/watch?v=4RItSaVy-EI>



# Why do we use ROVs/AUVs?



*ABC's Lost, Season 4, Episode 2: "Confirmed Dead," (7 February, 2008)*

# Wet Trials: SeaPerch



Credit: Chris Petrone

# *ROVs in the News*

# NOAA locates YP-389 off of Cape Hatteras, NC

From wavy.com





*Military uses of  
underwater/autonomous  
technology*

# ABCs of Underwater Technology

## UUV?



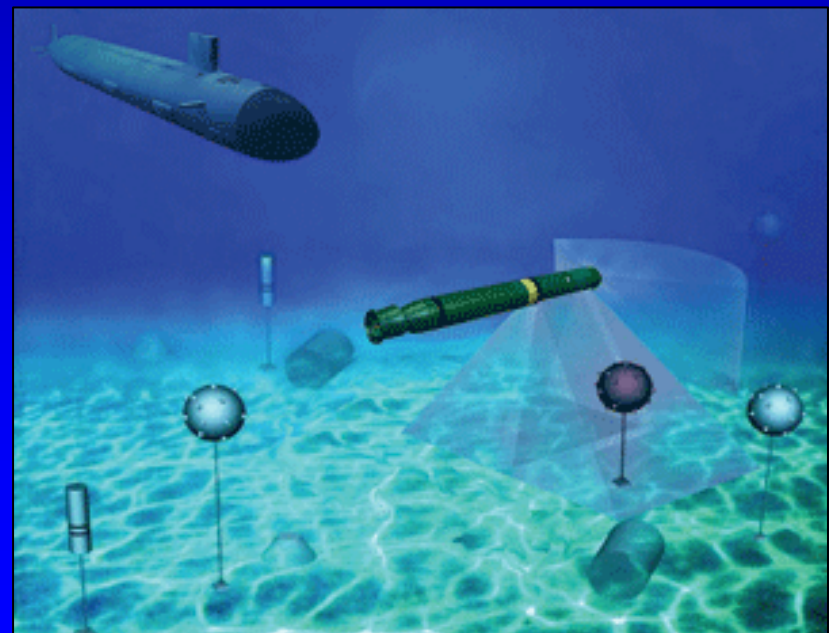
From <http://warisboring.com>

# ABCs of Underwater Technology

## Unmanned Underwater Vehicle



From <http://www.southcom.mil>



[http://www.navy.mil/navydata/cno/n87/usw/issue\\_26/uuv.html](http://www.navy.mil/navydata/cno/n87/usw/issue_26/uuv.html)

# ABCs of Aerial Technology

## UAV?



From <http://www.skycontrol.net>



# ABCs of Aerial Technology

## Unmanned Aerial Vehicle



*How can YOU get involved?*

# Robotics!



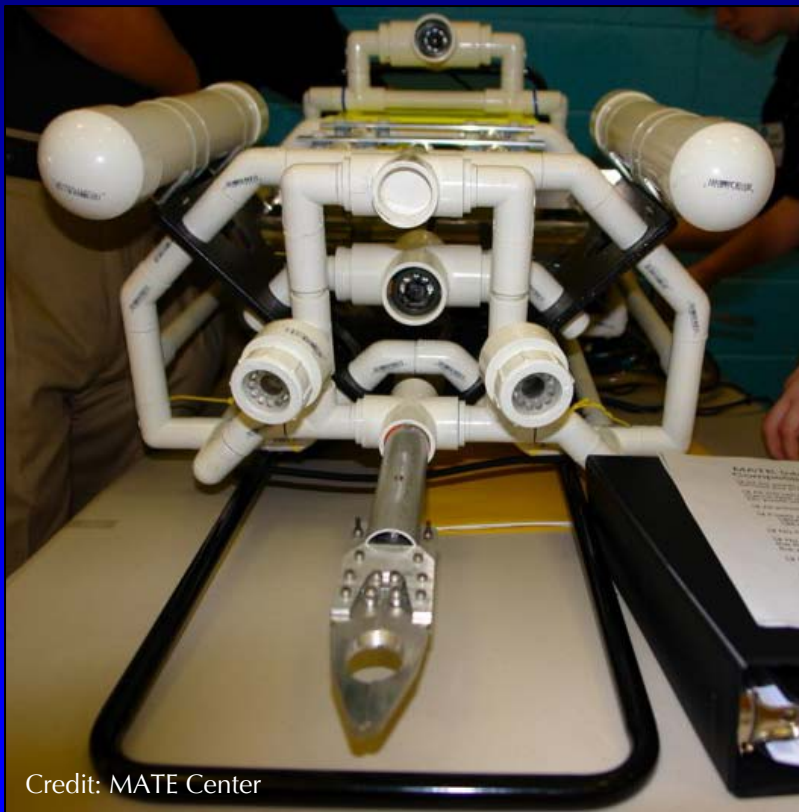
From [www.seaperch.org](http://www.seaperch.org)

[www.seaperch.mit.edu](http://www.seaperch.mit.edu)

[www.seaperch.org](http://www.seaperch.org)

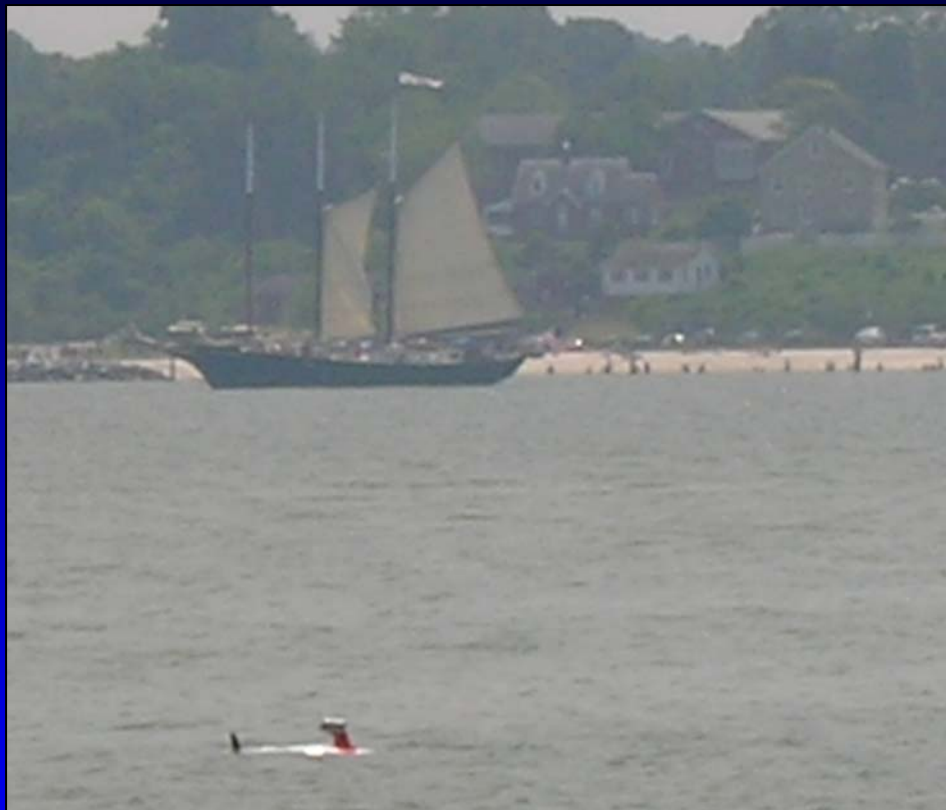
# ROV Competitions

- MATE Center - [http://www.marinetech.org/rov\\_competition](http://www.marinetech.org/rov_competition)





# Questions?



<http://www.marine-ed.org/bridge>  
[petrone@vims.edu](mailto:petrone@vims.edu)

