



2011 Research Vessel Operators Committee Meeting

Outline

- Schmidt Ocean Institute Mission
- Current composition of staff
- Lone Ranger
- Falkor
- Organization of cruises
- Scientific and academic projects



The mission of the Schmidt Ocean Institute is to advance ocean exploration, discovery, and knowledge, and to be a catalyst for sharing the information about the oceans.



- **2009 Schmidt Ocean Institute founded**
- **Early 2009 acquired the Falkor**
- **Spring 2009 Lone Ranger was donated to the Institute**
- **Jan 2011 First science cruise onboard Lone Ranger**



SCHMIDT OCEAN INSTITUTE

- Victor Zykov Director of Operations
- Eric King Marine Operations Manager
- Pete Zerr Marine Operations Manager
- Lisa Spivey Program Manager

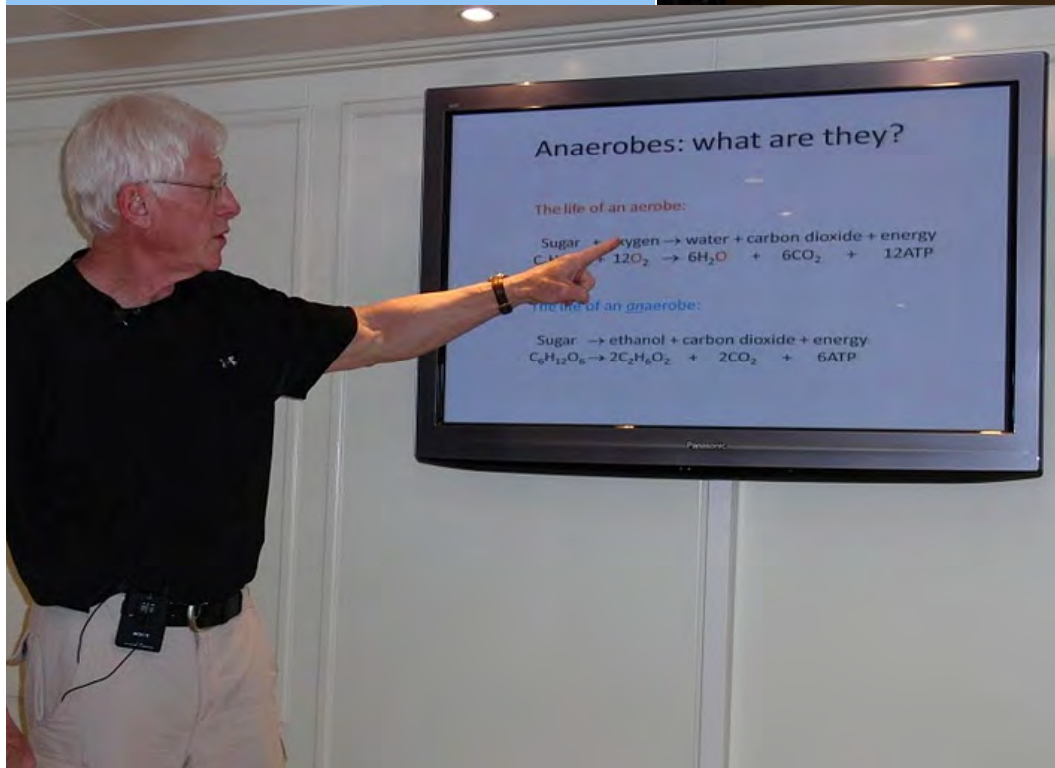


Lone Ranger Main Particulars:

Length	77.4 m (254 feet)
Freeboard	~1 m
Beam	13 m (43 feet)
Design Draft	5.58 m
Maximum Draft	6.67 m (21.9 feet)
Gross Tonnage	1600 GRT

Former ocean tug, then private expedition yacht
Built in 1973 in Bremerhaven Germany





Falkor Main Particulars:

Length OA	82.9 m (272 ft)
Freeboard	2.3 m (7.5 ft)
Breadth	13.0 m (42.7 ft)
Draft	4.7 m (15.4 ft)
Depth (molded)	6.7 m (21.9 ft)
Gross Tonnage	1930 GRT

Former German Fishery Protection Vessel

Built in 1981 in Lübeck, Germany

Dynamic Positioning

Zero speed stabilizers

Transducer systems:

EM 302 1x1 degree

EM 710 0.5x1 degree

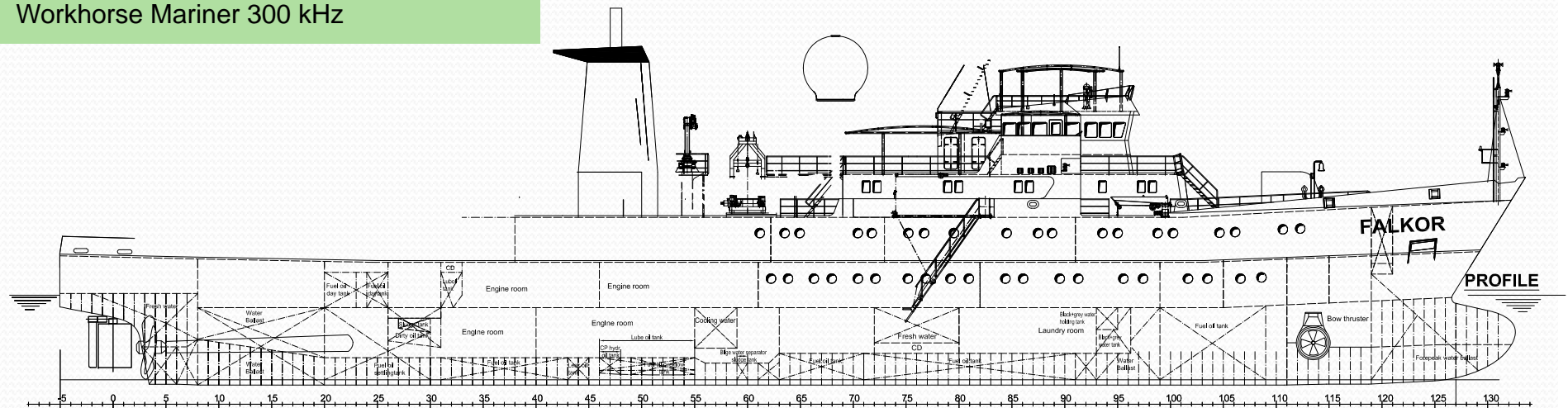
EA 600 System 12/38/200kHz

EK 60 Fishery Research Splitbeam system

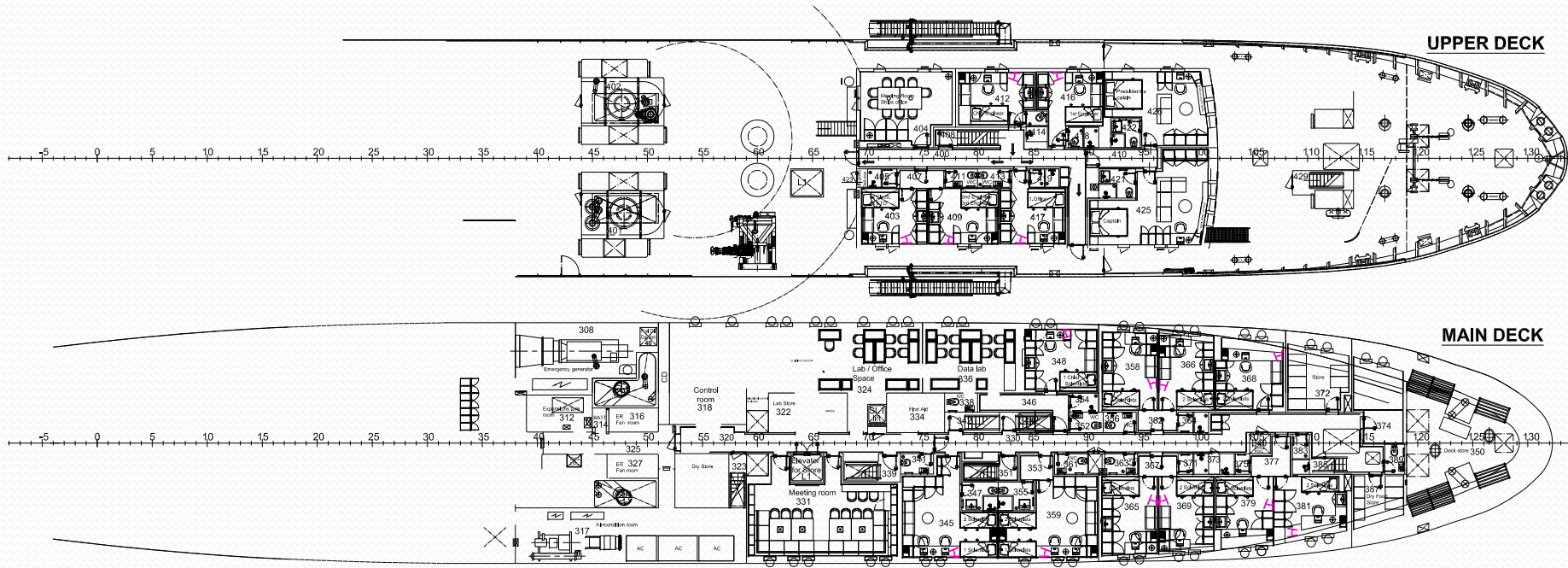
Knudsen 3260 Sub bottom profiler

Ocean Surveyor ADCP

Workhorse Mariner 300 kHz



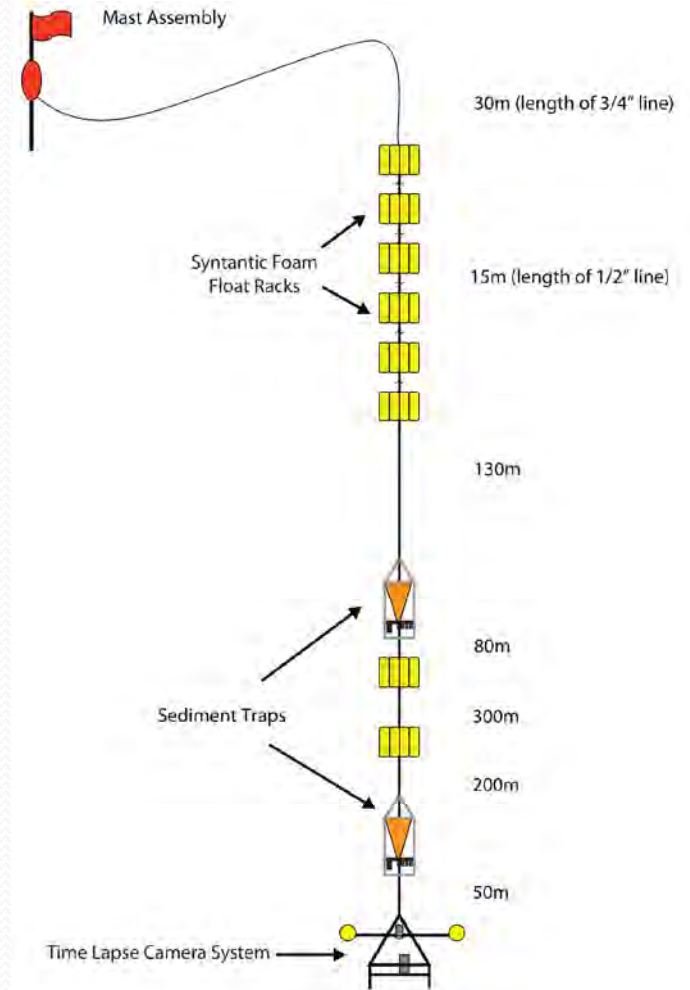
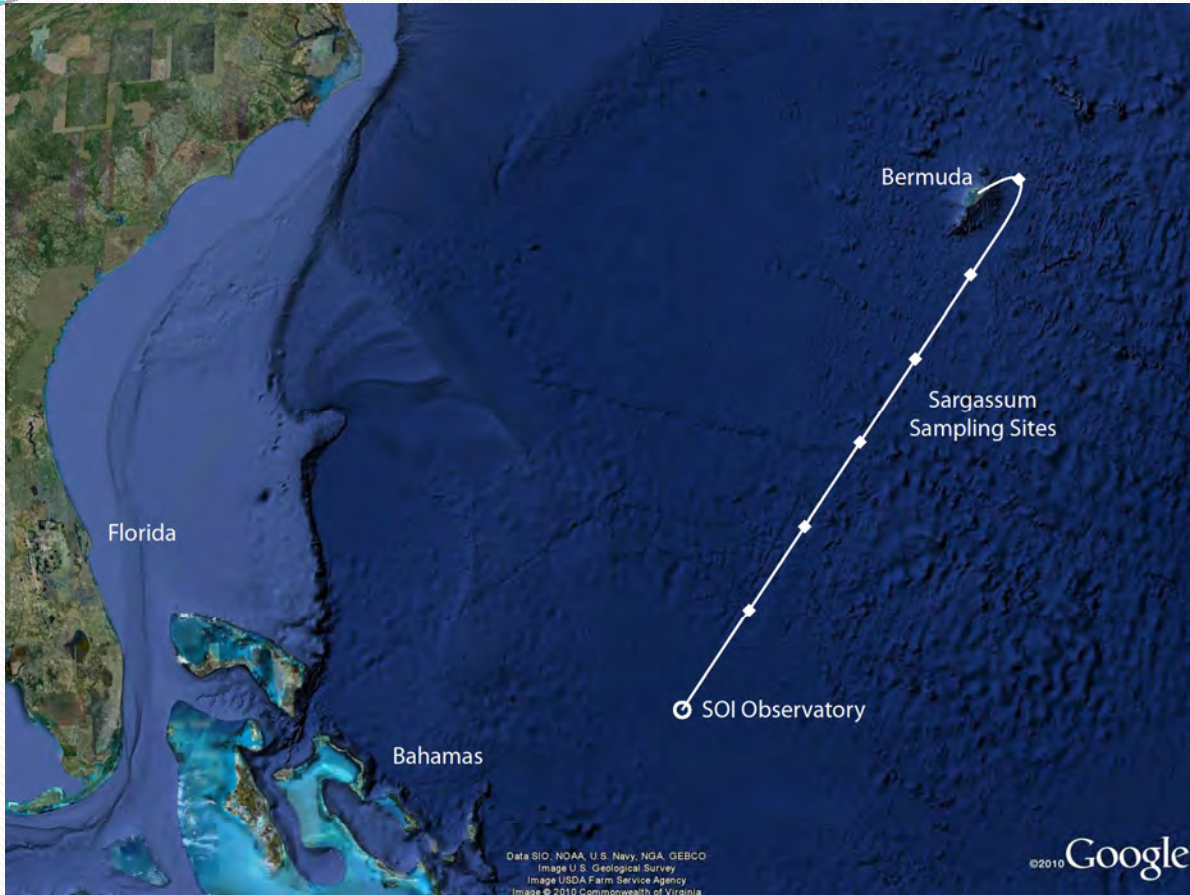




Post Doc, Fellow and PI slides

Lone Ranger – Sargasso Sea Cruise

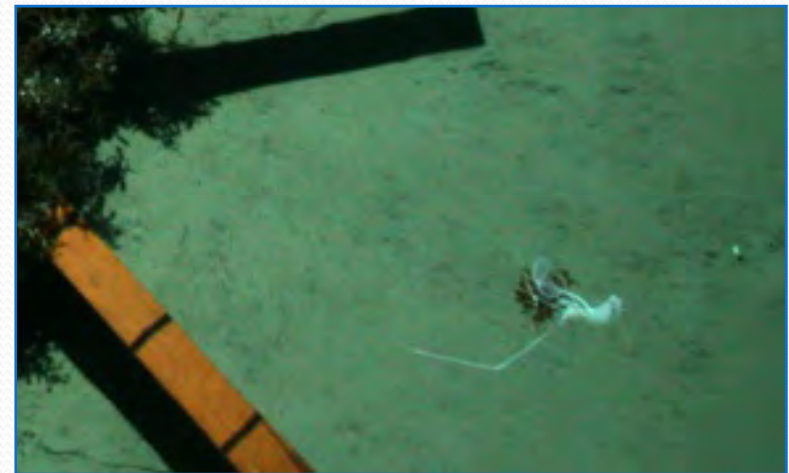
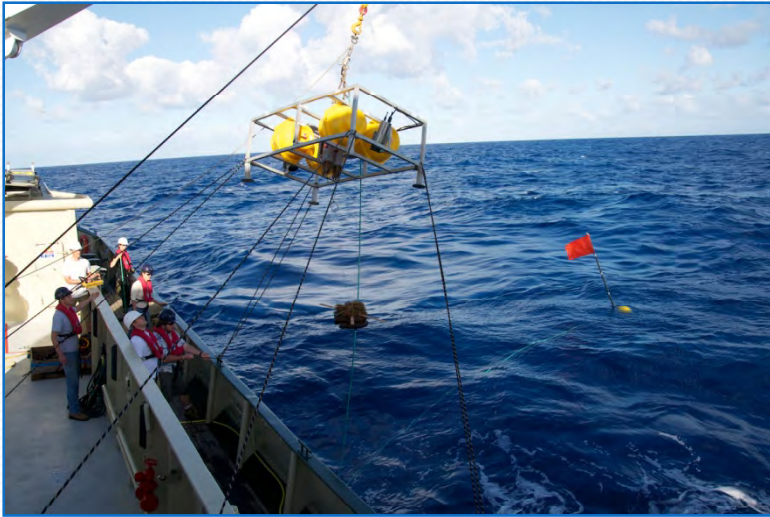
Ken Smith – Chief Scientist – MBARI



Deep Sea Observatory deployment at depth of 5400 meters

Abyssal Scavenger Studies

Jeff Drazen, University of Hawaii—Principle Investigator for Schmidt Ocean Institute



- Sargasso sea abyssal fish fauna is more similar to the oligotrophic Pacific than to eutrophic Atlantic
- A community of scavengers is rapidly attracted to falls of Sargassum, a potentially important and underappreciated food supply

Deep-Sea Coral Ecology Project

Peter Etnoyer, Research Fellow for Schmidt Ocean Institute



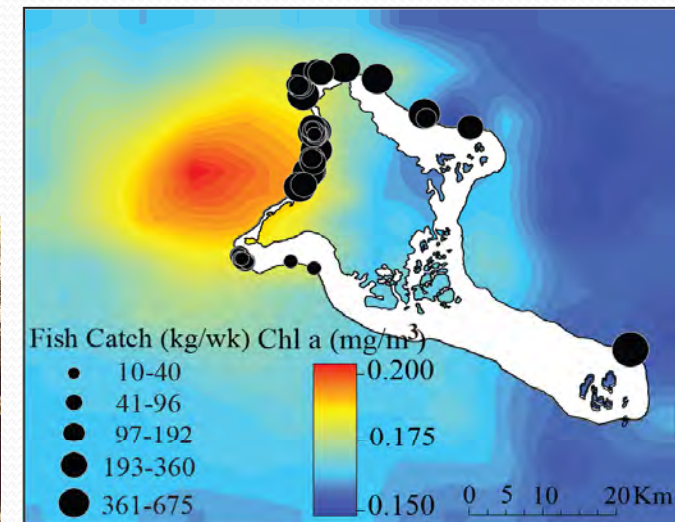
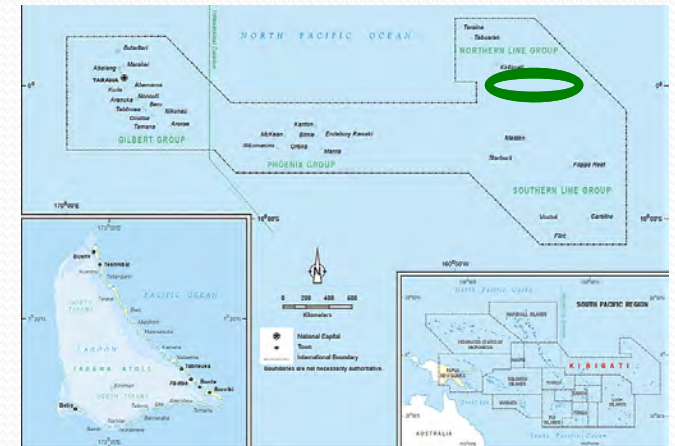
- Discovering new deep-coral habitats
- Assessing biodiversity, health, & condition
- Characterizing environmental chemistry
- Building cold aquaria for experimentation
- Monitoring with satellites and data loggers



Coral Reef Resilience on Kiritimati: the world's largest atoll

Julia Baum, Research Post-doc for Schmidt Ocean Institute

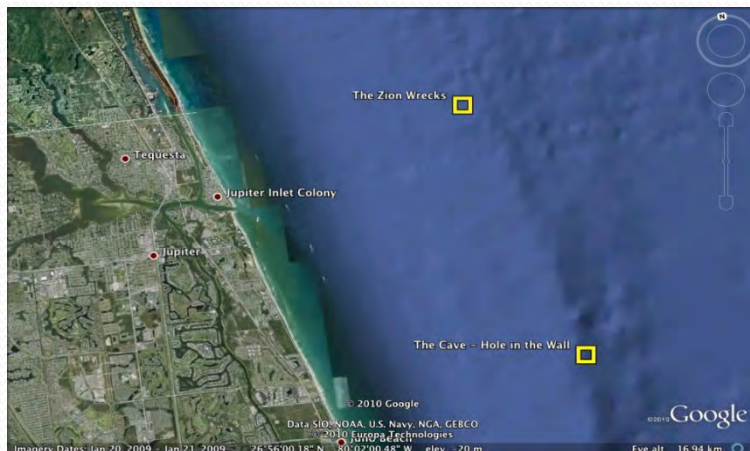
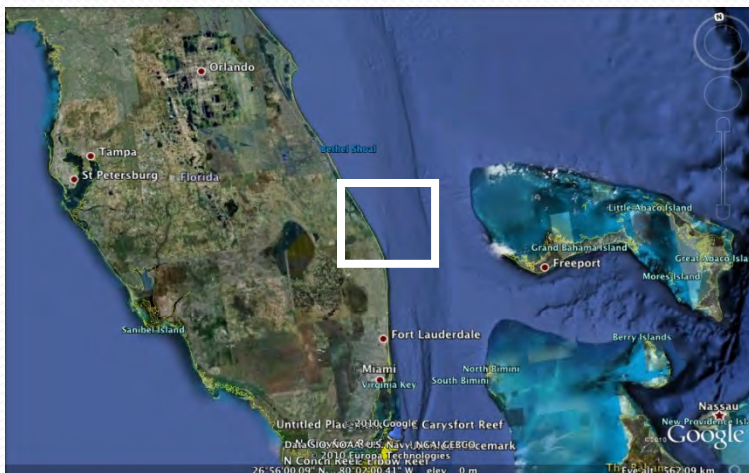
- Ecological monitoring (fish, invertebrates, berylls, algae)
- Predation and grazing experiments
- Stable isotope analyses to describe and reconstruct baseline food web



Schmidt Ocean Institute Research

Sarah Frias-Torres, Research Post-doc for Schmidt Ocean Institute

Two Florida dive sites not found anywhere else in the world hide the largest spawning aggregation of the almost extinct and critically endangered goliath grouper.



SOI is now supporting research to:

1. quantify the behavior of the spawning aggregation
2. understand how divers alter the behavior of the species
3. provide the baseline for future marine reserves in reef fish spawning aggregation sites

Extremes in Coral Thermal Tolerance

Daniel Barshis, Research Post-doc for Schmidt Ocean Institute and
Advisor Stephen R. Palumbi

- Identification of markers of increased coral stress resistance using next-generation genome sequencing:
 - What corals are strongest?
 - Make these a priority for conservation.
 - What genetic mechanisms underlie exceptional stress tolerance?
 - Develop diagnostic tools to assess these mechanisms in other coral populations
- Finding and protecting strong corals will be vital in ensuring the survival of those corals most likely to withstand climate change

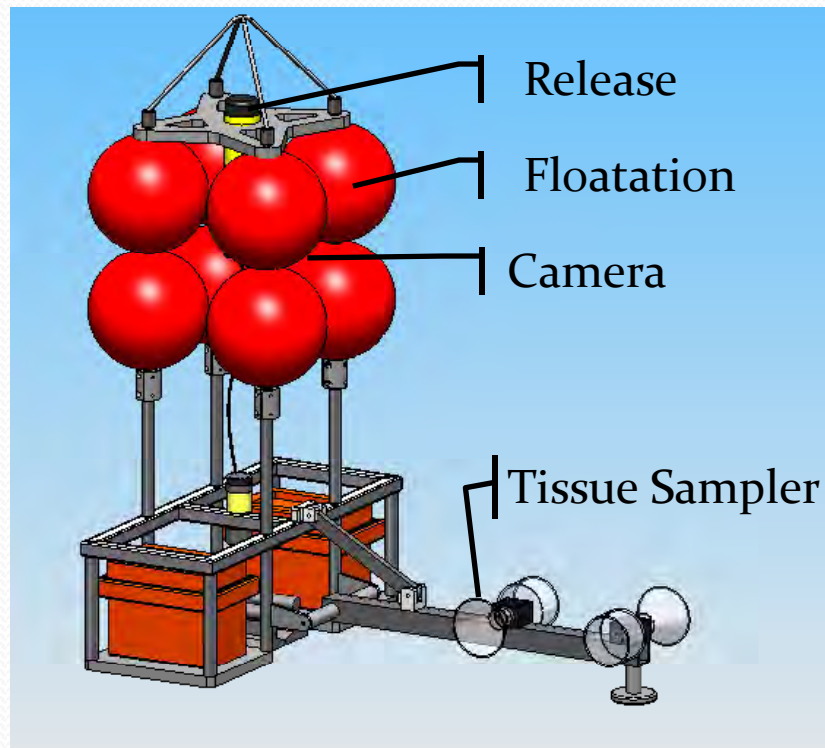


Autonomous Tissue Sampler

Dr. Erika Raymond, Research Post-doc for Schmidt Ocean Institute

- Objectives

- Development of tool for minimally-invasive, non-lethal recovery of genetic material from marine fishes *in situ* for molecular & toxicology studies
- Linked to video observation
- Ability to withstand extended deployment in the field with minimal DNA degradation



- System

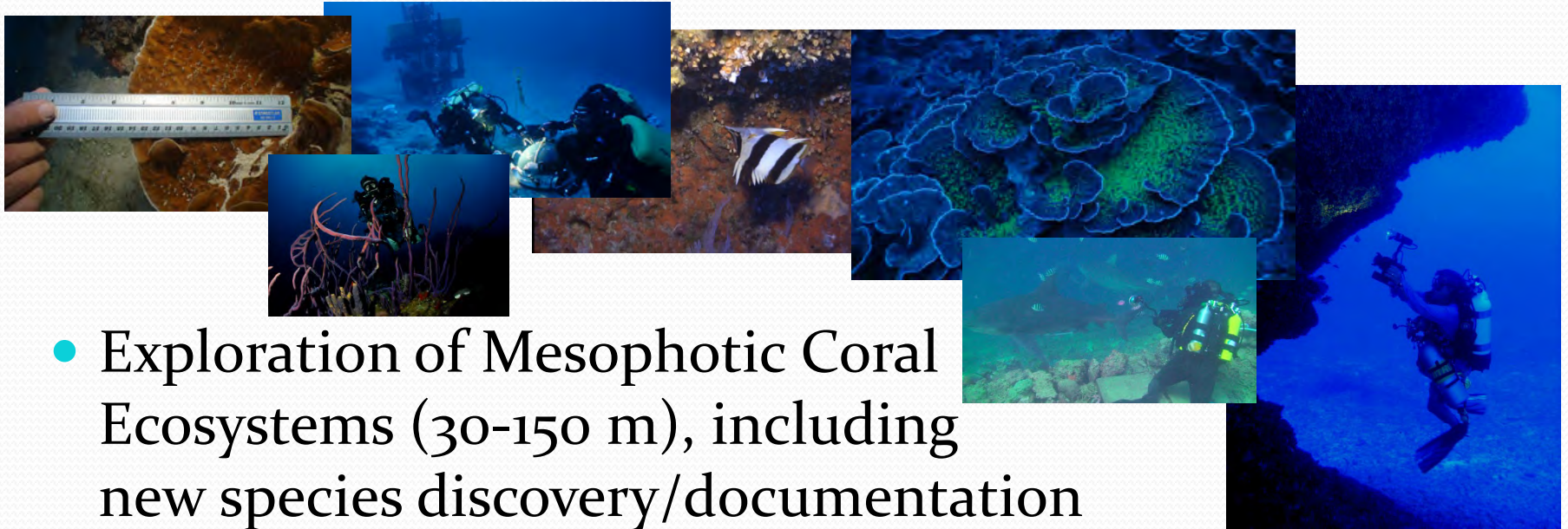
- Frame
- Acoustic release
- Sample & video trigger
- Tissue-sampling tips
- IR communication port

- Results

- Lander deployment and recovery
- System autonomously recorded time-lapsed video down to 1200 m
- Fishes approached baited target
- Off-the-shelf biopsy needles investigated during 2010 require further modification for release at depth

Richard L. Pyle, PhD

Research Fellow for Schmidt Ocean Institute

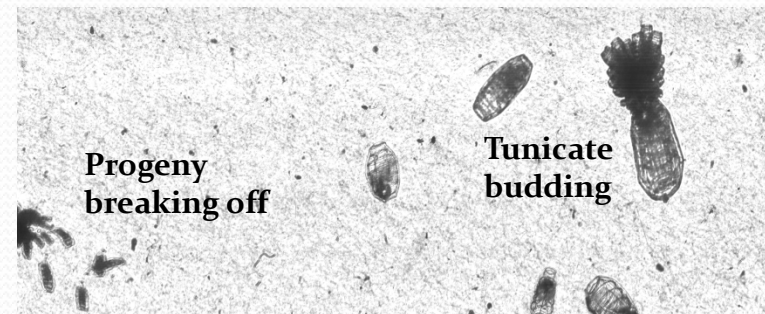


- Exploration of Mesophotic Coral Ecosystems (30-150 m), including new species discovery/documentation
- Development of advanced mixed-gas diving technology & techniques for scientific exploration
- Field work in Fiji, Cayman Islands, Northwestern Hawaiian Islands, Eilat (Red Sea) & Maui

Viewing Plankton

Kirsten Grorud-Colvert, Research Post-doc for Schmidt Ocean Institute

- Research question: *Do oceanographic frontal zones accumulate organisms, making them ideal locations for marine protected areas?*
- Wealth of data from in-water observations
 - *In-situ* Ichthyoplankton Imaging System (ISIIS)
 - Half a million images from July 2010 cruise
 - First known observation of tunicates reproducing in their natural habitat
 - May be concentrated in frontal zones



www.schmidtocean.org

