

# Mesophotic Coral Cruise

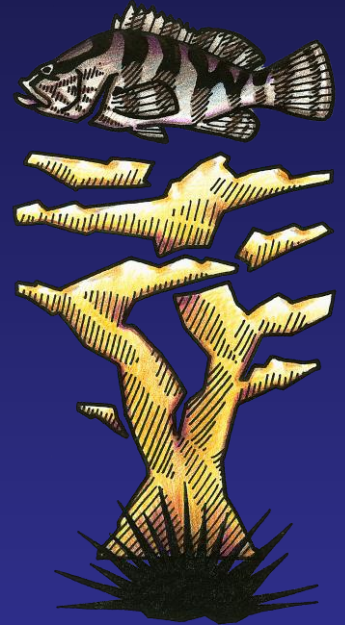
Caribbean Coral Reef Institute

Funding from CSCOR

With collaboration from:

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Exploration, Research and Technology

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# Mesophotic Coral Ecosystems

Mesophotic coral ecosystems (MCEs) are characterized by the presence of light-dependent coral and associated algal and sponge communities that are typically found at depths between 30 – 100+ m in tropical and subtropical regions

Because of ... technological limitations, fully two-thirds of the total depth range of zooxanthellate coral environments remain largely unexplored

Hinderstein et al. 2010

# Mesophotic Cruise: January 9-23, 2009



- Mesophotic Cruise Sites
- Deep CRES Sites



**Platform:**  
*Nekton Rorqual*



**Scientific Crew:**  
*Deep Divers*  
*ROV Operators*  
*Graduate Students*  
*Support Scientists*  
*Shallow Divers*  
*Documentary Film Crew*

# Mixed-gas Rebreather Diving

High Resolution Collections and  
Quantitative Sampling:  
Phototransects, Visual Census



# Remotely Operated Vehicle (ROV)

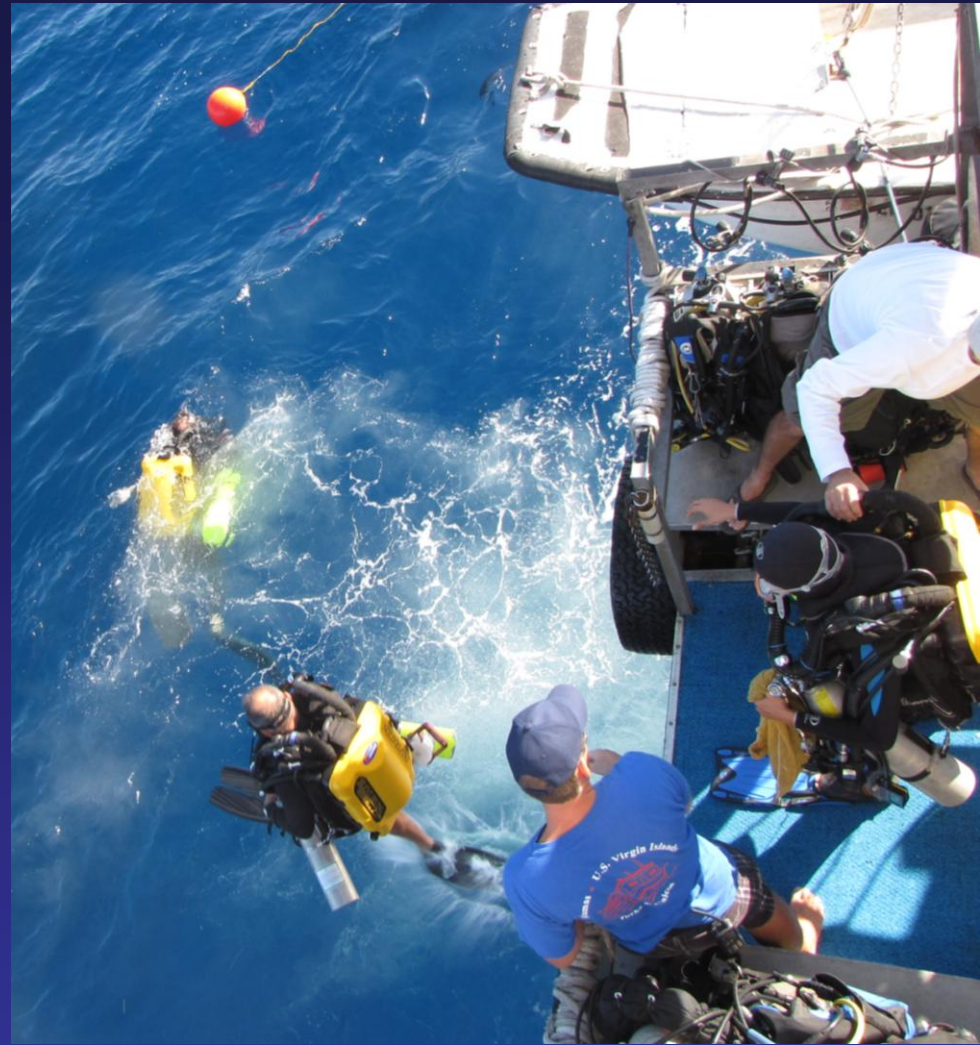


Qualitative Observations  
Video Documentation  
Greater Bottom Time



# Results

- ~100 man-hours of deep, rebreather dives conducted at 7 sites to depths of 250 ft.
- 8 ROV dives to depths of 420 ft.
- Established reliability and value of mixed-gas rebreather technology.



# Results

- Documented MCEs ecosystems in areas of various geomorphologies and exposures to waves and currents → model conditions promoting mesophotic coral development.
- Documented corals to depths of 308 ft.
- Discovered new areas with significant mesophotic coral development at all islands, but not at all locations.



Cane Bay, St. Croix – High *Agaricia lamarkii* development down to ~50 m





Grammanik Bank, St. Thomas – High coral cover at 80-90 m (260-290 ft)



Mostly *A. lamarkii*  
with some  
*Montastraea cavernosa*

US HGS 103HD+1 CA-50 21JAN10  
DS LS 0082.2MS 27C 11:31:18

# Collections



- Coral Reproduction
- DNA – population structure and connectivity across region & depth
- Gene expression – stress levels in corals
- Bacterial content – coral health

# Potential New Species of Algae and Invertebrates



Documented the  
established  
presence of the  
invasive lionfish  
at Mona Island to  
depths of 260 ft

