

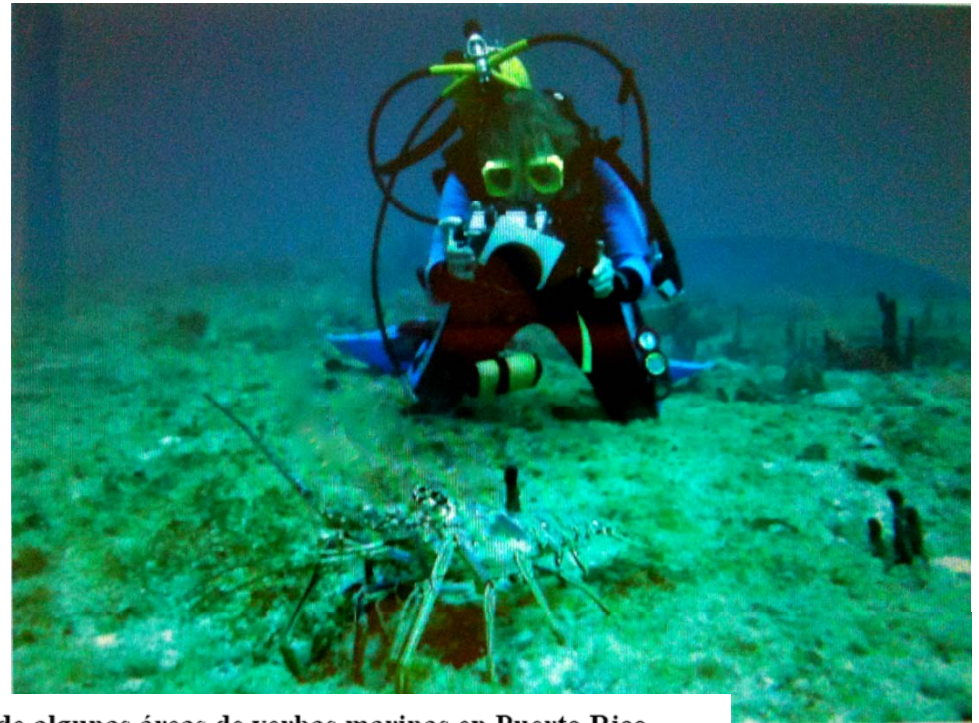
# Description of novel details on the habitat of the silk snapper (*Lutjanus vivanus*) off the West Coast of Puerto Rico

Graciela García-Moliner<sup>1</sup>, Eugenio Piñeiro Soler<sup>1</sup>, Roy Armstrong<sup>2</sup>  
and Hanu Singh<sup>3</sup>

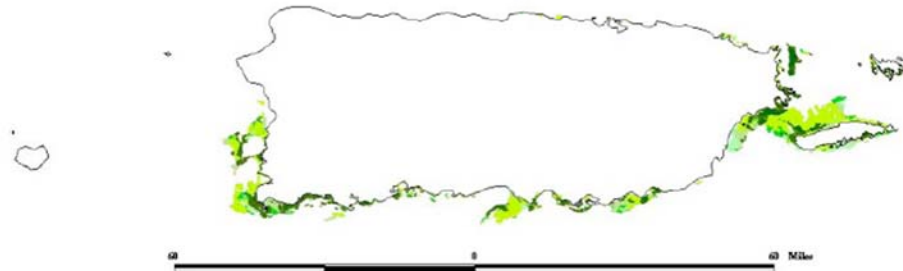
<sup>1</sup>Caribbean Fishery Management Council






<sup>2</sup>University of Puerto Rico Mayagüez Campus

<sup>3</sup>Woods Hole Oceanographic Institution,



Localización de algunas áreas de yerbas marinas en Puerto Rico  
Datos del Mapa Béntico Producido por NOAA



- Yerbas Marinas en Puerto Rico**
-  Yerbas Marinas Continuas
  -  Yerbas Marinas 10-30%
  -  Yerbas Marinas 30-50%
  -  Yerbas Marinas 50-70%
  -  Yerbas Marinas 70-90%

Nota:  
El mapa no representa todas las áreas donde se encuentran las yerbas marinas en Puerto Rico debido, en parte a la escala de las fotos aéreas de 1999 utilizadas por la NOAA para producir los mapas bénticos y la escala de los mapas como tal.



# SEASONAL AREA CLOSURES

No bottom longlines, pots, traps, gillnets, trammel nets allowed year-round

Bajo de Sico

Red hind December-February Closures

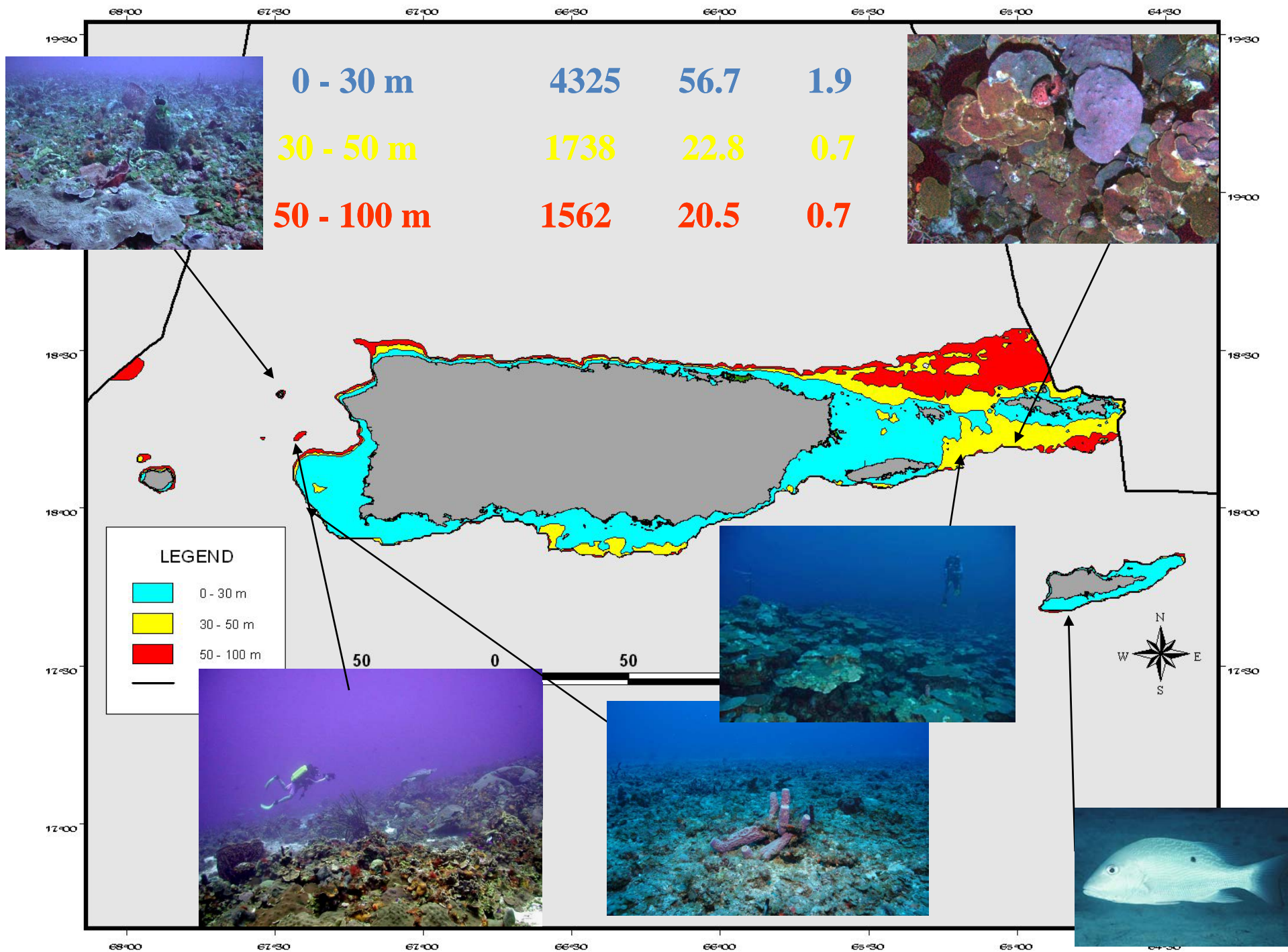
Tourmaline

Abrir la Sierra

**FISHING IS PROHIBITED  
DECEMBER 1- FEBRUARY 28  
EACH YEAR**

Chart Name: PUERTO RICO AND VIRGIN ISLANDS  
Chart ID: REG10  
Top Left: 18° 21' 22" N 67° 38' 18" W  
Bottom Right: 17° 56' 37" N 67° 0' 32" W



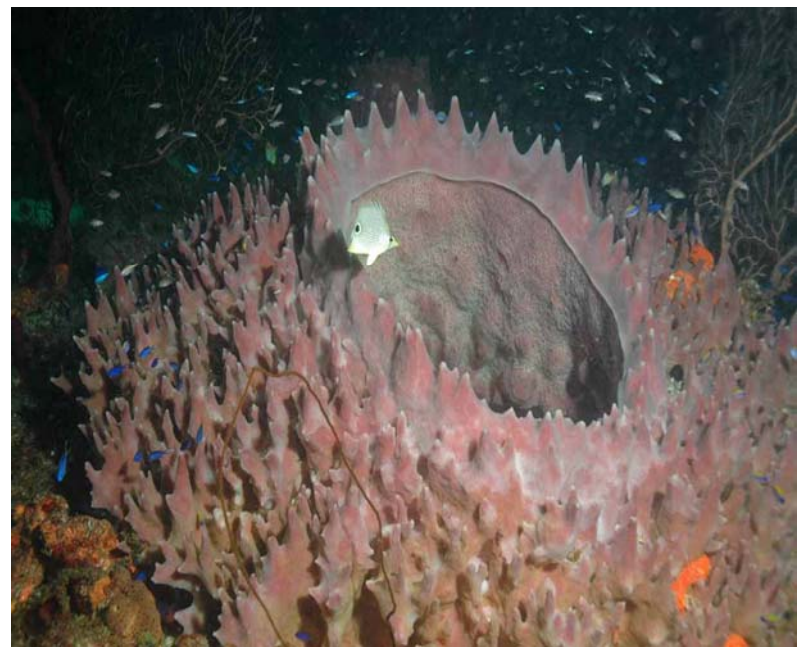


# Abrir La Sierra Rhodolith Reef Benthos

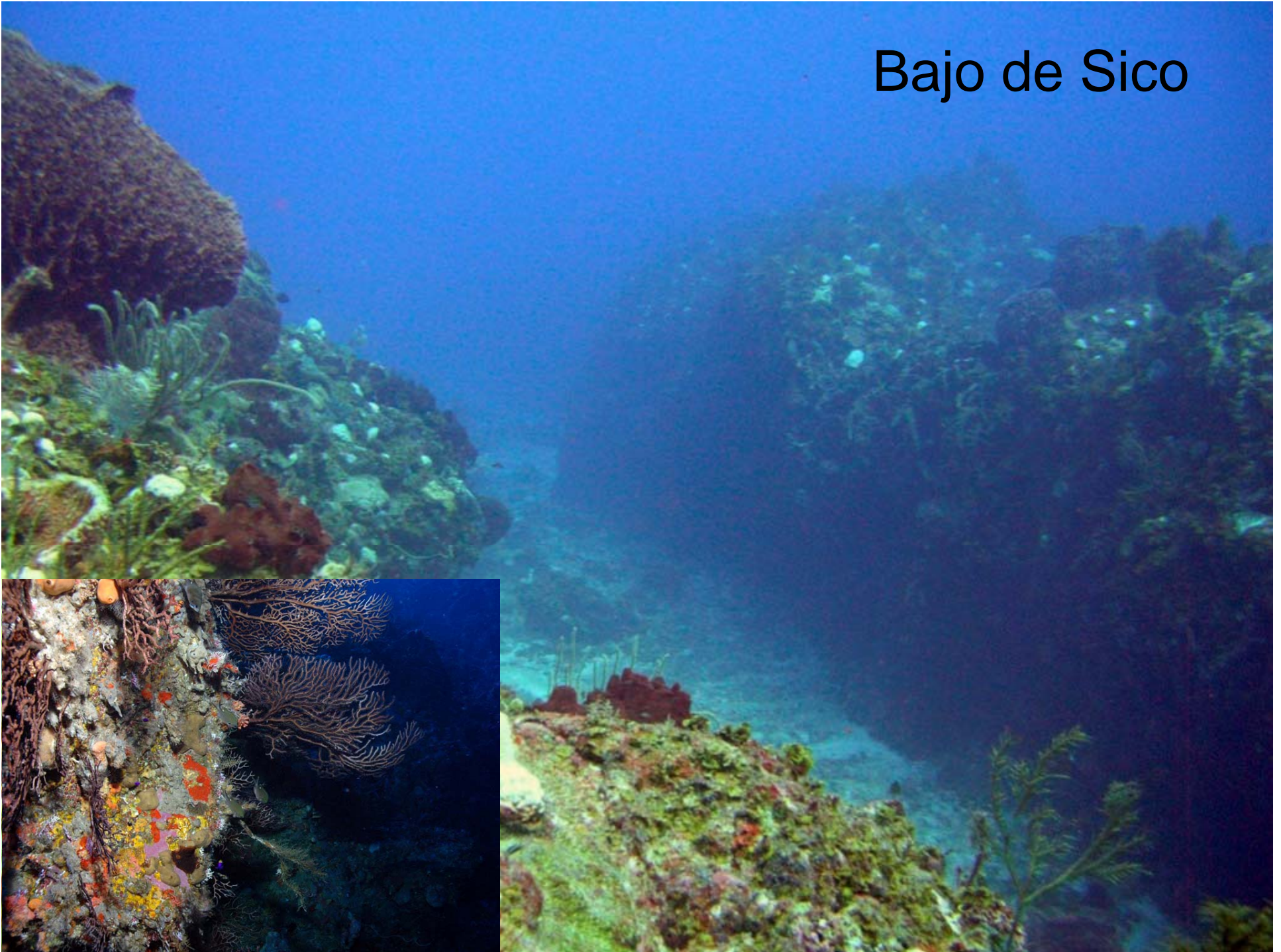
## Insular Slope – 30 m (Sessile-Benthic Community)



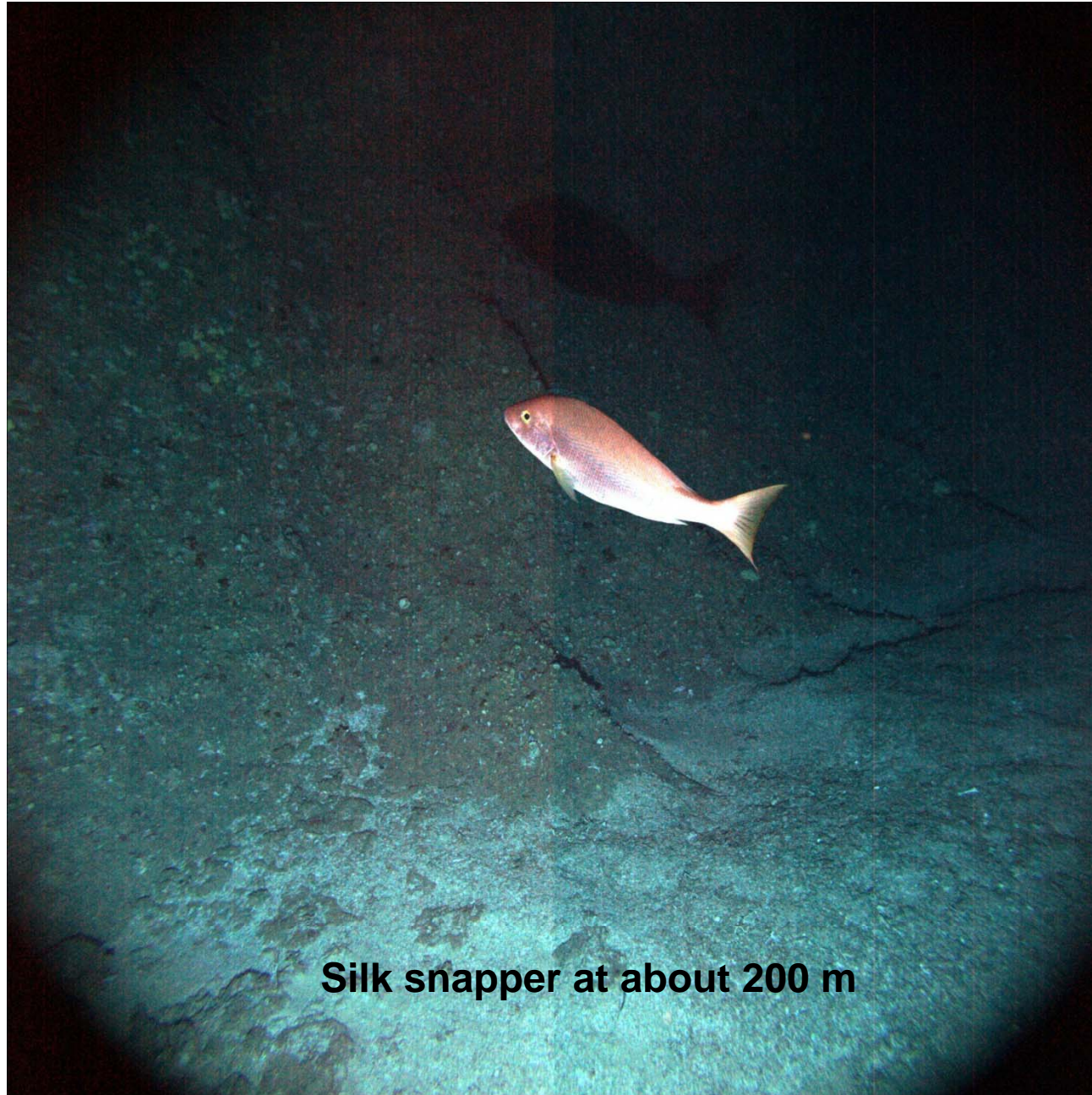
# Abrir La Sierra Inner and Insular Slope 40m and 50 m



# Bajo de Sico



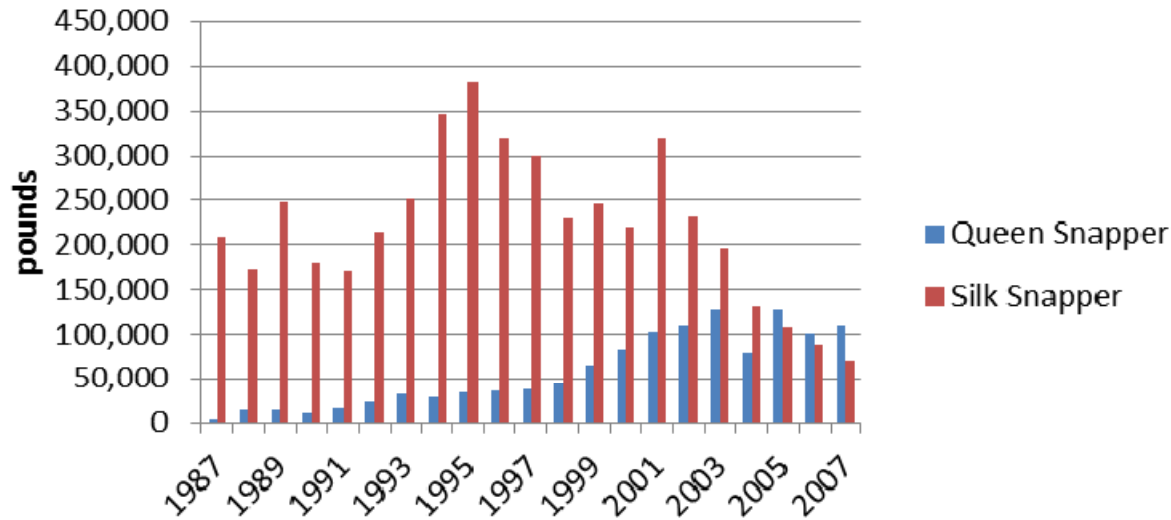
# Seabed AUV 2008 Mission



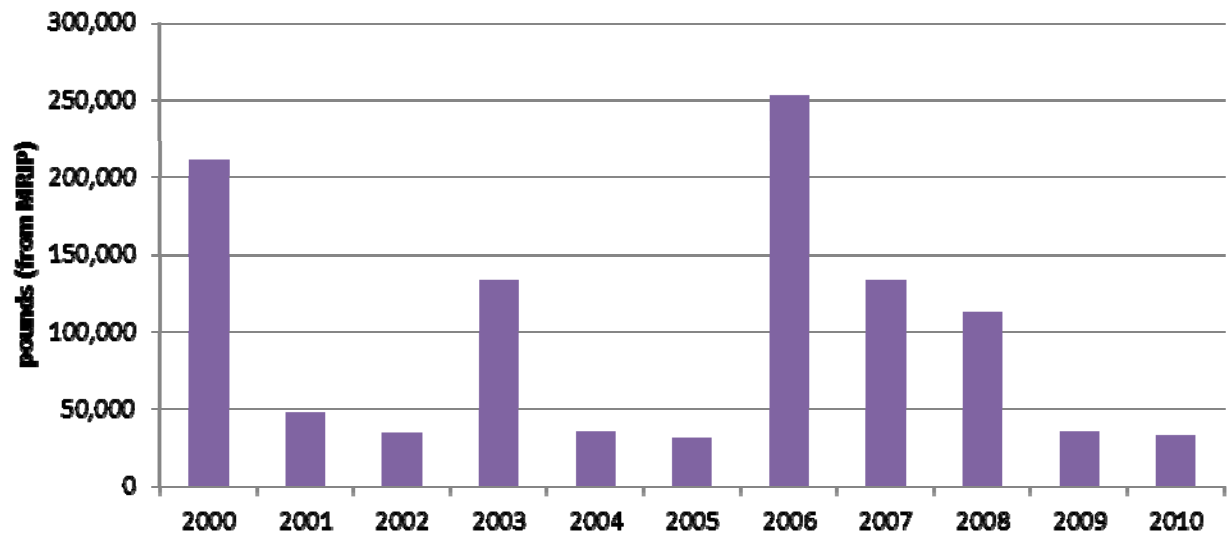
**Silk snapper at about 200 m**



## Silk and Queen Snapper Commercial Landings in Puerto Rico

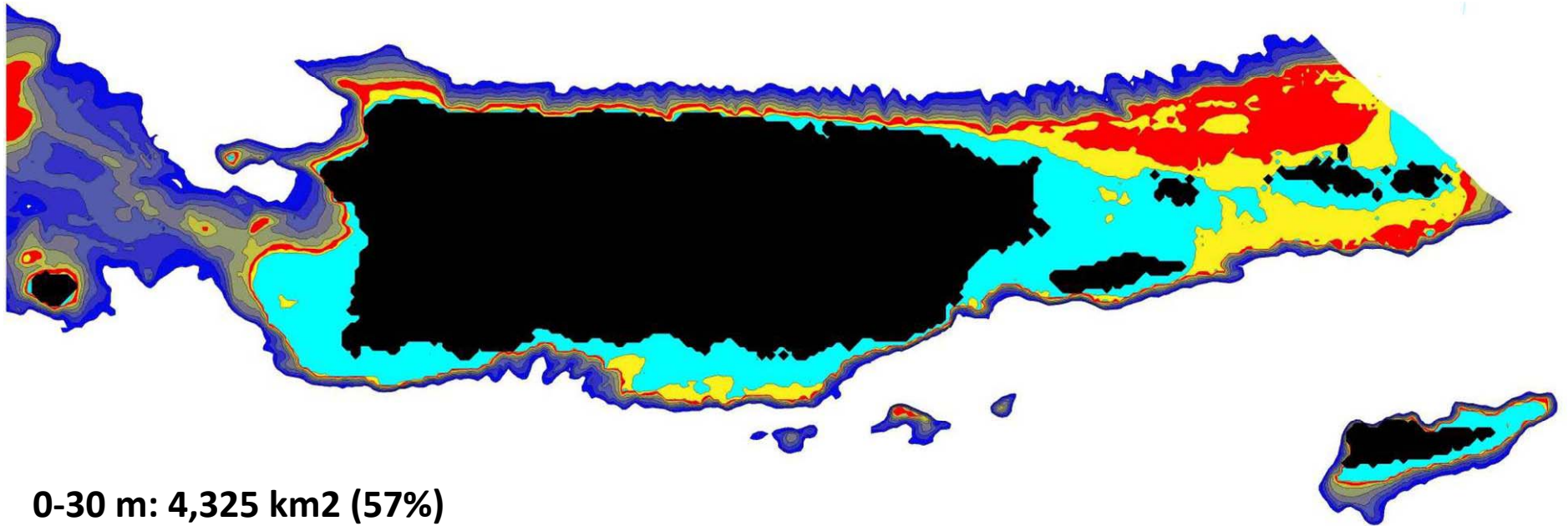


## Recreational Landings of Silk Snapper (pounds) in Puerto Rico



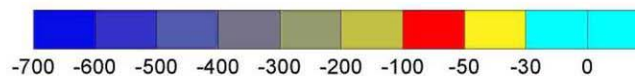
# Bathymetry

- Shallow water reefs - southwestern Puerto Rico
- Deeper insular shelf and upper insular slope reefs of Puerto Rico and USVI



**0-30 m: 4,325 km<sup>2</sup> (57%)**

**30-100 m: 1,738 km<sup>2</sup> (43%)**



SOUNDINGS IN METERS

Silk snapper 80-330 m; queen snapper -512 m

## Deep-Sea Corals

- The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, Public Law 109-479 (MSRA), provides NOAA additional science and management authorities related to deep-sea coral communities. The MSRA directs the Secretary of Commerce, in consultation with appropriate Regional Fishery Management Councils, and in coordination with other Federal agencies and educational institutions, to establish a Deep-Sea Coral Research and Technology Program. MSRA also authorizes Councils to designate zones to protect Deep-Sea corals from damage caused by fishing gear under FMP discretionary provisions.

## Deep-sea Corals

- Deep-sea corals, also referred to as "cold-water corals," are a diverse collection of organisms that occur in deeper or colder oceanic waters. Unlike the well-studied shallow-water tropical corals, these corals inhabit deeper waters on continental shelves, slopes, canyons, and seamounts in waters ranging from **50 m to over 2,000 m in depth**. Deep-sea corals lack symbiotic algae (zooxanthellae) characteristics of most reef building shallow water tropical corals. Unlike their shallow water relatives, which rely heavily on photosynthesis to produce food, deep-sea corals take in plankton and organic matter for much their energy needs. Deep-sea corals are also often extremely long-lived, slow growing animals, characteristics that make them particularly vulnerable to physical disturbance.
- The **high biodiversity** associated with deep-sea coral communities has shown potential value for commercially important fishes as they rely on deep-sea coral habitat for protection from predators and for enhanced feeding opportunities. Furthermore, deep-sea corals may provide significant opportunities for advancing pharmaceutical and medicinal applications. For example, several deep water sponges—often associated with deep-sea coral communities—have unusual qualities that may potentially aid in the development of drugs for cancer, heart disease, and other medical treatments.
- Despite scientific advances in the understanding of deep-sea corals, **there is still very little known** about their growth rates, reproductive cycles, their functional role as habitat for marine species, and their effects on biodiversity. However, what we do know is changing our view of the undersea world and the importance of these ecosystems.

# NOAA's Deep Sea Coral Program

## NOAA's Role

•NOAA plays an important role in the research, exploration, and conservation of deep-sea coral ecosystems. As the federal agency responsible for managing the Nation's marine living resources, NOAA is well-positioned to locate, characterize, and conduct targeted exploration and research to improve the understanding of deep-sea coral and sponge ecosystems. Sound management of these ecosystems requires scientifically based information on their condition, the causes and consequences of their condition, and the costs and benefits of possible management actions to maintain or improve their condition. To this end, NOAA has increased activities in recent years to locate, study, and protect deep-sea corals. The following issues have been identified as information needs to better understand and improve management of these ecosystems:

•**Locating, mapping, and characterizing deep-sea coral habitats**

•Understanding the taxonomy, biology, life histories, and **ecology** of deep-sea coral species

•Understanding the **biodiversity and ecology of deep-sea coral communities**

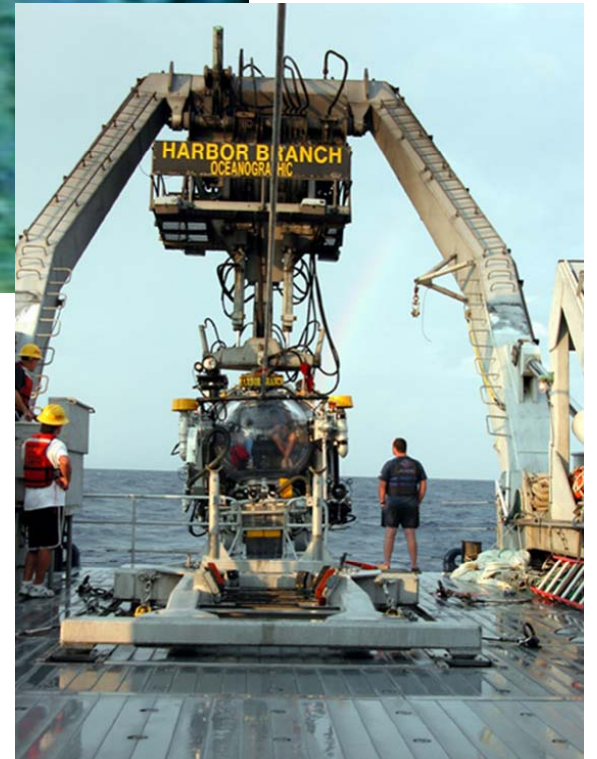
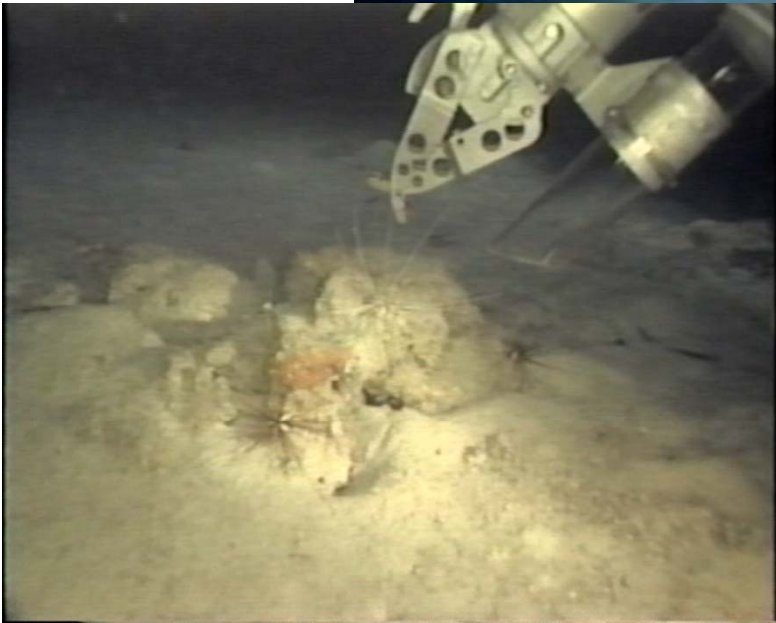
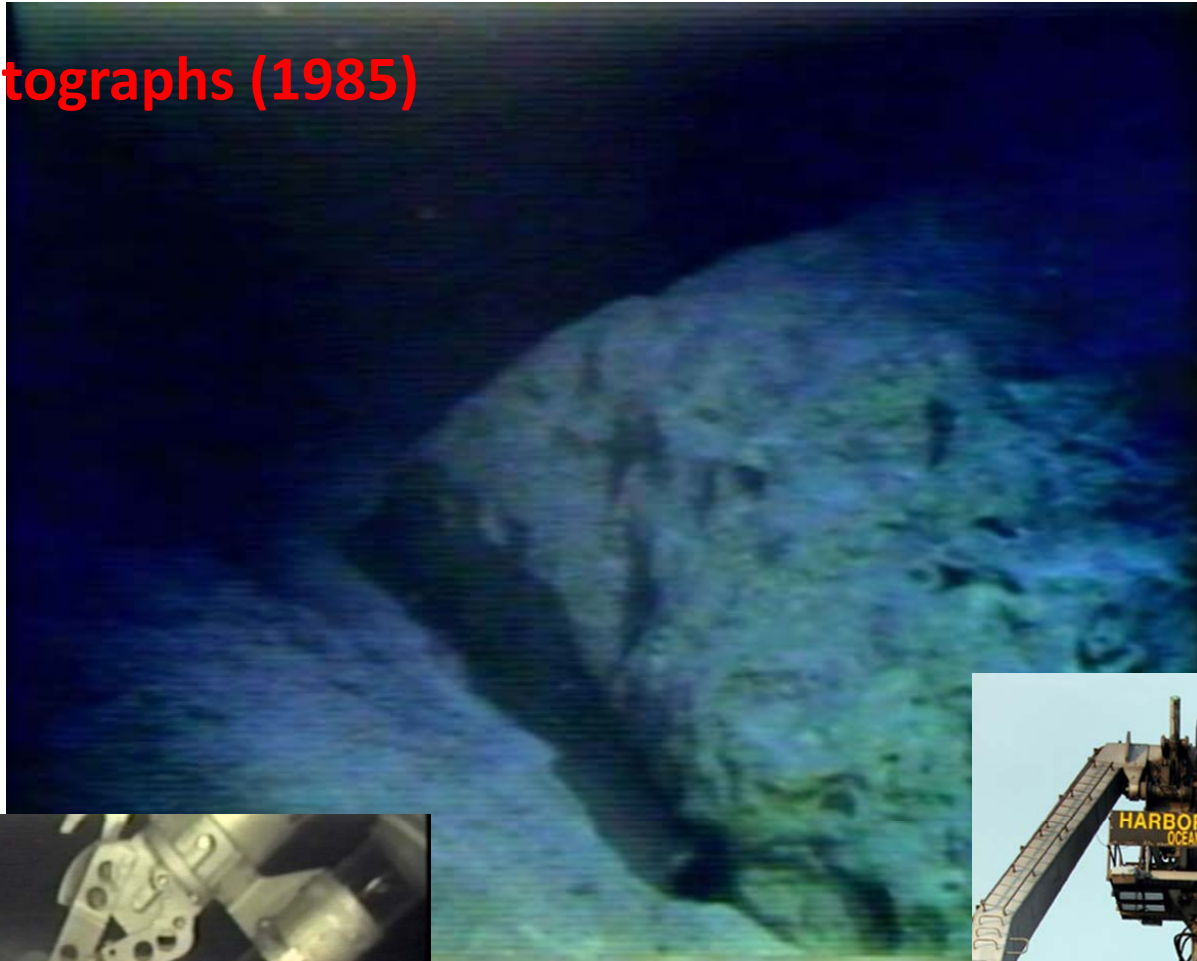
•Understanding impacts caused by fishing and other human activities

•Understanding the potential role of deep-sea corals to assess past ocean and climate conditions and improve climate changes models

### **New Publication:**

Report to Congress on the [\*Implementation of the Deep Sea Coral Research and Technology Program 2008-2009\*](#) summarizes activities initiated with fiscal year 2009 Deep Sea Coral Research and Technology Program funding.

# The first photographs (1985)



# AUV Photomapping of the MCD



UPR-RUM

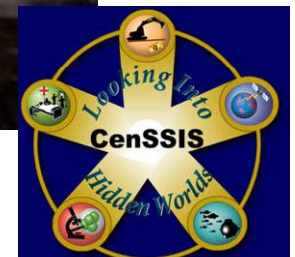
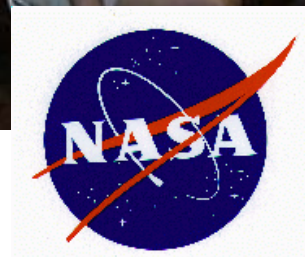
UVI  
USVIDPNR

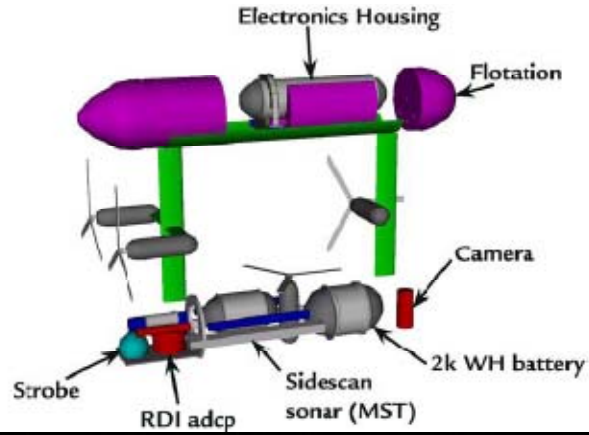
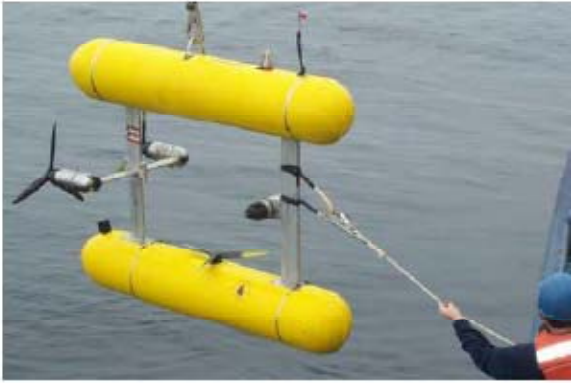
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WHOI

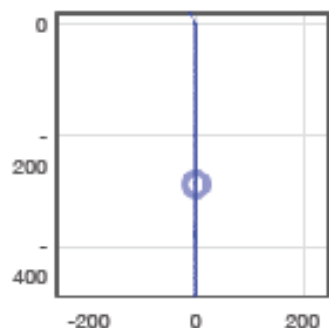
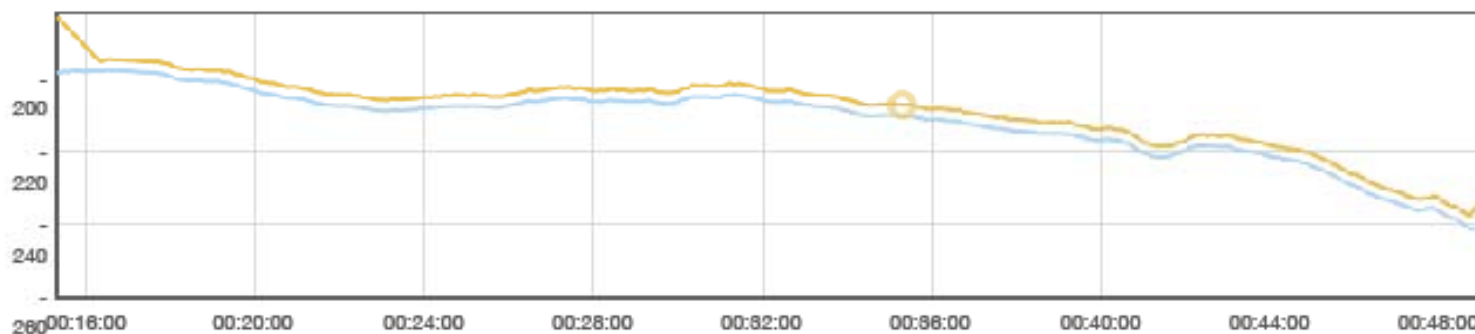
NASA





Seabed AUV maximum depth 700





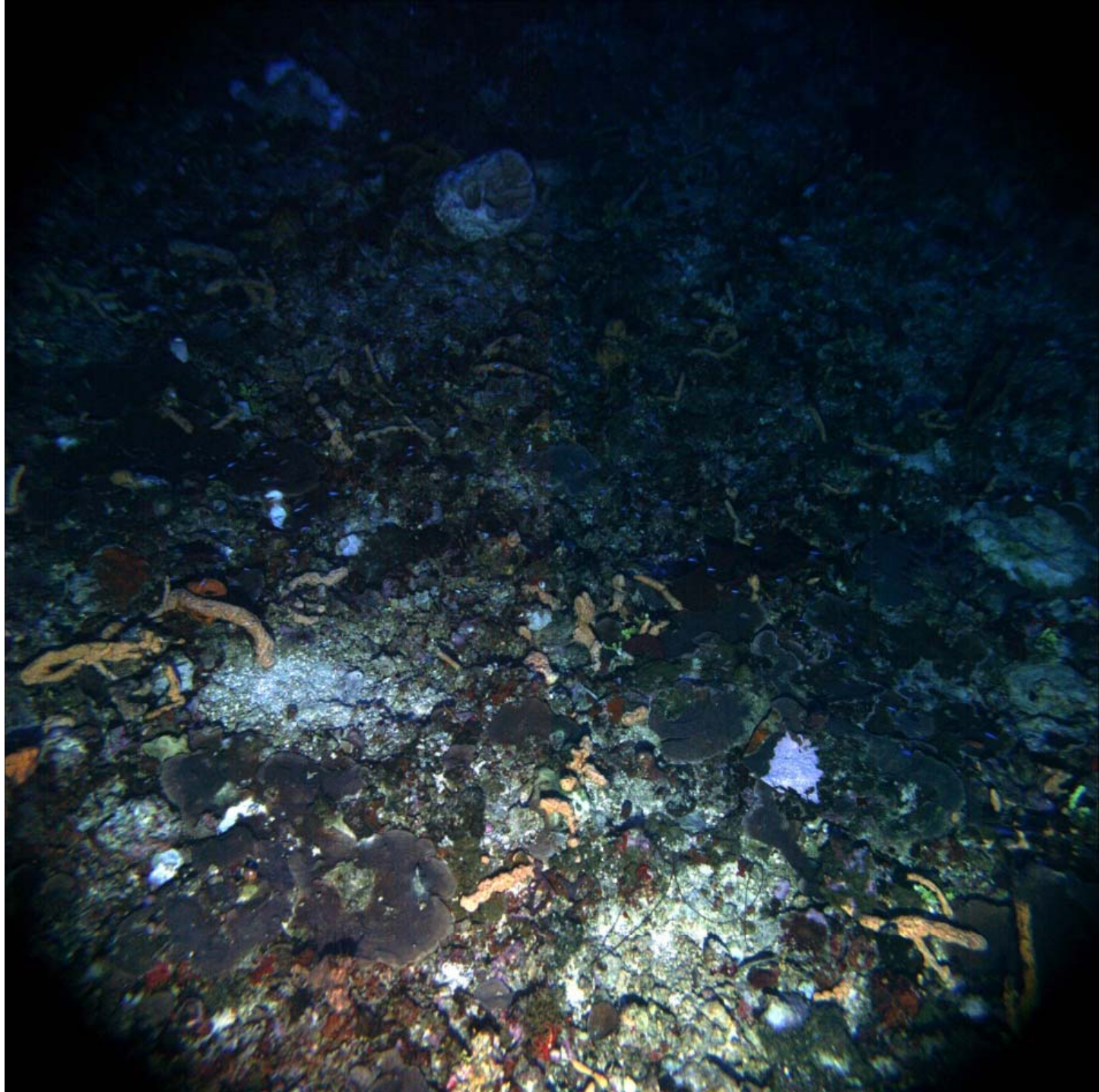
- Time: 16:51:47 GMT [ 0h35m18s ]
- Easting: -0.22m
- Northing: -288.52m
- Latitude: 18° 13.733' N
- Longitude: 67° 34.891' W
- Heading: 152.97°
- Roll: -2.28°
- Pitch: 1.64°
- Depth: 207.29m
- Altitude: 2.98m

[< Back to the dive](#)

Copyright 2009

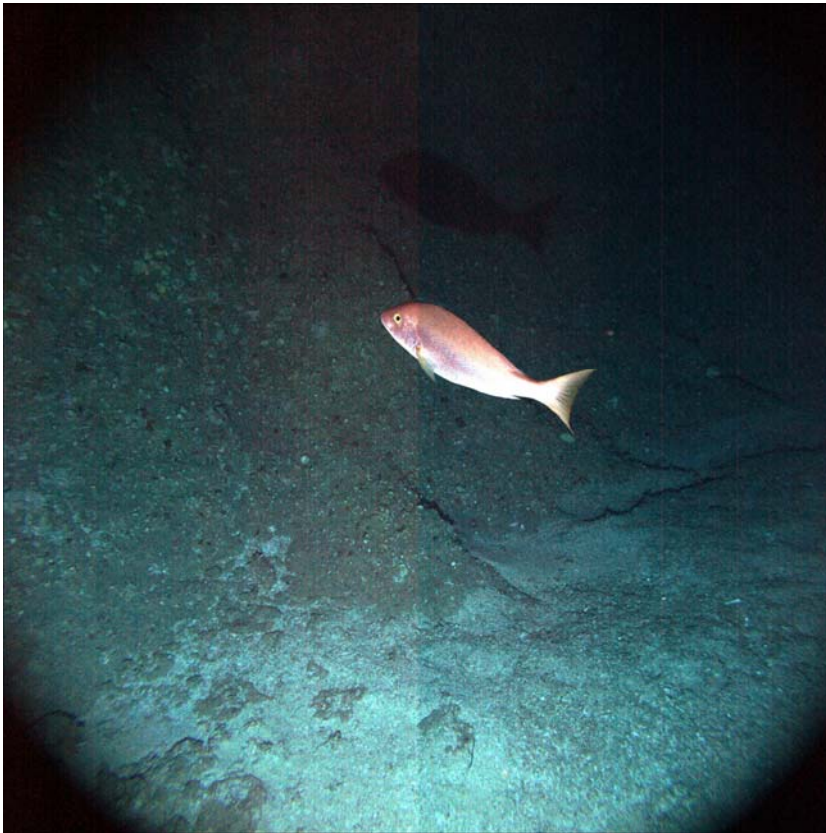
Woods Hole Oceanographic Institute

All rights reserved

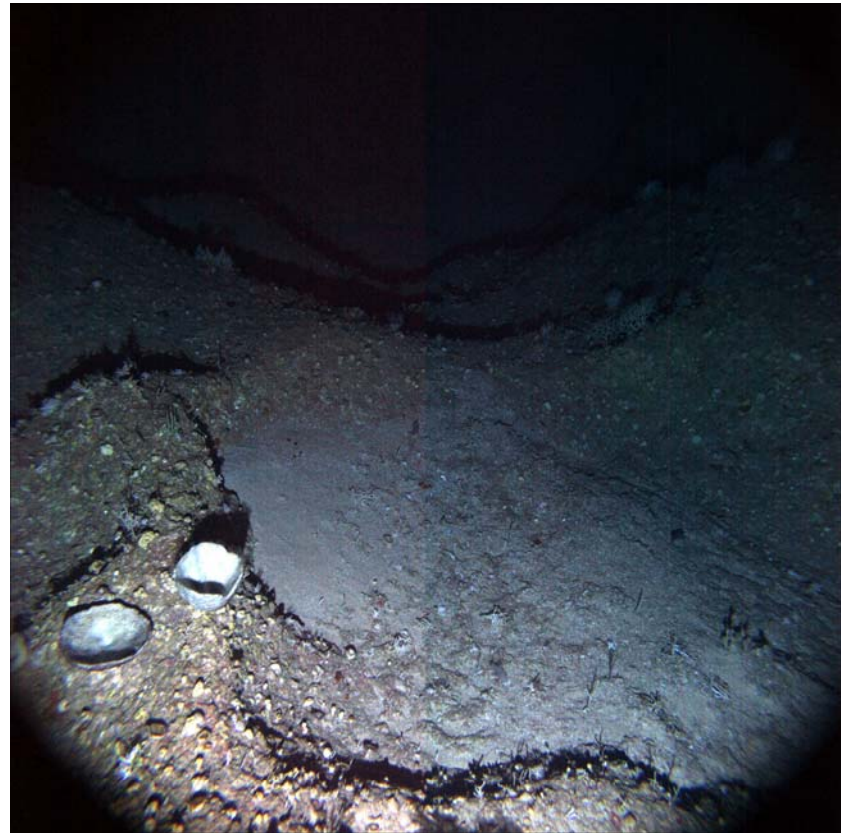


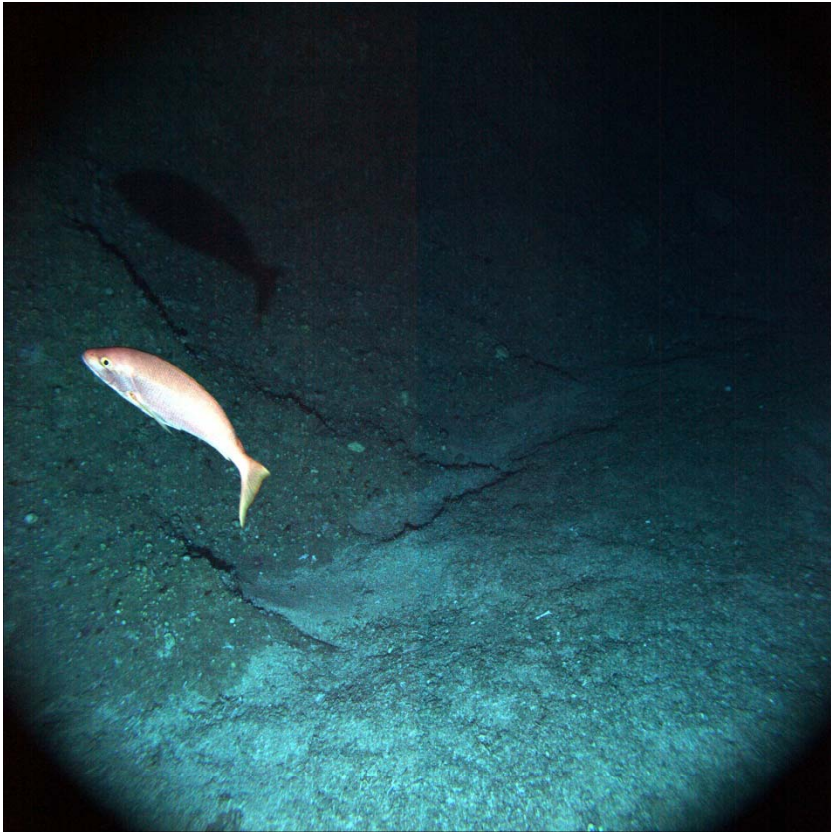
# Seabed AUV Mission 2008

**Silk snapper (200 m)**



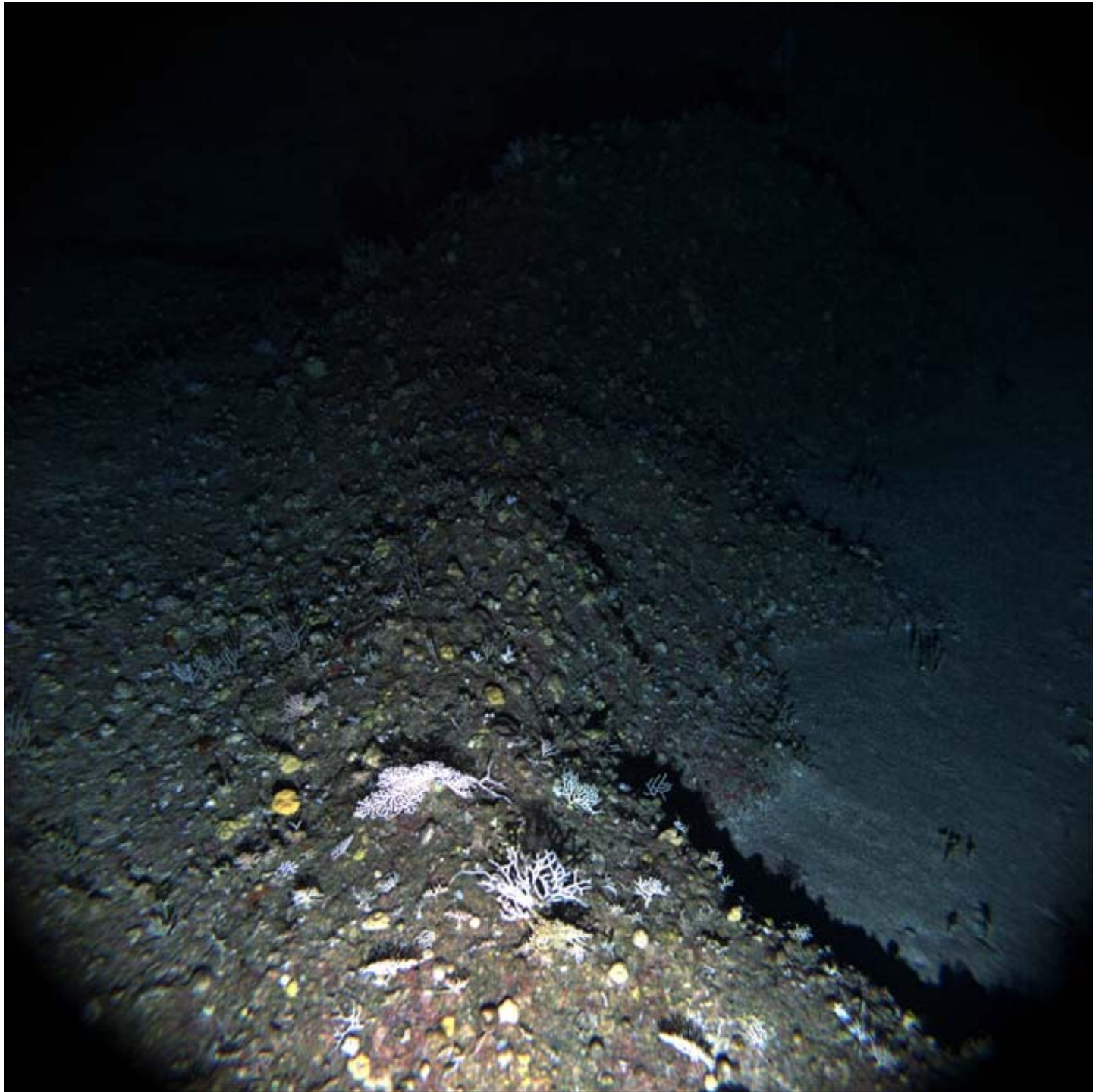
**Habitat at 274 m**



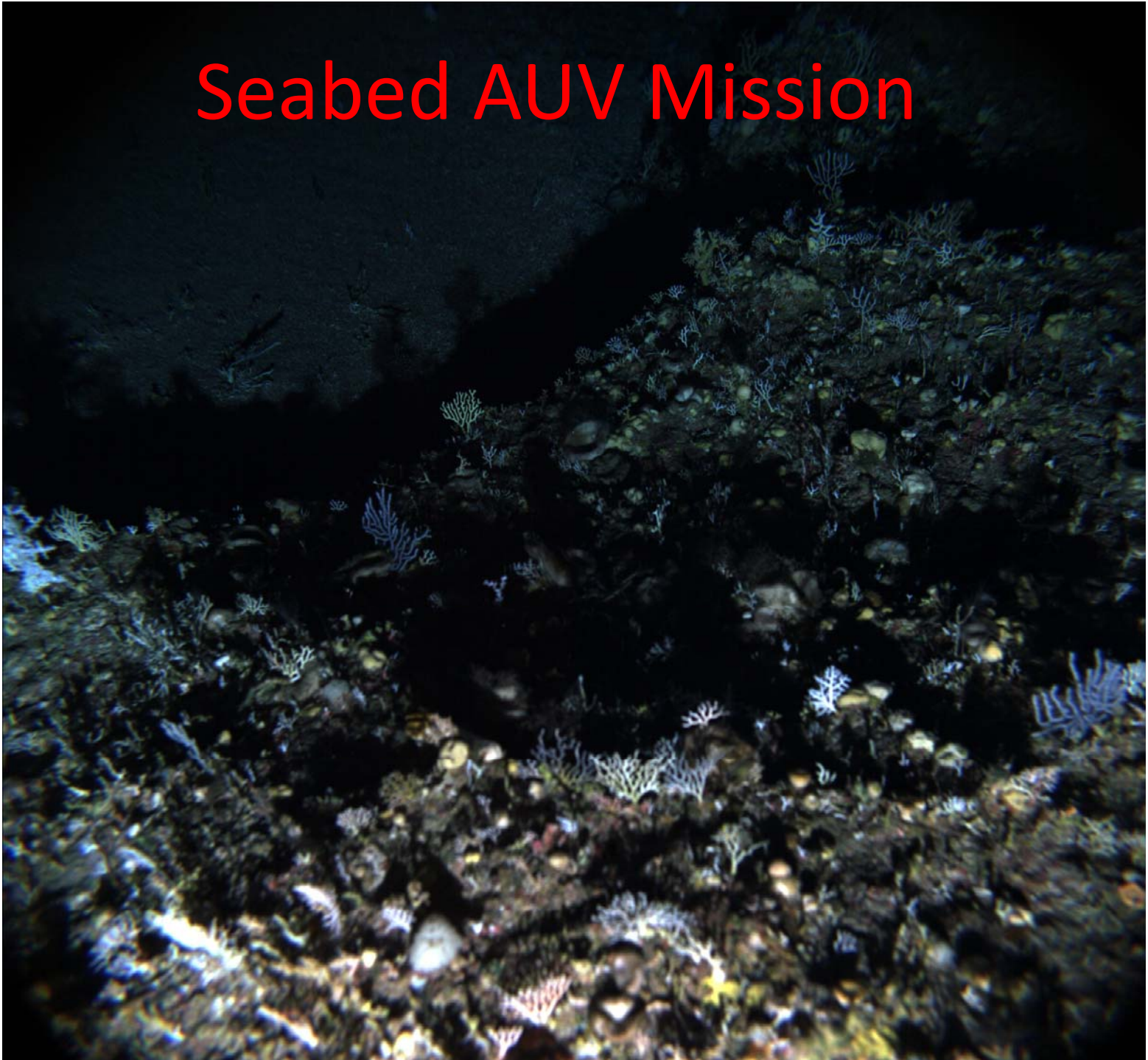


**Yes, the same silk snapper ...**

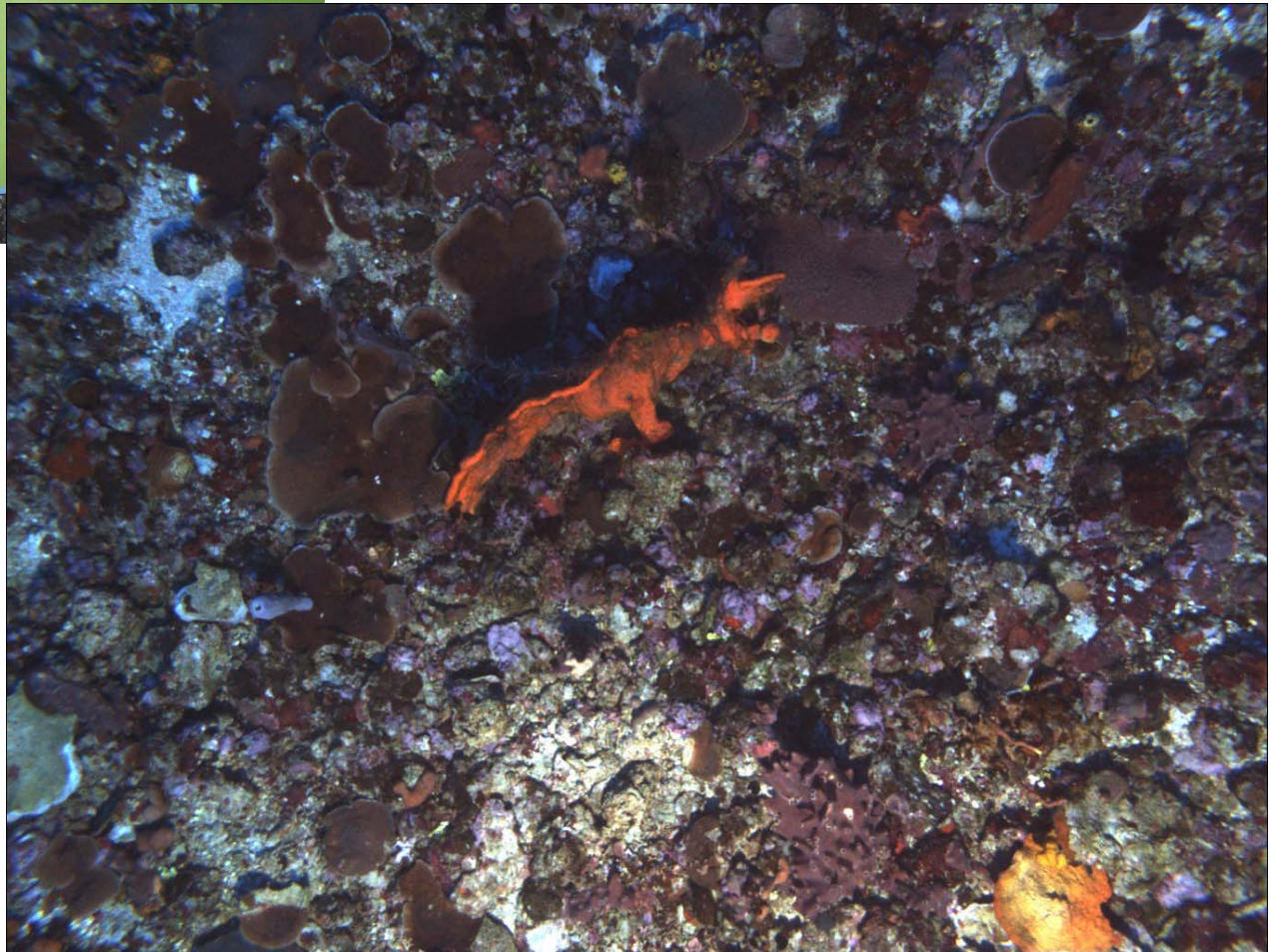




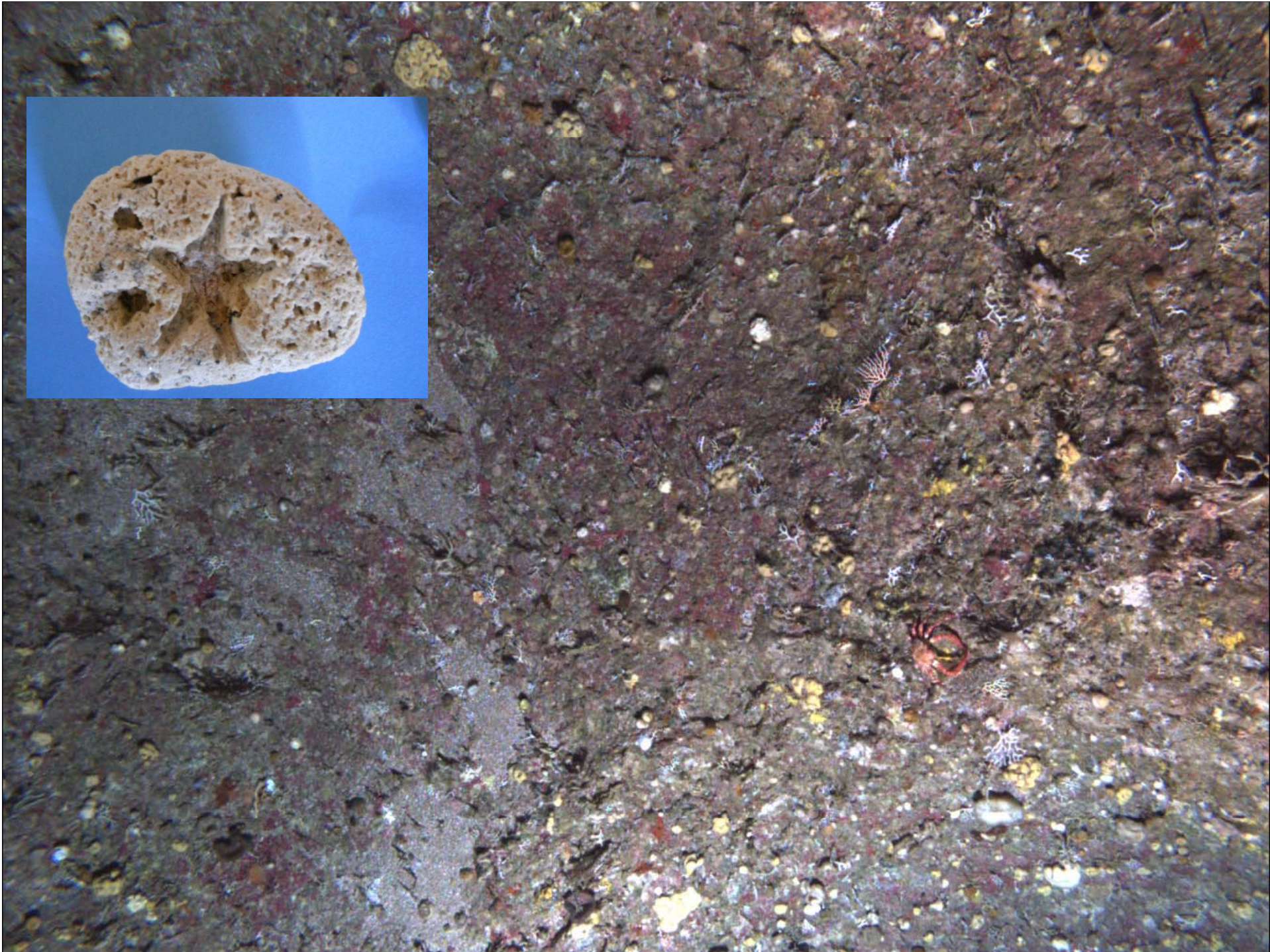
# Seabed AUV Mission

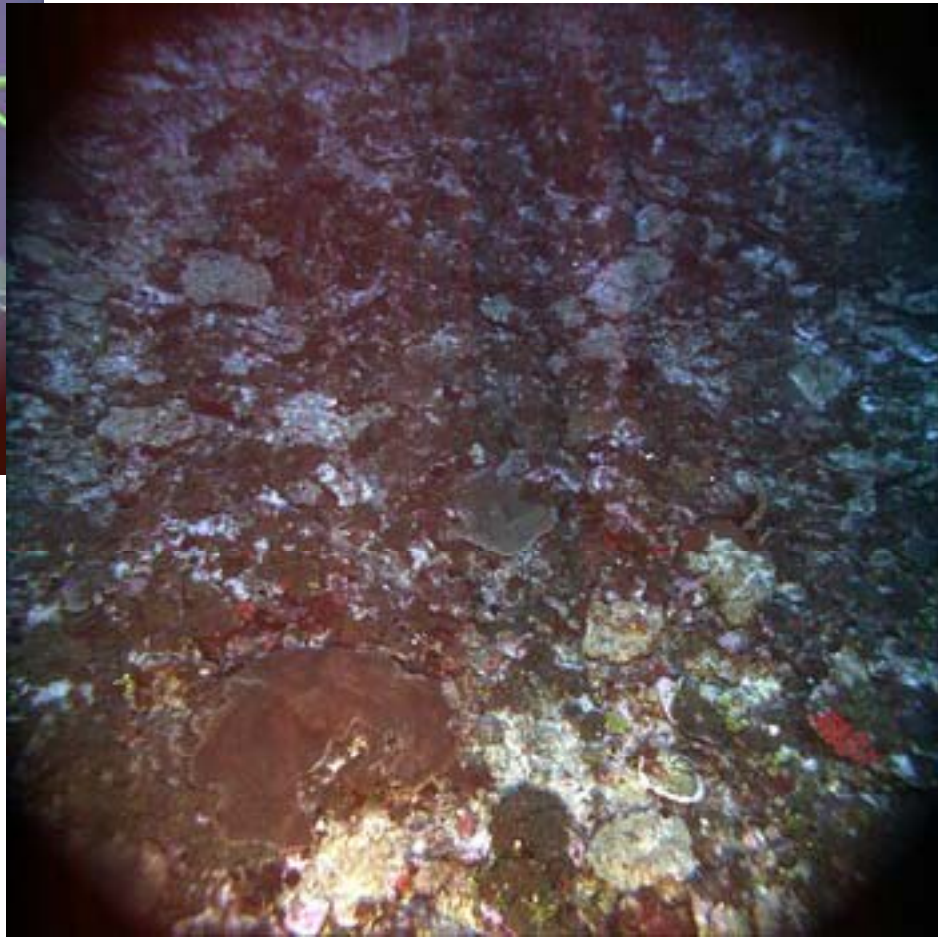
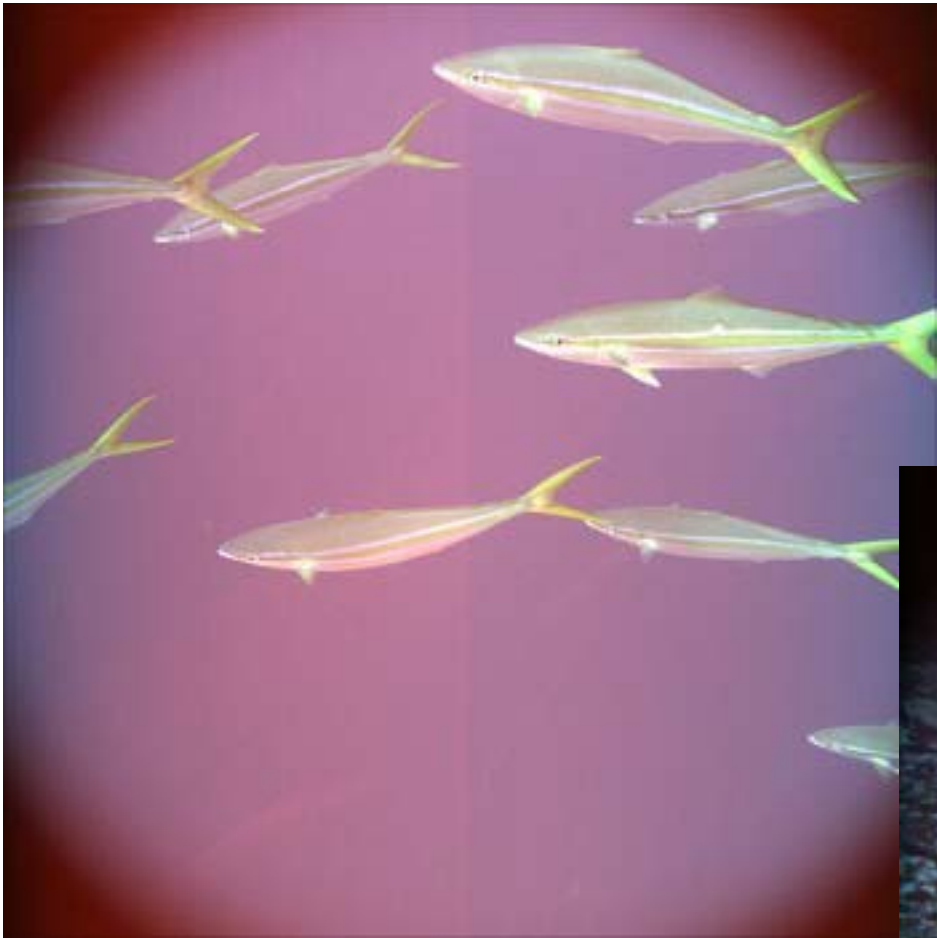


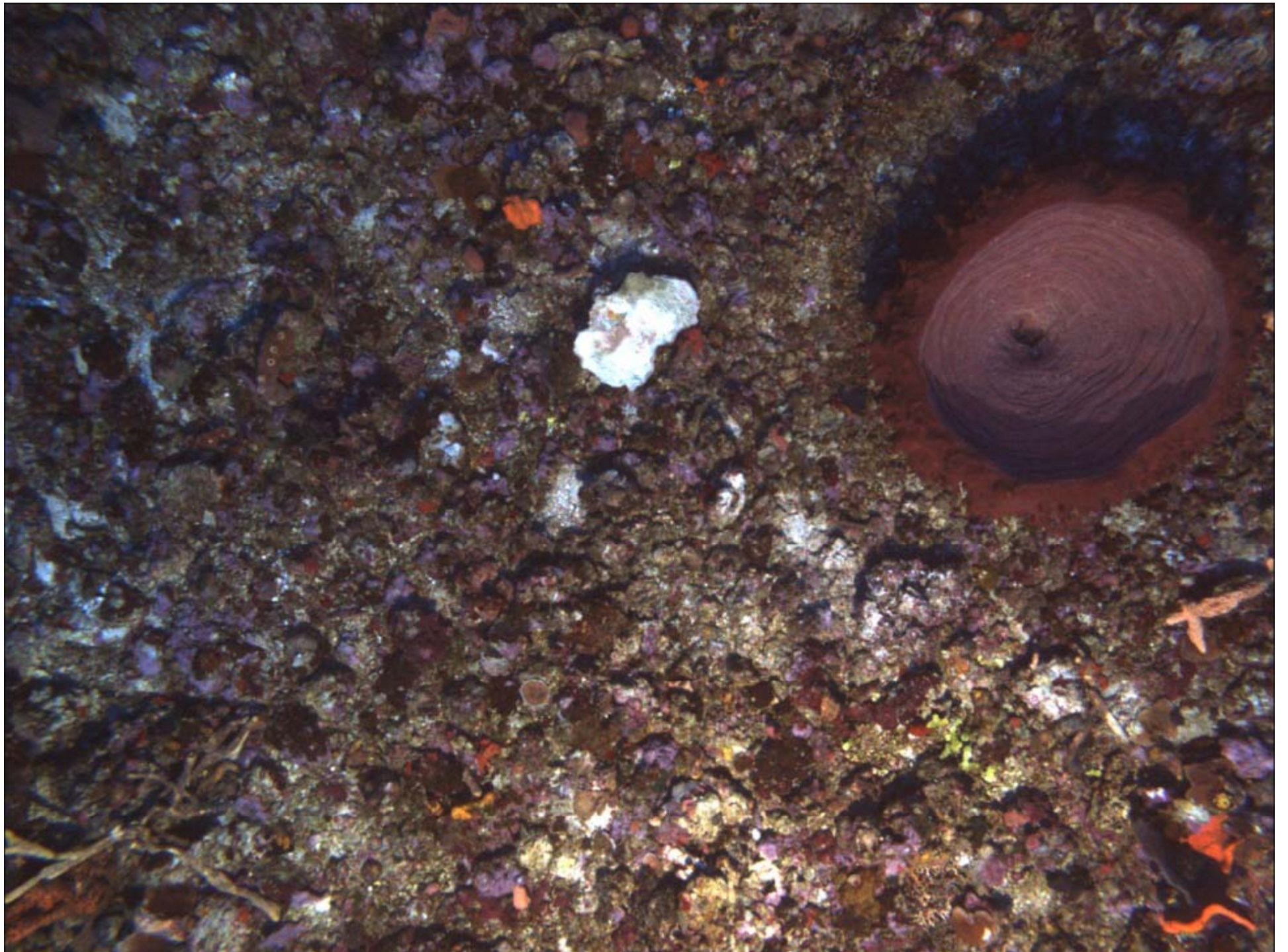




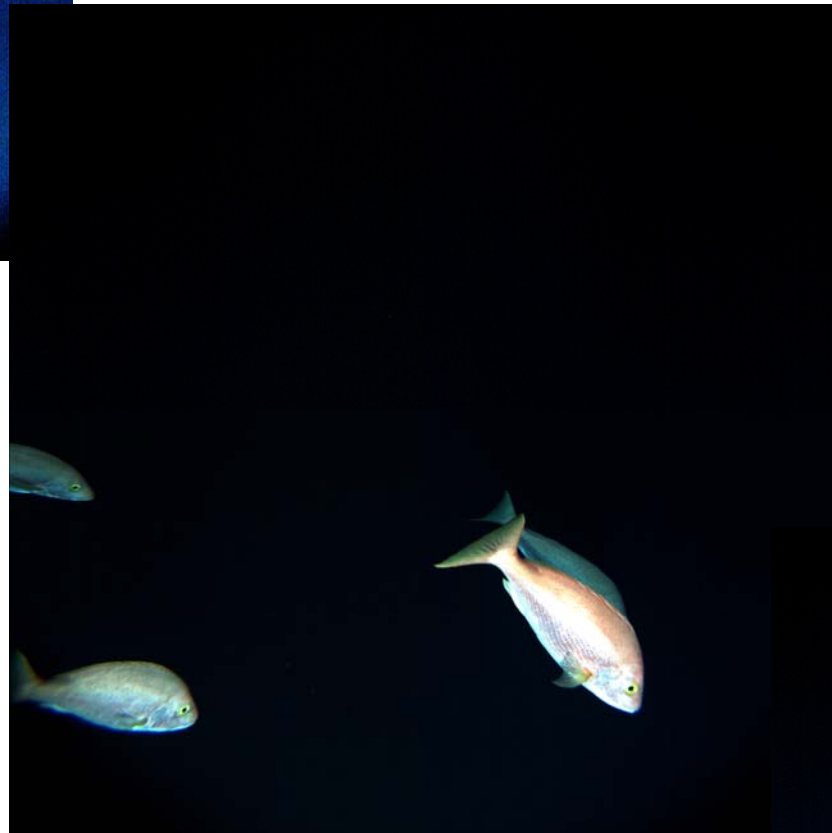
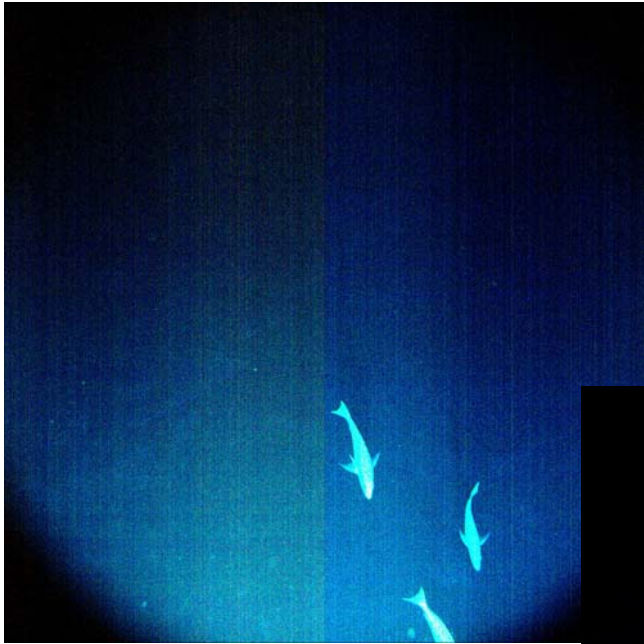


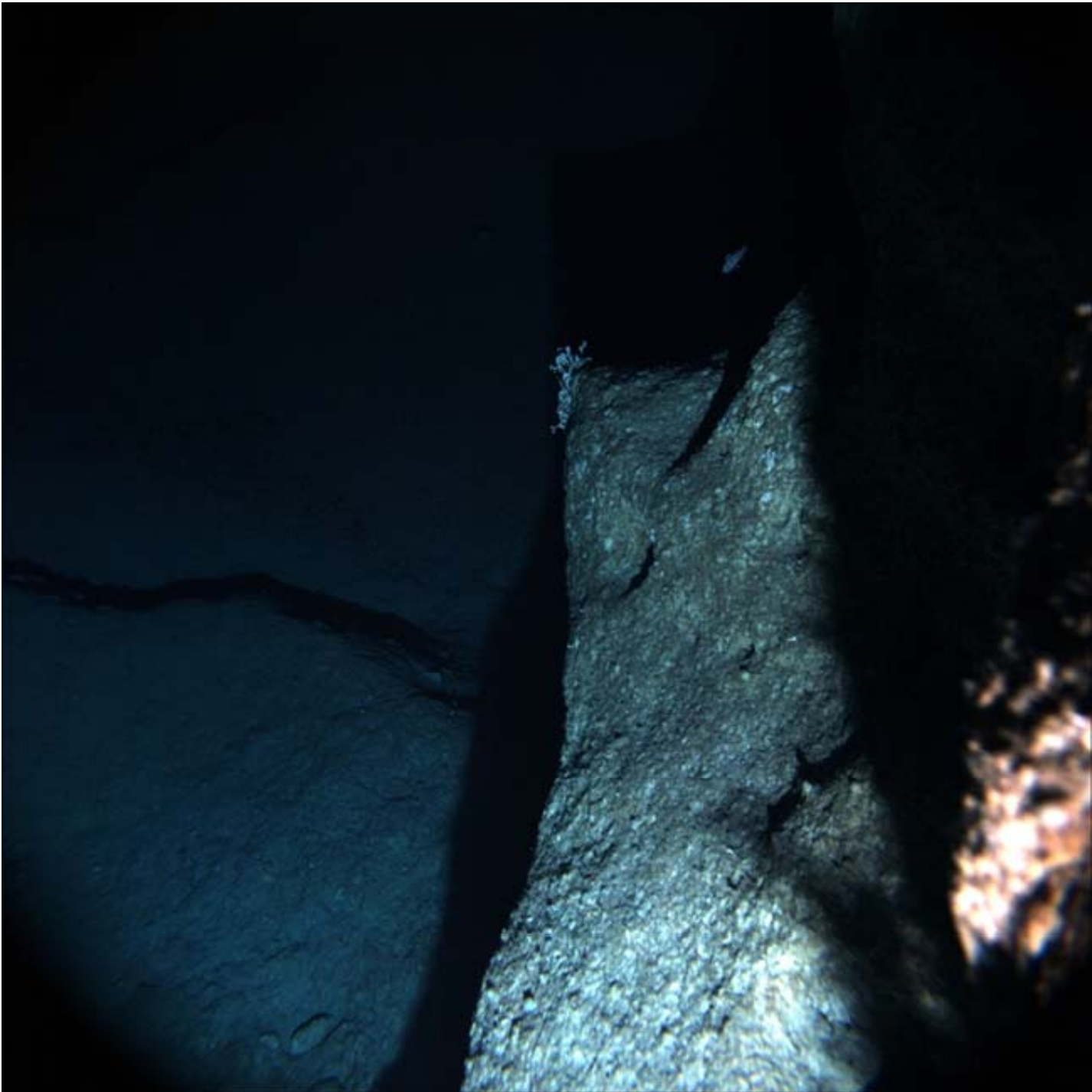






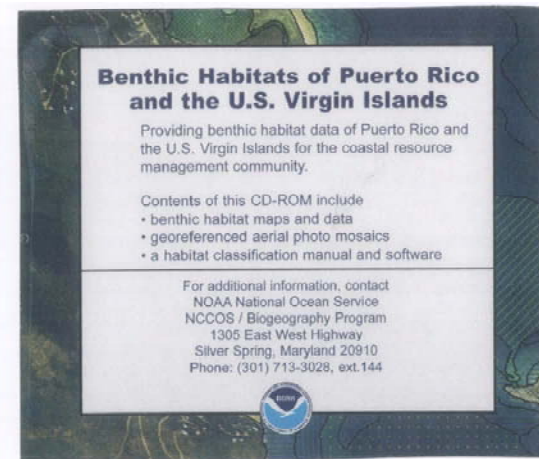
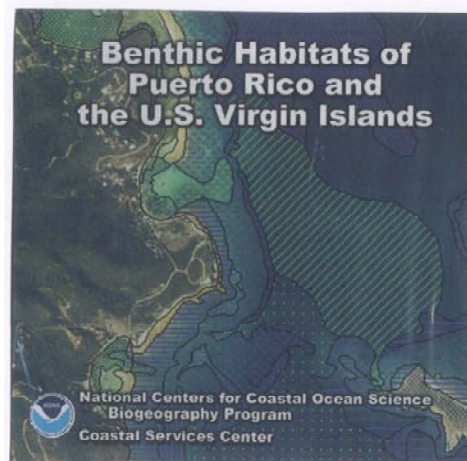






# Definitions

- EFH (essential fish habitat) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Steven Fishery Conservation and Management Act).







What's next? FY13 ...

