Southeast Deep-Sea Coral Research and Technology Program (SE-DSC) 2009 - 2011

Southeast Deep-Sea Coral Team

Andrew David, NOAA Fisheries – Panama City, FL
Team Lead

John Tomczuk, OAR – Silver Spring, MD
Team Co-Lead

George Sedberry, ONMS – Savannah, GA
Biological Diversity

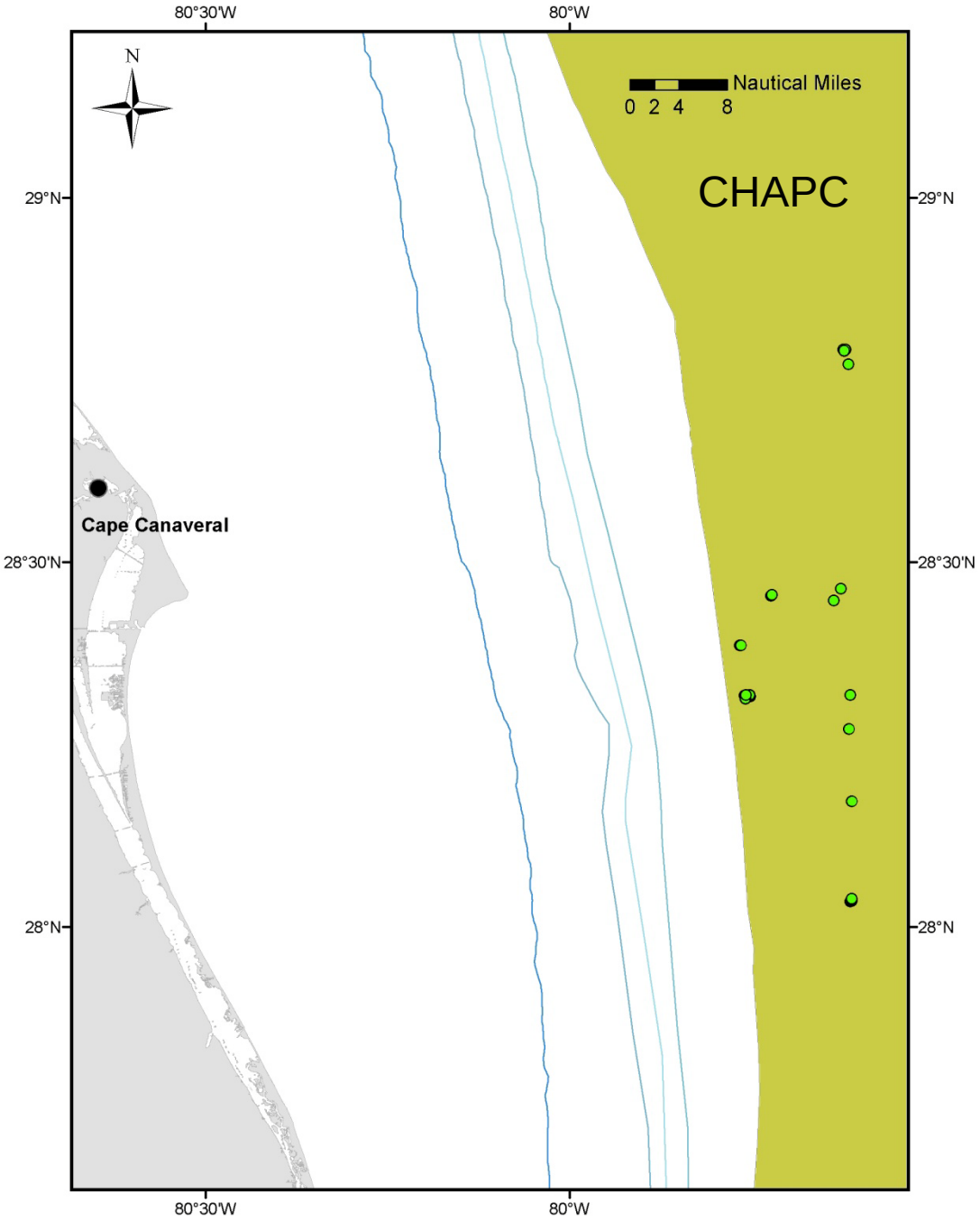
Andrew Shepard, UNCW/CIOERT – Wilmington, NC
Data Management, Logistics

Tim Battista, NOS/NCCOS – Silver Spring, MD
Mapping

A Research Planning Workshop was held in Wilmington, NC in July 2009.
The key recommendations were:

- Map and characterize deep-sea coral habitats in the proposed CHAPCs.
- Understand species and coral habitat relationships and the factors that control or influence them.
- Conduct research to identify and assess areas impacted by fishing and non-fishing activities.

Seward Johnson 2009



Seward Johnson
August 2009

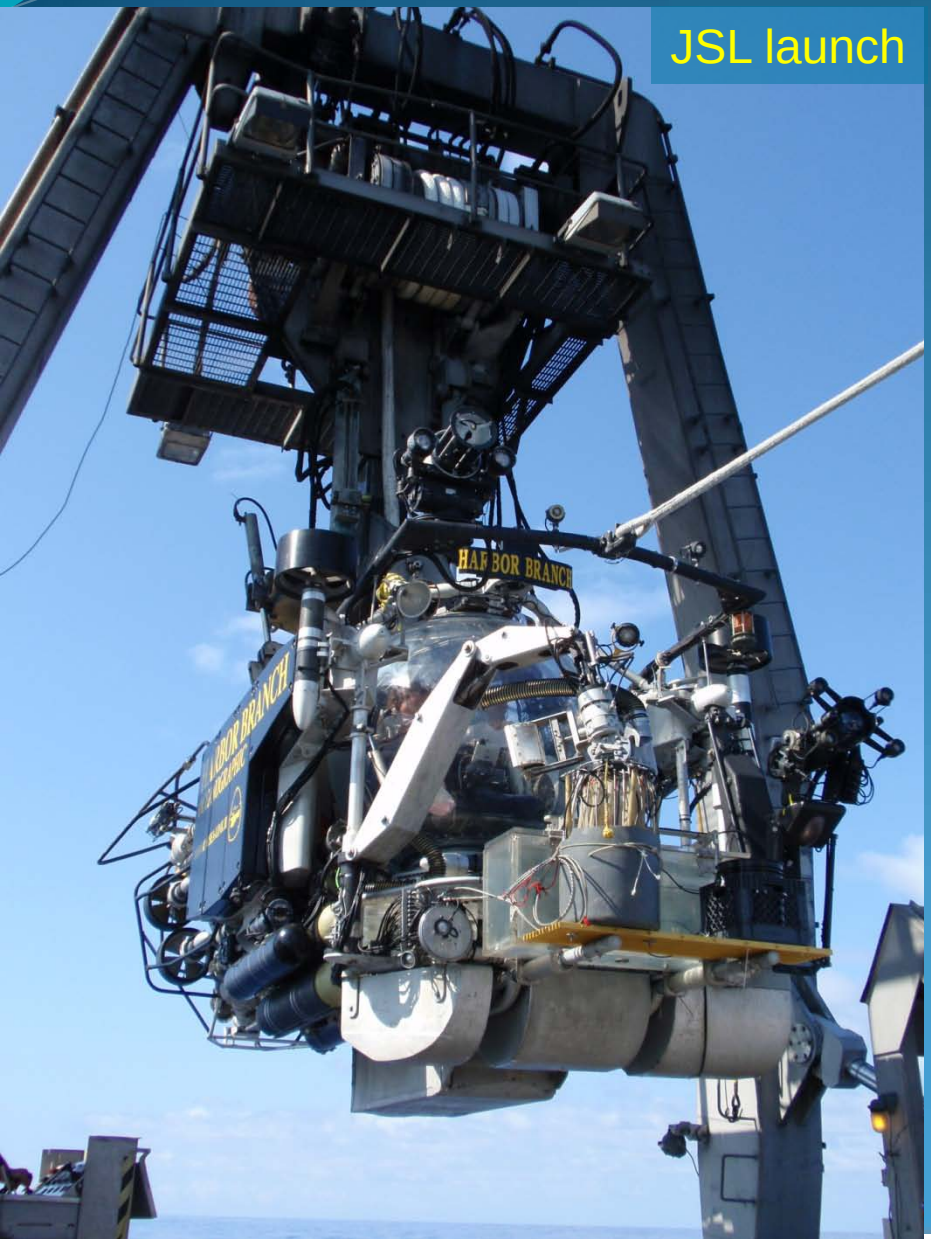
Submersible, Benthic Community sampling, Plankton collection

Johnson Sea Link
Harbor Branch/CIOERT

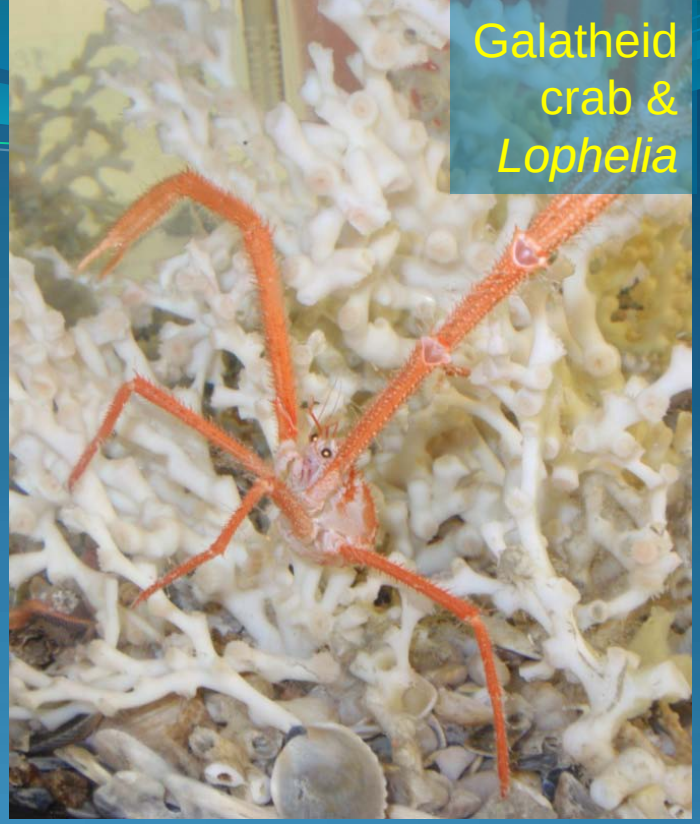
Canaveral region

22 Submersible dives
MOCNESS tows
CTD casts

Chief Scientist:
Steve Ross



JSL launch



Galatheid crab & *Lophelia*

MOCNESS catch

Micro Lander

Bamboo coral

Chain Dogfish & Corals

Golden crab

Nancy Foster 2009

Multibeam Mapping

Offshore of Canaveral *Oculina* HAPC

September 2009

580 km^2 mapped

Simrad EM1002 System (95 kHz)

Chief Scientist: Bryan Costa

Lost Coast Explorer 2010

Multibeam Mapping

Jacksonville Lithoherms,
Miami Terrace

October 2011

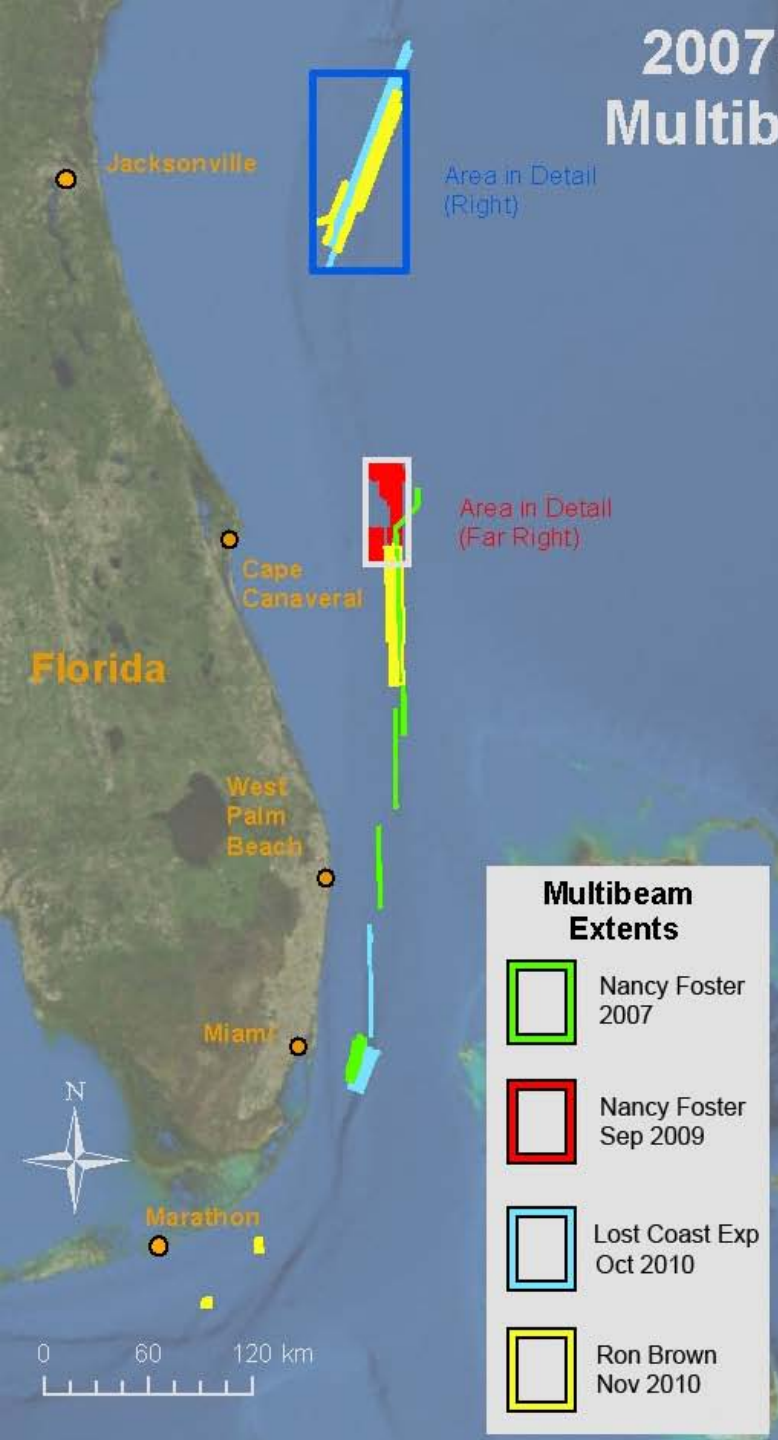
Simrad EM 710 Multibeam
(70-100 kHz)

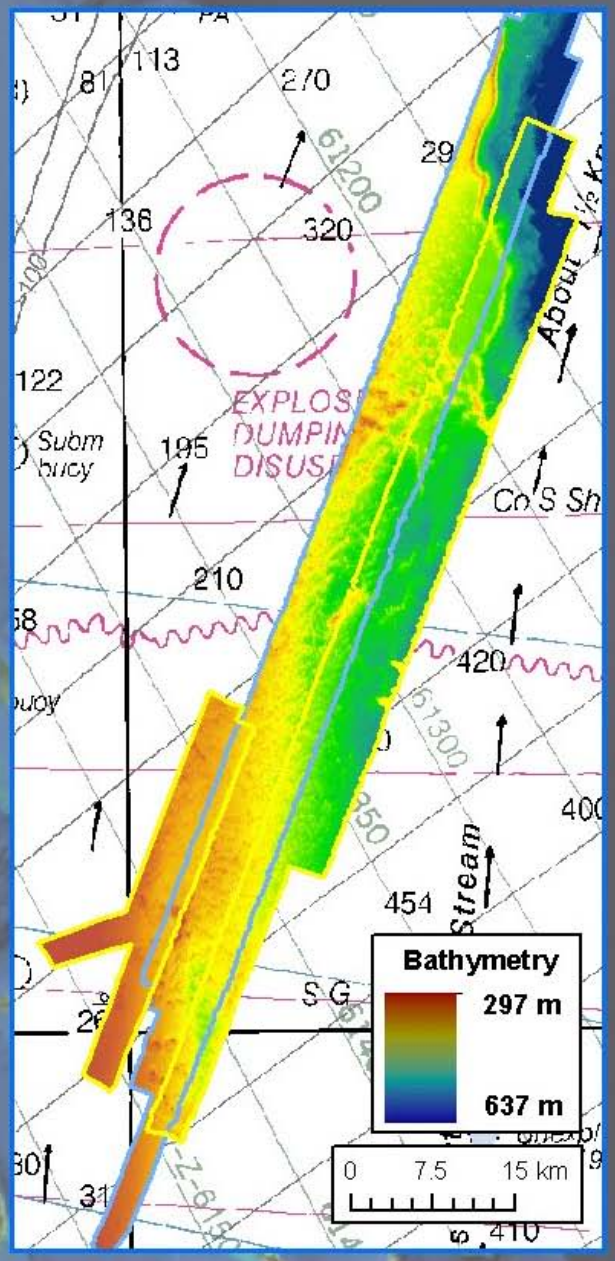
7460 km^2 mapped

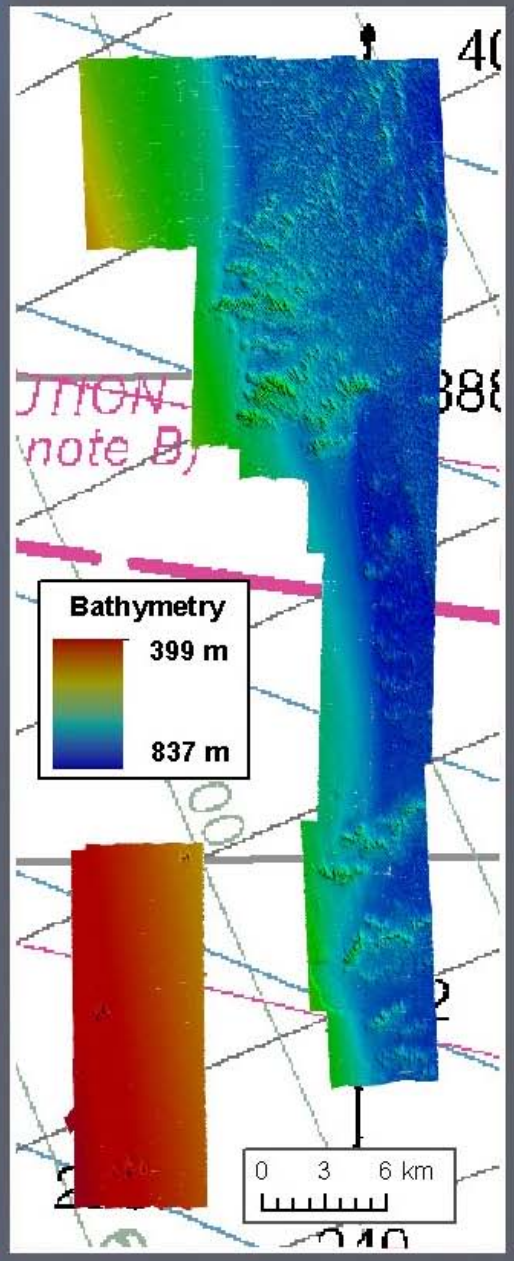
Chief Scientist:
David Naar

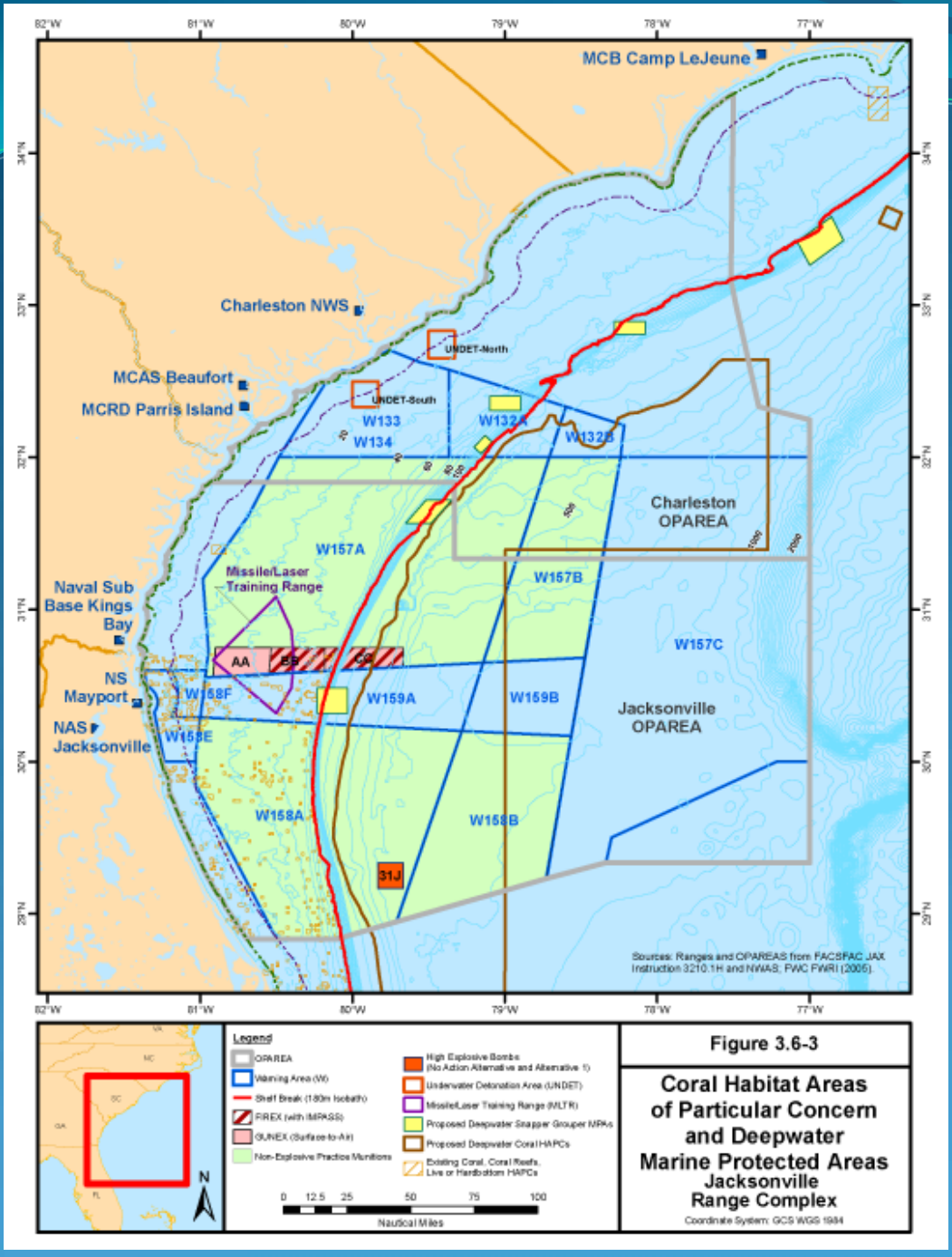
2007-2010 Deep Coral Multibeam Survey Areas

NOAA/CCMA Biogeography





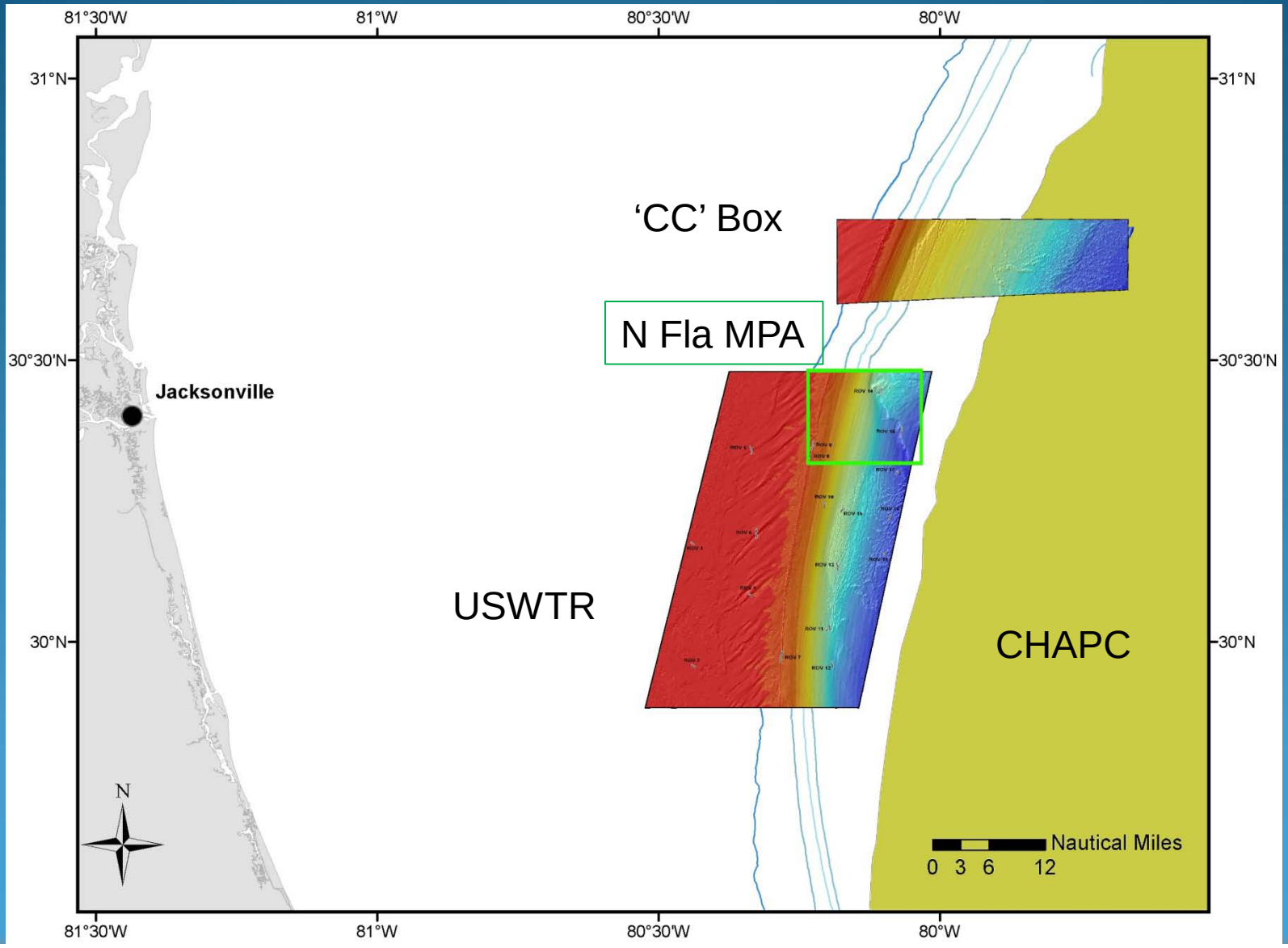


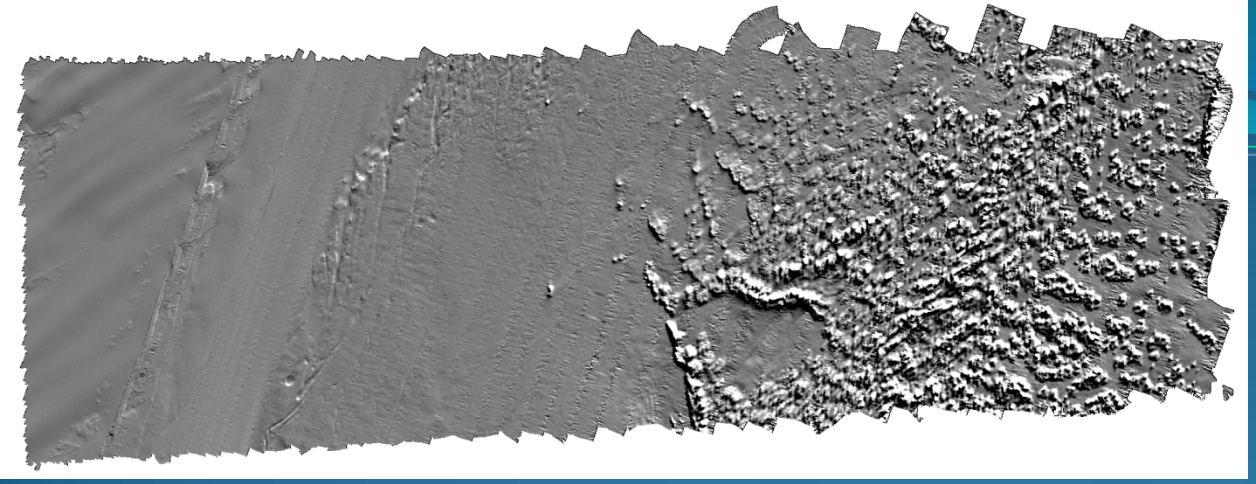


US Navy Activities

Planned US Navy training areas overlap several federally managed MPAs and HAPCs in the US South Atlantic. Many of their activities will involve acoustic simulators and will not directly impact habitat or managed species. Installation of an acoustic array may have impacts and NOAA is working with the Navy to minimize these.

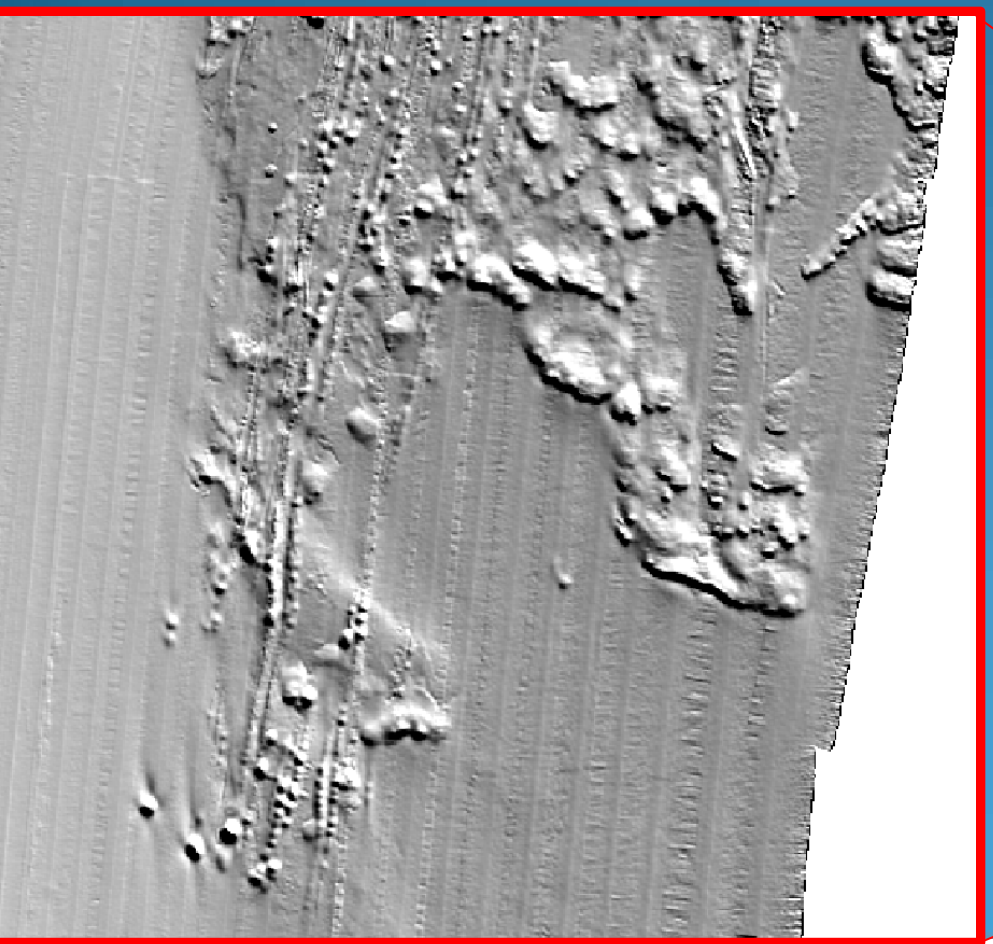
Recent US Navy Mapping



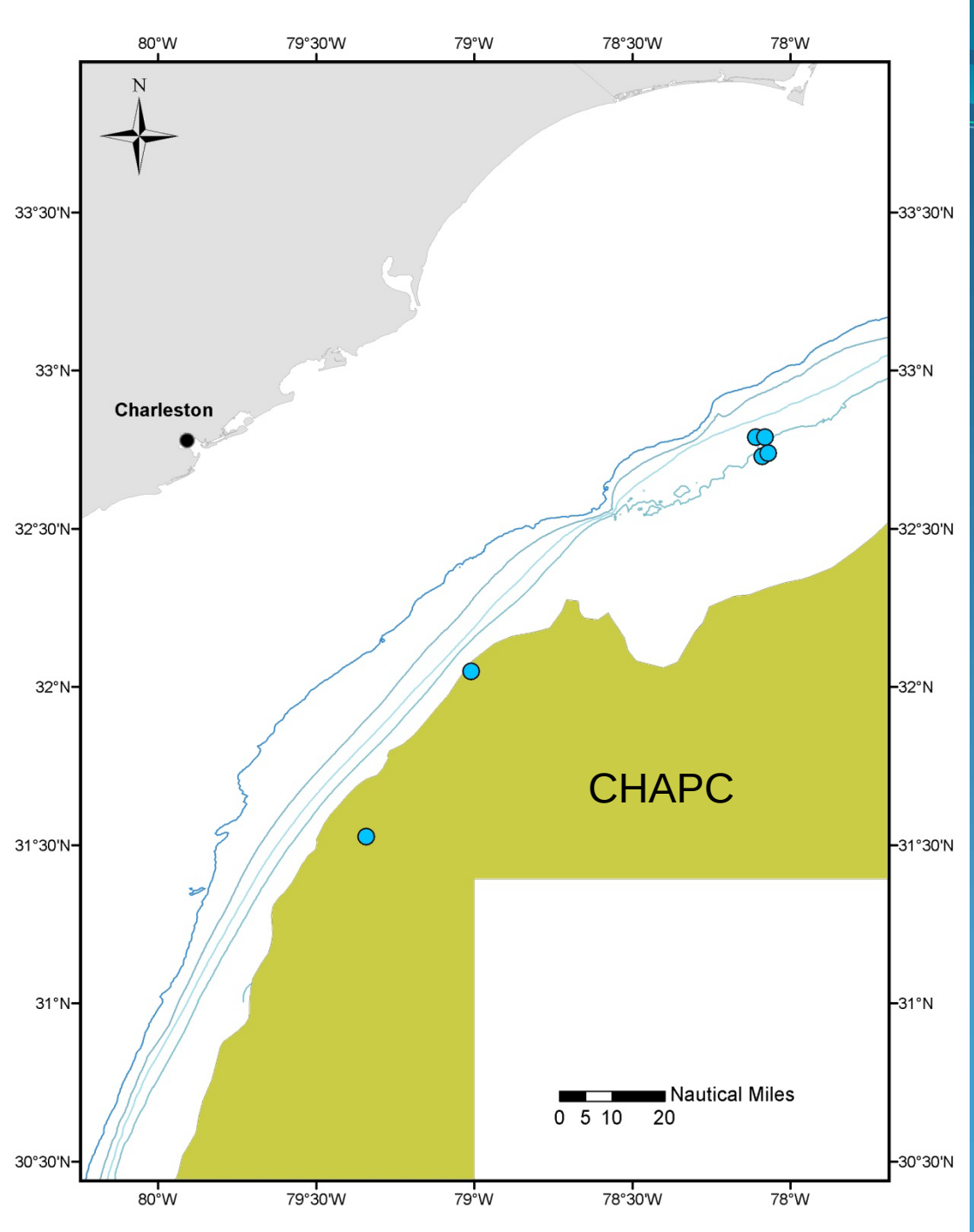


US Navy mapping

'CC' Box & USWTR
3123 km^2 mapped



Pisces 2010



Pisces
April 2010

ROV, Benthic Community sampling

Phantom ROV
SWFSC – La Jolla, CA

31 30 N Transect (central GA)

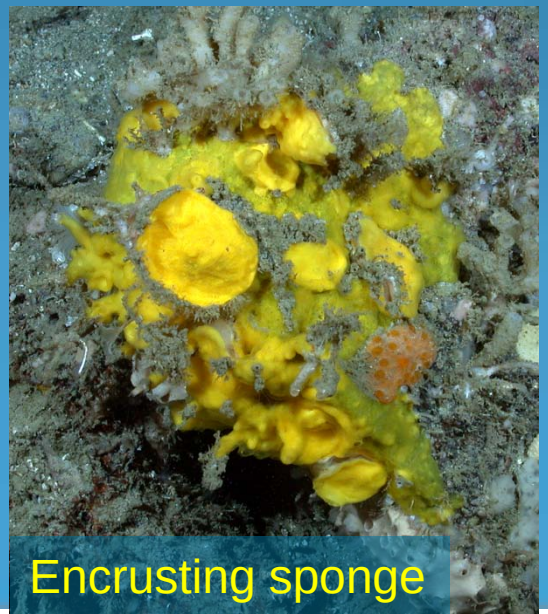
5 ROV dives
Benthic Grabs
CTD casts

Chief Scientist:
George Sedberry

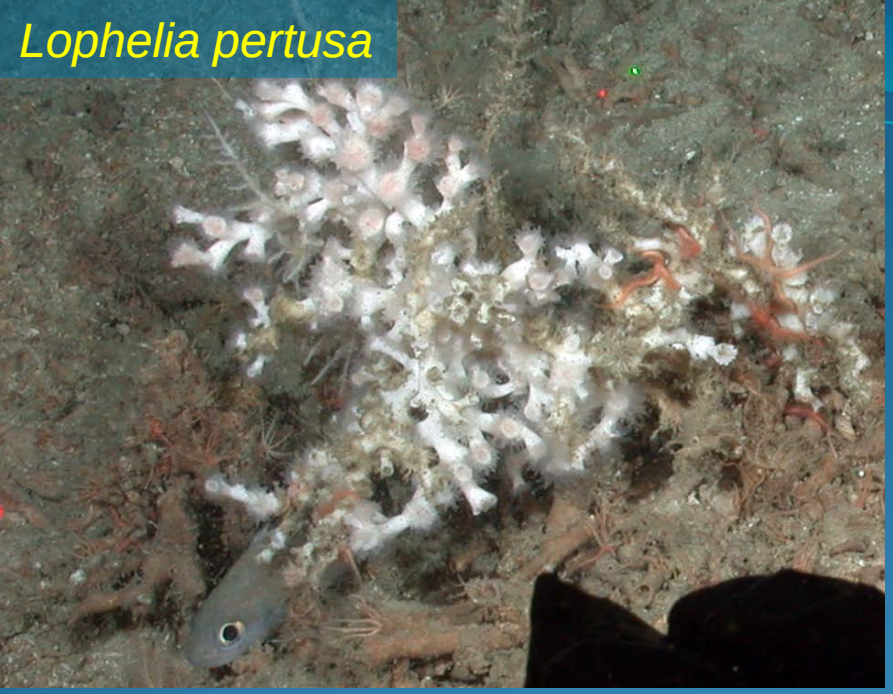
Phantom ROV

Leiodermatium sponge

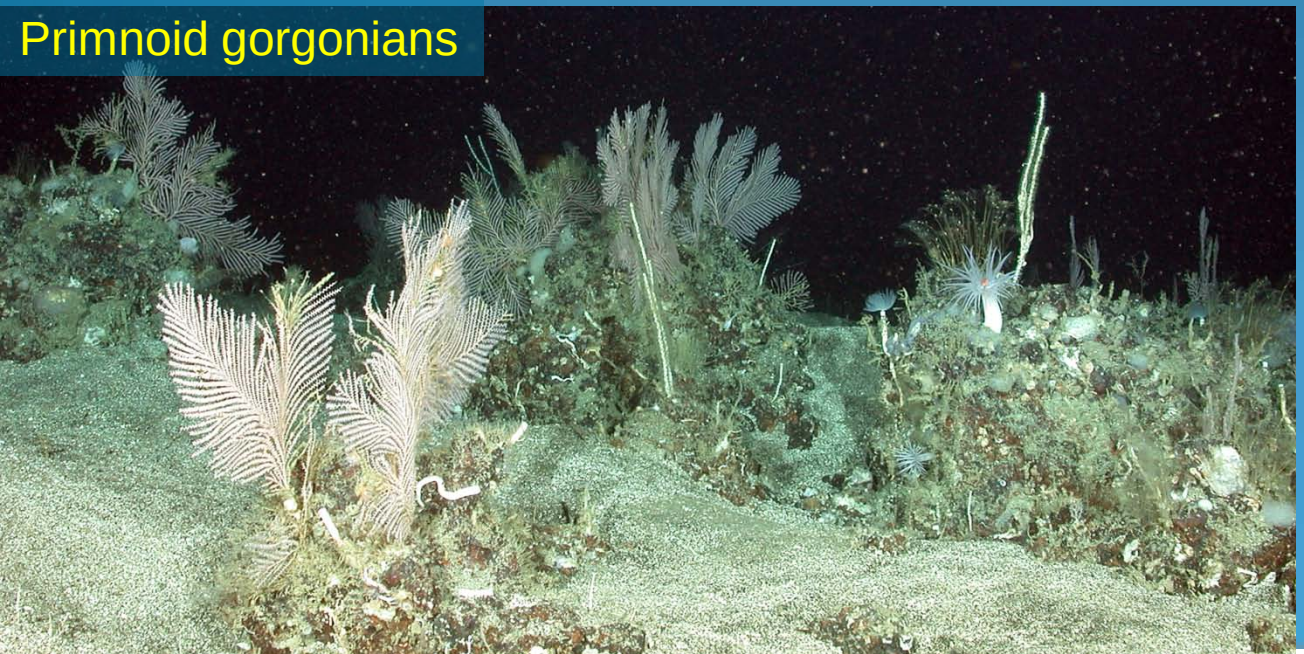
Golden crab


Encrusting sponge

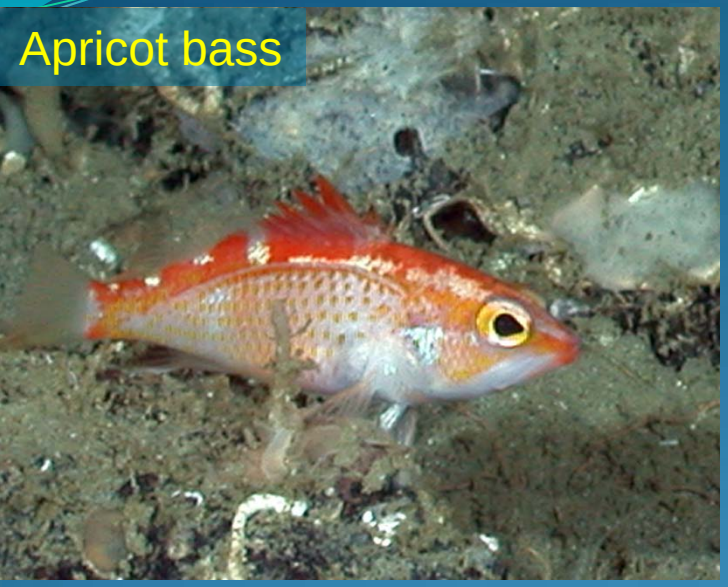
Royal Red shrimp


Lophelia pertusa

Snowy grouper

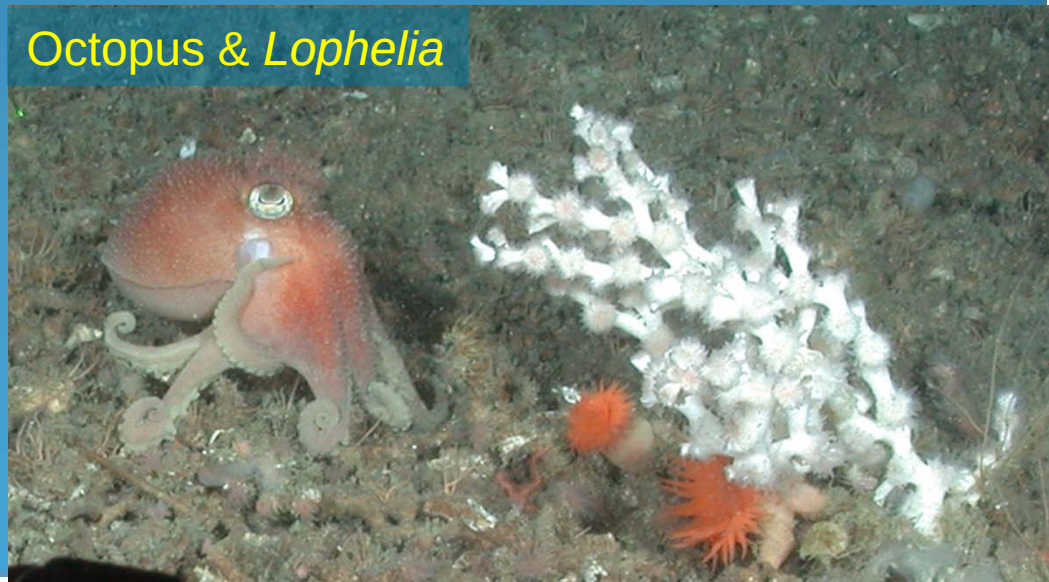

Primnoid gorgonians

Venus Flytrap anemone

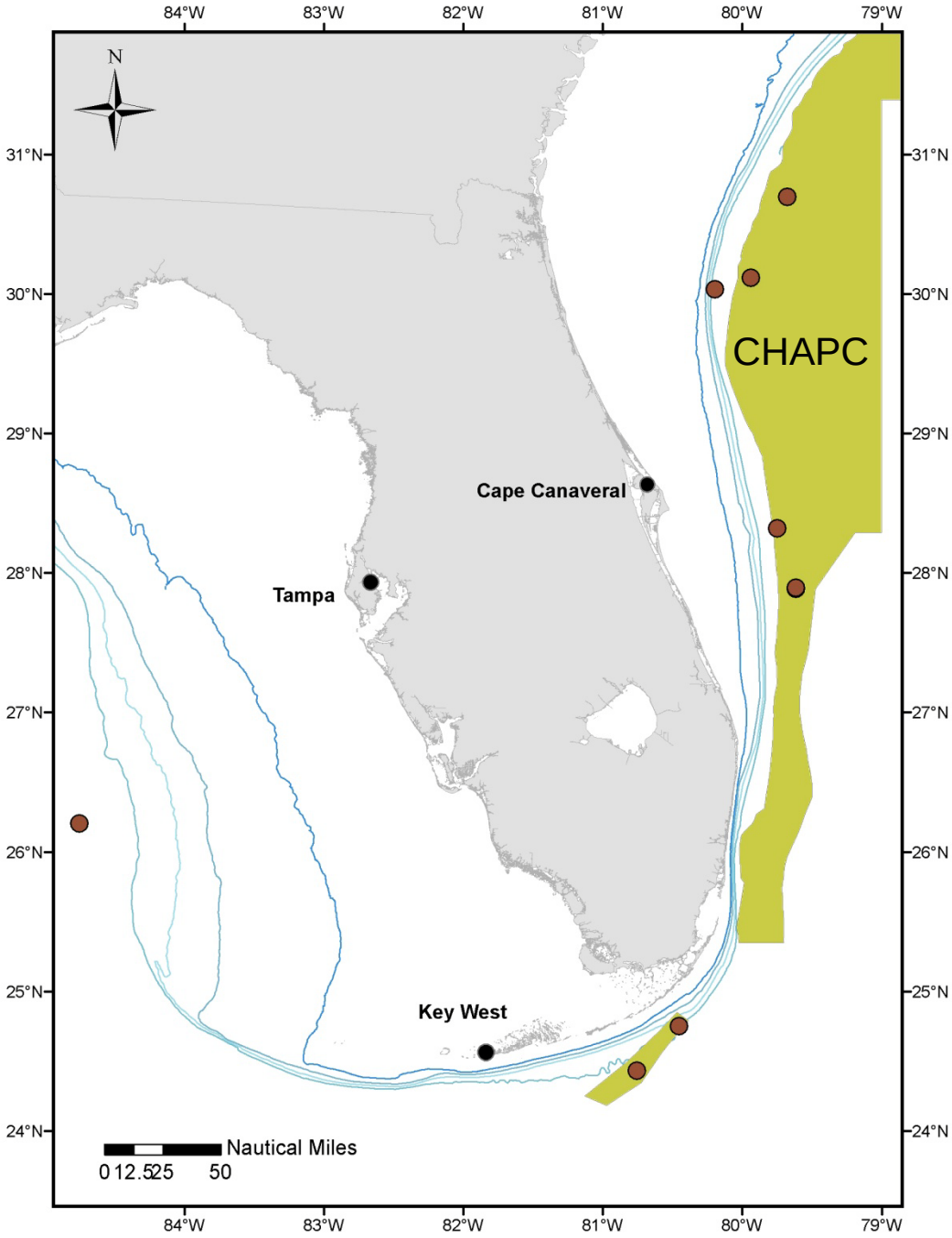

Apricot bass

Misty grouper

Holothurians


Octopus & *Lophelia*

Ron Brown 2010



Ron Brown
November 2010

ROV, Benthic Community sampling, Multibeam mapping

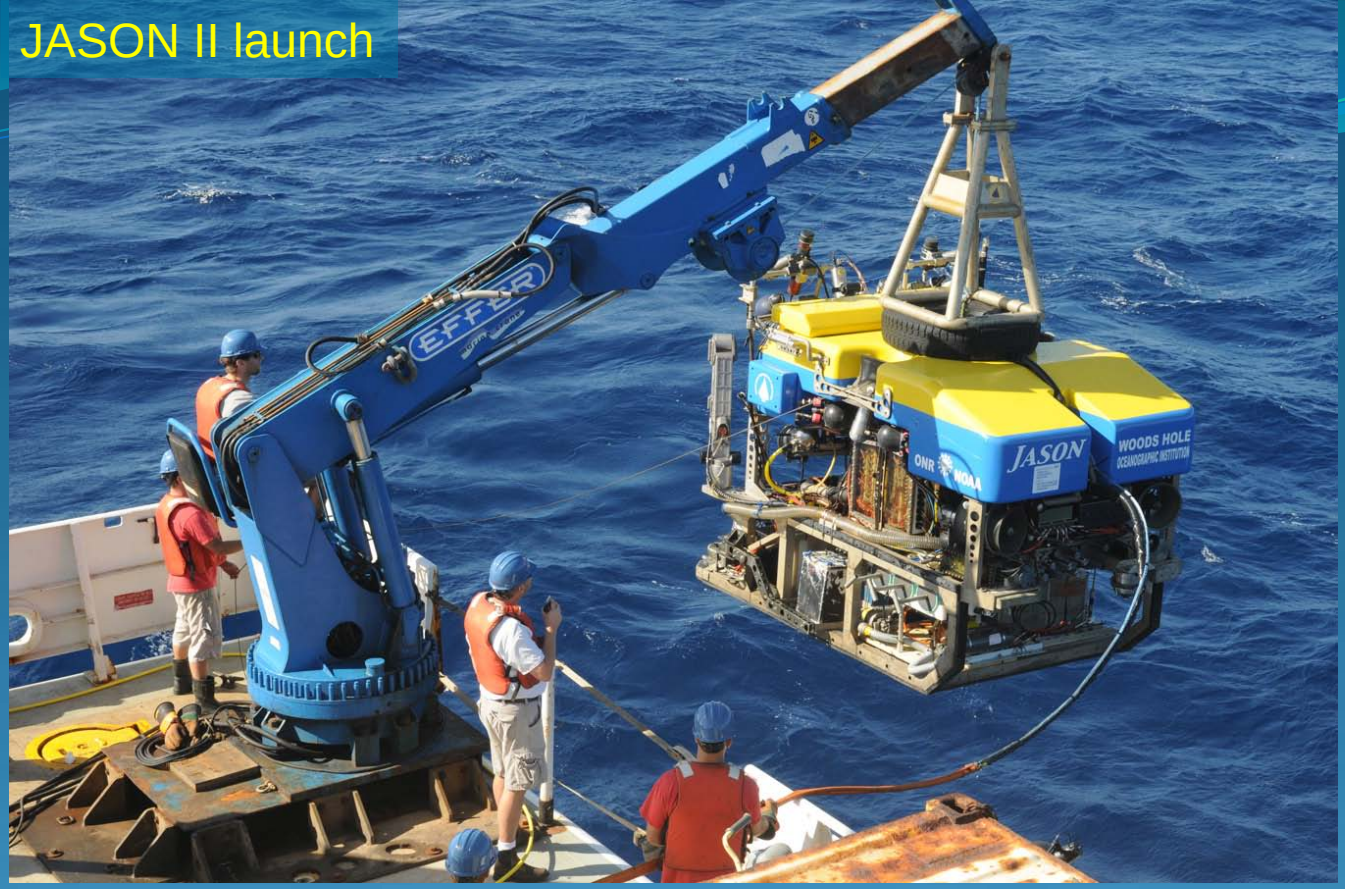
JASON II ROV
WHOI – Woods Hole, MA

Jacksonville Lithoherms
Canaveral Bioherms
Pourtales Terrace

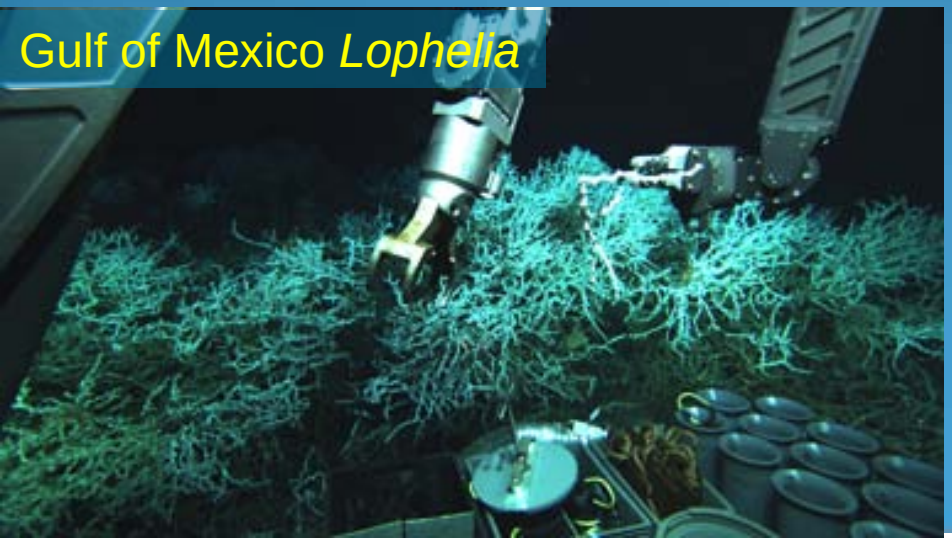
9 ROV dives
Otter Trawls, CTD casts
1575 km^2 mapped

Chief Scientists:
Steve Ross & Sandra Brooke

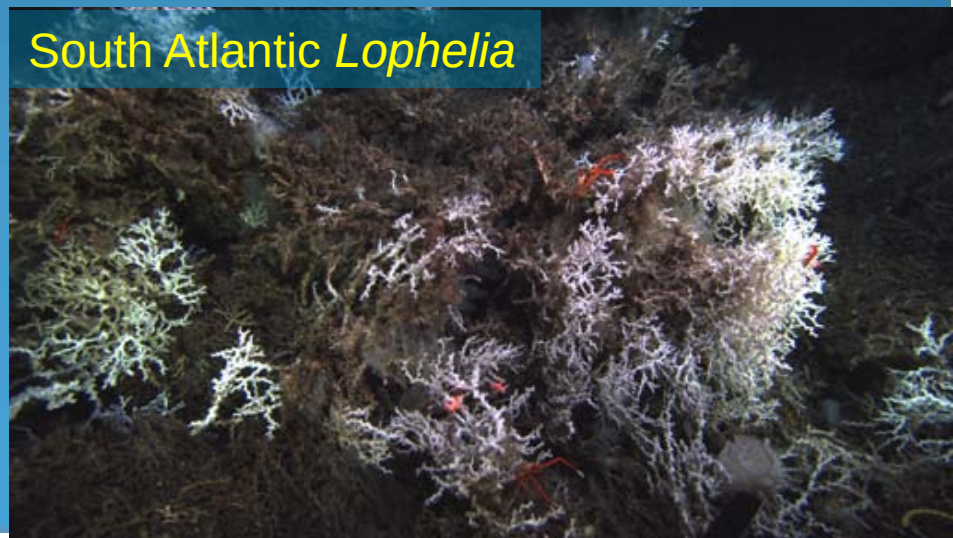
JASON II launch



Gulf of Mexico *Lophelia*

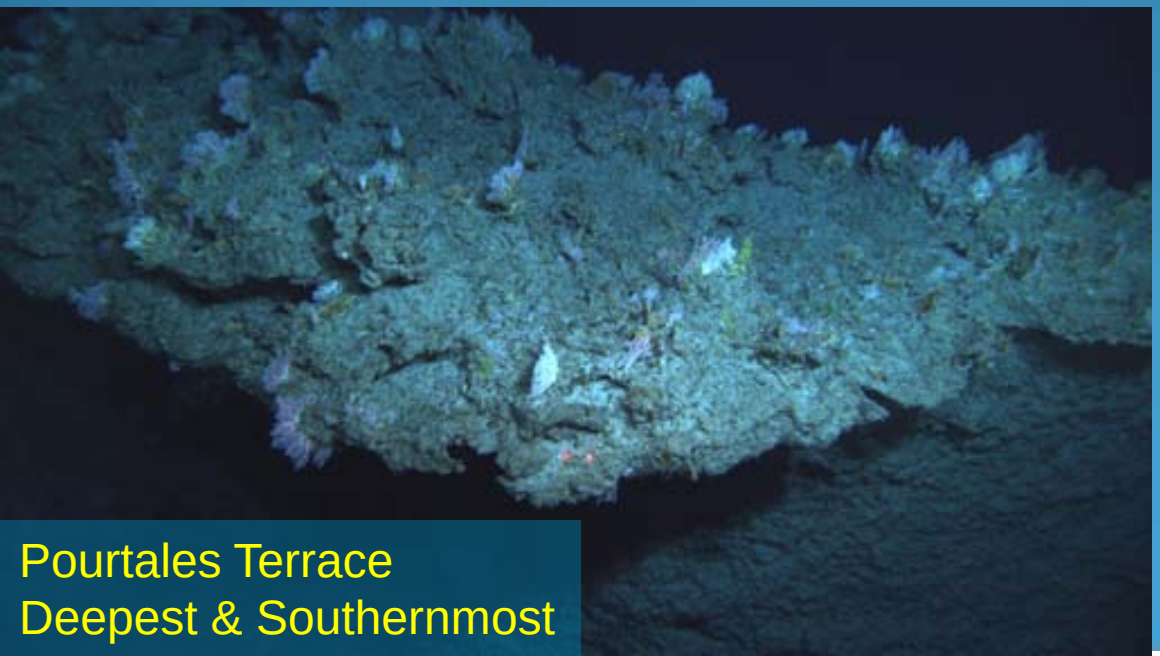


South Atlantic *Lophelia*

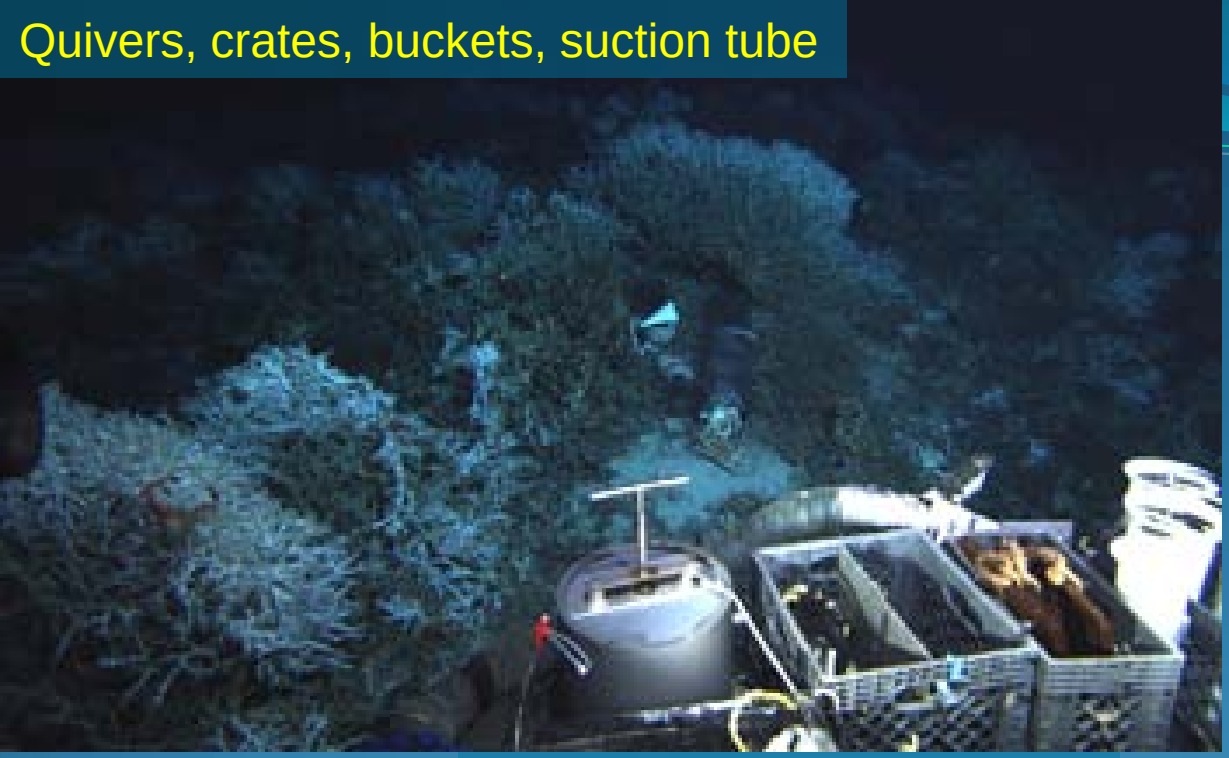


Jacksonville Lithoherms
Shallowest & Northernmost

Galatheid crabs
with prey

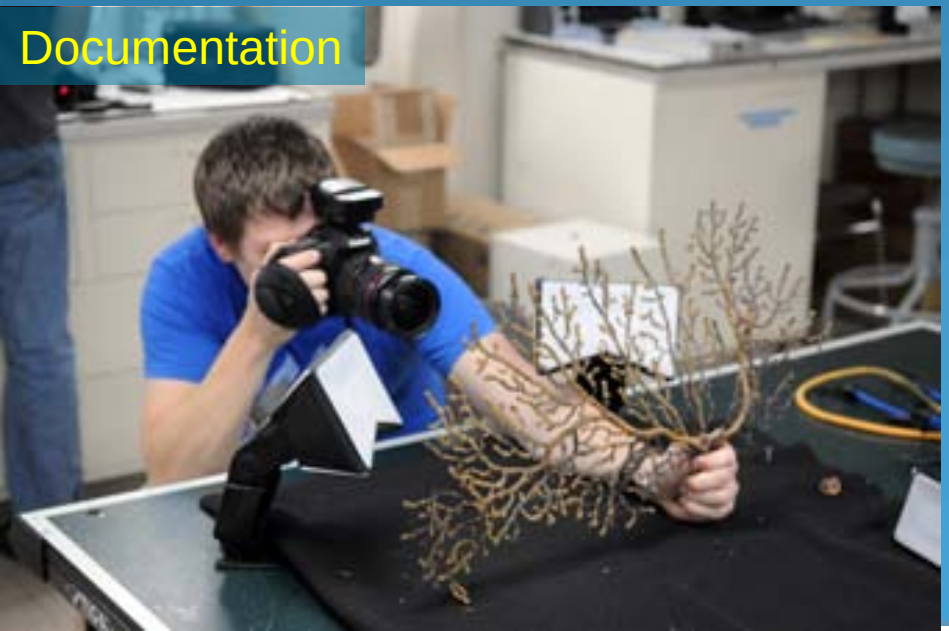


Pourtales Terrace
Deepest & Southernmost

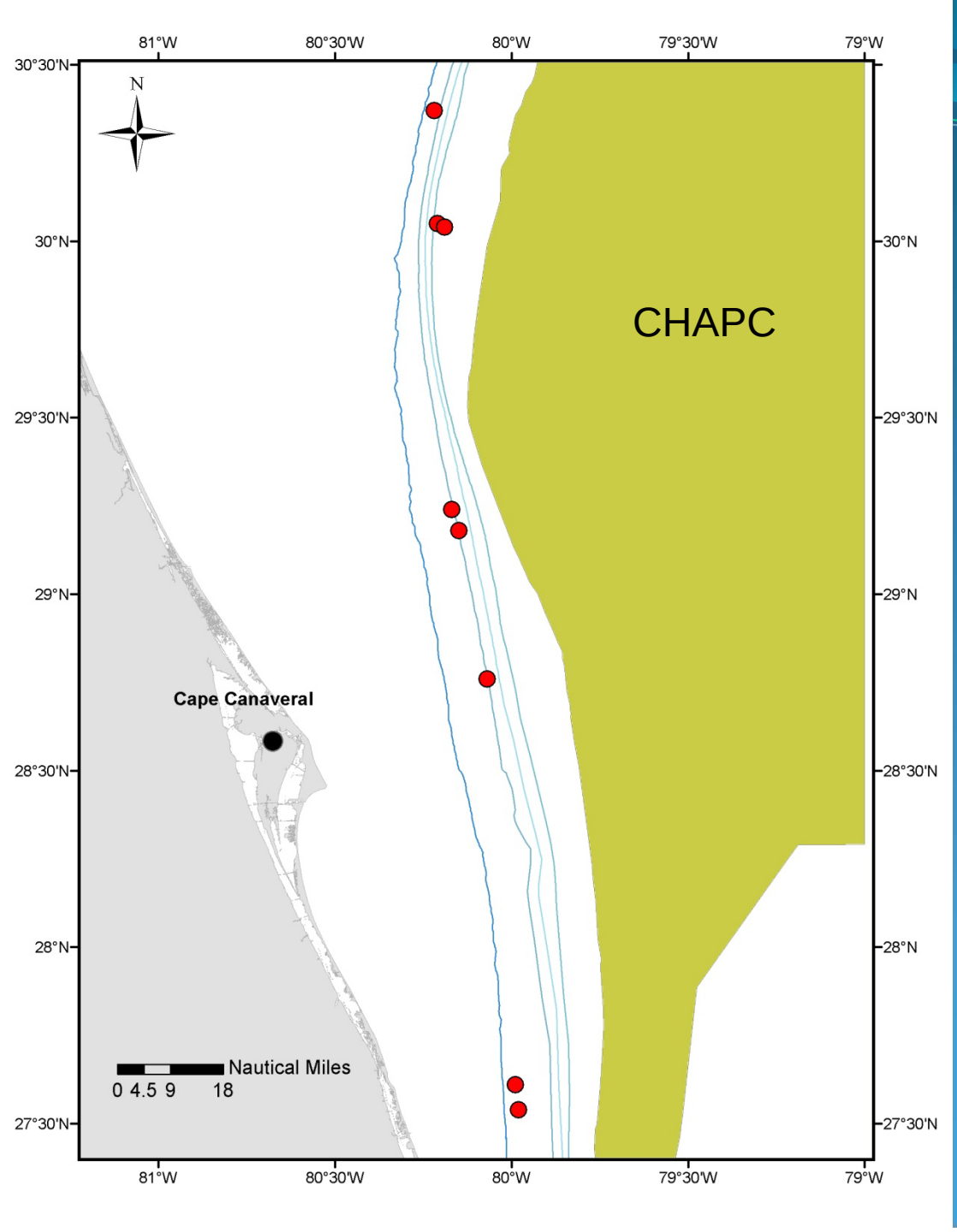


Collection capabilities

Data management



Pisces 2011



Pisces
June 2011

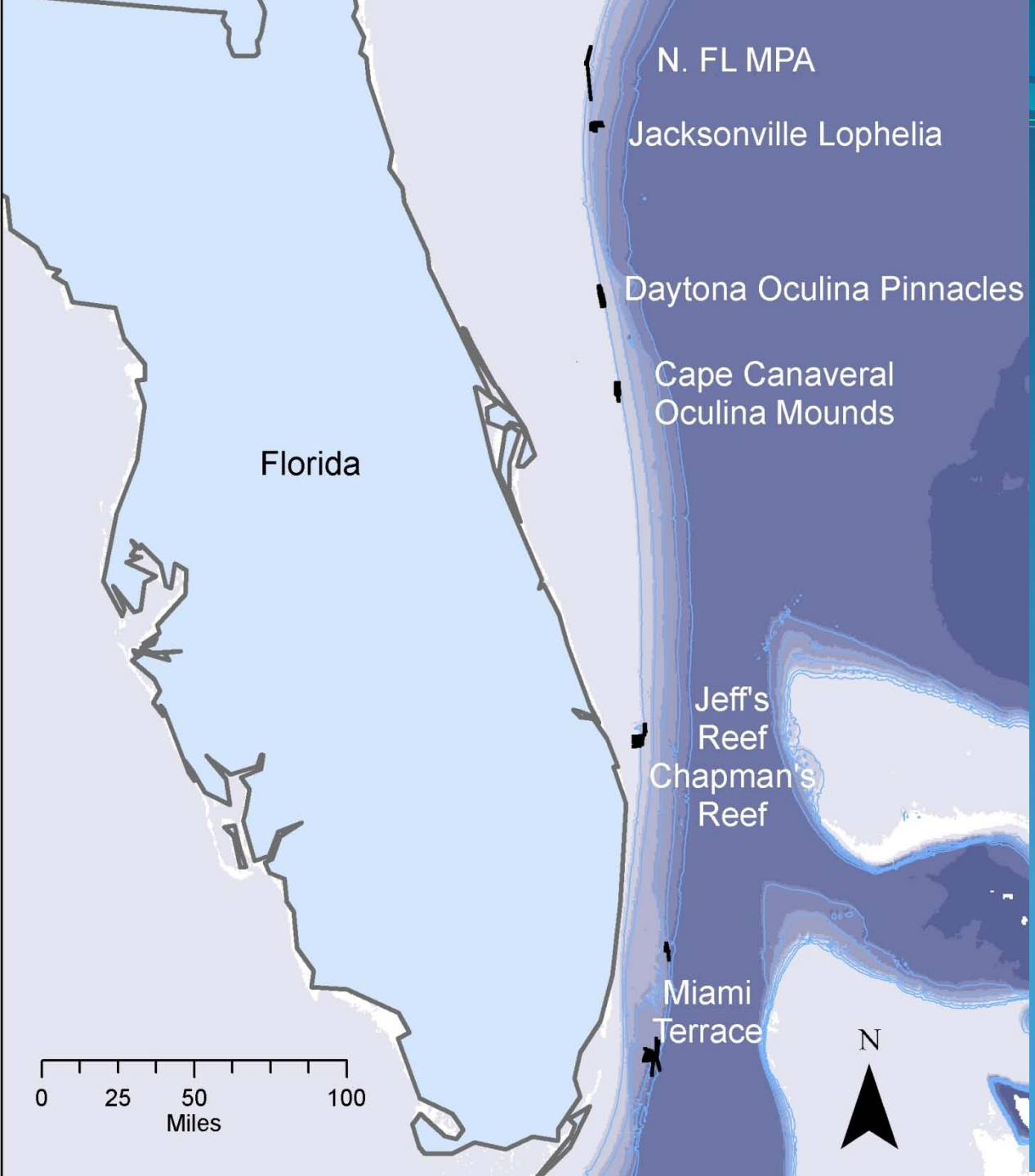
ROV, Benthic Community sampling, Multibeam mapping

HDHV & Phantom ROVs
SWFSC – La Jolla, CA

Jacksonville Lithoherms
Daytona *Oculina* Mounds
Oculina HAPC

8 ROV dives
Benthic Grabs, CTD casts
112 km^2 mapped

Chief Scientist:
Andrew David

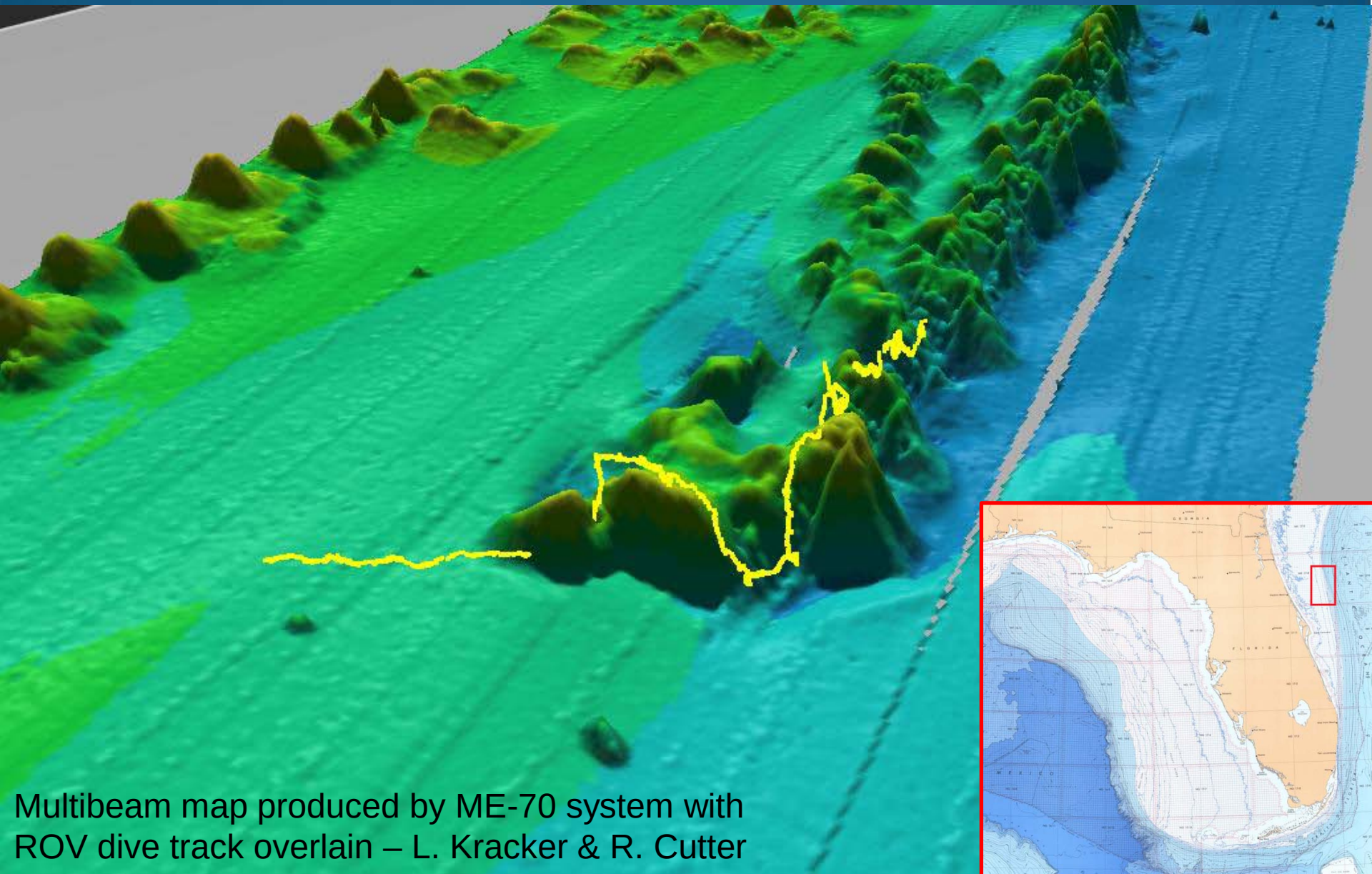


Pisces
June 2011

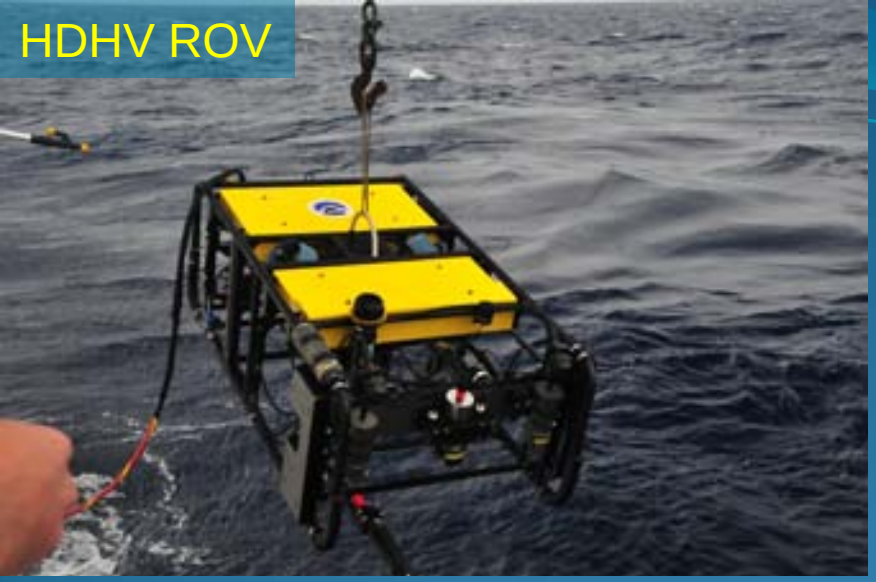
ME-70 Multibeam system used to map all survey sites for selection of ROV dive tracks and benthic grab locations.

Triplicate benthic grab collected at all ROV sites for infaunal community determinations and toxicological analyses.

Daytona *Oculina* Mounds
Pisces – June 2011



Multibeam map produced by ME-70 system with ROV dive track overlain – L. Kracker & R. Cutter


HDHV ROV

Lush epifauna in N FL MPA

Oculina off Daytona

Beardfish

Oculina on lost net

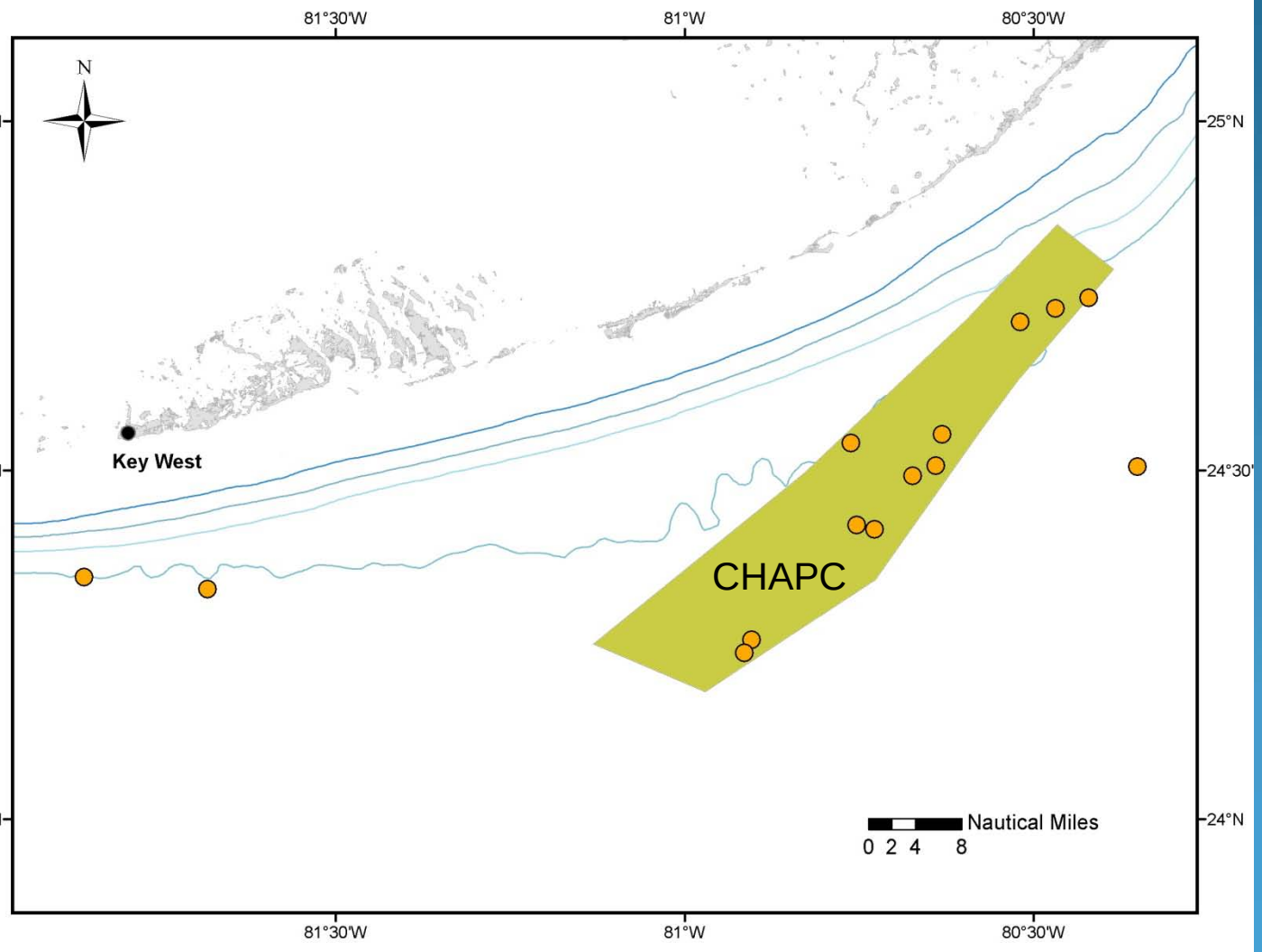
Benthic grab

Barrel sponge

Oculina rubble substrate

Nancy Foster 2011

Nancy Foster September 2011



ROV, Benthic sampling, Multibeam mapping

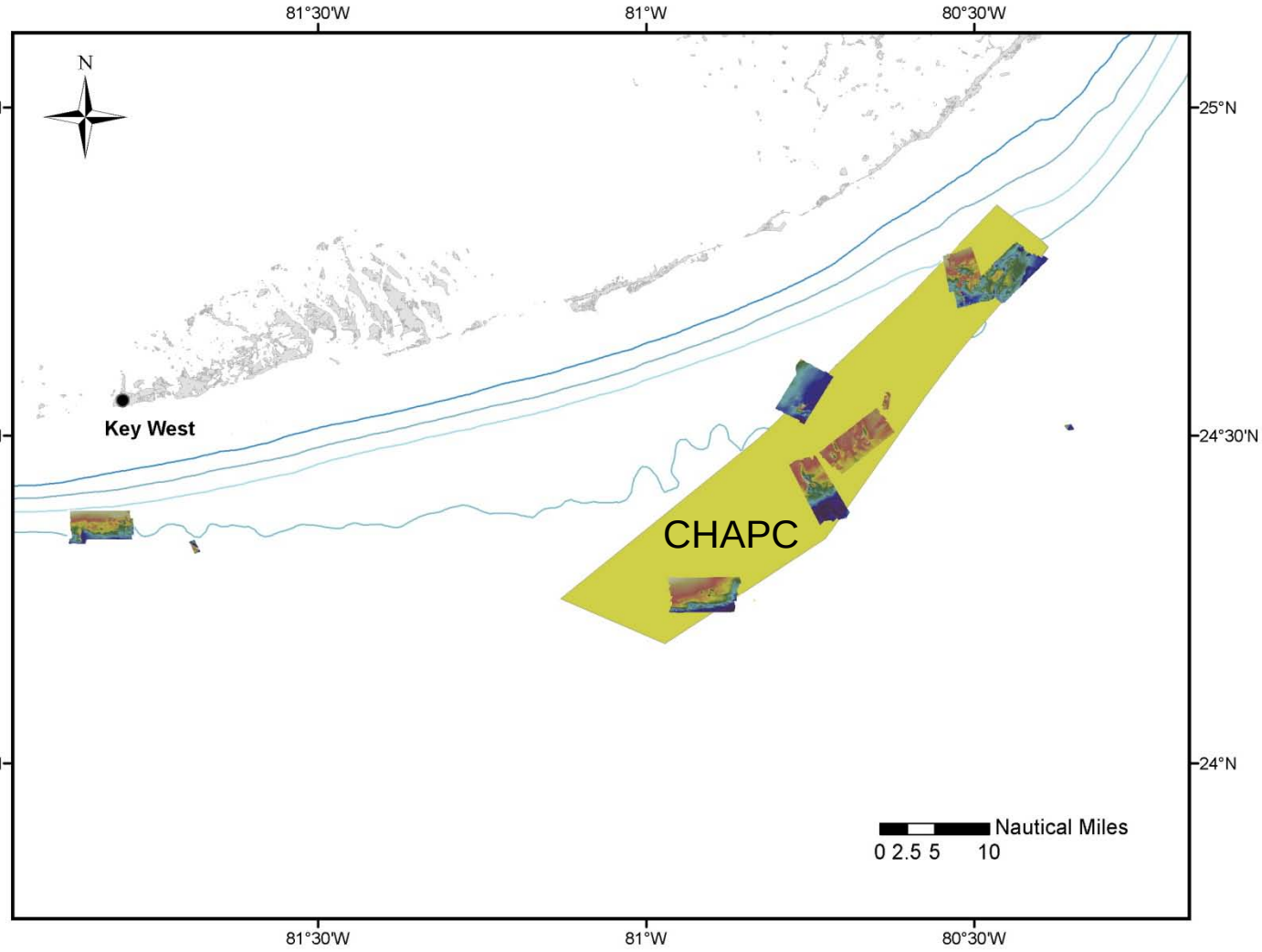
Kraken II ROV
UConn – Avery Pt, CT

Pourtales Terrace

14 ROV dives
MOCNESS tows,
CTD casts
373 km^2 mapped

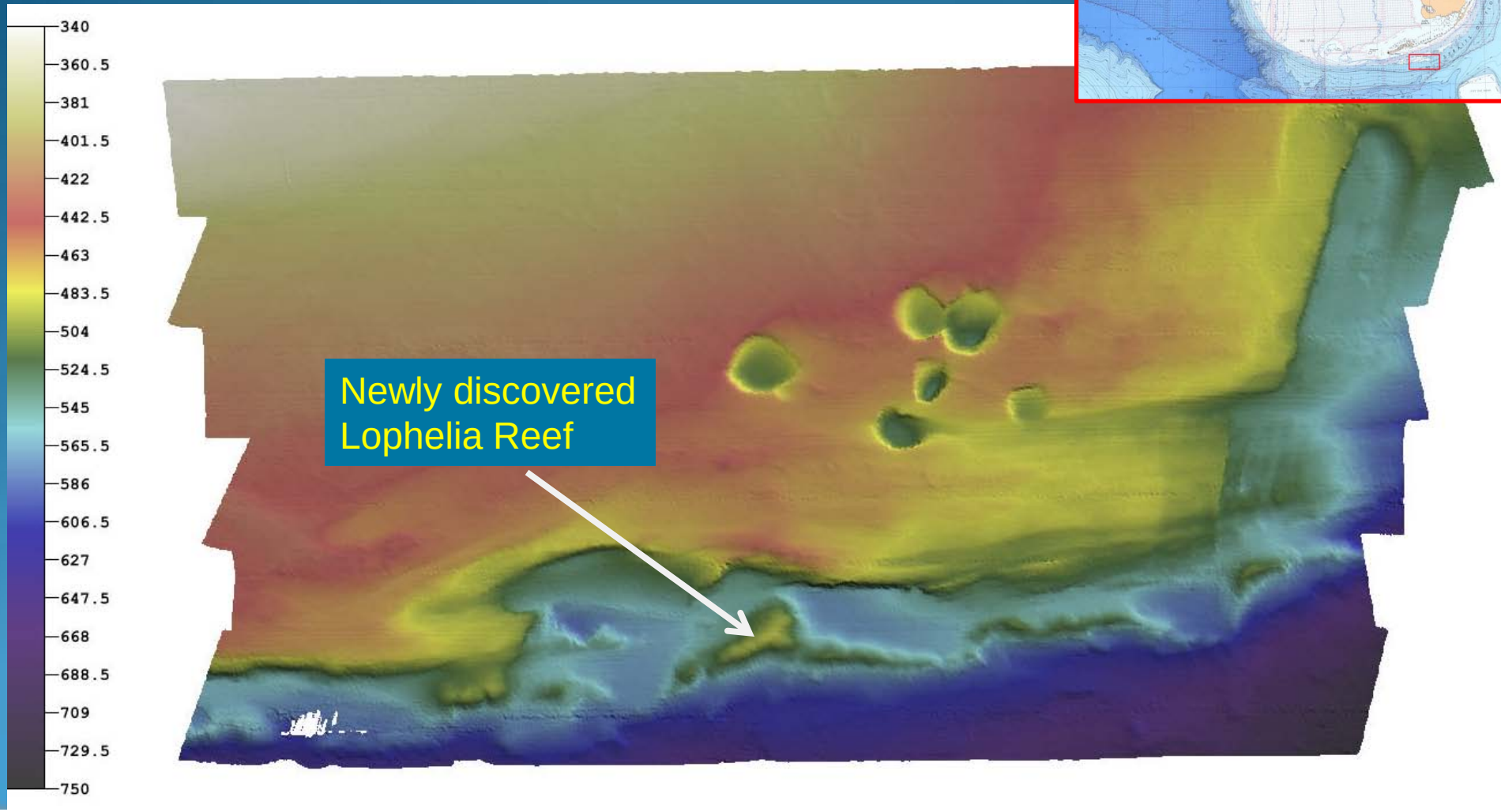
Chief Scientist:
John Reed

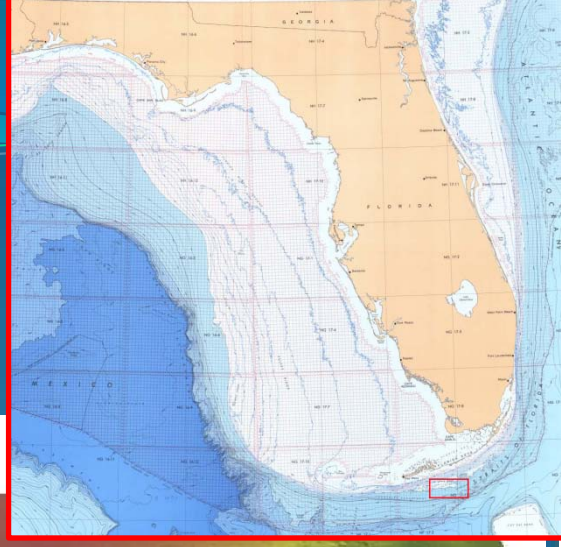
Nancy Foster September 2011



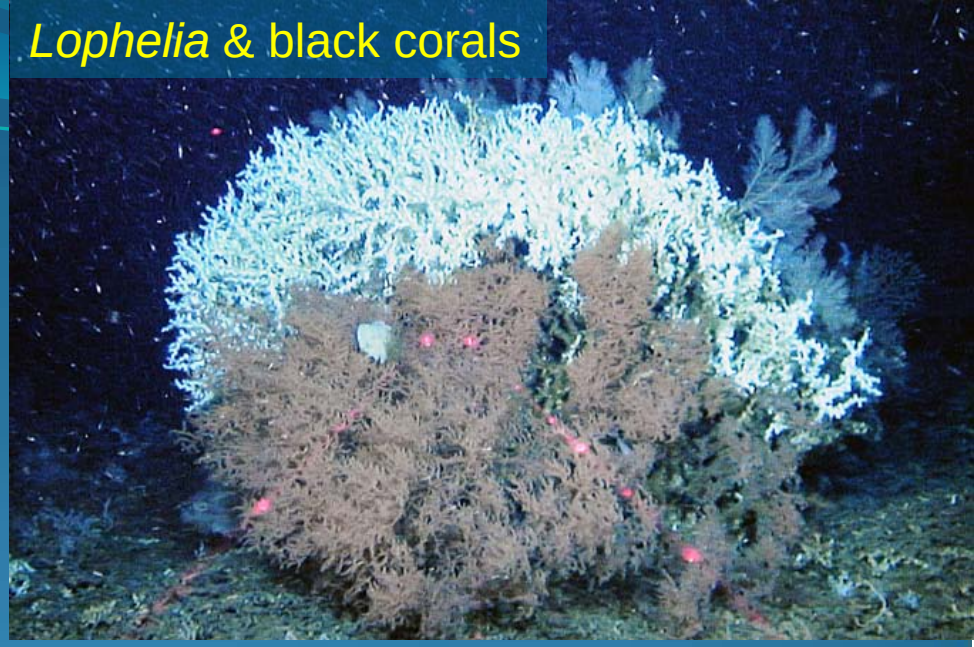
Seven major and three minor areas mapped prior to ROV dives. The majority of the mapping was within the CHAPC. Exceptions included two areas south of Key West and a deep wall at the edge of the escarpment. The total area mapped was 375 km^2 .

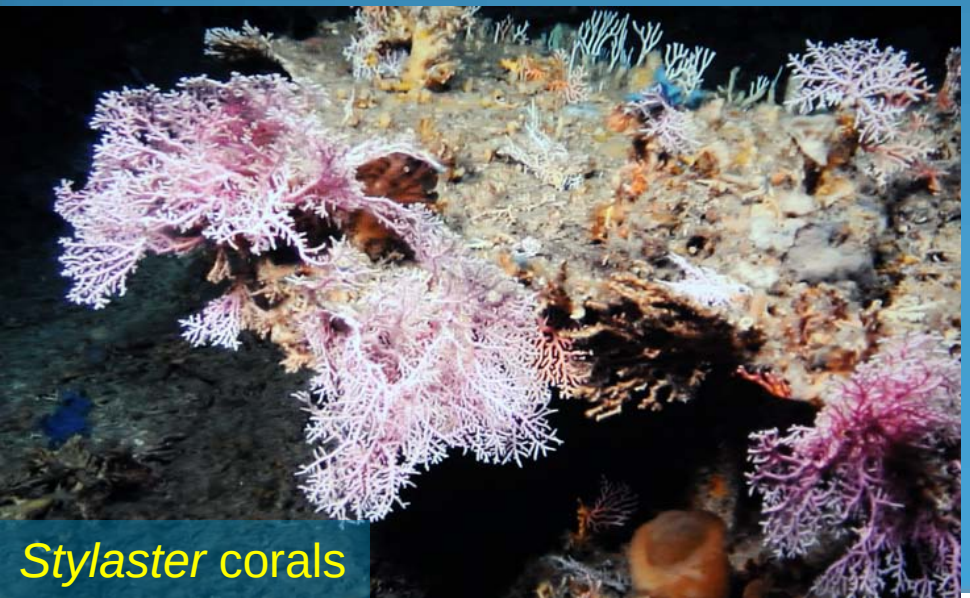
Pourtales Terrace *Lophelia* Bioherm
Nancy Foster – Sept 2011





Kraken II ROV


Lophelia & black corals


Stylaster corals

Lophelia & *Madrepora* corals

ROV control van

Golden crabs

Torpedo ray

Jambeau

Stylaster corals and encrusting sponges

Galatheid crab

MOB drill in Gulf Stream

Conger eel in dead *Lophelia*

Goosefish

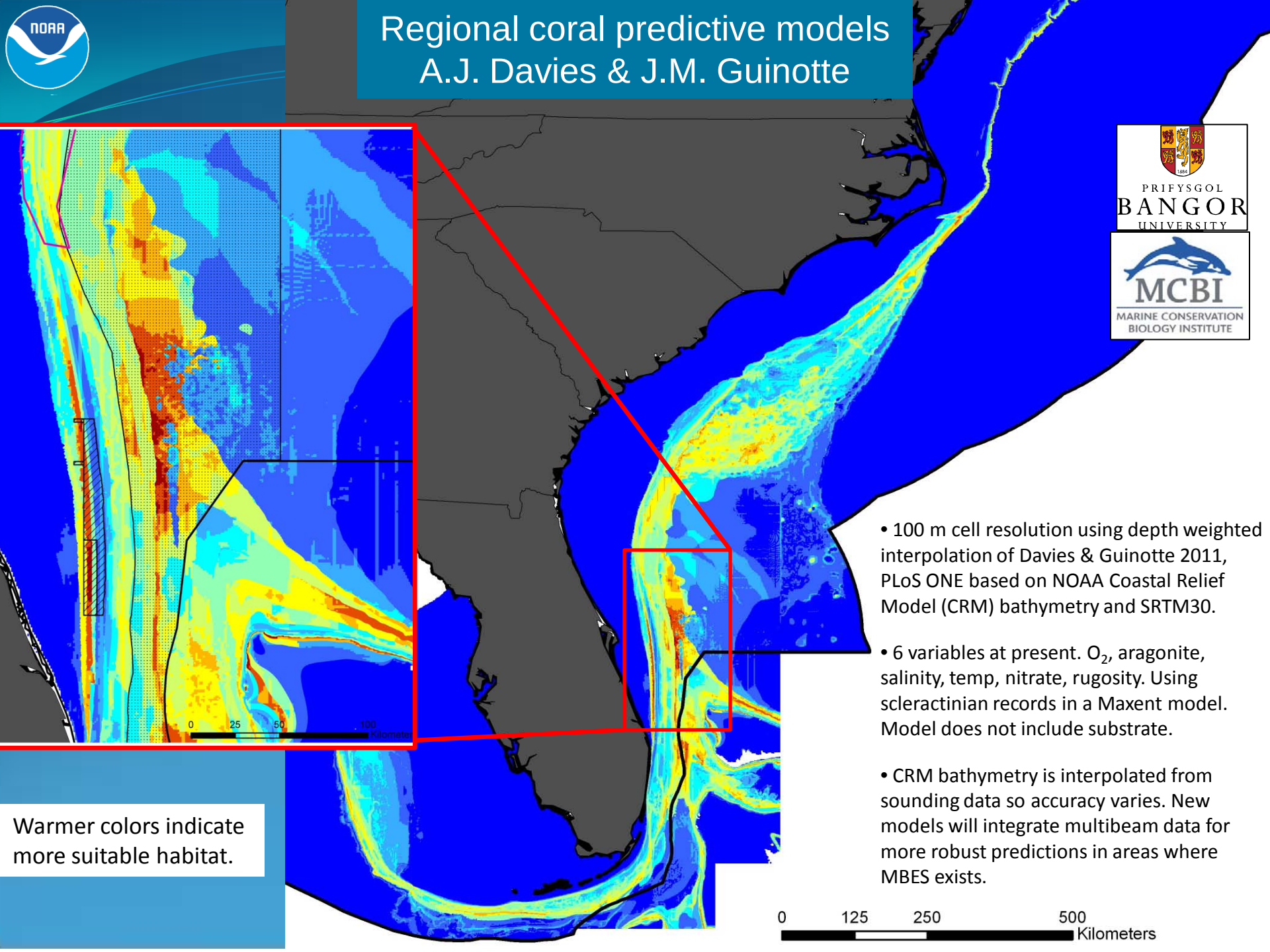
Bladefin basslet

Tripod fish

Caribbean roughshark

Regional coral predictive models

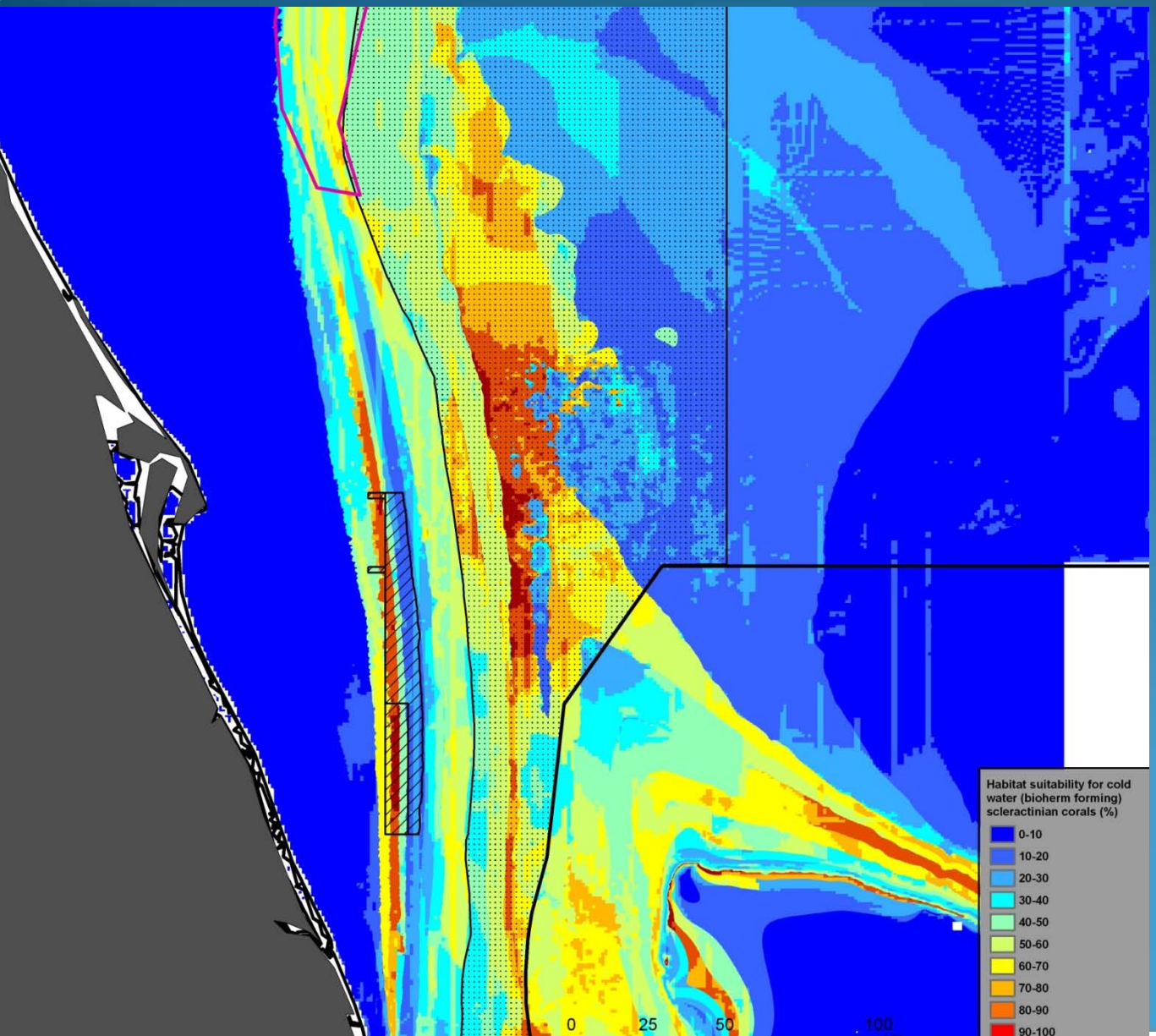
A.J. Davies & J.M. Guinotte



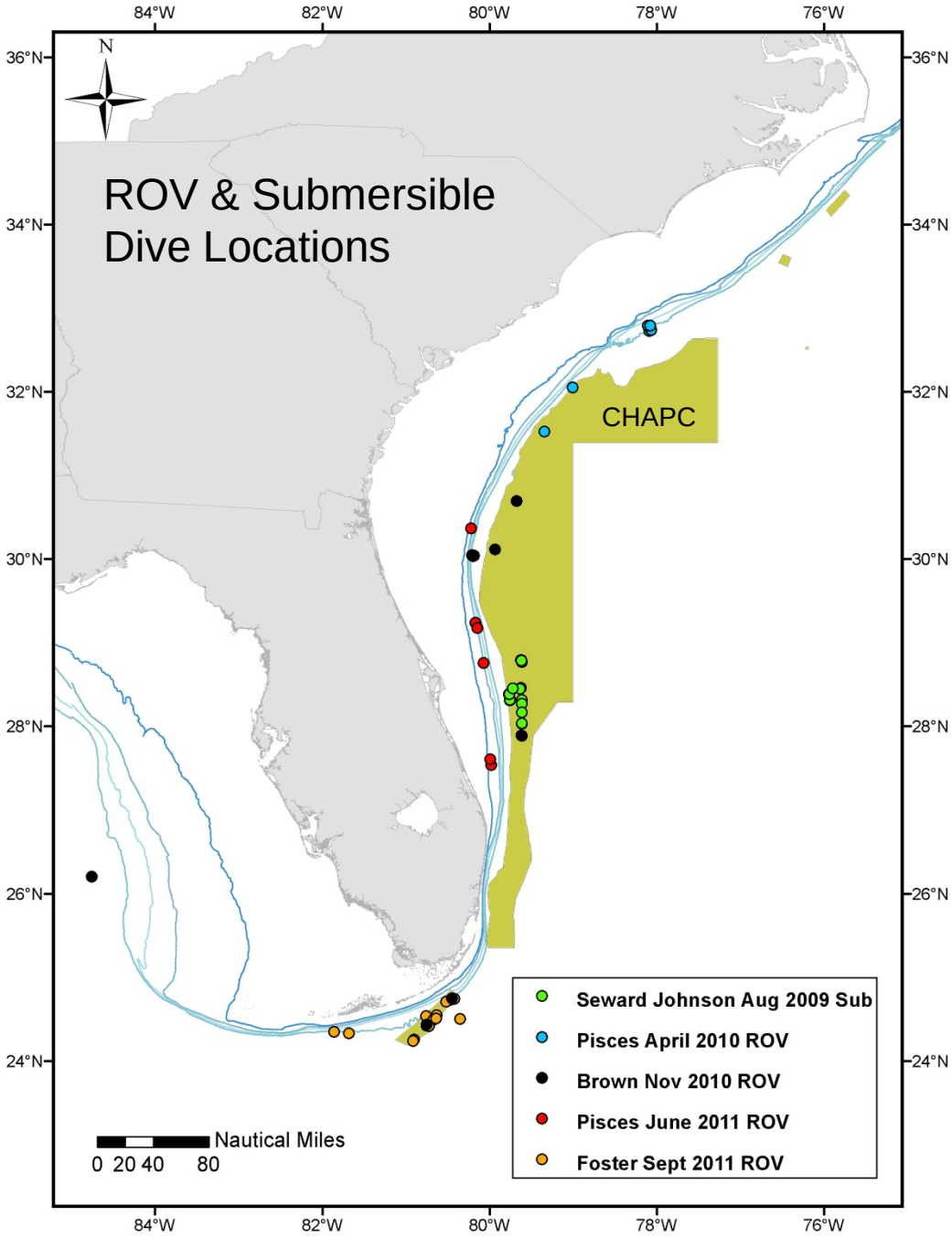
Warmer colors indicate more suitable habitat.

- 100 m cell resolution using depth weighted interpolation of Davies & Guinotte 2011, PLoS ONE based on NOAA Coastal Relief Model (CRM) bathymetry and SRTM30.
- 6 variables at present. O_2, aragonite, salinity, temp, nitrate, rugosity. Using scleractinian records in a Maxent model. Model does not include substrate.
- CRM bathymetry is interpolated from sounding data so accuracy varies. New models will integrate multibeam data for more robust predictions in areas where MBES exists.

Regional coral predictive models



NOS/NCCOS' Center for Coastal Monitoring & Assessment – Biogeography Branch is using a model patterned on Davies & Guinotte with additional multibeam bathymetry and visual groundtruthing to produce a new generation of predictive map.



Program Synopsis

7 Major cruises
- (2 mapping only)
- (2 ROV/Sub only)
- (3 ROV & mapping)

22 Submersible dives

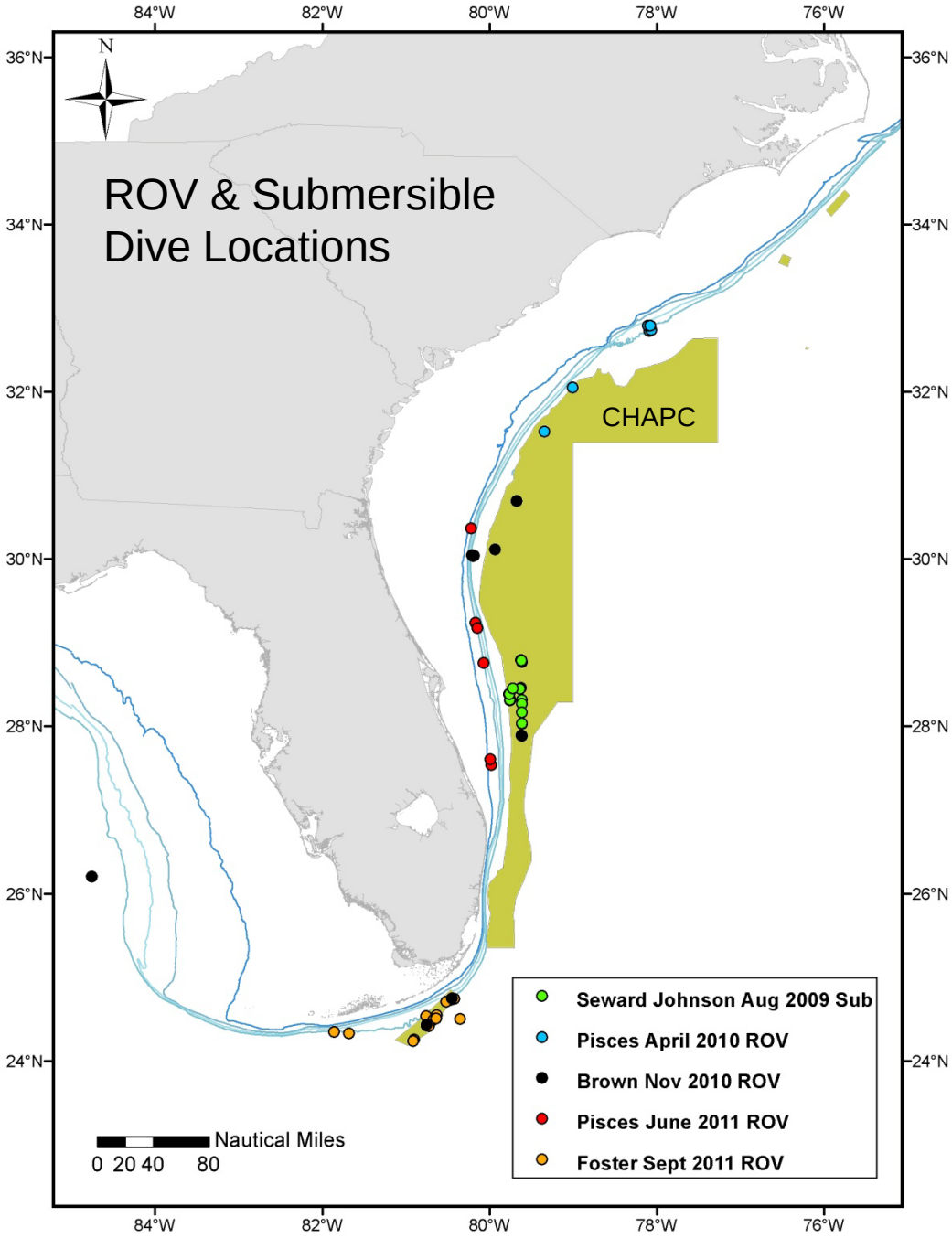
36 ROV dives

10,100 km^2 mapped

Lophelia found at shallowest location in US and southernmost locations in US

Possible new species of crustaceans collected

Predictive coral habitat map under development



Program Synopsis

100s of hours of video taken

100s of samples collected

1000s of photographs taken

Corals and/or sponges sampled for growth, reproduction, genetics, taxonomy, & biomedical applications

MOCNESS trawls (2 cruises)

Benthic infaunal community sampling (2 cruises)

Otter trawls, surface plankton trawls, CTD casts, water chemistry sampling

Final report to SAFMC in late 2012

Photo Credit: Art Howard