NOAA CORAL REEF
CONSERVATION
PROGRAM

[U.S.] National Coral Reef Monitoring Program (NC RMP)

MISSION

“To support conservation through documenting and understanding U.S. coral reef ecosystems”

Presented by Chris Jeffrey on behalf of Randall Clark
NOAA Coral Reef Conservation Program
National Coral Reef Monitoring Program

Overview

- NCRMP conducts nationally coordinated, sustained, and consistent coastal ocean observations to develop biological, climate, and socioeconomic status and trends indicators for priority U.S. coral reef areas.

- NCRMP goals include:
  - Collect geographically comprehensive status and trends data
  - Develop scientifically sound, consistent methods through strong partnerships
  - Deliver products and tools as a national context for localized monitoring & management

- NCRMP data provide a robust picture of the status and trends of U.S. coral reef ecosystems and the human communities dependent on them.
NOAA National Coral Reef Monitoring Program
Who, What, Where, When

- U.S. Pacific triennial biological and climate monitoring
  NMFS CRED (Honolulu, HI)
- U.S. Atlantic biennial biological and triennial climate monitoring
  NOS NCCOS (Silver Spring, MD), NMFS SEFSC, OAR AOML (Miami, FL)
- 7 States and Territories quadriennial socioeconomic monitoring
  NOS NCCOS Hollings Marine Lab (Charleston, SC)
- Satellite thermal stress monitoring - NESDIS Coral Reef Watch (College Park, MD)
- Data stewardship - NESDIS NO DC CoRIS (Silver Spring, MD)
- Planning, coordination, reporting - NOAA Coral Program (Silver Spring, MD)
NOAA Coral Reef Conservation Program
National Coral Reef Monitoring Program

- CRCP established 2001
- CREIOS established 2003
- External Program Review 2007
  - Roadmap Process 2008-2010
  - CREIOS Workshops 2008-2009
- NCRMP Planning 2010-2012
- NCRMP Implementation began 2013
- NCRMP Strategic Framework finalized 2014
Long-term decline in hard coral cover at three monitoring locations

**Southwest Puerto Rico**

**Virgin Islands National Park**
St John, USVI

**Buck Island Reef National Monument**
St Croix, USVI

Source: NOAA/NOS/NCCOS Biogeography Branch
Tracking Biological Trends

• Biological indicators to assess the condition of coral reefs and associated reef fish communities:
  • Coral abundance, size, and condition
  • Reef fish abundance and size
  • Habitat composition, complexity, and key species

• Data are collected through diving surveys of shallow-water (0-30 meters) hard-bottom areas.

• Scientists and coastal managers can use these data to evaluate coral reef and fish population management strategies, document endangered or invasive marine species, and assist with local monitoring efforts.
Monitoring Climate-Driven Impacts

- Climate indicators identify and monitor climate-driven trends:
  - Thermal stress
  - Ocean acidification
  - Ecological impacts on coral growth rates, erosion, and community structure

- Data are collected by moored instruments at fixed points, water samples via diver surveys, and satellite-based observations.
Understanding Socioeconomic Connections

- **Socioeconomic indicators:**
  - Knowledge, attitudes, and perceptions
  - Participation in coral reef activities
  - Economic and cultural value of coral reefs
  - Community well-being
  - Human population distributions

- Researchers collect data through periodic surveys that include standardized questions, as well as questions specific to local management needs.
National Coral Reef Monitoring Program

**IS NOT:**

- Monitoring...
  - Land-Based Sources of Pollution (LBSP)
  - Commercial or recreational fishing effort
  - MPA effectiveness

- Does not replace ...
  - Stock Assessments
  - Local state/jurisdictional monitoring
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Atlantic - Caribbean Biological Monitoring

- Co-led by NCCOS and NMFS/SEFSC
- Biennial fish and benthic surveys
- Grid based stratified random design
- Hardbottom habitats to 30 m
- Fish and coral independent survey design
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METHODS - FISH

- 25 x 4 m transect/7.5 m radius point count
- Species ID
- Size Frequency
- Density
- Biomass
- Species Richness
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METHODS - Line Point Intercept

- Percent cover of major benthic taxa
  - Coral
  - Algae
  - Gorgonians
  - Sponges

- Accompanies all fish counts
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METHODS – Coral Demographics

- Measure all corals >4 cm
  - Length/Width/Height
- % Live/Dead
- P/A Bleaching
- P/A Disease
- Colony Density
- Species richness
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METHODS – Other data

ESA Corals
- Dedicated search for presence/absence of ESA species along transect

Benthic Complexity
- Generate an index of complexity on every transect

Other invertebrates
- Lobster, conch, spiny sea urchins

Video/photos of habitat
- Useful for mapping
- Validation of habitat types
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NCRMP 2012 - St. Croix USVI

HIGHLIGHTS

• 234 KM² survey domain

• Fish prototype

• 276 surveys in 10 days; 7 boats, 40 field staff
HIGHLIGHTS

- 85 KM² survey domain

- First time to implement new benthic monitoring protocols

- 284 surveys in 10 days; 6 boats, 35 field staff
HIGHLIGHTS

• 1 KM² survey domain; no shallow reef extends from 60-150’

• First time to implement new benthic monitoring protocols

• 69 surveys in 5 days; 1 boat, 10 field staff
HIGHLIGHTS

- 273 km² survey domain
- Includes hard bottom from Port St. Lucie to Miami,
- First time to implement new benthic monitoring protocols
- 286 surveys in 6 months
- 5 cooperative agencies involved
HIGHLIGHTS

• 1163 km² survey domain
• Includes hard bottom from Miami to Key West
• First time to implement new benthic monitoring protocols
• 422 surveys in 6 months
• 5 cooperative agencies involved
Dry Tortugas Domain

HIGHLIGHTS

- 1155 km² survey domain
- Includes hard bottom from Marquesas to Dry Tortugas
- First time to implement new benthic monitoring protocols
- 424 surveys in 6 months
- 9 cooperative agencies involved
HIGHLIGHTS

- 849 KM² survey domain
- First time to implement new benthic monitoring protocols
- 225 surveys in 6 months; limited partnerships but GROWING!
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NCRMP CHALLENGES

- Logistically complex
  - Large sampling areas
- Boats
- Divers
- Scuba tanks/fills
- Training
- Data management
- Limited resources
NC RMP
WHAT MAKES IT WORK??

PARTNERSHIPS!

Examples:

*USVI - NPS

*FLORIDA
• Spatially comprehensive FIM data/2 yrs.
• Fish population data
• Coral population data
• NOAA handles data management & dissemination
• Complement local/jurisdictional monitoring
• Leveraging resources
• Cross-training
• Data delivery to partners within 12 months of surveys

• Data summary report within a year of survey

• Data queries available online 12-15 months after survey

• 4 yr. report, including all aspects of NCRMP. May be report card type style
### NCCOS National Coral Reef Monitoring Program Database

You are here:

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<tr>
<th>Region</th>
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#### Query Type

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<tr>
<td>Biomass</td>
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#### Species

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Download Data
Example data products and tools to support local monitoring and management actions

**Groupers**

- *Cephalopholis cruentata* (Graysby)
- *Cephalopholis fulva* (Coney)
- *Epinephelus adscensionis* (Rock Hind)
- *Epinephelus guttatus* (Red Hind)
- *Epinephelus morio* (Red Grouper)
- *Epinephelus striatus* (Nassau Grouper)
- *Mycteroperca bonaci* (Black Grouper)
- *Mycteroperca interstitialis* (Yellowmouth Grouper)
- *Mycteroperca tigris* (Tiger Grouper)
- *Mycteroperca venenosa* (Yellowfin Grouper)
- *Mycteroperca phenax* (Scamp)
Example data products and tools to support local monitoring and management actions.

Groupers

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