



Adaptive Management for Coral Reef Bleaching

Buck Island Reef NM's Response

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Overview

- Study site
- Bleaching event scenario
- Resource management response
 - Preliminary assessment
 - Full documentation
- Report of findings
- Continuation of routine monitoring



Atlantic Ocean

FL

Virgin Islands

PR

St. Croix

Caribbean Sea

100 miles



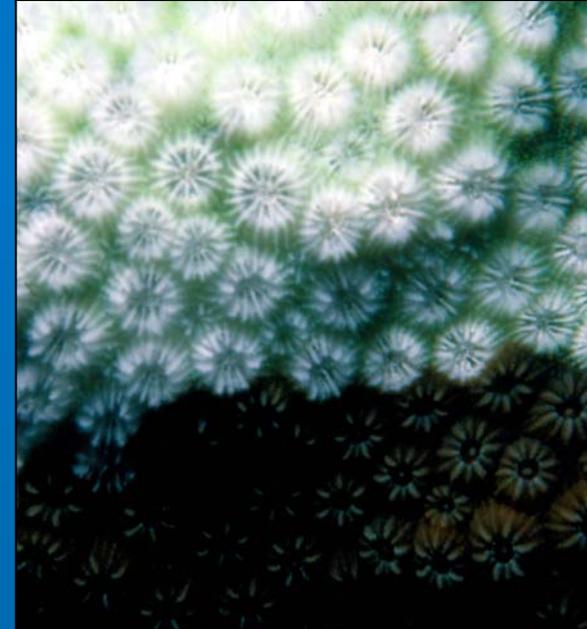




Bleaching Event

Notified by:

- Field observation by staff
- NPS concessions
- Coral Reef Network
 - Other parks
 - Marine protected areas
 - Government agencies
 - Universities





Coral Reef Network

- Informal between 1980-1990
- 2000: Coral Reef Task Force
 - Coral reef workshop participants
 - VI Government DPNR
 - Universities of Virgin Islands and Puerto Rico
 - NOAA CREWS station at Salt River Bay
NHP&EP



What is CREWs?

- Coral Reef Early Warning System
- Monitors conditions conducive to coral bleaching event
- Established at Salt River Bay NHP&EP 2002
- Data streams are posted on the Web at:
<http://www.coral.noaa.gov/crw>

Determine Extent of Bleaching

- Snorkel survey
- Check long-term coral sites
- Collect basic data
- Is full assessment needed?
- If not, continue monitoring weekly





Report Preliminary Findings

- Provide preliminary findings on bleaching event to Coral Reef Network
- Inform Park partners
- Inform local partners
- Inform general public



Full Documentation

- Tagged Coral Colonies
 - Photo all 350 tagged colonies
- Linear Chain Transects
 - Video document all twelve 20-m transects
- AQUAMAP Video Transects
 - Video document all twenty 20-m transects
- Water temperature



Buck Island Reef NM Coral Reef Program

- 1970s FDU West Indies Laboratory
- 1980-1990s NPS NRPP funded re-establishment of park Coral Reef Program
 - Linear chain transect sites
 - Tagged coral colony sites
 - Water temperature monitoring at 10 m
 - Ultimately AQUAMAP



Buck Island Reef NM Coral Reef Program (cont.)

- 1990-2003 NPS Inventory and Monitoring Program
 - Coral Colony Protocol
 - Annual survey of long-term sites
 - South Florida/Caribbean Network

Linear Chain Transects

- Established in late 1980s
- Shallow forereef and backreef
- Four 20-m transects at three sites
- Video and chain transect data collected
- Change in hard coral community over time





Tagged Coral Colonies

- Established in late 1980s
- Shallow forereef (10 m), backreef and lagoon pavement (2-4 m)
- Three species monitored
- Over 350 individual colonies monitored annually





Water Temperature

- Established in 1980s
- Ryan Thermograph installed at 10 m
- Water temperature recorded every 2 hrs



AQUAMAP Video Monitoring

- Developed by USGS BRD VI Natl. Park
- Sonar based under-water mapping system
- Random, non-intrusive, repeatable
- Used at VIIS & BUIS
- Potential for use in other coral reef areas

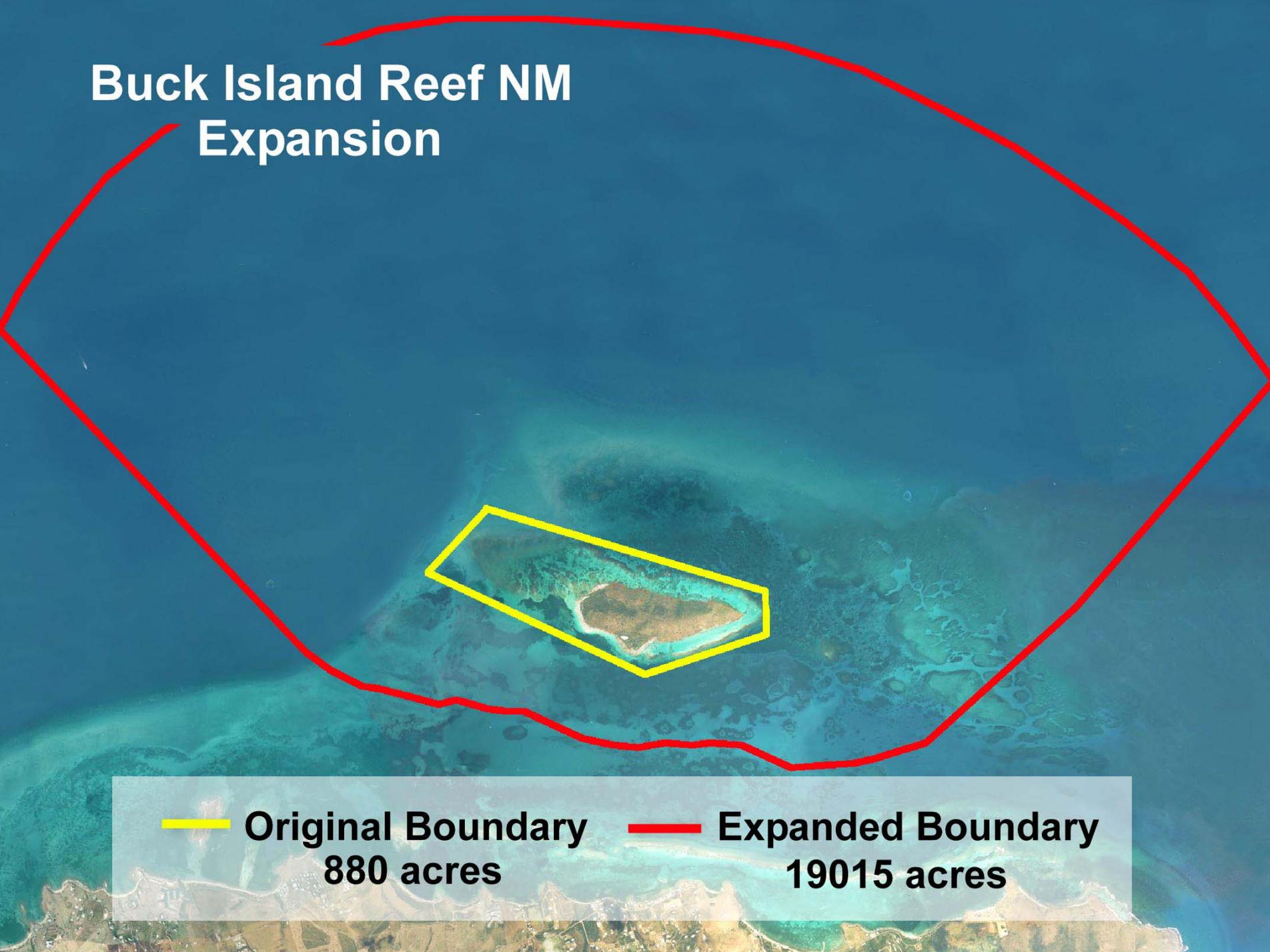


- Aquamap Base Stations
- Coral Tag Sites
- ★ Chain Transect Sites

Park Research Sites Map



Buck Island Reef NM Expansion



Original Boundary
880 acres

Expanded Boundary
19015 acres

Survey Expanded Area



- Add shelf edge survey
- Random locations
- Down to 130 ft depth



Communicate Findings

- Provide summary to
 - Territorial partner DPNR & CZM
 - Coral Reef Network
 - Park partners
 - Local dive shops
 - Other NPS areas
 - Local community

Post-Bleaching Event

- Conduct normally scheduled monitoring
- Determine amount of change in coral reef community
- Report





Long-term Response

- Coral Reef Program in place
- Work with coral reef community
- Document recovery/degradation
- Continue public education
 - To local community
 - Our own agency
 - Our congressional leaders

Conclusion

Nothing managers can do about a disease or bleaching event, but we can...

- Document
- Assess the Damage
- Monitor loss or recovery over time
- Educate everyone

