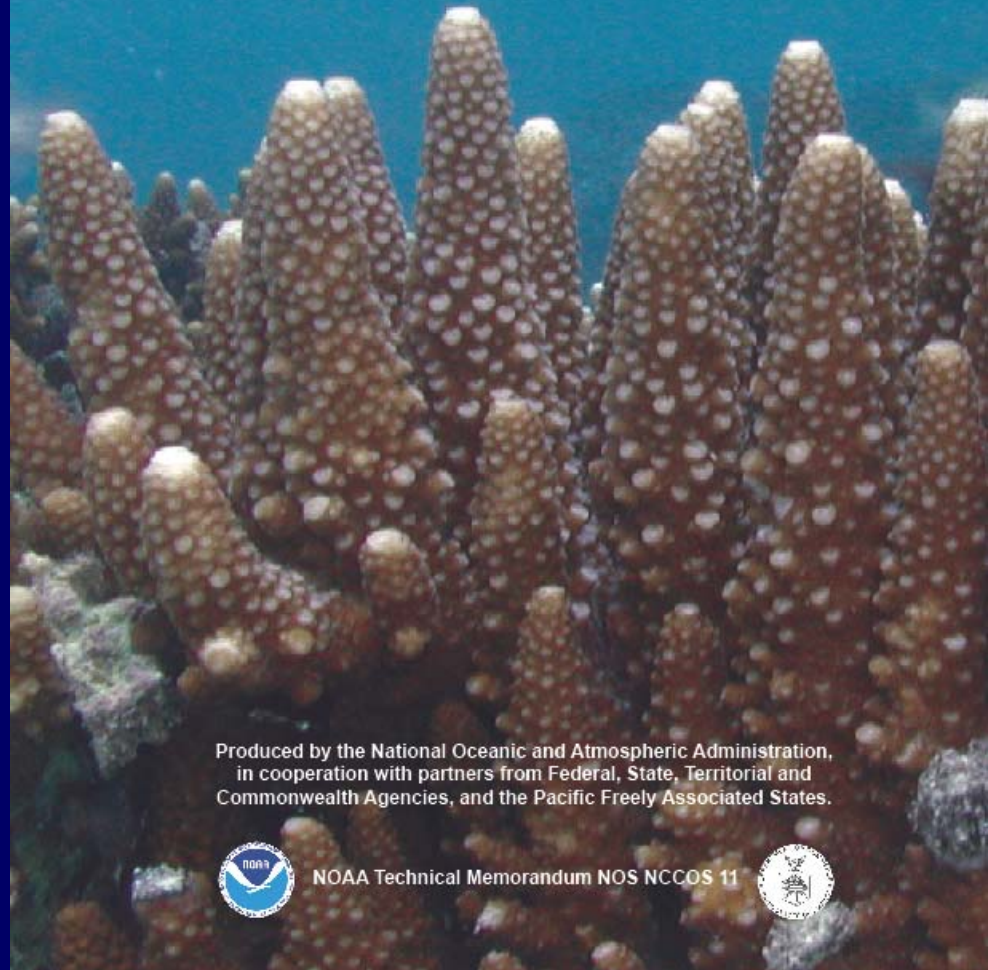


*The State of
Coral Reef
Ecosystems
of the
United States
and Pacific Freely
Associated States:
2005*

NOAA's
Coral Reef Conservation Program
<http://www.coralreef.noaa.gov>

The State of Coral Reef Ecosystems
of the United States and Pacific
Freely Associated States: 2005



Produced by the National Oceanic and Atmospheric Administration,
in cooperation with partners from Federal, State, Territorial and
Commonwealth Agencies, and the Pacific Freely Associated States.



NOAA Technical Memorandum NOS NCCOS 11



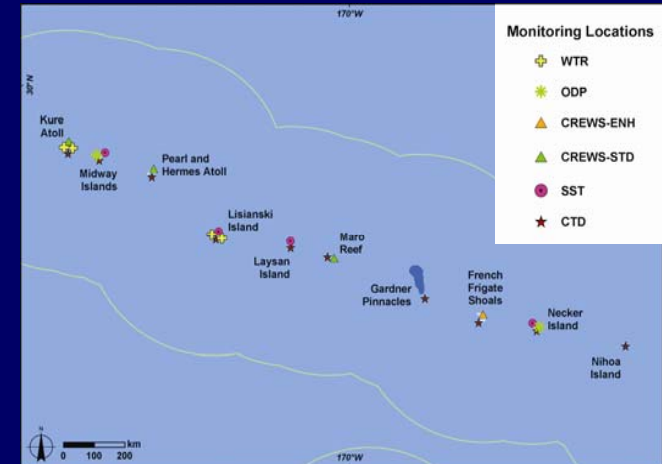
State of U.S. Coral Reef Ecosystems: 2005

What the report is:

- Product of broad collaboration among Federal, State/Territory, academic, and private partners
- First use of spatially-explicit quantitative monitoring data to assess condition of U.S. coral reef ecosystems
- Addresses requirements outlined in the *National Coral Reef Action Strategy* and the Coral Reef Conservation Act of 2000

Why the report is important:

- Tool for increasing management effectiveness
- Advances integration and coordination of reef monitoring efforts
- Promotes coral reef observing systems



Oceanographic buoy locations in the Northwestern Hawaiian Islands



Scientists monitor fish and benthic habitats in the U.S. Virgin Islands

Key Messages from the Report

What the report provides:

- Descriptions of threats to reef ecosystems
- Inventory of monitoring programs by jurisdiction
- Summarized results of monitoring efforts
- Review of recent current conservation management activities
- Conclusions and recommendations
- National summary
- Standardized GIS maps—key locations, storm paths, monitoring sites, benthic habitats

What the report doesn't provide:

- A quantitative national-level assessment comparable across jurisdictions
- Complete integration of monitoring data
- Direct cause and effect relationships between stressors and resource condition
- Comprehensive comparison of historical data to current reef ecosystem condition



Monitoring locations in Palau



Photo: J. Maragos

A crown-of-thorns sea star



Report Conclusions—General Results

- Coral reef ecosystem condition varies within and among jurisdictions
- Differences in monitoring techniques prevent comparisons among jurisdictions
- Some threats intensifying while others are decreasing. Key threats include: fishing, land-based pollution, diseases, storms, vessel groundings, and climate variability
- Reefs near population centers and industrial areas generally have greater impacts from fishing pressure, sedimentation, land-based pollution, and recreational use
- Quantitative data available for many metrics of coral ecosystem condition
- More tools available for effective management (e.g., digital habitat maps)
- Moving towards an integrated national coral reef ecosystem monitoring network



Report Conclusions—Specific Results

Monitoring programs most frequently target:

- seafloor community composition
- coral cover and diversity
- prevalence of disease
- fish abundance

Coral reef protected areas contribute to increased fish biomass and abundance.

Example jurisdictional results:

- In the U.S. Caribbean and parts of Florida, ‘coral rubble overgrown with algae’ is now the dominant habitat type.
- The uninhabited Northwestern Hawaiian Islands and Pacific Remote Islands support robust fish communities.
- Fish assemblages near populated areas are often far less abundant with few large fish and apex predators.
- Alien algae have proliferated on many Hawaiian reefs and pose a significant threat to Hawaii’s unique native marine biodiversity.



Report Conclusions—National Summary

- National Summary table presents the relative level of ‘perceived threat’ for each jurisdiction in 2002 and 2004

- Changes in perceived threat value are presented for each threat and jurisdiction

- Information is based on the expert opinion of writing teams in each jurisdiction

		Climate change & coral bleaching	Diseases	Tropical storms	Coastal development and runoff	Coastal pollution	Tourism and recreation	Fishing	Trade in coral and live reef species	Ships, boats, and groundings	Marine debris	Aquatic invasive species	Security training activities	Offshore oil and gas exploration	Other	Jurisdictional Composite Threat	Δ (2002 to 2004)
CNMI	2002	Red	Yellow	Orange	Red	Red	Orange	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	14	↓
	2004	Orange	Yellow	Orange	Orange	Orange	Yellow	Orange	Yellow	Orange	Yellow	Yellow	Orange	Yellow	Yellow	9	
Guam	2002	Yellow	Yellow	Orange	Red	Red	Orange	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	8	↑
	2004	Red	Yellow	Orange	Red	Red	Red	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	13	
Palau	2002	Red	Yellow	Yellow	Red	Red	Orange	Yellow	Orange	Orange	Orange	Yellow	Yellow	Yellow	Yellow	11	↓
	2004	Red	Yellow	Yellow	Red	Yellow	Orange	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	6	
Stressor Change Assessment	2002	12	6	7	19	17	9	18	9	17	10	10	5	1	8		
	2004	16	7	8	18	11	9	20	5	13	7	5	2	1	4		
Δ (2002 to 2004)		↑	↑	↑	↓	↓	-	↑	↓	↓	↓	↓	↓	-	↓		
Temporal Composite Threat		Red	Yellow	Orange	Red	Red	Orange	Red	Yellow	Red	Orange	Orange	Yellow	Yellow	Yellow		

Yellow = minor threat;
 Orange = medium threat;
 Red = significant threat



Report Conclusions—National Summary

Key parameters monitored in each jurisdiction.

	WATER QUALITY					BENTHOS					ASSOCIATED BIOTA				
	Turbidity	DO	Chlorophyll	Nutrients	Bacteria	Live coral % cover	Coral recruitment	Algal % cover	Coral disease	Coral bleaching	Fish abundance	Commercially important fish	Ecologically important macroinvertebrates	Commercially important macroinvertebrates	Protected species
USVI	●	●		●	●	●	●	●	●	●	●	●	●	●	●
Puerto Rico	●	●		●	●	●		●	●	●	●	●	●	●	
Navassa				●		●	●	●	●	●	●	●	●	●	●
Florida	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Flower Gardens NMS	●	●	●	●		●		●	●	●	●	●	●	●	●
Main Hawaiian Islands	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Northwestern Hawaiian Islands	●	●	●			●	●	●	●	●	●	●	●	●	●
American Samoa	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Pacific Remote Island Areas	●	●	●			●	●	●	●	●	●	●	●		●
Marshall Islands						●		●	●	●	●	●	●	●	●
Federated States of Micronesia	●	●			●	●		●			●	●	●	●	
Northern Mariana Islands	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Guam	●	●		●	●	●	●	●		●	●	●	●	●	●
Palau	●	●			●	●	●	●	●	●	●	●			



Looking Ahead—The Way Forward

- **Regional monitoring workshops planned for Spring 2006**
- **Bulk of writing targeted for 2007 to enable publication in Spring 2008 and distribution at ICRS**
- **Threat section updates to characterize how threats may be changing and identify emerging issues**
- **Incorporate additional monitoring data sets**
- **Addition of data collected in 2004-2006**
- **Broader collaboration among scientists and managers**
- **Suggestions for improving process, communication, and stronger support for writing teams**
- **Expanded National Summary chapter**
- **Potential outline modifications to better incorporate human dimensions, socio-economic and cultural aspects**



For More Information

Digital (Adobe PDF) files of the entire report and individual chapters are available at:



http://ccma.nos.noaa.gov/ecosystems/coralreef/coral_report_2005

