Improve the Use & Effectiveness of Marine Protected Areas

Program Review

NOAA Coral Reef Conservation Program

September 25th, 2007

Why are MPAs a priority for the NOAA CRCP?

- MPAs are an integral part of successful coral reef ecosystem management and conservation
- Well managed MPA networks help protect the biodiversity & resilience of coral reef resources
- MPAs can protect critical coral reef habitats and reef species

Why are MPAs a priority for the NOAA CRCP?

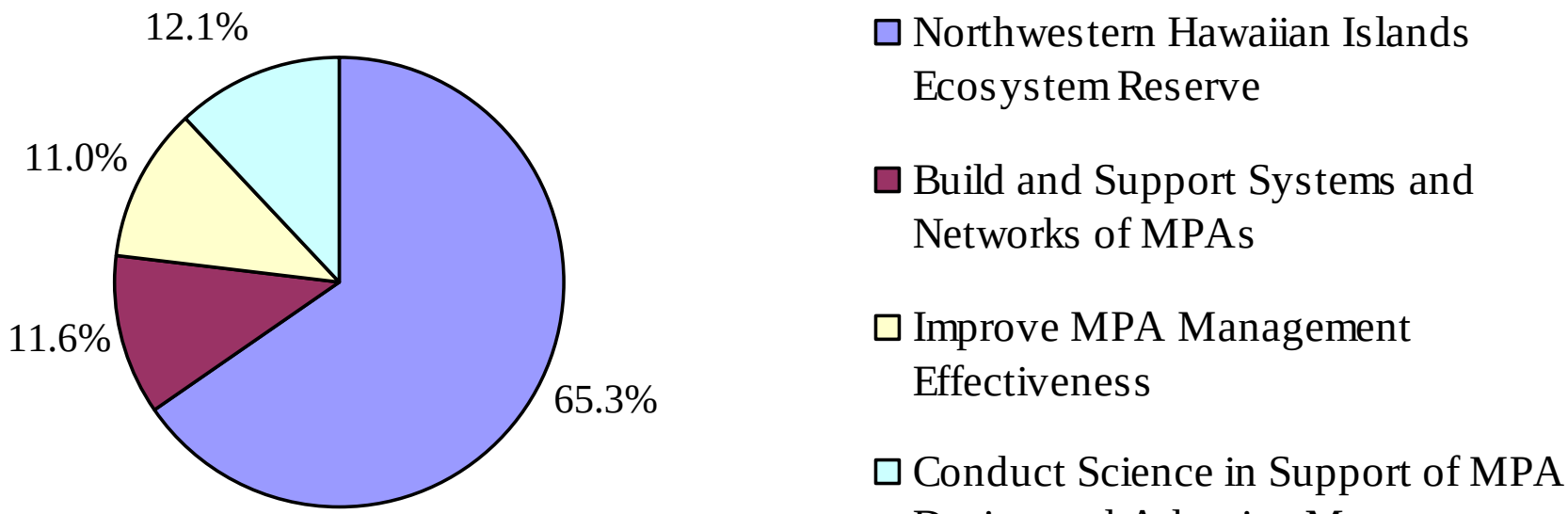
The US Coral Reef Task Force National Action Strategy calls on NOAA and other CRTF members to improve the use of MPAs in coral reef ecosystems.

CRCP Investment in MPAs

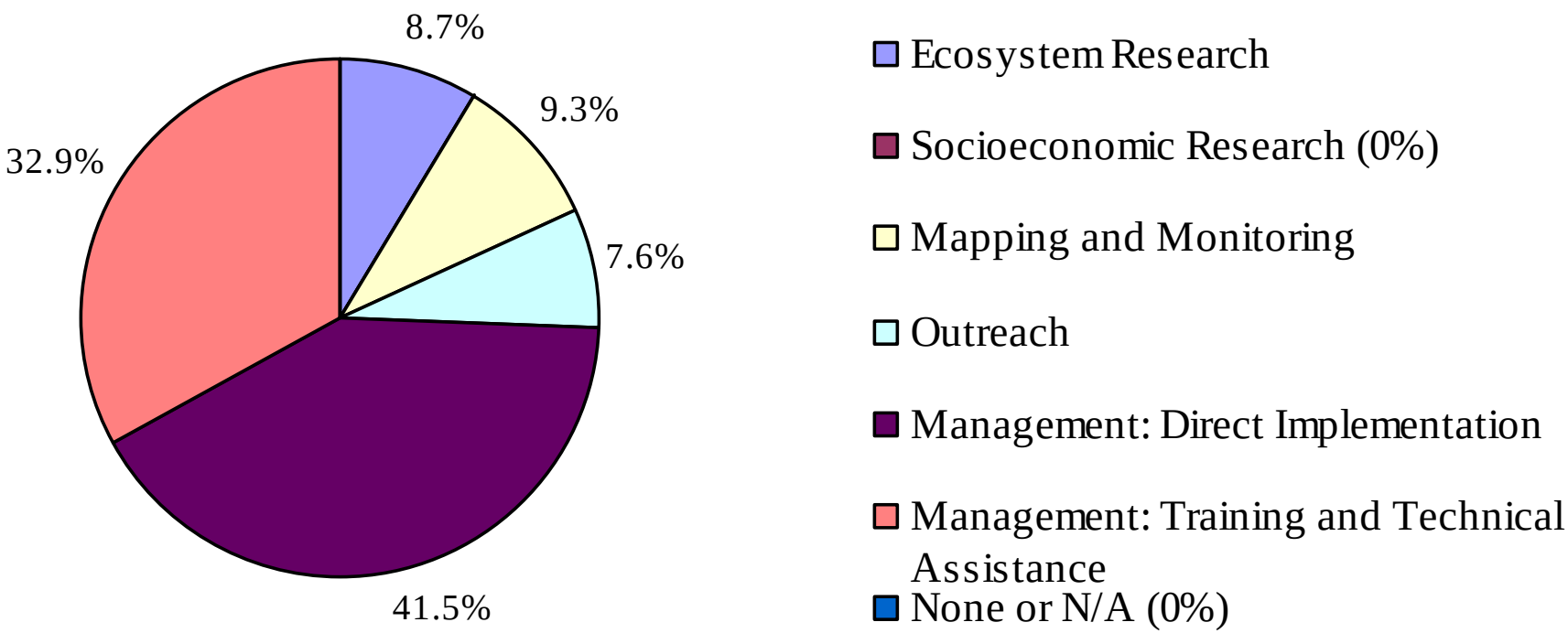
- **Funding: $23.4 M (18.1% total CRCP)**
- **Projects: 143 (11% total CRCP)**
- **Major tools:**
  - **73.1 % in direct management implementation**
  - **10.7% funding in ecosystem research**
  - **7% mapping and monitoring**
  - **5.3% in management – training and technical assistance**

Subcategories

Improve Use and Effectiveness of Marine Protected Areas (MPAs): Investment by Subcategory



Build and Support Systems and Networks of MPAs



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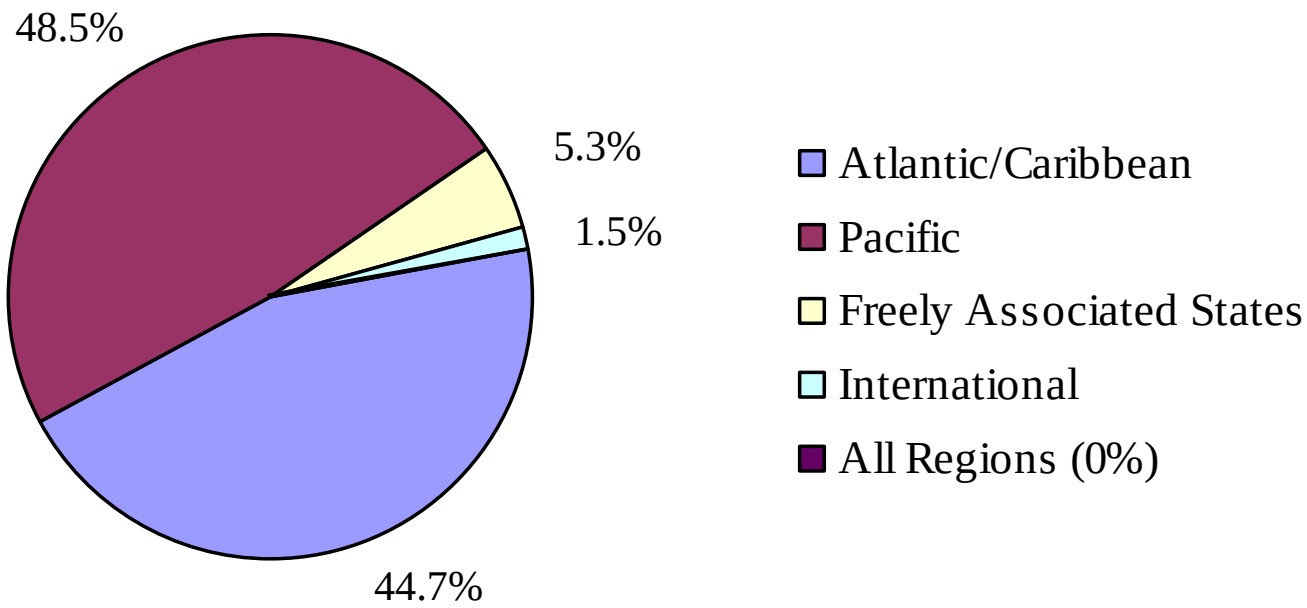
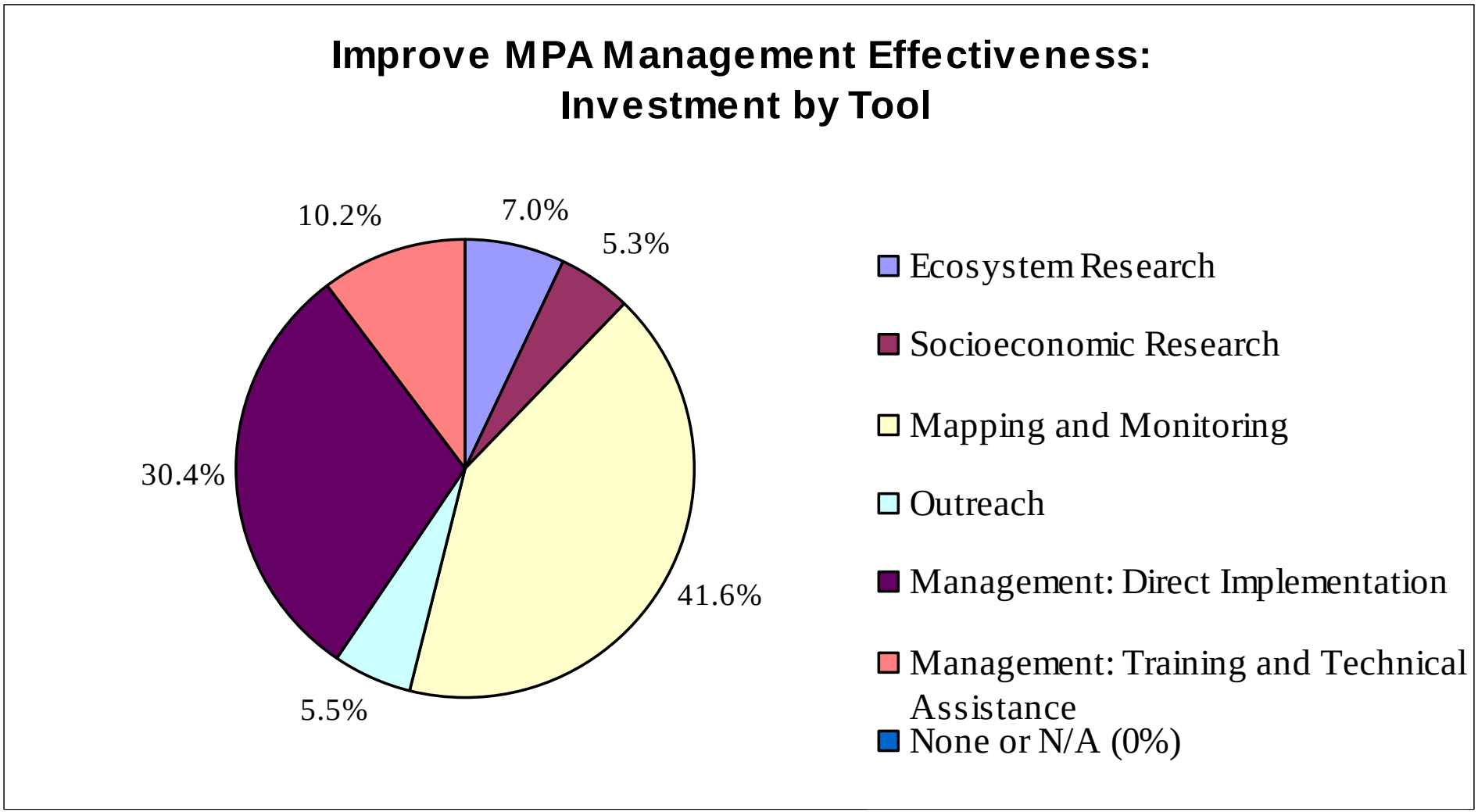
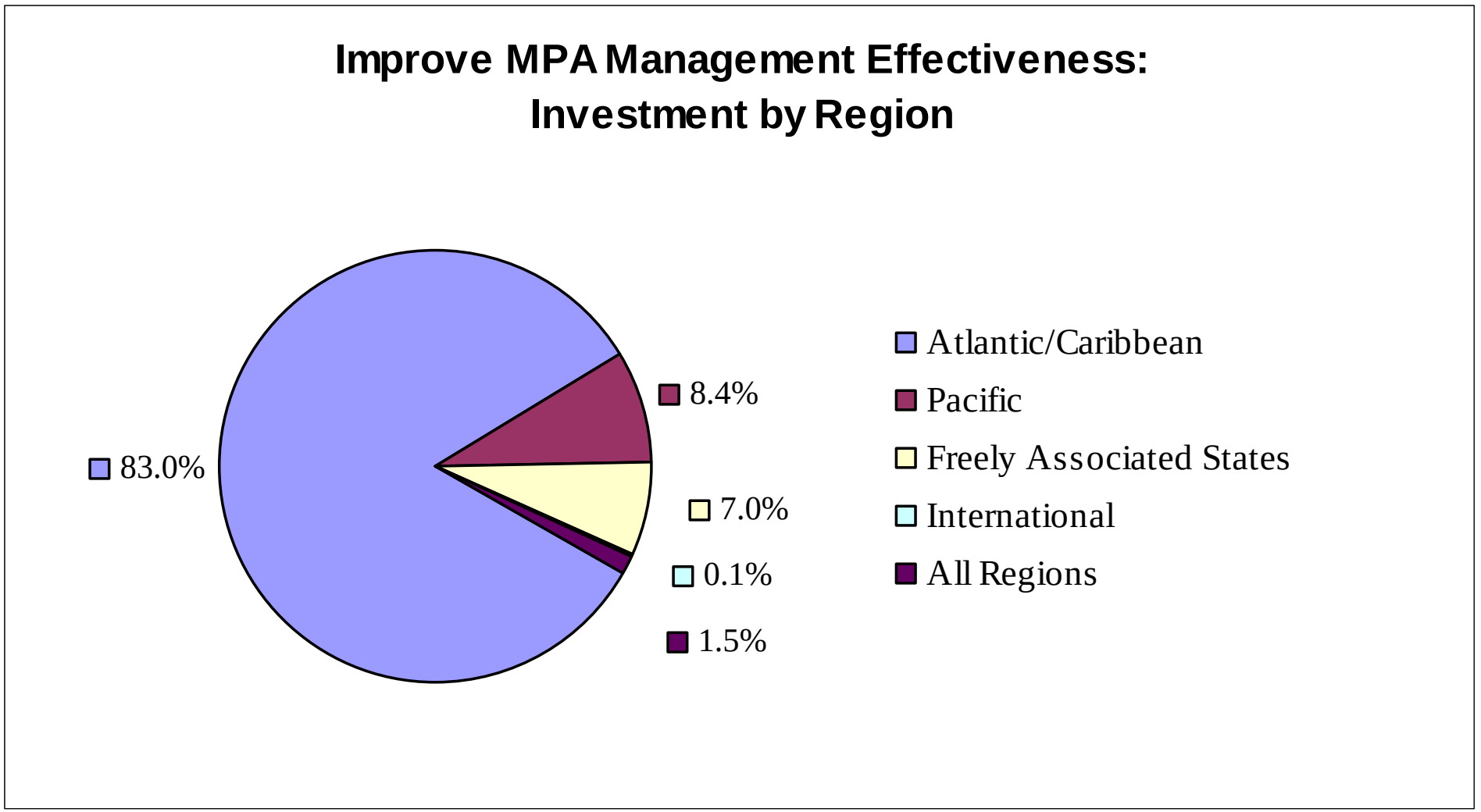


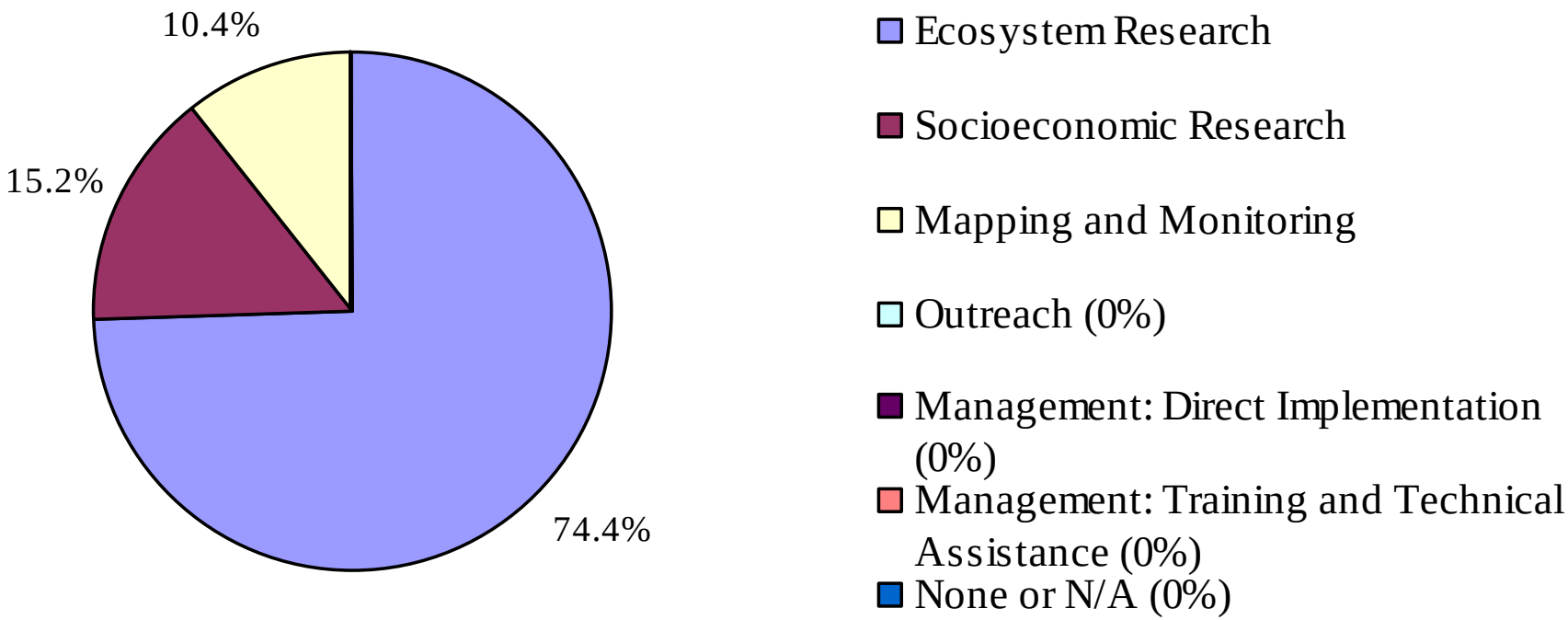
Improve MPA Management Effectiveness



Improve MPA Management Effectiveness



Conduct Science in Support of MPA Design and Adaptive Management



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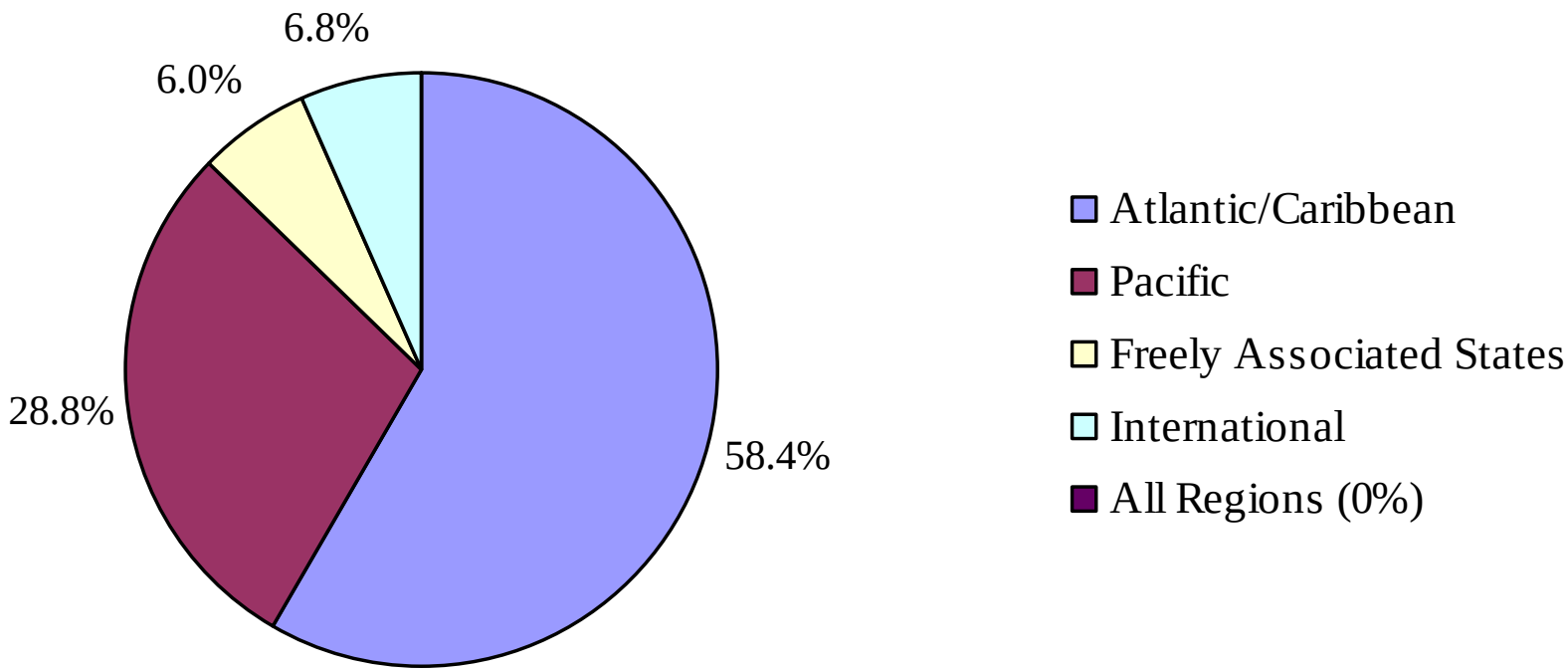
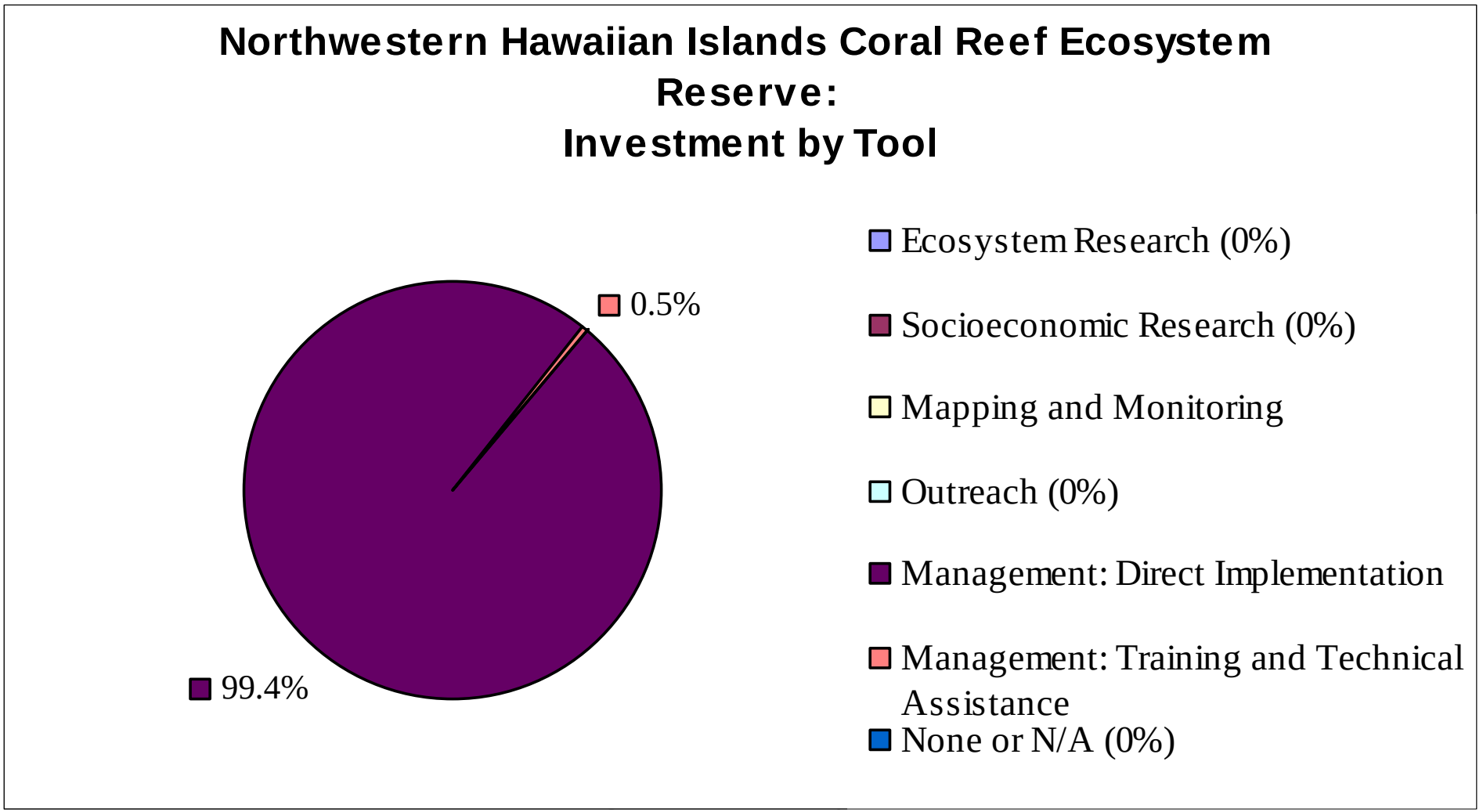
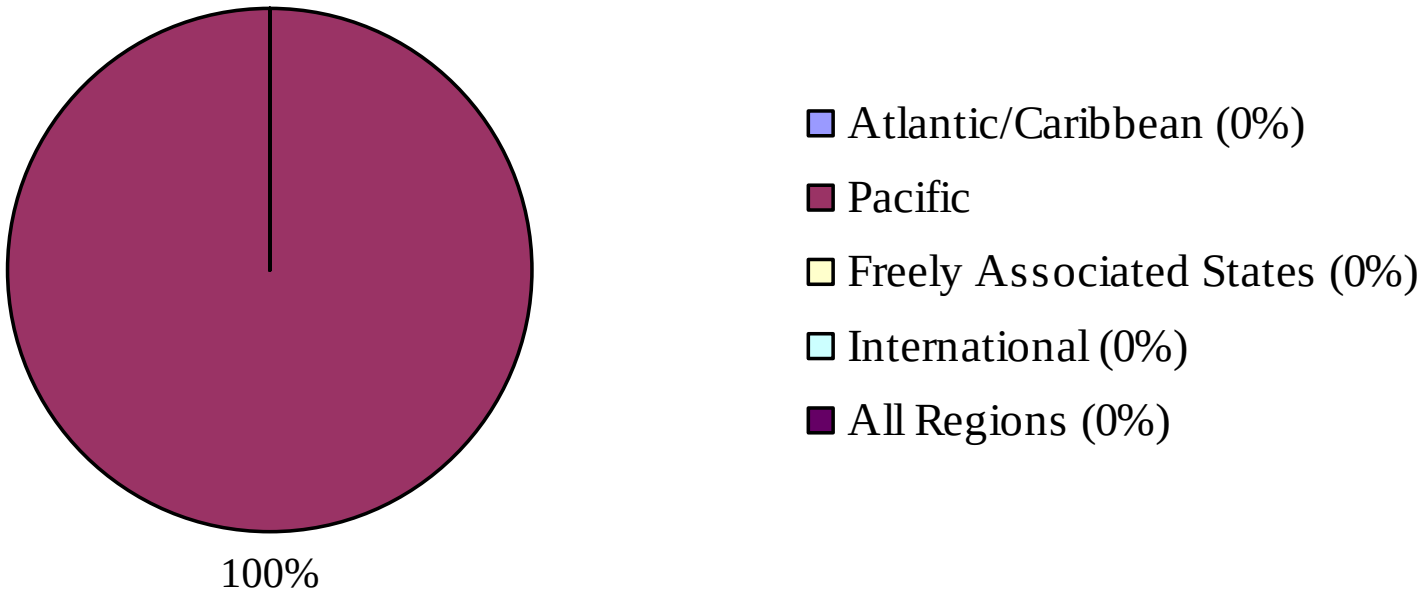


Support the Operations of the NWHI Coral Reef Ecosystem Reserve



Support the Operations of the NWHI Coral Reef Ecosystem Reserve

Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve: Investment by Region



MPA Research, Mapping & Monitoring

MPAs
Research, Mapping & Monitoring

3 Tools

- Biophysical Research and Modeling
- Socioeconomic Research
- Mapping, Monitoring, Assessment

This section covers the use of these tools in three subcategories

- Build and Support Systems and Networks of MPAs
- Improve MPA Management Effectiveness
- Conduct Science in Support of MPA Design and Adaptive Management

MPAs
Research, Mapping & Monitoring

- Scope of projects ranged from global to local, from one time projects to annual surveys, and from shore to OCS.
- Products included bathymetric and habitat maps, peer reviewed publications, ecosystem models, reports to FMCs, open access databases, and socioecon. surveys.
- Users of products included local, state, territorial, and federal managers of MPAs, public interest NGOs, scientists in numerous fields of research and the general public.
- 'Science' awards in the MPA section funded 68 projects which received $4,706,791 between 2002 and 2006.

MPAs
Research, Mapping & Monitoring

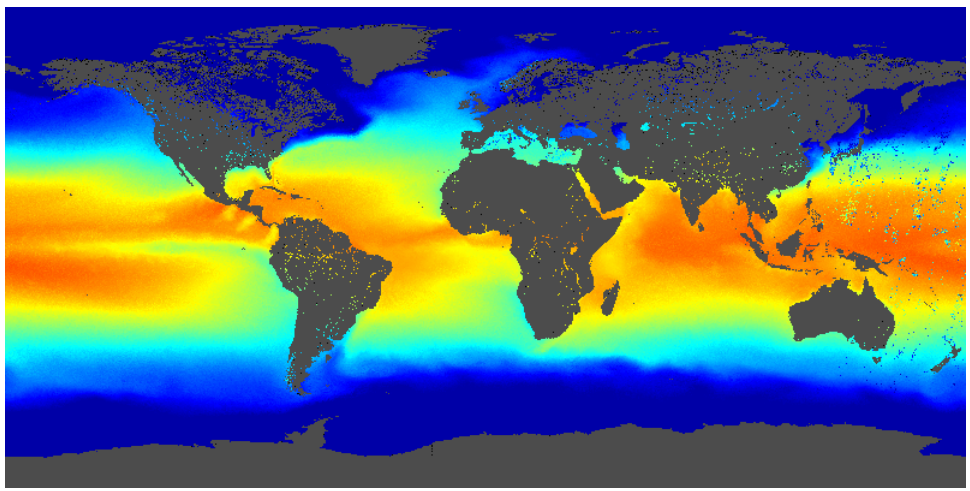
TOOL Biophysical Research and Modeling

- Identify priority sites for new MPAs as well as pre-closure evaluations of proposed MPAs.
- Examine spillover effects of larvae and adults.
- Recruitment surveys and searches for bioindicators.
- Characterization at many levels, from microbial to entire reef ecosystems.
- Models to evaluate performance and effectiveness of management actions.
- Genetic studies of connectivity within MPA networks.
- Majority of 'science' projects fell under this tool category with 42 projects funded with $2,516,894.

MPAs - Example
Biophysical Research and Modeling

Improving the Effectiveness of Coral MPAs through the Analysis and Synthesis of Coral Thermal Stress and Decline

2006 **NESDIS / National Oceanographic Data Center** **Global**



MPAs - Example
Biophysical Research and Modeling

Outputs

CoRTAD (Coral Reef Temperature Anomaly Database) – database of global sea surface temperature using satellite data collected between 1985 and present. Data has been reprocessed with Pathfinder system which created more stable, accurate and consistent data suitable for time series analysis. Several peer reviewed publications.

Outcomes

Best metric for predicting coral disease based upon thermal stress confirmed with *in situ* studies at long term monitoring sites on GBR. Used by Coral Reef Watch to predict potential disease outbreaks in the Caribbean. Database will be opened to the public in FY-08 which will provide the CREIOS team and coral MPA managers a powerful tool for disease prediction.

MPAs
Research, Mapping & Monitoring

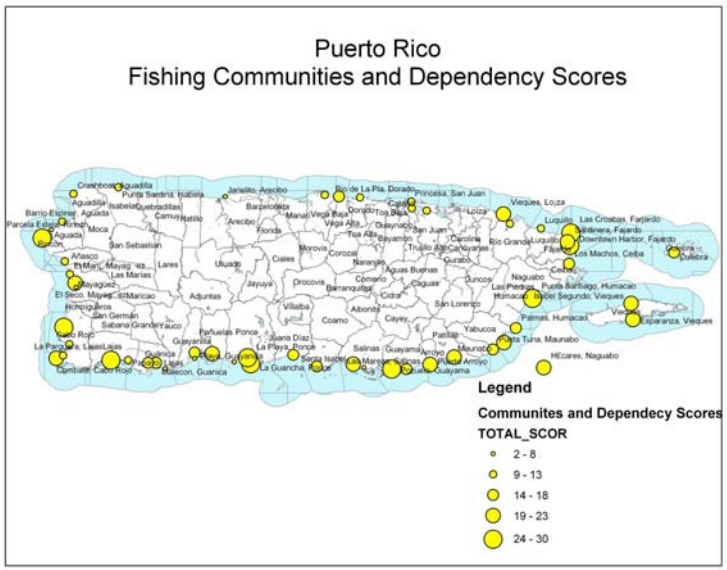
TOOL Socioeconomic Research

- Majority of projects conducted in Puerto Rico or the USVI, however the Florida Keys, Hawaii, and the Pacific Islands were also studied.
- Most projects focused on managers or targeted user groups (e.g., fishermen, divers).
- Survey goals aimed to increase compliance with MPA regulations, gauge perceptions of MPA success, and design larger scale assessments.
- Smallest number of 'science' projects fell under this tool category with 9 projects funded with $564,433.

MPAs - Example Socioeconomic Research

Social Dimensions of Marine Protected Areas in Puerto Rico

2003 NMFS / Southeast Fisheries Science Center – SEFSC Caribbean



MPAs - Example Socioeconomic Research

Outputs

Surveys indicate most anglers believe MPAs in Puerto Rico are achieving biological goals of protecting fish stocks and spawning aggregations. Notable findings included ~90% underreporting of catches and shift away from fish traps and toward hook & line and diving. The sociological effects of the MPAs receive more mixed reviews.

Outcomes

Managers now have information on the public perceptions of the successes of specific MPAs, which range from ~50% to ~90% approval. Fishing and use regulations can be changed to reflect these public perceptions which may increase compliance and improve safety. Issues not addressed by current management actions can now be considered.

MPAs
Research, Mapping & Monitoring

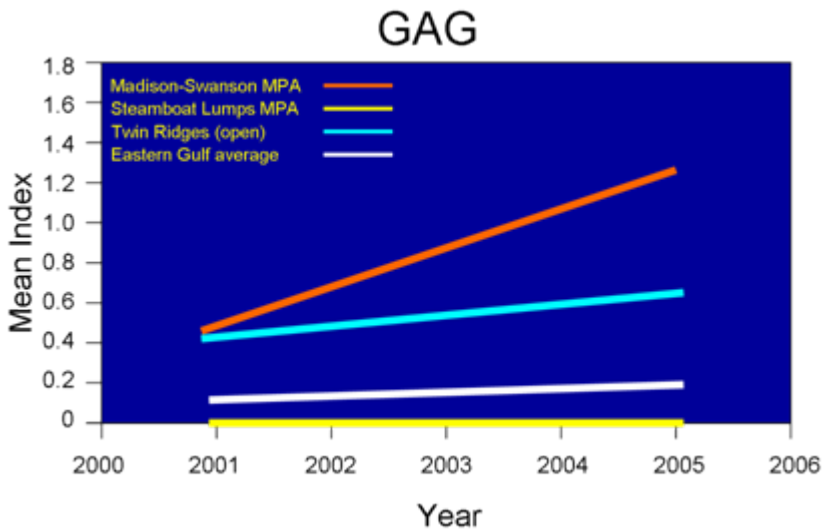
TOOL Mapping, Monitoring, Assessment

- Significant number of projects had strong links to management, either through efficacy evaluations or status assessments.
- Temporal nature of projects ranged between one-time synoptic assessments, annual monitoring, and periodic surveys repeated over longer time frames.
- Only six mapping projects are included in this section, however several MPA mapping projects are described in other sections of this review (CREIOS).
- 17 projects using this tool funded with $1,625,464.

MPAs - Example
Mapping, Monitoring, Assessment

Survey of habitat and fish assemblages in two Marine Reserves on the west Florida shelf

2005 NMFS / Southeast Fisheries Science Center – SEFSC Gulf of Mexico



MPAs - Example
Mapping, Monitoring, Assessment

Outputs

Annual reports to Gulf of Mexico Fishery Management Council (GMFMC) on status of reef fish stocks (abundance and distribution) inside Madison-Swanson and Steamboat Lumps MPAs as well as adjacent open-to-fishing areas with similar habitat types. Trends compared to those in eastern GOM.

Outcomes

GMFMC used evidence of increasing reef fish populations as rationale for continuing the initial 4 year closure for an additional 6 years. Consideration of further extensions and creation of additional or expansion of current MPAs will be discussed by the Council at their October 2007 meeting and NOAA Fisheries will present the results of the most recent surveys.

MPAs
Challenges

- **The timing of the release of funds continues to hinder many projects, particularly those in the Atlantic, Gulf of Mexico and Caribbean as field work must often be conducted during the most active portions of the hurricane season.**
- **Allocation of OMAO (NOAA) assets, especially vessels, are normally made 2-3 years in advance while CRCP projects are funded annually. This mismatch often inflates project costs when charter vessels are used rather than NOAA vessels.**
- **Many MPAs are remote and enforcement remains a significant problem. Evaluation of MPA effectiveness is greatly hampered by a lack of information on compliance levels.**

MPAs
Future Directions

- **Long term monitoring of existing MPAs should continue to allow efficacy evaluations of this management tool.**

- **NOAA liaisons to Fishery Management Councils should work with principal investigators to alert them to impending MPA selections, allowing pre-closure evaluations and establishment of monitoring programs in management plans.**

- **Multiyear project funding allows investigators to better utilize NOAA resources (vessels, aircraft, satellites), execute hypothesis driven research rather than only observational research, and maintain stability within research teams. Multiyear project funding should remain a tool of the Coral Program.**

MPA Management & Stewardship

MPA Management & Stewardship

- 3 Tool Areas
  - Management - direct implementation
  - Management - training & technical assistance
  - Outreach
- 2 Subcategories
  - Build and support systems and networks
  - Improve MPA management effectiveness

MPA Management & Stewardship: Direct Management Implementation

- Development of management plans and zoning strategies
- MPA coordinator & other staff positions
- Installation of MPA infrastructure
- Gap analyses and identification of priority areas
- Inventory and assessment of Coral Reef MPAs

Direct Management Implementation Activities

Activity: Needs assessment completed for 7 priority bay areas in the St. Croix East End Marine Park

Direct Management Implementation Activities

Activity: Needs assessment completed for 7 priority bay areas in the St. Croix East End Marine Park

Outputs/Outcomes: Information used to identify locations and place 46 new mooring buoys in the park. Boaters are now using these buoys instead of anchoring on reefs. Information from assessments was also used by the local government to establish park zoning structure and define regulations that are now in final stage of approval process.

Direct Management Implementation Activities

Activity: Strengthening Puerto Rico's Management of Coral Reef MPAs

Direct Management Implementation Activities

Activity: Strengthening Puerto Rico's Management of Coral Reef MPAs

Outputs/Outcomes: 10 priority sites for management plan development selected from system of 35 territorial MPAs, Implementation of community based initiatives to develop 5 MPA management plans, 3 sites have complete draft plans in approval process, built long term capacity to involve local stakeholders in MPA processes.

MPA Management & Stewardship: Management Training & Technical Assistance

- Trainings on management plan development and MPA effectiveness
- Legal analysis to explore opportunities for involvement of local communities in MPA management
- Development of social network of MPA managers in the Pacific
- Deployment of ecological acoustic readers in Pacific

Training & Technical Assistance Activities

Activity: Development of a social network of MPA managers in the Pacific to identify regional needs and opportunities

Training & Technical Assistance Activities

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Outputs/Outcomes: Regional training on management planning held for 33 Pacific island MPA managers. 3 jurisdictions received technical support on community-based management. Developed regional website, regional exchange program & 3 year strategic plan for "network".

Training & Technical Assistance Activities

Activity: Training and technical support for the development of MPA management plans and evaluation and monitoring of MPA management effectiveness in the Caribbean region.

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Outputs/ Outcomes: Managers from 7 Caribbean jurisdictions have received training. 8 new site specific management plans have been developed. Priority MPAs for continued plan development have been identified.

MPA Management & Stewardship: Outreach

- Development of outreach materials and media in American Samoa, Guam and Hawaii
- Implementation of Outreach and Education plan for St. Croix East End Marine Park
- Campaign to establish new MPA in Puerto Rico

MPA Outreach Activities

Activity: St. Croix East End Marine Park Outreach and Education Program Implementation

Outputs/Outcomes:

MPA Outreach Activities

Activity: St. Croix East End Marine Park Outreach and Education Program Implementation

Outputs/Outcomes: outreach materials including video, mobile learning lab, plans for park information center, development of network of environmental educators, snorkel camp. Has resulted in enhanced awareness of the park and increased commitment from local partners to support management activites.

MPA Outreach Activities

Activity: Salva Tres Palmas Campaign, Surfrider

MPA Outreach Activities

Activity: Salva Tres Palmas Campaign, Surfrider

Outputs/Outcomes: development new marine reserve protecting a very unique *acroporid* reef, now working on development of draft management plan

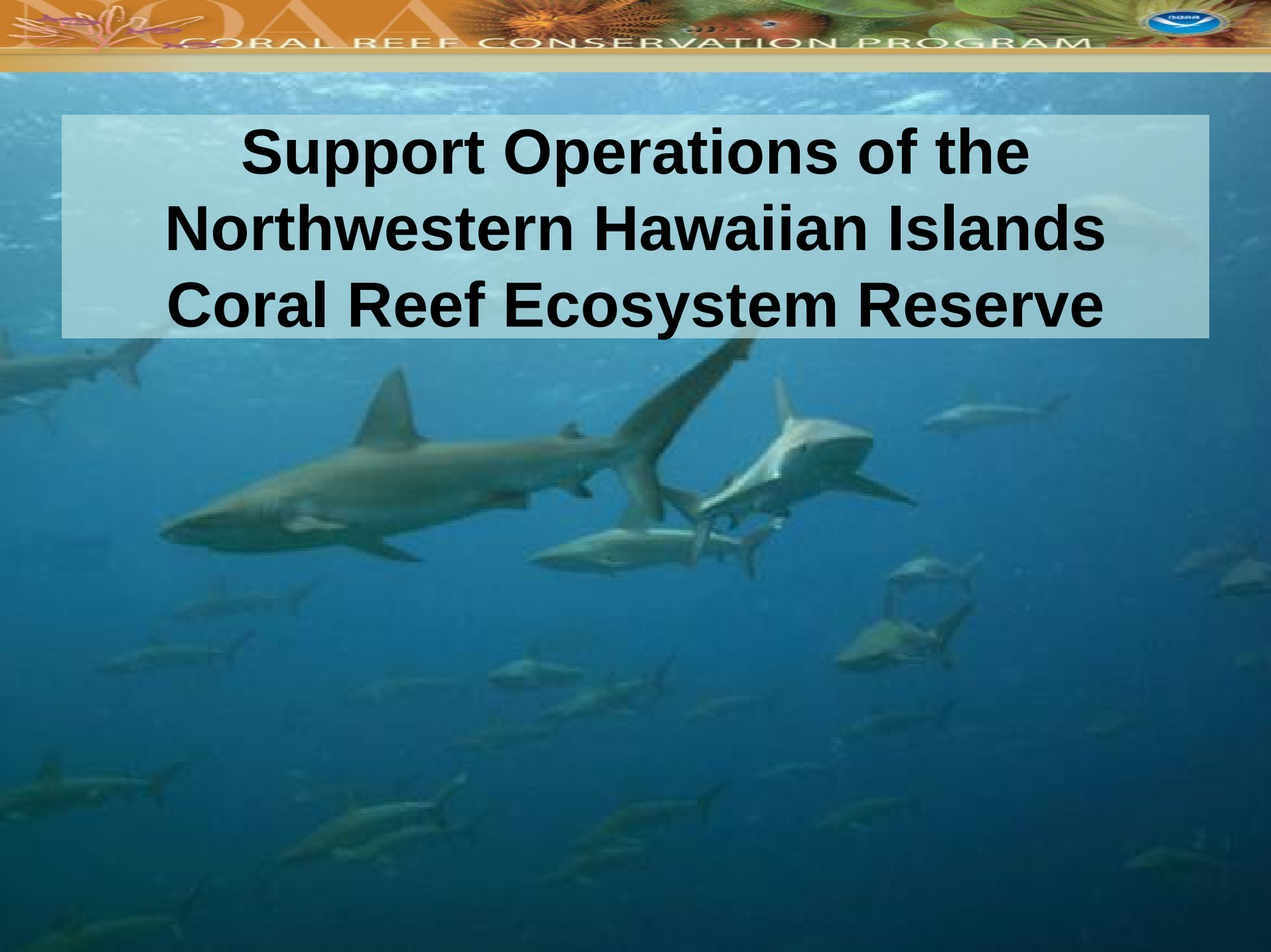
MPA Management & Stewardship: Challenges

- **Limited local staff capacity in islands**
- **Community and stakeholder engagement**
- **Public awareness and support**

MPA Management & Stewardship: Future Directions

- More support for MPA network development ex. Micronesia Challenge
- Work to increase community and stakeholder involvement in MPA management processes
- Continue to support development of management plans
- Provide support for implementation of management plan activities
- Assess and evaluate management effectiveness

Support Operations of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve



Support Operations of the NWHI Coral Reef Ecosystem Reserve

Management and Direct Implementation Tool

- Understanding and Interpreting
- Reducing Threats
- Managing Human Activities
- Coordinating Conservation and Management
- Achieving Effective Site and Field Operations

Changing Management Regimes

NWHI Coral Reef Ecosystem Reserve -> Proposed Sanctuary Designation -> Establishment of the Papahanaumokuakea Marine National Monument

Outcomes

- Designation of the NWHI as a Marine National Monument
  - High level of engagement and interest by the public
  - Increased local, national and international awareness of healthy coral reefs and the importance of protecting large stretches of ocean
- High level of coordination across multiple agencies and academia
  - Marine Debris

Challenges

- Ongoing coordination and communication between CRCP and Monument leadership to ensure priority management needs are identified and implemented.

- Successful data integration and synthesis to ensure investments will lead to information that informs management decisions.

Future directions

- Integrated joint agency Monument Management Plan and Science Plan under development
- Coordination with CRCP to ensure priority management needs are identified and implemented.
    - Research, Mapping, Integrated Information Management

Conclusion

Over the past 5 years the NOAA CRCP has supported many activities that address priority national MPA objectives.

Conclusion

- **Support for development of new MPAs**
- **Studies, models and assessments which demonstrate MPA outcomes and evaluate MPA effectiveness**
- **MPA characterization and mapping**
- **Social surveys of compliance and MPA perceptions**
- **Development of management plans and zoning strategies**
- **Placement of MPA staff positions**

Conclusion

- **Installation of MPA infrastructure**
- **Training on management plan development & effectiveness**
- **Development of social networks of MPA managers**
- **Observation and surveillance tools for managers**
- **Outreach materials and plans**
- **Management of NWHI Coral Reef Ecosystem Reserve**

Questions?