PacCREIOS Workshop: Guam team presentation

Bureau of Statistics and Plans: Guam Coastal Management Program
Guam Dept. of Agriculture, Division of Aquatic and Wildlife Resources
Guam Environmental Protection Agency
National Park Service, War in the Pacific NHP
US Department of Agriculture, Natural Resource Conservation Service, Pacific Islands Area, West Office
US Fish and Wildlife Service, Guam National Wildlife Refuge
Department of the Navy, Naval Facilities Engineering Command Marianas
The Nature Conservancy, Micronesia Program
University of Guam, Marine Laboratory

Setting the stage: Guam's coral reef resources

- Approx. 175,000 people
- Total land area of 550 km^2 (212 mi^2)
- 108 km^2 (42 mi^2) of shallow reef area within 0-3 miles; 110 km^2 between 3-200 miles
- Over 5100 marine species; over 300 species of coral, >1000 reef-associated fish species
- Possesses one of most species-rich marine ecosystems of any U.S. jurisdiction

Guam's Priority Issues: Watershed Impacts

- Intense urbanization, poor land use planning
- Arson, feral ungulates, off-roading
- Inappropriate construction methods
- Agricultural/aquaculture activities

Watershed Impacts – Information Needs

- Detailed, site-specific monitoring for determining effectiveness of watershed restoration efforts
- Continuous, long-term, unattended water quality monitoring
  - Telemetry or occasional data retrieval; – i.e. salinity, temperature, TSS or turbidity, dissolved oxygen, pH, chlorophyll, and nutrients
- Recommendations for improved reforestation/erosion control
- Non-point source pollution source identification, transport models, and recommendations for management/control
- Data to identify linkages between terrestrial activities and coral reef health
- Assistance with review and permitting of coastal development
- Land cover change detection; provision of satellite imagery

Watershed Impacts – Information Needs

- GIS and data management support
- Update water quality standards
- Eco risk assessment for contaminants
  - Information to set total maximum daily loads for contaminants; bioavailability
  - Development of bioindicators
- Decision support tool to model cumulative and secondary impacts of development activities to improve land use planning
  - GIS application to track development activities
- Alternatives to using sediment samples for contaminant monitoring
  - SPMDs, pore water, biomarkers

Guam's Priority Issues: Fisheries Management

- Guam's reef fisheries are both culturally and economically important

- Catches have declined over last few decades - have not recovered since big drop in 1980s

- Data from various sources suggest that excessive fishing pressure a major factor in decline

- Use of monofilament gillnets and spearfishing with scuba and lights of particular concern

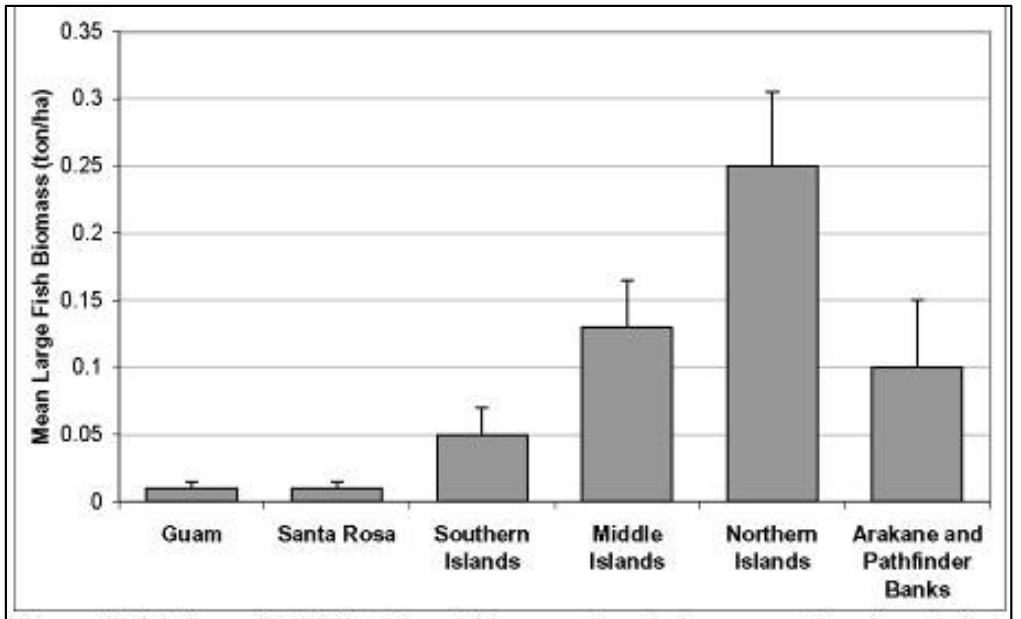


Figure 15.28. Large fish (TL >50 cm) biomass (tons/ha) measured on towed-diver surveys in the Mariana Islands. Source: PIFSC-CRED, unpublished data.

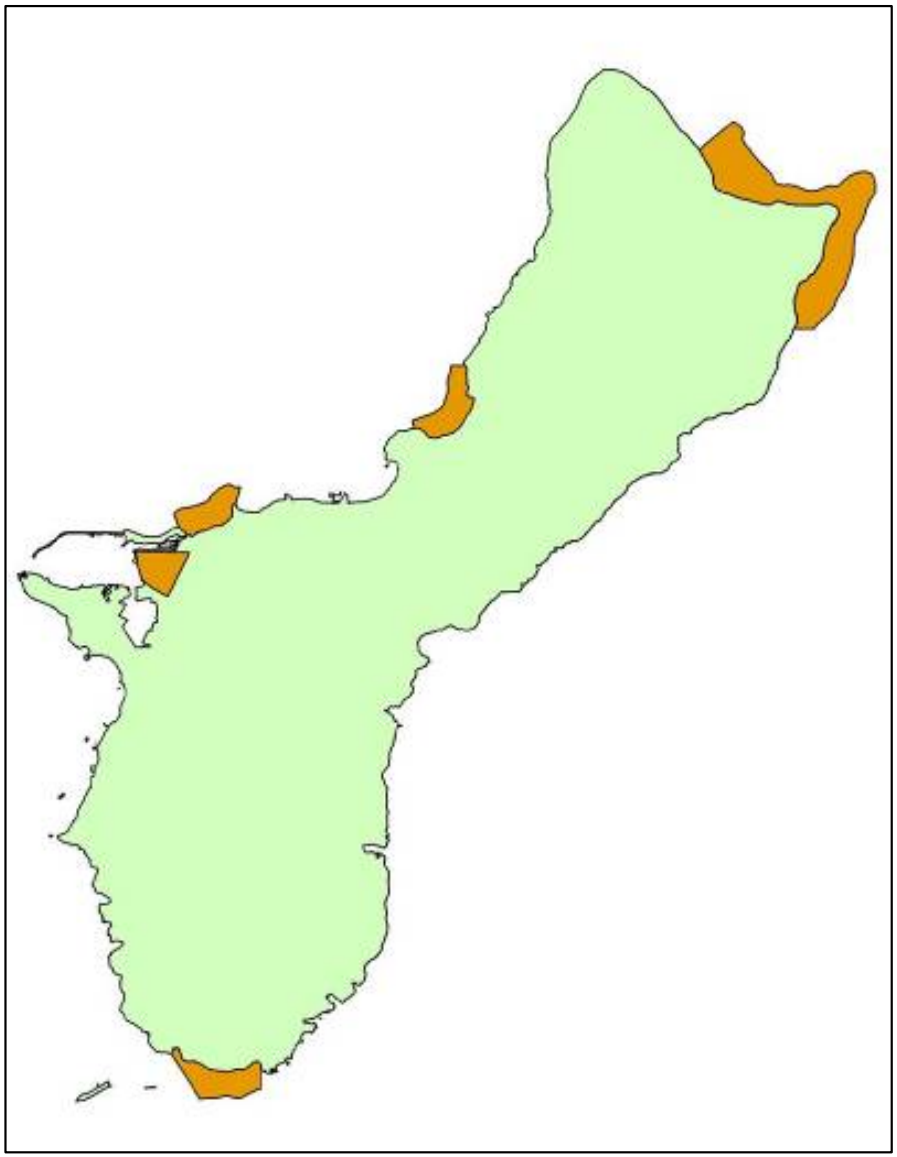
Fisheries Management – Information Needs

- Assistance with analysis of creel survey data
- Identification and protection of reef fish spawning areas
- Life history information for key fish species
- Additional data to support regulations outside of MPAs
- Data on fishing in nearshore federal waters – National Park Service, Navy, Air Force and Refuge
- Expansion of local creel survey efforts
- Data collection and analysis for fish/shellfish consumption advisories
- Deep water habitat mapping and refined EFH mapping
- Island wide *in situ* assessments
- Socioeconomic monitoring

Fisheries Management – Information Needs

Focus on Marine Preserves:

- Supplement local efforts to monitor preserves
- Assistance with analysis of preserve data collected by DAWR
- Assess preserve effectiveness (e.g, adult fish spillover, larval export)
- Current data (local and regional) - larval transport and settlement, source and sink



Guam's Priority Issues: Military Expansion

DoD proposed actions include:

- Relocating approximately 17,000 Marines and dependents from Japan to Guam by 2014 (largest military relocation since WWII)

- Nuclear aircraft carrier berthing and turning basin

- Construction or renovation of wharves, waterfront utilities, berths and shoreline infrastructure

- Associated increases in training activities

• Associated impacts from private development, infrastructure, construction workers, new contaminants, ship traffic, invasive species, etc.

Military Expansion – Information Needs

- Monitoring of short and long term impacts of DoD activities
- Baseline data and continued monitoring for evaluation of compensatory mitigation project effectiveness
- Monitoring socioeconomic impacts of buildup on local fishers/fishing industry, impacts on tourism and recreation activities, etc.
- Marine invasive species baseline assessment and long-term monitoring
- Long-term monitoring, risk analysis, and restoration of contaminated and cleanup sites

Guam's Priority Issues: Reef resiliency

- Climate change - bleaching, ocean acidification, sea level rise, storm frequency/intensity
- Nuisance species: *Acanthaster*, *Terpios*, *Chrysocystis*
- Coral diseases
- Low rates of coral recruitment
- Poor water quality in south
- Low herbivorous fish abundance

Reef Resiliency – Information Needs

- Some information needs covered under other priority issues
- Current patterns, connectivity
- Data to improve understanding of impacts of ocean acidification, SST increase, storm frequency/intensity changes
- Continued coral bleaching watches/warnings, forecasting
- Island-wide coral recruitment rates/patterns
- Island-wide coral disease prevalence
- Island-wide surveys for major herbivorous fish abundance/biomass
- Island-wide surveys for invasive/nuisance species (e.g., COTS, Terpios, Chrysocystis)

Overarching Needs Across Issue Areas

- Improved local agency capacity to carry out local-based monitoring
  - Increasing NOAA physical presence – upon request of individual agencies
  - Internships/fellowships (with expectation of being hired locally)
- Training for local staff
- Development of decision support tools
- Technical assistance – IGAs, NOAA contract support
  - Mitigation efforts, monitoring (i.e. bleaching events, NRDA, spills, groundings, disease outbreaks, etc…); reviewing of DoD projects; ecological modeling; and developing regulations
- Current modeling

Three Case Studies

- Assessment of watershed restoration activity effectiveness
  - Streambank stabilization
  - Reforestation
- Reef resilience Planning
  - Currents
  - Connectivity
- Data to support species-specific regulations
  - Life history
  - Home ranges
  - Reef fish, invertebrates