



Coral Assembly 2011

Puerto Rico, US and British Virgin Islands:
Improving Regional Reef Management

**December 8th - 9th 2011
Embassy Suites San Juan
Isla Verde, Puerto Rico**

Proceedings

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Figure 1: Coral Assembly participants at lunch.

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Executive Summary

On December 8-9, 2011, coral reef stewards from Puerto Rico, USVI, and the British Virgin Islands met in San Juan, Puerto Rico for the Coral Assembly. The two-day meeting was designed to bring together coral reef managers, practitioners and researchers from the three jurisdictions for a peer-to-peer information exchange to learn from each other and develop regional strategies for more effective long-term coral reef management and protection. The Assembly also included representation of local community groups, policy makers, funders, researchers and students from across the region.

The coral reefs of Puerto Rico and the US and British Virgin Islands share much in common. Apart from the biophysical connectivity there are common local and global stressors in the region such as climate change and invasive species (e.g., rising sea temperatures and lionfish, respectively). The Assembly participants share the motivation and drive to address the local factors affecting the health and vitality of their coral reefs. By coming together to share each other's experience and showcasing innovations in research, education and outreach, decision support tools, and finance mechanisms for coral reef initiatives, we are finding solutions together. **As we learn from each other and build on each other's successes, we strive to surmount the barriers to local coral reef management and forge a brighter future for our reefs.**

Assembly Objectives

- Building a network of coral reef managers, practitioners and researchers in the region
- Presenting the state and status of each jurisdiction's coral reef resources
- Sharing leveraging opportunities and lessons learned
- Identifying common challenges, visions, and goals to develop a regional approach for coral reef conservation

Thursday, December 8th, 2011

Day 1 Objectives: Introductions, learn of colleagues' work, identify shared challenges, concerns and explore regional collaboration opportunities.

Welcome

On Friday, December 8th, Damaris Delgado López of Puerto Rico's Department of Natural and Environmental Resources (DNER) provided a warm welcome to all participants and expressed hopes for a productive regional meeting. The Nature Conservancy's (TNC) Jeanne Brown gave an opening presentation illustrating the connectivity of Puerto Rico, and the US and British Virgin Islands. Various linkages across the three jurisdictions were highlighted, including common geography, stressors, ocean uses, and vulnerability to the effects of climate change. The Assembly included participants from a variety of backgrounds, including coral reef managers and practitioners willing to share knowledge, funders willing to support future research and collaborations, and researchers and university students who may become future natural resource managers and researchers.

The Assembly served as an information exchange for colleagues scattered across the three jurisdictions and was designed to support the present regional coral reef and protected area management priorities. These priorities are outlined in Table 1 (BVI) & Table 2 (Puerto Rico and US Virgin Islands). The management priorities of Puerto Rico and US Virgin Islands are specific to coral reef conservation.

Table 1. British Virgin Islands' Top Protected Areas Management Priorities
Assess existing protected areas in an effort to ensure all types of marine and terrestrial ecosystems are represented and management and conservation objectives are being met
Conduct a full capacity assessment of institutions for the establishment of new procedures, additional resources, and new skill sets
Integrate monitoring, protocols, data collection, management, and dissemination across all relevant agencies
Develop mechanisms for consistent two-way flow of information between management institutions and stakeholders
Develop a budget estimate for sustained financing for the full system of protected areas
Develop standard operating procedures at site and system level
Revise and standardize monitoring and evaluation protocols to set standards and track changes to resources
Assess economic impacts of five most heavily used sites on BVI community

Integrate new areas identified by institutions and stakeholders as protected areas with respective management plans
Technical Assistance, Financing, a Structured Consultation Process, and New Regulations will be provided in order to undertake priority activities

Source: Gardner, Lloyd. 2007. British Virgin Islands Protected Areas System Plan 2007-2017. BVI National Parks Trust. Tortola. January 4, 2007.

Table 2. Top Coral Reef Management Priorities of Puerto Rico and the US Virgin Islands		
	Puerto Rico	US Virgin Islands
Land-Based Sources of Pollution & Water Quality	<p>Implement land-use planning at the watershed scale to minimize water quality impacts to the coral reef ecosystem (G1A).</p> <p>Control and reduce pollutant transport to the marine environment (G1B).</p> <p>Strengthen enforcement and engage stakeholders through education to reduce pollutant transport to the coral reef ecosystem (G1C).</p> <p>Enable and promote sustainable development practices in the coastal zone and upland areas of Puerto Rico that are associated with priority coral reef areas (G3B).</p>	<p>Reduce impacts to coral reef ecosystems by reducing terrestrial sediment and pollutant inputs and improving water quality (G1).</p>
Education & Outreach	<p>Utilize enforcement and education to encourage public compliance with fishing regulations and reduce impacts of fishing (G1C).</p> <p>Utilize enforcement and education to encourage public compliance with fishing regulations and reduce impacts of fishing (G2C).</p>	<p>Develop and implement a comprehensive education and outreach program to create buy-in and build public support for an effective coral reef conservation program that targets resource users, general public and decision-makers (G2).</p>
Enforcement	<p>Strengthen enforcement and engage stakeholders through education to reduce pollutant transport to the coral reef ecosystem (G1C).</p> <p>Enhance enforcement and management programs to reduce fishing impacts to coral reef ecosystems (G2B).</p> <p>Utilize enforcement and education to encourage public compliance with fishing regulations and reduce impacts of fishing (G2C).</p>	<p>Increase the ability to effectively enforce existing rules, regulations and laws (G3).</p>

Fishing Impacts	<p>Protect coral reef ecosystem from large- and small-scale fisheries impacts through an informed planning process (G2A).</p> <p>Enhance enforcement and management programs to reduce fishing impacts to coral reef ecosystems (G2B).</p> <p>Utilize enforcement and education to encourage public compliance with fishing regulations and reduce impacts of fishing (G2C).</p>	<p>Reduce fishing impacts on critical stocks that most directly affect the health and resilience of the reef ecosystem (G4).</p>
Climate Change	<p>Manage for climate change and disease emanating from increase in storm frequency and impact, water temperature and air pollution and promote recovery of reefs from previous events (G4C).</p>	<p>Manage for resilience to climate change and related effects, including impact of elevated sea temperature; sea level rise; acidification and calcium carbonate dissolution; hurricane intensity/frequency and sedimentation to promote recovery of reefs from previous events (G5).</p>
Marine Pollution & Anchoring	<p>Manage the recreational and maritime uses of marine and coastal areas to reduce the impacts on coral reefs (G3A).</p>	<p>Reduce other sources of marine pollution and human impacts from areas that are most critical to coral reef protection and resilience (G7).</p>
Invasive Species	<p>Reduce the impact of invasive species with regulation, enforcement and education (G3C).</p>	<p>Protect against, prepare for and control/manage invasive species (G8).</p>
Management Coordination		<p>Improve and enable coordination and communication among USVI Coral Reef Practitioners (G6).</p>

Source: The Commonwealth of Puerto Rico and NOAA Coral Reef Conservation Program. 2010. Puerto Rico's Coral Reef Management Priorities. Silver Spring, MD: NOAA.
The Territory of the United States Virgin Islands and NOAA Coral Reef Conservation Program. 2010. United States Virgin Islands' Coral Reef Management Priorities. Silver Spring, MD: NOAA.

Island Presentations

Representatives from each jurisdiction presented on major management priorities and provided background information on relevant coral reef protection efforts occurring in their respective jurisdiction. Representatives presented on the current status and extent of coral reefs, governance or management structure, major partners, coral protection initiatives, funding mechanisms, unique and advanced research, existing collaborations, and potential areas for regional collaboration. The

presentations are available for download in pdf format from an online web portal. Brief summaries of each island presentation are below.

British Virgin Islands

“Improving Regional Reef Management: British Virgin Islands”

Presenter: Shannon Gore, Conservation & Fisheries Department, BVI

The Conservation and Fisheries Department and the National Parks Trust are the primary environmental agencies in the British Virgin Islands. Other partners in the BVI include Reef Guardians, Jost van Dykes Preservation Society, Green VI, Caribbean Youth Network, Econcerns, Ltd., Town and Country Planning (TCP), and other academia. Green VI has developed resourceful glass studios, recycling programs for glass and aluminum, an Environmental Education Strategy through UNESCO funding, and a Clean Energy Campaign.

Marine Protected Areas include 30% of each habitat type within BVI waters. Conservation and Fisheries Protected Areas are managed under the Protected Areas System Plan 2007-2017. Coral reef monitoring is conducted by the Association of Reef Keepers (ARK), Guana Island Marine Science Programme, Reef Check BVI, United Kingdom Overseas Territories Environment Programme (OTEP), and Caribbean Community Climate Change Centre.

BVI has major strategies addressing various initiatives including The Virgin Islands Climate Change Green paper and The Virgin Islands’ Climate Change Policy addressing climate change. Sustainable development goals for beach policy and management have been developed under TCP with 13 overarching goals and associated objectives encompassing environmental, economic and governance components. There is a Cruising and Marine Industry Assessment Project (C.A.M.I.A.) that aims to identify decadal scale impacts and effects of cruising and marine industry on the natural environment by identifying what natural resources were lost, what can be mitigated, and what can be done to ensure future sustainability. Damage assessments are being conducted in order to investigate vessel groundings.

Invasive lionfish are being combated by Reef Guardians who engage local fishermen, community leadership, the yachting industry, and dive operators. BVI has future goals for regional collaboration in order address issues of identifying connectivity between islands, data analysis, trans-boundary fisheries, and groundings.

Assembly participants from the BVI are in Figure 2.



Figure 2: Assembly participants from the British Virgin Islands.

US Virgin Islands

“USVI Coral Reef Initiative”

Presenter: Paige Rothenberger, Department of Planning and Natural Resources, USVI

The Division of Coastal Zone Management (CZM) of the Department of Planning and Natural Resources (DPNR) is the leading agency for the USVI Coral Reef Initiative and the point agency for NOAA coral funds to the territorial government. CZM collaborations with a variety of federal agencies (NOAA, CRCP, NOAA NMFS, EPA, USGS, DOI, NRCS, CFMC, NPS, TNC), territorial agencies (DPNR), and academia (University of the Virgin Islands).

Initiatives for MPAs include federal parks, monuments, and fishery closures, territorial marine parks, marine reserves, and wildlife sanctuaries, and Areas of Particular Concern (APCs) that seek to develop sustainable financing, an MPA system, and a sub-regional management plan. Coral reef management priorities are focused on the areas of the St. Croix East End Marine Park (STXEEMP), the St. Thomas East End Reserves (STEER), and St. John’s Coral and Fish Bays. Monitoring efforts include the Territorial Coral Reef Monitoring Program (since 2000), collaborations with NOAA’s Biogeography Program and NPS, MPA effectiveness assessments (NOAA), and *Acropora* (DPNR, UVI, NPS, TNC) and Mesophotic reef monitoring (UVI).

Ongoing projects include VICRAG, Economic Valuation, VI Reef Resilience Program (interagency, led by TNC), Lionfish removals and response plan (DPNR< UVI, SEA, CORE, fishers, others), Enforcement Training and Blitzes, CRE Management Capacity Assessment, and MPA Effectiveness. A Coral Fellow position is reserved for the development of sustainable tourism strategies for STXEEMP and STEER. A Caribbean Regional Ocean Partnership (CROP) is underway through an MOU between USVI and Puerto Rico with some additional funding provided by DPNR-CZM. Hopes for future collaborative opportunities are regional management and system focus for MPAs, connectivity of sources and sinks, invasive species management, climate adaptation, mesophotic systems, and financing to support ecosystem management.

Puerto Rico

“On Recent Efforts and Achievements”

Presenter: Damaris Delgado, Department of Natural and Environmental Resources, Puerto Rico

The Department of Natural and Environmental Resources (DNER) is the lead agency for coral reef initiatives in Puerto Rico. Primary collaborators include the National System of Marine Protected Areas and The University of Puerto Rico (UPR) Center for Applied Tropical Ecology and Conservation and Caribbean Coral Reef Institute (CCRI). Regional collaborations include the Caribbean Regional Ocean Partnership (PR, USVI), a MoU with Dominican Republic, and a cooperative agreement with TNC. Puerto Rico is working toward becoming an active member of the Caribbean Biological Corridor.

Natural protected areas of PR include 21 % of the near shore environment reaching depths up to 200 m, 16,000 acres of land, and the Great Natural Reserve of the Ecological Corridor of the Northeast. There are also efforts to designate the Isla Verde Natural Reserve. PR has recently nominated five MPAs to be part of the National System of MPAs and include Isla de Mona Natural Reserve, Isla de Desecheo Marine Reserve, Canal Luis Pena Natural Reserve, Cordillera Coral Reefs Natural Reserve, and Tres Palmas Marine Reserve. The top four coral reef geographic priority areas of Puerto Rico Coral Reef Local Action Strategies include Culebra, North East Reserves, Cabo Rojo, and Guánica. PR CZMP developed a Coastal and Marine Spatial Planning document that was shared with coastal municipalities and stakeholders. Reef monitoring efforts exist through academia collaboration under the UPR Center for Applied Tropical Ecology and Conservation and the Caribbean Coral Reef Institute (CCRI) and focus efforts on Mesophotic coral ecosystems.

Some PR management priorities include fisheries regulation, pollution (Phosphate Detergent Control Act), and watershed management (PR Watershed Stewardship Program initiative). PR looks forward to future regional collaboration through a Caribbean Challenge endorsement, Research, Community Integration and Planning, and Active Management.

Major Topics Presentations

During Assembly planning, invited participants were asked to complete an online survey indicating their level interest in prospective topics to be covered at the Assembly. The survey showed broad support for a wide range of topics and identified the priority topics for break out groups and major topic presentations. Regional experts on coral reef valuation, climate change, reef resilience and MPA capacity assessments presented on their respective areas. The presentations are available for download in pdf format from an online web portal currently under construction. Brief summaries of each presentation are below.

Coral Reef Valuation

“Economic Valuation of Coral Reefs and Associated Resources in Eastern Puerto Rico”

Presenter: Graham Castillo, Estudios Técnicos

Graham Castillo, of the consulting firm Estudios Técnicos, presented the results of a 2007 study conducted in Eastern Puerto Rico estimating the total economic value (TEV) of coral reefs and associated resources. The study area included natural protected areas and reserves, a state forest, national wildlife refuges, coral reefs, seagrass beds, bioluminescent bays, sandy beaches, marinas, airports, and maritime ports of Fajardo, Vieques, and Culebra. The TEV study considered the goods and services provided by artisanal fishing, tourism and leisure, coastal protection, and education and research. The study also incorporated passive-use values (i.e., non-use values) through future use, inheritance, existence, and biodiversity values. The variable data availability called for several different methods of data collection. Market value (MV), travel cost method (TCM), and contingency value method (CVM) were used for the valuation of goods, services, and passive-uses. While each individual good, service, and passive-use holds its individual calculated value, the TEV for coral reefs and associated environments in Eastern Puerto Rico for the year 2007 was \$1,602,568,080. The importance of environmental valuations is the practical application when budgeting for policy formulation, resource management assessment, funding strategies, risk assessment, and cost/benefit analysis.

MPA Capacity Assessments

“Assessing MPA Management Capacity for Priority Coral Reef MPA’s in the BVI and US Caribbean”

Presenter: Marlon Hibbert, NOAA Coral Reef Conservation Program

The purpose of the MPA management capacity assessment was to identify five-year priority management capacity needs for up to three demonstration MPA sites in each of the nine Caribbean countries and territories throughout BVI, PR, and USVI. Capacity assessments are aimed to inform and enable targeted efforts to better address MPA management capacity gaps and to facilitate information sharing and learning. It is important to keep in mind that this assessment is a facilitated self-assessment, not an evaluation. Assessments were based on the NOAA CRCP MPA Management Assessment Checklist including the following 14 assessment areas; management planning, ecological network development, governance, on-site management, enforcement, boundaries, biophysical monitoring, socioeconomic monitoring, MPA effectiveness evaluation and adaptive management, stakeholder engagement, financing, outreach and education, conflict resolution mechanisms, and planning for resilience to climate change. Six additional areas were added by CaMPAM and are currently being assessed in the BVI; however, these areas could also be useful to Puerto Rico and the USVI in the future. Under each of the 14 assessment areas there are three management ranking tiers, tier three being the highest management ranking. Assessment methodology involved interviews with MPA site managers, key staff, agency leadership, and NGOs in which participants selected one of the three ranking tiers under each area and provided a justification for selection. Capacity assessments are summarized by scorecards that incorporate all tier values and reflect where weaknesses in management are. The results of this assessment show that all three regions face weaknesses in MPA effectiveness evaluation, biophysical monitoring, and socio-economic monitoring. This scorecard, and all scorecards, are intended to be trending documents and should be reassessed every three to five years. Further goals of capacity assessments include sharing results with MPA practitioners and supporters, encouraging the use of results to develop site level capacity building plans, and working with partners to address capacity gaps. NOAA CRCP seeks to apply this assessment tool to eligible MPA sites to improve management capacity by providing funding and technical assistance to help managers progress through the tiers.

Climate Change in the Caribbean

“Climate Issues and Initiatives – Recap of November Caribbean Climate Change Conference” Presenter:

Kasey R. Jacobs, NOAA Coastal Management Fellow Puerto Rico Coastal Zone Management Program, DRNA, NOAA Coastal Services Center, The Baldwin Group, Inc.

This presentation included a recap from the recent Climate Change in the Caribbean: Puerto Rico and the US Virgin Islands Meeting held on November 15-16, 2011. In 2010, the Puerto Rico Climate Change Council (PRCCC) was launched and the Puerto Rico Coastal Adaptation Project 2010-2012 was developed. The primary outputs from the project will be a vulnerability assessment for multiple sectors and recommended adaptation strategies and policies. The four objectives of the PRCCC are to use the best available scientific information, to identify strategies and prioritize them, to communicate findings, and to cultivate a well-informed Puerto Rican society.

Analysis of available data reveals an increase in temperature throughout the Caribbean and a rise in sea level. The impacts of sea level rise will influence erosion, coastal flooding, inundation, saltwater intrusion, mangroves, tourist destinations, human settlements, water supply, agriculture, aquaculture, and fisheries. In addition to increased temperatures in the Caribbean, there has also been an increase in rainfall intensity and floods, abnormal rainfall patterns, an increase in droughts, and an increase in tropical cyclones and cyclone power. The impacts of stronger storms and heavier rainfall on coral reefs lead to greater loss and degradation of habitat through damage by more powerful waves, reduced salinity, increased turbidity, and increased acidification. Coral reefs are also impacted by increased and more intense bleaching events, which lead to loss of corals, reef structure, and associated fauna, increases in macroalgae and coral disease, and low recruitment. The hope is that corals will be able to adapt, which is possible if the rates of environmental change are gradual enough. If not, coral and coastal managers can play a critical role in responding to bleaching events and in helping control the issues that stress corals. In order to reduce stress to reefs and make them more resilient to climate change it is imperative to work with a of network partners on specific sites to identify and prioritize key stressors.

It is important to remember that climate change is more about the acceleration of changes and the exacerbation of existing vulnerabilities rather than facing new impacts. Previous focus of management has been based on “reactive adaptation,” referring to the changes in policy and behavior that people and organizations adopt after encountering climate change. However, new focus has shifted towards planned adaptation, the intentional and proactive adaptation that occurs at the societal level, which incorporates mainstream adaptations and builds upon existing tools.

Many future projection models exist for sea level rise, and while the exact measurement for rise is uncertain, the trends are all the same. Predictive models have been developed to show how habitats may respond to climate change depending upon the habitat or marine resource and the scenario. However, there are three main reasons for uncertainty in future climate change projections: the internal or natural variability of the system, the scientific uncertainty of models, and, most importantly, the socio-economic or human behavior uncertainty. While some uncertainty lies in the impacts, we know that we need to monitor our reefs now so that we can plan for well-informed coral reef management in the future.

Resilience Programs

“Building Anthropogenic Resilience into Coral Reef Conservation”

Presenter: Kemit-Amon Lewis, The Nature Conservancy, USVI

While there are multiple stressors that have led to the degradation of coral reefs, NOAA and TNC have identified priority stressors as global climate change, overfishing and destructive practices, and point and non-point sources of pollution. In order to recover from bleaching episodes and other events, reefs need to be

resilient. Resilience is the ability of systems to absorb, resist, or recover from disturbances or to adapt to change while continuing to maintain essential functions and processes.

Multiple stakeholders, including TNC, CZM, UVI, NPS, DFW, and NOAA CRCP, have worked together to develop the US Virgin Islands Reef Resilience Plan (VIRRP). The VIRRP strategies are to identify and improve management and protection of important reefs, respond to coral reef disturbances, develop opportunities for community engagement, develop a sustainable seafood program, and restore degraded reefs and help to recover important species. The VIRRP aims to reduce anthropogenic stressors by providing education and empowerment to the community in order to develop community-based research and restoration projects, and by changing behavior and creating a spectrum of coral reef stewards. In order to achieve such goals, the ecological, economic, and cultural importance of coral reefs must be clear and the need for protection and management must be convincing to all stakeholders.

The USVI Coral Restoration Program has already seen success at nursery sites where corals have been relocated and restored would have otherwise died due to natural or anthropogenic disturbances. Anthropogenic resilience can be built and this creates hope for restoring natural systems. One success story comes from Sandy Point on St. Croix where a sea turtle nesting beach was infested with feral animals, invasive plants, and poachers; all variables that reduced the number of adult females, nests laid, and hatchlings. Efforts were made to remove the anthropogenic stressors by closing the beach, relocating nests, and removing feral animals and invasive plants. The beach was successfully restored as a vibrant sea turtle nesting ground. The same kind of local interventions for building resilience are possible for coral reefs.

Break Out Sessions

Facilitated group discussions were held on different topics of interest also determined by the pre-Assembly participant electronic survey. During the afternoon of Day 1, two break out sessions were held simultaneously in different conference rooms over three hours in order to cover more issues and encourage participant involvement. Participants were offered the choice between the following topics:

Table 3. Day 1 Break Out Sessions		
	Room 1	Room 2
Session 1	Enforcement and regulation	Bleaching and disease monitoring response
Session 2	Watershed management/land use planning	Reef fisheries spawning aggregation management and research
Session 3	Boating management (moorings, grounding, pump out, cruisers)	Pollution monitoring and prevention

Each session was lead by a facilitator from TNC in a guided discussion which generally covered the following elements:

- 1. Information (recent research and results, approaches, projects and programs)**
- 2. Challenges**

- 3. Solutions (direction forward)
- 4. Research needs/training needs



Figure 3: TNC staff facilitating a breakout group on Marine Protected Area site planning.

Facilitators took notes of the major points made during each break out session. Given the time constraints, participants were also allowed to make any additional comments with note cards if they didn't have the chance during a session. In some sessions, participants were asked to create a "wish list" on the note cards, describing hopes for regional opportunities and changes in coral reef management. Table 3 describes the key points and additional comments made for each break out session.

Table 4. Challenges, Solutions, Research Needs, Wish Lists, and Additional Comments for each break out session topic. (Bold text indicates major points made during each session)	
Enforcement and Regulation	
CHALLENGES	<ol style="list-style-type: none"> 1. Conflicts of interest/Corruption 2. Failure to enforce due to political will and man power 3. Failure to communicate both interagency and regional 4. Lack of community knowledge and engagement 5. Administrative bureaucracy 6. Perception of environmental violations – false empowerment 7. USVI – 12 officers, PR ~400 rangers, BVI – 2 officers 8. Lack of ridge to reef oversight
SOLUTIONS	<ol style="list-style-type: none"> 1. Ticket book authority 2. Joint enforcement of local federal agencies 3. Ranger exchange program between PR, BVI, USVI jurisdictions 4. Building community capacity (stewardship and accountability) 5. Eliminate favoritism/increase transparency 6. Public posting of environmental infractions 7. Training for government - involve NGOs 8. Exchange Program 9. Enforcement detectives like forensics

WISH LIST	<ol style="list-style-type: none"> 1. Performance measures, re-training, continuing education, and leadership training for rangers 2. Enforcement officers who think of themselves as stewards 3. More political will to pass environmental laws 4. People realize the seriousness of offenses against the environment 5. Willing external assessment of ranger corps 6. Properly trained and accountable officers 7. Officers with specialized fields 8. Revise administrative procedures 9. BMPs from police sector replicated for rangers 10. Better interagency management with across the board increase of law enforcement and managerial responsibility and accountability from all communities 11. Police and biological training for ranger 12. Communication between rangers and community because they are there and watching but don't know protocol to get in touch with them. DNER- Carolina work together. 13. USVI officers – pay them the same as waste management officers 14. Poverty, inequality, environmental quality are core social issues that need addressed for preservation to work
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Bleaching and Disease Monitoring and Response	
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CHALLENGES	<ol style="list-style-type: none"> 1. Variety, rarity, identification and causes of disease 2. Knowing when and where disease is occurring 3. Causes of disease 4. No response plan 5. Community engagement 6. Impact and long-term consequences 7. Impacts in deep reefs 8. Cutting off emissions 9. Only a few reefs monitored 10. Impacts in fisheries 11. Oceanographic conditions 12. Low funding for experimental research 13. Lack of connectivity of local LAS priorities 14. Recovery ability of tissue, skeletal growth, and recruitment 15. Need for modeling products for coral survival 16. National vs. local strategies 17. Education
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SOLUTIONS	<ol style="list-style-type: none"> 1. Devise regional response and coordination plan 2. Create community engagement (BVI good example) 3. Develop real time monitoring 4. Train knowledgeable observers to make accurate reporting 5. Develop an early warning system 6. Incorporate reefs closer to land 7. Partnership and collaboration between universities, researchers, agencies, etc. 8. Integrate volunteers from the community 9. Improve management efforts to minimizing stressors
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RESEARCH	<ol style="list-style-type: none"> 1. Create a response plan for bleaching events 2. Long term impacts in fisheries 3. Look at different habitat regimes 4. Integrate CARICOOS data
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Watershed Management/Land Use Planning	
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CHALLENGES	<ol style="list-style-type: none"> 1. Implementation of plans 2. Lack of sewer infrastructure 3. Lack of funding 4. Heavy river sediments 5. Location of houses in the coastal zone 6. Watershed management vs. island wide planning 7. Non-point source pollution 8. 301 H Waiver for waste water treatment plant 9. Lack of info on waste management 10. Bureaucracy between municipalities sharing a common resource 11. Off-road recreational vehicles 12. Dirt road ownership 13. Improve water quality
SOLUTIONS	<ol style="list-style-type: none"> 1. Community-based watershed planning efforts and technical support 2. Ensure coral reef consideration into existing and underway planning processes 3. Coordinate across different watershed plans 4. Each watershed needs a driver – coordinator/champion/paid position 5. Road ownership, maintenance, paving (all jurisdictions) 6. Private land conservation important in watershed (role of local conservation trust is critical) 7. Improve stewardship of local individual land owners 8. Treat whole island as coastal zone i.e. BVI – sustainable development-decision makers see dollar signs 9. Separate SW and FW issues 10. More concise info to regional agencies i.e. guides, BMPs – not only plans 11. Increase capacity for watershed management 12. Communication beyond directly impacted municipalities 13. Individual and site level storm water management 14. Integrating and publicizing existing plans and efforts 15. Explore making private roads public in order to be eligible for federal aid 16. Promote the redevelopment of existing buildings rather than developing new undeveloped areas 17. Combine land protection with watershed management
RESEARCH	<ol style="list-style-type: none"> 1. Storm water criteria/Standard design manual 2. Proactive involvement of individual land owners 3. Locals to value vegetation’s importance 4. Watershed management, outreach, and education

WISH LIST & COMMENTS	<ul style="list-style-type: none"> • Balance land use and land planning • Promote incentives for permeable paving • Obtain money and authority for land regulation • Watershed watch groups based on natural geographic boundaries – coordination from grass roots, citizen/science styled participatory data collection, intra- and inter-island watershed ‘fun days’, free information exchange platforms • Ban plastics from the islands • Improve water quality • Multidisciplinary approaches to address long term impacts of land use changes • Develop modeling products for future predictions • Single tier system • Develop policy regulations for conservation and restoration of gut habitats • Implementation of BMPs by landowners • Major developers to design/test/implement BMPs as community demonstration projects • EPA Region 2 to administer/enforce NPDES Program • Ridges to Reef watershed planning and permitting to decrease sedimentation • A series of interagency meetings sharing existing data/plans and discussing future development • Consider climate change consequences • Updating water treatment plants and stations • Provide incentives to connect houses and businesses to same sewage system • Green infrastructure design and implementation • Create, approve, and implement drainage mitigation plans for new development of a property along with enforcing consequences for failure of compliance • Create rainwater gardens or recreate wetlands – keep water on land • Evaluate dilution system • Work at a different scale – watershed management operates are a low resolution/high degree scale; however, if the resolution of actions are at the individual, local level (property/community) and solutions are given to (sewage/sedimentation/erosion) then the solutions will scale up to make a palpable difference. Plan at very high resolution lands, prioritize individuals with practical solutions they can implement
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Reef Fisheries Spawning Aggregation Management and Research	
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CHALLENGES	<ol style="list-style-type: none"> 1. Connectivity 2. Not sharing scientific data 3. Various stock assessment methods and limitations 4. Locating sites for spawning 5. Non-aggregating species 6. Various fishing gear that leads to bycatch 7. Lack of enforcement and man power 8. Ontegenetics and migratory pathways 9. Don't know effectiveness of management strategies 10. Not asking for help from other agencies/regions 11. Depth limitations 12. Fishermen withholding knowledge 13. Fisheries dependent data 14. Need to improve statistics 15. Lack of data on regional fishery 16. Regulations and protected boundaries
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SOLUTIONS	<ol style="list-style-type: none"> 1. Include fishers as stakeholders in decision making 2. Identify reproductive characteristics, life stages, and habitat utilization 3. Develop a market-based approach for management 4. Identify success stories and use as a model (Fisher exchange) 5. Seasonal closures 6. Modifying fishing gear 7. Air and sea enforcement 8. Evaluate effectiveness of Management 9. Educate bottom-up with examples 10. Respect fisher ideas 11. Establish fisher relationships 12. Establish more alternatives for fishers 13. Consider ownership 14. Government top-down support 16. Determine connectivity between inter-jurisdictional areas
RESEARCH	<ol style="list-style-type: none"> 1. Recreational fishing impacts 2. Market research 3. Connectivity and migratory pathways 4. Life stages and habitat dependency
COMMENTS	<ul style="list-style-type: none"> • Fisheries data collection – standardize monitoring – independent fishery projects • Stock assessment – use/develop models that are able to be useful for tropical, multispecies fisheries • Challenge: Deepwater (>30 m) populations of coral and fish • Solution: Involve the pirate industry to participate by providing financial support • Research for stock assessment info: Detailed species specific fishery statistics, Growth rates, Size frequency distributions
Boating Management (moorings, grounding, pump out, cruisers)	
CHALLENGES	<ol style="list-style-type: none"> 1. Lack of pump out regulations 2. Lack of boating ramps and overall infrastructure 3. Derelict vessels 4. Uneducated boaters 5. Lack of Grounding response 6. Funding is limited, especially for maintenance 7. Unreported small vessel groundings 8. Moorings cause concentrated pollutants 9. Difficult for fast response for groundings 10. Commissioner is trustee for targeting negligent boaters 11. Cumbersome laws for small groundings 12. Liability is a deterrent for reporting 13. Area closures spread boater impacts 14. Closures and regulations = economic loss 15. Legality of identifying boat owners and abandoners

SOLUTIONS	<ol style="list-style-type: none"> 1. Outsource (privatize mooring services) 2. Collaboration – common cruising grounds – FL model 3. Removal of derelict vessels 4. BVI serves as great model for success 5. Angel Rodriquez, training exchanges 6. Grounding response training and collaboration/Inter-agency response plan and authority to implement 7. Acknowledge common cruising grounds and practices 8. Free system for maintenance of buoys 9. Determine maintenance fees to increase charges for boaters 10. Operator education and environmental education 11. Insurance requirements 12. Determine sand areas for anchoring 13. Liability agreement for captains 14. Sub-regional effort 15. Determine and create commonalities across regions 16. GPS integration of management areas 17. Build more boating infrastructure 18. Shore-based sitage 19. Sustainable finance 20. Special account only for mooring program in USVI that does not go into general USVI account
WISH LIST/COMMENTS	<ul style="list-style-type: none"> • Process through violation/penalty of groundings • Use of economic value data to inform grounding penalties • \$ from penalties to a management trust to support program implementation • Judicial/Legal support to pursue groundings • Prioritized list of derelict vessels for removal • Derelict, grounded, abandoned vessels confiscated and given to management agencies or sold with \$ going to marine resource/MPA trust fund • Color code buoys to aid boaters in figuring out regulations for areas • Better navigation markers for prevention • Define ‘common cruising’ ground rules for boats across regions • Tax boat license to support moorings • Require liability insurance for boat owners in the event of grounding • Insurance requirements that include costs for environmental impacts/monitoring/restoration • Expedite permit processes to install and maintain mooring buoys • Joint environmental communications for boaters within regions from all relevant government and industry bodies across borders regarding environmentally sensitive boating practices • Capacity and ecological assessments per bay per island in USVI for moorings • Create pump out program for USVI • Closure of home-made boat ramps on impacted habitats • Reauthorization of Coral Reef Conservation Act • Standardize fee structure and management approaches regionally • Implement additional fees to annual registration for locals and on-site collection user fee for non-locals • Complete mapping of sea bottom (BVI) • Designate mega yacht anchor zones • Receive funding towards assessing charter and yachting industries to identify where there are gaps in regulating charter companies
Pollution Monitoring and Prevention	

CHALLENGES	<ol style="list-style-type: none"> 1. Local water quality assessments 2. Lack of collaborations 3. Community involvement 4. Non-point source pollution 5. Continuity of research for proper results 6. Implementation 7. Bureaucracy to find funding 8. Lack of long-term commitment from federal agencies 9. Reduce soil erosion and sedimentation 10. Waste water treatment plants (mostly primary) 301 H Waiver 11. Lack of environmental legislation 12. Not sustainable approach regarding tourism 13. Oil spills – lack of enforcement, personnel, and resources 14. Illegal sewer spills 15. Corruption
SOLUTIONS	<ol style="list-style-type: none"> 1. Establish local water quality standards/baseline (not continental) 2. Community based citizenship – monitoring alert system, stewardship, watchdogs, Apps, web portals, list servers, Facebook, Twitter, etc. 3. Update regulations and fines 4. Building permits, environmental user fees 5. Collaboration – exchange stakeholders 6. Regulations to add surcharge as sustainable financing method to remove burden from individual landowners during permitting process (Environment User Fee) 7. Explore eliminating 301 H Waiver for water treatment plant 8. Explore tapping into tourism based revenue 9. Find funds for grants and resource management 10. Comprehensive land use plan 11. New legislation to reflect current problems (oil spills – fines) 12. Interagency cooperation for pollution monitoring 13. Promote funding with collaborative efforts
COMMENTS	<ul style="list-style-type: none"> • Need to establish nutrient standards for coastal waters that have seagrass and coral reefs • Improve water quality monitoring efforts (watersheds, coastal waters) • Commitment of federal government to support multi-year projects • Seek creative/alternative funding sources (i.e. fines, fees, green taxes) • Educate/integrate base-communities to regulate water quality monitoring programs, as well as integrate them in to planning and decision-making processes • Reduce soil erosion and sedimentation • Establish/implement/enforce land use plans • Control non-point source pollution, mostly sewage • Leakage of tourism revenue and the need of a sustainable approach to tourism • Address corruption issues at the enforcement level • Alternative to funding from federal agencies – crowd-sourced (grassroots) fundraising. i.e. ‘seifund challenge’ • Get the public to donate small amounts (\$5-10)

Friday, December 9th, 2011

Day 2 Objectives: Continue sessions, discuss regional coral reef management opportunities, make preliminary plans to advance regional agreements and initiatives.

Break Out Sessions

Day 2 began with TNC’s Aaron Hutchins welcoming both returning and new participants to the Assembly. The first scheduled event of Day 2 was a continuation of the break out sessions for the topics of MPA Management and Lionfish Response. For the session of MPA Management, participants were split up in to four groups. Each group was led by a TNC facilitator and discussed underlying issues of site planning, system networking, financing, and implementation. Participants shared local issues and efforts and also discussed cross-cutting issues present in all jurisdictions. Table 4 describes the highlights from the MPA Management break out session:

Table 5. Major Site Planning, System Networking, Financing, and Implementation issues for MPA Management	
Site Planning	
BVI	<ul style="list-style-type: none"> • Start with mapping resources • Zoning, access, use • (-)Many individual sites results = centralized planning (One site plan)
PR	<ul style="list-style-type: none"> • Upland issues very important • (+) Objectives – physical natural (ecological), socio-economical (traditional uses), historical/cultural • (-)Formal draft period time 3 years/1 year - depends on participation • (-) Conflicts when consulting with resource users • (-) Legal designation drives how MP is written • (-) No site planning process • (-) MPA legislation – can’t enforce • (-)Protection based on site location and not marine resources
USVI	<ul style="list-style-type: none"> • (+)Structured process for plan • (+)Public input • (+)Flexible to emerging issues • (+)Involve stakeholders as stewards • (+)Grammanik Bank and MCD examples • (-)Lack of management structure • (-)No ecological basis for some MPAs – NPS-NM
REGIONAL NEEDS	<ul style="list-style-type: none"> • Public needs • Consider ecological effects and perform evaluations • Monitoring programs including key species • Define MPA/What Kind? What are the goals? • Define clear objective of sites • Need adaptive boundary options based on targets/goals

System Networking	
BVI	<ul style="list-style-type: none"> • (+) Bottom-up stakeholder engagement • (+) Clear system-wide goals and objectives • (+) Comprehensive plan • (+) CARICOOS expand to BVI • (+) Likely to pursue MSP for MPA network
PR	<ul style="list-style-type: none"> • (+) Natural protected area statute • (-) Fragmented administration occurring
USVI	<ul style="list-style-type: none"> • (-) No overall framework for management • (+) Site level management occurring • System level planning could lead to multiple uses
Regional Needs	<ul style="list-style-type: none"> • Multi-jurisdictional compatibility • Determine biological connectivity and linkages • Consider vertical dynamics • Consider/address technical capacity • Formalized framework and coordination between organizations • Coincide protection areas with targeted protected resource • Set specific objectives
Financing	
Challenges	<ul style="list-style-type: none"> • Financing needed for consistent monitoring • What is the willingness to pay? • Cruise ship industry contribution to MPAs • PR/USVI facing diminishing federal money; BVI citizens are willing to pay
Solutions	<ul style="list-style-type: none"> • Mooring fees to maintain moorings • Create sustainable finance plans • Cruise ship passenger fees • Opportunities to include fishermen • Partner up to support each other/network • Compliment with tourist industry/ environmental tax as tourism user fee/ work with Department of Tourism • Regional approach to capitalize on tourism • Recreational fishing license program • Create license sharing • Set up accounts you can access • Consider carrying capacity • Harness consumer surplus of users (residents and visitors) • Gobs afraid of this ask? • Conservation trusts in the Caribbean road show – where have user fees worked? (\$.01 cerveza tax, PR example) • Public-Private partnership • Longer funding cycles • Designate agency and fund for system management with a diverse board

Implementation	
Challenges	<ul style="list-style-type: none"> • Community driven/engagement is critical • Communication and education • Lack of Management Plans • Unclear roles and responsibilities for enforcement • Sufficient data is required for adaptive management; especially better benthic data to fill gaps • Funding dependent • Monitoring is critical – both biological and social
Solutions	<ul style="list-style-type: none"> • Educate government officials • Other educational outreach • Encourage stewardship and ownership • Share results • System level plans i.e. bleaching and grounding responses • Biological assessments for baseline data for MPAs • Utilize adaptive management through monitoring data collection • Broader Institutional arrangements



Figure 4: Director of the BVI National Parks Trust, Joseph Smith Abbott, discussing the BVI coral reef management challenges a break out group.

The final break out session topic of regional interest was Lionfish Response. The discussion was held with all participants as a large, cohesive large group. TNC facilitators asked representatives from each jurisdiction to speak about their respective lionfish response efforts and needs. After sharing from each country, participants identified regional opportunities for addressing the lion fish invasive species issue.

Table 6. Lionfish response efforts, needs, and identified regional opportunities

British Virgin Islands	<ul style="list-style-type: none"> • Funding from UK • Community Educational Outreach • Collaboration with CORE in USVI and ECO in PR • Research on stomach content • Eradication with fishermen • Call in response line • Deploy markers • Stakeholders given tools and education to manage specific utilized area • Recreational users given response info
Puerto Rico	<ul style="list-style-type: none"> • Include media and community groups • Buying and distributing equipment to kill and/or capture • Research for better traps/attractions • Consumption promotion • Support from SeaGrant working with dive industries • Marketing campaign • Food source for other fish • Need better ways of capture & funding
US Virgin Islands	<ul style="list-style-type: none"> • Educate public with CORE • Utilize media outlets • Determining biological components • MPA control • Ciguatoxin Research • Environmental control through food source and disease • NOAA funding for removal including equipment • Compiling data regionally • Strategic removals • Spatial modeling
REGIONAL OPPORTUNITIES	<ul style="list-style-type: none"> • Mission possible! Believing we can make a difference • BVI can share outreach material • PR can share PSAs for radio, TV, and web - please visit coraltv.org • Incorporate lionfish in to tourism industry • Research means of attraction • Determine microhabitat preference • Determine best tools/methodologies to maximize catch effort • Form volunteer groups

Caribbean Regional Ocean Partnership

“Caribbean Regional Ocean Partnership”

Presenter: Ernesto L. Díaz, Director, Puerto Rico Coastal Zone Management Program (PRCZMP)

In July 2010, President Obama implemented the National Policy for the Stewardship of the Oceans, Coasts, and the Great Lakes. In order to achieve the visions of the National Ocean Policy, a comprehensive, collaborative, and regionally-based Coastal and Marine Spatial Planning (CMSP) process was established. In 2010, NOAA issued a Federal Funding Opportunity (FFO) for the establishment, development, or enhancement of Regional Ocean Partnerships (ROPs). Collaboratively, PRCZMP, USVI Governor’s Office, and TNC developed a proposal that received partial funding from NOAA in 2011. PRCZMP has furthermore been able provide additional funding that will contribute towards the collaborative efforts for CMSP. Puerto Rico and the US Virgin Islands are working toward establishing the Caribbean Regional Ocean Partnership (CROP). The CROP is being pursued to provide a regional platform in the arena national marine policy and address common issues facing the region, including coastal and marine resource conservation,

regional data and information management, offshore energy development, trans-boundary fisheries, climate change adaptation, navigation, pollution abatement, tourism, and interstate commerce.

Currently, coastal zone management agencies of Puerto Rico and the USVI are awaiting legal review of a Memorandum of Understanding (MoU) before formally adopting the CROP with the signatures of the territorial Governors. The MoU will establish coordination with existing regional organizations and require involved parties to continue cooperation and participation with governmental and non-governmental organizations and academic institutions. The MoU also includes the possible inclusion of the British Virgin Islands and the Dominican Republic.



Figure 4: Ernesto Díaz, Director of Puerto Rico’s Coastal Zone Management Program, presenting on the Caribbean Regional Ocean Partnership.

Panel: Regional Solutions

Panelists: Damaris Delgado: Coasts, Reserves and Refuges-PR DNER, Ernesto Diaz: Coastal Zone Management Program- PR DNER, Paige Rothenberger: USVI Department of Planning and Natural Resources, Joseph Smith Abbott: BVI National Parks Trust, Emma Doyle: CaMPAM, Jean-Pierre Oriol: USVI Department of Planning and Natural Resources- CZM

Regional representatives from territorial coastal zone and protected area management agencies of all three jurisdictions sat on a panel to discuss regional approaches to coral reef management. The primary goal of the panel was to identify opportunities for institutionalizing an approach that capitalizes on a regional solidarity to coral protection and shared initiatives, addressing common threats through collaborative means, and celebrating shared successes. A full summary of the panel is included in Appendix C.

Regional representatives expressed their gratitude for the opportunity to come together and exchange ideas about opportunities for regional collaboration. The panelists were hopeful that through the formalization of MoUs and the ROP, regional collaboration will enhance across regions and among communities. Panelists gave examples of opportunities for informal transfer and data sharing despite the current absence of formal relationships, such as exchanges of staff or cooperation through universities and list serves. During the future development of formal regional relationships for collaborative and standardized management practices, social science (socioeconomics) was highlighted as a fundamental issue that must be incorporated into the decision making process.

Panelists took turns sharing what they learned at the Assembly that they could take back to their own agencies or organizations, in particular, the challenges, solutions, and success stories of neighboring islands. For future Coral Assemblies, panelists agreed that community engagement, outreach, socioeconomics, and stakeholder input should be included as major topics for discussions, and also the inclusion of the Dominican Republic in current and future plans. Panelists want to have access to Assembly materials, potentially through an existing list-serve or website.



Figure 5: Regional representatives discuss cross-cutting coral reef management issues in the panel on regional solutions.

Closing Remarks, Recap, and Next Steps

Jeanne Brown expressed sincere thanks to all who participated in the Assembly and volunteered their time in helping coordinate the meeting. The Assembly would not have been possible without their attendance and contribution. The purpose of the Assembly was to bring together conservationists, managers, and researchers from Puerto Rico and the US and British Virgin Islands to promote regional collaboration. The Assembly demonstrated the value of bringing regional stakeholders together through the following: new working relationships were formed, colleagues had the ability to catch up with one another, researchers and managers shared ideas, participants exchanged contact information and discussed further collaborations.

Appendix A: Coral Assembly 2011 Agenda

AT A GLANCE

Schedule	Objectives	Attendees
Day One- Thursday, December 8	Sharing of information, ideas, shared funding opportunities, identify needs and general direction of regional coral reef management	Coral reef on-the-ground Practitioners/Implementers/Managers (<i>+observers, contributing scientists and guest speakers</i>)
Day Two- Friday, December 9	Capitalizing on the broader regional discussion to forge a strategic approach to shared challenges and opportunities	Attendees from Day One and Policy Makers, Leaders and Government Officials

DAY 1	THURSDAY, DECEMBER 8
	Objective: Present introduction, get to know colleagues, shared challenges, concerns and assess direction we want to head together
8:00-9:00 am	ARRIVAL USVI and BVI participants arrive by air, take taxi (reimbursable with receipt) to Embassy Suites San Juan, 8000 Tartak St., Isla Verde, Puerto Rico 00979
9:00-10:00 am	Registration, check-in at the ballroom, to the left of the lobby CONTINENTAL STYLE BREAKFAST
START	CORAL ASSEMBLY: <i>Palmeras Ballroom</i>
10:00 - 10:30am	Welcome, Objectives, and Desired Outcomes <ul style="list-style-type: none"> • Welcome Address • Assembly overview, review of agenda • Introductions
10:30-11:10am	Island Presentations <ul style="list-style-type: none"> • British Virgin Islands • US Virgin Islands • Puerto Rico
11:15-11:30am	BREAK: relief, coffee and other stimulants
11:30am-12:15pm	Major Topics Presentations <ul style="list-style-type: none"> • Coral Reef Valuation • MPA Capacity Assessments • Climate Change (recap from the Caribbean Climate Change Meeting) • Resilience Programs
12:15-12:30pm	Afternoon Overview
12:30-1:30pm	LUNCH in the Atrium
1:30- 4:30pm	BREAK OUT SESSIONS: <i>Palmeras Ballroom (A)</i> <i>Tropico Meeting Room (B)</i>
<i>1:30-2:30pm</i>	

	(A) Enforcement and Regulation (B) Bleach and Disease Monitoring and Response
2:30- 3:30pm	(A) Watershed Management/Land Use Planning (B) Reef Fisheries Spawning Aggregation Management and Research
3:30-4:30pm	(A) Boating Management (moorings, grounding, pump out, cruisers) (B) Pollution monitoring and prevention
3:00pm	BREAK: Afternoon stimulants in break out rooms
4:30-5:00pm	RECAP: Sharing what you've learned, who you will follow up with and collaborate with
5:30-6:30pm	<i>Cocktail Social</i> La Vista Terrace
6:30-8:00pm	DINNER La Vista- Guest speaker

FRIDAY, DECEMBER 9	
DAY 2	Objective: Continue sessions, provide an opportunity to discuss regional approaches, make preliminary plans to advance regional agreements and initiatives.
8:00-9:00am	BREAKFAST <i>on own (hotel guests can eat in Atrium)</i>
9:00 am	Welcome to Day 2, Agenda (Palmera Ballroom)
9:10- 11:00am	BREAK OUT SESSIONS:
9-10am	(A/B) MPA Management: site planning, system network and financing
10-11am	(A/B) Lionfish response
11:00-11:15	BREAK: relief, coffee and other stimulants
11:15-12:30pm	Recap on Day 1: Sessions highlights and shared regional initiatives
12:30-1:30	LUNCH
1:30-2:00pm	Regional Ocean Partnership <ul style="list-style-type: none"> • Current Status and Direction Forward (Ernesto Diaz)
2:30-3:30pm	Panel: Regional Solutions Find solutions to those challenges and ways that we could work together and help each other out, as a region.
3:00pm	Afternoon stimulants in foyer, participants can come and go
3:30-4:00pm	Closing Remarks Recap and Next Steps
4:00 pm	Departure

Appendix B: Coral Assembly 2011 Participants

Name	Title	
British Virgin Islands		
Brunn, Kathryn	Business Owner and NGO Director	
Dore, Joel	Fisheries Trainee, CFD	
George, Pearline	Professional Cadet, CFD	
Georges, Esther	Deputy Director, NPT	
Gore, Shannon	Marine Biologist, CFD	
Hastings, Mervin	Ag. Deputy Conservation & Fisheries Officer	
Leoniak, Lain	Conservation Coordinator	
Lewis, Lenette	National Coordinator Lecturer	
McDevitt, Charlotte	Executive Director, Green VI	
Penn, Dylan	Physical Planner	
Petrovic, Clive	Director, Econcerns	
Smith-Abbott, Joseph	Director, National Parks Trust	
Zaluski, Susan	Director, Jost Van Dykes Preservation Society	
US Virgin Islands		
Alexandridis, Kostas	Assistant Professor, U.V.I.	
Brandt, Marilyn	Research Assistant Professor, UVI	
Coldren, Sharon	President and Executive Director, Coral Bay Community Council	
Cramer-Burke, Carol	Program Director, SEA	
Gyory, Joanna	Postdoctoral Research Associate, U.V.I.	
Herlan, James	USGS Biologist	
Hibbert, Marlon	NOAA USVI Management Liaison	
Hillis-Starr, Zandy	Chief Resource Management & Research, NPS	
Murray, January	Fishery Biologist III, VIDFW	
Nemeth, Richard	Research Program Coordinator, UVI	
Oriol, Jean-Pierre	Director, VI CZM	
Ortiz, Lia	NMFS Coral Reef Fishery Biologist	
Pemberton, Roy	Director, Div. Fish & Wildlife	
Rothenberger, Paige	Coral Reef Initiative Coordinator, VI CZM	
Settar, Christine	Marine Stewardship Coordinator & Extension Specialist, UVI	
Smith, Tyler	Research Assistant Professor, U.V.I.	
Taylor, Marcia	Marine Advisor, U.V.I.	
Puerto Rico		

Alejandro, Pedro	Relacionista publico	
Aponte, Myrma	Biologist	
Archilla, Alberto	NGO Independent Reef Researcher	
Ascanio, Eduardo H.	VIDAS	
Cabrera, Christina	Special Assistant	
Candelas, Frances	SAM Executive Secretary	
Carde Cruz, Jennifer	CESAM/Guardarnenas	
Castillo, Graham	President, Estudios Técnicos, Inc.	
Chaparro, Ruperto	Director, Puerto Rico Sea Grant	
Chardón, María	Protected Area Manager	
Delgado López, Damaris	Director, Bureau of Coasts, Reserves and Refuges, DNER	
Desoto, Ricardo	GuardaMar	
Díaz, Ernesto	Director, Coastal Zone Management Program	
Diaz Perez, Luis J	NGO Independent Reef Researcher	
Echeuarrin, Wilfredo	DRNA	
Figueroa, Humberto		
Fonseca, Jaime	Tesoreria	
Fuentes, Maryguel	Planning Analist	
Galán Kercádo, Daniel	Secretary, DNER	
García, Miguel	Director, Fisheries and Wildlife	
García-Moliner	FMP and Habitat Specialist	
García-Sais, Jorge R.	Researcher	
Gonzalez, Carmen	JBNERR Manager	
Jacobs, Kasey	Coastal Adaptation Project Coordinator	
Julia Pacheco, Mariolga	VIDAS	
Hernández-Delgado, Edwin A.	Affiliate Researcher	
Laureano, Ricardo	NGO Independent Reef Researcher	
Lilyestrom, Craig	Director, Marine Resources Division	
López, Paco	Director, Arrecifes Pro Ciudad Inc.	
Lucking, Mary Ann	Director, CORALations	
Matos Garcia, Gracelyn	CESAM	
Medina, Jeiger	Student	
Meery, Alex		
Melendez, Joel	Ecotono, Inc.	
Neives, Jose	UPR	
Nieves, Miguel A.	Oficial, Manejo Recursos Naturales	
Norat, Jose	Professor	

Oms, Julio A.	Hydrologic Technician	
Ortiz, Rose A.	Planning Analyst V	
Oten Ceppeels, Eleinie		
Pagán, Francisco	Program Manager	
Ramos Álvarez, Antares	NOAA Puerto Rico Coral Management Liaison	
Ramos, Marcos A.	Environmental Educator	
Rivera Ocasio, Zoelie	CESAM/Guardarnenas	
Robles, Eliliet	Ranger	
Rodriguez, Angel	Boating Law Administrator	
Rodriguez, David	VIDAS	
Rodriguez Hernandez, Juan	Project Coordinator	
Rosado Pagan, Juliann	Environmental Interpreter and Biologist	
Rosado Sanchez, Leslie	Membro	
Rosario, Aida	Director	
Ruiz, Idelfonso	Refuge Manager	
Scharer, Michelle	Researcher	
Sebastian, Daniel	CESAM	
Sierba Rolon, Joshua	CESAM	
Suarez, Victor		
Suleiman, Samuel	Director	
Tolentino, Annette	Community director	
Velazco Domínguez, Aileen T.	Technical Advisor	
Velez, Ernesto	Observador	

Regional Partners

Almodovar, Edwin	Director USDA-NRCS Caribbean Area	
Carrubba, Lisamarie	Natural Resource Planner, Caribbean Field Office	
Doyle, Emma	Assistant Coordinator, CaMPAM	
Griffin, Sean	Habitat Restoration Specialist	
Irizarry, Emmanuel	NOAA-CRCP Biologist	
Jeffrey, Christopher F. G.	Marine Spatial Ecologist	
Kitchell, Anne	Senior Environmental Planner	
Silander, Susan	Project Leader	
Strum, Paul	Director	
Taylor, William Charles	Education and Outreach Coordinator	

Coral Assembly Planners and Facilitators

Brown, Jeanne	Coastal Program Director, TNC	
Byrne, James	Marine Science Program Manager, TNC	
Daugherty, Collin	Conservation Planner, TNC	
Espinoza, Raimundo	Puerto Rico Conservation Coordinator, TNC	
Graff, Nancy	Conservation Coordinator, TNC	
Hoffman, Anne Marie	STEER Implementation Specialist, TNC	
Hutchins, Aaron	Program Representative /Director of Government Relations, V.I. and P.R., TNC	
Lewis, Kemit-Amon	Coral Conservation Manager, TNC	
Ruffo, Ashley	Graduate Student, UVI	
Soto, Francisco	Graduate Student, UPR	
Wusinich-Mendez, Dana	NOAA Atlantic and Caribbean Team Lead	

**The Participant List was compiled with the best intention to include all information for all registered and non-registered participants; however, it is possible that some participants and/or participant information was left out or incorrectly entered.

Appendix C: Regional Solutions Panel Transcript

Coral Reef Assembly

Panel discussion

December 9th, 2011

San Juan, Puerto Rico



Who: J.P. Oriol, DPNR, CZM, USVI

Emma Doyle, CaMPAM (Caribbean MPA management network forum)

Joseph Smith Abbot, Parks Trust, BVI

Paige Rothenberger, DPNR, CZM, USVI

Ernesto Diaz, CZM, PR

Damaris Delgado, DNER, PR

Shannon Gore, Conservation/Fisheries, BVI

Moderators: Aaron Hutchins & Raimundo Espinoza, TNC

1. Aaron: What new opportunities do you see for collaboration with your neighbors?

Ernesto Diaz, CZM, PR: PR to seek advice from BVI to gain financial support for MPA management.

Emma Doyle, CaMPAM: Financing for MPAs is a big issue, and we [CaMPAM] have funding through NOAA and UNEP. Working particularly with countries who are participating in the Caribbean Challenge and the NOAA Capacity Assessment.

Interested in specific site-level projects and where small amounts of grant money can help sites and how these sites can be mentors (e.g., exchanges) for other sites and in the region. CaMPAM interested in networking MPAs with this sort of mentoring/exchanges/support.

J.P. Oriol, DPNR, CZM, USVI: Meetings like these create opportunities for people to sit down in the same room and discuss, share common challenges. We have the solutions for those challenges in the back of our minds but it's nice to put them down on paper together. These discussions over the last few days, and spending time think about this issues is a real benefit. Seeing and interacting with our regional partners and having discussion on what we're all doing in our own backyards or nearshore is a real benefit. As Puerto Rico and the USVI work together on CZM, we both know that we'll have to include our partners (DR and BVI, respectively) as we discuss things regionally. We find very interesting some of the things that BVI's Protected Area Trust is doing.

I'm very interested in the work that the BVI has completed regarding climate change because the USVI is just in its infancy in its CC strategy. Me getting someone's email is the first step.

Joseph Smith Abbot, Parks Trust, BVI: From the BVI perspective, it's refreshing to hear and to be included. There has been a lot of talk about collaboration over months and years, especially w/ the USVI. This has been challenging primarily for political reasons regarding how to best integrate the work that it happening at the federal level, and gaining access to the expertise that our US neighbors have had. Hopefully through the ROP and the formalization of MOUs we can transcend some of these issues and perhaps later (year or two) we can work on how we can get that done. We'll have to appreciate the fact that we're operating at two levels, the territorial and federal level. There's recognition of the importance of collaboration given the common shared waters and issues that we'll have to ultimately work on.

Damaris Delgado, DNER, PR: We see opportunities in all of the trust issues. Very important to have exchange of ideas. The proceedings of these meetings will be very helpful and important so we can share this message with everybody. There is power in our unity. We should take advantage of that and transmit it, our goals and challenges, to other agencies and legislators who can help us achieve our goals.

Shannon Gore, BVI Conservation/Fisheries: Seems like there is so much funding in the U.S. BVI hasn't been able to do very site-specific projects. BVI has a lot broader of projects which have been apparently quite successful because a lot of Assembly participants have approached us. We're happy to be here to meet all these people and organizations.

2. Raimundo: If you see an opportunity for regional collaboration among the communities? (Sharing of local fishers, watershed residents, etc.)

Ernesto Diaz, CZM, PR: As part of the development of the ROP, there is already collaboration occurring at the scientific and technical level regionally. Citizen-stakeholder advisory group along with scientific and technical advisory group as part of the ROP.

Paige Rothenberger, DPNR, CZM, USVI: ROP and its associated supporting bodies will provide natural mechanism for information transfer between our jurisdictions. Help facilitate the flow of information but also I think this meeting helps networking and the practice of formalizing the relationships. Formalization of partnerships at the government level will facilitate those exchanges at the community level.

3. Aaron: How much can we do in the absence of the formal relationships? Are their opportunities for informal transfers/sharing/collaboration and, if so, what are some examples?

Paige Paige Rothenberger, DPNR, CZM, USVI: List serves, academia partnerships, government document not entirely necessary BUT it does bring legitimacy and allow for leveraging of resources. Strong will for regions to be driving what is important to us in the region with regard to national ocean policy.

Joseph Smith Abbot, Parks Trust, BVI: There's another way to work together via disaster management side of things. There are existing MOUs including the UK government, federal, and territorial governments regarding disaster response and direct assistance in times of need (Coast Guard, FEMA, VITEMA, Department of Disaster Management). A lot of these existing relationships can be easily used to rationalize sharing mechanisms. This boils down to defining what protocol for assistance is: not just rapid response. Should be practical assistance as well, informal sharing mechanisms (exchanges of staff or cooperation through universities, etc). Within a short amount of time this is not insurmountable.

Emma Doyle, CaMPAM: The BVI is a signatory member of the SPOOR Protocol which opens a solid platform for collaboration and creates opportunities for very concrete follow-up to this Assembly. To address concerns that surfaced at this Assembly regarding number of fishers/operators/communities present. To follow up to this Assembly, we can look for a couple of small opportunities for exchanges in the region. There's a good small grants program at Gulf of Caribbean Fisheries Institute which in the past has facilitated training and exchanges along with assistance for displaced fishers- these opportunities are real and concrete for the community level.

Ernesto Diaz, CZM, PR: Collaboration has been occurring historically in the region, especially at the technical and scientific level. What we need to increase is collaboration among citizens and stakeholders of human uses of the ocean. Also need to strengthen collaboration among the research labs of the region.

The role of social science (e.g., socioeconomics) is fundamentally missing in this process. – Kostas Alexandaris, UVI

Emma Doyle, CaMPAM: CaMPAM trying to focus more on communications and looking at sustainable financing of MPAs. Finding out that MPA managers often need the skills of an economist/marketing person. We're realizing that this is an emerging need.

Damaris Delgado, DNER, PR: We're well aware of the need to incorporate social science into our MPA management. We've been doing social studies in different MPAs in PR w/ help of Sea Grant. We take the socioeconomic dimension seriously.

Ernesto Diaz, CZM, PR: Government agencies need that social dimension given that government will not grow anymore.

J.P. Oriol, DPNR, CZM, USVI: It's at the workshop level like this is when we talk about how we engage the community, our outreach programs, where we succeeded and why/why not, why was it successful in our area, how replicable it is for the region. Maybe, following this assembly, there are more focused groups that can get together (e.g., academia over regional lionfish study). This is how we can move forward informally.

Shannon Gore, Conservation/Fisheries, BVI: Beach/watershed management in the BVI is becoming a lot easier because of community engagement.

4. Aaron: What mechanisms for communication would we like to see come out of this?

Paige Paige Rothenberger, DPNR, CZM, USVI: There are a lot of lists, it's hard to keep up with all of them. Some thought needs to go into this. Whatever it is, how can it be more targeted and more useful?

J.P. Oriol, DPNR, CZM, USVI: A website, or at least an FTP site where we can access the materials/presentation from the Assembly. At least for a limited time this would be beneficial.

Joseph Smith Abbot, Parks Trust, BVI: Let's use one of the existing list-serves, e.g. CaMPAM.

5. Aaron: What additional items might we like future Coral Assemblies to take on (in addition to community engagement)?

Ernesto Diaz, CZM, PR: That's a good question for the Assembly participants. Engage socioeconomics, historical, natural, education, informal outreach...Would be great to see what the stakeholders believe should be a priority for discussion at the next Assembly.

6. Chris Jeffries, NOAA Biogeography Program: What is one thing you can take back to your agency/organization that can make a change?

J.P. Oriol, DPNR, CZM, USVI: We identified some challenges and solutions and a year from now we'll look at it and see if we were able to do anything about. We need to report our success stories. I've learned what some of my partners are doing in various realms and how we might apply them in the USVI.

Emma Doyle, CaMPAM: Reporting of success stories is very important. To use CaMPAM as a list serve would be a good outcome which we'd like to see. Now know in which areas all of you have something to offer regarding mentorship programs and specialization.

Joseph Smith Abbot, Parks Trust, BVI: Being a bit more methodical about how we share successes and resources. Physical exchanges of personnel across the region is something that we intend to work on.

Paige Rothenberger, DPNR, CZM, USVI: Taking back lessons learned and successes of our neighbors. Areas of expertise of others will be linked with USVI staff to find out how we can apply success of others to USVI.

Ernesto Diaz, CZM, PR: Community/citizen engagement key to resilience and sustainability.

Damaris Delgado, DNER, PR: Interest in working collectively with our partners in the Virgin Islands.

Shannon Gore, Conservation/Fisheries, BVI: A lot of people approached and offered help with data analysis. Environmental Education course for legislators.

Paco Lopez, Isla Verde, NGO, Representative: Shared his success story of a coloring book production which has raised \$3,500/year. An example of a funding stream.

Zandy Hillis-Star, NPS: We'd be more effective communicating collectively as a single force than independently for reaching higher policy levels. We need to figure out how to message our need to work collaboratively and

when we do, we do it together, it will be much more effective than just going back to our independent agencies/jurisdictions.

Emma Doyle, CaMPAM: Eastern Caribbean example of Sustainable Grenadines, tranboundary collaboration on protected area management between Grenada and St. Vincent and the Grenadines.

Damaris Delgado, DNER, PR: Does the Assembly want to write a letter to the DR inviting them to be part of this? That's something that could be done...We'd like to add them...

Aaron: Map will be shared as part of the proceedings from the workshop.

Joseph Smith Abbot, Parks Trust, BVI/J.P. Oriol, DPNR, CZM, USVI/Ernesto Diaz, CZM, PR: Given the common shelf, interest and needs, DR should be added to Assembly's current and future plans...



Appendix D: Assembly Evaluation Survey Results

*Not all Comments are reported.

Coral Assembly Participant Survey Responses

Number of Attendees: 110

Number of Surveys: 35

	Did Not	Met	Exceeded
Did the Coral Assembly meet your expectations?	2	18	10
	7%	60%	33%

Comments:

“Found it quite beneficial to see and discuss what neighboring jurisdictions are doing and what challenges are being faced.”

“I thought that the problem-solving focus was an excellent idea.”

“Provided opportunity for informal exchange and getting up to date on regional initiatives.”

“I expected stronger products and compromises.”

	Not Ben	Beneficial	Very Ben
Were the presentations beneficial to you?	0	22	8
	0%	73%	27%

Comments:

“Excellent, good for background info, news updates and input on particular needs.”

“Presentations set the tone for brainstorming ideas.”

“...the full presentations available on the web would be very beneficial.”

“As a newcomer to this region, I benefitted greatly from hearing about the different issues and initiatives in the different regions.”

	Str Agree	Agree	Unsure	Disagree	Str Disagree
Enforcement and Regulation					
I found this session interesting	10	6	0	0	0
	63%	38%	0%	0%	0%
I learned something useful	7	6	2	0	0
	47%	40%	13%	0%	0%
This information will help me in my job	8	4	3	0	0
	53%	27%	20%	0%	0%

I plan to follow up with co-participants	8	8	0	0	0
	50%	50%	0%	0%	0%

Comments: “There is a need to involve local community stakeholders and policymakers, especially for enforcement and regulation”

Bleaching and Disease Monitoring and Response

I found this session interesting	1	9	0	0	0
	10%	90%	0%	0%	0%
I learned something useful	2	6	1	1	0
	20%	60%	10%	10%	0%
This information will help me in my job	1	5	3	1	0
	10%	50%	30%	10%	0%
I plan to follow up with co-participants	2	6	1	0	0
	22%	67%	11%	0%	0%

Watershed Management/Land Use Planning

I found this session interesting	3	9	1	0	0
	23%	69%	8%	0%	0%
I learned something useful	3	7	2	0	0
	25%	58%	17%	0%	0%
This information will help me in my job	3	6	3	0	0
	25%	50%	25%	0%	0%
I plan to follow up with co-participants	4	7	2	0	0
	31%	54%	15%	0%	0%

Reef Fisheries/Spawning Aqs Management and Research

I found this session interesting	8	3	0	0	0
	73%	27%	0%	0%	0%
I learned something useful	5	5	1	0	0
	45%	45%	9%	0%	0%
This information will help me in my job	4	5	1	1	0
	36%	45%	9%	9%	0%
I plan to follow up with co-participants	3	5	1	1	0
	30%	50%	10%	10%	0%

Comments:
“The issue of poverty is real and must be addressed simultaneously with enforcement so there are still resources left once poverty is erased.”

Boating Management

I found this session interesting	5	6	0	0	0
	45%	55%	0%	0%	0%
I learned something useful	5	5	0	0	0
	50%	50%	0%	0%	0%
This information will help me in my job	6	4	0	0	0

	60%	40%	0%	0%	0%
I plan to follow up with co-participants	5	3	2	0	0
	50%	30%	20%	0%	0%

Pollution Monitoring and Prevention

I found this session interesting	4	8	0	0	0
	33%	67%	0%	0%	0%
I learned something useful	4	6	2	0	0
	33%	50%	17%	0%	0%
This information will help me in my job	4	4	4	0	0
	33%	33%	33%	0%	0%
I plan to follow up with co-participants	3	7	1	1	0
	25%	58%	8%	8%	0%

MPA Management

I found this session interesting	11	14	1	1	0
	41%	52%	4%	4%	0%
I learned something useful	12	11	3	0	0
	46%	42%	12%	0%	0%
This information will help me in my job	10	8	6	1	0
	40%	32%	24%	4%	0%
I plan to follow up with co-participants	10	12	4	1	0
	37%	44%	15%	4%	0%

Comments:

“I would suggest you split these sessions into different rooms or only have 2 sessions in one large ballroom so noise is not an issue.”

“This is the most important for us at this moment. We are proposing a co- management community and government.”

“Would have been helpful to receive info for each jurisdiction ahead of time”

Lionfish

I found this session interesting	9	14	0	1	1
	36%	56%	0%	4%	4%
I learned something useful	11	9	1	1	1
	48%	39%	4%	4%	4%
This information will help me in my job	9	7	3	2	1
	41%	32%	14%	9%	5%
I plan to follow up with co-participants	8	8	4	2	1
	35%	35%	17%	9%	4%

Comments:

“For lionfish ‘control’ I think we have to define what we consider ‘success.’ We can successfully control them to diving depths, in some areas, and celebrate that.”

“Talk more about trophic/food web ecology.”

If another Coral Assembly is held next year, what are some topics you believe should be covered?

- Stewardship and community involvement
- Education and outreach
- Marketing resources
- Training opportunities
- Tourism
- Success & failure management stories
- Success & failure regional partnership stories
- Watershed management
- Non-point source pollution
- Climate change
- Strategies and initiatives
- Collaborative data sharing and resources available for scientists and managers
- Stakeholders and NGOs
- Funding
- Lionfish reassessment
- Socio-economics of local management
- Zoning within MPAs
- Comprehensive planning
- Data needs
- Capacity assessments including communities
- Assessment measures

Comments:

"I'd like to hear a presentation from our ranger corps about how they plan to control overfishing."

"1. See if jurisdictions have made progress for financing MPAs already existing, 2. What have researchers found in their studies of lionfish, 3. Success/Failure of TNC Coral Nurseries - link this with any discussion on reef, any benefit ecologically."

"It would be good to focus on a smaller number of topics"

If another Coral Assembly is held next year, what are some outcomes you'd like to see developed?

Comments:

"Improving collaboration between islands"

"Some component to highlight success stories..."

"Draft action plans"

"Regional efforts to bridge education, communication, research gaps"

"Formalization of some partnerships that engage for funding"

"Contact the local community main persons such as fishermen, spearfishing clubs, jet skis, boat owners, etc. They need to be present."

"Establish coordination for regional response teams for Bleaching, Groundings, Education, Provide samples for education on marine issues, Create a 'one voice - one message' for marine environment conservation."

"List of BMP pooled from region."

"A survey about improvements and individual's research."

"Implementation - how to take it from discussion to actual steps - a roadmap to implementation."

"Networking"

"Develop interisland groups that compile information on the issues who will look for areas that the 3 islands can participate"

"Region-wide funding strategy for priority objectives i.e. reduce erosion"

Is there anything else you'd like the planning team to know that wasn't captured in notes or on this form?

Comments:

“Should foster wider participation of stakeholders”

“I think it could be useful if members of legislatures were invited so that they could be aware of the challenges being faced and maybe work with us to change or enact legislation...”

“Develop strong message to government to establish a conservation user tax, entry tax, tourism tax for island conservation to support storm water/pollution/ sediment control program! Decide what we are going to do with funds & do it!”

“Would like to see a person whose expertise and can bring information plus points of contacts such as websites and organizations.”

“Less ‘overview’ talks and more interactive sessions, as far as time allowance”

“There could be more communications about the event, like a press note or news brief to share with others, and communications especially for higher level decision-makers, so that they see the cross-border interest in coral reef management”

“Next time we should have a documentary made of the Assembly which includes clips of this effort and show via video in a non-intrusive way. In this way we can show the participants at the next Assembly what happened here and it will help TNC folks report back and document their achievements.”