



GUÁNICA BAY WATERSHED UPDATE

US Coral Reef Task Force Meeting

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The 26th meeting of the U.S. Coral Reef Task Force will be held on October 17-21, 2011, at the Marriott Harbor Beach Hotel in Ft. Lauderdale, Florida, in conjunction with the 2nd Reef Resilience Conference. The theme of the U.S. Coral Reef Task Force Meeting will be "Integrating Management of the Florida Reef Tract," which will address coastal and marine spatial planning, water management and coral reef restoration.



The Reef Resilience Conference theme will be "Planning for Resilience," and it will address spatial planning within Florida and in the Wider

Caribbean/Gulf of Mexico context. The conference, and public portions of the meeting, will be open to international participants in addition to Task Force member jurisdictions.

Submission Guidance

The Guánica Bay Watershed Update is issued bi-monthly. Please send any notices that you would like to share with the group to Patricia Bradley (bradley.patricia@epa.gov).

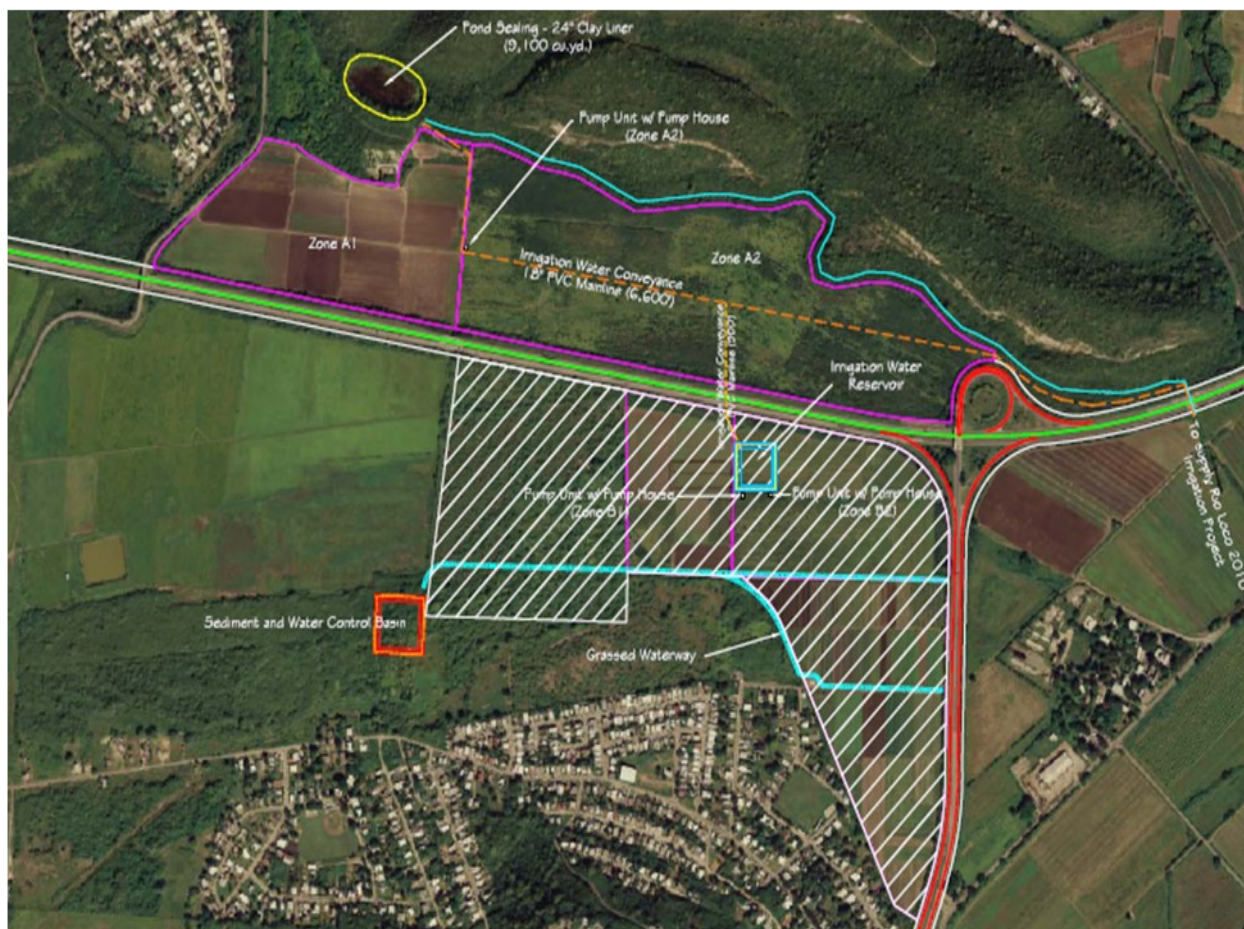
Please send photos that support your story and include a caption for each photo.



NRCS continues funding improvements in the Guánica Bay Watershed

U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) has funded the second stage of the Guánica Valley sediment and runoff control project, connecting the Santa Rita and Maria Antonia farms with the Rio Loco Dam irrigation channeling system and adding the Fraternidad farms, located west of Santa Rita Farms (see maps below). NRCS is providing \$816,597 for projects on 390.9 acres in the watershed. This is in addition to the almost \$1.5 million NRCS spent in 2010 on similar projects.

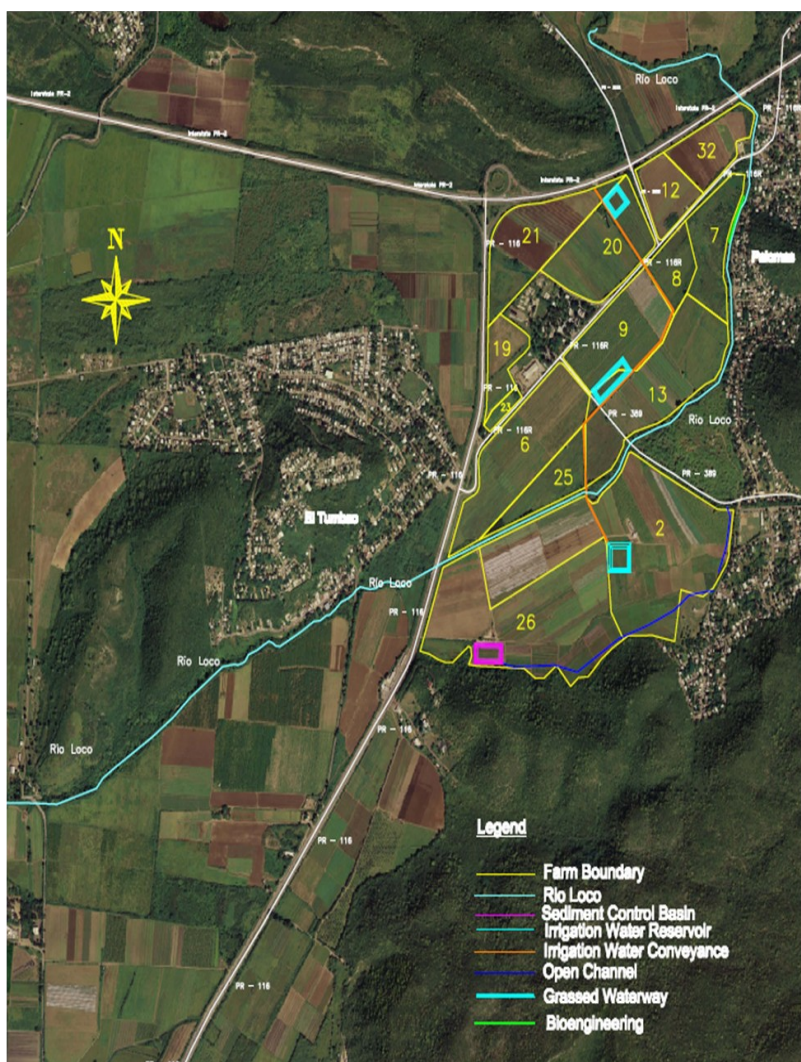
The 2011 projects include installing a new clay liner on an existing water reservoir that has been closed due to water leaks. This reservoir will be filled with water from the Rio Loco Dam through irrigation water channels that are the property of the Puerto Rico Electric Energy Authority. A new 6600 ft. 18 in. diameter pipe will connect the newly lined reservoir to the first stage projects, providing water for the Santa Rita and Maria Antonia farms.



Map #1: Includes Fraternidad Farms. These are public lands that are rented and cropped by about 8 private farmers

A pipe branching off the main line will connect to one of two new water reservoirs that will be constructed on Fraternidad farm. A new sediment control basin is being constructed to catch sediments coming from farmland runoff, and nearly 15,000 feet of grassed waterways are being constructed to divert water to the new sediment control basin. Irrigation systems are being upgraded to include new and more efficient water pumps and valves, and sediment filters are being added to reduce pipe clogging. NRCS is also cost-sharing 2 new bio-engineering riparian protection projects on the Rio Loco River and an agricultural waste management system for dairy operations.

NRCS is promoting integrated watershed and land use management practices on agricultural lands to overcome detrimental effects that agricultural lands may have on coastal waters and associated habitats, including coral reefs.



Map #2 : Includes Santa Rita and Maria Antonia Farms. These are public lands that are rented and cropped by about 35 private farmers.



Example of old irrigation valves that will be upgraded

National Oceans Month

June is National Oceans Month. Puerto Rico contains approximately 700 miles of coastline. The coastal zone - where land meets sea and where fresh and salt waters mix - contains some of Puerto Rico's most complex, diverse and productive ecological systems. The ecosystems in the coastal zone are important for biological and economic productivity, storm protection and erosion control. Coastal ecosystems in Puerto Rico feature beaches, bioluminescent bays, coral reefs, and mangroves. These diverse habitats support an abundance of marine life, including a variety of threatened and endangered species. Puerto Rico's coasts are also places where our families go for fun, rest and restoration.

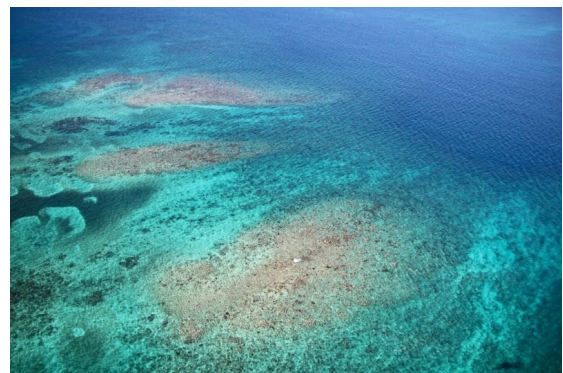


The coastal zone generally extends one kilometer inland, but extends further inland in some places to include important coastal resources. Puerto Rico's coastal zone and adjacent watersheds support major economic activities including shipping, tourism, and agriculture. Infrastructure within the coastal zone includes: 8 ports, 8 airports, 6 power plants, 1,080 miles of sanitary infrastructure, 81 industrial lots, and 114 miles of primary roads.

The coastal zone is subject to increasing pressure from rapid urbanization and economic development. Such pressures present significant challenges for coastal planning and management. The challenge is to identify the trends impacting coastal resources, balance the multiple and competing demands, and to implement strategies that will achieve sustainable management of the coast.

Puerto Rico's Coastal Zone Management Program is comprised of a network of agencies with authority in the coastal zone. The goal of the program is to develop guidance for public and private development in the coastal zone; to actively manage coastal resources; and to foster scientific research, education, and stakeholder participation as means of promoting sustainable development of Puerto Rico's coastal resources.

The Department of Natural and Environmental Resources serves as the lead agency and is responsible for managing the maritime zone, coastal waters, and submerged lands. The Puerto Rico Planning Board serves as the primary agency for managing coastal development. Other Commonwealth agencies that are part of the Coastal Program include the Environmental Quality Board, Regulations and Permits Administration, Department of Recreation and Sports, National Park Company, Department of Agriculture, and Institute of Puerto Rican Culture.





USCRTF Partnership Initiative 2011 Request for Proposals

The National Fish and Wildlife Foundation (NFWF), in partnership with members of the U.S. Coral Reef Task Force (USCRTF), specifically the Natural Resources Conservation Service (NRCS) and National Oceanic and Atmospheric Administration (NOAA), announces the availability of grant funding to build local capacity and support for projects that will help restore natural resources in the Guánica/Rio Loco watershed in Puerto Rico.

The purpose of this solicitation is to cultivate long-term capacity of local stakeholders, raise awareness about watershed issues in the region, and protect and conserve coral reef ecosystems through the implementation of local conservation projects.

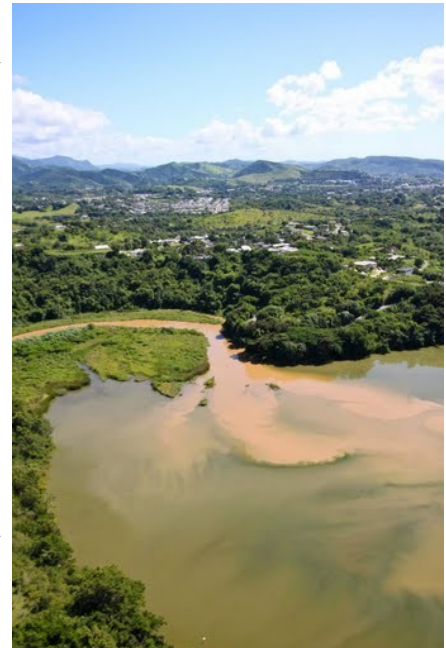
Priority will be given to proposals submitted by non-governmental organizations (NGOs) based in Puerto Rico. Other organizations with ideas for projects, such as universities, territorial agencies, individuals, or NGOs based outside of Puerto Rico, should partner with a local NGO to develop and execute their project. Proposals requesting funding for land or easement acquisition, political advocacy, lobbying, or litigation will not be considered.

The most competitive projects under this request for proposals will be those that build long term organizational capacity for conservation in the watershed and engage community members in actions as described in the Guánica Bay Watershed Management Plan, or other actions identified by stakeholders as important to reducing land-based sources of pollution and improving health of reefs in and near the bay. These include but are not limited to projects that will decrease sediment and nutrient run-off from agriculture, exposed soil, urban areas, and sewage systems. Priority categories of projects include, but are not limited to:

- On-the-ground restoration to reduce runoff of contaminated water and improve water quality;
- Non-governmental institutional capacity building for long term watershed protection; and,
- Awareness building and incentives for increasing environmental stewardship within the watershed through engagement of local businesses and communities

The majority of awards under this program will fall in the range of \$10,000 to \$60,000. Matching funds from non-U.S. federal sources are encouraged but not required. Projects may extend from 12-18 months.

For more details on the RFP, please visit www.nfwf.org/coralreefs and click on the link “Coral Conservation Funding Opportunities” under “Application Information”. For further information on the program or completing the application, please contact Erin Duggan (202-857-0166) / erin.duggan@nfwf.org or Michelle Pico (262-567-0601) / pico@nfwf.org.



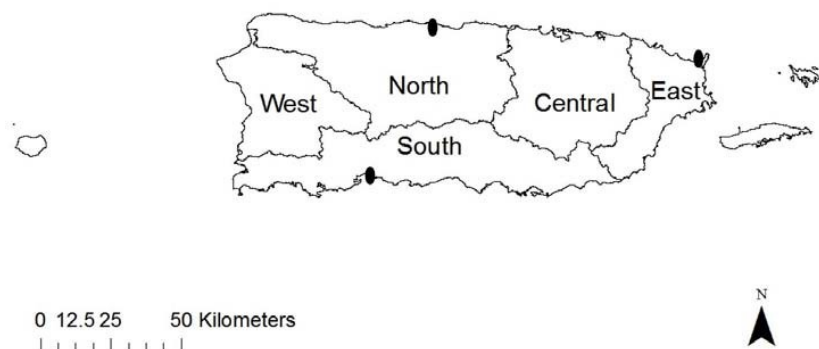
Unusually High Tides Observed in May

Tides are the alternating rise and fall in sea level with respect to the land, produced by the gravitational forces between the Earth and the moon as well as the Earth and the sun. The height of local tides also can be strongly influenced by the shape of shorelines, and water levels on any given day can vary with the wind or weather. Very high tides occur naturally and are caused when the sun and moon's gravitational pulls reinforce one another. The highest tides of the year are called "King Tides". When the highest tide of the year, the King Tide, occurs in Puerto Rico this October, it will provide an opportunity to witness the impacts of higher water levels and to communicate the message that sea-level rise will cause today's King Tides to become daily high tides in the future.

Recent scientific studies project that global sea-level will rise 3-5 feet by 2100. These new projections, combined with observed trends in vertical land motion, suggest that King Tide water levels will become average high water levels by the 2030s, 2040s, or 2050s. This is expected to intensify flooding of coastal areas, especially during major storm events. Rising sea levels also push coastal beaches inland and increase erosion of coastal areas, endangering homes and other structures built near the shore. Saltwater intrusion into coastal freshwater aquifers is also expected as sea levels rise. Sea-level rise impacts should be considered when investing in roads, sewers, and other infrastructure, developing homes and businesses, and restoring natural areas.

As part of the EPA King Tide campaign, environmental groups and government agencies throughout Puerto Rico are photographing these high tides. The initiative will help communities and policymakers to visualize projected flooding, and inspire them to take action to protect homes, harbors, shoreline treatment plants, and other key infrastructure, beaches, wetlands, and public access to the coast.

Higher than normal tides occurred May 18-19, providing an opportunity for the Conservation Trust of Puerto Rico (CTPR) to participate in the King Tide Campaign. The CTPR took photographs to show the change in the high tide mark on the beach of three regions of Puerto Rico. They also took actual measurements in the North region.



Map of Puerto Rico showing the five regions of the Conservation Trust of Puerto Rico and the points where information was collected on high tides during the month of May 2011.

In the North region Juliann Rosado Pagán, Belén Rosado Casanova, and Karen Bunce Rodríguez collected information at five points along different beaches within the property, Hacienda de Esperanza. At each point measurements were taken from the edge of the water (low tide mark) to the high tide mark. The predictions according to NOAA for tide height were 1.9 ft. Actual distances between the low tide mark and the high tide ranged from 7.3 ft to 37.5 ft!

In the South region Jose Silva took photographs on the beach at Punta Ballena. A stick with blue flagging marked the water level at high tide. High tide according to NOAA was predicted to increase by 0.7 ft. No significant differences in the high tide mark were observed at Punta Ballena.

In the East region Elizabeth Padilla took photographs at two beaches, Playa Redonel and Pasesos de Pescadores. The Predicted high tide according to NOAA was 1.9 ft. Significant differences in tide level were clearly observed (see photo), but not measured.



Punta Manati. There was a difference of 14.5 ft. on May 18.



Punta Ballena. Stick with blue flag marks high tide level.



Playa Redonel. Arrows show normal high tide and high tide on May 18.



Paseso Pescadores. Arrows show normal high tide and high tide on May 18.

Apps for the Environment Challenge

The U.S. Environmental Protection Agency (EPA) is announcing its “Apps for the Environment” challenge to encourage the development of innovative environmental applications for people and communities. The challenge invites the information technology community to create applications that help people make informed decisions about environmental issues that can affect their health. EPA is engaging students, colleges and universities, and developers across the U.S. to develop and submit an app.

The challenge is a step towards a longer term objective of engaging developers and raising awareness about the availability and usefulness of EPA’s data. Applications for the challenge must use EPA’s data and be accessible via the web or a mobile device. Submissions are due by September 16, 2011. EPA experts will select finalists and winning submissions based their usefulness, innovation, and ability to address one or more of EPA Administrator Lisa P. Jackson’s seven priorities for EPA’s future. In addition, the public will be able to vote for a “People’s Choice” winner. Winners will receive recognition from EPA on the agency’s website and at an event in Washington, D.C. in the fall, where they’ll be able to present their apps to senior EPA officials and other interested parties.

More information on the challenge: <http://www.epa.gov/appsfortheenvironment/>

NOAA in the Caribbean Meeting

NOAA’s Southeast and Caribbean Regional Team (SECART) initiated NOAA in the Caribbean (NinCarib) as a forum to improve communication and coordination among NOAA and its partners working in the Caribbean region. Through a “Town Hall” meeting on February 16, 2011, during the American Society for Limnology and Oceanography (now Association for the Sciences of Limnology and Oceanography, ASLO) meeting in San Juan, Puerto Rico, the SECART Caribbean Working Group presented the objectives of NinCarib to a diverse group of NOAA employees and potential partners currently active in research, management, training, and/or other efforts in the Caribbean. The goal was to stimulate interest and invite participation in NinCarib. The meeting was attended by 46 people, who engaged with members of the SECART Caribbean Working Group and other NOAA non-SECART members to make recommendations for moving forward with the initiative. For more information, contact Dr. Lisamarie Carrubba, phone: 787-851-3700; email

Lisamarie.Carrubba@noaa.gov.



Recently Added to the ESC

Oliver LM, Lehrter JC, Fisher WS. 2011. Relating landscape development intensity to coral reef condition in the watersheds of St. Croix, US Virgin Islands. *Marine Ecology Progress Series* **427**: 293–302. Land-based sources of pollution are a major threat to the health of coral reefs. The article reports a study that relates coral reef condition to human modifications of the landscape. Stony coral community richness, cover, colony size, and density were assessed along with 3-dimensional coral cover in the near-shore waters of St. Croix, US Virgin Islands, in 2006 and 2007. Land use/land cover data (LULC, 2.4 m resolution) and a landscape development intensity (LDI) index, an indicator of human activity calculated from the LULC data, were used to explore relationships with coral indicators. The LDI index was more robust than other indicators of human activity, exhibiting negative correlations with stony coral colony density, taxa richness, colony size, and total coral cover. High variability observed in coral density and taxa richness was better explained when percent natural land and average coral station depth were considered along with the LDI index. Percent impervious surface in the watershed was negatively correlated with 1 coral condition indicator, total coral cover. The LDI index is an effective landscape indicator of human impact on St. Croix corals, highlighting the link between land-based human activity and marine ecosystems. Further development of this tool will aid in land use planning and prioritization of conservation efforts. ESC Folder: Reading Room/Land-Based Sources of Pollution. (contact: Leah Oliver, oliver.leah@epa.gov).

Mora C, Aburto-Oropeza O, Ayala Bocos A, Ayotte PM, Banks S, Bauman AG, Beger M, Bessudo S, Booth DJ, Brokovich E, Brooks A, Chabanet P, Cinner JE, Cortés J, Cruz-Motta JJ, Magaña AC, DeMartini EE, Edgar GJ, Feary DA, Ferse SCA, Friedlander AM, Gaston KJ, Gough C, Graham NAJ, Green A, Guzman H, Hardt M, Kulbicki M, Letourneur Y, López Pérez A, Loreau M, Loya Y, Martinez C, Mascareñas-Osorio I, Morove T, Nadon MO, Nakamura Y, Paredes G, Polunin NVC, Pratchett MS, Reyes Bonilla H, Rivera F, Sala E, Sandin SA, Soler G, Stuart-Smith R, Tessier E, Tittensor DP, Tupper M, Usseglio P, Vigliola L, Wantiez L, Williams I, Wilson SK and Zapata FA. 2011. Global Human Footprint on the Linkage between Biodiversity and Ecosystem Functioning in Reef Fishes. *PLoS Biology* 9(4):e1000606. Using a global survey of reef fish assemblages, the authors show that in contrast to previous theoretical and experimental studies, ecosystem functioning (as measured by standing biomass) scales in a non-saturating manner with biodiversity (as measured by species and functional richness) in this ecosystem. They also report a significant and negative interaction between human population density and biodiversity on ecosystem functioning (i.e., for the same human density there were larger reductions in standing biomass at more diverse reefs). Human effects were found to be related to fishing, coastal development, and land use stressors, and currently affect over 75% of the world's coral reefs. Their results indicate that the consequences of biodiversity loss in coral reefs have been considerably underestimated based on existing knowledge and that reef fish assemblages, particularly the most diverse, are greatly vulnerable to the expansion and intensity of anthropogenic stressors in coastal areas. ESC Folder: Reading Room. (contact: cmora@dal.ca).

Wongbusarakum S. and Loper C. 2011. *Indicators to assess community-level social vulnerability to climate change: An addendum to SocMon and SEM-Pasifika regional socioeconomic monitoring guidelines.* The purpose of this addendum is to provide a minimum set of socioeconomic indicators related to climate change. These can be included in a socioeconomic assessment of any site for which climate change impacts are an important issue. The resulting information can then inform coastal management needs and adaptive management. This document is being added to regional socioeconomic monitoring guidelines produced by the Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon)¹ and its Pacific counterpart, SEM-Pasifika, which aim to improve site management of coastal and marine areas by providing simple, user-friendly guidelines on how to conduct a socioeconomic assessment. Such assessments help coastal managers incorporate community views into adaptive management of marine resources. ESC Folder: Reading Room. (contact: Christy Loper, christy.loper@noaa.gov).

New Study Finds Highly Diverse Reef Fish Systems Most Vulnerable to Human Threats

Human activities -- fishing, coastal development, pollution and tourism -- are known to adversely impact coral reef diversity. But a new study has shown that the most diverse reef fish ecosystems suffer the greatest impairments from stressors triggered by human populations.

In one of the largest-scale analyses of coral reef fish data and of human influence completed to date, 55 researchers gathered data from nearly 2000 coral reef sites. At each site they documented fish species' weight, size and abundance, enabling them to calculate the cumulative weight of individual reefs (standing biomass) and compare the results against demographic data. The goal of the study was to determine whether biodiversity influences the efficiency of coral reef fish systems to produce biomass and to link production of coral reef fish biomass with human population density.

In the resulting collaborative analysis, "Global Human Footprint on the Linkage between Biodiversity and Ecosystem Functioning in Reef Fishes," published in the journal *PLoS Biology*, the scientists demonstrated that the ability of reef fish systems to produce goods and services to humanity increases rapidly with the number of species. However, growing human populations hamper the ability of coral reefs to function normally, and the results of the global survey suggest that biodiversity loss in diverse coral reef areas has been considerably underestimated.

The study documented that the extent of this distress is widespread and likely to worsen because 75% of the world's reefs are near human settlements and because about 82% of the tropical countries with coral reefs could double their human populations within the next 50 to 100 years. According to lead author, Camilo Mora, coral reef ecosystems "work much better if they have more biodiversity. Every single species has a unique contribution to how well an ecosystem functions".



Photo taken by Thomas Vignaud

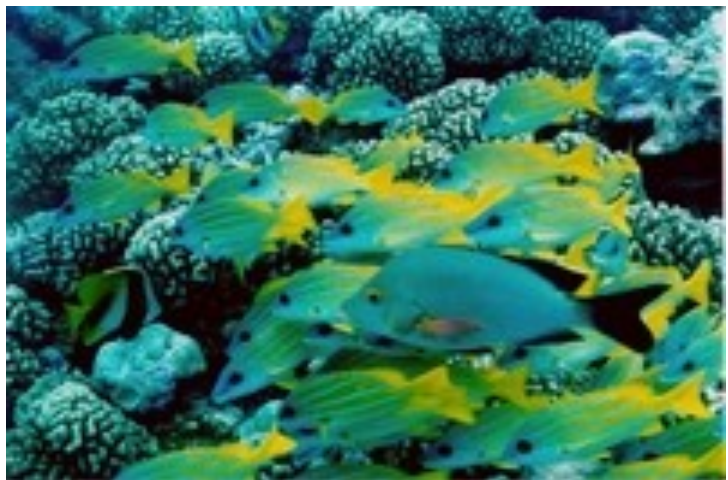


Photo taken by Andrew Brooks

Field Mission Supports Mapping of Coral Reef Ecosystems in SW Puerto Rico



Seagrass bed abutting a coastal mangrove forest in Southwest PR

Scientists with the National Centers for Coastal Ocean Science traveled to Puerto Rico to collect ground validation data in support of mapping of shallow water benthic habitats (<30m) from March 14-22. The new shallow-water benthic habitat maps will encompass southwest Puerto Rico from Guánica Bay to Cabo Rojo, as well as the Belvedere Natural Reserve on the west coast. The ground validation data collected during the field mission will be used to improve map generation. A combination of drop-camera video and digital pictures was collected at over 500 locations within the two study areas. This work builds on previous digital maps developed by NOAA in 1999. Improvements include a reduced

minimum mapping unit, a refined classification scheme and increased coverage into areas formerly classified as unknown. Benthic habitat features in the map were defined based on multiple attributes, including their geographic location, geomorphological structure type, and dominant biological cover.

The new benthic habitat maps will be included in a baseline assessment of the ecological resources of Guánica Bay and the surrounding ecosystem. This project represents a core component of a larger collaborative effort to restore the Guánica Bay watershed and improve the condition of the neighboring coral reef ecosystem. The project is a multi-disciplinary effort with numerous federal and territorial partners, including the CRCP, NOAA's Restoration Center, and the Center for Watershed Protection. The co-led CCMA/University of Puerto Rico component of this effort includes a baseline assessment of biological resources (fish, corals and seagrass), chemical contaminants, nutrients and sedimentation rates, prior to proposed watershed restoration activities.

The new benthic habitat maps will enable change detection in an assessment of the effectiveness of restoration activities on the condition of adjacent coral reef ecosystems. All maps, a satellite imagery mosaic, underwater video, and associated data will be made available online in late 2011.

For additional information, contact Laurie.Bauer@noaa.gov.



This *Porites porites* field on a shallow back reef in southwest Puerto Rico was documented by divers during the March survey

Hollings Scholars

The NOAA Fisheries Caribbean Field Office is hosting two NOAA Hollings Scholars during the months of June and July. Julianne Beblo will be working on a project to analyze fishing, boating, and other impacts to sea turtles in Puerto Rico based on stranding data and correlating these data with nesting data to determine high risk areas for sea turtles around the island in cooperation with the Puerto Rico Department of Natural and Environmental Resources. The information will be used



Julianne Beblo

to draft educational materials for boaters, fishers, and developers and to educate these stakeholders regarding measures to reduce impacts to sea turtles. Kaylan Gee will be working on a project to draft educational materials aimed at farmers and developers, in partnership with NRCS and the U.S. Fish and Wildlife Service, to promote stream conservation practices aimed at reducing downstream sediment transport, including appropriate road crossings and bank stabilization measures.

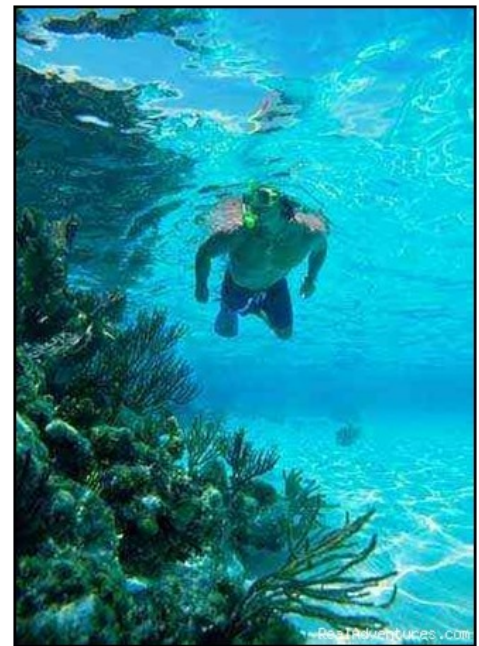


Kaylan Gee

Building Healthy Communities and Sustainable Communities

The Building Healthy Communities for Active Aging awards recognizes communities that have excelled in strategies, planning and programs that support active aging and smart growth. The Achievement Award, the top honor, is awarded to communities for overall excellence in building healthy communities for active aging. The Commitment Award recognizes communities that have developed and begun to initiate a specific plan to implement smart growth and active aging principles.

Communities self nominate for the award. A panel of judges selects the winners each year. Applications for 5th annual Building Healthy Communities for Active Aging the 2011 are due July 11, 2011. For more information see <http://www.epa.gov/aging/bhc/awards/2010/index.html>



Submit updates to:

Patricia Bradley
bradley.patricia@epa.gov
305-809-4690