

# **SOUTHEAST FLORIDA COASTAL OCEAN TASK FORCE FINAL RECOMMENDATIONS REPORT**

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## **EXECUTIVE SUMMARY**

The Southeast Florida Coastal Ocean Task Force (COTF) was established in 2012 through enabling resolutions of the Boards of County Commissioners of Miami-Dade, Broward, Palm Beach, and Martin Counties. The Task Force was charged with providing recommendations for coastal ocean resources and conservation priorities and strategies. This was in response to a call by the National Ocean Council Governance and Coordinating Committee for “Showcase Opportunities” that demonstrate the value of the National Ocean Policy.

The Task Force recognized that coastal marine resources protection is often conducted in a piecemeal fashion. Fisheries are managed by state resources agencies within their jurisdiction and fisheries management councils in federal waters. Often, this does not mesh with local efforts to protect habitats and marine communities. Combining these into an ecosystem-based approach where all levels of resources management and regulation work together would be a more efficient use of resources and provide for wider expertise and regulatory authority.

One answer to this challenge was to form an intergovernmental body, comprised of county and city officials, as well as, key stakeholders who would become educated on coastal marine resources in southeast Florida, review conservation measures implemented to date, and provide conservation recommendations. The context of the critical review would be for implementation feasibility and likelihood for success, impacts to local communities (environmental and economic), and perspectives of member communities.

The membership of the COTF includes county commissioners from Martin, southward, through Miami-Dade Counties (1 ea); three coastal city commissioners from each of Palm Beach through Miami-Dade and 1 city commissioner from Martin counties; representatives from the Florida Department of Environmental Protection (DEP), the Florida Fish and Wildlife Conservation Commission (FWCC), the National Oceanic and Atmospheric Administration (NOAA); and stakeholders representing recreational fishers, commercial ports, the dive charter industry, and the marine industry. Meetings were held monthly and the final recommendations were approved on June 11, 2015. It is hoped that affected counties and cities will endorse these recommendations by resolution of their governing body.

The COTF voted to approve a follow-up group of members wishing to work toward implementation of these recommendations. The follow-up group elected to call themselves the Southeast Florida Coastal Ocean Forum (COF). This document is intended to be dynamic in that it will be amended in the future to include accomplishments of the COF and updates to progress on implementation of the recommendations herein.

## Coastal Ocean Task Force Recommendations

Recommendation	Implementing Authority	Time frame
<b>I. General Recommendations</b>		
1. Apply to the appropriate government agencies to develop a holistic management plan for the southeast Florida coastal waters. The plan shall include stakeholder input and address measures to maximize water quality, improve fisheries, and minimize the impacts of coastal construction.	NOAA, FDEP	Mid-term
2. The Task Force encourages a collaborative effort by interested parties to further the implementation of the recommendations endorsed by the Task Force.	COTF	immediate
3. The Coastal Ocean Task Force opposes offshore oil drilling on the Florida coast.	BOEM, USFWS, Local govt.	ongoing
<b>II. Water Quality.</b> Address issues concerning water quality impacts to the reef by developing regional initiatives to reduce nutrient loading from all human sources and pathways, including surface water management (Comprehensive Everglades Restoration Plan [CERP] and Central Everglades Planning Project [CEPP]), septic systems and ocean outfall discharges (e.g., advanced treatment), to improve conditions for estuarine and marine habitats.		
1. Stormwater treatment		
i. The COTF encourages the construction of additional water storage reservoirs, stormwater treatment areas, flow equalization basins, and use of appropriate technologies to reduce nutrient levels before release of freshwater to southeast Florida estuaries and to modulate salinity changes in those estuaries.	SFWMD, FDEP, USACE	ongoing
2. Wastewater		

	<ul style="list-style-type: none"> <li>i. Update and replace wastewater infrastructure where necessary to improve surface and groundwater quality.</li> <li>ii. Replace all septic systems with common sewer hookups to prevent the addition of contaminated sewage and nutrients to groundwater.</li> <li>iii. Reduce the discharge of treated domestic wastewater into the ocean and build infrastructure for advanced water treatment and reuse to improve ocean water quality, reduce destructive algal blooms, and increase water reuse.</li> <li>iv. Promote the development and enactment of strategies and initiatives to reduce the current and future demand on wastewater infrastructure, including, but not limited to, utilization of more efficient fixtures and appliances and reclaiming and reusing gray water when feasible.</li> </ul>	cities and counties	Ongoing
3. Water flow and estuaries			
	<ul style="list-style-type: none"> <li>i. Support restoration of historical/natural “Everglades” water flow to minimize pulses of freshwater and protect marine ecosystems from poor water quality (nutrients).</li> <li>ii. Enhance existing estuaries and restore potential estuarine areas to support coral reef ecosystem function.</li> <li>iii. Restore and create estuarine habitats and redirect historical freshwater flows to increase habitat, improve water quality, and support nursery area for reef fauna.</li> <li>iv. Support incentives and initiatives to restore and preserve wetlands north of Lake Okeechobee to reduce discharges to coastal estuaries to protect estuaries and reefs.</li> <li>v. Identify point-source inputs into estuaries and retrofit them as needed to reduce pollutant loadings to restore healthy estuaries.</li> <li>vi. Direct funds from the water and land legacy amendment toward land acquisition and/or projects that will help preserve and restore coastal/wetland habitats to benefit coral reefs and water quality.</li> </ul>	cities and counties, SFWMD, FDEP, USACE	ongoing
4. Nutrient pollution			

	<ul style="list-style-type: none"> <li>i. Develop/improve water quality monitoring to include inlet discharges and offshore reef areas to track stormwater on reef and improve water quality</li> <li>ii. Develop mass balance for water going to tide to help prioritize effective management actions and make informed management decisions.</li> </ul>	State, Counties, FDEP, NOAA, USACE	ongoing
	5. Groundwater		
	<ul style="list-style-type: none"> <li>i. Enact a Florida Aquifer Protection Act that establishes guidelines to regulate pollutants introduced into the aquifer.</li> <li>ii. Reduce ground water pollution in targeted watersheds associated with priority reef areas to improve water quality and reef health.</li> </ul>	FDEP, local govt.	ongoing
	6. Boating		
	<ul style="list-style-type: none"> <li>i. Improve sewage and solid waste disposal services at marinas, including recycling, to minimize overboard discharges into water bodies.</li> <li>ii. Promote free pump-out stations to encourage boaters use these services and minimize overboard discharges.</li> <li>iii. Promote southeast Florida coral reef awareness and education and coral-specific boater and marina BMPs to augment Clean Marina Programs</li> <li>iv. Encourage development of less toxic marine products for boat maintenance and construction</li> </ul>	cities and Counties, Marine Industry	Short term, ongoing
	7. Yards, gardens, and golf courses		

	<ul style="list-style-type: none"> <li>i. Discourage lawn fertilizing during the rainy season and limit the types of fertilizer that can be sold to the public to reduce elevated nutrient levels in canals, rivers, lakes and estuaries.</li> <li>ii. Promote the use of environmentally friendly fertilizers, weed killers, and insecticides to reduce or eliminate toxic chemicals from entering bays, estuaries, and oceans through storm runoff.</li> <li>iii. Reduce yard clippings and other yard waste from entering water bodies to reduce nutrients in estuarine habitats.</li> <li>iv. Promote community compost programs where people can take their organic wastes for composting and receive free compost to reduce the use of inorganic fertilizer.</li> <li>v. Promote existing “rain garden” programs to relevant landowners to reduce contaminated rainwater runoff.</li> <li>vi. Develop and implement a “Green Club” certification program for golf courses (similar to Blue Star for dive industry and clean marina programs) to provide an incentive mechanism for golf courses to reduce their impact on the marine environment.</li> <li>vii. Provide incentives for land owners who convert to “ocean friendly” landscaping, especially the conversion of golf courses and lawns to a native Paspalum turf varieties to reduce pollutants to reefs and conserve water</li> </ul>	cities and counties	ongoing
	8. Public education		
	<ul style="list-style-type: none"> <li>i. Educate the public on the effects of land-based sources of pollution to reduce the amount of pollutants entering storm drains and waterways.</li> </ul>	cities and counties	Short term, ongoing
<b>III. Beaches</b>			
	1. FDEP shall encourage local communities to manage beaches in a regional context, such as the Palm Beach County Beach Management Agreement (BMA). Inlet management should be included in a regional approach to sand management for beaches.	cities and counties	ongoing
	<ul style="list-style-type: none"> <li>i. Inlet sand bypassing - Seek Congressional authorization and direction to require the USACE to share in the cost of design, construction, and operation of inlet sand by-passing systems at federally maintained navigation inlets.</li> </ul>	FDEP, cities and counties	Short to medium term

	<p>2. Modify federal agreements for inlet maintenance to recognize the importance of regional sediment management, and require placement of beach quality sand on adjacent impacted beaches.</p>	<p>USACE, FDEP, and counties</p>	<p>Short to medium term</p>
	<p>3. Beach Nourishment</p>		
	<ul style="list-style-type: none"> <li>i. Standardize input parameters for HEA (Habitat Equivalency Analysis) and UMAM (Uniform Mitigation Assessment Method) for coral reef environments to improve application of this rule to coastal ecosystems, to provide more consistent/accurate calculations, and to ensure ecological functions are maintained.</li> <li>ii. Modify federal agreements to allow General Reevaluation Reports (GRR) for beach nourishment, as required by the USACE, to remain valid for the life of the project (50 years) unless major substantive changes are made to the federal project.</li> <li>iii. Improve methods of offshore sediment dredging for beach nourishment to reduce muddy runoff turbidity and sediment stress on corals, eliminate damage from dredging “accidents,” and enhance sea turtle nesting beaches.</li> <li>iv. Consider alternatives to domestic sand, including use of sand from international sand sources.</li> <li>v. Encourage the use of recycled glass, if economically feasible, as a source of beach fill.</li> </ul>	<p>USACE, FDEP, cities and counties</p>	<p>long term</p>
	<p>4. Coastal construction.</p>		

	<ul style="list-style-type: none"> <li>i. Set new and appropriate water turbidity standards for marine construction to limit damage to reefs and associated habitats from coastal construction projects.</li> <li>ii. Create/enhance a “LEED”-like certification program for coastal construction companies and projects, as well as individuals working in the industry, to encourage smart development and best practices for coastal construction.</li> <li>iii. Revise the coastal permitting process to restrict or limit development and coastal construction projects during periods when corals are more susceptible to impacts (e.g. bleaching, spawning, other disturbance events) to reduce cumulative impacts to reefs.</li> <li>iv. Ensure that coastal construction permits contain best management and permitting practices and use available resources to educate contractors, consultants etc., on the importance and value of our reef systems. If impacts to reefs are expected to occur, understand and account for the direct and indirect impacts</li> </ul>	FDEP	Medium term
	5. Beach raking		
	<ul style="list-style-type: none"> <li>i. Reduce negative impacts from beach raking/cleanup practices to minimize negative impacts to the beach ecosystem by limiting mechanical beach raking to high public use beaches and eliminated raking in front of lower density residential properties.</li> <li>ii. Educate property owners on the ecological importance of the beach’s wrack line and the habitat and food sources that it provides to the beach ecosystem.</li> </ul>	cities and counties	short to medium term
	6. Shoreline Development		

	<ul style="list-style-type: none"> <li>i. Eliminate coastal storm water runoff to beaches to eliminate loses of sand due to scouring.</li> <li>ii. Promote land acquisition by the state and local governments to limit shoreline industry and maintain coastal wetlands to protect mangroves and coral reefs.</li> <li>iii. Increase and protect public access for sustainable use of coastal resources to increase appreciation of reef resources (and their value) by the general public.</li> <li>iv. Evaluate and enforce lighting regulations to make sure they are effectively protecting sea turtles</li> <li>v. Include consideration of sea level rise in revisions of Florida’s coastal construction control line (CCCL).</li> <li>vi. Eliminate/discourage government subsidies/funds to rebuild habitable storm-damaged structures near coast and estuarine shorelines.</li> <li>vii. Coordinate regional “living shoreline” objectives to promote the use and protection of natural infrastructure (e.g. coral reefs, native vegetation, mangroves, and wetlands) to provide natural barriers to storm surge and maintain coastal biodiversity.</li> </ul>	<p>cities and counties, FDEP, FEMA</p>	<p>ongoing</p>
<b>IV. Fisheries</b>			
	<p>1. Work with the Florida Fish and Wildlife Conservation Commission and consult with NOAA, academics and others as appropriate to promote the recovery of reef organisms, including reef fish, coral, and related species by using appropriate available tools and incorporate assessment monitoring to evaluate the success of these activities. Tools can include, but are not limited to bag limits, size limits, seasonal closures, special use areas, no-take areas. Additional guidance may also be provided by the recommendations of the Our Florida Reefs working groups.</p>	<p>FWCC, FDEP, NOAA, stakeholders</p>	<p>ongoing</p>
	<p>2. Consideration of forage fish should be included in fisheries management plans</p>	<p>FWCC, SAFMC</p>	<p>ongoing</p>
	<p>3. Encourage fisheries managers to provide special protection for fish spawning aggregations.</p>	<p>FWCC, SAFMC</p>	<p>ongoing</p>
<b>V. Coral Reefs</b>			
	<p>1. Encourage the State Legislature to mandate the incorporation of best permitting management practices</p>	<p>FDEP, State Legislature</p>	<p>ongoing</p>

	(BMP) for coral reef ecosystem protection in coastal construction permits.		
	2. Develop a best management practice for the dive industry	DEMA	Short term
	<ul style="list-style-type: none"> <li>i. Encourage dive charter operators provide a substantive pre-dive briefing on awareness, etiquette and low-impact techniques.</li> <li>ii. Discourage the use of gloves (If diver’s hands are bare, they are less likely to touch coral); emphasize buoyancy control and “fin awareness” during diver training and practice; teach new divers the “fins up” diving position; encourage divers to descend over sand, and, when possible, take this into consideration in siting mooring buoys; encourage in-water supervision of divers and overtly correct inappropriate diver behavior; consider using environmental success stories in advertising campaigns; encourage dive tour operators to invest in professional development dive guides.</li> <li>iii. Consider implementing a program like the Florida Keys National Marine Sanctuary (FKNMS) Blue Star Program and appoint a Northern Reef Tract diver education committee to develop a “Blue Star” like program with a dive shop certification in the four-county area.</li> </ul>		
	3. Support renewal of the Coral Reef Conservation Act of 2000 in Congress.	stakeholders	Short term
	4. Promote measures to minimize or eliminate anchoring on coral reefs by small boats.	FDEP, FWCC	ongoing
	<ul style="list-style-type: none"> <li>i. Encourage the use and funding of small boat moorings and education of anchoring and its impacts on reefs.</li> <li>ii. Create enforceable, temporary anchor zones during marine events to minimize impacts to hardbottom resources.</li> </ul>		
	5. Promote science-based, goal-oriented artificial reefs, using appropriate materials, for inshore and offshore waters; streamline the permitting process; and encourage expanded funding for artificial reef projects.	FDEP, FWCC, USACE	ongoing
<b>VI. Estuaries</b>			
	1. Manage muck sediments on both the freshwater and estuarine sides of estuaries to prevent them from entering coastal waters.	cities and counties, FDEP, USACE	ongoing

	2. Place a priority on restoration of shallow-water estuarine habitats and locate restoration projects strategically to improve connectivity among habitats.	FDEP, USACE, NOAA, cities and counties	ongoing
<b>VII. Socioeconomics</b>			
	1. Update the 2001 Socio-economic study of coral reefs in southeast Florida and expand the scope to include beaches.	FDEP, FWCC, NOAA, cities and counties	Short term
	i. Encourage valuation and consideration of ecosystem services in determining benefit/cost ratios as part of local, state, and federal project planning and land use decisions.	USACE	
	ii. Encourage members of the Task Force to work collaboratively to identify and target all possible funding sources to support work necessary to document the value of the Southeast Florida marine ecosystem, based on socioeconomic and use pattern studies, and use that information in a public awareness campaign to 1) increase public support for marine conservation, 2) change individual behavior/reduce impacts, 3) inform state, local and federal project planning 4) provide a real basis for impact assessment and 5) provide information to leverage county, state, and federal organizations for increased funding.	NOAA, FDEP, counties, private industries	ongoing
<b>VIII. Marine Debris</b>			
	1. Provide trash and recycling containers at beach entrances.	FDEP, cities and counties	ongoing
	2. Solid waste	FDEP, cities and counties	ongoing
	i. Cigarette litter		
	a) Promote the placement of visible cigarette receptacles at beach public access points. b) Work with Florida legislature and local municipalities to implement smoking bans on beaches, yet provide for designated smoking areas. c) Increase shoreline cleanup efforts.		
	ii. Straws/Stirrers, plastic utensils, plastic food-ware		

	<ul style="list-style-type: none"> <li>a) Work with beachside restaurants and businesses to limit single use plastics and switch to compostable or reusable alternatives.</li> <li>b) Follow the model set by Miami Beach and ban plastic straws from beachside use.</li> </ul>	FDEP, State Legislature, cities and counties	
	iii. Expanded Polystyrene Foam (EPS)		
	<ul style="list-style-type: none"> <li>a) Ban use of EPS foam food ware at all beachside establishments.</li> <li>b) Ban use of EPS foam coolers on beaches.</li> <li>c) Expand EPS foam food ware bans on beaches to cover coastal counties in the region.</li> </ul>		
	iv. Plastic, glass and recyclables.		
	<ul style="list-style-type: none"> <li>a) Encourage the placement of visible recycling receptacles at public access points, dune crossovers and popular beach sites.</li> <li>b) Encourage frequent recyclable pick up and mandate additional pickup after special events or large beach holidays (e.g., 4th of July, Labor Day, etc.).</li> <li>c) Work with Florida Legislature and municipalities to create a statewide “bottle bill” or container deposit law.</li> </ul>		
	v. Plastic bags		
	Encourage local municipalities to adopt “voluntary bag bans”, encouraging businesses to use only reusable bags.		
	3. Boating, Marinas and their Responsibilities	Marine Industry	ongoing

	<ul style="list-style-type: none"> <li>i. Encourage the placement of color-coded, clearly labelled recycling bins with lids on docks for staff and customers.</li> <li>ii. Encourage boaters and fishermen to bring their trash back to the docks for proper disposal.</li> <li>iii. Encourage boaters to set up an onboard system to segregate trash for easy disposal and recycling on shore.</li> <li>iv. Reduce the amount and impacts of derelict fishing gear by collaborating with the fishing and recreational industry to develop best practices to minimize the impact of lost gear or gear thrown into the ocean.</li> <li>v. Encourage these industries to develop and adapt educational effective messages about marine debris issues for placement in kiosks on docks.</li> <li>vi. Encourage marinas to offer Educational workshops/classes on marine debris issues to motivate and inspire people to take action at their marinas.</li> <li>vii. Inform the public that they can call the Coast Guard National Response Center at (800) 424-8802 to make a formal report on those who do not comply with the recommendations. Place large signs with this information near the recycling bins on the docks of the marinas.</li> <li>viii. Encourage greater funding of the derelict vessel program by the legislature, as well as streamlining the vessel removal process, if feasible.</li> </ul>		
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Acronyms:

BOEM – Bureau of Ocean Energy Management

Cities – cities in Martin, Palm Beach, Broward, and Miami-Dade counties

Counties - Martin, Palm Beach, Broward, and Miami-Dade counties

COTF – Southeast Florida Coastal Ocean Task Force

EPA – US Environmental Protection Agency

FDEP – Florida Department of Environmental Protection

FEMA – Federal Emergency Management Agency

FWCC – Florida Fish and Wildlife Conservation Commission

NOAA – National Oceanic and Atmospheric Administration

SFWMD – South Florida Water Management District

SAFMC – South Atlantic Fisheries Management Council

USACE – US Army Corps of Engineers

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## **I. INTRODUCTION**

Coastal marine resources are public resources that provide recreational benefits to users and income to local economies. A socioeconomic study of southeast Florida's coral reef resources was carried out in 2000 and 2001 (Johns et al. 2001, available from <http://coastalsocioeconomics.noaa.gov/core/reefs/02-01.pdf>). This survey of recreational reef use demonstrated that, during the survey period, 28 million person-days were spent on the offshore reefs. This provided economic contributions to the region of \$4.4 billion in sales, \$2.0 billion in income, and 71,300 jobs.

Natural resources of such high value are worthy of conservation management, to not only protect this value, but to protect their intrinsic environmental value. Coastal marine resources protection is often conducted in a piecemeal fashion. Fisheries are managed in state waters by state resources agencies and by fisheries management councils in federal waters. Other activities impacting coastal waters may be regulated by multiple local, state, and federal agencies. Often, there is no coordination at the regional level for protection of habitats and marine communities. Combining these into an ecosystem-based approach where all levels of resources management and regulation work together would be a more efficient use of resources and provide for wider expertise and regulatory authority.

An example of this approach is found in the Southeast Florida Coral Reef Initiative (SEFCRI) where staff from all levels of government have come together with stakeholders to develop local action strategies for protection of the reef resources. For the past ten years, SEFCRI has been developing plans to protect and better manage the extensive local resources. A missing component of this collaboration, however, has been the engagement of elected officials. Investment in and maintenance of public resources is a prime function of government and some of the strategies recommended by SEFCRI may require approval by state or local government. The Southeast Florida Coastal Ocean Task Force (COTF) is intended to facilitate implementation of a region-wide coordinated conservation plan by educating elected officials and bringing them into the planning process.

## **II. BACKGROUND**

### **A. Creation of Task Force**

The concept for the Coastal Ocean Task Force originated with Broward County Commissioner Kristin Jacobs (County Mayor at the time) and staff of the Broward Environmental Protection and Community Resilience Division in 2012. Commissioner Jacobs had been appointed to the National Ocean Council's Governance Coordinating Committee, and the Committee solicited proposals for "showcase opportunities" that demonstrated the value of the National Ocean Policy. These projects were intended to support the National Ocean Council efforts to identify near-term deliverables that would contribute to achieving the nine National Priority Objectives.

Letters of invitation were sent to the boards of county commissioners of Martin, Palm Beach, and Miami-Dade Counties to appoint one member from each county. Once these appointments were made, a resolution of support was developed and each county passed the resolution, officially signing on to the COTF (attached as appendices).

The first meeting of the Task Force was held in December 2012 at Nova Southeastern University Oceanographic Center. This was an organizational meeting focusing on election of a Chair and Vice Chair, Commissioners Jacobs and Abrams, respectively, and selection of stakeholder members from letters of interest. An introduction to the basic goals of the COTF and a briefing on applications of

Florida's Sunshine Law were presented. In October, 2014, Commissioner Jacobs, left the Broward County Commissioner and Commissioner Abrams was selected as Chair and Commissioner Haddox, Vice Chair, of the COTF.

## **B. Structure of Task Force**

The original 22-member Southeast Florida Coastal Ocean Task Force was created and convened on a monthly basis in accordance with the terms and conditions established in the enabling resolutions. The Task Force membership (Appendix A) included:

- 1) Four (4) County Commissioners from each of Martin, Palm Beach, Broward, and Miami-Dade Counties, appointed by each Board of County Commissioners;
- 2) Ten (10) policy makers, appointed by the Leagues of Cities, representing north, central, and south coastal cities of each county (due to shoreline length, Martin County had one coastal city member);
- 3) Three (3) resources agency directors or their appointees from NOAA, Florida Department of Environmental Protection, and the Florida Fish and Wildlife Conservation Commission;
- 4) One (1) academic institution representative;
- 5) Six (6) stakeholder group representatives from the marine industry, charter dive industry, recreational fishing, and commercial fishing, environmental organizations, and commercial ports;

Members were given the option of appointing alternates to serve in the place of the primary member in the event of a member absence.

The initial term of the Task Force was established for a period of eighteen (18) months per the enabling resolution; however, the term could be extended at the discretion of a majority of members to allow for adequate consideration of the numerous and complex issues being explored prior to finalizing recommendations as part of the Task Force report.

## **C. Goals**

The goals of the Coastal Ocean Task Force, as stated in the enabling resolutions, were:

- 1) Learn about the accomplishments of the Southeast Coral Reef Conservation Initiative (SEFCRI);
- 2) Review the priorities identified by local, state and federal coral reef managers in southeast Florida in partnership with National Oceanic and Atmospheric Administration's ("NOAA") Coral Reef Conservation Program;
- 3) Consider additional issues relating to coastal resource management and user needs;
- 4) Produce a final report with recommendations for coastal ocean resources and conservation priorities and strategies.

These themes would be recurrent elements of presentations and discussions held as part of Task

Force's deliberations.

#### D. Task Force

The meeting schedule and presentation topics for the Task Force were largely organized by staff from the Broward County Environmental Protection and Community Resilience Division (EPCRD). Task Force member input on order of topics and speakers was included in the schedule. A calendar of activities and subject presentations was developed with an eighteen months' time table as the target for completion of the Task Force report and recommendations. This time table was extended, however, to include breaks for summer and holiday recesses of elected bodies.

In order to provide the Task Force with a comprehensive understanding of the various technical issues, policy decisions, and resource challenges influencing coastal ocean resources and to create a strong foundation for their decision-making, the meeting agendas focused heavily on member education on southeast Florida's coastal resources and issues.

### III. CHALLENGES, ISSUES, AND TECHNICAL BACKGROUND INFORMATION

#### A. Water Quality

Coastal marine resources in southeast Florida are exposed to freshwater discharges from inlets, submerged groundwater discharges (SGD), and offshore disposal of wastewater. These sources deliver, not only freshwater, but pollutants, including nutrients, heavy metals, pharmaceuticals, herbicides and pesticides, and pathogens. Natural upwelling of offshore deep water can also bring nutrients to the coastal waters.

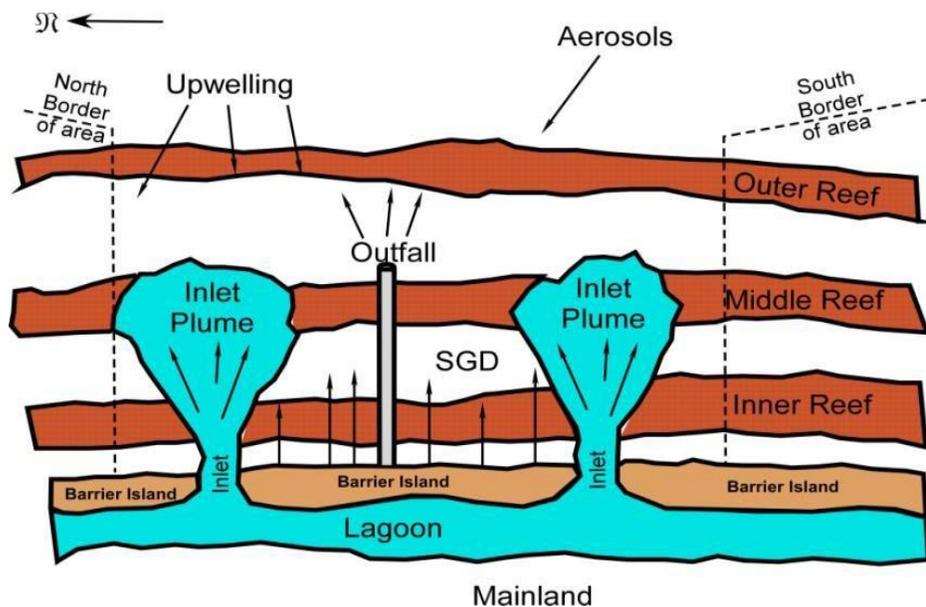


Figure 1. Illustration of sources of pollutants to southeast Florida coastal waters

Many marine organisms are adapted to a narrow range of salinities. This is particularly true for coral reef-associated organisms. Freshwater in the marine environment can result in mortality of organisms or, at reduced levels, can affect metabolic processes and result in stress to the organism. Stress can lead to disease and mortality.

Nutrients include nitrogen (N), phosphorus (P), iron (Fe), and dissolved organic carbon (DOC). Elevated concentrations of N and P, coupled with the loss of herbivorous grazers from overfishing and disease, are responsible for macroalgal blooms. Certain cyanobacteria fix atmospheric N and require Fe for this process so blooms may occur with adequate Fe. Both macroalgal and cyanobacterial blooms can result in death of other reef organisms by dominating available substrate (preventing recruitment of others), shading, oxygen depletion (during decomposition of the algae), and toxin production (cyanobacteria).

Many heavy metals are biologically essential to marine organisms, but they can become toxic if their concentrations exceed threshold values. Elevated concentrations can effect fertilization and larval settlement success.

Pharmaceuticals, such as lotions, fragrances, medications and synthetic hormones are found in wastewater discharges. Although they have not been extensively studied, they are reported to cause tissue thickening, reduced skeletal growth in corals, and reduced fecundity. Human estrogen is biologically active in some organisms and has been found to effect sex ratios in some fishes.

Organic compounds are related to oil spills and may increase mortality and fecundity of some species. Dispersants (used in oil spill response) may exacerbate hydrocarbon effects.

Herbicides and pesticides are widely used and can be introduced into the marine environment through terrestrial runoff and marine antifouling paints. These chemicals and their degradation products can be highly toxic at very low concentrations. Herbicides and pesticides are known to inhibit coral photosynthesis and may cause reduced fertilization success. This may lead to significant changes in community structure.

Human pathogens have been found in coastal waters and in beach sand. These may result in public health risks but also have potential impacts to the environment. Gene transfer between different species of microorganisms has been reported. In other words, harmful genes from human pathogens could be transferred to marine microorganisms, creating new pathogens to humans or marine organisms.

## **B. Beaches**

Beaches are dynamic landscapes valued by humans because they provide critical habitat for plants and animals, opportunities for active and passive recreation, storm protection, and beach-related employment, particularly tourism. Beaches and beach-related tourism activities create over 400,000 jobs and contribute more than \$15 billion dollars to Florida's economy annually (Stronge, 2000; Murley et al., 2003). In Broward County in southeast Florida beaches are estimated to add \$1.4 billion to local property values, increase local economic production by more than \$500 million, and generate almost \$30 million in revenue for the local government (Stronge, 1998a, b). Within this region the beach is a widely used coastal environment by residents and tourists because of proximity to urban areas, easy vehicular

access, and the social and cultural desirability of being by the ocean. Approximately 44% of tourists visiting a Florida beach do so in Southeast Florida.

The primary threats to beach ecosystems include erosion, beach nourishment, shoreline hardening, beach cleaning, pollution, and climate-change. While erosion is a natural process, it has been accelerated by shorefront development in southeast Florida. A study of erosion in Broward County (Olsen Associates, 2010) found a direct correlation between beach erosion rate and the seaward extent of the building development line. Natural beach systems migrate landward and seaward depending on the wave energy environment, i.e., storm conditions can cause a landward migration of the shoreline and calm conditions result in a seaward migration. If the development line is too far seaward sand is lost from the system due to scouring at the toe of seawalls during storm conditions. Shore-perpendicular structures, such as inlet jetties and beach groins, can block the natural southward migration of beach sand, starving downdrift reaches of beach.

Historically, the solutions to beach erosion have been sand nourishment from offshore borrow areas and beach structures, such as groins and seawalls. Beach nourishment is a temporary solution to erosion and must be repeated periodically. It is very expensive and as awareness of its environmental impacts has grown, the costs of mitigation and monitoring have increased substantially. Sources of sand in Miami-Dade and Broward Counties have mostly been depleted as well. Shore-perpendicular structures (groins) can hold sand adequately where they are constructed, but they usually increase erosion to the south, which must be mitigated. Shore-parallel structures, seawalls for example, can accelerate erosion on a narrow beach by wave scouring of sand. Offshore breakwaters are another type of beach structure that is intended to reduce wave energy, but these can also accelerate downdrift beach erosion.

Some counties in southeast Florida are moving away from offshore dredging of sand for beach nourishment because of environmental impacts and permitting difficulties. The most commonly used alternative source of sand is inland sand mines which is transported by truck to the beach. For some beaches, typically beaches in the southern reaches of the northern Florida reef tract, this sand is of more appropriate grain size so potentially results in fewer impacts to the environment. The color is lighter, therefore more appealing to beach users. North of Broward County offshore sand is abundant so alternative sources of beach fill are more expensive than dredging.

Another beach management tool that is becoming more common is the planting of dune vegetation where beach width is adequate. Sand accumulates in this vegetation and becomes an elevated sand dune. Dunes are good for moderating erosion during storm events, but they do not reduce the long term erosion rate.

Dean and Work (1993) and others suggested that most of the erosion on the east coast of Florida is caused by the interruption of the north-to-southward flow of sand (called littoral drift) by inlet jetties. Littoral drift is the natural means of sand replenishment to beaches and any interruption can greatly affect erosion rates. One solution to this problem is inlet sand-bypassing where sand is pumped from the north side of an inlet to the sand side where it can resume its southward flow. It is possible that this bypassed sand could be more strategically used to nourish hotspots downdrift of the inlets rather than just placing it on the south side. Updated inlet management plans should incorporate consideration of better use of bypassed

sand on a regional scale.

In southeast Florida sand transfer systems are in place at North Lake Worth Inlet, South Lake Worth Inlet (Boynton), Boca Raton Inlet, and Hillsboro Inlet. Sand transfer at Port Everglades is in the permitting stage. None of these bypassing facilities is capable of fully mitigating inlet impacts and additional construction projects are required to augment the sand required to achieve this goal. St. Lucie Inlet, because of its extreme width and north/south offset, cannot utilize bypass plants and conducts all bypassing projects through dredge and fill operations.

Maintaining beach width along the southeast Florida shoreline is costly. The federal government through the US Army Corps of Engineers (ACE) and the state through the Department of Environmental Protection have been traditional cost-sharing partners in beach nourishment projects. The recent national economic downturn has placed some of this funding in jeopardy so the sources of future funding are not clear.

### **C. Fisheries**

A substantial portion of Florida's economy is related to fishing. As a result, fish stocks are depleted throughout the state. This impacts commercial fish harvest, revenues related to sport fishing, and tourism. Fish depletion also impacts food chains in marine ecosystems. Most fish species targeted by fisherman are near the top of the food chain and represent a "sink" for carbon and nutrients. These predators also regulate fish and invertebrate populations at lower levels of the food chain. This is important for maintaining biodiversity.

Fishing in state waters (3 mi from shore on east coast; 12 mi on Gulf coast) is regulated by the Florida Fish and Wildlife Conservation Commission (FWCC). The South Atlantic Fishery Management Council regulates fishing in federal waters (from state waters seaward to Exclusive Economic Zone (EEZ) from Charleston to Key West, and The Gulf of Mexico Fishery Management Council regulates fishing in federal waters from Key West to Texas.

Traditionally, fishing has been regulated on a species-level basis through size and catch limits and seasonal restrictions. This concept has been evolving in recent years into an ecosystem level approach by protecting habitat and creating no-take zones (federal waters only), functionally allowing nature to manage fish stocks. The concept of no-take is based on the premise that fish populations will increase in the protected area and spill over into adjacent areas. Fish larvae, which are planktonic, will be carried out of the protected area and possibly supply areas significantly downstream. Removing fishing pressure also allows for larger individuals which produce more eggs than smaller individuals.

### **D. Coral Reefs**

The northern extension of the Florida reef tract and a complex of limestone ridges run parallel to the coastline of southeast Florida. They extend 170 km from the northern border of Biscayne National Park (BNP) in Miami-Dade County to the St. Lucie Inlet in Martin County. The reefs and hardbottom areas in this region support a rich and diverse biological community. Nearshore reef habitats in southeast Florida include hardbottom areas, patch reefs and worm-rock reefs with diverse octocoral, macroalgae, stony coral and sponge assemblages. Offshore, coral reef-associated biological communities occur on ancient reef ridges that extend from Miami-Dade County to Palm Beach County.

The coastal region of southeast Florida is highly developed, containing one third of Florida's population of 16 million people (U.S. Census Bureau, 2006). Many southeast Florida reefs are located just 1.5 km from this urbanized shoreline. As a result, southeast Florida's coral reefs are under a great deal of pressure from human sources, in addition to the natural stresses that occur.

Natural causes of stress include high energy weather events, such as tropical storms and winter cold fronts, and natural sources of nutrient input (upwelling). Storms can stress reefs from enhanced sediment resuspension, increased wave and current energy, increased turbidity which reduces ambient light, increased runoff and water flow through inlets, and direct physical damage to reefs. Storms can be a natural source of pollutants to reefs by inducing upwelling of cold, nutrient-rich deep water. Upwellings can be caused by other natural processes, such as internal waves.

Human-caused stressors to reefs include water pollution, overfishing, physical damage to organisms and substrate, impacts from coastal construction and dredging, land runoff, inlet and wastewater outfall discharges, invasive species, marine debris, and vessel groundings. There are a number of diseases affecting reef organisms, as well. Some have been shown to be exacerbated by stress in the organism.

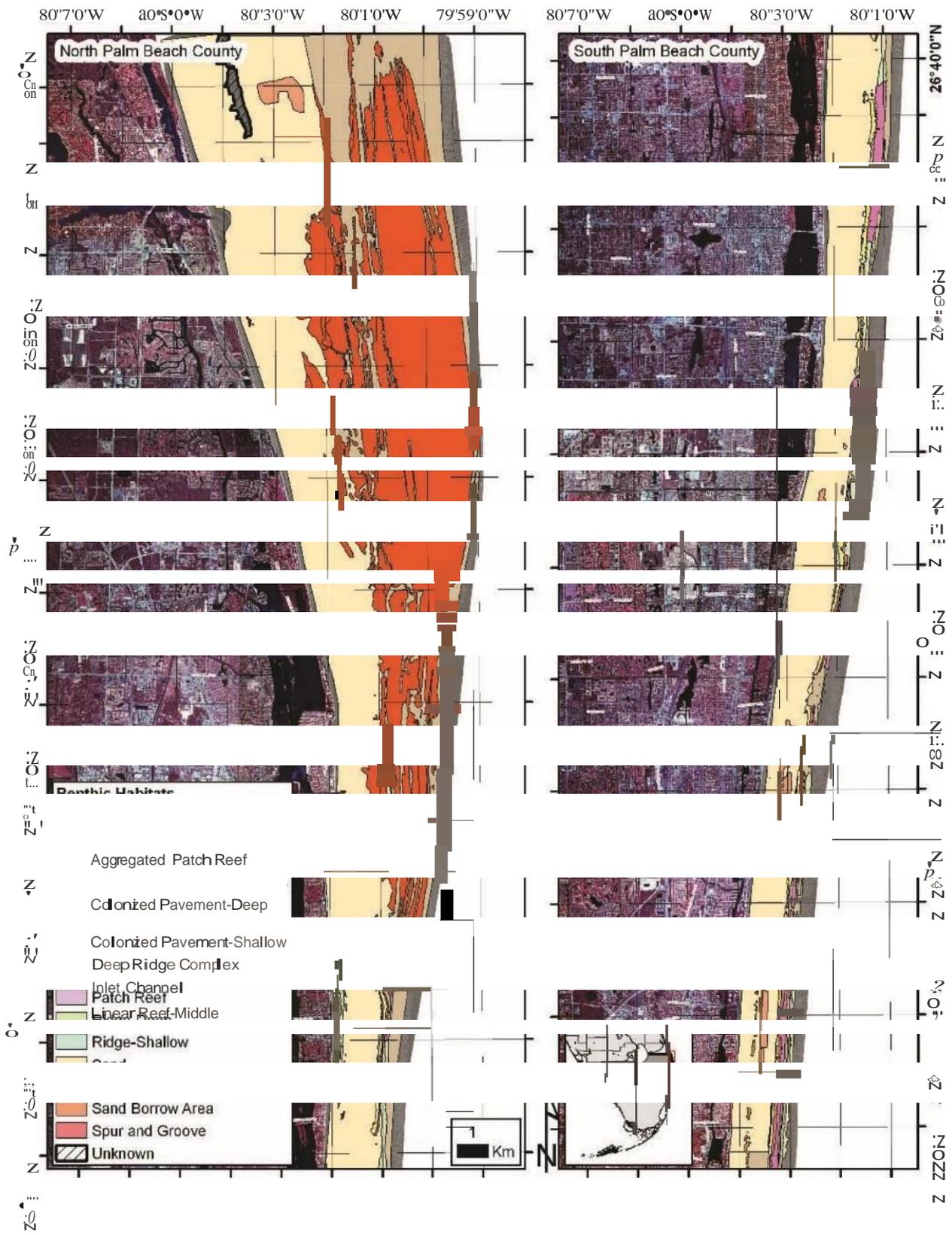


Figure 2. Habitat maps of the reefs offshore Martin and Palm Beach County (Banks et al. 2008)

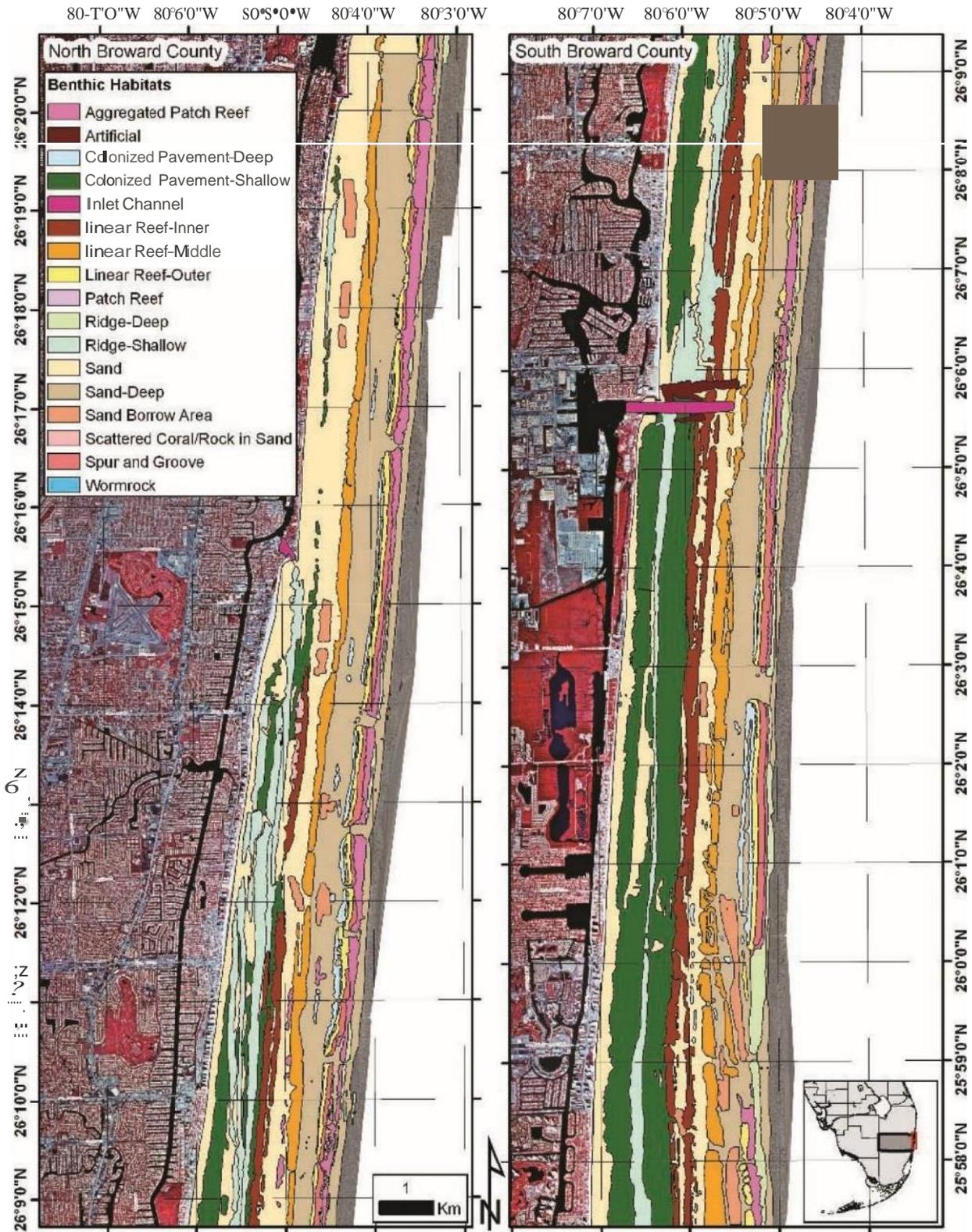


Figure 3. Habitat maps of the reefs offshore Broward County (Banks et al. 2008)

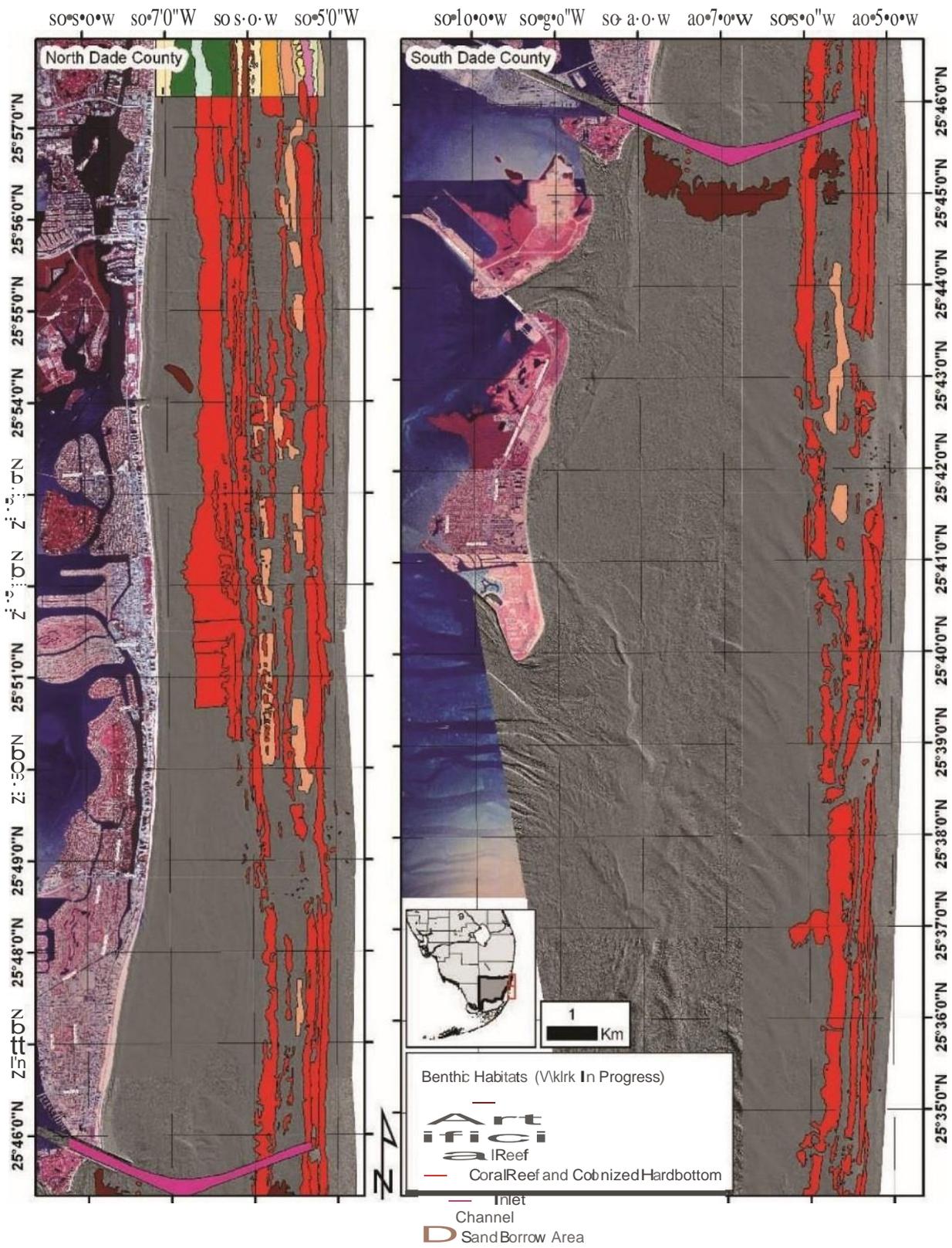


Figure 3 Habitat maps of the reefs offshore Miami-Dade County (Banks et al.2008)

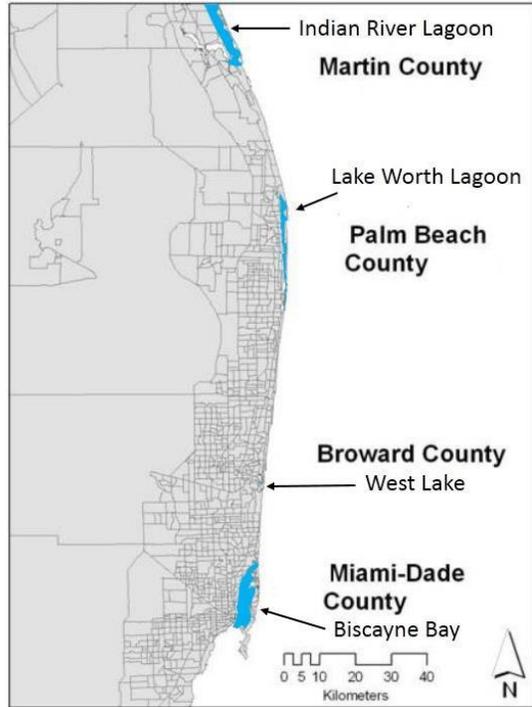
Given the complexities of the effects of human activities on southeast Florida's coastal resources and the related socioeconomic issues, it may be prudent to develop an overarching management plan for the region. This plan should be holistic, addressing all of the known issues affecting the coastal waters. Public participation in the development of a Plan would be crucial to a successful outcome.

### **E. Estuaries**

Historic flow of water in the interconnected south Florida watershed has been altered substantially with the region's development. Water moved from the Kissimmee River in the north to Lake Okeechobee (6-8 months' time frame), into the Everglades, and finally discharged southwestward to Florida Bay (16 months). In the early 1900s there was a demand to drain the swamp which led to compartmentalization of the system. Hurricanes in 1926 and 1928 led to mass destruction and loss of life so the Hoover Dike was constructed around Lake Okeechobee and direct connections to the east and west were constructed to quickly drain water from the lake. The Kissimmee River was also channelized causing higher flow rates into the Lake (3 days). Presently, about 1.7 billion gallons/day of freshwater is dumped to Atlantic Ocean (via the St. Lucie River) and Gulf of Mexico (via the Caloosahatchee River).

Estuaries serve as habitat to a diversity of wildlife, including many threatened and endangered species. They also function as nurseries to many species of fish, including those of commercial, recreational and ecological importance. This function has a great economic value to the region.

Southeast Florida's estuaries are subjected to three types of disturbance, influx of seasonal freshwater pulses from the watershed, natural habitat loss by human alterations, and invasive species such as the lionfish. Freshwater inputs are unnaturally episodic since water is retained (with nutrients and other pollutants) during dry periods by water managers and then released in large pulses. Invasive species are a recent development. The cycling has resulted in intrusion of mangroves into rivers where cypress trees formerly grew. Other estuarine communities, such as oyster reefs and seagrass, can also be damaged when freshwater pulses decrease salinity.



**Figure 4. Major estuaries in the southeast Florida region**

**F. Socioeconomics**

Tourism and recreation are two of Florida’s highest grossing industries, generating a combined \$62 billion in sales in 2005. Reef-based tourism and recreation are significant economic assets for the southeast Florida region inclusive of Miami-Dade, Broward, Palm Beach and Martin Counties. Results from two non-concurrent studies of natural and artificial reefs in southeast Florida (Table 1) indicate that a total of \$2.3 billion in sales and \$1.1 billion in income were generated annually from natural reef related expenditures, while supporting more than 36,000 jobs in the region (Johns et al., 2001; Johns et al., 2004). It is estimated that 15.2 million person days are spent on natural reefs in the southeast Florida region annually with primary activities including snorkeling, scuba diving and fishing. Although a little less than half (7.4

**Table 1: Economic Contribution of Reef-Related Expenditures to Each County  
June 2000 to May 2001 – Residents and Visitors (Johns et al. 2001)**

Type of Economic Contribution	Palm Beach County	Broward County	Miami-Dade County	Monroe County
Sales – All Reefs (in millions of 2000 dollars)	\$505	\$2,069	\$1,297	\$490
Artificial Reefs	\$148	\$961	\$419	\$127
Natural Reefs	\$357	\$1,108	\$878	\$363
Income – All Reefs (in millions of 2000 dollars)	\$194	\$1,049	\$614	\$139
Artificial Reefs	\$52	\$502	\$195	\$33
Natural Reefs	\$142	\$547	\$419	\$106

Employment – All Reefs (number of full- and part-time jobs)	6,300	36,000	19,000	10,000
Artificial Reefs	1,800	17,000	6,000	2,000
Natural Reefs	4,500	19,000	13,000	8,000

million) of the estimated person days spent on reefs were by visitors, tourists contributed to \$1.28 billion in sales, accounting for 72% (\$791 million) of the reef-related income generated for the region. The additional high use of coral reefs by residents of southeast Florida is explained by the fact that they lie adjacent to three of the four most populous counties in Florida (U.S. Census Bureau, 2007a), and >20% of all 2005-2006 state recreational saltwater fishing licenses were purchased by residents within these counties.

### **E. Marine Debris**

Marine debris is human-created waste that is persistent in the marine environment. Marine debris tends to accumulate in rotational circulations called gyres or eddies and along shorelines. This material can be harmful to the health and wellbeing of beach users, is aesthetically unappealing, can be ingested by marine animals, cause physical injury to marine organisms, and entangle animals. Annual volunteer events, such as the International Coastal Cleanup, pick up large amounts of debris, but this material continues to accumulate and must be addressed by other means.

## **IV TASK FORCE STRATEGIES AND RECOMMENDATIONS**

The Coastal Ocean Task Force has been meeting since December 2012. Each meeting included presentations from speakers specializing in the featured topic. This was intended to educate the members in the range of topics necessary to develop meaningful, informed recommendations. The list of recommendations was initially developed from those made by the speakers. COTF members added several additional recommendations.

### **GENERAL RECOMMENDATIONS**

- 1 Apply to the appropriate government agencies to develop a holistic management plan that can be accomplished for the southeast Florida coastal waters. The plan shall include stakeholder input and address measures to maximize water quality, improve fisheries, and minimize the impacts of coastal construction.

*Currently, there is no management plan for southeast Florida’s coastal resources. Some resources, such as sea turtle nesting, have management activities underway and protective regulations exist across multiple levels of government (Federal, State, local), but this approach is*

*fragmentary. A management plan should be developed which addresses all of the stressors on the resources and implements actions to reduce these stressors to the greatest degree feasible. Not only is this a better environmental approach, but it would be more cost-effective due to the more efficient use of economic resources. Many current regulatory programs overlap one another and could be more efficiently implemented by a single management authority.*

- 2 The Task Force encourages a collaborative effort by interested parties to further the implementation of the recommendations endorsed by the Task Force.

*Many of the recommendations will require approval and/or funding by government agencies. Support of elected officials will be critical for success.*

- 3 The Coastal Ocean Task Force opposes offshore oil drilling on the Florida coast.

*The Obama administration is reopening the eastern seaboard to offshore oil and gas exploration. This would occur in federal waters (beyond 3mi from shore), outside of state regulations. The initial environmental concern of this is the use of powerful acoustic methods to map subsurface geological structures. These methods have proven harmful to marine mammals.*

## **WATER QUALITY**

Address issues concerning water quality impacts to the reef by developing regional initiatives to reduce nutrient loading from all human sources and pathways, including surface water management (Comprehensive Everglades Restoration Plan [CERP] and Central Everglades Planning Project [CEPP]), septic systems and ocean outfall discharges (e.g., advanced treatment), to improve conditions for estuarine and marine habitats.

*Water connects the lakes, rivers, wetlands in the east, and Everglades in the west to the estuaries, coastal waters, and coral reef ecosystem of south Florida. Water picks up particles and chemicals as it moves through the landscape and causes flooding when we get too much rain. South Florida water managers are challenged by the need to balance the priorities of providing a clean water supply to our population, providing flood control to protect our property and ensuring the sustainable future of Florida's environmental resources (uplands, wetlands, seagrass, mangroves, oysters, worm reefs, hard bottom habitats and coral reefs).*

### **1. Stormwater treatment**

- i. The COTF encourages the construction of additional water storage reservoirs, stormwater treatment areas, flow equalization basins, and use of appropriate technologies to reduce nutrient levels before release of freshwater to southeast Florida estuaries and to modulate salinity changes in those estuaries.

*In the early 20th century, flood control and water supply priorities were addressed with projects like the Central and South Florida Project (the canal system we rely on today) and the Herbert Hoover Dike along the southern shore of Lake Okeechobee. The connections of water were changed through our dredging, filling and development. Over time, we have learned that the quality, quantity, timing and distribution (QQTD) of water through the south Florida ecosystems are extremely important not only to Florida's environmental*

*resources, but also to the water supply that we all depend on.*

*Today, federal, state, county and municipal agencies are working to restore the QQTD of fresh water to the inter-connected ecosystems of south Florida. They are using technologies and construction of projects from the parcel-scale (tens of acres) to the landscape-scale (tens of thousands of acres) to address the QQTD that provides water for people and the environment, while still protecting property in times of high rainfall. Water storage reservoirs store water for use in the dry season and reduce the extreme discharge events recently observed in south Florida estuaries. One such project is the ~16,000 acre, C-44 Reservoir that is under construction in Martin County. This water storage reservoir will improve the QQTD of water entering the St. Lucie River estuary. Stormwater Treatment Areas (STAs) are wetland systems that are designed and operated to remove pollutants from water and allow recharge of the surficial aquifer with clean water. STA 1E and STA1 West clean water from western Palm Beach County before it enters the Loxahatchee National Wildlife Refuge (also known as Water Conservation Area 1), which eventually provides clean water to the Everglades and recharge of the Biscayne aquifer (where we get most of our drinking water in south Florida). Recent advances in STA technologies include incorporating Flow Equalization Basins (FEBs) into STA design, so water collected during wet periods can be used during drier times to optimize STA nutrient and pollutant retention and reduce the amount of water sent “to tide”. Other technologies such as treatments to remove suspended solids and sediment sumps in canals to collect sediment upstream of the salinity control structure (before the water is discharged to the estuaries) have also shown promise and are being evaluated for use in south Florida. Reuse of treated waste water and using advanced water treatment for ocean outfall discharge will improve the availability of water for all users (human and environmental) and improve conditions for the south Florida ecosystems*

## 2. Wastewater

- i. Update and replace wastewater infrastructure, where necessary, to improve surface and groundwater quality.
- ii. Replace all septic systems with common sewer hookups to prevent the addition of contaminated sewage and nutrients to groundwater.
- iii. Reduce the discharge of treated domestic wastewater into the ocean and build infrastructure for advanced water treatment and reuse to improve ocean water quality, reduce destructive algal blooms, and increase water reuse.

*Sending millions of gallons of partially treated waste water through ocean outfalls to the southeast Florida reef tract each day is wasteful of fresh water resources and damaging to the quality of coastal waters. Sending large amounts of fresh water “to tide” (e.g. releases of large amounts of fresh water to the estuaries of south Florida) is wasteful of a precious resource that is needed when dry periods occur and damaging to the estuaries that support the fish, shellfish and coral reef ecosystem that south Florida is famous for.*

- iv. Promote the development and enactment of strategies and initiatives to reduce the current and future demand on wastewater infrastructure, including, but not limited to, utilization of more efficient fixtures and appliances and reclaiming and reusing gray water when feasible.

### 3. Water flow and estuaries

- i. Support restoration of historical/natural “Everglades” water flow to minimize pulses of freshwater and protect marine ecosystems from poor water quality (nutrients).
- ii. Enhance existing estuaries and restore potential estuarine areas to support coral reef ecosystem function.
- iii. Restore and create estuarine habitats and redirect historical freshwater flows to increase habitat, improve water quality, and support nursery area for reef fauna.
- iv. Support incentives and initiatives to restore and preserve wetlands north of Lake Okeechobee to reduce discharges to coastal estuaries to protect estuaries and reefs.

*Restoring and recreating natural habitats are key components of improving estuarine health and priority should be given to restoration of shallow-water estuarine habitats. These restoration projects should be located strategically to improve connectivity among habitats. A single eastern oyster can filter as much as 50 gallons of water per day. The creation of oyster reef restorations, which often support millions of living oysters, can greatly improve estuarine water clarity by reducing particulate matter in the water column. Additionally, these restored oyster reefs provide critical nursery habitats for a wide variety of economically and ecologically important species, like blue crabs, stone crabs, shrimp, snapper and grouper. By employing the “living shoreline” concept, waterfront homeowners can protect their property from erosion while still providing an ecologically beneficial habitat for estuarine plants and animals. During the creation of a living shoreline, abiotic erosion control structures (like seawalls) are replaced by natural barriers to erosion, typically a combination of rock piles, oyster reefs, mangrove seedlings, and marsh grass plantings. Living shorelines are functional, aesthetically pleasing, and ecologically beneficial to estuaries. Since many coastal restoration efforts are community based, residents can play a hands-on role in improving estuarine health.*

- v. Identify point-source inputs into estuaries and retro-fit them as needed to reduce pollutant loadings to restore healthy estuaries.

*The US Environmental Protection Agency (2010a) defines a point source of pollution as a load discharged at a specific location from pipes, outfalls, and conveyance channels from either municipal wastewater treatment plants or individual waste treatment facilities. Point sources can also include pollutant loads contributed by tributaries to the main receiving water stream or river. While point sources are a more manageable source of pollution than non-point sources they can still be very costly to ameliorate.*

- vi. Direct funds from the water and land legacy amendment toward land acquisition and/or projects that will help preserve and restore coastal/wetland habitats to benefit coral reefs and water quality.

*Florida's Water and Land Legacy Amendment, also called Amendment 1, won voter approval on November 4, 2015. It funds the Land Acquisition Trust Fund to acquire, restore, improve, and manage conservation lands, including the Everglades, and the water quality of rivers, lakes, and streams; beaches and shores; outdoor recreational lands; working farms and ranches; and historic or geologic sites, by dedicating 33% of net revenues from the existing excise tax on documents for 20 years (<http://floridawaterlandlegacy.org/sections/page/amendment>).*

#### 4. Nutrient pollution

- i. Develop/improve water quality monitoring to include inlet discharges and offshore reef areas to track stormwater on reef and improve water quality

*Presently, no region-wide water quality monitoring program is in place so it is not clear which, if any, pollutants are problematic in the coastal waters. In addition, it is important to understand the variability in water quality parameter concentrations to ultimately understand if pollution reduction strategies are successful.*

- ii. Develop mass balance for water going to tide to help prioritize effective management actions and make informed management decisions.

*In order to focus efforts to decrease pollutant loading to the coastal waters efficiently, it is necessary to know the relative contributions of various pollution sources. The product of this effort would be similar to a pie chart of pollutant loading showing sources (slices of the pie) and relative contribution (size of the slices).*

#### 5. Groundwater

- i. Enact a Florida Aquifer Protection Act that establishes guidelines to regulate pollutants introduced into the aquifer.

*The aquifers under southeast Florida provide the majority of our drinking water. There are two aquifers, the Floridan (extends throughout the state; the deepest) and the Biscayne (south Florida). The aquifers are easily polluted by surface waters which can percolate into the porous limestone substrate of southeast Florida or from injection wells.*

- ii. Reduce ground water pollution in targeted watersheds associated with priority reef areas to improve water quality and reef health.

*Due to the porous nature of south Florida's limestone substrate, groundwater can seep up on to reefs and percolate up through sand deposits. This is one source of pollutant loading to the coastal waters.*

## 6. Boating

*Activities related to boating can introduce a variety of pollutants into the environment. Pollutants from boats, themselves, include petroleum and cleaning products and human waste. Bilge water and “gray” water (waste water from galley operations and hand basins and showers) that are contaminated with oil, fuel, or other regulated contaminants may not be discharges from vessels per Federal and state regulations. Marinas and boatyards must have supplies and equipment accessible to remove oil and fuel from bilge water so that it may be disposed of legally. These include petroleum absorbents. The Clean Vessel Act (CVA) was authorized by Congress in 1992 and provides over \$10 million each year for construction of pumpout and dump stations facilities to prevent improper disposal of recreational boater sewage. The CVA is administered by FDEP. Boats are allowed to discharge sewage outside of 3 miles from shore, but they must use holding tanks inside of that limit. In spite of these regulations, many boaters find it troublesome to seek out and pay for a holding tank pumpout so they discharge in coastal waters.*

- i. Improve sewage and solid waste disposal services at marinas, including recycling, to minimize overboard discharges into water bodies.
- ii. Promote free pump-out stations to encourage boaters to use these services and minimize overboard discharges.
- iii. Promote southeast Florida coral reef awareness and education and coral-specific boater and marina BMPs to augment Clean Marina Programs and support marina clean-up programs.
- iv. Encourage development of less toxic marine products for boat maintenance and construction.

## 7. Yards, gardens, and golf courses

*Turf grass requires large amounts of water and the addition of fertilizer to maintain color and vigor. Since planted surfaces can be large in area, the large amount of water and fertilizer applied can percolate into ground water and run off into surface water, especially in the rainy season. Much of this ultimately ends up in coastal waters and can fuel algal blooms and possibly contribute to coral disease. Different types of grass have lower nutrient requirements than types currently used. For example, Altamirano (2010) found that tropical/subtropical Paspalum grasses had lower maintenance costs than Bermuda grasses. Part of this was driven by lower fertilizer requirements. An added advantage to southeast Florida is it's tolerance of high salinity water. Some cultivars of Paspalum can be maintained at water salinities of 34.5 psu (normal seawater is approximately 35 psu) (Duncan et al. 2000).*

*Other concerns related to plant management relate to the chemical used as insecticides, herbicides, and organic yard waste. The majority of pesticides do not target pests only and may affect other, beneficial, insects. Many have a long chemical life and do not degrade rapidly when introduced into the environment so they are apt to persist in soil and leach into groundwater and surface water. Evidence is mounting that glyphosate, an herbicide used in the product Round-up™, persists in the environment and may have negative health effects on*

*humans and the ecosystem. For example, Richard et al. (2005) showed that Round-up affected human placental cells and interfered with estrogen production in humans*

- i. Discourage lawn fertilizing during the rainy season and limit the types of fertilizer that can be sold to the public to reduce elevated nutrient levels in canals, rivers, lakes and estuaries.
- ii. Promote the use of environmentally friendly fertilizers, weed killers, and insecticides to reduce or eliminate toxic chemicals from entering bays, estuaries, and oceans through storm runoff.
- iii. Reduce yard clippings and other yard waste from entering water bodies to reduce nutrients in estuarine habitats.
- iv. Promote community compost programs where people can take their organic wastes for composting and receive free compost to reduce the use of inorganic fertilizer.
- v. Promote existing “rain garden” programs to relevant landowners to reduce contaminated rainwater runoff.
- vi. Develop and implement a “Green Club” certification program for golf courses (similar to Blue Star for dive industry and clean marina programs) to provide an incentive mechanism for golf courses to reduce their impact on the marine environment.
- vii. Provide incentives for land owners who convert to “ocean friendly” landscaping, especially the conversion of golf courses and lawns to a native *Paspalum* turf varieties to reduce pollutants to reefs and conserve water

#### 8. Public education

- i. Educate the public on the effects of land-based sources of pollution to reduce the amount of pollutants entering storm drains and waterways.

### **BEACHES**

1. FDEP shall encourage local communities to manage beaches in a regional context, such as the Palm Beach County Beach Management Agreement (BMA). Inlet management should be included in a regional approach to sand management for beaches.

*The Florida Department of Environmental Protection began a pilot project in 2012 to take a regional approach to permitting beach nourishment and inlet management. This is in contrast to the current approach where projects are permitted on an individual basis. A regional management perspective will identify beach nourishment and inlet management needs, cost-sharing opportunities and permitting requirements for this beach region rather than for a single beach project.*

- i. Inlet sand bypassing - Seek Congressional authorization and direction to require the USACE to share in the cost of design, construction, and operation of inlet sand bypassing systems at federally maintained navigation inlets.

*Inlet jetties are one of the leading causes of beach erosion in southeast Florida. Counties or inlet management districts are responsible for mitigating this erosion. Federally (USACE) maintained inlets contribute to this erosion, yet the US Army Corps of Engineers does not contribute to mitigating erosion caused by their inlets. The local taxpayers have the burden of paying for any mitigation strategies.*

2. Modify federal agreements for inlet maintenance to recognize the importance of Regional Sediment Management, and require placement of beach quality sand on adjacent impacted beaches.

*State statues 161.142 and 161.161 address the management of inlets in Florida and require sand bypassing to balance the impacts from an inlet. This reflects a recent change in 161.142 F. S. that now requires sand bypassing be designed to balance impacts to adjacent beaches. The effect of this change has resulted in recently updated or new Inlet Management Agreements with the state authorizing sand placement on beaches both north and south of an inlet, in certain amounts, based on the impacts to those beaches as determined through engineering analysis and numerical modeling.*

3. Beach nourishment

- i. Standardize input parameters for HEA (Habitat Equivalency Analysis) and UMAM (Uniform Mitigation Assessment Method) for coral reef environments to improve application of this rule to coastal ecosystems, to provide more consistent/accurate calculations, and to ensure ecological functions are maintained.
- ii. Modify federal agreements to allow General Reevaluation Reports (GRR) for beach nourishment, as required by the USACE, to remain valid for the life of the project (50 years) unless major substantive changes are made to the federal project.

*Currently shore protection projects are authorized, and a Project Cooperation Agreement (PCA) is signed for a period of 50 years. Recently projects nearing the end of that life have been begun to request extensions to their PCAs. The first Florida project to expire will be Pinellas Count's Treasure Island Segment in 2019, followed by Broward County's segment 2 and Fort Pierce Beach, both in 2020. To date, no extensions have been granted. The Secretary of the Army continues to review the requests.*

- iii. Improve methods of offshore sediment dredging for beach nourishment to reduce muddy runoff turbidity and sediment stress on corals, eliminate damage from dredging "accidents," and enhance sea turtle nesting beaches.

*Turbidity can harm or kill submerged aquatic vegetation and corals by blocking light necessary for photosynthesis and/or by directly covering and smothering the benthic community. Current state (Florida Department of Environmental Protection – FDEP) environmental protection laws require sand for beach nourishment projects to meet a*

*“beach compatible” criteria. The grain size distribution and color must be similar to the native beach and have no more than a minimal percentage of fine, clay like material. Creative solutions to the problems of sea turtle entrainment in dredges and cable-drag or sediment spillage events must also be addressed.*

- iv. Consider alternatives to domestic sand, including use of sand from international sand sources.

*Offshore supplies of beach-compatible sand in southeast Florida are mostly exhausted and economical alternative sources must be found. Foreign sources, such as the Bahamas, are available, but current Federal regulations prohibit their use when projects are cost-shared with the Federal government. This leaves upland quarries as the only source of sand. Alternative sources would increase the competition among suppliers and has the potential to lower sand costs for projects.*

- v. Encourage the use of recycled glass, if economically feasible, as a source of beach fill.

*Ground recycled glass can potentially be used for beach fill. (Babineaux 2012). Glass can be processed to desired grain sizes and sorted for color optimization. A sizeable fraction of native beach sand is composed of silica (quartz sand), and since glass is silicon dioxide, its composition is compatible with native sand. The results of a feasibility analysis of the use of glass cullet in Broward County (Feliciano 2013) found that the cost of sand from glass cullet was 5 – 10 times higher than the cost of offshore sand sources and 3 – 6 times higher than sand from upland sources. Market forces will certainly change in the future and this analysis should be re-visited to determine the cost effectiveness of recycled glass.*

#### 4. Coastal construction

- i. Set new and appropriate water turbidity standards for marine construction to limit damage to reefs and associated habitats from coastal construction projects.

*Permits for offshore construction activities require that those activities not result in high levels of turbidity. The State standard for turbidity is not based on impacts to coastal resources. Studies of the impacts of high turbidity (both intensity and duration) should be directed to establishing meaningful standards for coastal construction, and those standards should replace those currently in place.*

- ii. Create/enhance a “LEED”-like certification program for coastal construction companies and projects, as well as individuals working in the industry, to encourage smart development and best practices for coastal construction.

*LEED, or Leadership in Energy & Environmental Design, is a green building certification program (US Green Building Council) that recognizes best-in-class building strategies and practices. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification. Prerequisites and credits differ for each rating system, and teams choose the best fit for their project. A program, similar in concept,*

could be developed for the coastal construction industry to minimize environmental impacts resulting from these projects.

- iii. Revise the coastal permitting process to restrict or limit relevant development and coastal construction projects during periods when corals are more susceptible to impacts (e.g. bleaching, spawning, other disturbance events) to reduce cumulative impacts to reefs.

*Many coral reef-associated organisms are sensitive to environmental change. Since they have a narrow “comfort” zone, conditions outside of that zone may cause physiological stress responses. One stress response that is commonly seen in the warmer summer months is coral bleaching. Many corals have microscopic algal cells in their tissues that use coral waste products as nutrients and provide sugars, created by photosynthesis, to the corals. Under stressful conditions, such as very low temperatures or high temperature and high ultraviolet light, the corals may expel these algal cells, giving the coral a white, bleached, appearance. The coral is stressed under this condition and may be more susceptible to disease. If environmental conditions improve, the coral may recover its algae and resume a more healthful condition. While the coral is in the stressed condition added stresses may further reduce its ability to resist disease. Coastal construction activities may result in high turbidity or physical impacts to organisms. These are examples of added stresses that may result in coral disease. Timing coastal construction to months of lower stress, when feasible, may lower the risk of disease and mortality in reef organisms.*

- iv. Ensure that coastal construction permits contain best management and permitting practices and use available resources to educate contractors, consultants etc., on the importance and value of our reef systems. If impacts to reefs are expected to occur, understand and account for the direct and indirect impacts.

## 5. Beach raking

- i. Reduce negative impacts from beach raking/cleanup practices to minimize negative impacts to the beach ecosystem by limiting mechanical beach raking to high public use beaches and eliminate raking in front of lower density residential properties.

*Wave action can bring a variety of materials onto the beach. Seaweed, particularly the floating Sargassum, is the primary constituent in wrack (the material washed onto the beach by waves). Unfortunately, a substantial portion of the wrack line contains trash in the form of plastics, paper, yard waste and wood. Seaweed wrack is very important to beach ecosystems by providing a nutrient source from the ocean (nutrient import) to beach organisms. In fact, it represents the base of the food chain on many beaches (Duong 2008). Wrack can result in unpleasant odors, be unpleasant to walk through, take up limited beach space, and be unsightly. As a result, most municipalities along the southeast Florida coast remove the wrack line each morning and either place the material in dumpsters or bury it on the beach.*

- ii. Educate property owners on the ecological importance of the beach’s wrack line and the habitat and food sources that it provides to the beach ecosystem.

*Most people consider the wrack line as a nuisance of no value, yet it has great value to the beach ecosystem, as stated in the bullet above. Recognition of this value may aid in efforts to reduce beach raking where feasible.*

## 6. Shoreline Development

- i. Eliminate coastal storm water runoff to beaches to eliminate losses of sand due to scouring.

*Stormwater often runs off over the beach at street ends that end at the beach. This is particularly true when storm drains are plugged with solid waste or beach sand. This runoff erodes sand from the beach in the form of runoff channels and can be remediated by the addition of storm drains or adequate maintenance of existing drains.*

- ii. Promote land acquisition by the state and local governments to limit shoreline industry and maintain coastal wetlands to protect mangroves and coral reefs.

- iii. Increase and protect public access for sustainable use of coastal resources to increase appreciation of reef resources (and their value) by the general public.

- iv. Evaluate and enforce lighting regulations to make sure they are effectively protecting sea turtles.

*Large numbers of sea turtles nest on the beaches of southeast Florida each summer. The nesting female crawls ashore, digs a nest, deposits the eggs, buries the nest, and returns to the ocean. The eggs incubate and hatch in 50 to 60 days. The hatchlings crawl out of the nest and scramble to the water. The orienting factor for the nesting female and the hatchling and lights and shadows on the beach. Shorefront lighting can inhibit the nesting turtle and disorient the hatchling. The longer the hatchling takes for enter the water, the greater the risk of predation. For these reasons it is important to minimize the impacts of beach lighting.*

- v. Include consideration of sea level rise in revisions of Florida's coastal construction control line (CCCL).

*The coastal construction control line establishes an area of jurisdiction where special siting and design criteria are applied for construction and related activities. These standards may be stricter than those in the rest of the coastal building zone because of possible storm impacts.*

- vi. Eliminate/discourage government subsidies/funds to rebuild habitable storm-damaged structures near coast and estuarine shorelines.

*FEMA's Individual and Households Program (IHP) provides financial help or direct services to those who have necessary expenses and serious needs if they are unable to meet the needs through other means. The IHP has a maximum available amount adjusted each year. The forms of help available are Housing Assistance (including temporary housing, repair, replacement, and semi-permanent or permanent housing construction) and other needs*

assistance (including personal property and other items).

Housing repair is limited to those items not covered by insurance. The goal is to repair the home to a safe and sanitary living or functioning condition. FEMA will not pay to return a home to its condition before the disaster.

Housing replacement is funded under rare conditions, but if the home is located in a Special Flood Hazard Area, the homeowner must comply with flood insurance purchase requirements and local flood codes.

FEMA also has a Public Assistance (PA) Grant Program to provide assistance to state, tribal and local governments, and certain types of private nonprofit organizations. Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities. The Federal share of assistance is not less than 75% of the eligible cost for emergency measure and permanent restoration.

- vii. Coordinate regional “living shoreline” objectives to promote the use and protection of natural infrastructure (e.g. coral reefs, native vegetation, mangroves, and wetlands) to provide natural barriers to storm surge and maintain coastal biodiversity.

NOAA defines Living Shorelines is a method of stabilizing shorelines to preserve or improve natural intertidal habitat and the ecosystem services provided with sustaining connectivity between the land and water interface. Living Shorelines are not a way to control flooding and storm surge.

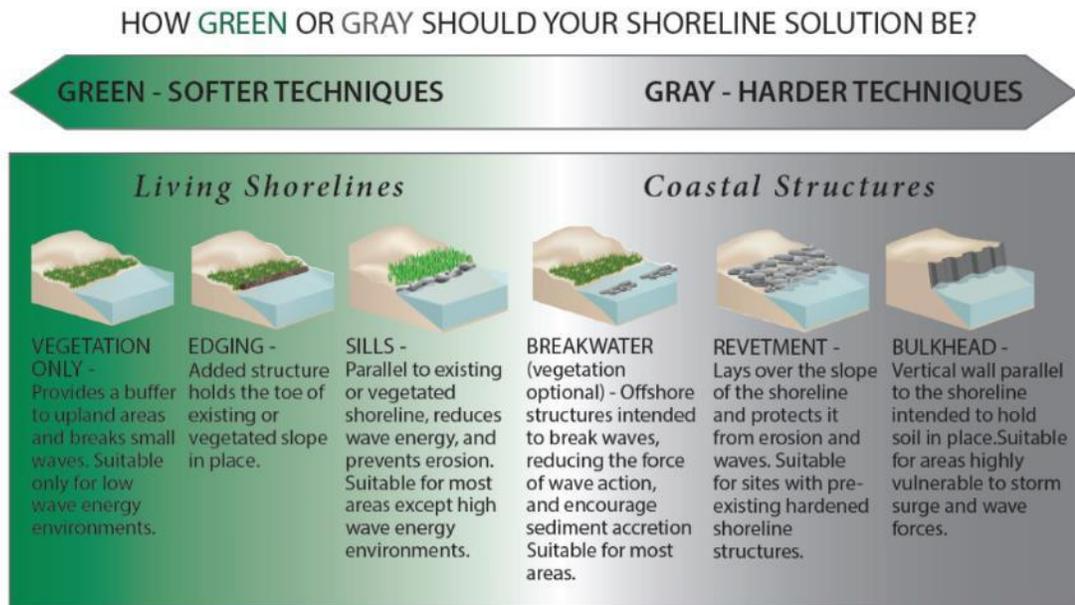


Figure 5. Conceptual approaches to living shoreline strategies.

## FISHERIES

1. Work with the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Environmental Protection (DEP), who regulates submerged state lands, and consult with NOAA, academics and others, as appropriate, to promote the recovery of reef organisms, including reef fish, coral, and related species by using appropriate available tools and incorporate assessment monitoring to evaluate the success of these activities. Tools can include, but are not limited to, bag limits, size limits, seasonal closures, special-use areas, no-take areas. Additional guidance may also be provided by the recommendations of the Our Florida Reefs working groups.

*Fisheries in state waters (with 3 mi from shore) are regulated by the Florida Fish and Wildlife Conservation Commission. The State of Florida acquired title to sovereignty submerged lands in 1845, by virtue of statehood. Title to these lands is held by the Board of Trustees (Governor and Cabinet) of the Internal Improvement Trust Fund. The Florida Department of Environmental Protection (DEP) is the lead agency for environmental management and stewardship of submerged State lands.*

*Reef fishery management strategies used in southeast Florida include: minimum size limits, bag limits, gear restrictions, and time closures. Area closures to fishing are not currently used in the region, although closures are used elsewhere, including the Florida Keys, the Dry Tortugas, and in Federal waters in east and west Florida. The most critical need for fisheries management decisions is fisheries-independent surveys of targeted reef fishes in the region.*

*Our Florida Reefs (OFR) is hosted by the Southeast Florida Coral Reef Initiative (SEFCRI) and is a planning process that brings together stakeholders, including local residents, reef users, business owners, visitors, and the broader public in southeast Florida (Martin County southward to Miami-Dade County) to discuss the future of coral reefs in the region. The process is intended to involve the public in future management of the region's reefs by involving stakeholders.*

2. Consideration of forage fish should be included in fisheries management plans.

*Forage fish are also called prey fish or bait fish. They are near the bottom of oceanic food chains and provide food for other larger fish, seabirds, and marine mammals. Many fishes targeted by fishermen rely on forage fish. They make up nearly 20% of the commercial catch off Florida's shores and they support recreational activities that generate more than \$12.3 billion and 109,835 jobs annually (<http://www.pewtrusts.org/en/multimedia/data-visualizations/2014/protecting-floridas-forage-fish>). Forages fish species in southeast Florida waters include striped mullet, pilchard, cigar minnow, pinfish, and thread herring. Forage species are used commercially for animal feed, cosmetics, fertilizer, and food (roe). According to the PEW Charitable Trusts, Florida has few rules directly limiting their catch, and those in effect do not protect their role in the ocean ecosystem. PEW recommends ensuring sufficient abundance, variety, and sizes of forage species to meet the needs of predators, obtain scientific data on species abundance, and protect forage fish habitats (mangroves, sea grasses, estuaries, rivers, and bays)*

3. Encourage fisheries managers to provide special protection for fish spawning aggregations.

*Many coral reef fishes aggregate in very dense groups when they spawn. The locations of these aggregations are fixed so that the species will return to the same site every season. These aggregations become very susceptible to overfishing of reproducing fishes. Limiting fishing during these times and at these sites can aid in preserving these species.*

## **CORAL REEFS**

- 1 Encourage the State Legislature to mandate the incorporation of best permitting management practices (BMP) for coral reef ecosystem protection in coastal construction permits.

*Engineering and construction projects that take place in the coastal zone may lead to negative impacts to resources. These impacts are often avoidable if certain measures are implemented during construction, but contractors or design/management consultants may not be aware of these measures. Educational programs can go a long way in improving this situation. Some permits already require presentations to be made to contractors informing them of the resources present, where they are located, and means of impact avoidance.*

- 2 Develop a best management practice for the dive industry

*The SCUBA diving industry makes a substantial contribution to the regional economy through dive shops and the spending of tourist and local divers on their sport. While diving in itself is not an extractive activity (spearfishing and lobstering are forms of fishing) and results in less than 1% of damage to reefs, there are potential impacts which may result. These include physical contact with marine organisms, boat anchor damage, and marine debris. Proper training and diver awareness could alleviate much of this potential damage*

- i. Encourage dive charter operators to provide a substantive pre-dive briefing on awareness, etiquette and low-impact techniques.
  - ii. Discourage the use of gloves (If diver's hands are bare, they are less likely to touch coral); emphasize buoyancy control and "fin awareness" during diver training and practice; teach new divers the "fins up" diving position; encourage divers to descend over sand, and, when possible, take this into consideration in siting mooring buoys; encourage in-water supervision of divers and overtly correct inappropriate diver behavior; consider using environmental success stories in advertising campaigns; and encourage dive tour operators to invest in professional development dive guides.
  - iii. Consider implementing a program like the Florida Keys National Marine Sanctuary (FKNMS) Blue Star Program and appoint a Northern Reef Tract diver education committee to develop a "Blue Star" like program with a dive shop certification in the four-county area.
3. Support renewal of the Coral Reef Conservation Act of 2000 in Congress.

*Florida's Coral Reef Conservation Act came into effect on July 1, 2009, and increased protection of Florida's coral reefs by raising awareness of the damages associated with vessel groundings*

*and anchoring on coral reefs. The law affects all commercial and recreational vessels that transit State waters of Martine through Monroe Counties. Those that injure reefs are held responsible for damages caused by grounding or anchoring.*

4. Promote measures to minimize or eliminate anchoring on coral reefs by small boats.
  - i. Encourage the use and funding of small boat moorings and education of anchoring and its impacts on reefs.

*Offshore small boat moorings (usually called 'mooring buoys') are moorings permanently installed on reef or sand bottom. Their intent is to reduce boat anchoring on reefs since anchors can damage organisms. They require expensive installation and maintenance and should not be used in areas where strong currents are common because of the risk of divers being swept away from their boat.*

- ii. Create enforceable, temporary anchor zones during marine events to minimize impacts to hardbottom resources.

*Coastal events such as air/sea shows, 4<sup>th</sup> of July fireworks displays, beachfront concerts, and boat races are popular with boaters who frequently anchor offshore of the event in concentrated numbers. This contributes to anchor damage on reefs. One solution is to designate sand-bottom areas as anchor zones for boats to minimize this anchor damage.*

5. Promote science-based, goal-oriented artificial reefs, using appropriate materials, for inshore and offshore waters; streamline the permitting process; and encourage expanded funding for artificial reef projects.

*Artificial reefs are popular recreational sites for SCUBA divers and fishermen. There are a number of environmental concerns about artificial reefs, including physical stability, durability, pre-existing hazardous materials, impacts to adjacent natural reef communities, improper siting, and impacts to sand-bottom communities. Although, local governments have been permitted to build artificial reefs for many years, the permitting process can be very lengthy and costly.*

*The Johns et al. (2001) socioeconomic study of reefs in southeast Florida found that the economic contribution of artificial reefs to the region was \$1.5 billion in sales, \$1.1 billion in income, and 24,800 jobs. In spite of these numbers, funding for artificial reef construction is limited and some of the programs must rely heavily on private contributions.*

## **ESTUARIES**

- 1 Manage muck sediments on both the freshwater and estuarine sides of estuaries to prevent them from entering coastal waters.

*Muck sediments are a product of suspended silt/clay (fine) material in water discharged from tributaries, canals, and storm drains. This material settles out in calm conditions and forms layers or pockets of muck. Estuaries in southeast Florida normally have sand bottom. Muck*

*blocks light from benthic grasses and organisms and slowly releases nutrients back into the water column, which can fuel algal blooms in estuaries. Methods to manage these sediments include dredging and removal or capping with sand.*

- 2 Place a priority on restoration of shallow-water estuarine habitats and locate restoration projects strategically to improve connectivity among habitats.

*Estuaries form a transition zone between freshwater and ocean environments. As transitional environments, estuaries are linked to offshore coral reefs and serve as nursery grounds for many reef organisms and as water filters for inland surface waters. Maintenance of healthy estuaries is critical to the health of southeast Florida’s coral reefs.*

## **SOCIOECONOMICS**

- 1 Update the 2001 Socio-economic study of coral reefs in southeast Florida and expand the scope to include beaches.

*This study was based on extensive surveys conducted between June 2000 and May 2001. It measured the economic contributions and use values of artificial and natural reefs to the economics and reef users of southeast Florida. The study was co-funded by the southeast Florida counties (Palm Beach, Broward, Miami-Dade, and Monroe), the Florida Fish and Wildlife Conservation Commission, and NOAA. A summary of the findings is found in Table ES-4:*

**Table ES-4  
Economic Contribution of Reef-Related Expenditures to Each County<sup>1</sup>  
June 2000 to May 2001 – Residents and Visitors**

<b>Type of Economic Contribution</b>	<b>Palm Beach County</b>	<b>Broward County</b>	<b>Miami-Dade County</b>	<b>Monroe County</b>
Sales – All Reefs (in millions of 2000 dollars)	\$505	\$2,069	\$1,297	\$490
Artificial Reefs	\$148	\$961	\$419	\$127
Natural Reefs	\$357	\$1,108	\$878	\$363
Income – All Reefs (in millions of 2000 dollars)	\$194	\$1,049	\$614	\$139
Artificial Reefs	\$52	\$502	\$195	\$33
Natural Reefs	\$142	\$547	\$419	\$106
Employment – All Reefs (number of full- and part-time jobs)	6,300	36,000	19,000	10,000
Artificial Reefs	1,800	17,000	6,000	2,000
Natural Reefs	4,500	19,000	13,000	8,000

- i. Encourage valuation and consideration of ecosystem services in determining benefit/cost ratios as part of local, state, and federal project planning and land use decisions.

*Benefit/cost ratios determine whether the US Army Corps of Engineers cost-shares in local*

*projects. The ratio is based on benefits to coastal infrastructure (storm protection) vs. the actual costs of doing the project. There may be other costs associated with projects, however, and one of those are the costs to the environment. Projects often impact the environment in a negative way, yet these costs are not included in the B/R calculation. This recommendation is to include these costs in benefit/cost ratios.*

- ii. Encourage members of the Task Force to work collaboratively to identify and target all possible funding sources to support work necessary to document the value of the Southeast Florida marine ecosystem, based on socioeconomic and use pattern studies, and use that information in a public awareness campaign to 1) increase public support for marine conservation, 2) change individual behavior/reduce impacts, 3) inform state, local and federal project planning 4) provide a real basis for impact assessment and 5) provide information to leverage county, state, and federal organizations for increased funding.

*The conservation value of economic information is very important. Measures that protect the environment, as well as stimulate economic activity are easier to sell to a broader audience.*

## **MARINE DEBRIS**

*Jambeck et al. (2015) reported that 8 million tons of plastic trash entered the ocean from coastal countries in 2010. They predict that the tonnage will increase tenfold in the next decade if corrective measures aren't taken. Global efforts to pick up debris from beaches, such as the International Coastal Cleanup, organized by the Ocean Conservancy, are useful but are episodic and can't stem the continuous flow of trash into the ocean. Regular efforts are needed such as the recommendations below.*

1. Provide trash and recycling containers at beach entrances.
2. Solid waste
  - i. Cigarette litter
    - i. Promote the placement of visible cigarette receptacles at beach public access points.
    - ii. Work with Florida legislature and local municipalities to implement smoking bans on beaches, yet provide for designated smoking areas.
    - iii. Increase shoreline cleanup efforts.
  - ii. Straws/Stirrers, plastic utensils, plastic food-ware
    - i. Work with beachside restaurants and businesses to limit single use plastics and switch to compostable or reusable alternatives.
    - ii. Follow the model set by Miami Beach and ban plastic straws from beachside use.
  - iii. Expanded Polystyrene Foam (EPS)

- i. Ban use of EPS foam food ware at all beachside establishments.
- ii. Ban use of EPS foam coolers on beaches.
- iii. Expand EPS foam food ware bans on beaches to cover coastal counties in the region.
- iv. Plastic, glass and recyclables
  - i. Encourage the placement of visible recycling receptacles at public access points, dune crossovers and popular beach sites.
  - ii. Encourage frequent recyclable pick up and mandate additional pickup after special events or large beach holidays (e.g., 4<sup>th</sup> of July, Labor Day, etc.).
  - iii. Work with Florida Legislature and municipalities to create a statewide “bottle bill” or container deposit law.
- v. Plastic bags
  - i. Encourage local municipalities to adopt “voluntary bag bans”, encouraging businesses to use only reusable bags.
- vi. Boating, Marinas and their Responsibilities
  - i. Encourage the placement of color-coded, clearly labelled recycling bins with lids on docks for staff and customers.
  - ii. Encourage boaters and fishermen to bring their trash back to the docks for proper disposal.
  - iii. Encourage boaters to set up an onboard system to segregate trash for easy disposal and recycling on shore.
  - iv. Reduce the amount and impacts of derelict fishing gear by collaborating with the fishing and recreational industry to develop best practices to minimize the impact of lost gear or gear thrown into the ocean.
  - v. Encourage these industries to develop and adapt educational effective messages about marine debris issues for placement in kiosks on docks.
  - vi. Encourage marinas to offer Educational workshops/classes on marine debris issues to motivate and inspire people to take action at their marinas.
  - vii. Inform the public that they can call the Coast Guard National Response Center at (800) 424-8802 to make a formal report on those who do not comply with the recommendations. Place large signs with this information near the recycling bins on the docks of the marinas.

- viii. Encourage greater funding of the derelict vessel program by the legislature, as well as streamlining the vessel removal process, if feasible.

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## **APPENDICES**

### **Resolutions of Support for the Southeast Florida Coastal Ocean Task Force**

BEFORE THE BOARD OF COUNTY COMMISSIONERS  
MARTIN COUNTY, FLORIDA

RESOLUTION NUMBER 12-7.10

A RESOLUTION RECOGNIZING THE NEED FOR COLLABORATIVE, MULTI-JURISDICTIONAL INPUT ON CONSERVATION MEASURES PROPOSED FOR SOUTHEAST FLORIDA COASTAL WATERS; ESTABLISHING THE SOUTHEAST FLORIDA INTERGOVERNMENTAL COASTAL OCEANS TASK FORCE COMPOSED OF ELECTED COUNTY AND COASTAL CITY COMMISSIONERS, APPOINTED OFFICIALS FROM THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, AND REPRESENTATIVES FROM SELECTED STAKEHOLDER ORGANIZATIONS; PROVIDING FOR DUTIES OF THE TASK FORCE; PROVIDING FOR STAFF SUPPORT; PROVIDING FOR REPORTING AND MAINTENANCE OF RECORDS; AND PROVIDING AN EFFECTIVE DATE

WHEREAS, southeast Florida has long depended upon coastal ocean waters for recreation, fishing, and commerce; and

WHEREAS, it has been determined that coastal ocean waters are under great user pressure, suffer from water quality degradation from human inputs, and climate change impacts; and

WHEREAS, collaborative, multi-agency conservation planning activities have been underway for the coral reefs of southeast Florida through the coordination of the Southeast Florida Coral Reef Initiative ("SEFCRI") since 2004; and

WHEREAS, the vision of SEFCRI is "To develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties."; and

WHEREAS, SEFCRI's program plan for 2010 to 2017 and beyond will develop, prioritize, and implement conservation management alternatives through a publicly-vetted, working group process; and

WHEREAS, implementation of some of the alternatives will likely require support from elected officials; and

WHEREAS, elected officials should be involved in the prioritization process in its early stages in order to be fully informed of the environmental and economic consequences of all management strategies.

NOW THEREFORE BE IT RESOLVED THAT the Board of County Commissioners:

Section 1: The adoption of this and companion resolutions by Miami-Dade County, Palm Beach County, Broward County, and Martin County shall have the effect of creating the Intergovernment Coastal Oceans Task Force ("ICOTF").

Section 2: The purpose of the ICOTF is to:

- (a) Learn about the accomplishments of the Southeast Coral Reef Conservation Initiative (SEFCRI) and Marine and Estuarine Goal Setting for South Florida (MARES).
- (b) Review the priorities identified by local, state, and federal coral reef managers in southeast Florida in partnership with National Oceanic and Atmospheric Administration's ("NOAA") Coral Reef Conservation Program.
- (c) Consider additional issues relating to coastal resource management and user needs.
- (d) Produce a final report with recommendations for coastal ocean resources and conservation priorities and strategies.

Section 3: The Task Force shall be composed of elected and appointed officials designated by the government entities identified in Section 4 of this resolution.

Section 4: The Task Force shall be composed of representatives of the following entities:

- (a) Four (4) County elected officials, one (1) from each County, appointed by respective County Commissions of Miami-Dade, Broward, Palm Beach, and Martin Counties.
- (b) Three (3) City elected officials from each County appointed by the respective County League of Cities, with emphasis on achieving appointments providing geographic representation from a City in the north, central, and south regions of each County. In a County with no League of Cities, the County representative on the Task Force will contact three (3) representative municipalities and request each municipality designate an appointee to the Task Force.
- (c) One (1) member from the Florida Department of Environmental Protection ("FDEP") which shall be the Secretary or designee.
- (d) One (1) Commissioner from the Florida Fish and Wildlife Conservation Commission ("FWC").
- (e) One (1) member from the National Oceanic and Atmospheric Administration.
- (f) One (1) recreational fishery representative.
- (g) One (1) commercial fishery representative.
- (h) One (1) marine industry representative.
- (i) One (1) charter dive industry representative.
- (j) One (1) representative of a Port Pilot Association (or equivalent).
- (k) One (1) representative of commercial port interests.
- (l) One (1) representative from an environmental organization.

(m) One (1) representative from an academic institution.

When making appointments, each entity shall consider and balance its appointments to reflect the diverse racial, ethnic, religious, economic, and geographic representation within the County.

Section 5: The Task Force membership will be finalized by the members who serve as direct appointments. These members will be responsible for reviewing nominations for each of the categories (f) through (m) and finalizing the membership through appointment by a majority vote.

Section 6: The Task Force shall meet on a frequency determined by the Task Force for an 18-month period following its initial organizational meeting. The time period may be modified at the discretion of a majority of the ICOTF members. The ICOTF shall, at its organizational meeting, elect a Chair and Vice Chair, adopt rules of procedure, including provisions for quorum, voting, and consideration of motions and other items, and establish such standing committees as necessary to conduct the work of the ICOTF.

Section 7: Broward County National Resources Planning and Management Division shall provide staff support to the Task Force in collaboration with technical staff from partner agencies.

Section 8: Support staff will prepare meeting notices and minutes, maintain records, coordinate or prepare draft reports, and prepare the final report containing the findings and recommendations of the Task Force.

Section 9: The governmental entities adopting this resolution recognize and agree their participation as members of the ICOTF is a voluntary effort. The participating governments further recognize that any final report issued by the ICOTF shall not be construed as imposing any mandates upon the participants or other government entities. It is understood and desired, rather, that the collaborative work of the ICOTF serve as recommendations to each community regarding conservation of coastal ocean resources in southeast Florida.

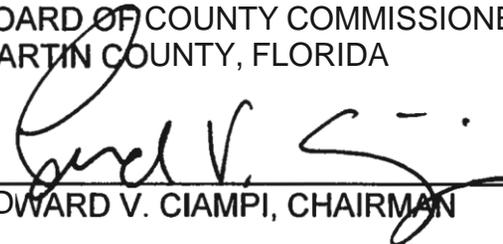
Section 10: Effective Date. This Resolution shall become effective upon adoption.

**Duly adopted this Twenty-fourth day of July 2012.**

ATTEST:

 EWING  
THE CIRCUIT COURT

BOARD OF COUNTY COMMISSIONERS  
MARTIN COUNTY, FLORIDA

  
EDWARD V. CIAMPI, CHAIRMAN

APPROVED AS TO FORM AND  
CORRECTNESS:

  
STEPHEN FRY, COUNTY ATTORNEY

RESOLUTION NO. 2012- 1554

A RESOLUTION OF THE PALM BEACH COUNTY BOARD OF COUNTY COMMISSIONERS; RECOGNIZING THE NEED FOR COLLABORATIVE, MULTI-JURISDICTIONAL INPUT ON CONSERVATION MEASURES PROPOSED FOR SOUTHEAST FLORIDA COASTAL WATERS; ESTABLISHING THE SOUTHEAST FLORIDA COASTAL OCEAN TASK FORCE COMPOSED OF ELECTED COUNTY AND COASTAL CITY COMMISSIONERS, APPOINTED OFFICIALS FROM THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, AND REPRESENTATIVES FROM SELECTED STAKEHOLDER ORGANIZATIONS; PROVIDING FOR DUTIES OF THE TASK FORCE; PROVIDING FOR STAFF SUPPORT; PROVIDING FOR REPORTING AND MAINTENANCE OF RECORDS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, southeast Florida has long depended upon coastal ocean waters for recreation, fishing, and commerce; and

WHEREAS, it has been determined that coastal ocean waters are under great user pressure, suffer from water quality degradation from human inputs, and climate change impacts; and

WHEREAS, collaborative, multi-agency conservation planning activities have been underway for the coral reefs of southeast Florida through the coordination of the Southeast Florida Coral Reef Initiative (SEFCRI) since 2004; and

WHEREAS, the vision of SEFCRI is *"To develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties."*; and

WHEREAS, SEFCRI's program plan for 2010 to 2017 and beyond will develop, prioritize, and implement conservation management alternatives through a publicly vetted, working group process; and

WHEREAS, implementation of some of the alternatives will likely require support from elected officials; and

WHEREAS, elected officials should be involved in the prioritization process in its early stages in order to be fully informed of the environmental and economic consequences of all management strategies.

NOW, THEREFORE, BE IT RESOLVED BY THE PALM BEACH COUNTY BOARD OF COUNTY COMMISSIONERS:

Section 1. The BCC supports the Coastal Ocean Task Force ("COTF").

Section 2. The purpose of the COTF is to:

- (a) Learn about the accomplishments of SEFCRI.
- (b) Review the Florida coral reef management priorities proposed by the National Oceanographic and Atmospheric Administration and Florida Department of Environmental Protection Coral Reef Conservation Program.
- (c) Serve as the liaison between SEFCRI and SEFCRI's representative governments.
- (d) Endorse final reports with recommendations for reef management and conservation priorities and strategies.
- (e) Make recommendations regarding conservation of coastal ocean resources in southeast Florida.

Section 3. The COTF shall be composed of representatives of the following entities:

- (a) Four (4) county elected officials, one (1) from each county, appointed by the respective county commissions of Miami-Dade, Broward, Palm Beach, and Martin counties.
- (b) Three (3) municipal elected officials from each county appointed by the respective county League of Cities, with emphasis on achieving appointments providing geographic representation from a municipality in the north, central, and south regions of each County.
- (c) One (1) member from the Florida Department of Environmental Protection (FDEP) which shall be the Secretary or designee.
- (d) One (1) local commissioner from the Florida Fish and Wildlife Conservation Commission (FWC) appointed by FWC.
- (e) One (1) member from the National Oceanic and Atmospheric Administration (NOAA) appointed by NOAA.
- (f) One (1) recreational fishery representative.
- (g) One (1) commercial fishery representative.
- (h) One (1) marine industry representative.
- (i) One (1) charter dive industry representative.
- (j) One (1) representative of a Port Pilot Association (or equivalent)
- (k) One (1) representative of commercial port interests

(l) One (1) representative from an environmental organization

(m) One (1) representative from an academic institution

Representatives for categories 3(f)-3(m) will be appointed by a majority vote of the members of categories 3(a)-3(e) based on a pool of applicants who submit a letter of interest. When making appointments, each entity shall consider and balance its appointments to reflect the diverse racial, ethnic, religious, economic, and geographic representation within the region.

Section 4. The COTF shall meet on a frequency determined by the COTF for an 18-month period following its initial organizational meeting. The time period may be modified at the discretion of a majority of the COTF members. The COTF shall, at its organizational meeting, elect a Chair and Vice-Chair, adopt rules of procedure, including provisions for quorum, voting, and consideration of motions and other items, and establish such standing committees as necessary to conduct the work of the COTF.

Section 5. Broward County Natural Resources Planning and Management Division shall provide staff support to the COTF in collaboration with technical staff from partner agencies.

Section 6. Support staff will prepare meeting notices and minutes, maintain records, coordinate or prepare draft reports, and prepare final reports containing the findings and recommendations of the COTF.

Section 7. The governmental entities adopting this resolution recognize and agree their participation as members of the COTF is a voluntary effort. The participating governments further recognize that any final reports issued by the COTF shall not be construed as imposing any mandates upon the participants or other government entities. It is understood and desired, rather, that the collaborative work of the COTF serve as recommendations regarding conservation of coastal ocean resources in southeast Florida.

Section 8. EFFECTIVE DATE.

This Resolution shall become effective upon adoption.

**RESOLUTION NO. 2012-1554**

The foregoing Resolution was offered by Commissioner Abrams, who moved its adoption.

The motion was seconded by Commissioner Taylor and, upon being put to a vote, the vote was as follows:

Commissioner Shelley Vana, Chair	<u>Aye</u>
Commissioner Steven L. Abrams, Vice Chairman	<u>Aye</u>
Commissioner Karen T. Marcus	<u>Aye</u>
Commissioner Paulette Burdick	<u>Absent</u>
Commissioner Burt Aaronson	<u>Aye</u>
Commissioner Jess R. Santamaria	<u>Aye</u>
Commissioner Priscilla A. Taylor	<u>          </u>

The Chair thereupon declared the Resolution duly passed and adopted this 16th day of October, 2012.

**PALM BEACH COUNTY, FLORIDA BY  
ITS BOARD OF COMMISSIONERS  
Sharon R. Bock, Clerk and Controller**

BYLL h31



**APPROVED AS TO FORM  
AND LEGAL SUFFICIENCY .**

BY: [Signature]  
County Attorney

STATE OF FLORIDA, COUNTY OF PALM BEACH  
I, SHARON R. BOCK, Clerk and Controller  
certify this to be a true and correct copy of the original  
filed in my office on 10-22-12  
dated at West Palm Beach, FL on 10-22-12  
By [Signature]  
Deputy Clerk

OCT 16 2012

Resolution 2012-430

1  
2 A RESOLUTION OF THE BOARD OF COUNTY  
3 COMMISSIONERS OF BROWARD COUNTY, FLORIDA  
4 RECOGNIZING THE NEED FOR COLLABORATIVE,  
5 MULTI-JURISDICTIONAL INPUT ON CONSERVATION  
6 MEASURES PROPOSED FOR SOUTHEAST FLORIDA  
7 COASTAL WATERS; ESTABLISHING THE SOUTHEAST  
8 FLORIDA INTERGOVERNMENTAL COASTAL OCEANS  
9 TASK FORCE COMPOSED OF ELECTED COUNTY AND  
10 COASTAL CITY COMMISSIONERS, APPOINTED  
11 OFFICIALS FROM THE FLORIDA DEPARTMENT OF  
12 ENVIRONMENTAL PROTECTION AND THE FLORIDA  
13 FISH AND WILDLIFE CONSERVATION COMMISSION,  
14 AND REPRESENTATIVES FROM SELECTED  
15 STAKEHOLDER ORGANIZATIONS; PROVIDING FOR  
16 DUTIES OF THE TASK FORCE; PROVIDING FOR STAFF  
17 SUPPORT; PROVIDING FOR REPORTING AND  
18 MAINTENANCE OF RECORDS; AND PROVIDING AN  
19 EFFECTIVE DATE.

20 WHEREAS, southeast Florida has long depended upon coastal ocean waters for  
21 recreation, fishing, and commerce; and

22 WHEREAS, it has been determined that coastal ocean waters are under great  
23 user pressure, suffer from water quality degradation from human inputs, and climate  
24 change impacts; and

WHEREAS, collaborative, multi-agency conservation planning activities have  
been underway for the coral reefs of southeast Florida through the coordination of the  
Southeast Florida Coral Reef Initiative ("SEFCRI") since 2004; and

WHEREAS, the vision of SEFCRI is *"To develop an effective strategy to preserve  
and protect southeast Florida's coral reefs and associated reef resources, emphasizing  
balance between resource use and protection, in cooperation with all interested  
parties."*; and

1 WHEREAS, SEFCRI's program plan for 2010 to 2017 and beyond will develop,  
2 prioritize, and implement conservation management alternatives through a publicly  
3 vetted, working group process; and

4 WHEREAS, implementation of some of the alternatives will likely require support  
5 from elected officials; and

6 WHEREAS, elected officials should be involved in the prioritization process in its  
7 early stages in order to be fully informed of the environmental and economic  
8 consequences of all management strategies; NOW, THEREFORE,

9

10 BE IT RESOLVED BY THE Board of County Commissioners of Broward County,  
11 Florida:

12 Section 1. The adoption of this and companion resolutions by Martin County,  
13 Miami-Dade County, and Palm Beach County shall have the effect of creating the  
14 Intergovernmental Coastal Oceans Task Force ("ICOTF").

15 Section 2. The purpose of the ICOTF is to:

16 (a) Learn about the accomplishments of the Southeast Coral Reef  
17 Conservation Initiative (SEFCRI) and Marine and Estuarine Goal  
18 Setting for South Florida (MARES).

19 (b) Review the priorities identified by local, state and federal coral  
20 reef managers in southeast Florida in partnership with National  
21 Oceanic and Atmospheric Administration's ("NOAA") Coral Reef  
22 Conservation Program.

23 (c) Consider additional issues relating to coastal resource  
24 management and user needs.

1 (d) Produce a final report with recommendations for coastal ocean  
2 resources and conservation priorities and strategies.

3 Section 3. The Task Force shall be composed of elected and appointed  
4 officials designated by the government entities identified in Section 4 of this resolution.

5 Section 4. The Task Force shall be composed of representatives of the  
6 following entities:

7 (a) Four (4) county elected officials, one (1) from each county,  
8 appointed by respective county commissions of Miami-Dade,  
9 Broward, Palm Beach, and Martin counties.

10 (b) Three (3) City elected officials from each county appointed by the  
11 respective county League of Cities, with emphasis on achieving  
12 appointments providing geographic representation from a City in  
13 the north, central, and south regions of each County. In a County  
14 with no League of Cities, the County representative on the task  
15 force will contact three (3) representative municipalities and request  
16 each municipality designate an appointee to the Task Force

17 (c) One (1) member from the Florida Department of Environmental  
18 Protection ("FDEP") which shall be the Secretary or designee.

19 (d) One (1) commissioner from the Florida Fish and Wildlife  
20 Conservation Commission ("FWC").

21 (e) One (1) member from the National Oceanic and Atmospheric  
22 Administration.

23 (f) One (1) recreational fishery representative.

24 (g) One (1) commercial fishery representative.

- 1 (h) One (1) marine industry representative.
- 2 (i) One (1) charter dive industry representative.
- 3 0) One (1) representative of a Port Pilot Association (or equivalent)
- 4 (k) One (1) representative of commercial port interests
- 5 (l) One (1) representative from an environmental organization
- 6 (m) One (1) representative from an academic institution

7 When making appointments, each entity shall consider and balance its appointments to  
8 reflect the diverse racial, ethnic, religious, economic, and geographic representation  
9 within the County.

10 Section 5. The Task Force membership will be finalized by the members who  
11 serve as direct appointments. These members will be responsible for reviewing  
12 nominations for each of the categories (f) through (m) and finalizing the membership  
13 through appointment by a majority vote.

14 Section 6. The Task Force shall meet on a frequency determined by the Task  
15 Force for an 18-month period following its initial organizational meeting. The time  
16 period may be modified at the discretion of a majority of the ICOTF members. The  
17 ICOTF shall, at its organizational meeting, elect a Chair and Vice-Chair, adopt rules of  
18 procedure, including provisions for quorum, voting, and consideration of motions and  
19 other items, and establish such standing committees as necessary to conduct the work  
20 of the ICOTF.

21 Section 7. Broward County Natural Resources Planning and Management  
22 Division shall provide staff support to the Task Force in collaboration with technical staff  
23 from partner agencies.

24

1 Section 8. Support staff will prepare meeting notices and minutes, maintain  
2 records, coordinate or prepare draft reports, and prepare the final report containing the  
3 findings and recommendations of the Task Force.

4 Section 9. The governmental entities adopting this resolution recognize and  
5 agree their participation as members of the ICOTF is a voluntary effort. The participating  
6 governments further recognize that any final report issued by the ICOTF shall not be  
7 construed as imposing any mandates upon the participants or other government  
8 entities. It is understood and desired, rather, that the collaborative work of the ICOTF  
9 serve as recommendations to each community regarding conservation of coastal ocean  
10 resources in southeast Florida.

11 Section 10. EFFECTIVE DATE.

12 This Resolution shall become effective upon adoption.

13

14 ADOPTED this *h(.r* day **J** *l.Lt"-L* '2012. **1±113**

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