Recent Timeline of Coral Reef Management in Florida

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Beach Renourishments

1970
First beach restoration project completed in Broward County, at Pompano Beach

1983
Beach restoration projects in Broward County, in Pompano Beach and Lauderdale-by-the-Sea

1989
Dunes in Coral Cove Park in Palm Beach County restored

1990
Beach re-nourishment project at town of Bal Harbour in Miami-Dade County

1992 - 1993
Delray Beach shoreline renourished in Palm Beach County

1994 - 1999
Ten acres of dune restored from Carlin Park in Jupiter to Donald Ross Road in Juno

1995
Beach nourishment project at Midtown, Palm Beach County

1998
Beach re-nourishment at Ocean Ridge Shore in Palm Beach County
Work on the site has included walkover construction and acquisition of land for parking at Ocean Hammock Park, removal of 11 derelict groins, construction of 8 groins and two acres of mitigation reef, placement of 782,745 yards of sand dredged from an offshore borrow area, and the planting of 2.27 acres of additional dune. Funding was provided by the County ($889,146), State ($889,146) and Federal governments ($5,334,875). Re-nourishment of existing beach project is anticipated every 6 years beginning in 2003.

2001
Beach nourishment project between the Juno Ocean Club Condominium in Juno Beach and the Diamondhead/Radnor Park in Jupiter completed in Palm Beach County
The project renourished a 2.4 mile, 1 million cubic yard beach. Eight acres of new dune was planted and 3.77 acres of limestone reef was constructed nearby to mitigate for the loss of nearshore hardbottom. Renourishment is planned every five years beginning in 2005-6.

2006
Beach nourishment in Phipps Ocean Park in Palm Beach County begins
The placement of approximately 1,226,600 cubic yards of sand was initiated, covering about 1.4 miles of shoreline. This reach also received an additional 56,000 cubic yards of shoreline during the Post-Fay Dune Reconstruction Project in 2011. A 3.1 acre mitigation reef was constructed between May 26 and June 1 of 2004.

CR Related Research & Monitoring

1979
Miami-Dade County Water Quality Monitoring Network initiated
The Network monitors status and trends in water quality parameters to evaluate progress toward achieving/maintaining water quality standards and protecting/restoring living marine resources in South Florida coastal waters. It is limited to Biscayne Bay and associated canals and tributaries.

1980
Broward County initiates a reef monitoring program

1983
Palm Beach County Environmental Resource Management Reef Monitoring Program (PBCERM) begins
This is a long-term non-destructive in situ monitoring of fish composition, abundance and size structure on artificial reefs. Benthos monitoring was added in 1998 and fish and benthos on natural reefs were added in 2004. Offshore reef monitoring was expanded in 2006. Pilot coastal water quality monitoring program targeting wastewater outfalls and Lake Worth Inlet began in 2008.

1990 - 2000
Johnson and others complete an 11 year study profiling all commercial and recreational marine fisheries in the SEFCRI region

1990 - 2000
Southeast Florida fishery landings data collected and published
Mean total landings for all fisheries was 21.4 million lbs/year. 66% was recreational, 31% was commercial, and 3% were headboat landings.

1991
Palm Beach County Reef Research Team established
This is comprised of a group of volunteer sport divers operating under the auspices of the Palm Beach Zoo, a non-profit conservation organization. The team monitors artificial reefs on a regular basis, using funding supplied from the State of Florida Fish and Wildlife Conservation Commission.

1991
Water Quality Monitoring Network (FIU/SERC) created
The goal of the network is to oversee the status and trends of monitoring of water quality parameters to evaluate progress toward achieving/maintaining water quality standards and protecting/restoring living marine resources in South Florida coastal waters.

1996
13th coral reef monitoring site established in Martin County
Forty-nine individual coral colonies, representing six species were mapped within this site, and images of the colonies will be used to estimate growth and track colony condition.

1997
Florida Keys National Marine Sanctuary Regulations published in the Federal Registrar

1997
Beach restoration project in Broward County in the John U. Lloyd Beach State Recreation Area
This involved dredging sand from offshore "borrow sites" and pumping the sand onto target beaches.

2000 - 2001
Study undertaken to measure the economic contribution and value of artificial and natural reefs in Southeast Florida
The study began June 2000 and ended May 2001, and was conducted by distributing surveys to boaters who are recreational fishers (commercial fishers were not included), reef divers, reef snorkelers and/or visitors viewing the reefs on glass-bottom boats. The study was funded by NOAA, FWC, and the four counties in Southeast Florida and employed extensive survey research.

2000
Nova Southeastern University takes over reef monitoring responsibility from Broward County
The study began June 2000 and ended May 2001, They added 5 new sites, and in 2003 added another 2 sites for a total of 25 sites.

2001
Small tire retrieval program conducted by Dr. Robin Sherman in Osborne Reef
Dr. Sherman, of the Nova Southeastern University, was able to coordinate the removal of around 1,600 tires at the cost of over $17.00/tire.

2001 - 2002
Studies conducted indicate sewage contributed to blooms of Codium isthmocladum

2003
Investigation conducted in Broward County by Moyer et al.
The investigation looked into spatial patterns in community structure among reef tracts. Moyer measured relative bottom cover using six replicate, 50 m point intercept transects at 31 sites within three cross-shelf corridors (Broward County north, central and south), each containing all three reef tracts.

2004
A fishery-independent, visual census on natural reef habitats off Broward County is conducted by Ferro et al.

- A total of 86,463 fishes (approximately 130 fish per site) belonging to 208 species and 52 families were observed in counts.
- Species richness (number of different species), abundance (number of fish) and biomass of fishes (the amount of fish living in a given habitat, such as kilograms per square meter of reef) increased significantly on reef lines moving away from shore.
- Although 232 red grouper were at the 667 sample sites, only two red grouper were above the legal minimum size. No goliath or black grouper were recorded.
- A total of 10 gag, yellowfin, or scamp grouper was observed at the 667 sample sites, none were the legal minimum size.
- Among six snapper species, 219 of 718 (~30%) were of legal size.

2011
Ault and Franklin conduct a review and synthesis of fishery-dependent information from state and federal agency data sets
These findings indicate that a majority of the exploited reef fish species in the southeast Florida region are experiencing overfishing and exist at unsustainable levels locally.

CR Related Laws & Regulations

1967
Florida legislature passes the Randall Act, Chapter 67-393 Florida Law
Established procedures regulating previously unrestricted dredge and fill activities on state-owned

1967
Florida legislature passes Florida Statute 253.03
Gave statutory authority to Florida's Board of Trustees to exercise proprietary control over state-owned lands in order to afford better management to their environmental protection.

1968
Complete revision of the state constitution
The revision consolidated the numberous boards and commissions into more streamlined Departments and Divisions, such as Departments of Natural Resources, Environmental Regulation, Education, State, Agriculture, Commerce, and Transportation.

1972
Clean Water Act enacted
The primary federal law that governs water pollution. Under the section 404(b) 33 CFR 323.2(e), the discharge of dredge or fill materials in US waters is regulated.

1972
Coastal Zone Management Act enacted
The Act provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation.

1972
Marine Mammal Protection Act enacted
All marine mammals are protected under the MMPA. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S.

1975
Florida Aquatic Preserve Act passed

1976
Magnuson-Stevens Fishery Conservation and Management Act enacted
This is the primary law governing marine fisheries management in United States federal waters. It was originally adopted to extend control of U.S. waters to 200 nautical miles in the ocean; to phase out foreign fishing activities within this zone; to prevent overfishing, especially by foreign fleets; to allow overfished stocks to recover; and to conserve and manage fishery resources.

1982
Board of Trustees adopts Chapter 18-20, F.A.C., Florida
This Florida Administrative Code highlights the maintenance and management of Florida's aquatic preserves.

1984
National Fishing Enhancement Act passes
This bill established national standards for the construction and siting of artificial reefs in the waters of the United States in order to enhance fishery resources and fishing opportunities and for other purposes. It resulted in the 1985 National Artificial Reef Plan.

1990
Oil Pollution Act enacted
The OPA improved the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the money and resources necessary, to respond to oil spills. The OPA also created the national Oil Spill Liability Trust Fund, which is available to provide up to one billion dollars per spill incident. In addition, the OPA provided new requirements for contingency planning both by government and industry.

1990
President George Bush signs law deauthorizing Cross Florida Barge Canal project
The law changed the purpose of the project into recreation and conservation.

1990
Florida Keys National Marine Sanctuary and Protection Act passed

1991
The Governor and Cabinet of the State of Florida sign a resolution agreeing to the terms of the Federal deauthorization bill on the Cross Florida Barge Canal project
The resolution was signed on January 22nd. This action ultimately led to the creation of the Cross Florida Greenway State Recreation and Conservation Area.

1993 - 2002
Florida's Net Ban implemented
The Net Ban may have contributed to increased harvest of spiny lobster, as commercial gill netters had to look for new work when the net ban went into effect. They therefore may have shifted their effort to the lobster trap fishery and other fisheries.

1995
'Net ban' referendum for spiny lobster enacted

1996
Sustainable Fisheries Act is added as an amendment to the Magnuson-Stevens Fishery Conservation and Management Act
This revision brought new requirements to prevent overfishing and rebuild overfished fisheries. The revised law required that each fishery management plan (FMP) specify objective and measurable criteria for determining when a stock is overfished or when overfishing is occurring, and to establish measures for rebuilding the stock.

2000
Coral Reef Conservation Act passed
The purposes of this act are to preserve the coral reef ecosystems within US jurisdictions, promote their management and sustainable use, develop scientific information, and provide financial resources for conservation programs.

2004
Florida Administrative Code 68B-8 Special Activity License passed
The Marine Special Activity License (SAL) program ssues licenses for activities that require a waiver of marine fisheries regulations. Activities that we license include (but are not limited to): scientific research, education, exhibition, aquaculture, the use of non-conforming gear (for research purposes only), the testing of innovative gear, the use of marine chemicals, the release of marine organisms, and the use of dredges for harvesting marine organisms.

2006
Outstanding Florida Waters Rule: 62-302.700: prohibits pollution
Prohibits degradation of water quality in outstanding Florida waters and outstanding natural resource waters.

2006
Florida Anti-degradation policy goes into effect
The policy is comprised of Florida Administrative Code 62-302.300 "Surface Water Quality Standards" and Code 62-4.242 "Permits". Under this policy, the permitting of new or previously unpermitted existing discharges is prohibited where the discharge is expected to reduce the quality of a receiving water below the classification established for it. Any lowering of water quality caused by a new or expanded discharge to surface waters must be in the public interest.

2008
The US Coast Guard amends anchorage regulations in Port Everglades
The amendment modified the current anchorage area by eliminating that portion of the anchorage closest to sensitive coral reef areas, expanding that portion of the anchorage area that poses less risk to these areas, and limiting the amount of time a vessel may remain in the anchorage area.

2008
Creation of Broward County's Environmental Protection and Growth Management Department
Broward County merged its urban redevelopment and planning functions with those of environmental protection, emergency management and consumer protection and so formulated this entirely new department.

2008
Advanced Wastewater Treatment (AWT) bill passed
Florida Legislature passed a bill to end dumping of partially treated sewage onto the reefs of Southeast Florida. Wastewater must meet the higher standard of Advanced Wastewater Treatment (AWT) by 2018 and achieve at least 60% reuse of the wastewater by 2025. New or expanded ocean outfalls will not be allowed and use of the pipes will be prohibited after the 2025 date.

2009
Florida Coral Reef Protection Act (403.93345 F.S.) passed
The act prohibits damage to coral reef and hardbottom resources from vessel-related impacts like grounding and anchor damage. Any permits associated with deployments, or subsequent monitoring visits, must include specific language regarding any anticipated impacts to reef resources from vessels associated with the permit. Anchoring plans are encouraged to be developed to ensure that there are minimal coral reef or hardbottom resource impacts (i.e. vessels must anchor in the sand). If an inadvertent impact to resources occurs, it is required to be reported to FDEP within 24 hours.

2009
Boynton-Delray Beach outfall shut off
The outfall was shut off after the passage of new legislation regulating wastewater disposal due to the efforts of Cry of the Water, Reef Rescue, and other environmental groups that have worked for over 10 years to end the discharge of inadequately treated sewage onto the reefs. The remaining outfalls, located in Boca Raton, Pompano Beach, Hollywood, North Miami, and Virginia Key, re planned to be shut down by 2025.

2011
Florida Administrative Code rule 68B-42 is passed
Under this administrative code, removal and possession of wild live rock, coral, common and Venus sea fans, and fire coral in state waters is prohibited unless user has special activity license from FWC.

2011
Florida Statute Chapter 403 Pollution Control passed
Defines pollution and sets standards on the prevention of pollution in air, water, and land and sewage disposal. Also sets criteria for punishments in violation of pollution control. In subsection 403.121, The Environmental Litigation Reform Act allows for more efficient use of admin. process for imposing damages and penalties related to pollution, and outlines administrative penalties for specified violations rules and statutes.

2011
Florida Statute 403.021 Clean Water passed
Decrees that it is a public policy of the State of Florida to conserve and protect the air and water quality so that it will be safe for humans and the environment.

2011
Florida Statute 258.008 Coral Protection in State Parks passed
In section 3A, it is illegal to damage or mutilate any water-bottom formation or coral in a Florida State Park; in doing so, there will be severe penalties.

2012
Florida Statute 253.04 Protection of Sovereign Submerged Lands passed
The Board of Trustees of the Internal Improvement Trust Fund is charged with the acquisition, administration, management, control, supervision, conservation, protection, and disposition of all lands owned by the state, except for lands acquired for certain purposes.

2012
Amendment to Florida Statute Chapter 373 Environmental Resource Permitting
The amendment requires an environmental resource permit (ERP) before land use or construction activity that could affect wetlands, alter surface water flows, or contribute to water pollution in the state of Florida. The ERP is administered by the Submerged Lands and Environmental Resources Program (SLERP), which is implemented by FDEP and Florida's water management districts.

2012
Florida Statute 161.054 & .055 Joint Coastal Permit passed
Allows the FDEP to concurrently process applications for coastal construction permits, environmental resource permits, and sovereign submerged land authorizations. The consolidation of these programs and the assignment of responsibility to a single bureau (BBCS) has eliminated any potential conflict between agencies.

2012
Surface Water Quality Standards updated
F.S. 302.500: Turbidity cannot exceed 29 Nephelometric Turbidity Units (NTUs) above natural background conditions in Class I – V Waters. Turbidity cannot exceed ambient background conditions in Aquatic Preserves. F. S. 302.530: This rule establishes the criteria for state water quality for all activities. Violation of these standards will require a FDEP permit.

2012
Broward County Coral Permitting regulation passed
The Environmental Protection Growth and Management Department issues and enforces licenses that can involve impacts to corals. Environmental Resource Licenses are required if projects will potentially impact reefs (used for activities such as pipeline or cable construction, dredging, ship anchoring, etc.)

Political Offices

1979 - 1987
Bob Graham is elected as Florida's 38th governor
Bob Graham was a Miami businessman and former State Senator. Graham launched the most extensive environmental protection program in the state's history, focused on preserving endangered lands. During his tenure thousands of acres of threatened and environmentally important lands were brought into state ownership for permanent protection. His keystone accomplishment was the establishment of the Save the Everglades program, which has now been joined by the federal government in a commitment to restore the Everglades. He is reelected in 1982.

1987-1991
Bob Martinez inaugurated as the 40th governor

1991-1998
Lawton Chiles inaugurated as the 41st governor

1999 - 2007
Jeb Bush is inaugurated as 43th governor
Bush is credited for making many environmental improvements. For example, he signed legislation to protect the Everglades and opposed federal plans to drill for oil off the coast of Florida. In early October 2005, Bush attempted to strike a compromise with fellow Republicans that would allow offshore drilling in an area that stretches 125 miles (201 km) off Florida's coastline and give the state legislature the power to permit drilling closer to the state's coastlines.

2007 - 2011
Charlie Crist inaugurated as 44th governor

2011
Rick Scott inaugurated as the 45th governor

CR Related Management

1961
John Pennekamp Coral Reef State Park created
Miami-Dade/Central Wastewater Treatment Plant is discharged through a 120 and 90-inch pipe that extends 18,800 feet from the shoreline and reaches a depth of 100 feet.

1966
Florida legislature creates first aquatic preserve
The first aquatic preserve is known as Estero Bay.

1967
Bill Baggs Cape Florida State Park opens, in Miami-Dade County

1968
The Interagency Advisory Committee issues a report recommending the establishment of 26 aquatic preserves

1969
Coupon Bight & Lignumvitae Aquatic Preserves created

1969
St. Lucie Inlet Preserve Park opens, in Martin County

1973
Creation of the John U. Lloyd Beach State Park, located in Broward County

1973
Fort Pierce Inlet State Park opened

1974
Broward County undertakes an expansion project to the Osborne artificial reef
About 1-2 million tires were placed in the ocean to create an artificial reef environment, but the expansion was a failure. The tires were bound together with nylon/steels clips, which soon corroded in the saltwater. This caused the tires to drift lose, preventing any marine life from latching on. In addition, with any tropical storms and cyclones, the tires would collide with natural reefs up to only 70 feet away.

1974
Biscayne Bay Aquatic Preserve established

1975
Key Largo National Marine Sanctuary created

1975
Biscayne Bay-Cape Florida to Monroe County Line Aquatic Preserve established

1980
Biscayne Bay National Park established

1985
Florida's state park system marks its 50th anniversary
Begun during the Depression with nine parks, the system now includes 92 park and recreation areas.

1985 - 1989
A series of Aquatic Preserve Management Plans are designed and implemented
These Aquatic Management Plans serve to guide and set directions for the overseeing of Florida's Aquatic Preserves.

1989
|John D. MacArthur Beach State Park opens to the public, in Palm Beach County

1990
Florida Keys National Marine Sanctuary created
Called for the development of a comprehensive management plan.

1991
Curry Hammock State Park opened

1992
Dry Tortugas National Park created

1992
Seabranch Preserve State Park opened

1997
Florida Keys National Marine Sanctuary Management Plan created

1997
Broward County Marine Biological Monitoring Program (BCEPD) begins
This is a long-term fish and coral monitoring program to check relative health of the reef community habitats offshore of Broward County. This program began with 18 offshore reef community transect sites. Five transect sites were later added in 2001 and an additional two transect sites in 2004 for a total of 25 sites.

2000
U.S. Coral Reef Task Force (USCRTF) adopts the National Action Plan to Coral Reef Conservation
The National Action Plan is the first U.S. plan to comprehensively address the most pressing threats to coral reef, designed to be the Nation's roadmap to more effectively understand coral reef ecosystems, reduce the adverse impacts of human activities and to serve as a long-term plan and provide the guiding framework for the priorities, strategies,and implementation plans of the Task Force and its members.

2001
Dry Tortugas are incorporated into the Florida Keys National Marine Sanctuary

2000
U.S. Coral Reef Task Force (USCRTF) adopts the National Action Plan to Coral Reef Conservation
The National Action Plan is the first U.S. plan to comprehensively address the most pressing threats to coral reef, designed to be the Nation's roadmap to more effectively understand coral reef ecosystems, reduce the adverse impacts of human activities and to serve as a long-term plan and provide the guiding framework for the priorities, strategies,and implementation plans of the Task Force and its members.

2003 - 2013
Broward County Segment III Mitigation begins
The burial of nearshore reefs due to beach renourishment will be mitigated for through the construction of artificial reefs by placing limestone boulders in nearshore reef sand pockets.

2003
Plans to route undersea fiberoptic cables through coral reef gaps are approved
Governor Jeb Bush and the Florida Cabinet approve the plan, which includes new rules that offer telecommunication companies incentives to route cables through five natural corridors in the reefs off Broward and Palm Beach counties, rather than through denser coral beds where the cables could cause more damage. The rules prohibit cables off Biscayne Bay and the Florida Keys -- areas with richer stands of coral, sponges and other marine life.

2004
Construction of an artificial reef in the vicinity of Phipps Ocean Park, Town of Palm Beach, Florida
The 3.1 acre artificial reef is mitigation for anticipated impacts to 3.1 acres of hardbottom. A biological assessment of the mitigation reef was conducted by Coastal Planning & Engineering, Inc. The principal objective of this study is to compare the benthic community of the mitigation reef with the surf-zone community of anticipated impact to quantify how thoroughly the mitigation reef replaces the ecological functions of the impacted hardbottom.

2004
AES Ocean Express, LLC is given approval to construct a pipeline in South Florida
The Federal Energy Regulatory Commission (FERC) authorizes AES Ocean Express to build and operate a 54.5-mile, 24-inch diameter pipeline stretching from a proposed LNG terminal in the Bahamas to Broward County.

2004
Calypso US Pipeline, LLC is given approval to construct a pipeline from the Bahamas to South Florida
The Federal Energy Regulatory Commission (FERC) authorizes Calypso US Pipeline to construct the pipeline.

2006
FDEP is asked by Coastal America to work on a project to remove the tires in Osborne Reef
"Coastal America organized a cooperative project with the US Navy, US Army, US Coast Guard, NOAA, Broward County Environmental Protection and Growth Management Department and DEP to abate the tire pile that is endangering the Broward County Osborne Reef."

2006
Palm Beach County Reef Research Team initiates work on the natural, deeper reefs
Palm Beach County Reef Research Team had performed routine monitoring and assessment of benthic communities on artificial reefs for 10 years before expanding to the natural, deeper reefs.

2006
Mooring ball program is launched for shallow water reefs in Palm Beach County
This was a joint effort led by the Florida Fish and Wildlife Conservation Commission, the Wildlife Foundation of Florida, and Palm Beach County Environmental Resource Management.

2006
Baseline Limerock Boulder Reef Monitoring starts
Evaluation of benthic and fish assemblages on five multi-layered limerock boulder reefs throughout Miami-Dade County.

2007
Boynton-Delray Coastal Water Quality Monitoring program is carried out
Six cruises were undertaken in the Boynton-Delray treated-wastewater plant outfall plume, the Boynton inlet, and the Lake Worth Lagoon in Palm Beach County. The results indicated the water was more acidic and lower in salinity than coastal water, and there were higher concentrations of nutrients.

2008
First full phase of tire removal operations begin offshore of Broward county
Divers worked an estimated 27 days with 16 dive days cancelled due to adverse weather conditions. An estimated 44,000 tires were removed over the course of the operation by approximately 66 military personnel, including boat drivers and LCU crew.

2008
Reef Injury and Response Program created
The primary goal of the program is to develop and implement management actions that prevent coral reef injuries associated with commercial and recreational vessels using tools created through the Southeast Florida Coral Reef Initiative and other local action strategies. If damages do occur, then the goal is to ensure that appropriate restoration and/or mitigation is carried out.

2009
Palm Beach County Mooring Buoy Program begins
The program created a mooring buoy system in several popular reef locations so that boaters, divers, and fisherman can safely moor their vessels to buoys instead of dropping anchor on the reef.

2009
Southeast Florida Coral Reef Water Monitoring Project created
The objective is to evaluate the long-term status and trends of water quality, identify declines or recovery of coastal and offshore water quality, and determine if water quality may be linked to land-based sources of pollution, or changes in coral condition in southeast Florida. This program uses SECREMP's 22 monitoring sites in order to use the information to assist resource protection and management decisions.

2009
Second full phase of tire removal operations offshore of Broward County
Divers worked an estimated 16 whole or partial days with two dive days cancelled due to adverse weather conditions or equipment failures. An additional 11 days of mission operations were cancelled due to unscheduled mission assignments to support the NASA shuttle launch. An estimated 15,000 to 18,000 tires were removed over the course of the operation by approximately 50 military personnel, including boat drivers and LCU crew.

2011
Southeast Florida Marine Debris Reporting and Removal Program established
A joint venture by the FDEP, FWC, and Palm Beach County's Reef Rescue Team, this program encourages local divers and dive shops to report marine debris, then reef clean-up events are organized to remove the debris.

2011
Coral Reef Resource Awareness Program established
This program is geared towards training local permitting agencies, construction companies, consulting firms, and industry personnel on the basic biology and ecology of local coral reef ecosystems, as well as the rules and regulations that pertain to reef resources. The goal is to increase the knowledge of regulatory program staff on coral resources so that there will be better permit conditions and deeper understanding and compliance with coral reef laws.

2012
Southeast Florida Fisheries-Independent Program formulated
Fisheries-independent monitoring is a fish monitoring program using standardized sampling methods to examine the population of fishes as a whole. The data collected in southeast Florida will be based on the Reef Visual Census (RVC) method, so that southeast Florida fish data will be comparable to the decade's worth of data from the National Parks and Florida Keys National Marine Sanctuary. This will be the first time the fish population of the Florida Reef Tract will be looked at holistically.

1960s

1970s

1980s

1990s

2000s

2010s

Disclaimer

The purpose of this timeline is to present a simplifying visualization of the events that may have influenced the development of capacity to manage coral reefs in Florida over time.

By its nature, it is incomplete. For example, the start date is somewhat arbitrary and therefore does not include events relating to coral reef management that have occurred prior. Furthermore, it is intended as a living document that we hope will continue to evolve and improve as past events are added, existing events are reinterpreted and future events included.

While the primary intended use of this was to help inform a coral reef capacity needs assessment we conducted in 2012, we believe the visualization of events can be used in the future to improve a collective understanding of coral reef management,

serve other educational purposes, and illustrate the importance of investing in capacity to manage oral reefs into the future.

We value your input to the timeline and encourage you to contact us at info@sustainametrix.com with any suggestions you might have to improve it.

1970 - 1979
Miami-Dade North District wastewater treatment plant constructed
The Miami-Dade/North Outfall consists of a 90-inch reinforced pipe. It extends 11,700 feet from shoreline and discharges effluent through 12 ports at a depth of 108 feet.

1974
Boyton-Delray South Central Regional watewater treatment plant constructed
Treated effluent from the Boynton-Delray Wastewater Treatment Plant is discharged through a 30-inch pipe that extends 5,200 feet from the shoreline and reaches a depth of 90 feet.

1975
Broward County North Regional Broward/North wastewater treatment plant constructed

1985
National Artificial Reef Plan published
The plan set national standards and guidelines for permitting procedures, siting, constructing, monitoring and managing artificial reefs in U.S. coastal waters.

1985
Formation of Palm Beach County's Artificial Reef and Environment Enhancement Committee (AREEC)
Created by the Board of County Commissioners, local government officials, commercial and recreational anglers, SCUBA divers, scientists, and conservationists review, discuss, and make recommendations for artificial reef and estuarine enhancement projects.

1987
Creation of Shore Protection Section of the Coastal and Wetlands Division of Palm Beach County's Department of Environmental Resources
Their responsibility is to direct countywide erosion efforts, through which there can be environmental impacts on offshore reefs.

1987
Formation of Palm Beach County's Department of Environmental Resources Management
The Palm Beach County Board of County Commissioners created the Department of Environmental Resources Management. Today, ERM administers nineteen environmental programs and employs over 140 people organized in five divisions.

1993
Florida Department of Environmental Protection created
FDEP was created by the Florida Environmental Reorganization Act of 1993, merging the former Departments of Natural Resources and Environmental Regulation. The Department's mission is to protect, conserve, and manage Florida's environment and natural resources.

1993
The Reef Environmental Education Foundation (REEF) created
Their mission statement: The Reef Environmental Education Foundation is a grass-roots organization that seeks to conserve marine ecosystems by educating, enlisting and enabling divers and other marine enthusiasts to become active ocean stewards and citizen scientists.

1994
US All Islands Coral Reef Committee (AIC) created
A collaboration of marine resource managers from state, commonwealth, territorial agencies and freely associated states work together with federal agencies to conserve and protect coral reefs in the United States.

1998
US Coral Reef Task Force (USCRTF) created
Established by Presidential Executive Order 13089, its goal is to lead US efforts to protect and conserve coral reef ecosystems. The USCRTF is responsible for developing and implementing efforts to map and monitor US reefs, research the causes of, and solutions to coral reef decline; reduce and mitigate coral reef degradation from pollution, over fishing and other causes; and implement strategies to promote conservation and sustainable use of coral reefs internationally.

1999
Florida Fish and Wildlife Conservation Commission (FWC) created
The FWC is a government agency charged with managing and regulating Florida's fish and wildlife resources, and enforcing any related laws. Seven Commissioners meet five times a year to hear staff reports,consider rule proposals, and conduct other Commission business in order to enact rules and regulations regarding the state's fish and wildlife resources.

2002
USCRTF produces a complementary document to the National Action Plan to Coral Reef Conservation

2003
Southeast Florida Coral Reef Evaluation and Monitoring Project (SECREMP) is formulated
This is an extension of the Florida Coral Reef Evaluation and Monitoring Project (CREMP) to the coral reef of southeast Florida. SECREMP is a long-term monitoring project with 10 sites located off the shores of Miami-Dade, Broward, and Palm Beach Counties. Additional sites are to be added off of Martin County.

2003
Southeast Florida Coral Reef Initiative (SEFCRI) formulated
A team of marine resource professionals first gathered in May 2003 to develop local action strategies in Southeast Florida--this team was known as SEFCRI. Their mission statement eventually became: To develop and support the implementation of an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing the balance between resource use and protection, in cooperation with all interested parties.

2003
State of Florida publishes Artificial Reef Strategic Plan

2003
Florida Fish and Wildlife Conservation Commission completes the "Florida Strategic Artificial Reef Plan"
The state strategic plan is intended to provide a general framework within which local entities can develop their own more comprehensive local or regional plans, based on local needs and management strategies.

2004
Inception of the Florida Area Coastal Environmental (FACE) Program
The FACE program conducts surveys in order to understand the many controlling oceanographic and coastal environmental factors that influence Florida public health and coastal biota, and to provide this knowledge to the area's environmental regulators, resource managers, utility operators, and to the public.

2004
Florida Reef Resilience Program (FRRP) created
The program is designed to improve understanding of reef health in the region of the Dry Tortugas extending all the way up to Martin County, and to identify factors that influence the long-term resilience of corals, reefs and the entire marine ecosystem. A focal area of the program has been filling spatial and temporal information gaps for stony coral bleaching and other bioindicator monitoring data.

2004
SEFCRI begins series of Best Management Practice documents
The goal of the documents are to improve the performance of marine construction activities in Miami-Dade, Broward, Palm Beach and Martin counties in order to enhance protection of natural coral reefs.

2004
Florida Coral Reef Conservation Program (CRCP) initiated
The Coral Reef Conservation Program (CRCP) coordinates research and monitoring, develops management strategies, and promotes partnerships to protect the coral reefs, hardbottom communities, and associated reef resources of southeast Florida. CRCP is also charged with the implementation of SEFCRI and through that, the implementation of long-term management programs for southeast Florida.

2004
Broward County Environmental Protection Program's long-term monitoring program expands
The program now includes 25 sites. programs for southeast Florida.

2004
National Coral Reef Institute (NCRI) begins SE Florida regional reef mapping project
The NCRI is part of the Florida Fish and Wildlife Research Institute (FCC). Maps have been completed for Broward County. Palm Beach and Miami-Dade county maps are planned or underway.

2004
Expanded reef monitoring program extends from northern Dade County to St. Lucie County
Initiated by the Florida Fish and Wildlife Institute and Harbor Branch Oceanographic Institution.

2005
Florida Reef Resilience Program Disturbance Response Monitoring program begins
Through this program, annual surveys are conducted over 8-week periods during summer peak bleaching temperatures by scientific divers. Coral bleaching data from these surveys allow scientists to zero in on which corals and reefs have been more or less resilient in years past by measuring coral species diversity, abundance, and size and how resilient they are at present by assessing their condition.

2006
SECREMP expands
SECREMP adds three new sites in Martin County.

2006
NOAA Marine Debris Program funds a reconnaissance project to develop a strategy for removing and disposing the tires located in Osborne Reef
Retrieval techniques were explored; 30 sample tires were retrieved and examined for processing suitability. Handling, staging and transportation methods were considered; and end uses were explored. As there has not previously been a recovery of waste tires from the ocean of this scale, it was decided that a pilot program (carried out in 2007) was needed to test diver retrieval productivity, loading and transport methods, and tire processing and use.

2006
FDEP-CRCP assumes added responsibility
Their responsibility now includes coordinating and leading response to vessel groundings and anchor damage incidents.

2007
Broward County contacts the United States Assistant Secretary of Defense for Reserve Affairs about their Innovative Readiness Training (IRT) program for a potential project to clean up Osborne Reef
The IRT looks for civil-military projects that improve military readiness and address the needs of the American public. CWO Donovan Motley said that the cleanup of Osborne Reef met the requirements, and a pilot program was launched with 40 military divers from the US Military and the US Coast Guard and one Landing Craft Utility (LCU) ship in order to determine the priority areas and set a plan for the removal of the tires.

2008
11th International Coral Reef Symposium held at the Greater Fort Lauderdale/Broward County Convention Center
The Symposium's goal was better understanding of coral reef ecosystems and consequently effective conservation and management strategies. The Symposium promoted the dissemination of knowledge about reef sustainability and resilience, particularly important to many nations who depend upon coral reefs for their economy and food supply.

2010
Marine Regulation Awareness Program develops
Individuals who have received marine regulation citations (for fishing, diving, or boating) may, at the discretion of the U.S., state, and/or local district attorney's office(s) and the ticketing law enforcement agent, take the Marine Regulation Awareness Program in exchange for having their fined reduced or waived. This program will also be offered for free to the public in order to increase marine awareness.

2010 - 2015
Climate Change Action Plan for the Florida reef system developed
This plan is intended to guide coordination of reef management across many jurisdictions and serve as a more detailed, Florida-specific companion to the climate change goal and objectives in "NOAA Coral Reef Conservation Program Goals & Objectives 2010-2015." It was formulated by reef users, managers, and scientists as part of the Florida Reef Resilience Program.

2011
Southeast Florida Marine Event Response Program (SEMERP) created
SEMERP is an expansion of the Mote Marine Laboratory's Marine Ecosystem Event Response and Assessment Program (MEERA) in the Florida Keys National Marine Sanctuary. It will fill the reporting/response gap in the southeast Florida region and will be designed to provide a similar and continuous response program for the entire Florida Reef Tract. Upon notification of a biological disturbance event, FDEP CRCP will coordinate with regional partners to schedule initial site assessments, implement event response protocols, and analyze samples, where possible and appropriate.

2012
Southeast Florida Action Network launched (SEAFAN)
SEAFAN is a reporting and response system designed to improve the protection and management of southeast Florida's coral reefs by enhancing marine debris clean-up efforts, increasing response to vessel groundings and anchor damage, and providing early detection of potentially harmful biological disturbances.

2013
The FDEP has ordered the Town of Palm Beach to build artificial reefs and coral nurseries
These reefs are meant as mitigation for the coral damage caused by the 2003 and 2006 Mid-Town beach renourishment projects. As a condition for FDEP to allow future renourishment projects in the area, Palm Beach must build acres of mitigation reef, transplant 5,000 coral colonies and monitor the nurseries for the next 10 years. Project costs are expected to exceed many millions of dollars.

2013
Florida CRCP seeks public input via general meetings
Twelve meetings, located in West Palm Beach, Stuart, Delray Beach, Ft. Lauderdale, North Miami, and South Miami will allow the public to participate in a process called Our Florida Reefs to collect concrete proposals for reef protection. The meetings, being coordinated by the Florida Department of Environmental Protection, are aimed at plugging a gap in managing South Florida's reefs, vital marine ecosystems that attract boatloads of tourists for fishing, snorkeling and diving.

2013
Discussions to harmonize regulations and fisheries management structures across South Florida
FWC, Atlantic Fisheries Council, and Gulf Fisheries Council hold discussions to try to harmonize regulations and fisheries management structures for south Florida, particular for the management of certain fish in state waters in South Florida (many of which are reef fish species)

2013
Port Everglades call for expansion plans that could harm nearby reefs
The $313 million project with the Army Corps of Engineers calls for blasting and dredging through limestone and coral to deepen the port's entrance channel from 42 feet to 48 feet.

1960
Florida's population is 4,951,560
The Federal census ranks Florida the 10th most populated state in the nation.

1961 - 2003
Global sea levels rise
Sea level rise averages about 1.8 mm/year (1.3–2.3).

1964 - 1998
Recreational fishing increased 444% in South Florida

1964 - 2002
Commercial shipping into the ports at Palm Beach, Port Everglades, and Miami increases by 150% and the number of recreational boats in SE Florida increases by 500%
The proximity of reefs to the navigational inlets and commercial ship anchorages leads to a high risk for ship groundings and anchor damage with subsequent reef damage. This reaches an extreme around Port Everglades Inlet where a relatively shallow (d = 20 m) anchorage lies in sand offshore of the middle reef tract.

1968 - 1969
Investigations into Turkey Point Nuclear Power Plant reveal that the heated water effluent, used to cool the reactors, is being released into Biscayne Bay
These investigations, conducted between the summer of 1968 and the fall of 1969, revealed that the effluent was responsible for the dying plants and decreased populations of animals in the area. Efforts by the US Atomic Energy Commission and Federal Water Pollution Control Administration led to the discontinuation of water water effluent into the bay, and the replanting of turtle grass. Instead of releasing the water to Biscayne Bay, the company was permitted to build 168 miles (270.4 km) of cooling canals from 6,800 acres of mangroves.

1970
Population of Florida is 6,789,443

1975-1989
Unprecedented, slow biophysical changes occur to coral reefs on a Caribbean-wide scale
Acropora die-off (elkhorn coral, staghorn coral) and loss of extensive Acropora 3-D habitat structure. Loss of fastest-growing reef framework-builders in the Caribbean.disappeared. On some reefs, the storm scoured the tops, rolling over the 200 year-old coral heads and breaking off branching corals.

1980
"Throughout the 1980s, oil drilling proposals, reports of deteriorating water quality, and evidence of declines in the health of the coral reef ecosystem continued to mount."

1980 - 1999
Proliferation of coral diseases throughout Florida

1983 - 1984
Diadema sea urchin die-off
The disease began off the Carribbean coast of Panama, and eventually spread its way throughout the Carribbean and to the Florida reef system. It was widespread and virulent, with a 98% mortality rate. No causitive agent for the pathogen has been conclusively identified.

1989
Extensive blooms of Codium isthmocladum
These blooms affected deep (37-45 m) reefs off northern Broward County and Palm Beach County, and were adapted to low light levels and developed seasonally in the late spring and summer.

1988 - 2008
12 acres of nearshore reef are damaged during pipeline installation

1990
Concrete recycling becomes more prominent
Large, portable concrete crushers are readily available for use directly at construction sites, reducing the cost-savings incentive for donations of secondary-use concrete for artificial reef construction. As a result, the use of secondary concrete for artificial reef construction has reached a plateau in southeast Florida. Reduced use may be expected in future years.

1992
Hurricane Andrew hits South Florida
This was the most severe hurricane in the last decade. Major storm effects included changes in the nearshore water quality, localized intense bottom scouring, and beach overwash. The stirring of sediments increased the dissolved phosphate levels, leading to plankton blooms and low oxygen levels. In hard-bottom communities, sponges, corals, and sea whips were sheared from their substrate and deposited among extensive wracks of debris. The juvenile spiny lobsters normally found under sponges and corals in central Biscayne Bay disappeared. On some reefs, the storm scoured the tops, rolling over the 200 year-old coral heads and breaking off branching corals.

1993 - 2007
11 ship groundings took place at Port Everglades Inlet anchorage
Port Everglades Inlet has a relatively shallow (d = 20 m) anchorage offshore of the middle reef tract. 40,000 square meters were impacted.

1994 - 2006
11 ship groundings and 6 anchor drag cases in Broward County
This led to 11 acres of damaged reef habitat.

1997 - 1998
Especially strong El Niño year occurs
Corresponds with coral stress bands in 1998-1999. This illustrates the connection between coral growth and global-scale climate patterns.

1997 - 1998
First global mass coral bleaching event
Loss in stony coral cover

1998
Hurricane George hits Florida
Loss in stony coral cover, mostly within the Florida keys region

1998
Over 40 million tourists visit Florida

1999
Hurricane Irene lands in central Florida
Coastal communities experienced rough surf, storm surge, rain and wind gusts.

2000 - 2001
Decline of sponges
Sponges decline significantly but later stabilize. High rates of concomitant sedimentation in the winter of 2001 may have contributed to sponge mortality.

2000
A bloom of Australian spotted jellyfish, invasive to southeast Florida, occurs
The bloom had a significant impact on the shrimp fishery in the Gulf of Mexico. While this outbreak was relatively confined, there is the possibility that future blooms may occur over broad areas and potentially affect fish spawning success because the jellyfish preys on the eggs and larvae of many species.

2001
Pacific species Caulerpa brachypus parvifolia discovered on reef communities off Riviera Beach
This invasion expanded northward to Ft. Pierce, forming thick mats that covered up to 90% of reefs in northern Palm Beach County and resulted in loss of biodiversity and fisheries habitat.

2001 - 2002
Lowest average monthly temperatures
Average maximum monthly water temperatures in this time period exceeded 29°C in the summers of 2001 and 2002. Elevated water temperatures can induce coral bleaching and while bleaching of some stony corals, octocorals, and Palythoa caribbeorum colonies has been observed, mass bleaching events have not occurred since the El Niño of 1997–98.

2002 - 2006
Discovery of elevated nutrient enrichment from the Delray outfall
Water quality monitoring data from the experiment shows that there is substantial nutrient enrichment of the environment down from the Delray outfall, which can be one of the causes of the cyanobacteria and algae blooms near Palm Beach County.

2003
Blooms of cyanobacteria Lyngbya confervoides and L.polychroa occur offshore of Broward County

2004
Hurricane Charlie, Frances, Ivan, and Jeanne hit Florida
Wide-spread accumulation of silt/clay size sediment was observed on nearshore hardbottom from Cape Canaveral to Fort Lauderdale. This material filled sand depressions on the inter-reef sand plains and buried patches of nearshore hardbottom and persisted through at least the winter of 2007. Hurricanes Frances and Jeanne temporarily removed the invasive C. brachypus blooms, but the species reestablished itself in winter 2007.

2005
Hurricanes Katrina, Wilma, and Rita hit Florida
Severe sea conditions during hurricane Katrina resulted in the highest sedimentation rates measured in that year. Sediment resuspension levels did not return to pre-hurricane passage levels even four days after Hurricane Wilma passed.

2005 - 2006
Extensive cyanobacteria blooms subside
Algae blooms subside, although shorter time scale boom/bust cycles are apparent.

2005 - 2006
Southeast Florida accounts for more than 20% all recreational saltwater fishing licenses sold in Florida

2006
More than 165,000 recreational boats are registered in southeastern Florida
Many of these vessels anchor on to coral reefs, causing extensive damage.

2006
Staghorn and Elkhorn coral species are listed as threatened
The Endangered Species Act was first created under President Nixon in 1973. Staghorn coral (Acropora cervicornis) and elkhorn coral (Acropora palmata) that are found in south Florida waters and throughout the Caribbean are listed as Threatened Species under the federal Endangered Species Act in 2006.

2007
Macroalgae blooms in northern Broward and southern Palm Beach Counties
The bloom comprised of Cladophora liniformis, Enteromorpha prolifera, and Centroceras clavulatum, which formed a thick mat on sand bottom and reef. The cause has not been identified.

2007
Caulerpa brachypus spreads into northern Broward County
Harmful algal blooms of Caulerpa brachypus have occurred extensively offshore Palm Beach County during the past decade and are spreading. Extensive blooms of cyanobacteria Lyngbya confervoides and L. poly-chroa have been reported on the reefs offshore of Broward County. These blooms have had a significant impact on reef-associated organisms by smothering and out-competing recruits of sessile benthos

2010
Orange cup coral (invasive exotic species) threatens local coastal biodiversity
The orange cup coral, Tubastraea coccinea, is a non-native stony coral in the South Atlantic region.