**EVR 4356 Coastal & Marine Environmental Policy**

Florida International University

Miami, Florida

**Instructor:** Dr. Stephen Leatherman; Office: AHC-5, Room 385; Phone: 305-348-8364; Email: Leatherm@fiu.edu

**Class Schedule:** Thursdays, 5-7:40 PM; PC-212

**Reference Texts and Videos (Available in Green Library Reserve and On-Line):**

- Sand Wars, documentary video, Paris, France (Green Library).
- Shark Whisperer, Jim Abernethy videos (Vimeo on-line).
- Florida’s Red Tide Problem, Misty Wells Radio Show (available on-line).

**Discussion Papers (Provided via Drop Box or available on line):**

- Miami Beach at 100, Shore & Beach, 2015.
**Literature Review:** You will be asked to locate relevant articles on-line for some classes, which should be summarized in bullet points and discussed in class.

**Course Description and Objectives:**

Coastal areas are experiencing rapid population growth; more than 50% of the U.S. population resides near the coast, and 17 of the 20 world’s largest cities are located in the coastal zone. Some of the most pressing environmental issues involve climate change, coastal development and resilience, overfishing, introduced/invasive species such as Burmese pythons, red tide and marine disasters, particularly oil spills. Understanding these issues and how to address them is essential for short and long-term sustainability of the coastal and marine environment. Development of proper management and effective policies by governments to deal with environmental degradation involves scientific, socioeconomic and political factors.

The overall objective of this course is to develop the scientific knowledge base and critical thinking skills to understand the policy and management issues involved in dealing with environmental change and degradation. Through case studies and specific examples, the diverse range of problems as well as the successes and failures of coastal and marine resource policy and management will be revealed.

**Field Trips:** Saturday field trip to Key Largo Dolphin Therapy Center and tarpon experience at Robbie’s Marina in Islamorada, Florida Keys.

**Grading Policy:** Grades will be based on the following scores:

- Class discussions and debates 20%
- Weekly write-ups of assigned readings and literature reviews (use bullet points for main points and critical questions; limit one page per assignment with second page for three questions & references) 20%
- Power-point presentations 10%
- Mid-term exam 25%
- Final exam 25%
Grading Scale:
A  93-100    B  83-86    C  70-76    D  60-69    F  <60
A-  90-92    B-  80-82
B+  87-89    C+  77-79

Class Schedule

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Review of the history of ocean policy from Secretary of State Thomas Jefferson’s declaration in 1793 that US territorial waters extended 3 miles offshore to President Ronald Reagan’s establishment in 1983 of the exclusive economic zone (EEZ) to extend 200 nautical miles from shore in order to protect fisheries and secure oil and mineral rights. The United Nations Convention on the Law of the Sea and U.N. Framework Agreement on Climate Change in 1992 have still not been ratified by the U.S. Congress. China is building offshore islands in order to expand their territorial waters. The U.S. Commission on Ocean Policy was established to provide a guide for coastal and marine policy for the 21st century.

Assignment for next week: One-page literature review of the problems and possible solutions for remediation of blue-green algae in Lake Okeechobee, which is greatly impacting Florida waterways, canals and beaches.
Week 2  Harmful Algal Blooms (HABs): Blue-Green Algae and Lake Okeechobee

Coastal red tide and inland (freshwater) blue-green algae (actually a cyanobacteria) have killed large numbers of fish and blighted bays and beaches with tainted water along both the Atlantic and Gulf coasts of South Florida for many years. The problem has escalated in recent years and cannot be solved in the short term, but some remediation is possible using a range of approaches. The release of nutrient-rich water from Lake Okeechobee by the U.S. Army Corps of Engineers has slimed canals and bays in Southeast Florida and significantly reduced beach water quality.

Assignment for next week: One-page literature review of red tide as a worldwide problem but with special emphasis on Southwest Florida. Selected students will prepare a 10-minute power-point presentation on this issue.

Week 3  Red Tide in Florida

Red tide blooms on the Florida Southwest coast date back to explorer times in the 1500s, but its persistence and more frequent occurrence are believed to be related to excessive nutrients from fertilizer runoff from yards and the influx of freshwater algal blooms. Red tide causes the death of not only fish, but also dolphins and manatees, makes shellfish poisonous to consume and results in aerosol toxins at Gulf beaches, making them unusable by the public. The Chinese, which have terrible problems with oceanic water pollution, have been using modified clay to control red tide.

Assignment for next week: One-page literature review regarding the impact of introduced species on South Florida, especially Australia pines. What is the difference between introduced and invasive species? Selected students will prepare a 10-minute power-point presentation on this issue.
Week 4  Are All Introduced Species Harmful?

Non-native species have been introduced intentionally and accidentally worldwide, often in the ballast of ships, such as the zebra mussel in the Great Lakes that has been devastating to the lake ecology and freshwater inputs to coastal cities like Chicago. The mongoose was introduced into Hawaii and nutria in Louisiana, resulting in unintended consequences. But are all introduced species harmful? The orange tree appears on most Florida license plates so it must be a native tree? What is the origin of the most beautiful tree in Miami that is celebrated annually by the city of Coral Gables? Why were Australia pine trees at Ft Desoto Park in St. Petersburg all destroyed while these trees provide welcome shade at Haulover Park?

Assignment for next week: One-page literature review regarding the problem and control of pythons in the Everglades. Selected students will prepare a 10-minute power-point presentation on this issue.

Week 5  Can the Everglades Be Saved, Considering the Python Invasion?

Approximately 500 invasive species have been introduced into the Everglades—what is the impact on this International Biosphere Reserve termed the “river of grass”? The multi-decadal, $12 billion project to save The Everglades is underway, which includes raising portions of Tamiami Trail; should sea-level rise be incorporated into this planning? Does the development of a four-lane highway from Key Largo to the mainland for hurricane evacuation degrade this fragile ecosystem as claimed by many environmental groups? What are the problems of introduced/invasive species, especially Burmese pythons, on the Everglades ecosystem? Should new policies be considered for Argentine tegu lizards and giant African snails?

Assignment for next class: One-page literature review regarding swimming with dolphins both positive and negative. Selected students will prepare a 10-minute power-point presentation on some aspect of this issue.

Week 6  Marine Species: Recreation vs. Preservation Issues

Is swimming with dolphins important to promote public awareness and conservation of these animals or simply species exploitation? There is a dolphin conservancy in Key Largo where kids with extreme disabilities swim with these marine mammals, making them smile or even attempt to talk for the first time. Shark diving is a major attraction in the Bahamas, such as
Stuart’s Cove in Nassau. Shark whisperer Jim Abernethy performs incredible stunts with some of the largest and most fierce predators—6-meter tiger sharks. By contrast to attractions at the Miami Seaquarium and Orlando Sea World, consider the no-catch zones in Biscayne Bay which have been designed as a National Marine Sanctuary. In the past, opponents carried signs that stated: “Just Say No to NOAA.”

**Assignment for next week:** One-page literature review on the fate of whales due to Japanese fishers, polar bear population changes in Canada or seal overpopulation and recent attacks by great white sharks at Cape Cod, Massachusetts. Selected students will prepare a 10-minute power-point presentation on some aspect of this issue.

**Week 7  Fate of Large Coastal and Marine Animals**

What are the problems of fishing or overfishing of whales and sharks? Are Japanese and Norwegian fishers still catching whales and if so, which ones and why? What international policies are in place or need to be enacted to preserve these marine animals and how can they be enforced? What are the principal threats to polar bears in Arctic countries, such as Canada? Is the melting of Arctic sea ice the principal threat to polar bears and a cause of rising sea level?

**Assignment for next week:** Prepare for Mid-Term Exam.

**Week 8  Spring Break (February 24-28)**

**Week 9  Mid-Term Exam**

**Week 10  No Class—Saturday (March 14) Field trip to Dolphin Therapy Center in Key Largo and Robbie’s Marina in Islamorada**
Assignment for next week: One-page literature review of sea level rise impacts on Miami, which is considered “ground zero” for climate change impacts. Selected students will prepare a 10-minute power-point presentation on some aspect of this issue.

Week 11 Should Miami Be Abandoned?

What is the forecast for Miami-Dade County in response to rising sea levels during the next 50 to 100 years? Should we start planning for retreat/abandonment and if so, when? Large development tracts in the past, such as Weston, have been made possible by dredge and fill operations (e.g., removing the top layer of organics and filling with crushed limestone to achieve desired elevation). Thunderstorms are already causing flooding in the Sans Souci area of North Miami. Will Miami Beach become the new Atlantis? How can world-famous resorts, such as South Beach, be maintained (e.g., shore stabilization with seawalls or beach nourishment)?

Assignment for next week: One-page literature review each of video on Sand Wars (available via Green Library) and Surfside Sand Controversy (see DropBox). Selected students will prepare a 10-minute power-point presentation on some aspect of this issue.

Week 12 Sand Wars and the Surfside Story

Sand is the magical stuff—waves pile it up at the shore to build beaches whereas silt and clay, which make water turbid (e.g., muddy) are not stable on an oceanic beach and are deposited offshore in deep water. Miami Beach was largely beachless in the 1970s. Time magazine reported in a 1977 article that “So rapidly has the seven-mile-long island degenerated that it can be fairly described as a seedy backwater of debt-ridden hotels, gaudy condominiums and decaying apartments.” A massive beach nourishment project that cost $51 million brought back a wide beach and hence visitors and the economy. More recently, fill from excavation for a mid-rise, beachfront hotel was placed on Surfside Beach, which resulted in tremendous controversy as the white sand was covered with brown sand that contained some construction materials and presumably toxic chemicals, including arsenic.

Assignment for next week: One-page literature review on Clifton Heritage Park vs. other parks in New Providence Island, Bahamas—history and present status (e.g., what facilities are
Week 13  Challenges for Coastal & Marine Parks

What are the challenges of developing national coastal and marine parks in small island countries? Consider the case of Clifton on the west end of New Providence Island (Nassau), Bahamas wherein a large development with dredged canals to make waterfront homes for boating was proposed. Prized coral reefs for snorkeling, diving and movie production exist only tens of meters offshore, which would have surely been destroyed by construction of the proposed 500 canal-front houses. Instead, the Bahamian government purchased the land via private donor contributions to establish the Clifton Heritage Park, which includes Jaws Beach. How many public beach parks are located in New Providence Island? By contrast, the United States National Park System may include too many minor or only locally significant areas that have been placed into the NPS system by the action of influential Congressmen who want the public at large to pay for what should be state or county parks.

Assignment for next week: One-page summary of literature review on climate change, hurricanes, increasing coastal populations and property damage. Selected students will prepare a 10-minute power-point presentation on some aspect of this issue.

Week 14  Climate Change, Hurricanes and Increasing Property Damage

Did global warming cause Super Storm Sandy in 2012 that ravaged northern New Jersey and New York City? A large portion of the population believes this to be true. What is the relationship between global warming and hurricanes in terms of their frequency and magnitude? Was Hurricane Katrina that devastated New Orleans in 2005 caused or related to global warming as often stated by the media who sometimes also reported it to be a category 5 hurricane? What is the reason(s) for the increasing coastal property damage over time?
Bermuda is often directly hit by hurricanes, yet property damage is usually minor even with major hurricanes; why is this the case?

**Assignment for next week:** One-page literature review of the coastal policies that have evolved in the wake of oil spills, spanning from the Santa Barbara Blowout in 1969 to present. Selected students will prepare a 10-minute power-point presentation on this issue.

**Week 15  Oil Spills in the Marine Environment**

Was the BP oil spill in the Gulf of Mexico the worst environmental disaster in North America as often reported by the media? Consider the Exxon Valdez and Pemex oil spills in 1989 and 1979, respectively. What policies and regulations were promulgated in the wake of these major events? How much oil is lost to the marine environment with the off-loading of tankers in ports such as Tampa Bay?

**Assignment for next week:** Study for Final Exam

**Week 16  Final Exam:** The schedule will be announced when available from FIU; there will be no other activities except the Final Exam during final examination week. The Final Exam will consist of multiple-part, short-answer questions as was the case for the Mid-Term Exam.