ENC1102

Presented to Jacqueline Johnston

Research paper – Final essay

Letter to the EPA (Environmental protection agency)

By Gary Cassagnol

Florida International University

Friday July 28, 2017

The Honorable Scott Pruitt, Administrator

Environmental Protection Agency

USEPA Headquarters

William Jefferson Clinton Building

1200 Pennsylvania Avenue, N.W

Mail code: 1101A

Washington, DC 20460

Greetings Administrator Pruitt,

My name is [redacted]. I am a landscape architecture and an environmental design student at Florida International University. I am writing to urge the EPA to revitalize the environmental health of Florida's coastal edges. I believe The pressing issues are as follow: Saltwater intrusion, long-term harmful side effects of pesticides, freshwater mussel habitat loss, and nuclear plant leaks, all affecting the water quality of Florida (Scott T. Prinos 2014). I am also writing to urge you to continue regulation for water quality in inland and off land areas, resulting from numerous harmful pollutants. To do any less will cause economic damage and threaten the health of Florida's coastal ecology.

Let me begin by friendly reminding you that the Biscayne Bay is where the the fresh warm water transports and provide nutrients to existing species within its coastal

edges. Also, the Floridian aquifer, containing the water table, is the second most important source of fresh water after the Everglades. Recently, it has been reported by the Miami Herald newspaper that nuclear waste spills have intoxicated the bay causing an invasion of harmful blue algae blooms. These toxic marine plants are often consumed by the marine species, poisoning them thus. (Staletovich 2017)

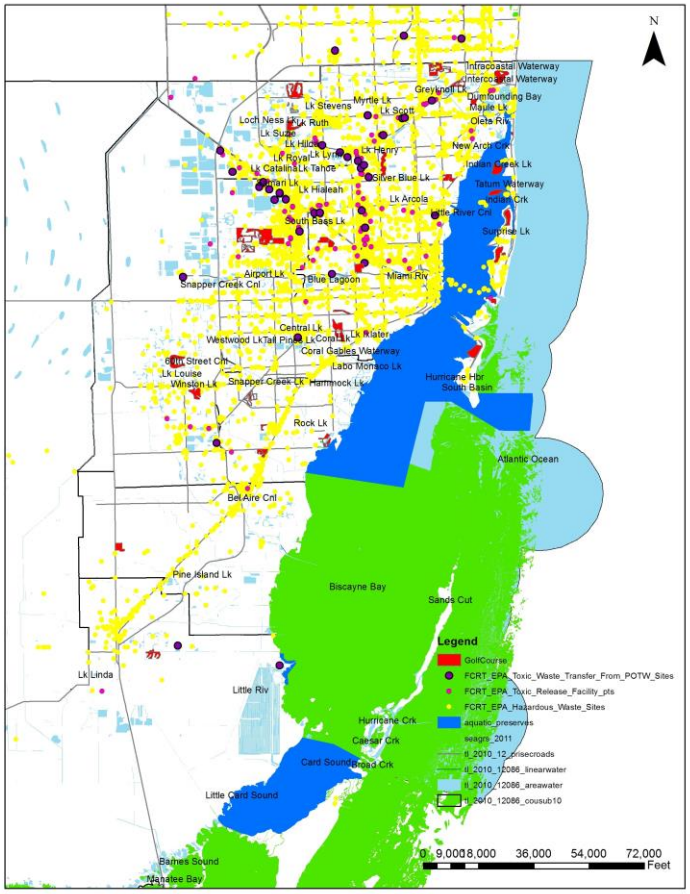
Many studies by the pesticide action network of North America and others have shown how pesticides can have cancer health effects. Their frequent application on golf courses for maintenance purposes, can not only have long-term effects on the player's health, but contaminate the Floridian water table. Moreover, according to a New York Times magazine article by Lizette Alavarez, entitled "Outcry Erupts Over Miami Beach's Pesticide Spraying to Curb Zika", studies showed that harmful chemicals with harmful potential to pregnant women, were found in the pesticides that the county has been spraying over the city to fight the ZIKA virus. Miami Beach Mayor Philip Levine, supports the spraying even after potential threats have been identified from the product. "It would be irresponsible not to listen to the experts." Said Mayor Levine (Alvarez 2016). I believe the mayor does not seem to worry about this pressing issue, requiring immediate environmental reforms. Natural immediate alternatives to chemically engineered pesticides can be applied for maintenance. While waiting for these environmental friendly alternatives to become mandatory by law, other alternatives such as native vegetative strip systems can help address pesticide runoffs in golf courses.

According to Veterinary and lab analyst Barbara Deflorio, from the University of Massachusetts, there is a way to naturally filter pesticides. In a video study entitled "vegetative strips study", Deflorio demonstrates how native grasses can tackle the harmful side effects of pesticide runoffs. In the context of Inland polluted water sources, vegetative strip systems can be an effective way to address water pollution issues. In Florida, many golf courses have artificial water ponds that help prevent floods from storm water runoffs. They are called retention and detention ponds. When pesticide runoffs, along with storm water runoffs, end up in these ponds, they penetrate the ground and reach the water table, thus contaminating it. Along the coastal edges, of Key Biscayne for example, the golf courses are very close to the waters, allowing the pesticide runoffs to be easily evacuated into the marine waters, thus intoxicating the existing species in the bay. Through the process of phytoremediation[1] and bioremediation[2], native grasses such as the blue flag iris, the woolgrass, the prairie grass, the bluestem grass and the eastern gamagrass can break down the pesticides into non-harmful chemicals. (Deflorio 2010)

Another ecological approach would be habitat preservation. According to the authors of "fresh water mussels of Florida", Williams, James D. Butler, Robert S. Warren, Gary L. and Johnson, Nathan A. Warren there is a freshwater mussel habitat loss. These mollusks have the ability to filter pollutants and other harmful elements from the waters they live in (Williams 2014). One adult mussel can filter up to fifty gallons of water in twenty-four hours. Even after filtering the dirty waters, their biological constitution help them remain safe to be eaten by people and other species.

[1] When the plant takes the pesticide from the soil and incorporates it into its tissues.
[2] When the rizospheres of the plants have bacteria that break down the pesticides to non-harmful chemicals.

It caught my attention that Mayor of Miami Beach, Philip Levine objected to the article published by the Miami Herald magazine, saying it was taking advantage of the situation to sell adds. Mayor Levine not only rejected the article, but also rejected the pollution study by Florida International University experts. By doing so, the mayor may be implying that nuclear wastes are not a threat to the bay. I investigated further on the matter and noticed that other news establishments such as CBS and Local 10 news have been broadcasting the nuclear waste pollution issue in the bay since 2016. Therefore, I disagree with Mayor Levine, minimizing the Turkey point nuclear scandal and its impact on the bay. I believe that Floridians should question their surroundings and be responsible consumers of information. (news 2016)



After collecting data from the National Oceanic Atmospheric Administration, I assembled a map through the Arc GIS software by ESRI. This map is showing polluted sites in Miami-Dade County, pollution generators, seagrass habitat and aquatic preserves. The Biscayne Bay is not part of those preserved areas; Why not?

The Biscayne Bay is not only polluted by boat fuel waste, trash dumping, nuclear and sewage wastes. Inland water contamination also participates in its intoxication. Inland water sources such as rivers and canals are being evacuated into the coastal edges, henceforth affecting the salt water and its species. (Staletovich 2017) (Williams 2014)

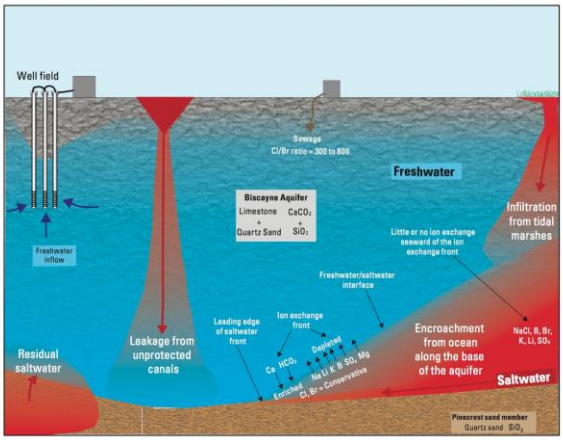
Landscape Architect and environmental advocate Kate Orff with the expertise of marine biologist Doctor Ido Sella, formulated strategic design approaches to address environmental threats such as the ones faced by the Biscayne Bay. In Orff's book, the author conceptualizes an urban ecology project called Oyster-tecture. This project, with oyster reefs, can help filter the New York City's coastal edges. It is a hybrid project, where people and nature can genuinely coexist (Orff Jul 12, 2016). Since Oysters do not thrive well in warm waters provided by the Gulf of Mexico and the Atlantic Ocean, Mussels, having the same abilities as Oysters, can filter water, just as successfully. Moreover, to support the argument that mussels can filter water, Marine Scientist Eric Heupel, videotaped an experiment he conducted on adult mussels. He filled two tanks with dirty water: one with and one without mussels. After one hour, a dozen mussels filtered ten gallons of dirty water. The result was significant. In addition, in his notes, Heupel added that based on his research, the water sources of Long Island and Chesapeake were clearer in the 17th Century compared to the present. (Heupel 2011)

As mentioned earlier, nuclear waste pollutants have affected Biscayne Bay, generating an invasion of toxic blue algae blooms. Increasing the oxygen level in these waters, and improving drainage systems, could help solve said issue.

In order to address the water pollution issue in Florida, more specifically in the Biscayne Bay, I strongly believe that by strategically installing mussel farms within the bay would naturally help maintain the waters clean. These salt-water mussels are just as effective as the fresh water mussels.

According to a scientific investigation report by the United States Geological Survey, there is evidence of salt-water intrusion and changes in the distribution of salt water in Miami-Dade County. This intrusion can and will affect the quality of the water that is distributed in Florida. It is Florida's primary source of drinkable water. Red and white mangroves, which thrive very well in South Florida, can and will filter the salt from the air and ground around them.

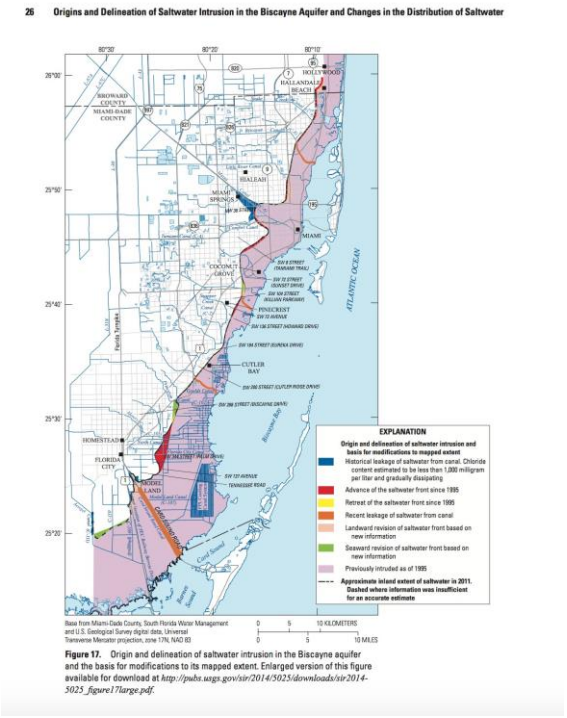
Origins and Delineation of Saltwater Intrusion in the Biscayne Aquifer and Changes in the Distribution of Saltwater in Miami-Dade County, Florida



Scientific Investigations Report 2014–5025

(Scott T. Prinos 2014)

In order to protect the health of the environment and the health of the local population, preserving the local ecology is a matter of priority. Not only would these farms and reefs keep the Bay clean, but they would also provide food for the people, thus boosting the local economy.



(Scott T. Prinos 2014)

Ecological and agricultural tourism would be added to the existing touristic activities in Florida. In addition, I am worried that the new budget cuts undermine the tourism-dependent economy of the region.

Therefore, I urge you to consider reinforcing coastal edge protection programs and promoting active aquaculture farming:

1. Rationally enforce and reform laws regarding the use of pesticides on any type of vegetation. This particular action should especially be enforced in golf courses along the Biscayne Bay, given its recent environmental threats.
2. Urge the federal government to reconsider their budget cuts, due to their many consequences on the environment.
3. Encourage collaborations between landscape architects, architects, ecologists, biologists and environmentalists. Together, sustainable design practices are twice as effective.
4. Urge the Governor of Florida to strongly suggests his mayors to consult with Israeli Marine Biologist Doctor Ido Sella and New Yorker Environmental designer Kate Orff, to evaluate the feasibility of a potential mussel reef project in Biscayne Bay. I believe such project will help improve the environmental and economic health of the Bay.
5. The Floridian coastal edges are facing erosion issues and mangrove habitat loss, and salt-water intrusion, affecting soil fertility. Restore the mangrove habitat to address the erosion issue happening along the coasts of Miami Beach, the Keys and Key Biscayne. Not only will the white and red mangrove prevent the sandy soil to erode and minimize storm impact on the coast, but will also filter the salt out of the salt water intruding the urban grounds.

Thank you for your action on this matter,

Best Regards,

Gary Cassagnol

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July 28 2017

Bibliography:

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