

Environmental Impacts on the Gulf of Mexico and Its Coast

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¹That is the sound of the American alligator. We will think back to him in a bit but first, Welcome to this edition of the Waterbytes podcast.

Today, we will be exploring the ways in which the Coast of the Gulf of Mexico been impacted by environmental issues.

But, first, a *very* brief history lesson. This semi-enclosed ocean basin and its coast, started forming when the mega-continent Pangea started breaking up around 180MM years ago². Sometime before 10,000 years ago people began populating the region, alongside mastodons, giant rodents³, and massive alligator⁴.

By the 19th century, what had been a subsistence activity, fishing, was now a method of commerce needed to feed a growing population. For a very long time, the bounty of the Gulf seemed endless⁵.

⁶Now, *that*, is the sound of the outboard motor of a very small fishing vessel. Fishing is still a mainstay all along the Gulf Coast, as is shrimping, shell-fishing, and agriculture. There are other industries, such as aerospace, pharmaceutical production, and tourism, but even those unfamiliar with the broader coastal economy know two things: the Gulf has shrimp and it has oil and gas. If for no other reason, the former is known because of the catastrophic BP Oil spill in 2010. Unfortunately, that was not the beginning of the problems for the Gulf of Mexico, its coast, and its people.⁷

For as long as humans have interacted with this body of water they have used it to dispose of unwanted refuse⁸. Early inhabitants left their “garbage” in the form of piles of shells for archaeologists to later discover⁹. As the industrial revolution has unfolded, the refuse drowned in the crystal green-blue waters became increasingly toxic.

For instance, in the 1940s, right about the time that oil drilling began in the Gulf, it also became a dumping ground for munitions, mines, and chemical bombs¹⁰. Over many decades, the amount of nitrogen from pesticides discharged into the Mississippi and finally into the Gulf has grown to over 1.5MM tons annually¹¹. This nitrogen, in combination with urban and sewage runoff provides a feeding frenzy for phytoplankton¹². Bully for them! A feast and population boom for the phytoplankton! Except that, when those increased numbers of phytoplankton die, their decomposition uses up all the available oxygen, which kills other living creatures, like shrimp and fish. The oxygen-deprived region is called the “dead zone” for obvious reasons, last summer it was bigger than the US state of Connecticut.¹³

But let's get back to the coast and coastal life. Let's consider those people who make a living by fishing on the Gulf. One report cited by the NRDC estimates that, by 2020, due to the oil spill alone, the fishing industry will lose 8.7 billion¹⁴ dollars. And, that's just the fishing industry. Many coastal people make their living from tourism, according to NRDC projections, losses in that industry reached \$22.7 billion through 2013.

And then, there are the health consequences to residents living along the coast and for those who helped with the clean up. While there are no definitive numbers available for those impacts, immediate health concerns associated with the dispersants used¹⁵ to "clean up" the oil, include skin rashes and respiratory problems. Long-term studies are ongoing¹⁶ but we will not know the true affects for years to come.

The environmental impacts for animals and humans continue to grow from this single incident but scientists tell us there are other reasons for concern. Among them: rising water temperature which contributes to more frequent and intense storms whose impacts become greater and more wide spread due to rising sea level¹⁷. According to the Department of the Interior and the USGS, there are also the problems of dwindling dunes¹⁸, which provide shoreline protection¹⁹. There is also an issue of short-sighted water shed management²⁰ causing further damage, as cited in a study published in the *Journal of Coastal Research*. Additionally, scientists have identified further issues affecting the Gulf Coast including declining bio-diversity²¹ and natural habitats²²- such as those of the American Alligator.

And, why is that important to humans? Because, as found in a 2011 Penn State Department of Geography, College of Earth and Mineral Sciences study, healthy ecosystems with higher biodiversity are better able to withstand and recover from disasters²³. Humans are part of the ecosystem and as a result, also benefit from its health.

So, how did this situation come to be? Some cite lax regulation, lack of proper conservation investment²⁴ as stated in a recent New York Times article or there is the difficulty of appropriate infrastructure development²⁵ as identified in the *Journal of Coastal research*.

It seems, the answer is, over time, individual contributors both natural and human - that might not, all by themselves, ruin the whole Gulf of Mexico, have come together to make one big toxic gumbo.

So, what can be done about it? It will take tremendous, concerted, combined effort, and a lot of money to resolve the issues affecting the Gulf Coast. If the folks at the *Journal of Coastal Research* have it their way, in the future, the Gulf Coast needs an ecosystem-based management approach²⁶ with greater investment in shore conservation and protection as supported by the *Journal of Environmental Conservation*²⁷. And, the enforcement of existing regulation²⁸ must be a priority. According to the *Journal of Soil and Water Conservation*, it requires dead zone mitigation²⁹, which includes 21st century water shed management³⁰ as suggested by a study published in the *Journal of Coastal Research*. And, according to the *International Journal of Environmental Research and Public Health*, it requires a public health system designed with climate change³¹ in mind -including resources for supporting the mental health of Coast dwellers.

Much can be learned on this subject, as was recently found in a 2015 study on Oil Spills and Community Resilience³², performed with the help of Louisiana's coastal residents. In short, what scientists found was that over hundreds of years of natural catastrophes and decades of man-made ones - practices of ingenuity and adaptation that remain in what is referred to as the "community memory" provide the foundations for better coping with the interruptions. Among the four primary elements of the resilience cited in this study were: anticipation and reduced vulnerability. These are two elements that policy makers and coastal management practitioners might do well to keep in mind as the frequency of these types of events increase and intensify along the Gulf Coast. In fact, as our climate changes, we might all do well to take a page from their book.

So, if the state of the Gulf and its coast leaves you feeling kind-of downhearted, try to remember the inherent wisdom found within the people of Coastal Louisiana. You might envision yourself in New Orleans, staring out at the sparkling water, surrounded by a community of people who for generations have adapted and thrived through numerous disasters- then, enjoy this 1920s jazz tune aptly-titled, *The Alligator Blues*.³³

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