

REPORT

Et in Arcadia, Oil!

Darwin Bond Graham

The Gulf Coast wetlands ecosystem—over 1.3 million square miles if we just count the Mississippi River’s distributary watershed—is a delicate and profound balance of tides, winds, and ocean temperatures. The forces that propel its most basic cycles are almost cosmic.¹ Tides driven by the sun and moon push and pull vast and deep columns of water through narrow passes into lakes and bays and back out to the open ocean. This is a marine cardiovascular system on a continental scale, its lifeblood the freshwater drained from more than 40 percent of the United States’ landmass along with Gulf saltwater circulated through the mighty Loop Current that rises off the Yucatan Peninsula and arcs through the Gulf of Mexico. The Loop Current’s warm tropical waters create unusually large and diverse blooms of plankton and larval fishes.²

The interaction of the Mississippi River with the sea supports waters that roil with life. Winds move shallow layers of salt water toward the shore, and the river and bayous push back with floating columns of brackish and freshwater from lakes like Pontchartrain, Borgne, and Salvador. These fresh water layers float above seawater creating habitats spanning many aqueous zones. The coastal prairies and cypress swamps breathe. Water temperatures and salt concentrations from the edge of the continental shelf, and as close as the shallows of Chandeleur Sound and Barataria Bay, trigger complex movements of sea life, telling all manner of animal when to spawn and where to feed. Larger seasonal shifts provide signals to migratory birds traversing the Mississippi Flyway, ushering them to land upon horizon-to-horizon beds of grass where they feed from the bounty all around. Sun, moon, tides, wind, cycle.

Humans have proven able to live in this balance, too. Prior to French colonization, nations such as the Chitimacha lived at the Mississippi delta’s land building terminus. Earth mounds and enormous quantities of shell midden scattered about the natural levees of bayous hint at the extent of their settlement and the bounty of seafood, waterfowl, deer, and muskrat they harvested. Chitimacha cosmology has it that the earth was brought about to exist only after the creator told crawfish to dig up the mud. Crawfish created the earth; there couldn’t be a clearer statement of how important the wetlands are to a people. Living today on their reservation southeast of Lafayette, the Chitimacha say that “land loss” began with European “exploration” and colonization in the 1700s, that it was made painfully permanent with the Louisiana Purchase in 1803, an event that brought Anglo-American planters to join the French who had already carved up most of the land into arpents for sugar plantations. This loss was finally codified in 1919 when the McIlhenny family, famous for their Tabasco Pepper Sauce, sold several hundred acres to the federal government for the tribe, formalizing their dispossession of all that the eye could see, save about 300 acres.³

In the 1700s, southern Louisiana became an unlikely Promised Land to European and African settlers, freed servants, and escaped slaves. This Rabelaisian mix of asylum seekers and refugees—Cajun, Isleno, Creole, and African-American fishermen and trappers—have for centuries watched the tides and

¹ Almost, because the word cosmic refers to the entire universe which is not directly a factor. Galactic, relating to the Milky Way, is too big also. A more accurate term is celestial, at the scale of the solar system. Planetary is too small.

² W.J. Richards, et al., “Larval Fish Assemblages at the Loop Current Boundary in the Gulf of Mexico,” *Bulletin of Marine Science*, Vol. 53, No. 2, August 1993.

³ Timothy Mueller, Sarah Goldsmith, and Risa Mueller, *Nations Within: The Four Sovereign Tribes of Louisiana* (Baton Rouge: LSU Press, 2003).

licked their fingers to the winds, following the shrimp, oysters, fish, and fowl of this land-meets-ocean-edge-world. They each in their own way have deemed it a paradise. “Acadiana,” from which “Cajun” is a modified anglicization, at its root refers to the idyllic place of Greek beauty and bounty, Arcadia. The motley French settlers of the Canadian region now known as Nova Scotia fished and trapped in part of present day Canada, then known as Acadia or Acadie. Its Greco-inspired name was given by European colonial scouts who were struck by the pastoral and forested beauty of the land, which reminded them of the Arcadia first described in Jacopo Sannazzaro’s book of that title, written in the 1480s. Sannazzaro popularized the Greek region of Arcadia as a rural hinterland of hard but dignified labor, where sustenance was gained from Mother Nature and camaraderie abounded through music and dance of simple but proud people. He wrote:

On the summit of Parthenius, a not humble mountain of pastoral Arcadia, there lies a delightful plain . . . whereon . . . there are perhaps twelve or fifteen trees of such unfamiliar and excessive beauty that anyone seeing them would conclude that Mistress Nature had striven with the greatest delight to fashion them. Being at some distance from each other, and arranged in a not artificial order, with their rarity they ennoble immeasurably the natural beauty of the place.⁴

But as the painter Nicolas Poussin’s contemplative shepherds remind us, “*et in Arcadia ego*”—interpretable as “even in paradise, death exists.”⁵ Death, and also pain and suffering, and by extension we should suppose harms brought about by great injustices, all exist in Arcadia. In the 1600s, the Acadians of Canada were expelled by the British empire during the Seven Years War. In exile and searching the earth for a new homeland, they ultimately settled in southern Louisiana’s wetlands—the new Acadia. It was designated so by their very presence, and the region soon took on a similarly mystical quality of harsh and wild, but also beautiful and bountiful life.⁶

The seeming paradise of southern Louisiana, resulting from cosmically dynamic interactions of ocean tides, wind, and river flows, has been morbidly upset by human greed, arrogance, and ignorance. The death that exists there is a slow one being brought on by the capitalist underdevelopment of the region, principally through a plantation model of extraction that began with monocrop, export-oriented agriculture and now appears to be reaching its terminal end with hydrocarbon extraction and global commodity transport.

Beginning with the estates of the 1700s, vast forests along the Mississippi and distributary bayous were cleared. Swamps and marshes, which at the time were seen as dismal places of disease and rot, were drained, levees were erected, and canals dug. African slaves and to a lesser extent Irish indentured servants provided the muscle, and many perished as a result. Export of sugar, indigo, cotton, cypress timber, and other goods created unprecedented fortunes in the process. These American plantations were among the first factory forms of capitalist production. They were also founding institutions of Caribbean society, of which southern Louisiana is the northernmost part.⁷

Some of this slave-generated wealth was conspicuously sunk into palatial Greek Revival plantation houses and stylized mansions in New Orleans’ Uptown district. King cotton and queen sugar reigned supreme, befouling their hinterlands in the process until the early 20th century when the petrochemical and

⁴ Ernest Hatch Wilkins, “Arcadia in America,” *Proceedings of the American Philosophical Society*, Vol. 101, No. 1, February 15, 1957, p. 5.

⁵ Erwin Panofsky, “Et in Arcadia Ego: Poussin and the Elegiac Tradition,” in Erwin Panofsky, *Meaning and the Visual Arts*, (Chicago: University of Chicago Press, 1983).

⁶ Carl A. Brasseaux, *The Founding of New Acadia: The Beginnings of Acadian Life in Louisiana, 1765-1803* (Baton Rouge: LSU Press, 1997).

⁷ George Beckford, “Plantation Capitalism and Black Dispossession,” in *The George Beckford Papers* (Traverse City, MI: Canoe Press, 2000), pp. 323-334.

shipping industries eclipsed any ecological harm cotton and sugar had ever caused. The shift from agricultural plantations to chemical plants, from the extraction of crops to the extraction of minerals, did more than upset the already assaulted cosmic balance. Southern Louisiana, Acadia, is dying today. The land is disappearing. What land remains has been made toxic by the chemical plants and oil wells, dump ponds, slag and waste, and now one of the largest oil spills in history.

The Deepwater Horizon's explosion, and the "river of oil" now⁸ flowing from its ruptured well riser 5,000 feet beneath the ocean surface is a catastrophe, the proportions of which are unknown and only beginning to be understood. It will take years to gauge the long-term effects of this blow-out on the marine ecosystems and coastal communities stretching from Cajun country to western Florida. At a distance of about 120 miles from the blow-out, New Orleanians can smell the oil blown at them by strong onshore winds. The radius of the oceanographic boundaries of this catastrophe is far more expansive.

Elizabeth Cook, herself a native of Thibodaux living in the Crescent City, wrote on May 10:

The smell of oil is particularly strong and sickening today. Instant headache, a friend said. Lisa Jackson was in town again today, but no community meetings that I know of. You had to request a meeting with her if you are the media. I requested, but the email was bounced back. A friend went down to Grand Isle this weekend: tar balls have already shown up on shore. They are desperately trying to sand bag and dredge shut the space between the barrier islands to keep the oil out of the Barataria estuary. If they fail, it's all over for that estuary. The oil will kill the marshes if it gets in. There is no doubt about that. Same story for east of the river. Can they dredge in time to close the gaps between barrier islands and keep out the oil?⁹

Estimates of just how much oil is spewing forth from the ocean floor have been upped repeatedly by factors that indicate early estimates were merely guesses, based more on desperation to downplay the incident than reckon with its clearly disastrous scale. First BP claimed 1,000 barrels a day, but later agreed that it was 5,000.¹⁰ Some knowledgeable observers estimate that the flow is actually much higher. Scientists analyzing video of the flow and satellite images of the slick have calculated the figure as being between 20,000 and 84,000 barrels per day, while others have put it at as much as 95,000.¹¹ Who really knows? BP and the government have desperately thrown resources at the oil slick, but the company's efforts have so far not kept up with the speed at which the disaster is unfolding. "Man's" technology and mastery over nature has been rendered a pathetic illusion. Upset with the slow pace at which the federal government marshaled resources, some in the slick's path have already called this "Obama's Katrina," or a "slow-motion Katrina." The administration finally declared the spill an "event of national significance" on Thursday, April 29, but still deferred to BP to lead the cleanup effort. References to Chernobyl are beginning to be made, not just by activists, but by marine biologists who fear the leak will result in long-term ecosystemic damages to the very heart of the region's reproductive chemistry.

Billions and Trillions

⁸This essay was completed in early June, 2010, and reflects the status as of that time.

⁹Elizabeth Cook, "Can You Smell It?," letter to the author, Monday, May 10, 2010.

¹⁰Jim Polson and Mark Chediak, "Oil Gushes From BP Well as Scientists Study Leak Size," *BusinessWeek*, May 21, 2010, online at: <http://www.businessweek.com/news/2010-05-21/oil-gushes-from-bp-well-as-scientists-study-leak-size-update2-.html>.

¹¹One of the more rigorous attempts to measure the flow is Purdue's Steve Werley, professor of mechanical engineering, who applied a method known as particle image velocimetry to footage of the undersea leak. His estimate ranges from 56,000 barrels to 84,000 barrels each day. See Richard Harris, "Gulf Spill May Far Exceed Official Estimates," *National Public Radio*, May 17, 2010, published online at: <http://www.npr.org/templates/story/story.php?storyId=126809525>. Other independent scientists estimate that the spill could be hemorrhaging as much as 95,000 barrels of oil into the Gulf each day. See "BP Acknowledges Oil Spill is Larger than Previous Estimates," *Democracy Now!*, May 21, 2010, online at: <http://www.democracynow.org/2010/5/21/oil>.

Shrimp, the crustaceans whose name in the dominant culture is synonymous with smallness or insignificance, are in fact almost cosmic beings. Their life cycle is fused with geophysical forces linked to celestial cycle—tidal and temperature movements propelled by the sun, earth, and moon, and by unfathomably complex wind patterns. Their life cycle begins far out in the ocean in waters of several hundred feet in depth. At the right times, there are many trillions of shrimp eggs floating in the Gulf of Mexico, suspended in columns of water. April and May are the heaviest spawning months for some species, but the phenomenon occurs year round and follows both seasonal and episodic fluctuations in temperatures and tides.

From their early nauplius and protozoa larva stages, they remain in the deep waters, the pelagic zone that is neither close to shore nor the ocean bottom. They move with the current, feeding off anything suspended around them, growing with amazing speed. From this stage to adulthood, they provide a source of food for nearly everything that swims around them. They are reduced from many trillions to fewer trillions in number. Into the mysis larva and post-larva stage, shrimp begin to move toward shore with flood tides.¹² Strong northerly winds also push them toward the marshes when they rise toward the surface. They continue to feed and grow. Mike Tidwell describes their “celestial” journey;

For help, the infant crustaceans, roughly the length and width of grains of rice, turn to a spherical body 92 million miles away in outer space, a G2 dwarf star otherwise known as our sun. Twice a month this fiery body of hydrogen gas nearly a million miles in diameter joins forces with the earth’s moon, a mere 238,000 miles away, to create a combined gravitation and centrifugal force of enormous power. This force generates ocean tides on earth—so-called spring tides—which are much greater than the tides occurring daily throughout the rest of the month [...] this celestial force is plenty strong enough to bear them landward in a high incoming tide that squeezes between Louisiana’s barrier islands and sweeps the shrimp up into the food-rich interior marshes. By March, thanks to the spring tides, all the autumn-spawned brown shrimp lucky enough to have survived the marathon journey—perhaps one in a hundred—are now inside the estuary nursery grounds where they begin to feed ravenously.¹³

From the juvenile through adult phases of their lives, they live right along the coast, often letting surface flows, deep currents, and tides push them far into the brackish water marshes. Here they flit among the protection and abundance of the *Spartina* grass that is absolutely necessary for their survival. They forage along the shallow bottoms of bayous and bays. In these rich aquatic prairies they gain mass and prepare for the final stages of their lives.

Subtle signals in the water, from temperature to salinity, stimulate a final movement among adult shrimp, back out into the ocean. They congregate by the hundreds of millions in bayous and passes at night and await strong tides to pull them back out into the open Gulf where they will forage along the bottom at depths of up to several hundred feet. In this benthic zone they grow to full size and finally, when water temperatures increase, they rise and spawn, floating trillions upon trillions of eggs to renew the cycle.

Shrimp are by no means unique. All life forms along the coastline are pushed and pulled by the celestial forces that animate the proverbial yin and yang of ocean and land. What makes shrimp different is that they are among a few keystone life forms, like oysters, that provide food and structure the habitat for nearly all other living things. Oysters, for example, produce reef beds in brackish and saltwater zones creating nesting, forage, and hunting habitat for innumerable species of fish and crustaceans. Like the

¹² Frederick R. Schram and Adrian Wenner, *Crustacean Issues 2: Larval Growth* (Boca Raton, FL: CRC Press, 1985).

¹³ Mike Tidwell, *Bayou Farewell: The Rich Life and Tragic Death of Louisiana’s Cajun Coast* (New York: Pantheon Books, 2003), pp. 144-145. My understanding of the Gulf Coast is obviously indebted to Tidwell’s work, but also to my colleague Alysha Jordan, whose extensive photo-documentation of the wetlands can be viewed online at: <http://www.flickr.com/photos/neworleanslady/>.

shrimp, oysters patiently await subtle signs of temperature increases and tidal fluctuations to spawn. The month of May is in fact spawning season, when billions of oysters across the Gulf release eggs and sperm into open waters. Eggs become fertilized, hatch into larva, which soon develop shells, and then settle onto beds of existing oysters. Tidal and wind circulation of waters from the Gulf into the marshlands is always essential. It's the same at the top of the "food chain." Bluefin, and yellowfin tuna and swordfish spend springs in the Gulf where each female fish can release millions of eggs that turn into larva that float and grow near the surface, exactly where BP is now dumping tons of dispersants on oil sheen. In a good year, perhaps several million eggs will survive to adulthood to mate.¹⁴ The scale of these processes and the threshold conditions sustaining them are sublime.

But there are other sublime numbers beneath the Gulf: billions of barrels of oil and trillions of cubic feet of natural gas. These billions and trillions are measurable as billions of dollars in profits for corporations like BP, Halliburton, and other major energy firms. It was with the discovery of oil in the swamps in the early 1900s that Acadiana, paradise found, was lost for good. The industry tore byzantine networks of canals through the marshes in order to reach prospects and haul drilling equipment in on barges. The shipping industry—a large portion of which services the petrochemical refineries upriver of New Orleans, which themselves were sited in proximity to the natural gas fields of the Gulf—did its part also to cut the wetlands into fragments. Concentrated salt water intruded where it never should have. Sediment deposits from annual floods were reduced and finally deleted as the Mississippi and other major waterways were locked into place to benefit plantations, expanding urban zones, and ship traffic. "Man" conquered nature, rationalized its sloppy flows, and stamped his concrete and metallic grids atop it. Subsidence, storms, the die-off of cypress and oak forests, and the melting of horizon-stretching expanses of prairie grass—it all intensified after World War II. By the 1990s, southern Louisiana had seen almost 2,000 square miles of land disappear beneath the Gulf's waves. In the early 2000s, the rate of land loss was 24 square miles a year, an area larger than Manhattan.¹⁵

Atē, another word of Greek origin, comes to mind here. In Greek tragedies, *atē* is the action of a protagonist that leads to downfall as a result of hubris. *Atē* means defying the gods. Few words better describe the cosmic folly some humans have brought upon the Gulf Coast today: tragic, hubristic nemesis. But here, all literal refrains to Greek mythology and language fall flat. Unlike Greek tragedies where the hero brings shame and death upon himself, the slow-Katrina destruction of Acadiana is not the fault of prideful Louisianans over-stretching their limits and pretending to godly levels of knowledge and power. Search as you might, you will find few people more humble and happy with simplicity and sustenance than the majority of New Orleanians, Cajuns, Creoles, Islenos, and African Americans who call southern Louisiana home.

Rather, the death of the wetlands is the result of corporate and state hubris, largely beyond the control of most Louisianans. Their state is being disappeared by a hydrocarbon-hungry U.S. economy and the major oil corporations that sit atop it. The gods—i.e., the cosmic forces of tides, river flows, winds, and temperatures—are being defied by a small elite who seek billions of dollars in profits at the expense of trillions of living beings, including millions of Louisianans who live in New Orleans, Houma, St. Bernard Parish, Terrebonne Parish, and down all the bayous.

Extraction Economics

Today the Louisiana coast is comparable to regions like the Persian Gulf and Niger Delta in terms

¹⁴ Mark Shleifstein, "Bluefin Tuna Particularly Vulnerable to Gulf of Mexico Oil Leak," *New Orleans Times-Picayune*, May 13, 2010.

¹⁵ Committee on the Restoration and Protection of Coastal Louisiana, National Research Council, *Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana* (Washington, D.C.: National Academies Press, 2006).

of its exploitation by the oil and gas industry. In January of 2010, the state was made to churn out 42 million barrels of oil, 37 million of which came from the Outer Continental Shelf. Even though these are legally federal waters, all of the supply ships, pipelines, much of the refinery capacity, and the tanker ports that process everything from crude oil and raw gas into distilled fuel and fertilizers are located in, or pass through, Louisiana. Much of this infrastructure is on the Mississippi River between New Orleans and Baton Rouge, and there are industrial mega-sites like Port Fourchon right on the Gulf.¹⁶ The state's Department of Natural Resources claims that, "together with the facilities in the rest of the state, nearly 34 percent of the nation's natural gas supply, and over 29 percent of the nation's crude oil supply, moves through the state of Louisiana and is connected to nearly 50 percent of U.S. refining capacity."¹⁷ Louisiana boasts the nation's only deepwater oil port, known as the LOOP, and a tangle of pipelines running crude across the state. Oil infrastructure also includes two of the nation's four massive salt dome caverns that contain the U.S. Strategic Petroleum Reserve. The southern third of the state is nothing less than a geo-engineered hydrocarbon mining, transport, and processing machine.

The global giants of the oil industry were in Louisiana from the very beginning. It was Standard Oil that built the state's first, and still one of the nation's largest, refineries in Baton Rouge on a former cotton plantation in 1909. Precursors eventually bought out by Standard Oil (now Exxon Mobil) and other majors like Chevron and ConocoPhillips set many records drilling far into the marshes and out into the ocean during the first half of the 20th century. Louisiana became a laboratory for the development of offshore hydrocarbon mining techniques. The first well drilled out of sight of land was off Morgan City in 1947.¹⁸ Other records would follow, including BP and Transocean's boast in 2008 that the Deepwater Horizon had drilled the world's deepest well while tapping into the massive Tiber prospect. It was a 35,050-foot deep shaft in 4,130 feet of water. Perhaps that was the moment of *atë*, for it came replete with heroic boasts by both companies.¹⁹

The state's political leadership has been more than happy to comply with big oil's appetite by keeping regulations lax. In earlier days, this was due to the direct taxing of oil and gas profits by populist state and local politicians. Huey Long famously demonized Standard Oil, not that it took much in the way of theatrics with an already resentful rural majority who saw the wealth of their state being siphoned away by Rockefeller and Co. The company's production was taxed to fund infrastructure, health care, education, and other programs in addition to lining elite pockets in New Orleans and Baton Rouge. Therefore, as bad as he'd tar them, Long knew in the end that Standard Oil was the key to his "share our wealth" plan. Another version of this neocolonial oil-for-food politics was developed by swamp oligarchs like the arch-segregationist Leander Perez, District Attorney of Plaquemines and St. Bernard Parishes, the very places today being slathered with oil from the blow-out. Perez set up dummy corporations to control oil leases that majors then subleased at many times the price. The Perez family profited nicely. But most of the wealth created by oil and gas was exported beyond state lines.

Between 1945 and 2009, Louisiana state lands produced more than 13 billion barrels of oil, amounting to roughly \$357 billion in wealth. Counting OCS (Outer Continental Shelf) oil, which began

¹⁶ Louisiana Oil and Gas Association, "LOUISIANA TOTAL CRUDE OIL and CONDENSATE PRODUCTION," published online at: http://dnr.louisiana.gov/sec/execdiv/techasmt/facts_figures/table04.htm.

¹⁷ Bob Sprehe, "AMERICA'S WETLANDS: ENERGY CORRIDOR TO THE NATION, A Proud History of Service to America's Energy Needs, Part 1," Louisiana Department of Natural Resources, Technology Assessment Division, Spring 2003.

¹⁸ Diane Austin, et al., "History of the Offshore Oil and Gas Industry in Southern Louisiana, Interim Report," Volume I: Papers on the Evolving Offshore Industry, Interim Report, OCS Study MMS 2004-049 – 051, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, July 2004.

¹⁹ Transocean, Ltd., "Deepwater Horizon Drills World's Deepest Oil & Gas Well," published online at: <http://www.deepwater.com/fw/main/IDeepwater-Horizon-i-Drills-Worlds-Deepest-Oil-and-Gas-Well-419C151.html>; BP, "BP Announced Today a Giant Oil Discovery at its Tiber Prospect in the Deepwater U.S. Gulf of Mexico," September 2, 2009, published online at: <http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7055818>.

gushing in a big way in the 1960s, the total is much higher, upwards of \$844 billion worth of crude. In 1977 federal OCS leases outproduced state lands and waters for the first time, a gap that would widen fast. Today federal OCS oil wells outproduce state leases by seven times. None of this basic accounting includes natural gas, nor the value added in refined oil and gas products created in the state's industrial plants.²⁰ Measured in billions of barrels, trillions of cubic feet, or dollar amounts, it all adds up to an extraction economy of monumental proportions.

State fields peaked decades ago, causing a fiscal crisis for Louisiana. There was no more wealth to share. The most recent fix was the Gulf of Mexico Energy Security Act of 2006. The bill opened up more than 8 million acres of OCS territory for leasing to oil companies and stipulated that Gulf states share 37.5 percent of revenues generated through auctions and subsequent royalties. It was hailed in 2006 as a breakthrough by politicians like Senator Mary Landrieu, who said it would finally reward Louisiana for its role as the nation's energy epicenter. Champions of the act projected it would eventually provide the state with \$1 billion a year, beginning in 2028.²¹ A state assistant secretary for the U.S. Department of Interior's Office of Mineral Resources testified in favor of the legislation saying:

The revenue shared with Louisiana under this new law will not be wasted [...] Under the *Gulf of Mexico Energy Security Act*, Louisiana is projected to receive at least \$13 billion over the next 30 years. The dedicated funds will be used to finance a comprehensive coastal protection and restoration plan....²²

The actual revenue generated for the state so far has been a mere fraction of those projections. In 2009, Louisiana's total allocation under the law amounted to \$874,696. When the funds were split among parishes, Orleans received just over \$16,000 (about equal to a poverty-level annual income for a single person), while St. Bernard, where many fishing communities are currently praying for divine intervention to stop the oil from killing their wetlands, was given \$10,760—not enough to purchase bait and fuel for one captain's fishing season.²³

Even \$13 billion, the highest figure associated with the new revenue sharing arrangement, is too small an amount to fund coastal restoration projects capable of saving the Gulf Coast. The Army Corps of Engineers' Louisiana Coastal Protection and Restoration Report, which studied marsh restoration, river diversion, and levee construction across the region, estimates that "total first costs for potential coastwide plans (consisting of an alternative from each planning unit) range from approximately \$59 billion for the combination of least costly alternatives in each planning unit to approximately \$139 billion for the combination of most costly alternatives in each planning unit."²⁴

Acadia Lost

In 2007, BP's corporate propaganda organ, *BP Magazine*, published a feature article on New

²⁰ Figures are drawn from State of Louisiana Department of Natural Resources, Technology Assessment Division, published online at: http://dnr.louisiana.gov/sec/execdiv/techasmt/facts_figures/oil_prod.htm. The value of oil is assessed here at a very conservative average of \$26.64 per barrel (tracking 1945-2008 in 2008 inflation adjusted dollars). See WTRG Economics, "Oil Price History and Analysis," published online at: <http://www.wtrg.com/prices.htm>. The actual dollar value of wealth extracted in the form of crude oil from Louisiana is certainly much higher, probably on the order of several trillion dollars. The average price per-barrel since the 1973 OPEC oil embargo has been much higher than \$26.64.

²¹ Kim Quillen, "Gulf of Mexico Lease Sale Draws \$3.7 Billion in High Bids," *New Orleans Times-Picayune*, March 18, 2008.

²² Marjorie A. McKeithen, Assistant Secretary, Office of Mineral Resources, "Testimony to the Committee on Energy and Natural Resources," Hearing on Oil and Gas Resources on the Outer Continental Shelf and Areas Available for Leasing in the Gulf of Mexico, United States Senate, January 25, 2007.

²³ Minerals Management Service, "Gulf of Mexico Energy Security Act of 2006 Fiscal Year 2009 Allocations," U.S. Department of the Interior, published online at: <http://www.mms.gov/offshore/PDFs/GOMESAFY09Final.pdf>.

²⁴ U.S. Army Corps of Engineers, "LACPR Summary Report," in "LACPR Final Technical Report," August 2009, p. S-33, published online at: http://lacpr.usace.army.mil/default.aspx?p=LACPR_Final_Technical_Report.

Orleans' reconstruction after Hurricane Katrina. Without acknowledging the Katrina catastrophe's origin in oil and gas and shipping industry activities, the voice of BP waxed eloquently about southern Louisiana's culture and future:

[...] French Canadians, known as Acadians, relocated in and around New Orleans. At the time, there was a much-perceived difference between the two peoples and their lifestyles. Cajuns, as the Acadians came to be known, carried on their way of life as shrimpers, fishermen and trappers around the Louisiana territory, while the Creoles developed the agricultural industry. The Cajun contribution to New Orleans's mixture of music, food and language endures, and its influence continues to grow today throughout the U.S.

The article concluded:

Now in its second hurricane season since Katrina, New Orleans is still exposed to tidal waves, flooding and hurricanes. The opportunity exists to design and build a modern system to protect people, property and business. How and when it can be achieved rests in the hands of the U.S. nation, industries such as oil and gas, and the people of the "new" New Orleans. Keep the music playing and the rhythm that is New Orleans will beat a tune of hope for a safe, prosperous future."²⁵

It should be patently obvious by now that tidal waves, flooding and hurricanes are not the cause of the Gulf Coast's vulnerability. Rather, the threat *is* the prevailing system of property and business, and the "modern" technological conquest of nature that BP has become synonymous with. Whether or not BP successfully stems the flow of oil and gas before this issue of *CNS* goes to print, catastrophic damage has already been done. At least hundreds of thousands and probably millions of barrels of oil are riding wind-driven waves and deep tides, and oil has already infiltrated marshlands and damaged intertidal and benthic zone habitat wherever it has settled.

It's quite likely that Deepwater Horizon has already become the second largest oil spill in history. The largest—the oil apocalypse unleashed by Saddam Hussein and the United States military during the Gulf War in 1991, resulting in a spill of possibly more than 10 million barrels—would be hard to rival from a single well head, no matter how much pressure it's under.²⁶ However, the second largest spill on record, from Pemex's Ixtoc I well, is very much like the Deepwater Horizon blow-out. Ixtoc I (an uncanny anagram for "toxic I") spewed approximately 3.5 million barrels of crude oil—also into the Gulf of Mexico—between June 1979 and March 1980, the time frame it took to plug the leak. Ixtoc I released between 10,000 and 30,000 barrels everyday, a figure at the low end of most independent estimates of Deepwater Horizon's flow. Pemex tried every means of capping the well, similar to what BP has attempted. The Mexican state oil company first fiddled with the blow-out preventer, and failing this tried jamming steel and lead balls into the well head (BP has also tried using rubber and golf balls in a "junk shot"). Next a "sombbrero" funnel was lowered onto the well head, a measure similar to BP's failed containment domes. What finally worked with Ixtoc I was mud injection into relief wells, an effective measure, but one that takes many months of drilling and preparation.²⁷ At the ruptured well's current flow rate, time is something that the people and ecosystem of the Gulf Coast simply do not have. Add to this NOAA's May 27 prediction that there is "an 85 percent chance of an above normal" hurricane season this summer.²⁸ Stressed and killed by oil, much of the marsh grass and its mud foundation could be swept away permanently by even a mild hurricane or strong tropical storm.

²⁵ Paula Kolmar, "New Orleans Throws Off the Blues," *BP Magazine*, Issue 3, 2007, pp. 32-39.

²⁶ Then again, estimates of the Gulf War oil spill vary extremely. Even if we accept a figure of 10 million barrels, it would not be impossible for the Deepwater Horizon to exceed this figure. If Deepwater Horizon is releasing 84,000 barrels per day, then it will only take 119 days of release to approach the 10 million barrel Gulf War spill. Ixtoc I released oil for 290 days.

²⁷ Arne Jernelöv and Olof Lindén, "Ixtoc I: A Case Study of the World's Largest Oil Spill," *Ambio*, Vol. 10, No. 6, The Caribbean, 1981, pp. 299-306.

²⁸ NOAA, "NOAA: 2010 Atlantic Hurricane Season Outlook," NOAA Press Release, May 27, 2010, published online at: <http://www.cpc.noaa.gov/products/outlooks/hurricane.shtml>.

Like the shrimp, many other keystone species of the Gulf exist in sublime relation to the cosmic forces of tides and winds. One could almost say that the shrimp are the tides, and that the tides are the shrimp. This is the final damning reality of the catastrophe. Crude spewing from the Deepwater Horizon's well into the Macondo prospect is now riding the same wind-driven waves as the shrimp. It's coming ashore into the wetlands with them, propelled by onshore gusts and spring tides. It's going to kill in the Gulf, deep underwater, and in the wetlands, suffocating grass, oyster reefs, and virtually everything else.²⁹

In their apparent panic, federal authorities have granted BP's crews permission to liberally apply dispersant chemicals to break up oil patches and sink the slick beneath the surface. The assumption has been that quicker dispersion will be less harmful when oil meets shore, and also less harmful in open sea. This strategy, however, is already proving to be just another harried response to a tragedy that exceeds human-scale decision-making powers. Dispersants have had only limited effects on breaking up the surface slick. They have also submerged the oil as tiny globules into deep columns of water. Petroleum is now riding deep currents and settling on the bottom of the Gulf. Scientists have already measured gigantic plumes of submarine oil over many miles in expanse. These plumes are likely the result of several factors: BP's injection of dispersants at the well head combined with the temperatures and salinity of deep water. These plumes are quickly depleting oxygen and could produce a massive dead zone.³⁰ Use of dispersants on this scale and by these means is entirely experimental and may actually multiply the catastrophic effects of the blow-out.

A 2005 National Research Council study on the use of oil dispersants observes that little is actually known about the trade-offs between sinking oil slicks with chemicals versus struggling to contain them on the surface.³¹ These are two very different strategies that lead to very different kinds of toxic exposure for sea life. After all, "dispersing" oil is simply a euphemism for sinking it in particulate form where it remains dissolved in columns of water, eventually settling on the ocean floor. For the shrimp, dispersants are perhaps just as bad as letting the slick reach the shore and damage marsh habitat. In the former case, shrimp may be killed in open waters by oil particles, or at the ocean bottom where they feed. In the latter case, their marsh habitats may be choked with crude oil. There seems to be no good strategy, just bad and worse. According to the National Research Council:

...the relative importance of different routes of exposure, that is, the uptake and associated toxicity of oil in the dissolved phase versus dispersed oil droplets versus particulate-associated phase, is poorly understood and not explicitly considered in exposure models. Photoenhanced toxicity has the potential to increase the impact "footprint" of dispersed oil in aquatic organisms, but has only recently received consideration in the assessment of risk associated with spilled oil. One of the widely held assumptions is that chemical dispersion of oil will dramatically reduce the impact to seabirds and aquatic mammals. However, few studies have been conducted since 1989 to validate this assumption.³²

Is Acadiana lost? In truth, the Cajuns and their kindred have been losing the idyllic wetlands for decades. Deepwater Horizon may just be the *atē* imposed upon them by capital's hubris. Beyond the Gulf's ever-quickening death at the hands of the energy sector is a trend in the current crisis-ridden global political economy of oil-fueled capitalism. Hydrocarbons have become increasingly difficult to produce, while demand has only slackened slightly with the Great Recession. BP's gambit for billions of barrels in the Macondo prospect is just one of many increasingly risky and net-energy reduced attempts to produce

²⁹ Qianxin Lin and Irving A. Mendelsohn, "A Comparative Investigation of the Effects of South Louisiana Crude Oil on the Vegetation of Fresh, Brackish and Salt Marshes," *Marine Pollution Bulletin*, Vol. 32, No. 2, February 1996.

³⁰ Justin Gillis, "Giant Plumes of Oil Forming Under the Gulf," *The New York Times*, May 15, 2010.

³¹ Committee on Understanding Oil Spill Dispersants: Efficacy and Effects, National Research Council, *Oil Spill Dispersants: Efficacy and Effects* (Washington, D.C.: National Academies Press, 2005).

³² *Ibid.*

oil beyond the global peak of production. As energy corporations stretch technology and investments to keep the spigot open, risks from catastrophic incidents such as blow-outs increase, but so do the assured catastrophic outcomes awaiting us—such as the further increase of CO₂ emissions and other direct products of oil mining projects like deepwater drilling or tar sands production.