

2021

Canals, Community, and Coastal Permits: Overcoming Inadequate Remedies for Erosion Within the Barataria-Terrebonne National Estuary

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CANALS, COMMUNITY, AND COASTAL PERMITS: OVERCOMING INADEQUATE REMEDIES FOR EROSION WITHIN THE BARATARIA-TERREBONNE NATIONAL ESTUARY

ABSTRACT

The Barataria-Terrebonne National Estuary has lost over 934 square miles of land since 1932, causing a mass exodus of communities within the estuary, including the Biloxi-Chitimacha-Choctaw tribe of Isle de Jean Charles. Though some of this erosion can be attributed to rising sea levels and natural subsidence, scientists now realize that the majority of this loss has been caused by human development. Specifically, navigation and pipeline canals dredged by the oil and natural gas industry are alleged to be responsible for as much as 89% of all land lost within Louisiana before 1983. This ongoing land loss has led to numerous attempts to hold developers liable for the damage, but the Louisiana Code does not support non-adjacent erosion claims under theories of tortious nuisance, nor can plaintiffs succeed as third-party beneficiaries from the licenses and permits issued to developers. Federal coastal legislation—sometimes used as a last resort—is similarly ineffective in land loss suits by individual litigants.

Though some recent federal decisions would support a Fifth Amendment takings claim for non-adjacent erosion to the extent that causation could be proven, myriad hurdles stand in the way. A six-year statute of limitations on takings claims would prevent most successful claims, and the 10,000-mile network of canals in Louisiana would preclude practical causation determinations. Worse, the damages would be limited to the land actually taken: a few feet of property in most instances. Further, compensating a landowner for eroding shoreline does nothing to mitigate future erosion, nor does it combat the threat that sea level rise might claim these coastal communities even before the land erodes from beneath them.

Coastal communities suffering from land loss frequently condition coastal development permits on impact fees that go to wetlands restoration funds. This Comment proposes that these coastal impact fees be drastically elevated to include mandatory contributions to a relocation fund for refugees of coastal land loss. Such a fund would be an adequate remedy for those unable to undergo the extensive causation burdens of viable takings claims and for whom claims in tortious nuisance and contract can provide no relief. Most importantly, it would

place the cost of relocation on those accountable—oil and natural gas companies—instead of taxpayers.

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INTRODUCTION

This Comment begins where the life of its author began: the Barataria-Terrebonne National Estuary (BTNE). Stretched between the Mississippi and Atchafalaya rivers in South Louisiana, the BTNE encompasses 4.2 million acres covering all or parts of sixteen parishes.¹ To advocates of America's wetlands, the BTNE is a paradise for ecological diversity, a treasure trove of natural resources, and a refuge for diverse cultures and indigenous tribes.² Though long famous for its recreation and tales of the pirate Jean Lafitte,³ the BTNE achieved national significance in 1990, when Congress created the Barataria-Terrebonne National Estuary Program (BTNEP) as part of the National Estuary Program.⁴

Though BTNEP and similar organizations serve as environmental stewards and engineers of restoration, their efforts are not enough. For every acre that Louisiana reclaims, many more are lost to the tide.⁵ Estimates fluctuate, with one Supreme Court opinion stating that natural environmental factors such as “[s]oil compaction, sea level rise and recurrent storms are destroying approximately [twenty to thirty] square miles of Louisiana wetlands each year.”⁶ To counteract Louisiana's massive loss of wetlands, “the state would have to churn out a hundred and eighty-six acres every nine days,”⁷ but these results and their land-loss predicates vary widely parish-to-parish and basin-to-basin,⁸ requiring nuanced and particularized solutions. For example, the Terrebonne

¹ Louisiana uses the term “parish,” not county. These parishes include Ascension, Assumption, Iberia, Iberville, Jefferson, Lafourche, Orleans, Plaquemines, Pointe Coupee, St. Charles, St. James, St. John the Baptist, St. Martin, St. Mary, Terrebonne, and West Baton Rouge. *What is BTNEP?*, BARATARIA-TERREBONNE NAT'L ESTUARY PROGRAM, <https://btnep.org/about-btnep/what-is-btnep/> (last visited Dec. 16, 2020). See generally *National Estuary Program Study Areas*, ENV'T PROT. AGENCY, https://www.epa.gov/sites/production/files/2020-04/documents/nep_national_map_2020.pdf (last visited Dec. 16, 2020) (map of national estuary programs in the United States).

² Elizabeth Kolbert, *Louisiana's Disappearing Coast*, NEW YORKER (Mar. 25, 2019), <https://www.newyorker.com/magazine/2019/04/01/louisianas-disappearing-coast>.

³ *Id.*

⁴ *Overview of the National Estuary Program*, ENV'T PROT. AGENCY, <https://www.epa.gov/nep/overview-national-estuary-program> (last visited Dec. 16, 2020) (“The National Estuary Program (NEP) is an Environmental Protection Agency place-based program to protect and restore the water quality and ecological integrity of estuaries of national significance. Currently, 28 estuaries located along the Atlantic, Gulf, and Pacific coasts and in Puerto Rico are designated as estuaries of national significance.”).

⁵ Kolbert, *supra* note 2.

⁶ *Massachusetts v. EPA*, 549 U.S. 497, 522 n.18 (2006).

⁷ Kolbert, *supra* note 2.

⁸ See *Coastal Louisiana Basins*, COASTAL WETLANDS PLANNING, PROT. & RESTORATION ACT, <https://lacoast.gov/new/About/Basins.aspx> (last visited Dec. 16, 2020) (describing in depth each of Louisiana's basins' fresh water, sediment, shape, erosion, and ecology).

Basin lost more than 30,000 acres of wetlands from 1932 to 2016, whereas the Atchafalaya Basin gained 4,000 acres of wetlands in the same time frame.⁹

Land loss fluctuations are often the result of innumerable complex factors, such as natural erosive processes, tropical storms, hurricanes,¹⁰ canal dredging, and even nutria.¹¹ Levees along the lower Mississippi River also prevent the perennial flooding that had once carried sediment necessary for soil accretion and land growth.¹² Though “land formed by river sediments *naturally* subsides and sinks over time as part of the delta cycle,”¹³ this veritable straight-jacketing¹⁴ of the Mississippi Delta has resulted in dramatically increased, *unnatural* subsidence due to the “elimination of riverine input to most of the coastal zone.”¹⁵ Laudable attempts at rebuilding the Terrebonne Basin are projected to

⁹ Alisha Renfro, *A Tale of Two Basins: Why One Is Thriving While the Other Is Dying*, RESTORE MISS. RIVER DELTA: DELTA DISPATCHES (May 7, 2018), <http://mississippiriverdelta.org/a-tale-of-two-basins-why-one-is-thriving-while-the-other-is-dying/>. The difference between the Atchafalaya Basin and the Terrebonne Basin can best be explained through sediment deficiency: “[t]he key to successful, ongoing land-building in the Atchafalaya Basin is the steady flow of sediment” from the area’s receipt of, “on average, 30 percent of the combined flow of the Mississippi and Red Rivers.” *Id.* These water inflows carry with them a “constant stream of sediment into the broad, shallow Atchafalaya Basin [that] has resulted in this being the only basin in Louisiana to experience net land gain.” *Id.* The Terrebonne Basin, on the other hand, has faced an unprecedented “disintegration of [its] productive and protective wetlands” due to its poor sedimentation and freshwater inflows, “leaving coastal communities, industry and vital infrastructure increasingly vulnerable to storms.” *Id.*

¹⁰ Doug Herman, *Prospects Are Looking Up for this Gulf Coast Tribe Relocating to Higher Ground*, SMITHSONIAN MAG. (Aug. 9, 2018), <https://www.smithsonianmag.com/smithsonian-institution/prospects-are-looking-gulf-coast-tribe-relocating-higher-ground-180969932/>. In an interview completed as part of Smithsonian’s “Recovering Voices” series, Deputy Chief Wenceslaus Billiot, Jr. of the Biloxi-Chitimacha-Choctaw tribe of Isle de Jean Charles discussed the potential for storm impacts:

[I]f there’s a hurricane in Texas, we get seven or eight feet of water here. There’s no more land, no buffers, no barrier islands to stop the surge. Not just from the canal digging, but hurricanes, and subsidence. And sea level rise. There are some docks that in the 1970s were two feet above the water. Now they’re under water and they had to build a new dock above it.

Id.

¹¹ Heidi Beck, *Why Is Louisiana Losing Land?*, NICHOLAS SCH. INTERNSHIP BLOGS (July 7, 2011), <https://blogs.nicholas.duke.edu/internshipblogs/why-is-louisiana-losing-land/>. Nutria, known locally as “swamp rats,” are “large semi-aquatic rodents indigenous to South America.” *Nutria*, NUTRIA.COM, <https://www.nutria.com/site.php> (last visited Dec. 16, 2020).

¹² Ted Jackson, *On the Louisiana Coast, A Native Community Sinks Slowly into the Sea*, YALE ENV’T 360 (Mar. 15, 2018), <https://e360.yale.edu/features/on-louisiana-coast-a-native-community-sinks-slowly-into-the-sea-isle-de-jean-charles>.

¹³ *Causes of Land Loss*, RESTORE MISS RIVER DELTA: LAND LOSS, <http://mississippiriverdelta.org/our-coastal-crisis/land-loss/> (last visited Dec. 16, 2020) (emphasis added).

¹⁴ Levees located in the delta, combined with “valuable land-building sediment [being] trapped behind locks and dams on the Missouri, Mississippi and Ohio Rivers,” have led to a 70% decrease in “the amount of sediment in the Lower Mississippi River.” *Id.*

¹⁵ John W. Day, Jr., Louis D. Britsch, Suzanne R. Hawes, Gary P. Shaffer, Denise J. Reed & Donald Cahoon, *Pattern and Process of Land Loss in the Mississippi Delta: A Spatial and Temporal Analysis of Wetland Habitat Change*, 23 ESTUARIES 425, 426 (2000). The Mississippi River Mid-Basin Sediment Diversion Program

take years to complete and decades to effectuate significant results, leaving little recourse for the communities whose land is disappearing beneath their feet,¹⁶ particularly the residents of Isle de Jean Charles.

In 2016, the U.S. Department of Housing and Urban Development granted Louisiana \$48.3 million in Community Development Block Grant funds to help resettle the tightly knit community on Isle de Jean Charles.¹⁷ Inhabited since the early 1800s, the Island is a coastal fishing village resting deep in the BTNE, nearly sixty miles southwest of New Orleans.¹⁸ In the 1950s, the Island encompassed 22,400 acres.¹⁹ It now sits at a paltry 320 acres,²⁰ each day shrinking to the relentless tide. In fact, “the surrounding wetlands are so compromised that even a strong south wind combined with a high tide will flood the only roadway linking the [I]sland to civilization,”²¹ the neighboring fishing village of Pointe-aux-Chênes, where many of the Island’s descendants now reside.²²

has been laid out to address this problem, attempting to “reconnect the [Mississippi] River and restore the natural processes that initially built the delta.” *Mississippi River Mid-Basin Sediment Diversion Program*, COASTAL PROT. & RESTORATION AUTH., <https://coastal.la.gov/our-work/key-initiatives/diversion-program/about-sediment-diversions/> (last visited Dec. 16, 2020).

¹⁶ John Carey, *Louisiana Wetlands Tattered by Industrial Canals, Not Just River Levees*, SCI. AM. (Dec. 1, 2013), <https://www.scientificamerican.com/article/carey-louisiana-wetlands-tattered-by-industrial-canals/>. The Mississippi River Mid-Basin Sediment Diversion Program is a part of Louisiana’s 2012 Coastal Master Plan, which has the overarching goal of “rebuild[ing] the state’s vanishing coastal wetlands [by] cutting gaps in the levees, diverting water and sediment so that the land-building material flows again across parts of the landscape.” *Id.*

¹⁷ *The Story of Isle de Jean Charles*, ISLE DE JEAN CHARLES RESETTLEMENT, <http://isledejeancharles.la.gov/> (last visited Dec. 16, 2020). Within Terrebonne Parish and coastal Louisiana, one rarely hears the full name “Isle de Jean Charles.” Instead, residents have condensed its name to merely “the Island,” corresponding to the only way to drive there: the “Island Road.” *Id.*

¹⁸ Kolbert, *supra* note 2.

¹⁹ Emilee Martichenko, *Climate Refugees: Louisiana Tribe Fights for Sovereignty over Resettlement as Island Disappears*, CULTURAL SURVIVAL (Mar. 29, 2019), <https://www.culturalsurvival.org/news/climate-refugees-louisiana-tribe-fights-sovereignty-over-resettlement-island-disappears>.

²⁰ Jackson, *supra* note 12.

²¹ *Id.*

²² Already in a precarious condition, the fate of Isle de Jean Charles was sealed in 1998, when the U.S. Army Corps of Engineers decided not to extend the Morganza-to-the-Gulf Flood Protection System to encompass the Island, ostensibly because “building the extension would have added a hundred million dollars to the project’s [\$10 billion] price tag and preserved just three hundred soupy acres.” Kolbert, *supra* note 2. In similarly affected coastal communities, such as those in North Carolina and Alaska, residents “have struggled to secure assistance . . . because there is no bureaucratic framework for relocation” and because inertia has set in from “inherently uncertain” climate-change forecasts. Michelle Nijhuis, *When Is It Time to Retreat from Climate Change?*, NEW YORKER (Mar. 27, 2017), <https://www.newyorker.com/tech/annals-of-technology/when-is-it-time-to-retreat-from-climate-change>. Residents of Isle de Jean Charles, however, have benefitted from bureaucracy, working with the Louisiana Office of Community Development so that this community can be moved to Schriever, Louisiana, twelve feet above sea level and nearly an hour north of Isle de Jean Charles. Jackson, *supra* note 12.

However, the narrative regarding sediment deficiency's role in land loss is rapidly changing. Recent scholarship has established that the 10,000-mile network of navigation and pipeline canals, constructed primarily for the oil and natural gas industry, has played a significantly larger role in land loss than previously indicated, with one study alleging that industrial canals are responsible for as much as 89% of all land lost in Louisiana prior to 1983.²³ This Comment shows that there are no adequate, existing remedies at law to address such massive land loss stemming from industrial canals, and land loss victims would benefit from a legislative solution in the form of a coastal impact fee-based relocation fund.

Part I of this Comment examines the history of navigation and pipeline canals in coastal Louisiana, specifically within the Barataria-Terrebonne National Estuary. It lays out how canals proliferated throughout the coast without regulation, eventually becoming a network of 10,000 miles, shredding estuaries and causing the mass exodus of coastal communities, such as the Biloxi-Chitimacha-Choctaw tribe of Isle de Jean Charles. Part II of this Comment analyzes the inadequacies in three different remedies at law: tortious nuisance, a theory of third-party beneficiaries from licenses and permits issued to developers, and citizen suits under the Clean Water Act (CWA). Part III argues that litigation following *Banks v. United States* would support a successful Fifth Amendment taking claim in the context of canal-induced erosion to the extent that causation can be proven. It then argues that the expenses of proving causation and the statute of limitations under the Tucker Act, though not preclusive to victory in *Banks*, would effectively prevent individual coastal litigants from pursuing such a claim in the BTNE. Last, Part IV argues that coastal legislatures should modify their respective coastal impact fee programs for the development of relocation programs for victims of canal-induced land loss. Such an impact fee system would hold developers accountable for their prior conduct while also providing the only adequate remedy for the victims of coastal land loss: relocation.

I. CANALS AND LAND LOSS: HISTORY AND BACKGROUND

With a vanishing coast and cultures on the run, many have wondered who, or *what*, is to blame. Could it be Mother Nature, humbling us with her heavy and unpredictable hand? There is no doubt that natural events, such as hurricanes and tropical storms, have ravaged the Gulf Coast, causing “elevated sea level,

²³ Oliver A. Houck, *The Reckoning: Oil and Gas Development in the Louisiana Coastal Zone*, 28 TUL. ENV'T L.J. 185, 205–06 nn.89–90 (2015); see *infra* note 49 and accompanying text.

known as storm surge, and extensive shoreline erosion and other geologic effects leading to the loss of property and life.”²⁴ Another contributing factor is the dreaded nutria rat, an herbivorous rodent that “eat[s] the roots and tubers of marsh plants,” furthering erosion because “land-building sediment is more easily eroded without plants present.”²⁵ However, the blame levied toward nature should be reserved, lest Louisianans ignore the perennial soil accretion thwarted by the leveeing of the lower Mississippi River²⁶ and their own culpability in bringing the nutria to Louisiana in furtherance of the fur industry.²⁷

Beyond levees and nutria, significant scholarship has focused on other human elements driving coastal land loss, with many commentators treating Isle de Jean Charles as a case study for the health of the Gulf Coast as a whole,²⁸ and some suggesting that such human catastrophes should compel a reevaluation of the takings doctrine regarding coastal erosion.²⁹ Though this scholarship has laid out in great detail the various environmental traumas afflicting South Louisiana, there has not been enough traction regarding the adequate remediation of this trauma.

Even with the grants already given to Isle de Jean Charles, there is still much work to be done in rebuilding a community that has already been torn apart. Furthermore, this relief is intended only to alleviate the effects of the underlying problem. Both the State of Louisiana and the federal government have chosen to pay away the symptoms instead of treating the causes of this disease, which has threatened not only one of Louisiana’s most vibrant and distinct cultures, but also the ecosystem that had sustained this culture for the last 170 years³⁰ and

²⁴ Abby Sallenger, *Hurricane Impacts on the Coastal Environment*, U.S. GEOLOGICAL SURV.: COASTAL & MARINE GEOLOGY PROGRAM, <https://pubs.usgs.gov/fs/hurricane-impacts/> (last visited Dec. 16, 2020).

²⁵ Beck, *supra* note 11.

²⁶ Jackson, *supra* note 12.

²⁷ Beck, *supra* note 11.

²⁸ See Alexander B. Lemann, *Stronger Than the Storm: Disaster Law in a Defiant Age*, 78 LA. L. REV. 437, 490–92 (2018); Joseph Rosenberg, *Condemn (The) Nation: Holding the United States Accountable Through Inverse Condemnation Claims for Its Role in Bringing About—and Then Failing to Mitigate and Adapt to Certain Effects of—Climate Change*, 26 BUFF. ENV’T L.J. 85, 88 (2019); Morgan E. Ducote, Comment, *Uprooted and Underwater: An Examination of the Ideology Towards the Legal Implications of Coastal Erosion*, 45 S.U. L. REV. 187, 191 (2017); Lauren Zanolli, *Louisiana’s Vanishing Island: The Climate ‘Refugees’ Resettling for \$52m*, GUARDIAN (Mar. 15, 2016), <https://www.theguardian.com/environment/2016/mar/15/louisiana-isle-de-jean-charles-island-sea-level-resettlement>.

²⁹ Rosenberg, *supra* note 28, at 89, 133; Clinton W. Shinn, *Of Coaste, the Takings Clause, and the Inexorably Shrinking Marsh: A Review with Lagniappe*, 29 S.U. L. REV. 271, 279, 285–87 (2002); Bud Davis, *Strengthening the Floodwalls: Reinterpreting the Federal Circuit’s Ridge Line Test to Limit Government Liability in Takings Jurisprudence*, 26 FED. CIR. BAR J. 29, 31–33 (2016); Ducote, *supra* note 28, at 191, 210–11.

³⁰ Herman, *supra* note 10.

Native Americans since approximately 1000 C.E.³¹ Such a mass exodus has been of particular interest to legal scholars,³² who are left scratching their heads wondering whether the stripping of earth from beneath coastal residents' feet also signals an equally dubious loss in property rights. This Part first overviews the vast network of canals within the BTNE before discussing their origins and direct relationship with coastal land loss.

A. *Overview of Navigation and Pipeline Canals in the Barataria-Terrebonne National Estuary*

One need only perform a cursory internet search of Isle de Jean Charles before being inundated with images of water and loss.³³ In stark contrast to the jagged coastlines and dilapidated housing dotting this island, however, are the sharp lines of clearly delineated navigation and pipeline canals used for the exploration and acquisition of oil and natural gas in Louisiana's marshlands.³⁴ Canal dredging for these purposes has been common since the early twentieth century, picking up in the late 1940s, yet there was minimal federal oversight until implementation of coastal legislation in the 1970s.³⁵ Only recently has scholarship attempted to shed light on the effects that these canals have had on the disappearance of Louisiana's wetlands, specifically through erosion.³⁶

The collapse of land density in and around Isle de Jean Charles is caused by innumerable factors, none of which can be taken in isolation. Each cause of environmental degradation exacerbates the effects of other causes.³⁷ For example, erosion can contribute to subsidence and vice versa. Whereas Isle de Jean Charles is undoubtedly sinking due to subsidence,³⁸ the lower, decreased

³¹ Naomi King, *Cemetery, Sacred Mound Receive State Marker*, HOUMA TODAY (Nov. 17, 2007, 12:25 AM), <https://www.houmatoday.com/news/20071117/cemetery-sacred-mound-receive-state-marker>.

³² See *infra* Part III.C.

³³ Images of Isle de Jean Charles, GOOGLE, <https://www.google.com> (follow "Images" hyperlink; then search "Isle de Jean Charles").

³⁴ *Id.*; see Houck, *supra* note 23, at 195–96 (describing the visual appearance of canals along Louisiana's coast from the 1920s to present day).

³⁵ See *infra* Part I.D.

³⁶ See Ricardo A. Olea & James L. Coleman, *A Synoptic Examination of Causes of Land Loss in Southern Louisiana as Related to the Exploitation of Subsurface Geologic Resources*, 30 J. COASTAL RSCH. 1025, 1035–37 (2014).

³⁷ Day et al., *supra* note 15, at 426.

³⁸ According to Bob Marshall, a New Orleans-based environmental journalist, "[e]xperts familiar with the issues in Louisiana and other coastal areas of the U.S. would disagree" that climate change is the problem underlying Isle de Jean Charles' land loss. Bob Marshall, *The People of Isle de Jean Charles Aren't the Country's First Climate Refugees*, LENS (Dec. 6, 2016), <https://thelensnola.org/2016/12/06/the-people-of-isle-de-jean-charles-arent-the-countrys-first-climate-refugees/>. It would be more accurate to call residents of this island "'America's first subsidence refugees.'" After all, the [I]sland rests on a sediment-starved delta that is one of the

landmass encourages more saltwater infiltration, which, in turn, can kill off the vegetation sustaining these land-masses, thereby furthering subsidence.³⁹ For the residents of this island and other coastal communities, it is a never-ending cycle of land loss perpetuating land loss.⁴⁰

Though it is the totality of circumstances pervading the estuary that causes such massive wetlands erosion, few can doubt the tremendous impact that industrial and navigation canals have had on Louisiana's landscape. At one point in time, Isle de Jean Charles was accessible only by *pirogues*, a small canoe-shaped dugout,⁴¹ before larger canals were dredged for fishing boats to navigate.⁴² Following the Great Depression, "oil fields came in and started making canals to bring in more [oil] rigs. In 1953 a road was built to access the oil tanks. Saltwater seeped into the canals."⁴³ Dredging was not limited to the areas surrounding Isle de Jean Charles, though many of its most immediate effects were felt by the Island's residents. Chantel Comardelle, tribal secretary of the Biloxi-Chitimacha-Choctaw tribe residing on Isle de Jean Charles, has stated that "[w]hen I was growing up, it was mostly brackish water, lots of fresh water. I was told the[re] were rice fields, but you wouldn't know because now it's just water over there."⁴⁴ What was once brackish and fresh is now mostly life-depriving saltwater rushing deeper and deeper inland from canal inflows.

It is also beyond dispute that South Louisiana's network of canals is interrelated, with no single canal being a determinant in the health of the system as a whole. Recent litigation has focused specifically on this interrelationship, as most canal networks "continue[] to introduce increasingly larger volumes of damaging saltwater, at increasingly greater velocity, ever deeper into Louisiana's coastal landscape and interior wetlands."⁴⁵ What is more important

fastest-subsiding coastal landscapes on the planet." *Id.* Marshall also interviewed Alex Kolker, a researcher from the Louisiana Universities Marine Consortium, who said, "[s]ubsidence was about five times faster than global sea level rise at Isle de Jean Charles last century, and it's now about three times faster than global sea level rise." *Id.*

³⁹ Marshall, *supra* note 38; *see also* Day et al., *supra* note 15 (describing the link between saltwater intrusion and widespread death of marshes).

⁴⁰ As Walter Williams, a filmmaker responsible for documentaries on coastal restoration, put it: "it's not just the over 10,000 miles of canals, it's the trillions of barrels of oil they sucked from beneath us that collapsed major areas of the region below sea level. It's not rocket science. It's mud and gravity." Houck, *supra* note 23, at 210 (citation omitted).

⁴¹ Herman, *supra* note 10.

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ Pet. for Damages and Injunctive Relief at 9, Bd. of Comm'rs of the Se. La. Flood Prot. Auth. – E. v. Tenn. Gas Pipeline Co., 2013 WL 3948577 (La. Dist. Ct. 2013) (Trial Pleading).

is that any given canal does not only further erosion of the adjacent canal banks, but also the estuary as a whole:

Oil and gas activities continue to transform what was once a stable ecosystem of naturally occurring bayous, small canals, and ditches into an extensive—and expanding—network of large and deep canals that continues to widen due to [oil companies'] ongoing failure to maintain this network or restore the ecosystem to its natural state.⁴⁶

Even scholars who reject that canals are the primary driver of coastal erosion⁴⁷ admit that “hydrologic restoration, specifically with reference to canal spoil banks, should be a necessary component of a holistic, integrated delta restoration plan.”⁴⁸ With all facets of scholarship recognizing that harm posed by canals is interrelated as part of a larger network of devastation,⁴⁹ one cannot help but speculate upon not only the origins of these canals, but the driving factors in their construction: blind avarice and willful ignorance toward their adverse environmental effects.

B. Origin and Utility of Canals in the Barataria-Terrebonne National Estuary

In a particularly exhaustive article on the history of oil and gas development on the Louisiana coast, Oliver A. Houck, environmental law professor at Tulane University, laments the political strangleholds on challenging the oil industry before launching his attack: following Hurricane Katrina, politicians became all too aware that “50 miles of marshes and cypress swamps that once buffered its levee system from Gulf storms were largely gone, shredded by oil industry canals.”⁵⁰ But how did these canals come about?

⁴⁶ *Id.*; see also LA. CIV. CODE ANN. arts. 667–69 (2019) (detailing limitations and regulations on use of property to prevent inconvenience to neighbors).

⁴⁷ Day et al., *supra* note 15, at 436. In this study, the authors agree that “canals have been, and continue to be, an important agent in contributing to this land loss.” *Id.* However, the authors argue that the “eliminat[ion of] a major land building and maintenance mechanism” from the leveeing of the lower Mississippi River, which forces “the exclusion of sediments, freshwater, and nutrients,” is the most determinant factor in coastal erosion. *Id.*

⁴⁸ *Id.*

⁴⁹ Olea & Coleman, *supra* note 36, at 1035–37. The data implicating canals speaks largely for itself:

Rates of land loss reported by the U.S. Geological Survey . . . do show an acceleration in land loss during a period from 1974–88, accounting for as much as an additional 1000 km² land loss over the historical rate of about 50 km²/y before and after this period. This survey represents a 30–59% increase in land loss relative to the trend before and after 1974–88, which may be attributed primarily to canal constructions.

Id. at 1034.

⁵⁰ Houck, *supra* note 23, at 186.

The birth of the oil industry in Louisiana coincides with the discovery of an oil field located at the Spindletop salt dome in 1901, “vault[ing] the Gulf Coast of the United States to prominence in the world petroleum industry.”⁵¹ Less than a decade later, John D. Rockefeller and his Standard Oil Company completed a refinery along the banks of the Mississippi River in Baton Rouge, ushering in a new era of industry for South Louisiana.⁵²

In the beginning, the petroleum industry was not propagated through chance discoveries, despite romanticized notions that “[oil] was everywhere, oil bubbling up from seeps in the Gulf of Mexico . . . , from salt domes in the ground, wisps of methane in the air, exploding, usually in tiny pockets, once big enough to set an entire island on fire for several months, phenomena of wonder.”⁵³ In fact, “[e]xploring such environments tended to be a gradual and incremental process, involving the adaptation of land-based equipment and technologies to particular locations.”⁵⁴ Salt domes and some inland waters⁵⁵ provided particularly easy access, but the vast swaths of shallow open water, swamps, and marshlands frustrated the purposes of oilmen.⁵⁶ Many turned to methods used by muskrat trappers, such as using *pirogues* in order to navigate various *trainasses*, “tiny canals often carved out of the swamps and marshes by hand with the aid of a pirogue paddle.”⁵⁷

As technology developed, Gulf Oil designed a type of marsh buggy used by geophysical crews, “propell[ing] the buggy as fast as 10 mph in the marsh and

⁵¹ DIANE AUSTIN, TYLER PRIEST, LAUREN PENNEY, JOSEPH PRATT, ALLAN J. PULSIPHER, JOSEPH ABEL & JENNIFER TAYLOR, U.S. DEP’T. OF THE INTERIOR, GULF OF MEX. OCS REGION, OCS STUDY MMS 2008-042, PAPERS ON THE EVOLVING OFFSHORE INDUSTRY 13 (2008).

⁵² Houck labels this refinery, which is still the largest in the country, as “a looming permanence behind the state capital building,” ostensibly connecting this monolith of industry as something that not only “molded the politics and economics of Louisiana[;] it molded the mind.” Houck, *supra* note 23, at 189, 192.

⁵³ *Id.* at 188.

⁵⁴ AUSTIN ET AL., *supra* note 51, at 25.

⁵⁵ *Id.*

⁵⁶ One researcher later explained the problem in terms of a cost-benefit analysis:

There were no roads in the marshes, no bridges over the bayous, no bases from which to move out into the bays. That whole expanse from Calcasieu Lake to Breton Sound was a sort of nature’s no-man’s land, neither land nor sea. A steamboat ran from Lake Charles to Cameron; the road would not be built until the mid-1930s. . . . Even the largest oil companies regarded the cost of building roads and bridges prohibitive. Transportation of personnel by boat and barge was difficult.

Id. (quoting R.L. Lankford, *Marine Drilling*, in HISTORY OF OIL WELL DRILLING 1379 (J.E. Brantly ed., 1971)).

⁵⁷ *Id.* at 26. Though early oilmen were able to carry some of their lighter equipment via these *trainasses*, vegetation often prohibited larger boat traffic, requiring exploration by foot, sometimes “waist-deep in swamp water dodging cypress roots and saw-toothed palmetto leaves” in addition to snakes and leeches. *Id.*

water,” destroying muskrat habitat and traps.⁵⁸ Many of the tracks carved by these swamp buggies grew back with lush vegetation, but tracks used repeatedly left lasting damage as “open water areas expanded, breaking up natural barriers and leading to tidal scouring and increased water salinity.”⁵⁹ These tracks, canals, and pipelines “permanently altered the environment of southern Louisiana, contributing to the increasing submergence and disappearance of vast areas of marshland which greatly threatens the survival of Cajun communities today.”⁶⁰ The current ecosystem now “resembles a war zone with prime marsh torn to rags, acres of no land at all, and a wide sweep of water spotted with remnant strips of grass.”⁶¹

As Houck points out, the effects of these canals did not take decades to accumulate, nor did it take years for people to begin raising the alarm.⁶² In 1925, for example, Percy Viosca, an environmentalist who “held every important wildlife post in Louisiana,” remarked that “[m]an-made modifications in Louisiana wetlands, which are changing the conditions of existence from its very foundations, are the result of flood protection, deforestation, deepening channels[,] and the cutting of navigation and drainage canals.”⁶³ He further noted that the “[t]ime is ripe for an enormous development of the Louisiana wetlands along new and intelligent lines.”⁶⁴ Despite these cognizable damages, wetlands merely stood in the way of oil companies, who eventually developed “submersible drilling barges that could be pushed or towed to the site and new floating draglines to clear the passage,”⁶⁵ allowing development of oil fields that would otherwise have been insulated from the high cost of exploration, navigation, and development.

Canals quickly became a cheap way to circumvent the land itself. As developers and regulators soon learned, however, this dredging came with a hefty price: tens of thousands of acres lost to the tide, all in pursuit of profit.

C. Canals and Coastal Land Loss

What was once mere habitat destruction quickly turned into vast and unparalleled geological and hydrological changes, fueled by drilling barges,

⁵⁸ *Id.* at 28.

⁵⁹ *Id.* at 28–29.

⁶⁰ *Id.* at 29.

⁶¹ Houck, *supra* note 23, at 195.

⁶² *Id.*

⁶³ *Id.* at 198 (citation omitted).

⁶⁴ *Id.*

⁶⁵ *Id.*

floating draglines, and greed. In 1955, “one Muskrat Line engineer wrote, ‘[w]hen comparing the marsh areas with aerial photos that we have, we find that much of the terrain has changed and continues to change day-to-day,’”⁶⁶ establishing that these effects were known decades before current controls on canal dredging were implemented. Smaller canals dredged for exploration and development quickly paved the way for “a galaxy of yet bigger canals to serve industry tankers, barges, and crew boats,” which by and large have become the most significant contributors to wetlands destruction.⁶⁷ Whereas natural channels in coastal wetlands are relatively shallow and discrete, typical industrial canals are four to five meters deep and forty-one to forty-five meters wide.⁶⁸ These larger navigation canals “provide trunk access from which the companies can cut to new sites and corridors,” allowing the penetration of deeper “interior canals and ditches.”⁶⁹

Though few would doubt that the dredging of navigation canals, specifically for the oil and natural gas industry, has effectuated dramatic land loss, there is dispute as to the extent of the loss directly caused by these canals.⁷⁰ Even commentators who most ardently advocate for the reevaluation of canal maintenance practices, in light of their damage, understand that “wetland hydrologic flows are complicated” and that “[h]ydrologic changes following dredging . . . extend widely and perhaps unpredictably.”⁷¹ Part of this unpredictability stems from the “extensive human-induced changes on this coast

⁶⁶ *Id.* at 202–03 (quoting JASON P. THERIOT, AMERICAN ENERGY, IMPERILED COAST 47 (2014)).

⁶⁷ *Id.* at 203. These larger canal projects drastically expedited the erosive processes:

[For example,] the Gulf Intracoastal Waterway, Calcasieu Ship Channel, Barataria Bay Waterway, Houma Navigation Canal, Mississippi River-Gulf Outlet Canal (MR-GO), Lower Atchafalaya River, and Bayous [Chêne], Boeuf, and Black Canals, and the list continues, with yet more begging for authorization today, all largely justified on the transportation of oil, gas, and petrochemicals, each channel deadly to the surrounding marsh. The ‘Atchafalaya River and Bayou[s] [Chêne], Boeuf and Black, Louisiana’ project, built to favor two oil rig manufacturers near Morgan City, sliced its way through 50 miles of the wetlands of Terrebonne Parish, the most rapidly disappearing terrain in the state. The MR-GO, intended to speed travel for tankers of all kinds, destroyed more than 30,000 acres of swamp forest below New Orleans and left the city open to two devastating hurricanes, one month apart. None of that damage has been repaired. The land is largely gone.

Id.

⁶⁸ Eugene Turner, *Discussion of: Olea, R.A. and Coleman, J.L., Jr., 2014. A Synoptic Examination of Causes of Land Loss in Southern Louisiana as Related to the Exploitation of Subsurface Geologic Resources*, 30 J. COASTAL RSCH. 1025, 1331 (2014).

⁶⁹ Oliver A. Houck, *Land Loss in Coastal Louisiana: Causes, Consequences, and Remedies*, 58 TUL. L. REV. 3, 50–51 (1983); *see also id.* at 46–48 (identifying navigation canal projects in the coastal zone).

⁷⁰ Day et al., *supra* note 15, at 426.

⁷¹ R. E. Turner, *Wetland Loss in the Northern Gulf of Mexico: Multiple Working Hypotheses*, 20 ESTUARIES 1, 11 (1997).

[that] have apparently overwhelmed the causal linkages identified in a historical reconstructionist view of deltaic gain and loss.”⁷² Perhaps more important than the barrage of factors contributing to erosion, however, is the fact that “the vast majority of spoil banks and canals are already constructed.”⁷³ It is therefore impossible to “determine precisely where wetland loss will and will not occur.”⁷⁴

Prognoses for future land loss are inherently imprecise, but there is still a wealth of research on the previous overarching effects of canals, including R. Eugene Turner’s own conclusion that “[t]he indirect consequences of dredged canals and the resulting spoil banks have led to the majority of land loss since the 1930s”⁷⁵ in Louisiana’s coastal Mississippi Delta. Studies vary widely, with Turner stating that the direct effects of channelization “accounted for 12% of total land loss” from the 1930s to 1990.⁷⁶ He also notes that much of the remaining wetland loss stems from indirect impacts of canals.⁷⁷ Another unpublished study puts the total figure of land lost in Louisiana by channelization at 35%.⁷⁸ Houck wrote that as much as 89% of all land lost in Louisiana prior to 1983 was caused by industrial dredging.⁷⁹

The extent of devastation serves as a useful—albeit imprecise—marker of causation, and these studies nevertheless reveal a direct causal connection with immeasurable indirect effects.⁸⁰ In fact, for every hectare of canals dredged, “2.85 h[ectares] of open water form . . . and an additional 1 h[ectare of] wetland converted to spoil bank.”⁸¹ Even without this concrete data, there is a multitude of facial assertions linking these industrial activities to land loss, such as “massive deforestation of cypress forests, establishment of thousands of canals for transportation and pipelines, development of oil and gas and a vast

⁷² *Id.*

⁷³ *Id.* Turner also stated that “the additional area of dredged canals added in 1993 was less than 0.2% of the total present in 1992.” *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.* at 4, 8.

⁷⁶ Turner, *supra* note 68.

⁷⁷ *Id.*

⁷⁸ S. Penland, I.A. Mendelsohn, L. Wayne & L.D. Britsch, *Natural and Human Causes of Coastal Land Loss in Louisiana*, COASTAL STUDS. INST. & WETLAND BIOGEOCHEMISTRY INST. (1996) (unpublished report) (on file with Louisiana State University: Baton Rouge).

⁷⁹ Houck, *supra* note 23, at 205–06 nn.89–90.

⁸⁰ See HEIDI BECK, ALICIA BIHLER, MELISSA KEMM, SAM PARDO & DOUGLAS PERRON, PHYSICAL AND PROGRAM OPTIONS FOR THE INLAND MIGRATION OF LOUISIANA’S COASTAL WETLANDS IN RESPONSE TO RELATIVE SEA LEVEL RISE, A REPORT FOR THE COASTAL PROTECTION AND RESTORATION AUTHORITY OF LOUISIANA (2012).

⁸¹ Aaron S. Bass & R. Eugene Turner, Abstract, *Relationships Between Salt Marsh Loss and Dredged Canals in Three Louisiana Estuaries*, 13 J. COASTAL RSCH. 895, 895 (1997).

infrastructure to support it, and huge alterations in patterns of erosion and sedimentation.”⁸²

Notably, this direct correlation was known long before these late-twentieth century scientific reports. As early as 1953, the Louisiana Department of Wildlife and Fisheries’ “oyster and water bottoms chief” spoke on the issue of canals: “When currents are changed by these canals and where dredgings [spoil banks] are placed along the sides of the canal, in many cases currents are stopped entirely or the flow lessened noticeably, . . . causing . . . changes in the ecology of a given area.”⁸³ In 1955, he said that “[e]cological and hydrographic changes may be permanent . . . and may affect extensive areas ten miles or more on either side of the canal.”⁸⁴

Even oil industry insiders warned that the damage done by canals is more extensive than what can be repaired in a controlled setting. A spokesperson for Esso, the precursor to Exxon, stated in a trade journal published in the 1950s that “[t]he land area [that] may be lost through soil erosion due to current through flotation canals . . . cannot be repaired with a few passes of a bulldozer, some shovel work, and a little seeding.”⁸⁵ Furthermore, single canals, in and of themselves, do not faze the coast as much as the web of canals culminating in the mass production of “small lakes and bays.”⁸⁶ By “provid[ing] passageways for Gulf saltwater to enter delicate freshwater marshes,”⁸⁷ these canals signal the death of marsh plants whose roots no longer anchor the soil, thereby causing and furthering erosion. This process allows canals to become pools, “pools [to] become ponds,” and “ponds [to] become lakes.”⁸⁸ Those lakes then become bays practically indistinguishable from the Gulf of Mexico.⁸⁹

⁸² AUSTIN ET AL., *supra* note 51, at 173.

⁸³ Houck, *supra* note 23, at 207 (quoting THERIOT, *supra* note 66, at 54).

⁸⁴ *Id.* at 208 (quoting THERIOT, *supra* note 66, at 58).

⁸⁵ *Id.* at 209 (quoting THERIOT, *supra* note 66, at 82).

⁸⁶ *Id.* at 210 (citation omitted).

⁸⁷ Shinn, *supra* note 29, at 291.

⁸⁸ *Id.*

⁸⁹ Image of Interrelated Bays and Lakes, GOOGLE MAPS, <https://maps.google.com> (follow “Directions” hyperlink; then search “Old Lady Lake Parish Governing Authority District 9”; click zoom out button to show labels) (revealing an interrelation of several bays and lakes: (1) Bay la Peur, (2) Lake Barre, (3) Jacko Bay, (4) Lake Felicity, (5) Old Lady Lake, (6) Terrebonne Bay, (7) Timbalier Bay, and (8) Lake Raccourci). Notably, *raccourci*, the past participle of *raccourcir*, can mean “to have shortened” or “shortcut.” See *Raccourcir*, DICTIONARY OF LOUISIANA FRENCH (Albert Valdman & Kevin James Rottet eds., 2010). For a discussion of how erosion within this district affects commercial fishermen, see Collin Serigne, *Shrimp Land, USA*, YOUTUBE, at 14:25 (Nov. 6, 2019), <https://www.youtube.com/watch?v=SiYT-IOWk6o&feature=youtu.be&fbclid=IwAR3dkq2iSc13dXPprweK0z14c2TtBP5peCHD5ItyKz6q98-LqVWqc96AzQc>.

In the 1970s, speculation and suppositions gave way to the United States Army Corps of Engineers (Corps)'s clear recognition that "[o]nshore pipeline construction may cause irretrievable marshland loss."⁹⁰ Once the harm was established and recognized, however, "attempts to at least soften the blow"⁹¹ came slowly. For example, the Louisiana Department of Wildlife and Fisheries recommended that companies plug "the ends [of canals] in order to arrest saltwater intrusion,"⁹² but those plugs were short-lived and "presented no obstacle to the incoming tide."⁹³ It was not until federal environmental intervention took place in the 1970s that any relief came to floundering coastal communities.⁹⁴

Canals, then, have been given free rein to propagate and expand, shredding Louisiana's estuaries. As discussed below, current legal remedies are inadequate to provide relief for coastal refugees.

D. The Limited Scope of Federal Coastal Regulation over Canal-Induced Erosion

The advent of federal law, particularly the CWA section 404 permitting program⁹⁵ for deposits of dredged material and the Coastal Zone Management Act of 1972,⁹⁶ were the first moderately successful efforts to rein in the ecology-altering effects of canal-induced coastal erosion. Congress enacted the CWA and its progeny "to restore and maintain the chemical, physical, and biological integrity of the Nation's water"⁹⁷ and to mitigate the disastrous effects of "the wholesale degradation of the nation's waters and the continuing failure of federally-assisted state pollution control programs to remedy the problem."⁹⁸ It is undisputed that "wetlands protection was critical to achieve national goals of high water quality"⁹⁹ pursuant to Congress's stated purpose of the CWA.

⁹⁰ Houck, *supra* note 23, at 209 (quoting U.S. ARMY CORPS OF ENG'RS, FINAL ENVIRONMENTAL IMPACT STATEMENT: CRUDE OIL AND NATURAL GAS PRODUCTION AND OTHER MINING OPERATIONS IN NAVIGABLE WATERS ALONG THE LOUISIANA COAST 86 (1973)).

⁹¹ *Id.* at 232–33.

⁹² *Id.* at 233.

⁹³ *Id.*

⁹⁴ *See infra* Part II.C.

⁹⁵ Clean Water Act § 404(a), 33 U.S.C. § 1344(a).

⁹⁶ Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–64.

⁹⁷ Clean Water Act § 101(a), 33 U.S.C. § 1251(a).

⁹⁸ Oliver A. Houck & Michael Rolland, *Federalism in Wetlands Regulation: A Consideration of Delegation of Clean Water Act Section 404 and Related Programs to the States*, 54 MD. L. REV. 1242, 1254 (1995).

⁹⁹ *Id.* at 1246.

In particular, section 404¹⁰⁰ pertains to the regulation of fill discharges and places a heightened level of importance on “steer[ing] wetland development away from wetlands in the first place by the examination of alternatives. The guidelines flatly prohibit the discharge of dredge or fill material in wetlands if there is a practicable alternative that would have less impact on aquatic ecosystems,”¹⁰¹ even going so far as to “*presume* the availability of alternative locations for activities that do not depend on proximity to water.”¹⁰² However, section 404’s protections of wetlands are limited in that they apply only to the discharge of dredged or fill materials into navigable waters without a permit,¹⁰³ not to the dredging itself. Even section 404’s mitigation requirements do not address canal-induced erosion, instead focusing on wildlife preservation and water integrity.¹⁰⁴ Further, this coastal legislation did not effectuate its intended benefits without significant opposition. Because the section 404 program was “[a]dministered by the Corps, . . . which had been digging its own navigation canals through the zone with enthusiasm, the section 404 program presented little obstacle for decades to come, much of them marked by Corps resistance to the new law.”¹⁰⁵

The Coastal Zone Management Act, which required that activities “directly affecting the coastal zone” be conducted “in a manner . . . consistent with approved state management programs,”¹⁰⁶ fared even worse. After the coastal commission in Louisiana “had the audacity to actually reverse a state permit for an oil access canal,”¹⁰⁷ it was “quickly abolished and the process turned over to the oil-and-gas-dominated [Department of Natural Resources], where it has safely remained.”¹⁰⁸

Thus, there is no statutory or regulatory provision that would prevent the wholesale degradation of Louisiana’s coastal environment from canal-induced land loss. As discussed below, litigation has proven even more futile, with virtually no existing legal remedies.

¹⁰⁰ Clean Water Act § 404(a), 33 U.S.C. § 1344(a).

¹⁰¹ Houck & Rolland, *supra* note 98, at 1255.

¹⁰² *Id.* at 1256 (emphasis added). *But see infra* notes 276–79, 300 (detailing the benignity of current impact fees in the BTNE).

¹⁰³ Clean Water Act § 404(a), 33 U.S.C. § 1344(a).

¹⁰⁴ *See infra* Parts I.D, I.I.C.

¹⁰⁵ Houck, *supra* note 23, at 233.

¹⁰⁶ Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1456(c)(1).

¹⁰⁷ Houck, *supra* note 23, at 235 (quoting Oliver A. Houck, Louisiana v. Lee *and the Battle of Lake Ponchartrain*, 26 TUL. ENV’T L.J. 1, 13–16 (2012)).

¹⁰⁸ *Id.*

II. LEGAL IMPLICATIONS OF CANALS

The absence of sufficient state and federal regulation has imposed significant burdens on Louisiana's wetlands. This inadequacy in governmental protection has also prompted significant civil litigation¹⁰⁹ regarding the disastrous effects of canal-induced erosion, as well as recent scholarship equating this sanctioned erosion to a governmental taking.¹¹⁰ But far-flung academic papers and big-name cases do little to assist the common complainant, suffering through a sense of malaise from a near total lack of remedies.

The residents of Isle de Jean Charles, from whom 98% of the land has been taken by the tide,¹¹¹ could arguably be seen as the lucky ones. After all, their nearly \$50 million-dollar block grant will afford them the opportunity to rebuild not only their homes, but also a deracinated community—all on land twelve feet above sea level.¹¹² When many nearby coastal homes are already elevated on stilts ten, fifteen, and even twenty feet high, protection from higher ground will undoubtedly provide a physical and psychological safeguard that is not yet available to individual complainants.¹¹³

For citizens to whom federal and state relief are not available, there is little else to do but watch the tide slowly chip away at property lines, seemingly erasing many property rights alongside them, for residents have inadequate legal recourse and even less means to pursue that recourse. As discussed below, tortious nuisance and contract disputes cannot provide relief for canal-induced land loss claims, and even citizen suit provisions under the CWA have provided virtually no relief for victims of coastal land loss.

¹⁰⁹ See *infra* notes 218–20 and accompanying text.

¹¹⁰ See Ducote, *supra* note 28, at 201; see also Shinn, *supra* note 29, at 284.

¹¹¹ Zanolli, *supra* note 28.

¹¹² See *supra* note 22 and accompanying text.

¹¹³ In one particularly tragic instance, paramedics responded to a call from Mark Naquin, Sr., one of the Island's oldest residents. After carrying Mr. Naquin down the twenty rickety steps of his elevated home, they crossed a hand-made bridge above the bayou separating his home from the Island Road. While crossing the bridge, it collapsed, sending the two paramedics, Mr. Naquin, and his wife, Oxcelia Naquin, into the inky brackish water below. Telephone Interview with Taylor Naquin, Daughter-in-Law to Mark Naquin, Sr. (Oct. 10, 2019); see Naomi King, *Local Cowboy Is a Legend in His Own Right*, HOUMA TODAY (Dec. 11, 2006, 12:29 PM), <https://www.houmatoday.com/article/DA/20061211/News/608099416/HC/>; see also Danielle SeeWalker, *The Intimate Photo Project That Explores Contemporary Native American Life*, AFAR (Feb. 2, 2019), <https://www.afar.com/magazine/the-intimate-photo-project-that-explores-contemporary-native-american-life>.

A. *The Unavailability of Tortious Nuisance to Remedy Canal-Induced Erosion*

Rooted in fundamental property rights, a nuisance is “any thing that worketh hurt, inconvenience or damage . . . , [or any thing] done to the hurt or annoyance of the lands, tenements or hereditaments of another.”¹¹⁴ Though it is another property law maxim that “everyone has the right to use his property as he sees fit,” that right must be balanced so as not to “unreasonably inconvenience a neighbor in the reasonable enjoyment” of that neighbor’s property.¹¹⁵ These property truths are no different in Louisiana, where “the owner of immovable property, or a person deriving rights from the owner, generally has the right to use the property as he or she pleases[;] [h]owever, the owner’s right may be limited if the use causes damage to neighbors (and others).”¹¹⁶

These “obligations of neighborhood” place significant burdens on establishing a nuisance claim when detriment to a plaintiff’s property is caused by activities conducted by anyone other than those within a plaintiff’s legal “neighborhood.” Unless a plaintiff can sufficiently allege that she is a “neighbor” of the actor conducting the harm—“Louisiana courts have interpreted ‘neighbor,’ as articulated in Article 667 [of Louisiana’s Civil Code], to contemplate estates that are physically close to one another”¹¹⁷—the plaintiff will not be able to establish that she has “some interest in an immovable near the defendant-proprietor’s immovable.”¹¹⁸ In *Barasich v. Columbia Gulf Transmission Co.*, a group of plaintiffs sought damages from oil and gas companies for causing erosion, thus rendering the area more prone to the destructive impact of hurricanes.¹¹⁹ The district court noted that the “[p]laintiffs’ Article 667 claim fails because they do not demonstrate that the ‘neighbor’ referred to in Article 667 could be a party whose property is physically remote from that of the defendants.”¹²⁰

¹¹⁴ 3 WILLIAM BLACKSTONE, COMMENTARIES *216; cf. Louise A. Halper, *Untangling the Nuisance Knot*, 26 B.C. ENV’T AFFS. L. REV. 89, 96 n.37 (1998) (“That definition is often used, but it is overbroad, for it could include trespass, an invasive injury.”).

¹¹⁵ *Devoke v. Yazoo & M. V. R. Co.*, 30 So. 2d 816, 819 (La. 1947); see also *Vill. of Euclid v. Ambler Realty Co.*, 272 U.S. 365, 388 (1926) (“[T]he question whether a particular thing is a nuisance[] is to be determined . . . by considering it in connection with the circumstances and the locality. A nuisance may be merely a right thing in the wrong place, like a pig in the parlor instead of the barnyard.”).

¹¹⁶ Bd. of Comm’rs of the Se. La. Flood Prot. Auth.—E. v. *Tenn. Gas Pipeline Co.*, 88 F. Supp. 3d 615, 641 (E.D. La. 2015); see also LA. CIV. CODE ANN. arts. 667–69 (2019).

¹¹⁷ Bd. of Comm’rs of the Se. La. Flood Prot. Auth.—E., 88 F. Supp. 3d at 643.

¹¹⁸ *Id.* (quoting *Roberts v. Cardinal Servs., Inc.*, 266 F.3d 368, 386 (5th Cir. 2001)) (finding that plaintiffs injured on an offshore oil platform have no right of action under Article 667, which “clearly requires that activity on the defendant’s premises must damage the neighbor or the neighboring ‘estate’”).

¹¹⁹ *Barasich v. Columbia Gulf Transmission Co.*, 467 F. Supp. 2d 676, 678 (E.D. La. 2006).

¹²⁰ *Id.* at 690.

Though claims of tortious nuisance are unavailable to potential non-adjacent erosion-based tortious nuisance claimants due to an inability to establish this “legal neighborhood,” some complainants have sought recourse through Article 2315 of the Louisiana Civil Code, which provides that “[e]very act whatever of man that causes damage to another obliges him by whose fault it happened to repair it.”¹²¹ In *Barasich*, the district court noted that “[l]iterally interpreted, Article 2315 could hold a tortfeasor liable for any damage remotely caused by his or her fault,” but “Louisiana courts have established limitations on the extent of damages for which a tortfeasor can be held liable in the duty portion” of a liability determination under Article 2315.¹²² Courts have thus found this burden to remain quite high, and most plaintiffs will be unable to win on the merits.

Tortious nuisance can provide an equitable remedy in simple cases, but its limitations are inadequate to settle the claims of an entire region of the Gulf of Mexico floundering in the face of land loss. Tortious nuisance is therefore unlikely to provide relief for the vast majority of potential land loss plaintiffs because they “will be unable to establish that defendants owed them a duty or that defendants’ conduct was a cause-in-fact of their injuries.”¹²³ In *Barasich*, the court stated that there was no “basis in Louisiana law to assert that defendants owed a duty to protect [the plaintiffs] from damage caused by hurricanes,”¹²⁴ but the court neglected to discuss duties not to cause the erosion that had initially led to the stripping away of coastal lands, including barrier islands, which had acted as a shield against gulf storms for centuries. Such a scope of care is unforeseeable in Louisiana, where even mineral leases sought out by oil and petroleum developers do not create a duty to restore adjacent wetlands lost to that development.¹²⁵

Even more problematic, however, is the second rung of the court’s analysis, requiring proof that “defendants’ conduct was a cause-in-fact of [plaintiff’s] injuries.”¹²⁶ The erosion of coastal wetlands is the result of innumerable factors, none of which can be taken in isolation.¹²⁷ For example, it is possible and foreseeable that one defendant’s canal could only have exacerbated the inflows already in place from a yet-unknown defendant’s canal. Alternatively, this same canal might hypothetically be carrying life-starving vegetation deposits from the

¹²¹ LA. CIV. CODE ANN. art. 2315 (2019).

¹²² *Barasich*, 467 F. Supp. 2d at 690–91.

¹²³ *Id.* at 691.

¹²⁴ *Id.*

¹²⁵ See *Terrebonne Par. Sch. Bd. v. Castex Energy, Inc.*, 893 So. 2d 789, 805–07 (La. 2005).

¹²⁶ *Barasich*, 467 F. Supp. 2d at 691.

¹²⁷ See *supra* notes 37–40 and accompanying text.

soil banks of yet a third canal. It is also conceivable that one canal, hypothetically alleged to be the primary cause of erosion, is actually transferring the inflows of a levee cut-out, thus bringing silt used for soil accretion instead of the seeds of erosion. Even with expert hydrogeological testimony, it would still be impossible to apportion damages because of myriad unknown canals and unidentifiable defendants.

Causation is clearly the most difficult rung to overcome in a claim of tortious nuisance against canal developers. Yet, it can logically be presumed that the causation is still there. Even as early as 1955, the officials in the Louisiana Department of Wildlife and Fisheries stated that “[e]cological and hydrographic changes may be permanent . . . and may affect extensive areas ten miles or more on either side of the canal.”¹²⁸ More importantly, canals work not in isolation, but as part of a system, culminating in the mass production of “small lakes and bays.”¹²⁹ If a canal, seen in isolation in 1955, could potentially affect the ecology and hydrography of every aquatic area in a ten-mile radius, the damage presumably associated with a network of canals is astonishing. For example, paddling through the aptly named Wonder Lake, a relatively large body of water adjacent to Isle de Jean Charles, one is not just left wondering what happened to the cow pastures and rice fields that had once sustained nearby residents, but also what happened to the canals themselves, as many of them have eroded into oblivion.¹³⁰

Though causation has been established with respect to the industry as a whole, the inability to calculate damages caused by individual canals or developers renders tortious nuisance ineffective. Even if a duty of care and causation could be proven as to individual parties, a paltry collection of damages would do little to stymie the ever-shifting tides and future devastation. As stated in the doctrinal case on private nuisance, *Pate v. City of Martin*, “[s]eldom, if ever, will an award of damages, standing alone, be an adequate remedy where the nuisance gives every promise of continuing and is one that can be corrected.”¹³¹ Whereas injunctions—in conjunction with damages—typically serve to provide an adequate remedy for most nuisance claims,¹³² this type of remedy might be ineffective in the context of coastal erosion, where the driving

¹²⁸ Houck, *supra* note 69, at 24 (identifying navigation canal projects in the coastal zone) (internal quotations omitted).

¹²⁹ Houck, *supra* note 23, at 210 (citation omitted).

¹³⁰ See *supra* note 89; *infra* notes 137–39, 280 and accompanying text.

¹³¹ *Pate v. City of Martin*, 614 S.W.2d 46, 48 (Tenn. 1981).

¹³² See generally *Boomer v. Atl. Cement Co.*, 26 N.Y.2d 219 (N.Y. 1970) (analyzing equity in terms of balancing financial remedies with injunctive relief).

factors have already been established. Not only is there already a 10,000-mile network of industrial canals exacerbating land loss, but these canals are still being dredged.¹³³ What remains more viable than damages or injunctions is remediation,¹³⁴ which thus far has been largely limited to contract claims between governmental entities and private developers.¹³⁵

B. The Inadequacies of Remediation Through Contract

Even if tortious nuisance claims were available to potential land loss claimants, damages do not necessarily effectuate remediation of the environment. Under a theory of environmental remediation through contract, monetary damages and the loss of property rights are not the plaintiff's goal.¹³⁶ Rather, parties hope to use contractual obligations to force a mitigation in damages through affirmative action by the developer in maintaining an ecological status quo. Despite this potential for wetlands remediation, several legal decisions make clear that Louisiana courts are unwilling to provide sufficient remedy through the law of contract.

In *Terrebonne Parish School Board v. Columbia Gulf Transmission Co.*, the Board filed suit against companies who owned gas pipelines constructed on servitudes located on the Board's land.¹³⁷ These canals, however, drastically widened, "exceed[ing their] permissible width by thirty feet" in 1957.¹³⁸ This failure to maintain the oilfield canals, the plaintiff argued, implicated an Article 2315 duty. Because "the servitude agreements here at issue d[id] not expressly impose on [the defendants] the duty to prevent the canals from widening and eroding adjoining marshland," the contracts did not impose an implied duty to backfill the canals or perform other remedial measures on the leased land.¹³⁹

¹³³ *La. Oystermen Ass'n, Inc. v. Hilcorp Energy Co.*, No. 16-10171, 2017 U.S. Dist. LEXIS 12216, at *1-2 (E.D. La. 2017).

¹³⁴ *But see Whalen v. Union Bag & Paper Co.*, 101 N.E. 805, 805 (N.Y. 1913) ("Although the damage to the plaintiff may be slight as compared with the defendant's expense of abating the condition, that is not a good reason for refusing an injunction. Neither courts of equity nor law can be guided by such a rule, for if followed to its logical conclusion it would deprive the poor litigant of his little property by giving it to those already rich. It is always to be remembered in such cases that denying the injunction puts the hardship on the party in whose favor the legal right exists, instead of on the wrongdoer.") (internal quotations omitted).

¹³⁵ *See Terrebonne Par. Sch. Bd. v. Columbia Gulf Transmission Co.*, 290 F.3d 303, 307, 311 (5th Cir. 2002); *Bd. of Comm'rs of the Se. La. Flood Prot. Auth.—E. v. Tenn. Gas Pipeline Co.*, 88 F. Supp. 3d 615, 618-20, 625, 645 (E.D. La. 2015).

¹³⁶ *See State v. La. Land & Expl. Co.*, 110 So. 3d 1038, 1040-41 (La. 2013).

¹³⁷ *Terrebonne Par. Sch. Bd.*, 290 F.3d at 307-09.

¹³⁸ *Id.* at 316.

¹³⁹ *Id.* at 325; *see also Terrebonne Par. Sch. Bd. v. Castex Energy, Inc.*, 893 So. 2d 789, 794 (La. 2005) (holding that even under Louisiana state law, lessees causing erosion through channelization had no implied duty "to restore the surface of the leased land to its pre-lease condition by backfilling the canals").

Similarly, in *Board of Commissioners of the Southeast Louisiana Flood Protection Authority—East v. Tennessee Gas Pipeline Co.*, a state flood control agency sought damages and injunctive relief based on industrial activities that allegedly caused coastal erosion, thereby making the area significantly more vulnerable to gulf storms and flooding.¹⁴⁰ Specifically, the plaintiff wanted responsible parties in the oil and natural gas industry to be charged with filling in canals east of the Mississippi River alleged to have contributed to environmental harm.¹⁴¹ The plaintiff's theory was one based in contract, whereby the plaintiff alleged to be a third-party beneficiary from the licenses and permits issued to the oil companies by the Corps.¹⁴² Licenses and permits, however, do not constitute contracts under Louisiana law, and the plaintiff was unable to establish that it was a third-party beneficiary outside of the necessary contract relationship.¹⁴³ The plaintiff was therefore unable to find relief through contract.

Though the aforementioned cases provide just a narrow sample of contract-based litigation, they nevertheless establish the incredible burden a plaintiff has in establishing a contract claim based on canal erosion, even with powerful, big-name plaintiffs.¹⁴⁴ This lack of success has prevented thirteen coastal parishes from filing suit against the oil and natural gas industry for canal-induced erosion.¹⁴⁵ What recourse, then, is available to the average victim of land loss? It clearly does not arise in tort or contract.

¹⁴⁰ *Bd. of Comm'rs of the Se. La. Flood Prot. Auth.—E.*, 88 F. Supp. 3d at 618–19.

¹⁴¹ Mark Schleifstein, *Appeals Court Rules for Oil Firms, Against Levee Authority in Wetlands Damage Suit*, TIMES-PICAYUNE (Mar. 4, 2017, 12:51 AM), https://www.nola.com/news/environmental/article_deb7a37a-091c-57e9-be50-a528fc5172ca.html.

¹⁴² Plaintiffs also asserted five other causes of action, including negligence, strict liability, natural servitude of drain, public nuisance, and private nuisance. *Bd. of Comm'rs of the Se. La. Flood Prot. Auth.—E.*, 88 F. Supp. 3d at 618–19.

¹⁴³ The court further noted that under the Restatement (Second) of Contracts § 313, “even if the permits were construed as contracts, however, Plaintiff has not and cannot establish that it is an intended third-party beneficiary under the terms of the permits.” *Id.* at 645 (quoting RESTATEMENT (SECOND) OF CONTRACTS § 313 (AM. L. INST. 1981)).

¹⁴⁴ See generally *Terrebonne Par. Sch. Bd.*, 893 So. 2d 789; *St. Bernard Par. Gov't v. United States*, 887 F.3d 1354 (Fed. Cir. 2018).

¹⁴⁵ U.S. CHAMBER INST. LEGAL REFORM, LITIGATION VS. RESTORATION: ADDRESSING LOUISIANA'S COASTAL LAND LOSS 8 (2019), <http://instituteforlegalreform.org/uploads/pdfs/addressing-louisianas-coastal-land-loss-report.pdf>.

C. *The Inadequacies of Coastal Regulation in Mitigating Canal-Induced Erosion*

At both the federal and state level, the network of environmental legislation and regulation¹⁴⁶ has decelerated annual land loss, though not to the extent necessary to provide meaningful relief for victims of land loss. Prior to implementation of section 404 permitting through the CWA, Louisiana was losing land at a rate of fifty square miles per year.¹⁴⁷ By the mid-2010s, land loss was reduced to between sixteen and twenty-five square miles per year.¹⁴⁸ One key to both this reduction in land loss and environmental remediation is “mitigation,” a requirement under section 404 permitting.¹⁴⁹

Mitigation takes a variety of forms, but these controls are often inadequate, despite consistent clarification that mitigation is integral to the section 404 permitting scheme.¹⁵⁰ In addition to mitigation by avoiding the proposed area altogether,¹⁵¹ section 404 also requires minimizing¹⁵² impacts to an aquatic resource and compensatory mitigation, which requires “replacing or providing substitute aquatic resources for impacts that remain after avoidance and minimization measures have been applied.”¹⁵³ For compensatory mitigation, the Environmental Protection Agency further states that it is best “achieved through

¹⁴⁶ This Comment limits its exploration of regulatory litigation to the CWA. For a brief discussion of the inefficacy of the Coastal Zone Management Act in Louisiana, however, see *supra* notes 106–08 and accompanying text.

¹⁴⁷ Adam Wernick, *Louisiana’s Coastline Is Disappearing at the Rate of a Football Field an Hour*, PUB. RADIO INT’L (Sept. 23, 2014, 1:00 PM), <https://www.pri.org/stories/2014-09-23/louisianas-coastline-disappearing-rate-football-field-hour>.

¹⁴⁸ See *id.*; Donald D. Davis, *Coastal Land Loss in Louisiana: From Denial to Reality*, AM. ASS’N OF GEOGRAPHERS (Jan. 1, 2018), <http://news.aag.org/2018/01/coastal-land-loss-in-louisiana-from-denial-to-reality/>; *supra* note 6 (Supreme Court decision stating in 2006 that Louisiana was losing between twenty and thirty square miles of land each year).

¹⁴⁹ Clean Water Act § 404(a), 33 U.S.C. § 1344(a).

¹⁵⁰ 2015 Presidential Memorandum, *Mitigating Impacts on Natural Resources From Development and Encouraging Related Private Investment*, https://www.epa.gov/sites/production/files/2015-12/documents/presidential_memo_regarding_mitigation_11-3-15.pdf (last visited Dec. 16, 2020).

¹⁵¹ See *infra* notes 101–02 and accompanying text. Generally, new developments must mitigate impact to an aquatic resource by “selecting the least-damaging project type, spatial location and extent compatible with achieving the purpose of the project. Avoidance is achieved through an analysis of appropriate and practicable alternatives and a consideration of impact footprint.” *Types of Mitigation Under CWA Section 404: Avoidance, Minimization and Compensatory Mitigation*, ENV’T PROT. AGENCY, <https://www.epa.gov/cwa-404/types-mitigation-under-cwa-section-404-avoidance-minimization-and-compensatory-mitigation> (last visited Dec. 16, 2020).

¹⁵² ENV’T PROT. AGENCY, *supra* note 151. The Environmental Protection Agency also writes that “[m]inimization is achieved through the incorporation of appropriate and practicable design and risk avoidance measures.” *Id.*

¹⁵³ *Id.*

appropriate and practicable restoration, establishment, enhancement, and/or preservation of aquatic resource functions and services.”¹⁵⁴ Mitigation can, therefore, include “dedication . . . of easements over similar threatened lands, as well as commitments to undertake projects for marsh improvement and restoration, water diversion, beach nourishment, and similar measures.”¹⁵⁵

With petroleum industry channelization, specifically, mitigation can take the form of “alternative siting, use of existing canals, limitations upon canal and board road lengths, increased use of directional drilling, plugging (and often backfilling) of abandoned canals, restoration of sites upon abandonment, and other requirements to ‘mitigate’ for adverse impacts.”¹⁵⁶ However, a petroleum corporation’s pledge to dedicate an acre of land to wildlife preservation in exchange for a section 404 dredging permit does nothing to resolve the complaints of a landowner whose shoreline is shrinking due to ecological and hydrological shifts caused by those canals. After all, the CWA was largely a response to the United States’ increasingly polluted waters¹⁵⁷ with the express goal of eliminating “the discharge of pollutants into the navigable waters . . . by 1985.”¹⁵⁸ It was not intended to remediate land loss from canal-induced erosion, nor was it intended to account for complainants forced to relocate their homes due to dramatic land loss.¹⁵⁹

Further, section 404’s mitigation requirements might not even be applicable to the actor dredging the channel because section 404 applies to the discharge of dredged or fill materials,¹⁶⁰ not necessarily to the channelization itself. In fact, the D.C. Circuit has ruled that the act of dredging, by itself, does not even confer jurisdiction on the Corps to regulate the dredging activity,¹⁶¹ regardless of “the virtual certainty of fallback.”¹⁶² Though the Ninth Circuit has previously held that creating minor fallback from metal prongs being “pulled across the wetlands base, tearing up soil, including the protective clay layer”¹⁶³ did confer such jurisdiction, there is still not enough in the statute to provide real protection.¹⁶⁴

¹⁵⁴ *Id.*

¹⁵⁵ Joseph E. LeBlanc, Jr., *The Clean Water Act and Coastal Zone Considerations in Permitting Oil & Gas Activities in Louisiana*, 31 ANN. INST. MIN. L. 110, 121 (1984).

¹⁵⁶ *Id.* at 111.

¹⁵⁷ Julie Grant, *How a Burning River Helped Create the Clean Water Act*, ALLEGHENY FRONT (Apr. 21, 2017), <https://www.alleghenyfront.org/how-a-burning-river-helped-create-the-clean-water-act/>.

¹⁵⁸ Clean Water Act § 101(a)(1), 33 U.S.C. § 1251(a).

¹⁵⁹ *See supra* notes 33–36 and accompanying text.

¹⁶⁰ Clean Water Act § 404(a), 33 U.S.C. § 1344(a).

¹⁶¹ *Nat’l Mining Ass’n v. U.S. Army Corps of Eng’rs*, 145 F.3d 1399, 1403–05 (D.C. Cir. 1998).

¹⁶² JONATHAN R. NASH, *ESSENTIALS: ENVIRONMENTAL LAW AND POLICY* 90 (2010).

¹⁶³ *Id.* at 91.

¹⁶⁴ *Borden Ranch P’ship v. U.S. Army Corps of Eng’rs*, 261 F.3d 810, 816–17 (9th Cir. 2001).

Therefore, on a facial level, section 404's protections do not extend to insulating wetlands from the erosive effects of canal dredging, only to the health of the water system from deposits of fill material.

The most direct recourse coming from the regulatory state for individual complainants is the CWA's citizen suit provision,¹⁶⁵ with the express purpose of "empowering private citizens to assist the federal or state governments in the enforcement of the CWA."¹⁶⁶ However, land loss associated with dredging is not a cause of action under the CWA, a limitation reflected in *Louisiana Oystermen Ass'n v. Hilcorp Energy Co.* In *Louisiana Oystermen*, a fishing association "accuse[d] Hilcorp of unpermitted dredging in the vicinity . . . of Lake Grand Ecaille"¹⁶⁷ via, *inter alia*, "propwashing, a process whereby the large propeller blades of a tug are used to carve a channel through the waterbottom."¹⁶⁸ Despite the alleged damage, however, the courts could offer no recourse. Continuous or intermittent violations are actionable under the CWA, but the Act does not confer subject matter jurisdiction to consider "citizen suits for wholly past violations."¹⁶⁹

Louisiana Oystermen makes clear that the burden on potential plaintiffs and requirements of citizen suit notices often act as a procedural preclusion to any hope of remediation. However, there is a much larger problem: citizen suits only apply to illegal pollutant emissions of dredged fill material, not to the thousands of miles of canals dredged legally. Unpermitted dredgings presumably cause more harm than legal dredgings, as illegal dredgings do not undergo any sort of environmental impact assessment.¹⁷⁰ Still, even heavily regulated dredgings can suffer from an absence of oversight or fundamental misunderstandings in the effects one canal may have on an estuarine system.¹⁷¹ Furthermore, the effects of any canal would not necessarily be specific to the complainant who had

¹⁶⁵ *La. Oystermen Ass'n, Inc. v. Hilcorp Energy Co.*, 2017 U.S. Dist. LEXIS 12216, at *4-5 (E.D. La. 2017).

¹⁶⁶ Donald "D.J." Stack, Jessica L. Day, Kate F. Marks & Tracy L. Starr, *Follow the Yellow Brick Road: Citizen's Suits – Notice and Standing and Filing Oh My!* 3 (Jan. 12–13, 2009) (unpublished manuscript) (on file with Stack & Associates, P.C.), <https://www.stackenvirolaw.com/Publications/Land-Use-Conference-CWA-Citizen-Suit.pdf>.

¹⁶⁷ *La. Oystermen*, 2017 U.S. Dist. LEXIS 12216, at *2.

¹⁶⁸ *Id.* (internal quotations omitted).

¹⁶⁹ *Id.* at *5 (quoting *Gwaltney of Smithfield v. Chesapeake Bay Found.*, 484 U.S. 49, 64 (1987)).

¹⁷⁰ See generally *National Environmental Policy Act Review Process*, ENV'T PROT. AGENCY, <https://www.epa.gov/nepa/national-environmental-policy-act-review-process#EIS> (last visited Dec. 16, 2020) (explaining the procedure for environmental impact statements under the National Environmental Policy Act (NEPA)).

¹⁷¹ Further, NEPA charges the U.S. Department of the Interior Minerals Management Service "with documenting the social and economic effects of the [oil and natural gas] industry." AUSTIN ET AL., *supra* note 51, at 3.

initiated the citizen suit, for “[e]cological and hydrographic changes may be permanent . . . and may affect extensive areas ten miles or more on either side of the canal.”¹⁷² It is foreseeable that the estuarine or canal system could have other complainants miles away.¹⁷³

Therefore, it is clear that a landowner suffering from canal-induced land loss has virtually no existing remedy at law. First, the “neighborhood” requirements of private nuisance prevent treating the petroleum industry as a tortfeasor for non-adjacent canal-induced erosion. Second, relatively few entities affected by channelization would have the type of contractual relationship required to assert a claim in contract, as even those who would arguably be treated as third-party beneficiaries in other jurisdictions cannot sustain a contract claim in Louisiana courts. Third, citizen suit provisions are often a desperate last-minute attempt to hold a party liable rather than an attempt to recover from past damages,¹⁷⁴ as the so-called “recourse” entails civil penalties owed to the federal treasury,¹⁷⁵ not civil damages that could potentially mend some of the effects of a tattered personal shoreline.

Given the incredible burdens facing potential litigants, the solution might require adopting the position not of the property scholar analyzing rights, but of the layman struggling to explain what is going on around him: “This land was taken. It didn’t just disappear. Someone took it.”¹⁷⁶

III. TAKINGS

The Fifth Amendment to the U.S. Constitution states, “nor shall private property be taken for public use, without just compensation.”¹⁷⁷ Though this clause is a “tacit recognition”¹⁷⁸ of the government’s power to claim immense tracts of land, it “‘was [also] designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.’”¹⁷⁹

¹⁷² Houck, *supra* note 23, at 208 (quoting THERIOT, *supra* note 66, at 58).

¹⁷³ See Houck, *supra* note 69, at 24 (“[T]he secondary effects of these canals, channels, pipelines, and their associated work cause greater losses through erosion, intrusion, and subsidence than the original work itself.”).

¹⁷⁴ Stack et. al., *supra* note 166, at 16.

¹⁷⁵ See generally Elizabeth R. Thagard, Note, *The Rule That Clean Water Act Civil Penalties Must Go to the Treasury and How to Avoid It*, 16 HARV. ENV’T L. REV. 507 (1992).

¹⁷⁶ Telephone Interview with Mark Naquin, Oyster Boat Captain and Owner, Mark’s Oyster & Seafood Co. (Oct. 11, 2019).

¹⁷⁷ U.S. CONST. amend. V; see also LA. CONST. art. I, § 4(B)(1) (2001) (setting forth Louisiana’s analogue to the federal Takings Clause).

¹⁷⁸ United States v. Carmack, 329 U.S. 230, 241–42 (1946).

¹⁷⁹ Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1071 (1992) (quoting Armstrong v. United States, 364

The prototypical example of Fifth Amendment takings jurisprudence involves the use of eminent domain, such as taking land for transportation infrastructure. If the government constructs a railroad or highway that “cuts through private land, the government owes the owners payment equal to fair market value.”¹⁸⁰ With eminent domain, the land “taken” is limited to that being physically occupied,¹⁸¹ but takings also frequently occur during the construction of public utility projects, such as “one of almost 700 dams the Army Corps of Engineers operates, with a range of purposes that include supplying water and providing recreation and hydropower in addition to controlling floods.”¹⁸² It is in this context of water-based takings that residents of the BTNE, and arguably other coastal communities, could find a modicum of relief. First, this Part explores Fifth Amendment takings in the context of water coverage and water damage. Next, this Part surveys contemporary cases and literature that could shed light on takings claims in the context of canal-induced erosion within the BTNE. Last, this Part addresses the myriad hurdles litigants would face in a takings claim based on canal-induced erosion in the BTNE.

A. *Overview of Fifth Amendment Takings Predicated upon Water Coverage*

Where the invasion of water is permanent, a taking has occurred.¹⁸³ In *Pumpelly v. Green Bay*, the seminal case on whether invasion by water can effectuate a taking, the Supreme Court held that a dam continuously flooding the plaintiff’s land resulted in a taking.¹⁸⁴ For a taking to occur in this context, “[i]t is not required that property be formally taken Serious interference with the common and necessary use of property, as by continuous flooding,”¹⁸⁵ surpasses the burden requisite to establish a constitutional taking. When the invasion of water is temporary, however, courts have been resistant to declare a taking, for if “agencies that manage natural resources for the government had to worry about liability for takings for every management decision, they would lose

U.S. 40, 49 (1960)).

¹⁸⁰ Editorial, *When Flooding Is Not a Taking*, N.Y. TIMES (Oct. 5, 2012), <https://www.nytimes.com/2012/10/06/opinion/when-flooding-is-not-a-taking.html>.

¹⁸¹ *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 430 n.7 (1982).

¹⁸² Editorial, *supra* note 180.

¹⁸³ *Pumpelly v. Green Bay Co.*, 80 U.S. 166, 181 (1871) (holding “where real estate is actually invaded by superinduced additions of water, . . . so as to effectually destroy or impair its usefulness, it is a taking, within the meaning of the Constitution”).

¹⁸⁴ *Id.*

¹⁸⁵ ROBERT MELTZ, CONG. RSCH. SERV., 97–122, TAKINGS DECISIONS OF THE U.S. SUPREME COURT: A CHRONOLOGY 20 (2015).

the flexibility”¹⁸⁶ needed to monitor those natural resources.¹⁸⁷ More recently, in *Arkansas Game & Fish Commission v. United States*, the Supreme Court held that flooding can constitute a taking only if the flooding is permanent or “intermittent but inevitably recurring,”¹⁸⁸ based on factors such as “severity, duration, character of parcel, and owner’s expectations regarding parcel’s use.”¹⁸⁹ If the courts in both *Pumpelly* and *Arkansas Game & Fish Commission* each emphasized the permanence of the invasion as requisite criteria for a taking, then it would seem logical to place canal-induced erosion in this same category, for the stripping away of land that is not typically prone to such drastic erosion cycles is the pinnacle of a permanent invasion.

Regardless of whether it was one square inch taken or one square mile, erosion signals the permanent denial of every right in a property owner’s bundle of sticks. In *Loretto v. Teleprompter Manhattan CATV Corp.*, an apartment owner argued that New York City’s permitting of a cable company to install a half-inch cable running thirty feet across her roof and small directional taps constituted a compensable taking.¹⁹⁰ The Supreme Court held that “any permanent physical *occupation* is a [per se] taking,”¹⁹¹ regardless of the size of the parcel being occupied. It does not “matter how important the public interest served or how minimal the economic impact.”¹⁹² Therefore, the space occupied only speaks to the monetary amount required for “just compensation,” not to the threshold issue of whether a taking has occurred.

Not only does *Loretto* suggest that the miniscule, seemingly infinitesimal dregs of marshland being washed away would establish a compensable taking if caused by government action, *Loretto* also loosens the distinction between government and third-party actions that further the occupation of the space allegedly being “taken.” Specifically, the Court had to wrestle with the fact that it was a cable company—rather than a government agency—that had installed the cable.¹⁹³ Ultimately, the Court disagreed that “a similar invasion by a private party should be treated differently” to a “physical invasion ‘by government,’”¹⁹⁴

¹⁸⁶ Editorial, *supra* note 180.

¹⁸⁷ See *Ark. Game & Fish Comm’n v. United States*, 568 U.S. 23, 30, 38 (2012) (holding that temporary flooding from 1993–2000 did not effectuate a taking, despite \$5.7 million in property damages).

¹⁸⁸ *Id.* at 32 (quoting *United States v. Cress*, 243 U.S. 316, 328 (1917)).

¹⁸⁹ MELTZ, *supra* note 185, at 4.

¹⁹⁰ *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 421–22 (1982).

¹⁹¹ *Id.* at 432.

¹⁹² MELTZ, *supra* note 185, at 9.

¹⁹³ *Loretto*, 458 U.S. at 432–33 n.9 (quoting *Penn Cent. Transp. Co. v. City of N.Y.*, 438 U.S. 104, 124 (1978)).

¹⁹⁴ *Id.*

stating instead that “[a] permanent physical occupation authorized by state law is a taking *without regard* to whether the State, or instead a party authorized by the State, is the occupant.”¹⁹⁵ In the instance of canal-induced erosion, it is often the third-party contractor, as opposed to the State, that has caused the land loss. Further, Louisiana law provides that the “land that sinks beneath the Gulf or is gobbled up by the Gulf, so that it is covered by water and can be interpreted as being navigable, becomes the state’s property.”¹⁹⁶ Such a permanent occupation of that space by the government, in virtually any other circumstance, would constitute a *prima facie* taking requiring a post-hoc claim of inverse condemnation against the government.¹⁹⁷

Whereas most takings in the context of land loss involve the government’s purchase of lands to submerge or dredge,¹⁹⁸ inverse condemnation claims require extensive, “essentially ad hoc, factual inquiries”¹⁹⁹ that are difficult to predict with any precision. Despite ample support from *Loretto*, *Pumpelly*, and *Arkansas Game & Fish Commission* in establishing that non-adjacent canal-induced erosion could constitute a compensable taking, causation remains a problem under any inverse condemnation analysis.²⁰⁰

At a policy level, burdens suffered by landowners confronting canal-induced land loss should be covered under the same rationale sustaining a takings claim, for it was the government who permitted—either tacitly prior to the CWA, or actively through section 404 permitting—the dredging of industrial navigation and pipeline canals.²⁰¹ Further, the Corps still plays an active part in the dredging of canals for the exploration of oil and natural gas, in addition to providing general support to the maritime petroleum and natural gas industry.²⁰² This land loss clearly falls under the takings rationale, which “‘bar[s] the] Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.’”²⁰³

¹⁹⁵ *Id.* (emphasis added).

¹⁹⁶ Shinn, *supra* note 29, at 284 (quoting CHRISTOPHER HALLOWELL, *HOLDING BACK THE SEA* 45 (2001)).

¹⁹⁷ *See supra* note 191. For an argument supporting a claim of inverse condemnation for specific effects of climate change, see Rosenberg, *supra* note 28.

¹⁹⁸ *See generally* Tempel v. United States, 248 U.S. 121, 121–22, 131 (1918) (holding that the dredging of a channel constituted a Fifth Amendment taking).

¹⁹⁹ Penn Cent. Transportation Co. v. City of N.Y., 438 U.S. 104, 124 (1978).

²⁰⁰ *See supra* notes 70–93 and accompanying text.

²⁰¹ *See supra* Parts I.B, I.C, I.D.

²⁰² *See infra* notes 216–17 and accompanying text.

²⁰³ Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1071 (1992) (quoting *Armstrong v. United States*, 364 U.S. 40, 49 (1960)).

Whether this land loss is the result of a taking turns on whether the dredging is defined as “governmental”²⁰⁴ action and whether causation can be established with any certainty. Though *Loretto* arguably supports the conclusion that the tacit acceptance of unpermitted dredgings prior to enactment of the CWA would have constituted a taking,²⁰⁵ such a claim would be precluded by more than forty years due to the Tucker Act’s introduction of a six-year statute of limitations on takings claims.²⁰⁶ However, recent decisions by the Federal Circuit have held that a Corps-constructed jetty that prevented soil accretion—thereby resulting in erosion—was compensable to the extent that causation could be proven. This next section will first survey erosion-based takings claims in Louisiana before discussing Federal Circuit claims addressing soil accretion.

B. Survey of Erosion-Based Takings Litigation

In the realm of civil litigation, there have been few erosion-based takings cases and even fewer pertaining to canals. In *Board of Commissioners of the Southeast Louisiana Flood Protection Authority—East v. Tennessee Gas Pipeline Co.*, the plaintiffs alleged that eighty-eight oil and gas companies rendered Louisiana increasingly susceptible to tropical storm damage due to the erosive effects of their industrial activities.²⁰⁷ Though their takings claim was based on the flooding caused by erosive effects and not predicated upon the erosion itself, this case nevertheless sheds light on some of the many limitations facing takings claims, including the problem of jurisdiction.²⁰⁸

However, federal courts have taken up other types of takings claims linked to canals. For example, in *Avenal v. United States*,²⁰⁹ 130 oystermen “holding oyster leases from the State of Louisiana sought compensation from the federal government alleging that the freshwater diversion altered the salinity in the

²⁰⁴ Ducote, *supra* note 28, at 210.

²⁰⁵ See *supra* notes 193–94 and accompanying text.

²⁰⁶ 28 U.S.C. § 2501 (“Every claim of which the United States Court of Federal Claims has jurisdiction shall be barred unless the petition thereon is filed within six years after such claim first accrues.”).

²⁰⁷ Bd. of Comm’rs of the Se. La. Flood Prot. Auth.—E. v. Tenn. Gas Pipeline Co., 88 F. Supp. 3d 615, 618–19 (E.D. La. 2015).

²⁰⁸ Ducote, *supra* note 28, at 202–09. The U.S. District Court for the Eastern District of Louisiana evaluated whether it could hear a takings claim under several different theories of jurisdiction: (1) admiralty jurisdiction, denied because “coastal erosion caused by dredges in navigable waters does not have a disruptive effect on maritime commerce;” (2) federal enclave jurisdiction, denied because the harm did not take place at the federal structures and enclaves in New Orleans, despite those enclaves being subject to increased flood risk; (3) the Outer Continental Shelf Lands Act, denied because “Plaintiff’s injury would have occurred regardless of operations on the [Outer Continental Shelf];” (4) the Class Action Fairness Act of 2005, denied because the suit did not meet the definition of a “mass action;” and (5) claims arising under federal law, denied. *Id.* at 206–08.

²⁰⁹ 100 F.3d 933 (Fed. Cir. 1996).

water over the leased oyster beds, rendering them unsuitable for oyster cultivation.”²¹⁰ The court rejected that the loss was a total diminution of value,²¹¹ instead treating the damages as a regulatory taking.²¹² However, the court held that destruction of the oyster beds was not a compensable taking for two reasons: (1) the plaintiffs’ investment-backed expectations were not reasonable;²¹³ and (2) the oyster leases were acquired after the government had planned and announced its four diversion projects, including the flood diversion project that had allegedly “taken” the oyster beds.²¹⁴ Further, the oystermen had a more serious problem precluding a takings claim: “[t]he [Avenal] plaintiffs retained the use of their leaseholds; it was not the plaintiffs who were ousted by the government project, but the oysters.”²¹⁵ As Charles Shinn, an environmental law professor, has suggested, the Fifth Circuit’s rejection of this takings claim might no longer be viable today for two reasons: (1) *Florida Rock Industries Inc. v. United States*²¹⁶ established that “a categorical taking is akin to a physical taking so that investment-backed expectations are not relevant”;²¹⁷ and (2) *Palazzola v. Rhode Island*²¹⁸ established that “acquiring title after the event causing the takings claim cannot ‘cure’ the uncompensated taking.”²¹⁹ This modern takings analysis opens the door for other theories arising under the Fifth Amendment Takings Clause for claims involving industrial canals.

More recently, in *St. Bernard Parish Government v. United States*,²²⁰ local landowners alleged that state and federal government actors were liable for damage to their real property caused by flooding from Hurricane Katrina and other storms due to the government’s failure to properly maintain the canal banks or otherwise modify the Mississippi River-Gulf Outlet (MRGO), a canal constructed and operated by the Corps.²²¹ In the midst of Hurricane Katrina, “a 25-foot storm surge went directly up the MRGO, destroying the levees and devastating St. Bernard Parish.”²²² In spite of the damage and presumed

²¹⁰ Shinn, *supra* note 29, at 279.

²¹¹ See, e.g., *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1017 (1992).

²¹² See generally *Penn Cent. Transp. Co. v. City of N.Y.*, 438 U.S. 104, 131 (1978) (discussing the modern regulatory takings doctrine when there is not a total diminution in value).

²¹³ *Avenal*, 100 F.3d at 937.

²¹⁴ *Id.* at 938.

²¹⁵ *Palm Beach Isles Assocs. v. United States*, 231 F.3d 1354, 1360 (Fed. Cir. 2000).

²¹⁶ 18 F.3d 1560 (Fed. Cir. 1994).

²¹⁷ Shinn, *supra* note 29, at 282.

²¹⁸ 533 U.S. 606 (2001).

²¹⁹ Shinn, *supra* note 29, at 283.

²²⁰ 887 F.3d 1354 (Fed. Cir. 2018).

²²¹ *Id.* at 1357.

²²² Thor Heame, Stephen S. Davis & Ilya Shapiro, *St. Bernard Parish v. United States*, CATO INST. (Oct. 19, 2018), <https://www.cato.org/publications/legal-briefs/st-bernard-parish-v-united-states>.

culpability of the government, the Fifth Circuit held against the plaintiffs for two reasons: (1) allegations of government inaction could not be the basis of a takings claim;²²³ and (2) “there was a failure of proof on the key issue of causation” because plaintiffs had not considered “the impact of the risk-reducing [Lake Pontchartrain and Vicinity Hurricane Protection Project].”²²⁴ Though it is clear that if the government floods private property, there is a Fifth Amendment taking that requires just compensation, this case has “provid[ed] the government with a convenient escape route by which it can avoid the constitutional responsibility to compensate landowners for taking their property by not taking reasonable steps to prevent damage.”²²⁵

However, the court’s rejection of any finding of causation might not be as sound in fact as it is in law, for “as a general rule of thumb, every two to four linear miles of coastal wetlands may reduce storm surge by a height of one foot.”²²⁶ After all, it was the government that had initially constructed the MRGO, thereby creating the vacuum for the twenty-five-foot storm surge that wreaked so much havoc on St. Bernard Parish.²²⁷ This evidence notwithstanding, the question remains open whether canal-induced erosion caused by non-adjacent canals can effectuate a taking. One significant case involving jetties in Michigan might shed light on whether artificial devices that exacerbate ongoing erosive processes without directly causing the erosion can trigger a Fifth Amendment taking.

In *Banks v. United States* (Banks II), the United States Court of Federal Claims held that erosion allegedly caused by the construction of a jetty by the Corps was compensable as a Fifth Amendment taking to the extent that the plaintiffs could prove causation. Essentially, the plaintiffs had to prove that the

²²³ *St. Bernard Par.*, 887 F.3d at 1361–62.

²²⁴ *Id.* at 1367–68.

²²⁵ Hearne et al., *supra* note 222.

²²⁶ Sandra Zellmer, *Treading Water While Congress Ignores the Nation’s Environment*, 88 NOTRE DAME L. REV. 2323, 2353 n.221 (2013).

²²⁷ Twenty years prior to *St. Bernard Parish*, in *Simmons v. Board of Commissioners*, the court did find a taking when a dredged channel extension compromised a canal’s adjacent banks. 624 So. 2d 935, 951 (La. Ct. App. 1993). Following the dredging of canals along the rear of plaintiffs’ parcels, “the canal banks, consisting of wooded land, developed crevices and dropped off in large sections toward the water in the canal.” *Id.* at 938. The banks had not completely stabilized, even at the time of trial eight years after the dredging began. *Id.* The district court agreed with the trial court’s finding “that the land and trees actually lost when the canal banks failed were ‘taken’ in the constitutional sense, and that the taking caused and will continue to cause severance damages to the remaining property.” *Id.* In this case, causation was clear. These plaintiffs would likely have won even under a theory of tortious nuisance, a remedy unavailable to potential complainants from land loss not adjacent to a canal due to Louisiana’s “obligations of neighborhood.” *See also* Davis, *supra* note 29 (discussing the separation of takings analyses and torts arising under the Federal Tort Claims Act).

jetties constructed by the Corps caused the shoreline's erosion because "any further erosion caused by the protective structures is properly viewed as a 'direct, natural, or probable result' of the activities of the Corps in St. Joseph Harbor."²²⁸ Though the plaintiffs would still have the incredible burden of proving causation, the Federal Circuit's holding allowed the takings analysis to proceed. Importantly, these complainants with lavish homes adjacent Lake Michigan had significantly greater monetary damages than citizens of the BTNE,²²⁹ further muddying whether this remedy is viable.

More recently, in *Banks V*, the plaintiffs sought the "value of all of the sand" that had eroded, totaling \$1,397,440.²³⁰ Though the court held that the plaintiffs had offered "no legal support for the proposition that courts may award just compensation on a permanent physical takings claim for the value of lost resources,"²³¹ it did briefly explore a theory of littoral rights that could have been used by the plaintiffs. Essentially, the plaintiffs could have argued that they had littoral landowners' rights to accretions in the form of "naturally-forming additions of land to property caused by sand, sediment, and deposit" and relictions in the form of "land once covered by water that becomes dry when water recedes."²³²

Banks II and *Banks V* support the argument that erosion within the BTNE and other estuarine communities caused by non-adjacent industrial canals could be a Fifth Amendment taking to the extent that a complainant could establish damage that was a "direct, natural, or probable result" of governmental action, be it through the permitting of dredging activities, or by the Corps's own dredging activities. Though littoral rights to soil accretion would speak more to the impact that the levee systems have on coastal land loss,²³³ the extensive network of 10,000 miles of industrial canals shredding the gulf coast also significantly affects accretion.²³⁴ After all, if there is no vegetation to trap it, "nearly 90 million tons of sediment" flow from the Mississippi River,

²²⁸ *Banks v. United States*, 69 Fed. Cl. 206, 214 (Fed. Cl. 2006).

²²⁹ *Banks v. United States*, 721 F. App'x 928, 931 (Fed. Cir. 2017).

²³⁰ *Id.* at 943.

²³¹ *Id.* See *La. Oystermen Ass'n, Inc. v. Hilcorp Energy Co.*, No. 16-10171, 2017 U.S. Dist. LEXIS 12216 (E.D. La. 2017).

²³² *Banks*, 721 F. App'x at 943. *But see* *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env't Prot.*, 560 U.S. 702, 708 (2010) ("Littoral owners have, in addition to the rights of the public, certain 'special rights' with regard to the water and the foreshore, . . . [including] the right of access to the water, the right to use the water for certain purposes, the right to an unobstructed view of the water, and the right to receive accretions and relictions to the littoral property.").

²³³ See *supra* notes 20–25 and accompanying text.

²³⁴ See *supra* note 40.

“bypass[ing] the marshes that desperately need it, including Barataria Bay and Breton Sound,”²³⁵ with much of this sediment settling on the floor of the mid-to-outer continental shelf.²³⁶

C. *Scholarship on Takings in the Context of Canal-Induced Land Loss*

Though the takings doctrine has not garnered any significant remedies for victims of canal-induced erosion in the world of civil litigation, there is a growing body of legal scholarship speculating whether the government’s culpability in the permitting of industrial canals can effectuate a taking.

In *Of Coase, the Takings Clause, and the Inexorably Shrinking Marsh: A Review with Lagniappe*, Clinton W. Shinn muses whether “canals [are] the cause, or merely facilitating factors”²³⁷ of massive coastal erosion. Arguing that “demonizing”²³⁸ the oil and natural gas industry is too easy a solution for such a complex problem, Shinn advocates for a more modest approach, privatizing the canals so as to mitigate extensive future harm. But is privatization a viable solution? After all, he, himself, admits that the oil industry has made itself “an easy target”²³⁹ because of “the removal of oil and gas, water, and other supportive sub-structures,”²⁴⁰ which he suggests is at least partially responsible for “the whole coast . . . subsiding at an alarming and increasing rate.”²⁴¹ Looking out from above, one sees nothing but a vast horizon of derelict valves, “eroding pipelines[,] and canals.”²⁴²

Joseph Rosenberg, another environmental scholar, argues that the Fifth Amendment Takings Clause should play a much larger part in providing remedies for coastal communities ravaged by land loss, in addition to other drastic environmental disasters caused by rising sea levels and average surface

²³⁵ *Wasted Sediment*, RESTORE MISS. RIVER DELTA, <http://mississippiriverdelta.org/our-coastal-crisis/wasted-sediment/> (last visited Dec. 16, 2020).

²³⁶ *Id.*; Telephone Interview with Bryant Naquin, Oil & Natural Gas Producer (Nov. 22, 2019). Mr. Naquin works for an oil and gas exploration and production company, where he is stationed at a production platform near the Outer Continental Shelf off the Louisiana Gulf Coast. Periodically, he can see grasses reaching toward the surface of the Gulf of Mexico from their bed of sediment carried from the Mississippi River—through the canals, lakes, bays, and bayous—before settling on the floor of the Gulf. Ironically, his company had looked into dredging away this new land because it poses an impediment to boats transporting oilfield workers to rigs and other platforms. *Id.*

²³⁷ Shinn, *supra* note 29, at 291.

²³⁸ *Id.* at 290.

²³⁹ *Id.*

²⁴⁰ *Id.* at 292.

²⁴¹ *Id.* at 291.

²⁴² Houck, *supra* note 23, at 195.

temperatures.²⁴³ More specifically, he argues that the federal government should be liable for some natural catastrophes because of its own contributions to global greenhouse gas emissions, as well as its specific affirmative duties regarding protection against and “respon[se] to climate change effects.”²⁴⁴ Though Rosenberg’s scholarship focuses specifically on climate change, a topic not expansively explored in this Comment, he eloquently lays out a formula from which a host of government action or *inaction* could result in a compensable taking. Rosenberg offers three scenarios in which a taking should result from situations in which “a particular federal entity knew or should have known that its actions were inadequate, or that its inactions would result in significant risk of harm,”²⁴⁵ the first of which can shed light on implications for canal-induced erosion.

In this first hypothetical scenario, a complainant has built a coastal home, “reasonably rel[ying] on Federal Emergency Management Agency (FEMA)-prepared flood maps and purchas[ing] the recommended flood insurance through the FEMA-administered National Flood Insurance Program (NFIP).”²⁴⁶ FEMA, however, has often been negligent in updating its flood maps, especially in light of the acceleration of sea level rise in the last ten years.²⁴⁷ With rainstorms and high tides, the hypothetical complainant suffers from flooding, establishing liability on the federal government because the following criteria were met:

Plaintiff’s investment backed expectations were reasonable because plaintiff relied on FEMA’s flood maps and NFIP program when building. The federal government caused plaintiff’s harm because it either knew or should have known—under 42 U.S.C. 4101(E), FEMA is required to reassess its flood maps every five years—that its flood maps were outdated and so posed a significant risk of serious harm. Finally, plaintiff’s property here is arguably uninhabitable and, inarguably, plaintiff’s reasonable and intended use of the land is foreclosed because of the flooding by sea level rise.²⁴⁸

If uninhabitability can trigger a taking, so, too, should non-adjacent erosion. After all, land loss stemming from industrial canals signals a much more grievous harm than flooding: the total eradication of all property rights associated with a given parcel of property. In Rosenberg’s scenario, the

²⁴³ Rosenberg, *supra* note 28, at 85.

²⁴⁴ *Id.* at 96.

²⁴⁵ *Id.*

²⁴⁶ *Id.* at 97.

²⁴⁷ *Id.* at 97–98, 127–28.

²⁴⁸ *Id.* at 97.

landowner's bundle of sticks remains somewhat intact, even if it is underwater. With the loss of land, however, that bundle disappears entirely.²⁴⁹

Not all commentators would agree with Rosenberg's suppositions. In one student comment, Bud Davis stated that "arguments that the Government should have done more or done something differently to protect property rights are invalid in the takings context because their essence lies in tort."²⁵⁰ In separating tortious conduct actionable under the Federal Torts Claims Act,²⁵¹ Davis relied on originalist interpretations of the Takings Clause to argue that most post-Katrina takings litigation would be barred because the Takings Clause requires intentional government action.²⁵² He further writes that "[t]here is no taking under the [F]ifth [A]mendment unless there is an intent on the part of the condemnor to take the condemnee's property, or an intent to do an act the natural consequence of which is to take the property."²⁵³ What remains most crucial is the identification of "some intentional, affirmative action taken in furtherance of the public's health, safety, and welfare in an increasingly populated world."²⁵⁴ Though Davis' argument would preclude post-Katrina litigation regarding storm damage or flooding from the MRGO, it does little to dissuade arguments that canal networks have caused the actual erosion. If permitting the dredging of canals and *physically dredging those canals* are not "intentional, affirmative action[s]," it would seem like nothing would be.

D. Problems with Takings Jurisprudence: Gradual Erosion and Inadequate Remedies

Though recent precedent could support a Fifth Amendment takings claim for instances of canal-induced erosion, these claims might become more trouble than they are worth. The Tucker Act established a six-year statute of limitations for takings claims, and a difficult question arises when that "taking [is] occasioned by a gradual physical process,"²⁵⁵ such as erosion.

In *Boling v. United States*, the federal circuit held that a compensable taking had occurred "when the banks of a government-created navigable canal eroded through the effects of private vessel traffic wakes beyond the easement."²⁵⁶

²⁴⁹ See *supra* text accompanying note 195.

²⁵⁰ Davis, *supra* note 29, at 33.

²⁵¹ See 28 U.S.C. § 1346.

²⁵² See Davis, *supra* note 29, at 33–34.

²⁵³ *Id.* at 34 n.28.

²⁵⁴ *Id.* at 36.

²⁵⁵ *Boling v. United States*, 220 F.3d 1365, 1370 (Fed. Cir. 2000).

²⁵⁶ Shinn, *supra* note 29, at 287 n.106.

Previously, in *United States v. Dickinson*, the Supreme Court had held that a flood was actionable when the factual situation had “stabilized” such that the “consequences of the inundation have so manifested themselves that a final account may be struck.”²⁵⁷ However, the *Boling* Court held that “requiring the plaintiffs to sue immediately upon the initial encroachment of their land is too rigid an application of the stabilization principle.”²⁵⁸ The *Boling* Court further noted that “the touchstone for any stabilization analysis is determining when the environmental damage has made such substantial inroads into the property that the permanent nature of the taking is evident and the extent of the damage is foreseeable.”²⁵⁹ Even though this stabilization analysis seems to strike a fairness balance—that is, claimants are no longer “required to resort either to piecemeal litigation or to premature litigation to ascertain the just compensation for what is really taken”²⁶⁰—the Tucker Act would still preclude most takings claims from canal-induced erosion.

For the bulk of the late twentieth and early twenty-first centuries, Louisiana landowners were told that it was hurricanes and nutria causing the rampant land loss and that the levee system, constructed to protect citizens from tropical storm flooding, was preventing perennial land accretion. With very few exceptions,²⁶¹ canals were insulated from blame. Even if a landowner was aware that she was losing land, it would not immediately be apparent that the damage was caused not just by the adjacent bayou or channel, but by the interrelationship of canals spanning the estuary,²⁶² each picking up the inflows from the next in a network of incredibly disastrous erosive processes.²⁶³

More importantly, expecting significant remedies from a takings claim might prove futile here, as the damages would be based only on the value of the missing shoreline, which is relatively little compared to the value of the property as a whole or the cost of relocation. As the Supreme Court established in *Loretto*, even a nominal payment of \$1 paid prior to the taking can be just compensation for a permanent physical invasion.²⁶⁴ Here, a few inches of land lost each year would trigger equally paltry “just compensation”²⁶⁵ returns, thereby rendering

²⁵⁷ *United States v. Dickinson*, 331 U.S. 745, 749 (1947).

²⁵⁸ *Boling*, 220 F.3d at 1372.

²⁵⁹ *Id.* (internal quotation marks omitted).

²⁶⁰ *Dickinson*, 331 U.S. at 749.

²⁶¹ *See supra* notes 75–83.

²⁶² Shinn, *supra* note 29, at 294.

²⁶³ *See supra* notes 37–39 and accompanying text.

²⁶⁴ *Loretta v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 423–24 (1982).

²⁶⁵ *Id.* at 421.

takings insufficient to confer just remedies, even if a takings suit were successful.

As discussed below, the BTNE might require a legislative solution in the form of revised impact fees, also called exactions. However, legislators must be wary lest their conditional permitting also be deemed a regulatory taking, thus negating the purpose of such a solution. Under the current exactions doctrine, coastal communities could significantly further the policy behind coastal development permits by conditioning such permits on contributions to a relocation fund.

IV. “TAKING” IT BACK: USING EXACTIONS TO REMEDY CANAL-INDUCED LAND LOSS

Thus far, this Comment has explored various potential remedies for litigants suffering from canal-induced erosion and the myriad problems involving such litigation. Furthermore, compensating a landowner for eroding shoreline does nothing to mitigate future erosion, nor does it stop the threat of sea level rise claiming these coastal communities during the ensuing legal battles.²⁶⁶ All throughout the Terrebonne side of the BTNE, residents are floundering not only to save physical markers of their culture,²⁶⁷ but also their homes and livelihoods. Regarding coastal restoration and wetlands construction, wealthy sports entities such as Ducks Unlimited have done their part to restore habitat for fish and waterfowl, but this laudable restoration neglects the populations traditionally dependent on that fish and waterfowl for survival.²⁶⁸ Even the Louisiana University Marine Consortium, “built to be at the edge of the world” and withstand winds of 250 miles per hour, might one day close its doors due to a combination of erosion and rising seas.²⁶⁹ For many victims of land loss, such as the Biloxi-Chitimacha-Choctaw tribe of Isle de Jean Charles, there is nothing

²⁶⁶ See John Schwartz, *Marine Labs on the Water’s Edge Are Threatened by Climate Change*, N.Y. TIMES (Jan. 7, 2020), <https://www.nytimes.com/2020/01/07/climate/climate-change-marine-science.html>.

²⁶⁷ King, *supra* note 31.

²⁶⁸ *Resiliency Funding for Louisiana Restoration Work*, DUCKS UNLIMITED, <https://www.ducks.org/conservation/sr/louisiana/resiliency-funding-for-louisiana-restoration-work> (last visited Dec. 16, 2020). Although Ducks Unlimited claims that its “marsh creation and nourishment with dredged material” will have a great “benefit to human community resilience,” these projects benefit sports fishermen and hunters significantly more than property owners. Interview with Keith Naquin, Oyster Boat Captain and Dock Manager, Mark’s Oyster & Seafood Co. (Jan. 1, 2019).

²⁶⁹ Schwartz, *supra* note 266. For a visceral time loop of how LUMCON fared during Hurricane Zeta, see Jesse Ferrell, *LUMCON Webcam Loops from Hurricane Zeta*, YOUTUBE (Oct. 31, 2020), <https://www.youtube.com/watch?v=aoHfgoqoSio>.

left to do but relocate from lower ground to higher ground. The only question remaining is who is going to pay for the relocation.

First, this Part explores the current exactions doctrine, detailing the extent to which municipalities can condition new developments without constituting a Fifth Amendment taking against the developer. Next, this Part proposes an impact fee-based relocation fund that would enable municipalities to offset the migratory impact of new coastal developments without effectuating a Fifth Amendment taking.

A. *Constitutional Limitations on Land Use Conditions*

It is axiomatic in the field of land use and property regulation that “new developments create new burdens”²⁷⁰ on municipalities, often requiring land developers to mitigate anticipated negative impacts of a development, otherwise known as exactions. Exactions often take the form of impact fees, which are mandatory fees set by a municipal ordinance to offset the expected negative impacts of development by funding capital improvements needed to serve growth, particularly additional burdens to infrastructure²⁷¹ and utilities.²⁷²

However, land development can also be conditioned on such far-ranging “mitigat[i]ons” as the construction of bicycle paths,²⁷³ preservation of residential occupancy limits,²⁷⁴ and, most relevant to the BTNE, wetlands remediation.²⁷⁵ Exactions, especially in the form of impact fees, are not novel to the BTNE. Nevertheless, the current exactions scheme could be significantly amplified against developers dredging these navigation and pipeline canals without constituting a Fifth Amendment taking.

Located inside the BTNE, Terrebonne Parish Consolidated Government (TPCG) is the legal body responsible for authorizing and regulating all new coastal developments within its jurisdiction, of which 65% is wetlands or open

²⁷⁰ ROBERT MELTZ, DWIGHT H. MERRIAM & RICHARD M. FRANK, *THE TAKINGS ISSUE: CONSTITUTIONAL LIMITS ON LAND USE CONTROL AND ENVIRONMENTAL REGULATION* 241 (1999).

²⁷¹ DUNCAN ASSOCS., *NATIONAL IMPACT FEE SURVEY: 2015*, at 1 (2015), http://impactfees.com/publications%20pdf/2015_survey.pdf.

²⁷² Jim Rossi & Christopher Serkin, *Energy Exactions*, 104 *CORNELL L. REV.* 643, 713 (2019) (proposing an extension of current energy exactions practices to incorporate community values into energy planning).

²⁷³ *Dolan v. City of Tigard*, 512 U.S. 374, 397 (1994).

²⁷⁴ *Seawall Assocs. v. City of N.Y.*, 542 N.E.2d 1059, 1059–62, 1071 (N.Y. 1989) (holding that the local provisions on preventing single-room occupancy property owners from restoring and refurbishing existing structures violate the Takings Clause of the Fifth Amendment).

²⁷⁵ *Koontz v. St. John's River Water Mgmt.*, 570 U.S. 595, 601–02, 605 (2013).

water.²⁷⁶ In Article III of its Parish Code, which details land use regulations on “Pipeline, Seismograph, Well Site, and Bulkhead Construction,” the TPCG states that it “may place any *reasonable* conditions deemed necessary so as to minimize or compensate for environmental impact.”²⁷⁷ Though the TPCG has reserved for itself the right to take action to mitigate harm to the BTNE, the default mechanism for controlling development is an impact fee-based coastal permitting scheme that issues “coastal impact certificate[s].”²⁷⁸

It is not immediately apparent that these ordinances have been designed to mitigate harm to the estuary since the TPCG Parish Code surprisingly treats canals favorably compared to other industrial, nonresidential facilities. Whereas commercial developments requiring a coastal zone permit from the Louisiana Department of Natural Resources or a section 404 permit from the Corps are subject to a sliding scale of fees ranging from \$500 to \$5,000 based upon the value of the development in conjunction with the wetland and water bottom acreage impacted, the certificate fee carries a flat rate of \$500 for “the construction of any well, well site, well platform, other mining operation, pipeline, canal; or for the dredging of canals, bayous, borrow pits, wetlands, lakes, bays, slips, shells or other excavation.”²⁷⁹ Though such a request would still have to be authorized through a section 404 permit,²⁸⁰ the impact fee to dredge a canal, lake, or bay is a mere \$500, despite concerns dating back to the 1950s that “[e]cological and hydrographic changes may be permanent . . . and may affect extensive areas ten miles or more on either side of the canal.”²⁸¹ Further, the canals themselves cause immediate adjacent erosion, often resulting in lakes and bays bearing the same name as the canal.²⁸² Ironically, these coastal impact certificates make up Terrebonne Parish’s Coastal Restoration and Preservation Fund, designed to encourage multiple uses and synergize development with restoration.²⁸³ How can such synergy exist when these

²⁷⁶ *Bayou Country: Houma & Terrebonne*, HOUMA TRAVEL, <https://houmatravel.com/about/bayou-country> (last visited Dec. 16, 2020).

²⁷⁷ TERREBONNE PARISH, LA. CODE OF ORDINANCES § 12-74 (2019) (detailing coastal impact fees on new developments) (emphasis added).

²⁷⁸ *Id.* § 12-73.

²⁷⁹ *Id.*

²⁸⁰ *See supra* notes 97–100, 149 and accompanying text.

²⁸¹ Houck, *supra* note 23, at 208 (citations omitted).

²⁸² Image of Bush Canal and Resulting Bush Lake, GOOGLE MAPS, <https://maps.google.com> (follow “Directions” hyperlink; then search “Bush Canal, Parish Governing Authority District 9, LA”).

²⁸³ The TPCG described the fund in its 2017 accounting budget:

[The Coastal Restoration and Preservation Fund’s] mission is to provide aggressive leadership, direction, and consonance in the development and implementation of policies, plans and programs which encourage multiple uses of the coastal zone and achieve a proper balance

navigation and pipeline canals actively destroy virtually all other non-industrial uses?

In light of the land already lost from an overdeveloped estuary, “the removal of oil and gas, water, and other supportive sub-structures”²⁸⁴ furthering subsidence, and a canal network expediting erosive processes, one would expect the only “reasonable condition[]”²⁸⁵ imposed by the TPCG to be a permanent injunction against the dredging activities themselves. However, few legislators, if any, would risk enjoining activities that have served as the economic bedrock of their constituency for close to a century.²⁸⁶ Arguably, such an economic collapse might be worse for the culture of these coastal communities than the land loss threatening their homes.²⁸⁷ Further, a permanent injunction depriving the would-be developer of beneficial use of his property might also give rise to liability on the TPCG, for “if regulation goes too far it will be recognized as a taking.”²⁸⁸ As conditions levied on the development “expand beyond the geographic boundaries of a plat or constitute a public benefit not related to a

between development and conservation, restoration, creation and enhancement of Coastal Resources in Terrebonne Parish for the enjoyment and long-term benefit of our residents consistent with the State Comprehensive Plan for Coastal Restoration.

Terrebonne Parish, Adopted Budget 71, 99 (2017) https://www.tpcg.org/files/accounting/budget_2017.pdf.

²⁸⁴ Shinn, *supra* note 29, at 292.

²⁸⁵ TERREBONNE PARISH, LA. CODE OF ORDINANCES § 12-74 (2019).

²⁸⁶ Houck, *supra* note 23, at 206 n.91 (citation omitted). Houck paints a dismal picture of reliance on the oil industry:

We had little choice but to base our economy on the oil industry. After all, prior to that Terrebonne Parish was an agricultural community with a very productive fishing industry. Oil was good to us, but now we are left with the residue and devastation of our wetlands. Subsidence, erosion, useless canals by the hundreds, toxic waste, and whatever else we inherited when our area was, for all practical purposes, abandoned and left to deteriorate even further.

Id.

²⁸⁷ For an exploration of how relocation might affect coastal communities within Southeast Louisiana, including immigrant populations who have already gone through their own diaspora, see Nicole P. Lirette, *Capturing the Dissolving Native Story: Saving Louisiana’s Historic Coastal Settlements Through Community Relocation with Cultural Documentation* 81, 120 (2017) (M.P.S. Thesis, Tulane University) (available at <https://digitallibrary.tulane.edu/islandora/object/tulane%3A94324/datastream/PDF/view>).

²⁸⁸ *Penn. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922); *see* *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1029–30 (1992) (providing that unless the owner’s proposed use of the property is one already prohibited by state law principles of property or nuisance, any regulation depriving owner of *all* beneficial use of his or her property is a taking requiring just compensation). However, the TPCG could potentially escape takings liability through its local zoning authority by “phas[ing] out nonconforming uses [dredging] with amortization provisions that require the owner to discontinue the nonconforming use after a certain period of time.” *Bd. of Zoning Appeals v. Leisz*, 702 N.E.2d 1026, 1032 (Ind. 1998); *see also* Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 *Nw. U. L. Rev.* 1677, 1731 nn. 268–70 (2007) (discussing the amortization of non-conforming uses to avoid takings liability).

plat-created harm, they become exactions subject to invalidation or a requirement to pay just compensation.”²⁸⁹ Therefore, any municipality imposing a condition should be wary, lest the developer realize a benefit from his proposed development, regardless of that development’s potential harm. Not only would such a takings claim add insult to injury, it would fundamentally stifle efforts by the TPCG to mitigate harm to its waters and the BTNE as a whole.

The TPCG could also condition the permits upon a certain amount (in acreage or dollars) of wetlands remediation. However, if the dredging is ongoing, these “attempts to . . . soften the blow”²⁹⁰ might still not be enough. Remedial measures such as plugging “the ends [of canals] in order to arrest saltwater intrusion”²⁹¹ are short-lived solutions that “present[] no obstacle to the incoming tide.”²⁹² More drastic measures such as artificially creating wetlands would dramatically arrest saltwater inflows, but without sediment replenishing the land,²⁹³ new wetlands would be prone to similar levels of coastal intrusion as those caused by canals in the original wetlands.

Be it an injunction against dredging, mandatory canal-plugging, or wetlands remediation, each of these options—readily available to the TPCG—is subject to the one resource that is most limited: time. Such remedial projects would not likely be realized in the lifetime of those currently suffering from land loss, making many of these remedies more beneficial to the environment than citizens suffering within that environment.²⁹⁴ Wetlands remediation is a laudable goal, but property rights were taken from humans, not land, and rising sea levels indicate that any restorative measures implemented today will likely be claimed by the Gulf of Mexico tomorrow,²⁹⁵ leaving landowners with no available remedies. Rampant land loss, “rising waters[,] and escalating flood insurance rates will drive thousands of families farther inland”²⁹⁶ from “the rich, still bayous” of these communities’ ancestors. For many, relocation will be the only true remedy.²⁹⁷

²⁸⁹ MELTZ ET AL., *supra* note 270, at 240.

²⁹⁰ Houck, *supra* note 23, at 233.

²⁹¹ *Id.* (internal footnote omitted).

²⁹² *Id.*

²⁹³ See *supra* notes 12–16 and accompanying text.

²⁹⁴ Nathaniel Rich, *Destroying a Way of Life to Save Louisiana*, N.Y. TIMES (July 21, 2020), <http://www.nytimes.com/interactive/2020/07/21/magazine/louisiana-coast-engineering.html>.

²⁹⁵ Schwartz, *supra* note 265.

²⁹⁶ Annie Snider, *Letter from Louisiana: ‘It’s Not Going to Be All Right’*, POLITICO (Sept. 1, 2017), <https://www.politico.com/magazine/story/2017/09/01/harvey-texas-louisiana-floods-relocation-215565>.

²⁹⁷ Many of these refugees will settle in Houma, the industrial base of the BTNE. That population increase “could more easily win additional levees and flood protection” for manufacturers supplying nearby oil and natural gas companies, the same actors responsible for the need for relocation. *Id.*

Given current projections for rising sea levels, it is therefore imperative that the oil and natural gas industry be held accountable for their ongoing dredging activities contributing to land loss before the Gulf of Mexico covers not only the remaining wetlands within the estuary, but also the evidence proving that it was canal dredging (in addition to natural resource exploration and extraction) that jumpstarted the erosive processes that initially made the BTNE more susceptible to the rising sea levels. These communities might very well disappear before any remedy takes effect, essentially allowing the oil and natural gas industry to escape liability for almost a century of profits at the cost of thousands of square miles of Louisiana's greatest natural resource: its delta.²⁹⁸

B. The Constitutionality of an Impact Fee-Based Relocation Fund

For untold thousands of residents in coastal communities, including those within the BTNE, the only way to alter the human devastation from land loss and rising seas is relocation. However, relocation, especially at a large-scale level, is incredibly expensive,²⁹⁹ and deracination comes with its own intangible costs: the loss of culture and community.³⁰⁰ In a grim article titled '*It's Not Going to Be All Right*', Annie Snider recently labeled coastal relocation as "toxic . . . [It is] disruptive and interventionist, the kind of move that foments revolutions."³⁰¹ Despite Louisiana's "massive battle against the rising tide, [including] planning and funding ambitious efforts to restore buffering wetlands and build levees and floodgates," the State acknowledges that "even [its] best efforts will not be enough."³⁰² When it becomes clear that the land will not be restored, what comes next?

One solution to solve both the problem of relocating victims of land loss and holding responsible parties accountable is altering the current system of impact fees to account for relocation. The TPCG—or other coastal governments struggling to address both land loss and climate change—could issue dredging or other development permits that are contingent upon paying into a relocation fund for anyone affected by land loss within the estuary of the development, such that individual complainants (or communities) similar to Isle de Jean Charles could conceivably relocate without federal block grants.

²⁹⁸ See *supra* note 49.

²⁹⁹ See *supra* notes 17, 287 and accompanying text.

³⁰⁰ See *supra* note 287.

³⁰¹ Snider, *supra* note 296.

³⁰² *Id.*

The current default impact fee for the dredging of canals within the jurisdiction of the TPCG carries with it a presumption of benignity and casts doubt on whether the TPCG's notice of potential future exactions is merely an idle threat. Even if canal-induced erosion is not a legal tortious nuisance, it is an actual nuisance with all indicia of permanence, suggesting that a single, one-time impact fee paid to the local government will always be an inadequate remedy.³⁰³ Further, impact fees were never intended to supplant a claim of nuisance or act as a penalty; rather, they are intended to provide a mechanism by which the state may attempt to remediate issues caused by a future development. Given the impending mass exodus of coastal communities caused, at least in part, by the dredging of canals, it is ostensible that these developments will lead to future urban growth in other communities.³⁰⁴

A relocation fund would then act in precisely the same manner as more conventional impact fees purposed for future urban growth, with two insignificant distinctions. The first distinction is that this relocation fund, in addition to fueling more conventional utility and transportation infrastructure for the expected future growth, would benefit individuals more directly. Traditional impact fees benefit the entire community by advancing public projects involving transportation or utilities.³⁰⁵ Here, such a relocation fund would also go toward individual plots of land that coastal land loss refugees could then develop. The second distinction is that this proposed fund would also function as an adequate remedy for those who could not undergo the extensive causation burdens of a takings claim,³⁰⁶ and for whom tortious nuisance, contract law, and the regulatory state can provide no relief.

With such a fund, even if the land loss prompting the relocation was not caused by the specific canal subject to the exaction, it would not trigger a Fifth Amendment taking under the current exactions doctrine, as reflected in *Nollan v. California Coastal Commission*,³⁰⁷ *Dolan v. City of Tigard*,³⁰⁸ and *Koontz v. St. Johns River Water Management District*.³⁰⁹

³⁰³ *Pate v. City of Martin*, 614 S.W.2d 46, 48 (Tenn. 1981) (“Seldom, if ever, will an award of damages, standing alone, be an adequate remedy where the nuisance gives every promise of continuing and is one that can be corrected.”). Although *Pate* pertained to an award of monetary damages for tortious nuisance, the rationale behind injunctions for a permanent nuisance is correlative with damages caused by industrial canals.

³⁰⁴ Snider, *supra* note 293.

³⁰⁵ Ronald H. Rosenberg, *The Changing Culture of American Land Use Regulation: Paying for Growth with Impact Fees*, S.M.U. L. REV. 177, 245–46 (2006).

³⁰⁶ See *supra* notes 70–93 and accompanying text.

³⁰⁷ 483 U.S. 825, 836–37 (1987).

³⁰⁸ 512 U.S. 374, 384, 387–88, 394–95 (1994).

³⁰⁹ 570 U.S. 595, 616–17, 619 (2013). In *Koontz*, the Supreme Court held that the exactions analysis

In *Nollan*, landowners attempted to invalidate a condition set by the California Coastal Commission granting to the public an easement across their beachfront property.³¹⁰ For any land use condition to be valid, however, it must “further the end advanced as the justification for the prohibition.”³¹¹ Though conditions serving legitimate police-power purposes are not takings,³¹² this “evident constitutional propriety disappears . . . if the condition substituted for the prohibition utterly fails to further the end advanced as the justification for the prohibition.”³¹³ Therefore, there must be an “essential nexus” between the conditional permit and the purpose behind the conditional permit.³¹⁴ This proposed system of an impact fee-based relocation fund would overcome the “essential nexus” test of *Nollan*. Because dredging activities are the predominant cause of coastal land loss, thereby rendering residents more susceptible to rising sea levels and tropical superstorms, it is clear that funding relocation would bear an “essential nexus” to elevating impact fees for relocation contributions.

In crafting this type of impact fee scheme, municipalities would still have to prove “rough proportionality” under *Dolan*. In *Dolan*, which lays out the second step in the Supreme Court’s exactions analysis, the City of Tigard conditioned a redevelopment permit on a pedestrian and bicycle pathway easement and dedication of a floodplain to offset the predicted flooding impacts of a larger retail store.³¹⁵ After evaluating whether there was an “essential nexus” under *Nollan*, the Court adopted the “reasonable relationship” test from a majority of state courts, requiring “rough proportionality”³¹⁶ “between the required dedication and the impact of the proposed development.”³¹⁷ Because “[e]cological and hydrographic changes may be permanent . . . and may affect extensive areas ten miles or more on either side of the canal,” it is also clear that the permitting of any single canal will have permanent adverse effects on the nearby environment. What remains problematic is that “hydrologic changes following dredging . . . extend widely and perhaps unpredictably.”³¹⁸

adopted in *Nollan* and *Dolan* also applies to monetary exactions, including dedications and impact fees. *Id.* at 612, 616.

³¹⁰ *Nollan*, 483 U.S. at 827.

³¹¹ *Id.* at 837.

³¹² *Id.* at 836 (contrasting by analogy that conditions attached to prohibitions that fail to further legitimate state interests are not takings).

³¹³ *Id.* at 837.

³¹⁴ *Id.* Here, the coastal commission’s condition did not advance its rationale, which included lowering psychological barriers and protecting visual access to the beach, thereby rendering the condition invalid. *Id.* at 837–39.

³¹⁵ *Dolan v. City of Tigard*, 512 U.S. 374, 377–78, 388 (1994).

³¹⁶ *Id.* at 391.

³¹⁷ *Id.* at 390.

³¹⁸ Turner, *supra* note 71, at 11.

However, unpredictability, by itself, is not enough to defeat a claim of “rough proportionality.” A regulating entity imposing land use conditions is not required to prove that the expected negative impacts will actually occur. All that is necessary for use of the police power to be justified here is that the entity or municipality rely on credible, legitimate studies in making their findings. Though the effects of channelization are wide and unpredictable,³¹⁹ there is ample support for a linear connection between the area initially dredged and the area of land lost because of that channelization—as much as 2.85 hectares of land lost for each hectare of land dredged, not counting the additional hectare of spoil banks causing other erosive effects.³²⁰ Given the wealth of research linking the dredging of canals to land loss,³²¹ it can be presumed that such an impact fee would be “an appropriate exercise of the police power” and not an arbitrary “excuse for taking property simply because at that particular moment the landowner is asking the city for some license or permit.”³²²

Therefore, conditioning coastal developments on paying into a relocation fund would be a legitimate use of the locality’s police power and survive a takings claim by developers. Such a program would enable municipalities to compel developers of canals to provide an equitable remedy for those suffering from land loss.

CONCLUSION

It is clear that within the BTNE and other coastal communities, property rights have been and continue to be taken—both physically and constitutionally. There is a harrowing lack of remedies available for victims of coastal land loss, despite arguably viable claims of tortious nuisance and theories of third-party beneficiaries in contract suits. Regulatory protections and citizen suits have proven equally futile. Though recent case law involving erosion³²³ and scientific studies involving canals³²⁴ could support a takings claim for residents within the BTNE, this remedy would be inadequate and the causation incalculable.³²⁵ Most importantly, however, is the fact that compensating a landowner for eroding shoreline does nothing to mitigate future erosion or the threat that sea level rise

³¹⁹ *Id.*

³²⁰ *See supra* notes 80–81 and accompanying text.

³²¹ Houck, *supra* note 23, at 205–06 nn.89–90; *supra* note 49 and accompanying text.

³²² *Dolan*, 512 U.S. at 390 (quoting *Simpson v. City of North Platte*, 292 N.W.2d 297, 319–20 (Neb. 1980)).

³²³ *See supra* notes 227–31 and accompanying text.

³²⁴ *See supra* notes 23, 49 and accompanying text.

³²⁵ The Tucker Act also precludes most potential takings claims stemming from canal-induced erosion, despite current jurisprudence on “stabilization.” *See supra* notes 254–59 and accompanying text.

might claim these coastal communities even before their land erodes into oblivion.³²⁶

It is therefore imperative that coastal communities, particularly the BTNE, adopt new regulatory schemes to offset the human impacts from navigation and pipeline canals: the loss of community, culture, and the land that sustains each. Under the current exactions doctrine, coastal communities can—and should—implement an impact fee-based relocation fund to assist those prone to land loss in relocating to higher, firmer ground. Such a program would compel those responsible for the majority of this land loss—oil and natural gas companies operating a network of 10,000 miles of navigation and pipeline canals—to pay for the relocation of individual complainants or communities similar to Isle de Jean Charles.

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³²⁶ Schwartz, *supra* note 266.

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