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THE VALUES OF PRACTICING HISTORICAL GEOGRAPHY

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ABSTRACT: Academic offerings in historical geography may be in a period of eclipse, but scholarship on geographies of the past is prolific. There are several reasons for this, and one that is often overlooked is the fundamental value of this line of inquiry beyond the academy. This lecture considers three historical maps as tools to examine the values of historical geography to current and future societies. A 1940s depiction of a chemical plant's toxic dump exposes knowledge of hazardous wastes well before federal legislation addressed this danger. It had significant value in recent environmental litigation and federal efforts to clean up damaged landscapes. An 1850s sanitary map of New Orleans reveals early efforts to depict threats and to delimit the sources of epidemic disease that foretold the emergence of risk assessment and served as a stepping stone in hazards mapping. New Orleans's "Green Dot" map released in the aftermath of Hurricane Katrina highlights the erosion of social memory in adapting to hazardous situations and the need for planners and government bodies to allow thorough and effective citizen participation in responding to changing environments. Each represents a different type of value, while underscoring the deep and enduring social contributions that can arise from well-researched and clearly written historical geography.

KEYWORDS: *pollution, hurricanes, environmental litigation, yellow fever, New Orleans, research methodology*

INTRODUCTION

I am deeply honored to be invited to speak to you today in the Distinguished Historical Geography Lecture series. Colleagues whom I greatly respect have preceded me, and it is a privilege to be included in their esteemed company. I am particularly grateful to Arn Keeling, an emerging force in the field whom I have known since he was a student, for extending the invitation on behalf of the Historical Geography Specialty Group—an organization that I am proud to have been affiliated with for quite some time.

Not only do I want to thank the specialty group officers and all the members who are doing the crucial important work sustaining an important specialty that is sadly neglected in the academy, I would be remiss if I failed to mention my mentors who shaped how I approach this marvelous field. Don Meinig at Syracuse created a nurturing setting, and even as I toyed with abandoning my studies, he kept the doors open and the lights on. Without his patience, I might not have enjoyed what has amounted to a thoroughly satisfying career. It's worth noting that I'm the third Meinig student to be included in this series. Bill Wyckoff and Rich Schein preceded me—so he did something right. Before I met Don, Sam Hilliard, Milton Newton, and Bill Davidson at LSU lit the fires that still burn, albeit with a little less intensity than during my student days. The waning flames are due more to the fact that the fuel is diminishing than to a lessening of inspiration or fascinating research opportunities on the horizon.

Furthermore, I find a remarkable symmetry presenting this paper at the AAG in New Orleans. In 1978 I gave my first professional paper, drawing on my freshly defended MA thesis, at the Hyatt Hotel a few blocks from here. So now I am able to offer a capstone, though not final, presentation some forty years later. Although I could make this presentation thoroughly memorable if I disappeared in a cloud of smoke as I conclude, I promise not to resort to such theatrics.

My purpose today is to point out what I see as the values of practicing historical geography from multiple perspectives:[1] not its economic value, but its value in understanding our past—both academically and practically, in linking our past to the present, and its value in shaping policies for the future. After a brief detour down the path I took to get here, I'll use three historical maps as touchstones to examine my discovery of some of the many values of historical geography.

A HAZARDOUS CAREER

I will be a bit self-indulgent here with some comments on how I came to this point which followed a vagabond trajectory, albeit a geographically rich route. Some might describe my career as one benefiting from the misfortunes of others. Let me explain. My employment prospects unexpectedly took a hazardous turn when I accepted my first job. I landed, in of all places, in a Quaternary research center at the Illinois State Mu-

seum among archaeologists, paleontologists, and other assorted natural scientists with a project supported by a sister agency dedicated to scientific research on hazardous wastes. I was a curator without portfolio—that is, they would not let me assemble a collection as is the norm in collections-based museums. The prohibition against amassing a collection was the result of my research topic: hazardous wastes. My initial task was to determine if Illinois had a toxic waste site comparable to the infamous Love Canal near Niagara Falls, New York, secluded among the landfills, wetlands, and slag heaps on Chicago's South Side.[2] My work focused on a much more recent period than my museum colleagues, so I was an outlier among them both in terms of subject matter but also temporal horizons. But they had secured funding and specifically sought out a historical geographer. It was a supportive setting, but at the same time a somewhat isolated situation.

In addition, the topic dropped in my lap was largely unexplored by historical geographers. So I set out an uncharted course to identify what archival sources would enable me to trace the industrial waste disposal practices in an era before federal legislation mandated a cradle-to-the-grave tracking of hazardous wastes. The project before me, similar to the work of my archaeologist colleagues, was in one sense prehistoric—looking for records in the landscape and before official records were kept. Fortunately, it turned out there was an amazing, albeit hugely incomplete, historical record, and I did not have to gain training in geochemistry or toxicology. From municipal waste disposal records, to public health and occupational safety documents, to court cases of nuisance suits, there were multiple sources that yielded information that was not a product of their original intent. I had to read between the lines and follow up on leads from numerous and sometimes unrelated government agencies. And although historical geographers had yet to wade into toxic landscapes, historians had preceded me and provided sound guidance and welcomed my early efforts.[3] The state of Illinois and my environmental history colleagues found value in the historical geography perspective.

The most powerful message that came through from this research was the remarkably current value of knowledge about these past hazardous waste dumps. I turned frequently to the oft-used William Faulkner comment, "the past is not dead, it is not even past." The value lay not in the aesthetic appearance of overgrown dumps, nor in terms of their

marketability, but in our current knowledge of where dangerous dumps from the past lay beneath the surface of our urban landscapes. The historical geography had direct value to current litigation, to the USEPA's enormous waste cleanup enterprise, and ultimately to a system devised to screen damaged properties for unwitting buyers and their lenders. Knowledge of past activity, a site's geographic past, had current value beyond academic or antiquarian uses.

At the time the USEPA was overseeing a laborious and costly process to identify the worst of the worst hazardous wastes sites and desperately needed historical information to guide their technical inquiries. This activity involved documenting past activity that contributed to a site's degraded condition. Millions of dollars were being spent on site cleanups, and knowing what was dumped where could enable efficient mapping of sites where expensive geophysical samples could be collected, thereby saving substantial sums of money. Complex lawsuits among the "potentially responsible parties" alleged historical damages from prior owners or from temporary operators of sites—including the US government during World War I, the Great Depression, and World War II. Tens of millions of dollars of liability hung in the balance in these legal cases that relied on solid historical geography. That kind of monetary value gets people's attention.

Litigation that I became involved in often hinged on insurance policy terminology that would deny payments for historical actions if the damages were "expected or intended." This prompted me to steer away from simple documentation of past practices into what J. K. Wright termed the geosophy of industrial waste managers.[4] What was the state of knowledge framing their decisions about placing dangerous substances in unlined pits and lagoons during the 1940s and 1950s? What was the accumulated wisdom available to the typical practitioner about the potential threat for groundwater contamination? To pursue this course of research, I turned to Clarence Glacken and Yi-Fu Tuan, who examined the evolution of knowledge of environmental processes.[5] And what I consider one of my highest accomplishments was when a federal judge cited a *Geographical Review* article I had written. The courts and the litigants found value in historical geography.[6]

From hazardous wastes, I migrated to broader urban hazards and found myself in the midst of my own perfect storm—Hurricane Katrina. In August 2005 a powerful, but not exceptional hurricane in

terms of wind speed made landfall on the Mississippi/Louisiana Gulf Coast. Its eye headed almost directly along the forecasted route up the Pearl River and over my birthplace, Bogalusa, Louisiana. The surge that accompanied that storm exceeded twenty feet along the Mississippi shore and overwhelmed levees in suburban parishes east of New Orleans and along Lake Pontchartrain. Devastation was extensive and exposed technical failures with the levees, gapping social inequities, and lapses in state and federal response capabilities. That event has now taken its place in New Orleans's long hazards historical geography. It was a transformative event not only for the city and its residents but for me as well. My book *Unnatural Metropolis* appeared earlier that year and offered a useful environmental historical geography of the city, and it gained unexpected exposure in the days following the storm.[7] As the city tried to drain the floodwaters, I was swamped with media interviews for the next several months. My initial reaction to the media demands was to treat them as unwanted distractions and interruptions. But I realized this was a once-in-a-lifetime opportunity to talk to the public writ large about historical geography. It was disruptive but also tremendously gratifying in the sense that I was able to put historical geography before a global audience—even though I was often misidentified as a geologist. I would like to believe that the general public discovered value in historical geography.

When this episode erupted, I had assumed my work on New Orleans was largely complete, but it became an all-consuming activity for the next decade—and more. I'm not complaining—it was an exceptionally rewarding problem to have. I've logged some impressive frequent flier miles en route to give presentations across the US, in the Netherlands, New Zealand, and Brazil, and been invited to participate in projects that otherwise might not have materialized. But I am not an ambulance chaser. The work on New Orleans and its perpetual struggle with hazards preceded the storm of a lifetime and illuminated at least briefly the value in historical geography. It was remarkably fortuitous timing amidst the suffering of others, much more than my scholarship, that catapulted it into the public eye.

Since Katrina I have been involved in a series of projects looking at community resilience, and historical geography provides an essential foundation for these efforts. If we accept the general notion that resilience is the ability of communities to effectively prepare for, respond to,

and recover from extreme hazard events, and that resilience is a core component of a sustainable society, then I would argue that knowing how a society overcame the stresses and disturbances of past events, particularly if they are common although irregular events, is a key to future survival. Building resilience and sustainability demands knowing the adaptive practices that proved successful in the past and also those that were ineffective. Working in several collaborative projects, I sought to document the actual practices deployed at the local level to minimize the impacts of future events and to rebound from past ones. Most studies of resilience rely on proxy economic and demographic measures. But these records were not assembled to gauge resilience, and my colleagues and I sought out historical documentation of what people and communities actually did to make themselves more resilient—even before the term came into academic vogue. We argue that it is vital to examine the past practices that enabled communities to survive for centuries in perilous places.[8] Most of this work has centered on adaptation to extreme hazards and also the chronic, slow-moving coastal crisis in Louisiana.

Others have visited this topic as well. Karl Butzer and Georgina Endfield have responded to the discussions about collapse and resilience, and their work underscores the significance of seeking analogs in the sometimes distant past.[9] My work on resilience has focused on a more recent time period than their work and on the Louisiana coast, a place where high ground is less than five feet high and offers little protection against rising sea level. This topographic deficiency is accentuated by the fact that the relict and current deltas of the Mississippi are sinking under their own weight while the flood protection levees starve the wetlands of rejuvenating alluvial sediment. There is an abundance of historical geography to be done in this setting and other similarly threatened areas around the globe where understanding past adaptations is vital to chart future adaptations.[10]

My career track has led me into multiple situations where historical geography was viewed as having current value, as providing a utility to answer pressing social and environmental questions, to address future challenges. So, as I begin to wander down the final leg of my career, I begin projects with the question: is there value to this project, value in terms of the society I live in, to the people around me and future generations, to the educational institution that supports my work, and to scholars who will follow me? I have been labeled an empiricist

and a materialist, as a scholar who eschews theory. I unapologetically cede that arena to those more inclined and talented in that direction. At the same time, I can pursue my trade with satisfaction knowing that I am building a body of work that I hope has the potential to influence the human condition in a positive way and perhaps outlive the ever-changing theoretical passions—all the while recognizing that my work, too, will fade from academic visibility quite quickly.

VALUE IN THE ARCHIVES

Now let me introduce you to three maps that exemplify the role of historical documents in creating valuable historical geographies. The research underlying my work on hazardous wastes, New Orleans, and coastal Louisiana was based on archival sources. I am convinced that the publications that arose from those efforts stood the test of public scrutiny because of their solid empirical foundations. And I want to explore the role of three maps that shaped my thinking. Each provided critical insights and bolstered or confirmed other historical sources. The first is a 1940s engineering plat of the Monsanto Chemical plant in Sauget, Illinois, the second an 1854 sanitary map of New Orleans, and the third the notorious "Green Dot" map for New Orleans's recovery from Hurricane Katrina in 2005. I decided to focus on maps, despite their disappearance in much recent critical geography. These documents are powerful historical records and reveal a great deal about how they both reflected and contributed to contemporaneous geographies. They serve as vital links between the past and the present.

My search for documentation of past hazardous wastes brought to light some amazing sources. While working on my first project on Chicago, the city discovered some nineteenth-century records that had been warehoused for decades and had been assumed lost. But in preparation for demolishing what was generally considered a decrepit structure, workers found pigeon guano–encrusted boxes of old municipal records, including documents related to garbage and waste disposal. This information was critical to an accurate mapping of nineteenth-century garbage disposal activity.[11] In addition, I worked my way through the tedious testimony of a landmark federal court case about dumping of industrial wastes in the Calumet River in the 1950s, which contained details about otherwise undocumented activity on

the city's South Side. There were other records, albeit not dedicated to hazardous wastes, that exposed points of intersection between waste disposers and public bodies—in the form of workplace conditions, permits, inspections, enforcement, and litigation.

For a project on the East St. Louis region, I reviewed files kept by the state geological survey and the predecessor to the state's EPA that contained applications to create waste disposal sites reviewed by the state's sanitary engineer. Dating from the early 1950s, one Illinois State Geological Survey file constituted what amounted to a Rosetta stone–type discovery. It was a 1940s engineering map of a portion of the Monsanto Chemical Company site on the American Bottoms of Illinois—the floodplain opposite St. Louis (fig. 1).[12] The company had mapped various operations, but also waste disposal sites on its property. The cartographer clearly labeled one "toxic dump—filled in" and another "new toxic dump." This single item swelled in significance when coupled with other information from trade literature and publications by chemical industry waste management organizations. One of the most illuminating was the National Safety Council's (NSC) 1948 waste disposal pamphlet that outlined "the hazards and problems of the complex process of safe disposal of industrial wastes."[13] It explicitly used the term "hazardous waste" long before federal statutes codified its legal meaning—undermining a common industry claim that there were no hazardous wastes before 1976. It cautioned manufacturers to consider their ongoing "disposal practices for possible sources of personal injury (either on the plant or outside), property damage, or nuisance." It noted the potential of soluble wastes migrating off site with groundwater and their threat to distant water wells. The Rosetta stone moment appeared in the recommendation "that a plan of the plant premises be made, showing areas used for dumping and precisely what has been dumped in each area. This information may become important in the location of future buildings."[14] This guidance, while challenged in litigation on the grounds that I could not prove individuals in industry consulted it, was already being practiced by Monsanto. The map indicated that professional guidance to document past dumps had moved from practice into the safety manual, into the knowledge base available to practitioners, and was not just idle, unfulfilled advice.

This pamphlet was not alone in its recommendations to handle dangerous substances with care and to illustrate communication among

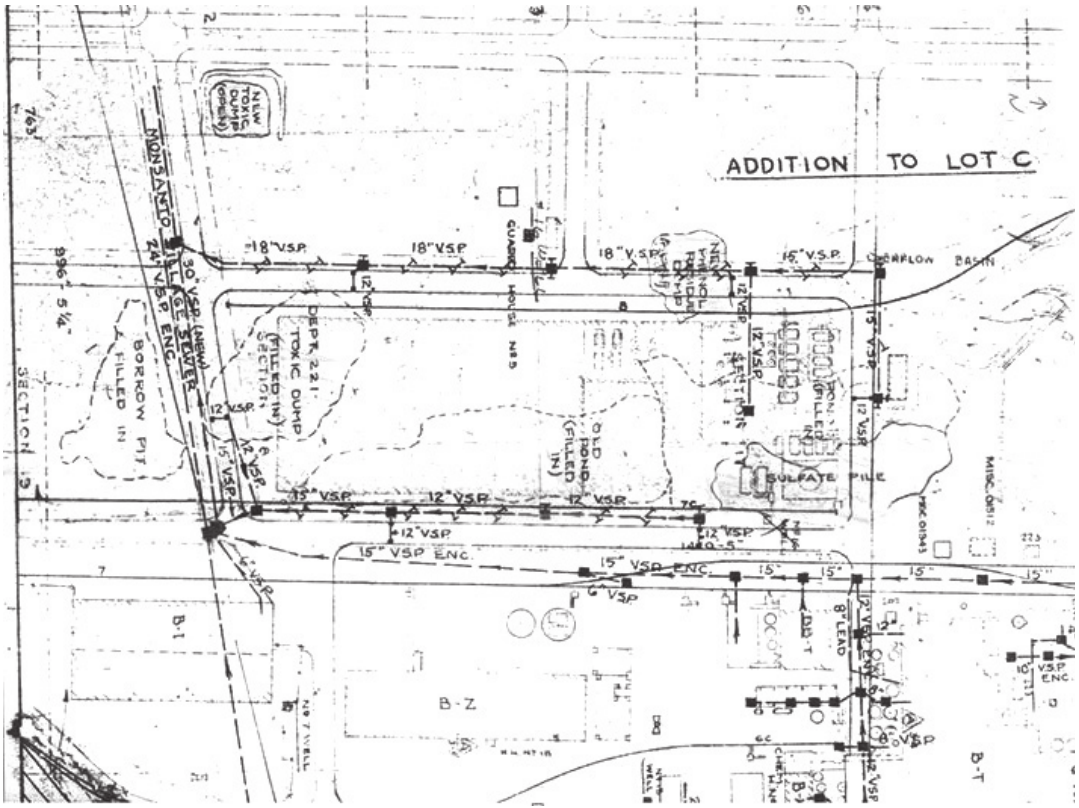

FIG. 1. Toxic dumps at Monsanto Chemical Company facility in Sauget, Illinois. Monsato Chemical Company, Engineering Plan for Monsanto Illinois Plant, 1940s. Illinois State Geological Survey, Landfill Review Files, St. Clair County folder.

practitioners. Trade organizations, beginning in the 1910s, assembled expert teams to grapple both with the waste management issue and the fear of costly damage suits. In 1883 an attorney published a tome on the potential legal liabilities that coal-gas manufacturers faced when releasing offensive and harmful effluent into waterways.[15] As early as 1908 courts sided with Ballantine and Sons, a New Jersey brewer, that claimed a gas works had damaged the groundwater it relied on for making its product.[16] This knowledge was not limited to judicial circles; in 1919 the American Gas Association reported on contamination of the water supply of an ice plant that resulted from tar that leaked from a gas works.[17] The association formed a waste management committee that same year to help disseminate information on waste treatment and recovery methods and thereby reduce the threat of litigation.[18]

Moving from the coal-gas industry in the 1910s, to petroleum refining in the 1920s, to chemical manufacturers in the 1940s, the formation of professional trade association committees represents a response to public recognition and disapproval of pollution problems and industry concern mainly with public relations and legal/financial risks.[19] Following several years of public scrutiny of oil pollution problems in the 1920s,[20] the American Petroleum Institute (API) formed its Committee on Disposal of Refinery Wastes. Composed of practitioners, it sought to address the problem with treatment options with an audience of plant managers and engineers.[21] The Manufacturing Chemists' Association (MCA) followed suit and created a water pollution abatement committee following World War II at a time of intensive public attention to water pollution. Like the API, the MCA published a series of manuals to provide guidance on treatment and control of wastes.[22] Its 1961 guide specifically addresses hazardous wastes and included comments quite similar to the 1948 NSC pamphlet on the risks associated with buried materials and the ability of soluble wastes to move with groundwater.[23] My research documented considerable knowledge of the hazards of wastes, which diffused freely within the professional ranks and acknowledged comprehension of the risk of off-site harm when wastes migrated through the soil. There was a sound geosophical foundation within the ranks of practitioners to alert them to the "expectation" that pollution problems could result from poorly managed waste disposal.[24]

Beyond the industry committees, practitioners in related fields also created a solid record of investigations and discussions about the threat

to water supplies posed by chemical wastes. The American Water Works Association carried out a survey and issued a series of reports in the 1950s about the relationship of industrial waste disposal and public water supplies. In its second report in 1953, the task group explicitly stated "that a potential hazard is generally to be expected wherever changing economics attracts water-using industry to ground water recharge areas." This was a fundamentally historical geographic perspective. Changing land uses, due in part to economic conditions, could introduce waste disposal activity to groundwater recharge zones. The group advised that prevention, rather than an after-the-fact response, was the preferable public policy to protect groundwater.[25] By the early 1960s there was a flurry of professional activity related to groundwater contamination. A massive report on the status of the field appeared in 1960. The authors, a pair of MIT engineers, assembled an amazing bibliography of over seven hundred titles on the subject. Their comments on organic chemical wastes reinforced the observations of the water-supply professionals: "Where existing industries may be discharging liquid process wastes, or had done so in recent years, into lagoons or into underground disposal areas, sometime even into practically dry streams, the probable contamination of ground water can be anticipated."[26]

Furthermore, the professional response to groundwater contamination incidents illustrated open channels of communication among professionals. When irrigation wells on the Colorado plains became contaminated, hydrologists looked up-gradient for potential sources. They did not have to look far to find the waste disposal basins at the Rocky Mountain Arsenal (a World War II chemical warfare production facility and postwar agricultural chemical manufacturing facility). They plotted out what they considered the potential plume of contaminant movement and then installed monitoring wells to collect samples. Their map of "anticipated area of influence" provided excellent guidance to the actual plume detected through sampling.[27] The common use of the terms "expect" and "anticipate" by professionals from multiple fields underscores to me the prevailing state of knowledge and the acceptance of the fundamental notion that land disposal of toxic chemicals could threaten water supplies. Experts defending historical malpractice of chemical waste disposers often built their arguments around the actual practices of industry, which ignored the prevailing wisdom. Ignoring that knowledge was not the same as not knowing.

In 1853 New Orleans endured a yellow fever epidemic of unprecedented scale. It killed approximately 8,000 residents, while another 29,000 suffered from the disease—staggering numbers for a city of 154,000. Thousands more evacuated to the Mississippi coast or the north shore of Lake Pontchartrain to escape its ravages.[28] Following this catastrophic epidemic, the New Orleans Sanitary Commission conducted an extensive review of the outbreak's causes.[29] In today's terms, this report authored by Edward Barton would be characterized as an after-action report. Included in the report was a sanitary map, or more accurately an unsanitary map of the city. I selected it as a second historical document that provided extraordinary geographic insights, particularly when paired with other documentary sources. Although preceding our current understanding of the germ theory of disease and the comprehension of mosquitoes as vectors of this terrifying affliction, it reveals how the community responded to a tragic event. The report and accompanying map appeared the same year as Edgar Snow's famous map of the source of London's cholera outbreak that has been touted (and criticized) as a pioneering work in medical geography.[30] Barton's work never received the same acclaim, but in many respects it could be recognized as a pioneering work in risk assessment—that is, it mapped the zones of yellow fever risk and offered suggestions on mitigation (fig. 2). It also alerted medical and public officials that greater precision in mapping the geography of yellow fever cases could more accurately locate both sources and causes.[31] And it illustrates one step in the progression of mapping risk at the local level.

In the full report, Barton tabulates the cases of yellow fever by wards and associates the outbreaks with the presence of nuisance conditions or environmental factors believed to permit the disease to thrive. In comparison to Snow's cartography, which mapped individual cases of cholera, Barton took on a broader geographic analysis. He delimits the areas of disturbed ground, cemeteries, nuisance industries, and areas of standing water as locations that produce the disease. These nuisance conditions, as he terms them, represent locations that gave rise to the disease and thereby represent zones of risk—even if he did not use the term. In his narrative, he compares these sources with the number of cases and the prevalence of disease in a given ward. Without the aid of modern statistical or GIS methods, he draws connections between source conditions and high incidence of the disease. Among his conclusions based

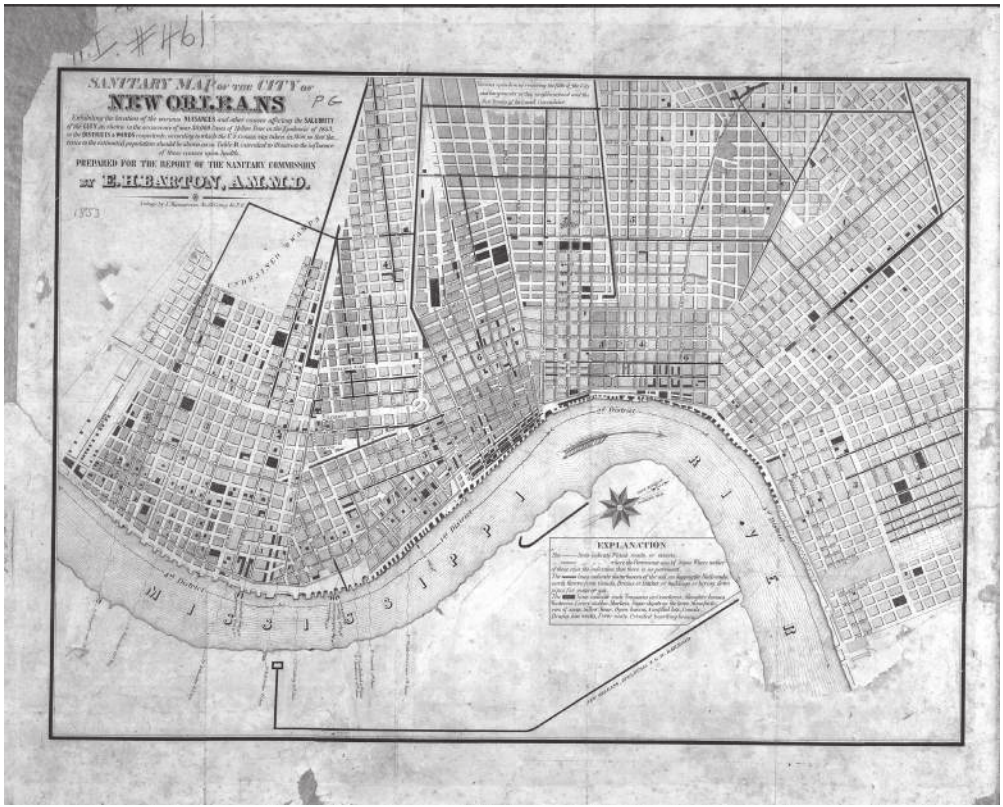

FIG. 2. Sanitary map of New Orleans, 1854. Sanitary Commission of New Orleans, *Report of the Sanitary Commission of New Orleans on the Yellow Fever Epidemic of 1853* (New Orleans: Picayune, 1854). Courtesy Louisiana State Museum.

on a process of eyeballing nuisances in particular wards, he notes that the insalubrity is "ascribable to local conditions which are mainly removable."[32] This reveals two very fundamental past conceptualizations of hazards that carry forward to today. First, managing hazards is locally based, and second, proper steps can mitigate those hazards.

Medical theory in the mid-nineteenth century was still deeply rooted in local wisdom, and this was certainly the case in New Orleans.[33] Prominent medical authorities each espoused their own theory about the causation of this perplexing killer, and the 1854 report included testimony of several practitioners. Barton notes that there were numerous influences necessary for a massive outbreak—principally atmospheric and terrene. The atmospheric causes were meteorological—largely temperature and precipitation. Physicians knew that outbreaks occurred during the warmer summer months and disappeared after a fall frost. Rainfall produced standing water, which was seen as another contributing factor. "Terrene" conditions or the exposure of soil, the report declares, was the *sine qua non* of New Orleans's outbreaks since the eighteenth century.[34] Barton asserts that only with large-scale soil disturbances, in conjunction with warm, moist conditions, did the disease repeatedly afflict the city.[35] In his careful tabulation of nuisance factors, Barton delineated disturbed soil along routes of canals and road construction. He explicitly argues that "the numerous undrained, unfilled lots and squares dotting the surface of the city, becoming muddy pools in the rainy season, which is always the sickly season, and common receptacles for filth and garbage of all kinds, are exhibited in our sanitary map, and should be abated."[36] Soil disturbance in cemeteries produced conditions for the disease to thrive. It is important to point out that despite the city's reputation for above-ground burials, not all families could afford this practice, and the pauper's cemetery continued to practice in-ground interment well into the nineteenth century. "Fever nests" and offensive industries also gained a place on his map as sites where miasmas could originate and affect nearby populations. While Barton argued that there was a relationship between people and nuisances, he only mapped the nuisances.

Following the 1853 epidemic, public officials initiated actions to improve drainage, remove garbage and privy wastes, and exclude abattoirs from the more densely settled sections of the city—with mixed success.[37]

Occupying Union forces during the Civil War (1862) were more successful in imposing sanitary order on the landscape than local authorities. Following the war, internal political and economic discord contributed to the return of insalubrious conditions. And despite local ordinances that forbade digging canals and disturbing the soil between May 1 and September 1, the disease returned.[38] What was not understood in the 1850s and 1860s was that private household cisterns served as breeding grounds for mosquitoes that spread the bacteria. While contemporaneous observers often mentioned that prolific mosquito infestations were a sign of an impending epidemic, the mechanics of vector-borne disease spread were not known when the next major epidemic occurred in 1878.[39] During this outbreak, public health officials tabulated the age, place of birth, and address of each mortality.[40] This represented a considerable improvement in the detail of information, but it took over a century till a former colleague mapped out the geography of this detailed spatial data.[41] While the 1878 outbreak was less deadly than the 1853 event, it exposed the shortcomings of mitigation directed at removing nuisance industries and restricting soil disturbance. It also reflected the recognition that there was value in knowing the immediate past geography of the disease's spread.

The final yellow fever epidemic erupted in New Orleans in 1905 and prompted the mapping of areas where the disease was prominent and also the habitats of specific mosquitoes (fig. 3).[42] This approach revealed the introduction of recent findings about the transmission of yellow fever by insects and the waning in the belief in terrene causes. Armed with this new expertise, the US Public Health Service took the lead role, with support from local officials, in a systematic attack on mosquitoes that effectively stemmed the deadly fever's spread. This approach followed advances in both epidemiology, which linked mosquitoes to the disease's transmission, and recognition that the *Stegomyia* (now known as the *Aedes aegypti*) mosquito was responsible, not the "swamp" mosquito (*Anopholes*). It was a variety that thrived in urban settings such as cisterns and other canisters of water found in populated urban districts. Key control measures were placing oil on the surface of cistern water, installing screens on cisterns, and fumigating the interior of houses. These prophylactic measures, or mitigation, effectively undercut the threat of a massive epidemic, and mortalities remained under five hundred that

year—the last of the significant outbreaks.[43] The cartographic presentations of mosquito habitats and human fatalities expose the relationship between specific species and particular neighborhoods.

FIG. 3. Distribution of yellow fever cases in New Orleans in 1905. Rupert Boyce, *Yellow Fever Prophylaxis in New Orleans, 1905* (London: Williams & Norgate, 1906).

Their value for historical geographic research resides in the wider application of maps in public health and the evolving use of such representations. Obviously Snow was not the only medical authority attempting to plot out the distributions of diseases. If Barton and Snow were undertaking similar mapping exercises in 1854, there must be other examples that could afford even greater insights than either taken in isolation. Also, the evolving collection of data and its cartographic presentation in New Orleans illustrate changing expectations and demands for geographic information from the near past. This presents other opportunities and challenges for more intensive and comparative analysis.

Although yellow fever has been arrested in New Orleans, mosquito-borne disease remains a chronic problem here. In the 1960s there was a major campaign to wipe out mosquitoes, and the city created a mosquito control authority. Air-conditioning has done as much as aerial spraying to minimize discomfort of the pesky pricks—which in Louisiana can take place year round. The outbreak of West Nile fever in the early 2000s highlighted the role of insects in transmitting deadly diseases, and once again public health authorities attacked mosquitoes to control the menace. Since 2015, concern with Zika, spread by the same vector as yellow fever—the *Aedes aegypti*—underscores the persistence of this species even in the absence of nineteenth-century scourge. The geographies of mosquito habitats and diseases have changed, and there is a long-term arc to this tale that has yet to be told.

It is also important to comment on the social aspect of hazards management. Medical practitioners in the nineteenth century drew on their professional and more generally social memory to address epidemics.

Accounts written by physicians consistently reveal that they developed theories about the causation and spread of yellow fever based on prior personal experiences. As part of the local environmental knowledge, the mechanisms of the disease's diffusion and the factors used to arrest it were firmly ensconced in prevailing wisdom. A part of that social memory was tinted by racist attitudes—and these were not limited to African Americans. The epidemic of 1853 ran rampant among recent arrivals—or the unacclimated—largely Irish.[44] Barton explained the demographic impact this way: the disease "seizes the most susceptible first; that is usually in the filthiest, worst drained and paved and worst ventilated and most crowded portions of the city; and here it seems to gather force and strength, and extend to neighboring portions, that this was specially verified with us" until it reached "the paved portions of the city and classes of society that paid more respect to their hygiene."[45] In 1905 the distribution of cases was most prominent in neighborhoods inhabited by recent Italian arrivals. In what is now the French Quarter, Boyce recounts conditions that were similar to Barton's 1854 description. "No proper drainage existed in the yards, the closets were very dilapidated, and were constructed on the cess pit or pail system. The whole neighbourhood overcrowded, foreign, insanitary, and superstitious, constituted the most favourable nidus in the City for any infective process to take deep root and spread, provided the Stegomyia was also present." His map labels the "Old Italian Quarter" as the most inflicted district and the neighborhood from which the disease spread (fig. 3).[46] Although Barton notes that a portion of the responsibility for crowded housing rested with greedy landlords, the association of recent immigrant workers and the blossoming of the epidemic persisted into the twentieth century. Anti-Italian sentiment ran deep in New Orleans and contributed to the violent lynching of a group of Italians in 1891. One authority on anti-Italian history points out that racist sentiments toward this group were a hindrance to white unity in the city.[47] Nonetheless, race figured into epidemiology as much as environmental factors and advances in medical science and vector control did not eradicate racial prejudice.

At about the same time that germ theory and mosquito eradication gained legitimacy among physicians, New Orleans was embarking on major public works projects to provide improved drainage, sewage removal, and potable water supplies. One of the system's intended pur-

poses was to address the problems of waterborne diseases—the likes of cholera and typhoid commonly occurred when domestic privies leached into drinking water wells nearby. Granted, New Orleans relied to a greater extent than many cities on cisterns to collect rainwater for home consumption, but in poorer quarters wells that tapped unconfined and near-surface groundwater were the primary option. As Progressive Era ideas infused New Orleans politics, grand plans for engineering works to solve both public health and social problems came to the fore. The city launched construction of a combined drainage, sewerage, and water system in 1900.

In theory and design, this ambitious project would extend these services to all residents, black and white, and some of the initial sections did indeed bring service to a racially mixed portion of town.[48] The extension of public works foisted locally unwanted land uses on minorities and the poor.[49] This core environmental justice issue has been subjected to criticism when carried out without a sound historical context.[50] Comparing current populations to existing disamenities or hazards ignores the composition of the population at the time the decision was made and also diminishes issues related to open space and land values. I sought to invert the discussion by asking if New Orleans extended desirable urban infrastructure to all citizens regardless of race or class in a time of Progressive Era impulses that touted equality. But poor residents, including many blacks, were unable to afford water or sewer connections—even if they had the financial ability to install indoor plumbing. Initial tabulations indicate that rates of waterborne diseases fell much more rapidly in more affluent, white neighborhoods that were able to take advantage of these new systems. As the system continued to reach more remote districts, inequities appeared in the delivery of services, particularly in African American neighborhoods in one of the low-lying districts (fig. 4).[51] To an extent this reflects what Laura Pulido has termed "white privilege"—geographies that sustain privileges of those in power. And other urban amenities such as parks also reveal racial inequities. So there were inequities that persisted despite recognition that serving the poor would reduce the risk of disease for all.[52]

Large-scale public works are a hallmark of the New Orleans landscape. The riverfront levees have obscured the view of the Mississippi since colonial times. Since the 1930s a set of hurricane protection levees have completed the encirclement of the city with elevated barriers. In theory

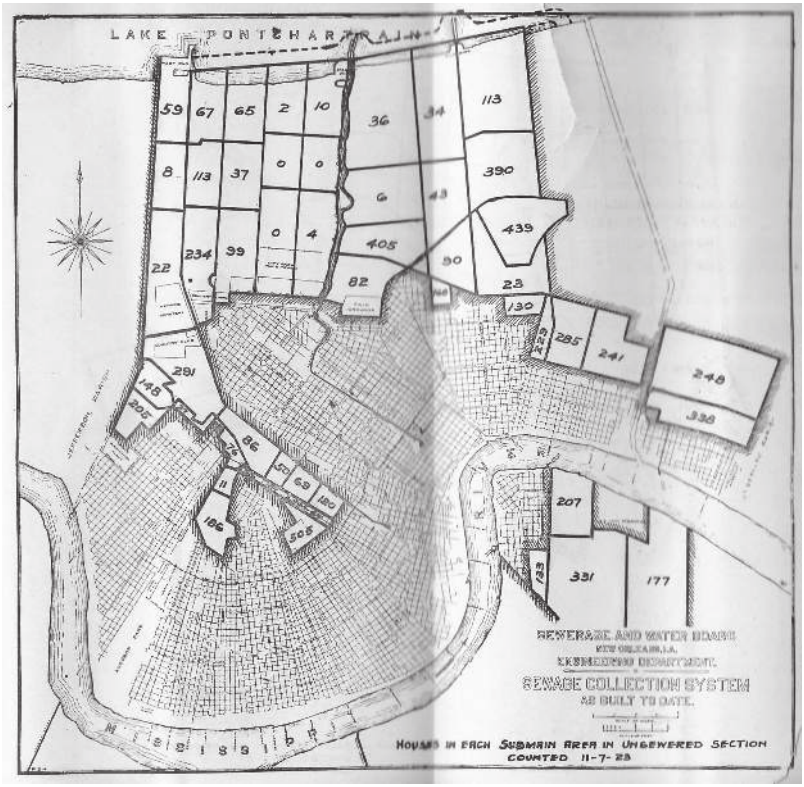

FIG. 4. New Orleans sewerage system and "unsewered" houses in low-lying areas. Sewerage and Water Board of New Orleans, *Forty-Eighth Semi-Annual Report* (New Orleans, 1923), 27.

these structures afford protection to all. River levees have not failed in New Orleans since the 1860s. Many residents are protected, but a fair number of communities adjacent to the river and in the Atchafalaya Basin have been displaced to make way for the ever-enlarging levee system. To protect the urban residents and economic infrastructure, the levees have displaced risk to the Atchafalaya Basin. Consequently, they have disrupted livelihoods of fishermen in coastal areas of Mississippi and Louisiana.[53] When the giant diversion systems are put into use, there is inevitable damage to marine ecologies and the fisherfolk who depend on them. But hurricanes have exposed both failures in the levees systems and the inequities of risk. Hurricane protection levees

have design limits and are subject to overtopping if floods exceed their design heights. This has happened repeatedly in New Orleans since the first seawall was completed in the 1930s along the shore of Lake Pontchartrain. After the 1947 storm, local planners noted that the most serious damage impacted newer homes built slab-on-grade in low areas. Extensive flooding accompanied Hurricane Betsy in 1965 and prompted claims that the city deliberately sacrificed low-lying African American neighborhoods to protect white districts.[54] Again in 2005, levee failures exposed tragic inequities that persisted in this segregated city.

The historical geography of hazards management has tremendous value. One of the most frequent critiques of social encounters with extreme hazards is the failure to sustain readiness between infrequent events such as hurricanes. Described as a loss of the sense of urgency or social memory of lessons learned from tragic events, hazards managers repeatedly point to the need to sustain preparations. Likewise, they often bemoan the fact that this did not happen when a modest hazard event inflates into a full-blown disaster. I would argue that sound reporting, in readable prose, can help perpetuate the lessons learned and pass along the knowledge and wherewithal to prepare for, respond to, and recover from traumatic natural occurrences.[55]

The third map is a recent one—prepared for the Bring New Orleans Back Commission—shortly after Hurricane Katrina in 2005 (fig. 5).[56] It represents the Urban Land Institute's (ULI) conceptualization of a post-disaster New Orleans footprint. This cartographic image became a flash point for displaced residents who saw the green dots, or proposed open space, as restrictions on their "right to return." The ill-conceived map predicted a reduction in the residential footprint in the topographically lowest areas of the city and a rededication of those spaces to parks and flood retention basins. This vision made sense in terms of future risk exposure but thoroughly neglected public input or even effective communication. Displaced residents who were scattered across the South from Atlanta to Dallas saw this as an attempt to grab their property and inhibit their return. They roared their disapproval and demanded a more participatory planning process and not one carried out by a developer-friendly trade organization based in Washington, DC. I suspect that a map that had labeled the low areas as "high flood hazard" zones might have inspired a very different response. Nonetheless, public protest sparked a revamped planning process that assembled neighborhood

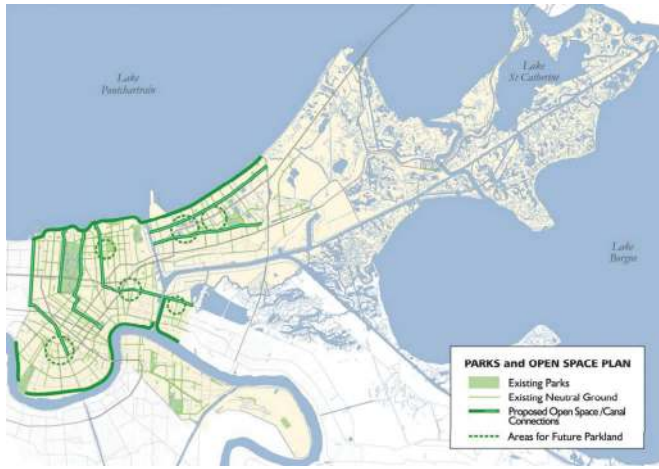

FIG. 5. Green Dot map, 2006. Bring New Orleans Back Commission, *Action Plan for New Orleans: The New American City* (Washington, DC: Urban Land Institute, 2006).

planning groups and attempted to cobble together a coherent citywide plan for a multiyear recovery—as many displaced residents were struggling to make decisions about rebuilding from afar.[57] The Green Dot map is now a historic document and one that is part of a larger set of records that reveal the complex social process underlying numerous adaptive efforts under way in coastal Louisiana—a place facing the highest relative sea level rise in the country—and one prone to promptly forget lessons learned. And I hasten to add that I say this out of compassion and not academic arrogance.

Before Katrina made landfall, blacks represented over two-thirds of the city's population. That percentage fell dramatically as many of the evacuees were either unable or opted not to return to the Crescent City. Some of the city's elite saw the departure of the poorest of the poor as an overall benefit for the city. Others charged that numerous obstacles made it most difficult for those with the least resources to return even if they wanted to. Race has been a contentious part of the protracted recovery as it has been in most other matters in the city's past. Race and environmental inequities often disadvantage marginalized communities and favor disaster capitalism, which is compounded by the inability of local leaders to sustain the lessons learned from previous disasters.[58]

I have examined records of prior recoveries from devastating hurricanes and traced forward the ability of local leaders to carry through on their promises to rebuild and to make their city less susceptible to future damage—or their ability to build community resilience. A long series of responses that do not reflect wisdom gained from past experiences illustrate a failure to sustain local ecological knowledge and perpetuate resilient adaptations to a perilous place. Historical geography should be of value to this region that faces more than occasional tropical cyclones.[59]

Neil Adger makes the case that social memory is the repository for the "accumulated wisdom, knowledge, skills and experience" that are "passed on within a community" and serve as the history for decision making that enables resilience. Institutions harbor this knowledge and sustain a community's capacity to deal with adversity.[60] And Lindsey McEwen and her colleagues in the UK have argued that remembering floods is a form of resilience.[61] How has the memory of major hurricane strikes translated into effective, long-term adaptation? Have lessons learned eroded into what Susan Cutter refers to as mere "lessons identified"?[62] The first major storm of the twentieth century, an unnamed 1915 storm, prompted a major response after causing extensive damage to lakefront communities and recreation areas. New Orleans leaders took a common stance and declared the event an "act of god" and boasted that New Orleans was greater than the storm. They defiantly announced that they did not need outside assistance and that the city would rebound.[63] One step toward recovery was the planning of a seawall along the Lake Pontchartrain shore. Designed to stand half a foot higher than the 1915 surge, it drew on the social memory of the relative effectiveness of river levees to fend off high water. More importantly, it demonstrated the "levee effect" and encouraged the development of residential and commercial districts in the city's most flood-prone area. It took nearly twenty years to complete, and with inadequate local funds, only federal Works Project Administration funds made it a reality. The process revealed the protracted process of installing mitigation systems and the fiscal incapacities of the city to handle such an expensive undertaking for even a small segment of the lakefront. It also encouraged construction of houses, for the first time, that did not rely on elevated construction for flood proofing. In effect, resilience was designed out of the city's footprint and its architecture.[64]

A 1947 storm once again pushed wave and surge across the city's lake-

front, overtopped the seawall, and caused extensive damage in the city and the new postwar suburbs in adjacent Jefferson Parish. A poststorm editorial noted that "people forget during the usually long interludes between the great hurricanes that strike this part of the coast,"[65] and the local planning agency observed that new slab-on-grade houses suffered the worst damage.[66] Local officials had already appealed to the Corps of Engineers to build lakefront levees for the suburban parish, and they pressed for completion of the project.[67] Reliance on federal support was essential to continue expanding the urban area into the marshy terrain where future development would face the same peril as comparable neighborhoods in New Orleans.

Hurricane Betsy in 1965 was a major tragedy for New Orleans. The city's failure to close some of its drainage canals allowed surge to invade neighborhoods along the Industrial Canal and inundate nearly 45 percent of the urban territory. African Americans were the predominant residents in this area, and community members charged that the flooding was the result of deliberate decisions intended to save white neighborhoods. State officials promised nothing like this would happen again.[68] The principal response was to secure funding for a previously designed and vastly improved levee system to be built by the Corps of Engineers. For many reasons, this undertaking was still a work in progress forty years later.[69] The city eagerly permitted numerous new subdivisions in areas that were under water in the wake of the 1965 storm, and construction of new homes in these neighborhoods expanded the city's tax base. Construction during this era was largely slab-on-grade and far from flood-proof, a problem compounded by subsiding soils due to drainage of the newly enclosed tracts. This process left substantial areas more than five feet below sea level within the ring of levees and accentuated the risk for homes there (fig. 6).[70]

When Katrina roared ashore in 2005, the levee system was still incomplete and critical sections failed, which resulted in 80 percent of the city going under water and over 1,200 fatalities. There were glimmers of social memory among those who rode out the storm (which has been the tradition in New Orleans). Those who found floodwaters creeping into their homes slogged to nearby schools for shelter. These public structures had been the official emergency shelters in 1965, but that was no longer the case in 2005, and people had to break in—a sensible alternative to drowning. Residents of the Lower Ninth Ward, which saw

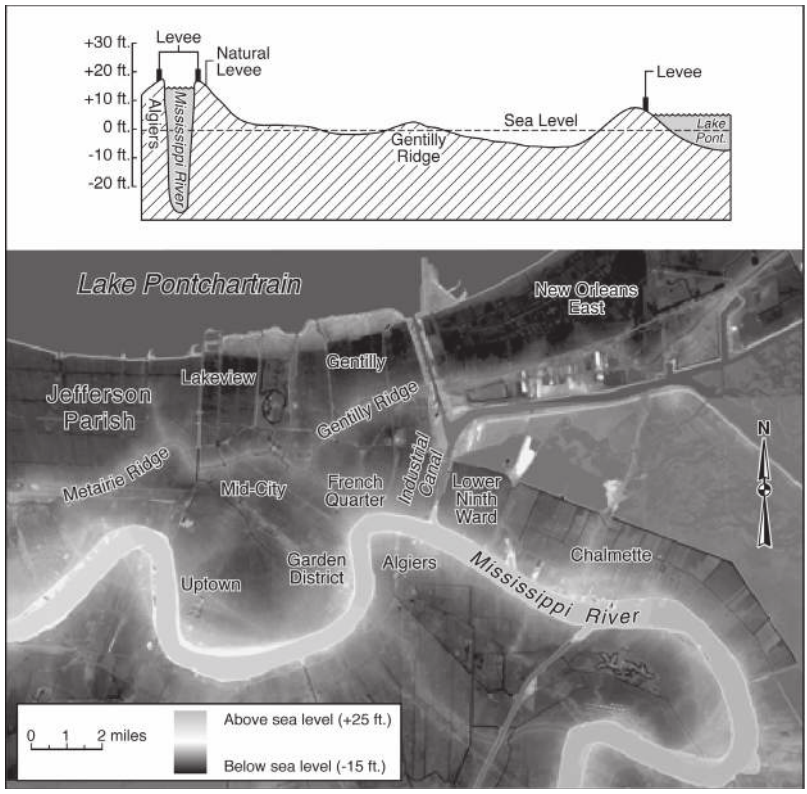

FIG. 6. Cross-section and topographic elevation of New Orleans. Cartography by Dewitt Braud.

some of the worst destruction when levees failed, like residents in the neighborhood in 1965, charged that the flooding was intentional and that it sacrificed their homes while saving homes of white residents.[71] Facing a gargantuan recovery effort with its municipal budget in tatters and its experts dispersed, New Orleans turned to outside experts to draft a plan, and the ULI offered the Green Dot map plan. It sought to remedy some of the common failures by steering development away from the lowest areas of the city. This idea sparked the defiant public outcry.[72]

Since the rejection of the ULI concept, citizen-driven planning gradually unfolded and reflected the urge of property owners to return to their neighborhoods. But the city's population has declined by about 20 percent, and many neighborhoods are filled with empty houses or

empty lots where houses have been razed. Granted, there has been a strong commercial recovery, fueled with federal dollars and young entrepreneurs. One of the more telling aspects of the revitalized plan was that it called for redeveloping on the footprint of the most recent flood—in defiance of the tragic consequences of Katrina.[73] Social memory has been promptly set aside. As some of the residents of the city relocated upstream to St. John the Baptist Parish, they encountered hurricane-driven floods in 2012 and demanded additional levees.[74] So the chronic pattern of expanding into wetlands and requesting levees continues. Even though I would argue that New Orleans is more resilient now with fewer residents and some improvements to the levee system, the age-old responses to tropical cyclones reflect the commitment to building levees with federal dollars and permitting risky development in their shadows. Historical geography has an important role to play in helping perpetuate the memory of tragedy and accomplishment, of social struggle and social equality, of poor judgment and common sense. There is value to what we do, now and in the future.

CONCLUSIONS

I have been extremely fortunate to be able to head down meandering paths in my professional career. I have ridden on the wake of tragedies: Love Canal, Katrina, and the BP oil spill, and most recently Louisiana's chronic hazard—its disappearing coastline. Perhaps I am an ambulance chaser, an academic opportunist, but I think the opportunities have demonstrated the real-world value of a rich and well-documented historical geography, the value of place-based, humanities-driven scholarship, assembled and presented in monographs, and the place for our specialty in the wider academy. I cringe when I recall the end of the regional historical geography organizations—the MHGA and the EHGA. The demise of these specialty organizations I saw as a decline in the number of active practitioners. Yet I am buoyed by the fact that the International Historical Geography Conference announced in December 2017 that it had 500 submissions for its 2018 meeting in Warsaw, when it anticipated around 250. Scholarship on past geographies, under many labels, is abundant and is providing powerful insights. Obviously others, too, see value in historical geography and on a truly global scale. I implore the younger members of this audience to carry the banner for-

ward, to find ways to insert our knowledge into larger discussions of social import, to make evident the power of a historical geographic perspective to our colleagues, our students, and the wider public.

NOTES

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7. Craig E. Colten, *An Unnatural Metropolis: Wresting New Orleans from Nature* (Baton Rouge: Louisiana State University Press, 2005).

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13. National Safety Council, Industrial Waste Disposal (Chicago: National Safety Council, Industrial Safety Series No. Chem. 7, 1948), 1. The pamphlet drew on a bibliography prepared by R. W. Hess, "Industrial Waste Disposal and Bibliography on Chemical Wastes," *Industrial and Engineering Chemistry* 25, no. 5 (May 1947): 676–82.

14. Quotations from National Safety Council, Industrial Waste Disposal, 1, 3.

15. Charles P. Greenough, *A Digest of the Reported Decisions of the Courts of the United States of America and of Great Britain and Her Colonies, Relating to the Rights and Liberties of Gas Companies* (Boston: Little, Brown, 1883).

16. Ballantine and Sons v. Public Service Corporation of New Jersey (1908) 70 Atlantic 167; also (1915) 91 Atlantic 95.

17. American Gas Association, "The Disposal of Waste Water from Water Gas Plants on Streams Adjacent to Parks," *AGA Monthly* 1 (April 1919): 191–93.

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