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A Tale of Two Imperiled Rivers: Reflections from a Post-Katrina World

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ESSAY

A TALE OF TWO IMPERILED RIVERS: REFLECTIONS FROM A
POST-KATRINA WORLD

*Sandra Zellmer**

*Let the river run;
let all the dreamers
wake the nation.¹*

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I. INTRODUCTION

Last year, hundreds of thousands of residents of the lower Mississippi River basin were forced to flee Hurricane Katrina.² Having scattered like leaves before the gale-force winds that pounded the Gulf Coast, many are

* Professor and Hevelone Research Chair, University of Nebraska College of Law. I am grateful to the University of Florida Levin College of Law, and especially to Professors Alyson Flournoy and Christine Klein, for inviting me to speak at the 12th Annual Public Interest Environmental Conference, *In Fairness to Future Generations*. Conference topics, which ranged from literature to law to children’s interactions with the environment, were organized around the central themes of intergenerational equity and conservation of resources for the future. I was charged with setting the stage for a series of panel discussions on sustainable river management. This Essay builds on that presentation. I am also indebted to Professor Klein for her insightful comments and to Kate Saunders for her research assistance.

1. CARLY SIMON, *Let the River Run*, on WORKING GIRL: ORIGINAL SOUNDTRACK ALBUM (Arista Records 1989).

2. Kevin McCoy, *Fraud Mounts in Katrina Aid Program*, USA TODAY, Feb. 13, 2006, at 1A, available at 2006 WLNR 2475731.

still displaced by the wreckage caused by storm surges and floodwaters.³ Those who have returned continue to experience the adverse effects of a shattered infrastructure as they attempt to rebuild their homes and their lives. The environmental calamity is profound: drinking water sources polluted by destroyed septic systems and leaking storage tanks; contaminated sediments from the bayous to the residents' backyards; decimated marshes and oyster beds—in short, an ecology turned inside out.⁴

Hurricanes are a natural phenomenon in this region. Why were the Gulf Coast communities so vulnerable? The answer to this question is frustratingly elusive. One might understandably believe that, as a developed nation, the United States has the most sophisticated technologies at its fingertips and first-rate environmental laws to ensure appropriate implementation through open public processes. Yet in actuality, there were serious failures at every level of government.

One year after Hurricane Katrina, the U.S. Army Corps of Engineers responded to a congressional request for an accounting with a report admitting culpability for much of the devastation of New Orleans.⁵ Its structural defenses failed not because Congress had authorized only moderate Category-3 protection, which in turn let floodwaters overflow the city's levees, but because the levees and floodwalls simply collapsed.⁶ The report revealed a multitude of design errors.⁷ The network of federal and local structures was a haphazard “system in name only,”⁸ where floodwalls and levees of varying heights used mismatched materials that

3. Spencer S. Hsu, *FEMA Extends Housing Aid to Those Displaced by Storms: Assistance Will Continue Through at Least August*, HOUS. CHRON., Jan. 20, 2007, at A11, available at 2007 WLNR 1180675.

4. See Norman A. Dupont, *New Orleans After Katrina: A Superfund Site?*, 20 NAT. RESOURCES & ENV'T. 38, 41-42 (2006) (exploring the use of a Superfund designation to clean up New Orleans); Beth Daley, *La. Ecological Harm Called Unprecedented*, BOSTON GLOBE, Sept. 30, 2005, at A1, available at 2005 WLNR 15425207; U.S. EPA, Response to 2005 Hurricanes: Test Results, <http://www.epa.gov/katrina/testresults/index.html> (last visited Feb. 17, 2007) (summarizing results of sediment and water quality sampling).

5. Editorial, *Katrina's Unlearned Lessons; A Government Agency Admits Error, and Congress Wants to Reward It*, WASH. POST, June 7, 2006, at A22 [hereinafter *Katrina's Unlearned Lessons*]. The nine-volume, 6000-page report, costing nearly \$20 million, was made available to some lawmakers on June 1, 2006, and was delivered to Congress on July 10, 2006. *Gulf Coast Hurricane Disaster; GAO Reports Massive FEMA Aid Fraud; Other Developments*, FACTSONFILE WORLD NEWS DIG., June 15, 2006, at 470C1; News Release, U.S. Army Corps of Eng'rs, Army Forwards Preliminary Technical Report on Louisiana Coastal Protection and Restoration to Congress (July 10, 2006), <http://www.hq.usace.army.mil/cepa/releases/lacpr.htm>.

6. *Katrina's Unlearned Lessons*, supra note 5.

7. *Id.*

8. *Id.*

did not properly interface.⁹ Construction engineers failed to account for the gradual sinking of native soils, leaving the levees vulnerable to floodwaters.¹⁰ For their part, the local levee districts failed to ensure that necessary repairs on levees and floodgates were completed or that pumps would continue functioning during a catastrophic storm event.¹¹ Instead of fanning the flames of reform, the Corps' report prompted Louisiana's senators and their congressional allies to appropriate tens of billions of dollars for the construction of more and higher levees and to seek exemptions from federal environmental requirements.¹²

This response is all too typical. The management mission of the Corps does not reflect a cohesive national water policy; rather, it arises from the piecemeal, pork-barrel conglomeration of multiple-use statutes.¹³ The vacuum created by the lack of a coherent federal management vision allows and even encourages federal, state, and local actors to scramble for money and power while avoiding responsibility and shifting blame. If we look beyond the Gulf, the catastrophic consequences of the lack of a cohesive federal policy can be seen throughout the nation. Due to dredging and channeling for flood control and commercial navigation, much of the

9. Ann Carns, *Holes in the Dike: Long Before Flood, New Orleans System was Prime for Leaks*, WALL ST. J., Nov. 25, 2005, at A1.

10. INDEPENDENT LEVEE INVESTIGATION TEAM FINAL REPORT, INVESTIGATION OF THE PERFORMANCE OF THE NEW ORLEANS FLOOD PROTECTION SYSTEMS IN HURRICANE KATRINA ON AUGUST 29, 2005, at 15-5 (2006), available at http://www.ce.berkeley.edu/~new_orleans/; Robert Sanders, *UC Berkeley-Led Levee Investigation Team Releases Final Report at Public Meeting in New Orleans*, May 24, 2006, http://www.berkeley.edu/news/media/releases/2006/05/24_leveereport.shtml.

11. See Carns, *supra* note 9.

12. See Mark Schleifstein, *Corps Report Ignores Call for Specifics; Details of Category 5 Protections Left Out*, TIMES-PICAYUNE (New Orleans), July 1, 2006, at 1, available at 2006 WLNR 11442605; *Katrina's Unlearned Lessons*, *supra* note 5; KEITH BEA, EMERGENCY SUPPLEMENTAL APPROPRIATIONS FOR HURRICANE KATRINA RELIEF (2006), available at <http://www.fpc.state.gov/documents/organization/71874.pdf> (detailing congressional appropriations for Katrina recovery); See also American Bar Ass'n, Letter to Stephen L. Johnson re: Legislation Creating Exemptions to Environmental Laws and Regulations, p.5, Nov. 21, 2005, available at <http://www.abanet.org/environ/katrina/Whitepaper.pdf> (opposing waivers proposed in various Senate Bills introduced by Louisiana Senators Vitter and Landrieu and others). Although these bills did not pass, several exemptions were granted by administrative action. See, e.g., Department of Homeland Security, National Environmental Policy Act Alternative Critical Physical Infrastructure Arrangements in New Orleans LA, 71 Fed. Reg. 14712 (Mar. 23, 2006) (adopting alternative procedures to avoid full compliance with the National Environmental Policy Act for reconstruction grants); U.S. EPA, Letter to Governors of Florida, Louisiana, Alabama, and Mississippi, Emergency Fuel Waiver, Aug. 30, 2005 (allowing refiners, distributors, and outlets to supply diesel fuel and gasoline without complying with Clean Air Act requirements on a temporary basis), available at http://www.epa.gov/region6/6xa/pdf/fuel_waiver_slj_tif.pdf; *infra* note 186 (describing controversy over waiver of landfill requirements).

13. See *infra* Part III (detailing federal laws that govern the Corps' activities).

Missouri River, for example, is now “a dead snake, rigid, unable to move, constricted by the levees along its banks.”¹⁴

In other works, I have proposed the development of a federal preservation strategy for the interjurisdictional waters of the Missouri River.¹⁵ This essay integrates the Mississippi River, as it makes its 2,300-mile journey from northern Minnesota to its delta in southern Louisiana. Just as common problems face the Missouri and Mississippi Rivers, there may just as well be common solutions. In fact, any lasting solution that secures sustainability and intergenerational equity likely *requires* a large-scale, basin-wide strategy—a federal Interior Rivers Ecosystem Act that governs the management of the Missouri-Mississippi River system.

This statute must be comprehensive in two senses. First, it must recognize and reflect the close linkage between ecosystem integrity and human well-being.¹⁶ Second, it must be a true organic act that establishes an adaptive, holistic federal strategy for these two intertwined, interjurisdictional rivers.¹⁷ More specifically, the Act should provide clear parameters for the management activities of the Corps of Engineers. The Corps is the nation’s oldest water-resources agency and one of the largest federal land-management agencies;¹⁸ yet unlike the National Forest Service,¹⁹ the National Park Service,²⁰ the U.S. Fish and Wildlife Service,²¹ the Bureau of Reclamation,²² and the Bureau of Land Management,²³ the Corps lacks an organic act to cabin its discretion.

There are two significant impediments to a comprehensive federal Interior Rivers Ecosystem Act. One is the Corps’ love for the “rational” sciences of engineering and economics, particularly cost-benefit analysis (CBA).²⁴ The other impediment is federalism. Congress, the state legislatures, the federal agencies, and the courts hide behind both as a means of evading responsibility for protecting and conserving the integrity

14. BRUCE BABBITT, *CITIES IN THE WILDERNESS* 52 (2005).

15. Sandra B. Zellmer, *A New Corps of Discovery for Missouri River Management*, 83 NEB. L. REV. 305, 337-47 (2004).

16. See Robert Costanza & Michael Mageau, *What is a Healthy Ecosystem?*, 33 AQUATIC ECOLOGY 105, 105 (1999).

17. See *infra* Part V (describing an organic act for the Interior Rivers Ecosystem).

18. See BABBITT, *supra* note 14, at 46; Corps of Engineers Overview, <http://www.lre.usace.army.mil/planning/overview.html> (last visited Feb. 17, 2007).

19. National Forest Management Act of 1976, 16 U.S.C. §§ 1600-1614 (2000).

20. National Park Service Organic Act, 16 U.S.C. § 1 (2000).

21. National Wildlife Refuge System Administration Act of 1966, 16 U.S.C. §§ 668dd-668ee (2000).

22. Reclamation Act (National Irrigation Act of 1902), 43 U.S.C. §§ 371-498 (2000).

23. Federal Land Policy and Management Act of 1976 (Bureau of Land Management Organic Act), 43 U.S.C. §§ 1701-1785 (2000).

24. A. Dan Tarlock, *A First Look at a Modern Legal Regime for a “Post-Modern” United States Army Corps of Engineers*, 52 U. KAN. L. REV. 1285, 1285-86 (2004).

of the nation's water and water-dependent resources. The result has been degraded waterways, disastrous flood events, a crumbling national infrastructure, and potentially irreversible losses of biological diversity and ecological resilience.²⁵

Sustainable transboundary management measures are feasible in spite of these obstacles. A nuanced application of CBA can play a role in resilient, equitable decisionmaking when employed as a supplemental, rather than predominant, decisionmaking factor. And a dynamic view of federalism—a pragmatic, interactive strategy of governance with clear lines of authority and incentives for cooperation and innovation among and between federal, state, local, and tribal entities—should encourage, rather than obstruct, more coherent leadership in conservation policy. Moreover, there is precedent for adopting a comprehensive strategy for a major interjurisdictional river system, as legislation and interstate compacts have embraced such strategies in other basins.²⁶

This Essay begins in Part II with a snapshot of the historical events and physical characteristics that shaped the Missouri and Mississippi River basin communities. Part III then explores the existing management matrix of federal laws governing the Corps of Engineers' activities in these basins. Part IV demonstrates how CBA and federalism have obstructed integrated, sustainable management strategies. This Essay concludes in Part V with an assessment of how these obstructions can be overcome in a post-Katrina world and with suggestions for an Interior Rivers Ecosystem Act.

II. CROSSING MUDDY WATERS

The Missouri and the Mississippi Rivers lie at the very heart of our nation, and they are connected in more ways than might initially meet the eye. Together, they form the largest river system in North America,²⁷ and they drain more than forty percent of the land base of the continental United States.²⁸ The Missouri is the longest tributary of the Mississippi, supplying vast quantities of fresh water from the Rocky Mountains and the Great Plains.²⁹ The two rivers support an abundance of endemic fish and wildlife species and form the primary flyway for millions of migratory

25. BABBITT, *supra* note 14, at 115, 128-31; Gerald E. Galloway, *Perspectives on a National Water Policy*, WATER RESOURCES UPDATE, Nov. 2003, at 6, 8.

26. See *infra* notes 217-20 and accompanying text.

27. See American Rivers, River Facts, http://www.americanrivers.org/site/PageServer?pagename=AR7_RiverFacts (last visited Feb. 17, 2007).

28. See U.S. Army Corps of Eng'rs, The Mississippi River and Tributaries Project, <http://www.mvn.usace.army.mil/pao/bro/misstrib.htm> (last visited Feb 17, 2007).

29. See Zellmer, *supra* note 15, at 311.

birds.³⁰ These two rivers can also claim the dubious distinction of being the most heavily altered river systems in the country, requiring immediate rescue efforts and continuing life support.³¹

Common themes of navigation and westward expansion flow through both river systems. Management of the rivers has been indelibly marked by the dream of a lucrative navigational corridor³² and the desire to hold back the flood waters to protect extravagant development in the floodplains.³³

The rich history of the Mississippi River is interwoven with that of the Missouri River.³⁴ Anyone familiar with *The Adventures of Huckleberry Finn*³⁵ appreciates the Mississippi's role in the life of nineteenth-century America. Yet the Mississippi's significance to the nation's culture and aspirations extends back much further in time.

French explorers René-Robert de La Salle and Father Louis Hennepin traversed the upper Mississippi in the late-seventeenth century.³⁶ Hennepin located and named the Falls of St. Anthony, where Minneapolis is now

30. See *id.* at 320-21; Mississippi National River and Recreation Area, Mississippi River Facts, <http://www.nps.gov/archive/miss/features/factoids> (last visited Feb. 17, 2007).

31. See American Rivers, River Facts, *supra* note 27; National Park Service, River and Water Facts, <http://www.rivers.gov/waterfacts.html> (last visited Feb. 17, 2007).

32. See DESOTO NAT'L WILDLIFE REFUGE, U.S. FISH & WILDLIFE SERV., FINAL COMPREHENSIVE CONSERVATION PLAN 22 (2001), available at <http://www.fws.gov/midwest/planning/desoto/desotoccp%20ch3.pdf>; MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG'RS, MISSISSIPPI RIVER NAVIGATION: HISTORY (1985), available at <http://www.mvn.usace.army.mil/pao/history/MISSRNAV/>.

33. See John A. Robb, *Economic and Environmental Challenges*, WATER RESOURCES UPDATE, Autumn 1994, at 17, 18.

34. On a personal note, my interest in these rivers arose at an early date. I grew up boating and camping on the Missouri River and learned to appreciate the power, beauty, and ephemeral nature of its current and its sandbars, snags, and banks. My affiliation with the Mississippi River also stems from early roots. My family often traveled to various campsites in Minnesota to fish the streams and lakes in and around the Mississippi's headwaters at Lake Itasca. My parents honeymooned at Lake Itasca fifty-five years ago, and in my office I keep a framed photograph of my mother, age eighteen, stepping on stones placed across the tiny stream that eventually forms the "Mighty Mississippi." Years later, as a visiting professor at Tulane Law School, I lived in the uptown area of New Orleans, where I bicycled on the levee near Audubon Park and satiated myself on seafood delivered by shrimpers and oystermen from the Gulf. These two rivers have been a constant source of wonder and wildness throughout my life, just as they have been a powerful influence in the lives of generations of people in this country.

35. MARK TWAIN, *THE ADVENTURES OF HUCKLEBERRY FINN* (Grosset & Duniap, Inc. 1963) (1884). For an account of Twain's experiences as a "cub" riverboat pilot before the Civil War and his subsequent dismay upon traveling the river years later, see MARK TWAIN, *LIFE ON THE MISSISSIPPI* 44-53, 486-96 (1883). While traveling from St. Louis to New Orleans, Twain found all the markings of "greed, gullibility, tragedy, and bad architecture." MERRIAM-WEBSTER'S *ENCYCLOPEDIA OF LITERATURE* 681 (Merriam-Webster, Inc. 1995).

36. See James Sullivan, *Destined for Mystery; LaSalle Not Aboard When Griffon Sailed into Storm—and History*, S. BEND TRIB., Apr. 10, 2005, at F8.

located.³⁷ Although Hennepin boasted of being the first explorer to travel the length of the Mississippi, La Salle actually accomplished the task first.³⁸ La Salle named the entire basin “Louisiana” in honor of King Louis XIV and claimed it for France in 1682.³⁹ These events had great significance for both the Mississippi and Missouri River basins. France’s claim to the lands west of the Mississippi River and its hold on the Port of New Orleans—an essential port for international trade—eventually led to President Jefferson’s Louisiana Purchase in 1803 and the exploration of the Missouri River by Captain Meriwether Lewis and Lieutenant William Clark in 1804.⁴⁰

Lewis and Clark were sent up the Missouri River in hopes of discovering an all-water route to the Northwest that would tie the young nation together from east to west.⁴¹ These dreams were dashed, however, when the expedition encountered the formidable Rocky Mountains and realized that an all-water route simply did not exist.⁴² Although Jefferson’s navigational aspirations were not fulfilled, the Corps of Discovery brought back a wealth of scientific information and made unparalleled zoological and botanical discoveries.⁴³

Meanwhile, the Americans, much as the French had before them, exerted heroic efforts to tame the Mississippi River to serve the nation’s navigational ends. The first steamboat to ply the waters of the Mississippi, the *New Orleans*, arrived in the city of New Orleans in 1812.⁴⁴ The Mississippi soon became the major artery for military supplies, oil, and grain.⁴⁵ In the 1820s, at the direction of Congress, the Corps of Engineers

37. *Id.*

38. See Virtual Museum of New France: Louis Hennepin, http://www.civilization.ca/vmnf/explor/henn_e2.html (last visited Feb. 17, 2007).

39. Texas State Library & Archives Commission, Texas Treasures—Robert Cavelier, Sieur de La Salle, <http://www.tsl.state.tx.us/treasures/giants/lasalle/lasalle-01.html> (last visited Feb. 17, 2007). “No river has played a greater part in the development and expansion of America than the Mississippi.” MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG’RS, *supra* note 32.

40. See Roger K. Ward, *The Louisiana Purchase*, 50 LA. B. J. 331, 332-34 (2003); Zellmer, *supra* note 15, at 310-11 (citing STEPHEN E. AMBROSE, UNDAUNTED COURAGE 101 (1996)).

41. Zellmer, *supra* note 15, at 310-12.

42. *Id.* at 311-12.

43. *Id.* at 310-12. See generally DANIEL B. BOTKIN, BEYOND THE STONY MOUNTAINS: NATURE IN THE AMERICAN WEST FROM LEWIS AND CLARK TO TODAY (2004) (describing the Missouri River as seen by the Corps of Discovery from St. Louis to Three Forks).

44. MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG’RS, MISSISSIPPI RIVER NAVIGATION: STEAMBOAT NAVIGATION (1985), available at <http://www.mvn.usace.army.mil/pao/history/MISSRNAV/steamboat.asp> [hereinafter STEAMBOAT NAVIGATION].

45. MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG’RS, MISSISSIPPI RIVER NAVIGATION: RIVER COMMERCE (1985), available at <http://www.mvn.usace.army.mil/pao/history/MISSRNAV/commerce.asp> [hereinafter RIVER COMMERCE]. Today, the Port of New Orleans is the “number one port in the United States.” *Id.*

conducted a thorough investigation of the navigational capabilities and physical characteristics of the Mississippi and Ohio Rivers. Legislation was subsequently passed requiring the “removal of snags and other obstructions from the channels of the rivers.”⁴⁶ In 1861, Captain A. A. Humphreys and Henry Abbott addressed both navigation and flood control in their now-famous “Report Upon the Physics and Hydraulics of the Mississippi River; Upon the Protection of the Alluvial Region Against Overflow; and Upon the Deepening of the Mouths.”⁴⁷ This report dictated the Corps’ “levees-only policy” of navigation and flood control and continues to influence modern-day river management.⁴⁸

By 1880, miles of levees had been constructed on the Mississippi River, and the Corps conducted dredging operations with a vengeance to keep the channel clear of sediment and debris.⁴⁹ Shortly after the Civil War, however, “competition from railroads had made steamboats passé.”⁵⁰ By World War I, commercial use of the Mississippi’s navigational systems came to a standstill.⁵¹ Undeterred from the dream of promoting Mississippi River navigation, Congress authorized construction of a nine-foot-deep channel and multiple locks and dams.⁵² These structures replaced the Mississippi’s rapids and falls with a highly regulated “stairway of water” to allow greater commercial traffic.⁵³ A resurgence in inland river transportation occurred during World War II as fuel and military vessels moved from inland ports to the Gulf.⁵⁴ Today, nearly 500 million tons of cargo move through Mississippi River ports in Louisiana and Mississippi annually.⁵⁵ To support these endeavors, the “delta below the City of New

46. MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG’RS, MISSISSIPPI RIVER NAVIGATION: FEDERAL PARTICIPATION IN WATERWAYS DEVELOPMENT (1985), *available at* <http://www.mvn.usace.army.mil/PAO/history/MISSRNAV/federal.asp> [hereinafter FEDERAL PARTICIPATION].

47. *Id.* This report was considered “a great step forward in the development of river engineering in the United States.” *Id.*

48. See JOHN M. BARRY, RISING TIDE: THE GREAT MISSISSIPPI FLOOD OF 1927 AND HOW IT CHANGED AMERICA 90 (1997); FEDERAL PARTICIPATION, *supra* note 46.

49. See Diane M. Grassi, *Levees Not to Blame for Response Management Failures*, AM. CHRON., Sept. 7, 2005, <http://www.americanchronicle.com/articles/viewArticle.asp?articleID=2281>.

50. MERRIAM-WEBSTER’S ENCYCLOPEDIA OF LITERATURE, *supra* note 35, at 681.

51. Michael C. Robinson, *Mobilizing the Waterways: The Mississippi River Navigation System*, in BUILDERS AND FIGHTERS: U.S. ARMY ENGINEERS IN WORLD WAR II 259, 262 (Bary W. Fowle ed., 1992), *available at* <http://www.usace.army.mil/publications/eng-pamphlets/ep870-1-42/c-4-4.pdf>.

52. FEDERAL PARTICIPATION, *supra* note 46.

53. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, About the Upper Mississippi River System, http://www.umesc.usgs.gov/umesc_about/about_umrs.html (last visited Feb. 17, 2007).

54. RIVER COMMERCE, *supra* note 45; see Robinson, *supra* note 51, at 265.

55. Press Release, Univ. of Del. Graduate Coll. of Marine Studies & Sea Grant Program, UD

Orleans alone is cut by more than a dozen commercial waterways . . . totaling more than 300 miles.”⁵⁶ The Corps relies on levees to thwart the river’s natural tendency to shift its flow and find a “more direct and less resistant course to the Gulf.”⁵⁷

In spite of equally extensive efforts to thwart nature’s will, navigational aspirations for the Missouri River never materialized. The Missouri is notorious for its unpredictable channels, crumbling banks, and hidden snags that can sink a boat in the blink of an eye.⁵⁸ Today, only a handful of barge operators conduct business between St. Louis, Missouri and Sioux City, Iowa.⁵⁹ They carry a miniscule amount of the grain exported from riparian states, and commentators have quipped that it would be cheaper for farmers to ship via Federal Express.⁶⁰

Besides being an expensive and never-ending commitment, navigational enhancement and flood prevention are ecological disturbances for rivers like the Mississippi and the Missouri, both of which rely on periodic flooding to provide connectivity between channel and floodplain.⁶¹ The natural hydrograph of the meandering, braided Missouri River is marked by spring and early summer rises from precipitation on the Plains and snowmelt in the Rockies, followed by a late summer decline in flow.⁶² Prior to the mid-1950s, periodic and occasionally extreme flooding kept the connections between the main channel, its tributaries, and its

Marine Transportation Experts Analyze Hurricane Katrina’s Effects on U.S. Shipping (Sept. 7, 2005), <http://www.ocean.udel.edu/newscenter/HurricaneKatrina.html> (citing NAVIGATION DATA CTR., U.S. ARMY CORPS OF ENG’RS, ANNUAL CARGO SUMMARY—SHORT TONS CARGO PER YEAR (2003)). Together, the Ports of New Orleans, South Louisiana, and Baton Rouge move between ten to fifteen percent of all U.S. waterborne cargo annually. *See id.*; VANESSA CIESLAK, PORTS IN LOUISIANA: NEW ORLEANS, SOUTH LOUISIANA, AND BATON ROUGE 2 (2005), available at <http://fpc.state.gov/documents/organization/57872.pdf>.

56. Oliver Houck, *Can We Save New Orleans?*, 19 TUL. ENVTL. L.J. 1, 9 (2006); *see also* JOHN MCPHEE, THE CONTROL OF NATURE 36-37 (1989) (describing the development of the Mississippi River floodplains).

57. David Getches, *Water Wrongs: Why Can’t We Get It Right the First Time?*, 34 ENVTL. L. 1, 8 (2004).

58. *See* BILL LAMBRECHT, BIG MUDDY BLUES: TRUE TALES AND TWISTED POLITICS ALONG LEWIS AND CLARK’S MISSOURI RIVER 64-67 (2005).

59. *See* Michael Grunwald, *Washed Away: Bush v. the Missouri River*, NEW REPUBLIC, Oct. 27, 2003, at 16, 17, available at <https://ssi.tnr.com/p/docsub.mhtml?i=20031027&s=grunwald102703>.

60. *See id.*

61. *See* John H. Davidson, “Sound Science” on the Missouri River—How It Should Influence Law and Policy (Feb. 4, 2004), <http://southdakota.sierraclub.org/livingriver/mripaper.htm>; Mississippi River Basin & Gulf of Mexico Hypoxia Channelization, <http://www.epa.gov/msbasin/subbasins/challenges/navigation.htm> (last visited Feb. 17, 2007).

62. *See* WATER SCI. & TECH. BD., NAT’L RESEARCH COUNCIL, THE MISSOURI RIVER ECOSYSTEM: EXPLORING THE PROSPECTS FOR RECOVERY 22, 56 (2002), available at <http://books.nap.edu/catalog/10277.html>.

broad floodplain alive.⁶³ Since then, the Corps' activities have eliminated ninety percent of the Missouri sandbars and eighty percent of its aquatic food sources.⁶⁴ The Corps has also eliminated the fecund wetlands along the river corridor, which, prior to dikes, levees, and bank stabilizations, had been recharged with each flood pulse.⁶⁵ More than sixty native species are listed by state and federal authorities as endangered or threatened, primarily as a result of riparian habitat destruction.⁶⁶

The Mississippi River has been heavily altered as well. Levees encase more than eighty percent of the lower river, and the floodplain between St. Louis and the Gulf is armored by levees that form a veritable straitjacket.⁶⁷ In spite of humankind's best engineering efforts, the Mississippi, like the Missouri, occasionally flexes its muscles and escapes its banks, gobbling up everything in its path.⁶⁸ Sometimes it takes a hurricane to provoke this behavior; sometimes, as in 1927, it just takes rain.

The Great Mississippi Flood of 1927, a product of sustained rainfall in the Mississippi Basin, brought international attention to the lower Mississippi when it washed away entire cities and caused billions of dollars of economic damages.⁶⁹ In the 1940s and early 1950s, several floods on the Missouri River devastated surrounding communities situated in the river's floodplain.⁷⁰ In 1965, Hurricane Betsy inundated the Gulf Coast.⁷¹ In 1993, the upper Mississippi and its tributaries flooded 17,000 square miles, killing fifty people, damaging 70,000 buildings, and causing economic damages exceeding \$12 billion.⁷² After the 1993 flood, a "blue ribbon" interagency committee headed by former Army Brigadier General Gerald Galloway recommended a shift in floodplain management away

63. *See id.* at 2.

64. Davidson, *supra* note 61.

65. For a more extensive discussion, see Zellmer, *supra* note 15, at 312-19.

66. *See* WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, *supra* note 62, at 3. Of the sixty-seven native fish species in the mainstream river, fifty-one are vulnerable in all or part of their historical range. *Id.*

67. *See* MISS. VALLEY DIV., U.S. ARMY CORPS OF ENG'RS, MISSISSIPPI RIVER NAVIGATION, available at <http://www.mvn.usace.army.mil/PAO/BRO/Navigation.pdf>; U.S. Army Corps of Eng'rs, The Mississippi River and Tributaries Project, www.mvn.usace.army.mil/pao/bro/miss_trib.htm (last visited Apr. 2, 2007); *see also* Nat'l Research Council, Ocean Studies Board, Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana 36 (2006), available at http://www.nap.edu/openbook.php?record_id=11476&page=36.

68. *See* BARRY, *supra* note 48, at 89-91; ROBERT KELLEY SCHNEIDERS, UNRULY RIVER: TWO CENTURIES OF CHANGE ALONG THE MISSOURI 222-51 (1999).

69. *See* BARRY, *supra* note 48, at 13-17.

70. *See* LAMBRECHT, *supra* note 58, at 72-73 (describing the Great Flood of 1943); SCHNEIDERS, *supra* note 68, at 187-98 (describing the Great Flood of 1952).

71. Beth Davidson, Note, *How Quickly We Forget: The National Flood Insurance Program and Floodplain Development in Missouri*, 19 WASH. U. J.L. & POL'Y 365, 367 (2005).

72. *Id.* at 365.

from levees to non-structural responses, such as wetland restoration.⁷³ Although his recommendations were widely applauded, they have been largely ignored in practice.⁷⁴

For most readers today, the disastrous socio-economic impacts of the nation's failed flood-control policies were vividly illustrated by the losses of human life and property stemming from Hurricane Katrina in the fall of 2005.⁷⁵ By August 31, 2005, eighty percent of New Orleans was under water as a result of the failure of levees designed to hold back Lake Pontchartrain.⁷⁶ The levees gave way under the combination of heavy rainfall, strong winds, and storm surges,⁷⁷ resulting in 1,300 deaths, more than \$100 billion in property damage, and the nation's largest housing crisis since World War II.⁷⁸ According to the insurance industry, as of January 2006, total economic losses attributed to Hurricane Katrina were thirty percent higher than economic losses due to the destruction of the World Trade Center on September 11, 2001.⁷⁹ In early 2006, federal officials announced that reconstructing the levees would cost approximately \$10 billion.⁸⁰

73. See INTERAGENCY FLOODPLAIN MGMT. REVIEW COMM., EXEC. OFFICE OF THE PRESIDENT, SHARING THE CHALLENGE: FLOODPLAIN MANAGEMENT INTO THE 21ST CENTURY 5-7 (1994).

74. Scott Faber, *Flood Policy and Management: A Post-Galloway Progress Report*, RIVER VOICES, Summer 1997, at 1, 7, available at <http://www2.rivernet.org/library/rv1997v8n2.pdf>; cf. Thomas A. Birkland et al., *River Ecology and Flood Hazard Mitigation*, NAT. HAZARDS REV., Feb. 2003, at 46, 46 (concluding that continuing policies favoring structural mitigation “fail to protect lives and property while also contributing to the degradation of the riverine environment”); Jan Sendzimir et al., *Adaptive Understanding and Management for Floods*, at 15, <http://www.adaptivemanagement.net/Flooding.doc> (describing an exceptional post-flood systems approach in Minnesota where “flood-damage reduction and restoration of ecosystem services are being given separate but equal consideration”).

75. See *Hurricanes Katrina and Rita*, NEWS HIGHLIGHTS (Nat'l Climatic Data Ctr., Asheville, N.C.), Fall 2005, at 1, 1, available at http://www.ncdc.noaa.gov/oa/about/NOAA_Newsletter4.pdf (describing Hurricane Katrina and Hurricane Rita, which followed closely on Katrina's heels, as part of the most volatile Atlantic hurricane season on record).

76. *Id.*

77. *Id.*

78. See Spencer S. Hsu, *Waste in Katrina Response Is Cited; Housing Aid Called Inefficient in Audits*, WASH. POST, Apr. 14, 2006, at A01; *Death Toll from Katrina Likely Higher than 1,300*, ASSOCIATED PRESS, Feb. 10, 2006, available at <http://www.msnbc.msn.com/id/11281267/>; Nat'l Climatic Data Ctr., *Billion Dollar U.S. Weather Disasters*, <http://www.ncdc.noaa.gov/oa/reports/billionz.html> (last visited Feb. 18, 2006) (characterizing Katrina as “the most expensive natural disaster in U.S. history”).

79. Ted Rekerdres, *Insurance Industry Addresses Katrina Losses*, TEA & COFFEE TRADE J., Jan. 20, 2006, at 48, 48.

80. Peter Whoriskey & Spencer S. Hsu, *Wait Ends on Rules for Katrina Rebuilding; \$2.5 Billion More for Levees Also Proposed*, WASH. POST, Apr. 13, 2006, at A01.

Levee expenditures might provide a short-term solution to the immediate needs of coastal residents, but levee reconstruction accomplishes nothing for the overall well-being of the Mississippi River basin. Fertilizers and polluted run-off from crop production and animal-feeding operations in the floodplains of the Missouri and the upper Mississippi dump into the rivers, rush down the Mississippi, and shoot out into the Gulf. The deep, fast navigational channel and levees aid and abet this process.⁸¹ Oyster beds, commercial fisheries, and interior marshes are being choked to death by nutrients, and the Gulf at the mouth of the Mississippi is a “‘dead zone’ of oxygen-starved water that is larger than the state of Delaware.”⁸²

Ironically, the Mississippi Delta needs the upper basin’s sediments. Prior to the construction of dams and reservoirs, the Missouri River carried approximately 140 million tons of sediment per year downstream past Sioux City, Iowa, but in the post-dam era, this has been reduced to about four million tons per year.⁸³ Soils more slowly transported and delivered at the proper time, place, and manner and filtered through oxbows and riparian wetlands could eventually replenish the coastal marshes of the Delta and provide essential nesting and spawning habitats for local imperiled fish and bird species.⁸⁴ Coastal marshes serve as “horizontal levees” that both nurture the Gulf’s legendary seafood industry and absorb storm surges,⁸⁵ but these natural levees are rapidly disappearing. Since the 1980s, losses to development, navigation, and flood-control devices, as well as oil and gas canals, average twenty to twenty-five square miles per year.⁸⁶ Before Hurricane Katrina hit, between New Orleans and the Gulf, there were still about eighty miles of marsh that provided at least a six-foot

81. See Houck, *supra* note 56, at 56.

82. *Id.* at 42.

83. WATER SC. & TECH. BD., NAT’L RESEARCH COUNCIL, *supra* note 62, at 2.

84. See John H. Davidson, *Multiple-Use Water Resources Development Versus Natural River Functions: Can the WSRA and WRDA Coexist on the Missouri River?*, 83 NEB. L. REV. 362, 366 (2004) (citing U.S. FISH & WILDLIFE SERV., BIOLOGICAL OPINION ON THE OPERATION AND MAINTENANCE OF THE MISSOURI RIVER MAIN STEM RESERVOIR SYSTEM, OPERATION AND MAINTENANCE OF THE MISSOURI RIVER BANK STABILIZATION AND NAVIGATION PROJECT, AND OPERATION OF THE KANSAS RIVER RESERVOIR SYSTEM 120 (2000)); WATER SC. & TECH. BD., NAT’L RESEARCH COUNCIL, *supra* note 62, at 123; U.S. Geological Survey, Upper Midwest Environmental Sciences Center, *supra* note 53 (explaining that today’s sedimentation patterns, altered by the construction of locks and dams on the river, have caused severe ecological degradation).

85. See Houck, *supra* note 56, at 35.

86. See CHRISTOPHER HALLOWELL, HOLDING BACK THE SEA: THE STRUGGLE FOR AMERICA’S NATURAL LEGACY ON THE GULF COAST 11-38 (2001) (describing coastal development and the loss of coastal marshlands and communities); Houck, *supra* note 56, at 35 (citing LA. COASTAL WETLANDS CONSERVATION & RESTORATION TASK FORCE & WETLANDS CONSERVATION & RESTORATION AUTH., COAST 2050: TOWARDS A SUSTAINABLE COASTAL LOUISIANA 551 (1998)).

reduction in storm surge.⁸⁷ Far less remains today.⁸⁸ But navigation and floodplain development are still top priorities on both river systems, requiring deep channels, bank stabilization, and vertical, manmade levees.

III. STASIS, ISOLATION, AND COLLAPSE

Is it possible for long-standing societal goals for these managed rivers to evolve? For evolve they must, if we care about restoring and sustaining resilient human and ecological communities. The horrific damages wrought by Hurricane Katrina provide a powerful stimulus to alter our river-management priorities.

Ever since the earliest days of our nation, undue confidence has been placed in the “rational” disciplines of engineering and economics to solve our water-resource problems.⁸⁹ The apparent objectivity of these two fields lulls our decisionmakers into complacency with the happy delusion that hard choices about whether and where to develop need not be made; after all, it is just a matter of doing things smarter.⁹⁰

For years, the only science brought to bear on the Missouri and Mississippi Rivers has been that of civil engineering.⁹¹ One nice thing about engineering is that it appears to be so certain.⁹² Engineering reflects the laws of mathematics and physics;⁹³ as such, engineering solutions are tangible and concrete—literally and figuratively. In contrast, under the scientific method utilized in ecology, biology, and other earth sciences, a thesis may stand only until subsequent revelations push it aside.⁹⁴ Uncertainty is the name of the game. In the hurly-burly of river

87. See Houck, *supra* note 56, at 35.

88. See Press Release, U.S. Geological Survey, Nat’l Wetlands Research Ctr., USGS Reports Latest Land Change Estimates for Louisiana Coast (Oct. 3, 2006), *available at* http://www.nwrc.usgs.gov/releases/pr06_002.htm. The 2005 hurricane season converted 217 square miles of Louisiana’s marshland into open water. *Id.* In comparison, Louisiana lost 1,900 total square miles of coastal lands between 1932 and 2000. *Id.*

89. See Tarlock, *supra* note 24, at 1315-16.

90. See Houck, *supra* note 56, at 51-52 (describing the ineffectiveness of levees).

91. *Id.* at 52; see Davidson, *supra* note 61.

92. Houck, *supra* note 56, at 55. Nineteenth-century engineer James Eads boasted that

every atom that moves onward in the river . . . is controlled by [engineering] laws as fixed and certain as those which direct the majestic march of the heavenly spheres. . . . [T]he engineer needs only to be assured that he does not ignore the existence of any of these laws, to feel positively certain of the result he aims at.

BARRY, *supra* note 48, at 77.

93. See Houck, *supra* note 56, at 55.

94. *Id.* For an in-depth look at the role of science in endangered species protection, see Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act’s Best Available Science Mandate*, 34 ENVTL. L. 397, 408-11 (2004).

management, this means that ecologists and biologists, charged with protecting migratory birds, endangered species, and ecological functions, fall by the wayside. For decisionmakers, uncertainty is an impediment to credibility, to finality, and to funds for the home district. But uncertainty can also be used as a shield for the decisionmaker who wishes to preserve the status quo by doing nothing.⁹⁵

Reliance on engineering is deeply embedded in federal water management because it is deeply embedded in the mindset of the Corps of Engineers. The Corps was the first federal agency to involve itself in water affairs.⁹⁶ It traces its lineage back to 1775, when the Continental Congress appointed a Chief of Engineers of the Continental Army under General George Washington.⁹⁷ The original Corps served as the military's engineering and construction arm until the end of the Revolutionary War in 1783.⁹⁸ Congress reestablished the Corps within the U.S. Army in 1802.⁹⁹

The Rivers and Harbors Act of 1899 was one of the earliest explicit congressional expressions of strong federal powers over an array of activities connected with navigable waters.¹⁰⁰ It gives the Corps broad authority to prevent obstructions to navigation and to promote the federal navigational servitude, including transportation improvement and flood control efforts on mainstems and tributaries of navigable waters.¹⁰¹ Other than constructing navigational enhancements and clearing navigational impediments, the federal government took little or no responsibility for water or water-dependent resources until the New Deal. Additionally, it routinely proclaimed its deference to the states when it came to water-resources management.¹⁰²

95. Sandra Zellmer, *A Preservation Paradox: Political Prestidigitation and an Enduring Resource of Wildness*, 34 ENVTL. L. 1015, 1028 (2004).

96. See Corps of Engineers Overview, *supra* note 18.

97. See Martin Reuss & Charles Hendricks, U.S. Army Corps of Engineers: Brief History, <http://www.usace.army.mil/history/brief.htm> (last visited Feb. 18, 2007). Its authorities were expanded by subsequent enactments and Executive Order. See WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, NEW DIRECTIONS IN WATER RESOURCES PLANNING FOR THE U.S. ARMY CORPS OF ENGINEERS, 10-17 (1999), available at <http://www.nap.edu/catalog/6128.html>.

98. See Reuss & Hendricks, *supra* note 97.

99. Act of Mar. 16, 1802, ch. 9, §§ 26-28, 2 Stat. 132, 137.

100. See 33 U.S.C. §§ 401-418 (2000).

101. *Id.* §§ 401, 403, 407; see *United States v. Standard Oil Co.*, 384 U.S. 224, 229-30 (1966) (finding that gasoline discharged through a valve into the St. Johns River came within the Act's ban on the deposit of "refuse matter"); *United States v. Republic Steel Corp.*, 362 U.S. 482, 483-85 (1960) (enjoining companies from placing industrial deposits in the Calumet River, a tributary of the Mississippi, because the deposits reduced the depth of the channel of the river and created an obstruction).

102. See Reed D. Benson, *Deflating the Deference Myth: National Interests vs. State Authority Under Federal Laws Affecting Water Use*, 2006 UTAH L. REV. 241, 242. However, there are good

The Great Mississippi Flood of 1927 marked a watershed moment when the fallacy of letting local governments and powerful individuals take the lead for water-resources management—saving “Main Street with Main Street,” as President Hoover once remarked—was laid bare.¹⁰³ Citizens cried out for federal leadership, technology, and financial resources to control floods and to remediate their devastating effects.¹⁰⁴ The Flood Control Act of 1928 proclaimed that the federal government would take full responsibility for the Mississippi River.¹⁰⁵ The Act established “a precedent of direct, comprehensive, and vastly expanded federal involvement in local affairs [and] a major shift in what Americans considered the proper role and obligation of the national government.”¹⁰⁶ Existing local levee districts, however, were left with the lion’s share of responsibility for maintaining floodwalls and pumps in New Orleans.¹⁰⁷

Congress enacted a series of Flood Control Acts between 1928 and 1965.¹⁰⁸ Along with these Acts, appropriations for specified navigational enhancements, dams, levees, and other engineering structures have been provided through the years in various Water Resources Development Acts.¹⁰⁹ Many of these projects are “earmarks,” cherry-picked and championed by individual congressional members to benefit their home districts.¹¹⁰ Hurricane Betsy, a catastrophic hurricane in 1965, resulted in one such enactment.¹¹¹

reasons to question “the conventional wisdom of federal deference to States in water resource matters.” *Id.* at 243 (citing Amy K. Kelley, *Staging a Comeback: Section 8 of the Reclamation Act*, 18 U.C. DAVIS L. REV. 97, 117 n.98 (1984)); David H. Getches, *The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States’ Role?*, 20 STAN. ENVTL. L.J. 3, 6 (2001).

103. See BARRY, *supra* note 48, at 375.

104. See *id.* at 374.

105. Flood Control Act of 1928, Pub. L. No. 70-391, 45 Stat. 534 (codified at 33 U.S.C. § 702 (2000)); see also BARRY, *supra* note 48, at 375.

106. BARRY, *supra* note 48, at 407.

107. See John A. Lovett, *Batture, Ordinary High Water, and the Louisiana Levee Servitude*, 69 TUL. L. REV. 561, 562 & n.2 (1994); Richard P. Wolfe, *The Appropriation of Property for Levees: A Louisiana Study in Taking Without Just Compensation*, 40 TUL. L. REV. 233, 236-38 (1966).

108. See, e.g., Flood Control Act of 1936, Pub. L. No. 74-738, 49 Stat. 1570 (codified at 33 U.S.C. § 701(a) (2000)); Flood Control Act of 1944, Pub. L. No. 78-534, 58 Stat. 887 (codified at 33 U.S.C. § 701-1 (2000)); Flood Control Act of 1965, Pub. L. 89-298, 79 Stat. 1073.

109. See, e.g., Water Resources Development Act of 1986, Pub. L. No. 99-662, 100 Stat. 4082 (codified at 33 U.S.C. § 2201 (2000)); Water Resources Development Act of 1990, Pub. L. No. 101-640, 104 Stat. 4604 (codified at 33 U.S.C. § 2201 (2000)); Water Resources Development Act of 2000, Pub. L. No. 106-541, 114 Stat. 2572 (codified at 33 U.S.C. § 2201 (2000)).

110. See *infra* note 174 and accompanying text (describing “pork barrel” funding).

111. Southeast Hurricane Disaster Relief Act of 1965, Pub. L. No. 89-339, 79 Stat. 1301 (allocating up to \$70 million for disaster relief).

In Betsy's wake, Congress authorized the Lake Pontchartrain and Vicinity Hurricane Protection Project, a massive system of levees intended to protect New Orleans.¹¹² The authorization for the Lake Pontchartrain Project made the Corps responsible for design and construction, with the federal government paying seventy percent of the cost and the state and local entities covering the balance.¹¹³ Under agreements between the Corps and the New Orleans levee districts, the local districts are responsible for post-construction operation, maintenance, and repair of the levees.¹¹⁴ The levee project was chosen over an alternate system of barriers because it cost less and, according to the Corps, had “fewer detrimental effects on Lake Pontchartrain's environment.”¹¹⁵ In hindsight, this was a poor choice, but the die had been cast years before with the policies expressed in the Flood Control Act of 1936 (FCA).¹¹⁶

The FCA is particularly notable because it explicitly recognized the federal responsibility for flood-control measures nationwide.¹¹⁷ It failed, however, to impose any significant parameters on the Corps' selection and construction of flood-control projects.¹¹⁸ So long as the Corps is able to secure funding from its benefactors in Congress, the FCA affords it unbridled discretion to conduct any project it chooses whenever “the benefits to whomsoever they may accrue are in excess of the estimated

112. DONALD T. HORNSTEIN ET AL., *CTR. FOR PROGRESSIVE REFORM, BROKEN LEVEES: WHY THEY FAILED* 3 (2005) (citing *Hurricane Protection Plan for Lake Pontchartrain and Vicinity: Hearing Before the Subcomm. on Water Resources of the H. Comm. on Public Works and Transportation*, 95th Cong. 20 (1978)), available at http://www.Progressivereform.org/articles/CPR_special_Levee_Report.pdf.

113. *Hurricane Protection—Statutory and Regulatory Framework for Levee Maintenance and Emergency Response for the Lake Pontchartrain Project: Hearing Before the S. Comm. on Homeland Security & Governmental Affairs*, 109th Cong. 3 (2005) (statement of Anu K. Mittal, Director, Natural Resources & Environment, U.S. Gov't Accountability Office), available at <http://www.gao.gov/new.items/d06322t.pdf>.

114. *Id.* at 3.

115. HORNSTEIN ET AL., *supra* note 112, at 5 (quoting U.S. GEN. ACCOUNTING OFFICE, *IMPROVED PLANNING NEEDED BY THE CORPS OF ENGINEERS TO RESOLVE ENVIRONMENTAL, TECHNICAL AND FINANCIAL ISSUES ON THE LAKE PONTCHARTRAIN HURRICANE PROTECTION PROJECT* 2 (1982), available at <http://archive.gao.gov/d42t14/119206.pdf>). Within days of Hurricane Katrina, pundits claimed that environmentalists' litigation had prevented the implementation of the barrier plan. *Id.* at 1. The case in question, *Save Our Wetlands v. Rush*, No. 75-3710, slip op. (E.D. La. Dec. 30, 1977), established that the environmental impact statement (EIS) for the Corps' proposal was inadequate under the National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(2)(C) (2000), due to reliance on obsolete studies. HORNSTEIN ET AL., *supra* note 112, at 10-11. An injunction was issued against the Corps, but levee construction was allowed to continue. *Id.* at 11. The Corps subsequently reevaluated its options and chose the levee project. *Id.* at 12.

116. 33 U.S.C. § 701a (2000).

117. *See id.*

118. *See id.*

costs.”¹¹⁹

On its face, this CBA directive may appear to provide a rational decisionmaking metric. By requiring that the costs and benefits of a proposed action be quantified and translated into dollar terms, CBA is said to be a neutral, unbiased method of evaluating the social effects of a proposal and exposing bad proposals that would impose ruinous social costs.¹²⁰ It has not, however, accomplished this goal in the Corps’ decisionmaking processes.

Since 1936, the Corps has spent billions of dollars on dams, reservoirs, levees, and other structures for flood control and related purposes.¹²¹ In spite of the FCA’s directive, the Corps has built numerous projects with negative cost-benefit ratios.¹²² According to Dan Tarlock, “The Corps has a long history of inflated and methodologically unsound benefit-cost analysis techniques”¹²³ There are many examples of projects where the Corps overestimated the benefits and downplayed both the social and ecological costs in order to justify construction.¹²⁴ The benefits of navigational enhancements on the Missouri to support commercial barge traffic were exaggerated “almost tenfold.”¹²⁵ In 2002, the National Research Council issued an indictment of the inflated cost-benefit methodology used by the Corps to justify replacing aging locks and dams on the upper Mississippi.¹²⁶ Judicial intervention has rarely curbed the

119. *Id.* A 1944 amendment added a savings clause for state water law, proclaiming congressional policy “to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control.” *Id.* § 701-1. This clause has been all but ignored by the courts. *See infra* notes 160-61 and accompanying text.

120. Frank Ackerman et al., *Applying Cost-Benefit to Past Decisions: Was Environmental Protection Ever a Good Idea?*, 57 ADMIN. L. REV. 155, 155 (2005).

121. Christine A. Klein, *On Dams and Democracy*, 78 OR. L. REV. 641, 679 (1999).

122. *Id.* at 679-80; *see also* MARC REISNER, *CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER* 171 (1986) (condemning the Corps’ uncompromising tactics in promoting its projects and describing it “as opportunistic and ruthless an agency as American government has ever seen”).

123. Tarlock, *supra* note 24, at 1315; *see* John H. Davidson & Thomas Earl Geu, *The Missouri River and Adaptive Management: Protecting Ecological Function and Legal Process*, 80 NEB. L. REV. 816, 859 (2001); Robert C. Lothrop, *The Misplaced Role of Cost-Benefit Analysis in Columbia Basin Fishery Mitigation*, 16 ENVTL. L. 517, 534-38 (1986).

124. *See* Oliver Houck, *Unfinished Stories*, 73 U. COLO. L. REV. 867, 939 (2002) (“In-depth and documented reports of . . . cost-benefit manipulations, false reporting, employees terminated for honesty, and humiliating servility to whatever Congress wants funded appear regularly in the media . . . with little effect.”); Daniel McCool, *The River Commons: A New Era in U.S. Water Policy*, 83 TEX. L. REV. 1903, 1906 (2005) (citing WATER SCI. & TECH. BD., NAT’L RESEARCH COUNCIL, *supra* note 97, at 67-78).

125. Klein, *supra* note 121, at 680 (citing Bruce Upbin, *A River of Subsidies*, FORBES, Mar. 23, 1998, at 86, available at 1998 WLNR 5180995).

126. *See* McCool, *supra* note 124, at 1906-07, 1918-19.

Corps' activities; deference to the agency runs high, especially when it comes to complex river-management issues.¹²⁷

As for Hurricane Katrina, the Corps' application of CBA likely exacerbated the devastation of the Gulf Coast. As a result of the Corps' failure to consider the cost of lost human lives and environmental destruction, most of the Corps' levees were situated to protect undeveloped, highly vulnerable floodplains instead of existing developments.¹²⁸ As commonly stated, hindsight is often 20/20. In considering alternatives for addressing future hurricanes in the Gulf, the Corps now admits that its traditional approach to CBA is unlikely to "'justify risk reduction measures for storms having the surge characteristics contemplated' by Congress, in part because they 'do not consider such non-economic assets as human life.'"¹²⁹

Of course, CBA is not uncommon among federal mandates; Executive Orders currently require it for all major federal regulations.¹³⁰ And of course, the Corps is not the only federal agency that can be accused of using CBA to inflate projected benefits and to minimize costs in order to favor pro-development results.¹³¹ The failures of CBA as used by the U.S. Environmental Protection Agency and other federal regulatory agencies are well-documented.

Although the benefits of health and environmental protection are vitally important, . . . the pecuniary value of the deaths and diseases avoided by reducing pollution cannot be meaningfully expressed in monetary terms. . . . The cost-benefit calculation's attempt to assign monetary values distorts, misrepresents, and narrows the priceless values of life, health, and nature, and belittles the widespread concern

127. See, e.g., *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 378 (1989); *Am. Rivers Inc. v. U.S. Army Corps of Eng'rs (In re Operation of the Mo. River Sys. Litig.)*, 421 F.3d 618 (8th Cir. 2005), cert. denied, 126 S. Ct. 1879 (2006), 126 S. Ct. 1880 (2006), and 126 S. Ct. 1880 (2006); see also Houck, *supra* note 124, at 939 ("Immune from the president and in large part from the courts, . . . there is no reason, fiscal, environmental, or otherwise, that appears able to stop [the Corps and the Bureau of Reclamation].") (footnote omitted)).

128. Michael Grunwald, *Par for the Corps: A Flood of Bad Projects*, WASH. POST, May 14, 2006, at B01.

129. Schleifstein, *supra* note 12, at 1.

130. Exec. Order No. 12,866, 3 C.F.R. 638 (1993), reprinted in 5 U.S.C. § 601 app. at 557-61 (2000).

131. See Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing*, SK058 A.L.I.-A.B.A. 571, 573, 588 (2005) (describing the U.S. EPA's experiences with arsenic and asbestos regulations); Lisa Heinzerling, *Discounting Our Future*, 34 LAND & WATER L. REV. 39, 54-57 (1999) (describing use of discounting by federal agencies to inflate predicted future benefits).

for the well-being of future generations.¹³²

In practice, the use of CBA, an “intricate process accessible only to experts,”¹³³ often results in the rejection of sustainable, equitable policies.¹³⁴ Conversely, the most successful regulations enacted in this country “cleaned up the air and water, protected fragile ecosystems, and achieved great gains in public health without reliance on cost-benefit analysis, and clearly without destroying the economy.”¹³⁵ If lawmakers insisted on making all regulatory requirements meet CBA constraints, the agencies charged with administering the Clean Water Act, the Clean Air Act, and other progressive environmental statutes “would, in retrospect, have gotten the wrong answer time after time.”¹³⁶

Like excessive reliance on CBA, excessive reliance on engineering technologies can also mask bad policy choices. Like CBA, the objective, value-neutral language of engineering can cloak subjective, value-laden outcomes with a façade of respectability, allowing decisionmakers to hide behind “purportedly unquestionable . . . truths to avoid the political consequences of a potentially unpopular decision.”¹³⁷ Placing undue faith in either CBA or engineering typically stems both from a failure to appreciate the limits of these disciplines and from the desire to avoid political ownership for uncertain or unpopular outcomes.

Just as zeal for the “rational” domains of CBA and engineering technology should pose no serious impediment to the enactment of a comprehensive, holistic federal strategy, neither should zeal for federalism. The purported federal deference to state water law is not nearly as strong as one might think. The Supreme Court has not hesitated to find state law preempted when it interferes with federal navigational powers, flood control, hydropower, or vessel safety.¹³⁸ Moreover, a polyphonic view of federalism—where federal, state, tribal, and local authorities are appropriately matched with geographic and socio-economic issues in a cooperative rather than exclusive fashion—should encourage, rather than

132. Ackerman et al., *supra* note 120, at 157 (footnote omitted).

133. *Id.*

134. *See id.* at 156.

135. *Id.* (describing three case studies—the extraction of lead from gasoline, the choice not to dam the Grand Canyon for hydropower, and the regulation of exposure to vinyl chloride in the workplace—where the application of CBA would have defeated regulations that are now recognized as highly beneficial).

136. *See id.* at 192.

137. Christine A. Klein, *On Integrity: Some Considerations for Water Law*, 56 ALA. L. REV. 1009, 1058-59 (2005) (citing Wendy E. Wagner, *Congress, Science, and Environmental Policy*, 1999 U. ILL. L. REV. 181, 221); *see also supra* notes 89-95 and accompanying text (discussing pitfalls of reliance on engineering solutions to water resource problems).

138. Benson, *supra* note 102, at 252-54.

obstruct, strong leadership in conservation policy.¹³⁹

Federalism, defined generally as the extent to which state autonomy limits the exercise of federal power, is intended to promote a decentralized government that is more responsive to the needs of a diverse democratic society by preventing “capture” by industry, increasing opportunities for public involvement, and encouraging creativity and experimentation by making states compete to satisfy a highly mobile citizenry.¹⁴⁰ American federalism can be seen as a firewall to safeguard the public from dangerous, tyrannical impulses by allowing flexible, decentralized institutions to flourish.¹⁴¹ But by the same token, it can be seen as a wasteful, inefficient impediment to equitable, comprehensive planning.¹⁴² Water law demonstrates that neither of these viewpoints is entirely accurate.

From the halls of Congress to the Town Hall and from the White House to the State House, the allocation of power has been a ubiquitous theme in the allocation of water rights, the protection of water quality and riparian habitat, the conservation of wetlands, and the provision of water power and flood control. Supreme Court jurisprudence on water-related matters is replete with federalism rhetoric, but in fact, federal-state relations over water are anything but consistent.¹⁴³ According to Professor Amy Kelley, “A more accurate description is that the field is a concoction of Byzantine politics and legalistic archaeology.”¹⁴⁴

In one of the most anxiously awaited decisions of the 2006 session, the Supreme Court invoked federalism to strike a blow against wetlands conservation.¹⁴⁵ The issue in *Rapanos v. United States*¹⁴⁶ was whether the Corps and the EPA could extend federal protection to small tributaries and wetlands near, but not directly abutting, navigable waters.¹⁴⁷ The Clean Water Act covers all “waters of the United States,”¹⁴⁸ but Congress did not define that phrase.¹⁴⁹ The plurality by Justices Scalia, Roberts, Thomas, and Alito cleared the way for development of most wetlands and non-

139. See Robert A. Schapiro, *Toward a Theory of Interactive Federalism*, 91 IOWA L. REV. 243, 316 (2005) (“Federalism . . . achieves its goals not through the separation of state and national power, but through their interaction.”).

140. See Erwin Chemerinsky, *The Values of Federalism*, 47 FLA. L. REV. 499, 503-04 (1995).

141. See DONALD J. PISANI, WATER AND AMERICAN GOVERNMENT: THE RECLAMATION BUREAU, NATIONAL WATER POLICY, AND THE WEST, 1902-1935, at 295 (2002); Chemerinsky, *supra* note 140, at 525-30.

142. PISANI, *supra* note 141, at 295.

143. See Getches, *supra* note 102, at 7-8.

144. Benson, *supra* note 102, at 243 (quoting Kelley, *supra* note 102, at 117).

145. See *Rapanos v. United States*, 126 S. Ct. 2208, 2235 (2006).

146. *Id.*

147. See *id.* at 2214-15.

148. 33 U.S.C. § 1362(7) (2000).

149. See *id.* § 1362.

perennial streams.¹⁵⁰ According to Scalia, to cover these waterways would stretch the Act's coverage "beyond parody."¹⁵¹

Federalism provides only a superficial explanation for this outcome. As in a 2001 case, *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC)*,¹⁵² Justice Scalia justified his limited view of Clean Water Act power by espousing a need to preserve "primary state responsibility for ordinary land-use decisions."¹⁵³ In *SWANCC*, the Court applied an interpretive canon to strike down the Corps' so-called "migratory bird" rule that asserted jurisdiction over isolated ponds: "Where an administrative interpretation of a statute invokes the outer limits of Congress' power, we expect a clear indication that Congress intended that result."¹⁵⁴ Justice Scalia continued with this rationale in *Rapanos*:

As we noted in *SWANCC*, the Government's expansive interpretation would "result in a significant impingement of the States' traditional and primary power over land and water use. *Regulation of land use, as through the issuance of the development permits sought by petitioners in both of these cases, is a quintessential state and local power.*¹⁵⁵

Justice Scalia further explained, "We ordinarily expect a 'clear and manifest' statement from Congress to authorize an unprecedented intrusion into traditional state authority. The phrase 'the waters of the United States' hardly qualifies."¹⁵⁶

Ironically, in *Rapanos*, thirty-three states and the District of Columbia filed friend-of-the-court briefs on behalf of the United States, seeking to *maintain* broad federal power over wetlands and non-perennial streams.¹⁵⁷ Apparently, a majority of the states believe that wetlands preservation is

150. See *Rapanos*, 126 S. Ct. at 2214, 2235.

151. *Id.* at 2222. Justice Kennedy concurred in the Court's judgment but not in its reasoning. *Id.* at 2236 (Kennedy, J., concurring). He recognized that non-perennial streams and wetlands may be covered, but, to come within federal protection, he opined that regulators must make a determination that the non-perennial streams and wetlands have a significant hydrological nexus to a navigable water body. *Id.* at 2241 (citing *United States v. Riverside Bayview Homes*, 474 U.S. 121, 133 (1985)).

152. 531 U.S. 159, 173-74 (2001).

153. *Rapanos*, 126 S. Ct. at 2234.

154. *SWANCC*, 531 U.S. at 172; William Funk, *The Court, the Clean Water Act, and the Constitution: SWANCC and Beyond*, 31 *Env'tl. L. Rep. (Env'tl. Law Inst.)* 10,741, 10,758 (2001).

155. *Rapanos*, 126 S. Ct. at 2224 (emphasis added) (citation omitted) (quoting *SWANCC*, 531 U.S. at 174).

156. *Id.* (citing *BFP v. Resolution Trust Corp.*, 511 U.S. 531, 544 (1994)).

157. Brief of the States of New York et al. as Amici Curiae in support of Respondents at 14, *Rapanos v. United States*, 126 S. Ct. 2208 (2006) (No. 04-1034), 2006 WL 139208.

best accomplished by the federal government. Why, then, did the plurality opinion reject the states' reasoning? This is not about states' rights; it is about promoting development at the expense of at-risk human and ecological communities. The invocation of federalism has promoted an illusion of balance and accommodation, while in reality leaving federal, state, and tribal governments to compete with each other for monetary and political favor.

A closer look at Supreme Court jurisprudence shows that deference to states in matters touching upon river and floodplain development is by no means a foregone conclusion.¹⁵⁸ Particularly when it comes to federal navigational interests, there is no question that an inconsistent state law gives way.¹⁵⁹ In *ETSI Pipeline Project v. Missouri*,¹⁶⁰ the Court barely gave a passing reference to South Dakota's argument that a statutory savings clause for state-sanctioned water rights empowered it to convey water from a Corps' flood control reservoir to a private interest.¹⁶¹ Similarly, in *United States v. Riverside Bayview Homes*,¹⁶² the Court prioritized the Clean Water Act's goal of safeguarding the integrity of all U.S. waters, including their adjacent wetlands, over any interest the state asserted in land-use planning and development.¹⁶³ In several cases arising under the

158. See Benson, *supra* note 102, at 294 (“[T]here is no universal policy of deference that applies consistently across the many areas of federal law relating to water.”).

159. See, e.g., *United States v. Locke*, 529 U.S. 89, 108 (2000); *United States v. Alaska*, 503 U.S. 569, 579-80 (1992); *Ray v. Atl. Richfield Co.*, 435 U.S. 151, 165 (1978); *Sinnot v. Davenport*, 63 U.S. (1 How.) 227, 241 (1859); *Gibbons v. Ogden*, 22 U.S. (1 Wheat.) 1, 72-74 (1824).

160. 484 U.S. 495 (1988).

161. See *id.* at 498, 511-12; see also Benson, *supra* note 102, at 297 n.393 (remarking that the Corps' programs for improvement of navigation, flood control, and hydropower “were never subject to any form of state control” (quoting FRANK J. TRELEASE, U.S. NAT'L WATER COMM'N, FEDERAL-STATE RELATIONS IN WATER LAW 9-11 (1971))).

162. 474 U.S. 121 (1985).

163. See *id.* at 131-32. As dissenting Justices Stevens, Souter, Ginsburg, and Breyer pointed out in *SWANCC*, to deny federal jurisdiction over isolated wetlands is unfaithful to *Riverside Bayview*:

Contrary to the Court's suggestion, the Corps' interpretation of the statute does not [infringe] upon [state control] over land use. “Land use planning in essence chooses particular uses for the land; environmental regulation, at its core, does not mandate particular uses of the land but requires only that, however the land is used, damage to the environment is kept within prescribed limits.” The CWA is not a land-use code; it is a paradigm of environmental regulation. Such regulation is an accepted exercise of federal power.

Solid Waste Agency of N. Cook County v. U.S. Army Corps of Eng'rs (SWANCC), 531 U.S. 159, 191 (2001) (Stevens, J., dissenting) (citation omitted) (quoting *Ca. Coastal Comm'n v. Granite Rock Co.*, 480 U.S. 572, 587 (1987)).

Federal Power Act,¹⁶⁴ the Court found that the Act preempted state minimum streamflow requirements that might negate the Act's broad purpose—to be a national regulatory scheme promoting full development of the nation's water resources.¹⁶⁵ The Court went on to explain that the federal purpose would be best served by comprehensive planning and the consideration of impacts on “the full spectrum of commerce interests.”¹⁶⁶

Even if one believes that the control of water resources is a traditional state prerogative, it does not necessarily follow that states have some special competence that justifies deference by the federal government; indeed, “there seems to be no compelling argument that the states inherently *deserve* deference in this area.”¹⁶⁷ Certainly, there may be instances where a state is best suited to make a particular decision—such as restricting inter-basin diversion projects within the state—where relevant factors turn on internal water supplies, local economic priorities, present and future demands, and the cultural and ecological importance of protecting the basin of origin.¹⁶⁸ But there is no justification for invoking a blanket rule of deference in *all* water-related cases. Local responses are not adequate when it comes to interjurisdictional rivers threatened with multiple transboundary threats. Hurricane Katrina drives this point home. The levees failed at the weakest points, which were maintained by local levee districts with little oversight or support from the Corps.¹⁶⁹

164. 16 U.S.C. § 791a (2000).

165. See, e.g., *California v. Fed. Energy Regulatory Comm'n*, 495 U.S. 490, 492-93 (1990); see also *First Iowa Hydro-Elec. Coop. v. Fed. Power Comm'n*, 328 U.S. 152, 177-82 (1946); *United States v. Appalachian Elec. Power Co.*, 311 U.S. 377, 426 (1940) (rejecting the argument that regulation of water projects within state boundaries rests with the State unless federal regulation is directly related to navigation and remarking that “[f]lood protection, watershed development, recovery of the cost of improvements through utilization of power are likewise parts of [federal] commerce control”); Benson, *supra* note 102, at 295 (concluding that the Court reads the Federal Power Act's savings clause narrowly, in effect, “refusing any role for states that could interfere with the broader purposes of the statute”).

166. *Fed. Power Comm'n v. Union Elec. Co.*, 381 U.S. 90, 101 (1965). In *California v. United States*, 438 U.S. 645 (1978), the Court distinguished the federal Reclamation Act of 1902, which expressly requires the Bureau of Reclamation “to proceed in conformity with” state laws governing use of water from federal reclamation projects. *Id.* at 674-75. The refusal to allow the Bureau to adversely affect state-sanctioned private water rights is perhaps a lone exception to the general pattern of strong federal control. See Benson, *supra* note 102, at 242-43 (noting that the Court has issued its strongest proclamations of deference for state decisions regarding water rights in cases addressing reclamation).

167. Benson, *supra* note 102, at 314 (emphasis added).

168. *Id.*

169. See Carns, *supra* note 9; Sanders, *supra* note 10.

IV. TIPPING POINTS

The various Flood Control Acts¹⁷⁰ and Water Resources Development Acts¹⁷¹ passed between 1928 and today have been stacked one upon another by successive congressional sessions with little to no integration. These statutes provide wide discretion to the Corps to conduct construction in the name of just about anything, however loosely tied to navigation or flood prevention.¹⁷² Rather than following a rational, coordinated strategy, the Corps' activities are governed by the "aggregate sum" of whatever individual congressional members want.¹⁷³ Invariably, each member wants something that sends money and jobs to his or her own district.¹⁷⁴

On both the Missouri and Mississippi Rivers, the law has failed to address the needs of human and ecological communities. Concerning the Missouri, upper basin states are pitted against lower basin states in the courts, and both have had their run-ins with federal agencies. The Corps stands at the center of the controversy, with the states, environmental groups, and commercial associations demanding contradictory and even mutually exclusive responses in river operations.¹⁷⁵ The stakes are high. Three federally-protected species hang in the balance, along with recreational and commercial interests related to shipping, tourism, and sport fisheries.¹⁷⁶ The impetus for the latest bout of litigation has been the Corps' revision of its Master Manual for river operations under the Flood Control Act of 1944.¹⁷⁷ Dozens of orders from numerous federal courts have ensued.¹⁷⁸ The sum of this effort is that the Corps has received the imprimatur to exercise its broad discretion to determine how best to fulfill the "primary" navigational and flood control purposes of the FCA, notwithstanding ecological imperatives.¹⁷⁹ In short, the Corps continues to

170. See *supra* note 108.

171. See *supra* note 109.

172. See *ETSI Pipeline Project v. Missouri*, 484 U.S. 495, 512 (1988); *South Dakota v. Ubbelohde*, 330 F.3d 1014, 1027 (8th Cir. 2003).

173. *BABBITT*, *supra* note 14, at 52.

174. See *McCool*, *supra* note 124, at 1903, 1916 (noting the intransigence of "pork-barrel politics and special-interest welfare" and identifying "political tradition, fueled by pork-barrel politics and special interest welfare" as obstructions to progressive legislation); *Tarlock*, *supra* note 24, at 1316-17 (describing "pork barrel" politics of the Corps).

175. See *Am. Rivers, Inc. v. U.S. Army Corps of Eng'rs (In re Operation of Mo. River Sys. Litig.) (Mo. River Sys. Litig.)*, 421 F.3d 618, 624-25 (8th Cir. 2005); *Ubbelohde*, 330 F.3d at 1021; *Am. Rivers v. U.S. Army Corps of Eng'rs*, 271 F. Supp. 2d 230, 251-52 (D.D.C. 2003). For the etiology and outcomes of these cases, see *Zellmer*, *supra* note 15, at 324-33.

176. *Zellmer*, *supra* note 15, at 308.

177. *Id.*; see also *LAMBRECHT*, *supra* note 58, at 117-36 (describing the battle between birds, barges, states, and federal agencies).

178. *Zellmer*, *supra* note 15, at 308; see also *LAMBRECHT*, *supra* note 58, at 287-305 (providing a behind-the-scenes look at Missouri River litigation).

179. See *Mo. River Sys. Litig.*, 421 F.3d at 631 ("[T]he FCA . . . allows the Corps to decide

enjoy great latitude and uses it to maintain the status quo for the benefit of entrenched, parochial interests rather than long-term ecological needs.

Concerning the Mississippi, post-Katrina litigation has blossomed. Lawsuits have been filed against both the Corps and the local levee districts for property damage and loss of life caused by the failed levee system and pumps.¹⁸⁰ Louisiana Governor Kathleen Blanco has sued in federal court to prevent the United States from awarding mineral leases in the Gulf, alleging that the federal government failed to properly analyze and mitigate the adverse effects of oil and gas exploration to Louisiana's coastline in light of damage from Hurricane Katrina.¹⁸¹ Homeowners have filed class action lawsuits against insurers for denying coverage for damages resulting from the levee failures.¹⁸² Residents of Orleans, Bernard, and Jefferson Parishes have sued various oil companies for damages to coastal marshes caused by their canals and pipelines.¹⁸³ Last but not least, citizens' groups have asserted Clean Water Act¹⁸⁴ and National Environmental Policy Act¹⁸⁵ claims against the Corps to prevent it from issuing an emergency permit to allow the dumping of hurricane-related demolition debris near a minority community in New Orleans East.¹⁸⁶

Throughout these trials and travails, one dominant theme has emerged—the failure to replace ill-suited and outdated human strategies in favor of long-term ecosystem needs. When the Flood Control Acts were adopted, navigational hopes were high and “ecosystem” was barely a recognized concept among scientists, much less policy-makers. These Acts

how best to support the primary interest of navigation in balance with other interests” and may require the Corps to elevate navigation over endangered species).

180. See John P. Manard, Jr. et al., *Katrina's Tort Litigation: An Imperfect Storm*, 20 NAT. RESOURCES & ENV'T 31, 33-35 (2006).

181. Complaint for Declaratory & Injunctive Relief at 1-2, 19, *Blanco v. Burton*, No.06-3813 (E.D. La. July 20, 2006), 2006 WL 2430359, available at <http://www.gov.state.la.us/assets/docs/PDFs/LS200Complaint.pdf> (alleging violations of the NEPA, the Coastal Zone Management Act, and the Outer Continental Shelf Lands Act).

182. Mitchell F. Crusto, *The Katrina Fund: Repairing Breaches in Gulf Coast Insurance Levees*, 43 HARV. J. ON LEGIS. 329, 330-31 (2006).

183. See *Barasich v. Columbia Gulf Transmission Co.*, 467 F. Supp. 2d 676, 691-93 (E.D. La. 2006) (dismissing negligence claims on grounds that defendants had no duty to these hundreds of thousands of plaintiffs to protect them from the results of coastal erosion allegedly caused by activities that were physically and proximately remote from plaintiffs and their property).

184. Federal Water Pollution Control (Clean Water) Act, 33 U.S.C. §§ 1251-1387 (2000).

185. National Environmental Policy Act of 1969, 42 U.S.C. § 4321 (2000).

186. Complaint for Declaratory & Injunctive Relief, *La. Env'tl. Action Network v. U.S. Army Corps of Eng'rs.*, No. 06-2020 (E.D. La. Apr. 18, 2006), 2006 WL 1267567. The court dismissed their claims, finding that the Corps had the discretion to authorize the permit under its previously issued “General Permit for Emergency Authorizations within the New Orleans District.” Patricia E. Salkin, *2006 Update: Environmental Justice*, SM004 A.L.I.-A.B.A. 929, 932 (2006).

express a highly discretionary multiple-use requirement that gives the Corps almost carte blanche authority to operate the rivers, with the blessing of its most powerful congressional patrons. According to George Cameron Coggins, this type of mandate is nothing but a “vacuous platitude.”¹⁸⁷ Oliver Houck puts it even more bluntly, describing multiple use as “a code word for let’er rip and Katy-bar-the-door.”¹⁸⁸ The Corps is routinely given free rein to prioritize flood control and navigation while merely considering recreation and fish and wildlife needs.¹⁸⁹

This is not to say that the underlying objectives of the Flood Control Acts were way off base at the time of enactment. Federal flood control efforts have served laudable objectives by protecting vulnerable communities. But developing the floodplain and armoring the rivers’ banks has spawned a vicious, deadly cycle. Floods happen. Flood damage and losses to homes and commercial enterprises follow. Disaster relief, typically comprised of federal payments and more federal flood control projects, comes right on the heels of the flood. Next come renewed encroachment and development in the floodplain, now seen as safely behind the new flood control projects. Then comes another flood, and the cycle repeats itself.¹⁹⁰

Hurricane Katrina provides a wake-up call and a call to action. According to former Secretary of Interior Bruce Babbitt, law, like a river engaged in avulsion, will occasionally make “a clean break, abandoning the old channel to create a new course.”¹⁹¹

Crisis can open windows of opportunity and spawn long-lasting solutions that transcend immediate pressures and political maneuvering.

187. George Cameron Coggins, *Of Succotash Syndromes and Vacuous Platitudes: The Meaning of “Multiple Use, Sustained Yield” for Public Land Management*, 53 U. COLO. L. REV. 229, 229 (1982); see also Zellmer, *supra* note 95, at 1034-35 (assessing arguments that the MUSY standard is outmoded).

188. Houck, *supra* note 56, at 37.

189. See *Am. Rivers, Inc. v. U.S. Army Corps of Eng’rs (In re Operation of the Mo. River Sys. Litig.)*, 421 F.3d 618, 629 (8th Cir. 2005); *South Dakota v. Ubbelohde*, 330 F.3d 1014, 1030-31 (8th Cir. 2003). For a description of the judicial role in reviewing Corps’ decisions, see Tarlock, *supra* note 24, at 1313-15, 1321-24.

190. Houck, *supra* note 56, at 22. Houck describes the relentless press of development, protected by levees, dikes, dredges and pumps, as walling off the environment and then feeding it “through the bars of diversion structures like some beast in a zoo.” *Id.* at 42.

191. Bruce Babbitt, Sec’y of Interior, *Western Water Policy—From Reclamation to Restoration*, Remarks at the University of Colorado Natural Resource Law Center’s Program on Western Water Law and Policy (June 8, 1999), available at <http://www.doi.gov/news/archives/speeches&articles/univ.htm>. The inherent variability and unpredictability of river systems teaches us “to pay attention to the realities of the natural world and to be open to observing and adapting to nature’s vicissitudes rather than denying or trying to control them.” Getches, *supra* note 57, at 8; see Judy L. Meyer, *Changing Concepts of System Management*, in WATER SCI. & TECH. BD., NAT’L RESEARCH COUNCIL, SUSTAINING OUR WATER RESOURCES 78, 78 (1993), available at http://print.nap.edu/pdf/0309049482/pdf_image/78.pdf.

The smoldering Cuyahoga River in Ohio provided momentum for the enactment of the federal Clean Water Act of 1972.¹⁹² The discovery of toxic wastes seeping into people's basements and schoolyards at Love Canal prompted the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980.¹⁹³ The highly publicized release of deadly chemicals from a Union Carbide facility in Bhopal, India led to the Emergency Planning and Community Right-to-Know Act of 1986.¹⁹⁴ The 1989 wreck of the *Exxon-Valdez* broke the long-running impasse over the federal Oil Pollution Act, enacted in 1990.¹⁹⁵

V. ADAPTATION AND RESILIENCE: AN INTERIOR RIVERS ECOSYSTEM ACT

The first step toward crafting and eventually enacting an Interior Rivers Ecosystem Act is to define the end goal. This is not terribly difficult. Sustaining the natural functioning and resilience of the river systems for the human and ecological communities that rely on them must be the overarching objective. Tailoring our actions to achieve that goal will be the true challenge.

On the Missouri, the Endangered Species Act¹⁹⁶ provided the motivation to bring the science of ecology to the table and to develop a conservation plan.¹⁹⁷ The earth sciences came to a consensus: Restore and maintain ecological and human communities by restoring a semblance of the natural flow regime.¹⁹⁸ The Corps, however, resisted this move, as did its downstream allies who insist on maintaining lower basin flows and the minimal commercial barge traffic below Omaha.¹⁹⁹

If the rivers were to be managed to replicate the natural flow regime,

192. Federal Water Pollution Control (Clean Water) Act, 33 U.S.C. §§ 1251–1387 (2000); William L. Andreen, *Water Quality Today—Has the Clean Water Act Been a Success?*, 55 ALA. L. REV. 537, 565 n.195 (2004). For a detailed account of some of the events leading to passage of the Act, see Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 FORDHAM ENVTL. L.J. 89, 94–106 (2002).

193. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601–9675 (2000); see WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW 682 (2d ed. 1994).

194. Emergency Planning and Community Right-to-Know Act, 42 U.S.C. §§ 11001-11050 (2000); U.S. EPA, EPCRA Statute, Regulations & Enforcement, <http://www.epa.gov/compliance/civil/epcra/epcraenfstareq.html> (last visited Feb. 19, 2007).

195. Oil Pollution Act of 1990, 33 U.S.C. §§ 2701-2762 (2000); U.S. EPA, Oil Pollution Act Overview, <http://www.epa.gov/oilspill/opaover.htm> (last visited Feb. 19, 2007).

196. Endangered Species Act of 1973, 16 U.S.C. §§ 1531-1544 (2000).

197. Davidson, *supra* note 61.

198. WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, *supra* note 62, at 83-85.

199. See Zellmer, *supra* note 15, at 349-57.

navigation will be reduced. No commercial movement on the Missouri River is possible below 30,000 cubic feet per second, which means there will be no barges on some stretches of the rivers in late summer.²⁰⁰ Yet, on the Missouri alone, the Corps itself acknowledged that the \$2-3 million loss in navigational benefits would be more than offset by increases in ecosystem services.²⁰¹ The National Research Council estimated that recreational enhancement and other tangible, easily monetized benefits of a restored flow regime would amount to more than \$9 million a year, not to mention the value of other, less readily monetized long-term ecosystem benefits.²⁰² Highlighting the hydrological connection between the Missouri and Mississippi Rivers, the Council also noted that restored flows on the Missouri could enhance ecosystem services such as soil fertility and sediment transport throughout the system, assisting in the restoration of the Delta.²⁰³

This is an appropriate juncture to acknowledge that there may be a subsidiary role for CBA in the Corps' activities, but CBA must be directed and applied in a candid manner that acknowledges uncertainties and accurately reflects the full range of social and ecological costs as well as values provided by an intact, flowing river system. A strong cautionary note is in order. Even where Congress has attempted to temper the application of CBA with environmental considerations, the power and persuasiveness of conventional CBA has won the day. Since 1990, the Corps has been required to "include environmental protection as one of [its] primary missions,"²⁰⁴ but this hopelessly vague directive has been unenforceable in court.²⁰⁵ Even where Congress has explicitly prioritized ecological needs over economic gains, success is not inevitable. By way of example, the Northwest Power Act²⁰⁶ directs the Northwest Power Planning Council to favor biological outcomes over economics.²⁰⁷ Only when recovery measures are equally effective in satisfying biological goals

200. See WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, *supra* note 62, at 92.

201. See *Am. Rivers v. U.S. Army Corps of Eng'rs*, 271 F. Supp. 2d 230, 261 (D.D.C. 2003) (citation omitted); WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, *supra* note 62, at 105.

202. WATER SCI. & TECH. BD., NAT'L RESEARCH COUNCIL, *supra* note 62, at 105.

203. *Id.* at 2-3, 11.

204. 33 U.S.C. § 2316(a) (2000); see also Tarlock, *supra* note 24, at 1307-08 (noting that the Corps accepts the notion of environmental stewardship, but its "environmental mission remains undeveloped").

205. See *Raymond Proffitt Found. v. U.S. Army Corps of Eng'rs*, 175 F. Supp. 2d 755, 765-68 (E.D. Pa. 2001) (holding that a failure to consider environmental protection was not reviewable because Congress provided no guidance on how this requirement was to be fulfilled), *aff'd on other grounds*, 343 F.3d 199 (3d Cir. 2003).

206. Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. §§ 839-839h (2000).

207. Lothrop, *supra* note 123, at 547-50.

do the relative costs of alternative measures become relevant.²⁰⁸ The Act also lowers the burden of proof by requiring that fish recovery programs “be based only on ‘best available scientific knowledge,’ not scientific certainty.”²⁰⁹ These provisions sound ideal in theory, but according to the Ninth Circuit, the Act has not lived up to its promise.²¹⁰ The reason is that the federal agencies in charge of operating dams along the Columbia River, one of which happens to be the Corps, “insist upon judging the justifiability of remedial efforts by cost-benefit analysis.”²¹¹ Meanwhile, ever more salmon and steelhead species are being listed as endangered or threatened.²¹²

The question remaining for our federal legislators is how to adapt the law to respond to the lessons of Hurricane Katrina in a fashion that both places power and responsibility at appropriate levels of government and synthesizes governmental conduct in areas of overlapping authority. The answer will surely require replacing the current hodgepodge of highly discretionary Flood Control Acts coupled with piecemeal funding of favored projects through Water Resource Development Acts with a holistic, organic act for the entire basin—an Interior Rivers Ecosystem Act.²¹³ Programmatic enactments that create or empower administrative agencies and specify their overarching mission are generally known as organic acts.²¹⁴ The organic act called for here would serve as a charter for

208. *Id.* at 549 (citing 16 U.S.C. § 839b(h)(6)(C)).

209. Davidson & Geu, *supra* note 123, at 856 (citing *Nw. Res. Info. Ctr., Inc. v. Nw. Power Planning Council*, 35 F.3d 1371, 1378 (9th Cir. 1994)); *see also* Lothrop, *supra* note 123, at 539, 541-42 (stating that the use of CBA “not only ignores distribution and equity concerns, it often fails to integrate information in a useful and ‘intellectually honest’ manner. . . . [and it] has had a subtle, but pernicious effect on the anadromous fish of the Columbia River Basin [by] foster[ing] a perception that the fisheries resource could be exchanged for inexpensive hydropower” (footnotes omitted)).

210. *Nw. Res. Info. Ctr.*, 35 F.3d at 1395.

211. Lothrop, *supra* note 123, at 553; *see also* *Nw. Res. Info. Ctr.*, 35 F.3d at 1394 (admonishing the Council that “a fish and wildlife measure cannot be rejected solely because it will result in power losses and economic costs”).

212. *See* 50 C.F.R. §§ 223.102, 224.101 (2006) (listing threatened and endangered anadromous species, respectively). *See generally* Richard O. Zerbe Jr. & Linda J. Graham, *The Role of Rights in Benefit Cost Methodology: The Example of Salmon and Hydroelectric Dams*, 74 WASH. L. REV. 763, 765 (1999) (arguing that a refined CBA that better reflects both legal rights and psychological expectations will be key to understanding trade-offs and making informed decisions in the course of protecting threatened salmon species).

213. For citations to statutes granting authority to the Corps, *see supra* notes 100-01, 108-09. In a previous article on Missouri River Management, I sounded the call for a Missouri River Organic Act. Zellmer, *supra* note 15, at 346-57. In the wake of Hurricane Katrina, it has become clear that we need to reach farther and include the entire Missouri-Mississippi River basin.

214. RICHARD J. PIERCE, JR. ET AL., *ADMINISTRATIVE LAW AND PROCESS* 220 (1985); Robert L. Fischman, *The National Wildlife Refuge System and the Hallmarks of Modern Organic Legislation*, 29 *ECOLOGY L.Q.* 457, 502-13 (2002).

the Corps and the lands and resources it administers by providing an overarching mission statement, supported by clearly-delineated designated uses and substantive management criteria, along with comprehensive planning requirements and measures that ensure public participation and accountability.²¹⁵ Together, these provisions would weave an otherwise disparate collection of federal management mandates into a system that is far greater than the sum of its parts.²¹⁶

Comprehensive, integrated management strategies for major interjurisdictional river systems have been accomplished in other basins, by legislation or interstate compacts. For example, on the Colorado River, the “Law of the River” governs the activities of the federal agencies that manage it and the seven states and numerous Indian tribes that draw their lifeblood from it.²¹⁷ Similarly, in the Great Lakes, a multi-faceted interstate agreement that has been approved by eight state governors and two Canadian Premiers is currently under consideration for ratification as an interstate compact.²¹⁸ Under the proposed compact, the states and bordering Canadian provinces would cooperatively manage the Great Lakes and their tributary surface and ground waters under common standards.²¹⁹ These standards would be incorporated into state law and, once approved by Congress, enforceable as a matter of federal law.²²⁰

Key components of a comprehensive, organic Interior Rivers Ecosystem Act should adhere to the following principles:

- (1) *Think like a river*:²²¹ Adopt adaptive, ecologically-resilient management objectives;
- (2) *Live within our means*: Prioritize measures that promote resilience and sustainability, rather than measures that may seem economically desirable for the short term but are unsustainable in the long run,²²²

215. See Zellmer, *supra* note 15, at 346; see also Fischman, *supra* note 214, at 510-13 (describing five “hallmarks” of organic legislation).

216. See Fischman, *supra* note 214, at 510.

217. JOSEPH L. SAX ET AL., LEGAL CONTROL OF WATER RESOURCES 799-800 (4th ed. 2006).

218. See Noah D. Hall, *Toward a New Horizontal Federalism: Interstate Water Management in the Great Lakes Region*, 77 U. COLO. L. REV. 405, 406 (2006) (citing GREAT LAKES-ST. LAWRENCE RIVER BASIN WATER RESOURCES COMPACT (Dec. 13, 2005), available at http://www.cglg.org/projects/water/docs/12-13-05/Great_Lakes-St_Lawrence_River_Basin_Water_Resources_Compact.pdf); Council of Great Lake Governors, Great Lakes Water Management Initiative, <http://www.cglg.org/projects/water/index.asp> (last visited Feb. 19, 2007).

219. Hall, *supra* note 218, at 435.

220. *Id.* at 405, 411.

221. See Babbitt, *supra* note 191 (noting that “Aldo Leopold once wrote that to understand a landscape, it is necessary to ‘Think like a mountain’; we must now pause to ‘think like a river’”).

222. Houck, *supra* note 56, at 61. For example, the Feingold-McCain Water Resources

- (3) *Enhance institutional leadership*: Provide the Corps with primary responsibility for flood control measures, cabined by clear, ecologically-based standards, with continued monitoring and oversight through probing judicial review, and supported by a secure, non-partisan funding source.²²³
- (4) *Stop wetlands losses and restore damaged wetlands and floodplains*: Prioritize areas that are most essential for wildlife reproduction, nesting, and feeding, as well as areas that, if lost, would jeopardize vulnerable human communities and cultural resources (the French Quarter may be one example of the latter point); and, perhaps most of all,
- (5) *Recognize that land and water policies are inextricably linked and plan for both restored flows and open space*.²²⁴
 “[C]ede nature its space.”²²⁵

On a related note, but one that reaches beyond the Corps’ programs, Congress must cut perverse subsidies. Under current policies, flood insurance payments stimulate construction in vulnerable areas where flooding and rebuilding occurs and recurs time and time again. The National Flood Insurance Program and other agricultural and urban subsidies must be tailored to ensure against floodplain development.²²⁶

Planning and Modernization Act of 2006 would compel the establishment of “national priorities for flood damage reduction, navigation, and ecosystem restoration.” S. 2288, 109th Cong. § 3 (2006). It would also require the Corps to “avoid the unwise use of floodplains, . . . protect and restore [natural ecosystems], and mitigate any unavoidable damage to natural systems.” *Id.* For a summary of this bill, see Press Release, Feingold, McCain Introduce Bill to Modernize the Army Corps of Engineers (Feb. 15, 2006), available at http://mccain.senate.gov/press_office/view_article.cfm?ID=84. Unfortunately, the bill gained little traction in the 109th Congress. See Tom Ichniowski, *Congress Leaves Much Work to Be Finished*, ENGINEERING NEWS-REC., Oct. 9, 2006, at 9, 9; Katherine McIntire Peters, Corps Reform, GovExec.com (Oct. 25, 2006), <http://www.govexec.com/dailyfed/1006/102506mm.htm>.

223. The Feingold-McCain bill addresses institutional concerns by proposing a reinvigorated oversight role for the national Water Resources Council and annual evaluations of the Corps’ authorized water projects. S. 2288 § 4(b). Even if this bill is stymied, one institutional reform that does appear to be moving forward at the local level is the creation of “superboards” for levees in New Orleans, staffed by engineering professionals, rather than political appointees of the governor as under the current system in Louisiana. *Make Levees Larger, Safer*, ADVOC. (Baton Rouge), Sept. 10, 2006, at B10.

224. BABBITT, *supra* note 14, at 142; see Galloway, *supra* note 25, at 8.

225. Houck, *supra* note 56, at 61.

226. FEMA, The National Flood Insurance Program (NFIP), <http://www.fema.gov/plan/prevent/floodplain/index.shtml> (last visited Feb. 19, 2007). Federally supported flood insurance is available for homeowners in communities that adopt provisions designed to minimize flood losses. *Id.*; see Martin M. Randall, *Coastal Development Run Amuck: A Policy of Retreat May be the Only Hope*, 18 J. ENVTL. L. & LITIG. 145, 148-51 (2003). Flood-prone lands, however, continue to be developed. See Davidson, *supra* note 71, at 391 (noting that, in spite of the provisions of the NFIP, “Missouri’s hands-off approach to floodplain development resulted in a race to develop much of

It would be a mistake to believe that an Interior Rivers Ecosystem Act that incorporated these recommendations would amount to an abandonment of all human life along the rivers. People can still live on uplands and natural ridges that are outside the floods' and hurricanes' bulls-eyes, and they can still play in the open space along the rivers' banks and on the rivers themselves.²²⁷ Their experiences will be all the better for the aesthetic and ecological improvements that flow from ceding nature its space.

VI. CONCLUSION

In examining whether and how to rebuild New Orleans, Oliver Houck makes an excellent case for what amounts to plain old common sense: Plan for the resources first, then plan for human development and use in sustainability zones.²²⁸ Any resilient solution entails not just flood control, engineering, and river management, but also people management—changing the way people think and interact with their surroundings. Meanwhile, excessive reliance on CBA and engineering solutions must give way, and federalism myths must be dispelled so that federal leadership can take root and enhanced synergies between federal, state, and tribal programs can grow.

Skeptics will no doubt scoff at an ambitious proposal for an organic act for the entire interior Missouri-Mississippi ecosystem, claiming that it is too big or too much of a departure from the status quo. The obvious response to the skeptics is to ask: “If not this, what? If not now, when?” True, the enactment of a comprehensive organic act for the nation’s biggest interior river system will take immense fortitude and foresight, both of which are often lacking in politicians at every level—federal, state, and local. But the effects of Hurricane Katrina prove that the time for action is upon us while the wounds inflicted by misbegotten flood control and navigational policies are still fresh and the nation’s attention remains focused on the nation’s interior rivers, floodplains, and wetlands. Surely, statesmanship like that exhibited by the congressional members who sponsored the National Environmental Policy Act, the Clean Water Act, and other landmark environmental laws is not extinct. Visionary leaders and activists may rise like the phoenix from the ashes of Katrina’s devastation and guide the nation toward an organic law that promotes a sustainable, resilient future for both human and ecological communities. Fairness to future generations demands nothing less.

the most risky and flood-prone land in the state”). In the St. Louis region, more than \$2 billion worth of new development now stands on land that was submerged by the flood of 1993. *Id.* at 365.

227. See Houck, *supra* note 56, at 61.

228. See *id.*