Collaborative Climate Change Adaptation: A Case Study of Army Corps Coastal Protection Projects

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As the climate warms, governments in the U.S. are attempting to increase the resilience of populations and physical environments to the impacts of higher temperatures. This article analyzes the efforts of the U.S. Army Corps of Engineers to design and build coastal protection infrastructure, such as seawalls, storm surge barriers, and nature-based approaches, as an example of intergovernmental collaboration to adapt to climate change. The Army Corps' unique model of project development requires it to study and construct projects with a non-federal sponsor that is typically a state or local government. The article makes three main points about the Army Corps' nascent efforts to address increased risks of coastal flooding. First, it emphasizes that major urban areas along the eastern and southern seaboards, such as Boston, Miami-Dade, and New York City, are seeking to use the Army Corps to build coastal protection infrastructure to mitigate flood risks that are increasing with climate change. Second, the article characterizes the Corps' coastal protection projects as a decentralized form of inter-jurisdictional collaboration to adapt to climate change. Third, the article argues that the decentralized development of coastal protection on a project-by-project basis should be

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complemented by periodic regional- or national-level analyses of coastal flood risks. Looking closely at actual efforts to adapt highlights the importance of considering whether adaptation should be undertaken in a more decentralized or centralized manner as the need to adapt to warming temperatures increases.

I. INTRODUCTION

The U.S. is experiencing increasingly intense hurricane seasons as global temperatures rise.[1] These hurricanes are causing more severe storm surge flooding in major metropolitan areas along the eastern and southern seaboards as ocean temperatures and sea levels rise.[2] When hurricanes

[1] Walter A. Robinson, *Climate Change and Extreme Weather: A Review Focusing on the Continental United States*, 71 J. AIR & WASTE MGMT. ASS'N 1186, 1195–99 (2021) [On File with the Columbia Journal of Environmental Law] (discussing climate's impact on tropical cyclones in terms of rainfall, size, and storm surge); Young-Kwon Lim et al., *The Roles of Climate Change and Climate Variability in the 2017 Atlantic Hurricane Season*, 8 SCI. REPS. 1, 7 (2018) [https://perma.cc/GH5M-GUJ5] (finding that climate change played a role in the active 2017 hurricane season).

[2] Alice Kaswan, *Climate Change Adaptation and Land Use: Exploring the Federal Role*, 47 J. MARSHALL. L. REV. 509, 511 (2013) [https://perma.cc/3AXH-PZBF]. *See also* Keith H. Hirokawa & Cinnamon P. Carlarne, *The Climate Moratorium*, 11 TEX. A&M L. REV. 365, 370–71 (2024) [https://perma.cc/A7BH-J6VM] (describing increasing flood risks along the eastern seaboard).

strike, state governments appeal to the federal government to declare a disaster, which triggers the release of federal funding to cover disaster response and rebuilding.[3] In addition, in a development little noticed in legal scholarship, local and state governments along the eastern and southern seaboards are requesting federal help from the Army Corps of Engineers (ACE, USACE, the Corps, or the Army Corps) to proactively design and build coastal protection infrastructure.[4] A branch of the Department of Defense with many civilian employees, the Corps was established in 1802, long before much of the industrialization leading to planetary warming.[5] Since the early nineteenth century, the Corps' mission has grown from improving navigation to controlling riverine flooding, restoring ecosystems, and now protecting coasts threatened by flooding exacerbated by climate change.[6]

The furthest along of the Corps' recent major climate-related coastal protection projects is the project to protect Norfolk, Virginia, home to a major naval base. In 2020, Congress authorized a $2.6 billion Corps project to protect Norfolk, and in 2021, it appropriated some funding to plan for construction.[7] In 2022, Congress authorized a $34.38 billion project to protect the Houston and Galveston areas, as well as local petrochemical and refining facilities, from storm surge flooding.[8] If built, the Coastal Texas project would be the most costly in the Corps' history,[9] but Congress has yet to appropriate funding for construction. In 2022, the Corps tentatively proposed a record $52.6 billion plan to protect New York

[3] REBUILD BY DESIGN, ATLAS OF DISASTER 16–17 (2022) [https://perma.cc/7B7G-VHKN]; *see also* 42 U.S.C. § 5170 [https://perma.cc/C8KT-XR6Q] ("All requests for a declaration by the President that a major disaster exists shall be made by the Governor of the affected State.").

[4] Historically, many Army Corps projects have been approved or funded in disaster relief legislation, rather than proactively through disaster preparedness. NAT'L RSCH. COUNCIL, REDUCING COASTAL RISK ON THE EAST AND GULF COASTS 62 (2014) [https://perma.cc/C8KT-XR6Q].

[5] Oliver A. Houck, *Breaking the Golden Rule: Judicial Review of Federal Water Project Planning*, 65 RUTGERS L. REV. 1, 6 (2012) [https://perma.cc/G2PD-9W78]; THEODORE PORTER, TRUST IN NUMBERS 148 (1995) [On File with the Columbia Journal of Environmental Law].

[6] For a history of the evolution of the Corps' responsibilities, *see* KAREN O'NEILL, RIVERS BY DESIGN: STATE POWER AND THE ORIGIN OF U.S. FLOOD CONTROL (2006) [On File with the Columbia Journal of Environmental Law].

[7] U.S. GOV'T ACCOUNTABILITY OFF., GAO-24-105496, CLIMATE CHANGE: OPTIONS TO ENHANCE THE RESILIENCE OF FEDERALLY FUNDED FLOOD RISK MANAGEMENT INFRASTRUCTURE 23 (2024) [hereinafter GAO-24-105496] [On File with the Columbia Journal of Environmental Law].

[8] *Id.* at 20

[9] *Water Resources Development Act of 2022 Signed into Law*, COASTAL TEX. PROJECT, https://coastaltexasprogram.com/2022/12/23/water-resources-development-act/ [https://perma.cc/VQ78-7XJG] (last visited Aug. 2, 2024) (referring to the Chief's Report recommending the project to Congress as recommending "the largest single investment recommendation to Congress in USACE history").

City and nearby areas in New Jersey and New York State.[10] Meanwhile, the Corps is working on other coastal protection projects to address climate-related flood risks.[11]

This Article analyzes the ongoing development of Army Corps coastal protection projects as an emerging example of federal, state, and local collaboration to adapt to climate change. As it has become apparent that the planet is warming, communities throughout the U.S. have recognized that it is necessary to adapt to increased instances of extreme heat, drought, wildfires, and flooding. By default, local and state governments are often taking the lead to adapt their communities to the impacts of planetary warming, such as extreme heat. But they typically lack the fiscal capacity and expertise to undertake costly adaptation measures, such as building major infrastructure like storm surge barriers and seawalls and thus seek federal assistance.[12]

We make three main points in this Article about the nascent Corps' coastal protection efforts to address climate risks. First, we emphasize that major urban areas along the eastern and southern seaboards, such as Boston, Miami-Dade, and New York City, are seeking to use the Corps to build coastal protection infrastructure to mitigate flood risks that are increasing with climate change. While there is some awareness of the repurposing of the Army Corps for climate-related coastal protection,[13] the

[10] N.Y. STATE DEP'T OF ENV'T CONSERVATION ET AL., NEW YORK-NEW JERSEY HARBOR & TRIBUTARIES COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY: DRAFT INTEGRATED FEASIBILITY REPORT AND TIER 1 ENVIRONMENTAL IMPACT STATEMENT (2022) [hereinafter N.Y. STUDY] [On File with the Columbia Journal of Environmental Law]; Robert Yaro & Daniel Gutman, Opinion, *The Plan to Save New York From the Next Sandy Will Ruin the Waterfront. It Doesn't Have To.*, N.Y. TIMES (June 15, 2023), https://www.nytimes.com/interactive/2023/06/15/opinion/nyc-flood-waterfront-plan.html [https://perma.cc/LN74-V4PK] ("The plan is . . . by far the most expensive project ever proposed by the Corps."). In July 2025, as this article was in the publication process, the Army Corps issued a Draft Integrated Interim Response Feasibility Report and Environmental Assessment for a few smaller projects in the New York/New Jersey area for which it is hoping to obtain Congressional authorization in 2026. The draft report indicates that the Corps is still aiming to develop a comprehensive strategy to address the area's coastal storm risks, but over a longer period of time. N.Y. STATE DEP'T OF ENV'T CONSERVATION ET AL., NEW YORK-NEW JERSEY HARBOR & TRIBUTARIES COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY: DRAFT INTEGRATED INTERIM RESPONSE FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT FOR ACTIONABLE ELEMENTS ii (2025) [hereinafter N.Y. JULY 2025 DRAFT REPORT] [On File with the Columbia Journal of Environmental Law].

[11] *See* Table 1.

[12] *See, e.g.*, KATRINA M. WYMAN & DANIELLE SPIEGEL-FELD, LOCAL GREENS: CITES AND 21ST CENTURY ENVIRONMENTAL PROBLEMS (2025).

[13] *See generally* SUSAN CRAWFORD, CHARLESTON: RACE, WATER, AND THE COMING STORM (2023) [On File with the Columbia Journal of Environmental Law]; Christopher J. Fulmer, *Rising Sea Levels: A Flood of Concerns For the Army Corps of Engineers Flood Risk Management Legislation*, 17 CHARLESTON L. REV. 725 (2023) [On File with the Columbia Journal of Environmental Law]; D.J. Rasmussen, Robert E. Kopp & Michael Oppenheimer, *Coastal Defense*

extent of the ongoing efforts to use the Corps in this way has not received much sustained attention in legal scholarship. These projects represent significant efforts to adapt to climate change, and they provide some early indications of the challenges that adaptation will involve.[14]

Second, we characterize these coastal protection projects as decentralized inter-jurisdictional collaborations to adapt to climate change. Local interests often initiate ideas to build projects to protect against storm risks. The Corps designs projects with input from local and state interests, and the Corps is incentivized to respond to these interests in project development. State and local governments have a voice in whether coastal protection projects proceed and the form they take because these governments must generally agree to contribute to the cost of designing and building coastal protection projects, and pay for their operation and maintenance.[15] Moreover, Congress is unlikely to authorize or fund a project without the support of the Congressional delegation from the region that the project is intended to protect, and these regional Congressional delegations are influenced by local and state interests. Thus, Corps coastal climate change adaptation projects are in effect the product of negotiations between multiple players at the federal, state, and local levels, and not purely federal projects. As such, these projects represent an example—although an imperfect one, as we discuss—of the participatory approach to adaptation for which academics, policymakers, and activists often advocate. [16]

Megaprojects in an Era of Sea-Level Rise: Politically Feasible Strategies or Army Corps Fantasies?, 149 J. WATER RES. PLAN. MGMT. 04022077-1 (2023) [On File with the Columbia Journal of Environmental Law]; Geoff Dembicki, *The Progressive Way to Save Cities from Superstorms*, NEW REPUBLIC (Aug. 2, 2023), https://newrepublic.com/article/174664/progressive-way-save-cities-superstorms [https://perma.cc/DZ4U-QW7G].

[14] In suggesting that Corps coastal protection projects provide a case study for thinking about the implementation of climate change adaptation, we recognize that there are some distinct features of these Corps projects. For example, they focus on a particular type of climate risk—flooding, often more specifically storm surge flooding. The Corps' long experience addressing flood risks means that these risks are not a novel task for it, unlike for some of the local governments being called upon to address flooding in an era of global warming. Third, the Corps' highly technocratic and political approach to flood management may distinguish its approach from those of other governmental agencies facing flood risks. Precisely because of some of its unique features, the Corps' approach to climate change adaptation is particularly interesting to examine, as it suggests the difficulties of operationalizing adaptation even for a highly sophisticated, well-resourced federal agency.

[15] On the significance of local cost-sharing for the distribution of authority in designing a coastal protection project, *see infra* notes 122–125, 138–56.

[16] *See, e.g.*, ROB VERCHICK, THE OCTOPUS IN THE PARKING GARAGE: A CALL FOR CLIMATE RESILIENCE (2023) [On File with the Columbia Journal of Environmental Law]; Alice Kaswan, *Seven Principles for Equitable Adaptation*, 13 ENV'T J. & EQUITY 41 (2012) [https://perma.cc/HN7G-LXFP]; David A. Dana, *Climate Change Adaptation as a Problem of Inequality and Possible Legal Reforms*, 117 NW. U. L. REV. 71 (2022) [https://perma.cc/897J-

Third, we argue that the decentralized development of coastal protection projects on a project-by-project basis involving local interests should be complemented by more regional or national-level flood risk analyses by the Corps. In recent years, the Corps has attempted to address longstanding criticisms of its development of individual projects by altering the procedures it uses to develop project proposals. For example, the Corps changed its approach to benefit-cost analysis and introduced more equity considerations into project development. We emphasize that reforming the individual project planning process is insufficient. The development of individual projects in response to local concerns should be supplemented with periodic efforts by the Corps to analyze coastal flood risks on a regional or national scale. Greater availability of information about coastal flood risks could help ensure that the Corps addresses the most serious flood risks facing the nation.[17] Our proposal for using risk-based analysis to help inform where and when the Corps prioritizes project development builds on recent efforts by the Corps to analyze coastal flood risks in two areas of the country – the Northern and Southern Atlantic – that have been associated with the development of projects. These efforts should be formalized and extended by, for example, requiring the Corps to assess coastal flood risks for large geographic areas periodically, so that the Corps, the Office of Management and Budget (OMB), and Congress can

GJA9]; Eric K. Chu et al., *Varieties of Approaches to Climate Adaptation in Cities: Toward a Focus on Equity*, *in* GLOBAL SUSTAINABLE CITIES 275, 283 (Daniel Spiegel-Feld et al eds., 2023) [https://perma.cc/W4D5-XG4J]; Eric K. Chu & Clare E.B. Cannon, *Equity, Inclusion and Justice as Criteria for Decision-Making on Climate Adaptation in Cities*, 51 CURRENT OPINION IN ENV'T SUSTAINABILITY 85 (2021) [https://perma.cc/8BHZ-JMYC]; Linda Shi et al., *Roadmap Towards Justice in Urban Climate Change Adaptation Research*, 6 NAT'L CLIMATE CHANGE 131 (2016) [https://perma.cc/54JJ-97Z2]; Linda Shi & Susanne Moser, *Transformative Climate Adaptation in the United States: Trends and Prospects*, 372 SCI. eabc8054 (2021) [On File with the Columbia Journal of Environmental Law]; Judith Taylor, Norman S. Levine, Ernest Muhammad, Dwayne E. Porter, Annette M. Watson, & Paul Sandifer, *Participatory and Spatial Analyses of Environmental Justice Communities' Concerns about a Proposed Storm Surge and Flood Protection Seawall*, 19 INT'L J. ENV'T. RES. PUB. HEALTH 1192 (2022) [https://perma.cc/X7B4-JBSP]; REBUILD BY DESIGN, *supra* note 3, at 668; Amy Chester, *The Right Vision a Decade After Superstorm Sandy*, N.Y. DAILY NEWS (Oct. 28, 2022), https://www.nydailynews.com/opinion/ny-oped-right-vision-decade-after-sandy-20221028-eve466w5ovahbpu2lf63rp4qqu-story.htmlhttps://www.nydailynews.com/2022/10/28/the-right-vision-a-decade-after-superstorm-sandy/ [https://perma.cc/R5L3-HDAB]; Patrick Sisson, *Behind a Billion-Dollar Bid to Save Lower Manhattan*, BLOOMBERG (July 26, 2022), https://www.bloomberg.com/news/features/2022-07-26/how-nyc-s-battery-park-city-is-preparing-for-rising-seas [https://perma.cc/EY3C-ZGC2]; N.Y.C. ENV'T JUST. ALL., NYC CLIMATE JUSTICE AGENDA: STRENGTHENING THE MAYOR'S ONENYC PLAN 8 (2016) [https://perma.cc/24R2-KK9F].

[17] We further develop the idea of a risk-based approach to coastal protection in Max S. Miller & Katrina M. Wyman, *Federal Adaptation Efforts: A Case Study of the U.S. Army Corps of Engineers*, a chapter that will be published in INSTITUTIONS AND EFFECTIVE CLIMATE ACTION, a book edited by Professors Cherie Metcalf and Stephanie Stern.

use these assessments to inform the allocation of the Corps' resources for developing and building projects.

The Article proceeds as follows. Part II highlights the efforts to use the Corps to adapt to coastal storm risks exacerbated by climate change and outlines the scale and scope of proposed coastal protection infrastructure. Part III analyzes the multi-step processes through which the Corps designs coastal protection projects with local interests. It highlights the opportunities for local and state interests to influence the design of coastal protection projects, which suggests that project design is mostly a decentralized process of interjurisdictional collaboration. Part IV discusses Biden-era reforms to individual project planning and emphasizes the need to complement the decentralized work of the Corps in developing individual projects with local interests with risk-based assessments of the potential for coastal flooding in large geographic areas. Complementing the decentralized development of projects with information about coastal flood risks on a regional and potentially a national level could help the Corps, OMB, and Congress direct the Army Corps' scarce resources toward areas with the most serious flood risks. We conclude by emphasizing that the Army Corps is not the only longstanding governmental agency whose mission is being broadened to include increasing the country's resilience to climate change. There are similar questions about the approaches that subnational governments should use to promote efficient and equitable adaptation.

II. ONGOING ARMY CORPS CLIMATE-RELATED COASTAL PROTECTION PROJECTS

The Army Corps has been building projects to improve navigation and reduce riverine flooding since the nineteenth century.[18] However, it was not until 1955 that Congress enlisted the Corps to prevent harm to people and property from flooding in coastal storms, such as hurricanes.[19] That year, Congress authorized the Corps to study projects to reduce harm to people and property from coastal flooding from hurricanes along the eastern and southern seaboards after several major hurricanes struck these

[18] O'NEILL, *supra* note 6; 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, 1301 (2004) [https://perma.cc/B6KD-NFG4]; Houck, *supra* note 5.

[19] An Act to Authorize an Examination and Survey of the Coastal and Tidal Areas of the Eastern and Southern United States, with Particular Reference to Areas Where Severe Damages Have Occurred from Hurricane Winds and Tides, Pub. L. No. 84-71, 69 Stat. 132 (1955) [https://perma.cc/3KGV-AC5C].

areas in 1954.[20] Since ACE first gained the statutory authority for coastal storm risk management (CSRM) projects,[21] it has constructed numerous coastal barriers. A table compiled by the National Research Council in 2014 lists 143 coastal flood damage reduction projects.[22] Most of these are beach nourishments, but some feature extensive coastal construction.[23] The Corps has rarely built the types of megaprojects to protect modern American cities that it is contemplating on the eastern and southern seaboards.[24]

Currently, the Corps is developing major coastal protection projects to address flood risks exacerbated by climate change in Boston, Massachusetts; Charleston, South Carolina; Coastal Texas (Galveston and Houston); Miami-Dade County in Florida; New York/New Jersey; and Norfolk, Virginia.[25] The major ongoing coastal protection projects are at various stages of development. The Army Corps has not started constructing any of these projects. Some are closer to construction than others, with the Norfolk project currently the closest.

The projects are principally intended to reduce risks of coastal flooding from storm surges during hurricanes and other storms, which are exacerbated by climate change.[26] The Corps historically focused on storm surge flooding because, until recently, it was only authorized to consider

[20] On the hurricanes in 1954 that provided the backdrop to the adoption of this law, *see* Fulmer, *supra* note 13, at 735–36.

[21] *See* Pub. L. No. 84-71, 69 Stat. 132 (1955). The Army Corps refers to these projects as "Coastal Storm Risk Management" and "Hurricane and Storm Damage Risk Reduction." Framing the projects in terms of risk reduction highlights that no project will eliminate flood damages. In this article, we sometimes refer to these projects as "coastal protection projects" in the interest of style and brevity.

[22] NAT'L RSCH. COUNCIL, *supra* note 4, at 179–186.

[23] *Id.* For more information on beach nourishment, *see* U.S. ARMY CORPS OF ENG'RS, BEACH NOURISHMENT: HOW BEACH NOURISHMENT PROJECTS WORK (2007) [On File with the Columbia Journal of Environmental Law].

[24] NAT'L RSCH. COUNCIL, *supra* note 4, at 179–86 (listing few structural projects with project lengths of more than 5 miles).

[25] *See, e.g.*, N.Y. STUDY, *supra* note 10, at 4 ("The need for the study derives from the significant and widespread damage to communities, infrastructure, and the economy caused by coastal storms" including Hurricane Sandy); U.S. ARMY CORPS OF ENG'RS, COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY: FINAL REPORT 8 (2021) [hereinafter TEX. STUDY] [On File with the Columbia Journal of Environmental Law] ("The Texas coast is an economic engine, home to ports, oil and gas refineries, corporate headquarters, military bases, petrochemical facilities, and numerous other enterprises. The shutdown of even a single Texas port can impact state and national economies for a significant period of time . . . ."). The Corps is also developing numerous smaller CSRM projects, like three recently authorized projects in Washington, D.C., Baltimore, Md., and Narragansett Bay, R.I. *See* Pub. L. No. 118-272, Div. A, § 1401, 138 Stat. 2992, 3168–69 (2025). We do not discuss these projects extensively in the body of this article.

[26] *See* Table 1.

coastal flood risk arising from hurricanes and coastal storms.[27] In 2022, Congress granted authority to the Corps to address flood risks arising from increased rainfall and higher tides in the context of its efforts to address coastal storm surge flooding.[28] The projects analyzed for this article are not (yet) designed to address these other flood risks.[29] Limiting a CSRM project's scope to only storm surge damage can exacerbate other flood risks in some circumstances.[30]

[27] *See* Pub. L. No. 84-71, 69 Stat. 132 (1955). *See also* U.S. ARMY CORPS OF ENG'RS, ENGINEER REGULATION 1105-2-100: PLANNING GUIDANCE NOTEBOOK at 3-18 (2000) [On File with the Columbia Journal of Environmental Law] [hereinafter ER 1105-2-100]; *Id.* at E-133 ("[t]he Corps participates only in those projects formulated exclusively for hurricane and storm damage reduction"); Fulmer, *supra* note 13, at 725, 735–736.

[28] Water Resources Development Act of 2022, Pub. L. 117-262 § 8106, 136 Stat. 3699, 33 U.S.C. § 2282g [https://perma.cc/T2GH-WBUM] [hereinafter WRDA 2022]. WRDA 2022 does not allow a local partner to entirely offload responsibility for traditionally local projects because the study must be originally justified as a "flood risk management or hurricane and storm damage risk reduction" project. *Id.* The Corps has produced implementing guidance for this provision of WRDA 2022. *Water Resources Development Act (WRDA) of 2022*, U.S. ARMY CORPS OF ENG'RS, https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/Legislative-Links/WRDA-2022/ [On File with the Columbia Journal of Environmental Law] (last visited May 14, 2024).

[29] The Water Resources Development Act of 2024 incorporated comprehensive flood risk into the scope of the New York/New Jersey project. Pub. L. No. 118-272, Div. A, § 1343, 138 Stat. 2992, 3152–53 (2025) [hereinafter WRDA 2024] [https://perma.cc/729B-RKDK] (modifying the project to require the Corps, "upon the request of the non-Federal interest for the project, to include . . . an investigation of" components that maximize the "net public benefits, including ecological benefits and societal benefits, from the reduction of comprehensive flood risk" within the study area).

Before WRDA 2024, New York State's Department of Environmental Conservation requested that the Corps conduct an additional study for multiple types of flood risk as part of the feasibility study for coastal protection for New York/New Jersey. *Advocates Celebrate Breakthrough in Campaign to Overhaul Flawed Army Corps Flooding Plan for NY-NJ Harbor*, ENVT'L DEF. FUND (Nov. 13, 2023), https://www.edf.org/media/advocates-celebrate-breakthrough-campaign-overhaul-flawed-army-corps-flooding-plan-ny-nj?utm_source=Newsletter+&utm_medium=Email&utm_campaign=Corps1 [https://perma.cc/UDA5-CZBD].

[30] *See, e.g.*, Jake Bittle, *The 'Ike Dike' is the Army Corps of Engineers' Largest Project Ever. It May Not Be Big Enough.* GRIST (Apr. 24, 2023), https://grist.org/extreme-weather/houston-ike-dike-army-corps-flooding/ [https://perma.cc/X3AD-HWW9] (In normal storms, Houston's flooding issues come from drainage of rainwater into Galveston Bay; Hurricane Harvey caused more damage from rainfall than storm surge); Ziyu Chen, Philip Orton, & Thomas Wahl, *Storm Surge Barrier Protection in an Era of Accelerating Sea-Level Rise: Quantifying Closure Frequency, Duration and Trapped River Flooding*, 8 J. MARINE SCI. & ENG'G. 725, 727 (2020) [https://perma.cc/5AJW-Q4QZ] (describing how frequent or lengthy closure of storm surge gates can increase riverine flooding); Letter from Natalie Snider, Assoc. Vice President of Climate Resilience Coasts & Watersheds, Env't Def. Fund, to Michael Connor, Assistant Sec'y of the Army, Civil Works, U.S. Army Corps of Engineers, at 6 (Nov. 10, 2021), https://www.edf.org/sites/default/files/documents/National%20USACE%20Sign-On%20Letter%2011-10-21.pdf [https://perma.cc/EKM2-X4GU] (storm surge gates for Galveston Bay could lock rainwater in the Bay, which could exacerbate flooding in Houston). *See also* BRUCE EBERSOLE, JENS FIGLUS & BAS JONKMAN, RESPONSE TO USACE TEXAS COASTAL STUDY, Ch. 1, p. 4 (2021), https://www.tamug.edu/ikedike/index.html [https://perma.cc/T6JQ-QPZP] (discussing

Risks of storm surge flooding can be addressed in different ways, including through structural measures, such as storm surge barriers, seawalls, and levees, non-structural measures, such as elevating homes, and "nature-based solutions," such as restoring wetlands.[31] To varying degrees, the four major projects that Congress already has authorized—in Charleston, Coastal Texas, Miami-Dade, and Norfolk—include large structural components, such as storm surge barriers, as well as non-structural features, such as elevating buildings.[32] Other projects still at an earlier design stage are contemplating similar structural and non-structural components.[33] Several of the projects could be extremely expensive; as mentioned above, with estimated construction costs of over $30 billion, the Coastal Texas project would be the most expensive project that the Corps has built in its history.

Some academics have argued that local and state governments should be primarily responsible for adapting to climate change, since they will be the main beneficiaries of avoiding harms to people and property within their borders.[34] However, even these academics tend to acknowledge that there are some justifications for federal involvement in adaptation. These justifications include the impacts on other jurisdictions of local decisions to (or not to) adapt and the economies of scale associated with federal assistance, as opposed to individual jurisdictions building expertise

how the failure of the Texas Plan to seal off the San Luis Pass will make a storm surge within the bay larger than it would be had the Pass been sealed).

[31] U.S. ARMY CORPS OF ENG'RS, ENGINEER PAMPHLET 1105-2-61, FEASIBILITY AND POST-AUTHORIZATION STUDY PROCEDURES AND REPORT PROCESSING REQUIREMENTS 19–20 (2023) [hereinafter EP 1105-2-61], https://www.publications.usace.army.mil/Portals/76/EP%201105-2-61_2023%2007%2001.pdf?ver=ug2obmZxgGHyppgvatGzPw== [On File with the Columbia Journal of Environmental Law].

[32] *Norfolk Coastal Storm Risk Management Project*, U.S. ARMY CORPS OF ENG'RS. https://www.nao.usace.army.mil/NCSRM/ [On File with the Columbia Journal of Environmental Law] (last visited Aug. 14, 2024); *Coastal Texas: About the Project*, COASTAL TEX. PROJECT, https://coastaltexasproject.com/about/?_gl=1*nzw3fb*_ga*MzQ1Mjk3NDg0LjE3MjE0OTQ2MTM.*_ga_S92J3E5DM0*MTcyMTQ5NDYxMy4xLjAuMTcyMTQ5NDYxMy4wLjAuMA [https://perma.cc/CUK4-KK8F] (last visited Aug. 14, 2024); *Battery Extension FAQ*, U.S. ARMY CORPS OF ENG'RS (Aug. 9, 2023), https://storymaps.arcgis.com/stories/6bfbd647cd5a48b8865fb6844ca0e371 [https://perma.cc/KVE6-3N2H]; U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE COUNTY, FLORIDA, MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT, at ES-4 (2024), https://www.saj.usace.army.mil/Portals/44/Miami-Dade%20Back%20Bay%20CSRM%20Final%20Integrated%20Feasibility%20Report%20and%20EA%20July%202024.pdf [On File with the Columbia Journal of Environmental Law] [hereinafter MIAMI STUDY II] (proposing to elevate 2,052 residential buildings and to dry floodproof 403 nonresidential buildings).

[33] *See, e.g.*, N.Y. STUDY, *supra* note 10.

[34] *See, e.g.*, Daniel A. Farber, *Climate Adaptation and Federalism: Mapping the Issues*, 1 S. D. J. CLIMATE & ENERGY L. 259, 270 (2009).

necessary to adapt.[35] The coastal protection projects analyzed for this article are often justified by the Corps as addressing a national need because of the impact of failures to adapt in discrete areas on the nation as a whole. For example, the Coastal Texas project is justified partly on the basis that a coastal storm surge could damage nationally important refineries and petrochemical facilities in the Houston-Galveston area.[36] The contemporary efforts on the part of project proponents to identify national benefits from investing in regional coastal protection recall the efforts by local elites in the nineteenth and early twentieth centuries to characterize controlling riverine flooding as in the national interest to make the case for Corps involvement.[37]

Table 1 identifies examples of major coastal protection projects in which the Corps is engaged. For each of the projects listed, the table identifies the district office leading the project on behalf of the Corps, the non-federal sponsors and partners working with the Corps,[38] the status of the project as of June 2025, the relationship between climate change and the project as explained in project documents, and the estimated cost of

[35] *Id.* at 285.

[36] *See* TEX. STUDY, *supra* note 25, at 8.

[37] On the history of the Corps' involvement in controlling riverine flooding, *see* O'NEILL, *supra* note 6.

[38] In its guidance documents, the Corps refers to the local and state governments with which it works on projects as non-federal partners (the statutory term is "non-federal interest"). Non-federal sponsors are a subset of non-federal partners. Whereas non-federal partners are "States, Tribes, county or local governments, or agencies that [partner] with USACE to participate in civil works project," non-federal sponsors are partners "that are contractual or cost-sharing partners with USACE." Sponsors "must have the legal and financial capability to fulfill the requirements of cost sharing and local cooperation" and they must "[p]rovide cash or work-in kind contributions to meet … cost-share requirements." *Partnering with the U.S. Army Corps of Engineers: A Guide for Communities, Local Governments, States, Tribes, and Non-Governmental Organizations*, U.S. ARMY CORPS OF ENG'RS, https://www.nap.usace.army.mil/Portals/39/docs/Civil/Partnering-With-USACE-Brochure-2019.pdf [On File with the Columbia Journal of Environmental Law] [hereinafter IWR 2019-R-02], at 6; *Non-Federal Sponsorship of a U.S. Army Corps of Engineers Project*, U.S. ARMY CORPS OF ENG'RS, https://www.nww.usace.army.mil/Portals/28/docs/assistanceprograms/2014/FS_Non-federalSponsor_140305.pdf [On File with the Columbia Journal of Environmental Law].

Notably, local and state governments can partner with the Corps on projects without assuming the status of non-federal sponsors. New York City is a partner—not a sponsor—in the Corps' New York/New Jersey project. N.Y. STUDY, *supra* note 10, at i ("The USACE New York District, in partnership with the New York State Department of Environmental Conservation (NYSDEC) and the New Jersey Department of Environmental Protection (NJDEP) as the non-federal sponsors, are undertaking this study. In addition, the City of New York and the New York State Department of State are non-federal partners. The Feasibility Cost Sharing Agreement was executed on July 15, 2016, between the USACE New York District, the NYSDEC, and NJDEP."). While partners do not have the leverage over projects that the financial obligations of sponsors provide them, the Corps consults partners, and they appear to have a formal status in projects that elevates them above other interest groups in project development. *See* N.Y. STUDY, *supra* note 10, at i.

building the project if the Corps has identified a tentatively selected plan, a recommended plan, or Congress has authorized a project. The table does not purport to be a comprehensive list of the climate-related coastal protection projects in which the Corps is involved. [39] The table illustrates the scale of the efforts to repurpose the Corps for climate change adaptation, and the potential reach of Corps coastal protection efforts into major American cities, such as Boston, Miami, and New York.

[39] For example, we exclude coastal protection projects of a relatively small scale. These include U.S. ARMY CORPS OF ENG'RS, FAIRFIELD AND NEW HAVEN COUNTIES COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY vi (2020), https://www.nae.usace.army.mil/Portals/74/docs/Topics/FairField/Final%20Reports%20-%202024/20201026%20CT_Coastal_IntegratedReport_Final_22OCT20_NAD_submittal.pdf [On File with the Columbia Journal of Environmental Law] (recommending a project with first cost of just over $133 million); U.S. ARMY CORPS OF ENG'RS, RHODE ISLAND COASTLINE COASTAL STORM RISK MANAGEMENT STUDY, FINAL INTEGRATED FEASIBILITY STUDY & ENVIRONMENTAL ASSESSMENT vi (2023), https://www.nae.usace.army.mil/Portals/74/docs/Topics/RICoastlineCoastalStormRisk/NAE-05-RI-Coastline-Final%20Report-V3.pdf [On File with the Columbia Journal of Environmental Law] (recommending a nonstructural plan covering only 497 structures); *U.S. Army Corps of Engineers Completes Baltimore Storm Risk Management Study; $77 Million Identified For City Tunnels*, U.S. ARMY CORPS OF ENG'RS(Aug. 12, 2024), https://www.nab.usace.army.mil/Media/News-Releases/Article/3869825/us-army-corps-of-engineers-completes-baltimore-storm-risk-management-study-77-m/ [On File with the Columbia Journal of Environmental Law]. The Rhode Island and Baltimore projects were authorized in Pub. L. No. 118-272, Div. A, § 1401, 138 Stat. 2992, 3168–69 (2025), and the Connecticut project was authorized in WRDA 2022. Pub. L. No. 117-263, Div. H, § 8401(3), 136 Stat. 2395, 3840 (2022).

We also exclude coastal armoring projects in San Francisco because they are authorized under a different statutory authority and hence have different characteristics. *Compare* Water Resources Development Act of 1976, Pub. L. No. 94-587, § 142, 90 Stat. 2917, 2930 (1976) (authorizing study of projects in the San Francisco area "with a view toward determining the Federal interest in providing protection against *tidal and fluvial* flooding" (emphasis added)), *with* Pub. L. No. 84-71, 69 Stat. 132 (1955) (authorizing study of "the eastern and southern seaboard of the United States with respect to hurricanes").

Table 1: Examples of Major Ongoing ACE Climate-related Coastal Protection Projects

	USACE District Leading the Study	**Non-federal Sponsors and Partners Working with the Corps**	**Status of the Project as of June 2025**	**Link to Climate Change**	**Estimated Construction Cost ($ billion)**
Boston, Massachusetts	New England District[40]	Sponsor. City of Boston. [41]	Feasibility study ongoing.[42]	"Coastal Storms, along with the effects of climate change and sea level change, threaten the City of Boston's coastline including its communities, businesses, residences, public infrastructure, and mass transit system both water and landside."[43]	N/A

[40] *Study for City of Boston Coastal Storm Risk Management,* U.S. ARMY CORPS OF ENG'RS, https://www.nae.usace.army.mil/Missions/Projects-Topics/City-of-Boston-Coastal-Storm-Risk-Management-Project/ [On File with the Columbia Journal of Environmental Law] (last visited June 14, 2025).

[41] *Id.* The Army Corps is also engaged in the Boston Metropolitan Area Coastal Study, MASS. EXEC. OFF. OF ENERGY & ENV'T AFFS., https://www.mass.gov/info-details/boston-metropolitan-area-coastal-study [On File with the Columbia Journal of Environmental Law] (last visited Aug. 8, 2023); *See also*

[42] *Study for City of Boston Coastal Storm Risk Management*, *supra* note 40.

[43] Memorandum from Reinhard W. Koenig, Program Dir., North Atlantic Div., to Commander U.S. Army Corps of Eng'rs, New England Dist. 4 (Jan 30, 2023), https://www.nae.usace.army.mil/Portals/74/Review%20Plan%20Package.pdf [On File with the Columbia Journal of Environmental Law].

	USACE District Leading the Study	**Non-federal Sponsors and Partners Working with the Corps**	**Status of the Project as of June 2025**	**Link to Climate Change**	**Estimated Construction Cost ($ billion)**
Charleston, South Carolina	Charleston District[44]	Sponsor: City of Charleston.[45]	Congress has authorized the project.[46] Charleston is conducting design work on the project before signing a Design Agreement with the Corps and moving to the Preconstruction, Engineering and Design phase.[47]	"As a low-lying peninsula in a tidal estuary, the Charleston Peninsula, South Carolina is highly vulnerable to coastal storms, a vulnerability which will be further exacerbated by a combination of sea level rise and climate change over the period of analysis."[48]	$1.133[49]

[44] U.S. ARMY CORPS OF ENG'RS, CHARLESTON PENINSULA, SOUTH CAROLINA COASTAL STORM RISK MANAGEMENT FINAL INTEGRATED FEASIBILITY REPORT / ENVIRONMENTAL IMPACT STATEMENT (2022), https://erdc-library.erdc.dren.mil/items/ff5f959e-fcdc-40f8-b98c-2ee360896abc/full [On File with the Columbia Journal of Environmental Law] [hereinafter CHARLESTON STUDY].

[45] *Id.*; Memorandum from Scott A. Spellmon, Chief of Eng'rs, to Sec'y of the Army (June 10, 2022), https://www.sac.usace.army.mil/Portals/43/docs/civilworks/peninsulastudy/ChsPenStudy_Signed_Chief's_Report.pdf?ver=Ok2ZD-pG8UPlvzH_mg5tMA%3d%3d [On File with the Columbia Journal of Environmental Law].

[46] Pub. L. No. 117-263, Div. H, § 8401(3), 136 Stat. 2395, 3842 (2022).

[47] *Charleston Peninsula CSRM Project - PED Phase*, U.S. ARMY CORPS OF ENG'RS, https://www.sac.usace.army.mil/Missions/Civil-Works/Charleston-Peninsula-CSRM-Project/Preconstruction-Engineering-and-Design-PED-/ [On File with the Columbia Journal of Environmental Law] (last visited June 14, 2025).

[48] CHARLESTON STUDY, *supra* note 44, at 6.

[49] *Id.* at ES-12.

	USACE District Leading the Study	**Non-federal Sponsors and Partners Working with the Corps**	**Status of the Project as of June 2025**	**Link to Climate Change**	**Estimated Construction Cost ($ billion)**
Coastal Texas Project	Galveston District[50]	Sponsor: Texas General Land Office (for the feasibility study); [51] Gulf Coast Protection District (for construction and partnership).[52]	Congress has authorized the project.[53] Preconstruction, Engineering and Design ongoing.[54]	"Existing hurricane flood protection systems . . . will be increasingly at risk from storm damage due to relative sea level rise and climate change."[55]	$34.38[56]

[50] TEX. STUDY, *supra* note 25.
[51] *Id.*
[52] *News Release: Coastal Texas Project Provided Funding in FY 2024 Work Plan*, GULF COAST PROT. DIST. (May 15, 2024), https://gcpdtexas.com/posts/2024-05-15/news-release-coastal-texas-project-provided-funding-in-fy-2024-work-plan/ [https://perma.cc/GLJ8-73GZ]; *see also News Release: First Component of the Coastal Texas Project Moves Into Design*, GULF COAST PROT. DIST. (March 25, 2025), https://coastaltexasproject.com/wp-content/uploads/2025/03/G-28-Design-Work-to-Begin_March-2025.pdf [https://perma.cc/8QAN-WKL6].
[53] Pub. L. No. 117-263, Div. H, § 8401(4), 136 Stat. 2395, 3842 (2022).
[54] *News Release: Coastal Texas Project Provided Funding in FY 2024 Work Plan*, GULF COAST PROT. DIST. (May 15, 2024), https://gcpdtexas.com/posts/2024-05-15/news-release-coastal-texas-project-provided-funding-in-fy-2024-work-plan/ [https://perma.cc/ET8S-N23L].
[55] TEX. STUDY, *supra* note 25, at 19.
[56] GAO-24-105496, *supra* note 7, at 20.

	USACE District Leading the Study	**Non-federal Sponsors and Partners Working with the Corps**	**Status of the Project as of June 2025**	**Link to Climate Change**	**Estimated Construction Cost ($ billion)**
Collier County, Florida	Norfolk District[57]	Sponsor: Collier County.[58]	Feasibility study paused for lack of funding.[59] In August 2022, the feasibility study had been re-initiated after concerns with the original (2020) tentatively selected plan.[60]	"Collier County, Florida has high levels of risk and vulnerability to coastal storms which will be exacerbated by the compound effects of sea level rise and climate change over the study period."[61]	2020 proposal: $3.033[62]

[57] *Collier County Coastal Storm Risk Management Study*, COLLIER CNTY. & U.S. ARMY CORPS OF ENG'RS, https://colliercsrm-usacenao.hub.arcgis.com/ [https://perma.cc/HP2P-3XR8] (last visited Dec. 25, 2024).

[58] *Id.*

[59] Laura Layden, *Army Corps Pauses Coastal Resiliency Study in Collier County. Here's Why*, NAPLES DAILY NEWS (Jan. 30, 2025), https://www.naplesnews.com/story/news/local/florida/2025/01/30/storms-army-corps-pauses-coastal-resiliency-study-in-collier-county/78019131007/ [https://perma.cc/GRY6-DNQJ].

[60] *Id.*

[61] U.S. ARMY CORPS OF ENG'RS, COLLIER COUNTY, FLORIDA COASTAL STORM RISK MANAGEMENT: DRAFT INTEGRATED FEASIBILITY STUDY AND ENVIRONMENTAL IMPACT STATEMENT 1 (2020), https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/14939 [https://perma.cc/84JY-U7BT] [hereinafter NAPLES STUDY].

[62] *Id.* at iii.

	USACE District Leading the Study	Non-federal Sponsors and Partners Working with the Corps	Status of the Project as of June 2025	Link to Climate Change	Estimated Construction Cost ($ billion)
Miami-Dade Back Bay, Florida	Norfolk District[63]	Sponsor: Miami-Dade County.[64]	Congress has authorized the project.[65] The feasibility study was re-initiated in August 2022 after concerns with the previous (2020) tentatively recommended plan; the second draft feasibility study was released in April 2024[66] and the final feasibility study was issued in July 2024.[67]	"This study is needed because Miami-Dade County is extremely vulnerable to flooding from storm surge. Associated risk levels and vulnerability to coastal storms are expected to continue to increase because of sea level change and climate change in the future."[68]	2020 proposal: $4.586[69] 2024 proposal: $2.68[70]

[63] Press Release, U.S. Army Corps of Eng'rs & Miami-Dade Cnty., U.S. Army Corps of Engineers Releases Miami-Dade Back Bay Coastal Storm Risk Management Draft Feasibility Report (Apr. 23, 2024), https://www.miamidade.gov/global/release.page?Mduid_release=rel1713902532768394 [https://perma.cc/K8HP-X3DQ].

[64] *Miami-Dade County 'Back Bay' Study*, MIAMI-DADE COUNTY, https://www.miamidade.gov/global/economy/resilience/back-bay.page [https://perma.cc/S5EA-JCNW] (last visited Sep. 26, 2023).

[65] Thomas R. Carper Water Resources Development Act of 2024 § 1401, Pub. L. No. 118-272, Div. A, 138 Stat. 2992, 3168 (Jan 4, 2025).

[66] U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT (2024), https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/25605 [https://perma.cc/966V-DS2T] [hereinafter MIAMI II DRAFT].

[67] MIAMI STUDY II, *supra* note 32.

[68] *Id.* at 30.

[69] U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT DRAFT INTEGRATED FEASIBILITY REPORT AND PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT, at vi (2020), https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/14453 [https://perma.cc/EM6E-QBAX] [hereinafter MIAMI STUDY I].

[70] MIAMI STUDY II, *supra* note 32, at ES-4.

	USACE District Leading the Study	**Non-federal Sponsors and Partners Working with the Corps**	**Status of the Project as of June 2025**	**Link to Climate Change**	**Estimated Construction Cost ($ billion)**
New York/New Jersey	New York District[71]	Sponsors: New York State Department of Environmental Conservation, New Jersey Department of Environmental Protection. Partners: New York State, Department of State, New York City Mayor's Office of Climate and Environmental Justice.[72]	Feasibility study ongoing. In September 2022, the Corps released a draft feasibility study with a comprehensive tentatively selected plan for the entire region.[73] After many criticisms of the tentatively selected plan, the Corps released a draft interim response feasibility report in July 2025 with three small "actionable elements."[74]	"The Study Area, as it stands, is vulnerable to coastal damage from storm surge, wave attack, erosion, and intense rainfall events that can also cause riverine or inland flooding. These forces constitute a threat to human life and increase the risk of flood damages to public and private property and infrastructure. Global climate change and historic RSLC [relative sea level change] has exacerbated flooding over the past century, and potential RSLC in the future will only increase the magnitude, frequency, and extent of the problem."[75]	2022 tentatively selected plan: $52.627[76] 2025 actionable elements: $1.27[77]

[71] N.Y. STUDY, *supra* note 10, at i.
[72] *Id.*
[73] N.Y. STUDY, *supra* note 10.
[74] N.Y. JULY 2025 DRAFT REPORT, *supra* note 10. The draft report indicates that the Corps is also still aiming to develop a comprehensive strategy to address the area's coastal storm risks. *Id.* at ii.
[75] N.Y. STUDY, *supra* note 10, at 13.
[76] N.Y. STUDY, *supra* note 10, at vi.
[77] N.Y. JULY 2025 DRAFT REPORT, *supra* note 10, at iv.

	USACE District Leading the Study	Non-federal Sponsors and Partners Working with the Corps	Status of the Project as of June 2025	Link to Climate Change	Estimated Construction Cost ($ billion)
Norfolk, Virginia	Norfolk District[78]	Sponsor: City of Norfolk.[79]	Congress has authorized the project.[80] Preconstruction, Engineering and Design ongoing.[81]	"Norfolk, Virginia has high levels of risk and vulnerability to coastal storms which will be exacerbated by a combination of sea level rise and climate change over the study period."[82]	$2.6[83]

The Corps has rarely engaged in megaprojects to protect major American cities from storm surge flooding.[84] The main analogue for present-day efforts to armor cities against storm surges is the Corps' beleaguered history in New Orleans, which provides a cautionary tale for areas facing risks of storm surge flooding that are seeking the Corps' help.[85] The Lake Pontchartrain and Vicinity Hurricane Protection Project ("LPV"), which was meant to protect downtown New Orleans and was a major source of controversy after Hurricane Katrina in 2005, was authorized by Congress in 1965.[86] The originally authorized plan—termed

[78] *Norfolk Coastal Storm Risk Management Project*, U.S. ARMY CORPS OF ENG'RS, https://www.nao.usace.army.mil/NCSRM/ [On File with the Columbia Journal of Environmental Law] (last visited Mar. 17, 2025).

[79] U.S. ARMY CORPS OF ENG'RS, FINAL INTEGRATED CITY OF NORFOLK COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY / ENVIRONMENTAL IMPACT STATEMENT (2018) [On File with the Columbia Journal of Environmental Law] [hereinafter NORFOLK STUDY].

[80] Consolidated Appropriations Act § 401(3), Pub. L. No. 116-260, Div. AA, 134 Stat. 1182, 2738 (Dec. 27, 2020).

[81] *Project Updates*, RESILIENT NORFOLK (last visited June 14, 2025), https://www.resilientnorfolk.com/pages/project-updates [https://perma.cc/S8F6-SEPE].

[82] NORFOLK STUDY, *supra* note 79, at 1.

[83] *See* GAO-24-105496, *supra* note 7, at 23.

[84] NAT'L RSCH. COUNCIL, *supra* note 4, at 179–86 (listing few structural projects with project lengths of more than 5 miles).

[85] CITY OF N.Y., PLANYC: A STRONGER, MORE RESILIENT NEW YORK 49–50 (2013) (recognizing the failure to protect New Orleans in Hurricane Katrina in opposing a single storm surge barrier to protect New York City). *See also* Rasmussen, Kopp & Oppenheimer, *supra* note 13 (studying two Rhode Island projects, both initiated in the 1960s).

[86] An Act Authorizing the Construction, Repair, and Preservation of Certain Public Works on Rivers and Harbors for Navigation, Flood Control, or Other Purposes. PUB. L. No. 89-298, 79 Stat. 1073, 1077 (1965); *see also* DOUGLAS WOOLLEY & LEONARD SHABMAN, DECISION MAKING CHRONOLOGY FOR THE LAKE PONTCHARTRAIN & VICINITY HURRICANE PROTECTION PROJECT 2-

the "Barrier Plan" because it used storm surge barriers[87]—was designed to protect against a category 3 hurricane.[88] The year the LPV was congressionally authorized, Hurricane Betsy swept through New Orleans, causing the Corps to determine that it needed to increase the level of protection provided by the LPV.[89] After the National Environmental Policy Act[90] ("NEPA") became law in 1970, the Corps prepared an Environmental Impact Statement ("EIS") for the LPV, which the Corps released in 1975.[91] Litigation commenced over the EIS, resulting in a partial injunction of the project in 1977.[92] The construction of the LPV during this period was characterized by engineering delays, cost increases, difficulties in acquiring rights of way, and local opposition.[93] Thus, the Corps began to restudy the LPV, and in 1984, it switched to the "High-Level Plan," which was considered and rejected in the original feasibility study.[94] The High-Level Plan featured higher walls within New Orleans itself, rather than barriers in Lake Pontchartrain.[95] Construction issues continued to plague the Corps, and by the time Hurricane Katrina reached New Orleans, the total project cost estimate was $738 million (with a federal contribution of $528 million), and the project was only 90% complete.[96]

Hurricane Katrina devastated New Orleans, and the LPV failed to protect the city. As a report co-authored by the NAACP underscored, "the city's extreme poverty areas, all of which were predominantly Black, bore

5 (2007), https://graphics8.nytimes.com/packages/pdf/national/20070711_HPDC.pdf [https://perma.cc/97SK-W8NZ].

[87] U.S. GOV'T ACCOUNTABILITY OFF., GA0-08-751, HISTORY OF THE LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION PROJECT: HEARING BEFORE THE S. COMM. ON ENVT. & PUB. WORKS, at 2–3 (Nov. 9, 2005) (statement of Anu Mittal, Dir. Natural Res. & Env't).

[88] NICOLE T. CARTER, CONG. RSCH. SERV., RL33188, PROTECTING NEW ORLEANS: FROM HURRICANE BARRIERS TO FLOODWALLS 5 (2005).

[89] Statement of Anu Mittal, *supra* note 87, at 5.

[90] National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370h (1970).

[91] Save Our Wetlands, Inc. v. Rush, 424 F. Supp. 354, 356 (E.D. La. 1976); WOOLLEY & SHABMAN, *supra* note 86, at 2-8.

[92] Save Our Wetlands, Inc. v. Rush, Civ. No. 75-3710, slip. op. at 10 (E.D. La. 1977); WOOLLEY & SHABMAN, *supra* note 86, at 2-9.

[93] Statement of Anu Mittal, *supra* note 87, at 5. For a detailed discussion of the opposition to the Barrier Plan from local commercial, political, and environmental sources, *see* CRAIG E. COLTON, PERILOUS PLACE, POWERFUL STORMS: HURRICANE PROTECTION IN COASTAL LOUISIANA 68–74 (2009). Colten suggests that one of the reasons the Corps switched to the High-Level Plan was political pressure. *Id.* at 73 ("Given the local political climate, the high-level plan also was more acceptable to the public.").

[94] Statement of Anu Mittal, *supra* note 87, at 3 (the High-Level Plan was originally thought to be more expensive and have a longer construction timeline); WOOLLEY & SHABMAN, *supra* note 86, at 2-12.

[95] CARTER, *supra* note 88, at 6.

[96] *Id.* at 5.

the brunt of the disaster; Black households were fifty percent more likely to experience flooding and, by extension, more likely to be displaced."[97] Most of the failures of the LPV were caused by overtopping, which occurred because its barriers were not designed to withstand a category 4 hurricane.[98] However, there were four locations (each along drainage canals) where the LPV failed before its capacity was exceeded.[99] Criticism has been directed towards multiple decision makers and agencies for the failures of the overall system and these four locations. Some suggest that the canal floodwall failures were caused at least partially by design changes pushed by local interests.[100] Others blame NEPA, invoked in the 1976 litigation, for delaying the Corps and causing it to change to a less effective project design.[101] Still others blame the alleged incompetence of the Army Corps in its design,[102] construction,[103] and internal coordination.[104] Since Katrina, the Corps has completed a more comprehensive CSRM system to protect New Orleans.[105]

[97] NAACP & COLUMBIA UNIVERSITY MASTER OF PUBLIC ADMINISTRATION, ENVIRONMENTAL SCIENCE AND POLICY, 2021, TURNING THE TIDE: ADVANCING RACIAL JUSTICE IN FEDERAL FLOOD INFRASTRUCTURE PROJECTS 27 (2021) [hereinafter TURNING THE TIDE].

[98] CARTER, *supra* note 88, at 3. Katrina made landfall as a high-end category 3 hurricane. RICHARD D. KNABB, JAMIE R. RHONE & DANIEL P. BROWN, NAT'L HURRICANE CTR., TROPICAL CYCLONE REPORT, HURRICANE KATRINA 23-30 AUGUST 2005, at 7 (2023), https://www.nhc.noaa.gov/data/tcr/AL122005_Katrina.pdf [https://perma.cc/EQ5Q-T9PJ].

[99] CARTER, *supra* note 88, at 3.

[100] CARTER, *supra* note 88, at 8 (detailing how the Orleans Levee District and the Sewage and Water Board of New Orleans successfully lobbied Congress to direct the Corps to construct parallel walls along the canals rather than butterfly floodgates, the Corps' desired option).

[101] Douglas O. Kysar & Thomas O. McGarity, *Did NEPA Drown New Orleans? The Levees, the Blame Game, and the Hazards of Hindsight*, 56 DUKE L.J. 179, 199-202, 210-211 (2006) (citing—but casting doubt on—claims that NEPA was causal in the New Orleans flooding).

[102] Jennifer Dirmeyer, *The Futile Fight Against (Human) Nature: A Public Choice Analysis of the U.S. Army Corps of Engineers—Special Focus on Hurricane Katrina*, 35 INT'L J. SOC. ECON. 627, 634 (2008) (describing the untested assumptions upon which some levee designs were based). *See also* Kysar & McGarity, *supra* note 101, at 227–31 (focusing criticism on the Corps' cost-benefit procedures).

[103] Dirmeyer, *supra* note 102, at 635.

[104] *Id.* at 636; Katie Sinclair, *Water, Water Everywhere and Communities on the Brink: Retreat as a Climate Change Adaptation Strategy in the Face of Floods, Hurricanes, and Rising Seas*, 46 ECOLOGY L.Q. 259, 264–66 (2019) (describing the risks posed by the Mississippi River Gulf Outlet, an ACE navigation project running through New Orleans). Attempts to recover against the Army Corps for damage caused by its projects have been largely unsuccessful. *See* In re Katrina Canal Breaches Consolidated Litigation, 696 F.3d 436 (5th Cir. 2012).

[105] *Greater New Orleans Hurricane and Storm Damage Risk Reduction System: Facts and Figures*, U.S. ARMY CORPS OF ENG'RS (Jan. 2018), https://www.mvn.usace.army.mil/Portals/56/docs/HSDRRS/HSDRRS%20Facts%20and%20Figures%20Brochure%20Jan%202018-web.pdf [On File with the Columbia Journal of Environmental Law].

III. THE COLLABORATIVE PROCESS FOR DESIGNING CORPS COASTAL PROTECTION PROJECTS

The Army Corps' extensive experience building water projects to reduce flooding and, more recently, restore ecosystems,[106] makes it a logical federal agency to involve in protecting large urban areas from climate change. However, as its experience in New Orleans suggests, the Army Corps is not universally beloved. Proponents of fiscal prudence and environmentalists have criticized the Corps for decades for building expensive, wasteful, and ineffective water projects at the behest of local constituencies, which have destroyed ecosystems, such as wetlands in Louisiana, and harmed communities lacking political power.[107] As historian Theodore Porter comments, the Corps, "is synonymous with interest groups, lobbying, 'logrolling,' and above all 'pork barrel.'"[108]

Implicit in these criticisms is an insight into key aspects of the statutory and regulatory framework governing the Army Corps' civil works programs. Major decisions about each project—from initiation, to aspects of the benefit-cost analysis, to authorization and funding—are made on a project-by-project basis. As we discuss in this part, each Corps project follows roughly the same process from initiation to construction, and the Corps both sets the metrics by which each project will be analyzed and conducts the analysis. The Corps also takes the lead in project planning. However, the Corps often becomes involved in project planning in response to local interest in working with the Corps, not a nationwide Corps analysis of where the most serious flood risks lie in the country. Moreover, at key decisional points, local or state project sponsors, or members of Congress likely to be listening to local interests, have either explicit or implicit veto power over a project.

This part analyzes four important stages in the multi-step process that leads to the development of Corps projects: (1) project initiation, (2) authorization and appropriation for feasibility studies, (3) the feasibility study process, and (4) authorization and appropriation for projects. The analysis brings out the opportunities for local interests to influence the process at each stage, and the different levels of participation of non-

[106] Tarlock, *supra* note 18, at 1308.

[107] Tarlock, *supra* note 18, at 1316; *see also* Houck, *supra* note 5, at 31-32, 51 (discussing environmentalists' distrust of the Corps); PORTER, *supra* note 5, at 177 (referring to cost overruns on Army Corps projects).

[108] PORTER, supra note 5, at 148–149. *See also* JOHN A. FEREJOHN, PORK BARREL POLITICS: RIVERS AND HARBORS LEGISLATION, 1947–1968 (1974); O'NEILL, *supra* note 6, at xv; Tarlock, *supra* note 18, at 1304 (referring to the "'iron triangle' … of the Corps, powerful Congressional committee chairs, and local project proponents").

federal sponsors and other local interests.[109] These opportunities for influence help explain why the coastal protection projects described in Table 1 are collaborative, Corps-led adaptation efforts. In addressing coastal flood risks, the Corps advances locally-focused projects; it is not systematically implementing a risk-based plan it has developed for reducing flood risks on a national scale.

A. Project Initiation

Starting in the nineteenth century, local elites drew the Army Corps into riverine flood protection, initially in the Mississippi and Sacramento rivers.[110] In the twenty-first century, local interests, such as city and state governments and civic leaders, are similarly seeking to enlist the Corps in helping to protect their areas against coastal flood risks exacerbated by climate change. For example, the $34.38 billion proposal to protect the Houston-Galveston region emerged from ideas in the area to build a storm surge barrier to reduce harm to people and property from flooding caused by hurricanes. The Houston-Galveston area is no stranger to storm surge flooding; in 1900, a major hurricane devastated Galveston, leading to the construction of a long seawall.[111] After Hurricane Ike caused "$29.5 billion in damages" along the Texas Coast in 2008,[112] William Merrell, a professor of marine science at Texas A&M Galveston, proposed "an offshore storm surge barrier."[113] Merrell drew inspiration from the world-renowned Dutch system of engineered dikes protecting the low-lying country, and the Texas project is colloquially known as the "Ike Dike."[114] After local Texas governments asked for congressional intervention, Congress appropriated funding in 2014 for a feasibility study to design a coastal storm risk management project.[115] While there is no explicit

[109] *See* LINDA LUTHER, CONG. RSCH. SERV., R43209, ENVIRONMENTAL REQUIREMENTS ADDRESSED DURING CORPS CIVIL WORKS PROJECT PLANNING: BACKGROUND AND ISSUES FOR CONGRESS 9 (2013); FEREJOHN, *supra* note 108, at 16–17.

[110] *See* O'NEILL, *supra* note 6, at xii, 95-96.

[111] Xander Peters, *Galveston's Texas-Size Plan to Stop the Next Big Storm*, SMITHSONIAN MAG. (July/Aug. 2024), https://www.smithsonianmag.com/science-nature/galveston-texas-plan-stop-next-big-storm-hurricane-ike-180984487/ [On File with the Columbia Journal of Environmental Law].

[112] *Hurricanes Ike & Dolly*, TEX. GEN. LAND OFF., https://www.glo.texas.gov/disaster-recovery/action-plans/hurricanes-ike-dolly-action-plan [https://perma.cc/R74G-L4R2] (last visited Aug. 2, 2024).

[113] Peters, *supra* note 111.

[114] *Id.*

[115] *Id.* On the appropriation in 2014, see TEX. STUDY, *supra* note 25, at 4. The Corps funded the Coastal Texas Study with funds secured by the Energy and Water Development and Related Agencies Appropriations Act of 2014, Pub. L. No. 113-76, Div. D, Tit. I, 128 Stat. 5, 152. *See also U.S. Army Corps of Engineers Releases Work Plans for Fiscal Year 2014 Civil Works*

statutory requirement that a local interest reach out to the Corps in the first instance, the Corps traditionally does not begin project planning processes without prodding from either a local interest or Congress.[116]

B. Authorization and Appropriation for Feasibility Studies

In addition to identifying ideas for projects, local interests move projects forward by reaching out to members of Congress to support the feasibility studies through which the Corps designs coastal protection projects.[117] For the Corps to begin a feasibility study, there must be statutory authority for the study, and Congress must appropriate funding for it.[118] As a political reality, a region's congressional delegation must support a feasibility study for it to obtain the necessary authorization and appropriations, and local

Appropriations, U.S. ARMY CORPS OF ENG'RS (Mar. 4, 2014), https://www.usace.army.mil/Media/News-Releases/News-Release-Article-View/Article/475460/us-army-corps-of-engineers-releases-work-plans-for-fiscal-year-2014-civil-works/.

[116] U.S. Army Corps of Eng'rs, *Planning Community Toolbox*, https://planning.erdc.dren.mil/toolbox/project.cfm?Step=1 [https://perma.cc/C9LW-TDQT] (last visited Aug. 2, 2024) (emphasizing that the community is the prime mover in initiating a water resources project). Many statutory provisions governing the Corps contemplate the local interest requesting action from the Corps. *See, e.g.*, 33 U.S.C. § 2347 (requiring Corps action "upon request of the non-Federal interest"); 42 U.S.C. § 1962d-5f (same); 42 U.S.C. § 1962d-16 (same). The feasibility study cannot begin until the Corps and the non-federal sponsor sign a cost sharing agreement. 42 U.S.C. § 1962d-5b; 33 U.S.C. § 2215.

To be sure, ideas for specific coastal protection projects can emerge from the Corps. For example, Congress may direct the Corps to study certain broad geographical areas, after which the Corps may identify certain regions for further study. For example, after Hurricane Sandy in 2012, Congress authorized and funded a study of vulnerability to coastal flooding in the North Atlantic states damaged by the hurricane. Disaster Relief Appropriations Act of 2013, Pub. L. 113-2, Tit. II, 127 Stat. 5 (2013); U.S. ARMY CORPS OF ENG'RS, NORTH ATLANTIC COAST COMPREHENSIVE STUDY: RESILIENT ADAPTATION TO INCREASING RISK (2015) [hereinafter NACCS]. That study highlighted "high-risk areas along the Atlantic Coast," including Norfolk, and New York/New Jersey area which are now working with the Corps on coastal protection infrastructure. NORFOLK STUDY, *supra* note 79; N.Y. STUDY, *supra* note 10, at 1.

[117] On the statutory requirements for a feasibility study, *see* 33 U.S.C. § 2282(a)(2).

[118] IWR 2019-R-02, *supra* note 38, at 8. Congress does not always need to pass new legislation to authorize or appropriate funding for a feasibility study; the Corps may be able to rely on an existing statutory authority for a feasibility study, and fund the study from general appropriations. As statutory authority for the New York/New Jersey study, the Corps is relying on the 1955 law that originally authorized it to engage in coastal protection; after the Corps and the non-federal sponsors signed a cost-sharing agreement, the Corps funded the New York/New Jersey study from its Work Plan, which directs funding from the Corps' general appropriations. U.S. Army Corps of Eng'rs, *Army Civil Works Program, FY 2016 Work Plan, Investigations* (2016), https://usace.contentdm.oclc.org/digital/collection/p16021coll6/id/1999 [https://perma.cc/GST3-45QY].

interests are likely important in determining whether their members of Congress support a study.[119]

Subnational support is also required for initiating a feasibility study because, under federal law, these studies must have a non-federal co-sponsor.[120] These sponsors typically are local or state governments or agencies thereof. [121] The general rule is that the Corps cannot initiate a feasibility study unless a non-federal sponsor contractually agrees to pay fifty percent of the study's cost;[122] the federal government pays the remaining fifty percent.[123] The Corps and the non-federal sponsor (or sponsors) negotiate a cost-sharing agreement to cover the feasibility study.

In addition to paying for half of the cost of the feasibility study, non-federal sponsors usually must agree to pay thirty-five percent of the cost of building the project, and one hundred percent of the cost of operating,

[119] *See generally* Rasmussen, Kopp & Oppenheimer, *supra* note 13, at 9. The "congressional authorizing committees" for Corps projects are "the House Transportation and Infrastructure Committee and the Senate Environment and Public Works Committee." NICOLE T. CARTER & ANNA E. NORMAND, CONG. RSCH. SERV., RL31340, ARMY CORPS OF ENGINEERS: WATER RESOURCE AUTHORIZATION AND PROJECT DELIVERY PROCESSES 4 (2019).

[120] 33 U.S.C. § 2215.

[121] A nonprofit may also propose a project, and even serve as the non-federal sponsor, so long as the nonprofit has "the consent of the affected local government." 42 U.S.C. § 1962d-5b(b)(2); CARTER & NORMAND, *supra* note 119, at 10 (indicating that Congress sometimes authorizes nonprofits as sponsors).

[122] 33 U.S.C. § 2215(a)(1)(A) ("The Secretary shall not initiate any feasibility study for a water resources project after November 17, 1986, until appropriate non-Federal interests agree, by contract, to contribute 50 percent of the cost of the study."). *See also* NICOLE T. CARTER & ADAM NESBITT, CONG. RSCH. SERV., R47946, *Process for U.S. Army Corps of Engineers (USACE) Projects*, tbl. 2 (Study Phase—Cost Share) (Aug. 29, 2025) (noting feasibility studies are cost-shared 50/50 after the first $100,000) [https://perma.cc/W8MH-WTE7].

[123] At least sometimes, the federal government actually pays for more than fifty percent of the cost of feasibility studies; the federal government has paid over fifty percent of the cost of several of the feasibility studies for coastal protection projects discussed in this article. For example, in 2018, the Bipartisan Budget Act "authorized additional funding, not-requiring local cost-share, to complete the Coastal Texas Feasibility Study and EIS." See TEX. STUDY, *supra* note 25, at 5. "In June 2022, the [New York/New Jersey feasibility] study was converted from cost-shared funding to be 100% federally funded with appropriations from the Disaster Relief Supplemental Appropriations Act (DRSAA) to its completion." See U.S. ARMY CORPS OF ENG'RS, *Fact Sheet: New York/New Jersey Harbors & Tributaries Focus Area Feasibility Study*, (updated Jan. 7, 2025), https://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/2495552/fact-sheet-new-yorknew-jersey-harbor-tributaries-focus-area-feasibility-study/ [On File with the Columbia Journal of Environmental Law]. The federal government paid the entire cost of the feasibility study for Charleston. See U.S. ARMY CORPS OF ENG'RS, *Charleston Peninsula Coastal Storm Risk Management Study*, https://www.sac.usace.army.mil/Missions/Civil-Works/Charleston-Peninsula-CSRM-Project/ [On File with the Columbia Journal of Environmental Law] (last visited Aug. 6, 2024). See also Water Resources Development Act of 2024, Pub. L. No. 118-272, div. A, § 1139 (Jan. 4, 2025) (allowing the Corps to make exemptions for cost-sharing for low-income non-federal sponsors) [https://perma.cc/52KY-NAE7].

maintaining, replacing, and rehabilitating the project.[124] In exchange for agreeing to these financial obligations, the non-federal sponsor implicitly has a veto over the design of the project and whether it proceeds.[125] If the sponsor (or sponsors) pulls out, the Corps cannot pursue the project unless another non-federal sponsor emerges.

Table 1 identifies the local and state governmental agencies that are the non-federal sponsors for the examples of Corps' coastal protection projects discussed in this article, including sponsors for the feasibility studies.[126]

C. The Feasibility Study Process

The goal of the feasibility study is the development of a recommended plan for a coastal protection project that Congress will authorize and appropriate funding to build.[127] During the feasibility study, the Army Corps district office responsible for the project takes the lead in developing and analyzing potential construction alternatives, drawing on experts in

[124] 33 U.S.C. §§ 2213(a)(2) & (b)(1); 33 U.S.C. § 2213(j). On the history of cost-sharing, see Houck, *supra* note 5, at 35 (President Carter supported cost-sharing to deter low-value Corps projects, and "modest cost-sharing" was adopted under President Reagan); CARTER & NORMAND, *supra* note 119, at 8 (dating cost-sharing to 1986 Water Resources Development Act); MARTIN REUSS, U.S. ARMY CORPS OF ENG'RS, *Reshaping National Water Politics: The Emergence of the Water Resources Development Act of 1986*, at 3–4, 59–92 (1991) [https://perma.cc/NZE7-EFAR].

[125] *See* TARLOCK, *supra* note 18, at 1316–1317 (dating cost-sharing to the 1986 Water Resources Development Act, arguing it arose from the concerns of "fiscal conservatives and environmentalists," and that it "has increased the power of local sponsors and their Congressional representatives to influence project selection and design"); *Id.* at 1320 (Cost-sharing "has given local sponsors, local representatives, and senators a greater role in project selection, designs, and, most importantly, scope."). In some respects, the 1986 amendments requiring cost sharing represented a return to the situation that prevailed earlier in the nineteenth and twentieth centuries when state and local governments shared in the cost of flood protection. O'NEILL, *supra* note 6, at 173 (referring to argument of Martin Reuss); *Id.* at 149, 162, 168.

[126] Non-federal interests may also study and construct federally-authorized projects themselves pursuant to 33 U.S.C. §§ 2231–32. These provisions allow the non-federal interest to study and construct water resources projects with technical guidance from the Corps. *Id.* §§ 2231(a)(2)(B), 2231(e)(2), 2232(c)(1). If a non-federal sponsor produces a feasibility study that the Corps itself ultimately constructs, the cost of the feasibility study is credited toward the non-federal sponsor's cost share. *Id.* § 2231(d). If a non-federal sponsor constructs a federally authorized project or a separable element of one, the non-federal sponsor may receive credit or reimbursement up to what the federal cost-share would have been. *Id.* § 2232(d).

Congress has amended these provisions numerous times in recent years. WRDA 2024 requires the Corps to provide more federal assistance. See WRDA 2024, *supra* note 29, §§ 1109–10. WRDA 2018 streamlined the permitting requirements for non-federal water resources projects. *See* Water Resources Development Act of 2018, Pub. L. No. 115-270, § 1153 [https://perma.cc/V7VR-7GBD].

None of the projects analyzed for this article invoked sections §§ 2231–2232.

[127] *See generally* EP 1105-2-61, *supra* note 31, at 12–24, 38–44.

areas such as engineering, hydrology, and economics.[128] In addition, local interests influence the project in myriad ways in this phase. Reflecting the decentralized undertaking of feasibility studies, there is a degree of regional variation in analysis, even with the Corps' standardized frameworks.

The Corps' regulations require it to coordinate with the non-federal sponsor in undertaking the feasibility study, as Congress and the Corps have designed the process to be completed in conjunction with this sponsor.[129] Non-federal sponsors help set the parameters of the study by defining the problems and opportunities to assess.[130] During the study, the non-federal sponsor works with the Army Corps, for example by providing data to the Corps.[131] Their input is critical to determine whether each alternative succeeds on the "completeness" and "acceptability" criteria for evaluating project alternatives.[132]

In addition to the opportunities mentioned above for the non-federal sponsor to participate in a study, there are three formal opportunities for other interests, as well as the non-federal sponsor, to provide input during the study. These are (1) when the Corps is initially developing the scope of the study and the environmental impact statement that will accompany

[128] Table 1 identifies the Army Corps district offices responsible for the main feasibility studies discussed in this article.

[129] *See* ER 1105-2-100, *supra* note 27, at B-2 (directing Corps planners to "develop and implement an effective management structure to ensure that effective collaboration [with the non-federal sponsor] is an integral part of the feasibility process"); *see also, e.g.*, 33 C.F.R. § 234.6 (2025); 33 U.S.C. §§ 2282(a)(2), 2347.

[130] ER 1105-2-100, *supra* note 27, at 2-2 ("statements of problems and opportunities will reflect the priorities and preferences of the Federal Government, the non-Federal sponsors and other groups participating in the study process"); *see also* 33 C.F.R. § 234.6(d), (f). This step incorporates "scoping" for the purposes of the National Environmental Policy Act. ER 1105-2-100, *supra* note 27, at 2-3.

[131] *See* U.S. ARMY CORPS OF ENG'RS, NEW YORK-NEW JERSEY HARBORS AND TRIBUTARIES STUDY, APPENDIX D: ECONOMIC APPENDIX 21–22 (2022) [hereinafter N.Y. APP'X D] (describing data provided by non-federal sponsors) [On File with the Columbia Journal of Environmental Law].

[132] ER 1105-2-100, *supra* note 27, at 2–4 ("Completeness is the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities… Acceptability is the extent to which the alternative plans are acceptable in terms of applicable laws, regulations and public policies."). The Corps has shifted the acceptability prong away from accounting for local concerns in its new regulations. *Compare* U.S. ARMY CORPS OF ENG'RS, ER 1105-2-103, *Policy for Conducting Civil Works Planning Studies*, at 20 (2023) [hereinafter ER 1105-2-103] (acceptability includes "the extent to which the plan is welcome from a political or preferential perspective.") [On File with the Columbia Journal of Environmental Law]; 33 C.F.R. § 234.2 (acceptability "does not include local or regional preferences for solutions or political expediency."). Non-federal sponsors may also set additional criteria upon which to evaluate alternatives. *See* ER 1105-2-100, *supra* note 27, at 2-6. *See also* 33 C.F.R. § 234.6(f)–(h).

it to comply with the National Environmental Policy Act,[133] (2) after the Corps releases a draft study and EIS with a tentatively selected plan, [134] and (3) after the release of the final report and EIS.[135] Non-federal partners, including sponsors and other interest groups, also informally provide input through meetings with the Corps at other stages during the feasibility study.[136] For example, the Corps hosts public meetings to solicit feedback.[137]

The Corps is incentivized to take into account the preferences of powerful local interests during the feasibility study. Straying too far from these preferences risks jeopardizing the project. Congressional authorization and appropriation are required to build any proposal that emerges from the feasibility study; the views of the regional Congressional delegation will likely be influential in Congress and the views of Congress members will likely be influenced by those of local interests.[138] Moreover,

[133] 40 C.F.R. § 1501.9 (2024); *see also Id.* § 1502.4. In 2025, the Council on Environmental Quality rescinded the agency's longstanding regulations, which are cited in this and the next two footnotes. Council on Environmental Quality, Removal of National Environmental Policy Act Implementing Regulations, 90 Fed. Reg. 10610 (Feb. 25, 2025); Council on Environmental Quality, Removal of National Environmental Policy Act Implementing Regulations, 91 Fed. Reg. 618 (Jan. 8, 2026).

[134] 40 C.F.R. § 1503.1–.4 (2024).

[135] 40 C.F.R. § 1502.20; § 1506.11 (2024).

[136] *See, e.g.,* N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS. PROJECT, COLUM. CLIMATE SCH. ET AL., *Public Comments on the United States Army Corps of Engineers' (USACE) New York and New Jersey Harbor & Tributaries Focus Area Feasibility Study*, at 15 (Mar. 23, 2023) (NYNJHATS) [hereinafter N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS.] (referring to attending "several private meetings, co-presentations, and . . . USACE hosted public meetings") [https://perma.cc/WSM4-3JF7]. *See generally* 33 C.F.R.§234.6(d) ("The planning process will seek to achieve full collaboration with a wide range of affected Tribes, governmental and non-governmental stakeholders, communities with environmental justice concerns, and the public in all stages of the planning process.").

[137] 33 U.S.C. § 2282(f); ER 1105-2-100, *supra* note 27, at 2-14 to -15. For examples, see *Public Engagements Information*, COLLIER CSRM, https://colliercsrm-usacenao.hub.arcgis.com/pages/public-notice [https://perma.cc/VF4J-LEGS] (last visited May 21, 2024); U.S. ARMY CORPS OF ENGINEERS, *Miami-Dade Back Bay Coastal Storm Risk Management Study Re-Initiation* [hereinafter Miami Re-Initiation] (2022) [On File with the Columbia Journal of Environmental Law].

[138] During the ongoing New York/New Jersey study, congressional representatives from the study area have sent letters to the Corps asking for changes in, *inter alia*, its sea level rise data and its levels of protectiveness of environmental justice communities. Non-federal partners and community groups have also advocated for similar changes to the ongoing study. *See* Letter from Sean P. Maloney, Nydia M. Velázquez, et al., Members of Congress, to Deputy Assistant Sec'y Jamie Pinkham, U.S. Army Corps of Eng'rs (May 26, 2021) [https://perma.cc/T3F8-M2Q2]; Letter from Nydia M. Velázquez, Dan Goldman, et. al., Members of Congress, to Assistant Sec'y Michael L. Connor, U.S. Army Corps of Eng'rs (Sept. 12, 2023) [https://perma.cc/NT32-6W5P]; Kate Boicourt, Director, Climate Resilient Coasts and Watersheds, New York – New Jersey, Environmental Defense Fund, to U.S. Army Corps of Engineers, *Re: NY & NJ Harbor & Tributaries Focus Area Feasibility Study (HATS) Tentatively Selected Plan 2* (March 31, 2023) [hereinafter Environmental Defense Fund] [https://perma.cc/PAV6-UFVU]; Shawn M. LaTourette, Commissioner, State of New Jersey, Department of Environmental Protection; Basil Seggos,

the Corps cannot begin construction without a project partnership agreement from a non-federal sponsor.[139] Non-federal sponsors must also be willing to provide "all lands, easements, rights-of-way, and dredged material disposal areas" that a project requires, and pay thirty-five percent of the construction costs[140] and one hundred percent of the costs of operating and maintaining projects once built.[141] If the Corps deviates too much from the preferences of local and state interests, the non-federal sponsor and/or the region's congressional delegation may refuse to support a project.[142] The executive branch may also derail projects. President Trump's opposition to a storm surge barrier led to a temporary pause in the New York/New Jersey study during his first administration.[143]

The Corps' experience in Miami is a useful case study of the influence of the non-federal sponsor and other stakeholders on the Corps' project planning through the feasibility study. The Corps initiated its coastal storm risk management study for Miami-Dade County in 2018 with Miami-Dade County as the non-federal sponsor.[144] In 2020, the Corps issued a draft

Commissioner, State of New York, Department of Environmental Conservation; Rohit Aggarwala, Chief Climate Officer, New York City, Mayor's Office of Climate & Environmental Justice, *Non-federal Interest Comments on the New York and New Jersey Harbor and Tributaries Study (HATS) Draft Integrated Feasibility Report and Tier 1 Environmental Impact Statement 1* (Mar. 31, 2023) [hereinafter NJ DEP, NYS DEC & NYC MOCEJ].

[139] 42 U.S.C. § 1962d-5b(a)(1).

[140] 33 U.S.C. § 2213(a)(2), (b)(1). The value of the lands, easements, rights-of-way, relocations, and disposal costs counts in determining whether the 35 percent cost share requirement is satisfied. The lands, easements, rights-of-way, relocations, and disposal costs can occasionally satisfy—or even exceed—the local interest's 35 percent cost share requirement. *See* ENV'T LAW INST., *USACE Project Partnership Agreements: Problematic Provisions for Non-Federal Sponsors 1*, at 24–27 (Dec. 2023), https://www.eli.org/sites/default/files/files-pdf/USACE%20PPAs%20-%20Issue%20Brief%20-%20ELI%20Jan%202024_0.pdf [https://perma.cc/6J5A-PQ8P].

[141] 33 U.S.C. § 2213(j).

[142] Rasmussen, Kopp & Oppenheimer, *supra* note 13, at 9; FEREJOHN, *supra* note 108 at 52–55. On the other hand, the Corps' acquiescence to suggestions from local stakeholders sometimes may reduce the effectiveness of project designs in addressing flood risks. *See* U.S. ARMY CORPS OF ENG'RS, COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY, APPENDIX A: PLAN FORMATION, at 138–39 (2021) [hereinafter TEX. APP'X A] (removing levees and increasing dune heights in response to public comments) [On File with the Columbia Journal of Environmental Law]; EBERSOLE, FIGLUS & JONKMAN, *supra* note 30, ch. 2 at 8–9 (arguing that the Corps strayed from flood risk reduction as a driving paradigm by incorporating the reduced levels of flood protection advocated by commenters).

[143] Anne Barnard, *After Trump Mocks a Seawall in New York, Plan is Abruptly Suspended*, N.Y. TIMES (Feb. 26, 2020), https://www.nytimes.com/2020/02/25/nyregion/sea-wall-nyc.html [https://perma.cc/Y8VE-X5UN]. Long before President Trump, President Carter sought to rein in spending on Corps' projects, but he ran into opposition in the House and Senate. REUSS, *supra* note 124, at 48–52, 57–64. For discussion of the mechanisms by which the President influences agency action, *see* Sarah E. Anderson & Matthew Potoski, *Agency Structure and the Distribution of Federal Spending*, 26 J. Pub. Admin Rsch. & Theory 461 (2016).

[144] MIAMI STUDY I, *supra* note 69, at 1.

feasibility study.[145] Local opposition mounted after publication of the draft feasibility study, which recommended extensive structural measures that would have cost over $4.5 billion to construct.[146] The Miami Downtown Development Authority, an "independent agency of the City of Miami," submitted a comment to the Corps which criticized the plan for its "overwhelmingly detrimental effect on the entire waterfront area of Miami[.]"[147] Because of the location of the proposed seawall, the draft study "produced a rare moment of agreement between environmentalists and real estate developers[.]"[148] Local concerns included the effects of the seawall on tourism, property values, city character, low-income communities, and the environment.[149] Miami-Dade County submitted formal comments echoing these concerns.[150] Just over a year after the close of the comment period, the County decided to reject the Corps' proposed plan and move forward with a locally preferred plan (LPP).[151] However, in August of 2022, the Corps and Miami-Dade re-initiated the feasibility study, and the Corps promised "Enhanced Coordination and Stakeholder Involvement."[152] Some environmental groups view this experience as a positive case study in local participation because advocacy groups successfully lobbied the non-federal sponsor to reconsider its involvement

[145] *Id.*

[146] *Id.* at vi.

[147] Letter from Manolo Reyes, Chairman, Miami Downtown Development Authority, to Susan L. Conner, Chief, *U.S. Army Corps of Engineering Planning and Policy Branch 1 (Aug. 19, 2020)*, https://www.miamidda.com/wp-content/uploads/2019_08_19_Army-Corp-of-Engineers-Back-Bay-Study-Recommendations-with-Renderings.pdf [https://perma.cc/6CRZ-DNR8].

[148] Patricia Mazzei, *A 20-Foot Sea Wall? Miami Faces the Hard Choices of Climate Change*, N.Y. TIMES (Jun. 2, 2021) (updated Jun. 22, 2023), https://www.nytimes.com/2021/06/02/us/miami-fl-seawall-hurricanes.html [https://perma.cc/9286-QYNY].

[149] *See* Letter from Manolo Reyes to Susan L. Conner, *supra* note 147; Erik Bojnansky, *Residents Fight Floodwalls Proposed by Army Corps of Engineers*, BISCAYNE TIMES (N.D.) (Aug. 02, 2021), https://www.biscaynetimes.com/news/residents-fight-floodwalls-proposed-by-army-corps-of-enginee/ [https://perma.cc/3ZQL-ZHK9]; Miami WaterKeeper, *County & Miami DDA Join Environmental Stakeholders in Addressing Back Bay Study Pitfalls* (Aug. 20, 2020), https://www.miamiwaterkeeper.org/county_miami_dda_join_environmental_stakeholders_in_addressing_back_bay_study_pitfalls [On File with Columbia Journal of Environmental Law].

[150] Letter from Jack Osterholt, Deputy Mayor, Miami-Dade Cnty., to Susan E. Layton, Plan. and Pol. Branch Chief, U.S. Army Corps of Eng'rs Norfolk Dist. (Aug. 19, 2020), https://files.constantcontact.com/108fc699501/17cd8183-f932-415d-aa27-5170eb610389.pdf [https://perma.cc/R9G6-A7SL].

[151] *See* Press Release, Miami-Dade Cnty., Miami-Dade County Asks for Locally Preferred Plan on Back Bay Study, Focusing on Nature-Based Resilience and Continued Community Input (Aug. 30, 2021), https://www.miamidade.gov/releases/2021-08-30-mayor-back-bay.asp [https://perma.cc/MS5P-XDNM]; Jenny Staletovich, *Miami-Dade County Rejected an Army Corps Plan to Fight Storm Surge – Here's What the Corps Says is Up Next*, WLRN 91.3 FM (Sept. 2, 2021), https://www.wlrn.org/news/2021-09-02/miami-dade-county-rejected-an-army-corps-plan-to-fight-storm-surge-heres-what-the-corps-says-is-up-next [https://perma.cc/64BF-GWXC].

[152] Miami Re-Initiation, *supra* note 137 (capitalization in original).

with the Corps.[153] Released in April 2024, the second draft feasibility study for the Miami project was markedly different from the first; most notably, it did not propose a seawall. The tentatively selected plan focused almost entirely on flood proofing and elevating residential buildings and critical infrastructure, both of which are classified as "nonstructural" measures.[154] The Corps finalized the report in August 2024 with the aim of obtaining Congressional authorization for the project in the biennial Water Resources Development Act (WRDA) expected that year.[155] Congress authorized the updated project in the WRDA passed in December 2024.[156]

1. Benefit-cost Test and National Environmental Policy Act

The feasibility study is undertaken pursuant to statutory requirements and Army Corps regulations, and the Army Corps plays a leading role in fulfilling these various legal requirements. We highlight two analytical requirements that the Corps is required to comply with in completing the feasibility study: the requirements to undertake benefit-cost analysis of project proposals and to comply with NEPA.

a. The Benefit-Cost Test

Since the early twentieth century, a project must generally pass a benefit-cost test for the Army Corps to recommend it to Congress for authorization and appropriations.[157] The benefit-cost test requires that the benefits of Corps projects exceed their costs from a national perspective. It therefore prevents the project's local benefits from being the sole consideration in determining whether a project proceeds and how it is

[153] *See* Jeremy Cox, *In Danger of Drowning, Norfolk Faces Criticism over Flood-Protection Plan*, BAY JOURNAL (Mar. 7, 2022), https://www.bayjournal.com/news/climate_change/in-danger-of-drowning-norfolk-faces-criticism-over-flood-protection-plan/article_3898e226-94da-11ec-8a47-0b5f4c3681cc.html [https://perma.cc/R9QT-FGM8].

[154] MIAMI II DRAFT, *supra* note 66, at ES-4. Tellingly, "the majority of Miami-Dade County remains at coastal storm risk." *Id.* at 171.

[155] MIAMI STUDY II, *supra* note 32, at ES-3. Congress typically passes a WRDA biennially.

[156] Thomas R. Carper Water Resources Development Act of 2024, Pub. L. No. 118-272, § 1401, 138 Stat. 2992, 3168 (2025).

[157] 33 U.S.C. § 701a ("the Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected"); ER 1105-2-103, *supra* note 132, at 2; *see also* 33 U.S.C. § 2282(a)(2); 33 U.S.C.A. § 2282a (identifying costs that must be considered in benefit-cost analyses for flood damage reduction projects).

designed.[158] Indeed, in the early twentieth century, the Corps incorporated benefit-cost analysis into project planning partly to provide the Corps and the executive branch with a tool to resist low-value projects championed by local interests and members of Congress at their behest.[159]

Rules developed within the executive branch and the Corps establish the parameters for the benefit-cost analyses that it undertakes as part of feasibility studies.[160] The benefit-cost analyses for climate-related coastal protection projects analyzed in this article were undertaken pursuant to the 1983 Reagan-era Economic and Environmental Principles and Guidelines for Water and Related Land Implementation Studies (P&G), and the 2000 Planning Guidance Notebook (PGN) implementing the P&G.[161] As we discuss in Part IV, late in the Biden administration, in December 2024, the Army Corps finalized new rules (Agency Specific Procedures, or ASPs) that may significantly alter the agency's approach to benefit-cost analysis

[158] Additionally, 2024 rules governing Corps project planning prevent the Corps from considering "regional economic development effects" in formulating the alternative plan that maximizes "net public benefits to society." 33 C.F.R. § 234.8(a)(5) (2025).

[159] Houck, *supra* note 5, at 9–13, 24 (describing the benefit-cost requirement in the Flood Control Act of 1936 as emerging from executive branch desires to rein in spending on Corps' projects, and the Corps' internal practice of prioritizing projects based on benefit-cost ratios); PORTER, *supra* note 5, at 149 ("Cost-benefit methods were introduced to promote procedural regularity and to give public evidence of fairness in the selection of water projects.").

[160] Army Corps water resources planning is not bound by Circulars A-4 or A-94. Exec. Order No. 12,866, 58 Fed. Reg. 51735 (Sept. 30, 1993) (applying only to regulations or rules, not to water resources construction projects); OFF. OF MGMT. & BUDGET, EXEC. OFF. OF THE PRESIDENT, CIRCULAR NO. A-4 (Nov. 9, 2023) [hereinafter CIRCULAR A-4] (applying to regulatory actions under EO 12,866 and subsequent amendments thereof); *Id.* at 4 (exempting water resources projects). Under the Agency Specific Procedures finalized by the Corps in December 2024, "the Corps will consider and, where it deems appropriate, align with the latest Federal methods and guidance (for example, updated OMB Circulars and applicable interagency guidance) to ensure that the analytical framework accounts for all significant economic, environmental, and social costs and benefits, including ecosystem services." 33 C.F.R. § 234.7(b)(2). *See also* Corps of Engineers Agency Specific Procedures to Implement Federal Investments in Water Resources, 89 Fed. Reg. 103992, 104015 (Dec. 19, 2024) ("In general, the Corps will follow the principles presented in Circulars A-4 and A-94 for implementing a benefit-cost analysis."). Notably, the Corps applies a distinct discount rate in undertaking benefit-cost analysis. "The discount rate used by the Corps is based on a requirement in section 80 of WRDA 1974." *Id.*; *see also* 42 U.S.C. § 1962d-17 (establishing the approach for determining the interest rate for water resources projects); 18 C.F.R. § 704.39 (1968) (specifying formula for determining interest rate); Bureau of Reclamation, "Change in Discount Rate for Water Resources Planning," 89 Fed. Reg. 100533 (Dec. 12, 2024) (for fiscal year 2025, the water planning discount rate is three percent). In an early executive order in his second term, President Trump ordered the director of the Office of Management Budget to revoke the Biden-era revisions to Circular A-4 cited in this footnote and reinstate the 2003 version of the circular. Unleashing Prosperity Through Deregulation, Exec. Order No. 14192, § 6(b), 90 Fed. Reg. 9065, 9067 (Jan. 31, 2025).

[161] *See* U.S. WATER RES. COUNCIL, ECONOMIC AND ENVIRONMENTAL PRINCIPLES AND GUIDELINES FOR WATER AND RELATED LAND RESOURCES IMPLEMENTATION STUDIES (1983) [hereinafter P&G]; *See also* ER 1105-2-100, *supra* note 27.

in project planning, assuming the new rules endure.[162] In light of the centrality of the "old" rules for the projects discussed in this article, and uncertainty about the impacts (and longevity) of the new rules, this section provides an overview of the old rules.

Under the P&G and PGN, the benefits and costs of project designs were allocated among four accounts, rather than considered holistically in a single benefit-cost analysis: the National Economic Development (NED) account, the Environmental Quality (EQ) account, the Regional Economic Development (RED) account, and the Other Social Effects (OSE) account.[163] The NED was the only account that the Corps was required to consider in choosing a project design;[164] specifically, the Corps had to select the option which "reasonably maximize[d] net economic benefits consistent with protecting the Nation's environment[.]"[165] In practice, this meant that the Corps typically selected the highest-scoring NED plan, provided assessments for the other accounts were acceptable.[166] The Corps chose the plan that maximized national economic efficiency (the NED plan) in each of the draft or final feasibility studies for the coastal storm risk management projects in Charleston, Coastal Texas, New York/New Jersey, and Norfolk, even if other options scored higher in the EQ and OSE accounts.[167]

[162] *See* Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed. Reg. 103992 (Dec. 19, 2024) (codified at 33 C.F.R. pt. 234). The Agency Specific Procedures remain in effect as this article goes to press.

[163] In general, the Corps analyzes the benefits and costs of a project for 50 years from the economic base year. ER 1105-2-100, *supra* note 27, at 2–11.

[164] P&G, *supra* note 161, at 8 ("The NED account is the only required account."); JUSTIN R. EHRENWERTH ET AL., ENHANCING BENEFITS EVALUATION FOR WATER RESOURCES PROJECTS: TOWARDS A MORE COMPREHENSIVE APPROACH FOR NATURE-BASED SOLUTIONS 23 (2022), https://ewn.erdc.dren.mil/wp-content/uploads/2022/10/EvolutionofUSACEWaterReourcesProjectSelection.pdf [https://perma.cc/NC94-NKLT] ("[T]he P&G re-established NED as the primary purpose of water resources management").

[165] ER 1105-2-100, *supra* note 27, at 2-7. *See also* P&G, *supra* note 161, at v ("A plan recommending Federal action is to be the . . . NED plan").

[166] *See* NAT'L RSCH. COUNCIL, *supra* note 4, at 58 ("projects are designed to maximize NED benefits relative to financial costs, while ensuring that the project does not cause unacceptable adverse environmental impacts"); *Id.* at 122 ("Aside from major adverse environmental impacts, environmental and social effects no longer significantly influenced water resources decisions").

[167] *See* NORFOLK STUDY, *supra* note 79, at 92 ("Alternative 4d [the selected plan] overall [has] the greatest negative environmental impacts."); N.Y. STUDY, *supra* note 10, at 178–87 (selected plan scoring third out of five on OSE and EQ metrics); CHARLESTON STUDY, *supra* note 44, at C-65 (identifying the selected alternative as the NED plan); TEX. STUDY, *supra* note 25, at 53–55 (identifying the NED plan as the recommended plan). *See also* NAT'L RSCH. COUNCIL, *supra* note 4, at 58; EHRENWERTH ET AL., *supra* note 164, at 34 ("USACE planning experts noted that this policy preference for the 'NED alternative' is well-understood and enforced (through policy review) within the agency").

Notably, a non-federal sponsor always had the option of asking the Assistant Secretary of the Army for an exception to enable the Corps to move forward with a locally preferred plan that did not maximize NED benefits.[168] Miami-Dade County and the ACE project team requested and received an exception for the coastal protection project that Congress authorized in 2024; the project's costs exceeded its benefits.[169]

For coastal storm risk management projects, the benefit-cost analysis in the NED has typically been limited to the value of reduced damage to structures and their contents, minus the cost of construction and operation of the project.[170] To calculate anticipated damage reductions, the Corps

[168] ER 1105-2-100, *supra* note 27, at 2-8; ER 1105-2-103, *supra* note 132, at 19 (including the locally preferred plan in the "array of alternatives" if the local partner requests an LPP that is not among the Corps' proposed alternatives, and Assistant Secretary approves this request).

The Secretary of the Army may waive the requirement to choose the NED plan "when there is some overriding reason for selecting another plan, based upon other Federal, State, local, and international concerns." P&G, *supra* note 161, at 15. *See also* ER 1105-2-100, *supra* note 27, at 2-8 (locally preferred plan); ER 1105-2-103, *supra* note 132, at 55 ("Departures from the NED plan may be considered to manage residual risk . . . or when overriding reasons to recommend another plan are revealed in the analysis of the alternatives"); 33 U.S.C. § 701b-15 (2014) (outlining ability of the Secretary to carry out locally preferred plan under certain conditions).

[169] U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT STUDY APPENDIX A-5, at 49–50 (2024) [hereinafter MIAMI II APP'X A-5] (requesting a deviation from the NED plan); Fulmer, *supra* note 13, at 740–42; MIAMI STUDY II, *supra* note 32, at ES-5, 185 (referring to the grant of an NED policy exception). The Miami Study's NED policy exception was necessary because the "Recommended Plan is not the National Economic Development . . . Plan[,]" and was granted "based on maximization of public benefits including benefits to social cohesion and reduction of life loss in Environmental Justice communities." Memorandum from Scott A. Spellmon, Chief of Eng'rs, U.S. Army Corps of Eng'rs, on Miami-Dade Back Bay, Miami-Dade County, Florida, Coastal Storm Risk Management 1 (Aug. 26, 2024), https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/26749 [https://perma.cc/K8WU-7VAV].

WRDA 2024 also authorized a coastal protection project for Washington, D.C. for which the Assistant Secretary had granted an exception. Thomas R. Carper Water Resources Development Act of 2024, Pub. L. No. 118-272, § 1401, 138 Stat. 2992, 3168 (2025); U.S. ARMY CORPS OF ENG'RS, METROPOLITAN WASHINGTON DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY: FINAL INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT viii (2024) [hereinafter WASHINGTON STUDY] (NED policy exception approved on March 18, 2024, allowing the "Recommended Plan to include non-economically justified separable elements based on environmental and other social effects.").

[170] *See, e.g.*, ER 1105-2-100, *supra* note 27, at 3–21 ("For hurricane and storm damage reduction projects estimated benefits are principally reductions in actual or potential damages to affected land uses . . . The primary benefit to be claimed in hurricane and storm damage reduction projects is reduction of damages to existing structures."); ER 1105-2-103, *supra* note 132, at 53 (narrowing the definition of non-physical damage reflected in the NED account); EHRENWERTH ET. AL., *supra* note 164, at 33 (summarizing challenges identified by Corps "planning experts[:]" "economic costs and benefits (e.g., flood property damages avoided) drive the selection of the preferred alternative and thus limit the inclusion of ecosystem services, equity, social justice and other outcomes/benefits that may not been [sic] readily monetized in the context of NED"). On the focus on avoided property damages as the main benefits of a project in the NED, *see* N.Y. APP'X D, *supra* note 131, at 7 ("The National Economic (NED) Benefits for the project are the difference in expected damages to

uses a model that takes as inputs an inventory of structures within the study area, the relationship between depth of flooding and its probability of occurrence, and the relationship between damages and the depth of flooding.[171] The Corps estimates avoided damages to structures using depreciated replacement value, which favors projects protecting areas with higher market value properties.[172] The tendency to focus in the NED on avoided property damages as the main project benefit meant that many project impacts were not counted within the NED, including avoided

structures and their contents without and with a selected alternative in place"); U.S. ARMY CORPS OF ENG'RS, NORFOLK COASTAL STORM RISK MANAGEMENT STUDY, APPENDIX C C-27 (2018) [hereinafter NORFOLK APP'X C] (using the HEC-FDA model, whose main inputs are structure and content values, to calculate NED benefits).

To the extent that other benefits (than avoided property damages) can be quantified and monetized, they should be included in the NED account, even under longstanding Engineer Regulations. *See* U.S. ARMY CORPS OF ENGINEERS INSTITUTE FOR WATER RESOURCES, IWR 2009-R-4, HANDBOOK ON APPLYING "OTHER SOCIAL EFFECTS" FACTORS IN CORPS WATER RESOURCES PLANNING 38 (2009) [hereinafter IWR 2009-R-04] ("Some social effects are monetary in scope and can easily be presented in monetary terms . . . For such effects it is entirely appropriate to describe their monetary costs and benefits and where permissible under evaluation policies to include them in the NED account.").

[171] *See* N.Y. STUDY, *supra* note 10, at 19–40.

[172] Structure value is determined by depreciated replacement value, and content value is typically estimated as a function of structure value. U.S. ARMY CORPS OF ENG'RS, INST. FOR WATER RES., IWR 2011-R-09, COASTAL STORM RISK MANAGEMENT 79, 81, 115 (2011) [hereinafter IWR 2011-R-09]; *see also* James J. Comiskey, *Overview of Flood Damages Prevented by U.S. Army Corps of Engineers Flood Control Reduction Programs and Activities*, 130 J. CONTEMP. WATER RSCH. & EDUC. 13, 16 (2005) ("[Structure value analysis] reflect[s] the replacement costs minus depreciation to the existing (pre-flood) structure."). The Corps does not use market value in its CSRM projects unless it can be shown that market value closely tracks depreciated replacement value. U.S. ARMY CORPS OF ENG'RS, INST. FOR WATER RES., IWR 1991-R-10, NATIONAL ECONOMIC DEVELOPMENT PROCEDURES MANUAL-URBAN FLOOD DAMAGE 15–16 (1991).

mortalities[173] and morbidities,[174] impacts on ecosystems,[175] recreation,[176] and visual effects.[177] These impacts might have been considered in the Environmental Quality or Other Social Effects Accounts, but these accounts were historically much less important in Corps decision-making than the NED account.[178] The bias of the NED in favor of proposals that

[173] IWR 2009-R-04, *supra* note 170, at 37 ("Loss of life estimates are not usually monetized"). For discussion of why the value of lives saved should be monetized and included in Corps' benefit-cost analyses, *see* Kysar & McGarity, *supra* note 101, at 227–31 (describing the shortcomings of the Corps' benefit-cost analysis pre-Katrina and arguing that incorporating the value of lives saved would have helped the Corps plan for larger storms in New Orleans); Inst. for Pol'y Integrity, Comment Letter on Proposed Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources 9-10 (Apr. 15, 2024) [hereinafter Institute for Policy Integrity Comments], https://policyintegrity.org/projects/update/comments-to-the-army-corps-of-engineers-on-agency-specific-procedures-to-implement-the-principles-requirements-and-guidelines-for-water-resources-investments [https://perma.cc/47K9-84UY].

[174] ER 1105-2-100, *supra* note 27, at D-39 (recommending life, health, and safety effects to be considered within the OSE account, either as beneficial or adverse effects). *See, e.g.*, N.Y. APP'X D, *supra* note 131, at 73–88 (discussing contamination risks and how the plan would mitigate them, but not monetizing reduced incidence of illness); CHARLESTON STUDY, *supra* note 44, at 240 (discussing mold-borne illness reduction without an explicit monetization or quantification of this effect).

[175] *See, e.g.*, N.Y. STUDY, *supra* note 10, at 183 (quantifying EQ effects); MIAMI STUDY I, *supra* note 69, at 239–366 (describing EQ effects qualitatively).

[176] *See, e.g.*, N.Y. APP'X D, *supra* note 131, at 19 (removing "outdoor recreational facilities" from the structure inventory for the NED model); CHARLESTON STUDY, *supra* note 44, at 221–25 (including recreation in the OSE account). The Corps could choose to include recreation effects in the NED so long as they were not greater than 50% of the total benefits of the project. ER 1105-2-103, *supra* note 132, at 56; ER 1105-2-100, *supra* note 27, at 3–30.

[177] Aesthetics were frequently placed in another account. *See* N.Y. STUDY, *supra* note 10, at 181 (OSE); MIAMI STUDY I, *supra* note 69, at 218–19 (OSE); CHARLESTON STUDY, *supra* note 44, at 261–66 (EQ). This occurred despite the fact that aesthetics can have major impacts on the local economy. *See, e.g.*, MIAMI STUDY I, *supra* note 69, at 219.

[178] The EQ account identified the environmental benefits and detriments of a particular project. LUTHER, *supra* note 109, at 11 (discussing the distinctive features of the EQ account compared to NEPA compliance). The Corps has a long history of discussing the environmental benefits and detriments of its projects; the P&G, however, demoted environmental impacts to a second-order consideration. P&G, *supra* note 161, at 1; EHRENWERTH ET AL., *supra* note 164, at 24–25; TURNING THE TIDE, *supra* note 97, at 22.

Environmental quality assessments varied. *Compare* N.Y. STUDY, *supra* note 10, at 183–87 (using numerical metrics to discuss variable environmental impacts across numerous categories), *with* MIAMI STUDY I, *supra* note 69, at 240–69 (presenting qualitative impacts along similar, yet distinct, categories).

The OSE account was a catchall for the impacts of coastal protection projects not directly linked to the other three accounts. E.R. 1105-2-100, *supra* note 27, at D-39. The OSE account could be the location for environmental justice analyses, among other considerations. *See, e.g.*, N.Y. STUDY, *supra* note 10, at 180 (including Environmental Justice analysis in OSE analysis); NORFOLK STUDY, *supra* note 79 (same). IWR 2009-R-04, *supra* note 170, at 35–37. The Corps does not monetize OSE factors; one ACE report claimed doing so could pose numerous conceptual problems. *Id.* at 37–39 (advocating for keeping OSE as a qualitative analysis). Regional Army Corps offices appear to have some degree of choice regarding how to display an OSE analysis. *Compare* CHARLESTON STUDY, *supra* note 44, at 257–58 (discussing mostly life loss in

avoided property damage, and the overarching importance of the NED, contributed to criticisms that the Corps' benefit-cost analyses privilege projects that protect areas with high property values, and under-protect low-income communities and communities of color.[179] As will be discussed in Part IV, the ASPs adopted in 2024 addressed some of these criticisms.

b. National Environmental Policy Act Analysis

The National Environmental Policy Act requires agencies whose actions will have "a reasonably foreseeable significant effect on the quality of the human environment" to prepare an Environmental Impact Statement.[180] The Corps prepares an EIS—or otherwise complies with NEPA—in conjunction with the feasibility study.[181] The EIS identifies and analyzes the environmental impacts of the Corps' recommended alternative and other options but does not require that the Corps select the project plan that will minimize environmental impacts.[182]

Stakeholders that oppose a project can sue based on a failure to comply with NEPA but likely not until the Corps submits a recommendation for a project plan to Congress, since final agency action is required to sue for a NEPA violation.[183] Congressional authorization of a project is not a barrier

OSE) *and Id.* at 262–66 ("Cultural Resources & Historic Properties . . . Recreation . . . Visual Aesthetics; . . . Environmental Justice . . . [and] Future Residential Development" in EQ), *with* N.Y. STUDY, *supra* note 10, at 180–82 (assigning a quantitative score to many OSE factors).

As a practical matter, the RED account appears to have been a proxy for construction costs. *Cf.* N.Y. APP'X D, *supra* note 131, at 70.

[179] *See, e.g.,* TURNING THE TIDE, *supra* note 97, at 23; N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS. *supra* note 136, at 7.

There are examples in feasibility studies for coastal storm risk management projects of areas with low property values receiving nonstructural measures, while areas with higher property values receive seawalls and storm surge barriers. *See, e.g.*, N.Y. APP'X D, *supra* note 131, at 9, 65 (detailing reaches receiving full and partial risk reduction); CHARLESTON STUDY, *supra* note 44, at ES-7 (protecting downtown Charleston); *Id.* at 244 (describing nonstructural measures for affordable housing areas); NORFOLK STUDY, *supra* note 79, at 386 ("Due to the nature of the shoreline on the south side of the Eastern Branch and lower property values structural measures could not be economically justified, so only nonstructural measures would be employed there.").

[180] 42 U.S.C. § 4336(b)(1) (the text cites the language added to NEPA in 2023).

[181] *See* CARTER & NORMAND, *supra* note 119, at 12 (Box: USACE Feasibility Studies: National Environmental Policy Act Compliance and Economic Analyses) ("The U.S. Army Corps of Engineers (USACE) integrates its NEPA compliance process with the development of a feasibility study."). In the second draft feasibility study for Miami-Dade County, the Corps prepared only a draft Environmental Assessment, not an EIS. MIAMI STUDY II, *supra* note 32.

[182] Robertson v. Methow Valley Citizens Council, 490 U.S. 332 (1989); Seven Cnty. Infrastructure Coal. v. Eagle Cnty, Colo., S. Ct. 1497 (2025).

[183] 5 U.S.C. § 704. Courts use the test articulated in *Bennett v. Spear* to determine whether an agency action is final. Bennett v. Spear, 520 U.S. 154, 177–78 (1997). Applying the test in *Bennett*, for Corps civil works projects, it is likely that the final agency action is the Corps' submission of the Chief's Report to Congress. *Cf.* Oregon Nat. Res. Council v. Harrell, 52 F.3d 1499, 1503 (9th

to litigation, and NEPA can be a basis for suit even after construction has begun.[184] Remedies include injunctive relief[185] and compelled action.[186] However, precedents suggest that it may be difficult for project opponents to prevail in court relying on NEPA.[187] In addition to NEPA, there are several other legal bases on which project opponents might sue to force changes to a project, or delay or block it.[188] The potential that opponents

Cir.1995) (holding that the Corps' Record of Decision "was reviewable final agency action" even without congressional appropriation of funds).

[184] *See* WildEarth Guardians v. U.S. Army Corps of Eng'rs, 429 F. Supp. 3d 1224, 1235 (D.N.M. 2019) (construction of one aspect of the project had already been concluded at the time of litigation); Sierra Club v. U.S. Army Corps of Eng'rs, 803 F.3d 31, 42 (D.C. Cir. 2015) (litigation commenced, and was allowed to proceed, despite construction beginning); Save Our Wetlands, Inc. v. Rush, 424 F. Supp. 354, 356 (E.D. La. 1976) (allowing NEPA suit to proceed despite 10 years of construction).

[185] *Sierra Club*, 803 F.3d at 42–43; Save Our Wetlands, Inc. v. Rush, Civ. No. 75-3710, slip. op. at 10 (E.D. La. 1977).

[186] Courts may compel an agency action pursuant to 5 U.S.C. § 706(1) when an "agency ignored 'a specific, unequivocal command' in a federal statute or binding regulation." Fort Bend Cnty. v. U.S. Army Corps of Eng'rs, 59 F.4th 180, 197 (5th Cir. 2023) (quoting Norton v. S. Utah Wilderness All., 542 U.S. 55, 63 (2004)).

[187] *See, e.g.*, Nat'l Audubon Soc'y v. U.S. Fish & Wildlife Serv., 55 F. Supp. 3d 316 (E.D.N.Y. 2014) (denying plaintiff motion for preliminary injunction based partly on NEPA violations); WildEarth Guardians v. U.S. Army Corps of Eng'rs, 429 F. Supp. 3d 1224 (D.N.M 2019) (rejecting NEPA challenges); St. Johns Riverkeeper, Inc. v. U.S. Army Corps of Eng'rs, 462 F. Supp. 3d 1256 (M.D. Fla. 2020) (rejecting NEPA challenges); Nat'l Wildlife Fed'n v. Westphal, 116 F. Supp. 2d 49, 58–59 (D.D.C. 2000) (holding that the Corps' decision to not analyze the nonstructural alternative of purchasing flowage easements did not violate NEPA); Nat'l Audubon Soc'y v. U.S. Army Corps of Eng'rs, 991 F.3d 577 (4th Cir. 2021) (rejecting challenges to environmental impact statement for permit for construction of "'terminal groin'" to address beach erosion); Matter of Defend H20 v. Town Bd. of the Town of E. Hampton, 147 F. Supp. 3d 80, 115–17 (E.D.N.Y. 2015) (finding that the Corps' environmental assessment and finding of no significant impact complied with NEPA). *But see* Env't Def. v. U.S. Army Corps of Eng'rs, 515 F. Supp. 2d 69, 88 (D.D.C. 2007) (finding violation of NEPA), *appeal dismissed upon voluntary motion of appellants*, 2008 WL 4562202 (D.C. Cir. 2008); 2008 WL 4561439 (D.C. Cir. 2008).

[188] For example, opponents might argue that the Corps violated its Engineer Regulations in developing the project. Courts have hinted that the Corps can be bound by its Engineer Regulations insofar as they contain "mandatory language." Fort Bend Cnty. v. U.S. Army Corps of Eng'rs, 59 F.4th 180, 197 (5th Cir. 2023); *cf.* Raymond Proffitt Found. v. U.S. Army Corps of Eng'rs, 343 F.3d 199, 206 (3d Cir. 2003) (*dicta*) ("Where a statute itself has been permissive or discretionary as to the agency, this Court has even read an agency's self-imposed practices or regulations into the statute so as to provide a basis for review."). However, the dominant view seems to be that Engineer Regulations do not create an enforceable legal obligation on the Corps. *See, e.g.*, Alabama v. U.S. Army Corps of Eng'rs, 704 F. Supp. 3d 20, 92 (D.D.C. 2023) ("[N]umerous courts have concluded that the ERs are non-binding general policy statements." (citing circuit and district court cases); *Id.* at 92, 96, 128 (holding two Engineer Regulations are "non-binding general policy statements")

Opponents also might attempt to sue based on the Corps' failure to comply with requirements found in the WRDAs. The Administrative Procedure Act (APA) provides a right of action for claims concerning WRDAs. *Env't Def.*, 515 F. Supp. 2d at 76, 88 (rejecting challenges based on WRDAs due to lack of standing). Requirements contained in a WRDA have been held enforceable against the Corps. *Raymond Proffitt Found.*, 343 F.3d at 205–12 (holding that the Corps' compliance with a provision of WRDA 1990 is judicially reviewable under the APA but finding no violation of the WRDA provision); *cf.* Nat'l Wildlife Fed'n v. U.S. Army Corps of

may litigate likely provides local interests with an additional source of leverage in project design, on top of the influence that they exert through other components of the process.

Eng'rs, 75 F.4th 743, 749–53 (7th Cir. 2023) (holding that 33 U.S.C. § 2283, as amended by the Water Resources Development Act of 2007, applies only to reports that the Corps submits to Congress, not a final supplemental environmental impact statement that the Corps used itself, but implying (although not stating) that the court would enforce an applicable WRDA requirement); *Nat'l Wildlife Fed'n*, 116 F. Supp. 2d at 54, 58 (plaintiffs lack standing to challenge the absence of cost-sharing as a violation of WRDA 1986 and 1996 and the WRDA cost-sharing requirements are inapplicable in any event to the project; NEPA does not require the Corps to "consider the requirements of WRDA" given that WRDA cost-sharing does not apply); Johnston v. Davis, 698 F.2d 1088, 1092 (10th Cir. 1983) (upholding the Soil Conservation Service's use in an environmental impact statement of a low discount rate set out in WRDA 1974, but requiring the statement to recognize that the low discount rate was congressionally mandated, and that the project's costs would exceed its benefits under the discount rate currently used in water resource projects).

The D.C. Circuit, in a 1981 case, suggested that Congressional ratification of the Corps' benefit-cost analysis through Congressional approval of a project effectively eliminates a litigant's ability to argue that the analysis was inadequate under the Water Resources Planning Act, the Flood Control Act, and the Corps' cost-benefit regulations, among other sources. *See* Izaak Walton League of Am. v. Marsh, 655 F.2d 346, 357–58, 380 (D.C. Cir. 1981), *cert. denied,* Atchison, Topeka and Santa Fe Railway v. Marsh, 102 S.Ct. 657 (1981). A plaintiff could still challenge the analysis under NEPA, but courts appear reluctant to overturn a benefit-cost analysis under that statute. *Izaak Walton League of Am.*, 655 F.2d at 359, 365 (Corps cost-benefit analysis is reviewable under NEPA even after Congressional approval of a project because NEPA is intended to enable public participation, not "solely for the benefit of Congress"); South La. Environmental Council, Inc. v. Sand, 629 F.2d 1005, 1013 (5th Cir. 1980) (congressional approval limits a court's review of benefit-cost analysis, and courts should only require the Corps to reconsider if "Congress was misled by the inclusion of . . . erroneous benefits in its consideration of environmental consequences"); Hughes River Watershed Conservancy v. Glickman, 81 F.3d 437, 447 n. 9, 451 (4th Cir. 1996) (Natural Resources Conservation Service (NRCS) and the Corps violated NEPA by relying on an environmental impact statement prepared by the NRCS "that included an inflated estimate of the [proposed dam's] … recreational benefits"; the inflated estimate accounted for "approximately fifty-seven percent of the economic benefits" in the analysis underpinning the Corps' benefit-cost ratio). *See generally* Hughes River Watershed v. Johnson, 165 F.3d 283 (4th Cir. 1999) (upholding Agencies' recalculation of economic benefits after remand against NEPA challenge); *Env't Def.*, 515 F. Supp. 2d at 87–88 (considering, but rejecting, challenge to Corps benefit-cost analysis under NEPA for flood control project); Alabama v. U.S. Army Corps of Eng'rs, 704 F. Supp. 3d 20, 129 (D.D.C. 2023) (NEPA does not require the Corps to quantify net recreational impacts because of slight impacts of project on lake levels, quoting Nat'l Wildlife Fed'n v. Marsh, 568 F.Supp. 985 (D.D.C. 1983), which quotes *Sand*).

For academic commentary on suing the Corps based on its benefit-cost analysis, *see* Houck, *supra* note 5, at 53 (arguing that environmentalists should be able to sue for inadequate benefit-cost analysis under NEPA and the APA); Tarlock, *supra* note 18, at 1315 & 1315 n.135 (arguing that the courts will only judicially review Corps' benefit-cost analyses "in rare cases where the ratio is per se flawed" and identifying "[t]he leading case" as *Hughes River*, 81 F.3d 437).

In addition to NEPA, APA, and WRDA claims, plaintiffs have also attempted to challenge Army Corps projects for violating the Coastal Zone Management Act, *Matter of Defend H20*, 147 F. Supp. 3d 80, the Clean Water Act, *Nat'l Audubon Soc'y*, 991 F.3d 577, and the equal protection and due process clauses of the Fourteenth Amendment. Anania v. United States, No. CV163542SJFARL, 2019 WL 6388847, at *9 (E.D.N.Y. Mar. 21, 2019), *report and recommendation adopted*, No. 16CV3542SJFARL, 2019 WL 3811899 (E.D.N.Y. Aug. 14, 2019).

2. Variations in Feasibility Studies

One indication of the significance of local concerns in project planning is the variations across feasibility studies. Table 2 provides an indication of the variations in the benefit-cost and environmental justice (EJ) analyses in four final feasibility studies (the 2018 Norfolk, 2021 Coastal Texas, 2022 Charleston, and 2024 Miami-Dade final studies), and one draft feasibility study (the 2022 New York/New Jersey study). These variations likely reflect the decentralized, project-by-project character of Corps project planning and the responsiveness of project teams to local priorities. However, there are also other potential explanations for these variations. Studies are conducted not only in different places, by different ACE district offices working with different local sponsors, but also during different presidential administrations with varying priorities, and in areas with different economies and populations facing varying flood risks.

The table illustrates that while all studies analyzed avoided property damages as a project benefit, some studies considered other benefits in the NED account as well. For example, the Coastal Texas study included as project benefits in the NED reduced disruptions to the national economy from storm damage to the energy and petrochemical facilities in the area.[189]

Table 2 also indicates that there were variations in the ways past studies analyzed the impacts of project proposals for environmental justice. During the period that the five studies were undertaken, Executive Order 12,898 was in effect and required agencies to "conduct [their] programs, policies, and activities that substantially affect[ed] human health or the environment, in a manner that ensure[d] such programs [did] not have the effect of . . . denying persons (including populations) the benefits of . . . such programs, policies, and activities, because of their race, color, or national origin."[190] One of the five studies quantified the impacts of the project proposals on environmental justice populations in the study area (the draft New York/New Jersey study). In contrast, the Charleston, Coastal Texas, Miami-Dade, and Norfolk studies discuss the impacts of the proposed projects on environmental justice in essentially qualitative

[189] *See* U.S. ARMY CORPS OF ENG'RS, COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY, APPENDIX E-1: ECONOMICS FOR THE COASTAL STORM RISK MANAGEMENT - UPPER TEXAS COAST 56–82 (2021) [hereinafter TEX. APP'X E-1] (including damage to storage tanks, damage to transportation infrastructure, and indirect losses in the NED account); *see also* U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT STUDY, APPENDIX C, at C-4 to -5 (2020) (considering physical flood damage reduction and emergency cost reduction).

[190] Exec. Order No. 12,898, § 2-2, 59 Fed. Reg. 7629, 7630–31 (Feb. 11, 1994). This Executive Order was revoked by Exec. Order No. 14,173, § 1, 90 Fed. Reg. 8633 (Jan. 21, 2025).

terms.[191] The studies used different criteria and tools for defining environmental justice populations. The studies also addressed the environmental justice impacts of projects in different accounts.[192] In three studies, equity appeared in the Other Social Effects account; in the other two, equity appeared in the Environmental Quality account, with the Coastal Texas study's equity analysis occurring in a separate EIS. As mentioned earlier, the notable variations in the economic and environmental justice analyses across studies arguably reflect the decentralized character of the processes from which coastal protection proposals emerge.

[191] *See, e.g.*, CHARLESTON STUDY, *supra* note 44, at 241–45, 266 (discussing coverage of EJ communities, and explaining that some communities receive only nonstructural measures); U.S. ARMY CORPS OF ENG'RS, COASTAL TEXAS PROTECTION AND RESTORATION FEASIBILITY STUDY, FINAL ENVIRONMENTAL IMPACT STATEMENT 6-34 (2021) [hereinafter TEX. FEIS] ("the recommended plan would not have a disproportionately high and adverse impact on any low-income or minority populations" and is therefore compliant with EO 12898); NORFOLK STUDY, *supra* note 79, at 70 (assuming citywide measures will be most beneficial to minority communities); MIAMI STUDY II, *supra* note 32, at 159–61 (describing the impacts to disadvantaged communities of flood proofing critical infrastructure and raising homes).

However, the studies that include environmental justice in their Other Social Effects account attempt to score alternatives on their environmental justice impacts. *See* U.S. ARMY CORPS OF ENG'RS, APPENDIX A12, TIER 1 OTHER SOCIAL EFFECTS/ENVIRONMENTAL JUSTICE ANALYSIS, NEW YORK – NEW JERSEY HARBORS AND TRIBUTARIES COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY 64–65 (2022) [hereinafter N.Y. APP'X A12]; MIAMI STUDY II, *supra* note 32, at 98; NORFOLK STUDY, *supra* note 79, at 76. All studies identify census tracts containing disadvantaged communities; it is not necessarily clear to what extent the proposed plan covers these communities. *See* N.Y. STUDY, *supra* note 10, at 118–19; TEX. FEIS, *supra*, at 3-83 to 3-87; CHARLESTON STUDY, *supra* note 44, at 145–50; MIAMI STUDY II, *supra* note 32, at 37, 77–78; NORFOLK STUDY, *supra* note 79, at 75–77, 233–34.

The Corps' environmental justice analyses tend to focus on whether a project will *not* burden EJ communities rather than whether the project will affirmatively advance these communities' interests. *See, e.g.*, CHARLESTON STUDY, *supra* note 44, at 266 ("alternative does not disproportionately favor or adversely burden any socioeconomic or disadvantaged group."); TEX. FEIS, *supra*, at 6-34 ("the recommended plan would not have a disproportionately high and adverse impact on any low-income or minority populations" and is therefore compliant with EO 12898); N.Y. STUDY, *supra* note 10, at 180 (selected plan does not score highest on EJ categories); NORFOLK STUDY, *supra* note 79, at 70 (assuming citywide measures will be most beneficial to minority communities).

[192] *See* Table 2.

Table 2: NED and Environmental Justice Analyses in Five ACE Feasibility Studies

Study (Phase; Year)	**Total Annual NED Benefits**	**NED Benefit Categories**	**Account in which EJ is Addressed**	**Are Project Impacts Quantified for EJ Populations?**	**EJ Definition**
Charleston (Final; 2022)	$493 million[193]	Damage to structures and their contents.[194]	Environmental Quality	No	Uses EJScreen, presents data on racial minority status, socioeconomic status, educational attainment, linguistic isolation, and age.[195]
Coastal Texas (Final; 2021)	$2.306 billion[196]	Damage to structures and their contents; damage to transportation infrastructure; damage to above-ground storage tanks and their contents; indirect losses to the national economy.[197]	Environmental Quality (in Final Environmental Impact Statement)	No	"[T]he minority population of the affected areas exceeds 50 percent, or . . . the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In addition to minority populations, low-income populations should be identified with the annual statistical poverty thresholds from the Bureau of the Census' data."[198]

[193] U.S. ARMY CORPS OF ENG'RS, CHARLESTON PENINSULA, SOUTH CAROLINA COASTAL STORM RISK MANAGEMENT STUDY, ECONOMICS: APPENDIX C, at C-64 (2022) [hereinafter CHARLESTON APP'X C].
[194] *Id.* at C-18 to-22, C-33 to -34.
[195] CHARLESTON STUDY, *supra* note 44, at 145–50.
[196] TEX. APP'X E-1, *supra* note 189, at 84.
[197] TEX. APP'X E-1, *supra* note 189, at 2, 56–82. Indirect losses are those resulting from "disruptions in the production of goods and services by the industries affected by the storm." *Id.* at 2. Only absolute disruptions, rather than geographic shifts, are includable in NED. *Id.*
[198] TEX. FEIS, *supra* note 191, at 3-83.

Study (Phase; Year)	**Total Annual NED Benefits**	**NED Benefit Categories**	**Account in which EJ is Addressed**	**Are Project Impacts Quantified for EJ Populations?**	**EJ Definition**
Miami-Dade County (Final; 2024)	$62 million[199]	Damage to structures and their contents.[200]	Other Social Effects	No	Uses the Climate and Economic Justice Screening Tool (CEJST), except where underserved communities were specifically identified by a municipality, this overrode CEJST data in importance.[201]
New York-New Jersey (Draft; 2022)	$6.259 billion[202]	Damage to structures and their contents.[203]	Other Social Effects	Yes	"[C]ommunities that meet established thresholds for low-income (having populations with greater or equal to 23.59% below the federal poverty level) and minority (greater than or equal to 51.1% identify as minority) and live in proximity to at least 1 pollutant in the 90th percentile for the country."[204]

[199] U.S. ARMY CORPS OF ENG'RS, MIAMI-DADE COUNTY, FLORIDA, COASTAL STORM RISK MANAGEMENT FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT, ECONOMIC ENVIRONMENT AND SOCIAL CONSIDERATIONS APPENDIX A-5, 48 (2024).

[200] *Id.* at 1, 10–23. Life loss reduction was quantified but not monetized. *Id.* at 46.

[201] MIAMI STUDY II, *supra* note 32, at 77. The Climate and Economic Justice Screening Tool was developed by the Biden administration to map disadvantaged communities. Climate and Economic Justice Screening Tool, Methodology, https://screeningtool.geoplatform.gov/en/methodology (last visited Aug. 16, 2024). While the tool is no longer available through the White House website, CEJST can now be accessed through the Public Environmental Data Partners website. *Climate & Economic Justice Screening Tool*, PUB. ENV'T DATA PARTNERS (Jan. 24, 2025), https://public-environmental-data-partners.github.io/j40-cejst-2/en/#3/33.47/-97.5 [https://perma.cc/4868-CHK2].

[202] N.Y. STUDY, *supra* note 10, at 210.

[203] N.Y. APP'X D, *supra* note 131, at 7 ("The National Economic (NED) Benefits for the project are the difference in expected damages to structures and their contents without and with a selected alternative in place.").

[204] N.Y. STUDY, *supra* note 10, at 118–19.

Study (Phase; Year)	Total Annual NED Benefits	NED Benefit Categories	Account in which EJ is Addressed	Are Project Impacts Quantified for EJ Populations?	EJ Definition
Norfolk (Final; 2018)	$178 million[205]	Damage to structures and their contents; land erosion; incidental recreation benefits.[206]	Other Social Effects	No	Identified predominantly minority areas with incomes averaging $35,000 or less.[207]

D. Authorization and Appropriation for Projects

Congress must authorize, and appropriate funds for, almost all Army Corps water resources projects.[208] After the ACE district office and the non-federal sponsor complete a feasibility study, ACE's Chief of Engineers prepares a report with the recommended project, which the Corps submits to "the Assistant Secretary of the Army for Civil Works and the Office of Management and Budget (OMB) for Administration review."[209] This report contains the signed record of decision, final EIS, "[s]tate and [a]gency [r]eview letters," and other study materials.[210] OMB reviews each report for consistency with "the program and policies of the Administration."[211]

[205] NORFOLK STUDY, *supra* note 79, at 100.

[206] NORFOLK APP'X C, *supra* note 170, at C-83 ("the difference between FWOP [future without project] and FWP [future with project] damages will be used to determine primary CSRM benefits."), C-88–90 (discussing included structure types), C-111–12 (reduced erosion), C-112–16 (recreation).

[207] NORFOLK STUDY, *supra* note 79, at 233–34.

[208] The exception is the "continuing authorities program," which only covers small-scale projects. *See* 33 U.S.C. §§ 2281c, 2282d(c)(1)(D)(iii) (listing the statutes under which the continuing authorities programs are authorized).

[209] CARTER & NORMAND, *supra* note 119, at 11. *See also* Exec. Order No. 12,322, 46 Fed. Reg. 46,561 (Sept. 17, 1981); 33 U.S.C. § 2282a(f)(2); LUTHER, *supra* note 109, at 8; CARTER & NESBITT, *supra* note 122, at 5; EP 1105-2-61, *supra* note 31, at 41.

OMB reviews water resources projects for consistency with presidential policies, among other matters. Exec. Order No. 12,322, 46 Fed. Reg. 46,561 (Sep. 17, 1981); MELISSA SAMET, A CITIZEN'S GUIDE TO THE CORPS OF ENGINEERS 127 (NAT'L LIFE FED'N 2009), https://www.waterprotectionnetwork.org/wp-content/uploads/2015/06/citizens-guide-to-the-corp.pdf [https://perma.cc/MJW2-3QCV].

[210] EP 1105-2-61, *supra* note 31, at 41.

[211] *Id.* at 42–43. OMB and the Assistant Secretary have 120 days to review the report before they are required to send it to Congress. 33 U.S.C. §§ 2282a(g), 2282b. *But see* Rick Stevens & Doug Lamont, *Understanding OMB Role in Corps of Engineers' Projects and How Project Sponsors Can Help Themselves*, DAWSON & ASSOCS., https://www.dawsonassociates.com/post/understanding-omb-role-in-corps-of-engineers-projects-and-how-project-sponsors-can-help-themselves

After the submission of the Chief's Report, the Corps can begin its preconstruction engineering and design (PED) phase (if the Corps has funds to do so) and draft a project partnership agreement with the non-federal sponsor.[212] Congress sometimes authorizes a project before PED has begun; sometimes it does so afterward.[213]

For construction to begin, Congress must appropriate funding in addition to authorizing the project.[214] Obtaining funding to build projects is a key hurdle to project completion. OMB reviews Army Corps project proposals to determine which projects to request appropriations for from Congress.[215] OMB requires a minimum benefit-cost ratio, set at 2.0 in the Biden administration, meaning that for every $1 that a project costs, it should yield at least $2 in benefits.[216] Historically, OMB has applied a higher discount rate to request congressional funding for construction than the Corps applies in developing project proposals, which makes it harder for a project to meet the minimum benefit-cost ratio that the executive branch applies for funding requests.[217]

Table 3 illustrates the wide variation in benefit-cost ratios included in Corps draft or final feasibility studies for six coastal storm protection projects.[218] The low benefit-cost ratio (0.51) for the recommended plan for

[https://perma.cc/LA6P-V2FZ] (last modified Apr. 27, 2021) (suggesting there is no deadline in practice for OMB review).

[212] LUTHER, *supra* note 109, at 9; CARTER & NORMAND, *supra* note 119, at 9.

[213] CARTER & NORMAND, *supra* note 119, at 9. *See also About the Project*, COASTAL TEX. PROJECT, https://coastaltexasproject.com/about/ [https://perma.cc/9PK8-JDNV] (last visited May 13, 2024) (Congress authorized before PED had begun).

[214] CARTER & NORMAND, *supra* note 119, at 9.

[215] Hannah Northey, *Biden Plans Boosts Army Corps' Climate, Justice Missions*, E&E NEWS (June 1, 2021), https://www.eenews.net/articles/biden-plan-boosts-army-corps-climate-justice-missions/ [https://perma.cc/NV4K-C48X].

[216] *Id.*

[217] TURNING THE TIDE, *supra* note 97, at 22 (explaining that OMB applies a higher discount rate than the Corps).

[218] The benefit-cost ratios are for the tentatively selected plan if there is no final feasibility study and only a draft study; they are for the recommended plan if the feasibility study is complete. In the case of Collier County, the Corps re-initiated the feasibility study; the benefit-cost ratio is presented for the original draft feasibility study. The Corps re-initiated the study for Miami-Dade; the benefit-cost ratio for the final feasibility study is included.

The timeline for completion is provided since it might be hypothesized that the benefit-cost ratios would be influenced by the number of years it takes to construct a project. Holding matters constant, a project that takes longer to build might be thought to have a lower benefit-cost ratio since the benefits only begin accruing after construction is complete, and the Corps historically estimated benefits and costs for a 50-year period for all alternatives. *See also* N.Y. APP'X D, *supra* note 131, at 63 ("In accordance with current USACE planning guidance, the period of analysis for each alternative does not extend past 50 years after the common economic base year of 2044."); ER 1105-2-100, *supra* note 27, at 2-11; Tarlock, *supra* note 18, at 1291. The practice of setting a common economic base year and calculating benefits from that year might have the perverse effect of disadvantaging larger projects that take longer to build. For example, the New York/New Jersey

Miami-Dade is striking, since it suggests that the costs of the plan exceed the benefits; as mentioned above, Miami-Dade obtained an exception from the requirement that the selected plan maximize economic efficiency, and Congress authorized the project in WRDA 2024.[219]

Table 3: Benefit-cost Ratios and Timelines of Selected Coastal Storm Risk Management Projects

Project	**Estimated Timeline of Tentatively Selected Plan or Recommended Plan, in Years**	**Benefit/Cost Ratio**
Charleston, South Carolina Final Feasibility Study	10 (assumed)[220]	10.8[221]
Coastal Texas Project Final Feasibility Study	12–20[222]	1.91[223]
Collier County, Florida Draft Feasibility Study	2020 proposal: 5[224]	2020 proposal: 3.6[225]
Miami-Dade County, Florida Final Feasibility Study	2024: 13[226]	2024: 0.51[227]
New York/New Jersey Draft Feasibility Study	14[228]	2.5[229]
Norfolk, Virginia Final Feasibility Study	5[230]	3.2[231]

Many projects do not make it all the way through the process to receive appropriations. There is a "backlog" of projects that have been congressionally authorized but for which Congress has not appropriated construction funding, including the Charleston and Coastal Texas

study compared five alternative plans, three of which had 50 years of benefits, while the other two had 40 and 32 years of benefits, respectively. N.Y. APP'X D, *supra* note 131, at 53. The 32- and 40-year projects were less net beneficial than the temporarily selected (50-year) project, despite their larger geographical coverage. N.Y. STUDY, *supra* note 10, at 177.

[219] *See supra* note 156.

[220] CHARLESTON APP'X C, *supra* note 193, at C-64.

[221] *Id.* at C-65.

[222] TEX. STUDY, *supra* note 25, at 166.

[223] *Id.* at 129 (note that this benefit-cost ratio does not reflect GAO's updated estimate of the project's cost). *See supra* Table 1.

[224] U.S. ARMY CORPS OF ENG'RS, COLLIER COUNTY COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY, APPENDIX C, at C-101 (2020).

[225] NAPLES STUDY, *supra* note 61, at iii.

[226] MIAMI STUDY II, *supra* note 32, at 203 (construction to "begin in 2027 and to be completed by 2040").

[227] MIAMI STUDY II, + note 32, at 192–93.

[228] N.Y. APP'X D, *supra* note 131, at 3.

[229] *Id.* at 63.

[230] NORFOLK APP'X C, *supra* note 170, at C-40.

[231] NORFOLK STUDY, *supra* note 79, at iv.

projects.[232] If Congress appropriates funding for construction, the Corps, not the non-federal sponsor (which partially pays for construction), "typically functions as the project manager," and contracts out construction to private firms.[233]

Political considerations influence which projects Congress authorizes and funds. Rasmussen, Kopp, and Oppenheimer argue that support from the congressional delegation of the area where a project is proposed is crucial for project approval.[234] In a 1991 study of the determinants of Congressional appropriations for projects, John Hird found that "projects with large benefits [were] more likely to be favored[,]"[235] although benefit-cost analysis also influenced project funding decisions.[236] Members of Congress presumably view projects with considerable benefits as an opportunity for electoral support.[237]

Local interests encourage Congress to authorize and fund projects recommended by the Corps.[238] For example, in the hearings for WRDA 2022, Michel Bechtel, the mayor of the City of Morgan's Point, Texas, and the president of the Gulf Coast Protection District created by the state of Texas to be the non-federal sponsor for the construction of the Coastal Texas project, testified in favor of authorization to the House subcommittee on Water Resources and Environment.[239] As part of making the case for authorization, he provided the subcommittee members with a list of the commodities used within their states that pass through Port

[232] NAT'L RSCH. COUNCIL, *supra* note 4, at 62. *See also* CARTER & NORMAND, *supra* note 119, at 3 (as of 2019, there was "a $98 billion backlog of projects that have construction authorization that are under construction or are awaiting construction funding.").

[233] CARTER & NORMAND, *supra* note 119, at 14.

[234] Rasmussen, Kopp & Oppenheimer, *supra* note 13, at 9.

[235] John A. Hird, *The Political Economy of Pork: Project Selection at the U.S. Army Corps of Engineers*, 85 AM. POL. SCI. REV. 429, 439 (1991).

[236] *Id.* at 448 (finding "that the information the cost-benefit analysis imparts has a significant effect on the project funding outcomes" but that knowledge of overall benefits, in addition to the cost-benefit ratio, "was the primary impetus for efficiency."). *See also* FEREJOHN, *supra* note 108, at 43–46 (confirming the existence of a pork barrel in Army Corps water resources projects).

[237] *See* Hird, *supra* note 235, at 449 (finding support for the theory that "legislators are driven primarily by their desire for reelection and that among other activities, they will exercise their power to channel funds to their constituents in the form of pork."). *See also* ROBERT M. STEIN & KENNETH N. BICKERS, PERPETUATING THE PORK BARREL 6 (1995) (describing congress members' need for agencies to deliver benefits to their constituents).

[238] Stevens and Lamont suggest that non-federal sponsors should also be encouraging OMB to approve projects and indicate that sponsors often lack understanding of the importance of OMB support for projects in obtaining Congressional authorization and appropriations for projects. Stevens & Lamont, *supra* note 211.

[239] *Hearing before the Subcomm. on Water Res. & Env't of the H. Comm. on Transp. & Infrastructure*, 117th Cong. 7–8 (Feb. 8, 2022) (statement of Michel Bechtel, Mayor, Morgan's Point, Tex.), https://congressional.proquest.com/congressional/result/congressional/congdocumentview?accountid=12768&groupid=100172&parmId=19050D81E3F [https://perma.cc/MD6B-TVGZ].

Houston, which the project would protect. The message was that reducing flood risk in Galveston Bay would have significant national benefits.

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This part has emphasized that Army Corps projects involve a collaboration between the Corps and the local or state governments that are the projects' non-federal sponsors. Other local interests, such as community groups, also participate in developing the projects, although they have fewer formal levers of influence than the non-federal sponsors. Project and feasibility study initiation and congressional authorization and appropriation all involve local interests or their representatives' approval. One result of this decisional framework is that individual projects can vary in their approach in response to local concerns. Another result is that Corps coastal protection projects do not emerge from a national evaluation of the flood risks facing the country and the comparative benefits and costs of addressing flood risks in different regions at a given point in time.

IV. THE CONTINUING FOCUS ON INDIVIDUAL PROJECT PLANNING AND THE NEED FOR A RISK-BASED FRAMEWORK

The decentralized approach to developing Army Corps coastal protection projects analyzed in Part III has numerous advantages. Local actors knowledgeable about the flood risks that their communities face have opportunities to advance ideas for addressing these risks. Local interests also have opportunities to participate in developing projects. However, as discussed further below, there are many criticisms of the Corps' project development process as technocratic and providing insufficient opportunities for public participation, especially from politically marginalized populations.

This part begins by analyzing some of the changes that the Biden administration made to the individual project planning process to address several of the longstanding criticisms of this process. We discuss the Corps' efforts during the Biden administration to update its approach to benefit-cost analysis to improve the efficiency analyses of project proposals. In addition, we highlight the Corps' efforts during this administration to address concerns about inequities in project development by increasing public participation, especially from environmental justice populations, and through analytic requirements.

The Biden administration's attempted reforms to the project planning process implicitly took as a given that coastal protection projects will be developed in a decentralized fashion, on a project-by-project basis, with

little overarching strategic guidance from the Corps or other parts of the federal government about where Corps resources should be focused. In Part IV.B., we argue that the existing decentralized process for developing individual coastal protection projects should be supplemented with periodic efforts by the Corps to assess coastal flood risks on a national or regional scale and to identify parts of the country facing unaddressed risks that should receive greater attention. We do not argue for replacing the prevailing decentralized approach to project development. Rather, we argue for complementing it with national or regional risk-based analyses that could help ensure that the country's growing coastal flood risks are addressed in a more systematic manner. In making this recommendation, we draw attention to promising recent studies undertaken by the Corps in the North and South Atlantic identifying flood risks on a regional basis. Greater information about the flood risks facing the nation could help to ensure that federal resources are channeled to the areas facing the most urgent, and potentially most damaging, flood risks.

A. Biden Era Reforms to Individual Project Planning

As mentioned in passing in Part III, in December 2024, the Corps codified new Agency Specific Procedures to govern Corps project planning.[240] These ASPs implement the 2013 Obama-era Principles, Requirements and Guidelines for Federal Investments in Water Resources (PR&G).[241] The Biden-era ASPs seek to address two longstanding, inter-related criticisms of Corps' project planning: the Corps' 1980s-era approach to benefit-cost analysis focused excessively narrowly on avoided property damages as the main project benefits; and the agency's approach

[240] *See* Corps of Engineers Agency-Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed. Reg. 103, 992 (Dec. 19, 2024) (codified at 33 C.F.R. pt. 234).

[241] *U.S. Army Corps of Engineers Implementing Procedures for Principles, Requirements and Guidelines Applicable to Actions Involving Investment in Water Resources*, REGULATIONS.GOV [hereinafter PR&G], https://www.regulations.gov/docket/COE-2023-0005 [https://perma.cc/D4NL-NPPX] (last visited May 13, 2024).

The 2007 Water Resources Development Act required the Secretary of the Army, in consultation with other Executive Department heads, to update the PR&G, which the Obama Administration's CEQ eventually did in 2013. *See* PR&G, *supra*. Congress initially barred the Corps, through riders, from updating its internal guidance to match the PR&G due to concerns from some members of Congress about changing the relative decisional weight of water resources planning objectives. EHRENWERTH ET AL., *supra* note 164, at 28 (noting that WRDAs until WRDA 2020 contained riders which directed the Corps not to update its guidance to reflect the PR&G) (citing concerns of Rep. Boozman in the 111th Congress); *see also* Water Resources Development Act of 2007, Pub. L. 110-114 § 2031, 121 Stat. 1082, 42 U.S.C. § 1962-3. These riders were lifted in WRDA 2020, in which the Corps was given six months to update its internal guidance. 42 U.S.C. § 1962-4(a).

to project planning disadvantaged environmental justice populations, in part because of the narrowness of the project benefits in the Corps' benefit-cost analyses, but also because of difficulties that local interests (other than non-federal sponsors) have in participating in project planning.

1. Toward a More Comprehensive Approach to Benefit-Cost Analysis

As described in Part III, the Corps' longstanding approach to benefit-cost analysis generally required it to select the project alternative that maximizes national economic efficiency (the NED plan), and avoided property damages were the principal benefit monetized in assessing national economic efficiency. By 2024, this approach to benefit-cost analysis was outdated and inconsistent with contemporary economic thinking about such analysis.[242] For example, dividing project effects into four categories is arbitrary because impacts, such as ecological effects, consigned to the environmental account, may have economic effects and vice versa.[243] Moreover, focusing on avoided property damages from flooding in assessing national economic efficiency, and the lack of monetization of other benefits such as lives saved and ecological impacts, is inconsistent with the emphasis on monetizing as full a range of effects as possible in contemporary benefit-cost analysis.[244] Focusing on avoided property damages as the principal benefit also likely had undesirable consequences for the distribution of the protection offered by Corps' projects. The NAACP and others argue that Black Americans and low-income communities are "under-protected" relative to other communities from flood risks because the Corps' benefit-cost analysis focuses on the property damages that a project will avoid as the main project benefits.[245]

[242] For discussion of some of the ways in which the Corps' current approach deviates from contemporary thinking, and frameworks updated by the Biden administration, see Institute for Policy Integrity Comments, *supra* note 173.

[243] *Id.* at 10.

[244] It is interesting to reflect on the evolution over time thinking about the appropriate scope of Corps benefit-cost analysis. The Reagan-era changes to benefit-cost analysis at the Corps followed critiques in the mid-to-late twentieth century that the Army Corps exaggerated project benefits and underestimated construction costs, to support the construction of projects of dubious value with politically powerful champions. *See, e.g.,* FEREJOHN, *supra* note 108, at 44, 46; PORTER, *supra* note 5. The Corps was criticized for inflating benefit estimates through techniques such as using low discount rates and including hard-to-quantify-and-monetize benefits among project benefits. Houck, *supra* note 5, at 3–4, 20–24; Tarlock, *supra* note 18, at 1307–08, 1315; PORTER, *supra* note 5. *But see* PORTER, *supra* note 5, at 177 (arguing that for the Corps, benefit-cost analysis was not "just for show" and that the agency worked to maintain a credible approach to benefit-cost analysis to limit the number of projects it assumed).

[245] TURNING THE TIDE, *supra* note 97, at 42; *see also id.* at 5, 23, 34; N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS., *supra* note 136, at 3 ("The unequal distribution of protection is partly

Since property values are lower in low-income communities, it is more challenging to justify expensive investments in flood protection in these communities. According to a study by Jeremy Martinich and others, when the plan that maximizes net benefits is that which avoids the most property damage from storm surge flooding at the lowest price, that plan will favor armoring high property value areas and relocation in lower property value areas.[246]

The ASPs aim to address some of the problems with the agency's Reagan-era approach to benefit-cost analysis.[247] They abandon the quadripartite account structure for benefit-cost analysis in favor of a single holistic benefit-cost analysis.[248] The ASPs direct the Corps to monetize all economic, environmental, and social benefits to the extent feasible.[249] The ASPs combine these categories into a single metric: net public benefits.[250] In contrast to selecting the NED-maximizing alternative, which focused on a narrow set of national economic considerations,[251] the ASPs dictate that the Corps should "seek to . . . maximize net public benefits, relative to public costs."[252] The Corps may still recommend a plan that does not "maximize net public benefits" if the Assistant Secretary of the Army for Civil Works grants an exception.[253] Addressing longstanding criticisms about the inadequate consideration by the Corps of ecosystem impacts, the proposed ASPs expressly indicate that "[e]cosystem services are an important benefit-cost category that should be included in the benefit-cost analysis."[254]

due to lower property values resulting from a legacy of discriminatory policies and other factors used in the Benefit-Cost Ratio (BCR).").

[246] Jeremy Martinich, James Neumann, Lindsay Ludwig & Lesley Jantarasami, *Risks of Sea Level Rise to Disadvantaged Communities in the United States*, 18 MITIGATION AND ADAPTATION STRATEGIES FOR GLOB. CLIMATE CHANGE 169 (2013).

[247] *But see* Institute for Policy Integrity Comments, *supra* note 173 (urging greater harmonization of Corps' agency-specific procedures with Circular A-4 and A-94 than ACE proposed in the Agency Specific Procedures proposed in February 2024).

[248] 33 C.F.R. § 234.7. However, the ASPs retain the categorization of benefits and costs into economic, environmental, and social benefits and costs. 89 Fed. Reg. 103992, 104,014 (Dec. 19, 2024).

[249] 33 C.F.R. § 234.7(c)(1). *See also Id.* § 234.7(b)(1). The ASPs endorse considering quantified impacts where monetization is not feasible and qualitatively-described impacts where neither monetization nor quantification is feasible. 33 C.F.R. § 234.7(b)(2).

[250] *Id.* § 234.4(c).

[251] *See supra* notes 163–79 and accompanying text.

[252] 33 C.F.R. § 234.11(a)(4). *See also Id.* at § 234.4(c).

[253] *Id.* at § 234.11(b).

[254] *Id.* § 234.7(b)(1).

The Corps has recently issued studies on valuing and designing Natural and Nature Based Features, and during the Biden administration, the Office of Information and Regulatory Affairs developed guidance on valuing ecosystem services. U.S. ARMY CORPS OF ENG'RS, INTERNATIONAL GUIDELINES ON NATURAL AND NATURE BASED FEATURES FOR FLOOD RISK

The shift to a more holistic benefit-cost analysis might help address some of the concerns that the Corps' longstanding approach has under-protected low-income communities and communities of color from flood risks. By considering benefits and costs within a single envelope and encouraging the monetization of benefits and costs to the extent feasible, the proposed ASPs might reduce the extent to which property values influence whether a project is benefit-cost justified under the approach used since the 1980s. For example, the Corps might monetize lives saved and morbidities avoided through flood protection in addition to avoided property damages.[255] The increase in factors considered, however, likely complicates the analysis. Some commenters have warned that this new approach might make it harder to isolate the efficient project design than the old approach, which determined the efficient design using a limited range of benefits and costs.[256]

As this article goes to press, the second Trump administration's view of the ASPs is not known. However, towards the end of the first Trump administration, the Assistant Secretary of the Army for Civil Works issued two memoranda that expressed support for moving to a comprehensive approach to benefit-cost analysis similar to that implemented in the ASPs. In a January 5, 2021 memorandum, for example, the Assistant Secretary issued a policy direction "to ensure the USACE decision framework

MANAGEMENT (2021), https://hdl.handle.net/11681/41946 [https://perma.cc/TW38-UVS7]; EHRENWERTH ET AL., *supra* note 164; OFF. OF MGMT. & BUDGET, OFF. OF INFO. & REGUL. AFF. GUIDANCE FOR ASSESSING CHANGES IN ENVIRONMENTAL AND ECOSYSTEM SERVICES IN BENEFIT-COST ANALYSIS (2024).

[255] *But see* 89 Fed. Reg. 103992, 104005 (Dec. 19, 2024) (refusing to require the Army Corps to monetize avoided mortality).

The ASPs also opened the door to more explicit consideration of "distributional effects" in comparing project alternatives. For example, the ASPs state that "[w]hen calculating net benefits, . . . distributional effects can be examined using techniques like income weighting." 33 C.F.R. § 234.10(a)(3). Income weighting entails adjusting benefits and costs upwards (or downwards) to reflect the incomes of the beneficiaries or payers. It reflects the economic principle of diminishing marginal utility, according to which an additional dollar in the hands of a low-income person is likely to produce more improvement in welfare than an additional dollar in the hands of a high-income person. CIRCULAR A-4, *supra* note 160, at 65. Although there are many complexities in implementing income weighting, in theory, it might mean that in analyzing a project's benefits, the Corps might adjust the benefits upwards in low-income areas to reflect the potentially greater benefits from avoiding flooding in these areas. *Id.* at 66–67. Such an adjustment might increase the likelihood that a project to protect such an area would pass a benefit-cost test and have a higher benefit-cost ratio and presumably be built. However, if the Corps adjusts the benefits of flood protection upwards for low-income areas, the Corps also might need to adjust the costs upwards insofar as low-income taxpayers contribute to the local cost share of a project to reflect the greater disutility that low-income people might experience from paying for coastal protection than higher-income people with more resources. *Id.* at 65–66 ("same weights should be applied to benefits and costs"). Adjusting the costs might reduce the extent to which income weighting might redistribute flood protection investments in favor of low-income areas.

[256] 89 Fed. Reg. 103,992, 104,014 (Dec. 19, 2024).

considers, in a comprehensive manner, the total benefits of project alternatives, including equal consideration of economic, environmental and social categories."[257] The memorandum required the Corps' project delivery teams to "identify and analyze benefits in total and equally across a full array of benefit categories."[258] These statements suggest that the Corps was already moving to modernize its approach to benefit-cost analysis under the prior Trump administration. Notably, WRDA 2024 contains a "sense of Congress" statement on "comprehensive benefits" that indicates there is support in Congress for the shift to a modernized, holistic approach to benefit-cost analysis embodied in the ASPs. Section 1156 of WRDA 2024 states that "[i]t is the sense of Congress that in carrying out any feasibility study, the Secretary should follow, to the maximum extent practicable" the guidance in the two memoranda from the Assistant Secretary in 2020 and 2021, and a third 2020 memorandum from the Director of Civil Works.[259] While time will tell, it is possible that the Corps may be shifting toward a comprehensive approach to benefit-cost analysis, even if the second Trump administration revises the ASPs.[260]

2. Increasing Focus on Environmental Justice

As mentioned in Part III, the Corps historically applied the Clinton-era executive order on environmental justice, 12,898, in project planning.[261]

[257] Memorandum from R.D. James, Assistant Sec'y of the Army (Civil Works), on the Comprehensive Documentation of Benefits in Decision Document to Commanding Gen. 1 (Jan. 5, 2021) [hereinafter 2021 Guidance], https://planning.erdc.dren.mil/toolbox/library/MemosandLetters/ComprehensiveDocumentationofBenefitsinDecisionDocument_5January2021.pdf [https://perma.cc/ZV3F-D37V].

[258] *Id.* at 2. The documents still refer to the NED category; however, one of the documents requires the display of a "net total benefits" maximizing plan, rather than a NED plan. *Id.* at 3. Most of the 2021 Guidance is devoted to supplementing guidance on the RED and OSE accounts, as "[s]ufficient guidance and procedures exist to account for benefits to the national economy and the environment . . . ." *Id.* Thus, the quadripartite account structure is retained despite the 2021 Guidance's stated goal to "supplement[] the guidance provided in [the PGN] by requiring comprehensive consideration of total project benefits including economics, environmental, and social categories." *Id.* at 1.

[259] Pub. L. No. 118-272, Div. A, tit. I, § 1156, 138 Stat. 2992, 3046 (Jan. 4, 2025).

[260] A move toward comprehensive benefit monetization may not wholly eliminate the Reagan-era account structure. Congress preserved in WRDA 2024 the requirement that non-federal sponsors are liable for project costs above the NED plan. *Id.* at § 1139(a)(1). And the ASPs themselves prevent the Corps from considering RED benefits in formulating the plan that maximizes net public benefits. 33 C.F.R. § 234.8(a)(5). Thus, the four accounts may continue to operate in the background in the near future. *See also* 2021 Guidance, *supra* note 257, at 3 (requiring a display of the plan maximizing "net total benefits," but giving guidance on NED, RED, and OSE benefits).

[261] Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Exec. Order No. 12,898, 52 Fed. Reg. 7,629 (1994). Courts had held Executive Order 12,898 to be enforceable against the Corps through NEPA. Clifford J. Villa, *No "Box to Be Checked": Environmental Justice in Modern Legal Practice*, 30 N.Y.U. ENV'T L.J. 157, 183 n. 109

During the Biden presidency, the Corps also applied other executive orders concerning environmental justice in project planning.[262] Nonetheless,

(2022) (discussing Standing Rock Sioux Tribe v. U.S. Army Corps of Eng'rs, 440 F. Supp. 3d 1, 9 (D.D.C. 2020), in which the district court stated "in this Circuit, NEPA creates, through the Administrative Procedure Act, a right of action deriving from Executive Order 12,898"). For this proposition, the district court cited Cmtys. Against Runway Expansion, Inc. v. FAA, 355 F.3d 678, 688–89 (D.C. Cir. 2004), which notably offers a qualified statement about the ability to enforce 12,898 through NEPA, suggesting that where an agency "exercise[s] its discretion to include the environmental justice analysis in its NEPA evaluation, . . . that analysis therefore is properly subject to 'arbitrary and capricious' review under the APA."

[262] For Biden-era executive orders relevant to environmental justice, *see, e.g.*, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, Exec. Order No. 13,990, 86 Fed. Reg. 7037 (Jan. 20, 2021); Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, Exec Order No. 13,985, 86 Fed. Reg. 7009 (Jan. 25, 2021); Tackling the Climate Crises at Home and Abroad, Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021); Revitalizing Our Nation's Commitment to Environmental Justice for All, Exec. Order No. 14,096, 88 Fed. Reg. 25251 (April 26, 2023). For references to the environmental justice executive orders in Corps project planning, *see* CHARLESTON STUDY, *supra* note 44, at 304–06 (stating that the study is compliant with Executive Orders 12,898, 13,985, and 14,008, among others); MIAMI STUDY II, *supra* note 32, at 76–77, 210 (describing the Corps' obligations under EOs 14,096, 14,008, 13,985, and 12,898 and stating that the feasibility study is in full compliance with each); N.Y. STUDY, *supra* note 10, at 516 (table noting the Corps' obligations under EOs 14,008 and 12,898 with compliance status "in progress;" no mention of 13,985). The Coastal Texas Study, published in 2021, only analyzed compliance with Executive Order 12,898. TEX. FEIS, *supra* note 191, at 6-33 to -34.

In 2022, referencing the Clinton and Biden administration executive orders, the Corps issued an interim guidance document on implementing environmental justice and the Biden administration's Justice40 Initiative. Memorandum from Michael L. Connor, Assistant Sec'y of the Army (Civil Works) on Implementation of Environmental Justice and the Justice40 Initiative (Mar. 15, 2022) [hereinafter Connor Memorandum]. Justice40 was an initiative of the Biden administration that "40 percent of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution." The White House, *Justice40: A Whole-of-Government Initiative*, https://www.commerce.gov/justice40-initiative [https://perma.cc/M3SM-995M] (last visited December 24, 2024). The guidance directed the Corps to focus its efforts in relation to environmental justice on "disadvantaged communities" and identified the Climate and Economic Justice Screening Tool developed by the Biden administration's Council on Environmental Quality as the "default" for identifying these communities. Connor Memorandum, *supra*, at 5. Under the CEJST, a community was considered disadvantaged "if it is in a census tract that is (1) at or above the threshold for one or more environmental, climate, or other burdens, and (2) at or above the threshold for an associated socioeconomic burden." Climate and Economic Justice Screening Tool, Methodology, https://screeningtool.geoplatform.gov/en/methodology (last accessed Aug. 16, 2024). While the tool is no longer available through the White House website, CEJST can now be accessed through the Public Environmental Data Partners website. *Climate & Economic Justice Screening Tool*, PUB. ENV'T DATA PARTNERS (Jan. 24, 2025), https://screening-tools.com/climate-economic-justice-screening-tool [https://perma.cc/4S2T-258N]. Race was not used as a criterion for identifying disadvantaged communities to minimize legal risk, even though race is widely identified as an important predictor of environmental disadvantage. Lisa Friedman, *White House Takes Aim at Environmental Racism, but Won't Mention Race*, N.Y. TIMES (Feb. 15, 2022), https://www.nytimes.com/2022/02/15/climate/biden-environment-race-pollution.html [https://perma.cc/N57R-TLGU]; Jean Chemnick & Kevin Bogardus, *Missing from White House EJ*

there are longstanding critiques that the Corps' flood protection projects "under-protect" Black Americans and other communities of color and low-income communities relative to other communities.[263] The 2024 ASPs also reflect an effort to address these critiques, in addition to an effort to update the Corps' approach to benefit-cost analysis.

Significant concerns have been raised that some of the coastal protection projects for addressing climate risks discussed in this article will under-protect disadvantaged communities compared to other nearby communities.[264] For example, the Charleston project, which Congress has authorized but not funded, includes building a seawall that will stop short of protecting, and may even increase flooding in, the historically Black neighborhood of Rosemont and Bridgeview Village, an affordable housing complex.[265] The plan that the Corps tentatively selected in 2022

Screening Tool: Race, E&E NEWS (Feb. 17, 2022), https://www.eenews.net/articles/missing-from-white-house-ej-screening-tool-race/ [https://perma.cc/6UTX-D8EA].

[263] TURNING THE TIDE, *supra* note 97, at 42.

An often-cited example of a Corps decision exacerbating environmental injustice concerns the Isle De Jean Charles Indigenous community, whose displacement is threatened due to decisions made in the Army Corps' Morganza project. *See* Coral Davenport & Campbell Robertson, *Resettling the First American 'Climate Refugees'*, N.Y. TIMES (May 2, 2016), https://www.nytimes.com/2016/05/03/us/resettling-the-first-american-climate-refugees.html [https://perma.cc/HP3V-VJST]. The Corps built a ring levee around the island, but it did not extend the full Morganza levee system to encompass the island. Charquia Wright, *Unmasking Western Science*, UCLA L. REV. IN L. MEETS WORLD 1, 6 (2020). As a result of the structural measures placed near the island, flooding will increase during major storms. *Id.* The Corps' stated reason for this decision is that it would cost an extra $100 million to protect the island, while relocating all the island's residents would cost only $8 million. Marisa Katz, *Staying Afloat: How Federal Recognition as a Native American Tribe Will Save the Residents of Isle De Jean Charles, Louisiana*, 4 LOY. J. PUB. INT. L. 1, 6 (2003). The oceanography around the island was the stated reason a floodwall would be so expensive, yet local leaders routinely identified to the Corps a suitable ocean ridge for levee building. Wright, *supra*, at 5. Scholars have proposed various reasons why the Isle de Jean Charles community's concerns were undervalued by the Corps, ranging from the fact that the tribe is not federally recognized, Katz, *Staying Afloat*, at 8, to fundamental flaws in cost-benefit analysis, Elizabeth Marino, *Sea Level Rise and Social Justice: The Social Construction of Climate Change Driven Migrations*, in CLIMATE CHANGE AND ITS IMPACTS: RISKS AND INEQUALITIES (Colleen Murphy, Paolo Gardoni & Robert McKim, eds. 2018), at 189, to "willful ignorance[,]" Wright, *supra*, at 4. *See also generally* Sunjana Supekar, Comment, *Equitable Resettlement for Climate Change-Displaced Communities in the United States*, 66 UCLA L. REV. 1290, 1306–07 (2019).

[264] This article uses the terms of "equity" and "environmental justice" interchangeably, while recognizing that many would disagree that the terms are interchangeable.

[265] *See* US ARMY CORPS OF ENG'RS CHARLESTON DIST., CHARLESTON PENINSULA, SOUTH CAROLINA, COASTAL STORM RISK MANAGEMENT STUDY, RESPONSE TO PUBLIC COMMENTS APPENDIX - I (February 2022). Ten percent of the comments on the draft Charleston feasibility study concerned environmental justice. *Id.* at 5. *See also Id.* at 16–18 (concerns and "master response"); Judith Taylor, Norman S. Levine, Ernest Muhammad, Dwayne E. Porter, Annette M. Watson, & Paul Sandifer, *Participatory and Spatial Analyses of Environmental Justice Communities' Concerns about a Proposed Storm Surge and Flood Protection Seawall*, 19 INT'L J. ENV'T. RSCH. PUB. HEALTH 1192 (2022); John Ramsey, *As Charleston Sea Wall Plan Heads*

for the New York/New Jersey region "fails to protect many low-income waterfront communities in the impacted study area," including the South Bronx and Hunts Point, and Sunset Park in Brooklyn, to quote the comments from the New York City Environmental Justice Alliance and the Resilient Coastal Communities Project at Columbia University's Center for Sustainable Urban Development.[266]

The Corps' approach to project planning has been criticized not only for the way that it distributes protection against flood risks, but also from a procedural perspective for not sufficiently engaging low-income communities and communities of color. A major theme in comments on ongoing Corps coastal protection projects, such as the New York/New Jersey project, is that the Corps has not adequately involved community groups in designing coastal protection infrastructure that will have a significant impact on communities. In their joint comments on the 2022 draft feasibility study for New York/New Jersey, the New York City Environmental Justice Alliance and the Resilient Coastal Communities Project stated that "USACE and our non-federal partners have not made the good faith effort to engage EJ communities to the degree that is required of a project of this scale and impact."[267]

through Congress, Local Doubts Linger, THE POST AND COURIER (July 16, 2022), https://www.postandcourier.com/environment/as-charleston-sea-wall-plan-heads-through-congress-local-doubts-linger/article_529ea92c-fca3-11ec-a327-a3ecfc994d25.html [https://perma.cc/5H9B-DJCU] (quoting Skip Mikell, Charleston Community Research to Action Board (discussing the effect of the Corps' design, which may be increased flooding in Rosemont)).

For the Corps' discussion of Rosemont and Bridgeview Village, *see* CHARLESTON STUDY, *supra* note 44, at 241–44 (finding it was not cost effective to extend the flood wall to these areas). Instead of extending the floodwall, the Corps recommends nonstructural measures, raising and flood proofing individual homes, and cooperating with evacuation measures. CHARLESTON STUDY, *supra* note 44, at 242–44.

[266] N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS. *supra* note 136, at 1; Letter from Arif Ullah, South Bronx Unite, to Bruce Wisemiller, Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 2–3 (Mar. 31, 2023) (identifying "Hunts Point, Pelham Bay, and Throgs Neck" as unprotected areas); Letter from Lael K. Goodman, Env't Just. Program Manager, North Brooklyn Neighbors, to Bruce Wisemiller, Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 2 (Mar. 6, 2023) (stating that most of North Brooklyn remains unprotected, with the exception of Greenpoint).

On the other hand, the plan tentatively proposed to protect Miami-Dade County in 2024 is the most protective of environmental justice communities of the five alternatives considered according to the feasibility study and was selected even though it fails to maximize efficiency. MIAMI STUDY II, *supra* note 32, at ES-5.

[267] N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS., *supra* note 136, at 1. For more examples, *see* Environmental Defense Fund, *supra* note 138, at 2 ("to date the USACE has not made sufficient efforts to proactively engage communities on their preferences and priorities, rather than sharing a finished and tremendously complex proposal for their reaction"); Letter from Stuart F. Gruskin, Nathan Frohling & Eric Olsen, The Nature Conservancy, to Bruce Wisemiller, Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 5 (Mar. 21, 2021) ("Implement a specialized engagement strategy and account for the unique needs of environmental justice communities . . . ."); Letter from Elizabeth Goldstein, President, Mun. Art Soc'y of N.Y., to Bruce Wisemiller,

The 2024 ASPs addressed the distributive and procedural dimensions of environmental justice in individual project planning.[268] Acknowledging the distributive dimension, they indicate that one of the "[g]uiding [p]rinciples" in project planning is ensuring that "all people, regardless of income, race, color, national origin, Tribal affiliation, or disability . . . [a]re fully protected from disproportionate and adverse human health and environmental effects . . . and hazards including those related to . . . the legacy of systemic racism."[269]

The 2022, Biden-era draft New York/New Jersey study includes the most in-depth environmental justice analysis of the studies that we reviewed, and this analysis implicitly raises a sensitive question about what it would mean in practice to achieve a just distribution from a Corps coastal protection project. The 2024 ASPs do not provide a concrete answer to this question, but we nonetheless highlight it here to encourage other researchers to consider it.

The draft New York/New Jersey study includes quantitative estimates of the number of people in environmental justice populations who would be protected against flooding by the tentatively selected plan and the four

Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 3 (Mar. 6, 2023) ("MAS recommends the establishment of local stakeholder task forces and an in-depth peer review process . . . ."); Letter from Tyler Taba, Rise to Resilience Coalition, to Bruce Wisemiller and Cheryl Alkemeyer, U.S. Army Corps of Eng'rs N.Y. Dist. 4–5 (Mar. 31, 2023) (advocating for an extended public comment period and a "robust public engagement and community empowerment strategy . . . ."); Letter from Sarah Sanchala, Program Manager, SWIM Coalition, to Bruce Wisemiller, Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 2–3 (Mar. 6, 2023) (criticizing the quality of the Corps' engagement with environmental justice communities); Letter from Tracy Brown, President and Hudson Riverkeeper, Riverkeeper, to Bruce Wisemiller and Cheryl Alkemeyer, U.S. Army Corps of Eng'rs N.Y. Dist. 34–36 (Mar. 13, 2023) (criticizing the Corps for failing to meet its public engagement obligations under WRDA 2020 and NEPA); Letter from Kimberly Ong, Staff Att'y, NRDC, to Bruce W. Wisemiller, Project Manager, U.S. Army Corps of Eng'rs N.Y. Dist. 6 (Mar. 31, 2023), https://www.nrdc.org/sites/default/files/2023-04/nynjhats-tier-1-eis-comments-nrdc-20230331.pdf [https://perma.cc/LXF6-TTUC].

The non-federal sponsors and partner agreed in their comments that engagement with environmental justice communities had been deficient and indicated that they would work with the Corps to increase such engagement after the comment period. NJ DEP, NYS DEC & NYC MOCEJ, *supra* note 138, at 1. Multiple comments urged the Corps to establish and fund the Climate and Environmental Justice Group that it had apparently previously committed to create. N.Y.C. ENV'T JUST. ALL. & RESILIENT COASTAL CMTYS., *supra* note 136, at 5; Environmental Defense Fund, *supra* note 138, at 3.

[268] For discussions of the meaning of fairness, equality, and justice in the context of environmental justice, see, e.g. Robert R. Kuehn, *A Taxonomy of Environmental Justice*, 30 ENV'T L. REP. 10681 (2000); Vicki Been, *What's Fairness Got to Do With It: Environmental Justice and the Siting of Locally Undesirable Land Uses*, 78 CORN. L. REV. 1001 (1993) (elaborating various potential meanings of fairness in the siting of undesirable land uses).

[269] Corps of Engineers Agency Specific Procedures to Implement the Principles, Requirements, and Guidelines for Federal Investments in Water Resources, 89 Fed. Reg. 101,836, 101,872 (Dec. 19, 2024) (to be codified at 33 C.F.R. § 234.6).

other alternatives analyzed.[270] The granular information underscores that even if the Corps and the non-federal sponsors are committed to prioritizing equity, there are policy choices involved in determining which project alternative will best promote an equitable distribution. For one, the granular information in the draft study concerns the shares of environmental justice and non-environmental justice populations in the study protected *against flooding*. However, avoiding flooding might not be the only good that a study seeks to realize; other supplemental or alternative goals might include maximizing net benefits (benefits minus costs) for environmental justice communities, maximizing investments, or guaranteeing a certain share of federal investment flows to environmental justice communities, such as 40 percent of climate investments under the Biden administration's Justice40 Initiative.

Assuming that protection against flood risk is the desired goal, it may not be self-evident which alternative will best address environmental injustices. Consider Table 4 below, which illustrates the share of the population exposed to flooding, the environmental justice population exposed to flooding that is protected, the non-environmental justice population exposed to flooding that is protected, and the share of the protected population that is from an environmental justice community for the five proposed alternatives in the New York/New Jersey draft study. The data is based on raw numbers published by the Corps. The largest plans are the most comprehensive in coverage: Alternative 2, which involves a storm surge barrier from Sandy Hook, New Jersey, to Breezy Point, New York,[271] covers 97.44% of the at-risk environmental justice population in the study area. Alternative 3B, the tentatively selected plan (and the NED plan), only covers 79.57% of this population. Here, the option that maximizes national efficiency offers less protection to communities of color and low-income communities (as well as to others).

Is Alternative 2 more equitable than 3B, given that protecting 97% of the environmental justice population protects more than close to 80%? Several other considerations further complicate the issue. First, it will take

[270] In addition, this study scores the impacts of the tentatively selected plan and the other four alternatives based on the number of people in environmental justice populations that the proposal would protect against flooding, and the effects that construction would have on environmental justice communities (in terms of the construction itself, and interference with views, "and other disruptions"). N.Y. APP'X A12, *supra* note 191, at 64–65 (Table 6.2 Results-Scaled scores for alternatives by criteria). The New York/New Jersey study also scored the impact of alternatives based on "Socially Vulnerable Populations in Risk-Reduced Areas." *Id.* at 52–53, 63–65. The 2024 Miami-Dade study and the 2018 Norfolk study include similar scoring to the New York/New Jersey area under the Other Social Effects category. *See supra* note 191.

[271] N.Y. STUDY, *supra* note 10, at 162.

longer to build Alternative 2 than Alternative 3B,[272] meaning that all populations would receive less protection under the former plan in the short term. Second, the project alternatives vary by the extent to which the overall protected population is composed of environmental justice community members. Alternative 3B is the proposal in which the protected EJ population is the largest proportion of the total protected population; 64% of the protected population is from an environmental justice population in 3B, compared to 60.6% in Alternative 2. Third, as mentioned above, Alternative 3B does not protect well-known environmental justice communities in the study region, such as the South Bronx. As this analysis suggests, determining which alternative most advances equity appears to depend in part on the metric used to evaluate equity, and the choice of metric would represent a value choice.

Table 4: NY-NJ Harbors and Tributaries Plan Coverage by Alternatives[273]

Proposed Alternative	**% of Exposed Population Protected**	**% of Exposed EJ Population Protected**	**% of Exposed non-EJ Population Protected**	**% of Protected Population is EJ**
Alt 2	96.01	97.44	93.90	60.58
Alt 3A	90.88	95.41	84.16	62.67
Alt 3B (Tentatively Selected)	73.85	79.57	65.38	64.31
Alt 4	66.22	70.18	60.35	63.26
Alt 5	10.61	10.64	10.57	59.82

With respect to the procedural dimension of environmental justice, the 2024 ASPs lay out a more collaborative approach to project development, consistent with efforts by the Corps in recent times to expand public

[272] N.Y. APP'X D, *supra* note 131, at 53.

[273] Raw data is in N.Y. APP'X A12, *supra* note 191, at 63. The PDF as displayed on the Corps' website cuts off Alternative 5; the Corps provided the authors with the remaining information after the authors submitted a FOIA request.

The numbers in the table have been calculated based on raw data provided by the Corps in Appendix A12 as follows. "% of Exposed Population Protected" divides each alternative's count in risk reduced areas by the total number of individuals in the floodplain. "% of Exposed EJ Population Protected" divides the number of environmental justice community members protected by the population of environmental justice community members in the floodplain. "% of Exposed non-EJ Population Protected" takes the number of non-EJ individuals in risk-reduced areas and divides it by the non-EJ risk-reduced population for each alternative. Finally, "% of Protected Population is EJ" divides the number of protected EJ community members by the number of total protected individuals for each alternative.

participation beyond the input of the non-federal sponsor.[274] The ASPs indicate that the Corps "will seek to achieve full collaboration with a wide range of affected Tribes, governmental and non-governmental stakeholders, communities with environmental justice concerns, and the public."[275] They state that Tribes and EJ communities "shall have an opportunity to play a key role in identifying alternatives, enhancing the positive benefits to their communities from potential federal investment, and describing any concerns they may have with a potential project."[276] Under the ASPs, project planning would be bookended by explicit consideration of stakeholder views. At the formulation of objectives phase, the Corps would include a summary of stakeholder views on planning objectives.[277] The Corps would then submit in its report on the recommended plan a summary of the Tribal and other stakeholder views on each alternative.[278] Even with these changes, however, community groups would still have less formal influence over project development than some would like, and non-federal sponsors would still have more leverage than other stakeholders, as described in Part III.

[274] *Compare* ER 1105-2-100, *supra* note 27, 2–15 (describing the importance of collaboration but affording each district office discretion), *with* ER 1105-2-103, *supra* note 132, at 15 ("Non-federal partners are critical to successful completion of planning studies . . . Planning teams will develop and implement stakeholder and community engagement strategies to meaningfully engage the public throughout the planning process.").

There also has been support in Congress for increasing public involvement in the work of the Corps. During the first Trump administration, both WRDAs contained provisions requiring public input. For example, WRDA 2018 required the Corps to allow non-federal interests to provide recommendations when the Corps updates its implementation guidance for various water resources laws. Pub. L. No. 115-270 § 1105 (Oct. 23, 2018). WRDA 2020 contained numerous provisions to ensure the Corps focused on "economically disadvantaged communities," and many of these provisions required public comment. Pub. L. No. 116-260, Div. AA, §§ 110(d) (public comment in issuing agency-specific procedures), 112 (public engagement in updating guidance to address unequal environmental burdens), 118 (soliciting participation in pilot programs to address flood control needs of economically disadvantaged communities). The most recent WRDA emphasizes stakeholder involvement through disclosure: many provisions in WRDA 2024 ensure the Corps provides adequate information to non-federal sponsors. *See, e.g.*, Pub. L. No. 118-272, div. A §§ 1101 (advanced notice of financial obligations for completed projects); 1104 (advanced notice of real estate obligations); 1109–10 (greater Corps technical involvement in projects designed and built by non-federal entities). Moreover, WRDA 2024, in directing the continuation of New York/New Jersey study, expressly directs the Corps to "consult with applicable Federal and State agencies and other stakeholders within the geographic scope of the project . . . [and] solicit public comments." Pub. L. No. 118-272, div. A, § 1343 (d)(2) & (3), 138 Stat. 2992, 3153 (Jan. 4, 2025). This appears to acknowledge the criticisms of that project for not sufficiently engaging communities.

[275] 33 C.F.R. § 234.6(d)(1).

[276] 33 C.F.R. § 234.6(d)(1). The ASPs ensure the Corps retains discretion in "[e]ngagement methods and scope[,]" which will vary depending "on the stage of the planning process." *Id.* § 234.6(d)(2).

[277] 33 C.F.R. § 234.6(f)(6) (2025).

[278] 33 C.F.R. § 234.11(a)(1) (2025).

The second Trump administration has already rescinded many of its predecessors' environmental justice initiatives. It has revoked executive orders concerning environmental justice, including Executive Order 12,898 from 1994, and ordered agencies not to address environmental justice in NEPA analyses.[279] It is shuttering environmental justice offices.[280] It is firing employees at environmental agencies,[281] although the Corps appears to have been spared massive layoffs so far.[282] The Bureau of Reclamation, another agency focused on water resource projects, has lost 25% of its staff in the first five months of the Trump administration.[283] In contrast, the Corps notified about 1,068 employees, 3% of its civilian staff, of their eligibility for the Trump administration's federal employee buyout program.[284] The Corps, like other federal agencies, was subject to the hiring freeze extending to July 15, 2025.[285] As of June 2025, the administration's proposed 2026 fiscal plan would cut 25% of the Army

[279] *See* Ending Illegal Discrimination and Restoring Merit-Based Opportunity, Exec. Order No. 14,173, 90 Fed. Reg. 8633 (Jan. 21, 2025); Initial Rescissions of Harmful Executive Orders and Actions, Exec. Order No. 14,148, 90 Fed. Reg. 8237 (Jan. 20, 2025); Unleashing American Energy, Exec. Order. No. 14,154, 90 Fed. Reg. 8353 (Jan. 20, 2025); COUNCIL ON ENV'T EQUALITY, EXEC. OFF. OF THE PRESIDENT, MEMORANDUM FOR HEADS OF FEDERAL DEPARTMENTS AND AGENCIES: IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT (Feb. 19, 2025) (superseded by COUNCIL ON ENV'T EQUALITY, EXEC. OFF. OF THE PRESIDENT, MEMORANDUM FOR HEADS OF FEDERAL DEPARTMENTS AND AGENCIES: IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT (Sept. 29, 2025)). The Trump administration is seeking to limit environmental review in other contexts as well. *See, e.g.,* Valerie Volcovici, *Trump's Army Corps Seeks to Fast-Track 600 'Emergency' Projects Through Environmental Review*, REUTERS (Feb. 19, 2025), https://www.reuters.com/world/us/us-army-corps-lists-600-emergency-projects-bypass-environmental-review-2025-02-19/ [https://perma.cc/6LH6-TE6L].

[280] Lisa Friedman, *E.P.A. Plans to Close All Environmental Justice Offices*, N.Y. TIMES (Mar. 11, 2025), https://www.nytimes.com/2025/03/11/climate/epa-closure-environmental-justice-offices.html [https://perma.cc/AD5D-78J4].

[281] *See* Pamela King, *DOJ Environment Section Chiefs Reassigned to Work on Immigration*, E&E NEWS (Jan. 24, 2025), https://www.eenews.net/articles/doj-environment-section-chiefs-reassigned-to-work-on-immigration/ [https://perma.cc/6WA6-GU4M]; Kevin Bogardus, *EPA Fires 'Probationary' Employees*, E&E NEWS (Feb. 14, 2025), https://www.eenews.net/articles/epa-pushes-out-almost-500-probationary-employees/ [https://perma.cc/Q8CA-W53B].

[282] Annette Choi et al., *Tracking Trump's Overhaul of the Federal Workforce*, CNN (Mar. 28, 2025), https://www.cnn.com/politics/tracking-federal-workforce-firings-dg [https://perma.cc/AE73-GPTW].

[283] Jennifer Yachin & Daniel Cusick, *Bipartisan Senators Decry Cuts to Army Corps, Reclamation*, E&E NEWS (June 12, 2025), https://www.eenews.net/articles/bipartisan-senators-decry-cuts-to-army-corps-reclamation/ [https://perma.cc/4E26-GE5D].

[284] Nichola Groom, *US Army Corps of Engineers Offers Buyouts to Some Civilian Staff*, USA TODAY (Mar. 12, 2025), https://www.usatoday.com/story/news/politics/2025/03/12/army-corps-of-engineers-buyouts-civilian-employees/82323213007/ [https://perma.cc/T6LU-9DBB]; Kathryn Palmer, *Dozens of Lakes Impacted by Closures as USACE Grapples with Cuts. Check Your Lake's Status*, USA TODAY (May 24, 2025), https://www.usatoday.com/story/news/nation/2025/05/23/lake-boat-ramp-beach-closures-usace/83650440007/ [https://perma.cc/CF7D-QBRK].

[285] Palmer, *supra* note 284.

Corps' budget.[286] The Corps requested $6.7 billion for its Civil Works program, down from the $7.22 billion requested (and $8.7 billion appropriated) for fiscal year 2025.[287]

In this context, it is worth recalling that there is a statutory basis for incorporating environmental justice into Corps project planning. The Corps' consideration of environmental justice is not solely a reflection of the policy preferences of a given presidential administration. For example, without naming the Clinton-era executive order on environmental justice, WRDA 2020—passed in the latter months of the first Trump administration—required the Corps to comply with Executive Order 12,898.[288] Although different interpretations are possible, the statutory language could be read to require compliance with 12,898 even though President Trump rescinded it.[289] WRDA 2020 also contained several

[286] Yachin & Cusick, *supra* note 283.

[287] *Fiscal Year 2026 Budget Requests for the Army Corps of Engineers (Civil Works) and the Bureau of Reclamation: Hearing Before the Subcomm. on Energy and Water Dev. and Related Agencies of the H. Comm. on Appropriations*, 119th Cong. 2 (2025) (statement of William H. Graham, Jr., Lieutenant General, Chief of Engineers); ANNA E. NORMAND & NICOLE T. CARTER, CONG. RSCH. SERV., IF12648, U.S. ARMY CORPS OF ENGINEERS: FY 2025 (2025).

[288] Water Resources Development Act of 2020, 33 U.S.C. § 2356(b)(1) ("In the formulation of water development resources projects, the Secretary shall comply with any existing Executive order regarding environmental justice in effect as of December 27, 2020, to address any disproportionate and adverse human health or environmental effects on minority communities, low-income communities, and Indian Tribes."). As Table 2 indicates, the Norfolk feasibility study, which was completed during the first Trump administration, included discussion of environmental justice.

[289] The argument for requiring compliance despite President Trump's rescission of EO 12,898 proceeds as follows. Courts interpret the phrase "existing Executive order" to mean operative, non-revoked executive orders. *See* ACLU v. U.S. Dep't of Just., 265 F. Supp. 2d 20, 27 (D.D.C. 2003) (using the phrase "existing executive order" (citing Campbell v. U.S. Dep't of Just., 164 F.3d 20, 30 (D.C. Cir. 1993), and then citing King v. U.S. Dep't of Just., 830 F.2d 210, 217 (D.C. Cir. 1987)). This phrase, read in conjunction with its subsequent modifier, "in effect as of December 27, 2020," means that relevant executive orders were not revoked or superseded, with the date clause indicating the date of reference for whether the orders were existing. Having been modified by the "in effect" clause, the word "existing" does not mean that supersessions after December 27, 2020, affect the Secretary's obligations under § 2356(b)(1). In sum, Congress directed the Corps to comply, in perpetuity, with all environmental justice executive orders that had not been revoked and had legal effect on December 27, 2020. This includes Executive Order 12,898, which was issued in 1994 and rescinded in 2025.

This argument is bolstered by the subsections surrounding § 2356(b)(1). § 2356(b)(2) directs the Secretary of the Army to update the Corps' internal regulations, policies, and guidance as "necessary to implement any Executive order described" in § 2356(b)(1) "[n]ot later than 1 year after December 27, 2020." § 2356(b)(3) directs that "[i]n updating the policies, regulations, or guidance under paragraph (2), the Secretary shall . . . (B) provide opportunities for interested stakeholders to comment on potential updates." Neither subsection contemplates that the Secretary will amend Corps policies, regulations or guidance if Executive Order 12,898 (or any other environmental justice executive order in effect on December 27, 2020) is subsequently modified.

Contrast § 2356 with 5 U.S.C. § 7135, which also incorporates executive orders by reference. There, Congress stated that some enumerated executive orders, and any others, "as in effect on the effective date of this chapter, shall remain in full force and effect until revised or

provisions to address the needs of "economically disadvantaged communities" (EDCs), a term that the Army Corps defined in guidance in 2023,[290] as well as other communities, including rural communities. WRDA 2020 required the Army Corps to establish a pilot program to evaluate the CSRM needs of "rural communities and economically disadvantaged communities."[291] Congress directed the Corps to evaluate and recommend flood risk management and CSRM projects for these communities "without demonstrating that each project is justified solely

revoked by the President, or unless superseded" by other legislation. § 7135 indicates that when Congress seeks to allow the President to modify a statutory scheme, it expressly grants this authority. Further, 33 U.S.C. § 2356(d) indicates that the Congress that enacted WRDA 2020 would have used language to authorize the President to amend a statutory scheme through an executive order if the Congress wanted the President to have this authority. In 33 U.S.C. § 2356(d), Congress directed the Secretary of the Army to act consistent with "the Tribal Consultation Policy affirmed and formalized by the Secretary on November 1, 2012 *(or a successor policy)*" (emphasis added). Thus, in § 2356(d), but not § 2356(b), Congress mandated that the Secretary adapt in line with changes made within the executive branch. The contrasts within § 2356, and between § 2356(b) and § 7135, support the view that Congress intended the Army Corps to comply with Executive Order 12,898 until Congress directs otherwise.

When an executive order "unacceptab[ly] conflict[s]" with a statute, the executive order must yield. Chamber of Comm. of U.S. v. Reich, 74 F.3d 1322, 1333–34 (D.C. Cir. 1996); *see also* United States v. R.I. Dep't of Corr., 81 F. Supp. 3d 182, 188 (D.R.I. 2015) ("if an executive order conflicts with an existing statute, the executive order must fall" (citing *Reich*, 74 F.3d at 1332–34)); HIAS v. Trump, 985 F.3d 309, 322 (4th Cir. 2021). Executive Order 14,713—the one that rescinds 12,898—materially conflicts with § 2356(b)(1) to the extent that the former directs the Army Corps not to comply with 12,898. Therefore, § 2356(b)(1) controls.

We note that, notwithstanding 33 U.S.C. § 2356(b)(1), the Army Corps' New York District did not include an environmental justice analysis in a draft feasibility study published in July 2025. *See* N.Y. JULY 2025 DRAFT REPORT, *supra* note 10. Executive Order 12,898 is not listed among the orders with which the Corps says it must comply. *Id.* at 196 (tbl. 45). Further, the Environmental Quality analysis does not score the project on socioeconomic or demographic lines. *Id.* at 92–102. The Other Social Effects account scores each actionable element of the project proposal on its effects on "Socially Vulnerable Groups in Risk-Managed Areas," but the explanations are vague. *Id.* at 106, 109–10.

[290] Water Resources Development Act of 2020, Pub. L. No. 116-260, Div. AA, §§ 116, 118, 137, 165, 134 Stat. 1182, 2627-32, 2650, 2668-69. The Corps defined this term in a 2023 memorandum in response to a Congressional delegation in WRDA 2020 to define the term. Water Resources Development Act of 2020, Pub. L. No. 116-260, Div. AA, § 160, 134 Stat. 1182, 2665 (referencing 42 U.S.C. § 3161). The definition that the Corps issued in 2023 lists five sufficient conditions: (1) per capita income less than or equal to 80% of the national average; (2) unemployment rate greater than or equal to 1% above the national average for the prior 24 month period; (3) "Indian country as defined in 18 U.S.C. § 1151[;]" (4) "U.S. territories; or" (5) "[c]ommunities identified as disadvantaged" by CEJST. Memorandum from Michael L. Connor, Assistant Sec'y of the Army for Civil Works, Implementation Guidance for Section 160 of the Water Resources Development Act of 2020, at 1–2 (Mar. 14, 2023), https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll5/id/36002 [https://perma.cc/WRK5-PH4J]. The first four factors would allow the benefits of the EDC designation to run to a large array of communities, including low-income rural communities.

[291] Water Resources Development Act of 2020, Pub. L. No. 116-260, Div. AA, § 118, 134 Stat. 1182, 2629–32.

by [NED] benefits."[292] This section requires the Corps to "consider the geographic diversity among proposed projects[.]"[293] WRDA 2020 also added a pilot program to "carry out feasibility studies" directed towards the flood risk management and CSRM needs of EDCs, to which WRDA 2024 added a list of priority projects.[294] WRDAs 2022 and 2024 included reductions in the required cost share for EDC sponsors of certain projects,[295] authorization for the Corps to waive cost sharing and fee collection for EDCs,[296] prioritization for rural and urban EDCs in outreach efforts relating to the Corps' "technical service programs[,]"[297] and a federal interest determination provision that ensures the Corps initiates projects designed to benefit EDCs and identifies these projects to Congress in requests for supplemental appropriations.[298] The existing legislative provisions channeling some Corps work to assist EDCs and rural communities suggest that, in the flood protection context, equity concerns may be enduring, even if less prominent in the planning processes of certain administrations compared to others.

B. A Proposal to Supplement Decentralized Project Development with Large-Scale Flood Risk Assessment

The Biden-era changes to Corps project planning described above, most notably the 2024 ASPs, focused on changes to the process for planning individual Corps projects. The changes largely presume that projects would continue to emerge from local communities, the Corps would develop these projects in collaboration with non-federal sponsors and others, and Congress would approve and appropriate funding for projects sequentially. These assumptions are consistent with the decentralized manner in which Corps projects have been developed over decades.

[292] *Id.* § 118(c), 134 Stat. at 2630–31.

[293] *Id.* § 118(d), 134 Stat. at 2631. Congress also included a geographic diversity requirement in an unrelated provision in WRDA 2022. Water Resource Development Act of 2022 Pub. L. No. 117-263, Div. H, § 8130(a)(2)(B), 136 Stat. 2395, 3718 (Dec. 6, 2022).

[294] Water Resources Development Act of 2020, Pub. L. No. 116-260, Div. AA, § 118, 134 Stat. 1182, 2629-32; Water Resource Development Act of 2024, Pub. L. No. 118-272, Div. A, § 1303(h), 138 Stat. 2992, 3114-15.

[295] James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, Div. H § 8103, 136 Stat. 2395, 3697–98, 33 U.S.C. § 2332.

[296] *Id.* § 8119, 136 Stat. 3711, 42 U.S.C. § 1962d-16; Water Resource Development Act of 2024, Pub. L. No. 118-272, Div. A, § 1130, 138 Stat. 2992, 3018-19.

[297] James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, Div. H, Tit. LXXXI, § 8117, 136 Stat. 3709, 33 U.S.C. § 2281b.

[298] Congress also directed the Corps to establish a "Tribal and Economically Disadvantaged Communities Advisory Committee" to ensure better project delivery for tribal and urban and rural EDCs. James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, Div. H § 8115, 136 Stat. 2395, 3707–08.

However, the largely bottom-up approach to coastal protection may not be tenable for long in an era of planetary warming, given increasing needs for adaptation, the staggering costs of potential adaptation projects, and resource scarcity at all levels of government.[299] It may be necessary to devise an approach to investing in coastal protection that does not focus solely on designing projects that are efficient and distributively just within the geographic area covered, but also enables trade-offs across regions and over time.

Consider the current situation: As Table 1 indicates, Congress has authorized the Charleston, Coastal Texas, Miami-Dade, and Norfolk projects, all of which are designed in part to address risks exacerbated by climate change, most notably of storm surge flooding. The construction costs for the projects range from $34.38 billion (for Coastal Texas) to $1.133 billion (for Charleston), for a total of almost $41 billion.[300] Between fiscal year 2018 and 2024, Congressional appropriations for the Corps ranged from just under $7 billion to close to $9 billion annually, most of which the Corps used for maintenance of existing infrastructure rather than new construction.[301] Should Congress appropriate funds for all of these projects? For the projects that Congress should fund, when should they be funded—this year, a decade from now, or in tranches over a period of time? Moreover, what areas of the country should the Corps be studying through feasibility studies for potential projects?

Currently, the benefit-cost ratios that the Corps develops for individual projects are the primary tool for weighing the comparative merits of funding different coastal protection projects. These ratios, which stem from the benefit-cost analyses that the Corps is required to undertake for individual projects, are used by the Office of Management and Budget when it is deciding the projects for which it will request funding in the President's budget proposal.[302] However, the benefit-cost ratios are an inadequate tool for allocating finite resources for coastal protection. First, the ratios are based on Corps benefit-cost analyses, which, as discussed in Part IVI.A., have been criticized on methodological grounds. Second, the ratios do not provide a basis for comparing the equities of funding different projects. A project might have a comparatively low benefit-cost ratio, but the community that would benefit might be a low-income community with few resources to address its flood risks other than Corps-built infrastructure. Third, benefit-cost ratios are useful only for comparing coastal protection projects that have been the subject of completed

[299] *See, e.g.*, REBUILD BY DESIGN, ATLAS OF DISASTER, *supra* note 3, at 668.
[300] *See* Table 1.
[301] NORMAND & CARTER, *supra* note 287.
[302] *See supra* notes 216–18 and accompanying text.

feasibility studies. There are likely areas of the country facing severe flood risks that have not been the subject of feasibility studies, and that might warrant Congressional investments in flood protection beyond the areas that have had the resources to obtain feasibility studies previously. Existing benefit-cost ratios might help decide which of the studied projects should be appropriated construction funding. However, they do not help answer the prior question of which areas of the country the Corps should be studying for potential projects in the first place.

Elsewhere, we argue that the Corps should periodically analyze flood risks in coastal regions to identify the areas at high risk of coastal flooding.[303] The analysis should be undertaken for all coastal regions as a whole, or the nation's coastal areas should be divided into regions for analysis, perhaps tracking the boundaries of the Corps' districts.[304] The Corps should then seek to prioritize undertaking feasibility studies and building projects in areas its analyses identify as high-risk for flooding, rather than waiting for these regions to propose projects to the Corps. The assessment of flood risks could be updated on a regular cycle, such as every ten years, to reflect changes in understandings of flood risks and changes in local conditions, such as local efforts to mitigate flood risks, for example, through land use regulation. Such large-scale risk assessments might help to create a more nationally efficient and equitable flood control program.

The shift to a more modern, comprehensive approach to benefit-cost analysis in the 2024 ASPs might help the Corps and non-federal sponsors better identify efficient designs for specific projects, but increasing the efficiency of individual projects does not guarantee that the Corps' coastal protection efforts will maximize efficiency on a national scale. While each project that the Corps builds might, in theory, be net beneficial if it selects the project design that maximizes net benefits, there may be other projects that it could build that would be even more net beneficial. A national strategy for investing in coastal protection in different regions, and at different times, based on net benefits, might lead to more efficient investments in adaptation from a national perspective. However, a national strategy based purely on net benefits would be informationally demanding to generate. It might not give adequate consideration to concerns about the equitable distribution of flood protection. It could also be potentially contentious, given that it would likely entail prioritizing protecting certain

[303] We develop this idea in Max S. Miller & Katrina M. Wyman, *Federal Adaptation Efforts: A Case Study of the U.S. Army Corps of Engineers' Coastal Storm Risk Management Projects*, a chapter that will be published in a book edited by Professors Cherie Metcalf and Stephanie Stern, INSTITUTIONS AND EFFECTIVE CLIMATE ACTION.

[304] U.S. Army Corps of Eng'rs, *Where We Are* (On File with the Columbia Journal of Environmental Law).

regions over others. For members of Congress, the existing project-by-project approach has the advantages of avoiding trade-offs between regions and allowing everyone in Congress to advocate for projects for their constituents.[305]

Our suggestion that the Corps periodically assess the coastal flood risks facing different parts of the country might be a small step in the direction of a national strategy for coastal protection as the planet warms. The regional or national level coastal flood risk assessments would be an additional input into decision-making by the Corps, the Office of Management and Budget, and Congress. The assessments might be particularly helpful in prompting feasibility studies to be completed by the Corps in areas facing high flood risks, and thus in ensuring that there are proposed projects for areas of the country where the risks are greatest (even if these areas lack the political and economic clout to obtain feasibility studies). OMB and Congress could use the assessments, as well as benefit-cost ratios, in deciding which projects to fund for construction. The two tools would provide different lenses into the value of coastal protection; benefit-cost ratios are a localized measure of project efficiency, while large-scale flood risk assessments would provide an indication of the comparative severity of the flood risks facing different parts of the country.

There are also reasons grounded in equity for a national or regional level coastal flood risk assessment to provide an informational input into decision-making in Congress, the Corps, and the Office of Management and Budget about the allocation of Corps resources for coastal protection. An NAACP report with Columbia University's Master of Public Administration-Environmental Science and Policy Program emphasizes the importance of considering not only about which communities are protected and to what extent within a given project, but also where projects are—and are not—built.[306] In particular, the NAACP report underscores that there are barriers hindering the construction of flood protection projects in low-income communities of color.[307] For example, the local cost-share requirements may be a significant hurdle for local and state governments that cannot afford to pay a share of the costs of feasibility studies and construction, let alone the entire cost of operating and maintaining the projects.[308] Congress has "authorized a pilot program, allowing USACE to waive the cost-sharing requirement for 10 feasibility

[305] *See, e.g.*, REUSS, *supra* note 124, at 35; Tarlock, *supra* note 18, at 1317*;* Houck, *supra* note 5, at 6, 54; O'NEILL, *supra* note 6, at 12, 100.
[306] TURNING THE TIDE, *supra* note 97.
[307] *Id.* at 21.
[308] *Id.* at 21, 30.

studies in rural and economically disadvantaged communities, as long as federal costs equal $10 million or less."[309] Congress can also waive the cost-share requirements, and it has done so,[310] but obtaining a Congressional exception presumably requires political clout. Periodic evaluations of where coastal flood risks lie might help identify parts of the country that require federal investments in coastal protection but that have not had the political or economic resources to obtain a feasibility study or project from the Corps. Such evaluations might lead to a more just allocation of federal coastal protection resources, especially if social vulnerability to flooding is considered in analyzing flood risk.

In recent years, Congress authorized two regional studies of flood risk that provide precedents for the type of large-scale, periodic assessments of coastal flood risks for which we advocate to help guide the prioritization of the Corps' coastal protection work. Congress authorized the Northern Atlantic Coast Comprehensive Study (NACCS)[311] on the heels of Hurricane Sandy in the Disaster Relief Appropriations Act of 2013.[312] Modeled on the NACCS, the Southern Atlantic Coastal Study (SACS)[313] was authorized in Section 1204 of WRDA 2016.[314] Funding for the SACS was provided in the Bipartisan Budget Act of 2018,[315] in response to a particularly devastating 2017 hurricane season.[316] Each study identifies multiple high-flood risk locales in the region covered for further study. The methodology for both was similar. Each determined potential exposure to flooding based on three indices: population density and infrastructure, social vulnerability, and environmental and cultural resources.[317] Risk was calculated as a function of the probability of a storm's occurrence and the composite index of the three exposure categories.[318] The studies appear to have had an impact; Congress recently

[309] *Id.* at 30. *See also* Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, § 118, 134 Stat. 2615, 2629, 33 U.S.C. 2201.

[310] *Supra* note 123. WRDA 2024 also gives greater discretion to the Army Corps to waive cost-sharing requirements for economically disadvantaged communities. *See* WRDA 2024 Pub. L. No. 118-272. Div. A, § 1139, 138 Stat. 2992, 3026–27 (2025).

[311] NACCS, *supra* note 116.

[312] Disaster Relief Appropriations, Pub. L. No. 113-2, tit. II, 127 Stat. 4, 5 (Jan. 29, 2013).

[313] U.S. ARMY CORPS OF ENG'RS, SOUTH ATLANTIC COASTAL STUDY: MAIN REPORT (Oct. 2021), (on file with the Journal of Environmental Law) [hereinafter SACS].

[314] Water Infrastructure Improvements for the Nation Act, Pub. L. No. 114-322, tit. I, § 1204, 130 Stat. 1628, 1685 (Dec. 16, 2016).

[315] Bipartisan Budget Act of 2018, Pub. L. No. 115-123, tit. IV, 132 Stat. 64, 76 (Feb. 9, 2018).

[316] SACS, *supra* note 313, at 1-4.

[317] NACCS, *supra* note 116, at 44; SACS, *supra* note 313, at 4-14 to 4-15.

[318] NACCS, *supra* note 116, at 45; SACS, *supra* note 313, at 4-24.

authorized three projects protecting high-risk areas identified in NACCS and two projects protecting high-risk areas identified in SACS.[319]

The history of the NACCS and SACS suggest that Congressional authorization and appropriations would be necessary for the Corps to undertake periodic regional or national-scale assessments of coastal flood risks. The biennial Water Resources Development Acts might provide the legislative vehicle for advancing the idea. Even if such assessments do not gain political support in Congress in the near-term, planetary warming, and the flood risks that it exacerbates, likely require thinking about coastal protection on a larger geographic scale than the current serial, project-by-project approach affords.

V. CONCLUSION

The Army Corps is engaged in planning a series of coastal protection projects to address flood risks exacerbated by climate change along the eastern and southern seaboards. The design of these projects entails a distinct form of collaboration between the Corps and local and state governments sponsoring the projects. To a lesser extent, other stakeholders, such as community groups, also play a role in the development of these projects.

While the development of the Corps projects is ongoing, these projects provide a window into live efforts to adapt to climate change using a collaborative process. Looking closely at the evolution of these projects highlights an important question about the geographic scale at which adaptation to climate change should be approached. In particular, should adaptation be planned in a decentralized, project-by-project manner similar to the way that the Corps currently works with local and state governments and other interests to plan coastal protection projects? Alternatively, should adaptation be planned in a more centralized manner, based on national or regional scale risk assessments, with a view to prioritizing adaptation investments in areas that would be most efficient and/or equitable to protect at a national level? Or would a hybrid approach allowing localities to propose federal adaptation investments combined with centralized federal parameters for such investments be preferable? This article modestly proposes that the Corps' current decentralized approach be complemented with periodic national or regional assessments

[319] Thomas R. Carper Water Resources Development Act of 2024, Pub. L. No. 118-272, Div. A, tit. IV, § 1401 (authorizing projects protecting Washington D.C., Baltimore, Rhode Island, Miami, and Puerto Rico); NACCS, *supra* note 116, at 104 (Washington D.C., Baltimore, and Rhode Island); SACS, *supra* note 313, 7-14 (Miami and Puerto Rico).

of coastal flood risks to help channel the Corps' scarce resources toward areas of the country facing the greatest flood risks.

Notably, other governmental efforts to adapt to climate change face a similar challenge to that discussed in this article, of prioritizing investments across geographies and over time. Consider the challenge in New York City. After Superstorm Sandy flooded 17 percent of the city's landmass in 2012, New York City began planning a series of construction projects to reduce the risk of damages from storm surge flooding and sea level rise.[320] Many of these locally led projects are in lower Manhattan, the most notable being the East Side Coastal Resiliency project, a $1.45 billion project that the city is currently constructing, which involves rebuilding and elevating a public park on landfill, among other measures.[321] New York City's focus on building projects in lower Manhattan, historically an economically important part of the city, has led to criticisms that local investments in time and effort in adaptation are inequitable because they have neglected outlying boroughs, such as the Bronx, Brooklyn, and Staten Island that also face significant risks of coastal flooding.[322] This and similar controversies elsewhere underscore that not only federal agencies, such as the Corps, but also subnational governments are struggling with allocating investments in adaptation, given pressing needs in many areas.[323]

As the climate continues to warm, the actual experiences of government agencies engaged in adaptation should be studied to identify the issues that they are encountering and the range of ideas they are developing to address these issues. There has been an outpouring of legal scholarship recently about adapting to climate change.[324] Assuming present climate trends

[320] CITY OF N.Y., *supra* note 85, at 13. The City also supported the NACCS study that preceded the ongoing Army Corps' feasibility study for New York/New Jersey. *Id.* at 64.

[321] Michael Kimmelman, *What Does It Mean to Save a Neighborhood?*, N.Y. TIMES (updated June 15, 2023), [https://perma.cc/M6LM-JJ34].

[322] N.Y.C. ENV'T JUST. ALL., NYC CLIMATE JUSTICE AGENDA – CLIMATE JUSTICE IN A STATE OF EMERGENCY: WHAT NEW YORK CITY CAN DO 13–14 (2017), https://search.issuelab.org/resources/27269/27269.pdf [https://perma.cc/8CAA-3JJZ].

[323] *See also* Leslie DelasBour, *Harris County Voters Approve Flood Control District Proposition*, FOX 26 HOUS. (Nov. 6, 2024), https://www.fox26houston.com/news/harris-county-flood-control-district-prop-a-those-opposed-react-news-votes-passed-election-night [https://perma.cc/7K5F-6MAX] (discussing a recent ballot measure to increase funding for flood control in Houston, as well as some criticisms of the measure); Aman Azhar, *After Hurricane Harvey, a Heated Debate Over Flood Control Funds in Texas' Harris County,* INSIDE CLIMATE NEWS (Apr. 4, 2021), https://insideclimatenews.org/news/04042021/after-hurricane-harvey-a-heated-debate-over-flood-control-funds-in-texas-harris-county/ [https://perma.cc/85S9-UXSJ] (reporting on controversy over the allocation of flood control funding in Harris County, Texas, which includes Houston).

[324] *See, e.g.*, VERCHICK, *supra* note 16; J.B. Ruhl & Robin K. Craig, *4° Celsius*, 106 MINN. L. REV. 191 (2021); Mark Nevitt, *The Legal Crisis Within the Climate Crisis*, 76 STAN. L. REV. 1051 (2024); Keith H. Hirokawa & Cinnamon P. Carlarne, *The Climate Moratorium*, 11 TEX. A&M L.

continue, adapting to climate change will be a pressing issue in the years to come.

REV. 365 (2024); Jonathan Rosenbloom, *Sacrifice Zones*, 24 NEV. L.J. 891 (2024); Shelley Ross Saxer, *Building Climate Resilience with Local Tools*, 58 GA. L. REV. 1663 (2024).