



Environment & Public Works Committee Hearing Testimony

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America's Engineered Shoreline

America has an engineered shoreline. The most iconic beaches in the country have all been restored, renourished, and re-engineered to mimic natural systems. The beaches of the Jersey Shore, Delaware, Ocean City, the Hamptons, Gulf Shores, Galveston, Malibu, Santa Monica, and Waikiki are part of our national coastal infrastructure that has been engineered with nature as a guide. Coney Island was the first significantly engineered beach, renourished back in 1923. Today, nearly every beach on the East and Gulf Coast, and many on the West and Great Lakes coasts, have been engineered. Increasingly, even our estuarine and back-bay shorelines are engineered, either by "armoring" with bulkheads and riprap, or with more natural solutions such as restoration and living shorelines.

The U.S. Army Corps of Engineers (USACE), authorized by and acting under policy established in Water Resource Development Acts (WRDAs), has been building natural infrastructure and engineering with nature for a long time. And the American Shore and Beach Preservation Association (ASBPA) has been working with USACE for nearly a hundred years.

ASBPA is an organization of beach and coastal practitioners. We are the communities, industries, and academics who build, maintain, manage and research our nation's beaches and shorelines. We are geologists, engineers, town managers, elected officials, professors, students and coastal advocates. Our mission is to merge science and policy to protect, restore and enhance the U.S. coastline; we were founded in 1926 and have been advocating for a healthy coastline ever since.

ASBPA believes a healthy coastline, whether restored or natural, provides **four interconnected values** to coastal communities specifically and to the nation more broadly:

- a) **Protection** from coastal storms, hazards and sea level rise, and as buffer to sensitive estuarine ecosystems¹²;

¹ USACE has documented that coastal storm damage risk reduction projects reduced damages from Hurricane Sandy by \$1.9 billion, however this comprehensive regional analysis has not been publicly produced for subsequent hurricanes.

USACE – NAD, "MEMORANDUM FOR RECORD - SUBJECT: Damages Prevented by Corps Projects, Hurricane Sandy", Nov. 19, 2012.

<https://www.nad.usace.army.mil/Portals/40/docs/ComprehensiveStudy/Estimate%20of%20Sandy%20damages%20avoided.pdf> [Submitted for the record.]

² Narayan, S. "The Value of Coastal Wetlands for Flood Damage Reduction in the Northeastern USA", *Scientific Reports*, Vol. 7, Article number: 9463 (2017). <https://www.nature.com/articles/s41598-017-09269-z>

- b) **Ecologically valuable habitat** for birds, turtles, fish and other coastal plants and wildlife;
- c) **Economic vitality** through tourism, shipping, fishing and other industries;
- d) **Recreation** for tens (if not hundreds) of millions of Americans who visit the beach in greater numbers than all our national parks combined.

ASBPA would like to see these values maximized in USACE's management of our nation's shoreline. Doing so will take USACE using the full authorities provided to them, Congress authorizing and encouraging USACE to use a multi-benefit approach to coastal management and project development, and the Office of Management and Budget (OMB) budgeting for, and allowing the timely use of congressionally appropriated funds, for critical coastal projects.

WRDA

In the last two WRDAs, Congress has included a number of provisions that allows or directs USACE to manage the US coastline to achieve these multiple benefits. The three areas discussed here are:

- 1) **Regional Sediment Management (RSM)** and the **Beneficial Use of Dredged Material (BUDM)**
- 2) Modification of the **Benefit-Cost-Ratio (BCR)**
- 3) **Natural Infrastructure.**

Regional Sediment Management and the Beneficial Use of Dredged Material

Regional Sediment Management (RSM) is a comprehensive approach to planning and integrating riverine and coastal projects with the core principle that sediment is a finite resource not to be wasted. RSM seeks to *move* sediment from where it is not wanted to where it is wanted, rather than simply *removing* sediment from the littoral system. RSM can reduce overall costs through cross-business line planning and budgeting. Beneficial Use of Dredged Material (BUDM) is one aspect of RSM, in which sediment dredged for navigation purposes is used to benefit a restoration and/or flood risk reduction project. Ultimately, ASBPA believes that USACE needs to evolve its budgeting and planning operations to reflect RSM principles so that **100% of uncontaminated dredged sediment is used beneficially.**

On average, USACE dredges about 214 million cubic yards of sediment per year from navigation channels nationwide. Of that, 82 million cubic yards (or 38%) is used beneficially on beaches, in wetlands, and in nearshore water each year.³ This is a good first step, but in an era of sediment shortage – less sediment is reaching the coast than ever before due to dams, hardened riverbanks and cliff faces, and straightened channels – and rising seas, anything less than 100% beneficial usage is not enough. One good example of RSM in practice is at the mouth of Columbia River in Oregon, where the USACE Portland District is working with partners to develop a network of nearshore placement sites for dredged sediment. The goal is to keep material in the littoral zone so that it feeds the beaches of Oregon

³ Federal coastal navigation projects were inventoried to examine the extent to which RSM goals have been implemented across USACE at the project level. This study examined USACE navigation projects that beneficially reuse sediments dredged from Operations & Maintenance (O&M) projects nationwide. These data were derived from a comprehensive analysis of nearly 20 years of USACE dredging data at both the national and district level. The data have been quality checked, updated, and revised over the last five years through extensive interviews of USACE staff at the District, Division and HQ levels. *USACE RSM, 2019. USACE Navigation Sediment Placement: An RSM Program Database (1998-present), U.S. Army Corps of Engineers Regional Sediment Management Program, <https://qim2.aptim.com/rsm>, accessed July 2, 2019.*

and Washington through natural coastal processes. Placing 500,000 cubic yards of sediment in a nearshore site, with no more than five centimeters of accumulation on the seabed per disposal, has yielded \$200,000 in cost savings to date, helped naturally maintain an eroding coastline, and yielded no crab mortalities (the primary environmental concern with nearshore placement in this region).

In another example of RSM, near St. Augustine, FL, the Jacksonville District has combined multiple federal projects so that timing of dredging and placement is aligned. They have also instituted inlet bypassing, so less sand accumulates in the St. Augustine Inlet and instead is distributed to a down drift shoaling area that distributes sand to eroding beaches. This resulted in a \$2 million cost savings from reduced dredging and associated environmental mitigation efforts and by combining permits.

WRDA 2016 authorized a pilot program for BUDM (Sec. 1122), that was expanded in WRDA 2018 (Sec. 1216). Sec. 1122 was slow to get going: implementation guidance took a year to finalize, and after 90+ projects were submitted for the initial ten pilot projects, project selection took nearly another year. But the projects are now underway. One project, Deer Island Lagoon in MS, has been completed, and USACE has estimated the remaining nine will be in construction by FY2022, assuming current dredge timelines hold and construction funding is available.⁴⁵

Local communities have widely supported the 1122 program. Washington State Department of Ecology (WADEC), the local sponsor for the “Grays Harbor South Jetty Placement” project, used this process to convene key stakeholders to plan for the beneficial use of dredge sediment to help protect shipping channel jetties, coastal beaches and nearshore habitats from erosion while avoiding and minimizing adverse impacts to environmental resources, and navigation safety. Through the development of the Grays Harbor project, WADEC identified additional opportunities for beneficial use in other parts of Washington, and developed a strategy to achieve economies of scale through coordination with local partners across the state – reducing the cost sharing challenges that many communities face. Although the Grays Harbor project is not impacting the Town of Ocean Shores, WA, Mayor Crystal Dinger has credited the 1122 process with helping her community by providing *“invaluable information concerning our ongoing erosion problems. This continued engagement in our community process to address emergencies and support long-term strategies are critical to helping our community make resilient investments for our future. Without such data and assistance, we are operating blind.”*⁶

USACE has not publicly determined when or how the additional ten projects authorized in WRDA 2018 Sec. 1216 will be selected, but USACE and congressional appropriations committees have each indicated they would like to see the successful completion of the first ten pilot projects before constructing the next ten.

What else is needed:

⁴ FY19 appropriations included an \$8.5 million increase to CAP204 (BUDM) to \$10 million with report language, “the Corps is directed to fund these pilots, if otherwise competitive, under the CAP Section 204 line item and the applicable additional funding line items in this account.” FY20 Energy & Water appropriations passed by the House includes \$7.5 million for “BUDM Pilot Program” as well as \$20 million for CAP204 (BUDM).

⁵ See also: “Increasing Beneficial Use of Dredged Material” ASBPA Factsheet *[Submitted for the record.]*

⁶ Interview with Bobbak Talebi, Senior Coastal Planner, Shorelands & Environmental Assistance Program, Washington State Department of Ecology, July 2, 2019.

The BUDM pilot project is an important step in directing USACE districts to think more broadly about how they can use dredged sediment and how they can work with local project sponsors. But this sort of approach must be systemic across USACE projects, not limited to a handful of pilot projects, or within districts that seek innovative approaches. ASBPA recommends the following 2 policies:

1. **Requiring the U.S. Army Corp of Engineers (USACE) to include the economic valuation of sediment, including potential ecosystem restoration benefits, storm damage reduction benefits, and other economic values and long-term costs when determining the “least cost alternative” for the disposal of dredged materials.**

Conceptually, the Federal Standard is an important policy to ensure USACE is efficiently spending taxpayer money: the cost of a navigation project should only include the least expensive placement of the dredged material. However, current implementation of the Federal Standard is based on the understanding of dredged material as a “spoil” that needs to be disposed of, rather than a resource that should be used. As seas rise and offshore sediment sources become scarce, we now understand that sand is the second most used natural resource in the world behind water.⁷ Geologists and geomorphologists are considering whether imported sand from as far away as Greenland could be economically feasible in the future.⁸ The Federal Standard must be based not on the cheapest way to *get rid of* dredged sand, but the most efficient way to *use* dredged sediment (including beach-quality sand and fine-grains that restore ecosystems) beneficially.

The simplest way to do this is to account for dredged sediment’s value to projects – both federal and non-federal – that could use that material currently and in the future to benefit the public. The value of future uses would presumably come with a discount rate, but if a community wanted to use material dredged from a channel to restore a beach in, say, ten years, but it would cost them more to go off-shore than it would to access the material if it were still in the channel, than that cost must be borne by the navigation project. In short, dredged material needs to be treated as any other natural resource would. If a navigation project disturbed a wetland, there would need to be recompense to restore the ecological value of a wetland; similarly if dredge material is removed, a project should account for the *public use value* of the sediment.

2. **Require each USACE district to produce an annual five-year sediment management report that forecasts expected sediment removal (i.e., dredging) and placement needs, sets goals for sediment reuse, and identifies local and state partners that may want access to federally dredged sediment and will be consulted on timing of projects.**

While many USACE districts are already employing regional sediment management (RSM) concepts and planning, RSM is not consistently practiced throughout all USACE districts and not all districts provide public plans for how they manage sediment. Requiring a five-year sediment management plan from each district will help a) ensure districts are all operating using the budgetary cost-saving principles of RSM; b) ensure transparency in project planning and budget

⁷ <https://www.imf.org/external/pubs/ft/fandd/2015/12/edwards.htm>

⁸ <https://www.nytimes.com/interactive/2019/07/01/climate/greenland-glacier-melting-sand.html>

development, thereby allowing local communities to have a better understanding of when they will need to provide their local cost share; and c) ensure states and all sediment-user stakeholders are at the table as USACE districts plan where and how to remove and use sediment within their watersheds and littoral systems.

Five year sediment management plans can likely build upon existing plans, but should include:

- A five year sediment budget for each watershed and/or littoral system within the district, including:
 - Expected sediment removal projects with estimates of amount and type of sediment to be removed;
 - Expected and potential sediment placement projects with estimates of amount and type of sediment needed;
 - Coordination with neighboring districts for watersheds and/or littoral systems that cross district boundaries;
- Goals for maximizing beneficial re-use of sediment and cost-savings from aligning projects that cross budget-lines;
- A list of state agencies, local communities and NGO partners who will be consulted and/or informed in the planning of any sediment project.

Benefit-Cost-Ratio

Benefit-cost-ratios (BCRs) for water resource infrastructure projects ensure the federal taxpayer is only paying for projects that provide positive economic benefits – when benefits outweigh costs. However, as currently implemented, USACE BCRs have two fundamental flaws:

- a) BCRs are calculated using the economically verifiable benefits of a project's primary purpose, while under-calculating other benefits; and
- b) Projects in wealthier communities inevitably get prioritized over projects in poorer communities, since the economic benefit of risk reduction is greater for valuable property than inexpensive property.

Using the economically verifiable benefits of a project's primary purpose sounds sensible, but it means projects are designed to maximize just a single benefit, rather than balancing multiple benefits. A project that is intended to reduce flood risk, such as a beach and dune system, might also have tremendous value as habitat and in supporting a tourism-based economy. But in designing a project authorized as a "flood risk reduction" or "coastal storm risk reduction," **USACE will calculate the benefits derived from reducing flood risk, but not the full recreation benefits, nor any of the ecological or social benefits, so the project will not be designed to support the economy or habitat.** Furthermore, a project that does have multiple benefits must compete for federal dollars with no advantage against projects that have a single benefit.

In the case of beaches, the economic value and even the direct return on investment via tax revenue can be remarkably high. Economist Dr. James Houston has calculated that beach travel and tourism generates \$285 billion to the national economy and \$23 billion in federal tax revenue annually.⁹

⁹ Houston, J.R. 2018. "The economic value of America's beaches — a 2018 update." *Shore & Beach*, 86 (2), 3-13. [Submitted for the record.]

Additionally, beach tourism support 2.5 million jobs directly and 4.4 million jobs including direct, indirect, and induced impacts.¹⁰ While USACE is not an economic development agency, and not in business to generate revenue for the U.S. Treasury, these economic figures ought to be considered when deciding which flood risk management projects to prioritize.

Second, prioritizing flood risk management projects based on calculation of avoided economic damage means projects in areas of a high concentration of wealth and property value have a higher BCR than less wealthy or less densely populated areas. This may be a sensible market-based decision-making tool, but it exacerbates the problem of lower income communities living in flood-vulnerable areas without federal support in reducing risk. It also perpetuates a cycle of development in flood-vulnerable areas to increase the economic benefits derived from risk reduction measures. **A more sensible BCR or decision-making tool would account for the societal value created by reducing risk to low-income communities as well as valuing open space or other flood mitigation measures that are currently dis-incentivized by the BCR.**

WRDA 2018 authorized two studies to look at USACE budgeting practices, a National Academy of Science (NAS) study on USACE budgeting (Sec. 1103) and a General Accountability Office (GAO) study on Benefit-Cost Analysis Reforms (Sec. 1204). To ASBPA's knowledge Sec. 1103 has not been funded nor begun, while Sec. 1204 is currently underway. Both of these studies will help reform USACE's BCR process and should be completed as soon as possible.

What else is needed:

While studies are helpful in clarifying specific challenges to current policy or operating procedure, as well as recommending potential solutions or steps for improvement, they don't actually change anything. **USACE's BCR for flood risk management projects is an archaic tool that needs to be modernized.** ASBPA recommends the following policy:

- 3. For water infrastructure projects, including flood risk reduction projects, proposed for authorization, require USACE to determine and publish the full range of benefits – including, but not limited to, economic value derived from tourism and recreation; ecological improvements and social cohesion – as part of the (BCR).**

While this will support better projects whose primary purpose is flood risk management, it may also support better navigation projects that have multiple benefits (such as important BUDM placement sites, or ecological value in clearing channels).

Natural Infrastructure

Wide beaches, high dunes, and verdant wetlands, reefs, mangroves and seagrass beds are essential to the 40% of American who live along the coast. Properly maintained, this natural infrastructure can improve communities' resilience and is itself resilient. Dunes and marshes can adapt to rising seas, and reefs and coastal forests regenerate after storm damage. The same can't be said for "grey" (concrete and steel based) infrastructure. USACE has been building beaches and dunes for flood risk reduction for nearly a century and restoring aquatic ecosystems for more than half a century. It should be looking at

¹⁰ Ibid.

how to fully integrate these missions in combination with its mandate to maintain coastal navigation. By doing so, USACE can more effectively restore and rebuild our nation's natural infrastructure, in collaboration with other federal, state and tribal agencies.

USACE has many authorizations to use natural infrastructure solutions and to consider natural and nature based features in place of more traditional grey infrastructure. Recent WRDAs have clarified and built upon previous authorizations:

- WRDA 2016, Sec. 1154 authorized collaborative regional assessments on coastal resilience that prioritized natural infrastructure;
- WRDA 2016, Sec. 1184 required "natural features" to be considered in feasibility studies;
- WRDA 2018, Sec. 1149 specifically allowed "natural and nature based features" to be included in aquatic ecosystem and flood risk management projects;
- WRDA 2016 & 2018 authorized regional coastal resilience studies in the South Atlantic, Great Lakes, and coastal Texas that included natural infrastructure solutions.

None of these were wholly new authorities requiring action from USACE, so implementation has been mixed. Districts that use "natural" solutions have more leeway to do so, but ASBPA hasn't seen a notable increase in use of natural infrastructure since 2016. ASBPA considers comprehensive coastal resilience studies to be invaluable and is pleased that the South Atlantic Coastal Study has been funded and is underway, and disappointed that the Great Lakes Coastal Resilience study has not received approval to begin as a new start and is still on hold.

What else is needed:

Rather than simply encouraging USACE to use or consider natural infrastructure in place of hard, grey infrastructure, **Congress should advance the recommended policies above, which will result in natural infrastructure being the preferred alternative due to its multi-benefit approach.** Additionally USACE's regulatory requirements should ensure natural solutions are as easy to permit as hard infrastructure. For example, USACE took a good step in creating a nationwide permit for living shorelines, but USACE could look at regulatory hurdles to natural infrastructure and ensure permitting is not easier for a comparable gray infrastructure project.

The USACE's efforts to "Revolutionize"

Many of the challenges the USACE has in modernizing to meet the needs of the 21st century – the ability to adaptively manage projects in the face of climate impacts, expediting project delivery, being reactive to the high and lows as well as delays in funding by the Administration and Congress – is not something Congress can directly fix. These challenges are procedural and cultural that will take years, if not decades, to fully address. ASBPA has been pleased with General Todd Semonite's call to "Revolutionize" USACE, as well as Director of Civil Works James Dalton's efforts at implementing procedures to allow USACE to operate as a risk-informed, not risk-averse institution.

But after Gen. Semonite and Mr. Dalton leave, these efforts will need to continue. It is incumbent on Congress, and the Environment & Public Works (EPW) Committee specifically, to **provide oversight to ensure these procedural and cultural changes continue.** USACE is an essential agency as our nation faces the biggest coastal threats in history, and it needs to be operating efficiently and effectively.

Office of Management and Budget (OMB)

Finally, it is imperative to note that efforts to reduce flood risk to coastal communities proposed by USACE, then approved and funded by Congress, have far too often been stymied by OMB.

Since Congress no longer provides project specific funding (“earmarks”), OMB both sets the USACE budget for the administration *and* has final approval on project funding. This means that projects that do not meet OMB’s specifications, simply do not get funded. Or a project may be delayed and made more expensive in efforts to comply with OMB specifications. Even more troublesome is that OMB’s specifications for what they will fund are opaque and inconsistent.

OMB’s review of coastal flood risk projects does not appear to be evenly balanced with inland flood risk management projects. Over the past decade, USACE’s annual budget has been between 19 (FY2011) and 120 (FY2017) times greater for inland versus coastal funding.¹¹ The administration’s proposed FY2020 budget included just \$18 million on coastal flood risk investigation and construction, compared with \$193 million for inland flood risk investigation and construction. H.R. 5895, the FY19 mini-omnibus Appropriations bill that included Energy & Water, called for a report from USACE to help identify the shortfall on coastal funding, stating “the report shall include [for each of the last ten fiscal years] the total amount of funding allocated to coastal projects... name each project and include an analysis comparing level of funding in proportion to the amount of work needed in coastal areas.”¹² But to our knowledge this report has never been produced.

Perhaps more frustrating than OMB’s proposed funding levels, which Congress can choose to accept or change (i.e., provide additional funding), is OMB’s ability to withhold or delay funding to coastal projects when Congress has provided additional funds for coastal projects (“shore protection”) and USACE has developed a workplan for which projects should be funded. OMB should have a role in fiscal oversight to prevent misuse of funds, but too often their oversight has crossed the line to standing in the way of Congress’s and USACE’s intent.

Conclusion

As the EPW Committee reviews the success of recent WRDAs and develops policies for a 2020 WRDA, ASBPA encourages the committee to consider how USACE is able to advance coastal projects that have multiple benefits. USACE has been building beaches for 100 years and wetlands for 50 years, so the concept of restoring natural infrastructure with flood risk reduction, ecological, economic and recreation benefits is not new. But the next step is for USACE to maximize each of these values for individual projects and within coastal systems. This will take systemic changes to increase the beneficial use of dredged material, budgeting changes to ensure the full value of sediment is calculated and all benefits are included in a BCR, and on-going oversight to ensure procedural and cultural changes at USACE proceed, as well as oversight into OMB under-funding and delaying coastal projects.

¹¹ Whitehouse, S. “Letter to A.S.A. RD James”, Feb. 12, 2019.

<https://www.whitehouse.senate.gov/news/release/whitehouse-calls-out-major-gap-between-inland-and-coastal-states-on-key-water-resource-funding>

¹² H. Rept. 115-929 – “Energy and Water Development and Related Agencies for the Fiscal Year Ending September 30, 2019, and for Other Purposes,” 115th Congress (2017-2018)

<https://www.congress.gov/115/crpt/hrpt929/CRPT-115hrpt929.pdf>

Finally, the needs of our nation's coastline are too enormous to be solved with policy changes and authorized projects in WRDA alone. **Our country must make a major investment in infrastructure that includes dedicated support for coastal resilience and for waterways.** From sediment management to preparing for storms and rising seas, the challenges of our coastlines and our waterways are linked and must be solved together. The policy solutions described here -- including RSM, BCR reform and natural infrastructure -- all address these challenges. But to be successful these need significant federal funding and need to be part of a national infrastructure investment program. ASBPA looks forward to working with the EPW Committee to address these challenges in WRDA and in infrastructure legislation.

Thank you for considering our testimony, and we are happy to answer any questions.

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