AECOM

FEMA BRIC Application Best Practices and Recommendations

Environmental Defense Fund

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Delivering a better world

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Abbreviations and Acronyms

BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
BRIC	Building Resilient Infrastructure and Communities
BCEGS	Building Cost Effectiveness Grading Schedule
C&CB	Capability- and Capacity-Building
CRS	Community Rating System
CZMP	Coastal Zone Management Program
DCR	Department of Conservation and Recreation
EDF	Environmental Defense Fund
EHP	Environmental Planning and Historic Preservation
EIS	Environmental Impact Statement
ET	Eastern Time Zone
FEMA	Federal Emergency Management Agency
FIMA	Federal Insurance and Mitigation Administration
FMA	Flood Mitigation Assistance
FRM	Flood Risk Management
FY	Fiscal Year
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HQ	Headquarters
HUD	U.S. Department of Housing and Urban Development
JPA	Joint Powers Authority
MEMA	Maryland Emergency Management Agency
NbS	Nature-based Solution
NED	National Economic Development
NFIP	National Flood Insurance Program
NGO	Non-governmental Organization
NNBF	Natural and Nature-based Features

NOAA	National Oceanic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
NTR	National Technical Review
OCZM	Office of Coastal Zone Management
O&M	Operations and Maintenance
PE	Professional Engineer
SHMO	State Hazard Mitigation Officer
SLR	Sea Level Rise
T&E	Threatened and Endangered species
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

Introduction

Background

The Federal Emergency Management Agency (FEMA)'s new Building Resilient Infrastructure and Communities (BRIC) program, which accepted its first round of applications in fiscal year (FY) 2020, is a competitive grant program that provides pre-disaster mitigation funding to states, local communities, tribes, and territories to protect their populaces from future natural hazards and disasters. In the first year of its inception, the BRIC program received 991 subapplications[1], from which 406, or approximately 41 percent, were selected for further review and potential funding. Actual grant awards are anticipated to be made beginning in late December 2021, pending the results of further programmatic reviews by FEMA. While the BRIC program in its first year authorized $500 million in federal funding, the total cost of the projects selected was nearly $1.2 billion, including federal and non-federal cost shares. FEMA selected 46 projects for small and impoverished communities with $39.2 million in total project costs. Eight communities were selected to receive non-financial direct technical assistance, of which six are small and impoverished communities and three are tribes. The top five project types for selected projects by total project cost are shown in Figure 1 and the number of projects and total funding by subapplication type are shown in Figure 2.

During FY20, FEMA allocated a maximum of $600,000 to each state, as well as $20 million for federally recognized tribes. Once reaching those set-aside amounts, FEMA used the remainder of the total BRIC program funding for mitigation projects submitted to its national competition. For the national competition, FEMA selected 22 projects in 10 states with an average federal share of $17.2 million per project, of which two were for small and impoverished communities and 12 were phased projects. Total federal funding for individual projects ranged from $1.05 million to the program cap of $50 million, while the total project costs ranged from $1.5 million to $243 million. Over 81 percent of the selected projects (18 of 22) through the national competition had strong nature-based solution (NbS) components. The types of projects selected included 12 flood control projects, four utility and infrastructure protection projects, two relocation projects, and one each of roadway elevation, floodproofing, saferoom/shelter, and wildfire projects.

Project Purpose

Given the early stages of the BRIC program, applicants, subapplicants, and practitioners involved in soliciting and securing BRIC grants have been working vigorously to determine how to craft the most effective application packages. The purpose of this document is for AECOM to use its expertise in the field of nature-based solutions for disaster recovery and connections with other practitioners to aid the Environmental Defense Fund (EDF) and their partners in developing stronger subapplications for future rounds of BRIC program funding. The AECOM Team will do this first by understanding how the first round of FY20 BRIC funds were awarded, then by documenting lessons learned, and finally by identifying strategies to improve the likelihood of future subapplications that include nature-based features being selected and funded in the future.

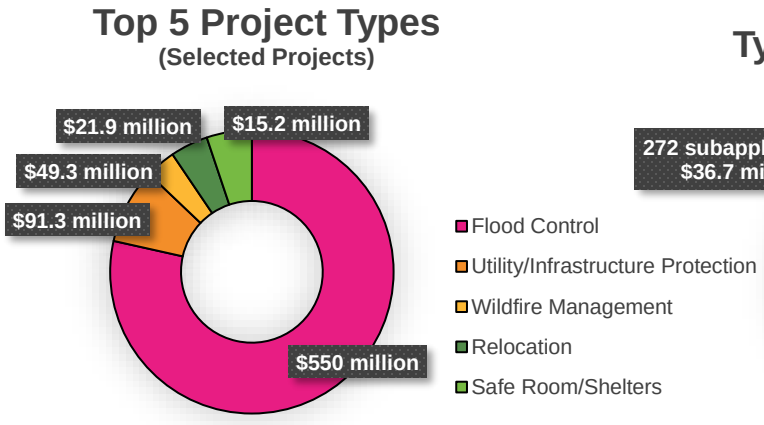


Figure 1. Top 5 Selected Project Types

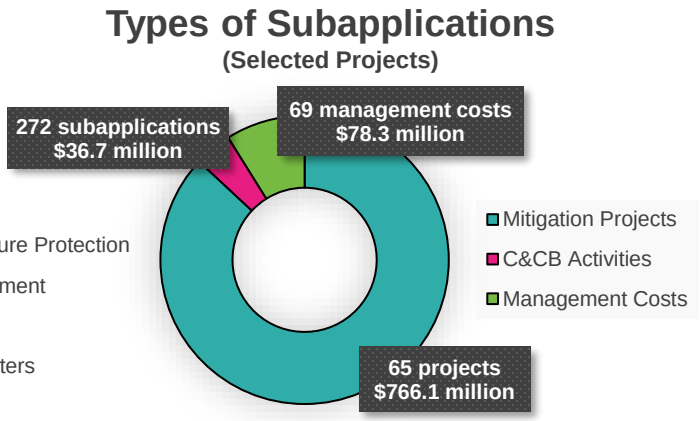


Figure 2. Types of Subapplications for Selected Projects

[1] In FEMA terminology, *applications* are combined packages from states, tribes, and territories of a collection of the *subapplications* developed at a community-level for individual mitigation projects and other BRIC-eligible activities

Intended Outcome

The intended outcome of this document is that EDF and the partners, communities, and project proponents EDF works with will be able to maximize the competitiveness of their NbS-oriented BRIC applications and be successfully awarded funding in future BRIC program application cycles. The best practices and recommendations herein will assist EDF staff to steer subapplicants toward more successful project planning and subapplication strategies for success.

Methodology

The following methodology summarizes the approach AECOM took to develop this report for EDF.

Four Step Approach: Scope, Deliverables, and Timeline

For this project, AECOM put together a team of practitioners that understand the importance of using nature-based solutions to support the increasing need for disaster resilience in the United States. AECOM devised a four-step approach to solicit the most relevant information regarding the nature of the awards for the first round of BRIC funding awarded by FEMA. The four-step process AECOM used to complete the work is described below.

Step One: Project Setup, Controls, and Client Kick-Off

AECOM finalized its project team, prepared a written quality plan, and organized an initial kick-off meeting with EDF's project team to ensure that there was a mutual understanding of and agreement on the project scope, objectives, deliverables, timeline, budget, and communications procedures.

Step Two: Identify Best Practices and Other Aspects of Successful Applications

AECOM conducted seven interviews with an assortment of individuals, including those with FEMA and other federal agencies involved in reviewing and assessing BRIC applications, as well as beneficiaries of the BRIC program who were involved in developing successful applications in FY20. The purpose of these interviews was for AECOM to solicit feedback from BRIC application reviewers and preparers to gather an understanding of trends of what was included in selected subapplications, as well as tips, techniques, and pitfalls that were found to be successful when preparing BRIC subapplications. This step will include a summary of the interview notes that were collected for each of those interviews. In addition to the interviews that were held for the purposes of the project, AECOM also conducted a literature search and review to supplement the findings with other FEMA or agency-documented guidance and recommendations from other practitioners working on nature-based solutions for hazard mitigation.

Step Three: Identify Criteria to Maximize Likelihood of a Successful Proposal

Drawing from the information gathered during interviews conducted during Step Two, AECOM developed a "cheat sheet" of a bulleted listing of practical and pragmatic ideas that subapplicants can learn from to help them craft more competitive subapplications. The list, while focusing on the outcomes of the interviews, also draws from the experience and expertise of the AECOM Team, as well as findings from the literature review.

Step Four: Final Report

AECOM then developed this report as a synthesis of the data collection efforts described in Step Two and Step Three. This report is the primary deliverable of the project and catalogs the information collected as part of the project.

Timeline

Given the time sensitive nature of EDF receiving this information and incorporating it into future BRIC program applications, the project was conducted on an accelerated timeline. Given challenges with coordinating schedules between interviewers and interviewees, the interviews with identified candidates were conducted from November 2021 to January 2022. This report was prepared concurrently with the interviews as they were completed.

Selection of Interview Candidates

Interview candidates were selected based on if they met one or more of the following criteria:

1) Interviewee had program-level knowledge of the BRIC program

2) Interviewee served as a reviewer during the BRIC FY20 project selection phase

3) Interviewee was part of a subapplicant team that was selected for FY20 grant funding in the national competition

A shortlist of interview candidates was selected, and included interviewees from FEMA, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Army Corps of Engineers (USACE), the City of Menlo Park, and Tighe & Bond. From these, interviews were held with those with availability during the timeframe indicated. A list of the final interviewees is provided in Table 1.

Table 1. Final Interview Candidates

Interviewee(s)	Organization	Title	Interview Date/Time
Ryan Janda	FEMA	Chief, Non-Disaster Grants Implementation Branch, Hazard Mitigation Assistance (HMA) Division	Nov 18, 2021 2:30-3:00 pm ET
Camille Crain	FEMA	BRIC Section Chief, FEMA Federal Insurance Mitigation Administration (FIMA) Headquarters	Nov 22, 2021 1:00-1:30 pm ET
Adam Stein	NOAA	Senior Policy Advisor, Office for Coastal Management	Dec 6, 2021 2:30-3:00 pm ET
Todd Bridges	USACE	Senior Research Scientist and National Lead, Engineering with Nature	Dec 8, 2021 10:30-11:30 am ET
Eric Hinkley	City of Menlo Park, CA	Associate Engineer	Dec 13, 2021 12:00-12:45 pm ET
Gabrielle Belfit and Troy Barry	Tighe & Bond	Senior Environmental Scientist (Ms. Belfit) and Stream Restoration Specialist (Mr. Barry)	Dec 22, 2021 10:00-10:45 am ET
Jamie Carter	NOAA	Northeast Regional Geospatial Coordinator, Office for Coastal Management	Jan 06, 2022 2:00-3:00 pm ET

Selection of Interview Questions

BRIC Application Reviewers

A shortlist of interview questions was decided upon with input from the EDF Team partners. These questions, although sometimes tailored for the specific individual being interviewed (to account for the different backgrounds, organizations, and experiences of the interviewees, for example), generally included the following:

General application questions:

1. What are the top three things you look at when applications are reviewed?
2. What “stood out” in successful BRIC applications (e.g., type of community, population, demographics, location, past events, other)?
3. What advice do you have for applicants preparing for the next round?
4. What made BRIC applications ineligible or less competitive?
5. How can small, economically disadvantaged communities compete effectively with larger communities with resources?
6. How important is project schedule in evaluating applications (i.e., is the time required to start realizing project benefits a consideration)?
7. Based on the changes that have been made ahead of the FY21 BRIC application cycle, what advice do you have for states seeking competitive funding?

8. What are the major changes/updates to the BRIC application process for FY21?
9. In terms of project size, what might “too small” look like and what might “too big” look like?
10. How are risks/mitigation strategies considered in evaluating project applications?

Nature-based specific questions:

11. Did you see specific types of nature-based projects stand out more than others in the review process and if so, what made them stand out?
12. What are the biggest hurdles for nature-based projects to be selected?
13. What advice do you have for applicants preparing a NbS project submission for the next round?
14. How are non-traditional or non-quantifiable benefits (e.g., equity, climate change resilience, quality of life) considered in the selection process beyond such items as damage avoidance to structures, contents, and environment?
15. What were the major scoring factors for successful Nature Based Solutions projects in FY20 BRIC applications?

BRIC National Competition Grant Recipients

For interviewees who had been successfully awarded grant funding through the BRIC program, the following questions were generally used:

General application questions:

1. Please describe the project for me.
2. What are the top three things you think led to your successful win?
3. What were the most important elements of the project from you’re perspective?
4. What advice do you have for applicants preparing for the next round?
5. How did you engage the state as you were preparing/submitting your package?

Nature-based specific questions:

6. Did you include nature-based elements to your project? If so, why and how did you land on the types of elements and their locations?
7. What were some of the biggest hurdles for getting the nature-based elements woven into the project?
8. What advice do you have for applicants considering nature-based solutions?
9. Did you quantitatively or qualitatively describe the benefits (e.g., equity, climate change resilience, quality of life) of your nature-based elements? How did you do it?

Interview Process

Individual interviews were conducted between November 2021 and January 2022 in 30-minute to 60-minute sessions using the Microsoft Teams virtual platform. The interviews were facilitated by AECOM Subject Matter Experts with a scribe recording notes from the interviews during each session. In general, the interviewees were asked the questions listed above and given time to respond based on their experiences with the BRIC program. The findings from the interview process, including the notes taken during each interview, are provided in greater detail later in this report.

Literature Search and Review

In addition to leading the interviews with BRIC application reviewers and grant recipients, the AECOM Team conducted a literature search and review to supplement the findings from the interviews and take advantage of best practices noted by other organizations and FEMA itself. The findings from this literature search and review are provided in greater detail later in this report.

AECOM Experience

The AECOM Team brings a wealth of experience working with FEMA and other agencies and partners to help advance the science and engineering related to using nature-based solutions to provide hazard mitigation for flooding, wildfires, droughts, and other natural hazards. AECOM's Team includes:

- Dr. Michael Donahue: Dr. Donahue is a founding member of the National Infrastructure Initiative—a unique consortium of consulting firms, non-profit organizations, and universities dedicated to promoting the use of NbS for coastal and riverine protection and restoration projects—and director of AECOM's Coastal and Ecosystem Restoration Practice. Dr. Donahue served as the project manager for this effort.
- Dr. Jae Park: A recognized leader in hazard mitigation and disaster resilience, Dr. Park has been supporting development BRIC application guidance and program support materials for FEMA and is an expert in the current and future priorities being scoped for the BRIC program. Dr. Park provided senior level reviews of the summary materials developed for this project.
- Doug Bellomo, PE: A former FEMA employee and Subject Matter Expert on the BRIC Program, Mr. Bellomo conducted several interviews related to the project and provided senior level reviews of the summary materials developed.
- Marisa Mason: Ms. Mason has over 16 years driving community resilience through solution focused programs, giving her the ability to understand the needs of complex federal and state projects and push them forward to success. Her experience includes work with both FEMA- and the U.S. Department of Housing and Urban Development (HUD) funded disaster mitigation, response, and long-term recovery programs.
- Taylor Nordstrom, PE: Ms. Nordstrom is a coastal engineer and resilience planner who worked with The Nature Conservancy to prepare a guidebook that assists subapplicants in developing NbS for BRIC program applications. For this project, Ms. Nordstrom prepared interview summaries and drafted report materials.

The BRIC Program Overview

Process

The BRIC program provides pre-disaster funds for hazard mitigation projects and associated capability- and capacity-building (C&CB) activities that improve the ability of communities to implement nature-based solutions to natural hazards like riverine, urban, and coastal flooding, storm surge, wildfires, landslides, and droughts. Ideally, BRIC applications for candidate projects are prepared after a community has undergone a rigorous hazard mitigation planning process, that includes steps such as conducting a vulnerability and risk assessment, determining the key hazard mitigation needs, and creating strong partnerships to support nature-based solutions that address the identified needs.

The BRIC program accepts applications from eligible states, federally recognized tribes, and U.S. territories (for complete eligibility requirements, refer to the current Notice of Funding Opportunity [NOFO] for the fiscal year during which an application is being prepared). The activities accepted include:

- ***C&CB Activities**** – capability- and capacity-building activities that enhance the technical competencies of a particular community to be better able to administer and implement hazard mitigation projects (particularly those with NbS) in the areas of building codes, partnerships, project scoping, and mitigation planning and planning-related activities
- ***Mitigation Projects*** – projects aimed to reduce loss of life, injuries, and damages to infrastructure, services, and properties from natural hazards and the effects of climate change
- ***Management Costs**** – financial reimbursement of administrative expenses associated with mitigation projects or C&CB activities
- ***Non-Financial Direct Technical Assistance*** – direct support provided by FEMA staff to better equip communities to be able to plan mitigation projects, apply for funding, and implement hazard mitigation solutions

**These activities do not require a benefit-cost assessment*

As described above, in FEMA terminology *applications* from states, tribes, and territories are combined *subapplication* packages developed at a community-level for individual mitigation projects and other BRIC-eligible activities. Subapplicants should coordinate with their State Hazard Mitigation Officer (SHMO) regarding State deadlines, which typically close at least one to two months before the federal deadline. Once FEMA receives applications for any of the activities noted above within the BRIC program, FEMA undertakes a comprehensive review of the applications, makes BRIC program selections, and announces funding awards (Figure 3).

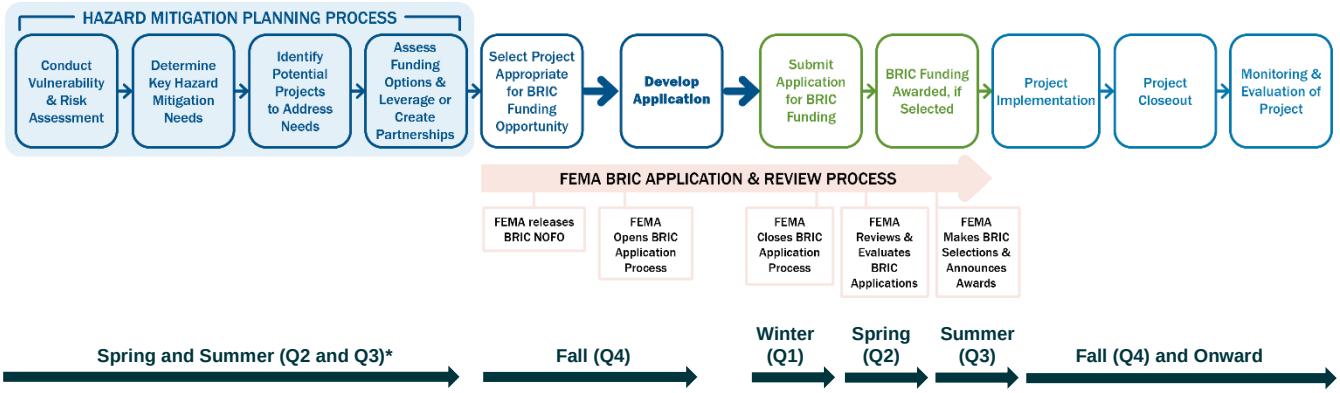


Figure 3. BRIC Program Process Overview

Project Opportunities for Nature-based Solutions

Using nature-based solutions for hazard mitigation is one of the priorities for the BRIC program. Ideally, planning for nature-based solutions will begin in the early stages of project concept development, and the selected solution will be creative, robust, scaled appropriately for the size of the project and community, and integrated into the overall proposed infrastructure improvements. However, even if pre-planning for NbS lags behind other project features, considering and adding NbS into the project at a later point in time is still preferrable to not including them at all. There are burgeoning opportunities for nature-based solutions that can be scaled broadly and seem to align with FEMA's vision for the BRIC program, based on the AECOM Team's literature review and interviews, as well as the FY20 selected BRIC projects:

- Large-scale ecosystem restoration, e.g., for acquisition and buyout properties, that would return high quality, regional ecological function to those lands. Look for opportunities like restoring stream banks and floodplains, expanding wildlife refuges or improving habitat corridors, and reconnecting fragmented habitats, hydrologic systems, or human use areas.
- Multi-use features, such as large-scale detention areas, that double as recreational spaces or critical habitat protection, e.g., for federally threatened or endangered species. For example, the Northwest Resiliency Park in Hoboken, New Jersey provides the City with 5.4 acres of recreation and public space above ground with green infrastructure and innovative stormwater management measures underground.
- System-level improvements of what would otherwise be small, piecemeal solutions to a widespread issue. For example, addressing culvert blockages for an entire region, rather than on a case-by-case basis, while restoring a larger stream corridor.
- Shoreline, reef, and/or wetland restoration projects in coastal environments that create habitat and uplift for species while also reducing shoreline erosion, wave propagation, or other coastal hazards. Look for benefits to coastal roadways and communities.
- Innovative solutions to address wildfires, drought, and urban heat, e.g., creating additional buffer spaces with thinned vegetation in fire-prone regions. Managing the drought-fire-flood effect that leads to mudslides and other hazardous conditions will also be important.

There are many resources available online, such as FEMA's Mitigation Action Portfolio, The Nature Conservancy's Promoting Nature-based Hazard Mitigation Through FEMA Mitigation Grants guidebook, and Naturally Resilient Community's Nature-based Solution Case Studies to assist community planners with selecting a nature-based solution that is fitting for the project location and the mitigation needs. It is also appropriate to work with experienced professionals who can help guide project partners toward feasible, technically sound, and cost-effective solutions.

Interviews

Introduction

As described previously, AECOM conducted seven interviews with BRIC program developers, BRIC application reviewers, and grant recipients to garner firsthand accounts of FEMA's vision for the BRIC program, learn about the challenges that reviewers encountered upon reviewing the inaugural round of BRIC applications, hear the future perspectives for the BRIC program that were conceptualized on account of the challenges encountered, and ask award recipients for their experiences developing strong applications and working with FEMA subsequent to the initial notification of their awards to ensure full eligibility and, ultimately, funding.

Interview Notes and Key Outcomes

Interview notes from each of the interviews conducted are included in chronological order in **Appendix A**. See Table 1, above, for the full list of interviewees and the dates and time of each interview.

Key takeaways from the interviews are included in the Cheat Sheet: Criteria for a Successful Proposal, which is included in a later section of this report.

Literature Review

Reports and Other Documents Consulted

The AECOM Team consulted several reports and other documents related to improving BRIC subapplications and maximizing the potential of award. The primary documents consulted are shown in Table 2.

Table 2. Literature Review Reports and Other Documents Consulted

Author	Document Title	Description
Arcadis	FEMA Grants Overview: Upcoming Opportunities with BRIC, HMGP, & FMA – Simplifying the Complexities (Presentation)	Presentation given by Ms. Keren Bolter of Arcadis for the Southeast Florida Regional Climate Change Compact on August 18, 2021 discussing best practices and lessons learned for securing FEMA grant funding
City of Menlo Park	FEMA FY20 BRIC Grant Application	Application documents submitted by the City of Menlo Park that led to the City's successfully being awarded BRIC funding in FY20
FEMA	Building Community Resilience with Nature-based Solutions: A Guide for Local Communities (PDF)	Guidebook to help subapplicants select a nature-based solution, make a business case for its hazard mitigation benefits, and improve public and private planning, policymaking, and partnerships
FEMA	Building Resilient Infrastructure and Communities FY 2020 Subapplication Status (Webpage)	Summary of the FY20 selections for BRIC grant funding, including information about the number of subapplications received, project costs, locations of project awards, etc.
FEMA	FY21 BRIC NOFO, including Eligibility and Completeness Review Criteria; Technical Criteria (PDF); Qualitative Criteria (PDF)	FEMA requirements and official program guidance for submitting FY 2021 subapplications
Maryland Emergency Management Agency (MEMA)	Mitigation Series: 2020 Lessons Learned and Moving Forward (Presentation)	Presentation given by Ms. Kayhla Cornell of MEMA on June 23, 2021 describing lessons learned and best practices for subapplicants in the state of Maryland preparing BRIC subapplications for the FY 2021 BRIC cycle
The Nature Conservancy (TNC)	Promoting Nature-based Hazard Mitigation through FEMA Mitigation Grants (PDF)	Guidebook to help subapplicants identify, scale, and plan future nature-based solutions and prepare associated BRIC applications

Key Outcomes

Key takeaways from the literature review are included by document consulted, below.

Arcadis's FEMA Grants Overview: Upcoming Opportunities with BRIC, HMGP, & FMA – Simplifying the Complexities Presentation

This presentation was prepared by Arcadis for the Southeast Florida Regional Climate Change Compact as part of the Climate Compact VA Workshop on August 18, 2021 to describe best practices and lessons learned when developing FEMA HMA grant applications. According to Arcadis, an engineering firm whose staff has helped subapplicants develop these grant applications, *having a strong vision for the nature-based solution being pursued and beginning the project planning and application processes early are critical to crafting a successful subapplication*. Based on the number of applications submitted in FY20, competition for the BRIC program is high, and most projects needed adjustments to meet technical scoring criteria. Key strategies for subapplicants to consider to strengthen their subapplications include *phasing mitigation projects, prioritizing equity and showing how it will be operationalized in the solution, and avoiding language in the subapplication related to maintenance of existing systems*. A subapplicant should be able to make a *strong business case* for why the selected project increases the level of protection for the community and mitigates the consequences that are otherwise expected without the project. *The benefits of the project, including avoided losses and added value, should outweigh the costs of the project*, including construction and maintenance costs, over time. Arcadis also emphasized FEMA's willingness to work with subapplicants to ensure that all the components of the application are captured, rather than disqualifying otherwise strong subapplications on technicalities, by reaching out to subapplicants to request additional information if it is deemed necessary during FEMA's subapplication reviews.

City of Menlo Park's FY20 BRIC Application

The City of Menlo Park provided responses for the BRIC application directly in the FEMA GO online application boxes and attached supplementary materials that were also referenced in those boxes. The three mitigation activities the City identified for the project (by primary activity type/primary sub-activity type) included (1) Flood Control/Levee, (2) Utility and Infrastructure Protection/Electrical-Power, and (3) Stabilization and Restoration/Wetland Restoration-Creation. The project directly benefited two Community Lifelines, Energy/Power Grid and Safety & Security/Community Safety. The primary and secondary hazard sources selected were Flooding and Infrastructure Failure. Seven communities in the National Flood Insurance Program (NFIP) Community Rating System (CRS) were found to be benefitted by the project. The project was *proposed to be completed in two phases*: Phase 1 would include engineering/design to 90 percent completion, public outreach, and environmental permitting and Phase 2 would include final design, procurement/contracting for construction management, and construction activities. The project team *worked with stakeholders* to have the project *included in the next update of the local Hazard Mitigation Plan (HMP) and the project aligned with the goals of the effective plan*; the City provided a copy of the HMP along with its subapplication. The benefit-cost analysis (BCA) was completed by an engineering consultant *using FEMA's BCA toolkit, and the project had a benefit-cost ratio (BCR) of 9.14*, accounting for sea level rise in the flood elevations and including environmental benefits. The City *provided a significant amount of supporting technical information* as supporting documentation including site plans and sections, a feasibility report, a prior resiliency study, ecological monitoring reports, a detailed description of construction methods, backup documentation for populations impacted, a media article written about the project, funding commitment letters, environmental and historic preservation review information, a detailed schedule in Gantt chart format, and a budget/construction cost estimate. Importantly, however, the City included most of this information in appendices, keeping *the main part of its application focused and well organized around the BRIC requirements*, thus making it easy for reviewers to quickly find what they needed to score the package.

FEMA's Building Community Resilience with Nature-based Solutions: A Guide for Local Communities

FEMA developed this guide to aid future applicants and subapplicants to the BRIC program in early project planning stages to give a framework for developing nature-based solutions, tips for improving BCAs, recommendations for planning and policy-making, and best practices for project implementation. In general, *FEMA advocates for nature-based solutions that are built from strong project partnerships and integrated into a community's existing or future built environment*, and that due consideration be given to the scale of the project, e.g., whether it is landscape or neighborhood/site scale. Pertaining to developing strong BCAs, FEMA recommends that subapplicants *identify the broad range or community co-benefits*, such as ecosystem services, economic, and societal benefits. Subapplicants should also consider community cost savings, including not only avoided damages but also reduced stormwater management costs, reduced drinking water treatment costs, and so on. To improve subapplicants capabilities to fund nature-based projects, FEMA encourages communities to *seek both public*

investments in the form of general funds, bonds, taxes, grant funds, and capital improvement funds, among others, and private investments through public-private partnerships, financing programs, cost-share agreements, low-interest loans, etc. Whenever possible, FEMA advocates *a consistent approach for hazard mitigation within the community* and favors projects that are included in or closely align with, among others, the community's local Hazard Mitigation Plan, Comprehensive Plan, Transportation Plan, Stormwater Management Plan, and Land Use plans, as applicable.

FEMA's Building Resilient Infrastructure and Communities FY20 Subapplication Status

Key takeaways from this reference are included in the Introduction section of this report, above. The mitigation projects that were selected during the FY20 award period included one or more of the following nature-based elements (this list may not be comprehensive):

- ***Habitat creation*** – wetlands, special aquatic habitats, forests, green space
- ***Biological protection*** – avian species, threatened and endangered species
- ***Stream restoration*** – bank stabilization, fish passage
- ***Recreational use*** – trail expansions, public parks, greenway corridors
- ***Hybrid features*** – living shorelines, vegetated berms, dune, ecotone revetments

Traditional infrastructure components protected by the projects included one or more of the following elements (this list may not be comprehensive):

- ***Utilities*** – water or wastewater treatment plants, pump stations
- ***Transportation infrastructure*** – bridges, roadways, and culverts
- ***Critical facilities*** – electric substations, hospitals, police stations, schools, fire stations, city halls
- ***Structures*** – building elevation, floodwalls, earthen levees, dam decommissioning

FEMA's FY21 BRIC NOFO and Technical, Qualitative, and Eligibility and Completeness Review Criteria

BRIC Notice of Funding Opportunity – The NOFO synthesizes the details and requirements of the BRIC program, including funding amounts, eligibility criteria, and program priorities for that fiscal year. The NOFO should be reviewed in its entirety prior to subapplicants beginning to prepare a subapplication to ensure that the applicant, subapplicant, and proposed project all meet the eligibility criteria.

> ***Eligibility and Completeness Review Criteria*** – Prior to reviewing applications or subapplications, FEMA first confirms that applicants have had a major disaster declaration within seven years and a FEMA-approved Hazard Mitigation Plan. All proposed activities must be in compliance with applicable environmental and historic planning regulations and floodplain and land use laws, as well as the two most recently published building codes. If FEMA receives more subapplications than they are able to review in full, FEMA uses the technical criteria to screen subapplications and determine which to select for qualitative review; as such, achieving a high score on the technical criteria is important. At least one subapplication from each applicant will be sent to the national panel for qualitative review.

BRIC Technical Criteria – Projects either receive all of the specified points for each of the BRIC criteria or zero points for each criterion based on factors FEMA is required to consider by statue, as well as stakeholder comments that FEMA chose to incorporate into the program. In particular, FEMA weights heavily the requirements that the project is an infrastructure project that mitigates the risk to one or more of FEMA's Community Lifelines and that certain building codes have been adopted and Building Cost Effectiveness Grading Schedule (BCEGS) ratings achieved. This document should be reviewed in its entirety as subapplicants prepare their subapplications.

BRIC Qualitative Criteria – Projects receive points for meeting qualitative criteria on a graded scale, depending on how well the subapplication meets the criteria. These qualitative criteria are intended to capture non-quantifiable benefits, such as equity, resilience, and partnership of proposed projects, that could not otherwise be captured in a project BCA. The qualitative criteria guidance gives prompts for each of the qualitative scoring categories, and subapplicants should address all of the prompts, in order and as applicable, in their subapplications for the best chances of success. This document should be reviewed in its entirety and referenced frequently as subapplicants prepare their subapplications.

MEMA's Mitigation Series: 2020 Lessons Learned and Moving Forward Presentation

The Maryland Emergency Management Agency developed this presentation to assist subapplicants preparing BRIC subapplications for the FY21 BRIC program cycle. MEMA is the state agency responsible for preparing and submitting Maryland's application package directly to FEMA. MEMA highlighted several aspects of the BRIC program for subapplicants to consider, including *that technical evaluation criteria are reviewed by FEMA staff and points are "all or nothing"—points are either awarded or they are not—whereas qualitative evaluation criteria are prorated and reviewed by a very diverse national review panel* comprised of volunteers from state/local/tribal/territorial governments and federal agencies. One consideration MEMA mentioned related to these application reviews was that, while the thorough documentation subapplicants often provided as attachments is useful, it is also important that subapplicants *address the application questions in the FEMA GO text boxes to make sure the reviewers see it to know where to go to find more information*. Common pitfalls MEMA noted in subapplications, based on experience from FY20, included lack of partnerships and limited discussions of social vulnerability. In general, MEMA recommended that subapplicants *prioritize mitigating FEMA's Community Lifelines, seeking out multi-disciplinary and regional solutions, and bringing in additional partners and stakeholders into the overall process*. When considering partnerships, MEMA noted that entities listed in the subapplication could include funding partners, outreach/public relations partners, design consultants, universities, governments, non-profits, subject matter experts, etc., and that partners could contribute to the project at any stage. MEMA recommended that subapplicants spend more time describing the populations impacted by answering questions such as: What percent of the community will benefit? How will the project positively/negatively impact vulnerable members of the community? What are the direct/indirect benefits of the project? How will the project prevent cascading impacts to residents, businesses, public services, etc.? Finally, MEMA cautioned that common pitfalls of nature-based solutions include that they are "more technically difficult" and "potentially [have] more expensive up-front costs," which pose particular challenges in the BCA; subapplicants should be adequately prepared to resolve issues that might arise as a result.

TNC's Promoting Nature-based Hazard Mitigation through FEMA Mitigation Grants Guidebook

The Nature Conservancy prepared this guidebook to assist subapplicants developing BRIC applications identify and select appropriate nature-based solutions for specific hazards. The guidebook gives example activities that could fall under each of the possible project types and funding categories and offers recommendations for project planning, computing the cost-benefit for projects, determining project feasibility and eligibility, and honing in on the proper project scale. One key takeaway from this guidebook is that *the BCR for a project does not need to be significantly greater than 1.0 for the project to be competitive under FEMA's scoring criteria*. Similarly, TNC explains that full models may not be required for economic justification—recommendations are given in the guidebook pertaining to when an economic model may be needed depending on the project type and complexity. Related to that, *subapplicants should be careful not to oversell the value of the project*, as all selected projects will undergo a third-party technical review to ensure that the claims made are justifiable. TNC provides tables that include examples of economic, social, and environmental benefits that can be monetized for the purposes of a subapplication, as well as ecosystem services. TNC also recommends that *benefits that are not able to be monetized are described qualitatively in the narrative of the application*. In addition, *projects should be aligned as closely to state and local goals, such as climate action plans and comprehensive plans, as possible* to improve the likelihood that they are selected for the overall application and show a whole community approach. Taking the time to build strong partnerships by looking to stakeholders from a variety of backgrounds.

AECOM Experience

Background

The AECOM Team has extensive collective experience developing grant applications for the FEMA Hazard Mitigation Grant Program (HMGP) and other federal funding opportunities. In addition, the AECOM Team is experienced with planning for, permitting, designing, and implementing NbS projects linked to hazard mitigation. AECOM recommendations that supplement the findings from the literature review and interviews for this project include the following:

1. **Cater to the Funding Agency:** Take the time to thoroughly review all FEMA materials and have a clear understanding of what the agency is asking for. Then, address those requirements in that order. Structurally, the subapplication should match FEMA's thought process so that, when FEMA reviews the applications, there is no guesswork involved.

2. **Submit a Complete and Thoughtful Application:** Come to the table with projects that were put together thoughtfully and completely. Any team preparing a grant subapplication should have worked through each phase of the project wholly and completely with ample time to complete different elements of the application. Grant application reviewers typically want to see that proposed projects are ones that are feasible operationally.
3. **Schedule and Budget:** Spend the time to develop a thorough construction cost estimate and schedule. Grant applications for multi-million-dollar projects that include only a handful of high-level budget line items or a flimsy schedule tend to come across to application reviewers as "half-baked." Subapplicants should be prepared to show how they will spend the grant funding year by year, in detail, including hard (e.g., construction materials and equipment) and soft (e.g., permitting, design, administrative) costs. Additionally, subapplicants should clearly address how resources will be procured or if they already exist in-house.
4. **Talk to FEMA:** Agency representatives are typically very willing to work with applicants and subapplicants to help teams craft the best and most comprehensive project applications. Coordinating with FEMA during the project planning process can only help to strengthen a future subapplication.

Key Outcomes

Some key NbS hazard mitigation projects that the AECOM Team has assisted with are included below. These project highlights may help future subapplicants in preparing for future NbS projects in their communities.

Northwest Resiliency Park in Hoboken, New Jersey

AECOM assisted with phases of the design a resiliency park in Hoboken, New Jersey using HUD funds awarded as part of the Rebuild by Design program in the aftermath of Superstorm Sandy. The final design for the project was completed in 2019 and construction is expected to conclude in Fall of 2022. The 5.4-acre park provides a mix of above-ground recreation and public spaces—including an athletic field, basketball basin, ice-skating rink, lowland gardens, a pavilion, and play areas—that are designed to hold surface water with innovative, underground stormwater management measures that can hold up to one million gallons of stormwater during large rainfall events. The park design includes dense planting and multi-purpose areas that were selected to improve quality of life in the areas of nature, culture, athletics, and recreation in a deindustrializing neighborhood. Once completed, the Northwest Resiliency Park will be the City's largest park.

Project rendering by E&LP, Olin, and nArchitects

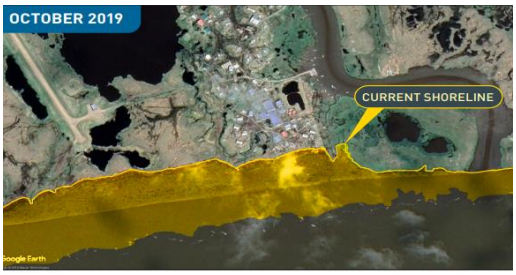
American Samoa Rockfall Mitigation Project

AECOM prepared the Final Environmental Assessment and provided construction management services for a rockfall mitigation project in American Samoa. The project received HMGP funding to implement mitigation measures to prevent landslides along steep and rocky slopes for a critical access route, Highway 001. The project used wire mesh to stabilize at-risk areas, preventing direct damage to roadway infrastructure and structures along developed portions of the highway. Some of the benefits for the project included reducing the likelihood of injuries or deaths as a result of rockfalls, reducing the cost of roadway cleanup in the aftermath of rockfall events, minimizing loss of function of the highway due to blockages, reducing the number and frequency of roadway closures, and reducing the long-term cost of maintenance in response to landslides. Construction of the project was phased to minimize the impact of road closures on residents.

Credit: Robb Williamson, AECOM

Relocation of Newtok Village, Nelson Island, AK

AECOM prepared a feasibility study and site selection report for relocating Newtok Village, an indigenous Alaska Native community, after the village voted to relocate in 2002. The village, located on a barrier island that had been experiencing extreme erosion resulting from a large permafrost layer melting as global temperatures rise, was also vulnerable to the compounded effects of sea level rise, storm surge, and wind-driven erosion. The community is being relocated to a new site, called Mertarvik, that is 10 miles from the original village on a more stable island. Construction began on the site in 2014 and the first residents relocated in October 2019. The project is in part being funded using FEMA and HUD funds.



Yellow polygon shows shoreline lost between 2007 and 2019

Cheat Sheet: Criteria for a Successful Proposal

The following summary of best practices is intended to assist applicants in successfully being awarded funds for Nature-based Solutions projects under the competitive Building Resilient Infrastructure and Communities grants program administered by the Federal Emergency Management Agency. These items are drawn from several sources including interviews with individuals that review/evaluate BRIC proposals and BRIC grant recipients that have prepared successful proposals in the recent past, as well as the experience of an Environmental Defense Fund consultant, AECOM, with extensive expertise in assisting both FEMA and applicant communities with the BRIC program.

General Recommendations

- **Start Early:** Begin preparing the proposal early to ensure there is enough time to develop a competitive subapplication. Know the difference between state and federal deadlines.
- **Ask for Help:** Consider requesting non-financial, direct technical assistance from FEMA to help your staff develop a BRIC application, build expertise to identify the best NbS to address a hazard or need, or craft and sustain a mitigation program. Work with your State to see if other resources are available to supplement your local capabilities.
- **Extra Points:** An application generated from a previous FEMA HMA Advance Assistance or Project Scoping award under C&CB will not only receive extra points but will also help communities to develop well-thought-out project applications.
- **Get Smart:** Attend BRIC Program Webinars and other training offered by FEMA regarding the BRIC program.
- **Engage the State:** Coordinate with your State Hazard Mitigation Officer to ensure that your proposed project aligns with state priorities and to confirm subapplication deadlines. Typically, state/territorial/tribal application periods close before the official BRIC program deadline.
- **Take the Long View:** In general, it is better to submit a mitigation project subapplication for a project that has already had some upfront work completed or has achieved some milestones (e.g., some permitting, some design, some Environmental Planning and Historic Preservation [EHP] coordination, etc.). Alternatively, consider putting forward a large project that is made up of separable pieces, each small and self-standing, but clearly part of a large, more valuable whole. The proposed project solution should be well thought-out with sufficient supporting data and documentation for review.
- **Hire a Pro:** Consider soliciting support to develop the proposal from an experienced consultant, particularly for the BCA. Reviewers can typically tell when a proposal has been prepared by an experienced professional versus not.
- **Show Support:** Request letters of support and letters of funding commitment from project partners to include with the application. Having strong partnerships gives projects a big leg up.
- **Be Ready for Questions:** FEMA will request more information for proposals rather than throwing out otherwise good subapplications.

Project and Subapplicant Eligibility

- **Make Sure Your Project is Eligible:** Is the project feasible and effective? Is the project a standalone, long-term solution (even if phased)? Is the project cost effective? Are building code criteria met? Does the project meet all EHP requirements?
- **Have A Local Hazard Mitigation Plan In Good Standing:** Subapplicants MUST have a local Hazard Mitigation Plan (HMP); not meeting this criterion is the fastest way to become ineligible. The proposed project must address the risk analysis in the HMP and align with community mitigation goals.
  - For greater likelihood of success, the project should also be included in any local Capital Improvement, Floodplain Management, and/or Comprehensive Plans to show whole community/system preparedness.
- **Reduce Natural Hazard Risks:** Projects need to mitigate natural hazards, not simply the risks to specific community lifelines. For instance, FEMA cannot build a new communications tower under the BRIC program, because it doesn't protect against a natural hazard.

- **Be Honest:** Put forward realistic timeframes to complete the project—it's better to ask for more time upfront than for a time extension later. Timeframes do not impact eligibility, but subapplicants may be asked to provide more supporting information to justify the need and to show how associated risks will be mitigated.
- **Consider a Portfolio Approach:** State applicants should emphasize portfolio management and submit only strong BRIC candidates to the BRIC program. Other projects should be submitted to HMGP and FMA, as applicable.

Technical and Qualitative Criteria

- **Read the Answer Key:** Read the Technical and Qualitative Criteria for the BRIC Program. FEMA uses these as "answer keys" when selecting projects. Subapplicants should read the NOFO in full and watch the Webinar Series.
- **Focus on Scoring Points:** Craft your project proposal to align with the current FY Technical/Qualitative scoring criteria. Spend the most time on Technical/Qualitative categories with the greatest point values. Technical criteria points are awarded as "all or nothing," while Qualitative criteria points are on a graded scale.
- **Building Codes and BCEGS are Critical:** While formally not a FEMA requirement, the most successful communities had adopted building codes in accordance with FEMA criteria and had Building Cost Effectiveness Grading Schedule (BCEGS) ratings of 5 or less.
- **Align with BRIC Priorities:** Projects should be aligned to FEMA's BRIC Program Priorities, as defined in the NOFO for that FY (for example, for FY21: Infrastructure, Community Lifelines, Building Codes, Climate Resilience, Nature-based Solution, Equity).
- **Acknowledge and Address Project Risks:** Describe possible risk and mitigation strategies associated with meeting the proposed project cost and schedule. Reviewers should have a high level of confidence that the project will do what is intended and adequately mitigate known risks.
- **Consider Phasing the Project:** Phasing gives more flexibility for large-scale projects and projects still needing design. The C&CB category gives subapplicants a pathway to collect needed data to complete a future application (and receive points for having received a previous qualifying award).
- **Don't Guess:** Technical claims made in the proposal must be accurate. FEMA uses a third-party review team to verify that proposed projects will be technically feasible and cost effective.
  - Typical technical documentation includes a scope of work, hydrologic/hydraulic modeling or other with/without project modeling, EHP reviews, permits, alternatives analysis, design drawings, cost estimate, economic impact analysis, and a benefit-cost assessment.
- **Leverage Third Party Data:** Use online data viewers and local/state/national datasets (such as those for sea level rise, land cover, social vulnerability, etc.) to help identify and quantify information like future conditions, acres of habitat types protected, or populations benefitted.

Project Narrative

- **Use a Strong Structure:** Organize the narrative so that it is clear and follows the BRIC Technical and Qualitative Criteria scoresheets. This will make it easier for reviewers to give out points.
- **Tell a Story With Numbers:** Ensure the application is well-written and tells a clear story backed up by solid numbers and data. A reviewer should be able to pick up the application having no prior background and be able to understand exactly what the project is trying to do, what/who will benefit, etc.
- **Know your Audience:** In FY20, the national review panelist group for the qualitative criteria review was very diverse with representatives from a wide variety of agencies. Keep this in mind when writing a subapplication.
- **Focus on the Need:** AVOID language on required maintenance, deferred maintenance, repair, and replacement work. Instead, focus on why the project is needed to increase the level of protection.
- **Drive the Point Home:** If the project is a nature-based solution, this fact should be referred to frequently and often and should be included in the project title. It should be abundantly clear to reviewers that there is a nature-based component of the broader infrastructure solution.

Nature-Based Solution

- **Be Clear About Infrastructure Benefits:** The project MUST include a substantial benefit to infrastructure, in addition to the nature-based component.
- **Consider Thinking Big:** Both large-scale and small-scale projects are eligible for BRIC funding. However, landscape-scale projects that are considered from the perspective of whole community preparedness performed well in the national competition—the average federal cost share for projects was $17.2 million per project in FY20.
- **Craft an Integrated Project:** Nature-based solution projects that were selected also had strong non-nature-based elements.
- **Propose a Complete Solution:** Projects that address only a small area within a greater area of need tend to underperform and run the risk of being seen as band-aid solutions. Projects should address the full extent of the hazard, even if that makes for a more expensive project.
- **Partner:** Successful projects have strong partnerships involving local, state, federal, private organizations, non-governmental organizations (NGOs), and/or academic partners and a strong technical team.
- **Outreach to Beneficiaries:** Be prepared to educate stakeholders with respect to the nature-based solution through modeling and renderings. Demonstrated community outreach and buy-in is a plus.
- **Grease the Skids:** Coordinate early with any applicable resource agencies to ensure that the project is feasible from a permitting standpoint and to begin building consensus and support for the project. Note that permitting conditions and priorities may change over time.
- **Be Creative:** Successful projects incorporated nature-based solutions in artful ways to integrate green/gray elements and show the interdependency of the project to the entire community's resiliency. That said, projects still need to be technically sound and within the bounds of reason. The most innovative solutions will require the most justification.
- **Rely on the Science:** Invest in engineering and modeling for the proposed NbS to substantiate the project need.
- **Learn from Winners:** Successful national competition projects shared the following four elements: they were infrastructure projects, mitigated one or more Community Lifelines, received high building code scores, and had low BCEGS ratings (5 or less).
- **Understand FEMA Interests:** FEMA is particularly interested in innovative NbS to address urban heat and drought, as well as projects that restore the ecological function, flood storage capacity, recreational opportunities, and habitat creation potentials of buyout lands.
- **Create Environmental Value:** Develop nature-based projects that raise ecological baselines (provide uplift), support T&E species, and self-mitigate.
- **Link Social and Environmental Benefits:** Consider how the NbS can enhance equity by supporting socially vulnerable communities. This might be through providing recreational benefits to improve mental and physical health, or by providing spaces near nature where families and friends can celebrate birthdays, weddings, or other social events.
- **Address Future Conditions:** Sufficient technical justification should be included to demonstrate that the subapplicant has considered future conditions, such as sea level rise, population and demographic changes, intensity and frequency of rainfall, etc.

Benefit-Cost Analysis

- **Go Beyond Damages Avoided:** In addition to damages avoided, consider direct and indirect/induced benefits; cascading impacts to Community Lifelines, residents, businesses, public services, infrastructure, and natural systems; and future conditions. The FEMA BCA tool is limited in how it captures social, environmental, resilience, and other non-traditional benefits from NbS. Discuss the project's intangible and non-quantifiable benefits in the narrative with ample justification for scoring under Qualitative Criteria.
- **Find Funding Partners:** There is a cap on the federal cost share FEMA provides, but not the overall project cost—very large projects that exceed the federal cap will require a larger non-federal match. Leveraging partnerships effectively can create opportunities for an in-kind match to replace a cash match.

- **The BCR is a Threshold Criteria:** The benefit-cost ratio itself is not factored in as part of the competition criteria, meaning that projects with higher BCRs do not necessarily perform better than projects with lower (but still greater than 1.0) BCRs.
- **Describe Outyear Benefits:** Some NbS benefits are realized on a longer term than the discount rate that FEMA's BCA Toolkit will recognize. These benefits can be discussed qualitatively in the narrative with supporting justification.
- **Consider Contingencies:** Applicants should plan well because FEMA does not provide additional funds for cost overruns after award.
- **Address Social Vulnerabilities:** FEMA builds in criteria to help smaller communities remain competitive (e.g., evaluating the percentage of the population benefited by the project, rather than the total number of people). Indicate the populations that will be impacted by the project, including what percentage of the community and any disadvantaged populations.
  - BRIC program criteria have been updated to create stronger support for Economically Disadvantaged Rural Communities or areas with higher Social Vulnerability Indices by requiring lower non-federal matches or BCRs.

Going Forward

FEMA is enhancing its BRIC program to include the following key priorities that should be considered in future applications.

- Funding projects that provide system-wide mitigation impacts for whole communities with a focus on resilience.
- Addressing climate change and other expected future conditions.
- Building strong stakeholder engagement, involvement, and collaboration.
- Increasing the capacity and capability of stakeholders to conceptualize, design, and implement NbS.
- Exploring opportunities to build new partnerships to benefit underserved communities and vulnerable populations.

FEMA Resources

FY21 NOFO | Technical Criteria | Qualitative Criteria | Webinars | Application Tips

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Appendix A: Interview Minutes

Minutes

Meeting name
Environmental Defense Fund
BRIC Interviews

Subject
Interview with Ryan Janda, FEMA Chief, Non-Disaster Grants Implementation Branch, HMA Division

Attendees
FEMA
Ryan Janda

AECOM
Doug Bellomo
Taylor Nordstrom

Meeting date
Thursday, November 18, 2021

Time
2:30-3:00 PM ET

Location
MS Teams

Project name
Nature Based Solutions to Natural Hazard Risks

AECOM project number
60667983

Prepared by
Taylor Nordstrom

General Application Questions:

1. **What are the top three things you look at when applications are reviewed?**
    - (1) Two documents, BRIC Qualitative Criteria and BRIC Technical Criteria are referenced extensively during reviews. These are "the answer key." Applicants that use these documents tend to score very well qualitatively in their narratives.
        - BRIC Technical Criteria: May be harder for Applicants/Subapplicants to control outcomes here since the technical criteria is either achieved or not. Includes things like building code status, BCEGS rating, whether the project addresses Community Lifelines.
        - BRIC Qualitative Criteria: Does the applicant have a mitigation plan? Is the project an eligible activity?
    - (2) Project Eligibility
        - Is the project feasible and effective (does it do what it's supposed to do)? Is it cost effective?
        - Environmental planning (Environmental Impact Statement [EIS]) and historic preservation.
        - Project must be standalone and a long-term solution.
    - (3) How well is the subapplication written?
        - The best and most well-written project applications tend to win and the subapplicants probably used a consultant to write them.
2. **What "stood out" in successful BRIC applications (e.g., type of community, population, demographics, location, past events, other)?**
    - Subapplicants that followed the qualitative scoresheet scored relatively well. You can tell who did and didn't use the guidance. Subapplications should be organized to directly respond to the prompt questions.
    - In total, 408 subapplications were reviewed across the entire BRIC program. Of these, 22 subapplications were selected/awarded for the competitive process. 18 of the 22 selected included a nature-based component.
    - Some standout features: phasing projects, proposing NbS (not simply a typical acquisition/elevation project), capturing Community Lifelines, and emphasizing infrastructure improvements.
3. **What advice do you have for applicants preparing for the next round?**
    - Follow the instructions/guidance FEMA provides. Organize the narrative so that it is clear.
4. **What made BRIC applicants ineligible or less competitive?**
    - Applicants (State, Tribal, or Territorial): Typically, Applicants don't have an issue with eligibility and normally have their Hazard Mitigation Plans in place.

- Subapplicant (Local entity): Typically, Subapplicants are deemed ineligible, not the Applicants. Subapplicants MUST have a mitigation plan. There were a number of subapplicants that didn't have a current, local Hazard Mitigation Plan. That's the fastest way to become ineligible.
  - FEMA work with Mitigation Planners in the region/Headquarters and use the Mitigation Planning Portal to verify subapplicant eligibility.
- Projects that are less competitive are those that are not fleshed out very well (not enough data, not enough of a project concept) to articulate the value of the project. The applications look rushed or are not coherent, or the projects are not a good product (feasible/cost effective) of the mitigation planning process.

5. **How can small, economically disadvantaged communities compete effectively with larger communities with resources?**
   - As a result of Justice 40 and relooking at equity under the BRIC program, subapplications for projects in economically disadvantaged/socially vulnerable communities OR that reduce impacts to disadvantaged/vulnerable populations can receive a higher number of points now in FY21 (documented in the FY21 NOFO).
   - The changes have not received negative feedback (no news tends to be good news for FEMA).
6. **How important is project schedule in evaluating applications (i.e., is the time required to start realizing project benefits a consideration)?**
   - For BRIC (different than for HMA), project applicants are invited to be honest about the timeframes they actually need. Subapplicants should ask for the performance period they actually need (for example, HMA has a 3-year limit, but BRIC is allowing subapplicants to be request 6+ years, categorized as risk). Timeframes do not impact eligibility.
   - FEMA may have a conversation with subapplicants prior to award to identify risks of hitting schedules, but points are not docked, and awards are still possible.
7. **Based on the changes that have been made ahead of the FY21 BRIC application cycle, what advice do you have for states seeking competitive funding?**
   - Use FEMA's program support materials. Read them thoroughly, watch the webinars, know the ins and outs of the NOFO.
8. **What are the major changes/updates to the BRIC application process for FY21?**
   - Point structure changes to competitive program. Noncompetitive criteria remain the same.
   - Increased State allocation from $600K in FY20 to $1M each in FY21.
   - Total BRIC program funding increased from $500M in FY20 to $1B in FY21.
   - FEMA has increased direct technical assistance available to communities (from 10 to 20 communities).
9. **In terms of project size, what might "too small" look like and what might "too big" look like?**
   - Too big = FEMA is fairly flexible. The maximum federal share for the current cycle is $50M for national competition. Subapplicants can match this to a higher $ amount, so no project is "too big."
   - Too small = FEMA has not run into an issue with this, as long as the project is well-framed and has a good subapplication.
10. **How are risks/mitigation strategies considered in evaluating project applications?**
    - FEMA Panel Reviews: Three panel reviewers look at every subapplication. If the subapplicant does a good job with the application (feasible, cost effective, describes risks and mitigation strategies), it will score higher. If reviewer doesn't have a high level of confidence that the project will do what it's supposed to, it will score lower.
    - Third Party Technical Reviews: FEMA undergoes a third-party technical review process to verify that projects are technically feasible and cost effective. Technical claims made in the subapplication must be accurate.
    - Cost/Schedule/Objectives are all important.

Nature-based Specific Questions:

11. **Did you see specific types of nature-based projects stand out more than others in the review process and if so, what made them stand out?**
    - 18 of 22 BRIC competitively selected projects had nature-based components. Camille Crain might be able to say more about how various NbS subapplications stood out.
12. **What are the biggest hurdles for nature-based projects to be selected?**
    - Applicants and subapplicants don't seem to be well-prepared to submit good NbS projects yet. Many of the NbS projects selected scored highly in other areas of the application and weren't selected just because of the NbS (i.e., projects had strong non-nature-based elements).
    - Some selected subapplications just "happened" to be nature-based or the NbS points simply helped boost the total score.
    - In FEMA's eyes, there is still a long learning curve to make NbS more innovative (BRIC still received a lot of subapplications for typical acquisition and elevation projects) and to ensure we get true NbS in the future. Need to help communities to develop more and better NbS.
    - Has been challenging to quantify returns on investment for NbS. There is a limited amount of science on how NbS features perform. FEMA would welcome more science to include the BCA toolkit. More working together with other organizations to help develop data (FEMA, NOAA, etc.) is a future goal. This is something for the Agency to look at, not subapplicants.
      - Work like EDF's will be beneficial to help BRIC receive better submissions in the meantime.
13. **What advice do you have for applicants preparing a NBS project submission for the next round?**
    - Not answered due to time constraints.
14. **How are benefits (e.g., equity, climate change resilience, quality of life) considered in the selection process beyond such items as damage avoidance to structures, contents, and environment?**
    - Not answered due to time constraints.
15. **What were the major scoring factors for successful Nature Based Solutions projects in FY20 BRIC applications?**
    - Out of the 22 national competition projects selected for BRIC, all shared four aspects: they were infrastructure projects, mitigated 1+ Community Lifelines, had high building code scores, and had high BCEGS ratings.
    - Other positives: Some subapplicants were able to provide a higher increase in their non-federal cost share. In two cases, the recipients were economically disadvantaged communities. In two cases, the subapplicants had received Advance Assistance.

Other Comments:

- Ryan is interested in seeing a copy of the final EDF guidance document, when available.

Minutes

Meeting name
Environmental Defense Fund
BRIC Interviews

Subject
Interview with Camille Crain, BRIC Section Chief, FEMA FIMA HQ

Attendees
FEMA
Camille Crain

AECOM
Doug Bellomo
Taylor Nordstrom

Meeting date
Monday, November 22, 2021

Time
1:00-1:30 PM ET

Location
MS Teams

Project name
Nature Based Solutions to Natural Hazard Risks

AECOM project number
60667983

Prepared by
Taylor Nordstrom

General Application Questions:

1. **What are the top three things you look at when applications are reviewed?**
    - As a deputy division director and the BRIC section chief, I don't review applications in my position.
    - What I would expect to see in BRIC applications:
        - Aligned to the six FEMA priorities for funding (competition criteria align to the program priorities for the year): Infrastructure, Lifelines, Building codes, Climate resilience, NbS, Equitable outcomes, Resilience.
2. **What "stood out" in successful BRIC applications (e.g., type of community, population, demographics, location, past events, other)?**
    - What stood out was how the projects met the BRIC program priorities.
    - FEMA made 406 selections across the board (State allocations + National competition)
        - The most successful States and Territories used their allocations for project scoping, building capacity or partnerships, or taking advantage of new project types (i.e., building codes).
    - Impressed with the 22 competitively selected projects – many subapplicants spent the time/effort to look at whole community perspectives.
        - Successful projects had fascinating partnerships and there was an interdependency of the proposed projects to their whole community's resiliency. Successful applicants incorporated NbS in artful ways to do gray/green together.
        - Princeville, a small, impoverished town of 2,000 in North Carolina has been ravaged by flooding. The community understands that their flooding issues are going to increase with climate change, and they are interested in keeping community together.
            - The plan has involved multiple local, federal, state, and academic partners. The BRIC project is $10M to relocate 25% of the town's infrastructure out of flood prone areas, used in conjunction with Community Development Block Grant/HMGP funds. The community understands that they need to re-think their relationship with flooding.
            - This project shows how a small, rural town can compete successfully.
3. **What advice do you have for applicants preparing for the next round?**
    - Review the program support materials and watch the NOFO webinar.
    - One challenge seems to be with applicant awareness and access to FEMA materials (print/on demand webinars). Many people are living in land of void/rumor and don't know that the materials exist.
    - These materials are the "keys to the test." It is easy to tell which applicants read the materials.

4. What made BRIC applicants ineligible or less competitive?

- Some applications discussed mitigating the risk to specific lifelines (Emergency Operations Centers, fire stations), while forgetting that the project needs to mitigate natural hazards. FEMA can't build a new communications tower, for instance, because it doesn't protect against the natural hazard.
- FEMA is trying to avoid creating a checklist of eligible/ineligible projects.
  - If a project can be shown to be cost effective and mitigate the natural hazard, that's good. FEMA is interested in seeing what projects people come up with.
  - FEMA is particularly interested in innovative solutions for urban heat/drought.

5. How can small, economically disadvantaged communities compete effectively with larger communities with resources?

- Successful, small communities existed in a state that had updated building codes and BCEGS and hit on all the marks (partnership, outreach, climate, and future conditions).
- The Princeville, NC project, for instance, included NbS, protected critical lifelines, was deep in outreach and partnership, looked at climate and future conditions, mitigated the natural hazard. They checked all the boxes.

6. How important is project schedule in evaluating applications (i.e., is the time required to start realizing project benefits a consideration)?

- There are 15 points for implementation measures – this lets FEMA look at the quality of the application as far as the process to implement. Projects score points for a schedule that makes sense, people resources allocated, a good project management plan.
- FEMA understands that 36 months to complete a project is a challenge. FEMA put in an option for applicants to request >36 months if they can justify it. FEMA's concern is that this is something some applicants didn't know.
  - FEMA would rather someone give a realistic work schedule than to try to fit a project into a mold of 36 months. Do this by describing the phases of projects (phase out design, permitting, procurement, etc.).
  - There is a long, bureaucratic process to get work extensions once the 36-month requirement is in place.

7. Based on the changes that have been made ahead of the FY21 BRIC application cycle, what advice do you have for states seeking competitive funding?

- Want States to understand program changes:
  - $1M in allocation funds (up from $600K last year)
  - FY21 points are different than FY20 (equity considerations have changed certain point values, for example). Point values assigned to each criterion should help applicants understand the weight of each.
  - State applicants should emphasize portfolio management – which projects fit which FEMA program?
    - States should not submit all projects to BRIC if not all of them are BRIC eligible or are not strong for BRIC criteria. Put others to HMGP for COVID-19, for instance.
    - FEMA's fear is that States will take a more linear approach – i.e., submitting all applications to BRIC, and then the rejected ones to HMGP, and then the remainder to FMA.

8. What are the major changes/updates to the BRIC application process for FY21?

- Discussed previously.

9. In terms of project size, what might "too small" look like and what might "too big" look like?

- The average cost of the 22 selected projects was $17M, but there is no minimum.
- "Too small" = There is nothing in the program that says there is a minimum dollar amount for projects. Some criteria are built in to help smaller communities remain competitive. For instance, in evaluating certain criteria, the percentage of people impacted by the project is used instead of total number of people so that small towns are not exempted out.

- "Too big" = There is a $50M cap on the federal cost share, but no cap on the total project cost. Really big projects would need a larger non-federal share. One project in New Jersey was way over-matched.

10. How are risks/mitigation strategies considered in evaluating project applications?

- Schedule is part of the point criteria under Implementation Measures. The applicant should have done a thorough review on schedule, cost, staff resources available, risk, etc.
- Applicants should plan well because FEMA does not provide additional funds for cost overruns.

Nature-based Specific Questions:

11. Did you see specific types of nature-based projects stand out more than others in the review process and if so, what made them stand out?

- For the national competition, 18 of the selected 22 had NbS elements. The NbS elements range from specific vegetated areas around a building to entire shorelines being rethought.
  - Tottenville, NY is planning to redo an entire shoreline using different types of NbS techniques.

12. What are the biggest hurdles for nature-based projects to be selected?

- Anecdotally, I've heard it's the benefit-cost analysis. The discount rate seems to be the hang-up; the benefits provided by NbS are longer term than the discount rate will allow for. In other words, FEMA's BCA toolkit does not allow for the long-term benefit capture that NbS provide, and a project's benefits are worth less if those benefits do not come until later in the project lifetime.

13. What advice do you have for applicants preparing a NBS project submission for the next round?

- FEMA is very happy that applicants are considering NbS (many projects are being considered today that don't even start here). The more that NbS can be added in, the better the project will be.

14. How are benefits (e.g., equity, climate change resilience, quality of life) considered in the selection process beyond such items as damage avoidance to structures, contents, and environment?

- Risk reduction resiliency effectiveness is the most significant place to do this in the Qualitative section of the application.
  - Gives the applicant space to talk about the project outside of the BCA (or pre-approved alternative to the BCA). The BCR itself is not factored in as part of the competition criteria.
- Ancillary benefits (water quality, habitat creation, Justice 40 initiative – how does project benefit disadvantage groups, social/economic indirect benefits) are some of the biggest points available on the qualitative side.

15. What were the major scoring factors for successful Nature Based Solutions projects in FY20 BRIC applications?

- The 18 selected projects also scored high in other point criteria area, so just being a NbS alone was not enough for a project to perform successfully.
  - Populations impacted (what % of community and any disadvantaged populations), established building codes and BCEGS, infrastructure and lifelines tied to NbS.
  - The NbS component is only 15 points of the total 230, so it's not the only category that is important in an application.

Other Comments:

- Make sure that whatever guide is ultimately written is "evergreen" (i.e., good for years after FY21). If getting too specific into the FY21 criteria, the document will be out of date pretty quickly.

Minutes

Meeting name
Environmental Defense Fund
BRIC Interviews

Subject
Interview with Adam Stein, Senior Policy Advisor; NOAA Office for Coastal Management

Attendees
FEMA
Adam Stein

AECOM
Marisa Mason
Taylor Nordstrom

Meeting date
Monday, December 6, 2021

Time
2:30-3:00 PM ET

Location
MS Teams

Project name
Nature Based Solutions to Natural Hazard Risks

AECOM project number
60667983

Prepared by
Taylor Nordstrom

Introductions: Adam is a Senior Policy Advisor with NOAA (Coastal Hazard Mitigation and Climate Adaptation). He served in a 5-month detail in FIMA during the development of the BRIC program as a coastal issues advisor. He also worked to establish the National Coastal Resilience Fund, and previously ran a resilience grants program within NOAA.

- Jaime Carter from NOAA would have the most specific, detailed information related to EDF's project. Jaime is currently working to understand some of the issues related to natural infrastructure from year 1 of the BRIC proposal review process.
- Rafael ("Rafa") Canizares with FEMA would be another potential project contact. He is an engineer who recently (within the last year) came over from R&D to work in HMA, rafael.canizares@fema.dhs.gov.

General Application Questions:

1. **What are the top three things you look at when applications are reviewed?**
    - The plans have been reviewed by an engineer.
    - The project has had the necessary Environmental Historic Preservation consultations to ensure that the project could be permitted.
    - One challenge: what are the protective benefits of the natural infrastructure? For example, planting grass on the top of the bulkhead is not natural infrastructure. We want to know that there is a future protective benefit from the constructed infrastructure.
2. **What "stood out" in successful BRIC applications (e.g., type of community, population, demographics, location, past events, other)?**
    - There should actually be mitigation benefits for the infrastructure because of the NbS. You might be able to plant 100s of acres of oyster reef – however, if you can't provide the hazard mitigation benefit (i.e., flood reduction, wave energy reduction, NOT water quality, not habitat). It's hard to consider the project as a hazard mitigation benefit otherwise.
3. **What advice do you have for applicants preparing for the next round?**
    - Coordinate with your state Coastal Zone Management Programs (CZMP) and their network of affiliated partners.
4. **What made BRIC applicants ineligible or less competitive?**
    - Anecdotally, the lack of engineering design was a significant hurdle.
5. **How can small, economically disadvantaged communities compete effectively with larger communities with resources?**

- Smaller communities need technical assistance that is no or low cost from organizations such as EDF, TNC, state CZMP, national estuarine research reserves, etc. that have experience and expertise. In some cases, those organizations may be applicants themselves.

6. **How important is project schedule in evaluating applications (i.e., is the time required to start realizing project benefits a consideration)?**
    - Unable to answer this question based on his experience.
7. **Based on the changes that have been made ahead of the FY21 BRIC application cycle, what advice do you have for states seeking competitive funding?**
    - Not familiar enough with the most recent application materials. Jamie Carter would be a big help. I would encourage you to schedule an hour with Jamie.
    - Cost effectiveness is a challenge that applicants have with NbS. Technical assistance specifically for cost effectiveness is critical.
8. **What are the major changes/updates to the BRIC application process for FY21?**
    - Skipped this question due to time constraints.
9. **In terms of project size, what might "too small" look like and what might "too big" look like?**
    - One of the challenges and a potential issue to highlight – because the funding for BRIC goes through the State, the State has already filtered out projects that don't hit priorities for that individual state.
    - One thing that can be a limitation is that projects might not make it to FEMA because they may not be a State priority. This could be a political issue, or other factors outside of the scope of the BRIC program.
10. **How are risks/mitigation strategies considered in evaluating project applications?**
    - Skipped this question due to time constraints.

<u>Nature-based Specific Questions:</u>

11. **Did you see specific types of nature-based projects stand out more than others in the review process and if so, what made them stand out?**
    - Restoration of ecological function to acquired properties stands out as a successful solution (this is a NOAA perspective that is not based on the BRIC program). There is considerable opportunity to perform restoration of buyouts. Many local or state governments aren't taking advantage of the ecological function, flood storage capacity, recreational opportunities, and habitat creation potential of the property.
12. **What are the biggest hurdles for nature-based projects to be selected?**
    - For a local applicant – navigating the myriad government programs to be able to successfully access funding.
13. **What advice do you have for applicants preparing a NBS project submission for the next round?**
    - Consideration of equity – there is an increased focus within the BRIC program to reach disadvantaged communities.
14. **How are benefits (e.g. equity, climate change resilience, quality of life) considered in the selection process beyond such items as damage avoidance to structures, contents, and environment?**
    - Unable to answer this question based on his experience – Jamie Carter may be able to provide more context.
15. **What were the major scoring factors for successful Nature Based Solutions projects in FY20 BRIC applications?**
    - Skipped this question due to time constraints.

Minutes

Meeting name
Environmental Defense Fund
BRIC Interviews

Subject
Interview with Todd Bridges, Senior Resrach Scientist and National Lead, Engineering with Nature, U.S. Army Corps of Engineers

Attendees
USACE
Todd Bridges

AECOM
Doug Bellomo
Taylor Nordstrom

Meeting date
Wednesday, December 8, 2021

Time
10:30-11:30 AM ET

Location
MS Teams

Project name
Nature Based Solutions to Natural Hazard Risks

AECOM project number
60667983

Prepared by
Taylor Nordstrom

General Application Questions:

1. **What are the top three things you look for when considering Natural and Nature-based Features (NNBF) in USACE projects?**
    - Still a work in progress within USACE. Both agencies are trying to figure out how to "stretch into" NNBF and NbS. The answer to this question depends on the functional area that someone is concerned with.
    - From a planning point of view, USACE is struggling to figure out how to consider the economics for NbS. For many practitioners, NbS projects are a unicorn-type project.
        - FEMA is also struggling with this (determining comprehensive benefits from NbS as opposed to another flood wall project).
        - USACE has a policy research project underway to determine how to develop a more comprehensive value case for NNBF.
    - From an engineering design point of view, designing NbS is also a challenge because the design can't be "pulled off the shelf." How do we within USACE or FEMA pursue the development of multi-layered systems for flood risk management (FRM) as opposed to single structures (i.e., a wall, a levee)?
        - Other challenging elements within engineering – how to cost the projects, what's the Operations and Maintenance (O&M) required, and added uncertainty.
        - Utter dependence engineers have on existing standards makes new designs challenging – there is nothing on the shelf telling engineers how to do it.
    - There is a goofy point of view that nature is so delicate that it can't be relied upon for protection – this is clearly not true for coastal mangrove forests, coral reefs, etc. Given the millennia that these systems have been exposed to storms, they would be totally wiped out if that were true – how delicate can they really be?
2. **What types of projects (flood risk reduction, navigation, regulatory, hydropower, recreation, water supply) stand out as ripe for NNBF?**
    - Navigation – there are some great examples already of nature being incorporated into projects. Navigation and operations are particularly ripe because the projects are not constrained by the well-established planning procedures that govern/dominate FRM projects. There is a lot of latitude to make adjustments to navigation projects if there is a good enough business case.
    - Hydropower – projects at the federal/state level on the flood and drought sides. Would be very surprised if there is another flood wall dam built in California that does not include NNBF.

- Regulatory – a different challenge. One bright opportunity is to find efficiencies at the intersection of threatened and endangered (T&E) species and NNBF. This requires collaboration between USACE/FEMA with U.S. Fish and Wildlife Service (USFWS)/NOAA, and their state analogs to pursue projects that are "self-mitigating."
  - Should look at not merely reducing the impacts on T&E species, but how infrastructure projects can raise the baseline, support, and promote endangered species populations. Engineering organizations will have to change how they work with resource and regulatory agencies to realize this change.
  - NGOs like EDF have a role to find positive direction/innovation, helping inspire change at the planning and organizational levels for potential projects rather than litigation.
  - One example: The *Comprehensive Management Plan for the Lower Mississippi River*, one of USACE's most significant projects. This plan follows a different path to the Endangered Species Act Section 7(a)(1) to develop a system-scale approach for managing threatened species within a system. USACE Mississippi Valley Division, Engineer Research and Development Center, and USFWS put the plan together to manage multiple threatened species and raise their baselines. USACE estimates they will save $60 to $70 million in first 10 years of operations compared to the old model.

3. What advice do you have for those contemplating using NNBF in their projects?

- Don't be afraid of opportunities – there are great opportunities and an increasing number of resources to guide this process. USACE produced guidelines in September 2021. IECM, World Bank, and other organizations have developed an array of documents that could help.
- Projects would be implemented mostly by cities, counties, states – they also need to find expertise within the engineering and construction community, which does exist. Seek out support from private sector organizations with demonstrated experience innovating and delivering projects like this.
  - Often times, the construction companies at the local level and familiar contractors do not have the right experience, rather than trying to convert a riprap contractor to deliver a NbS, use experienced contractors.
- The intersection between NbS and equity is ripe. There are underserved communities where social intersections can be capitalized upon.
  - NbS can serve multiple purposes within a city/county beyond the practical side of flood risk mitigation.
  - FEMA has the same 40% charge as the Corps to advocate for underserved communities.

4. When might consideration of NNBF not be appropriate?

- One example: Grand Isle, Louisiana is very far offshore and difficult to protect. The U.S. needs to decide if they want to enable living in these types of extreme circumstances. However, there may still be NbS that are possible solutions to keep the town afloat.
  - Putting in a flood wall is often not a desirable solution, as it disconnects the community from the water/land. Miami-Dade County rejected the Corps' flood wall design, as another example.
  - In urban locations where there is not much space, the community is hemmed in on all sides and a wall may be the only solution.
  - Land management and space management should begin sooner rather than later.
- There is a spectrum: on one end, there is a completely nature-based solution to these problems; on the other end, a completely walled solution is possible. Most projects for the 21st century will fall in the middle.

Nature-based Specific Questions:

5. Do certain types of NNBFs stand out more than others and if so, what makes them stand out?

- Think bigger and more broadly. Large scale and innovative features should be considered more frequently.
  - Some engineers create a strawman concept of NbS by recommending one-off systems (e.g., a single seagrass bed or a single wetland) that is detrimental to the overall conception of NbS.

  - NNBF concepts should instead include landscape features such as islands, beaches/dunes, forests, reefs, etc. There is great opportunity to support, expand, restore, or developing new islands.
    - For example, Fort Pierce, Florida decided to build a 20-acre archipelago of islands using sand. They planted mangroves, oyster reef, seagrass, etc. The project has won multiple awards.
- NNBF can be phased, over decades, even. NNBF projects are more flexible and adaptable than building a wall, for example, which is a one-time solution. A system of NNBF can be added to in the future. These systems can also self-heal, improving their effectiveness and longevity.

6. What are the biggest hurdles for using NNBF going forward?

- Getting experience with developing more comprehensive business cases for the project (understanding that there are benefits to NbS beyond damage avoidance).
  - Again, understanding equity and how infrastructure investment has impacted equity is significant.
    - For example, parks with walking trails that support FRM and give underserved communities a place to get out in nature are a good opportunity. There is a huge problem with obesity among the poor in Mississippi, leading to diabetes and kidney disease. Providing NNBF opportunities to stimulate positive behavior and exercise could transform communities. Maybe USACE could eventually consider health economics in their analyses?
    - There is currently a narrow view of National Economic Development (NED) as it is used to select projects – externalities (social, health benefits, etc.) are simply not part of the NED equation, which becomes a self-fulfilling prophecy over time. The simple BCR approach as a sole basis to select projects doesn't work anymore.
    - There is a longstanding issue of building infrastructure for the wealthy. If we have to create exceptional decision pathways for projects to protect the poor, then there is a problem with the system. It doesn't get more antiseptic than an NED-based decision, where decision makers don't have to think about real people, ruined lives, etc. – just dollars and cents.
    - Big Agriculture in the central valley of California, water policy, and large federal and state water projects have driven huge amounts of inequity in the last 100 years. USACE, FEMA, Department of Transportation, and Bureau of Recreation projects have been a driving factor in those projects and decisions.
  - Social benefits, such as reduction in crime should also be considered. There is a lot of research to support.
    - Pointing out ways project proponents can consider incorporating other social effects could be a great addition to the EDF guide.
  - We as a community of practice need to become more comfortable with inputs to decision making that are not all monetized. Being able to compare apples to oranges and still be able to understand the value being created by a project is the first step to then making a decision about a project.

Minutes

Meeting name
Environmental Defense Fund BRIC Interviews

Meeting date
Monday, December 13, 2021

Location
MS Teams

AECOM project number
60667983

Subject
Interview with Eric Hinkley, Associate Engineer, City of Menlo Park, CA

Time
12:00-1:00 PM ET

Project name
Nature Based Solutions to Natural Hazard Risks

Prepared by
Taylor Nordstrom

Attendees
City of Menlo Park
Eric Hinkley

AECOM
Doug Bellomo
Taylor Nordstrom

General Application Questions:

1. **Please describe the project for me.**

- The project began in 2015/16. It was not a City of Menlo Park led initiative originally. San Francisquito Creek Joint Powers Authority (JPA) formed in 1998 with member agencies from Palo Alto, Menlo Park, and Water Control Agencies from the two counties (San Mateo and Palo Alto). The JPA is part of a larger San Mateo County Flood and Sea Level Rise Resiliency District.
  - The JPA wanted to take a look at the areas for that are or will be susceptible to coastal flooding. A feasibility study was done to look at the shoreline to determine erosion needs in the City of Menlo Park. There are 7.1 miles of protection in total—the BRIC project is for 3.7 miles of that alignment. As much as possible, there will be hardened levees for 100-year flooding scenario +3.5 feet of sea level rise (SLR) (the projections of SLR are variable) to provide hazard protection. In some locations, floodwalls will be necessary because of space constraints (not enough real estate for traditional levees).
  - Ecotone levees are planned where possible for upland refugia and more wetlands habitat. Oyster shell and pea gravel habitat planned for snowy plover nesting near levee will be included. The levees don't necessarily tie into high ground, so this project is just a start.
  - There is a Pacific Gas and Electric (PG&E) transmission substation near the City. PG&E came to Menlo Park with $10 million in non-federal match funding to get the project started. The project will protect power for 300,000 people in San Mateo County.
  - JPA used to be run by Len Materman who became executive director of the resiliency district and could be a good point of contact for the history of the project and the vision for the initial feasibility study.
- The project is located along the Don Edwards National Wildlife Refuge surrounding Menlo Park's borders with the bay. There is an ongoing restoration project for salt ponds in the southern portion of the bay. There were existing and good working relationships with partners for that restoration project. The BRIC project will build upon that work and allow Menlo Park to expand the footprint and construct more ecotone levees.
- There was no ongoing restoration at the transmission substation. The BRIC project will allow breaching of a levee that USFWS maintains but has no plans to upgrade to a greater service level. The levee being located more inland opens up the salt ponds for restoration now that they are not needed to serve for flood protection.

2. **What are the top three things you think led to your successful win?**

- The City is fortunate to have the JPA, who had been working on this since 2016, as a partner. The JPA already had a consultant who was able to help Menlo Park with their grant application. The consultant and the match offer from PG&E allowed the City to move faster with their application.
- The City was very direct in their responses to the prompts given by FEMA in the Technical Criteria and submitted 11 comprehensive attachments with greater detail (Community Lifelines, etc.). From what the City

has heard, this format made it easy for FEMA reviewers to see how the project met the BRIC program guidelines.

- The project was already well defined at the beginning of the application. It can be difficult for communities to front the money needed for a successful application to understand the project in order to win the grant, but it's important to spend some of the money up front to lay the groundwork. This project had been on the City's radar but getting the money from PG&E accelerated the City's ability to move the project forward.
- The partnership included large companies that could help overcome some political hurdles (like who should pay for what) and offset some of the complexities of the project given its size and scope.

3. What were the most important elements of the project from your perspective?

- The City was fortunate that the project was already situated next to nature-based features geographically. It was easy for the City to meeting the required BCR given the benefits provided by the electrical substation (which likely has more quantitative benefits than individual family homes). The City had more room to play with on the costs for the NbS because they had such high benefits from protecting the substation, so the additional cost to construct nature-based features was not a deal breaker.

4. What advice do you have for applicants preparing for the next round?

- The City kept the responses to the application succinct and highlighted which attachments had more information on specific subjects. The attachments expanded on hitting the Technical/Qualitative review criteria head on.
- This is the second grant application Mr. Hinkley has been a part of. With each application, he has wished that they had started preparing the application a year in advance (i.e., start now for 2022). This would give the applicant time to figure out where the strengths and weaknesses of the project are to firm up the application, and to have a better understanding of the project and how likely it is to be successful.
  - Shore it up. Take the long view (don't work on the application package last minute). Sufficiently develop the project. Spend money up front.
  - People should feel more comfortable taking the long view with respect to submitting an application, because the grant application programs aren't going anywhere.

5. How did you engage the State as you were preparing/submitting your package?

- The City didn't engage the SHMO directly early on but did a lot of engagement with state agencies (USFWS, State Coastal Conservancy, CalTrans, Bay Development Commission) to get letters of support.
- The State was not planning to submit the City's application to FEMA because they thought the project was not far enough along (30% design had not begun, nor had the environmental process).
  - In Mr. Hinkley's experience with the HMGP, the State decides what projects are competitive and sends them on for funding.
  - However, for the BRIC national competition, the State is just supposed to make sure the proposal is complete and act as a "pass through" to send it to FEMA. The City's team had to convince the State to put their application through—they think they were ultimately successful with this because their application was so complete.

<u>Nature-based Specific Questions:</u>

6. Did you include nature-based elements to your project? If so, why and how did you land on the types of elements and their locations?

- This question was already addressed in prior responses.

7. What were some of the biggest hurdles for getting the nature-based elements woven into the project?

- This was not a big hurdle. Geographically, the City is ideally situation and the NbS just made sense to be placed where they were.

8. What advice do you have for applicants considering nature-based solutions?

- Begin the application effort early as well as collaboration efforts at least a year in advance, ideally. If the applicant has local/regional partners, use them to help figure out where to use solutions, what type of solutions to use (from design/permitting/feasibility perspectives), and what the cost would be.
- Take a look at what FEMA is asking for in the BRIC application package this fiscal year and use that as the framework for the next grant cycle to be able to begin early.

9. Did you quantitatively or qualitatively describe the benefits (e.g., equity, climate change resilience, quality of life) of your nature-based elements? How did you do it?

- Quantitatively – laid out x-acres of ecotone levee, x-acres of snowy plover habitat nesting areas, etc. and built the quantitative assessment from that.
- Qualitatively – primary benefits were increasing current wildlife habitat and providing long-term climate change resilience.
  - Didn't discuss too much human impact but did note that the future build-out of SAFER Bay would provide whole system benefits based on the added resilience of the power grid.
  - It was more challenging to describe the benefits from the project that are not immediate (e.g., outside of the substation protection element).
  - Used online tools to identify populations in areas nearest the levees that would otherwise flood (lower income/disadvantaged communities) and discussed what the impact of flood protection would be for them. Although FEMA awards points for projects for disadvantaged communities, the City didn't qualify; however, qualitatively, the protected areas were disadvantaged (lower income) in comparison to Menlo Park and the surrounding community.

Other Comments:

- Public Outreach: The City relied on the JPA for the purpose of outreach to the local community. The JPA had already secured an HMGP grant for the SAFER Bay project, had done some local outreach already, and had contacts with community-based groups for public outreach, which allowed The City of Menlo Park project to have a single unified approach to public outreach (the community was aware of the broader project and the City was then able to add value to that project). The City became the voice of the levees for this project.

Minutes

Meeting name
Environmental Defense Fund BRIC Interviews

Subject
Interview with Gabrielle Belfit, Senior Environmental Scientist and Troy Barry, Stream Restoration Specialist, Tighe & Bond

Attendees
Tighe & Bond
Gabrielle Belfit
Troy Barry

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Meeting date
Wednesday, December 22, 2021

Time
10:00-10:45 AM ET

Location
MS Teams

Project name
Nature Based Solutions to Natural Hazard Risks

AECOM project number
60667983

Prepared by
Taylor Nordstrom

General Application Questions:

1. **Please describe the project for me.**
    - The Central Street Bridge Reconstruction Project went through a number of iterations. All the elements of the project were developed along the way using grant funds from other programs before the BRIC funding was received.
        - Six years, six different grants to get the project through alternatives analysis, design, and permitting.
        - The BRIC funding is the last piece of the funding needed and is for project construction.
    - The project involves a bridge/culvert system, living shoreline, retaining walls, and vegetative plantings. It's a very complex project but has always had a nature-based solution to it (the need has always been to restore a dammed pond to tidal salt marsh—the original habitat hundreds of years ago). Site has historical interest.
    - YouTube video about the project: https://youtu.be/zUE0WHAKLR0
    - Project involved public outreach, working with permit agencies to get on track with their goals and objectives. The project was advanced with a lot of stakeholder participation.
    - This project had been in the works for a very long time. The Sawmill Brook area experienced flooding in various locations, the worst being at the mouth of the brook. The team started looking at flood mitigation throughout the entire watershed with a focus on opportunities for green infrastructure.
        - The bridge/culvert was in terrible condition. There was a tide gate that was restricting federal/state listed species (rainbow smelt/trout). The bridge component it the most complicated and expensive, so the team started there.
        - There are 11 different sites/elements envisioned. Massachusetts Public Waterfront Act (Chapter 91) led to USACE recommendation that the team combine all project elements.
2. **What are the top three things you think led to your successful win?**
    - First, this project was a long time in the making. The project was a top priority in the local HMP and is the "top on the list" of several similar plans and has widespread support.
    - Second, there were lots of stakeholders involved, including a strong technical team:
        - Massachusetts's Department of Conservation & Recreation (DCR) has a priority project program where entities apply with project ideas. Every year, DCR chooses a number of small projects they want to help complete. Those selected receive technical advice, letters of support, and recommendations for funding sources.

  - The Sawmill Brook team received advice from a NOAA coastal specialist (specializing in mud flats, tidal marshes, and permitting) and an expert from the Massachusetts Division of Marine Fisheries.
  - A local Coastal Resources Advisory group volunteered time to take measurements, assist with public outreach, develop film, and write articles in support of the project.
- Third, the team looked at the watershed from a holistic standpoint. The project combined removing the tide gate, replacing the bridge, looking at tidal influences and terrestrial runoff together, alleviating flooding, looking at sea level rise, and restoring habitat and vegetation (root wads, spartina, etc.).
  - This project was more than just "fixing 300 feet of bank," and was designed to benefit the whole watershed, not just a small component.

3. What were the most important elements of the project from your perspective?

- Answered above.

4. What advice do you have for applicants preparing for the next round?

- Be prepared to educate stakeholders. This holistic approach was a new type of project in Massachusetts and Tighe & Bond spent a lot of time talking to stakeholders and homeowners (e.g., "You're not losing your pond; it's just not going to be a fixed water surface elevation throughout the year."). Some opposition was encountered.
  - The project team was able to prove through modeling that the tide gate wasn't performing as expected (tides were overtopping it), so they were able to show why removing the tide gate was appropriate. The team also created renderings (landscape graphics) to help people envision the end product.
- Similarly, be prepared to respond to push back from stakeholders who have their own ideas/preferences for the system (for instance, the community was losing their skating pond but would have more fishing opportunities). It's important to build a base of support before beginning a project.

5. How did you engage the State as you were preparing/submitting your package?

- The first grant for the project was through Massachusetts Office of Coastal Zone Management (OCZM) to complete an analysis of the watershed and make flood mitigation recommendations. As such, the state was aware of the project right away and was involved throughout.
- Through a second grant, the team worked with FEMA to update the town's Hazard Mitigation Plan.
- The team also met with resource agencies after those two grants, developed relationship with the various agencies, and later tapped into them for grant support.

Nature-based Specific Questions:

6. Did you include nature-based elements to your project? If so, why and how did you land on the types of elements and their locations?

- The project was always about removing the tide gate. This was identified in the early 1980s when Brad Chase completed a study of rainbow smelt. The gate/culvert was harming trout habitat (fish barrier), was a flood barrier not allowing freshwater to flow out (limited tidal exchange), and was jeopardizing the roadway.
  - The culvert has had some band-aid repairs but ultimately needs to come out.
- More in-depth hydrologic model and shear stress/velocity modeling was done during design and permitting.
  - Considered different species, public access footpaths, and a bridge crossing; some alternatives were not favored for the final design.
- The team prepared very detailed Technical Specifications to ensure all the nature-based elements would be included during construction.

7. What were some of the biggest hurdles for getting the nature-based elements woven into the project?

- Design kept getting more and more expensive throughout the project, because there were a lot of questions to answer from resource agencies.

- Education was a big hurdle. Change is difficult for stakeholders, and people had questions about biomimicry and living shorelines—these are still considered experimental in many states.
- Massachusetts OCZM asked for the project team to wait to move forward with certain elements of the project. This was challenging because waiting on certain aspects that are failing is not an option.
- Priorities and permitting conditions change over time.
- To get the ecological uplift, fixing the bridge/tide gate is critical; however, it's complicated to take the bridge out of service, since it's the main access point. This is also the most expensive part of the project.
- The ecosystem components are a fraction of the total project cost (1/5th to 1/6th of the total), but convincing others that they are needed is important.

8. What advice do you have for applicants considering nature-based solutions?

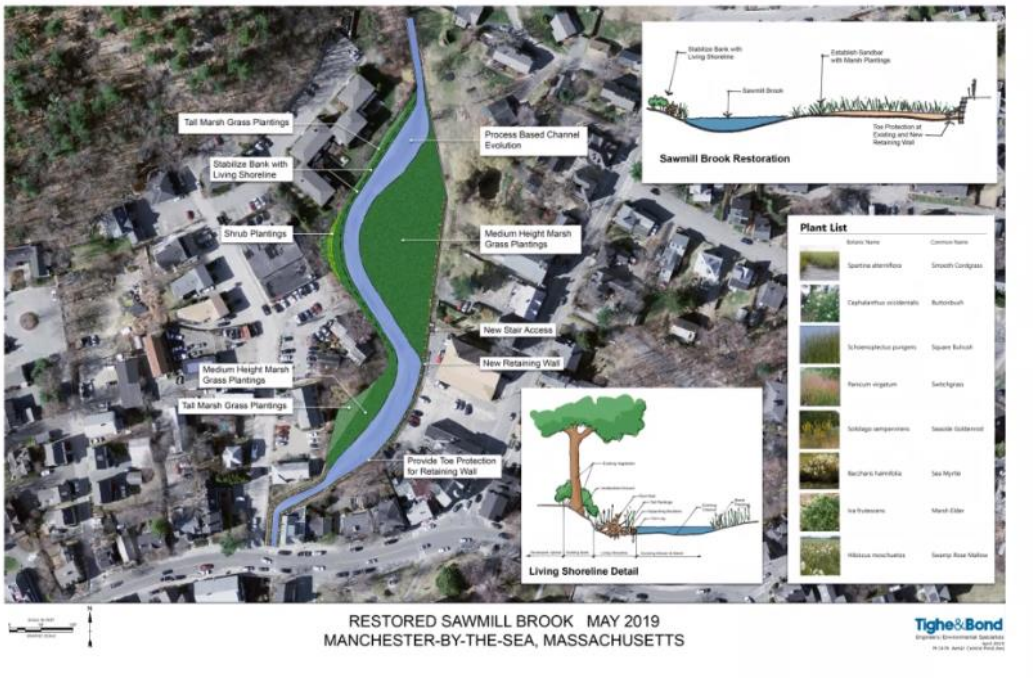
- Skipped this question for time constraints.

9. Did you quantitatively or qualitatively describe the benefits (e.g., equity, climate change resilience, quality of life) of your nature-based elements? How did you do it?

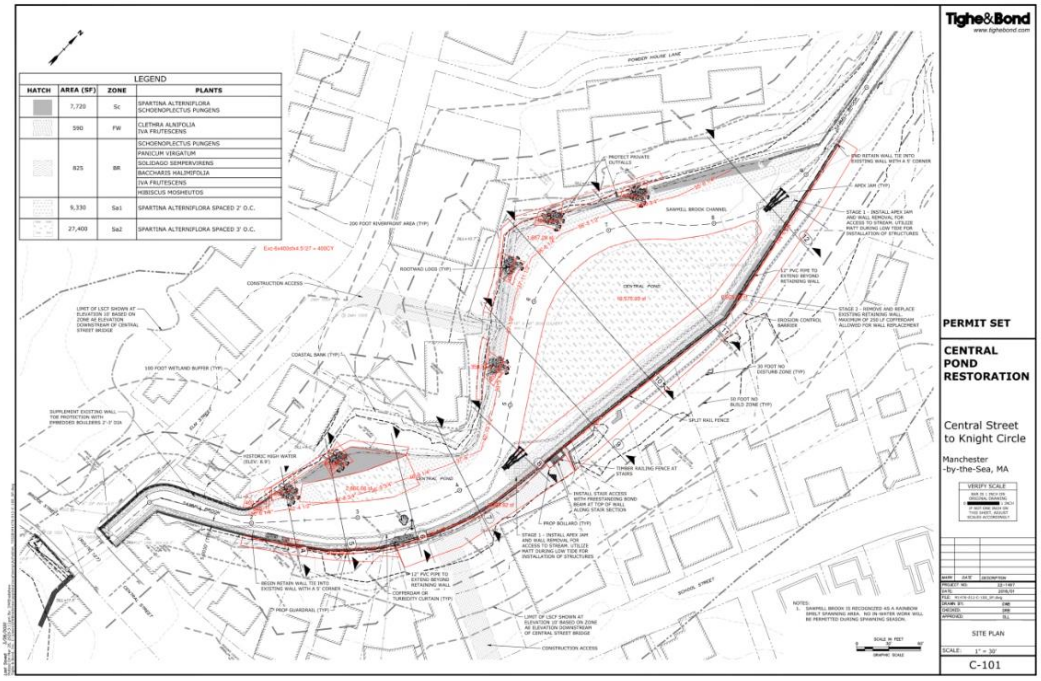
- The biggest economic benefits claimed included:
  - Transportation/traffic: The road is a major evacuation route to SH 128, so transportation and traffic were big considerations. The road provides access to downtown Manchester-by-the-Sea.
  - Emergency services: The project helps with response times for fire and police. Access to the town hall for emergency management, as well as the fire station were key benefits.
- The BRIC BCA formula is somewhat limited in what benefits can be claimed for restoration. Some nature-based benefits that were able to be claimed included:
  - Environmental benefits achieved from turning some area into salt marsh.
    - Due to the ecological uplift by salt marsh species (nutrient take-up in the mud flat).
    - This is an urban stream—some polycyclic aromatic hydrocarbons (PAHs) are in the sediment from stormwater runoff, and the vegetation will sequester and treat PAHs.
  - Nature-based shoreline stabilization and protection for infrastructure.
    - Root design using root wads and biomimicry is designed to stabilize the bank toes from tidal inflow/outflow and undercurrents.
    - This was significant because the banks are right up to the urban shoreline, so there are erosion concerns for upland infrastructure (apartments/condos, stormwater outflows, etc.).
    - Parts of the shoreline had previously been armored with rip ra and retaining walls. In some cases, replacing the walls is still required for adequate protection.

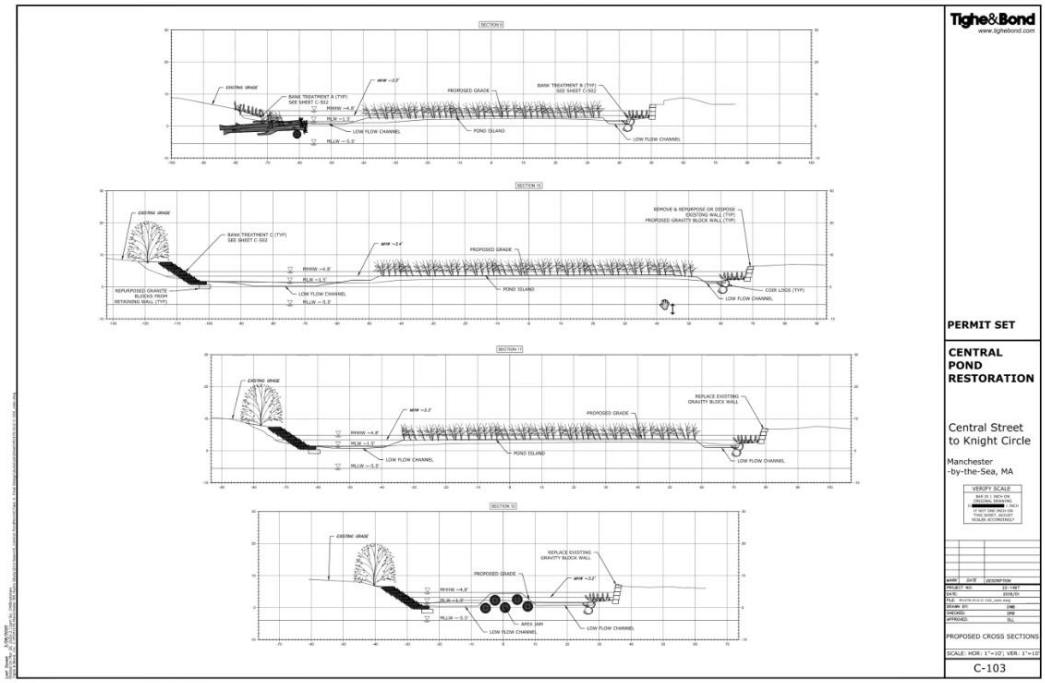
Other Comments:

- Example plan view of the project:



- Examples of permit figures that had been prepared prior to the BRIC award:
  - The first figure (C-101) shows the site plan. The second figure (C-103) shows the different styles of retaining walls used (stacked wall in the first cross-section versus a more amorphous design in the bottom three channel cross-sections):

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Meeting name Environmental Defense Fund BRIC Interviews	**Subject** Interview with Jamie Carter, Northeast Regional Geospatial Coordinator, NOAA Office for Cosatal Management	**Attendees** NOAA Jamie Carter AECOM Marisa Mason Taylor Nordstrom
Meeting date Thursday, January 6, 2022	**Time** 2:00-3:00 PM ET	
Location MS Teams	**Project name** Nature Based Solutions to Natural Hazard Risks	
AECOM project number 60667983	**Prepared by** Taylor Nordstrom	

Jamie Carter's background has been primarily in geospatial/coastal programs with NOAA. Working as part of NOAA's technical assistance/technical services team, he was embedded at FEMA to assist FEMA with understanding nature-based solutions during the FY20 BRIC cycle. He is currently working on a technical analysis of the nature-based solutions within FEMA FY20 BRIC projects.

General Application Questions:

1. **What are the top three things you look at when applications are reviewed?**
    - Jamie was involved in most steps of the BRIC project/application review—he began his detail with FEMA at the time when most FY20 BRIC applications were due. He helped looked at application eligibility, was part of FEMA's qualitative review panel, and saw portions of the National Technical Review (NTR).
    - Assuming projects are eligible, the top things we look for are:
        - At the qualitative level:
            - What is the hazard that's being mitigated?
            - Who is the benefiting population?
            - Which techniques/hazards are being considered?
        - Due to his background with NOAA, Jamie was also looking at how future conditions were being addressed.
            - Are future conditions addressed?
            - Why is the project being submitted? Is the application a "greenwashing" of a project or is it actually for a true NbS?
2. **What "stood out" in successful BRIC applications (e.g., type of community, population, demographics, location, past events, other)?**
    - The projects that had a variety of partners. It was clear that these subapplicant teams had done the legwork (project scoping/planning).
        - These projects were well-thought-out with a lot of buy-in, could more easily get non-federal sources of match fudning, and would be accepted by the community at large.
        - Projects with less buy-in didn't seem as strong right off the bat.
        - A lot of the projects that were ultimately selected for award had strong partnerships.

3. What advice do you have for applicants preparing for the next round?

- In some cases, it was clear that the applicants were under-resourced. Not enough effort was put into the BCA or to the design of the NbS.
- Unfortunately, some of the communities that really need projects fell in this bucket.
- Communities can't get ahead of themselves – they need to take time (1+ year in advance of applying for BRIC) to set up partnerships, complete studies, get buy-in, and built the scientific rigor and level of documentation for the project. Without that level of detail, it's not possible for FEMA to fund the projects.

4. What made BRIC applicants ineligible or less competitive?

- The number one thing that made a community ineligible was if the community didn't have an approved Hazard Mitigation Plan. This was the first and biggest deal breaker.
  - Most of the applications that came in were already eligible because that States had done that legwork.
  - This might be something States are seeing a lot of (no local HMP), as opposed to FEMA.
  - It's important to work with the SHMOs to make sure they understand eligibility requirements, since most of the projects are pre-screened, in a sense, here.
- During technical ranking, other project-specific issues came up.

5. How can small, economically disadvantaged communities compete effectively with larger communities with resources?

- Take advantage of FEMA's Direct Technical Assistance. There are not a lot of these opportunities, but it is a very low bar—all it takes is an email to FEMA stating the community's need.
  - There was a surprising lack of interest in Direct Technical Assistance in FY20.
- Think about partnerships—there is a lot of interest at the federal and agency-levels across the country to address the needs that communities have. Going forward, there may be more opportunities coming out (e.g., with NOAA, EPA, EDF, etc.) to partner with agencies to get the communities the technical help that they need.
  - Connect with SHMOs to determine if other entities have capacity to assist.
- Think about phasing projects: take a complicated project and break it into phases so that the community can fund some of the research and modeling they need, for example, to then be able to move into the second phase.

6. How important is project schedule in evaluating applications (i.e., is the time required to start realizing project benefits a consideration)?

- Having a solid schedule in place in the application is critical. This is addressed at the NTR level. Consulting engineers look at the project schedules during their review.
  - If the schedule doesn't look reasonable, FEMA may go back to the subapplicant to make sure that the schedule will work for the projects, but they won't necessarily disqualify a project.
- Reviewers didn't talk about looking specifically at when the benefits from NbS would start to accrue as part of the project schedule. The schedule needed is really just the end date for construction.
- There is an issue with the discount rate associated with NbS and FEMA can't/doesn't expect that the NbS benefits begin right away once the project is construction.
  - At this point in the BRIC program, it won't necessarily hurt a subapplicant's chances of having a project selected if NbS benefits don't start right away. It may be more of a consideration in the future.

7. Based on the changes that have been made ahead of the FY21 BRIC application cycle, what advice do you have for states seeking competitive funding?

- Know what State deadlines are since they vary state-by-state.
- Having appropriate documentation done before submitting an application is very important (partnerships, studies, etc.).

- Make sure the community's HMP is updated, in effect, and that FEMA is aware of it. FEMA checks subapplications against their internal HMP database.
- Building Codes and BCEGS (Building Code Enforcement) are important—across the board, communities that were successful in having their projects selected had building codes in effect. The most competitive had their BCEGS rankings of <5.
  - This is not formally a requirement for the BRIC program but is effectively a requirement at this point.
- The top-ranking projects were able to check the box across the board on the Technical Criteria. Some of the smaller categories (the 5-pointers) were not necessarily checked, but all the big boxes need to be able to be checked to get to the technical review phase.

8. What are the major changes/updates to the BRIC application process for FY21?

- Jamie was there when FEMA was putting together the NOFO for FY21.
- Funding caps were bumped up considerably for the program as a whole.
- FEMA renamed "small impoverished communities" to "economically disadvantaged rural communities." This is just a name change—no difference in the definition.
- FEMA provided guidance to the States to make sure that their deadlines were far enough in advance of the National deadline that there wouldn't be issues with application packages coming in at the last moment.
  - All the States have different deadlines.

9. In terms of project size, what might "too small" look like and what might "too big" look like?

- Practically, projects <$100,000 are probably too small (not worth the time/effort). FEMA also only awarded one project in FY20 that went all the way to the $50 million funding cap.
  - Imagine a normal distribution for the project costs and pick something in between.
- Projects that were incomplete solutions (i.e., only addressed a small area of a greater area of need) didn't perform well. Projects should address the full extent of the risk even if it makes for a more expensive project.

10. How are risks/mitigation strategies considered in evaluating project applications?

- FEMA has had the Pre-Disaster Mitigation (PDM) program in place for a long time—BRIC is essentially the update to that program.
- SHMOs are familiar with standard projects after PDM. BRIC is being used to encourage innovation.
  - Projects need to be within the bounds of reason and something that FEMA officials and reviewers will still be comfortable with.
  - Projects that are exceptionally innovative will need an abundance of documentation to justify and back-up their approach.

Nature-based Specific Questions:

11. Did you see specific types of nature-based projects stand out more than others in the review process and if so, what made them stand out?

- A lot of projects incorporated wetlands. Protecting coastal wetlands and riparian/riverine floodplain areas were the most common NbS.
- Living shorelines and stabilized/hybrid dune systems were pretty common.
- Fewer applications were received on the whole for wildfire/heat projects. Of these projects, creation of defensible space, incorporation of trees (urban canopy) and vegetation in urban areas to mitigate the effects of heat were the most common NbS.
- Most NbS were tied to infrastructure retrofits in two main categories: (1) protecting stormwater systems and critical infrastructure (utilities, hospitals), and (2) flood risk reduction.
  - They were always hybrid approaches with a mix of traditional engineering solutions tied-in with NbS.

12. What are the biggest hurdles for nature-based projects to be selected?

- Not too different from a traditional project.
- One challenge is that if the subapplicant is relying on the NbS to provide the risk reduction, there needs to be sufficient modeling to support that type of solution. The necessary data (showing a full record before mitigation and then the with-project mitigation results) need to be there.

13. What advice do you have for applicants preparing a NBS project submission for the next round?

- Thoroughly review and understand all of FEMA's guidance related to NbS, as well as other materials like the TNC guidebook for nature-based hazard mitigation.
- Adequately represent the NbS in the benefit-cost analysis. There are trainings available for this to help applicants think through their BCA, and FEMA has a BCA team with a helpline. FEMA is willing to accept benefits-transfer methods and other methods done outside of the BCA tool, but there has to be communication with FEMA ahead of time.
- Talk to FEMA! Make sure they agree that the subapplicant has a good approach.

14. How are benefits (e.g., equity, climate change resilience, quality of life) considered in the selection process beyond such items as damage avoidance to structures, contents, and environment?

- These benefits represent things that could eventually be quantified in the BCA (FEMA is looking at a future approach to including these secondary benefits). Right now, these elements are only being looked at in the qualitative review process.
  - FEMA relies heavily on national partners to come and help make the qualitative reviews.
  - Applicants need to be very clear in their writeups (typically the scope of work) to incorporate language related to non-traditional benefits, since this is what the qualitative review panelists will be reading.

15. What were the major scoring factors for successful Nature Based Solutions projects in FY20 BRIC applications?

- For a subapplication to end up at the top of the pile to go to the NTR panel, it must be extremely clear in the subapplication that this is a nature-based projects.
  - Some projects received 10 points when they weren't a NbS and vice-versa. This was sorted through/weeded out later.
  - Make sure the nature-based element is very clear. Include it in the title of the project.
  - Supporting documentation should continue referencing the nature-based approach throughout the subapplication.
- From a reviewer's perspective, the risk reduction benefits and ancillary benefits need to be spelled out clearly and documented/supported with justification.
  - E.g., does the engineering support the use of a living shoreline? Does the community account for sea level rise?

Other Comments:

- N/A

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