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## Case Study: Community Resilience Planning in the Hurricane Sandy Coastal Resilience Program

Contract # 5359

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# Case Study: Community Resilience Planning in the Hurricane Sandy Coastal Resilience Program

Prepared by Abt Associates, September 2019

## Summary

### Purpose

This case study forms part of a larger 2019 evaluation of the Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program) of the U.S. Department of the Interior (DOI) and the National Fish and Wildlife Foundation (NFWF). It provides an analysis of the coastal resilience impacts of community resilience planning projects.

### Scope

We examined 28 community resilience planning projects in the Hurricane Sandy Program portfolio. These projects created site-specific designs, management plans or assessments, and models or mapping tools for improving coastal resilience.

### Findings

Key findings identified using archival materials, a survey and interviews of project leads, and internet searches include:

- Hurricane Sandy Program community resilience planning projects created 126 management plans or assessments, 85 site-specific designs, and 65 resilience tools to identify, describe, or prioritize future actions that would improve community resilience. These plans promote the broader adoption of key resilience activities, such as dam removal, funded by the Hurricane Sandy Program.
- The adoption and implementation of planning products by communities varied across projects, with availability of funding noted as a key factor in the speed of uptake.
- The majority of the projects (18 of 28) have successfully completed their proposed activities.
- More than half (15 of 28) of the community resilience planning projects have already led to actions that are directly increasing resilience, with a rapid progression from planning to implementation.

### Conclusion

Overall these findings suggest that **investments in the Hurricane Sandy Program have catalyzed resilience benefits by attracting additional funding for on-the-ground resilience activities and promoting resilience activities to a broader set of communities.** Project leads developed planning products that provided site-specific designs for future projects, identified key assets and vulnerabilities, recommended actions for improving resiliency, and shared knowledge and outreach on potential strategies. These products also increased the visibility of natural and nature-based solutions to coastal hazards, and promoted the uptake and implementation of such solutions in communities beyond those funded directly by Hurricane Sandy Program grants. Early success stories (such as projects obtaining funding and moving rapidly toward implementation after plans were completed) indicate the potential value of resilience planning projects. Overall, however, the direct resilience benefits of planning efforts will take time to fully materialize, as plans need to be adopted and funding obtained before implementation proceeds.

## 1. Introduction

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This case study forms part of a larger 2019 evaluation of the DOI and NFWF Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program). Between 2013 and 2016, the Hurricane Sandy Program, administered through both DOI and NFWF, invested over \$302 million to support 160 projects designed to improve the resilience of ecosystems and communities to coastal storms and sea level rise.<sup>1</sup> The program supported a wide array of activities including aquatic connectivity restoration, marsh restoration, living shoreline creation, community resilience planning, and coastal resilience science to inform decision-making. Each of these activities has a distinct impact on ecosystem and community resilience.

DOI and NFWF drafted the following questions to serve as the focus of the evaluation:

1. To what extent did projects **implement activities** as intended? What factors facilitated or hindered project success?
2. What **key outcomes** were realized for habitat, fish and wildlife, and human communities?
3. Is there evidence that investments in green infrastructure are **cost-effective** compared to gray infrastructure?
4. Did investments in tools and knowledge related to resilience **improve decision-making**?
5. What **information is needed** to better understand the long-term impacts of investments in resilience?

The evaluation includes six case studies, each providing a deeper level of analysis on a subset of the projects.

### 1.1 Purpose

This case study provides an in-depth analysis of projects that focused on planning activities associated with improving community resilience. This case study focused on evaluation questions #1, #2, and #5 (above). We identify key findings about the development of these planning products and examine the available evidence about the impacts of these planning activities on community resilience.

### 1.2 Scope

This case study examined 28 community resilience planning projects in the Hurricane Sandy Program portfolio. Projects in this category produced plans, strategies, and recommendations for improving resilience. To be included in this category, a project must have focused on planning activities, including site-specific designs, community or regional management plans or vulnerability assessments, and resilience tools tied to specific planning activities. Projects that primarily focused on generating new scientific knowledge were included in the data, mapping, and modeling case study (Abt Associates, 2019a). See Section 3 for a more detailed description of the portfolio of community resilience planning projects; and Appendix A for a full list of the 28 projects.

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<sup>1</sup> The evaluation covers these 160 projects. In some cases DOI and NFWF reinvested unspent funds in new, additional projects after the December 2016 cutoff date. These new projects are not included in the evaluation.

### 1.3 Organization

The remainder of this document is organized as follows:

- Section 2 provides an overview of the methods and information sources used for this case study
- Section 3 provides a detailed overview of the community resilience planning projects included in the Hurricane Sandy Program
- Section 4 discusses key case study findings, organized by evaluation question and topic
- Section 5 provides a brief conclusion.

## 2. Methods Overview

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This case study integrates information from the following information sources:

- Archival materials from Hurricane Sandy Program project files (e.g., proposals, interim and final reports)
- A survey of project leads via a web-based instrument
- Interviews with 15 project leads who led community resilience projects
- Interviews with NFWF and DOI staff
- Quantitative information provided by project leads in their reports (e.g., number of outreach activities completed, number of people reached through outreach activities)
- Internet searches about specific projects, with a particular focus on identifying follow-on resilience-building actions.

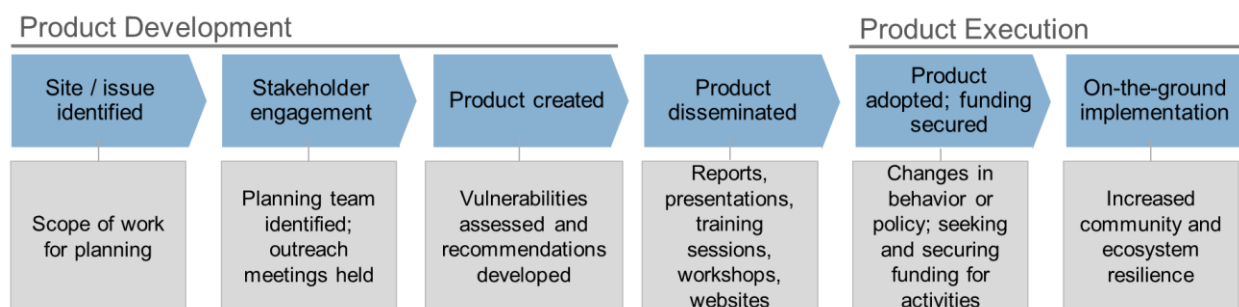
A more detailed description of evaluation methods can be found in Abt Associates (2019b).

## 3. Overview of Projects

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Engaging in planning activities can increase the potential for rapid and effective resilience actions in the future. For example, when site-specific designs are developed for on-the-ground restoration projects, these projects can proceed more rapidly to implementation once funding is received. At the community or regional level, management plans and tools can help identify the activities that will result in the greatest resilience benefits to the community. Overall, if planning activities are properly scoped and developed, they can expedite implementation of activities that improve community resilience (see Figure 1).

**Figure 1. Logic model showing how community resilience planning projects can support improved resiliency, with relevant examples from each step in the logic chain**

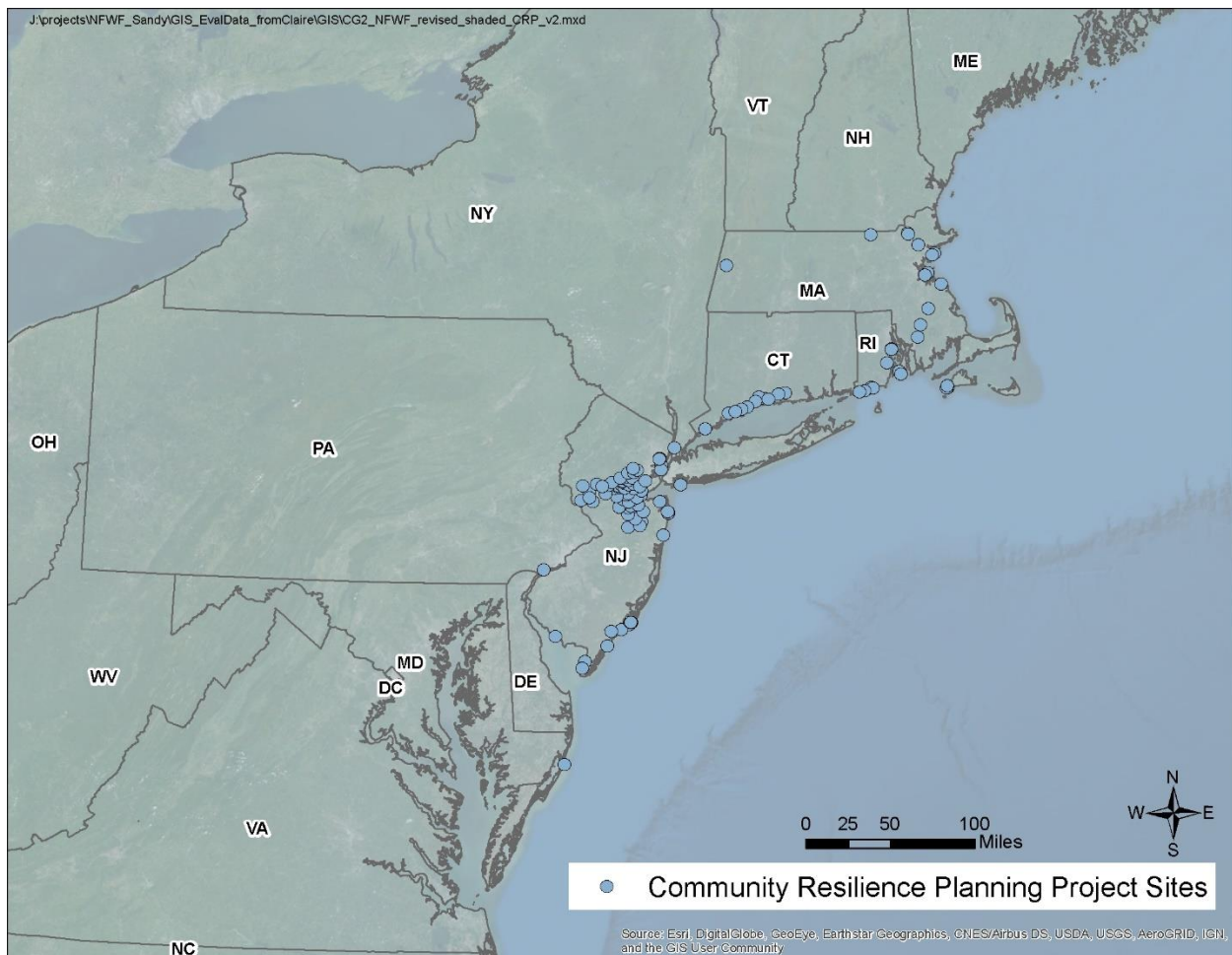




The Hurricane Sandy Program portfolio supported 28 projects that specifically focused on engaging in planning activities to improve coastal resilience; the program invested more than \$22.9 million in community resilience planning activities across these projects (see Figure 2). Twelve of these projects also included other resilience activities; the total funding provided by the program for all of the activities in the 28 projects was \$50.9 million.<sup>2</sup> The projects were implemented by NFWF and by a subset of bureaus within DOI, as follows (with the amount of funding provided specifically to community planning activities in parentheses):

- NFWF (24 projects, \$14.5 million)
- National Park Service (NPS) (two projects, \$0.9 million)
- Bureau of Land Management (BLM) (one project, \$3.5 million)
- Bureau of Safety and Environmental Enforcement (BSEE) (one project, \$4.0 million).

**Figure 2. Location of community resilience planning activities.<sup>a</sup>**



a. Since some projects conducted planning activities in multiple sites (see Appendix A), the number of community resilience planning project sites (dots) in the figure exceeds 28.

<sup>2</sup> Table A.1 presents the amount of project funding specifically allocated to community resilience planning activities. For 16 projects, this was the full project funding amount. For 12 projects, this is a subset of the total project funding. The allocation was based on available project documentation.

## 4. Findings

### Topic: Project Implementation (PI)

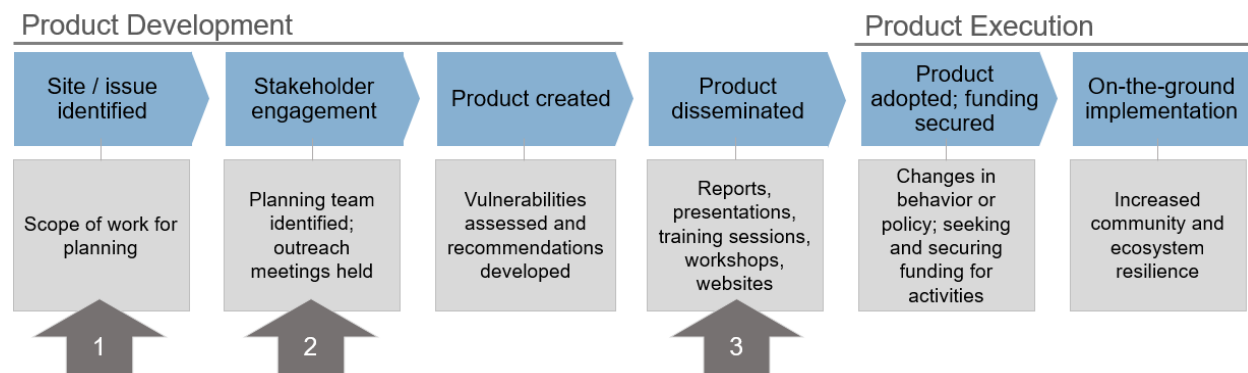
**Finding PI.1: Nearly 65% of the projects had successfully completed their proposed planning activities at the time of evaluation. There were typically minimal changes in scope of the planning activities.**

Eighteen of the 28 community resilience planning projects were completed<sup>3</sup> at the time of the evaluation, with 10 projects still considered active. For the projects that focused solely on planning, only two had changes in scope and both were minor. As discussed below, some planning projects had remaining funding and time to progress from the planning to implementation stage, which required a change in scope.

**Finding PI.2: A combination of factors delayed 21 of the 28 projects, including data gathering and coordination.**

Contract amendment data available through NFWF and DOI show that 21 of the 28 projects that included community resilience planning activities were delayed by an average of about one-and-a-half years (516 days), compared to the original completion estimates. However, 11 of these projects also included significant on-the-ground restoration components, and in all 11 cases, those project delays were related to on-the-ground activities (i.e., permitting project design, contracting, or procurement issues). The remaining 10 projects experienced delays at different stages in the planning cycle, including the need for additional data collection or changes to project design prior to creation (Figure 3 – Arrow 1), additional time to effectively coordinate project activities with other partners (Figure 3 – Arrow 2), and difficulties in completing outreach to key audiences of planning efforts (Figure 3 – Arrow 3).

**Figure 3. Planning steps associated with project delays.**



<sup>3</sup> While our evaluation generally provides findings elicited through the review of archival materials received through December 2018, project status information reflects information gathered through April 2019 (updated project status information was obtained through a supplementary web search in March 2019 and an updated spreadsheet provided by NFWF).

#### 4.1 Human Community Outcomes

**Finding PO.1: The program has supported the creation of 276 individual planning products that are designed to identify, describe, or prioritize future actions that would improve community resilience.**

Projects that included community resilience planning created different types of planning products as their final deliverables. To better understand the scope and purpose of these planning products, we categorized them into three different types of products (Box 1). Projects completed one or more of each type of product. To be included in this category, a project must have focused on planning activities; projects that primarily focused on generating new scientific knowledge were included in the data, mapping, and modeling case study.

##### Box 1. Products created by community resilience planning projects.

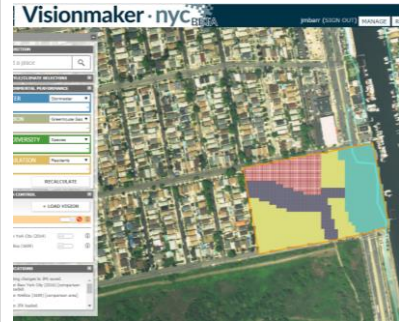
**Site-specific designs.** Projects created detailed plans for restoration activities at specific sites, including plans for restoration of aquatic connectivity, marsh restoration, beach and dune restoration, and green infrastructure.



**Management plans or assessments.** Projects created documents detailing key vulnerabilities and assets within their chosen area (ranging from a single community to a region), and provided recommendations for actions to improve resilience.



**Resilience tools.** Projects created datasets, mapping interfaces, websites, or online tools to inform resilience. These tools were published for use by community leaders and the general public to incorporate in their planning activities.



Source: Project reports.

Using the information from archival materials, we estimate that the community resilience planning projects funded through the Hurricane Sandy Program produced 276 planning products (Table 1). Human communities benefit from these planning products because they enable sound decision-making about future resilience investments.

**Table 1. Projects and their resulting community resilience planning products and implementation activities, organized by number of products.** (Dashes indicate no product was created or implementation is not yet proceeding.)

Project identification (ID)	Project title	Number of products by category			Type of Implementation
		Design	Plan or assessment	Tool	
NFWF-44193	Incorporating green infrastructure resiliency in the Raritan River Basin, New Jersey	54	55	56	Install green infrastructure
NFWF-42697	Building green infrastructure into community policies (RI)	3	1	2	–
NFWF-43429	Creating a resilient Delaware Bay shoreline in Cape May and Cumberland counties, New Jersey	1	8	–	–
NFWF-44020	Developing a green infrastructure plan for Chester City, Pennsylvania	1	1	–	Install green infrastructure
BLM-unknown	Seed banking for resiliency project: An end of year report to the Department of Interior on 2015 activities and planned activities in 2016	–	3	1	Perform seed collections
NFWF-43281	Restoring Delaware Bay’s wetlands and beaches in Mispillion Harbor Reserve and Milford Neck Conservation Area	2	–	1	Restore beach
NFWF-42671	Enhancing seven communities, ecosystems, and infrastructure resiliency by removing seven fish barriers, Massachusetts	13	–	–	Remove dams
NFWF-41739	Reusing dredged materials to enhance salt marsh in Ninigret Pond, Rhode Island	2	–	–	Restore marsh
NFWF-43931	Strengthening Marshes Creek through green and grey infrastructure, New Jersey	2	–	–	–
NFWF-42714	Transforming Hoboken’s Block 12 into a green infrastructure asset, New Jersey	1	–	–	Install green park
NFWF-42957	Designing a daylighting plan to improve Harlem River’s water quality and resiliency, New York	1	–	–	–
NFWF-42984	Enhancing Mill River’s flood resiliency and habitat corridor, Connecticut	1	–	–	Install green park
NFWF-43290	Developing a design that will enhance Liberty State Park’s marshes and upland habitats, New Jersey	1	–	–	Restore marsh
NFWF-43986	Strengthening Monmouth Beach’s marshes and dunes, New Jersey	1	–	–	–
NFWF-44199	Designing a plan to reuse dredged rock to protect the Boston Harbor shoreline, Massachusetts	1	–	–	Install rocky berm/reef



Project identification (ID)	Project title	Number of products by category			Type of Implementation
		Design	Plan or assessment	Tool	
BSEE-69	Improve resilience of the Ohmsett facility	1	–	–	Renovate facility
NFWF-42279	Building ecological solutions to coastal community hazards (NJ)	–	33	–	Restore instream habitat; install living shorelines
NFWF-44245	Developing a resiliency management plan for Pawcatuck River Watershed, Connecticut and Rhode Island	–	13	–	–
NFWF-44271	Creating a regional framework for coastal resilience in Southern Connecticut	–	4	–	–
NFWF-41766	Coastal resiliency planning and ecosystem enhancement for Northeastern Massachusetts	–	2	–	–
NFWF-43322	Enhancing Wampanoag Tribe of Gay Head's land resiliency in Martha's Vineyard, Massachusetts	–	2	–	Replant vegetation
NFWF-41795	Strengthening Sachuest Bay's coastal resiliency, Rhode Island	–	1	–	Install BMPs
NFWF-43861	Creating a natural resource resiliency assessment and action plan, Rhode Island	–	1	–	–
NFWF-44140	Improving coastal resiliency through community engagement, Ohio and Rhode Island	–	1	–	–
NPS-23	Final Fire Island wilderness breach management plan/environmental impact statement	–	1	–	–
NFWF-42551	Green infrastructure in Accomack and Northampton counties (VA)	–	–	2	Tool applied to plans
NFWF-44157	Repairing infrastructure and designing wetland and beach restoration plans along the Central Delaware Bayshore	–	–	2	–
NPS-14-7	Visionmaker Jamaica Bay: Evaluation and synthesis of community generated adaptation strategies to enhance resilient ecosystems in Jamaica Bay, NY (subproject)	–	–	1	–

## Site-Specific Designs

Fifteen community resilience planning projects focused on creating site-specific designs for future on-the-ground resilience projects. These included “shovel-ready designs” that can be implemented as soon as implementation funding is in place and “conceptual designs” that can enable project leads to prioritize future resilience projects based on factors such as cost, degree of benefit, and likelihood of success. The 15 projects completed a total of 85 site-specific design products. Approximately half of these projects proceeded with implementation of their planning activities (Box 2).

### Box 2. Site-specific designs: An example of developing plans to expedite future resilience projects.

A Massachusetts project created **site-specific designs for removing three dams** at risk for causing flood damage. After the plans were created, the project secured additional funding to move ahead with **removal of all three dams**. The project also developed **conceptual plans and cost estimates for an additional 10 new dam removals** based on a statewide public safety and ecological benefit prioritization process. With the conceptual plans in place, 1 of the 10 sites is planned to move forward with removal.



*Ipswich Mills Dam, funded for a removal feasibility study, scheduled to be removed in summer 2019.*

Source: Ipswich River Watershed Association.

## Management Plans or Assessments

Fourteen community resilience planning projects created 126 management plans or assessments that provided recommendations and guidance for improving resilience at the city, regional, or watershed level (Box 3). These planning products served two main purposes:

- To identify key assets and vulnerabilities within a city, region, or watershed so that future projects can focus on activities and areas that provide the greatest benefits for resilience
- To provide specific recommendations for future activities, including green infrastructure installation, marsh management strategies, and watershed conservation and management plans.

### Box 3. Management plans and assessments: An example of developing plans to expedite future resilience projects.

This project developed a framework document describing actions to expand the use of green stormwater infrastructure to enhance stormwater management, reduce water volume and flooding, and protect water quality in a Pennsylvania community. **The plan defines green stormwater infrastructure approaches, describes the applicability of different approaches within the community, outlines relevant regulatory requirements, and offers potential first steps toward implementation.** At the time of the plan's publication, which coincided with the city's broader climate adaptation planning strategy, the city announced a community-based public-private partnership to invest \$50 million in the design, construction, and maintenance of green stormwater infrastructure within the community over the next two decades.

*A screenshot of the City of Chester Green Stormwater Infrastructure Plan.*

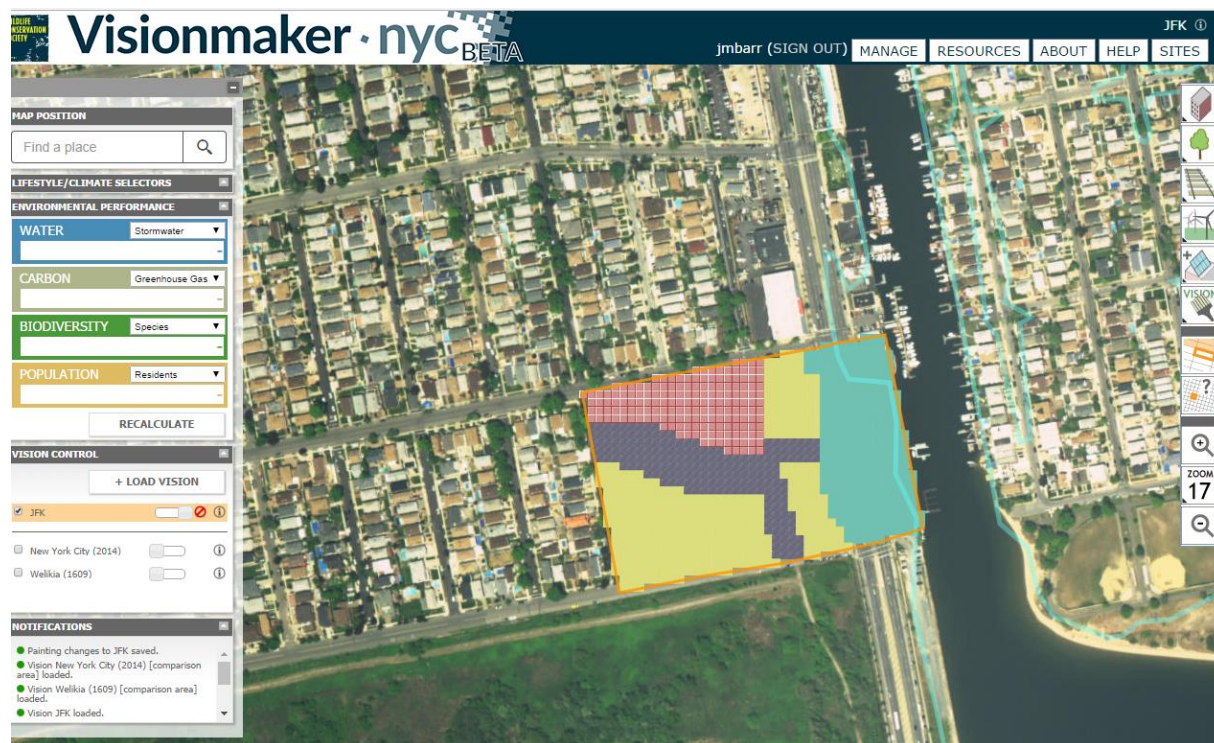


### Resilience Planning Tools

Seven community resilience planning projects created 65 models, maps, and web tools to provide resilience recommendations for future planning efforts. These tools are designed to inform future restoration and communicate available resilience options to the interested public and municipal leaders for implementation (Box 4).

#### Box 4. Resilience planning tools: An example of developing plans to expedite future resilience projects.

A New York project developed a free online tool called Visionmaker Jamaica Bay. The tool incorporates current values of relevant environmental metrics such as greenhouse gas emissions, combined sewer overflows, and population density. Users are able to modify ecosystems and infrastructure, and select climate scenarios to create “visions” to evaluate ecosystem and economic responses to various resilience strategies.



A screenshot of the Visionmaker Jamaica Bay tool from the Howard Beach neighborhood in New York City.

#### Finding PO.2: Adoption and implementation of planning products by communities varied across projects, with availability of funding noted as a key factor in the speed of uptake.

Following creation of these planning products, 14 projects reported hosting workshops, training sessions, or other forms of direct outreach to share their products (“Product disseminated” step in Figure 3). Teams held community and decision-maker engagement workshops, created outreach documents, and sent products directly to relevant stakeholders. The success of these outreach and engagement efforts was not measured systematically across projects. Anecdotally, projects noted positive reactions to their planning products and a willingness by communities to incorporate them into their planning processes. Overall, project leads noted that getting engagement and buy-in for their products from elected officials, community planners, and relevant city staff was a success factor in advancing the use and implementation of the plans.



Project leads for some projects described limitations or slowness in the uptake of their planning products, primarily due to funding limitations or to a lack of experience within communities for new resilience approaches. For example, one project created flood management plans for several communities, but noted the communities had limited funding and staff to readily incorporate major recommendations such as dam removals. The communities did readily incorporate some smaller elements into their planning, such as revisions to town ordinances and green infrastructure installations. Another project created several community vulnerability assessments, and noted that while the reception to their resilience guide was positive, individuals and governments were slow to integrate the new approaches into existing management strategies. They attributed this slowness to the relatively new approach of incorporating ecological solutions into community planning.

Factors contributing to successful uptake of planning products are described below under PO.3.

**Finding PO.3: For 54% of the community resilience planning projects, planning activities have already led to actions that have directly increased resilience and promoted adoption of resilience activities beyond the original project areas.**

Fifteen of the 28 community resilience planning projects have reported that implementation of the planned activities is already moving forward (Table 1; Box 5). Projects anecdotally reported that the existence of plans was a key factor in gaining funding and buy-in to move resilience efforts forward. Several projects' (see Boxes 2 and 5) Hurricane Sandy grants originally only focused on planning, but were modified to incorporate on-the-ground implementation of their planned activities. This rapid progression occurred because the planning documents enabled the project team to quickly leverage additional funding and proceed directly to implementation. In some cases, project success and implementation also spread outside the original project area or audience.

In addition to leveraging additional funding, project leads noted some common factors that led to successful adaptation or implementation of their planning products. The most important success factor was gaining buy-in from the public and relevant municipal actors throughout the development, dissemination, and execution of products. Gaining their input, and tailoring products to the concerns and needs of the actors, increased the likelihood of uptake upon project completion. Project leads also noted that a greater degree of specificity led to better uptake of the plans. For example, the creation of detailed plans for particular sites led to obtaining implementation funding. Providing comprehensive recommendations for actions to be taken enabled target audiences to better envision the benefits, compared to more general planning advice. While specificity was a factor for success, projects also emphasized the need for flexibility in plans. Several projects noted that any challenges that arose (e.g., new suggestions from stakeholders, funding and permitting setbacks, site-related issues) could be more easily overcome by having backup options or the ability to adjust their plans.



### Box 5. Examples of successful planning product incorporation and implementation.

A **New Jersey project** from Rutgers University created land cover assessments and site-specific designs of green infrastructure. Although the project originally envisioned focusing solely on the planning stage, development of the plans enabled the project to move forward to implementation under the Hurricane Sandy Program grant. The project used Hurricane Sandy Program funds to install 67 structures, including residential rain gardens and incorporation of green infrastructure best management practices (BMPs) at public sites. The structures in total are estimated to manage drainage across approximately five acres and prevent approximately two million gallons of stormwater from entering local waterbodies, thereby improving water quality and reducing flood risk. This project then catalyzed additional resilience activities. Project outcomes were presented at a Regional Green Stormwater Infrastructure Meeting at the University of Connecticut (UConn) in spring 2015, which resulted in a joint National Oceanic and Atmospheric Administration proposal for Rutgers University to work with UConn to develop similar green infrastructure planning products in Connecticut.

✓ Residential Rain Gardens

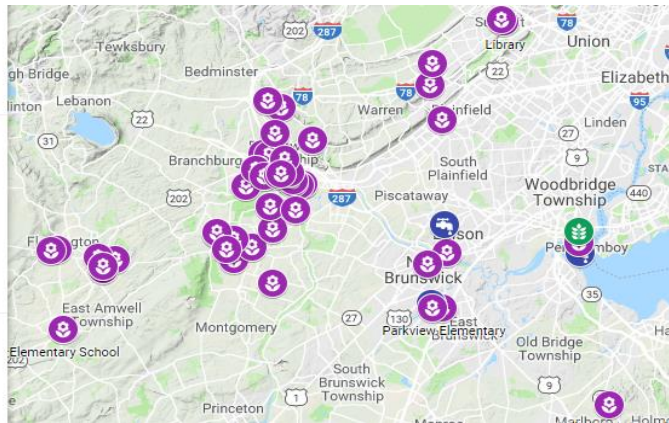
▼ Rain Garden

✓ Public BMP Sites

▼ Rain Garden

▼ Cistern

▼ Depaved



Source: Rutgers.edu.

A **Rhode Island project** reported that the three communities targeted in their plan had adopted their recommendations for stormwater retrofits and near-term implementation of green infrastructure. The project also noted that their green infrastructure planning product was incorporated into a larger state-wide program, expanding the target project audience from three initial communities to a larger network of municipal planners.

Source: Project final report.



A **New Jersey project** provided technical assistance to 10 municipalities to identify or implement new ecologically based resilience strategies, with a goal of implementing projects in 5 of the municipalities. Although delays occurred, by the end of the grant the project had exceeded its initial goals, and 9 of the 10 municipalities had successfully implemented their planned projects. These projects restored 1,010 linear feet of instream habitat and installed 550 linear feet of living shorelines.

Source: Project final report.



## 4.2 Habitat, Fish, and Wildlife Outcomes

**Finding PO.4: Implementation of community resilience planning products will result in the restoration of marsh, beach, and aquatic areas; and the installation of living shorelines and green infrastructure.**

As noted in Table 1, 15 projects are already moving toward implementation, including restoring marsh, beach, and aquatic habitats; removing dams to enhance aquatic connectivity; and installing living shorelines and green infrastructure. Additional projects have planned activities in these same categories but have not yet obtained the funding for implementation. As described in separate case studies, on-the-ground implementation of these activities will lead to habitat, fish, and wildlife benefits as the projects mature (Abt Associates, 2019c–f).

### Topic: Information Gaps (IG)

**Finding IG.1: More time is needed to observe how and to what extent different planning products are used to move forward with implementing on-the-ground resilience activities.**

Similar to data, mapping, and modeling projects, the direct resilience benefits of planning efforts take time to fully materialize. Key steps (as described in the logic chain; Figure 1) can include (1) promotion of the planning documents or tools, (2) adoption of planning documents or tools by relevant decision-makers, (3) further prioritization of proposed resilience activities within the plans, (4) acquisition of funding for implementation (which may include the need for further site-specific designs and environmental permitting), and (5) implementation of on-the-ground interventions. As described in the marsh and beach/dune restoration case studies, there is also a time lag between project implementation and full realization of the resilience benefits of those activities as the project matures. Although some projects moved quickly from the planning to implementation stages (see Finding PO.3), we expect that longer-term assessments are needed to fully understand how and to what extent these recently completed planning products have led to resilience benefits such as improving habitats or reducing flood risk for communities.

## 5. Conclusion

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Community resilience planning projects created a variety of products to better understand, communicate, and prepare for potential activities to increase coastal resilience. The format of these products included site-specific designs, management plans or assessments, and resilience tools, depending on the specific planning need targeted. These products have increased the visibility of natural and nature-based solutions to coastal hazards. Planning activities have promoted the uptake and implementation of such solutions in communities originally targeted by the grants, as well as across broader areas that have made use of the planning products. In some cases, the plans have enabled rapid progression to project implementation. Further time and assessment are needed to understand the full uptake of the planning products and how they have catalyzed long-term resilience benefits in coastal communities.

## 6. References

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Abt Associates. 2019a. Case Study: Improving Resilience through Data, Mapping, and Modeling in the Hurricane Sandy Coastal Resilience Program. Rockville, MD.

Abt Associates. 2019b. Evaluation of Hurricane Sandy Coastal Resilience Program. Rockville, MD.

Abt Associates. 2019c. Case Study: Improving Marsh Resilience through the Hurricane Sandy Coastal Resiliency Program. Rockville, MD.

Abt Associates. 2019d. Case Study: Cost-Effectiveness of Reducing Coastal Erosion through Living Shorelines in the Hurricane Sandy Coastal Resiliency Program. Rockville, MD.

Abt Associates. 2019e. Case Study: Restoration of Aquatic Connectivity in the Hurricane Sandy Coastal Resilience Program. Rockville, MD.

Abt Associates. 2019f. Case Study: Restoring Beaches and Dunes through the Hurricane Sandy Coastal Resilience Program. Rockville, MD.

## Appendix A. Project Summaries

**Table A.1. Community resilience planning projects supported through the Hurricane Sandy Program.** This table presents the amount of project funding specifically allocated to community resilience planning activities. For 16 projects, this is the full project funding amount; and for 12 projects, this is a subset of the total project funding. The allocation was based on available project documentation. All dollars rounded to the nearest hundred.

Project identification number	Project title	Project state	Project lead organization	Award amount	Reported matching funds
				Values represent community resilience planning activities only	
BLM-unknown	Seed banking for resiliency project	Multi: CT, DC, DE, MA, MD, ME, NH, NJ, NY, RI, VA	Bureau of Land Management	\$3,500,000	\$0
BSEE-69	Improve resilience of the Ohmsett facility	NJ	Bureau of Safety and Environmental Enforcement (BSEE)	\$4,000,000	\$0
NFWF-41739	Reusing dredged materials to enhance salt marsh in Ninigret Pond, Rhode Island	RI	Rhode Island Coastal Resources Management Council	\$325,000	\$38,600
NFWF-41766	Coastal resiliency planning and ecosystem enhancement for northeastern Massachusetts	MA	National Wildlife Federation	\$294,000	\$159,700
NFWF-41795	Strengthening Sachuest Bay's coastal resiliency, Rhode Island	RI	Town of Middletown	\$229,000	\$64,400
NFWF-42279	Building ecological solutions to coastal community hazards, New Jersey	NJ	New Jersey Department of Environmental Protection	\$3,440,000	\$894,900
NFWF-42551	Green infrastructure in Accomack and Northampton counties, Virginia	VA	The Nature Conservancy	\$292,000	\$59,000
NFWF-42671	Enhancing seven communities, ecosystems, and infrastructure resiliency by removing seven fish barriers, Massachusetts	MA	Fish and Game, Massachusetts Department of/ Division of Ecological Restoration	\$448,800	\$162,400
NFWF-42697	Building green infrastructure into community policies, Rhode Island	RI	University of Rhode Island	\$400,000	\$0
NFWF-42714	Transforming Hoboken's Block 12 into a green infrastructure asset, New Jersey	NJ	City of Hoboken	\$250,000	\$3,615,400

Project identification number	Project title	Project state	Project lead organization	Award amount	Reported matching funds
				Values represent community resilience planning activities only	
NFWF-42957	Designing a daylighting plan to improve Harlem River's water quality and resiliency, New York	NY	New York City Department of Parks and Recreation	\$250,000	\$2,116,000
NFWF-42984	Enhancing Mill River's flood resiliency and habitat corridor, Connecticut	CT	Mill River Collaborative	\$3,750,000	\$7,880,200
NFWF-43281	Restoring Delaware Bay's wetlands and beaches in Mispillion Harbor Reserve and Milford Neck Conservation Area	DE	Delaware Department of Natural Resources	\$450,000	\$151,900
NFWF-43290	Developing a design that will Enhance Liberty State Park's marshes and upland habitats, New Jersey	NJ	New Jersey Department of Environmental Protection – Office of Natural Resource Restoration	\$250,000	\$147,000
NFWF-43322	Enhancing Wampanoag Tribe of Gay Head's land resiliency in Martha's Vineyard, Massachusetts	MA	Wampanoag Tribe of Gay Head	\$67,000	\$23,200
NFWF-43429	Creating a resilient Delaware Bay Shoreline in Cape May and Cumberland counties, New Jersey	NJ	American Littoral Society	\$475,000	\$25,400
NFWF-43861	Creating a natural resource resiliency assessment and action plan, Rhode Island	RI	Narragansett Indian Tribe	\$180,000	\$60,200
NFWF-43931	Strengthening Marshes Creek through green and grey infrastructure, New Jersey	NJ	Rutgers University	\$272,000	\$22,200
NFWF-43986	Strengthening Monmouth Beach's marshes and dunes, New Jersey	NJ	Monmouth Beach, New Jersey	\$178,000	\$175,000
NFWF-44020	Developing a green infrastructure plan for Chester City, Pennsylvania	PA	Delaware Valley Regional Planning Commission	\$290,000	\$32,100
NFWF-44140	Improving coastal resiliency through community engagement, Ohio and Rhode Island	Multi: OH, RI	Association of State Floodplain Managers	\$341,700	\$86,100
NFWF-44157	Repairing infrastructure and designing wetland and beach restoration plans along the Central Delaware Bayshore	DE	Delaware Department of Natural Resources	\$200,000	\$117,000



Project identification number	Project title	Project state	Project lead organization	Award amount	Reported matching funds
				Values represent community resilience planning activities only	
NFWF-44193	Incorporating green infrastructure resiliency in the Raritan River Basin, New Jersey	NJ	Rutgers	\$410,000	\$176,800
NFWF-44199	Designing a plan to reuse dredged rock to protect the Boston Harbor shoreline, Massachusetts	MA	Maryland Division of Marine Fisheries	\$240,000	\$160,100
NFWF-44245	Developing a resiliency management plan for Pawcatuck River watershed, Connecticut and Rhode Island	Multi: CT, RI	Wood-Pawcatuck Watershed Association	\$720,000	\$188,000
NFWF-44271	Creating a regional framework for coastal resilience in Southern Connecticut	CT	South Central Regional Council of Governments	\$700,000	\$0
NPS-14-7	Visionmaker Jamaica Bay: Evaluation and synthesis of community generated adaptation strategies to enhance resilient ecosystems in Jamaica Bay, NY (subproject)	NY	Wildlife Conservation Society; National Park Service	\$350,000	\$0
NPS-23	Develop breach management plans for coastal national seashores to maximize ecological benefits	Multi: MD, NY	Denver Service Center; National Park Service	\$570,500	\$0