



New Jersey Coastal Management Program

Equitable Community Resilience: Metrics and Methods for Coastal Hazards Planning

Proposal for the 2018 Coastal Management Fellowship

NOAA Coastal Services Center

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1. Background and Introduction

Planners have long recognized the critical importance of bringing local populations into the planning process. Community members bring unparalleled knowledge of their neighborhoods, existing social networks, active civic organizations, and local values into the development of plans. Their involvement helps to ensure that the plans developed, often by outside groups, reflect the needs of the people they are for and ultimately gives them a stake in the success of the plans that are developed.

In the context of coastal resilience planning, the need to engage our most vulnerable populations has a special prominence. Vulnerable populations are defined here as individuals and groups of people who are challenged in their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard based on physical or socioeconomic factors (Singh, 2014). Key characteristics can include, but are not limited to (Baker, 2016): age (elderly and very young); low income; language other than English spoken at home; limited access to transportation; inadequate housing/shelter; low educational attainment; ethnic minorities; physically and mentally challenged; and special medical needs and addictions. Such characteristics help to explain why hazards impact some groups differently, even when exposure to the event is the same (Blaikie, et al., 2003).

The New Jersey Coastal Management Program (CMP) was recently awarded a Project of Special Merit Award entitled “A Seat at The Table: Integrating the Needs and Challenges of Underrepresented and Socially Vulnerable Populations into Coastal Hazards Planning in New Jersey” to develop replicable models to engage and systematically integrate socially vulnerable and traditionally underrepresented populations into coastal management decision-making. The project, which is focused on demographic and socioeconomic factors of social vulnerability, has an identified gap in its ability to assess the intervening physical and social factors of community resilience as described above.

What measures of social vulnerability often lack, however, are considerations of the unique physical and social characteristics of the broader *community* in which these populations reside and how these factors intersect with social vulnerability. Important factors, such as environmental degradation, historic disinvestment, social cohesion and civic engagement, undoubtedly play a role in a community’s ability to adapt to the increasing coastal hazards associated with climate change. Several national and international frameworks have been developed over the last few years to assess community resilience broadly, with varying degrees of application. A few examples include: the Community Resilience Index popularized through the 100 Resilient Cities Initiative (Arup, 2017); the Federal Emergency Management Agency’s Draft Interagency Concept for Community Resilience Indicators and National-Level Measures (FEMA, 2016); the University of South Carolina Hazards and Vulnerability Research Institute’s Baseline Resilience Indicator for Communities (BRIC) (HVRI, 2018); and, the International Federation of the Red Cross and Red Crescent’s Framework for Community Resilience (IFRC, 2014). Such frameworks can provide insight into the key systems within a community that require intervention if local resilience is to be enhanced. However, these frameworks have not been reviewed or piloted in New Jersey to understand their respective value in the execution of the state’s coastal management program. Additionally, frameworks measuring baseline conditions do not, in and of themselves, lead to enhanced resilience or equitable planning outcomes for communities.

Other challenges, which go beyond the measurement of community resilience, persist. For example, because of historic disenfranchisement, vulnerable groups may be excluded from the decision-making bodies of their

communities or may not trust or feel comfortable with the information and advice they receive from those bodies. Important relationships may not exist between those charged with “doing the planning” and critical constituency groups. Lastly, socially vulnerable people may lack important access to information or knowledge needed to advocate for themselves. A method for integrating measures of community resilience with suggested processes for equitable, community-driven resilience planning is needed to understand where systematic interventions might be taken. An equitable planning process would include not only inclusive engagement, but outcomes that are equitable, such as adaptation actions that address the needs of the most vulnerable or that start to address the root causes of social vulnerability and risk (USDN, 2017).

This need is especially pressing as the state has recently undertaken multiple regional and state-wide initiatives to build resilience to coastal hazards. This includes launch of a state Coastal Resilience Plan, which incorporates a decision-support system for investment decisions and project recommendations (DEP, 2018), and a regional planning grants program, Resilient NJ (DEP, 2018). Within both initiatives, the consideration of the needs of socially vulnerable populations and equitable and sustainable development are guiding principles. There is also a concerted effort, by direction of Governor Murphy through Executive Order 23 (New Jersey, 2018), to align state agencies in the consideration of environmental justice throughout the implementation of state policies, regulations, and programs. The CMP will look to the EO 23 guidance, along with resources developed through the “A Seat at the Table” project to inform how the state Coastal Resilience Plan, Resilient NJ, and administration of the coastal program can engage our most vulnerable citizens, integrate their needs into decision-making, and ensure equity in planning processes and outcomes.

In light of this, the CMP would like to partner with a NOAA Fellow in order to: 1) identify appropriate measures for community resilience, which are rooted in an understanding of social vulnerability and environmental justice, but are holistic in nature to measure a community’s broad resilience to coastal hazards associated with climate change and, 2) develop a method(s) for equitable community resilience planning that includes recommendations for inclusive engagement strategies (processes) and adaptation actions that address the root causes of vulnerability and risk (outcomes). Depending on the background and interest of the NOAA Fellow, there is flexibility in the project to explore one of these topics areas more deeply than the other, as well as the incorporation of more environmental science considerations within the first topic area.

2. Goals and Objectives

Goal: The goal of the NOAA Coastal Management Fellow is to: 1) identify appropriate measures or frameworks for evaluating community resilience, 2) develop a method(s) for equitable community resilience planning, and 3) suggest integration of these findings, where possible, with state resilience planning initiatives and execution of the coastal hazards enhancement strategy included in the CMP Section 309 Assessment & Strategy, 2016-2020 (DEP, 2015).

Objectives:

- 1) Engage with the project team and partners of the “A Seat at the Table” project, including policymakers, academics, and social service organizations (, through meetings, outreach events, and interviews to gain substantive input and guidance on important measures of community resilience.
- 2) Develop a framework, including quantitative and qualitative measures, to assess baseline conditions of community resilience. These measures should consider social resilience but be comprehensive in nature to measure a community’s broader resilience to coastal hazards.

- 3) Identify 3-4 pilot communities to run a desktop assessment of community resilience using the developed framework and policymakers, data users, and others that can review and provide feedback on the draft framework. Pilot communities selected should provide an inclusive topology of New Jersey’s coastal area (e.g. urban, rural, suburban).
- 4) Develop visual outputs of the framework, to include maps, charts, tables, and infographics to display findings.
- 5) Research and identify methods for community resilience planning that result in equitable processes and outcomes.
- 6) Make tools and information available to coastal managers, planners, and other technical staff within the CMP, including DEP staff involved with development of the Coastal Resilience Plan and administration of Resilient NJ.
- 7) Identify opportunities for how the CMP can leverage these developed resources through execution of the CMP Section 309 Assessment & Strategy, 2016-2020.
- 8) Disseminate resources developed through multiple media (e.g. webinars, presentations, print materials such as one-pagers or flyers, [CMP Instagram page](#), [CMP website](#)) and through our partner organizations.

3. Milestones and Outcomes

Year 1:

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| Months 1 | Fellow will review and gain familiarity with ongoing coastal management planning projects and meet existing stakeholders and partner organizations; develop a preliminary project work plan; and identify literature and sources for review. |
| Months 2-4 | Through the literature review and engagement with project partners on the “A Seat at the Table” project, the fellow will identify suitable measures and/or model frameworks for community resilience and review available data sources. The Fellow, with assistance from the CMP, will collect available data and identify an appropriate pilot community or communities, where baseline community resilience conditions will be assessed. |
| Months 5-6 | Conduct assessment of community resilience in pilot communities. |
| Months 7-8 | Fellow will examine the results of the assessment and seek review from key advisors, to be identified with the CMP, who will also assist with outreach and coordination of this review. |
| Months 9-12 | Fellow will address feedback received from the review of assessment outcomes. Fellow will develop a memo to the CMP for how community resilience is exhibited in the pilot communities, including how these factors are currently considered in coastal planning projects. Visual outputs will be developed, including but not limited to maps, tables, and a summary of literature findings. The memo will be shared with partners of the “A Seat at the Table” project, along with project management staff of the Coastal Resilience Plan and Resilient NJ. |

Year 2:

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| Months 1-2 | Based on the feedback received from the memo, Fellow will draft a framework for use in assessing community resilience. |
| Months 3-4 | Fellow will review and compile a list of the latest methods for equitable community resilience planning processes and strategies for determining successful outcomes. |
| Months 5 | Fellow will review these methods and consider the results of the community resilience assessment conducted in Year 1, to identify a set of strategies and/or preferred approaches |

that integrate these considerations into community resilience planning by the CMP. Fellow may conduct outreach to partners of the “A Seat at the Table” project and the NJCRC to provide feedback on the effectiveness of various approaches.

- Months 6-7 Fellow will draft a guidance document with a method(s) to achieve equitable processes and outcomes in community resilience planning.
- Month 8 Fellow will share draft document for review by project partners. While under review, Fellow will work with CMP to identify opportunities to leverage project findings (community resilience indicators, outcomes of pilot assessment, and guidance document) to advance the CMP Section 309 Assessment & Strategy, 2016-2020.
- Months 9-12 Fellow will incorporate feedback and finalize guidance document, to include specific strategies where the findings and resources developed under this project could be leveraged to advance the CMP Section 309 Assessment & Strategy, 2016-2020. Fellow will make information available to CMP staff and disseminate lessons learned through multiple media (including webinars), partner organizations, and other appropriate public meetings (including a presentation at the meeting of the New Jersey Coastal Resilience Collaborative) and state and national conferences (where feasible).

4. Project Description

The NOAA Fellow will be responsible for finding new strategies and appropriate methods for assessing community resilience and identifying equitable planning processes and outcomes.

- 1) Identify metrics and execute a framework, which assesses key factors of community resilience.
- 2) Experiment with the execution of this framework with a pilot community or communities. Develop a recommendation for the CMP in its use and further development of the framework for New Jersey’s coastal area.
- 3) Make information available to planning partners and municipal leaders on metrics used to assess community resilience, which may inform adaptation strategies and ongoing resilience planning decisions.
- 4) A variety of strategies and tools exist for measuring community resilience and methods for equitable planning, each with their own strengths and weaknesses. A better understanding of these resources is needed to see how they work in different contexts within resilience planning, particularly within the framework of state grantmaking. Some may work better or worse within different communities, to engage different groups, or to solve different problems. Some may do a better job than others at bringing socially vulnerable groups to the planning table or provide ways to determine whether equitable outcomes have been achieved. By experimenting with a variety of different strategies and tools, the Fellow will help coastal managers and planning practitioners by developing guidance on a method to determine the tools most appropriate for their projects.
- 5) Write a guide providing recommendations and replicable methods for how to ensure equitable community resilience planning and the authentic inclusion of socially vulnerable groups in resilience planning and coastal decision-making. The guide will go into detail on best practices based on the work the Fellow

completes over the course of the project. This will include stakeholder engagement, participatory planning exercises, and information transfer.

While New Jersey may be a physically small state, it is a highly diverse and densely populated one. Community resilience metrics and methods for planning processes that work in the urbanized northern coast may not be applicable in southern beachfront communities, along the Delaware Bayshore, or up the Delaware River. The rich ethnic and cultural heritage of the state will require the NOAA Fellow to work with a wide variety of groups. For that reason, the Fellow will be integrated, as time allows, into all active resilience planning projects of the CMP, instead of being tied to just one. These projects will serve as a living laboratory for the NOAA Fellow to observe the execution of different planning processes, across diverse regions of the state, and engage with a wide variety of stakeholders and planning partners around measures of community resilience, looking for nuances that can help inform the development of recommendations and tools not only relevant to New Jersey, but other coastal states.

Three specific projects that the NOAA Fellow will play a role and/or work will influence:

- 1) **A Seat at the Table:** Awarded to the Office of Coastal and Land Use Planning this Project of Special Merit will develop replicable models to engage socially vulnerable and traditionally underrepresented populations in coastal resilience planning. The NOAA Fellow will overlap with this project and will work closely with project partners and CMP staff to identify opportunities for development of community resilience metrics, which complement but go beyond characteristics of social vulnerability. These measures could include but not be limited to environmental degradation, historic disinvestment, social cohesion and civic engagement. Pilot communities for development of such metrics will be identified and a method executed. The goal of this assessment is to establish baseline resilience conditions within a community, which could also serve to measure progress towards implementation of adaptation and risk reduction measures. The Fellow's work will expand and improve the goals of the "A Seat at the Table" project and provide a unique opportunity to leverage established partners of the project, including the Office of Environmental Justice, community organizations, policymakers, and academics focused on the consideration of equity and community resilience within socially vulnerable and underrepresented populations.

- 2) **[Resilient NJ](#):** Awarded to the Office of Coastal and Land Use Planning as part of the U.S. Department of Housing and Urban Development's National Disaster Resilience Competition, this program will fund 4 regional planning projects in New Jersey. The grant program will enable communities to work together to plan at a regional level for flood resilience, natural resource protection, and sustainable development. The program will be occurring in two phases: Phase 1 is a comprehensive regional resilience planning process for each region; Phase 2 will focus on executing regionally significant actions identified in Phase 1, including the funding of a range of adaptation strategies. The following regions were recently selected as participants in the program:
 - Jersey City Team – Jersey City, Newark, Hoboken, Bayonne, the HOPES Community Action Partnership and the Ironbound Community Corporation.
 - Middlesex County Team – Middlesex County Office of Planning, Old Bridge, Perth Amboy, Sayreville, South River, Woodbridge and the Lower Raritan Watershed Partnership.
 - Long Beach Island Team – Long Beach Township, Barnegat Light, Beach Haven, Harvey Cedars, Ship Bottom, Surf City and the Long Beach Island Community Center.

- Ventnor Team – Brigantine, Atlantic City, Ventnor, Margate, Longport, Northfield, Pleasantville, Atlantic County and the American Red Cross.

The regional planning projects will provide opportunities for the fellow to identify where additional planning processes are needed within the CMP and the execution of its grant programs to ensure equitable outcomes.

- 3) [Coastal Resilience Plan](#): On October 9 and 10, DEP held a summit to begin work on a Coastal Resilience Plan. The Plan is the first step for the DEP to evaluate how its policies and programs allow for local, regional and state response to climate change within the coastal zone. The plan will guide policies, regulations, resource allocation and funding in the coastal zone to: reduce the impacts of coastal hazards; increase resilience for structures, infrastructure systems, environmental resources, and coastal communities; address the needs of socially vulnerable populations; and attract equitable and sustainable investment.

5. Fellow Mentoring

Elizabeth Semple, Manager, Office of Coastal and Land Use Planning, will be the assigned mentor to the NOAA Fellow, with responsibility for overseeing the Fellow's activities on a day to day basis. Ms. Semple will work with the Fellow to develop a workplan, develop research strategies, make introductions with partners, provide feedback on project ideas, and ensure the successful execution of all project tasks and deliverables. Ms. Semple has close to 30 years of experience and previously led development of New Jersey's Stormwater Management Rules, statewide update of sewer service area under the water quality management planning program, and is principal investigator for multiple competitive federal resiliency planning grants.

While Ms. Semple will be the official mentor for the Fellow, others in the Office of Coastal and Land Use Planning will provide regular assistance and feedback to guide the work of the fellow. The NOAA Fellow will participate in biweekly planning team meetings to share work progress, get feedback from program staff, and hear about what else is happening with coastal planning projects around the state. All of the members of Office of Coastal and Land Use Planning team work collaboratively on projects, and all look forward to playing a role in mentoring the Fellow. Three team members in particular will play significant roles in the Fellow's work.

Nicholas Angarone, PP/AICP is the Bureau Chief for the Office of Coastal and Land Use Planning (OCLUP) at the New Jersey Department of Environmental Protection. Nick serves as the lead project manager for planning projects of the CMP that provide improved and coordinated resiliency planning tools and direct technical assistance to 239 communities in the state. Nick holds a Master of City and Regional Planning from the Bloustein School of Planning and Public Policy and a Bachelor of Science in Environmental Planning and Design from Rutgers University.

Kelly Pflicke is a Senior Planner with the Office of Coastal and Land Use Planning. Her work supports planning projects and initiatives to build community resilience to coastal hazards, including managing regional and municipal planning projects; coordinating with federal, state, and local partners on key planning studies and initiatives; developing municipal-level guidance on adaptation actions; and refining assessment tools. Previously, she worked in hazard mitigation planning and conducted research on social vulnerability to environmental hazards, which resulted in two publications for which she is the lead author: "Populations Vulnerable to Climate Change in New Jersey: Update of a Statistical Analysis" (2015) and "Vulnerable Populations to Climate Change in New Jersey" (2014). Kelly holds a Master of City and Regional Planning from The Edward J. Bloustein School of

Planning and Public Policy at Rutgers University and a Bachelor of Arts in Geography from Georgia Southern University.

Another planner in the office, Michael Kolber, gained experience overseeing programs for vulnerable populations in New Jersey as Program Manager for Community Building at United Way of Greater Union County. His work for the International Rescue Committee as a monitoring specialist for the world’s largest community driven reconstruction program in the DR Congo will enable him to advise on monitoring and evaluation strategies for the Fellow’s work. Michael has a Master’s Degree in Urban Planning from Columbia University and wrote his thesis on “Community Participation and Decision Making in Refugee Camp Cooking Fuel Programs.”

While the NOAA Fellow will have a focus on community resilience and equity, the Fellow will be able to apply that focus to participate in a wide variety of planning and coastal management projects. This will include attendance at a range of planning, regulatory, and policy activities, such as project planning discussions, staff meetings, stakeholder engagement, training, and professional conferences. The office takes the professional goals of the Fellow seriously, and will make every effort to ensure that the NOAA Fellow can take advantage of workshops, trainings, and other learning opportunities across the spectrum of the Fellow’s professional interests.

6. Project Partners

The Coastal Management Program facilitates a group of resiliency practitioners called the New Jersey Coastal Resilience Collaborative (NJ CRC). This group of partners, including state agencies, public, academic, non-governmental, and professional organizations, works to coordinate efforts, share information, and advance a common framework for evidence-based coastal resilience planning and actions. These partners will all be available to provide guidance, information, and research support to the NOAA Fellow. In particular, partnerships with academic institutions will provide critical guidance for any research that the NOAA Fellow does on indicators of community resilience and development of equitable planning processes and outcomes. This research is often sensitive, and a high degree of care is needed to ensure that the research is valid. Our partnerships will help to ensure that this is the case.

New Jersey Coastal Resilience Collaborative Members

American Littoral Society	Partnership for the Delaware Estuary
Barnegat Bay Partnership	Rutgers University (The Bloustein School, Climate Institute, Center for Remote Sensing and Spatial Analysis)
Delaware Valley Regional Planning Commission	Stevens Institute of Technology
Jacques Cousteau National Estuarine Research Reserve (JCNERR)	The College of New Jersey
NJ Future	The Nature Conservancy
NJDEP	Urban Coast Institute, Monmouth University
NOAA	

7. Cost Share Description

The Department of Environmental Protection will provide its \$15,000 cost share from the Department’s Policy and Planning account. This match is provided through State appropriations and through the Corporate Business Tax. These funds are directed to implementation of the Department’s watershed initiative and to implementation of coastal programming and land use management. The level of State funding far exceeds the required match for

federal CZM awards and these funds meet NOAA's requirement to use a non-federal source to meet the cost share match in support of the fellow.

The NOAA Fellow will be a member of the OCLUP staff and project team, with office space and access to all office support and resources. The Fellow will be provided with administrative support. The Fellow will be provided with a Department-standard computer, standard and technical software, and communications equipment. Access to the Department's library, GIS data, and training opportunities will also be provided. Any special needs will be met to the best of the program's ability.

It is expected that the NOAA Fellow may need presentation materials, meeting supplies, and additional resources. While these needs are hard to predict, DEP is committed to providing these resources to the NOAA Fellow. Depending on the specific need, funds may come from CZM grant funds, Resilient NJ or other individual grant awards, or the Department's Policy and Planning account.

8. Strategic Focus Area

Having a NOAA Fellow dedicated to investigating ways to measure community resilience and create equitable planning processes meets NOAA's strategic focus of building **Resilient Coastal Communities**. Specifically:

- *Foster user-driven science and assessment efforts to enhance understanding of natural, social, and economic impacts of coastal hazards and climate change, and the approaches needed to adapt to and communicate about these threats.*

The systems and factors that enable resilience to the impacts of coastal hazards and climate change in any given community are often not well understood. Part of identifying these measures, and establishing a standard framework for assessment, is to improve identification of the areas for intervention and approaches that allow communities to adapt to the threats that they face.

- *Increase public awareness of coastal hazards and actions that can be taken to reduce the loss of life and property.*

Communities with vulnerable populations may be isolated from information about actions that they can take to reduce the risks they face before, during, and after disasters. The NOAA Fellow will research and help implement ways to reduce those information gaps through development of methods for equitable planning processes.

- *Build capacity to pursue strategies such as hazard preparedness, mitigation, and post-hazard redevelopment planning by providing an integrated suite of data, information, training, technical assistance, cooperative funding, and policy tools to coastal communities.*

While most coastal communities recognize that resilience to coastal hazards goes beyond the physical vulnerability of its assets, they may lack the data, training, or tools needed to assess broader systems and determinants of community resilience. The NOAA Fellow will pilot an assessment approach in a coastal community(ies) to improve that capacity. Lessons learned from this assessment will be incorporated into a framework for measuring community resilience and methods for equitable planning processes that will help build the capacity of communities around the country that are facing similar challenges.

- *Identify and engage partners in maximizing the understanding, visualization, and application of risk-wise strategies.*

In order to adequately plan for improved community resilience, baseline conditions of community resilience must be better understood. In addition, planning projects must be designed in an equitable manner and in a way that does not inherently prohibit the participation and consideration of the needs of vulnerable populations and traditionally underrepresented groups. The Fellow will enhance these efforts and provide a model for an equitable community resilience planning processes.

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