



Proposal for
**Stamford Coastal
Flood Resiliency Plan**

Submitted to
City of Stamford
Land Use Bureau

April 6, 2023



FUSS & O'NEILL



April 6, 2023

Erin McKenna
Associate Planner
City of Stamford

RE: RFP No. Agreement.2023.0003, Stamford Coastal Flood Resiliency Plan

Dear Ms. McKenna:

The City of Stamford has experienced the devastating impacts of coastal flooding from Superstorm Sandy and more recent storms, which are being magnified by rising sea levels and more severe weather events. The increasing frequency and intensity of these events, combined with significant critical infrastructure, major commercial development, and highly vulnerable populations in the southern part of the City, make Stamford extremely vulnerable to coastal flooding and a changing climate. In response to this urgent threat, the City is taking a comprehensive approach to identify coastal flood risk and vulnerabilities and develop cost-effective adaptation solutions that the City can implement in the coming years.

With our team's Connecticut and national experience, history working in Stamford, and proven approach, we will partner with you to develop a coastal flood resilience plan that responds to the needs of the City and the community and charts a course for successful implementation of the plan recommendations.

- **Fuss & O'Neill** has been providing flood resilience planning, design, and construction services to Connecticut municipalities, state agencies, and regional organizations for over 30 years. In addition to our ongoing flood resilience work for the City of Stamford, we are conducting similar large-scale coastal resilience projects in New Haven, New London, Branford, and coastal Rhode Island and Massachusetts.
- The Fuss & O'Neill team includes **SCAPE Landscape Architecture**, an award-winning landscape architecture and urban design firm headquartered in New York City. SCAPE has developed some of the most high-profile and forward-looking urban coastal resilience plans in the northeast, including Climate Ready Dorchester (Boston, MA), Resilient Boston Harbor Vision (Boston, MA), Resilient New Jersey (Middlesex County, NJ), Financial District and Seaport Resilience Project (NYC), and Living Breakwaters (Staten Island, NYC).
- Our team also includes **Woods Hole Group**, an international coastal science, planning, and engineering firm based in Falmouth, MA. Woods Hole Group studies have been utilized throughout the U.S. to perform coastal vulnerability assessments and resiliency planning. Their probabilistic, dynamic modeling approach has been used to develop the Boston Harbor Flood Risk Model and the Massachusetts Coast Flood Risk Model (simulating the entire coastal area of the State of Massachusetts).
- As described in the enclosed qualifications, our technical approach is informed by our experience providing the same services that Stamford has requested, including valuable "lessons learned" (e.g., what's worked and what to avoid) from similar projects in other large urban communities.

59 Elm Street
Suite 500
New Haven, CT
06510
t 203.374.3748
800.286.2469
f 860.533.5143

www.fando.com

California
Connecticut
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Vermont

Our team is excited for the opportunity to assist the City of Stamford with this important project. Please contact us should you have any questions about our qualifications or need additional information.

Sincerely,

Sara Morrison, MLA, WEDG
Project Manager
smorrison@fando.com
860.783.9777

Erik V. Mas, PE
Principal-in-Charge
emas@fando.com
413.333.5466

An aerial photograph of a coastal area, showing a dense residential neighborhood on the left and a large body of water on the right. A large blue overlay box covers the right side of the image, containing the title text. The text is white and reads "SECTION 1 Project Approach and Scope".

SECTION 1 Project Approach and Scope

Mar 22, 2022

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Section 1: Project Approach

UNDERSTANDING OF WORK TO BE PERFORMED

Project Understanding & Objectives

The City of Stamford is experiencing the devastating and costly impacts of changing climate conditions causing increased coastal, riverine, and drainage-related flooding. The extreme localized flooding that occurred during the 2021 storms underscores the urgency to make Stamford more resilient to flooding and its impacts. Building on the comprehensive, proactive approach the City is taking to better understand the causes of riverine and drainage-related flooding in Stamford, this project will round out the holistic understanding of flood impacts on the City of Stamford by evaluating coastal flooding and other coastal hazard risks while identifying cost-effective, practical solutions that the City can implement in the coming years to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources.

The City of Stamford has experienced a substantial increase in the frequency and intensity of coastal and drainage-related flooding in recent years, impacting infrastructure and public safety in many areas of the City. Portions of the project area, both within and outside of the Coastal Area Management Boundary, routinely experience flooding, including some major street flooding.

The project focus area is a highly urbanized commercial and residential area with major transportation infrastructure forming the northern boundary and the waters of the Long Island Sound at the southern edge. The project focus area contains some of Stamford's most critical infrastructure including:

- The sewage treatment plant and sanitation facilities
- 250+ acres of public parks and other public amenities
- More than 1,700 public/private properties



Flooding in the Cove Road, Ursula Place, and Dale Street neighborhoods upgradient of Cummings Pond.
(Source: City of Stamford)

- EJ communities ranking in the 90th percentile for most of the EPA EJ Screen environmental and demographic indicators, as well as outdated drainage infrastructure (some of which was constructed in the 1930s) which is severely undersized for today's storm events as well as future climate impacts.

Western Connecticut Council of Governments (WestCOG) and the Connecticut Institute for Resilience & Climate Adaptation (CIRCA) have completed significant flood resilience and adaptation planning efforts in the region identifying coastal flooding and hazards as a priority for the City. This area was particularly hard-hit during the recent storms that occurred in 2021 (Elsa and Ida). During these storms, portions of many roads were underwater, flooding hundreds of vehicles and requiring numerous water rescues of occupants trapped in vehicles by the Stamford Fire Department.

Given the scale of federal and state funding opportunities that are now available and are likely to grow, this project is an opportunity to make improvements that will support many of Stamford's long-term goals. Our team has substantial experience working with communities to maximize the value of their resilience investments. This includes current projects in Connecticut (New Haven, CT; Danbury, CT; Meriden, CT; and New London, CT) as well as other major urban communities in the northeast (Boston, NYC, Northern NJ, and others).

We believe that this project is much more than just making the waterfront and shoreline for Stamford more resilient to future flooding, it is an opportunity to both improve resilience throughout the neighborhoods in the project focus area and create additional community value beyond resilience.



Our goals are to engage local stakeholders and the public and to develop a purposeful plan that positions this area to maximize the value of the future investments that will be required to make this area of Stamford resilient to future climate impacts. This includes prioritizing actions that balance natural hazard risks and project costs as well as maximize the opportunity to create additional benefits for a community by doing things like heavily incorporating nature-based solutions into our resilience planning and design which generally improves overall cost-effectiveness and can create project co-benefits such as ecological restoration and shoreline access.

STRATEGIES FOR EXECUTION OF THE WORK

We Believe the Crucial Strategies for Project Success Are:

- Leverage Previous Efforts
- Understand Changing Vulnerabilities to Better Manage Risk
- Engage Communities
- Build Community Value
- Integrate Resilience Strategies into Ongoing Planning and Capital Projects
- Develop a Strategic Implementation Plan Aligned with Available Funding
- Position Stamford to Leverage Growing Flood Resilience Funding Programs

Leverage Previous Studies and Planning Efforts

The City of Stamford has already identified areas of coastal flood risk and drainage related flooding within the coastal area based on historic and recent observations of flooding and prior planning efforts. WestCOG and CIRCA have already completed significant flood resilience and adaptation planning efforts in the region. WestCOG and the City partnered on the update of Stamford's natural hazard mitigation plan, which identifies site-specific areas of flooding and flood



mitigation projects. CIRCA's ongoing Resilient Connecticut Project has also completed vulnerability assessments and flood resilience planning for municipalities in southwest Connecticut, including the City of Stamford. At the national level, FEMA and NOAA have developed robust tools for analyzing risk and projections which the team will use to guide the development of our approach to modeling future coastal flood risk scenarios.

Fuss & O'Neill is already working with the City of Stamford to pursue grant funding to address flooding, building on our extensive prior municipal stormwater, transportation, and facilities experience for the City and private development work in Stamford. (Source: City of Stamford)

Our team will coordinate with ongoing related efforts throughout the City (such as the parallel City-wide drainage assessment, urban tree canopy initiative, and neighborhood-specific resilience projects) to ensure that the plans and efforts build on each other rather than create duplicative efforts.

Our team will also be drawing from our past experiences with projects of similar scale to inform the process based on lessons learned and insight gleaned from this type of planning and design in coastal communities across the northeast like New London, Fair Haven (New Haven), and Stonington, CT; Salem and Dorchester (Boston), MA; Staten Island and lower Manhattan in NYC; and a large portion of northern coastal New Jersey (Resilient NJ). We will use this experience to develop an impactful, phased, and actionable plan tailored to the current and future coastal flooding challenges facing Stamford.

Understand Changing Vulnerabilities to Better Manage Risk

Coastal communities and stakeholders are facing an uncertain future. No longer can planning and designs be based on a static value simply based on a single type of condition or storm level. Providing protection against the prospect of rising sea levels and potentially increasing storm intensities and frequencies can be fiscally daunting. Many communities don't know where to start when thinking about building resilience or defining climate change adaptations where projections indicate a vast majority of an area may be facing future flooding conditions.

Sustainable and effective engineering and design approaches require technically accurate baseline information and design parameters. For example, coastal resilience projects require an understanding of tides and storm surge under existing and future conditions to develop cost-effective designs for both current conditions, and future conditions in a changing climate. Probabilistic assessment and/or modeling of sea level rise (SLR) and storm surge produces site-specific and detailed design parameters, and provides invaluable information far exceeding traditional, more simplistic flood data or maps. By providing a distribution of flood risk under changing climate conditions, key information is provided that normally is not available from traditional assessments.



Coastal Resilience Solutions for South Boston

Woods Hole Group led the mapping of flood pathways, phasing strategies that accounted for evolving flood pathway dynamics, and development of resilient design criteria for future flood protection systems using results from the Boston Harbor Flood Risk Model.

Probabilistic flooding results, at a site-specific scale, provide a breadth of information useful for deciding where protection is required, selecting adaptations, planning, and engineering design for changing risk levels. Numerous communities and stakeholders are using probabilistic results to complete comprehensive vulnerability assessments, develop engineering adaptations, and design resilient green, gray, or hybrid solutions. The probabilistic results, as a function of time, have given communities the ability to prioritize adaptations and start to build resilience in more fiscally manageable proportions.

A key pillar of our approach to the Stamford Coastal Flood Resiliency Plan is to develop these probabilistic flood risks for the city. This will allow Stamford to understand the changing vulnerabilities that they are facing, prioritize the overall resiliency approaches, and better manage overall risk in a more cost-effective way. This understanding will also allow for flexible and adaptable design approaches that can more effectively provide both near-term and long-term resilience.

Engage Communities to Develop the Best Plan

We agree with you that it is critical to develop a shared vision of what the community wants to accomplish with adaptation and flood risk management measures. To realize resilience plans and projects, we must first engage vulnerable communities around a shared understanding of the risks they face, and a shared vision for the future. Successful community engagement around resilience requires an ongoing and meaningful conversation with a wide range of stakeholders that is open, equitable, sustained, and systematic.

Community engagement is the process of building relationships and working collaboratively with groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting them. Meaningful engagement ensures that the expertise of those impacted is part of the decision-making process. However, there are many barriers to doing this successfully including planning fatigue, lack of strategic planning, historic and present-day policies and practices that perpetuate inequities among others. Building relationships in communities requires authentic approaches that consciously and intentionally create the space for critical thinking to challenge our assumptions and support collective problem solving. Our team is committed to the opportunity to create better outcomes through partnering with stakeholders, managing our bias, and activating our collective humility, humanity, and hope. To achieve this, we will:

Recognize that we aren't starting from scratch: Our team acknowledges that conversations around coastal risk and climate adaptation are not new in the West Side, Waterside, Downtown, South End, Shippan, Cove, or the East Side. As outlined in our understanding of this project, Stamford has experienced significant and repeated flooding in many of its urban and coastal areas. Many of these areas of flooding have been well-documented by the City and the public. The current Mayor and administration has made a major commitment to addressing coastal and inland flooding and making the City more resilient to the impacts of climate change.

Effectively communicate risk and resilience: Through our extensive resilience work in diverse communities, we have learned how important it is to “unpack the black box” of climate projections, hazard analyses, and tradeoffs like benefit cost analysis in clear language and legible graphics. The translation of the technical jargon of coastal modeling, risk assessment, and economic analysis into language and graphics that enable people to interpret the findings and relate them to their own perceived needs, concerns, and actual experiences is critical to meaningfully engaging people in decision-making, supporting collaboration, and building stakeholder confidence in and commitment to the process. This team knows how to translate complex analysis to legible tools for public engagement and dialogue about risk.

Connect to diverse constituents: Because of the project’s relevance to a wide range of residents, community organizations, institutions, private and public landowners, implementing agencies, and other stakeholders, outreach and engagement for this project will need to include a broad array of stakeholders and publics at different points in the process to identify their concerns and aspirations. To achieve this, we will work with you on tactics to increase the inclusivity of the outreach process by using a range of outreach tools/strategies (e.g. social media, ads in print media, communication through existing organizations, etc.), and make connections with community organizations and leaders, particularly those who represent marginalized communities who might not otherwise participate in the process.

Consider everyone an expert: People have expertise in their own lived experience of the city. In particular, people perceive their natural and built environment in different ways, through the lenses of their work, their location, their public realm activities, and their own cultural traditions. From anecdotal stories of how people’s lives have changed due to the impacts of climate change, to site-specific examples of protection and adaptation, this expertise is valuable and needs to be heard in order to develop truly inclusive plans.



Climate Ready Dorchester - Boston, MA

SCAPE worked with the City of Boston to develop solutions to equitably reduce coastal flood risk in Dorchester, the largest and most diverse neighborhood in Boston.

Engage stakeholders on their own terms: People listen, communicate, understand, interpret, and offer input in different ways. No communication or engagement technique is one-size-fits-all: variety and innovation in engagement is key to engaging diverse constituents and the success of any resilience project. Our team has extensive experience developing innovative tools to reach a broad and diverse audience, from inclusive events and installations to online, interactive media easily accessed through a smart-phone. We look forward to developing tailored techniques for Stamford in collaboration with you and the project Community Advisory Committee. As a part of this, meeting people where they are (e.g. providing local community organizations materials or going to existing community organization meetings to present the project and gather feedback), offering childcare so families may attend, and sharing materials in Spanish as well as English to overcome linguistic barriers. An equitable and inclusive engagement process that allows people to engage on their own terms will enable diverse voices to be heard and meaningfully shape project outcomes.

Be accountable and transparent: We will need to follow the guidance and direction of community leaders who represent marginalized folks and make the results of all public engagement activities public. Accountability and transparency in the process are key to building trust.

Through these approaches, we will foster a meaningful dialogue around the implications of coastal flood risk for quality of life for all stakeholders, the values and principles that should guide resilience planning at the city and neighborhood scale, and the benefits and tradeoffs of different resilience options being considered. This dialogue will enable the development of a shared city-stakeholder vision for the resilience future of Stamford and each of the seven neighborhoods that will be key to generating coastal resilience strategies that deliver flood risk reduction, while supporting broader neighborhood goals, including equity and connectivity. A shared vision will also be key to inspiring and sustaining project support and maintaining focus and productive dialogue around key project goals. Such a shared vision begins with listening and dialogue.

Build Community Value

To adapt and thrive, rather than just survive, communities on the coastal edge will also need to be on the cutting edge, embracing new and creative ways to live resiliently with water. We know that our waterfront communities are on the front lines of the challenges presented by climate change. Rising temperatures, rising sea levels, and increasingly intense storms and rainfall events threaten to irreversibly change not only the frequency of disasters, but our everyday urban experience. The changes we are experiencing in our cities and our climate are not happening in isolation, our 'natural' environment is inextricably linked to our economic and social behavior, and our solutions for adaptation must be similarly interconnected. To be resilient—to be able to successfully adapt to our changing environment, and to bounce-forward from disasters, not back—the Stamford Coastal Flood Resiliency Plan must help the city build ecological, economic, and social, as well as physical resilience, fostering quality of life and economic opportunities for all was residents.

Our team believes in a holistic and layered approach to waterfront resilience, where combinations of creative design and planning techniques enable communities to step down risk while also generating new opportunities for placemaking, education, and both economic and ecological activity. To help make Stamford resilient, we know we need to think big and long-term but act now, developing and implementing projects and policies that set the City on a path to a resilient future—economically, ecologically, socially, and culturally as well as physically. This is the attitude and commitment that our team will bring to the Stamford Coastal Flood Resiliency Plan.

Create Clear Pathways for Integrating Resilience Strategies into Ongoing Planning and Capital Projects

Implementation of coastal flood resilience measures is more cost-effective when integrated into planned infrastructure investments. Incorporating flood resilience elements into planned construction projects is a great opportunity to improve the resilience of existing infrastructure and surrounding neighborhoods. Our team will review City and neighborhood scale plans and look for ways to integrate coastal flood resilience measures with planned infrastructure improvements and economic development goals, including the potential for nature-based solutions such as living shorelines techniques and green infrastructure. In this review we will be asking the following questions:

- Are there proposed gray solutions that can be made green?
- Are there proposed gray infrastructure projects that can be re-imagined using a hybrid approach of gray-green infrastructure?
- Are there proposed gray infrastructure projects that must remain gray, but should be modified to accommodate and plan for future flood conditions?

By taking a deep dive into the City's planned projects, we aim to identify opportunities for land parcels that have good redevelopment or retrofit potential, providing opportunities for coastal flood mitigation strategies including green infrastructure, shoreline/waterfront strategies, and improvements to the public realm.

We propose to work with the City to identify public and private sector investments planned for the project areas, opportunities for incorporating flood resilience elements into planned projects, adapting land use and zoning to enhance flood resilience through private redevelopment, and phasing and prioritization of projects.

Develop a Strategic Implementation Plan Aligned with Available Funding

Our experience with large-scale multi-benefit projects has shown us that crafting design concepts and a strong design narrative that proactively engages potential challenges can go a long way in

To succeed, even high-level visions need grounding in reality. To bring tangible flood risk reduction and resilience benefits to these communities over time, the coastal resilience strategies we develop with you must be feasible and implementable. The most exciting, innovative, and aspirational designs cannot benefit the City if they cannot be realized.

setting innovative visions on a path to implementation. This is why our team includes members with strong technical knowledge and a deep understanding of development, construction, and permitting in Connecticut and Stamford specifically. For example, Fuss & O'Neill has been an on-call water resources consultant to CTDEEP for more than 10 years and we clearly understand Connecticut permitting. Our experience allows us to understand what is permissible and what is aligned with federal and state climate resilience programs and funding priorities. We apply our experience in designing, engineering, and permitting resilient coastal structures; with local and state waterfront regulatory and permitting context; and in working with federal, state, and local regulators. Our team will also advise the City on implementation issues including land ownership/real estate rights and multi-jurisdictional constraints of regulatory agencies, ensuring the value and practicality of final recommendations.

We also fully embrace the City's approach to developing coastal resilience strategies that can be deployed over time, building and accruing risk reduction and other benefits with each phase. This is the only way that long-term urban resilience can be achieved: flood risk and vulnerabilities as well as the character of the city will change over time, and it is important to think both about what needs to happen now, and what needs to be set in motion now to effectively and efficiently implement strategies far in the future. Thus, developing a thoughtful implementation roadmap that lays out "near-term", "catalytic", and "long-term" projects will be a key project deliverable. Specifically:

- **Near-term projects** are those that can be implemented within a typical planning or funding cycle, and perhaps most critically in a time-frame where stakeholders involved in the process can experience the benefits of the time and energy invested in planning and design. While this timeframe varies by place, we typically mean they can be fully implemented in the next 5-10 years and will focus on areas most exposed and vulnerable to flooding in the next 5-10 years.
- **Catalytic projects** are near-term projects that not only generate real benefits (supportive change) on the ground, they also pave the way for long-term projects and the next wave of near-term planning and design by laying the groundwork for future efforts through the creation of infrastructure or enabling policy, but also by building and sustaining momentum for change among community stakeholders.
- **Long-term projects** are those projects that will require greater levels of planning, investment, and coordination, but making these commitments usually generate significantly greater benefits and flood risk reduction levels that can meet long-term sea level rise and storm projections. These projects can take 10, 20, or even 30 years to achieve as they often require extensive permitting and environmental review and long-term funding and financing strategies.

A critical component of developing near-term and long-term resilience strategies is keeping in mind that these strategies are interrelated and support each other. We leverage our team's knowledge of flood risk, coastal design and engineering to develop comprehensive long term coastal resilience strategies and strategic near-term strategies that address most urgent flood risks, highest community priorities, leverage existing investment, and provide the foundation or catalyze actions necessary for long term strategies.

Position Stamford to Leverage Growing Flood Resilience Funding Programs

Our approach will emphasize grant funding to advance projects from planning to construction (i.e., project pipeline development and implementation). Even with the existing CIRCA Municipal Resilience Grant Program and the proposed CTDEEP Climate Resilience Grant Program, it will be important to identify and develop projects to maximize success for large federal grant programs such as FEMA Hazard Mitigation Assistance grants (BRIC, FMA, and HMGP), State Revolving Fund (SRF) funding/financing, HUD Community Development Block Grants, USDOT RAISE grants, NFWF Coastal Resilience Fund and Long Island Sound Futures Fund, and others. Our approach will also consider creative funding and financing mechanisms such as stormwater authorities, conveyance fees to support flood resilience projects, flood and erosion control board special assessment authorization for operation and maintenance costs, and the Environmental Infrastructure Fund through the Connecticut Green Bank to finance flood resilience projects.

Traditional funding sources have been inadequate to address the investments needed to make our communities more resilient to flooding impacts.

Given the unprecedented infrastructure funding that is expected, Stamford has a tremendous opportunity to take advantage of federal and state grant funding programs that can address flood protection and resilience objectives.



Raritan River and Bay Communities - New Jersey

Resilient New Jersey - Middlesex County, NJ

A planning program working to develop a 'roadmap' for climate adaptation with clear strategies, actions, and implementation pathways guided by local input from underserved and under-resourced communities.

Scope Outline

Building on our general strategic approach outlined in the preceding section, the following paragraphs describe our approach to each task, building on the RFP (“Base Scope”) and providing additional tasks that we recommend be considered (“Additional Optional Tasks”).

Task 1 – Data Collection, Synthesis, and Modeling

Base Scope

Our project team will review all ongoing and prior plans, data collection efforts, studies, and modeling projects that have been conducted for the Stamford area. Studies related to flooding and general resiliency along the Connecticut coast will inform the conceptual design development, as well as identify any uncertainties and gaps in knowledge. Overall, this task will consist of the following specific subtasks:

Coordination with CIRCA

This coordination effort will be conducted in two phases during this upfront task. An initial coordination effort will take place early in the project process to understand the studies and modeling efforts that CIRCA has already completed and plan to complete in the near-term, as well as learn about any additional studies that CIRCA may be aware of. A second coordination effort will be conducted following the project team’s review of all the studies, plans, data, and modeling efforts to identify any gaps in knowledge and provide recommendations on CIRCA modeling efforts that will help support this project.

Review of Previous Studies and Plans

As part of this review, the documents listed in the Appendix of the project RFP will be reviewed for key findings. In addition to the reference materials listed in the RFP, a wider examination of ongoing projects will be conducted, including engagement with CIRCA to understand the studies and modeling work that they have completed or currently have ongoing. This task will help streamline and centralize this process. The project team is already aware of several coastal community resiliency plans (many of which were conducted by members of the Fuss & O’Neill team) within the State of Connecticut, including but not limited to:

- City of Groton Community Resilience Plan
- Stonington Coastal Resilience Plan
- Town of Stratford Coastal Community Resilience Plan
- Town of Branford Coastal Resilience Plan
- Climate Change Risk Vulnerability, Risk Assessment, and Adaptation Study for Waterford, CT
- Southern Connecticut Regional Framework for Coastal Resilience

These will also be reviewed to provide an understanding of other Connecticut coastal community approaches to building resilience. These studies and more (both completed and ongoing) will be inventoried as part of this task and a simple database of studies will be created.

Review of Existing Data

All relevant existing data related to coastal processes (storm surge, wave, currents, tides, storm events, high water mark data etc.), landscape (topography and bathymetry, historic shoreline change), and changing climate conditions (sea level rise, downscaled precipitation, changing intensity and frequency of coastal storm events, etc.) will be gathered and reviewed to help support the conceptual design development, as well as serve as the backbone for the modeling review and assessment.

Review of Coastal and Hydrodynamic Modeling

The existing and proposed coastal flood and storm surge analyses conducted by CIRCA will be reviewed to understand both the existing and future conditions flood risk. It is our understanding that the CIRCA modeling results will be available to provide, at minimum, existing and future (2050 with 20" of SLR) predicted flood extents and water surface elevations across a range of Annual Exceedance Probabilities (AEPs). For existing conditions, AEP data will be provided to the project team from CIRCA at critical locations of interest and assets throughout the City. These existing model results will be compared to observed data, as well as local experiences as understood and observed by the City. It is expected that a meeting will be conducted with key City officials and the project team to discuss flood experiences and put them in context with the model results.

Future coastal flood risk modeling results will be reviewed by the project team, as provided by CIRCA, using a 20" Relative Sea Level Rise condition. It is expected that these results will provide, at minimum, the flood extent and water surface elevations across the same AEP levels. The project team will then utilize these data to develop appropriate design flood elevation information that considers adaptive management and design approaches. Ideally, these existing and future modeling results would be provided not just at critical assets and locations, but across the whole city such that not only can critical elevations be determined, but also flood pathways and prioritization of actions can be assessed.

In addition to the CIRCA modeling efforts, additional modeling and design criteria will also be evaluated as part of this task. For example, modeling results from the North Atlantic Coast Comprehensive Study (NACCS) completed by the US Army Corps of Engineers will be reviewed. This study produced a full distribution of AEP water levels across the North Atlantic. Additionally, fully probabilistic models, like the Massachusetts Coast Flood Risk Model (MC-FRM), which does include the entire coastline (and all the water bodies) in the state of Connecticut. All modeling efforts will also be assessed in context of potential usage for securing additional grant funding from State and Federal programs (e.g., FEMA BRIC grants). In reviewing existing coastal models, the project team will consider geographic extent, the physical drivers of flooding considered (i.e., sea level rise, tides, surge, wave setup, and wave runup and overtopping), output flood parameters and statistics, and uncertainties and error.

Finally, future precipitation duration, intensity, and magnitudes will also be reviewed and analyzed as part of this Task. This will include, but will not be limited to, the review of the draft CT Stormwater Quality Manual and draft Connecticut Guidelines for Soil Erosion and Sediment Control for state-based information, and other Federal resources (e.g., NOAA Atlas 14) and their downscaled adjustments for overall context.

Deliverables: Existing and Future Conditions Summary Technical Memorandum

RESILIENT FAIR HAVEN PROJECTED FUTURE 100-YEAR COASTAL FLOODING DEPTHS

In the projected future 100-year storm event, the extent of flooding along the Fair Haven shoreline is significant & expanded compared to the present day 100-year event, encompassing most of the waterfront parcels and additional portions of critical roadways and transportation corridors linking Fair Haven to other parts of the city. The greatest increases in the extent of coastal flooding and areas with flood depths of 3-3 feet are predicted for the commercial/industrial waterfront south of Chapel Street and along the Mill River.



RESILIENT FAIR HAVEN TRANSPORTATION INFRASTRUCTURE AT RISK

Catastrophic and damage-related flooding in the Fair Haven neighborhood impacts critical roadways and transportation corridors, including local bus service and bicycle lanes/routes, both within the community and that connect Fair Haven to the rest of the city. As shown on this figure, lowlying segments of several major roads along the Fair Haven shoreline (Front Street, River Street, John W. Murphy Drive) will be impacted by coastal flooding in the projected future 100-year event with 30 inches of sea-level rise. The approaches to the bridges/water crossings at East Grand Avenue and Chapel Street are also predicted to experience flooding during the future event, potentially disrupting traffic and emergency services including evacuation routes that serve the Fair Haven neighborhood.

Similarly, roadways that serve as critical linkages to points north and west pass under the rail line (Humphrey Street and James Street) and Interstate 91 (State Street, Willow Street, Ferry Street, Clinton Avenue, and Front Street). These underpasses are low points that regularly flood during heavy rainfall, restricting vehicle passage and posing a public safety hazard. The railroad underpasses of Humphrey Street and James Street generally experience more significant flooding than the other impacted underpasses that serve Fair Haven. Also notable is the Middletown Avenue underpass near Foxon Boulevard, located just northwest of Fair Haven and a major connection to the Quinnipiac Meadows area, which experiences flooding multiple times per year.



Resilient Fair Haven - New Haven, CT

Fuss & O'Neill is leading this Resilient CT Phase III project focusing on developing adaptation strategies to mitigate current and future climate induced flooding impacts to community assets and transportation corridors as well as mitigate the impacts of extreme heat for community residents.

Task 2 – Evaluation of Critical Infrastructure

Base Scope

A key objective of this task will be to analyze and evaluate critical infrastructure within the project area which will inform Task 4 and the development of strategies to mitigate impacts to the infrastructure system. We will assess the criticality of these infrastructural systems, and engage you in identifying the “risk tolerance” of different community and infrastructural systems which can be a function of the degree of risk and cost-effectiveness of adaptation. For example, what transportation routes can be allowed to periodically flood and what routes can become resilient corridors? How will flooded roads impact traffic or transit access to and from adjacent City neighborhoods? Understanding how these transportation routes are affected by flooding, including impacts on local traffic, normal access/egress, emergency evacuation routes, etc., is an important next step for prioritizing the most critical routes and developing realistic adaptation strategies. Each of the below infrastructural systems will be evaluated in this way and looked at from a holistic perspective to capitalize on system redundancies and potential community co-benefits.

Critical infrastructure & Hurricane Barrier and Flood Protection System

While the US Army Corps of Engineers maintains the Hurricane Barrier and Flood Protection System, it will be a key factor in coastal flood prevention which our team will review, understand the impacts of and incorporate into project recommendations. Using the City GIS data provided for the Coastal Flood Resiliency Plan Area, our team will highlight critical infrastructure in the context of the flood zone and Coastal Area Management Boundary while bringing to light any potential interdependencies of these systems.

Roadways, Critical Transportation & Potential Resilience Corridors

We will include policy guidelines for roadways in the floodplain with regard to emergency access and evacuation egress. Potential adaptation strategies that will be considered may include road elevations for dry egress, segments of flood protection systems, site-scale flood protection or accommodation strategies for critical community lifelines, and shoreline strategies.

Repetitive Loss Areas

Also included on the GIS Coastal Flood Resiliency Plan Area map are repetitive loss areas, which are flood prone areas where property owners have made repeated flood insurance claims. We will include recommendations for these areas and predict where future repetitive loss areas may appear with sea level rise and increased storm intensity.

Tree Canopy

We will identify the benefits of an enhanced coastal forest, including an analysis of the urban tree canopy with respect to urban heat management and environmental equity and associated costs and benefits of a greening program. This task will build on the City’s existing GIS-based tree inventory for downtown and other potential future expansion areas.

Property Acquisition

We will develop a list of potential properties to acquire to increase open space and reduce flood risk within the flood hazard area, including consideration of costs and benefit.

Elevation Certificates

Elevation certificates on file in the Environmental Protection Board will be reviewed and integrated into the analysis of impacted structures.

We will document the outcome of this task in a joint Task 1 and 2 memo which will be highly graphical and incorporated into the final deliverable for the project. The analysis and evaluation from Task 2 will be incorporated into the existing and future conditions mapping where possible with coordinating sections in the final Task 1 and 2 memo.

Deliverable: Mitigation Actions Memorandum



Resilient Meadow Street - Branford, CT

Fuss & O'Neill is leading this Resilient CT Phase III project which aims to reduce flood risk in the Meadow Street neighborhood, which is impacted by coastal flooding from the adjacent Branford River.

Task 3 – Community/Stakeholder Engagement

As described in our approach, we believe that effective and meaningful community and stakeholder engagement requires an ongoing and meaningful conversation with a wide range of stakeholders throughout the planning process and will be critical to developing the shared resilience vision you are looking for. To that end, engagement and outreach will be integrated seamlessly into the work of other tasks. We look at outreach and engagement process not as collections of discreet meetings, but rather as “waves” or phases of outreach and engagement coordinated with the planning and design process and milestones as described below. To ensure that engagement is effective and meaningful for stakeholders, it is critical that we give/share information with stakeholders as well as ask for/request input from them. To that end, aside from the development of the engagement plan and establishment of the advisory committee, Task 3 will not commence until the completion of Task 1 and 2 so that the City and project team are able to share the results of the existing and future conditions analysis, particularly flood modeling.

Base Scope

Develop a Community Engagement Plan

Working closely with you, we will develop an Engagement Plan at the project outset to set the overall intention for the community/stakeholder engagement process and outcomes; identify target stakeholders; outline mechanisms and partners for outreach; and identify strategies to engage participants, particularly those who may be harder to reach through conventional channels and methods. The Engagement Plan will:

- Articulate goals & outcomes: outline the intentions and goals of the community/stakeholder engagement process and desired outcomes, which will inform selection of the tactics and methods for outreach.
- Identify outreach strategies: describe outreach and engagement strategies specific to the project and identified stakeholders, particularly those who may be less involved or face barriers to attending meetings, such as work hours, family commitments, or linguistic barriers.
- Map out the engagement schedule: Establish a series of engagement phases aligned with other project tasks, identifying stakeholder touchpoints in coordination with key project milestones to allow for feedback to be correlated to inform the subsequent stages of the process.

Establish and Meet with a Project Advisory Committee

We will work with you to identify and facilitate the formation of an advisory committee comprised of technical and community/citizen stakeholders. We will work closely with the city to identify and engage members that represent a broad cross section of stakeholders with experience or expertise in the project area as described in the RFP. This must be a large enough group to represent diverse constituents in each neighborhood, but small enough to allow for a robust dialogue where all participants are engaged.

We will meet with the project advisory committee four times throughout the project:

- **Meeting #1:** kickoff and project orientation and review of analysis. During this meeting we will:
 - Introduce and orient the committee to the project,
 - Discuss and get feedback on the evaluation of existing plans and data prepared in Task 1
 - Review and climate conditions analysis and impacts of flooding and heat developed in Task 1, and
 - Review critical infrastructure in the flooding context (findings from Task 2).
- **Meeting #2:** Identify and describe potential Adaptation Approaches. Meeting #2 will take place prior to public workshop #2. During this meeting we will:
 - Establish and review adaptation priorities,
 - Define and describe potential adaptation strategies, and
 - Discuss trade-offs and compromises of potential adaptation strategies.
- **Meeting #3:** Prioritize adaptation strategies and identify focus areas. Meeting #3 will take place following public workshop #2. During this meeting we will:
 - Review criteria for prioritization and confirm priority focus areas
 - Present and interactively discuss the adaptation alternatives for priority areas (after Public Workshop #2).



Climate Ready Dorchester - Boston, MA

To inform the decision-making process behind various resilience strategies, the SCAPE team held a series of community and stakeholder engagement sessions including two open houses and attendance to numerous existing neighborhood meetings, all designed to educate and involve attendees using custom models, 'scenarios,' and interactive engagement tools.

- **Meeting #4:** Review and discuss designs, analysis, and implementation recommendations. Meeting #4 will take place during Task 6. During this meeting we will:
 - Present and review the preliminary draft report including the concept level designs, benefit cost analysis, and preliminary implementation recommendations, and
 - Present and discuss the steps to complete the project.

Prior to each meeting, the team will prepare meeting agendas to be circulated to the project advisory committee in advance of each meeting as well as meeting materials consisting of a presentation (pdf or ppt). Following each meeting we will prepare meeting minutes and circulate the minutes along with all presentation materials to the committee. It is assumed that project advisory committee meetings will be virtual to most flexibly accommodate and encourage attendance at all meetings.

Organize and Facilitate Public Workshops

We will work with you to organize a series of three public workshops to present information, gather input, and develop consensus among community members and stakeholders on key milestones and deliverables. Each will cover the entire project area but provide breakout portions for neighborhood-specific discussions. It is assumed that these will be virtual workshops. There will be three public workshops:

- **Workshop 1** – presentation of project scope, review of climate impacts, and solicitation of feedback on community needs and priorities related to the planning study area.
- **Workshop 2** – workshop on adaptation strategies and potential project concepts to mitigate climate risks in the planning study area.
- **Workshop 3** – present draft final report and discuss implementation next steps with the community and stakeholders.

We assume at this point that all or most of the public workshops will be virtual to enable the attendance and participation of the greatest number and cross section of stakeholders. Based on our experience designing and facilitating virtual public meetings, we will utilize digital tools in a way that enables discussion, keeps informational material short and concise, and makes use of interactive features such as break-out rooms and polls.

For each workshop, we will prepare meeting agendas and materials (including maps and visual aids for presentation); facilitating the events; and following the meetings provide a summary of outcomes and feedback from the community. This summary will be made available to all workshop participants through the project website or via email and will also be packaged as a Public Engagement Memorandum (1 per meeting) to be included in the final report. Workshop materials will be in English and Spanish.

Develop and Deploy Outreach Materials

In addition to establishing a robust and transparent dialogue with stakeholders, we will produce accessible graphics and materials to support that dialogue through each stage of the design. Our engagement strategy is designed to be inclusive, create space for critical thinking, and support collective problem solving. Clear, concise, and compelling graphics and narrative are key to achieving this. Early on, we will work with you to develop a clear introductory material on the project including a short introductory presentation and one-page project ‘fact sheet’ (flyer) that can be shared digitally through the project website or as printed material, depending on the audience.

For each of the three phases of engagement, we will develop: an updated project fact sheet, a slide deck providing an update on the project progress and presenting material in a manner that provides prompts for input and discussion from stakeholders that is highly graphic. Material will draw from graphics and visuals developed for the analysis and design phases of the project. We will create clear, compelling graphics that convey as much information as possible in a graphic manner that does not require translation, but we will prepare materials in English and Spanish, working with internal Spanish-speaking staff or a local translation consultant. Presentation materials for Advisory Committee meetings and Public meetings within the same project phase will be similar, but we acknowledge the need to make minor adjustments and modifications for the different audiences. In addition, we will prepare graphic materials that can be used for outreach formatted for the project’s website and social media platforms like Instagram.

We understand your desire to focus on and prioritize digital outreach, but our team is aware of the potential issues with digital access and literacy that come with a remote engagement, and we will work with you to develop designs for physical mailers, postcards, and physical materials to supplement digital material, raise awareness and facilitate participation in engagement activities.



Climate Ready Dorchester - Boston, MA
Coastal Resilience Vocabulary Guide

For the final Public Meeting, we will also prepare a “meeting-in-a-box” for your staff and stakeholder partners. This is a kit of custom project engagement materials that would allow your project team members or trained community representatives to take the engagement “on the road” to existing community hubs or gatherings. This would include template announcement/ email/or meeting advertisement, the master presentation (ppt or pdf), and a speakers/facilitator guide to accompany the presentation. Following the project, this can be used as a means of taking the proposed recommendations “on the road,” sustaining momentum from the planning effort, and building a constituency of knowledgeable advocates for the recommended projects for each focus area.

Deliverables: Community engagement plan including schedule of engagement meetings, agendas, presentation and outreach materials, information sheets, meeting minutes, Public Engagement Memorandum.

Task 4 – Concept Level Designs

Building on the outputs of Tasks 1-3 and drawing on our team’s deep experience with flood risk reduction and resilience project development and implementation in the region and nationally, we will identify and develop potential short-term and long-term adaptation strategies and resilience projects to help the City manage its vulnerable infrastructure, facilities, and natural resources in the face of increasing flood risks. Specifically, using the process described below, we will develop concept level designs for up to three prioritized focus areas to address flood risk reduction, ecological restoration, and other climate resilience goals identified through the stakeholder engagement process (potentially including: reducing extreme heat and addressing social resilience through public gathering spaces and equitable design), as well as critical implementation considerations such as ability to permit, cost, political feasibility, and eligibility for FEMA and other funding opportunities.

Through this project we will explore a breadth of adaptation strategies/options including green infrastructure and nature-based solutions as well as more traditional gray infrastructure and hybrid approaches. We find that the best approach is usually a layered one and about finding the right set of strategies—green, grey, and hybrid, deployed together in a complementary manner over time as part of a holistic vision and adaptation framework for a place.

Approaches considered will include structural solutions, coastal and inland nature-based solutions as well as non-physical solutions based on policy and potential community initiatives. A range of traditional urban green infrastructure solutions will be considered together with innovative shoreline and coastal solutions to layer in risk reduction and redundancies throughout the community while examining solutions which adapt to coastal impacts, reduce coastal impacts, and even potentially relocate critical assets out of areas of risk.

Base Scope

Identify Priority Focus Areas

Using the findings from Tasks 1 and 2 as well as input from the initial Advisory Committee meeting and public meeting, we will develop criteria to identify and prioritize focus areas. These criteria will be developed in collaboration with you and the Advisory Committee and informed by broader stakeholder input, so we cannot say what they will be, but we anticipate they will likely include considerations like: Magnitude/frequency of flood exposure, vulnerability of community and critical infrastructure to flooding, heat vulnerability, presence of vulnerable or disadvantaged communities, suitability/feasibility of providing significant risk reduction with near term actions. While these criteria can be flexible and refined through the process, we believe articulating values and priorities in clear, simple language is an important step in fostering agreement around priority focus areas, be they geographic or thematic. Working with you and the Advisory Committee and informed by stakeholder feedback, we will identify and characterize priority locations and problem areas for intervention. These areas will then inform the development of adaptation strategies. A summary memo of why the focus areas were selected, including the criteria, priority issues, and stakeholder input will be prepared and included in the final report.

Adaptation Options

Based on the specific physical and social conditions as well as exposure, vulnerabilities, and risks of the identified focus areas, we will develop a project-specific “pallet” of potential flood risk mitigation and adaptation strategies. These will draw from the team’s robust regional and national experience with best practices in flood risk mitigation and adaptation, but the strategies will be refined and grounded in the character, vulnerabilities, and needs of Stamford and the specific focus areas identified. In developing these strategies, we will draw from our team’s experience considering not just planning, but also implementation, considerations as well as the Resilient Connecticut PERSISTS decision support criteria to develop adaptation options that are realistic and implementable in Stamford and support stakeholder priorities and neighborhood quality of life/wellbeing. We will consider the full breadth of adaptation options from grey to green to programmatic, including nature-based strategies and non-structural strategies as well as traditional infrastructure, being sure to describe the pros and cons of each to enable stakeholders to understand and consider tradeoffs. We will prepare a summary of applicable adaptation options for stakeholder review, specifically Advisory Committee meeting #2 and Public Meeting #2.



Resilient New Jersey - Middlesex County, NJ

The action plan combined a suite of structural and ecological interventions responding to local conditions within each watershed, including protection, restoration, and transition.

These summaries will include diagrammatic illustrations along with precedent images and concise descriptions in simple language of the adaptation approaches as well as a high-level assessment of the relative performance/effectiveness at achieving identified project goals.

Preferred Alternatives and Concept Designs

Based on the feedback from the Advisory Committee (Meeting #1 & 2) and Public Engagement Meetings (Public Meetings #1 & 2), we will identify and select a suite of specific strategies for each focus area and develop concept level designs for up to 3 prioritized focus areas. This phase will kick-off with Advisory Committee meeting #3, which will be a facilitated charrette to engage the committee in confirming the priority focus areas and prioritize/select the adaptation strategies for each focus area. Building on the outcomes of this charrette, we will refine concept-level resilient designs for each adaptation areas. These concept designs will be frameworks for adaptation, identify near-term and long-term adaptation strategies and a phased approach to adaptation where appropriate or necessary (likely in most places). They will include high level programmatic and policy recommendations alongside physical measures where they are necessary or complementary. These concept-level designs will be developed to a level that enables the development of order-of-magnitude costs, perform a basic benefit-cost analysis, develop a rough project schedule and phasing, communicate the project to stakeholders, and submit materials for further funding. The level of detail and means of documentation may vary slightly among the focus areas based on size, complexity, or other factors. The conceptual design package for each focus area will include:

- A concise design narrative (approx. 1 page)
- One illustrative plan, and where relevant/important, and additional plan diagram
- One cross section
- One eye-level sketch perspective (“before” and “after”) (see Raritan River graphic below)

For projects that would involve a use of land, we will identify the owner/jurisdiction and depict the location of any likely/assumed easements on the plan. All materials will be prepared and provided to the city in electronic file format (PDF unless other is requested).



Resilient New Jersey - Middlesex County, NJ

Combining stream restoration, culvert enlargements, and a contiguous network of green spaces along Heards Brook, the vision for this site is to reduce the amount of impervious area and flood risk exposure for the surrounding neighborhoods.

Identification of Potential Grant Funding Opportunities

Based on the project types, designs, and outcomes, we will identify and prioritize potential grant funding sources including, but not limited to, CTDEEP Community Resilience Fund, FEMA hazard mitigation assistance grant funding, HUD CDBG, NFWS National Coastal Resilience Fund, Connecticut Community Investment Fund, state and federal earmarks, among others. We will pay particular attention to applicable federal funding flowing from the Bipartisan Infrastructure Law and Inflation Reduction Act which contains significant funding aimed at enhancing protection for coastal communities from the impacts of storms, floods, and other natural disasters. We will prepare a concise memo summarizing potential funding sources for each project and identifying the specific aspects of the projects that make that source most applicable.

Deliverables: Summary of priority locations, preferred adaptation strategies indicated by stakeholder engagement, conceptual designs for inclusion in the final report, and associated grant opportunities.



Gloucester Marine Station Coastal Resilience Plan and Site Improvements



Gloucester Marine Station Coastal Resilience Plan and Site Improvements - Planning and design decisions considered coastal and ecological resilience, with emphasis on reducing future risks. The plan also included the creation of a living laboratory for future research and study.

Task 5 – Cost estimates and cost-benefit analyses

Coastal resilience solutions planned thoughtfully can also be crafted, with little to no additional financial commitment, to address other City goals, from addressing the impacts of extreme heat in at-risk neighborhoods and improving quality of life through increased green space to economic development goals. A Benefit Cost Ratio greater than 1.0 is essential to secure federal funding for large-scale resilience projects. Resilience projects often need to be scaled to match potential benefits.

Base Scope

We plan to calculate potential benefits early in the concept development process based on the provided modeling results. This will serve as a benchmark to scale potential alternative designs that are available to address risks and impacts. Order-of-magnitude costs will be developed for alternatives to confirm whether they fit within the benefits calculated for the project and would be feasible (i.e., cost-effective).

In quantifying the benefits and costs for upgrades and improvements to the citywide drainage system in Stamford, it will be important to consider different types of benefits. Benefits can be defined as avoided damages over a certain timeframe. These have the potential to be high, especially in low lying areas of the City's South End, including the Harbor Point, Waterside, Shippan, and Cove neighborhoods, as well as areas along the Rippowam River that are densely developed with multiple assets and large infrastructure projects. Potential benefits are also higher for storm events over longer time horizons that cover the useful life of the infrastructure project. Benefits can also be considered simply from a funding and financing standpoint – grants, fees, taxes, and assessments.

Deliverables: BCA calculations and narrative for the preferred project concepts.

Task 6 – Final Coastal Flood Resiliency Plan

Base Scope

We will document the outcome of this project in a highly graphical report to serve as a roadmap for the next recommended actions to progress this project towards implementation. The final document will include a detailed project prioritization as well as the Final Coastal Flood Resiliency Plan. The Final Coastal Flood Resiliency Plan will detail: a summary of the process and outcomes from the planning and engagement process; deliverables from Tasks 1-5 above; a table of detailed preferred actions connected to timelines and funding sources; as well as accompanying drawings and site plans.

Deliverables: Final Report, Executive Summary (in both English and Spanish).

Project Schedule - Work Plan

This schedule shows the major tasks to be performed as well as timing of key engagement workshops. We have laid out a schedule in months from receipt of Notice to Proceed (estimated for this schedule as August 1, 2023).

Task Name	Month	AUG '23	SEPT '23	OCT '23	NOV '23	DEC '23	JAN '24	FEB '24	MAR '24	APR '24	MAY '24	JUNE '24	JULY '24	AUG '24
Task 1 - Data Collection, Synthesis, and Modeling		█												
Task 2 - Evaluation of Critical Infrastructure		█												
Task 3 - Community/Stakeholder Engagement				█										
Phase 0: Engagement plan & stakeholder identification		█												
Phase 1: Establish shared understanding of project outcomes, validate analysis, and establish preliminary project goals (AC #1, PW #1)					█									
Phase 2: Explore and discuss applicable adaptation strategies; Prioritize focus areas and adaptation strategies (AC #2, PW #2, AC #3)								█						
Phase 3: Share & discuss analysis and recommendations (AC #4, PW #3)														█
Task 4 - Concept Level Designs					█									
Task 5 - Cost Estimates and Cost-Benefit Analyses									█					
Task 6 - Final Coastal Flood Resiliency Plan														█

Additional Optional Tasks

Task 1 – Data Collection, Synthesis, and Modeling

Additional Optional Tasks

If for some reason, the City of Stamford and the project team feel that the CIRCA modeling results do not adequately meet the needs of the City and/or provide results within the required timeline, the Fuss & O'Neill project team is capable of and prepared to supplement the base scope with the following additional tasks that may be valuable in developing a comprehensive concept level design and overall implementation plan for design phasing and adaptability.

These potential optional tasks present some alternative approaches that could be used to develop the desired probabilistic flood results necessary to provide the best possible resiliency approaches, flexible adaptation designs, and phased implementation pathways for the City of Stamford. These optional services and tasks are intended to enhance the current scope or provide data if the expected existing and future flood conditions data to be provided from CIRCA are unavailable or delayed. Some of these potential options also provide cost-effective enhancements. Specifically, these optional tasks may include, but might not be limited to:

- **Use existing probabilistic model results to develop a full distribution of AEP water levels.** In addition to the information that will be provided by CIRCA, possible enhancement of it may be viable to enhance these data via utilization of existing physics-based modeling that has already been completed in the region. Specifically, application of the USACE NACCS model and/or the Massachusetts Coast Flood Risk Model (MC-FRM) provide full AEP distributions for the Stamford area. In the case of the MC-FRM, this includes full AEP distributions under current and changing climate conditions (4 scenarios).
- **Use existing probabilistic model results to determine other potential parameters.** If certain key parameters are not provided by the CIRCA modeling, then the project team can provide these data. For example, wave height conditions under various return period storm levels are an important factor for determining the required design flood elevation levels needed for design requirements. These wave heights can be acquired via existing modeling efforts that have already been completed.
- **Support of the CIRCA modeling with additional simulations or more refined AEP level conditions.** The project team could help support the overall CIRCA modeling effort by assisting with model simulations or production of more detailed results. This could also include the development of a fully probabilistic physics-based hydrodynamic model of the City of Stamford, which would include a complete Monte Carlo based assessment of flood risk.

Task 3 – Community/Stakeholder Engagement

Additional Optional Tasks

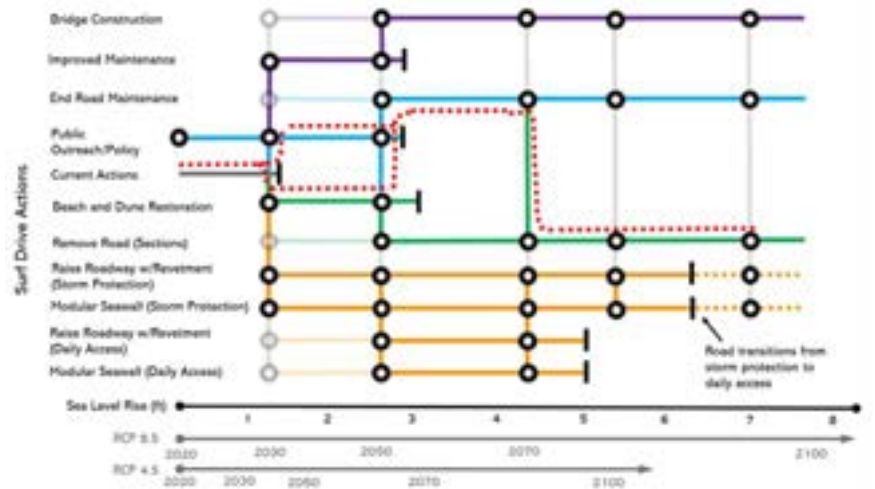
In addition to the base scope requested by Stamford, the team suggests considering the following additional community/stakeholder engagement activities, which we have found particularly effective in resilience planning projects with similar goals and scope. We can prepare a full proposal for any of the following if desired.

- **Additional “Meeting-in-a-Box”:** using the presentation materials from each engagement phase as a guide, we could also prepare a kit of custom project engagement materials that would allow project team members or trained community representatives to take the engagement “on the road” during the project process to expand on-the-ground engagement.
- **Separate technical & Citizen Advisory Committees:** Community stakeholders representing residents, workers, or community organizations often come to planning processes and project with very different perspectives and priorities than bureaucratic or technical stakeholders like agency representatives, academics, or technical experts and it can be advantageous to engage these stakeholders as separate groups to successfully get honest and complete input and feedback and foster productive discussions among stakeholders.
- **Neighborhood-specific public workshops:** rather than one public workshop with breakout areas for each neighborhood, separate workshops could be held for each neighborhood.
- **Place-based engagement:** The process of engaging people with the project site(s) often provides new perspectives and elicits productive input on considerations related to experience including comfort, safety, access, and materiality. This can supplement or replace other forms of community meetings and could include an outdoor site walk, on-site installation, or smaller group tour (for focus groups). These types of events or installations allow community members to discuss opportunities and constraints, explain technical considerations, and provide perspectives on the future uses and site character. They can also be paired with digital place-based apps to share input and make feedback publicly available.
- **Focus groups:** Focus groups can provide opportunities for deeper and more targeted outreach with key groups of stakeholders or user groups convened around shared interests or concerns. This setting can provide comfort and facilitate conversation within groups that might be less inclined to participate or speak openly in larger forums. Focus Groups can be virtual or in-person.
- **Virtual & Augmented Reality (VR/AR):** SCAPE has had success with communicating flood risk and design strategies through visualizing future flooding or design interventions using virtual reality viewers. These could be used during public workshops or other meetings.

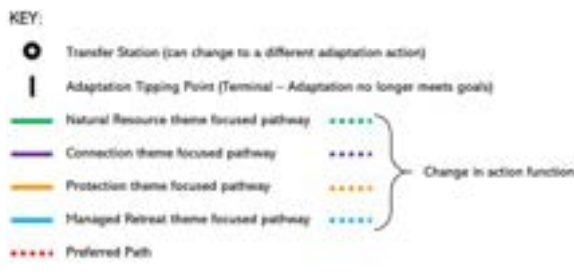
Task 4 – Concept Level Designs

Additional Optional Tasks

- **Additional graphics/renderings:** Additional graphics (renderings, modeling, sections, plans) could be provided to help visually communicate the intent of the adaptation options and/or concept designs.
- **Grant writing and preparation services:** If desired, the team could assist in preparing grant applications and/or grant application materials to assist the City in pursuing grant funding for the next phases of design and implementation.
- **Develop Dynamic Adaptation Planning Pathways:** Dynamic adaptation planning pathways (DAPP) can provide a powerful adaptive and visual management tool to guide a community through the process of adapting to changing climate conditions. DAPPs provide the range of potential actions available to reduce the flood vulnerability, provide key water level and temporal thresholds, and present decision points. While these can seem overwhelming at first, once understood, they provide an extremely powerful decision tool for Town planners and policy makers. An example of an applied DAPP that was completed by Woods Hole Group and is being carried forward by the Town of Falmouth, is presented in the figures below. This includes a key to interpreting the dynamic adaptation pathways figures where various pathways associated with each action are color-coded by theme (e.g., Natural Resources = green, Connection = purple, etc.). As you travel left to right along a pathway for a particular action, at key time steps you will encounter a “transfer station”. These transfer stations represent decision points and opportunities to transition or shift to a different action (i.e., move up or down along one of the vertical paths when a change in approach is decided upon due to variations in community desires, climatic conditions, or overall municipal policies).



Dynamic adaptation pathways – Surf Drive (barrier beach), Falmouth, MA



Pathway Scorecard	Path Actions	Relative Costs	Target Effects	Side Effects
1.	Managed Retreat	+	Salvages present uses with increased costs and risks in the future through a multi-phase retreat plan	Loss of Homes No Connection via Surf Drive Loss of Accessible Beach
2.	Protection	+++++	Protects operational capacity of existing infrastructure and features	Loss of Accessible Beach Aesthetics/Visual
3.	Natural Resources	+++	Preserves and enhances coastal and marine ecosystem functions	Loss of Homes No Connection via Surf Drive
4.	Connection	+++++++	Maintains important public access, utility connections and transportation corridors	Loss of Homes
5.	Preferred	+++	Salvages present uses w/increased costs and risks in the future through a multi-phase retreat plan, while enhancing ecosystems	Loss of Homes No Connection via Surf Drive
6.		+++	Improved maintenance for short-term uses w/ long term focus on ecosystem restoration	Loss of Homes No Connection via Surf Drive
7.		+++++	Coastal habitat restoration in the short term, upgradation of existing infrastructure in the long term	Loss of Accessible Beach Aesthetics/Visual

Pathway scorecard for Surf Drive (barrier beach), Falmouth, MA

In many cases, the most beneficial and cost-effective approach to protecting an asset is to phase in different actions over time or consider shifting the use of a specific asset over time, as rising water levels prompt additional actions or an alteration in the way an asset may be used in the future. For some actions, they will be effective throughout all time frames considered; for these actions, the solid colored line will continue to the right edge of the figure. For others, an adaptation tipping point (i.e., the point where that action can no longer function as intended) might be reached at a certain water level. These tipping points are indicated by a black vertical bar. When this occurs, the solid colored line representing an action will either end at that tipping point terminal (i.e., that action is no longer effective), or the line will continue past the tipping point terminal as a dashed line. The dashed line in this case indicates a change in function for that action. For example, an action that originally provided protection from storm damage flooding in the 2030 or 2050 timeframe, may only provide protection from daily tidal flooding in the future as water levels increase. These DAPPs can provide immense planning and cost-reduction value for a community, and they allow agile adaptations.

Task 5 – Cost estimates and cost-benefit analyses

Additional Optional Tasks

In addition to the core scope requested by Stamford, the team could also be available to assist the City with taking a closer look at how the BCA could play out in different scenarios across the entire project focus area. We can prepare a full proposal for the below if desired.

- **BCA Development for selection of phasing options project area-wide:** The team would define alternative approaches, including a comprehensive coordinated approach vs. an approach that assumes improvements and interventions are undertaken in a more partial and ad hoc manner. An analysis of each option would be undertaken in order to estimate costs and benefits for each proposed intervention relative to a no-build option. The net benefits of each proposed intervention as compared to the no-build option could then be determined and each option ranked.

Task 6 – Final Coastal Flood Resiliency Plan

Additional Optional Tasks

- GIS StoryMap

An aerial photograph of a marina, rendered in a blue monochrome palette. Two large barges are docked at a curved pier. Several boat lifts are visible, each with multiple sailboats hoisted. The water is dark, and the surrounding land shows some vegetation and structures.

SECTION 2

Committed Staff, Project Management Plan, and Organization

Section 2: Committed Staff, Project Management Plan, and Organization



We have assembled a team of highly qualified professionals with extensive Connecticut and national experience in coastal flood resiliency planning and implementation. The **Fuss & O'Neill** team includes **SCAPE Landscape Architecture**, an award-winning landscape architecture and urban design firm headquartered in New York City, and **Woods Hole Group**, an international leader in coastal resilience science, planning, and engineering based in Falmouth, MA. Fuss & O'Neill is partnering with SCAPE on several coastal resilience planning and design projects in Nantucket, MA and has a long-standing teaming relationship with Woods Hole Group on coastal projects throughout Connecticut and elsewhere in the northeast. Collectively, our team is working on some of the most impactful and high-profile coastal resilience and restoration projects in New England, New York City, and northern New Jersey.

The narrative below summarizes the qualifications of key staff and outlines their roles for this project. In this section, an organization chart of key personnel with resumes to follow.

Fuss & O'Neill
Full Time Employees: 313
Professional Employees: 347

SCAPE
Full Time Employees: 72
Professional Employees: 65

Woods Hole Group
Full Time Employees: 78
Professional Employees: 10



Erik Mas, PE
Principal-in-Charge

Erik combines planning and engineering experience in the areas of flood protection, climate resilience, and stormwater management. He has managed and is actively leading several statewide and regional scale flood resilience assessment projects in Connecticut, led the development of the Stamford Stormwater Drainage Manual, and is working with the City of Stamford on grant development for flood mitigation projects. Erik also authored the CT Stormwater Quality Manual, including ongoing updates to CT stormwater manuals. Erik will serve as Principal-in-Charge for this project.



Sara Morrison, MLA, WEDG
Project Manager

Sara's expertise is integrating natural and engineered systems using nature-based solutions to achieve socially resilient, economically viable, and environmentally sustainable projects. She has led the management, planning, and design of climate adaptation projects of varying scales across the northeast including complex, interdisciplinary coastal resilience projects in NYC in the aftermath of Superstorm Sandy.

Her experience includes both coastal and inland environments and ranges from living shorelines, salt marsh and dune enhancements, to floodplain and river restoration projects. Sara has been working with the City of Stamford on grant development for flood resilience projects and will serve as the Project Manager for this project.



Alex Maxwell, PhD, CC-P
Assistant Project Manager

Alex is a resilience planner with experience working on a wide range of municipal climate resilience projects, including coastal and inland flood resilience planning and design projects. He is currently managing a project to develop a coastal resilience action plan for the community of Manchester-by-the-Sea in MA aimed at reducing coastal flood risks and increasing coastal resilience in the community's inner harbor.

Alex is also working with Sara Morrison and Woods Hole Group on a master planning and design project at the University of Massachusetts Amherst Gloucester Marine Station, including a coastal climate flood risk assessment and unique nature-based waterfront resilience design elements. Alex will serve as an Assistant Project Manager for this project.



SCAPE is a landscape architecture and urban design practice headquartered in New York with offices in New Orleans and San Francisco. They design and advocate for the ecologically restorative and socially engaged landscapes, urban environments, and natural infrastructure of the future. SCAPE plans, designs, and builds parks, waterfronts, plazas, master plans and urban frameworks, greenways and multimodal trails, streetscapes, and more. SCAPE also communicates the transformative potential of landscapes through publications, exhibitions, research, thought leadership, and other initiatives. SCAPE leadership in landscape architecture and urban design in the context of coastal resilience adaptation has resulted in some of the most high-profile and forward-looking urban coastal resilience plans in the northeast, including Climate Ready Dorchester (Boston, MA), Resilient Boston Harbor Vision (Boston, MA), Resilient New Jersey (Middlesex County, NJ), Resilient Together: El Punto (Salem, MA), Financial District and Seaport Resilience Project (NYC), and Living Breakwaters: Design and Implementation (Staten Island, NYC). SCAPE is teamed with Fuss & O'Neill and Woods Hole Group on various coastal climate resilience projects throughout the region.



Pippa Brashear, RLA

Landscape Architecture, Urban Design, and Engagement

Pippa is Resilience Principal at SCAPE. A leading national expert on resilience planning and climate adaptation, Pippa works with large, multi-disciplinary teams to develop landscape strategies and next-century infrastructure that integrate environmental, economic and social benefit. Pippa has led high profile urban coastal resilience planning projects in metro-Boston, New York City, New Jersey, and elsewhere throughout the U.S. Pippa will lead the SCAPE team and play an integral role in the development of coastal resilience design concepts and community engagement for this project.



Despo Thoma

Urban Design and Engagement

Despo is a Senior Associate at SCAPE. With a background in architecture and urban design, Despo designs and advocates for equitable and resilient neighborhoods, with a focus on climate adaptation, engagement and visual storytelling. She leads interdisciplinary teams to develop strategies and next-century resilience infrastructure that integrate social and environmental benefit for projects in New York, Boston, Louisiana, the Bay Area and Southeast Asia. Despo will support the team in the areas of coastal urban design and community engagement.



Woods Hole Group addresses environmental problems worldwide with a focus on solving engineering and environmental problems along the coast, in the ocean, and in wetland and terrestrial environments. Relying on service, excellence and leadership, Woods Hole Group employs dedicated and highly qualified scientists and engineers recognized in their respective technical fields. Woods Hole Group studies have been

utilized throughout the U.S. to perform vulnerability assessments and resiliency planning, including numerous communities and state and private entities. Their probabilistic, dynamic modeling approach has been used to develop the Boston Harbor Flood Risk Model, the Massachusetts Coast Flood Risk Model (simulating the entire coastal area of the State of Massachusetts), and the Palm Beach Flood Risk Model. This highly comprehensive approach was awarded a Federal Highway Administrations 2017 Environmental Excellence award.



Kirk Bosma, PE
Coastal Flood Risk Analysis

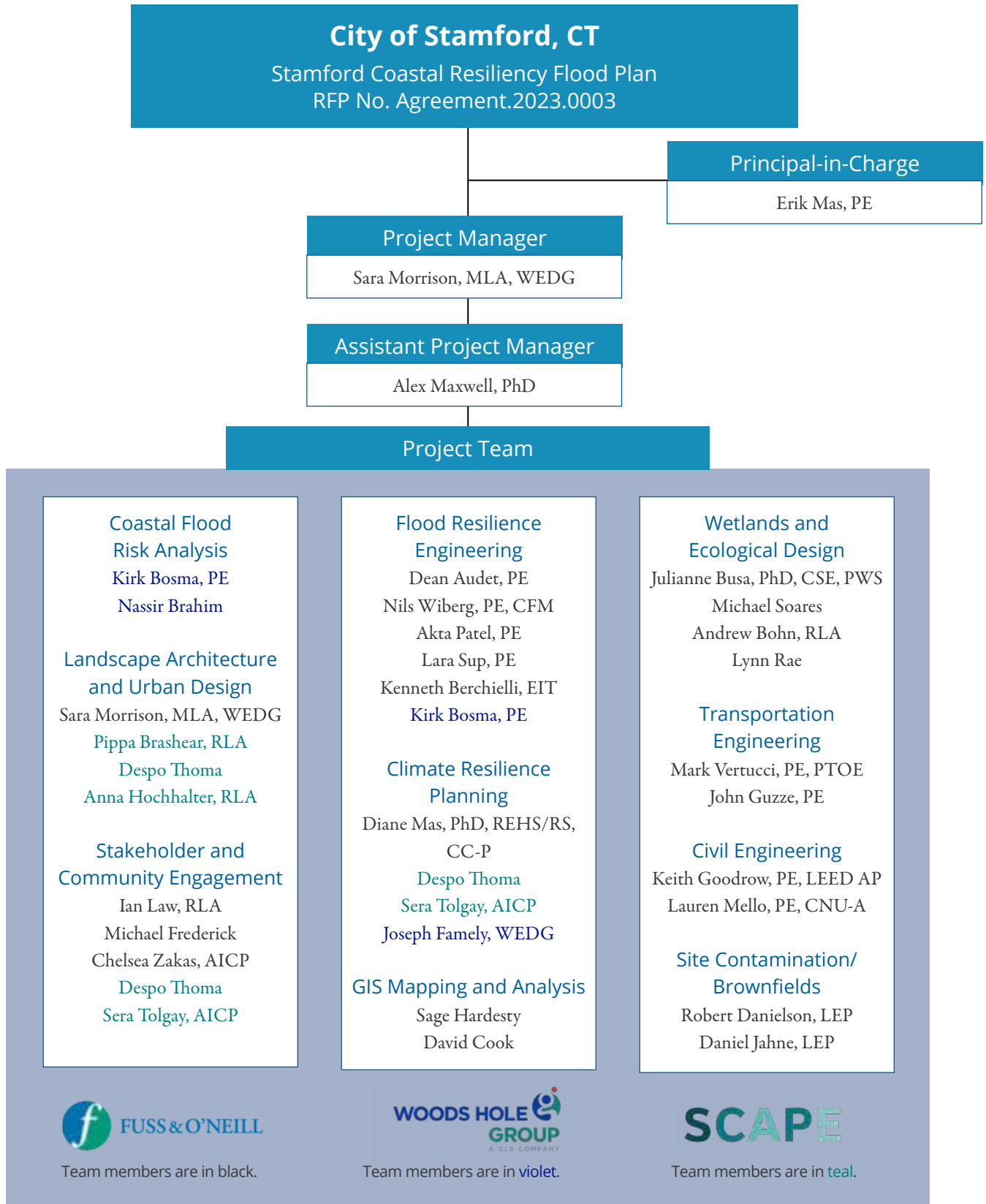
Kirk is a Senior Coastal Engineer and Innovation Director at Woods Hole Group. He has developed and applied the latest data and numerical methods toward capturing current and future flooding risk for climate change vulnerability assessments; and developed comprehensive coastal flood risk assessments that incorporate storm surge risk coupled with increased precipitation and sea level rise; and developed gray, green, and hybrid coastal engineering adaptations for fostering urban and rural resiliency in a cost-effective approach. Kirk will interface with the CIRCA coastal modeling team to evaluate current and future coastal flood risk and vulnerability within the Stamford project area.



Nassir Brahim, MEM
Coastal Flood Risk Analysis and Planning

Nassir helps build climate-resilient coastal communities by developing and implementing vulnerability assessments, resiliency plans, and capital and operational improvements. He has led coastal climate change resiliency projects with municipalities, transportation agencies, wastewater utilities, non-profit land conservancies, higher education institutions, and real estate property managers. Nassir Leads coastal resiliency projects at multiple scales, including asset, site, district, neighborhood, service area, municipality, region, and state. He will support the team in the areas of coastal flood risk analysis and coastal resilience planning.

Organizational Chart





Erik Mas, PE

Principal-in-Charge

“Applying math and science to solve environmental problems is what first attracted me to engineering, but working with really bright, passionate people on real-world projects – both simple and complex – is what I enjoy the most about being a consultant.”

emas@fando.com

413.333.5466

EDUCATION

BS, Civil Engineering - 1992
Tufts University

MSE, Civil Engineering - 1995
Princeton University

LICENSES & REGISTRATIONS

Professional Engineer CT
Professional Engineer MA

PROFESSIONAL AFFILIATIONS

New England Water Env Assoc
Water Environment Federation

EXPERIENCE

30 Years Professional Experience

Erik is a manager in our Water and Natural Resources Business Line. He combines planning and engineering experience in the areas of flood protection, climate resilience, and stormwater management. He has managed and is actively leading several statewide and regional scale flood resilience assessment projects in Connecticut, led the development of the Stamford Stormwater Drainage Manual, and is working with the City of Stamford on grant development for flood mitigation projects. Erik also authored the CT Stormwater Quality Manual, including ongoing updates to CT stormwater manuals.

REPRESENTATIVE PROJECTS:

FEMA BRIC/FMA Grant Development, Coastal Flood Resilience Plan, Stamford, CT: Project Manager for development of a FEMA grant application support for a coastal resilience plan to address existing and future flood prone areas.

FEMA HMGP Grant Development, Neighborhood-Scale Flood Mitigation Evaluations, Stamford, CT: Project Director for evaluation of flood protection alternatives to address riverine and drainage-related flooding in the Dannell Drive and Cummings Pond neighborhoods.

CIRCA Resilient CT Phase III - Flood Resilience Planning and Design, Danbury and Fair Haven, CT: Project Director for planning and design of infrastructure improvements to increase flood

resilience and resilience to heat impacts. Projects involve assessment and modeling of drainage, riverine, and coastal flooding; development and modeling of alternative solutions to mitigate flooding and heat impacts; development of conceptual designs; and benefit cost analysis.

Stamford Stormwater Drainage Manual, Stamford,

CT: Erik served as Project Director for the development of a stormwater drainage manual and revised zoning regulations for the City of Stamford to promote the use of green infrastructure and to address MS4 Permit requirements for post-construction stormwater management. The manual provides design guidance for green stormwater infrastructure practices in an urban, coastal setting.

Wood-Pawcatuck Watershed Flood Resilience

Management Plan, CT and RI: Led the development of a flood resiliency management plan for the 317-square-mile Pawcatuck River watershed, which is located within portions of 11 communities in southern Rhode Island and southeastern Connecticut. The management plan involves assessing the watershed for vulnerability to flooding and erosion, and developing management recommendations to protect and enhance the resiliency of the watershed communities to flood damages.

CCM Statewide Flooding Study: Project Manager for a statewide study on behalf of the CT Conference of Municipalities. The study evaluated the impacts of coastal, riverine, and drainage flooding on local municipalities and developed recommendations to allow communities to more effectively address flooding and become more resilient to current and future storms.

Coastal Flood Resilience Project, City of Milford,

CT: Project Manager for the initial planning phase of coastal resilience projects to address flooding in low-lying areas of Milford. The projects included a vulnerability assessment and feasibility study for raising a section of Beachland Avenue, and conceptual design of drainage infrastructure and outfall improvements to address tidal and storm-related flooding in the Bayview Beach area.

Connecticut Stormwater Quality Manual and

Updates, CT DEEP, CT: Project Manager for the development of a state-wide stormwater guidance manual for the CT DEEP. The manual provides guidance on the design and proper application of a wide variety of stormwater best management practices (BMPs) within the State of Connecticut. Project Manager and Lead Author for revisions to include updated guidance based on the current scientific understanding of stormwater control measures, improved regulatory consistency between the manuals and CT DEEP stormwater permit programs, and incorporation of climate change and resilience considerations for stormwater management design and implementation.

Upper Susquehanna River Watershed Flood Resilience Study, Tioga and Broome Counties, NY:

Project Manager for the development of a watershed-based flood resilience study and management plan for flood-prone tributaries to the Upper Susquehanna River in the Southern Tier of NY. The project included a road-stream crossing assessment and infrastructure-related recommendations related to stream crossing upgrades, stormwater green infrastructure, and nature-based solutions to enhance flood resilience.



Sara Morrison, MLA, WEDG

Project Manager

Landscape Architecture and Urban Design

"I get most excited about working on projects at the intersection of land and water and am passionate about helping communities and ecosystems evolve and adapt in the face of a changing climate. I like working on multi-disciplinary teams to integrate natural and engineered systems using nature-based solutions to achieve socially resilient, economically viable, and environmentally sustainable projects."

smorrison@fando.com

860.783.9777

EDUCATION

MS, Landscape Architecture -
2007 City College of New York

BS, Psychology - 2005
Louisiana Tech University

LICENSES & REGISTRATIONS

WEDG Associate

PROFESSIONAL AFFILIATIONS

American Soc Adaptation Profs
CT Association of Flood Managers
MA Assoc Floodplain Mgmt
American Soc of Landscape Arch

EXPERIENCE

16 Years Professional Experience

Sara Morrison is a Business Line Manager specializing in Climate Adaptation in our Water and Natural Resources Business Line with a background in systems-based, urban landscape architecture and large-scale climate resilience design and planning. Sara's expertise is integrating natural and engineered systems using nature-based solutions to achieve socially resilient, economically viable, and environmentally sustainable projects. She has led the management, planning, and design of climate adaptation projects of varying scales across the northeast including complex, interdisciplinary coastal resilience projects in NYC in the aftermath of Superstorm Sandy. Her experience includes both coastal and inland environments and ranges from living shorelines, salt marsh and dune enhancements to floodplain and river restoration projects.

REPRESENTATIVE PROJECTS:

FEMA BRIC/FMA Grant Development, Coastal Flood Resilience Plan, Stamford, CT: Project Technical Lead for grant development for a city-wide coastal resilience plan to address existing and future flood prone areas.

FEMA HMGP and LISFF Grant Development, Neighborhood Scale Flood Mitigation Evaluations, Stamford, CT: Project Technical Lead for grant development to evaluate flood protection alternatives to address riverine and drainage-related flooding in the Dannell Drive and Cummings Pond neighborhoods.

CIRCA Resilient CT Phase III - Flood Resilience Planning and Design, Fair Haven and Danbury, CT: Lead for coastal adaptation and nature-based solutions for planning and design of infrastructure improvements to increase flood resilience and

resilience to heat impacts. Projects involve assessment and modeling of drainage, riverine, and coastal flooding; development and modeling of alternatives to mitigate flooding and heat impacts; development of conceptual designs; and benefit cost analysis.

Marine Station Improvements Physical Improvements, University of Massachusetts,

Gloucester, MA: Project Technical Lead for physical improvements and infrastructure planning for the Gloucester Marine Station. The first phase of the project included field assessments, conceptual planning activities, schematic design development for stabilizing the bulkhead, restoring the open area behind the marine station, and installing a dock with crane/davit that will support future design, permitting, and public outreach/stakeholder engagement prior to final design and construction. An eelgrass survey, along with a coastal climate and flood risk assessment were conducted to develop the recommended design flood elevations (DFEs) for both the northern and southern shorelines of the site.

Coastal Vulnerability Action Plan, Manchester-by-the-Sea, MA:

Project Technical Lead to reduce coastal flood risks and increase coastal resilience. Fuss & O'Neill Developed the project website, which provides information on progress, upcoming engagement opportunities, and space for people to leave feedback. Created materials for stakeholder engagement and helped to facilitate community engagement.

Bank Street Flood Resilience Project, New London,

CT: Conducted a preliminary/high-level floodproofing assessment of all buildings in the project area. This project includes a Benefit-Cost Analysis (BCA) to determine the future risk reduction benefits of a hazard mitigation project and compares those benefits to its costs.

Updates to Connecticut Statewide Stormwater

Manuals, Statewide, CT: Supported lead author in developing updates to the Connecticut Stormwater Quality Manual and Connecticut Guidelines for Soil Erosion and Sediment Control.

Pocasset River Flood Control Improvements,

Cranston, RI: A \$48M capital project that combines traditional gray infrastructure and nature-based practices. The project includes buy-outs of more than 120 privately-owned buildings, with plans to convert that space to restored floodplain in urban neighborhoods. In addition to creating floodplain storage in a high-vulnerability watershed, these restored floodplain nodes will create open space and recreational access to the river in their urban neighborhoods. Sara leads the coordination of the buyout process and design of nature-based solutions, community access, and floodplain compensation.

Tottenville Shoreline Protection Project, Staten

Island, NY: At her previous firm, Sara served as Project Manager and Lead Designer for this \$32.5M coastal and community resiliency project to provide a layered system of risk reduction, ecological resiliency, and social resiliency. The design incorporates structured dunes, eco-revetments, and a robust shoreline planting and restoration plan to reduce erosion and attenuate wave action. Sara coordinated among five internal cross-disciplinary groups and six subconsultants. She led working groups that included members of the public, city/state agencies, academics, and elected officials to foster communication and attain buy in, improve understanding of local issues, and educate on risks to coastal habitats.



Alex Maxwell, PhD, CC-P

Assistant Project Manager

“I got into climate action work because it truly cuts across the fields of science, planning, and engineering. You need science to assess current and future conditions and impacts. You need planning to develop strategies for reducing greenhouse gas emissions and adapting to a changing climate. And, you need engineering to implement those strategies in ways that work for the communities and organizations that we serve. Together, these actions help our clients become more resilient in the face of one of the most pressing challenges of our time.”

amaxwell@fando.com

617.379.5876

EDUCATION

BS, Civil Engineering - 2009
Gonzaga University
MS, Environmental Science - 2011
Clarkson University
PhD, Urban Design - 2017
University of Strathclyde

LICENSES & REGISTRATIONS

Engineer-in-Training WA
Certified Climate Change
Professional

EXPERIENCE

10 Years Professional Experience

As an engineer and urbanist by training with over 10 years of experience, Alex has broadly focused on environmental planning, design, and sustainable development. Currently, he works as a resilience planner where he works on municipal vulnerability preparedness projects, environmental impact evaluations, and river corridor and climate resilience master plans. Previously, Alex served as a Senior Manager of Climate Programs at Second Nature, taught courses in civil and environmental engineering as an Assistant Professor at Gonzaga University, and worked as an environmental planning consultant on several projects related to local climate action planning, campus food waste, and walkable urban design. Overseas, Alex also spent several years working as a Fulbright-University of Strathclyde Research Scholar with the Urban Design Studies Unit in Glasgow, Scotland and for the Climate Change Planning Unit at the United Nations Human Settlements Programme in Nairobi, Kenya.

REPRESENTATIVE PROJECTS:

Coastal Vulnerability Action Plan, Manchester-by-the-Sea, MA: Project Manager for the CZM-funded project to develop a phased approach to establishing action-oriented mitigation measures aimed at reducing coastal flood risks and increasing coastal resilience in the inner harbor of Manchester-by-the-Sea. This planning effort includes an evaluation of existing and projected coastal flood conditions, a vulnerability assessment of critical infrastructure, and the development of neighborhood- and site-scale mitigation measures that can be implemented over time and used to maximize the potential for applications of nature-based and hybrid design solutions. The planning approach is centered around a community-driven engagement process to collect input from local residents, business owners,

municipal staff, and other key stakeholders to inform recommended actions.

Shawsheen River Watershed Land Conservation Planning and Prioritization for Climate Resilience and Environmental Justice, Andover, MA: Resilience Planner and Assistant Project Manager for Andover's FY22 MVP Action Grant project to identify and prioritize parcels for future land acquisition along the Shawsheen River with the goal of increasing climate and flood resilience. The assessment focuses on properties that could provide flooding relief to the most flood-prone areas in downtown Andover, including repetitive loss areas, as well as to downstream environmental justice communities in neighboring Lawrence. The assessment also considers habitat, water quality, and other ecosystem services, in addition to coordination with community volunteers.

Cherry Street Green Infrastructure and Slope Restoration Construction, Easthampton, MA: Resilience Planner for Easthampton's MVP Action Grant project focused on stream bank restoration and stabilization at the Cherry Street outfall and the reconstruction of Cherry Street to increase stormwater infiltration, add tree cover for shading, and improve sidewalk walkability and other resources in a local environmental justice community. Planning responsibilities include the development of an English and Spanish DIY guide to residential-scale resilient stormwater management solutions for local residents and a related workshop to demonstrate green infrastructure practices.

Climate Resilience and Sustainable Growth Plan, Belchertown, MA: Project Manager and Resilience Planner for Belchertown's FY 22 EEA Planning

Assistance Grant to develop a new Climate Resilience and Sustainable Growth Plan. The Climate Resilience and Sustainable Growth Plan will serve as a critical component of the Town's phased update to its Master Plan and will be developed through a community-driven planning process to provide an over-arching policy and planning framework to promote resilience and sustainable growth in Belchertown. The Plan will also provide a set of common goals and strategies to guide decision-making and develop actionable planning recommendations aimed at making the community more resilient to climate hazards and advance the Massachusetts Sustainable Development Principles.

Chicopee Brook Flood Resilience Improvements – FY23 MVP Action Grant Project, Town of Monson, MA: Project Manager for a hydrologic and hydraulic modeling study of the Chicopee Brook corridor and potential improvement scenarios at several key locations adjacent to the downtown area and within the downstream environmental justice community. Modeling of the Chicopee Brook corridor will enable the Town to identify optimal strategies for protecting against impacts of flooding through implementation of nature-based solutions ranging from right-sizing of culverts to increasing flood capacity through floodplain reconnection and green infrastructure. This project includes a large public involvement and community engagement aspect to participate in co-creating the vision for a resilient downtown Monson. The visioning workshop process focuses on improving flood resilience and developing a greater holistic understanding of how downtown Monson fits into the entire watershed.



Dean Audet, PE

Flood Resilience Engineering

“Solving complex engineering challenges is what primarily drives me. I like working with our clients to develop holistic solutions that best meet their long-term needs, not only from a design standpoint, but from a financial one as well. This includes thinking outside of the box to find the most suitable funding sources and creative engineering options.”

daudet@fando.com

401.533.5978

EDUCATION

BS, Civil Engineering - 1986
University of Connecticut

ME, Environmental Engineering -
1998 University of Hartford

LICENSES & REGISTRATIONS

Professional Engineer CT
Professional Engineer RI
Professional Engineer SC
Professional Engineer MA

PROFESSIONAL AFFILIATIONS

American Public Works Assoc
American Soc of Civil Eng
New England Water Env Assoc
Water Environment Federation

EXPERIENCE

37 Years Professional Experience

Dean leads our Water and Natural Resources Business Line. Throughout his career, he has completed a wide range of civil and environmental engineering projects, working with multiple technical disciplines. These projects have included drainage assessments, flood resilience, stormwater management, watershed management, wastewater, solid waste, and land development. Dean specializes in planning, designing, and constructing green infrastructure. He was an early adapter of green infrastructure in the 1980s, where he developed green infrastructure design approaches to better manage stormwater from both public roads and individual sites. In the 1980s and 1990s, he developed a range of infiltration practices and other methods to reduce the volume of runoff that is discharged from the site and incorporated, what today would be known as subsurface infiltration, bioretention, filter strips, and rain gardens. He has contributed to several state stormwater manuals and led the design of the first green streets and green infrastructure demonstration projects in New England.

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Danbury, Fair Haven,

Branford, CT: Project Director for development of conceptual designs to increase flood resilience and resilience to heat impacts in three CT communities. Projects involve assessment and modeling of drainage, riverine, and coastal flooding; development and modeling of alternative solutions to mitigate flooding and heat impacts; development of conceptual designs; and benefit cost analysis.

Sheffield Brook Stream and Floodplain

Restoration, Old Lyme, CT: Principal-in-Charge for stream restoration to regrade the stream channel using bioengineering techniques and restoration of the floodplain in an approximately 1.1-acre parcel.

Replaced undersized culvert with twin 36-inch culverts

with tidal gates to prevent backflow during high tidal water. A HEC-RAS model was developed for the existing and proposed conditions and an innovative solution was developed to reduce shoaling at the outfall. Significant public outreach and oversight by NRCS, which funded the project.

Beachland Avenue Flood Resilience Project,

Milford, CT: Led the planning and supervised the Fuss & O'Neill team for design, permitting and construction administration to raise a local road prone to routine tidal flooding. This included creation of a small berm given constraints with the raised road profile.

Coastal Flooding Controls, Bayview Beach and Calf

Pen Meadow, Milford, CT: Led the planning and initial public outreach for raising of critical infrastructure with an innovative pumping station to reduce flooding in a shoreline neighborhood. Evaluated existing drainage issues and designed cost-effective drainage system upgrades to reduce the risk of routine flooding and make the area more resilient to future storms.

Wood-Pawcatuck Watershed Flood Resilience

Planning and Implementation, Wood-Pawcatuck

Watershed Association, CT and RI: Project Director for a flood resilience management plan. This project was intended to increase resiliency to a watershed that has been challenged with riverine and drainage-related flooding. The management plan involved assessing the watershed for vulnerability to flooding and erosion, as well as developing management recommendations and conceptual designs to protect and enhance resiliency of watershed communities and to restore aquatic ecosystems.

Connecticut Stormwater Quality Manual: One of two primary authors of the current Connecticut

manual. Dean was responsible for developing manual requirements for the structural controls included in the manual, including green infrastructure controls. His work included developing design standards for these structural controls and authoring the design standard sections for the controls.

Coastal Resilience Plan, Town of Mattapoisett, MA:

Project Director to evaluate water and wastewater infrastructure and to identify improvements required to protect that infrastructure from targeted coastal storms.

Climate Change Vulnerability Assessment, New

Bedford, Acushnet, and Fairhaven, MA:

Conducted a screening evaluation of existing wastewater infrastructure (including pump stations, treatment facilities, and CSO outfalls) to assess potential impacts from future coastal storms. This assessment included identifying risks and ranges of costs to better protect existing infrastructure.

City-wide Stormwater Plan, City of Pawtucket,

RI: Dean was the Principal-in-Charge and senior technical advisor to develop a comprehensive city-wide plan for Pawtucket, RI to incorporate green infrastructure to achieve City goals. These goals include addressing water quality issues as well as providing opportunities for multi-modal transportation and greening neighborhoods with limited tree canopy and substantial impervious cover. An example is developing a green infrastructure plan for the City's new Transit-oriented Development near the train station development. This will include developing a crediting system where green infrastructure built in the ROW can be used to support private development in the TOD district.



Nils Wiberg, PE, CFM

Flood Resilience Engineering

“I’m passionate about the challenges and opportunities to develop creative solutions through water and natural resource projects in river, floodplain, and coastal environments. I thrive in understanding these dynamic environments and teaming with scientists and engineers to develop holistic solutions that enhance ecosystems while protecting public infrastructure.”

nwiberg@fando.com

401.533.5979

EDUCATION

BA, Physics - 1992
Ohio Wesleyan University
BS, Civil Engineering - 1994
Rensselaer Polytechnic Institute
MS, Ocean Engineering - 1997
Massachusetts Institute of Technology

LICENSES & REGISTRATIONS

Professional Engineer RI

PROFESSIONAL AFFILIATIONS

American Soc of Civil Eng
Assoc of State Floodplain Mgrs
New England Water Env Assoc
Assoc State Dam Safety Offcls

EXPERIENCE

26 Years Professional Experience

Nils is an Associate in our Providence office, leading a number of inter-disciplinary environmental and municipal projects within our Water and Natural Resources Business Line. Throughout his career at Fuss & O’Neill, and before working for an earthwork contractor on heavy civil projects, Nils has led and completed numerous infrastructure and restoration projects for public and private clients addressing dam safety, storm water quality, wetland and habitat restoration, solid waste, site remediation, environmental compliance. His strength is demonstrated by successfully leading teams of scientists and engineers to partner with clients in understanding, conceptualizing, designing and constructing complex multi-disciplinary projects requiring attention to detail and valuable hands-on technical experience. Nils specializes in the planning, design, and construction of large-scale coastal and riverine restoration projects to address flood resilience, habitat restoration, and water quality goals.

REPRESENTATIVE PROJECTS:

Herring River Flood Control and Restoration

Project, Wellfleet, MA: Project Manager for analysis of alternative approaches to achieve project hydraulic opening (165 feet) for a large tidal restoration project in the Cape Cod National Seashore. Project includes assessment of alternative and innovative tidal controls. Recommended plan is a bridge-type structure that can pass traffic but also serve as flood wall and hydraulic control. Conducted workshops with project partners and town staff to facilitate discussion of comparative strengths/weaknesses and other project elements that address community concerns. Project development includes geotechnical investigation, preliminary design of replacement bridge structure, and preparing draft operation and management plan for planned gate and flood controls.

Flood Mitigation and Culvert Design, Oak Bluffs,

MA: Project Manager for design of a replacement culvert structure to achieve tidal flushing to an impaired coastal pond. Project includes assessment of alternative tidal controls and flood mitigation measures to protect adjacent properties from flooding impacts. Conducted workshops with Town and pond abutters to review and discuss project elements and concerns. A geotechnical investigation was completed in support of foundation design. Prepared 25% design submittal package for MassDOT review.

Pawtuxet and Pocasset Rivers Flood Abatement and Floodplain Restoration, Cranston, RI:

Project Manager and Senior Design Engineer for two projects to improve flooding conditions along the Pawtuxet and Pocasset Rivers. Projects included geomorphic assessments, modeling of river and drainage systems to evaluate improvements for alternatives, and conducting public workshops. Designs incorporated elements to characterize, assess, and remove floodplain fill, constructing natural channels with bioengineered practices for stability, and establishing wetland grasses and plantings. Engineering services addressed survey, design (including preparation and evaluation of conceptual alternatives through to final design/bidding documents), permitting, bidding assistance, and construction administration.

Deerfield River Bioengineered Riverbank

Stabilization, Deerfield, MA: Project Manager and Senior Design Engineer to repair an eroded riverbank along the Deerfield River where severe erosion encroached upon a public roadway and threatened adjacent farmlands. Engineering services included preliminary and final design of bioengineered

stabilization measures, including stream barbs, fabric encapsulated soil lifts, root wads, live fascines, tree revetments and point plantings. Provided bidding assistance and oversight through construction.

Eagle Neck Creek Culvert Repair and Road Raising,

Truro, MA: Project Manager for investigation, design, permitting, and planned construction of a partially-blocked culvert that is impeding tidal and drainage. Conducted subsurface investigations in support of geotechnical analyses for an enlarged replacement culvert. Completed design assessments and prepared permitting design drawings and support documents for culvert replacement, raising of a low-lying roadway segment, and widening a breach opening in a former railroad causeway to improve tidal flushing in a degraded salt marsh downstream. Developed plans to conduct dredging of a tidal channel between the culvert and railroad berm, with beneficial re-use of dredged sediment to allow expansion of existing salt marsh platforms. Developed an opinion of construction cost for each project component.

Ninigret Pond Thin Layer Deposition Salt Marsh Restoration, Charlestown, RI:

Project Manager leading a team of scientists and engineers to investigate field conditions and develop design drawings and permitting documentation for a project to increase salt marsh elevations where degradation has occurred or is expected to occur due to sea level rise. Field investigations included sediment sampling of salt marsh areas to evaluate potential subsidence, assessment of vegetative communities to support evaluation of target elevations for placement of dredged sediment and topographic/hydrographic surveys of salt marsh and open water areas.



Akta Patel, PE

Flood Resilience Engineering

"I am passionate about finding resilient solutions for complex water resources challenges increasingly affecting the environment, communities, and built infrastructure."

apatel@fando.com

860.327.6012

EDUCATION

BA, Economics & Ethics - 2005
Trinity College

LICENSES & REGISTRATIONS

Professional Engineer PA

EXPERIENCE

11 Years Professional Experience

Akta is a Project Manager in Fuss & O'Neill's Water and Natural Resources Group. She has 10 years of experience designing and managing stormwater management projects in urban environments, parks, and schools. Akta has significant experience with construction oversight and management, operations and maintenance, and data analysis of green stormwater infrastructure projects. She also provides engineering analysis and design in support of inland and coastal flood resilience projects, including several ongoing Phase III flood and heat resilience pilot projects for the Connecticut Institute for Resilience and Climate Adaptation (CIRCA).

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Fair Haven, CT: Project Engineer for a Phase III pilot project of the CIRCA Resilient Connecticut program. The project involves planning and design to identify recommended adaptation measures for flood and heat resilience for the Fair Haven section of New Haven.

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Danbury, CT: Project Engineer for a CIRCA Resilient Connecticut Phase III pilot project to develop recommended adaptation measures for flooding in the East Ditch area and heat resilience in downtown Danbury.

Bank Street Coastal Flood Resilience Project, New

London, CT: Project Engineer for a coastal flood resilience planning and design project to increase flood resilience along Bank Street in New London.

Stormwater Drainage Manual, Danbury, CT:

Project Manager for the development of a local stormwater manual for the City of Danbury to comply with the post-construction stormwater management requirements of the 2016 MS4 Permit.

Nathan Hale School, MS4 Services, Meriden, CT:

Senior Engineer for a pilot bioretention retrofit project for the City of Meriden as part of the MS4 requirement for impervious area disconnection. Leading the design and plan production and providing technical oversight.

Green Stormwater Infrastructure Design, Philadelphia Water Department, Philadelphia,

PA: At a previous firm, Akta was Project Manager for several right-of-way green stormwater infrastructure design projects. Led the design of GSI and worked through urban site constraints to optimize the volume of stormwater managed. Responsibilities included client communication, technical oversight, review of deliverables. Deliverables included construction documents, technical specifications, cost estimates, and technical reports.

Green Stormwater Infrastructure Design, Trust

for Public Land, Philadelphia, PA: At a previous firm, Akta was Project Manager for several GSI design projects on public playgrounds and parks. Projects included revitalization of the playground and/or park. Responsibilities included client communication, technical oversight, review of deliverables, and coordination with landscape architects on playground and park design. Deliverables included construction

documents, technical specifications, cost estimates, and technical reports.

Green Stormwater Infrastructure Design and Construction Management, Capital Region

Water, Harrisburg, PA: At a previous firm, Akta was Project Manager for multiple GSI design projects. Responsibilities included leading the design and development of construction documents for GSI along the right-of-way as part of multi-modal streets improvements, urban revitalization, and pilot projects with innovative GSI such as living green walls.

Green Stormwater Infrastructure Construction Management, Capital Region Water, Harrisburg,

PA: At a previous firm, Akta was Project Manager for multiple GSI construction management projects. Responsibilities included managing the construction oversight for GSI projects including submittal reviews, RFI responses, overseeing inspectors, updating designs based on field conditions, and coordination with contractors and the owner.

Green Stormwater Infrastructure Program Development, Capital Region Water, Harrisburg,

PA: At a previous firm, Akta was Project Manager for multiple projects to develop Capital Region Water's GSI program. Projects included developing template technical specifications based on GSI design and construction experience, cost estimate template which included recommended bid items and unit costs, and the development of an As-Built Survey and Drafting Manual for contractors to use during project closeout.



Lara Sup, PE

Flood Resilience Engineering

“I love seeing ideas and designs become reality and watching how our projects can benefit communities. I am passionate about blending designs into the natural world and protecting the environment for future generations.”

lsup@fando.com

413.333.5882

EDUCATION

BS, Agricultural Engineering -
2001
University of Illinois at Urbana-
Champaign

LICENSES & REGISTRATIONS

Professional Engineer IL

EXPERIENCE

11 Years Professional Experience

Lara is a Climate and Flood Resilience Engineer. She has designed and provided technical oversight over many watershed management studies and stormwater designs. Her experience includes performing hydrologic and hydraulic modeling and analysis, watershed planning and development, local and regional drainage studies, wetland hydroperiod analysis, floodplain/floodway delineation, compensatory storage determination and design, and water quality modeling. She has assisted municipalities with the development and regulation of their stormwater programs, and has permitted and reviewed stormwater permit applications for federal, state, and local government agencies.

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Fair Haven, CT: Project Engineer for development of conceptual designs to increase flood resilience and resilience to heat impacts in the Fair Haven neighborhood. This project involves assessment and modeling of drainage, riverine, and coastal flooding; development and modeling of alternative solutions to mitigate flooding and heat impacts; development of conceptual designs; and benefit cost analysis.

Sluice Creek Tidal Restoration, Guilford, CT: Project Manager and Technical Lead for a marsh restoration project funded and managed by CTDEEP. The project will increase tidal exchange in Sluice Creek, leading to improved long-term health and resilience of the marsh system. This will provide flood mitigation benefits to

surrounding inland areas and opportunities for salt marsh migration, allowing for climate adaptation.

Warren Wright Road DER Culvert Replacement, Belchertown, MA: Senior Engineer for the preliminary design of a replacement culvert structure along Hop Brook. The project is funded by a Culvert Replacement Municipal Assistance Grant through the Massachusetts Division of Ecological Restoration. The existing roadway crossing is routinely submerged and the crossing was identified as among the top 5% of crossings prioritized for replacement by the Massachusetts Wildlife Climate Action Tool. The crossing links two pieces of conservation property that are mapped as a cold water fishery resource. The proposed design will provide important habitat connectivity and follow MassDOT guidelines.

Stormwater Retrofit Plan under MS4 Permit, Belchertown, MA: Lead Design Engineer for stormwater management improvements at the Belchertown Department of Public Works site facility. Under the MS4 permit requirements, the Town identified this area for a stormwater retrofit to incorporate best management practices as it is a Land Use with Higher Potential Pollutant Loads (LUHPPL). The proposed design includes incorporating an oil and grit separation chamber, hooded catch basins, and an underground infiltration trench.

Belchertown Water District Master Plan, Belchertown, MA: Assisted the Belchertown Water District in preparing a Master Plan for submittal to the Massachusetts Department of Environmental Protection. The Master Plan identifies and prioritizes capital improvement projects for the next 20 years and summarizes the District's assets in detail.

Grassy Creek Hydraulic Analysis, Indianapolis, IN: With a previous employer, Lara was the Project Manager a hydraulic analysis of approximately seven linear miles of Grassy Creek to determine base flood elevations and floodway limits based on detailed-study methodology. The results served as support documentation for a FEMA Flood Insurance Study and for the map modernization program.

Addison Creek Watershed Study, Bensenville, IL: With a previous employer, Lara was a Project Engineer who prepared a hydraulic and hydrologic study to identify flood-prone areas in a watershed and to develop alternatives to alleviate flooding throughout the Village. The associated floodplain was delineated for future regulatory purposes.

Downers Grove Downtown Area Master Plan, Downers Grove, IL: With a previous employer, Lara was the Lead Engineer who developed a watershed plan for addressing detention storage for areas inside the downtown area where redevelopment was planned. A fee-in-lieu-of detention variance was implemented and the funds were used for streambank stabilization and water quality improvements along St. Joseph's Creek.

Cook County Stormwater Plan, Cook County, IL: With a previous employer, Lara was a Project Engineer who developed the Cook County Countywide Stormwater Plan with the Metropolitan Water Reclamation District of Greater Chicago to provide Cook County a program of effective rules and regulations for projects that will reduce the potential for stormwater damage to life, public health, safety, and property. The Plan was adopted by the Water Reclamation District of Greater Chicago.



Kenneth Berchielli, EIT

Flood Resilience Engineering

“Growing up, I was always intrigued by the earth and how our planet interacts with modern day infrastructure. As a geotechnical engineer, I get to fulfill that interest by working positively with contractors and clients on various geotechnical projects.”

kberchielli@fando.com

401.533.5968

EDUCATION

BS, Civil Engineering - 2020
University of Rhode Island

LICENSES & REGISTRATIONS

Engineer In Training CT

PROFESSIONAL AFFILIATIONS

American Soc of Civil Eng

EXPERIENCE

3 years Professional Experience

Ken is a water resources engineer in our Providence, Rhode Island Office and has worked on a wide variety of water resources projects, dam safety projects, and geotechnical engineering investigations. Ken provides strong design, field investigation, and communication skills to the team. Typical projects have included stream restoration, fish passage, dam removal and rehabilitation, coastal resiliency, dam inspections, and subsurface investigations. Typical projects have included subsurface investigation, preliminary geotechnical studies, dam construction administration services, dam removal and improvement design, and dam inspections.

REPRESENTATIVE PROJECTS:

Riverfront Park Geotechnical Evaluation,

Riverfront Recapture, Hartford, CT: As geotechnical engineer, Ken oversaw the subsurface exploration program completing six soil borings within the Riverfront Park site including a shelby tube clay sample and rock core. Ken evaluated lab results for representative soils samples from the field and completed a preliminary geotechnical report to summarize findings.

Greenwich Cardinal Stadium, Greenwich High school, Town of Greenwich, CT:

As Geotechnical engineer, Ken oversaw the advancement of 21 soil borings and 26 saturated hydraulic conductivity test wells for groundwater infiltration. Ken worked collaboratively with the driller and project team to

complete the program in eight days. Ken used the data obtained in the field program to develop boring logs and hydraulic conductivity data for the Town's use.

Massachusetts Phase I Dam Inspections Multiple

Clients, Statewide, MA: As project engineer, Ken performed 10 Phase I Dam Inspections/Evaluations for private and public entities to meet Massachusetts Dam Safety Regulations. Ken completed visual inspection of dams, assessed hazard rating and condition, assessed adequacy of previous design work, and prepared reports on behalf of the clients for the Massachusetts Department of Conservation and Recreation Office of Dam Safety.

Significant Hazard Dam Emergency Action Plan

Brockton Reservoir Dam, City of Brockton, MA: As project engineer, Ken worked with the client to create an Emergency Action Plan for the dam in accordance with Massachusetts Department of Conservation and Recreation dam safety guidelines. Ken worked to identify the upstream and downstream hazards for the dam, compiled emergency contact information and included inundation mapping.

Waite Pond Dam Construction, Town of Leicester, MA: As project engineer, Ken worked with the contractor and the client to oversee full demolition and replacement of Waite Pond Dam. Ken completed weekly site visits to the dam to evaluate the conditions through demolition to the construction of the new dam. Site visits consisted of concrete pouring for the training walls, structural fill backfill and compaction testing, low-level outlet installation and toe drain installation.

Hatchet Pond Dam Repairs, Town of Southbridge,

MA: As project engineer, Ken collaborated with the contractor and the client to oversee repairs made to

Hatchet Pond Dam's primary spillway, downstream channel and headwall as construction administration. Ken completed weekly site visits to monitor construction progress, reviewed submittals from the contractor, attended meetings with the stakeholders and completed a closeout report upon project completion.

Belfield Drive Construction Administration, Town

of Leicester, MA: As project engineer, Ken worked with the contractor and the client to oversee full demolition and replacement of Waite Pond Dam. Ken completed weekly site visits to the dam to evaluate the conditions through demolition to the construction of the new dam. Site visits consisted of concrete pouring for the training walls, structural fill backfill and compaction testing, low-level outlet installation and toe drain installation.

McCoy Stadium Geotech Investigation, City of

Pawtucket, RI: As geotechnical engineer, Ken oversaw the subsurface exploration program completing eight soil borings in the McCoy Stadium project site. Ken evaluated lab results for representative soils samples from the field and completed a preliminary geotechnical report to summarize findings.

St. James Condominium Slope Stability Evaluation, St. James Condominium Association, North

Providence, RI: As geotechnical engineer, Ken oversaw the subsurface exploration program completing two soil borings on the top of the earthen slope within the St. James Condominium complex. Ken completed a slope stability model in GeoStudio 2019 using the soil characteristics obtained in the soil boring program to calculate a factor of safety for the slopes critical slip surface failure and made recommendations for



Ian Law, RLA, ASLA

Stakeholder and Community Engagement

"I love the collaborative nature of design. Listening to the needs of the community, working with my team to solve those challenges, and then seeing those designs come to life is the best part about this career!"

ilaw@fando.com 860.426.6039

EDUCATION

BS, Landscape Architecture -
1999, UMass Amherst
AA, Aviation - 1993
Embry-Riddle Aeronautical
University

LICENSES & REGISTRATIONS

Reg Landscape Architect NY

EXPERIENCE

24 Years Professional Experience

With more than two decades of experience, Ian is a recognized leader in urban design and planning, downtown revitalization, as well as community and park master planning. Ian has led, and been a team member for, a number of award-winning national and international projects. As a recognized expert in sustainable design and planning, Ian has presented throughout the country on the importance of integrating planning and design and issues of scale and context when applying the principles of urbanism.

Ian is a firm believer in a collaborative design process, and has led dozens of design charrettes and community design forums. He takes a hands-on approach to design, and is actively engaged in all phases of a project, from schematic design to construction documents and construction administration.

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Fair Haven, CT: Ian is leading community engagement and contributing to the development of concept design solutions to address flooding and extreme heat in downtown Danbury. This Phase III pilot project of the CIRCA Resilient Connecticut program will identify recommended adaptation measures for flood/heat resilience informed by community stakeholders, the City of Danbury, and CIRCA.

Stakeholder Engagement and Campus Design, Mount Holyoke College, South Hadley, MA:

With a previous firm, Ian led a four-day workshop that culminated in two alternatives for the College's waterways system. The purpose of this project was to

improve the ecological health of the system, enhance and prioritize the pedestrian experience, and create a dynamic rejuvenated ecosystem. The design workshop engaged stakeholders, introduced the project, informed the community about the existing waterways system, and collected information regarding design preferences.

Master Planning, Schenectady Gateway Plaza, Capital District Transportation Committee and City of Schenectady, NY: With a previous firm, Ian led master planning efforts and implementation of projects for a new downtown park. To serve both pedestrians and drivers, the design for the park is organized around two strong cross-axes that share a central focal point and establish a series of rooms and spaces that cater to a diversity of uses and users. Key elements include a detailed pedestrian axis, a vehicular view corridor, an urban plaza, and a great lawn that can also serve as an amphitheater. The design incorporates mixed-use infill along a new “Park Street” and incorporation of a cafe and newsstand in the existing Trailways Bus terminal. A contemporary style seating area near the new student housing and an interpretive walk celebrating a historic subgrade rail line will improve student connections to the downtown. The plan includes improvements to the existing bus rapid transit stop.

Site Design, Schenectady County Community College School of Music, Schenectady, NY: With a previous firm, Ian led the landscape design of a new gateway and entrance for this community college. The design includes a small plaza and seatwall near the main entry, grids of plants with contrasting heights and textures that mimic the pattern created by the

curtain wall, and a wildflower meadow creates a striking contrast while also stabilizing the hillside in a way that requires minimal maintenance. The hillside is also populated with aspens which are intended to celebrate the art of music-making through the quivering sounds they make when the wind blows. The campus landscape is designed to complement the contemporary architecture of the building, giving the campus a vibrant new face-lift.

NY Rising Community Reconstruction (NYRCR) Programs, Various Communities, NY: Following the disastrous events of Hurricane Irene and Tropical Storm Lee, Ian (with a previous firm) led a team of specialists in coordinating the design components of several NYRCR programs, including plans for the Town of Prattsville, the Village of Sidney, the Town of Union, and several other communities within Broome County.

State Street Streetscape and Landscape Architecture, City of Schenectady, NY: With a previous firm, Ian led Phases II and III of this redevelopment project that will repair the connection between upper and lower State Street by transforming a railway bridge into a vibrant downtown gateway and bus stop. The well-lit ornamental trusses on each side of the bridge, along with decorative arches and brick columns, provide safe and inviting pedestrian access. Phase III of the project featured a spacious urban piazza that was designed to bring the community together. Located at the intersection of the Jay Street Pedestrian Way and Upper State Street, the public gathering space included a water wall accented by colored LED lighting system, an elevated stage area for small-scale outdoor events, sculptural granite seatwalls, and a bosque of Honey Locust Trees.



Michael P. Frederick

Stakeholder and Community Engagement

"I use context, innovation, and form to create ways for people to experience a space in a lasting and deliberate way."

mfrederick@fando.com 860.426.6038

EDUCATION

BS, Landscape Architecture -
2015
SUNY College of Environmental
Science and Forestry

EXPERIENCE

7 Years Professional Experience

Michael has earned tremendous design and management experience, working on a variety of urban design, placemaking, school campus master plan, athletic facility, and outdoor learning space projects. Michael's ability to think strategically and spatially makes him an invaluable team member and designer.

Michael has considerable project management experience, managing projects from schematic design through construction details, bidding, implementation, and post-construction evaluation. He also has years of construction and design implementation experience gained by managing a residential landscape company. His knack for organization and punctuality underscores his successful role as an excellent construction contract administrator.

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Fair Haven, CT: Landscape designer for coastal adaptation and nature-based solutions for planning and design of infrastructure improvements to increase flood resilience and resilience to heat impacts. This project involves assessment and modeling of drainage, riverine, and coastal flooding; development and modeling of alternatives to mitigate flooding and heat impacts; development of conceptual designs; and benefit cost analysis.

Marine Station Improvements Physical

Improvements, University of Massachusetts, Gloucester, MA: Landscape Designer for physical improvements and infrastructure planning for the

Gloucester Marine Station. The first phase of the project included field assessments, conceptual planning activities, schematic design development for stabilizing the bulkhead, restoring the open area behind the marine station, and installing a dock with crane/davit that will support future design, permitting, and public outreach/stakeholder engagement prior to final design and construction. An eelgrass survey, along with a coastal climate and flood risk assessment were conducted to develop the recommended design flood elevations (DFEs) for both the northern and southern shorelines of the site. Michael was also integral to the development of the 3D renderings for the priority project areas.

Resilient Main Street and Flood Resiliency Study,

Wareham, MA: As Landscape Designer, Mike is part of an interdisciplinary team of coastal and water resource scientists, geotechnical engineers, and landscape architects to examine future sea level rise and storm surge impacts on Wareham's downtown commercial district in conjunction with redevelopment planning. With stakeholder engagement, the project will produce a conceptual plan for site and neighborhood scale that reduces risks and creates community co-benefits.

Shawsheen River Master Plan, Andover, MA:

Landscape Designer for Andover's Shawsheen River Master Plan project. The Shawsheen River Master Plan is intended to provide a high-level, graphically-rich planning document and conceptual vision for the Shawsheen River that will build public momentum and develop a road-map for future projects. The planning process builds upon local information gathering and inputs from the community, and is also intended

to integrate with the high-priority climate resilience actions identified through the Town's MVP planning process.

Clinton Market Collective Project, Capitalize

Albany Corporation, Albany, NY: Landscape designer for the redesign of a park to support the Clinton Market Collective, which will be a new market concept and proving ground for startup businesses, diverse pop-up retail, installments by local artists, and signature events. Fuss & O'Neill has been providing value engineering modifications to the construction documents and corresponding graphics, as well as project management, landscape architecture, civil, structural, and electrical engineering services.

Connecticut Children's Medical Center Site

Improvements, Cannon Design, Hartford, CT:

Landscape Designer for improvements for the site improvements supporting a new building on the Connecticut Children's Hartford campus. The project includes the development of a new building, renovation space, and a bridge from the new building to the parking garage across the street. Our team is using Lean design and construction methods on this project.



Chelsea Zakas, AICP

Stakeholder and Community Engagement

“My passion lies at the intersection of environmental health, climate mitigation and adaptation. I am here to help communities achieve their goal of becoming more climate resilient and sustainable, through meaningful and equitable community and stakeholder engagement.”

czakas@fando.com

860.783.4671

EDUCATION

BA, Geography - 2015
Georgia State University

BS, City and Regional Planning
- 2020
Georgia Institute of Technology

LICENSES & REGISTRATIONS

AICP Candidate

EXPERIENCE

3 Years Professional Experience

Chelsea is an Environmental Planner in Fuss & O'Neill's Water & Natural Resources Department. In her role, Chelsea provides support to a variety of projects through research and technical writing, facilitating community engagement, and using GIS to effectively visualize data.

Chelsea's background in municipal planning gives her experience working and communicating with a variety of stakeholders. She has served as a liaison to multiple community boards and committees, and has led the update to a City-wide Open Space and Recreation Plan.

REPRESENTATIVE PROJECTS:

Coastal Vulnerability Action Plan, Manchester-by-the-Sea, MA: Developed the project website, which provides information on progress, upcoming engagement opportunities, and space for people to leave feedback. Chelsea created materials for stakeholder engagement and helped to facilitate community engagement.

Bank Street Flood Resilience Project, New London, CT: Conducted a preliminary/high-level floodproofing assessment of all buildings in the project area. This project also includes a Benefit-Cost Analysis (BCA) to determine the future risk reduction benefits of a hazard mitigation project and compares those benefits to its costs.

Flood Resiliency Study, Wareham, MA: Leading stakeholder engagement tasks including organizing and preparing meeting materials and facilitating stakeholder engagement.

Municipal Vulnerability Preparedness Planning, Andover, MA: Technical facilitator to guide community engagement in the Town's Community Resilience Building workshop and assist Town staff and other stakeholders in a process of identifying vulnerabilities and climate resiliency priorities. Following the workshop, detailed notes were compiled on the Town's priorities, and prepared a workshop report to meet state program requirements, ensure the Town's eligibility for future MVP funding opportunities, and document the Town's climate resilience priorities.

Municipal Vulnerability Preparedness Planning, Easthampton, MA: Technical support for the Town's effort to build resiliency to increased precipitation. Developed a homeowner's Do-It-Yourself (DIY) guide to residential-scale resilient stormwater solutions to help residents take the next step toward managing stormwater and increasing climate resilience in their own yards. The guide includes practical advice for planning, implementing, and tracking down resources/vendors to support home rain garden projects, water harvesting, conversion of lawns to more habitat friendly, low-maintenance landscapes, and more.

MS4 Support Services, Paxton, MA: Technical specialist for the Town's efforts to achieve compliance with the MS4 General Permit. The project included development of the Town's Stormwater Management Program (SWMP), Annual Report, and written Illicit Discharge Detection and Elimination (IDDE) Program, review of the Town's existing IDDE legal authority

mechanisms, and support for the Town's MS4 infrastructure mapping.

MS4 Support Services, Spencer, MA: Technical specialist for the Town's efforts to achieve compliance with the MS4 General Permit. The project included an extensive review of the Town's existing bylaws and regulations related to construction site stormwater runoff control, and stormwater management in new development and redevelopment. Recommendations were made to revise the language of existing bylaws and regulations to fully meet the MS4 Permit requirements.

MS4 Support Services, Ayer, MA: Technical specialist for the Town's efforts to achieve compliance with the MS4 General Permit. The project included an extensive review of the Town's existing bylaws and regulations related to street design, parking lot guidelines, and low-impact development. Recommendations were made to revise the language of existing bylaws and regulations to fully meet the MS4 Permit requirements.

Executive Office of Energy and Environmental Affairs Planning, Belchertown, MA: Technical support for the Town's development of a Climate Resilience and Sustainable Growth Plan. Conducted an extensive review of existing plans and regulations to determine the Town's current goals related to sustainability. Condensed the detailed plans and regulations review into an easy-to-follow plan matrix. Developed engaging materials to facilitate a community listening session, and prepared a memorandum following the listening session to convey the key takeaways.



Diane Mas, PhD, REHS/RS, CC-P

Climate Resilience Planning

“There is a perception that engineering is not a “people” profession, but I’ve always felt that nothing could be further from the truth. Environmental engineering is at the intersection of science, law, policy, and public health. It is the ability of the issues at the heart of the profession to impact the daily lives of people that has always appealed to me.”

dmas@fando.com

413.333.5464

EDUCATION

BA, Geology - 1992
Amherst College
MSE, Civil Engineering - 1995
Princeton University
PhD, Civil Engineering - 2006
University of Massachusetts at Amherst

LICENSES & REGISTRATIONS

Reg Env Health Spec/San
Registered Sanitarian CT

PROFESSIONAL AFFILIATIONS

National Env Health Assoc
Assoc of Climate Change Officers
Intl Soc Sustainability Profs

EXPERIENCE

29 Years Professional Experience

Diane is a Water Resources Engineer, Sanitarian, and Chief Resilience Officer at Fuss & O’Neill, and a founding member of the company’s environmental impact assessment practice. She has spent nearly 30 years working in the areas of water quality modeling, watershed management, and environmental impact assessment. Her current areas of water resources practice focus on climate change resilience and adaptation for water resources; water quality assessment, modeling, and watershed management; harmful algal bloom impacts to drinking and recreational waters; and the relationship between water quality and public health. She also provides technical leadership for the preparation of state and federal environmental impact assessments, continuing to look for ways to streamline and focus analysis on key issues to assess and mitigate potential environmental effects.

REPRESENTATIVE PROJECTS:

Coastal Flood Resilience, City of Milford, CT:

Diane served as the Senior Technical Specialist for resilience projects to improve neighborhood resiliency to existing and projected coastal flooding. In the Beachland Avenue neighborhood, a road was raised to provide access during projected future high tide events and protect private property on the inland side of the road from tidal flooding. In the Bayview Beach neighborhood, four storm drains were reconstructed and raised, and tide check valves were installed. Sand dunes were raised, beach grass was reestablished, and two new pump stations were implemented.

Connecticut Stormwater Manuals Update:

Contributing author for updates to the Connecticut Stormwater Quality Manual and Connecticut Soil Erosion and Sedimentation Control Guidelines.

Pocasset River Flood Resilience Watershed Plan and Design, Cranston and Johnston, RI: Senior Technical Specialist for a comprehensive watershed plan designed to protect existing communities and infrastructure that are currently in the floodplain and that routinely flood. The plan utilizes a hybrid approach of green and gray infrastructure to maximize the resiliency of the watershed to future flooding. This includes removal of more than 150 structures and restoring that property to natural floodplain, flood-proofing of some selected structures, and construction of two new flood walls and pump stations.

State of Island Waters Best Management Practices Prioritization, Aquidneck Island, RI: Technical specialist for development of the State of Island Waters report that included the use of a prioritization tool for the implementation of stormwater best management practices. The tool incorporated a variety of factors in the prioritization process including resilience to future climate conditions, BMP performance for pollutants of concern, and community acceptable and engagement. The tool is an easy-to-use, transparent and flexible means to develop a prioritization for implementation of previously identified BMPs.

Narrow River Nature-based Systems Resilience Project, Narragansett, RI: Senior Technical Specialist for restoration plans to address water resource challenges and make the estuarine system more resilient to future climate impacts using nature-based systems. Projects included planning, design, and permitting for green infrastructure retrofit improvements at 20+ sites along the public right-of-way; green infrastructure in neighborhoods; a living shoreline; and salt marsh elevation.

Wood-Pawcatuck Watershed Flood Resilience Management Plan, CT and RI: Assisted with development of a flood resiliency management plan for the 317 mi² Pawcatuck River watershed, which is located within portions of 11 communities in Connecticut and Rhode Island. The management plan involves assessing the watershed for vulnerability to flooding and erosion, and developing management recommendations to protect and enhance the resiliency of the watershed communities to flood damages and improve aquatic ecosystems.

Sheffield Brook Stream and Floodplain Restoration, Old Colony Beach Club Association, Old Lyme, CT: NEPA specialist for NEPA documentation (an Environmental Assessment) required to consider project impacts. Key topics include wetlands, floodplain, and coastal area management. Sheffield Brook is susceptible to flooding and coastal storms create high-tide conditions that force water up into the culvert, which floods the brook and neighboring properties. This was part of our eventual work providing additional flood storage and conveyance, restoring wetland and floodplain areas, and installing tidal controls on the culvert(s). This project improves climate change resilience.

Coastal Resiliency Environmental Assessment, Ninigret Salt Marsh, RI: Primary author and NEPA technical specialist for the preparation of an Environmental Assessment for a thin layer deposition project to restore and improve coastal salt marsh resiliency to sea level rise. The EA was prepared for the U.S. Fish and Wildlife Administration, which funded the restoration project.



Sage Hardesty

GIS Mapping and Analysis

"I have always been intrigued by water and its role in the environment. I wake up excited for work because every new project brings an opportunity to expand my curiosity and make a positive impact on natural world around us."

shardesty@fando.com

860.783.4775

EDUCATION

BS, Environmental Science - 2014
University of Delaware

MS, Environmental Engineering -
2017 University of Connecticut

PROFESSIONAL AFFILIATIONS

American Soc of Civil Eng
Assoc State Dam Safety Offcls

EXPERIENCE

4 Years Professional Experience

Sage is a Project Engineer in our Water & Natural Resources Business Line. He supports a wide range of water resources and climate resilience planning and design projects throughout southern New England, including riverine and drainage related flood resilience coastal flood resilience, dam repair and removal, stream restoration, and green stormwater infrastructure projects. Sage has performed Phase I and II dam inspections, designed and drafted plans for dam repair or removal, analyzed hydrologic and hydraulic models for stormwater management, and simulated flood inundation extents. With degrees in both Environmental Science and Environmental Engineering, Sage is well positioned to assist with the firm's environmental projects throughout New England.

REPRESENTATIVE PROJECTS:

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Fair Haven, CT: Project Engineer for a Phase III pilot project of the CIRCA Resilient Connecticut program. The project involves planning and design to identify recommended adaptation measures for flood and heat resilience for the Fair Haven section of New Haven.

CIRCA Resilient CT Phase III - Flood Resilience

Planning and Design, Danbury, CT: Project Engineer for a CIRCA Resilient Connecticut Phase III pilot project to develop recommended adaptation measures for flooding in the East Ditch area and heat resilience in downtown Danbury.

Cove River Tide Gate Reconstruction CEPA, West Haven, CT: Project Engineer for a CEPA evaluation for proposed replacement of non-functioning tide gates on the Cove River at Ocean Avenue/Captain Thomas Boulevard with new, self-regulating tide gates to increase coastal resilience, to mitigate stormwater flooding, and to provide multiple environmental and recreational benefits. Prepared a Post Scoping Notice and Determination of findings consistent with Section 22a-1a-7 of CEPA regulations.

Noroton Heights Flooding, Darien, CT: Project Engineer for an engineering study for potential storm drainage system improvements and green infrastructure to improve water quality and alleviate street and commercial-area flooding. This project includes site mapping, permit identification, survey, environmental testing, hydraulic modeling, and preliminary engineering design.

Canal Assessment, Windsor Locks, CT: Project Engineer for a Capital Needs Assessment and Hydropower Feasibility Study to determine the potential for restoration of the Windsor Locks Canal, as well as its associated lock, gates, and walls as a cultural heritage asset.

Whitwell Avenue Flooding Analysis – Newport, RI: Project Engineer for the engineering services associated with the development and evaluation of a new drainage systems approach intended to disconnect impervious surfaces and reduce activities that contribute to the stormwater challenges in the densely developed Whitwell Avenue residential area. The existing stormwater infrastructure components were analyzed using PCSWMM hydraulic and hydrologic modeling software. A new potential

system approach was developed and modeled wherein residential parcels would relieve stresses currently experienced with the municipal stormwater infrastructure by disconnecting a portion of their impervious cover by the way of small-scale best management practices (BMPs) on their property. This project included site mapping, watershed analysis, hydraulic and hydrologic modeling, drainage network analysis, preliminary engineering design, and flood inundation mapping.

Cocasset Street Rail Underpass Drainage Assessment and Design, Foxborough, MA: Project Engineer for engineering services associated with the evaluation of existing drainage infrastructure and the frequent substantial flooding occurring during storm events using hydrologic and hydraulic modeling software (PCSWMM v. 7.4). Potential drainage system improvements were developed and modeled under current and future climate conditions. This project included site mapping, hydraulic and hydrologic modeling, drainage network analysis, preliminary engineering design with a focus on green infrastructure design and future climate conditions, flood inundation mapping, and cost estimates.



David Cook

GIS Mapping and Analysis

“Each day I embrace the challenge of assisting our clients’ needs in assessing their environmental concerns and proposing a variety of solutions that are both effective and in line with our clients’ goals. I believe it is vital to protect our clients’ interests while maintaining our country’s resources so that both present and future businesses can prosper.”

dcook@fando.com

860.783.4665

EDUCATION

BS, Environmental and Earth Science - 2011
Eastern Connecticut State University

PROFESSIONAL AFFILIATIONS

Env Prof Organization of CT
National Groundwater Assoc

EXPERIENCE

11 Years Professional Experience

Dave is a hydrogeologist with broad experience in remedial investigations and hydrogeological investigations, including aquifer testing and tidal influence studies. Dave specializes in Geographic Information Systems (GIS) technology and, as the administrator to both the GIS Enterprise Server and ArcGIS Online, he leverages the efficiencies of electronic data collection and project collaboration to meet the modern demands of data-driven projects.

Dave is an active member in the CT GIS Network. As an elected steering committee member he participates in public outreach and quarterly networking events. Dave is focused on staying current with the readily available and dynamic progression of web-based GIS tools to ensure that the best resources are being put to work throughout the GIS community. His pursuit promotes internal advances in automation, which allow our services to stay competitive.

REPRESENTATIVE PROJECTS:

Municipal Vulnerability Preparedness (MVP) Field Data Forms, Various Municipalities, MA, RI, and

NY: Dave implemented the use of electronic field data collection forms to streamline the data collection process for more than 1,000 road stream crossings for municipalities. At each identified stream crossing, field staff collected more than 100 data fields and several asset-related pictures on the electronic field data forms. The use of electronic field data collection removed tabulation transcription necessary to perform qualitative batch analysis and QA/QC controls were applied to the data collection form so that no entry was incomplete prior to being submitted. The stream crossing assets were visualized to stakeholders utilizing web-based applications whereby location

points could be clicked on and pop-ups containing the data and photos could be displayed.

Geodatabase Design and Implementation,

Eversource Energy, CT, MA, and NH: Dave designed and implemented a centralized geodatabase for Eversource Energy's utility right-of-way assets, resources, and ownership boundaries for select transmission pole replacement projects. The database structure allowed field team members access and ability to update the most recent versions of the centralized data. Collaborations of multi-phased project planning were streamlined while maintaining the integrity of the utility assets and resources.

MS4 Mapping, Various Towns, CT and MA: Dave developed mobile data collection applications for the update and inventory of municipalities' stormwater assets. Project staff and stakeholders had real-time access to the spatial data from their phones/tablets and work desktops. Collaboration on data collection reduced the project cost, whereby the municipality was able to collect and update data to the shared centralized project database. Dave managed the data collection efforts and executed data objective goals.

Bryant University, Smithfield, RI: Converted legacy CAD drawings into secure cloud based GIS platform. Created user workflow manuals for updating mapped asset items. Devised versioning schema to track existing, historic, verified, planned, and source attributes for mapped assets and related asset tracking database tables. Performed on-premises and virtual trainings for working with ArcPro and ArcGIS for AutoCAD plugins. Implemented autonomous routine secure backups of all hosted online content. Coordinated on-premises and virtual server

deployments. Developed mobile and web applications tailored to specified workflows and processes.

Deerfield River Watershed Vulnerability

Assessment, Franklin Regional Council of

Governments, MA: Dave implemented a streamlined geoprocessing workflow that iteratively assessed and calculated sub-regional watershed characteristics in the Massachusetts Deerfield River Watershed to assess flood risk vulnerability, water quality restoration potential, and water quality vulnerability. Dozens of resources were spatially attributed to each sub-regional watershed for comparative analysis. A model was implemented to automate the repetitive tasks and reduce user error.

Meriden Source Water PFAS/PFOA Risk

Assessment, Meriden, CT: Risk determination for drinking water supply wells and drinking water reservoirs was evaluated based on land use activity and operational use. Town GIS parcel information was composited into a geodatabase where land use types were reconciled into a consistent schema. Watershed catchment areas for drinking water supply reservoirs were updated based on the 2017 lidar elevation data to confirm the areas of interest. Intersecting high risk land use that was located within the drinking water supply wells aquifer protection areas and drinking water reservoir watershed catchment areas were isolated for further operational use evaluation. The water authority responsible for performing yearly inspections for the source waters now has an inventory of properties where the risk of PFAS/PFOA contamination is elevated.



Julianne Busa, PhD, CSE, PWS

Wetlands and Ecological Design

“Science and policy are often seen as separate worlds, but now, more than ever, it’s important for ecologists to participate in the public policy and management efforts seeking to apply meaningful solutions that positively affect local environments and communities. Consulting offers an avenue to link my analytical work to what’s happening at the ground-level, where planning and decision-making take place.”

jbusa@fando.com

413.333.5469

EDUCATION

BA, Ecology & International Studies - 2003
Ohio State University
PhD, Evolution, Ecology, Organic Biology - 2009, Ohio State University

LICENSES & REGISTRATIONS

Cert Senior Ecologist
Certified Soil Scientist
Professional Wetland Scientist

PROFESSIONAL AFFILIATIONS

MA Assoc of Conservation Comm
MassECAN
Ecological Soc of America
Society of Wetland Scientists

EXPERIENCE

14 Years Professional Experience

Julie is a Senior Project Manager, Senior Environmental Scientist, and Certified Senior Ecologist in the Water and Natural Resources Group at Fuss & O’Neill. She has more than a decade of experience in the areas of global biodiversity and forest conservation, sustainability, soil science, and ecological modelling. Julie works extensively with municipal clients, focusing on climate resiliency, stormwater and watershed management, MS4 compliance, and stream and wetland restoration projects. As a certified MVP provider, she has worked with more than two dozen communities on a variety of MVP Planning and Action Grant projects. Prior to joining Fuss & O’Neill, she served as President of the Society for Conservation Biology’s Working Group for Ecological Economics and Sustainability Science and has taught extensively, holding positions on the environmental studies faculties of multiple colleges.

REPRESENTATIVE PROJECTS:

Mill River Watershed-based Plan, Save the Sound, New Haven, CT: Environmental Scientist responsible for project coordination, technical analysis, and community engagement for a watershed-based plan based on the EPA nine-element watershed-based planning process. Work included documentation of existing conditions, modeling of pollutant loading, and development of green infrastructure project concepts through desktop and field screenings.

Little River Dam Removal and River Restoration, Haverhill, MA: Grant Writer and Project Manager for design and permitting of the Little River Dam Removal project in downtown Haverhill. Collaborated with the City and a community-based outreach liaison to host a series of public forums to share information, collect

feedback, and shape the community amenity aspects of the project. The design features removal of the dam, management of contaminated sediment, restoration of the upstream reach of the river, and installation of community amenities for river access, including a fishing platform and kayak launch at an existing upstream neighborhood park. This project is funded through an FY22/23 MVP Action Grant.

Windswept Cranberry Bog Restoration, MA Dept of Ecological Restoration, Nantucket, MA: Project Manager for restoration planning and design to restore natural hydrologic function and wetland habitats to a 37-acre retired cranberry bog.

Cherry Street Project, Easthampton, MA: Grant Writer and Project Manager for two MVP funded projects (FY21 and FY22/23) to advance the implementation of green infrastructure for improved drainage and flood resiliency in densely developed neighborhoods. The Cherry Street implementation project features a full streetscape redesign with integrated bioretention planters and treebox filters, as well as a streambank restoration at the existing stormwater outfall into an adjacent conservation area.

Hop Brook Culvert Replacement, Town of Belchertown, MA: Project Manager leading the effort to design an appropriate replacement road-stream crossing for use on a road that bisects an anastomosing stream and wetland complex within a town conservation property. Worked with the Town to write and apply for a Mass DER Culvert Replacement Municipal Assistance Grant. After award, participated in ecological data assessment, and led design and early coordination with regulatory agencies. The culvert design includes accommodations for aquatic passage and hydraulic sizing with respect to future climate conditions and the Massachusetts RMAT Guidelines. The recommended design incorporates a secondary crossing specifically for terrestrial passage of turtles.

Scarborough Brook Headwaters Resiliency, Belchertown, MA: Grant Writer and Project Manager for an MVP Action Grant project to support removal of two dams within the Scarborough Brook Conservation Area and replacement of two downstream culverts in accordance with the Massachusetts Stream Crossing Standards. Led a multidisciplinary team to complete data collection (including ecological reference data for use in defining a natural channel through the restored impoundments), conceptual design, sediment assessment, and preliminary design plans.



Michael Soares

Wetlands and Ecological Design

“I find great value in applying my technical knowledge and experience to projects that support the sustainable management and conservation of natural resources.”

msoares@fando.com

860.783.4755

EDUCATION

BS, Geology - 1998
Colby College

EXPERIENCE

18 Years Professional Experience

Michael is a Wetlands Scientist in our Water and Natural Resources Business Line. He is a Registered Soil Scientist and has more than 10 years of experience in natural resource assessments, planning, and management. His recent projects have focused on climate resiliency and management of freshwater systems: management planning for coastal watersheds, ecological restoration, and evaluating municipal stormwater infrastructure for green infrastructure opportunities. Michael's principal areas of expertise are wetlands delineation, conceptual design and monitoring of restored/created wetlands, habitat assessment and mapping, and permitting in support of a wide variety of land development, utility infrastructure, roadway, and climate resiliency projects.

REPRESENTATIVE PROJECTS:

Hop Brook Culvert Replacement, Town of

Belchertown, MA: Field Team Leader to assess habitat conditions and collect ecological data to inform the redesign of a municipal road-stream crossing under the Mass DER Culvert Replacement Municipal Assistance Grant program in accordance with Massachusetts Stream Crossing Standards. Data collection included stream channel and wetland characteristics to define an appropriate crossing design for use in a unique, anastomosing stream and wetland complex within an existing town conservation property. Assessments also included delineation of wetland resource areas and collection of cross section data for use in hydraulic modeling.

Windswept Cranberry Bog Restoration, MA Dept of Ecological Restoration, Nantucket, MA: Developed conceptual design for restoration of natural hydrologic function and wetland habitats to a 37-acre retired cranberry bog.

Queensville Dam Removal/Titus Pond Restoration, South Hadley, MA: As part of an MVP Action Grant project, conducted wetland delineation and ecological data collection for a dam removal and watershed improvement feasibility study to reduce flooding risk and provide improved habitat conditions. Field data will be used to define the characteristics of restored wetland areas within the restored impoundment, and to reconstruct and realign an existing culvert to better match the path of the stream channel and provide improved habitat connectivity in accordance with the Massachusetts Stream Crossing Standards.

Scarborough Brook Headwaters Resiliency, Belchertown, MA: Conducted wetland delineation and ecological data collection to support removal of two dams within the Scarborough Brook Conservation Area and replacement of two downstream culverts in accordance with the Massachusetts Stream Crossing Standards. Data collection included stream cross-section and profile information, streambed sampling, pebble counts, and reference data for use in defining a natural channel through the restored impoundments and new open-bottom road-stream crossing structures.

Little River Dam Removal and River Restoration, Haverhill, MA: Field Team Lead for wetland resource area delineations to support design and permitting for removal of the Little River Dam as part of an MVP Action Grant project in the City of Haverhill.

Regional Susquehanna River Flood Mitigation Assessment and Design Project, Tioga and Broome Counties, NY: Developing a watershed-based flood resilience study and management plan for flood-prone tributaries to the Upper Susquehanna River in the Southern Tier of NY. The project includes a road-stream crossing assessment and infrastructure-related recommendations related to stream crossing upgrades, stormwater green infrastructure, and nature-based solutions to enhance flood resilience.

Town-wide Road Stream Crossing Assessment and Climate Change Adaptation Plan, Town of Belchertown, MA: Field Team Leader to assess road-stream crossing and assisted in post-fieldwork analysis to identify high-priority crossings for improvements. The project identified and provided recommendations for high-priority crossings to enhance community resiliency, mitigate existing and potential future flooding, and increase stream continuity and aquatic passage. The project also included field survey of beaver activity and development of vulnerability assessments to quantify potential flood storage or flood risk from beaver impoundments and recommend appropriate management actions from restoration to beaver exclusion.

Niantic River Watershed Protection Plan Update, East Lyme, CT: Environmental scientist responsible for project coordination, technical analysis, and community engagement for a watershed based plan based on the EPA nine-element watershed-based planning process. Work included documentation of existing conditions, modeling of pollutant loading, and development of green infrastructure project concepts through desktop and field screenings.



Andrew Bohne, RLA

Wetlands and Ecological Design

“I take pride in low-impact development designs that blend the proposed work with the native environment.”

abohne@fando.com 860.426.6033

EDUCATION

BS, Landscape Architecture -
1999
UMass Amherst

LICENSES & REGISTRATIONS

Reg Landscape Architect CT
Reg Landscape Architect MA
Reg Landscape Architect NY
Reg Landscape Architect VT

EXPERIENCE

24 Years Professional Experience

Andy has a broad knowledge base in planning, landscape architecture, and ecology, which helps guide clients to economically-feasible and environmentally-conscious design solutions. Andy has experience with bio-basin stormwater systems, pod design and restoration, parking island rain gardens, residential bioswales and rain gardens, open space trail networks, wetland restoration, mitigation, and replication, natural channel design, and wildlife habitat enhancement areas. He provides innovative and alternative site sustainability and stormwater management approaches for restoration projects and undisturbed sites.

Andy has provided environmental impact analyses, environmental planning and feasibility studies, stream and river assessment and restoration designs, and erosion control plans. He has an extensive knowledge in CAD/GIS/GPS planning and graphic capabilities, using all aspects of the applications to make a project accurate and graphically readable for public outreach.

REPRESENTATIVE PROJECTS:

Resilient Fair Haven Phase III, CIRCA, New Haven,

CT: Senior Landscape Architect for forward-looking adaptation strategies and specific actions to mitigate the impacts of climate change on the Fair Haven community. Community engagement is a large component of this project, and stakeholder priorities are driving the strategies. Improvements include mitigation of the impacts of extreme heat and heat islands and mitigation of flooding impact to roads. Andrew is orchestrating the public workshops and creating outreach materials. A future task will be to create conceptual design renderings.

Marine Station Site Improvements, Dock, and Permitting, UMass Amherst, Gloucester, MA:

Senior Landscape Architect for master planning and site improvement. Priority improvements included

stabilizing the bulkhead, restoring the open area behind the marine station, and installing a dock with crane/davit that will support future design, permitting, and public outreach/stakeholder engagement prior to final design and construction. Planning and design decisions considered coastal and ecological resilience, with emphasis on reducing future risks. The plan also included the creation of a living laboratory for future research and study.

Scarborough Brook Culverts and Dam Removal (under FY23 MVP Action Grant), Town of

Belchertown, MA: This project includes removal of two dams within the Scarborough Brook Conservation Area and replacement of two downstream culverts in accordance with the Massachusetts Stream Crossing Standards. A natural channel was defined through the restored impoundments. As a Senior Landscape Architect, Andrew assisted with conceptual design and preliminary design plans.

Puffer's Pond Concept Plan and Feasibility, Town of

Amherst, MA: Senior Landscape Architect for a Vision Plan for Puffer's Pond, which will enable the Town to continue to accommodate and grow the dedicated use of this locally and regionally significant place while also achieving the conservation goals for the area. This project places special emphasis on ensuring that Puffer's Pond will thrive in changing climate conditions with regard to habitat adaptation, water quality, and increased storm events. An additional project goal is to make Puffer's Pond a place of respite from environmental justice issues and climate impacts such as extreme heat and accessible open space in the Town of Amherst. The Vision Plan is intended to serve as a roadmap for the site, both creating a

comprehensive vision of the site and an action plan leading to implementation of both the short- and long-term recommendations.

Winnekenni Castle Park and Grounds Concept Plan, City of Haverhill, MA:

Senior Landscape Architect for developing a vision for land use planning and landscape architecture improvements at the grounds of the Winnekenni Castle to encourage increased use and accessibility at this unique facility and prepare the City to pursue funding and implementation of larger improvements at the site. This project is being funded by an EoEEA Planning Assistance Grant. This project includes ecological consultation relative to the environmental conditions and sensitivities (e.g., potential impacts of proposed improvements to downgradient water resources and the existing forested habitat). The Vision Plan focuses on connectivity, accessibility, ecological enhancement via planting, climate impact, stormwater management, and revenue generation.

Queensville Dam Removal Design and Permitting (under FY23 MVP Action Grant), Town of South

Hadley, MA: Senior Landscape Architect for removal of an outlet control structure that maintains the depth of the Titus Pond impoundment to drain the impoundment during normal conditions, restoring the impounded area to wetlands, and using the outlet pipe to convey the stream under Route 116. This project offers resilience benefits to the project area and it eliminates the jurisdictional status and hazard threat associated with Queensville Dam. This project will address water quality issues and create an improved conservation area, including an outdoor classroom for an adjacent school.



Lynn Rae

Wetlands and Ecological Design

“Cross-sector collaboration is key for developing innovative and effective solutions to complex climate change and natural resource challenges. Bridging the gap between science, design, and decision-making is one of the most exciting and rewarding aspects of my job.”

lrae@fando.com 860.645.2002

EDUCATION

BS, Environmental Science - 2002
Northern Vermont University
MS, Natural Resource
Management - 2020
University of Arizona

EXPERIENCE

18 years Professional Experience

Lynn is a Project Manager in our Water and Natural Resources Business Line based out of Manchester. She is an established project and thought leader with nearly 20 years of experience within the environmental sector, with a core focus on climate adaptation, sustainable planning and development, and natural resource policy. Lynn has experience facilitating strategic planning efforts, stakeholder engagement, data and policy analysis, and regulatory compliance for local state, tribal, and federal programs. Previously, Lynn provided planning support for Tribes in the Southwest and Pacific Northwest to assess climate change risks, infrastructure, adaptation and mitigation actions, policies, and resource needs. She also served as an Independent Consultant for the Commission for Environmental Cooperation and was contracted for a tri-national project that supports cooperation among Canada, Mexico, and the United States to address floods, other extreme events, and environmental issues of continental concern.

REPRESENTATIVE PROJECTS:

Harbor Brook Flood Control Project, Meriden,

CT: Natural Resources Lead for the ongoing design and implementation of nature-based floodplain restoration, building floodproofing, and acquisition/removal of several structures in downtown Meriden.

Gorham Pond Dam Emergency Repairs, Darien CT:

Natural Resources Lead for the design, permitting, and construction phase services for an emergency repair to Gorham Pond Dam in Darien.

CEPA/NEPA Support for Cribari Memorial Bridge,

CTDOT, Westport, CT: Natural Resources Lead that is providing support to CTDOT for the review and completion of the Joint Environmental Assessment/Environmental Impact Evaluation for the replacement of the William F. Cribari Memorial Bridge, Route 136

over the Saugatuck River in Westport.

Hartford Riverwalk, Riverfront Recapture,

Hartford and Windsor, CT: Natural Resources Lead for environmental services for an extension of the multi-use pathway along the Connecticut River from its current terminus at the Greater Hartford Jaycees Community Boathouse northerly for approximately two miles toward Windsor. This project included federal and state jurisdictional waters, wetlands, and watercourses located within 50 feet of the proposed trail to the west in the new section and on the east side to the edge of the River. Wetlands and watercourses were delineated in accordance with State of Connecticut Inland Wetland and Watercourses Act. We provided a technical memorandum that included a summary of maps reviewed, a description of the site and its hydrology, classification of wetland and adjacent upland soils, an inventory of dominant wetland and adjacent upland vegetation, mapping of wetlands and watercourses within the project limits, and wetland field data forms. This project required the following permit applications: CTDEEP Stormwater General Permit, CTDEEP/CTDO Flood Management Certificate, and CTDEEP Section 401 Water Quality Certification.

Wetland Enhancement, Windsor-Bloomfield

Landfill, Windsor, CT: Natural Resources Lead for the enhancement of a wetland outlet adjacent to the Windsor-Bloomfield landfill. Fuss & O'Neill is also providing bidding and construction administration services as part of the project.

Congress Substation Environmental Permitting Support and Floodwall Installation, United

Illuminating, New Haven, CT: Natural Resources Lead for environmental permitting and oversight of the new floodwall installation at the United Illuminating Substation in New Haven.

Tohono O'odham Nation's Climate Adaptation Plan and Vulnerability Assessment, Tucson, AZ:

At a previous firm, Lynn was the Climate Adaptation Planner for the Tohono O'odham Nation's climate resilience planning initiative. The project focused on collaboration with Tribal leadership, government sectors and University climate programs to assess ecosystem services, infrastructure and community vulnerabilities to extreme heat and flooding. The project included the facilitation of multiple tribal government and community workshops and the development of a resource database, vulnerability assessment, and climate adaptation plan.



Mark Vertucci, PE, PTOE

Transportation Engineering

“As a child, I drew chalk roads on my driveway and installed paper road signs around my house. I coerced my mother to take me on long day trips just to drive along roads I had never been on before. Transportation has always been a passion of mine. To me, it is not all about the destination. Getting there is half the fun.”

mvertucci@fando.com

860.783.4756

EDUCATION

BS, Civil Engineering - 1998
Rensselaer Polytechnic Institute

LICENSES & REGISTRATIONS

Professional Engineer CT
Professional Engineer MA
Professional Engineer RI
Professional Engineer NY
Professional Traffic Ops Engineer

PROFESSIONAL AFFILIATIONS

Inst Transportation Engineers

EXPERIENCE

27 Years Professional Experience

Mark is a Vice President in our Transportation Business Line. He has many years of experience in traffic engineering, transportation planning, site development, and roadway improvement projects. Throughout his career, he has prepared numerous traffic impact studies, planning studies, corridor studies, parking studies, and traffic management plans.

Mark has extensive experience with traffic signal design projects, roadway design projects, and intelligent transportation systems. Mark is certified by the Institute of Transportation Engineers (ITE) as a Professional Traffic Operations Engineer (PTOE), and the current President of the Connecticut Chapter of ITE.

REPRESENTATIVE PROJECTS:

City-wide Bicycle and Pedestrian Improvements, Stamford, CT: Senior Transportation Engineer for numerous bicycle and pedestrian safety projects through the City that have included proven measures to reduce crashes and improve safety, such as high visibility retroreflective thermoplastic crosswalks, curb extensions at corners, “turning vehicles yield to pedestrians” signs, “no turn on red signs” and other signage, implementation of bike lanes, road diets, pavement marking and parking improvements. In addition, some of these projects have included the implementation of leading pedestrian intervals (LPI) at traffic signals and Rectangular Rapid Flashing Beacons (RRFB’s). These “quick hit” projects have been done in conjunction with programmed capital improvement projects on City roadways including Hope Street,

Stillwater Avenue, Strawberry Hill/Newfield Streets, Long Ridge Road, and West Broad Street.

Greenwich Avenue Corridor Improvements

and Roundabout Design, Stamford, CT: Project Director for conceptual plan alternatives to improve traffic safety and flow, pedestrian circulation, and the streetscape throughout the corridor limits.

This project included review of operations, safety, and capacity at 13 intersections and assessment of existing conditions parking demand and turnover on the study corridors. Traffic capacity analysis and a simulation model were developed for the study area. Three conceptual alignment alternatives, intersection improvement options, and cost estimates were prepared. This project included a public involvement process, including workshops with stakeholders to achieve input during the concept planning stage. Following selection of the preferred alternative, this project culminated with the design and permitting of a new roundabout at the Greenwich Avenue/Pulaski Street/O&G Industries Drive intersection.

Harbor Point Development Transportation

Planning, Stamford, CT: Senior Project Manager for transportation planning support for the \$3.5 billion Harbor Point development in the south end of Stamford. Project experience includes the Gateway office development, the Yale and Towne mixed-use/residential project, and the proposed \$750 million Bridgewater Headquarters project. In conjunction with these concurrent development projects, an interactive traffic model of the south end of Stamford was prepared to analyze traffic operations and impacts at more than 50 intersections and to answer a variety of “what if?” scenarios. A comprehensive set

of roadway improvements was proposed to mitigate project impacts.

Signal Design, Selleck Street at Greenwich Avenue,

Stamford, CT: Senior Transportation Engineer for a signal redesign as a result of an additional turn lane being added to help accommodate a new residential development in Stamford's south end. Initial efforts included traffic impact analysis at the intersection and recommendation of a new turn lane, followed by the design of a new signal and completion of signal plan updates.

Traffic Signal Hardware Upgrade, Phases D through

G, Stamford, CT: Senior Transportation Engineer for design, review, and oversight of the design plans for this major traffic signal system hardware upgrade project in the City of Stamford. The project involved improvements to dozens of traffic signals, including the installation of emergency vehicle preemption systems, video detection, pedestrian phasing, and CCTV dome-style cameras for traffic monitoring. This project involved the modernization of the existing City traffic control center with new equipment to enable an expanded monitoring capability for the additional intersections.

Urban Transitway Traffic Signal Design and Transit

Signal Priority, Stamford, CT: Senior Transportation Engineer for the preparation of traffic signal plans, equipment layout, and Synchro progression and capacity analyses for eight new traffic signals on the recently constructed Stamford Urban Transitway. This unique project featured exclusive transit lanes, priority bus preemption, and the incorporation of each signal into Stamford's city-wide computerized coordination system.



John Guzze, PE

Transportation Engineering

“Projects we have completed demonstrate what we know; future projects decide what we will learn. Soaking in all the knowledge from coworkers who can make any project become a reality is something I look forward to each week.”

jguzze@fando.com

860.783.4696

EDUCATION

BS, Civil Engineering - 2012
University of Massachusetts at Amherst
MS, Transportation Engineering - 2013
University of Massachusetts at Amherst

LICENSES & REGISTRATIONS

Professional Engineer CT

PROFESSIONAL AFFILIATIONS

Inst Transportation Engineers
CT Institute of Trans Eng

EXPERIENCE

9 Years Professional Experience

John is a Senior Transportation Engineer in Fuss & O’Neill’s Transportation Department in Manchester, Connecticut. John has been leading roadway, streetscape, and safety improvements projects throughout Connecticut for several years. Drawing on his practical background designing parking solutions, bikeway facilities, intersection improvements, and streetscape enhancements, John leads and creates practical and constructable solutions for Connecticut municipalities. John works closely with his clients, listening to their concerns and making sure he understands their needs – both current and future needs. He then leads teams to design context-sensitive improvements that create safer passageways for all roadway users.

REPRESENTATIVE PROJECTS:

Greenwich Avenue Corridor Improvements and Roundabout Design, LOTCIP Program, Stamford, CT:

Senior Transportation Engineer for design alternatives to improve traffic safety and flow, pedestrian circulation, and the streetscape throughout the corridor limits. This project involved improving the current all-way stop controlled intersection by constructing a new roundabout with two lane eastbound and westbound approaches. In addition, the northern portion of Davenport Street will be realigned to form the easterly approach of the roundabout consistent with the City’s plans to create a one-way loop with Greenwich Avenue and Davenport Street to the south and west. Final design services for the preferred alternative included reconstruction/realignment of Greenwich Avenue and

Davenport Street, permanent easements and property takings, streetscape enhancements, signalized intersections with audible pedestrian signals, street lighting improvements and crosswalk treatments, reconstruction of the Greenwich Avenue/Pulaski Street/O&G Industries Drive intersection with a new roundabout, and a multi-use path along Greenwich Avenue and Davenport Street.

Greenwich Avenue Roundabout Design, LOTCIP

Program, Stamford, CT: As Lead Engineer, John advanced the preliminary design alternative of a roundabout through remaining design submissions as part of CTDOT's LOTCIP. Planned improvements included the replacement of the stop-controlled intersection with a roundabout and revisions to the approaching roadway alignments. The roundabout design considerations consisted of geometric constraints, grading, drainage, lighting, coordination with overhead and underground utilities, property impacts, and enhanced erosion and sedimentation control elements due to CTDEEP coastal permits.

Boxer Square Construction Documents, CCGP

Program, Stamford, CT: John served as Project Manager and Lead Designer for this intersection improvement and community enhancement project. John worked with engineering and landscape architect professionals to create a realigned intersection that incorporated a plaza area adjacent to the roadway centered around an important community monument. Design considerations included bicycle lanes, grading constraints, streetscape and landscape elements, pedestrian lighting, drainage relocations, and traffic analyses. This project was funded through CTDOT's Community Connectivity Grant Program (CCGP).

Atlantic at Henry Street Intersection Design,

Stamford, CT: Project Engineer for the realignment of the east leg of Henry Street. This project included concept design plans, public presentation plans, and construction documents (which consisted of Local Roads Projects review and submission process through CTDOT). John progressed construction document plans and the contract project manual from Semi-Final to Final Design. Design tasks included updating existing drainage lines and structures, relocating utility poles, replacing the existing signal mast arms and equipment, incorporating on-street parking spaces, and improving the pavement structure. All construction improvements were coordinated with the utility companies. Test pits were conducted to identify utility conflicts, and the design mitigated major utility underground relocations.

Traffic Control Signal Replacement, CTDOT, District

3, CT: Senior Transportation Engineer for State Project No. 173-486/487. Under Fuss & O'Neill's Task-Based Traffic and Safety Engineering Services contract, 12 full equipment replacement traffic signals were selected for equipment replacement. The project included the upgrade of the existing infrastructure to the latest standards. Pedestrian control features upgraded included APS with pushbuttons and countdown signal heads. The project included construction/reconstruction of curb ramps, blended transitions, sidewalk extensions, landing areas, detectable warning surfaces, and realignment of skewed crosswalk pavement markings. Capacity analysis using Synchro software was conducted at each of the locations to determine any recommended changes to the signal phasing and/or timings.



Keith Goodrow, PE, LEED AP

Civil Engineering

“As an engineer, I find it very rewarding to be able to use my knowledge and experience to help our clients achieve their vision while being conscience of the environmental need to create sustainable low-impact solutions.”

kgoodrow@fando.com

860.783.4716

EDUCATION

BS, Civil Engineering - 2002
University of Connecticut

LICENSES & REGISTRATIONS

Professional Engineer CT
LEED-AP
Professional Engineer

EXPERIENCE

20 Years Professional Experience

Keith is a Senior Engineer in our Site Planning and Design Group. With more nearly 20 years of engineering experience, Keith has contributed to a wide variety of projects, including municipal roadway design, commercial and residential site development, and large campus improvements.

Keith specializes in stormwater management and the design of detention systems, low-impact water quality measures, and hydraulic storm modeling.

REPRESENTATIVE PROJECTS:

Bank Street Drainage Improvements, New London,

CT: Keith served as Project Engineer for the design of drainage improvements to reduce flooding during storm events. Services included evaluating the extent of the existing flooding and design improvements to alleviate or reduce flooding potential while working within several existing constraints.

Stamford Stormwater Drainage Manual, Stamford,

CT: Project Engineer for the development of a city-wide drainage manual for the City of Stamford.

Lower Wonsquatucket River Stormwater Control Designs, Providence, RI:

Keith served as Project Engineer/Designer for site/civil engineering support for the addition of green infrastructure to enhance the water quality of the stormwater runoff discharging to

the Woonasquatucket River. Site improvements to the downtown Providence parking lot included removing impervious pavement to add a bio-retention basin, vegetated swale, and landscaping. Services included site engineering, stormwater management, landscape architecture, and preparation of state and local permits.

Renovations, State Office Building, Hartford, CT:

Keith served as Project Engineer/Lead Designer for site/civil engineering support for the complete renovation of the State Office Building and construction of a public square and supporting parking garage. Services included site engineering, utility design, stormwater management, and landscape architecture.

Mixed-use Complex, Forest Manor, West Haven, CT:

As Project Engineer, Keith provided site/civil engineering support for construction of a mixed-use retail and residential complex supporting the University of New Haven. Services included site engineering, utility design, stormwater management, and landscape architecture.

Mixed-use Development and Construction,

Winstanley, New Haven, CT: As Senior Engineer, Keith assisted with the development of a feasibility study for a six-story mixed-use development site in New Haven. He prepared a site plan, evaluating access, utilities, water supply, and site grading. As part of this project, the following plans were created: site clearing/site preparation; site grading; site utility; erosion and sedimentation control; landscaping; signage; and remedial action. This project included design development, permitting, preparation of construction documents, construction administration, and multiple meetings with project stakeholders. The site has a historic building that was integrated into the overall site plan design.

Enfield ROADS 2010 Referendum and Stormwater Management, Town of Enfield, CT:

Keith served as Project Engineer for the design of stormwater management systems and hydraulic modeling of several large roadway reconstruction projects in the Town of Enfield. This project included roadway and drainage design for full-depth reconstruction of 15 streets in Enfield. The roadway projects included design, cost estimating, permitting (state and local), and construction administration.

Roadway Improvements, Town of Southington, CT:

Project Engineer for the design of water quality and low-impact measures for the removal of an overpass bridge and roadway intersection improvements. Services included quantifying the water quality requirements, modeling the design improvements, and writing a report to summarize the design.

Bowles Redevelopment, Hartford, CT:

Keith served as Senior Engineer for the phasing and site design of the redevelopment of Bowles Park. Keith provided site/civil engineering support of the redevelopment of a large housing project. Services included site engineering, utility design, grading, storm drainage design, stormwater management, landscape architecture, and preparation of all state and local permits.

Asnuntuck Community College Site/Civil

Engineering, Enfield, CT: Senior Civil Engineer for civil engineering support for the Manufacturing Technologies addition and Main Entrance renovations, including site engineering; utility design, stormwater management engineering, and environmental soil management. Project included OSTA certificate support and site-wide drainage review.



Lauren Mello, PE, CNU-A

Civil Engineering

“My guiding principle is inspired by this quote from Ghandi - ‘the future depends on what we do in the present.’”

lmello@fando.com

860.783.4733

EDUCATION

BS, Civil Engineering - 2013
Worcester Polytechnic Institute

MS, Civil Engineering - 2014
Worcester Polytechnic Institute

LICENSES & REGISTRATIONS

Professional Engineer CT
Congress of New Urbanism
Engineer-in-Training MA

EXPERIENCE

9 Years Professional Experience

Lauren is a Senior Engineer and Project Manager in Fuss & O'Neill's Community Development studio. A Connecticut Licensed Professional Engineer and an accredited professional with the Congress of New Urbanism, she has nearly a decade of experience in civil/site design.

Lauren has contributed to a wide variety of projects, including commercial and residential development, site conditions assessments, school construction, state and local permitting, and utility retrofits.

Lauren is an active mentor the Hartford ACE Mentor Program, which introduces high school students to architecture, construction, and engineering professions.

REPRESENTATIVE PROJECTS:

344 Winchester Avenue, Winstanley Enterprises, New Haven, CT: Civil Engineer for this adaptive re-use and site remediation project in order to allow redevelopment of a 250,000 ft² single-story high-ceiling manufacturing building for re-use as offices, warehousing, a data center, and library storage. This 15-acre development abuts the Farmington Canal bike trail and included reconstruction of a portion of Winchester Avenue to provide streetscape and traffic calming features. Services included survey, civil engineering, traffic engineering, landscape architecture, and environmental site assessment and remediation. Fuss & O'Neill was responsible for all of the environmental permits with CTDEEP, including filing of a remedial action plan.

Pedestrian Bridges at 100 College Street,

Winstanley Enterprises, New Haven, CT: Project Manager for the permitting, design, and construction for this ongoing project, which will create a pedestrian corridor beginning at 300 George Street, crossing over M.L.K. Jr. Boulevard, passing through the 100 College Street site, crossing over South Frontage Road, and terminating at a University medical center. The purpose of the corridor will be for pedestrian- and vivarium-related movements through an enclosed condition space between pharmaceutical companies and the medical school.

Parking Lot, Private University, New Haven,

CT: Civil Engineer for the permitting and design for a parking lot project. A former UPS building was demolished to create a transient permitted surface parking lot. Special considerations for security and safety features [e.g., emergency blue phones, parking facility controls (pay station), and lighting] were included in the design.

Site Renovation, Private University, Ann Beha

Architects, New Haven, CT: Civil Engineer for the permitting, design, and construction for the \$162M renovation project, including a 180-seat auditorium and 90-seat film screening room beneath the building's inner courtyard. The site's stormwater management design, developed by Fuss & O'Neill, contains a 190k+ gallon rainwater reclamation tank that will pump make-up water to the university's central power plant. The stormwater design met the City of New Haven's Zoning Ordinance Requirements and qualified for LEED's Sustainable Sites and Innovation In Design credits that aid in delivering the project a LEED (v3) Gold Award for New Construction

and Major Renovations.

Campus Site Design, University of Hartford, West

Hartford, CT: Civil Engineer for two projects for the University. The first project focuses on improvements to the Gengras Center for Student Success (CSS). Fuss & O'Neill is responsible for stormwater management, site utilities, erosion, and sediment controls.

The second project was at the Barney School of Business expansion, where Lauren provided stormwater management, site utilities, erosion, and sediment controls design services.

Athletic Building Site Design, Choate Rosemary

Hall, Wallingford, CT: Civil Engineer for a new twin rink hockey facility on the main campus. Project responsibilities for this LEED Gold project include site and civil design, as well as state and local permitting.

Facilities Master Plan, Simsbury Public Schools,

Simsbury, CT: Project Manager for this master planning effort. Project responsibilities included existing conditions reports and the analysis of public school sites with recommendations for improvements.

Academic Building, Private University, New Haven,

CT: Project Manager for the design and construction of a renovation project that addressed building- and site-related drainage issues. Site drainage retrofits and roof drainage connections were integrated into the existing site to prevent stormwater runoff from flooding the building's eastern entrance.

School of Graduate Studies Historic Renovation,

Private University, New Haven, CT: Civil Engineer for this tight urban site with an interior courtyard. The \$103M renovation required drainage design, utility routing and coordination plans, and erosion and sedimentation control plan services.



Robert Danielson, LEP

Site Contamination/Brownfields

"I enjoy working with talented professionals every day to evaluate environmental conditions and design solutions for a cleaner and more sustainable future."

rdanielson@fando.com

860.783.4768

EDUCATION

BS, Geology - 1986
Denison University

MS, Environmental Management
- 2002 Rensselaer Polytechnic
Institute

LICENSES & REGISTRATIONS

Licensed Environmental
Professional CT
Certified Professional Geologist CT

PROFESSIONAL AFFILIATIONS

Env Prof Organization of CT

EXPERIENCE

36 Years Professional Experience

Rob is a Project Manager in our Environmental and Facilities Business Line. Throughout his career, he has managed a wide range of complex assessment, remediation, and multidisciplinary projects. These projects have included investigation and cleanup of tank releases, PCB spills, polluted soils, groundwater contamination, maintenance facilities, landfills, brownfield properties, gasoline stations, dry cleaning facilities, transportation corridors, and specialty manufacturing facilities with cleanup costs ranging from a few thousand dollars to greater than \$50 million. Rob has previous experience with this Task Order contract and he has a detailed understanding of state and federal environmental regulations, including RCRA, TSCA, brownfields, Connecticut Property Transfer Act, and Connecticut's Remediation Standard Regulations.

REPRESENTATIVE PROJECTS:

Brownfield Assessment and Remediation, Harbor Point, Stamford, CT: Rob is the Project Manager and lead LEP for environmental assessment and remediation of multiple large brownfield properties (impacted by years of historic industrial use) associated with a \$4 billion Stamford Harbor Point redevelopment project. This project, which is situated on more than 100 acres along the waterfront in Stamford's South End, involved the implementation of a wide variety of remedial technologies including: DNAPL recovery, LNAPL recovery, soil excavation, soil stabilization and reuse, sub-slab venting design, vapor barrier installation, and engineered controls. This transit-oriented, LEED-ND Gold Certified redevelopment has reconnected the city to its waterfront and created a vibrant new residential, business, and cultural center.

Brownfield Pilot Program, City of Hartford EPA,

Hartford, CT: Rob was the Project Manager for numerous projects completed under the City of Hartford EPA Brownfields Pilot Program. Quality Assurance Project Plans, Remedial Action Plans, and Phase I, II, and III environmental assessments were completed at numerous sites throughout the city. The assessments helped to clear significant environmental hurdles and several of the sites have been redeveloped.

Metal Hydroxide Disposal Area Closure, Former

Aerospace Facility, North Haven, CT: Project Manager for: preparation of engineered control variance request, solid waste landfill permit application, local permitting, groundwater monitoring, site assessment, RCRA Corrective Action investigations, environmental land use restriction, cap inspections and ongoing environmental engineering consulting services. Work was conducted in accordance with CT's property transfer law and RCRA Corrective Action.

Brownfield Redevelopment, Science Park, New

Haven, CT: Rob was the Project Manager and LEP for environmental assessment and remediation of multiple properties associated with the former U.S. Repeating Arms complex in Science Park. This 15-acre brownfield site was challenged by more than 100 years of manufacturing, including more than 45 demolished buildings and a variety of contamination issues. These classic brownfield properties underwent cleanup and multi-million dollar redevelopment. Remediation included a soil vapor extraction system, sub-slab depressurization system, and vapor barriers to mitigate potential vapor intrusion, soil excavation, and disposal to address contaminated soil hot spots,

building decontamination, and the installation of DEEP-approved engineered controls.

Site Assessment and Remedial Design, Former

Gilbert & Bennett Mill, Georgetown, CT: Project Manager for environmental investigation, demolition, and remediation activities associated with the award-winning redevelopment of the former Gilbert & Bennett wire mill. Completed activities included detailed characterization of soil, groundwater, surface water and sediment quality, evaluation of ecological risks, preparation of plans and specifications, completion of a remedial action plan and CAMU application, building decontamination and demolition, preparation and implementation of soil management plans, local and state permitting, site remediation, and implementation of a public participation program.

Brownfield Redevelopment, Former Kenyon

Mill, Coventry, CT: Project Director and LEP for environmental assessments, remedial design, and site remediation for the former Kenyon Mill brownfield site. The 11-acre under-utilized site was occupied by a former silk and woolen mill complex. Working closely with the CT DEEP, areas of environmental concern were successfully identified and delineated. The town used a Special Contaminated Properties Remediation and Insurance Fund (SCPRIF) loan and small cities grant from the Connecticut Department of Economic Development (DECD) to advance assessment and cleanup of the site. Fuss & O'Neill prepared and implemented the remedial action plan, as well as plans and specifications that were approved by the CT DEEP. The property was sold and redeveloped into condominiums.



Daniel Jahne, LEP

Site Contamination/Brownfields

"I take satisfaction in completing a quality work product that is produced on time and under budget."

djahne@fando.com

860.783.4670

EDUCATION

BS, Geology - 1992
Union College

LICENSES & REGISTRATIONS

Licensed Environmental
Professional CT

PROFESSIONAL AFFILIATIONS

Env Prof Organization of CT
CT Economic Dev Assoc

EXPERIENCE

30 Years Professional Experience

Daniel has 28 years of experience and serves as a Senior Project Manager for Brownfield Assessment Programs, RCRA Corrective Action sites, investigation and remedial design projects, permitting, water diversion projects, and public-private partnership development projects.

He has extensive experience in the design and management of site investigation, remedial planning, and remedial cost estimating. Under both state and federal Brownfields programs, he has overseen remediation of contaminated properties. He is experienced with preparation of project financial and status reports as well as public outreach and community involvement activities. He also is experienced in water supply investigations and water supply impact evaluations in a variety of geologic settings. This has included designing hydrogeologic evaluations for water supply and water diversions to assess the potential impacts on surface water, wetlands, and groundwater.

REPRESENTATIVE PROJECTS:

On-call Environmental Contract, City of Hartford,

CT: Project Manager for ESAs completed at several City redevelopment projects. Responsibilities include design and implementation of "fast track" site investigations, coordination and planning with regulatory and City agencies, participation in remedial design development and cost estimating, and remedial activity oversight. He prepared grant funding applications for Brownfields assessment and cleanup funding. Prepared the QAPP for the Brownfields Project Pilot Program and the Community Relations Plan for the City's Brownfield Cleanup Grant program.

Riverfront Recapture Hartford Riverwalk,

Hartford/Windsor, CT: LEP and Task Manager for corridor assessment and site evaluation, remediation planning, remediation permitting, and

soil management for construction of a multi-use trail and cove expansion on a Brownfields property.

Coordination with multiple state agencies, EPA, and ACOE is required to achieve cleanup objectives involving excavation of >200,000 cubic yards of soil.

Investigation and Remediation Planning, District

NHV, New Haven, CT: Project Manager for Phase I, II, and III investigations, remediation planning, and construction oversight of a public-private partnership reuse development project of a seven-acre former CTDOT bus repair facility. The formerly blighted property was transformed into a work-play destination of mixed commercial and office use. Activities included assessment, remediation, demolition, planning, permitting, and outreach. The site is challenged by polluted urban fill and over half an acre of free-phase petroleum product.

Investigation and Remediation Planning, Former

New Haven Clock, New Haven, CT: Project Manager for Phase I, II, and III investigations, radiological assessment, hazardous building material evaluation, and remediation cost estimating for a 150,000 ft² former clock factory complex. Activities were funded through a CTDECD grant. The site is challenged by polluted fill, PCBs in soil and building materials, radium 226 in building materials, and a TCE release to soil and groundwater. Team coordination is ongoing to integrate remediation and abatement activities into a site reuse design.

Metro Hartford Community Wide Brownfield Assessment Program, CROG, Hartford, CT:

Project Manager providing program support with quarterly reporting to USEPA documenting project progress and participate in Steering

Committee meetings. Overseeing preparation and implementation of QAPPs and ESAs. Currently 14 sites have been investigated in 9 municipalities. Three of the projects are in the remedial planning phase, including preparation for entering formal state voluntary remediation programs.

Brownfield Assessment, Former National

Welding Facility, Town of Newington, CT: Project Manager for a brownfield assessment grant-funded investigation of a former industrial welding facility. The assessment included completion of a hazardous building materials survey for an approximate 100,000 ft² building. Responsible for QAPP preparation and implementation of Phase I, II, and Phase III investigations. Prepared a RAP that evaluated remedial options for several development scenarios.

Environmental Assessment and Remedial Action Plan, Steelpointe Development,

Bridgeport, CT: Project Manager helping the City relocate two businesses (Bloom Shellfish and MOVE Yacht Club) on the 50-acre development area by managing the environmental assessment of each property. Additionally, Project Manager for the CT Brownfield Redevelopment Authority and DECD-funded environmental investigation. Developed a historical environmental database, assessed data gaps, and designed a supplemental investigation to address data gaps. Prepared a RAP that provided remedial options for development scenarios. Environmental and engineering activities continue to be provided to the City and the developer for redevelopment activities, including TIGER II Grant-funded roadway work, shoreline steel bulkhead installation/sediment dredging, and new retail construction.



PIPPA BRASHEAR

RLA

SCAPE

Pippa Brashear is Resilience Principal at SCAPE. A leading national expert on resilience planning and climate adaptation, Pippa works with large, multi-disciplinary teams to develop landscape strategies and next-century infrastructure that integrate environmental, economic and social benefit.

Pippa holds a Master's in Landscape Architecture and Master's in Urban Planning with Distinction from Harvard University. She also holds a Bachelor's of Arts, cum laude, in Environmental Science and Public Policy from Harvard College.

RELEVANT PROJECTS

- Climate Ready Dorchester, Boston, MA
- Resilient New Jersey, Middlesex County, NJ
- Resilient Together: El Punto, Salem, MA
- Financial District and Seaport Resilience Project, New York, NY
- Living Breakwaters: Design and Implementation, Staten Island, NY
- Resilient Boston Harbor Vision, Boston, MA
- Ohio Creek Watershed Resilience Project, Norfolk, VA
- Battery Park City Authority North West Resiliency Project, New York, NY
- Battery Park City Authority Sustainability Project, New York, NY
- Jacksonville Resiliency Framework Plan, Jacksonville, FL
- Public Sediment: Resilient By Design Challenge, Bay Area, CA
- Hayward Shoreline Masterplan, Hayward, CA
- Measuring Success: Monitoring Natural and Nature Based Shorelines in New York State, NY
- CSO+: New Jersey Future, Gloucester, Jersey City, Perth Amboy, NJ
- National Disaster Resilience Competition, Facilitator & Subject Matter Expert, USA
- Hudson River RBD Feasibility Study, Hoboken, NJ
- Stormwater Greenstreets, Hutchinson River DEP Priority CSO Tributary Area, Bronx, NY
- Living Breakwaters, Rebuild by Design Competition, HUD, NJ/NY Metropolitan Region (Winner)

PROFESSIONAL EXPERIENCE

SCAPE Landscape Architecture
Resilience Principal / Partner
2015-Present

Parsons Brinckerhoff, New York, NY, Project Manager, Designer, Planner, 2012-2015

REGISTRATIONS

Landscape Architect: NY

EDUCATION

Harvard University Graduate School of Design, Cambridge, MA; Master in Landscape Architecture; Master in Urban Planning with Distinction

Harvard College, Cambridge, MA; Bachelor of Arts, cum laude, in Environmental Science and Public Policy

ACADEMIC

Studio Critic, Masters in Urban Design, Columbia University GSAPP, 2014-2019

Part-time Lecturer in Landscape Architecture, Rutgers University School of Environmental and Biological Sciences, 2011 - 2014

AWARDS

- Charles Eliot Traveling Fellowship in Landscape Architecture, Harvard GSD, 2007



DESPO THOMA

SCAPE

Despo Thoma is a Senior Associate at SCAPE. With a background in architecture and urban design, Despo designs and advocates for equitable and resilient neighborhoods, with a focus on climate adaptation, engagement and visual storytelling. She leads interdisciplinary teams to develop strategies and next-century resilience infrastructure that integrate social and environmental benefit for projects in New York, Boston, Louisiana, the Bay Area and Southeast Asia. Despo leads resilience and urban design & planning efforts, design competitions, and related business development pursuits.

Despo is a 2021 Forefront Fellow at the Urban Design Forum. Despo holds a Master's in Architecture and Urban Design from Columbia University, where she studied as a Fulbright Fellow and was awarded the GSAPP Prize or Excellence in Urban Design. She also holds a Bachelor's and Master's degree in Architecture from the National Technical University of Athens, and has taught in both the Urban Design program at Columbia and the College of Architecture and Design at the New Jersey Institute of Technology (NJIT).

RELEVANT PROJECTS

- Climate Ready Dorchester, Boston, MA
- Resilient New Jersey, Middlesex County, NJ
- Resilient Together: El Punto, Salem, MA
- Battery Park City North-West Resiliency, New York, NY
- 2023 Coastal Master Plan for the State of Louisiana, LA
- Downtown Waterfront Design & Use Guidelines, Boston, MA
- Eckerd College Resilience and Adaptation Framework Plan, St. Petersburg, FL
- Greater Corktown Neighborhood Planning Framework, Detroit, MI
- Pensacola Waterfront Framework Plan, Pensacola, FL

PROFESSIONAL EXPERIENCE

SCAPE Landscape Architecture
Senior Associate
2019-Present

Urban Design Forum, Forefront
Fellow, 2021-2022

One Architecture and Urbanism
(ONE), New York, NY, Urban
Designer, 2016-2019

Yunus and Youth NGO, New York,
NY, Designer, 2017

Studio REDE, New York, NY, Junior
Designer and Researcher, 2016-
2017

FIRM a.d., New York, NY, Junior
Designer, 2016

REGISTRATIONS

Registered Architect: Cyprus

EDUCATION

Columbia University GSAPP, New
York, NY
MS, Architecture and Urban Design,
2016

National Technical University of
Athens, Greece

Diploma, Architect Engineer
(equivalent to M.Arch), Summa
Cum Laude, 2015

AWARDS

- BSLA Merit Award in Analysis
& Planning for Climate Ready
Dorchester, 2021
- Van Alen Institute, 'To the
Streets' Competition 1st Prize
Award, 2017
- Columbia University GSAPP Prize
for Excellence in Design, 2016
- J. William Fulbright Fellowship
Award, 2015
- Cyprus Children Fund
Scholarship Award, 2015



ANNA HOCHHALTER

RLA

SCAPE

Anna Hochhalter, RLA, is an Associate at SCAPE. She works with clients across the U.S. to create more resilient and meaningful public spaces and ecological systems. With a wide-ranging background in municipal arts and sustainability planning, water management and environmental stewardship, she leads design teams for design and planning initiatives of all scales, with a particular interest in leveraging water for high-performance public spaces.

Anna holds a Master's of Landscape Architecture from University of Illinois at Urbana-Champaign and a Bachelor's of Science with distinction in Environmental Studies from Northland College.

RELEVANT PROJECTS

- Jacksonville Resiliency Framework Plan, Jacksonville, FL
- Coney Island Beach Operations Headquarters, Brooklyn, NY
- Gowanus CSO Tank & Salt Lot, Brooklyn, NY
- Amazon HQ2: PenPlace, Arlington, VA
- China Basin Park, San Francisco, CA

PROFESSIONAL EXPERIENCE

SCAPE Landscape Architecture
Associate

2021-Present

AECOM, NYC Landscape
Architecture and Urban Design
Studio, Brooklyn, NY, Associate,
Designer 2016-2021

AECOM, Chicago, IL, Designer,
2013-2016

City of Urbana, Urbana, IL, Public
Arts Coordinator and Community
Development Associate, 2006-
2011

Urbana Park District, Urbana, IL,
Environmental Program Leader at
Anita Purves Nature Center, 2007-
2008

REGISTRATION

Landscape Architect: NY

EDUCATION

University of Illinois at Urbana-
Champaign, Urbana, Illinois
Master of Landscape Architecture,
2013

Northland College, Ashland,
Wisconsin
Bachelor of Science,
Environmental Studies, Art and
Sustainability, 2006

AWARDS

- ACE Advocacy Award, 40
North|88 West, Champaign
County Arts, Culture and
Entertainment Council, 2010
- Sigurd Olson Fellow, Sigurd
Olson Environmental Institute
and Northland College, 2005



SERA TOLGAY

AICP

SCAPE

Sera Tolgay, AICP, is a Senior Designer at SCAPE. She collaborates with architects, engineers and planners on infrastructure, landscape and urban design projects that support resiliency, connect fragmented communities, and restore habitats and environmental systems.

Sera holds a Master's in City Planning and a Master's of Science in Architecture from the Massachusetts Institute of Technology (MIT) as well as a Bachelor's in Environmental Science and Policy with Distinction from Yale University.

RELEVANT PROJECTS

- Resilient New Jersey, Middlesex County, NJ
- Boston Downtown Waterfront Design and Use Guidelines, Boston, MA
- Living Breakwaters for Staten Island and Raritan Bay, Staten Island, NY
- Washington Street Corridor Coastal Resiliency Evaluation, Nantucket, MA
- South Works Framework Plan, Ithaca, NY
- Hudson Highlands Fjord Trail, Hudson Highlands, NY
- Sleepy Hollow East Parcel Climate Resilient Development Plan, Sleepy Hollow, NY*
- Ashokan Reservoir Reconstruction and Trail Plan, Ashokan, NY*
- Flood Resilience Handbook for Public Access Sites Along the Hudson River, New York, NY*
- Utica Avenue Corridor Transit Improvement and Land Use Study, Brooklyn, NY*
- Citywide Coastal Flood Resiliency Zoning Amendment, New York, NY*
- Special Natural Resource Districts Zoning Amendment for the protection of freshwater wetlands and significant natural features, Bronx & Staten Island, NY*
- Southern Boulevard Neighborhood Study, Bronx, New York*

*With previous firm

PROFESSIONAL EXPERIENCE

SCAPE Landscape Architecture
Senior Designer
2020-Present

WSP, New York, NY, Urban
Designer, 2018–2020

New York City Department of City
Planning, New York, Urban Design
Analyst, 2018

World Resources Institute –
EMBARQ, Istanbul, Turkey,
Environmental Planner, 2014-2015

REGISTRATIONS

American Institute of Certified
Planners, APA

EDUCATION

Massachusetts Institute of
Technology, Cambridge, MA
Master of City Planning, Master of
Science in Architecture, 2018

Yale University, New Haven, CT
Bachelor of Arts with Distinction,
Environmental Science and Policy,
2014

AWARDS

- New York Urban Design Forum,
Emerging Fellow, 2019
- MIT School of Architecture and
Planning Merit Scholarship, 2016
-2018
- MIT Legatum Fellowship
for Entrepreneurship in
Development

Kirk F. Bosma, M.C.E., B.S., P.E.
Senior Coastal Engineer/Innovation Director

EXPERTISE

Kirk F. Bosma, PE, is a Senior Coastal Engineer and Innovation Director at Woods Hole Group, with responsibility for advancement of the firm's climate change planning cross-disciplinary practice. He manages projects and develops engineering solutions related to climate change planning, coastal structure design, beach nourishment, beach management, inlet stabilization, water quality, environmental permitting, impacts of offshore dredging, marsh restoration, and coastal processes data collection. He holds expertise in habitat restoration, shoreline protection, and climate change planning projects for a diverse client base and specializes in applying numerical models to optimize engineering designs and reduce overall project life cycle costs. Has developed and applied the latest data and numerical methods toward capturing current and future flooding risk for climate change vulnerability assessments; and developed comprehensive coastal flood risk assessments that incorporate storm surge risk coupled with increased precipitation and sea level rise; developed gray, green, and hybrid coastal engineering adaptations for fostering urban and rural resiliency in a cost-effective approach. Has conceived large coastal and marsh restoration projects including comprehensive data collection and physical processes modeling programs.

QUALIFICATION SUMMARY

- More than 25 years of diverse professional experience as coastal engineer and climate change adaptation specialist
- Leader in coastal flooding risk under a changing climate, including development of storm climatology for probabilistic flooding risk
- Implemented technically advanced storm assessments under a changing climate; sea level rise and extreme storm numerical modeling techniques to assess climate change adaptations
- Managed multi-disciplinary coastal and marine projects requiring team management, scientific analysis, environmental sensitivity, diverse coordination, and cost-effective solutions
- Developed hydrodynamic and hydraulic models for water quality assessment, marsh restoration projects, discharge and mixing design, bridge scour, dredging impacts, and contaminated sediment fate and transport
- Numerical model experience with FVCOM, REF/DIF S, SWAN, STWAVE, ACES, BOUSS2D, GENESIS, RMA-Series, MIKE 21, CMS-Flow/Wave, EFDC, SED-2D CGWAVE, , CORMIX, WAVAD, XBEACH, ADCIRC and EDUNE



Education

1996– M.C.E.
Civil Engineering
University of Delaware
1994 – B.S.
Civil Engineering
Calvin College

Licenses and Registrations

P.E., Professional Engineer,
Massachusetts License #45849

Professional Affiliations

- Member, Association of Coastal Engineers (ACE)
- Member, Coasts, Oceans, Ports, and Rivers Institute (COPRI)
- Associate Member, American Society of Civil Engineers (ASCE)

Publications & Presentations

32

Work Experience

2017-Present Senior Coastal Engineer/Innovation Director, Woods Hole Group
2001-2016 Coastal Engineer/Team Leader, Woods Hole Group
1997-2001 Coastal Engineer, Woods Hole Group
1994-1996 University of Delaware (Teaching and Research Asst.)
1992-1994 Engineer, McNamee, Porter and Seeley, Inc.

KEY PROJECTS

Massachusetts Coast Flood Risk Model (MC-FRM), MassDOT – Project Manager/ Senior Coastal Engineer

Mr. Bosma is the project manager responsible for developing a highly resolved coastal flood risk model that assesses the combined impact of sea level rise, storm events (tropical and extra-tropical), winds, tides, and waves on coastal flooding in present, 2030, 2070, and 2100 time horizons. Results from the model include probability of flooding, inundation depth levels, wave impacts, flood pathways, flood volumes, flood duration, and wind speeds, among others. Results are being used statewide to assess vulnerabilities and plan and design climate resilient coastal flood mitigation strategies.

Resilient Massachusetts Action Team (RMAT) – Senior Coastal Engineer

Contributed to a statewide program to develop climate change resilience standards to evaluate climate change impacts, risks, and adaptation strategies across state projects. The scope was intended to provide RMAT technical support to incorporate resiliency measures into projects on a consistent basis. The project also included development of a web-based guide on best practices and how to apply standards. The Massachusetts Coastal Flood Risk Model (MC-FRM) provided a technical basis for statewide guidance.

Support Related to the Hardening of the Amelia Earhart Dam Facility and Surrounding Area, Massachusetts DCR – Senior Coastal Engineer

Providing analysis of alternative flood mitigation measures at and around the Amelia Earhart Dam to support sea level rise and storm surge resiliency planning and design. Flanking pathways are being verified in the Massachusetts Coastal Flood Risk Model (MC-FRM) to inform prioritization and mitigation alternatives analysis. Time series water surface elevation downstream of the dam and volumetric fluxes upstream of the dam are being provided to inform pumping operation vulnerability analysis. Woods Hole Group is also simulating the performance of flanking mitigation alternatives by integrating them MC-FRM and re-running flood scenarios. These information will support DCR's decision-making in future design and operations resiliency initiatives.

Nantasket Beach Seawall Repair and Reservation Master Plan Services, Hull, MA, Massachusetts DCR - Project Manager/Coastal Engineer

Led a project team to assess coastal processes and evaluate erosion mitigation alternatives at the Nantasket Beach Reservation, owned and operated by the Massachusetts Department of Conservation and Recreation (DCR). Nantasket Beach and the associated waterfront amenities serve as valuable resource from both a commercial, recreational, and cultural standpoint. Nantasket Beach has experienced ongoing erosion over the past 150 years, especially the public beach at the southern end of the system. Woods Hole Group conducted a detailed coastal processes study to determine potential alternatives to address the ongoing coastal erosion. The barrier beach system was simulated using state-of-the-art wave and sediment transport models to understand existing conditions, and assess potential alternatives. The project evaluated the performance of the existing seawall, as well as determined potential alternatives to enhance the beach and improve beach nourishment performance. The performance and lifetime of the beach nourishment were assessed in order to provide guidance on potential long-term solutions and future nourishment requirements.

Nasser Brahim

Senior Climate Resiliency Specialist

EXPERTISE

Mr. Brahim helps build climate-resilient coastal communities by developing and implementing vulnerability assessments, resiliency plans, and capital and operational improvements. He has led coastal climate change resiliency projects with municipalities, transportation agencies, wastewater utilities, non-profit land conservancies, higher education institutions, and real estate property managers. He is highly effective at managing projects, coordinating multi-disciplinary teams, communicating climate change risk and resiliency concepts to decision makers and the public, and building consensus and support for implementation. He is highly skilled and experienced in climate change hazard, vulnerability, and risk assessment; and climate resilient building and infrastructure retrofit approaches, nature-based solutions, emergency operations, design standards, and land use regulations.

QUALIFICATION SUMMARY

- More than 15 years of domestic and international experience conducting analyses and designing creative solutions related to climate change, infrastructure, and the environment.
- Leads coastal resiliency projects at multiple scales, including asset, site, district, neighborhood, service area, municipality, region, and state.
- Interprets and applies climate projections and flood hazard model results for risk assessment and engineering design (ADCIRC, SWAN, SLAMM, WHAFIS, XBeach, SLOSH, ICM-2D, HEC-RAS, SWMM).
- Develops and evaluates the cost-effectiveness of coastal resiliency engineering alternatives and provides risk-based prioritization and phasing strategies for capital programming.
- Understands critical functions, interdependencies, failure modes, probabilities, and consequences for a wide variety of systems.
- Plans and executes internal and external stakeholder engagement processes and programming.

WORK EXPERIENCE

2020-Present	Woods Hole Group, Senior Climate Resiliency Specialist
2013-2020	Kleinfelder, Senior Climate Resiliency Planner
2011-2013	World Bank Climate Investment Funds, Operations Analyst
2010-2010	Yale Climate & Energy Institute, Research Fellow
2007-2008	Florida Dept. of Transportation, Environmental Specialist
2005-2007	Global Water for Sustainability Program, Research Intern



Education

2010 – M.E.M.
Climate Change Adaptation & Mitigation
Yale University

2007 – B.A.
Florida International University

Licenses and Registrations

MA EOEAA Municipal Vulnerability Preparedness (MVP) Program Provider

Professional Affiliations

-Environmental Business Council, Climate Change Committee Member
-Massachusetts Climate Adaptation Forum, Steering Committee Member
-Resilient MA Action Team, Technical Advisory Group
-Mystic River Watershed Association, Vice President

Project Awards

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KEY PROJECTS

Coastal Risk Assessments and Resiliency Plans, Waterford, CT; Boston, Cambridge, Duxbury, Edgartown, Gloucester, Hingham, Hull, Oak Bluffs, Salem, Sandwich, Swampscott, MA; Washington, DC; Palm Beach, FL
Led or supported climate change risk assessments and resiliency plans for many coastal municipalities - separate projects with similar scopes of work. The assessments focused on populations, public infrastructure, and natural resource risks from flooding due to sea level rise and storm surge, and, in the case of Waterford, CT, Cambridge, MA, and Salem, MA, also heavy precipitation. Several projects were focused on Environmental Justice communities. Carried out risk assessments of vulnerable systems and developed prioritized resiliency recommendations with cost estimates and phasing in collaboration with multi-disciplinary design teams, municipal department staff, and multi-stakeholder steering groups. Resiliency strategies included traditional and nature-based engineering, operations, and policy/regulatory measures. Also responsible for public engagement, including presentations, workshops, and media.

Long-Term Coastal Resiliency Plan, Town of Marshfield, MA

Developing recommended policies and zoning to reduce future coastal flooding and erosion. Includes estimation of damage and loss and benefit-cost analysis of strategies such as acquisition, building elevation, and other mitigation measures under a variety of storm scenarios and time horizons, taking sea level rise into account. Risk communication is aligned with the Town's Community Rating System plan and earning credits for their rating.

East Beach Corridor Vulnerability Study, Town of Westport, MA – Senior Climate Resiliency Specialist

Mr. Brahim supported the development, evaluation, and selection of adaptation strategies for the East Beach Road corridor in Westport, MA. East Beach is a narrow barrier beach, fronting a river estuary and saltwater marsh system. It is susceptible to erosion (including breach) and overwash, as well as nuisance and potentially permanent inundation under medium-to-long term sea level rise and storm surge scenarios. East Beach Road serves as the main utility corridor and one of two emergency routes for a DCR beach reservation, marina and commercial area, and residential neighborhood. Mr. Brahim developed and evaluated the feasibility of nature-based and traditional engineering alternatives to maintain the existing functions of the corridor through incremental near-to-medium term actions and long-term planning, regulatory changes, and investments.

Climate Resiliency Plan for Wastewater Infrastructure, Narragansett Bay Commission (NBC), Providence, RI

Led the NBC's climate vulnerability assessment and resiliency plan, focused on impacts from flooding (extreme rainfall, sea level rise, and storm surge) on their wastewater treatment facilities and pump stations. Analyzed climate projections and engineering records to assess vulnerabilities; estimated damage costs and time horizons for flooding impacts; and developed resiliency strategies, cost estimates, and benefit-cost analyses for protecting vulnerable critical assets. The plan was rapidly approved by regulators and is referenced as a model.

Airport and Port Facilities Disaster and Infrastructure Resiliency Plan, Massachusetts Port Authority (Massport), Boston, MA

Led a comprehensive sea level rise and storm surge vulnerability assessment and resiliency plan for Massport's Logan International Airport and South Boston port facilities. Included hundreds of critical assets not limited to runways, navigational aids, terminals, fuel, utilities, and facilities. Developed design flood elevations incorporating sea level rise and storm surge projections. Co-authored a floodproofing design guide that is now used for all major capital projects. Developed flood mitigation alternatives, order-of-magnitude cost estimates, and risk-based prioritization for capital programming. Most recommendations have been fully implemented.

Joseph Famely, WEDG

Climate & Sustainability Team Lead

EXPERTISE

Focused on environmental and sustainability planning, Mr. Famely has expertise in assessing climate change vulnerability and risk for infrastructure and natural resources, and developing adaptation and resiliency plans for communities and organizations. As a trained provider in the Massachusetts Municipal Vulnerability Preparedness (MVP) Program, he has facilitated community engagement workshops following the Community Resilience Building Framework and successfully obtained funding through the MVP Action Grant program.

In addition to numerous sea level rise and storm surge vulnerability assessments, he has developed customized greenhouse gas assessment tools to help organizations benchmark and track their carbon footprints and prepare sustainability reports, and led strategic land use planning projects.

Mr. Famely's background in risk assessment, urban ecology, and environmental design brings a systems thinking approach to projects and facilitates collaboration with engineering and design professionals, as well as with clients and stakeholders.

QUALIFICATION SUMMARY

- 20+ years experience in environmental science and climate planning
- Certified MA Municipal Vulnerability Preparedness Program Provider
- Certified Waterfront Edge Design Guidelines (WEDG) Professional
- Climate change vulnerability assessment / adaptation planning
- Land use sustainability planning and metrics
- Greenhouse gas inventory and sustainability reporting
- Environmental impact statements
- Project management and grant writing

WORK EXPERIENCE

2009–Present	Woods Hole Group, Inc. (Senior Environmental Scientist)
2011–2012	Except Integrated Sustainability (Sustainability Consultant)
2009–2012	Anthroecology (Sustainability Consultant)
2008–2008	Yale Urban Design Workshop (Sustainability Planning Fellow)
2006–2007	Exponent (Environmental Scientist)
2000–2006	Menzie-Cura & Associates (Environmental Scientist)



Education

2009 – M.E.M.
Yale School of the Environment

2000 – B.A.
Bowdoin College

Licenses & Registrations

- MA EOEEA Municipal Vulnerability Preparedness (MVP) Program Provider
- Waterfront Alliance's Waterfront Edge Design Guidelines

Professional Affiliations

-Environmental Business Council, Climate Change Committee Member

Publications & Presentations

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KEY PROJECTS

Municipal Coastal Vulnerability Assessments and Adaptation Plans, Towns of Duxbury, Edgartown and Sandwich, MA - Project Manager, Senior Resiliency Specialist

Lead multidisciplinary teams of engineers, planners, municipal officials and local stakeholders in assessments of the vulnerability of infrastructure and natural resources to the impacts of sea level rise and storm surge. Funded by the MA EOEEA Municipal Vulnerability Preparedness (MVP) Action Grant program and leveraging the Massachusetts Coast Flood Risk Model, these projects used a risk-based approach to prioritize investment in adaptation projects over time and develop conceptual level adaptation designs for priority assets.

Cape Cod Low Lying Roads Project, Cape Cod Commission - Project Manager, Senior Resiliency Specialist

Leading the coastal vulnerability assessment, risk-based prioritization, and development of adaptation alternatives for roadways in ten (10) towns in Barnstable County, MA. Directed high resolution flood risk assessment of roadway infrastructure exposure to tidal and storm surge inundation, led the development and application of a framework for evaluating transportation asset criticality, and presented resulting risk-based vulnerability assessment and prioritization to Town staff and public using web-based mapping tools. The next phase of the project will explore traditional engineering solutions, nature-based solutions, and hybrid solutions for building coastal resilience for Cape Cod's most vulnerable roadways.

ResilientWoodsHole, Woods Hole Oceanographic Institution, Marine Biological Laboratory and NOAA Fisheries - Project Manager, Senior Resiliency Specialist

Lead a multidisciplinary team of engineers, planners, and research organization managers in an assessment of the vulnerability of infrastructure to the impacts of sea level rise and storm surge at Woods Hole Oceanographic Institution, the Marine Biological Laboratory, and the NOAA Northeast Fisheries Science Center. The project used a risk-based approach to prioritize investment in adaptation projects over time and developed conceptual level adaptation designs for specific facilities on each campus that provide resilient waterfront access for critical oceanographic research. The project team is also developing community-wide adaptation strategies for the Woods Hole Village district acknowledging the interdependencies among the scientific institutions, the business community, the residential community and the Town of Falmouth.

Allston Multimodal Project, TetraTech and MassDOT - Senior Resiliency Specialist

Lead author of MEPA and NEPA documentation focused on the evaluation of climate resiliency of a major highway realignment project. Assessed project alternatives' vulnerability to coastal storm surge and extreme heat, and worked with planning and engineering team to develop mitigation strategies.

Municipal Vulnerability Preparedness Program Community Resilience Building Workshops, Towns of Falmouth, Ipswich, Mashpee, Sandwich and Yarmouth, MA - Project Manager, Workshop Facilitator

Facilitated stakeholder engagement on climate change vulnerability and adaptation for Community Resilience Building workshops in various communities following MA EOEEA MVP guidelines. Guided stakeholders in assessing local vulnerability of infrastructure, environmental, and societal assets to multiple hazards using downscaled climate projections, and developing and prioritizing actions to reduce vulnerability and increase resilience.

An aerial photograph of a city, likely New York City, showing a dense urban area with a river and a large body of water. The image is overlaid with a semi-transparent blue rectangle in the upper right corner, which contains the text 'SECTION 3 Corporate Experience and Capacity'.

SECTION 3
Corporate
Experience and
Capacity

Section 3: Corporate Experience and Capacity

The Fuss & O'Neill project team has extensive Connecticut and national experience conducting regional, citywide, and neighborhood-scale coastal resilience planning and related flood resilience implementation projects, as well as a successful track record providing engineering services to the City of Stamford. The team includes SCAPE and Woods Hole Group, both of whom bring extensive experience in coastal resilience assessment, planning, and design in urban communities throughout the northeast both individually and working together. These partners complement Fuss & O'Neill's expertise and add resources to our team, which increases our capabilities to complete this planning study and future implementation of the planning recommendations. We are proud to present our past work of similar scope for some of the largest urban communities in the northeast and our experience working in the City of Stamford. In this section we will outline critical areas of expertise which our team brings to the project including our long term partnership with the City of Stamford; coastal flood resilience experience at the national scale; our success rates in securing funding for resilience projects; extensive experience with stakeholder and community engagement; as well as expertise in CT permitting and construction. All client references listed may be contacted.

Long Term Partnership with the City of Stamford

Working with a consultant that knows Stamford and that can support the City from planning through implementation will be critical to the success of this project. The City of Stamford is one of the State's leading employment centers, home to many large corporations and diverse residential neighborhoods. The City has a range of land use and development patterns (from ultra-urban to suburban) and has seen unprecedented residential and mixed-use development in recent years, primarily in the Downtown and in the South End, all of which are within the project area. The storm drainage infrastructure in many parts of the City, including coastal areas, is outdated and undersized for current and future precipitation events including in areas of existing and ongoing development, affecting critical infrastructure, key transportation corridors, businesses and economic development, and Stamford residents.

Fuss & O'Neill has been working in Stamford for the City and private sector clients for several decades and has a solid understanding of the City's flooding issues, drainage and transportation infrastructure, development patterns, economic development issues, as well as working relationships with key staff from the Office of Operations including Engineering, Transportation Traffic & Parking, Land Use, Building, and Stormwater Management.

City of Stamford Experience

Fuss & O'Neill has been working in Stamford as a partner to the City and for private sector clients for several decades. This experience give us first-hand knowledge of the City's flooding issues, drainage and transportation infrastructure, development patterns, economic development issues, and working relationships with City staff from key departments that will be involved in this project.

Our team can hit the ground running, with minimal learning curve getting up to speed on Stamford-specific issues, and build on our existing relationships with key City staff and departments. Our approach involves a long-term partnership with the City, from the initial planning phase through future implementation.

The following summarizes our municipal and private sector experience working in the City of Stamford.

- **Stormwater and Flood Protection** - Fuss & O'Neill worked closely with Engineering, Land Use, Stormwater Management, and other City departments to develop the Stamford Stormwater Drainage Manual, which addresses stormwater management for new development and redevelopment projects in the City. Fuss & O'Neill provides engineering and compliance services in support of the City's MS4 stormwater management program. We are also working with City staff to identify eligible projects and pursue flood resilience grant funding through FEMA, the Long Island Sound Futures Fund, the CTDEEP Climate Resilience Fund, Connecticut Community Investment Fund, and other sources.
- **Transportation** - Fuss & O'Neill has also been providing extensive engineering services to the Transportation Traffic & Parking department for a variety of transportation infrastructure projects throughout the City. Projects have included citywide bicycle and pedestrian improvements in conjunction with programmed capital improvement projects on City roadways such as Hope Street, Stillwater Avenue, Strawberry Hill/Newfield Streets, Long Ridge Road, East Main Street, and West Broad Street. This work has also integration of green stormwater infrastructure practices into the public right-of-way. Fuss & O'Neill also performed highway and traffic engineering design and construction services for a \$45 million Stamford Urban Transitway project in the City's South End.
- **Facilities and Schools** - Fuss & O'Neill has been providing a range of environmental and engineering services for the City's schools and related facilities.
- **Private Sector Experience** - For nearly a decade, Fuss & O'Neill has provided comprehensive engineering services for the \$3.5 billion Harbor Point mixed-use, brownfield development project situated on more than 100 acres of property along the waterfront in Stamford's South End.

We will continue to build on our relationship with the City of Stamford and draw from our deep understanding of the City's needs. Our expert team, key City staff and departments are expertly qualified and prepared to address coastal flooding challenges.



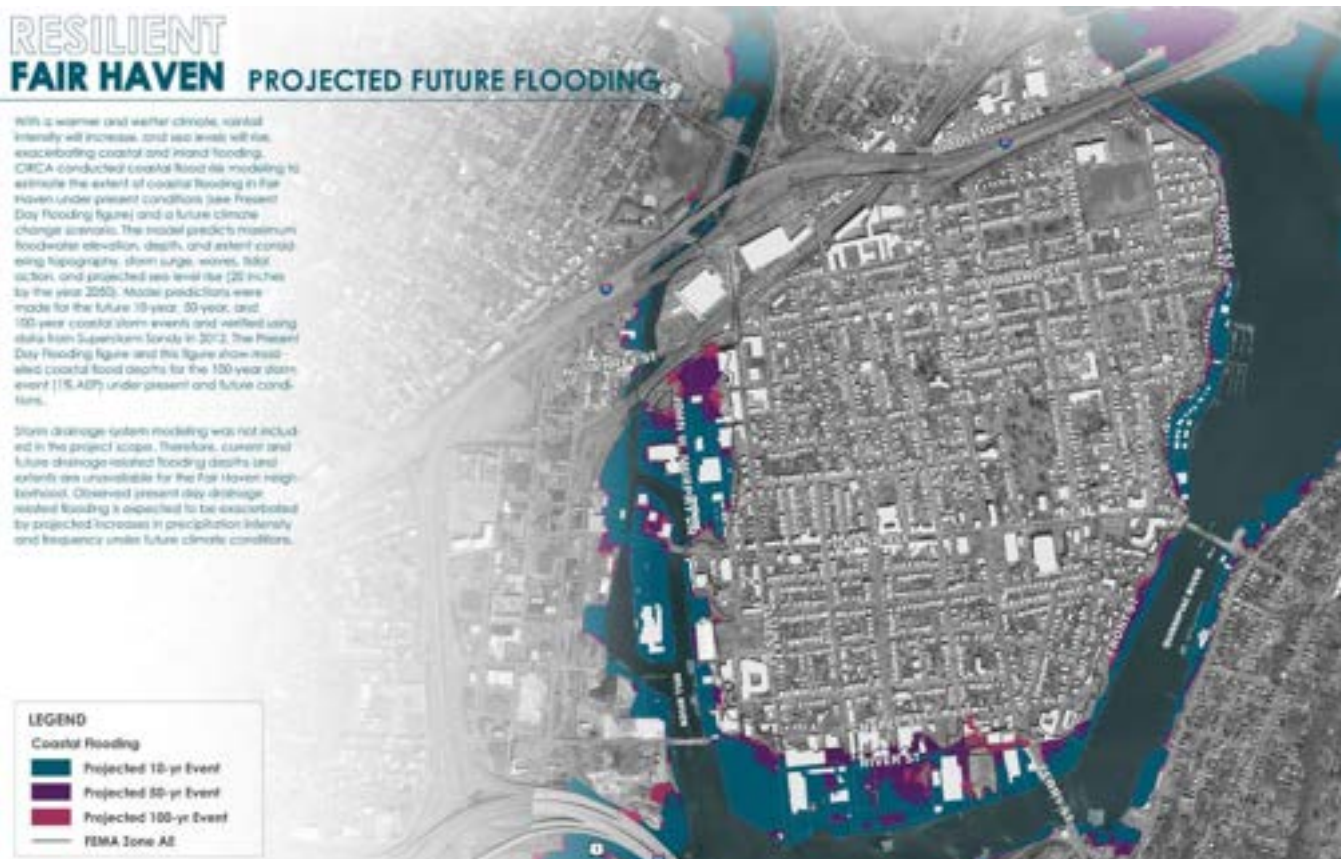
Coastal Flood Resilience Experience

Fuss & O'Neill has been providing flood protection planning, design, and construction services to Connecticut municipalities, state agencies, regional planning agencies, conservation districts, watershed organizations, and businesses for 30+ years. Our experience includes flood protection studies and mitigation projects for individual properties or neighborhoods, as well as community-wide, regional, and watershed-based flood resilience plans.

Fuss & O'Neill's flood protection and resilience practice combines expertise in both traditional engineered and nature-based approaches to address coastal, riverine, and drainage-related flooding. Engineering solutions are associated with man-made infrastructure such as bridges, culverts, roads, flood walls, dams, and drainage systems, while nature-based solutions involve the conservation or use of natural systems for flood control benefits such as coastal wetlands, marshes, and floodplains. To maximize the benefits of both approaches, we often develop hybrid designs that incorporate nature-based and hard infrastructure elements.

Fuss & O'Neill Regional Flood Resilience Experience

Fuss & O'Neill has partnered with Connecticut municipalities for several decades providing flood resilience and related technical services. We also have experience working with state agencies, regional Councils of Government, and other statewide and regional organizations on flood protection and resilience projects. Our current flood resilience work includes 3 CIRCA Resilient Connecticut Phase III planning and design projects (Fair Haven, Branford, and Danbury), a statewide flooding study and survey for Connecticut municipalities through the Connecticut Conference of Municipalities (CCM), and a flood mitigation contract with WestCOG.



Resilient Fair Haven - New Haven, CT

The model predicts coastal floodwater elevation, depth, and extent considering topography, storm surge, waves, tidal action, and projected sea level rise.

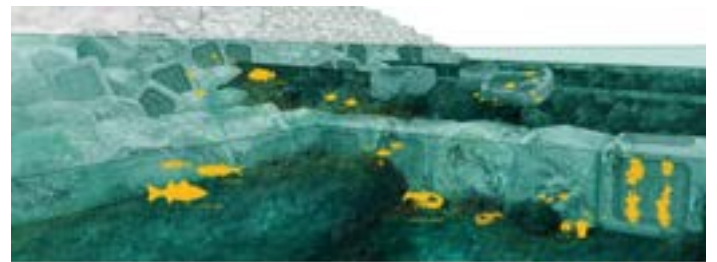
SCAPE is widely regarded as a firm at the cutting edge of planning and design innovation around climate adaptation and resilience, particularly at the water's edge. They are committed to working with clients and communities to envision and implement the right adaptation pathways for the communities, but they always take a holistic approach to resilience that considers not just risk reduction but overall community health and quality of life. SCAPE brings particular expertise in integrating natural infrastructure in urban landscapes and crafting visions that become constructable realities that reduce coastal flooding, bolster resilience, and increase quality of life.

Construction is also currently in progress on two large-scale resilience projects SCAPE helped carry from vision to design to implementation: **Living Breakwaters**, a signature nature-based infrastructure project that combines coastal risk reduction with habitat creation and community education programming in **Staten Island, NY**; and the **Ohio Creek Watershed Resilience Park**, where they designed Resilience Park as part of a larger neighborhood-wide flood risk reduction project in **Norfolk, VA**, that implemented extensive community engagement and city-wide partnerships.

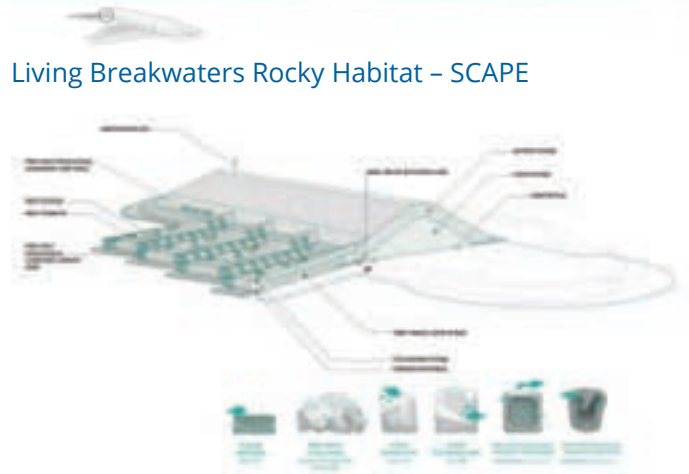
Woods Hole Group addresses environmental problems worldwide with a focus on solving engineering and environmental problems along the coast, in the ocean, and in wetland and terrestrial environments. They specialize in high resolution numerical modeling of coastal systems and climate change vulnerability assessments. Woods Hole Group studies have been utilized throughout the U.S. to perform vulnerability assessments and resiliency planning, including numerous communities and state and private entities. Woods Hole Group has produced detailed climate change modeling and assessment projects in **Palm Beach, Florida, Galveston, Texas, Grays Harbor, Washington, and other various locations throughout the northeast**. The probabilistic, dynamic modeling approach has been used to develop the **Boston Harbor Flood Risk Model, the Massachusetts Coast Flood Risk Model (simulating the entire coastal area of the State of Massachusetts), and the Palm Beach Flood Risk Model**. This highly comprehensive approach was awarded a Federal Highway Administrations 2017 Environmental Excellence award.



Living Breakwaters Bird's Eye Diagram - SCAPE



Living Breakwaters Rocky Habitat - SCAPE



Living Breakwaters Section - SCAPE

Woods Hole Group designs coastal resiliency projects through an understanding of the storm surge that influences the site under both existing, and future, conditions. Important factors such as the inundation depth levels, wave impacts, flood pathways, flood volumes, and probability of occurrence are all key considerations for developing cost-effective design approaches expected to function for current conditions, and perhaps more importantly, conditions occurring in a changing climate. This information has allowed Woods Hole Group to design resilient green, gray, or hybrid solutions for numerous infrastructure types (docks, piers, tunnel systems, buildings, hospitals, etc.). SCAPE & WHG also have a significant history of collaboration on coastal resilience planning for cities in the northeast

Fuss & O'Neill and Woods Hole Group have worked together for more than 15 years on a range of coastal resilience and ecological restoration projects throughout Southern New England. We are currently working together on 15 coastal flood resilience projects in New England and our past experience includes many dozens of projects. With this partnership, WHG provides world-class coastal modeling and processes expertise that is combined with Fuss & O'Neill's design and engineering innovation. Our strength is working together to develop innovative solutions that best solve complex problems. Some examples of our work together is the first bridge in North America designed to control the flow of water under the bridge that is now under construction on Cape Cod, and the first salt marsh elevation enhancement project completed in New England. Recent projects completed together in Connecticut include Bayview Beach resilience project in Milford and a neighborhood flood resilience project in Old Lyme.

In addition to their individual work, SCAPE and Woods Hole Group have a history of collaboration on resilience planning for cities in the northeast. In Boston, SCAPE and Woods Hole group have worked with the city to advance their Climate Ready Boston Initiative through modeling (WHG), visioning (SCAPE), and resilient design strategies (SCAPE & WHG). For **Climate Ready Dorchester**, led by SCAPE, they worked with the City of Boston to assess flooding and develop solutions to equitably reduce coastal flood risk in Dorchester, the largest and most diverse neighborhood in Boston. They focused on strategies that enhance access and mobility, promote the health of valuable ecosystems, and reinforce a connected, cohesive sense of place alongside providing coastal risk reduction. Now, SCAPE and WHG are moving the planning work forward for the city in developing a schematic design options that privilege resiliency and implement the plan (pictured right).



Climate Ready Dorchester, MA - SCAPE

The neighborhood resilience plan **Resilient Together: El Punto** for the City of Salem, MA and led by WHG with SCAPE's support and partnering with local organizations, is grounded in science and policy as well as the character and aspirations of the neighborhood. The resulting plan pairs risk reduction projects with community reinvestment, addressing specific hazards while enhancing public spaces, mobility, and connectivity across the neighborhood through a combination of gray and green infrastructure. This project was grounded in science and policy, and the resulting plan pairs risk reduction projects with community reinvestment, addressing specific hazards while enhancing public spaces, mobility, and connectivity across the neighborhood through a combination of gray and green infrastructure.

Securing Funding for Resilience Projects

Given the unprecedented infrastructure funding expected in the coming years, the City of Stamford has a tremendous opportunity to take advantage of federal and state grant funding programs that can address coastal flood protection and resilience objectives. When it comes to leveraging funding for implementation projects, creative planning and design that incorporates key funding agency priorities – such as climate resilience, nature-based solutions, and benefits for environmental justice communities – will position Stamford to effectively pursue a wide array of state and federal implementation funding. We know the funding agencies and understand the goals of various grant programs.

Fuss & O'Neill has worked with Connecticut municipalities to pursue and win state and federal funding for flood resilience projects, as demonstrated by our recent success in securing FEMA grant funding for flood resilience projects in Stamford, Norwalk, New London, Norwich, Meriden, Hartford, and New Haven.



City of Stamford

FMA funding for development of a coastal resiliency plan and HMGP Advance Assistance applications for neighborhood-scale project scoping/ flooding evaluations.



City of New London

BRIC grant funding for flood mitigation along Bank Street in downtown New London.



City of Norwich

BRIC grant funding for a project scoping/ feasibility evaluation for the removal of Upper Falls Dam to reduce flood risk along the Yantic River.



City of Danbury

HMGP funding for emergency generator upgrades and development of a grant funding strategy for city-wide flood mitigation projects.

Woods Hole Group has extensive experience in developing, writing, securing, and executing resiliency grants for a diverse range of state and federal levels, with specific focus on building resilience for coastal communities and development of unique nature-based and hybrid solutions. For example, in the State of Massachusetts, Woods Hole Group has secured and completed over 50 Massachusetts Coastal Zone Management Coastal Resiliency Grants and over 15 Municipal Vulnerability Preparedness Planning and Action Grants. On a federal level, Woods Hole Group has had success in securing FEMA Building Resilient Infrastructure and Communities (BRIC) grant funding and National Fish and Wildlife Foundation, National Coastal Resilience Fund (NCRF) grants, which are specifically focused on strengthening natural infrastructure to build resilience for coastal communities.



City of Boston, MA - Woods Hole Group

FEMA BRIC funding for construction of a flood resilient Moakley Park in Boston, MA. The project will implement an earthen berm and stormwater management improvements to protect an environmental justice neighborhood.



City of Boston, MA - Woods Hole Group

NFWF NCRF funding to explore nature-based solutions to protect the shorelines, over 250 bird species, and provide urban socio-economic benefits.



Living Breakwaters, Staten Island, NY - SCAPE

CDBG-DR funding to implement a layered resiliency to promote risk reduction through enhancing physical, ecological, and social resilience along the South Shore of Staten Island.



Town of Duxbury, MA - Woods Hole Group

MACZM resiliency funding for the Duxbury Beach Dune Restoration Project that was selected as a 2022 national award winning Best Restored Beach due to its incorporation of resiliency, ecological, and recreational benefits.

Public and Community Engagement

Our philosophy of engagement is rooted in the fact that there is no one-size-fits-all technique. For engagement to work, it must work for the people who are engaged—in their language, on their terms, and in a way that speaks to their lived experience. The Fuss & O'Neill team has extensive public and community engagement experience and weaves those voices into our planning and design work. We are presently involved in three flood and heat resilience planning and design projects (Fair Haven, Branford, and Danbury) as part of the CIRCA Resilient Connecticut program. These projects involve significant community engagement with Environmental Justice and climate vulnerable communities.

In their engagement work for Resilient Together: El Punto in Salem, MA, SCAPE worked with the vibrant, close-knit international community. Predominantly comprised of Spanish-speaking residents, it has a robust civic and cultural presence and is also designated an Environmental Justice community. Engagement events included multi-lingual virtual and in-person community forums, small group walks, a community mapping event, interviews, and online surveys.



El Punto - Salem, MA

Making sure that engagement materials are accessible to communities predominantly comprised of Spanish-speaking residents can be accomplished, in part, by translating not just outreach materials but project mapping and drawings as well.

For Climate Ready Dorchester in Boston, MA, the SCAPE project team gathered robust public input on the plan's priorities and proposed strategies as a central part of the planning process over nine months from 2019 to 2020. During this time, the team prepared a range of interactive public sessions, widening the toolbox of traditional engagement—embedding open houses, neighborhood meetings, and online surveys with scenario-based information, tools, models, flipbooks, and multi-lingual handouts to contribute their experiences, priorities, and aspirations for the Dorchester Shoreway relative to coastal flooding. Climate Ready Dorchester also utilized coastal flood modeling to determine the effectiveness of a wide range of proposed adaptation strategies, detailing the near- and long-term efficacy relative to compound risks including sea-level rise, storm surge, and fringe flooding.

Project Permitting and Construction Expertise

Permitting and construction of flood protection and resilience projects can be challenging and expensive. These projects are often located in regulated areas, sometimes requiring construction that permitting authorities have historically discouraged. Fuss & O'Neill has practical experience permitting and constructing flood protection and resiliency projects in Connecticut and elsewhere in southern New England. These range from permitting modifications to the hurricane barrier in Stamford, to permitting and construction of salt marsh elevation enhancement projects along the Rhode Island shoreline, to permitting \$1.5B in new water-dependent infrastructure at Electric Boat in Groton. We are a longstanding on-call consultant to CT DEEP, having permitted state water resources projects throughout Connecticut.

From our experience with Connecticut municipalities, Councils of Governments, and Connecticut state agencies, we have significant expertise with implementation of flood protection and resilience projects, including state floodplain management standards and National Flood Insurance Program provisions, and State contracting practices. Fuss & O'Neill's direct involvement with the Governor's Council on Climate Change (GC3) and GC3 Working Groups also means that our team is intimately familiar with Connecticut's climate resilience policies and implementation priorities.

The Fuss & O'Neill team also includes in-house construction expertise, having provided comprehensive design build services to Connecticut clients for over 30 years.



Stamford, CT
Permitting modifications to the hurricane barrier.



Rhode Island Shoreline
Permitting and construction of salt marsh elevation enhancement projects.



CT Statewide Stormwater Permitting
Completed CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters.

Representative Coastal Project Map

The following shows a sample of the Fuss & O'Neill team's recently completed and ongoing waterfront and coastal resilience planning, design, and implementation projects throughout the Northeast. This list is not comprehensive and intended to give an idea of the breadth of our relevant project experience.

Fuss & O'Neill Projects

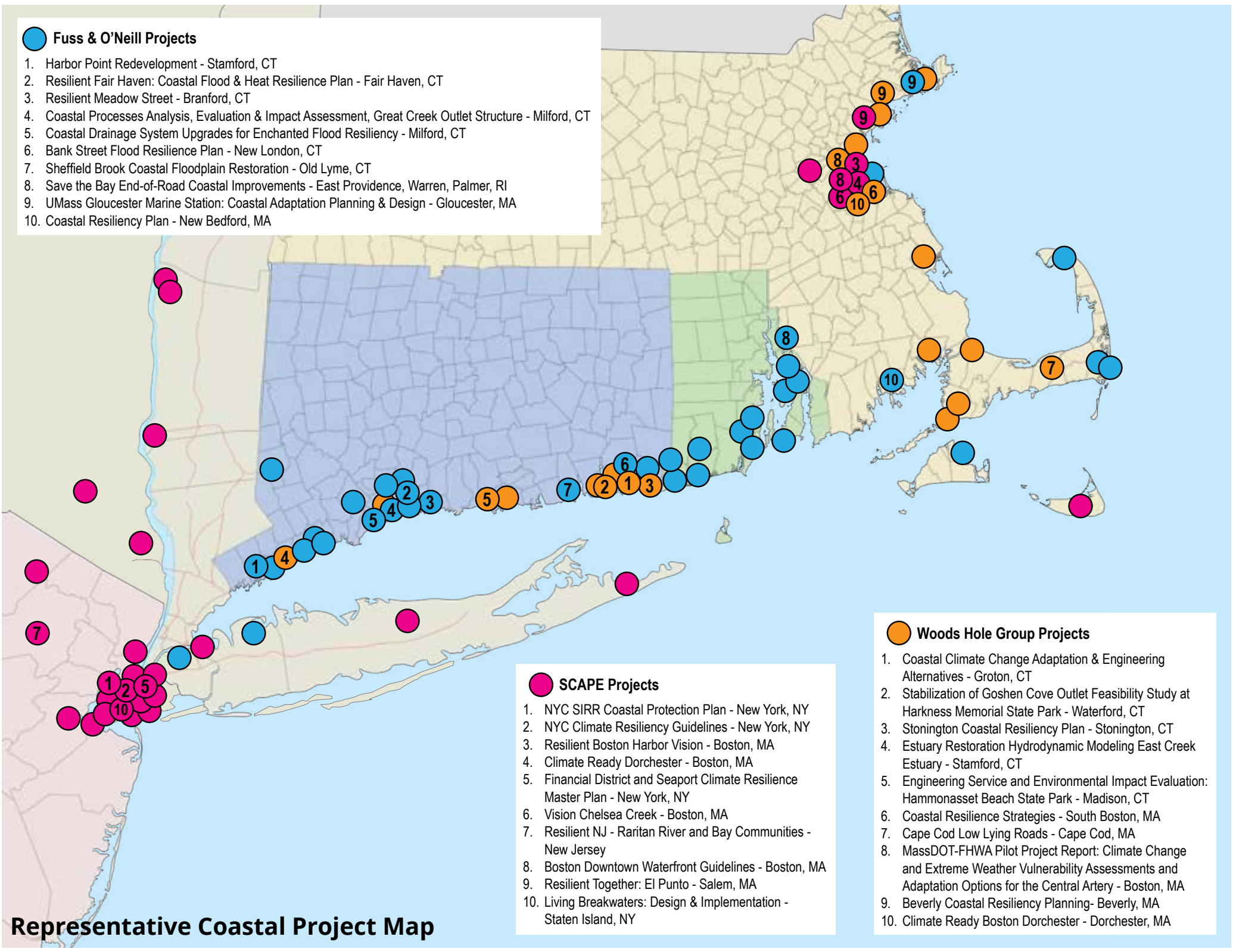
1. Harbor Point Redevelopment - Stamford, CT
2. Resilient Fair Haven: Coastal Flood & Heat Resilience Plan - Fair Haven, CT
3. Resilient Meadow Street - Branford, CT
4. Coastal Processes Analysis, Evaluation & Impact Assessment, Great Creek Outlet Structure - Milford, CT
5. Coastal Drainage System Upgrades for Enchanted Flood Resiliency - Milford, CT
6. Bank Street Flood Resilience Plan - New London, CT
7. Sheffield Brook Coastal Floodplain Restoration - Old Lyme, CT
8. Save the Bay End-of-Road Coastal Improvements - East Providence, Warren, Palmer, RI
9. UMass Gloucester Marine Station: Coastal Adaptation Planning & Design - Gloucester, MA
10. Coastal Resiliency Plan - New Bedford, MA

SCAPE Projects

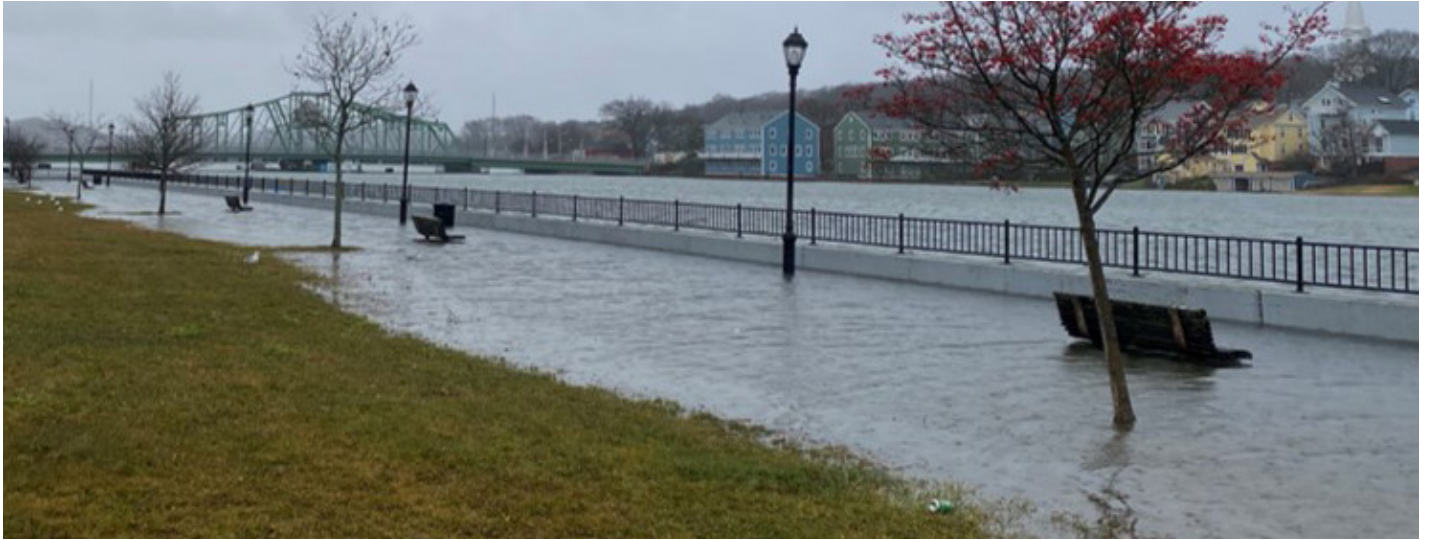
1. NYC SIRR Coastal Protection Plan - New York, NY
2. NYC Climate Resiliency Guidelines - New York, NY
3. Resilient Boston Harbor Vision - Boston, MA
4. Climate Ready Dorchester - Boston, MA
5. Financial District and Seaport Climate Resilience Master Plan - New York, NY
6. Vision Chelsea Creek - Boston, MA
7. Resilient NJ - Raritan River and Bay Communities - New Jersey
8. Boston Downtown Waterfront Guidelines - Boston, MA
9. Resilient Together: El Punto - Salem, MA
10. Living Breakwaters: Design & Implementation - Staten Island, NY

Woods Hole Group Projects

1. Coastal Climate Change Adaptation & Engineering Alternatives - Groton, CT
2. Stabilization of Goshen Cove Outlet Feasibility Study at Harkness Memorial State Park - Waterford, CT
3. Stonington Coastal Resiliency Plan - Stonington, CT
4. Estuary Restoration Hydrodynamic Modeling East Creek Estuary - Stamford, CT
5. Engineering Service and Environmental Impact Evaluation: Hammonasset Beach State Park - Madison, CT
6. Coastal Resilience Strategies - South Boston, MA
7. Cape Cod Low Lying Roads - Cape Cod, MA
8. MassDOT-FHWA Pilot Project Report: Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery - Boston, MA
9. Beverly Coastal Resiliency Planning - Beverly, MA
10. Climate Ready Boston Dorchester - Dorchester, MA



Representative Coastal Project Map



Resilient CT Phase III - Resilient Fair Haven Flood & Heat Resilience Planning and Design

Connecticut Institute for Resilience and Climate Adaptation
Fair Haven, CT

Fair Haven, located on a peninsula bounded by the Mill and Quinnipiac Rivers, is vulnerable to flooding from coastal storm surge, high tides, sea level rise, and heavy rainfall events. Flooding in the Fair Haven neighborhood threatens public safety and impedes access to critical lifelines and evacuation routes during storms. The neighborhood is also vulnerable to extreme heat due to high social vulnerability within the community, combined with dense housing, high impervious cover, disconnected green spaces, and long distances to potential cooling centers and/or shelters.

The Resilient Fair Haven project builds on prior planning and assessment of flood and extreme heat vulnerabilities by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) for the Fair Haven neighborhood completed as part of Phases I and II of Resilient Connecticut. This project focuses on developing adaptation strategies to mitigate current and future climate induced flooding impacts to community assets and transportation corridors in Fair Haven, as well as developing strategies to help mitigate the impacts of extreme heat for community residents.



A warmer and wetter climate will result in greater rainfall intensity and sea level rise, which will exacerbate coastal flooding. This model predicts 10-year, 50-year, and 100-year coastal storm events under projected future conditions.



Project Cost: \$200,000 (Ongoing)



Resilient CT Phase III - Resilient Meadow Street Flood Resilience Planning and Design

Connecticut Institute for Resilience and Climate Adaptation
Branford, CT

Fuss & O'Neill was retained by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) as part of Resilient Connecticut Phase III to develop conceptual designs for increasing flood resilience in Branford, Connecticut. The “Resilient Meadow Street” project aims to reduce flood risk in the Meadow Street neighborhood, which is impacted by coastal flooding from the adjacent Branford River.

Modeling done by CIRCA indicates that future conditions include 20 inches of sea level rise by 2050. The modeling also predicts that today’s 1% annual chance (100-year) frequency flood will be equivalent to the projected 10% annual chance (10-year) frequency flood in 2050. To combat the future change in sea level, our team identified two options that include the installation of a gate during floods, with varying degrees of operation and impact, with the goal of reducing the overall flood risk in this area over time.

The project will position the community to leverage additional state and federal funding for final design, permitting, and construction.



The “Cattle Crossing” (shown above) is a primary flood pathway, as the existing physical conditions are challenging.

CIRCA flood mapping shows substantial risk to the neighborhood via the Branford River.



Project Cost: \$100,000 (Ongoing)



Resilient CT Phase III - Resilient Danbury Flood & Heat Resilience Planning and Design

Connecticut Institute for Resilience and Climate Adaptation
Danbury, CT

Resilient Danbury is a Resilient Connecticut Phase III pilot project focused on developing adaptation strategies and implementable project concepts to mitigate the impacts of current and future climate-induced flooding to key community assets, while also helping to mitigate the impacts of extreme heat for the community.

The project focus neighborhood has endured decades of flooding caused by aged, undersized drainage systems directed to a watercourse called “East Ditch” that is constrained within an underground culvert. Existing pipes and culverts cannot handle the volume of water generated during present day severe storms over the small urban catchment area. The risks associated with this flooding continues to increase as we experience more frequent and severe precipitation events due to climate change. The current flooding presents public safety challenges to residents of the City, leading to closures of Main Street in front of a community health center where patients have been previously trapped by flooding events. Downtown Danbury is also vulnerable to extreme heat. This is attributed primarily to the high social vulnerability within the community, combined with dense housing, impervious surfaces, disconnected green spaces for mitigating high heat impacts, and the lack of capacity in existing heating centers.

The CIRCA Resilient Connecticut Phase III – Resilient Danbury project will further develop the work completed within Phase I and Phase II, which included the assessment of flooding and extreme heat risks due to climate change and the identification of areas of shared risk within Fairfield and New Haven Counties.



This map shows the current flooding conditions for a 100-year storm (left) in contrast to what future conditions may look like for the same storm without any intervention (right).



Flooding within the project area has long been a challenge in Danbury.

Project Cost: \$266,000 (Ongoing)

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Gloucester Marine Station Coastal Resilience Plan and Site Improvements

UMass Amherst – Gloucester, MA

The University of Massachusetts Amherst Gloucester Marine Station is an integral component to the region's long-standing commercial industry. As this industry is one especially impacted by climate change, the Station has become an even greater asset to the community as it offers immersive marine and coastal research, which has helped the coastal region adapt to the challenges of rising sea levels and a changing ocean.

After being awarded state and federal funding to facilitate site improvements, UMass Amherst hired Fuss & O'Neill to provide master planning and site design services. Priority improvements included stabilizing the bulkhead, restoring the open area behind the marine station, and installing a dock with crane/davit that will support future design, permitting, and public outreach/stakeholder engagement prior to final design and construction. A coastal climate and flood risk assessment was conducted to develop recommended design flood elevations for both the northern and southern shorelines of the site. Planning and design decisions considered coastal and ecological resilience, with emphasis on reducing future risks. The plan also included the creation of a living laboratory for future research and study.

As the project progressed, we provided permitting, engineering design services, stormwater management, construction documents, and bid documents for this project. Construction of this project is scheduled to begin in 2024.

Project Cost: \$160,000 (Ongoing)

www.fando.com



Fuss & O'Neill provided subcontractor management for an underwater structural assessment of the seawall, an updated eelgrass survey, and a coastal climate and flood risk assessment.



Site plans included: erosion and sedimentation control plan; layout plan; grading and drainage plan; site electrical and lighting plan; and a landscape plan.

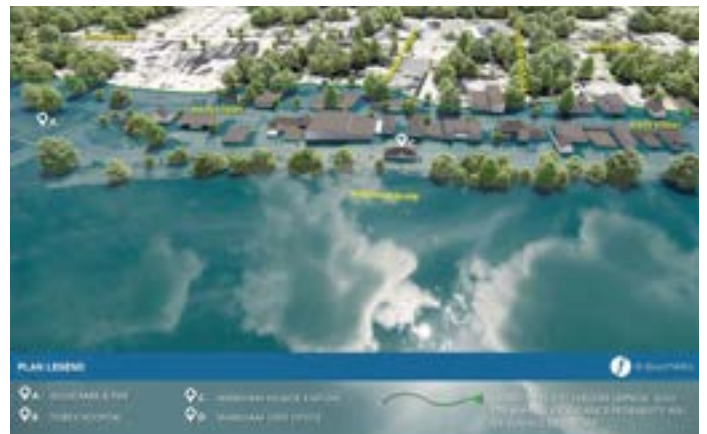


Resilient Main Street

Town of Wareham, MA

Fuss & O'Neill assisted the Town of Wareham in winning a Massachusetts Coastal Zone Management Coastal Resilience Grant in the summer of 2022. Utilizing grant funding, this project assesses the vulnerability of the downtown commercial district to future sea level rise and storm surge, and develops a conceptual plan for climate adaptation. This area, which abuts the tidally-influenced Wareham River, is the heart of downtown Wareham, encompassing local businesses, the entrance to Tobey Hospital's Emergency Room, the Wareham Fire District Fire Department and Headquarters, the MBTA line for the Cape Flyer, and Main Street/Route 6 (the major evacuation route).

This effort is unique in that it is being coordinated with the Town's Urban Redevelopment Planning work and public engagement process to understand the community's vision for Main Street and Merchant's Way. This project will assess several adaptation strategies and, with stakeholder input, will identify a preferred strategy to reduce flood risk while maximizing the use of nature-based solutions in the Merchant's Way commercial area and transportation corridor. Emphasis will be placed on design options that create co-benefits for the community (e.g., public open space, green space, bike trails, etc.). The final deliverable will be an adaptation concept design with a high-level cost-benefit understanding, a description of the permitting pathway, and a phased implementation approach to making the District more resilient.



Massachusetts Coastal Flood Risk Model showing 10% storm (annual exceedance probability) for 2050 on downtown Wareham, MA.



Existing conditions along Merchant's Way between MBTA Cape Flyer rail tracks and the backside of commercial buildings.

Project Cost: \$205,000 (Ongoing)

www.fando.com

CLIMATE READY DORCHESTER

BOSTON, MA

📌 Boston Society of Landscape Architects (BSLA)
Merit Award - Analysis & Planning (2021)

SCAPE worked with the City of Boston to develop solutions to equitably reduce coastal flood risk in Dorchester, the largest and most diverse neighborhood in Boston. The Dorchester shoreline stretches 9.5 miles along Boston Harbor and the Neponset River. Climate Ready Dorchester expands the vision for the future of the Dorchester shoreline, offering strategies to adapt to coastal flood risk while also establishing a framework to connect the waterfront parks, beaches, and marshes in the neighborhood, transforming them into one accessible, continuous waterfront—The Dorchester Shoreway.

The Shoreway consists of strategic flood protection interventions at critical flood pathways to protect from coastal flooding while increasing neighborhood access. They prioritize natural and nature-based features to reduce wave action and erosion while preserving or enhancing valuable ecosystems. To inform the decision-making process behind various resilience strategies, the SCAPE team held a series of community and stakeholder engagement sessions including two open houses and attendance to numerous existing neighborhood meetings, all designed to educate and involve attendees using custom models, 'scenarios,' and interactive engagement tools.

Size
7.4 square miles

Years
2019 - 2020

Client
City of Boston

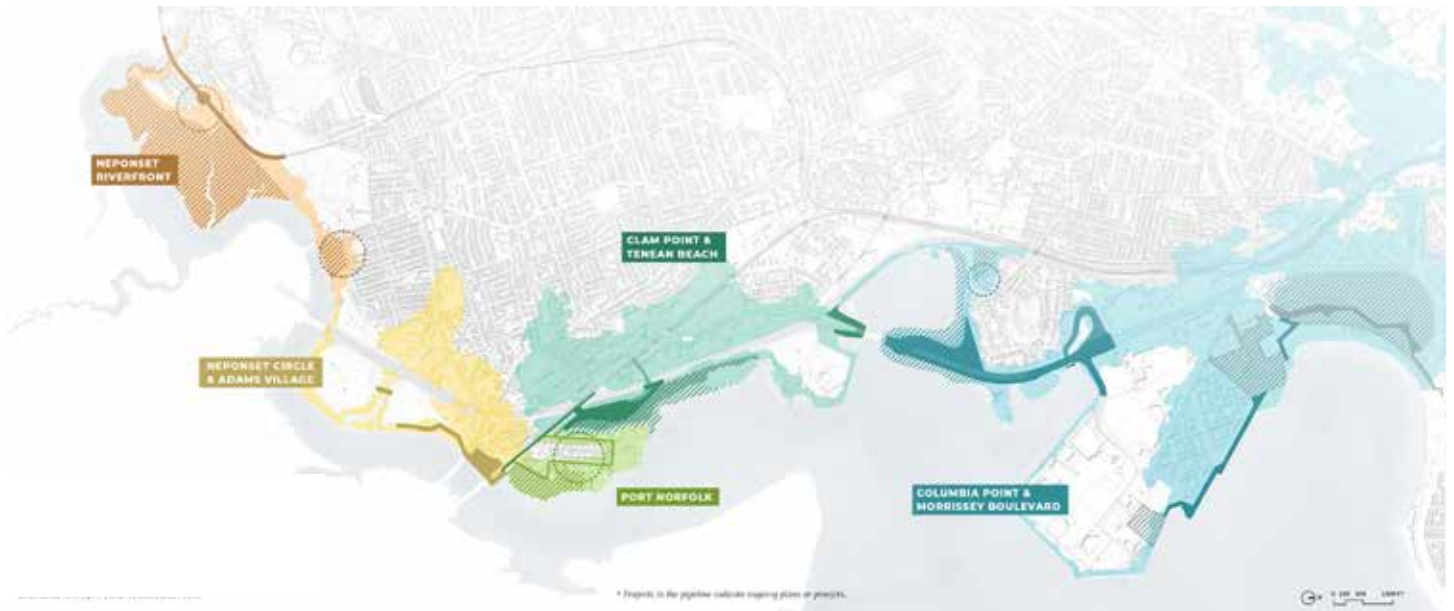
Services
Urban Planning and Design, Engagement

Collaborators
Utile, Nitsch Engineering, Tetra Tech, All Aces, Inc., Woods Hole Group

Reference
Dr. Alison Brizius
Climate Ready Boston
Coordinator, City of Boston
environment@boston.gov
(617) 635-1849



Coastal Resilience Vocabulary Guide



Site Map



Engagement materials included models, boards, plans, and 'design scenario' flipbooks to illustrate trade-offs



Neponset Circle and shoreline wetland restoration

Coastal Climate Change Adaptation and Engineering Alternatives: Groton, Connecticut



PROJECT CHARACTERISTICS

- Sea Level Rise Assessment and Predictions
- Return-Period Storm Surge Evaluation
- Sustainable Coastal Engineering Alternative Analysis
- Costs Estimations for Engineering Alternatives
- Recommended Engineering Adaptations for Sea Level Rise

Woods Hole Group worked with Battelle Ocean Sciences and the University of Southern Maine on assessing the impacts of Climate Change on coastal communities of Groton, Connecticut. Specifically, the regions of Groton Long Point and the infrastructure surrounding the Mystic River were evaluated. The evaluation included the impacts of sea level rise and storm events on potential flooding.

Working with ICLEI, local stakeholders were integrated into the discussion through a series of three community workshops. The Coastal Climate Adaptation Workshops brought together federal, state, and local stakeholders to begin addressing the question: “how do we collaborate across geo-political boundaries to prepare for climate change impacts?” The first workshop provided an overview of regional climate impacts and initiated dialogue on how different sectors are vulnerable to forecasted impacts. The second workshop focused on refining how federal, state, and local governments are vulnerable to changes in climate,

particularly sea level rise, and included consideration of potential adaptation actions to increase resilience. Finally, the third workshop focused on identifying strategies for implementing adaptation actions across geo-political boundaries.

For each location, conceptual designs of engineering adaptation alternatives were developed. The alternatives ranged from management approaches (e.g., evacuation, flood-proofing of structures, etc.), to soft-engineering options (e.g., beach nourishment, creation of wetlands, etc.), to more significant hard engineering structures (e.g., modular seawalls, revetments, tide gates, hurricane barriers, etc.). The community recommended alternatives for which cost estimates were determined. Engineering adaptations and costs estimates were provided for high and low rates of projected sea level rise, coupled with various return period storm events (10-, 20-, 50-, and 100-year) projected to the year 2070.

LOCATION

Groton, CT

PROJECT COST

\$18,000

CLIENT

Battelle

Stonington Coastal Resilience Plan Stonington, CT

PROJECT CHARACTERISTICS

- Coastal Risk and Vulnerability Assessment
- Sea Level Rise Assessment and Projections
- Development of Storm Climatology for 20th and 21st Century
- Combined Sea Level Rise and Storm Surge Risk Modeling
- Identification of Risk to Critical Infrastructure and Assets
- Probability and Depth Mapping
- Sustainable Coastal Engineering Alternatives

Woods Hole Group, working with Arup, assisted the Town of Stonington in the development of their Coastal Resilience Plan. As a coastal community bounded on 3 sides by water, the Town was facing growing risks associated with the changing climate and rising seas. Many of Stonington's community resources, assets, and residential properties are at significant risk from coastal flooding.



Woods Hole Group developed probability of flooding data and maps for the entire Town, and assisted in the development of a full risk assessment for Town assets and systems based on the hazard level, exposure and vulnerability. This allowed prioritization of resilience building projects throughout the Town. Conceptual resilient solutions were developed for various high value critical locations, as well as for major regional adaptations geared to protect larger areas of the community. Regional solutions were developed in a phased manner so that they could be cost-effectively planned and implemented.

LOCATION

Stonington, CT

PROJECT COST

\$38,000 (WHG Portion only)

CLIENT

Town of Stonington, CT



Coastal Vulnerability Action Plan

Manchester-by-The-Sea, MA

The town of Manchester-by-The-Sea received a grant from the Office of Coastal Zone Management to reduce coastal flood risks and increase coastal resilience. Fuss & O'Neill, in partnership with Woods Hole Group, was hired to complete a Coastal Vulnerability Plan that will identify alternatives to protect critical infrastructure within the downtown inner harbor waterfront.

Two primary services being provided as part of this Plan are coastal modeling and quantifying flooding probability. These tasks began by compiling base mapping, performing site observations, and collect elevation information. These data were used to develop nuisance-based flood elevations and sea level rise imagery, as well as to leverage available Massachusetts coastal flood risk model projections to map coastal flood exceedance probability and water surface elevation throughout the study area. Available sea level affecting marshes model data was leveraged to assess projected habitat change in the study area and identify barriers to salt marsh migration.

Fuss & O'Neill is identifying constructable and permissible neighborhood-scale and site-scale alternatives that have the potential to reduce flood risk and for sea level rise scenarios. These alternatives maximize the potential of nature-based and hybrid design approaches. We are proposing phasing of improvements to match several future climate risk scenarios.

We will meet with stakeholders to present our recommendations. After incorporating feedback, our Plan will include conceptual plan, elevations, representative three-dimensional renderings, proposed phasing to address future climate hazards, and an overall implementation plan.

Project Cost: \$200,152 (ongoing)

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Critical infrastructure identified includes the town hall, the wastewater treatment plant, and the downtown commercial district.



As outreach is an important part of this project, a public webpage was created to communicate project information to residents and allowing residents to provide feedback.



Statewide Flood Mitigation Program

Connecticut Conference of Municipalities - Statewide, CT

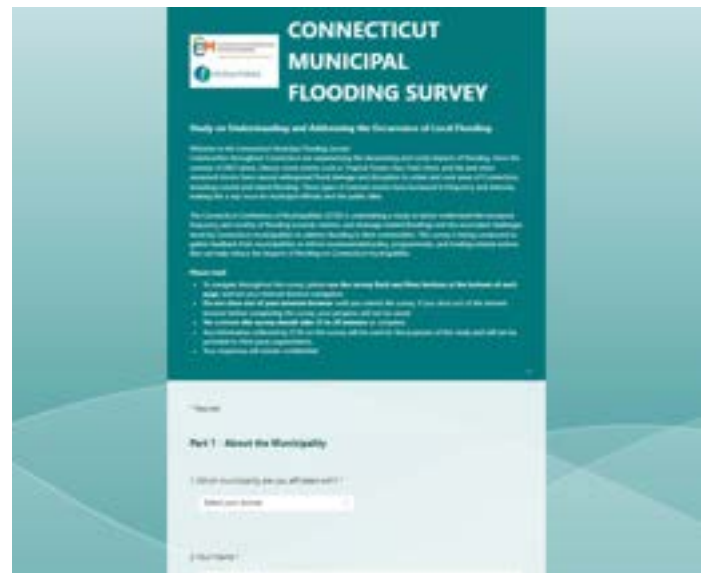
Fuss & O'Neill is conducting a statewide study on behalf of the Connecticut Conference of Municipalities (CCM) that will inform a better understanding of increased flooding and develop programmatic and policy-related recommendations to reduce the impact of flooding on municipalities. Since the summer of 2021 alone, intense storm events such as Tropical Storms Elsa, Fred, Henri, and Ida and other unnamed storms have caused widespread flood damage and disruption to urban and rural areas of Connecticut, including coastal and inland flooding. These types of extreme events have increased in frequency and intensity, making this a top issue for municipal officials and the public alike.

The project involves development of a statewide survey of municipalities on local flooding issues and concerns; workshop meetings with a project Advisory Committee consisting of staff from a range of municipalities across Connecticut; meetings with state agencies and the regional Councils of Government; and development of recommendations for future implementation projects.

We issued a survey to understand and address the occurrence of local flooding. The goal of the survey was to gather feedback from municipalities to inform recommended policy, programmatic, and funding-related actions that can help reduce the impacts of flooding on Connecticut municipalities.



Flooding in West Hartford resulting from an August 19, 2021 storm event. (Source: David Murphy, Resilient Land and Water, LLC)



Project Cost: \$108,500

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RESILIENT NEW JERSEY

SCAPE

MIDDLESEX COUNTY, NJ

ASLA-NJ

Merit Award – Landscape Architectural Planning & Analysis (2022)

Encompassing seven municipalities and approximately 310,000 residents, the Raritan River and Bay communities of New Jersey have been shaped by their proximity to water for centuries. As a key point of connection between Middlesex County, New York City, and New England at large, the region is a critical transportation hub and home to a wide variety of industries, ecosystems, and cultures. Today, many of its communities—including majority Black, Brown, and Latino/Latinx populations impacted by Superstorm Sandy in 2012—face high exposure to flooding and other climate-intensified risks.

Resilient New Jersey, a planning program administered through the New Jersey Department of Environmental Protection (NJDEP), is an initiative to develop a 'roadmap' for climate adaptation with clear strategies, actions, and implementation pathways guided by local input from underserved and under-resourced communities. For the Raritan River and Bay region, the resulting action plan focused on pairing risk reduction projects with social, economic, and recreational value emphasizing natural and nature-based strategies where feasible, as well as potential funding sources.

Over two years, the multi-disciplinary team behind the plan held three virtual open houses, design workshops, community presentations and ongoing meetings with a steering committee of local stakeholders (including representatives from each of the seven municipalities) to ensure all proposed strategies aligned with the lived experiences and needs of residents and stayed rooted in equity and environmental justice goals.

Size

100 square miles

Years

2020-2022

Client

New Jersey Department of Environmental Protection (NJDEP)
Middlesex County, NJ

Collaborators

Arcadis
Ingroup, Inc.
One Architecture & Urbanism
Irys
Sam Schwartz Engineering
Heyer, Gruel & Associates

Services

Climate Adaptation Planning
Engagement

Reference

Carly Foster
Arcadis
carly.foster@arcadis.com
850 228 6979



The action plan combined a suite of structural and ecological interventions responding to local conditions within each watershed, including protection, restoration, and transition.



In Cheesequake Inlet, a multi-purpose flood barrier system is integrated into redevelopment sites on either side of Noe's Creek with living shorelines as a buffer.



Combining stream restoration, culvert enlargements, and a contiguous network of green spaces along Heards Brook, the vision for this site is to reduce the amount of impervious area and flood risk exposure for the surrounding neighborhoods.



Along Noe's Creek, risk reduction strategies combine dune restoration, revetment upgrades, and an offshore living breakwater.

RESILIENT TOGETHER: EL PUNTO

SALEM, MA

Located on a small peninsula between South River and Palmer Cove, El Punto (“The Point”) is a coastal neighborhood of Salem that has undergone many transformations over the decades—by turns an Indigenous fishing place, a settler colonial shipyard, and a hub for Salem’s maritime economy throughout the 18th century. Today, it’s a vibrant, close-knit international community, predominantly comprised of Dominican and Spanish-speaking residents, with a robust civic and cultural presence. It’s also a designated Environmental Justice (EJ) community that, despite recent improvements in housing equity and economic development, faces disproportionate climate risks and socioeconomic challenges.

Resilient Together: El Punto is a multi-lingual climate adaptation action plan that presents a range of risk reduction strategies across the neighborhood. Informed by months of in-person and virtual engagement led in Spanish and English by the Gastón Institute at UMass Boston, the plan proposes actionable strategies in response to a range of physical risks—including the impact of flooding and extreme heat to homes and businesses.

Grounded in science and policy, the resulting plan pairs risk reduction projects with community reinvestment, addressing specific hazards while enhancing public spaces, mobility, and connectivity across the neighborhood through a combination of gray and green infrastructure.

Size

195 acres

Years

2021-2022

Client

City of Salem

Services

Climate Adaptation
Urban Design
Engagement

Collaborators

Woods Hole Group (Prime)
Gastón Institute at UMass Boston
Salem Sound Coastwatch

Reference

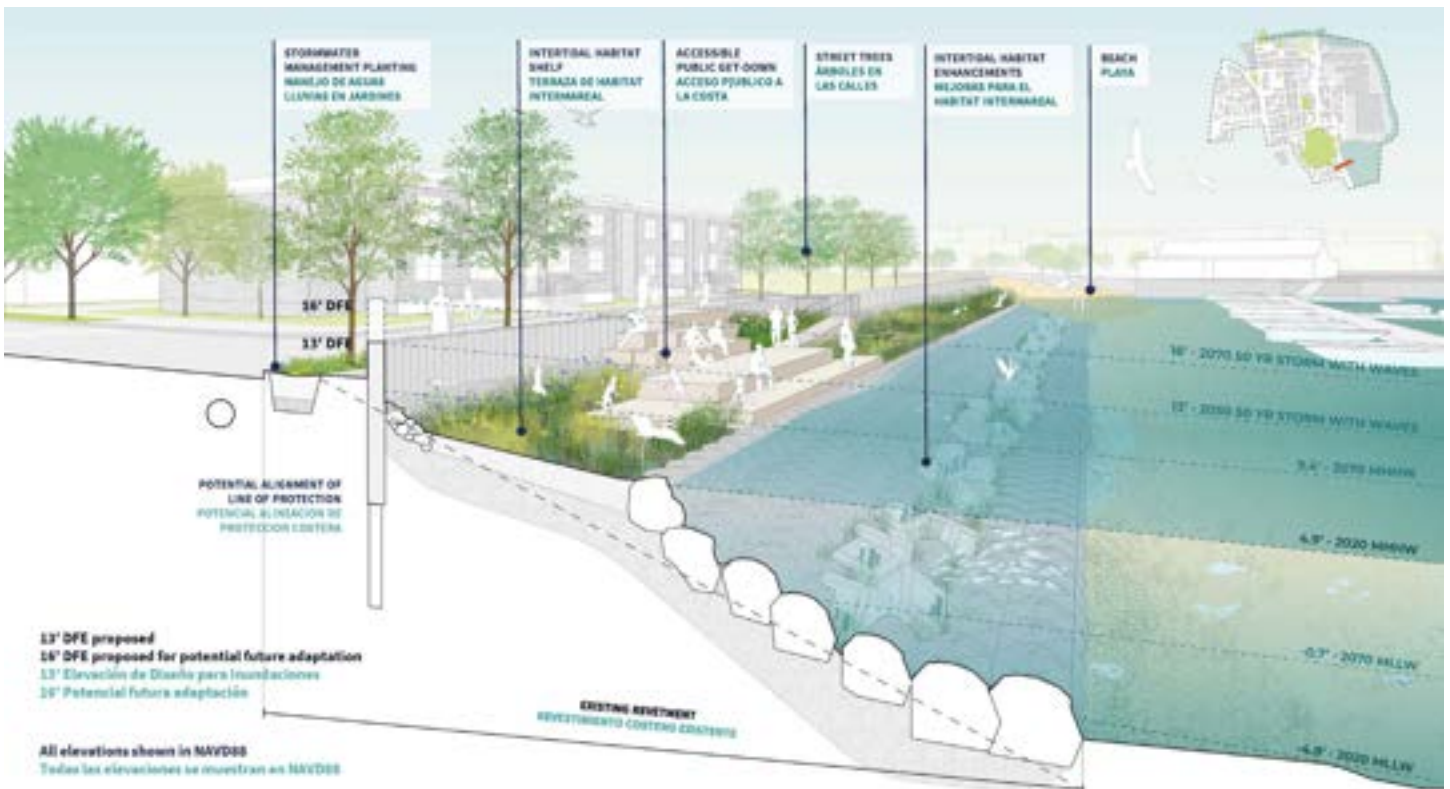
Kate Kennedy, Staff Planner,
Department of Planning &
Community Development
City of Salem
kkennedy@salem.com
(978) 619-5685



Coastal Resilience Design Recommendations



Each strategy is linked to potential funding sources, as well as a set of recommendations for related social programs that tie into local priorities.





Bank Street Flood Mitigation Analysis and Design

City of New London, CT

The City of New London was experiencing significant flooding on Bank and Blinman Streets near their shorefront even during short-duration rainfall events. This flooding was significantly impacting commercial and residential properties. The problems were exacerbated by a lack of storm drainage upstream of their 72-inch main outfall pipe to Shaw's Cove. They needed a fast-tracked analysis of the storm drainage system and recommendations for improvements to mitigate the flooding.

Key elements of Fuss & O'Neill's swift response included creating a comprehensive storm drainage system map, performing hydrologic and hydraulic modeling of the storm drainage network, and incorporating the use of an existing flood control pumping station. Storm drains were designed to capture gutter flow and re-route flows from a hydraulic bottleneck.

Fuss & O'Neill also partnered directly with the City of New London on a successful FEMA Building Resilient Infrastructure and Communities (BRIC) grant application to further address coastal- and drainage-related flooding along Bank Street and surrounding areas of downtown New London.



Fuss & O'Neill analyzed the drainage system and designed flood mitigation improvements to reduce flooding in the Bank Street area.



Flooding caused damage to commercial properties.

Project Cost: \$130,000 (ongoing)



Harbor Brook Flood Control Analysis and Design

City of Meriden, CT

Fuss & O'Neill was selected to develop a comprehensive plan and to complete the design of improvements to reduce current and future flood risk along a 1,800 linear-foot segment of Harbor Brook, which is home to City-owned infrastructure as well as privately-owned commercial and residential buildings. This project is being conducted in a manner that delivers co-benefits to the community by improving public access and creating open space while improving redevelopment potential. This is the next phase of a multi-phase project to improve flood resilience along the Harbor Brook corridor.

This project started with identifying and analyzing alternatives. The selected alternative removes 39 buildings from the 1% annual flood (i.e., 100-year storm) floodplain, floodproofing of three buildings that will remain in the floodplain, and removal of two buildings currently within the floodplain.

The recommended alternative uses a hybrid design approach that combines nature-based and traditional gray infrastructure. Major design elements have been developed to improve flood conveyance by reducing existing obstructions: multiple bridge crossings; creating 5 acres of new floodplain storage capacity and using that space to remove contaminated soils; creating a riparian wildlife corridor; creating a linear trail system with park amenities; and incorporating nature-based design elements to improve in-stream habitat, including riffles and point bars.

Fuss & O'Neill is currently in the design phase for this project, which includes the design of a new riffle pool channel; the design of two new bridges and channel retaining walls; design of floodproofing for three buildings; design of a new public park, wildlife/riparian corridor, and trail system; a soil remediation program; and hazardous materials investigation of structures to be demolished.

Project Cost: \$1.3 million (ongoing)



This project will reduce flood hazard risks and recurring damage by creating appropriate channel morphology and planform, establishing local flood benches, and replacing or removing undersized bridges. It will improve channel aquatic habitat and water quality by re-establishing a vegetated floodplain in the developed channel corridor and increasing the brook's cross-sectional flow area, as well as incorporating riffles and point bars as nature-based design features.



This project continues revitalization of Meriden's downtown urban core by extending a community greenway trail along Harbor Brook and developing a small park.



Coastal Flood Resilience Planning and Design

City of Milford, CT

The City of Milford experiences frequent coastal flooding caused by high tides and storm surge, as well as interior stormwater drainage that has no ability to drain through flooded outfalls. Fuss & O'Neill partnered with the City to make three neighborhoods more resilient to existing and projected coastal flooding. Our services included planning, design, permitting, and construction administration of flood protection measures, which were funded through Community Development Block Grant (CDBG) Disaster Recovery funding following Hurricane Sandy.

Calf Pen Meadow Neighborhood

Scientific and engineering analyses were completed to identify the feasibility of hydraulic and barrier-type controls to improve future flood protection.

Beachland Avenue Neighborhood

The road was raised to provide access during projected future high tide events and protect private property on the inland side of the road from tidal flooding.

Bayview Beach Neighborhood

- Reconstructed, raised, and installed tide check valves on four storm drains discharging to the Sound.
- Reconstructed sand dunes and reestablished beach grass to control high tide overland flooding.
- A stormwater pump station to pump water from the street.
- Constructed emergency stormwater pumping system to allow a temporary pump(s) to be placed outside of the floodplain that would draw water from flooded streets and discharge to the Sound.



Through hands-on meetings, we engaged decision makers by working through alternative design approaches to obtain feedback and buy-in on the systems that they will have to operate and maintain. We conducted public meetings with residents who were concerned with their ongoing flooding problems. We used these meetings to engage residents on potential solutions and to reach consensus on the final plan.





Resilient Riverfront Revitalization

Southern Rhode Island Conservation District – Westerly, RI

Fuss & O'Neill developed a Master Plan for the Resilient Riverfront Revitalization project along the Main Street corridor, where it abuts the Pawcatuck River. The Master Plan focused on mitigating the effects of stormwater on the Pawcatuck River by evaluating opportunities for green infrastructure, reducing impervious surfaces, and creating planted areas to infiltrate and treat stormwater. Through the strategic location of new plantings that serve the green infrastructure, we conceived of a refreshed “gateway experience” that celebrates the arrival to the downtown area. By improving the ecological condition and reorganizing pedestrian and vehicular traffic, the design aims to increase the economic vitality of Downtown Westerly and improve the quality of life for residents and visitors alike.

The project includes work on public and private lands; therefore, permitting at the local, state, and federal levels has required the team to think creatively about processes to achieve an efficiency and economy of scale when working with multiple properties with different ownership profiles. The project required the development of an EPA-approved QAPP to support data collection activities. As part of our multidisciplinary services, we provided transportation engineering services to assess deficiencies with the existing traffic circulation throughout the corridor and made recommendations for changes to reduce hazards and traffic impacts on the corridor for both vehicular and pedestrian circulation patterns.

Through a partnership with the RIDOT Charter Program, the project is eligible to obtain funding for implementing stormwater mitigation that reduces TMDL loading into the Pawcatuck River. Fuss & O'Neill prepared opinions of cost for the proposed improvements, outlined a phasing plan for implementation, and prepared a matrix for evaluating projects and prioritizing the allocation of funds for construction. The project is currently in design development for 10 of the properties in the corridor.



By improving the ecological condition and reorganizing pedestrian and vehicular traffic, the design aims to increase the economic vitality of Downtown Westerly and improve the quality of life for residents and visitors alike.



In the next phase of the project the team will consider the corridor's vulnerability to flooding from storm surge from Little Narragansett Bay and fluvial flooding from the Wood Pawcatuck River watershed, which drains 18 municipalities upriver from the Westerly Main Street riverfront.

Project Cost: \$69,500 (ongoing)

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Pocasset River Flood Resilience Watershed Plan and Design

Northern Rhode Island Conservation District – Johnston, RI

Overview

The Pocasset River is an urbanized, 26 mi² watershed. About 1.5 square miles of this watershed consist of largely developed floodplain. As a result, the surrounding neighborhoods routinely flood, with average annual flood damages exceeding \$3.2M and affecting 432 residences and 49 commercial and industrial properties. The original flood resilience plan (prepared by others) relied on a series of flood walls and pump stations. After discovering that the costs for implementing this gray infrastructure-based plan far exceeded what was estimated in the plan, project owners retained Fuss & O’Neill to revise the plan. Our approach was to maximize the use of nature-based systems to reduce costs and create open space in a dense urban environment with environmental justice populations.

Watershed-wide Flood Resilience Plan

Fuss & O’Neill updated the previously-prepared flood resilience plan to improve its cost-effectiveness. This included focusing on a more nature-based approach, as opposed to traditional gray infrastructure approach. This plan included an assessment of alternatives for each of seven impacted neighborhoods that incorporated several criteria.

Floodplain Restoration and Open Space Network Creation

This project includes the acquisition of 134 privately-owned structures in the floodplain. These structures and supporting infrastructure will be demolished. The remaining land will be restored as floodplain and an open space park system that will reduce the long-term flooding risk to surrounding neighborhoods. We have completed the design, permitting, and construction administration of two of these floodplain restoration projects.

Project Cost: \$3 million (ongoing)

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Given the scale of this project, it includes substantial engagement of political leaders, municipal officials, and local residents. To date, this has largely been accomplished through direct engagement with political leaders and municipal officials, as well as with public meetings in each municipality to directly engage the public, collect feedback, and address concerns.



During the design and permitting phase for the remaining design elements, our approach will include continued engagement of municipal officials with public meetings and online approaches to keep people up-to-date on progress.

Coastal Resilience Solutions for South Boston



PROJECT CHARACTERISTICS

- Sea Level Rise Assessment and Projections
- Flood Pathway Analysis at High Resolution (street-level)
- Combined Sea Level Rise and Storm Surge Risk to critical infrastructure and Assets
- Coastal Engineering Resiliency Design
- Public Engagement and Outreach
- Recommended Design Flood Elevations
- Development of Flexible, Phased Engineering Adaptations

Woods Hole Group was part of a multidisciplinary team that developed near-term and long-term strategies and engineering approaches for protecting South Boston from sea level rise and coastal flooding. The project was led by the City of Boston Environment Department and the Boston Planning & Development Agency. Coastal Resilience Solutions for South Boston was the second neighborhood coastal resilience plan from Climate Ready Boston, the City of Boston's ongoing initiative to adapt to climate change.

These study areas were selected because they are currently at risk from 1% annual chance coastal flooding and have high concentrations of vulnerable residents and critical infrastructure, as indicated by the Boston Harbor Flood Risk Model produced by Woods Hole Group and MassDOT.

The project involved extensive technical, design, and stakeholder engagement efforts, and Woods Hole Group was involved in all these efforts.

Woods Hole Group led the mapping of flood pathways, phasing strategies that accounted for evolving flood pathway dynamics, and development of resilient design criteria for future flood protection systems using results from the Boston Harbor Flood Risk Model. Through iterative design and stakeholder engagement, potential flood protection strategies for critical locations were identified, evaluated, and developed. A set of evaluation criteria, established with input from stakeholders, guided the design process towards feasible, effective, and flexible solutions that achieve multiple benefits over long time horizons.

This project won the Boston Society of Landscape Architects 2020 Analysis & Planning Merit Award and the American Planning Association, Massachusetts Chapter 2019 Sustainability & Resiliency Award.

LOCATION

Boston, MA

PROJECT COST

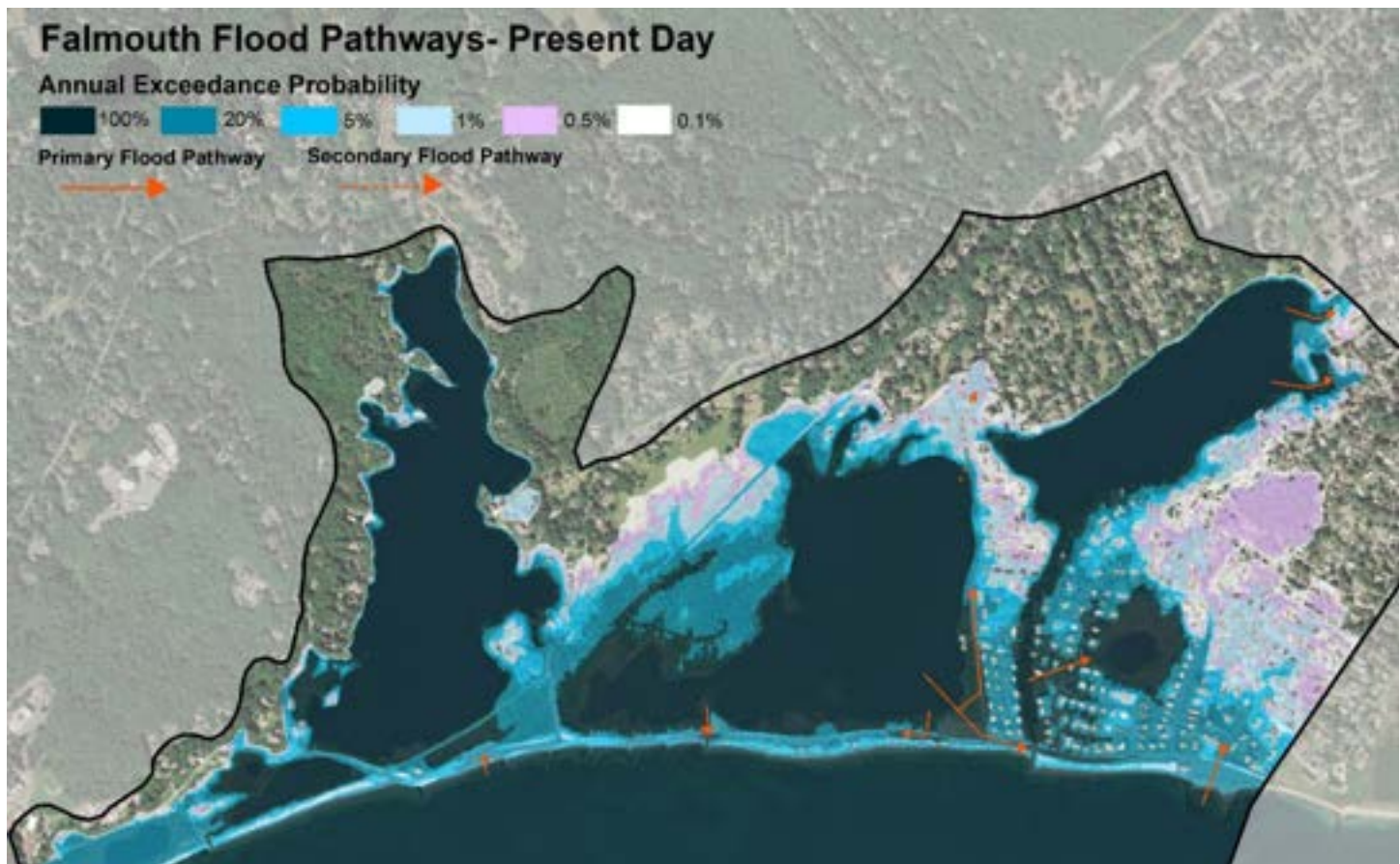
\$45,000 (WHG Portion only)

CLIENT

City of Boston



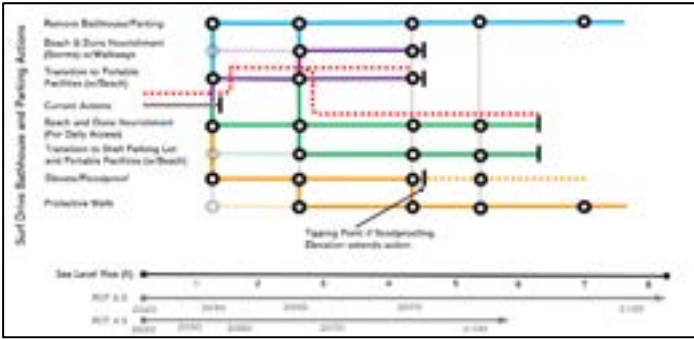
Coastal Resiliency Planning for the Surf Drive Area



PROJECT CHARACTERISTICS

- Long-term climate change and coastal resiliency planning
- Flood pathways assessment
- Detailed asset-based flood vulnerability assessment
- Resiliency action alternatives development and alternatives analysis
- Development of flexible adaptation pathways
- Public outreach workshops and presentations

To better understand the risk to individual municipal assets from flooding, the Town of Falmouth commissioned the Woods Hole Group to conduct a detailed town wide climate change flood vulnerability assessment, which was completed in January 2020. This prior study identified the Surf Drive area as one of the most vulnerable areas in town. Surf Drive already experiences significant stressors (e.g., regular inundation, erosion, overtopping, storm damage, etc.) under today's climate conditions. Climate change and sea-level rise will increase the frequency and severity of these stressors, resulting in increased vulnerability in the future.



Example dynamic adaptation pathway for the Surf Drive beach site.

In order to develop a plan to increase the coastal resiliency of the Surf Drive area, this study provided a conceptual phased management, identifying key time frames and sea level thresholds for action. This process utilized a dynamic adaptation pathways approach, which involves the following key steps:

- 1) Identification of the problem
- 2) Identification of key assets at risk
- 3) Development of potential actions
- 4) Assess efficacy of actions
- 5) Develop implementation pathways
- 6) Develop phasing and implementation plan

After identifying all critical assets and evaluating their vulnerability to flooding, a full range of potential adaptation actions, which can help reduce or eliminate those vulnerabilities, were developed within discrete themes. The four themes used to develop potential actions to address the study area vulnerabilities are:

- 1) **Natural Resources** – emphasizing ecosystem health and resilience
- 2) **Protection** – emphasizing protection and maintenance of infrastructure
- 3) **Connection** – emphasizing maintenance of access, transportation, and utility corridors
- 4) **Managed Retreat** – emphasizing a balance of uses with increased costs and risks in the future

Potential actions were identified for each of the area’s assets within each of the four themes. To aid in decision making, dynamic adaptation pathways were developed for each asset (see example figure to the left).

Dynamic adaptation pathways can provide a unique visualization of the potential adaptation actions and how they can fit together into an overall implementation strategy over time, highlighting key thresholds, dead ends, and opportunities to combine actions from different themes.

Based on the feasibility and effectiveness of the individual actions presented for the four themes, the water level and timing thresholds, and the estimated cost and effectiveness of each action, a recommended phased implementation plan was developed for the study area as a whole. The final recommendation included actions such as:

- Phasing out the barrier beach portion of the Surf Drive roadway in the long-term
- Elevating one section of the bikeway on piles and relocating another
- Relocating a section of the Woods Hole sewer main to a less vulnerable (i.e., more inland) location
- Elevating or floodproofing the Surf Drive sewer pump station
- Removing Mitchell Bathhouse and replacing it with portable facilities
- Protecting the adjacent low-lying neighborhood through the elevation of specific roadway sections and installation of a tide gate; and
- Restoring the barrier beach to a natural ecosystem (i.e., removing the existing roadway pavement, culverts, and shore protection structures).



LOCATION	PROJECT COST
Surf Drive, Falmouth, MA	\$107,000
CLIENT	
Town of Falmouth	



Assessing the Vulnerability of MassDOT's Coastal Transportation Systems to Future Sea Level Rise and Coastal Storms, and Developing Adaptation Strategies.

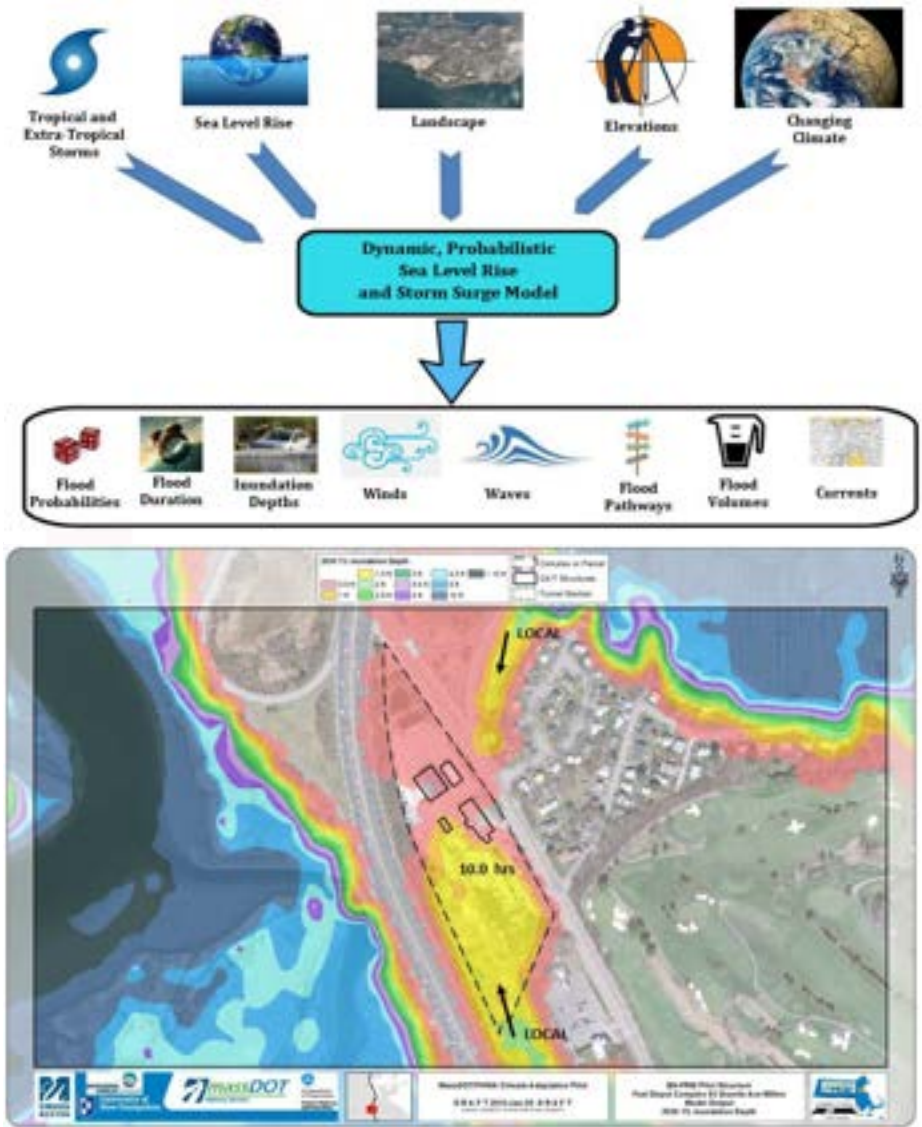


PROJECT CHARACTERISTICS

- Climate Change Assessment and Projections
- Development of Storm Climatology for 20th and 21st Centuries
- Coupled Wave and Hydrodynamic Modeling
- Combined Sea Level Rise and Storm Surge Risk to critical infrastructure and assets
- Cost Estimations for Engineering Alternatives
- Recommended, Phased Engineering Adaptations for Sea Level Rise

Woods Hole Group has supported vulnerability assessments by measuring, modeling, and forecasting flooding due to storms, sea level rise, climate change influences, and combined effects. A complete vulnerability assessment recognizes the dynamic physical processes and timing associated with storms, along with increasing risks of sea level rise and climate change. Woods Hole Group worked under contract to MassDOT to conduct a vulnerability assessment for all coastal transportation systems (roads, rail, airport, bridges, etc.) in the Commonwealth of Massachusetts. In order to determine the vulnerability of the systems, a highly resolved (less than 10 meters), numerical hydrodynamic model was developed to assess the combined impact of sea level rise, storm events (tropical and extra-tropical), winds, tides, river discharge, and waves. Tropical and extra tropical events were simulated using an ensemble Monte Carlo approach to develop probabilistic flooding distributions.

Results from the model were used to assess risk for assets throughout the transportation systems of the Commonwealth and to determine appropriate regional and site-specific adaptation designs to build resilience for the transportation networks. Woods Hole Group designs coastal resiliency projects through an understanding of the storm surge that influences the site under both existing, and future, conditions. Important factors such as the inundation depth levels, wave impacts, flood pathways, flood volumes, and probability of occurrence are all key considerations for developing cost-effective design approaches expected to function for current conditions, and perhaps more importantly, conditions occurring in a changing climate. Additionally, the results are being used by numerous other stakeholders (e.g., health care, universities, water commissions) and communities to assess risk and develop resilient solutions.



LOCATION

Commonwealth of Massachusetts

PROJECT COST

\$1,500,000

CLIENT

MassDOT Highway Division
 10 Park Plaza, Room 4260
 Boston, MA 02116

CONTACTS

Mr. Steve Miller (steven.j.miller@state.ma.us)
 (857) 368-8809



WOODSHOLEGROUP.COM



Before



After

- construction of new utilities, roadways, and public spaces
- 20+ buildings
- 4,000 apartment units
- 6,000,000 square-feet of floor space

- corporate headquarters
- 30+ retailers
- 14 restaurants (more in development)
- 11 acres of new parks
- 1+ mile of publicly-accessible waterfront

Harbor Point Brownfield Redevelopment

Harbor Point Development – Stamford, CT

Fuss & O'Neill has been the licensed environmental professional (LEP) for this award winning \$4 billion brownfield redevelopment project since 2010. This massive redevelopment (more than 100 acres) transformed the former manufacturing heart of the city into a thriving waterfront development.

As the site LEP, Fuss & O'Neill completed investigations in accordance with CTDEEP's Site Characterization document, developed remedial alternatives, prepared remediation plans and specifications, and oversaw extensive remediation. To begin the enhancement of the space, remedial actions included excavation and off-site disposal of more than 300,000 tons of polluted soil, TSCA PCB soil remediation, installation of more than 50 acres of geomembrane-engineered controls, construction of vapor barriers and mitigation systems, and reuse of more than 200,000 cubic yards of polluted soil, crushed concrete, and recycled stone. Project tasks also included HASP preparation, Investigation Work Plan Preparation, TSCA PCB cleanup plans, stormwater general permitting, pollution control plans, and environmental permitting, as well as design of engineer controls, vapor barriers, and sub-slab depressurization systems. The work was completed in accordance with very aggressive schedules to facilitate construction.

Site remediation is being conducted under Connecticut's Property Transfer law, with six properties reaching final LEP cleanup verification in accordance with Connecticut's Remediation Standard Regulations.

Project Cost: \$400 million



As a coastal project, improved resiliency was a major component. The remediation included the innovative integration of liner systems with high-density development, including the construction of clean utility and landscape corridors.

Project Highlights

- Construction Support (environmental inspection and compliance services)
- ECAFs, Form Filings, and Property Transfer Act Determinations
- Environmental Due Diligence/Site Evaluations
- Environmental Land Use Restrictions
- Investigated Sites in Accordance with CTDEEP's Site Characterization Document
- LEP Verifications
- Monitored Groundwater, Stormwater, and Wastewater Discharge
- Polluted Soil Reuse
- Preparation of Plans, Specifications, and Cost Estimates
- Remedial Action Plan
- Secured Regulatory Approvals
- Soil and Groundwater Remediation System Design



Stamford Urban Transitway

City of Stamford, CT

Fuss & O'Neill, Inc. performed highway and traffic engineering design and construction services for a \$45 million Stamford Urban Transitway project in the City's South End.

By connecting the south end area neighborhoods and Elm Street corridor to the City's Transportation Center on Atlantic Street, the Transitway will help revitalize the area with improved traffic and transit flow and relieve congestion in this urban area.

The Transitway includes streetscaping features and a pedestrian and bicycle lane. Numerous environmental and right of way constraints were overcome to accommodate the roadway alignment.

Unique project challenges and features included:

- Congested urban area
- Environmental and right-of-way constraints
- Federal Transit Administration New Starts Program
- Bridge widening to accommodate I-95 improvements



The Transitway includes streetscaping features and a pedestrian and bicycle lane. Numerous environmental and right of way constraints were overcome to accommodate the roadway alignment.



The new four- to six-lane facility will feature dedicated high occupancy vehicle (HOV) bus lanes, seven new traffic signal designs in a coordinated signal system, with bus and fire preemption and Intelligent Transportation System (ITS) enhancements.

Project Cost: \$4.5 million

References

FUSS & O'NEILL

Kathleen Knight
Connecticut Department of Energy and Environmental
Protection
kathleen.knight@ct.gov
860.941.5659

Brian Ennis, PE, City Engineer
City of Meriden
bennis@meridenct.gov
203.630.5869

Christopher J. Fox, Executive Director
Wood-Pawcatuck Watershed Association
chris@wpwa.org
401.569.8170

Mario Ricoszi, PE, Manager of Design
Greater New Haven WPCA
mricoszi@gnhwpcapca
203.469.8302

Gina DeMarco
Northern Rhode Island Conservation District
gdemarco.nricd@verizon.net
401.34.0840

Diane Rossini, Assistant City Engineer
City of Easthampton, MA
DRossini@easthamptonma.gov
413.529.1423

SCAPE

Chris Busch
Assistant Deputy Director for Climate Change and
Environmental Planning
Boston Planning & Development Authority (BPDA)
chris.busch@boston.gov
617.918.4451


Anne Coglianese
Chief Resilience Officer
City of Jacksonville
acoglianese@coj.net
904.255.7939

WOODS HOLE GROUP

David J. DeConto
Director, Department of Natural Resources
Town Of Sandwich
ddeconto@sandwichmass.org
508.833.8054

Leslie-Ann McGee
Director of Special Projects, Marine Facilities and Operations
Woods Hole Oceanographic Institution
lmcgee@whoi.edu
508.289.2712

Heather McElroy
Natural Resources Program Manager
Cape Cod Commission
hmcclroy@capecodcommission.org
508.744.1217

An aerial photograph of a waterfront development. On the left, a marina is filled with numerous white sailboats docked in rows. To the right, there are several multi-story buildings, including a prominent curved structure. The water is dark, and the sky is light. A semi-transparent blue rectangle is overlaid on the right side of the image, containing the text.

SECTION 4 Financial Proposal

FEE PROPOSAL FORM
RFP - STAMFORD COASTAL FLOOD RESILIENCY PLAN – March 2023

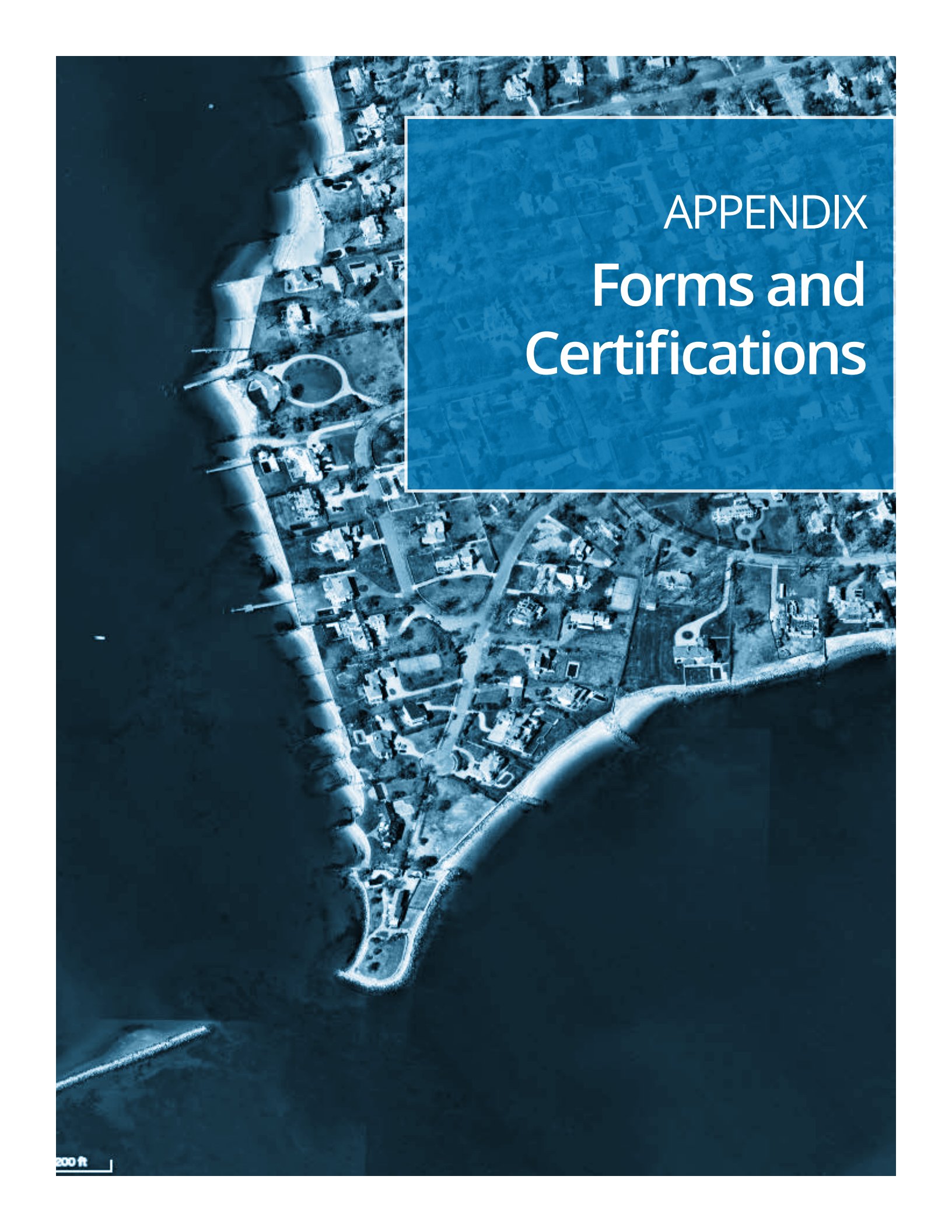
For the services described in the preceding sections of this Request for Proposals pertaining the Stamford Coastal Flood Resiliency Plan:

TASK / DESCRIPTION		FEE
Task 1: Data collection, synthesis, and modelling (including coordination with CIRCA)		\$20,000
Task 2: Evaluation of critical infrastructure and analysis of the urban tree canopy		\$12,000
Task 3: Community/stakeholder engagement process		\$60,000
Task 4: Concept level designs for up to 3 prioritized projects		\$114,000
Task 5: Cost estimates and cost-benefit analyses		\$34,000
Task 6: Final Report		\$10,000
Additional meetings with City staff (per meeting fee)	Virtual meeting, approx. In-person, approx.	\$1,500 per meeting \$3,000 per meeting
TOTAL PROPOSAL COST		\$250,000

Note: Depending on available funding and City priorities, the City at its sole discretion may award any combination of the above listed tasks. The tasks are not listed in any particular order of priority. Proposers are advised to submit fees for each task independent of each other. The City may also choose to do a phased award to the selected vendor.

Reimbursables, as per RFP, to not exceed: \$ 5,000

The validity of this offer is one hundred twenty (120) days from the date of the proposal.

An aerial photograph of a coastal area, showing a large body of water on the left and a developed landmass on the right. The landmass features a complex network of roads, buildings, and green spaces. A large, semi-transparent blue rectangular box is overlaid on the right side of the image, containing the title text in white. The text is arranged in three lines: 'APPENDIX' at the top, 'Forms and' in the middle, and 'Certifications' at the bottom. The font is a clean, sans-serif typeface. The background image is a high-resolution aerial view, showing details of the terrain and infrastructure.

APPENDIX Forms and Certifications

Non-Collusion Affidavit

The undersigned, having been duly sworn, affirms and says that to the best of his/her knowledge and belief:

1. The prices in this Proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other Proposer or with any competitor for the purpose of restricting competition.
2. Unless otherwise required by law, the prices, which have been quoted in this Proposal, have not been knowingly disclosed by the Proposer and will not knowingly be disclosed by the Proposer prior to opening, directly or indirectly, to any other Proposer or to any competitor.
3. No attempt has been made or will be made by the Proposer to induce any other person, partnership or corporation to submit or not to submit a Proposal for the purpose of restricting competition.

Name of Proposer: Fuss & O'Neill, Inc.

By: 

Print Name: Caleb D. Scheetz, I.E.P

Title: Vice President

ACKNOWLEDGMENT

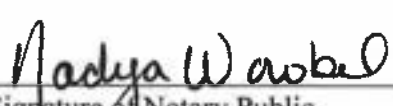
STATE OF Connecticut

COUNTY OF New Haven

ss. City of New Haven

Date: 4-4-2023

Personally appeared Caleb Scheetz as Vice President
of the above named firm, and attested that the foregoing statements are true and accurate to the best of his/her knowledge and belief.


Signature of Notary Public
My Commission Expires: 3-31-2025

EFFECTIVE: 2/24/09

CERTIFICATE OF CORPORATE RESOLUTION
RFQ/RFP

I, Tatia Lewis-Hayes, SECRETARY OF Fuss & O'Neill, Inc.

A CORPORATION EXISTING UNDER THE LAWS OF THE STATE OF Connecticut, DO
HEREBY CERTIFY THAT THE FOLLOWING IS A TRUE COPY OF CERTAIN RESOLUTIONS
ADOPTED BY THE BOARD OF DIRECTORS OF SAID COMPANY, AT A MEETING THEREOF
DULY CALLED AND HELD ON THE 12 DAY OF December, 2022.

“RESOLVED, THAT THE Vice President

OF THE CORPORATION BE AND IS HEREBY AUTHORIZED TO SIGN

A CONTRACT WITH THE CITY OF STAMFORD, CONNECTICUT FOR

Stamford Coastal Flood Resiliency Plan, RFP/RFQ No. Agreement.2023.0003”.

I, FURTHER CERTIFY THAT, Caleb D. Scheetz, LEP IS THE DULY
ELECTED Vice President OF Fuss & O'Neill, Inc.

AND THE FOREGOING RESOLUTION HAS NOT BEEN MODIFIED OR REPEALED AND IS
IN FULL FORCE AND EFFECT.

IN WITNESS WHEREOF, I HAVE, HEREUNTO, SUBSCRIBED BY NAME AND AFFIXED

THE SEAL OF SAID CORPORATION THE 3rd DAY OF April, 2023.

Tatia Lewis-Hayes
SECRETARY



City of Stamford
State of Connecticut Contractor Verification (in accordance with Public Act 16-67)

Compliance Affidavit

I, the undersigned, personally and on behalf of Fuss & O'Neill, Inc., having
(Contractor)
been duly sworn, affirm and say that I have read, understand and am in compliance with Public Act 16-67 Concerning the Disclosure of Certain Education Personnel Records, Criminal Penalties for Threatening in Educational Settings and the Exclusion of a Minor's Name from Summary Process Complaints, and that neither I nor said Contractor, to the best of my knowledge, is in possession of any information indicating a finding of abuse or neglect or sexual misconduct, or otherwise have knowledge of such a condition(s) for any employees working on the project identified in RFQ/RFP or Bid S- Agreement 2023.0003. Further, if I or said Contractor (RFQ/RFP or Bid Number) become aware of any information indicating such a finding, or otherwise gain knowledge of such a condition, I and/or said Contractor will immediately forward such information to the City of Stamford.

Contractor Name: Fuss & O'Neill, Inc.

Street Address: 59 Elm Street, Suite 500

City, State, Zip: New Haven, CT 06510

Title of person completing this form: Vice President

Signature: 

Printed Name: Caleb D. Scheetz, LEP

Date: 4/4/23

ACKNOWLEDGMENT

STATE OF Connecticut

COUNTY OF New Haven

ss. City of New Haven

Date: 4-4-2023

Personally appeared Caleb Scheetz as Vice President of the above named Contractor, and attested that the foregoing statements are true and accurate to the best of his/her knowledge and belief on behalf of himself and said Contractor.


Signature of Notary Public

My Commission Expires: 3-31-2025

Contractor's Statement

Pursuant to Section 103.1 of the Stamford Code of Ordinances, I hereby provide the following:

If a joint venture, trustee, partnership, limited liability company or partnership, the names and addresses of all joint ventures, beneficiaries, partners or members:

Not Applicable.

If a corporation, the names and addresses of all officers, and the names and addresses of all parties owning over 10% of its common stock or over 10% of its preferred stocks. If any of said stockholders is a holding corporation, the names and addresses of all persons owning a beneficial interest in over 10% if the common or preferred stock of said holding company.

Please see attached Ownership Disclosure.

The names and positions of all persons listed hereinabove who are elected or appointed officers or employees of the City of Stamford.

Not Applicable.

Name of Bidder/Proposer: Caleb D. Schretz, LEP

Signature of Bidder/Proposer: 

Title: Vice President

Company Name: Fuss & O'Neill, Inc.

Address: 59 Elm Street, Suite 500, New Haven, CT 06510

Indicate if company submitting this proposal is: _____ MBE _____ WBE _____ DBE

Fuss & O'Neill, Inc.
Ownership Disclosure
October 17, 2022

Fuss & O'Neill, Inc.

<u>Owner</u>	<u>Principal Occupation/Position in Company</u>	<u>Business Address</u>	<u>% Owned</u>	<u>Shares</u>
1 Audet, Dean (PE)	Senior Vice President, Director	317 Iron Horse Way, #204, Providence, RI 02908	5.69%	8.0
2 St. Germain, Tim (PE)	Senior Vice President, Director	1550 Main St., Suite 400, Springfield, MA 01103	5.69%	8.0
4 Chambers, John (PG, LSP)	Executive Vice President of Operations	146 Hartford Road, Manchester, CT 06040	5.69%	8.0
5 Lapinski, Craig (PE, LEED, AP BD +C)	Senior Vice President, Director	146 Hartford Road, Manchester, CT 06040	5.69%	8.0
6 Danielson, Robert (LEP, CPG)	Vice President, Director	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
7 Mas, Erik (PE)	Vice President, Director	1550 Main St., Suite 400, Springfield, MA 01103	3.56%	5.0
8 Bernardin, Eric (PE)	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	3.56%	5.0
9 Forzley, Phil (PE)	Vice President	205 Billings Farm Rd., #6B White River Junction, VT 05001	3.56%	5.0
10 Grigg, Kevin (President/CEO)	CEO, President, Director	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
11 Mailman, Kurt (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
12 Barbash, Adam (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
13 Martin, Shawn (PE)	Senior Vice President	317 Iron Horse Way, #204, Providence, RI 02908	3.56%	5.0
14 Solloway, Kristen (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
15 Sullivan, Kevin (PE, LEED AP)	Vice President	108 Myrtle St., Suite 502, Quincy, MA 02171	3.56%	5.0
16 May, Robert	Senior Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
17 Nanowski, Katherine	Vice President, Director	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
18 Snape, Margaret	Director of Human Resources	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
19 Fryer, JoAnn (PE)	Senior Vice President, Director	50 Commercial Street, Manchester, NH 03101	3.56%	5.0
20 Landry, Elizabeth (PE, CEM, CBCP)	Vice President, Director	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
21 Johnson, Kevin (PE, PTOE, NETTCP)	Executive Vice President of Business Developmt	317 Iron Horse Way, #204, Providence, RI 02908	3.56%	5.0
22 Vertucci, Mark (PE, PTOE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
23 Bafna, Sudip (PE, CHMM)	Vice President	146 Hartford Road, Manchester, CT 06040	3.56%	5.0
24 DeLany, Daniel (PE)	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	3.56%	5.0
26 Mas, Diane (PhD, REHS/RS, CC-P)	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	0.71%	1.0
27 Dowling, Patrick J. (CPG)	Associate	317 Iron Horse Way, #204, Providence, RI 02908	1.78%	2.5
28 Kortz, Brian E. (CPG, LSP, CNU-A)	Associate	317 Iron Horse Way, #204, Providence, RI 02908	1.78%	2.5
29 Greer, Linda (PE, PTOE)	Associate	50 Commercial Street, Manchester, NH 03101	1.78%	2.5
30 Scheetz, Caleb (LEP)	Associate	59 Elm Street, Suite 500, New Haven, CT 06510	1.78%	2.5
31 Shedd, Patricia	Associate	50 Commercial Street, Manchester, NH 03101	1.78%	2.5
			100.00%	140.5

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by [Sections 4a-60](#) and [4a-60a](#) of the Connecticut General Statutes; and, when the awarding agency is the State, [Sections 46a-71\(d\)](#) and [46a-81i\(d\)](#) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at [Section 46a-68j-21 through 43](#) of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by [Sections 4a-60](#) and [46a-71\(d\)](#) of the Connecticut General Statutes.

According to [Section 46a-68j-30\(9\)](#) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to “aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials.” “Minority business enterprise” is defined in [Section 4a-60](#) of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: “(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of [Section 32-9n.](#)” “Minority” groups are defined in [Section 32-9n](#) of the Connecticut General Statutes as “(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . .” An individual with a disability is also a minority business enterprise as provided by [Section 4a-60g](#) of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of [Section 46a-68j-21\(11\)](#) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder’s qualifications under the contract compliance requirements:

- (a) the bidder’s success in implementing an affirmative action plan;
- (b) the bidder’s success in developing an apprenticeship program complying with [Sections 46a-68-1 to 46a-68-17](#) of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder’s promise to develop and implement a successful affirmative action plan;
- (d) the bidder’s submission of employment statistics contained in the “Employment Information Form”, indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder’s promise to set aside a portion of the contract for legitimate minority business enterprises. [See Section 46a-68j-30\(10\)\(E\)](#) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following [BIDDER CONTRACT COMPLIANCE MONITORING REPORT](#) must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to [Sections 4a-60](#) and [4a-60a](#) CONN. GEN. STAT., and [Sections 46a-68j-23](#) of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder’s good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) **Definition of Small Contractor**

[Section 4a-60g](#) CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision [4a-60g](#) CONN. GEN. STAT.

2) Description of Job Categories (as used in Part IV Bidder Employment Information) (Page 2)

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving of written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category.

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

3) Definition of Racial and Ethnic Terms (as used in Part IV Bidder Employment Information) (Page 3)

<p><u>White</u> (not of Hispanic Origin)-All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.</p> <p><u>Black</u> (not of Hispanic Origin)-All persons having origins in any of the Black racial groups of Africa.</p> <p><u>Hispanic</u>- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.</p>	<p><u>Asian or Pacific Islander</u>- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa.</p> <p><u>American Indian or Alaskan Native</u>- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.</p>
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BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART 1 – Bidder Information

<p>Company Name: Fuss & O'Neill, Inc. Street Address: 146 Hartford Road City & State: Manchester, CT Chief Executive: Kevin Grigg, PE</p>	<p>Bidder Federal Employer 06-0845648 Identification Number: Or Social Security Number:</p>
<p>Major Business Activity: Fuss & O'Neill is a full-service consulting civil and environmental engineering firm. We specialize in engineering, planning, and scientific studies. Serving both public and private sector clients for more than 95 years, we provide solutions that maximize value and address our clients' long-term needs.</p>	<p>Bidder Identification (response optional/definitions on page 1)</p> <p>-Bidder is a small contractor? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> -Bidder is a minority business enterprise? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, check ownership category) Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Asian American <input type="checkbox"/> American Indian/Alaskan Native <input type="checkbox"/> Iberian Peninsula <input type="checkbox"/> Individual(s) with a Physical Disability <input type="checkbox"/> Female <input type="checkbox"/> -Bidder is certified as above by State of CT? Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Bidder Parent Company: (If any)</p>	
<p>Other Locations in CT: (If any) New Haven, CT</p>	

PART II - Bidder Nondiscrimination Policies and Procedures

<p>1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>9. Does your company have a mandatory retirement age for all employees? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p>4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/></p>
<p>5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>6. Does your company have a collective bargaining agreement with workers? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>12. Does your company have a written affirmative action Plan? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, please explain.</p>
<p>6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of CT? Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>13. Is there a person in your company who is responsible for equal employment opportunity? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, give name and phone number: Margaret Snape, (860) 783-4754</p>

1. Will the work of this contract include subcontractors or suppliers? Yes No

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above? Yes No

PART IV - Bidder Employment Information

Date: 3/30/2023

JOB CATEGORY*	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Management	86	53	27	1		1	1	1	2		
Business & Financial Ops	*39	29	7					1	1		
Marketing & Sales	8	1	7								
Legal Occupations											
Computer Specialists											
Professionals	*169	98	53	3	2	1	3	2	5		
Office & Admin Support	*18		15		1		1				
Bldg/ Grounds Cleaning/Maintenance											
Technicians	19	11	6	1		1					
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE	339	192	115	5	3	3	5	4	8		
Total One Year Ago	322	187	113	3	4	3	4	4	4		
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

*Business & Financial Ops category includes one male who is two or more races

*Professionals category includes two females who are two or more races

*Office & Admin Support category includes one female who is two or more races

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification (X)		3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination Fuss & O'Neill implements, monitors, and enforces our Affirmative Action/Equal Opportunity Employment Policy Statement and program in conjunction with all applicable Federal and State laws, regulations, and executive orders. In order to implement our Affirmative Action/Equal Opportunity Employment Program, Fuss & O'Neill will develop written strategies and plans designated to correct any deficiencies identified. Furthermore, our policy statement, as well as the Labor and Anti-discrimination Poster, shall be posted and otherwise made known to all workers in the company's home office, each satellite office, and at each job site. Managers and supervisory staff will be advised of their responsibilities to ensure success of the program.
SOURCE	YES	NO	% of applicants provided by source			
State Employment Service	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	X	Work Experience	
Private Employment Agencies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3	X	Ability to Speak or Write English	
Schools and Colleges	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7		Written Tests	
Newspaper Advertisement	<input type="checkbox"/>	<input checked="" type="checkbox"/>		X	High School Diploma	
Walk Ins	<input type="checkbox"/>	<input checked="" type="checkbox"/>		X	College Degree	
Present Employees	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1		Union Membership	
Labor Organizations	<input type="checkbox"/>	<input checked="" type="checkbox"/>		X	Personal Recommendation	
Minority/Community Organizations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1		Height or Weight	
Others (please identify)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			Car Ownership	
Company Job Board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	86		Arrest Record	
	<input type="checkbox"/>	<input type="checkbox"/>			Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature) <i>Hillary Goodrich</i>	(Title) HR Generalist	(Date Signed) 3/30/23	(Telephone) (860) 783-4690
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Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:


1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, Fuss & O'Neill, Inc., certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.



Signature of Contractor’s Authorized Official

Caleb D. Scheetz, Vice President

Name and Title of Contractor’s Authorized Official

April 4, 2023

Date

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Go to www.irs.gov/FormW9 for instructions and the latest information.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
Fuss & O'Neill, Inc.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

Individual/sole proprietor or single-member LLC

Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Other (see instructions) ▶ _____

C Corporation

S Corporation

Partnership

Trust/estate

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Apply to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
146 Hartford Road

6 City, state, and ZIP code
Manchester, CT 06040

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			-			-			
--	--	--	---	--	--	---	--	--	--

OR

Employer identification number

0	6	-	0	8	4	5	6	4	8
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Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ *J-K* Date ▶ **4/20/2022**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.



ADDITIONAL REMARKS SCHEDULE

AGENCY Willis Towers Watson Northeast, Inc.		NAMED INSURED Fuss & O'Neill, Inc. 115 Broad Street Boston, MA 02110	
POLICY NUMBER See Page 1		NAIC CODE See Page 1	
CARRIER See Page 1		EFFECTIVE DATE: See Page 1	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
 FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

INSURER AFFORDING COVERAGE: Beazley America Insurance Company Inc NAIC#: 16510
 POLICY NUMBER: C349D5230101 EFF DATE: 04/01/2023 EXP DATE: 04/01/2024

TYPE OF INSURANCE:	LIMIT DESCRIPTION:	LIMIT AMOUNT:
Professional Liability	Ea Claim:	\$5,000,000
No Retro Date Applies	Aggregate:	\$5,000,000
Retention		\$300,000



FUSS & O'NEILL

59 Elm Street Suite 500
New Haven, CT 06510
800.286.2469
www.fando.com