PDF 2 - PROJECT NARRATIVE

Faced with the urgent challenge of waterfront and inland flooding, the Tampa Bay region requires an integrated, multi-jurisdictional approach for effective flood risk management. The Tampa Bay Regional Planning Council (TBRPC) is seeking $1,999,450.74 over four years to create a Coastal Master Plan. This plan will illustrate flood risks for the region's vulnerable communities and habitats and propose a coordinated suite of enduring local adaptation projects. The resulting plan will equip the region with a prioritized list of restoration and flood risk mitigation projects that target compound flooding issues—high-tide events, storm surge, rainfall-related flooding, and the impacts of future sea level rise— across vulnerable, historically underserved areas and critical habitats.

The project's primary goal is to draft the inaugural Tampa Bay Coastal Master Plan ("Coastal Master Plan"), establishing a recurring five-year update cycle with extensive stakeholder engagement. Objectives of the proposed project include fostering cross-jurisdictional regional coordination, supporting meaningful and equitable community engagement, maximizing co-benefits for risk reduction, and increasing the enduring capacity for local and regional resilience adaptation. The project will unfold in four phases: convening stakeholders, assessing regional flood risk, identifying risk reduction project concepts, and publishing the final plan. The four-year planning process will be grounded in the best available science, extensive community engagement, and strong regional collaboration, leveraging local resources as well as pertinent tools, studies, and resilience efforts.

Already, 28 collaborators and 12 partners have committed to this collaborative adaptation effort, a number expected to increase. The Coastal Master Plan will build on the TBRPC's foundational work, such as the Tampa Bay Regional Resiliency Coalition and the Tampa Bay Regional Resilience Action Plan, enhancing existing networks and fostering new community connections. This comprehensive strategy aims to catalyze crucial conversations about risks from and responses to compound flooding and employ practical and equitable adaptation project concepts to unify more than 700 miles of coastline and 2,200 square miles within the Tampa Bay region. This approach will create a cohesive and adaptive strategy, mobilizing the region's resilience vision while supporting local and regional efforts to fund and implement climate adaptation actions.

Background

The Tampa Bay region encompasses six counties and is home to 3.8 million people (about twice the population of Nebraska despite being 10 times smaller in area). Its population is spread across communities of diverse cultures, socioeconomic backgrounds, and geographies. The region boasts significant ecological and economic assets, including the Gulf's world-renowned beaches, Florida's largest open-water estuary— Tampa Bay— Sarasota Bay Estuary, and five aquatic preserves. The region features important sub-, inter-, and supratidal habitats, including seagrass meadows, mangrove forests, salt marshes, salt barrens, sponge beds, marine springs, oyster reefs, hardbottom, freshwater wetlands, native uplands, and more. These habitats provide food, shelter, and other critical ecosystem services that support diverse birds, fish, mammals, and invertebrates. Numerous species are listed under the Endangered Species Act, including the loggerhead sea turtle, Kemp's ridley sea turtle, smalltooth sawfish, Gulf sturgeon, whooping crane, gopher tortoise, West Indian manatee, and many others.

Those ecosystems are inextricably linked to the local economy and livelihoods of residents. The region's coastal resources support valuable working waterfront industries, including fisheries, seafood production, and ecotourism. Over the last century, the region has experienced substantial population growth and coastal development at the expense of its wetlands and the loss of flood-regulating ecosystem services. Urbanization and shoreline hardening continue to disrupt natural hydrological processes and limit the adaptive capacity of habitats to migrate in response to rising sea levels and other climate change factors. Water is vital to the region, but it also puts our communities at significant risk of coastal and inland flooding. According to "The 3rd National Risk Assessment" 2021 study from First Street Foundation, many of the Tampa Bay region's counties face major to severe flood risk today and are among those in the state with the highest projected growth in flood risk over the next 30 years. The highly developed coastline leaves homes, infrastructure, and important economic and cultural resources

vulnerable to flood impacts. Communities across the region experience flooding during common rain events, whereas larger storms can result in millions of dollars in flood damage. For example, last year when Hurricane Idalia made landfall north of the Tampa Bay region, it still caused significant storm surge and tidal flooding that inundated neighborhoods and prevented access to barrier island communities, as seen in photos included in the Appendix - Additional Flood Risk Photos.

Recent data, including NOAA's NCEI Storm Event Database, underscores the urgent need for adaptation strategies, with 28 reported flooding and heavy rain events since 2020 resulting in over $10 million in damages, all of which were not related to tropical storms or hurricanes. The compound flooding from a major hurricane would have devastating consequences on the region, and our vulnerability grows as storm intensities increase and sea levels rise. A 2015 report from Karen Clark and Co. concluded that Tampa Bay is the most vulnerable place in the U.S. to storm surge flooding and could sustain $175 billion in damage from a single major event. Fifty percent of the population around Tampa Bay lives on ground elevations less than ten feet. In Pinellas County alone, 1 in 5 built properties is at risk of flooding from Category 1 hurricanes (Sampson and Taylor 2022). The Tampa Bay Partnership's 2022 report, "Making the Economic Case for Resiliency," presents stark projections for the Tampa Bay region: by 2045, daily tidal inundation could lead to a staggering $2.9 billion in property value loss, with permanent sea level expected to erode $34 million annually from sales, tourism, and property taxes. Alarmingly, these losses are predicted to increase more than five-fold by 2070. Yet, amidst these challenges lies a compelling economic opportunity for adaptation and resilience-building measures. The report highlights a significant return on investment for adaptation strategies, with savings of $2.27 for every $1 spent on resilience projects. This data underscores the immediate need for substantial adaptation investments to safeguard the region's most vulnerable communities. It is not merely a matter of mitigating losses but of seizing an economic imperative to enhance the region's resilience.

The FEMA National Risk Index reveals the Tampa Bay region's "relatively high" social vulnerability, whereas community resilience is characterized as "very low." The Climate and Economic Justice Screening Tool further highlights the disproportionate risk of flooding faced by 28.4% (267 of 939) census tracts within the project area. These census tracts are greater than or equal to the 90th percentile for the share of properties at risk of flooding in 30 years (Appendix - Regional Maps, Figure 1). Many of these flood vulnerable communities are historically underserved and underrepresented, with over half (53.0%) of households without a residing adult who speaks English fluently, 21.6% with ethnic or racial minority backgrounds, and 24.4% with residents older than 65 (Appendix - Regional Maps, Figure 2). Recognizing these challenges, the Coastal Master Plan will prioritize the inclusion of these vulnerable groups, especially marginalized, underserved, or underrepresented communities, to ensure local knowledge and support are incorporated in the plan's development process and contribute to adaptation decision making, effective risk communication, and long-term resilience initiatives. Collaborations with community-based organizations like the Alianza Center, serving Puerto Rican and Hispanic communities throughout Florida, and the Progress Village Civic Council, Inc., serving the first African American suburb in Hillsborough County, will deepen regional coordination and ensure that adaptation strategies address the community's specific needs. This approach aligns with the Justice40 Initiative, aiming to deliver tangible benefits to these underserved and marginalized communities through a participatory process at every project phase. The requested grant funding will be the seed that initiates a cycle of adaptive management to identify and communicate risk while developing a coordinated suite of equitable, cross-jurisdictional risk reduction projects to guide implementation across the region.

As the Tampa Bay region contends with rising groundwater and sea levels, alongside escalating coastal flooding and erosion, its communities face the difficult task of preparing for and adapting to these changing environmental conditions. This challenge is particularly acute for the region's most vulnerable residents, necessitating inclusive dialogues on diverse risk reduction strategies and equitable resource distribution among coastal and inland communities. The development of the Coastal Master Plan marks a pivotal step in initiating conversations about potential adaptation pathways that embrace the changing landscape and help define immediate, actionable steps for coexisting with rising waters. The Coastal Master Plan will identify flexible project designs to alleviate the most urgent flooding challenges, with

special attention paid to the needs of marginalized communities and incorporate considerations for anticipated sea level rise and changes in rainfall patterns. Regular updates to the plan, proposed every five years, will sustain the support and capacity needed to refine long-term adaptation pathways in subsequent plan iterations.

The U.S. Army Corps of Engineers' 2022 South Atlantic Coastal Study (SACS) identifies current institutional barriers to coastal flood risk management in the Tampa Bay region, including limited community engagement and understanding of risk management options, scientific data gaps, and a need for enhanced coordination and leadership at all levels. Currently, the region's approach predominantly emphasizes immediate storm response and recovery of infrastructure, which, while crucial, overlooks the equally important need for long-term mitigation of future storm impacts and the restoration or mitigation of environmental damage. This narrow focus underscores a missed opportunity to enhance the engagement of stakeholders to foster collaboration and facilitate the execution of projects across the region. Collective, coordinated community approaches to flood management can connect disparate resources and facilitate the shift from reactive response to proactive risk reduction measures.

Local governments are beginning to pursue small-scale resilience projects for their own sake, however there is little coordination across the region, and there is no regional strategy for long-term coastal adaptation which is hindering widespread implementation. Since water does not follow jurisdictional boundaries, neither should flood management, emphasizing the need for all six counties in the region to utilize consistent resources to be most efficient and effective in local and regional-scale flood protection decision making. The Coastal Master Plan seeks to harness the strengths of existing regional collaboratives to engage more communities and advance joint actions that accelerate the region's climate resilience and adaptation practices. By identifying opportunities for innovative, large-scale projects, the plan aspires to build a robust network of resilient infrastructure investments and provide a unified voice to assert the region's shared resilience priorities.

Compound flooding occurs at the intersection of coastal and inland typologies; thus, a watershed-scale vision of multiple flood drivers is needed to understand the changing landscape of risk across jurisdictional boundaries. Despite ongoing efforts to map individual flood impacts, for example through disparate vulnerability assessments and national tools, the Tampa Bay region lacks comprehensive flood maps that illustrate the compounding effect of numerous current and future flood drivers. The proposed Coastal Master Plan aims to fill this gap by creating open-source, regional compound flood maps that integrate socio-economic data, thereby identifying and prioritizing areas for comprehensive and equitable adaptation projects. The plan will leverage existing resources—including national datasets, current flood mapping efforts, the TBRPC's technical stakeholder committees, vulnerability assessments, Local Mitigation Strategies, and other tools—to inform these advanced flood maps and guide the identification and selection of adaptation projects.

The Tampa Bay Regional Planning Council (TBRPC) is a special district government that convenes and provides technical assistance to its member governments, including six counties and 21 municipalities. Citrus, Hernando, Pasco, Pinellas, Hillsborough, and Manatee Counties are collectively referred to as the "Tampa Bay region" and form the current boundaries of the proposed Coastal Master Plan (Appendix - Regional Maps, Figure 3). Under the leadership of the TBRPC, the Tampa Bay Regional Resiliency Coalition (the Coalition) synchronizes climate adaptation and mitigation activities and provides access to resources that advance local and regional responses to disruptions resulting from the impacts of climate change. Since its formation in 2018, the Coalition has grown to 33 member governments and more than 90 resilience partners. The Coalition created the first-of-its-kind Tampa Bay Regional Resiliency Action Plan (RRAP) in 2022 to serve as a five-year roadmap of best practices to guide resilience-building actions across the region. The RRAP is a useful resource developed by the TBRPC and member governments that reflects the vision for the region's current resilience landscape.

Whereas the RRAP is a framework for high-level cooperative action across numerous resiliency topics, the Coastal Master Plan will provide directives for more site-specific restoration and (non)structural flood reduction projects. For instance, the RRAP includes actions such as "reduce regional flood risk by convening regional stakeholders to identify innovative stormwater management strategies,

design, incentives, and pilot projects which also support habitat resilience and water quality," while the Coastal Master Plan will provide a means to implement this RRAP action. The proposed five-year cycle of the regional-scale Coastal Master Plan will complement the RRAP in building local governments' capacity and progress towards implementation by identifying high-impact, location-specific flood risk reduction projects. The TBRPC is prepared to secure other funding sources to further expand upon and implement the Coastal Master Plan planning process on a 5-year cycle.

The TBRPC, with its established community ties and expertise in making connections greater than the sum of its parts, is uniquely positioned to oversee the Coastal Master Plan's development and implementation. As a central figure in regional resilience planning, the TBRPC is poised to leverage its extensive networks and knowledge to drive meaningful progress in regional flood risk mitigation. This plan represents a critical step in enhancing the Tampa Bay region's capacity for effective and localized flood risk management, complementing the broader goals outlined in the RRAP and reinforcing the TBRPC's role as a pivotal force in regional adaptation efforts.

Resilience Vision, Strategies, and Activities

The Tampa Bay region envisions resilience as the enduring capacity of its diverse coastal communities and habitats to mitigate and adapt to the risks posed by long-term climatic changes and short-term weather extremes. Communities will be equitably supported with the resources and collaborations needed to adapt to changing conditions and withstand– and rapidly recover from– disruptions from hazardous events. More engaged and prepared communities can absorb shocks and quickly rebound while minimizing health, environmental, and economic impacts. Resilience is not a static state of being, rather it requires continuous action and innovation through feedback loops of adaptive management. The regional vision of resilience is one in which local governments are consistently implementing new flood risk reduction projects in coordination to sustain thriving people and places. In the proposed project, the TBRPC and its partners will facilitate a cross-jurisdictional and multi-stakeholder planning process to develop a coastal master plan for the Tampa Bay region that will identify flood-vulnerable communities and propose a suite of potential restoration and flood risk reduction projects (structural and nonstructural) to advance investments in regional adaptation. Thus, the goals for the project are two-fold, to build the planning cycle and collective network of community stakeholders, and to undertake the first iteration of the Tampa Bay Coastal Master Plan. The objectives of the proposed project include enhancing regional coordination, supporting meaningful community engagement, maximizing co-benefits, and increasing the local and regional capacity for adaptation. Communities will have new tools to better understand and communicate flood risk, as well as a suite of restoration and risk reduction projects that provide benefits to each county and the wider region. The resulting plan will serve as an adaptation resource and guide for decision makers to maximize enduring community benefits that support a thriving coast where people can continue to live, work, and enjoy the region's unique features. As the first of its kind in the state, the Tampa Bay Coastal Master Plan will foster the ongoing, iterative process of adaptive management to ensure long-term capacity building and informed decision making in the face of an uncertain future. In every phase, the project will include the participation of various communities and stakeholder groups across the region to cultivate an inclusive planning cycle underpinned by the co-production of local and scientific knowledge. The project will train local government staff, partners, and community organizations to lead efforts to engage communities, particularly those who have been traditionally underserved and under-resourced. In tandem, local universities will merge research efforts to calculate coastal water level conditions for present-day and future (2040 and 2070) climate conditions with consideration to sea level rise and potential changes in storm characteristics. The project will create compound current and future flood risk maps consisting of open-source data and transparent replicable methodology to facilitate knowledge transfer within and outside the Tampa Bay region. The Tampa Bay Coastal Master Plan will equip the region with a prioritized list of feasible resilience projects developed with and vetted by the community which will serve as guides to equitably address the many challenges posed by high-tide flooding, storm surge, rainfall-related flooding, and future sea level rise in vulnerable areas, particularly historically marginalized, underserved, and underrepresented communities. Project locations will be informed by the

modeling efforts such that the regional benefits can be maximized. With new 2020 Tampa Bay Habitat Master Plan (HMPU) resources, local governments will have the additional capacity and justification to apply for various funding sources to make meaningful progress on implementation. The plan—with early input from historically marginalized communities—will help shape resilience investments over time that also support the Justice40 initiative by ensuring that benefits will flow to disadvantaged communities. The plan will be developed through four phases, including: (1) convening stakeholders to finalize a four-year planning process; (2) regional flood risk analysis; (3) identification of project concepts; (4) communicate report publication.

1. Essential stakeholders will be convened to finalize a shared vision, goals, and methodologies for the plan's development. At the start of the project, the TBRPC and project collaborators will identify and engage additional key stakeholders to participate in working groups to support the plan's development. Key stakeholders will include community leaders, business and industry representatives, landowners, scientists, non-governmental organizations (NGOs), community-based organizations (CBOs), health professionals, resilience experts, local, state, and federal agencies, and other interested parties with an emphasis on engaging minority-serving institutions. The Tampa Bay Coastal Master Plan team will engage with community leaders and other stakeholders throughout the entire process and beyond, further fostering enduring capacity to inform and advance adaptation efforts. Existing community resilience networks of the TBRPC and other project collaborators will be leveraged to garner more project partners and expansive participation beyond the usual stakeholders, ensuring a multi-disciplinary and geographic balance of regional representation. Engagement of historically marginalized, underserved, or underrepresented communities will be prioritized to build inclusivity and diversity into the Master Plan development process and to advance equity through their involvement in the identification of risks and challenges, and implementation of adaptation strategies.

A variety of avenues and networks will be used to identify underserved communities and community organizations who may be interested in participating in the Coastal Master Plan's development, including the use of environmental justice and social vulnerability mapping tools to help define target areas in the region. Community leaders from faith-based groups, neighborhood associations, federally qualified health clinics, community centers, NGOs, community development agencies and others will be approached for suggestions of other individuals and groups to engage as well as an invitation for their own participation. For example, Hillsborough County's Office of Neighborhood Relations has offered a list of neighborhood association leaders. Leaders from these organizations will be invited to join the Community Workgroup as collaborators or partners and be part of the community engagement and outreach process at a level they deem appropriate. There is a budget to fund engagement by community leaders in their neighborhoods that they know best, and a portion of those dollars will compensate residents for their participation. Ample representation from underserved and overburdened communities will be prioritized to address the adverse flood conditions they experience and to ensure they benefit from the project rather than facing additional disproportionate burdens or underinvestment. Already nine community-based social organizations are committed collaborators or partners for the Coastal Master Plan, many of which work with underserved communities. For instance, Alianza Center serves Puerto Rican and Hispanic communities throughout Florida, and their perspective will be essential for engagement with Latinx community members, especially those experiencing linguistic isolation. The Progress Village Civic Council, Inc. is a non-profit organization committed to expanding the resources and opportunities available to the Progress Village community, the City of Tampa's first low-income housing suburb that also experiences routine flooding. Parallel participation from municipality staff associated with these underserved regions will double the number of community leaders who work on planning the details for the engagement and outreach strategies.

Following stakeholder identification, all project partners and collaborators will be invited to participate in a Project Kick-off/Launch Workshop to discuss the plan and develop a shared vision and goals. A Technical Workgroup and Community Workgroup of project collaborators and partners will meet quarterly throughout the four-year project to enhance collaboration and facilitate the co-production

of knowledge to advance the plan and project development process (further defined in the "Framework for Collaboration" section of this proposal). An Advisory Team of representatives from core collaborating organizations will be convened regularly for project decision making, ensuring that iterative engagement and shared goals are achieved. Community-based organizations will be compensated for their participation in workgroup meetings and any community meetings dedicated to the Master Plan. This regional approach for coordination will have numerous benefits, including relationship-building, cross-pollination of ideas, and the elimination of jurisdictional siloes.

This phase will result in two strategies that will guide the plan's development process— the Technical Strategy and the Outreach and Engagement Strategy. The Technical Strategy will include a framework for identifying and evaluating flood risk and project priority areas in Phase Two through open-source modeling and leveraging existing datasets and national tools, as well as developing an evaluation matrix and methodology with which to assess and screen projects in Phase Three for inclusion in the final plan. The Outreach and Engagement Strategy will include approaches to cultivate and nurture the participation of various communities - often left out of decision-making - and stakeholder groups across the project timeline and beyond to foster inclusivity and transparency. It will detail operating norms and practices, including decision making processes and will establish routine communication mechanisms, both within the collaborative and with stakeholders. The Outreach and Engagement Strategy will identify how the team can build the local capacity of underserved communities to engage with the plan's development, at its earliest stages, and implementation. Furthermore, the strategy will describe a plan of action for the draft and final Coastal Master Plan distribution in Phase Four, including materials for publication and advertising. Together, the Technical and Outreach and Engagement Strategies will define the four-year planning process and be designed to support future replication and enduring capacity for adaptation efforts.

Milestones: (1) Regional Workgroups are established with diverse stakeholder membership; (2) A project kick-off workshop is hosted to finalize a shared vision and goals; (3) equitable Outreach & Engagement and Technical Strategies are developed. Regional benefits include: (1) four-year replicable planning process and timeline that underpins a shared vision and goals; (2) relationship-building and increased community awareness and participation in coastal resilience efforts; (3) historically underserved communities engaged in community meetings and represented in the workgroups.

2. A regional flood risk assessment will provide quantitative insight on current and future flood risk as well as identify vulnerable communities to further inform proactive measures that provide resiliency and adaptation from storm surges and other flooding events.

Vulnerability assessments are currently performed in accordance with section 380.093 (2023) of Florida Statutes and have the objective of identifying critical assets and their sensitivity to future flood scenarios. These vulnerability assessments are limited to county and municipality boundaries without consideration of neighboring watersheds. They also utilize flood maps for current and future flood risk scenarios, however not all communities have the available datasets or tools to consider compound flooding or the interactions between different stressors (rain, high tide, etc.). Consistent and well-informed resources are essential for coordinated and innovative flood risk management.

The Tampa Bay Coastal Master Plan will build on the TBRPC's previous mapping efforts (more details in the "Framework for Collaboration" section) by assessing compound flooding and habitat coverage through the lens of a regional risk assessment. Compound flooding is a topic of active research as the majority of flood events, such as hurricanes, arise from the combination of more than one water source or driver. Compound flood events are increasing in frequency along the western Florida coast (Wahl 2015, Bevacqua 2020), and there is a growing demand to better understand which communities are most at risk. Existing national mapping tools (e.g. FEMA SFHA) limit their focus to one or few individual flood drivers, such as storm surge and sea level rise, and/or use an additive approach to considering multiple flood drivers. Mean Sea Level does not operate as a simple additive term in the calculation of storm surge (Arns 2015, Zhang 2013), and therefore it is more accurate to use numerical circulation models to calculate changes in future storm surge due to sea level rise. Thus, more complex modeling is needed to capture the compounding interactions between coastal and inland flooding.

The project team will develop current and future projected flood maps for the Tampa Bay region under current land-use conditions by incorporating the effects of tides, storm surges, sea level rise, and rainfall on coastal and riverine flooding. Local universities, including the University of Central Florida and University of South Florida, will be subawarded funding to collaboratively perform the modeling needed for the risk assessment, probabilistic flood maps, and subsequent evaluation of the effectiveness of selected projects (with the focus on broader-scale interventions given the scale and resolution of the model). This research includes the development and application of advanced multivariate statistical models to derive joint probabilities for multiple flood drivers to co-occur. It also includes using appropriate hydrodynamic numerical flood models, which can simulate compound flooding from different drivers and provide accurate estimates of inundation extent and depth resulting from those compound events. Merging the research efforts at the University of South Florida and University of Central Florida offers the opportunity to develop the first assessment of more informative compound flood hazard maps for the Tampa Bay region.

The team at the University of South Florida currently develops and applies Delft3D to create high-resolution coastal ocean circulation models capable of simulating accurate coastal water levels for Hillsborough, Pinellas, and Manatee counties. Delft3D is also used by the U.S. Naval Oceanographic Office to forecast surge and inundation (Veeramony 2017). To derive historic and future coastal water levels at high spatial resolution throughout the wider Tampa Bay region, the USF model domain will be extended to the adjacent coastal counties. Historical or hindcast simulations will roughly include 1975 to present using realistic boundary conditions (e.g., winds, rainfall, river discharge) based on values from federal databases such as the National Centers for Environmental Information, and other state and local databases as needed. This study will include effects of both winter frontal passages and summer tropical storms. Initial coastal ocean circulation model outputs will be calibrated and validated against two long-term tidal gauges located within Tampa Bay proper, following the procedure in Ulm et al. (2016).

Simulations of future coastal surge will be structured essentially the same as the hindcast but will include rises in Mean Sea Level. The range of modeled sea level projections will be bounded by the 2017 NOAA intermediate-low and intermediate-high sea level rise projections in accordance with section 380.093 (2021) of the Florida Statutes as part of the Resilient Florida Grant Program. Modeled standard water levels, including Mean Sea Level and Mean Higher High Water, will be extracted from the model output and used to calculate the frequency of High Tide Flooding (HTF), also known as “nuisance” or “sunny day” flooding (Harris 1981, Woodroffe and Barlow 2015).

Researchers at the University of Central Florida have developed a probabilistic framework that uses coastal water level and rainfall time series as input and can be extended to account for streamflow in adjacent rivers where necessary. Coastal water level information will come from the University of South Florida’s modeling outputs and will include a multi-decadal hindcast and select future scenarios including sea level rise. Historic rainfall time series information will come from long-term rain gauges and the National Weather Service’s Analysis of Record for Calibration (AORC). Statistical results from the rainfall analysis will be compared against and complemented by NOAA Atlas 14 data. Future rainfall scenarios for 2040 and 2070 will consider change factors derived and used for the Community Development Block Grant Mitigation (CDBG-MIT) program to make sure the analysis is consistent with other state-wide and community efforts. A copula-based multivariate extreme value model will be applied to capture the existing dependencies between the different flooding drivers (Jane 2020). The statistical model will then generate a large number of physically consistent event combinations of rainfall and coastal water levels where the marginal distributions and dependence structure between variables are preserved. When assessing future climates, the marginal distributions of rainfall and coastal water levels will be adjusted accordingly, while assuming the dependence structure between the flooding drivers does not change. The latter has been shown to have a smaller effect than changes in sea level and rainfall characteristics (Gori 2022) and would otherwise require computationally intensive and consistent simultaneous modeling of both future coastal water level and rainfall time series.

To reduce the computational cost of the hydrodynamic compound flood model, importance sampling will be applied to derive a smaller but optimal event-set of rainfall and coastal water level

combinations, including minor, moderate, and extreme events with associated joint probabilities. The rainfall and coastal water level peaks are then used to generate different realizations of spatially varying event time series to be used as boundary conditions for the compound flood model (Kim 2023). The compound flood model will be developed through the open-source Super-Fast INundation of CoastS (SFINCS) model, which has been specifically developed to facilitate regional scale compound flood modeling while considering a large number of flood driver combinations (Leijnse 2021). The final compound flood model will be validated through historical storm high-water marks and community testimonials.

In addition to the modeling outputs, existing data, tools, and local knowledge will be compiled and adapted, as needed, to further identify flood-vulnerable communities, both waterfront (gulf, bay, and riverine) and inland. Underserved and marginalized communities will be identified and prioritized in the assessment using national and local tools and open-source data, such as the Climate and Economic Justice Screening Tool, the EPA's Environmental Justice Screening and Mapping tool, and the Tampa Bay Estuary Program's Equity Strategy, as well as the compound flood model developed for this project. This approach will help prioritize locations for identifying flood risk reduction projects in the next phase of the project, ensuring the equitable flow of benefits to underserved communities, and preventing further disproportionate flooding impacts. These prioritized flood risk areas will also inform engagement and outreach efforts, including workshop locations, community meetings, and outreach events. Several jurisdictions throughout the region have completed or are in the process of completing vulnerability assessments that provide readily available data for regional critical assets and mitigation focus areas that can be integrated into the assessment.

While the modeling outputs will focus primarily on compound flooding hazards facing communities, the Tampa Bay Estuary Program will supplement this analysis with a habitat vulnerability assessment for the region. Sheehan et al. (2019) developed a habitat evolution model (HEM) for the Tampa Bay watershed that will be updated with current land use land cover information, Tampa Bay-specific sea level rise scenarios, and then re-run over the entire six-county project area. The Tampa Bay HEM extended the capabilities of the Sea Level Affecting Marsh Model (SLAMM v. 6.2) to include a decision tree specific to local processes and habitats, including seagrasses. The GIS-based model results will inform and identify community and habitat vulnerabilities that are projected to reduce future resilience. These overlays will be used to understand disproportionate vulnerabilities in identified underserved communities in the region, while also taking into account the remaining opportunities to preserve or expand these habitats in un- or softly developed areas. The resulting GIS-based vulnerability assessment will further guide where natural and/or nature-based resiliency strategies could best be implemented to avoid further natural capital losses in the region. All described models are open-source, and model configurations used for the Tampa Bay region will be made freely available through multiple platforms (further details can be found in the "Data Management Plan" section of this proposal). Supporting documentation will outline the models' configuration, widely accessible input data, and reproducible outputs to promote project implementation efforts and reproducibility of the Coastal Master Plan framework.

Next, three one-day, sub-regional training workshops will be held with Community Workgroup members from municipalities and community-based organizations to build skills in facilitating community discussions and listening sessions about flooding. The training workshops will be conducted by the Florida Cooperative Extension Service: Community Voices, Informed Choices program (CIVIC), which is cooperatively managed by Extension faculty from the University of Florida (UF) and Florida Agricultural and Mechanical University (FAMU), a historically black land grant university. Workshop participants will learn how to effectively build inclusive, safe spaces for candid discussions about community flood risks. Community leaders and municipal staff will review their existing engagement processes and consider ways to best attract and meet with their community members, including the public, elected officials, businesses, and others. For example, they may wish to conduct their community meetings as part of existing organizational meetings and events to ensure the greatest reach and inclusive dialogue. They will be equipped with flood risk educational materials informed by the project's flood

maps to share during their community meetings. A mock community meeting will be held so that participants feel well-equipped for meetings of their own. These training workshops will build the capacity of community leaders and municipal staff to listen to residents' concerns and facilitate a process to collaboratively identify potential solutions.

Following the workshops, the community-based organizations will help to coordinate and host six local flood risk listening sessions of their own throughout the region. Introductory materials will be developed to set the stage for listening sessions by describing the Coastal Master Plan, the need for discussions about flood risk, and the development of flood reduction projects and adaptation pathways. The goal is for community organization leaders, with assistance from municipal staff, to host and facilitate their own community meetings, engaging their members, clientele, and neighbors in community discussions about their experiences with flooding, their perceived risks and concerns, and suggestions for solutions. In doing so, the outcomes of the project may accurately reflect the needs of the community and increase willingness to accommodate and support proposed projects. Community leaders will identify where and when to hold these community meetings as well as the support they anticipate needing from the project team to host and facilitate them. Community collaborators will be compensated for coordinating the meetings, and public attendees will receive honorariums. Moreover, CIVIC will provide resources, facilitation kits, and survey forms to collect concerns and ideas, in a consistent way, during the community meetings. Engagement with underrepresented communities will be prioritized to support their participation in the planning process by increasing awareness about current risks and envisioning potential solutions. Local knowledge of flood risk areas will be recorded and incorporated into the model validation of the flood maps.

Initial educational outreach will be conducted by the National Wildlife Federation with targeted stakeholders across Tampa Bay to provide a foundational understanding of the Coastal Master Plan process and how it will benefit the region, as well as general education around coastal risks, examples of solutions, and the importance of community involvement. This outreach via presentations, events, and public messaging will lay groundwork for engagement in community training workshops and risk assessments. In addition, the National Wildlife Federation and the Community Workgroup will facilitate additional community risk assessment conversations to complement the community-led meetings and ensure comprehensive outreach coverage, especially in high-risk, disadvantaged areas that do not have volunteer meeting facilitators to provide an overview of the Coastal Master Plan process and the importance of community input. Meeting activities will include flood mapping and group discussions, similar to the meetings led by community members. This input will be reviewed by the Advisory Team and Community Workgroup to inform the projects that are modeled and the draft plan. If priority areas of flood risk that lack existing community meetings are identified, the project team will host a meeting in partnership with interested community leaders. The completed probabilistic flood maps, habitat assessment, socioeconomic assessments, and community listening sessions will provide a more holistic analysis of the region's resiliency.

Milestones: (1) Current and future compound flood maps are created across the region using consistent methods; (2) Habitat and socioeconomic assessments are conducted; (3) Workshop training of community leaders on facilitating listening sessions and communicating flood risk; (4) Community listening sessions and meetings are facilitated by community-based organizations to gather public needs, perceptions of risk, and solution ideas; (5) General educational outreach on coastal master planning and resilience conducted across region. Regional benefits include: (1) Compound flooding risks are identified across the region; (2) A holistic analysis of the regional resiliency and areas of concern; (3) Community leaders expand facilitation skills and capacity; (4) Community members gain knowledge on the project and begin relationship building; (5) Through workshops and community discussions, local government staff will be better equipped to more effectively understand and communicate risk.

3. Potential project concepts will be solicited from the public, members of advisory groups, and subawards and iteratively evaluated to determine their effectiveness at reducing flood risks and enhancing habitat adaptation, producing equitable outcomes, and feasibility for implementation.

The proposed regional compound flood risk assessment for the Tampa Bay region in Phase Two will identify flood risk hotspots under present-day and future climates to help prioritize project locations for developing flood mitigation and adaptation measures. A variety of methods will be used to develop, screen, and ultimately select candidate project concepts that reduce flood damage and enhance habitat adaptation in those areas most at risk, including structural, nonstructural, and restoration projects. Emphasis will be placed on identifying cross-jurisdictional projects that will support co-benefits, extending past the typical siloed watershed approach, and encouraging regional collaboration.

A six-month public solicitation of projects will foster innovation and support the collection of new and existing structural and nonstructural risk reduction and restoration project ideas. A variety of advertisement methods will be employed to promote the solicitation for projects and maximize the extent of public participation, such as mailing lists, social media posts, and website publications. Current engagement partners of the Tampa Bay Regional Planning Council (e.g. the Tampa Bay Regional Resiliency Coalition, Agency on Bay Management, etc.) will also be utilized to advertise the solicitation period through their established channels. The TBRPC will engage flood-vulnerable communities by attending existing meetings to announce the call for proposals and answer questions. Components of ongoing county-level projects and Adaptation Plans (e.g. Tampa Bay Habitat Master Plan, Tampa Bay Regional Resiliency Action Plan, etc.) that have scalable regional potential may also become candidate project concepts for further evaluation. During the listening sessions that take place in the prior risk assessment phase, community facilitators will collect ideas for solutions and any suggested project concepts. Therefore, anyone regardless of background, can propose projects which will promote creative design solutions, original approaches, and inclusivity.

The inclusion of diverse flood mitigation approaches, including restoration, structural, and nonstructural risk reduction projects, is essential for comprehensive and effective flood risk management. Projects will be developed with a focus on addressing regional-scale challenges and integrating restoration techniques to optimize benefits. Structural risk reduction approaches involve physical modifications to the environment to reduce flooding by controlling or directing the flow of water. Structural risk reduction projects will include nature-based features to harness natural processes in promoting a holistic and sustainable approach to managing flood risks while supporting biodiversity and ecosystem services. For example, Tidal flood barriers, such as living or hybrid shorelines and riparian buffer zones help absorb water, reduce erosion, and provide protection against storm surges and flooding. Retention basins and natural flood storage areas temporarily store excess water during heavy rainfall while providing water quality improvements. Wetland restoration projects involve re-establishing or enhancing ecosystems to slow down and absorb excess water. Urban stream restoration entails reshaping and naturalizing stream channels and reconnecting them with their floodplains. Reforestation involves planting trees in deforested or degraded areas to regulate water flow, reduce runoff, and stabilize soils, contributing to flood risk reduction.

Nonstructural projects include initiatives that focus on policies, planning, and community engagement rather than physical alterations to the environment. These strategies can be applied across numerous communities. For example, nonstructural measures often involve land use planning and zoning regulations to guide development away from flood-prone areas. Restricting certain types of construction in high-risk zones helps minimize exposure to flooding. The Jacobs Public Interest Law Clinic for Democracy and Environment at Stetson University's College of Law will be providing in-kind services to identify non-structural measures to improve resilience through disaster risk and impact reduction. The clinic will leverage mapping resources, demographic information, science, existing law and policy, and funding opportunities to inform the analysis. The clinic will explore existing Florida state and local policies and laws that impact non-structural risk management, participate in raising public awareness, and support training and education. Some examples of possible recommendations include elevating residences, commercial floodproofing, voluntary acquisition, insurance and financial incentives, coastal preservation and hardening tactics, real estate disclosures, and coastal setback provisions. Nonstructural risk reduction strategies will be considered to better support funding and implementation opportunities provided by multiple agencies and programs.

Through in-person and virtual meetings, the Workgroups of project collaborators and partners will collectively develop targeted flood reduction and restoration projects for the priority areas of flood risk. The Technical Workgroup will investigate opportunities to combine features from multiple project types into larger-scale, integrated concepts. Though not essential, in-person design charrettes will facilitate identifying additional conceptual project designs and adaptation pathways, thus the TBRPC will be seeking additional external grant funding to supplement these activities. Further development of partial or amorphous concepts, as well as cross-jurisdictional project opportunities, will be done through outsourced engineering consultants. Project partners and collaborators will also be prompted to discuss projects within the context of potential adaptation pathways, including incremental actions that support dynamic decision making in the face of uncertain conditions and migrating values.

The Tampa Bay Estuary Program will leverage their 2020 Tampa Bay Habitat Master Plan (HMPU) to identify potential areas and habitat types that could be integrated into natural and nature-based project concepts. Restoration opportunity assessments will be expanded to the plan's boundary, utilizing existing methods (Beck 2023) and newly released NOAA 1-m C-CAP land cover products for the Tampa Bay region. GIS analyses of the 1-m resolution NOAA C-CAP layer will identify additional areas for protection and restoration within the Tampa Bay region, specifically within the developed portions of the project area. Fragmentation potential and barriers to future coastal habitat migration corridors within a high-priority reservation space will also be investigated.

The solicitation period is anticipated to bring a wide spectrum of project ideas with varying levels of detail. An engineering firm will be contracted to refine the project concepts for further evaluation. A potential example of refinement might be the adaptation of a gray project concept to a similar hybrid approach. Refined project ideas will then be added to the solicitation list. When identifying and refining flood risk reduction project concepts, the team will leverage existing data and material resources, such as the U.S. Army Corps of Engineers' South Atlantic Coastal Study as well as opportunities for the beneficial use of dredge material. The Tampa Bay Coastal Master Plan will not be overly prescriptive about project details so that designs can be customized and appropriately engineered to site-specific conditions when implemented.

Candidate projects refined from the solicitation list will be evaluated with geospatial land loss and inundation models (as funding allows). The effectiveness of individual projects among the flood risk hotspot areas can be assessed by nesting smaller-domain, very high-resolution models within the University of South Florida's regional coastal water level model and examining impacts of specific mitigation strategies such as living shorelines or other protective measures that reduce coastal water level elevations. Larger-scale strategies, such as marsh restoration, can also be assessed using the University of Central Florida's flood model. All project scenarios will be modeled to 2040 and 2070 in accordance with the Resilient Florida Grant Program and compared to a scenario of no action taken to quantify the project's impact. Smaller localized projects will require additional dedicated modeling from a contracted engineering consultant.

An evaluation matrix of weighted criteria will be developed by the workgroups to further screen and evaluate projects, ensuring they support the plan's objectives as well as the shared vision and goals established in the beginning of the planning process. The Technical Workgroup will work in concert with the other workgroups to identify qualitative social and ecological metrics and their relative weightings to help rank and prioritize projects according to community outcomes, such as equity, habitat impacts, health, housing, navigation, and community vulnerability. The Tampa Bay Estuary Program will support the development of the ranking criteria and assemble scores and visualizations for each candidate project site concept. Specific metrics in the quantitative evaluation matrix may include the leveraging of existing resources. For example, project concepts that utilize the beneficial reuse of sediment from the Army Corps of Engineers' maintenance dredging would be prioritized over those that require new construction materials.

The two proposed resilience goals for the plan –flood risk reduction and enhanced habitat adaptation– will serve as decision drivers for the evaluation of project performance, hence minimizing adverse impacts to one or the other. All projects must have a direct connection to flood management and green or

hybrid strategies. Nature-based solutions and restoration projects will be prioritized as they can reduce flood risk and support ecosystems, whereas a hybrid bulkhead may be deprioritized if it causes further long-term erosion or habitat loss to adjacent coastline, but elevated in importance if it significantly reduces flood damages for an underserved community. Thus, the matrix will provide a way to quantitatively analyze and compare projects based on their anticipated impacts (positive or negative).

Like Phase Two, Phase Three also will consist of three one-day training workshops conducted by CIVIC across the region for groups of municipal staff and community leaders who wish to host and facilitate deliberative discussions with their community members and gather input on feasible project concepts. These workshops will build additional public engagement skills for collecting feedback and building consensus on specific project designs. Deliberation is the process of "raising and collectively considering issues… [where] people discuss, ponder, exchange observations and views, reflect upon information and judgments concerning matters of mutual interest, and attempt to persuade each other" (NRC 1996). The goals of deliberation will be introduced along with a discussion guide and a mock deliberative discussion. Each subregion will have different potential projects to reduce risk and enhance resilience, and each project will have potential advantages as well as trade-offs associated with its implementation. How individuals weigh these advantages and trade-offs is a product of their values and priorities. To achieve collective agreement and common ground, people need to hear others talk about why they prioritize one solution over another and balance these values. Leaders will be reminded that these meetings should, in the long run, empower community members to engage in community governance. Getting to know municipality staff and feeling more comfortable sharing their concerns are steps toward civic engagement.

Local leaders and municipal staff will be invited to host six community discussions across the six-county region. Supplemental funding is being sought to host additional meetings. Community members with diverse perspectives will be invited to share their ideas about the projects, their concerns about the trade-offs, and their priorities for what they believe could be done to increase resilience and reduce risk. Deliberation enables more people to be engaged in decision making, thus strengthening democratic systems and governance (Stern 2005). The goal is for people to share their opinions and preferences, after having been introduced to the issues and opportunities. Members of CIVIC will create a set of discussion guides and introductory materials to frame these discussions around the options that are viable and relevant to each sub-region, as well as likely trade-offs that could occur in the community if the projects were implemented. Engagement with underrepresented communities will be prioritized during the project identification period to empower their voices and participation in the planning process by increasing awareness about current risks and envisioning potential solutions. Community feedback will be integrated to provide another layer of evaluation and prioritization of projects that receive wide support. As a result, prioritized projects will have greater buy-in and endorsement from the community, which will help the communities accommodate and support their implementation. Compensation will again be provided for those organizations who host gatherings and provide responses.

Milestones: (1) Public solicitation period gathers initial broad list of project concepts/ideas around the region; (2) Community leaders and municipality staff trained in facilitating deliberative discussions; (3) Community deliberative discussion are held to gather feedback on refined solicitation list of projects; (4) Project assessment methodology, including modeling, and quantitative evaluation matrix; (5) Revised list of effective restoration and risk reduction projects. Regional benefits include: (1) Engagement of community members to directly contribute to the Master Plan through project solicitation will further build upon existing relationships and garner support of the project; (2) Informed decision making; (3) Community capacity for deliberating complex issues; (4) Leadership capacity for facilitating deliberation and community engagement.

4. A final Tampa Bay Coastal Master Plan will communicate flood risks around the region and prioritize risk reduction and restoration projects to support enduring adaptation. The planning process and results from all previous phases will be detailed in a final report organized by sub-region, such as by county or watershed. The report will summarize future landscape changes and flood risk reduction projects that provide co-benefits to the region's most vulnerable communities and ecosystems.

The TBRPC, with writing support from the National Wildlife Federation, will develop the draft plan. Community and Technical Workgroup meetings will gather feedback on the draft plan from a diverse set of project collaborators and partners, ensuring it reflects the shared vision.

Input from the community will be collected by the National Wildlife Federation through stakeholder engagement, community presentations, and an advertised public comment period. Constructive feedback will be integrated into the final plan including recommendations and lessons learned for the next plan iteration. Towards the end of the project, the workgroups will meet to identify potential funding sources and workforce development needs to support implementation.

An interactive dashboard will complement the Master Plan, enabling full access to data, information, maps and visuals found throughout the plan. The dashboard, developed by the TBRPC through ArcGIS, will allow users to explore elements of the plan and better understand how the coast will change and ongoing efforts to address flooding. Visuals will also be created to help communicate risk to residents and other public and private partners, highlighting how pilot project concepts across the region will progress adaptation efforts and enhance community resilience.

Using the plan of action for the final plan rollout developed in the Outreach and Engagement Strategy (Phase One), TBRPC staff will create resources in English and Spanish to facilitate dissemination, such as a press release and marketing materials. All codes will be published to GitHub, helping to ensure their availability for future use during plan updates, replication elsewhere, and innovative research. At the point of publication, a regional symposium will be hosted to showcase the final Master Plan and its projects. Hosted by the TBRPC, the symposium can feature presentations, panel discussions, and posters to raise awareness about this new resource that will serve as an implementation strategy for the region.

Overall, the plan's collaborative development process and final report will facilitate project identification to allow expedited execution of projects as funding becomes available, such as the NOAA Transformational Habitat Restoration and Coastal Resilience Grants. Therefore, the Coastal Master Plan will provide unified direction to guide investments across the region, thus one voice to assert shared priorities for federal projects. The cross-jurisdictional approach of the risk reduction projects will distribute the burden of applying for and carrying out grants, which is currently a major barrier for implementation by under-resourced local governments. The reported project list will allow local governments to apply for grants on projects backed by novel modeling capabilities and developed in conjunction with community needs and support. The region's underserved communities will thereby have new adaptation resources and be better positioned to receive large-scale flood risk reduction projects. In doing so, the overall resilience capacity of local governments will be enhanced, especially those with fewer resources. Moreover, once implemented, the risk reduction projects will direct long-term resilience benefits to underserved communities by protecting their properties and livelihoods. To further support implementation efforts, the project team will identify sources of potential funding to be incorporated within the plan. In addition, workforce development opportunities will be identified to support implementation across the region.

Ultimately, the Tampa Bay Coastal Master Plan will strengthen the identity of the Tampa Bay region and bolster adaptation and resiliency efforts. Model code and tools can be adopted by local governments to guide smaller-scale adaptation decisions. The plan will be a valuable communication resource for communities to better understand their flood exposure, how the coast will change over time, and place-based adaptation projects and potential pathways. Educational resources and training opportunities will help ensure staff continue to engage the community through deliberative discussions about risk and the ongoing process of adaptation. Finally, the Tampa Bay Coastal Master Plan will be iterated on a five-year cycle to ensure efforts are sustained.

Milestones: (1) Workgroups gather final feedback; (2) Published report separated by county summarizing modeling and risk assessment results and corresponding restoration and risk reduction projects; (3) Interactive dashboard to further visualize modeling outcomes; (4) Creation of summary communication materials, graphics, and Regional Symposium materials to disseminate the project and final outputs. Regional benefits include: (1) Regional coordination and community support to advance

concerted adaptation actions; (2) Local government staff, especially in under-resourced northern counties of the region, will have more capacity to take efficient and effective action when implementation funds become available; (3) Nature-based projects will provide resilience co-benefits to habitats and communities; (4) The region's underserved communities will have new adaptation resources and be better positioned not only to understand their risks but to also receive large-scale risk reduction projects.

Framework for Collaboration

Organizational Structure and Function. Key stakeholders will include community leaders, business and industry representatives, landowners, scientists, NGOs, grassroots community-based organization, health professionals, resilience experts, local, state, and federal agencies, and other interested parties. Stakeholders will be prioritized partly based on their ability to help this project achieve its objectives of fostering cross-jurisdictional regional coordination and collaboration, supporting meaningful and equitable community engagement, maximizing co-benefits for risk reduction, and increasing the local and regional enduring capacity for adaptation. Collaborators will be identified as entities who contribute substantially to the overall strategic direction and decision making and are committed to long-term interactions. Partners will be identified as entities supportive of the project but who do not participate in decision making and do not commit to regular and sustained engagement in collaborative activities. Both entity types will participate in the working group(s) most aligned with their expertise and level of involvement. An Advisory Team, Technical Workgroup, and Community Workgroup will foster regional collaboration to guide the project and focus efforts by leveraging on-the-ground experience and local perspectives. An Advisory Team of key project personnel, including the TBRPC, subawards, and contractors, as well as interested collaborating organizations will be convened monthly for project updates and major decision making. Additional Technical and Community Workgroups composed of project collaborators and partners will be established to support the planning process during the four-year project, ensuring that iterative engagement and shared goals are achieved. The Technical Workgroup will focus on gathering local data and completing the risk assessment and probabilistic flood maps. The Community Workgroup will focus on developing and carrying out the Outreach and Engagement Strategy to maximize regional coordination, participation, transparency, and innovation and build capacity among underserved communities. Workgroups will serve the entire region to communicate and promote knowledge transfer or lessons learned throughout the project. Leaders of the Community and Technical Workgroup will be part of the Advisory Team to disseminate meeting outcomes.

The Advisory Team will maintain regular communication via email and virtual meetings, as necessary, outside of the monthly meetings. As a regional project, all working groups will leverage online platforms and virtual meetings for wider reach and to accommodate those who may face barriers to attending in-person events. Virtual engagement options increase accessibility and inclusivity.

The evaluation of community engagement and satisfaction with the process and plan will be monitored by the Community Workgroup. The Advisory Team will serve to ensure milestones, such as developing specific facilitation skill sets, are met. Since the Advisory Team is composed of the leaders of both workgroups, alternative strategies can be developed as obstacles are faced with a cross-pollination of ideas from both the Community and Technical Workgroups. For example, if the probabilistic flood maps are found to be difficult for the community members to understand, then alternative more-effective designs tailored to events relatable to the community can be discussed. The final plan report will summarize the engagement process and lessons learned to be considered within the next iteration of the Master Plan.

Roles and Experience of Collaborators and Leveraged Resources. The Tampa Bay Regional Planning Council (TBRPC) will lead the development of the Tampa Bay Coastal Master Plan, including managing grants, organizing the project and its resources, ensuring milestones are met, coordinating and convening the various stakeholders and working groups, and other managerial tasks to complete the project activities. In addition, TBRPC staff will assist with mapping efforts and completing the dashboard, and report publication and communication materials. In recent years, the TBRPC has successfully managed over $4.5 million in grant funds, including federal and state awards.

Since 1962, the TBRPC has convened local governments and gubernatorial appointees to plan for and coordinate intergovernmental solutions to complex, large-scale issues. The TBRPC's membership includes 21 municipalities from within the six-county Tampa Bay region—Citrus, Hernando, Pasco, Pinellas, Hillsborough, and Manatee Counties—as well as gubernatorial appointees and state agencies. Through facilitation by the Regional Planning Council, the region's local governments and other stakeholders have been collaborating on environmental and resiliency challenges for over three decades.

As a regional convener, the TBRPC has extensive experience coordinating multi-jurisdictional and multi-disciplinary stakeholders to complete planning projects. An integral part of the TBRPC since 1985 and the first management entity for Tampa Bay, the Agency on Bay Management is a committee that serves as a broad-based forum for open discussion of the issues involving the Tampa Bay estuary, and a voice for protection, restoration, and wise use of its natural resources by the entire region. In addition, the TBRPC has been convening local governments, businesses, NGOs, universities, and advocacy organizations through the Tampa Bay Regional Resiliency Coalition since 2018 to further connect and collaborate on enhancing the resilience of the region. Published in 2022, the Regional Resiliency Action Plan (RRAP) is a living document created by the Coalition to address resilience challenges through intergovernmental and community collaboration. Existing community resilience networks of the TBRPC, including its Regional Resiliency Coalition and Agency on Bay Management, and other project collaborators will be leveraged to garner more project partners and expansive participation, ensuring a multi-disciplinary and geographic balance of regional representation.

For more than 20 years, the TBRPC has maintained a free, online environmental news publication, Bay Soundings. Each story receives thousands of views from across the region and beyond, connecting the environmental work by local, regional, and state agencies to the public. Bay Soundings will regularly publish stories with updates on the Tampa Bay Coastal Master Plan's developments to keep the wider public informed of the plan's progression. To educate the broader public, the TBRPC will also work with more traditional media outlets such as the Tampa Bay Times, the Florida Sentinel Bulletin (the only African American publication in Florida that prints twice weekly and owns all its own printing equipment), as well as with WUSF—the NPR affiliate—and WMNF, a community-owned radio station.

The TBRPC partnered with NOAA in 2023 to host a Risk Communication Workshop with local government staff at the TBRPC office building. The Master Plan's workshops will be similar in scope and feature participants from local community-based organizations and local government staff. In addition, the workshops will leverage NOAA risk communication materials such as those offered through the Digital Coast, including coastal datasets, stories, tools, and training for coastal communities' needs.

In 2023, the TBRPC's Tampa Bay Regional Inundation Coordination (TBRIC) project defined a set of best practices for collecting and analyzing flood scenario data to support vulnerability assessments through first gathering the current flood data utilized by project stakeholders. These datasets were documented in a data crosswalk to allow the flexible transfer of metadata between schemas. The types of flooding data reviewed through TBRIC included storm surge, FEMA flood zones, and sea level rise. Subject matter experts provided feedback on the data crosswalk and recommendations to improve flood scenario data analysis in the Tampa Bay region. Their insights shaped the TBRIC project's GIS data outputs and flood scenario tools. The Tampa Bay Coastal Master Plan will build upon the work of TBRIC by assessing compound flooding, or the interactions between flooding drivers, and habitat coverage through the lens of a regional risk assessment.

The TBRPC's Resilient Ready Tampa Bay was a technical assistance project that enhanced the capacity of Tampa Bay communities to assess, plan for, and adapt to flood impacts through the expanded use of multi-functional green infrastructure systems and resilient site designs. In 2022, the Resilient Ready team, along with local stakeholders, public, and private experts in resilience, including architecture, engineering, and planning professionals, convened for design charrettes in flood-prone study areas within the cities of Tampa, St. Petersburg, and Oldsmar. Charrette participants developed implementation-ready flood mitigation designs and cost-benefit information that can be used to justify state and federal grant funding project proposals.

This year, the TBRPC will be working with Citrus and Hernando Counties to complete their vulnerability assessments, which involves completing an exposure analysis, compiling a list of critical assets, and identifying and prioritizing project focus areas. Furthermore, with funding from the Florida Department of Environmental Protection, the Regional Planning Council is currently working with Stetson University to develop high tide flooding GIS data for the Council's member governments. The Tampa Bay Coastal Master Plan will integrate and build upon these efforts and their data and those of other vulnerability assessments across the region to conduct more extensive modeling (including current and future compound flooding) and larger-scale project concepts that have wider community benefits.

The TBRPC is the lead organization managing the coordinating implementation of the EPA's Climate Pollution Reduction Grant for the Tampa-St. Petersburg-Clearwater municipal statistical area ($1,000,000 grant award). This four-year project entails extensive multi-jurisdictional stakeholder engagement to manage the development of a regional greenhouse gas inventory and Comprehensive Climate Action Plan that will further guide short- and long-term local action to reduce emissions. The TBRPC is the foremost organization positioned to both undertake the Coastal Master Plan's development and sustain the momentum for future updates as another living planning document and resiliency resource. Subawards will be given to the Tampa Bay Estuary Program, National Wildlife Federation, University of Florida, University of Central Florida, and University of South Florida. The TBRPC, project subawards and contractors, and interested collaborators will meet during monthly virtual Advisory Team meetings to relay project updates and accomplish the proposed efforts. In addition, project personnel and collaborators will be distributed among the Community and Technical Workgroups. The TBRPC will conduct regular email and phone call correspondence with subawards, contractors, and other project collaborators.

The Tampa Bay Estuary Program's (TBEP) mission is to build partnerships to restore and protect Tampa Bay through the implementation of a scientifically sound, community-based management plan. TBEP will be involved with completing a habitat risk assessment identifying ecosystems around the region that are threatened by the impacts of sea level rise (e.g. Sherwood and Greening 2014, Sheehan 2019). In addition, TBEP will complete a regional habitat opportunity assessment to determine areas with high restoration potential that can inform project concepts. Through the development of a 2020 Tampa Bay Habitat Master Plan Update, TBEP vetted and developed a process to "maximize the potential" for natural and nature-based restoration solutions that would help attain long-term goals for critical coastal habitat coverage in the watershed (Beck 2023). TBEP proposes to update and expand these assessments with more recent land use land cover datasets to identify additional opportunities where resilience interventions will lead to better outcomes for key ecosystems and communities throughout the project area. As a project collaborator, TBEP will help identify natural and nature-based restoration project opportunities and concepts, develop metrics for a project evaluation matrix, and refine and prioritize project ideas based on available science.

The National Wildlife Federation (NWF) will lead the development of an Outreach and Engagement Plan and regional educational and outreach events during the Tampa Bay Coastal Master Plan development and release. NWF has a history of working across the Gulf of Mexico with key stakeholders to build a breadth and depth of engagement in resilience processes, including coastal master planning processes, resulting in strong public will and robust support for resilience efforts. NWF staff served as technical advisors and were leads on community engagement for Louisiana's 2012, 2017, and 2023 Coastal Master Plans, hosting CMP meetings alongside the Coastal Protection and Restoration Authority (CPRA) for hundreds of community leaders, engaging thousands of stakeholders in public comment processes, and hosting educational field trips and events for communities and diverse stakeholders across the coast. Through NWF's coastal master planning work in Louisiana, NWF has seasoned outreach and engagement resources, including presentation templates, educational master plan handouts and event strategies that can serve as a model. NWF has established best practices for connecting community leaders with coastal decision makers and communicating complex coastal data to broad audiences. NWF's strong partnership with Louisiana's CPRA has helped to reach more diverse audiences for engagement with their Coastal Master Plan, contributed to public messaging and

communication on the plan, and refined mapping and data viewers for public access. In Tampa Bay, NWF has worked on coastal resilience for the last decade, guiding RESTORE funding and researching innovative community engagement methods. Resources, including a storytelling film, a resilience boat tour guide for Tampa Bay, and a research study on local engagement around coastal risks and solutions, can be found on the NWF website. NWF's community engagement methods initiatives, funded by the National Academies of Sciences, enhanced local partnerships with Tampa Bay municipalities, the TBRPC, University of South Florida, Tampa Bay Watch, Tampa Bay Estuary Program, and the conservation filmmaker Wildpath. It also established a network of hundreds of community members interested in coastal resilience in the Tampa Bay area.

The University of Florida (UF) – The Community Voices, Informed Choices (CIVIC) program, co-managed with the Historically Black College/University (HBCU) Florida A&M University, will lead the Outreach and Engagement Strategy to build capacity of staff and community leaders to develop their specific engagement plans to participate in the Master Plan process. CIVIC will work with the project team to train municipal staff and community leaders to provide workshops and educational resources, identify appropriate community members to attend meetings, develop marketing materials and select meeting locations for concern collecting and deliberative discussions, and engage community members in understanding and responding to elements in the newly developed Coastal Master Plan. They will use well-developed strategies from the Kettering Foundation and the North American Association for Environmental Education Community Guidelines for Excellence. CIVIC's leadership consists of faculty with extensive experience and training in deliberative dialogue, facilitating community conversations, and evaluating programs. The long-term goal of deliberative dialogues is to build the capacity of communities and individuals to address local, complex issues and be inclusive of all community members. The CIVIC program has used this process to address water quality issues in the Indian River Lagoon region with under-resourced communities and land use issues in historic Black communities in the Florida Panhandle. Florida Cooperative Extension has faculty and staff in each of Florida's 67 counties who are well-connected to local governments, social agencies, and community organizations. CIVIC has trained over 150 county and state faculty on how to use CIVIC to address complex community issues and contribute to helping CIVIC expand its reach, especially into underrepresented and under-resourced communities.

The University of Central Florida (UCF) will perform the compound flood modeling. More specifically, this research includes the development and application of advanced multivariate statistical models to derive joint probabilities for multiple flood drivers to co-occur. It also includes developing appropriate hydrodynamic numerical flood models, which are able to simulate compound flooding from different drivers and provide accurate estimates of inundation extent and depth resulting from those compound events. UCF has many years of experience developing and applying statistical techniques to assess compound flooding, including past and ongoing partnerships with the South Florida Water Management District, USACE, FEMA, and DOD, among others, who are interested in using methods and tools developed by the UCF team for their respective missions as they relate to compound flood risk analysis and adaptation. The UCF team is also involved in a large-scale Hub funded by the National Science Foundation under the Coastlines and People Program where one of the priorities is to assess compound flooding and co-develop adaptation solutions with stakeholders in the megalopolitan NY/NJ region, focusing on disadvantaged communities with lack of resources. As part of this effort, UCF researchers have further advanced the statistical modeling framework and developed dynamic compound flood models using the Super-Fast INundation of CoastS (SFINCS) model (Leijnse 2021), which is computationally efficient enough to allow regional compound flood modeling considering a wide range of flood driver combinations. As a Hispanic-Serving Institution, UCF offers an inclusive environment to its students and staff, including Dr. Thomas Wahl's research group where 60% of the students and postdocs (many of whom will be exposed to the project) come from groups typically underrepresented in STEM fields.

The University of South Florida (USF) team has decades of experience designing, calibrating, and applying realistic numerical ocean circulation models, particularly of coastal Florida, to the study of coastal storm response, annual and interannual variability, and longer-term climate change. They maintain

the NOAA Physical Oceanographic Real Time System (PORTS®) of operational ocean sensors for Tampa Bay, and work routinely with federal data centers including the National Data Buoy Center (NDBC), National Ocean Service (NOS) Center for Operational Ocean Products and Services (CO-OPS), National Geophysical Data Center (NGDC), and National Centers for Environmental Information (NCEI) that provide access to data necessary for the project. The USF team participates in the Florida Flood Hub for Applied Research and Innovation, created to bridge the gap between scientists, policymakers, practitioners, and the public to help communities mitigate and adapt to flooding risks. The Hub supports the ability of communities to prepare for, withstand, and rebound from flood events and other natural hazards. The USF team is also collaborating on BlueGAP, an NSF-funded project to co-design and build capacity within frontline communities to overcome economic and health challenges caused by nitrogen pollution. BlueGAP participates in direct community engagement and outreach in water-related issues, such as working to co-sponsor and provide personnel for the recent public screening and panel discussion of the documentary "Splash of Color: Getting Black in the Water," a film about Black water advocates in Tampa Bay.

Other Collaborators. The Jacobs Public Interest Law Clinic for Democracy and Environment at Stetson University's College of Law works to create and maintain thriving, healthy and resilient communities and the environment by pursuing and defending justice through advocacy focused on our most pressing issues. The clinic provides public interest services to the public, nonprofit organizations, and local governments, while offering the next generation of advocates opportunities to provide hands-on services, receive multidisciplinary education, and develop leadership skills. It provides litigation support, networking opportunities, and access to knowledge and resources. It seeks to recognize, deepen, and amplify the connections between diverse communities with the shared aim of securing healthy, just communities. The clinic provides Stetson's law students a unique opportunity to learn about and practice movement lawyering, equipping the students with a comprehensive toolkit for client problem-solving. It has also provided legal aid to low-wealth neighborhoods struggling with industrial pollution, environmental and social justice organizations battling inadequate hazardous waste regulation, rural communities wishing to protect agricultural lands, and conservation organizations working to protect preserves and refuges. The clinic is providing in-kind services to identify non-structural risk reduction measures.

Local governments, including counties and municipalities, throughout the Tampa Bay region, have communicated the need for additional resources to support targeted adaptation and resilience measures, especially community engagement. These local governments will be key collaborators and partners throughout the project period. The need for a regional coastal master plan was first identified by local government staff, and they have contributed to this proposal's development. As the primary end users of the Coastal Master Plan and implementers of the adaptation projects, local government staff will be integral to the planning process, especially project identification and evaluation. To the greatest extent possible, mapping efforts will leverage existing local data and other contextual information on flooding provided by staff, such as community flooding complaints. Active projects being planned by these governments will be evaluated for inclusion in the plan to align with current efforts and leverage existing resources. Staff from collaborating local governments will participate in the plan's workgroups and various activities, and they will be encouraged to attend community meetings. The proposed training workshops will be tailored to both local government staff and community leaders to foster deeper relationships between them and to enhance their capacities to engage their respective communities for more impactful, holistic adaptation.

Nine community-based organizations have already committed to participating as collaborators or partners, and this number is expected to grow. These organizations include Florida Clinicians for Climate Action, Institute for Equitable Development, Inc., The Power of Help, Tampa Heights Junior Civic Council, Progress Village Civic Council, Inc., Alianza Center, Urban Progress Alliance, Inc., Enterprising Latinas, Inc., and the Dr. Walter L. Smith Library. A centralized community-based organization, to be determined, will be contracted to oversee the coordination and reimbursement of the other community organizations. All community-based organizations will be invited to join the Community Workgroup

(their participation at each meeting will be compensated), although all those who are interested may join the Advisory Team. These organizations will be essential liaisons for the community, and they will lead the coordination of the 12 local meetings (for which they will be compensated). Five additional environmental nonprofits are committed partners to the project, including Tampa Bay Watch, Tampa Bay Waterkeeper, and Ecosphere Restoration Institute, Inc., Gulf of Mexico Alliance, and The Water Institute. Through the workgroups and various community meetings, these organizations will support the collaboration and exchange of knowledge needed to pioneer and sustain this new cycle of adaptive flood management for Tampa Bay's coastal communities.

Other local, state, and federal agencies will participate as partners for the plan's development; therefore their representatives will attend the workgroups to inform the planning activities. The cooperation and regional collaboration of these agencies is critical to align resources, such as data and existing processes, therefore maximizing the potential for implementation. These agencies currently include the Southwest Florida Water Management District, MacDill Air Force Base, U.S. Fish and Wildlife Service, and U.S. Geological Survey. Additional efforts will be made to garner the support and expertise of other agencies when the project begins.

Sustaining Collaboration. This proposed first iteration of the Tampa Bay Coastal Master Plan will activate a structured and iterative planning process that will occur continuously over a five-year cycle to ensure sustained coordination, with a new edition of the Coastal Master Plan published at the end of each cycle. As a living document, the Coastal Master Plan will include recommendations and lessons learned for the next plan update. Between cycles the TBRPC will seek funding to support these activities and the participation of community members. The relationships fostered between collaborators, partners, and community members will be seeded with the first iteration of the plan, and subsequently nurtured through continued collaboration on other Tampa Bay Regional Planning Council projects and future plan updates. For example, the plan will forge deeper relationships between community-based organizations and local government staff. With every passing iteration, the relationship building between these entities will cultivate fruitful, symbiotic, and trusted partnerships. Since some of the final projects included in the plan may involve numerous municipalities or counties, they will be encouraged to continue collaborating as implementation efforts progress.

The proposed project includes two sets of workshops to train local organizations and municipal staff to communicate risk, listen to and integrate community concerns, and host deliberative discussions to collaboratively identify mutually beneficial solutions. These training workshops not only assist in informing the Coastal Master Plan, but they are also intended to enhance the capacity of participants, especially leaders of underserved communities and local government staff, to continue these crucial conversations about climate change, local risk, and equitable solutions long after the project is completed. Trained community leaders can sustain ongoing engagement efforts, ensuring that the community remains informed and involved over the long term. This sustainability is critical for adaptive management and resilience-building processes.

Communities can take advantage of the project collaborators' resources to catalyze project planning, funding identification, and grant writing. For example, NWF's Natural Infrastructure Center for Environmental Justice and Resilience (NICER) is a collaboration across the Federation's Environmental Justice, Climate, Coasts, and Regional Center teams to advance equitable and community-driven deployment of nature-based solutions around the nation, with a focus on underserved communities. The NICER also provides a forum for knowledge transfer and sharing of case studies and lessons learned within the Federation and affiliates network. Through NWF's collaboration throughout the coastal master planning process, local government staff working directly with communities to advance nature-based solutions will have access to a broader set of tools, expertise, and capacity to amplify successes or to seek advice as community needs adapt and evolve.

Engagement, Workforce Development, and Knowledge Transfer

Public Engagement. The main purpose for developing the Tampa Bay Coastal Master Plan is to provide guidance and support for local communities already facing challenges with flood risk. The inherent collaborative design of the plan's development process incorporates the input from a collective

network of community stakeholders and ensures that the communities' best interests are considered. Community engagement is paramount to the Tampa Bay Coastal Master Plan's overall development and implementation. Communities with actively engaged citizens are likely to be more resilient, more equitable, and more capable of making good decisions for their future (Ardoin 2023). By identifying and inviting community groups and organizations to be part of the Tampa Bay Coastal Master Plan process in its earliest stages, and by training community leaders to host and facilitate community discussions, this proposed project is integrating civic engagement into the fabric of the plan across the region in underserved communities from the bottom up and not the top down. This will foster trust and bring deeper connection and hands-on involvement for vulnerable communities to work directly on a coastal master plan that truly considers who is most likely to be impacted by the Master Plan. In this way, historically marginalized communities can become equals at the table and included in all levels of decision making.

The Tampa Bay Coastal Master Plan will form a representative Community Workgroup to engage, educate, support, and collaborate with local communities by means of training workshops, listening sessions, and deliberative discussions. The Community Workgroup will identify underserved communities, community-based organizations and leaders that are steeped in local needs and have the capacity to organize outreach and engagement in their neighborhoods. Identifying gaps and further developing these partnerships will be the first essential task of this planning grant. The Community Workgroup will use national environmental justice tools and engage local government staff, county extension offices, a variety of faith-based groups, neighborhood associations, community centers, social service agencies, non-governmental organizations, community development agencies, federally qualified health centers and others to identify community leaders and organizations in underserved areas with and without a history of civic engagement. Leaders from underserved communities will be invited to participate in the various project activities along with businesses, retirement communities, marinas, and other traditional stakeholders to ensure comprehensive and equitable outcomes. These leaders and organizations will be invited to join the project as collaborators or partners and participate in the Community Workgroup and the engagement and outreach process at a level they deem appropriate. Concurrent outreach efforts at existing community meetings will help inform public stakeholders of the planning process, the importance of adaptation efforts, and how to get involved. Continued, iterative engagement of the community and integration of their feedback at every stage of the plan's development will ensure the final plan reflects a regional vision and local voices often overlooked, elevating their agency and participation in decision making for their future.

Two sets of training workshops will be offered by the University of Florida's CIVIC team in Phases Two and Three to enhance the capacity of local governments and community-based organizations to continue engaging residents about flood risk and mitigation strategies. Community leaders, when trained, can convey complex information about flood risks and mitigation strategies in a way that is accessible and relevant to residents. Community leaders are trusted figures within their neighborhoods. When these leaders are knowledgeable about flood risks and mitigation, residents are more likely to trust the information and take it seriously. Furthermore, training community leaders encourages a sense of ownership over adaptation efforts. When leaders actively involve residents in the decision-making process, the community becomes more engaged and committed to implementing and sustaining flood reduction strategies.

Following the two types of workshops, community-based organizations will host six local community risk listening sessions and six deliberative discussions, respectively, where residents can share their knowledge and experiences with flooding as well as ideas for flood mitigation solutions. The project will provide honorariums for attendees, to ensure accessibility and inclusive participation. Mapping exercises will facilitate the identification of flood-prone areas, and candid conversations about flooding will help community leaders delve deeper into the unique concerns and needs regarding flood mitigation. Communities possess invaluable local knowledge about their areas, including historical flood patterns, vulnerable locations, and community-specific challenges. Directly engaging community members will tap into this expertise, ensuring that flood risk management strategies are informed by the people who

understand the local context best. Community leaders can leverage existing social networks to disseminate information and encourage collective action. Strengthening social ties within the community enhances its overall capacity to respond to flood risks, fostering a sense of unity and mutual support. To better support the engagement of stakeholders in developing the desired project outcomes, community-based organizations will be funded to participate in Workgroup meetings and coordinate their community risk listening sessions and project deliberative discussion meetings.

The community will also have a chance to provide feedback on the draft plan before it is finalized. Besides a public comment period, NWF will provide targeted community presentations as well as outreach to at least 50 stakeholders and collaborate with community-based organizations to garner input from historically marginalized communities. In addition, the Project Director and coordinator will provide presentations to any willing community or agency committees to solicit additional feedback.

Best Practices for Communicating Risk. The project's modeling efforts will produce probabilistic compound flood maps to better understand how the coastal landscape and risk will change over time, as well as which high-risk communities to engage. Although science can be used to communicate risk to some audiences, like researchers, science alone won't resonate with everyone. To effectively communicate risk, the Community Workgroup will first identify the diverse values and concerns of the various stakeholders to design a communication approach as part of the Outreach and Engagement Strategy. Ample representation from different stakeholder groups will ensure effective messaging for a variety of audiences. Community leaders who are trusted messengers will help to build rapport more quickly with audiences and more effectively deliver messages. As relationships are fostered, common jargon to communicate on personal experiences and exposure to flooding can occur. The Community Workgroup will seek technical assistance from NOAA staff and their existing resources to identify messaging that will resonate with the project's audiences and inspire action, which will be included in the training workshops, outreach efforts, and the final plan.

Community conversations about risk will focus on what people are observing in their neighborhoods to keep messaging local and the impacts personal and relatable. Establishing a two-way dialogue with community organizations on flood risks offers the opportunity to learn about their lived experiences and worldviews to create strategic communication plans that inspire stakeholder support and realistic action. Workshops will teach community leaders how to facilitate these important conversations and the ways to appropriately and clearly frame risk while listening to participant concerns. Discussions about the Coastal Master Plan and flood risk can be framed using messages that connect with audiences' core values, such as the need to be prepared, taking personal responsibility, stewardship, and working together as a community and region to reduce flood damage. For example, UCF can also provide flood maps of specific past events, with which communities can relate (e.g. they experienced that event), to produce event-based storylines as another option to better communicate flood risk (Sillmann 2021).

In addition to communicating risk, the project will help identify what can be done via specific projects to address said risk. In doing so, the project balances providing both information and actionable solutions to prevent invoking fear and anxiety. Pairing risk information with tangible ways people can respond is critical for successful adaptation. The two will go hand-in-hand in both sets of community meetings - the risk listening sessions will include time to propose solutions, and the deliberative discussions for project feedback will revisit risk to frame the need for each solution. The final plan and dashboard will similarly feature both current and future risks as future landscape changes as well as targeted solutions that demonstrate practical adaptation pathways. These resources will support informed decision making by all stakeholders who now have a better understanding of what is at risk and what they can do about it.

Knowledge Transfer. The Tampa Bay Coastal Master Plan entails a cross-jurisdictional development process that will facilitate knowledge transfer within and outside the Tampa Bay region to bolster coastal adaptation. Robust engagement efforts throughout will facilitate the co-production of knowledge with the community for a more inclusive integration of different knowledge types (scientific *and* local). For example, local knowledge and modeling efforts will have a mutually informative relationship. Recorded resident experience over known storm events will help validate the modeling

efforts, especially in areas lacking data. Likewise, outcomes of the modeling efforts, in the form of current and future flood map scenarios, will inform community members.

Prioritizing the accessibility of data and project concepts to the public through a variety of means, including reports, meetings, community events, maps, and a dashboard, ensures they will be both useful and usable long into the future. In recognition of the need to enhance the local capacities of knowledge transfer on these complex issues, the project's training workshops will focus on knowledge transfer, including that of risk and potential solutions. This includes creating safe spaces for knowledge exchange, learning how to facilitate listening sessions and deliberative discussions, and how to successfully communicate, distribute and integrate that knowledge for management.

To the greatest extent possible, the project will utilize open-source data and tools, so the plan is transparent and publicly accessible. All codes will be published to GitHub, helping to ensure their availability for future use, updates, and innovative research. Model code and tools can be adopted by local governments to guide adaptation decisions. The Tampa Bay Coastal Master Plan will be updated every five years to foster adaptive management. Therefore, the plan will be a living document, and each iteration will build upon the last. Subsequent editions of the plan will expand upon the models and decision-support tools with the latest research and newest technologies. As the first in the state of Florida, the Tampa Bay Coastal Master Plan will document and publish all technical and engagement methods to support replication outside of the region. As a result, other Regional Planning Councils and resilience entities will have a model to inform their own plan's development. Since full transparency and replicable methods will stimulate similar plans elsewhere, the Tampa Bay Coastal Master Plan can be a catalyst for coordinated adaptation across Florida and beyond.

Information Accessibility and Impact. Throughout the project, updates to the general public will be made available through stories published by the Tampa Bay Regional Planning Council's environmental news publication, Bay Soundings. In addition, Advisory Team members and participants in the Community Workgroup will be encouraged and supported to share information through their communication networks on websites, social media, newsletters, and other means. A media kit will be developed, including press releases, media graphics, biographies, talking points, contact information, and more. Once completed, the Coastal Master Plan will be communicated through a variety of channels, including presentations at regional meetings, traditional media outlets, amplified through social media, and community events. The TBRPC will offer presentations to community partners and meet with relevant local, regional, and state officials to ensure the plan and project team serve as a resource for future decision making. Upon publication, a final symposium event will be hosted to unveil the plan to the community, doubling as a press conference to generate media attention.

The Tampa Bay Coastal Master Plan will primarily be documented in two mediums - a final report and an interactive dashboard. The report is intended to provide a comprehensive overview of the plan's purpose, development, and findings. The report will include engaging graphics and summaries of the current and future flood risks faced by the region, as well as descriptions of the project concepts organized by county. An accompanying dashboard will facilitate information sharing by providing a more interactive, accessible platform for visualizing risk and proposed projects around the region. The dashboard will provide communities with a user-friendly tool to navigate the report's information. Compelling graphics and visualization will help to convey the proposed projects. The report and dashboard will be ADA compliant and made available in both English and Spanish to ensure equal access to all. Hard copies of the final report will be made available, and a digital copy, along with links to the dashboard and other resources, will be featured on its own webpage on the TBRPC website.

As the first comprehensive effort to fully model compound flooding across a multi-county region in Florida, the methods and means for completing a regional risk assessment can spur innovation in flood research and management. Since existing tools do not comprehensively assess compound flooding, this project will produce extensive flood maps that more accurately convey flood risk. As a result, communities in the Tampa Bay region will be better equipped to identify their actual flood risk and subsequently make mitigation decisions. Regional efforts to identify and evaluate risk reduction projects will position local governments to pursue funding on high-impact projects in coordination with one

another. As one of the most at-risk regions in the world for flood damage, the positive impact of this plan cannot be overstated.

Towards the end of the project, the workgroups will also identify potential funding sources and workforce development needs to support implementation. As the regional coastal concerns and adaptation projects are identified, some will likely herald significant change – change that may transform communities which will likely suggest the potential for new job creation and the need for workforce training. Project implementation can be a catalyst for new economic opportunities that support adaptation, further advancing the ability of the region's people and places to thrive in the face of global climatic changes. Potential grant opportunities will be summarized in the plan as an additional resource for local governments to carry out their respective projects. The menu of diverse restoration, structural, and nonstructural risk reduction projects will help sustain adaptation efforts by providing numerous types of activities for asynchronous yet coordinated implementation.

Strategy for Advancing Equity and Support for Underserved Communities

Numerous coastal and inland households across the Tampa Bay region face both flood risk and other socio-economic stressors, such as low income and linguistic isolation, that compound their vulnerability. Many of these marginalized and underserved communities are typically excluded and/or underrepresented in decision making processes. Therefore, a vision of resilience guiding this project is one in which all affected communities will have opportunities, resources, and representation to support local and regional adaptation efforts. The proposed project includes collaborators and activities specific to enhancing equity and advancing benefits for marginalized, underserved, and underrepresented communities and tribes. The previous "Resilience Vision, Strategies, and Activities" section of the narrative provides additional detail about community engagement throughout the four phases of the project.

The inclusive planning process of the Tampa Bay Coastal Master Plan will reach beyond governmental partners, a common barrier for large-scale planning efforts, to deeply engage and empower underserved communities, ensuring the project and its outcomes equitably reflect the interests, values, and priorities of all residents. Equitable community engagement involves participatory approaches and activities that prioritize input from all stakeholders, particularly those disproportionately affected by flooding. The plan will deploy a set of strategies for engaging in a way that will empower people to make a difference in their community and develop the knowledge, skills, and motivations to continue advancing adaptation efforts. These strategies include:

- **Capacity Building:** Providing training workshops and resources to community members to enhance their understanding of flood risks, mitigation strategies, and decision-making processes. Empowering residents and community leaders with knowledge and skills enables them to actively participate in developing and implementing flood resilience initiatives.
- **Transparent Decision Making:** Establishing clear mechanisms for sharing information, soliciting feedback, and selecting projects openly and transparently. This fosters trust and accountability within the community and ensures that all stakeholders have a voice in the decision-making process.
- **Place-Based Solutions:** Every community is unique, with diverse geographical, social, and economic characteristics. Engagement allows for the development of tailored flood risk management strategies that consider the specific needs and vulnerabilities of each community. The identification of individual place-based projects, and the inclusion of local input, will help to avoid maladaptive actions that would lead to increased vulnerabilities and disparities in underserved communities by engaging them early in the process.

Engagement has already begun during this proposal's development, and the project has gained substantial momentum which will progress even further once awarded funding. Several community-based organizations are already committed as project collaborators and efforts will be made to engage others for a geographic and equitable balance of representation. Non-profit organizations representing underserved communities will be prioritized for inclusion in the project. In addition, the project team will seek out minority-serving institutions, such as HBCUs, as partners or collaborators. Federal tribes that have historical connections to the area, including the Miccosukee Tribe, Seminole Tribe of Florida, and

Muscogee (Creek) Nation have been invited to participate in the planning activities, and additional attempts will be made upon project commencement.

Since most agency representatives participating in the project will be compensated for their time, under-resourced community-based organizations representing underserved areas should be too. The budget includes funding to contract a local community-based organization "Liaison" to coordinate and distribute funding to 15 community-based organizations for their participation in workgroup meetings and hosting respective community meetings. In addition, honorariums will be provided for community members to attend said community meetings. Organizations serving underrepresented communities will be compensated for their involvement and time, and they will each determine how to best use funds for the most effective outcomes in their community. For example, to compensate those who facilitate meetings or to provide transportation and a meal for those who attend the meeting.

Staff working on this project will be dedicated to continuing cultivating relationships with community leaders to foster deep engagement in governance. Relationship-building will engage diverse community leaders, such as faith-based leaders and community champions. Community leaders representing underserved areas will participate in Workgroup meetings and training workshops with local government staff and elected officials, facilitated by team-building activities, to nourish connections among them that can be sustained after the project ends. To ensure transparency and engagement, the contracted Community Workgroup Liaison will deepen trust communicating between the Advisory Council and community-based organizations and leaders. This will enable leaders to pursue future community concerns that may arise from facilitated discussions that are outside the scope of this plan for coastal resilience, such as rising temperatures and public health.

Project activities are designed to maintain a focus on underserved communities and will assess equity impacts to ensure benefits are directed to those people and places most vulnerable to flood impacts, allowing for any necessary adjustments in strategies to avoid unintended disparities. Underserved and marginalized communities will be identified and prioritized in the risk assessment to identify locations for projects that maximize the equitable flow of benefits so they will have new adaptation resources and be better positioned to secure funding and receive large-scale risk reduction projects. For example, identified communities within each county at risk of flooding in 30 years, and with more than two socioeconomic risk factors according to the Climate and Economic Justice Screening Tool, include but are not limited to: Point Ogden (Manatee County), Salt Creek (Pinellas County), Progress Village (Hillsborough County), Sea Pines (Pasco County), Chassahowitzka Swamp (Hernando County), Homosassa Springs (Citrus County). Progress Village Civic Council, Inc. is already a project collaborator engaging with Hillsborough County's first African American suburb. This community list will be expanded upon, and stakeholders will be included meaningfully at every phase of the project to guide decision making and maximize benefits in accordance with the Justice40 Initiative.

Furthermore, the project identification phase will feature an evaluation matrix of ranked criteria to screen and prioritize projects for inclusion in the final plan. Key social and ecological criteria will be assigned relative weightings informed by the workgroups such that the plan reflects accessibility and community equity. As a result, projects that reach more underserved communities will be prioritized higher. The advantage of the Coastal Master Plan's adaptive management cycle is that each activity phase can be flexibly tailored to serve the community needs and goals set forth at the onset of the project, and lessons learned can be reflected in future iterations.

Evaluation

The Tampa Bay Coastal Master Plan features numerous activities that can be tracked through quantitative and qualitative measures to better understand the project's success in achieving the desired outcomes. The Advisory Team will serve to ensure milestones, such as developing specific facilitation skill sets, are met. All contracts and subawards will report to the TBRPC quarterly to ensure progress; a standardized progress template will be used.

Community Engagement and Training Workshops. All community outreach tasks, workshops, and community meetings will produce recorded data. The evaluation of community engagement and satisfaction with the process and plan will be monitored by the Community Workgroup.

Within the Outreach and Engagement Strategy, the Community Workgroup will identify clear measures of success for the community engagement activities. Both quantitative and qualitative measures can be used for evaluating public participation. For example, measures may include the number of attendees, the number of active Community Workgroup members, the number of comments and content of feedback, and the number of recurring participants in community meetings. Pre- and post-surveys can be administered before and after the two sets of workshops to evaluate the success of learning outcomes. CIVIC has an online evaluation instrument that is used to determine whether deliberative dialogue participants 1) increased their knowledge of the issue, 2) heard other perspectives related to the issue, and 3) plan to take some action to address the issue (Monroe and Seals 2023).

Mapping Efforts. Specific metrics to assess the model's performance will compare the model-calculated water level along the coast to levels previously recorded by the tide gauges or high water marks. Community stakeholder input can also provide information on past flood events where historic data is lacking, especially in underserved areas. Independent review from NOAA Technical Assistance will verify the quality of the modeling framework and output. Review and comments will be assessed when possible, prior to the creation of the final report. Broader considerations will be noted in reporting documentations and considered upon the next iteration of the Coastal Master Plan.

Project Identification. The number of projects submitted and evaluated through the project identification phase provides a quantitative measure for tracking input. The feedback received on project concepts through community meetings will be a helpful indicator of public support. Feedback will be integrated into the final project concepts for further refinement and prioritization, ensuring the final projects reflect community input.

Project Publication and Beyond. The planning process will be documented in the final plan report, including lessons learned, which if then successfully implemented in the next iteration of the plan, will provide another measure of success in adaptive management. Following the report's publication, the TBRPC will prioritize assessing the level of community support for the plan through surveys, feedback sessions, and participation in ongoing resilience planning activities. High levels of engagement and support indicate successful outreach and communication efforts. The TBRPC will track the number of dashboard views and the average length of viewing sessions, in addition to the number of final reports handed out to communities. Email campaigns via Constant Contact will report the number of viewers and clicks received, which further quantifies the plan's reach.

To monitor the Coastal Master Plan's long-term effectiveness, the TBRPC will track the regional progress toward implementing the prioritized adaptation projects outlined in the master plan. This could include the completion of infrastructure projects, the adoption of policy recommendations, and the allocation of resources. Subsequent iterations of the Coastal Master Plan will include case studies of successful implementation actions resulting from the plan. The case studies will provide in-depth analysis of the projects with measured socio-economic and environmental benefits resulting from implementation. The measured values of these projects will not only evaluate their overall net-positive outcomes but will also provide a tangible precedent for other communities considering similar future projects.

Additionally, the TBRPC will monitor long term reduction in risk and vulnerability using the compound flood risk maps mentioned in the plan, comparing pre-implementation risk levels with post-implementation outcomes. The TBRPC will also monitor the extent to which the prioritized adaptation projects provide co-benefits to the region's most climate-vulnerable communities and ecosystems through improvements in public health, economic stability, biodiversity, and social equity data metrics. The various project deliverables will also serve as milestones to track progress and ensure success in completing the activities. The deliverables are summarized in the Appendix – Scope of Work Summary Table.

NOAA Technical Assistance

NOAA technical assistance could provide valuable support from the early stages of the project and beyond. The Advisory Team would take advantage of NOAA's regional contacts to supplement the stakeholder list, especially in underserved communities. The Technical Workgroup may also benefit from connecting with a compound flooding subject matter expert(s) to potentially serve on the Technical Workgroup, facilitate novel exchange of ideas or approaches, and/or provide useful review of the modeling methods and framework as described in the Technical Strategy. Assistance could be provided to further support and access relevant climate, geospatial, and socioeconomic datasets and modeling tools to be employed during the compound flood modeling efforts.

The Coastal Master Plan will benefit from NOAA for applying climate, geospatial, and socioeconomic data and tools, acquiring geospatial data or services, and assistance interpreting and integrating results from data analyses or modeling. Once all flood and socioeconomic maps are developed, providing assistance to interpret and integrate results from these efforts into a singular integrated flood risk assessment will be beneficial to facilitate the identification of ideal project site locations. The initial project concepts will then be refined through a quantitative project evaluation matrix. These metrics will be identified based upon priorities assessed from community feedback in combination with other appropriate hydrologic and ecological factors. NOAA technical assistance could support the identification and weighting metrics to be incorporated into the quantitative evaluation matrix for project concept evaluation.

The TBRPC has previous experience partnering with NOAA to host a climate risk communication workshop for local government and other agency staff. NOAA's assistance and staff facilitation during the proposed training workshops will connect attendees with valuable risk communication resources and expertise co-producing adaptation solutions with underserved communities. NOAA's Digital Coast will be leveraged as another tool to support community conversations about flood risk and management solutions.

Upon completion of the Master Plan, NOAA's resources and outlets will help to further disseminate lessons learned and approaches taken by collaboratives. Broadcasting the project outcomes and summary would promote further adoption of the Coastal Master Plan framework throughout the Gulf of Mexico and thereby encourage a comprehensive effort toward strengthening coastal resiliency. In this way, advertisement of the final project list and interactive dashboard will expand the impact of investments among and beyond the resilience challenge awards.

There is interest in hosting a fellow for the duration of the period of performance. Primary oversight would be provided by the Project Manager, and mentorship would be provided by a Project Coordinator. It would be expected that the fellow would participate on the Advisory Team and aid in coordinating workgroup meetings. The focus of their work would be adaptive to the fellow's skills and interest to maximize their reach. Flexible pathways exist both in the Community and Technical Workgroup. For example, in the Community Workgroup a fellow could assist facilitation of community leader training and synthesis of listening session data. While in the Technical Workgroup, a fellow would gain firsthand experience on the development process for an open-source compound flooding model configuration, hone GIS skills to refine large-scale map outputs at the county-level, and cultivate communication of technical information to a wide audience. Regardless of their path, a fellow would walk away with a better understanding of coastal management from a holistic perspective (e.g. science, policy, public), gain experience with interdisciplinary collaboration with stakeholders convened from diverse backgrounds, and develop project management skills that would be applicable to future career prospects.