



SUSTAINABILITY
AND RESILIENCY



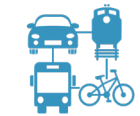
HISTORIC
PRESERVATION



ENVIRONMENTAL
SERVICES



PUBLIC
ENGAGEMENT



INFRASTRUCTURE
PLANNING



ECONOMIC
REDEVELOPMENT

CREATIVELY TRANSFORMING

HOW OUR WORLD IS envisioned + designed + experienced

CITY OF KEY WEST
COMPREHENSIVE ADAPTATION AND RESILIENCE
IMPLEMENTATION PLAN | RFQ #22-001

COPY





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Cover Letter

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CITY OF KEY WEST
RFQ #22-001

January 11, 2023

City Clerk
City of Key West
1300 White Street
Key West, Florida 33040

RE: Key West Comprehensive Adaptation and Resilience Implementation Plan | RFQ #22-001

Dear Selection Committee Members,


With its historic streetscapes and vibrant culture, the **City of Key West (City)** is among the world's most unique environments, with much to be proud of and many opportunities for continued success. **WGI, Inc. (WGI)** applauds the City for being proactive regarding your community's resiliency—understanding the compelling business case for aggressively addressing its vulnerabilities. We recognize the importance of this plan to the City, seeking **actionable solutions which are realistic, fundable, and supported by the community**. We intend to serve as the City's trusted advisor, providing you with a strategic, creative, and passionate team to help create an implementable plan to address adaptation and resilience within all aspects of the community, including social, ecological, and economic.

With the WGI team, the City receives:

- **TECHNOLOGY.** We incorporate innovation and technology in our projects—our data collection, outreach, planning, and design efforts will incorporate WGI's innovation and technology platforms where appropriate, including our proprietary Real-Time Flood Forecasting Model, which predicts flooding and gives communities the power to prepare, mitigate, and recover from a catastrophic event. Some other examples include using an ESRI platform called Story Map for interactive mapping, using an app similar to Key West Connect for public engagement, and collecting LiDAR data.
- **EXPERT LEADERSHIP.** WGI's **Angela Biagi, PLA, LEED BD+C** will serve as project manager, bringing her 20+ years of experience leading the successful collaboration of public agencies and stakeholders on countless projects throughout Florida, incorporating resiliency, multi-mobility, economic catalysts, green infrastructure, and placemaking. Principal in Charge **Michael Davis, MS** has extensive experience with high-profile planning and infrastructure projects, including local projects such as the Monroe County Comprehensive Plan and the Comprehensive Everglades Restoration Plan. He brings project strategy, local knowledge, program management experience, and national environmental, resiliency, and transportation policy experience. Angela and Michael will be supported by a strong team of professionals, with a task lead assigned to each key service category to ensure we tackle this project efficiently and in a structured manner.
- **LOCAL PUBLIC OUTREACH TEAM.** We emphasize inclusive and efficient outreach, especially for complex projects like this one. Key West-based team member **Heather Carruthers of K2M Design** will lead our outreach efforts, bringing a business and resident's perspectives from a well-known professional and local leader. Also, given the importance of Naval Air Station (NAS) Key West, we offer Navy-veteran **Jason Hignite of CHA Consulting** to serve as a liaison for cooperating with NAS Key West.
- **FAMILIARITY WITH THE CITY.** We have a deep understanding of the City's history and strategic vision. For example, our teaming partner **Moffatt & Nichol** is currently helping further this vision through their involvement on the Sasaki team for Mallory Square. We have a thorough understanding of the Key West landscape, geology, topography, and vulnerabilities associated with climate change and sea level rise. WGI offers the City an intentionally assembled team of local, state, and national experts with experience in vulnerability assessments; placemaking in destination-driven/historic town centers; effectively engaging communities; planning/designing infrastructure; using sustainability, resiliency, and historic preservation as key design principles; and promoting social wellness and economic development with an understanding that addressing the effects of climate change is not only the right thing to do, it is essential for economic growth and good for business.
- **COMMITMENT TO DIVERSITY.** WGI has a proven record of strong partnerships with women and minority-owned businesses (W/MBE). We are teamed with **three highly respected WBE firms** (including Key West local **Stafford Gordon Consultants** and consultant **Annalise Mannix, MS, PE, PMP, Envision SP**) on this project and look forward to utilizing their strengths and qualifications to enhance ours.

We look forward to assisting the City in preparing for and addressing the effects of sea level rise and heat, especially coastal flooding, erosion, and ecosystem changes, on the City's infrastructure and overall health. We are ready and prepared to serve as your reliable and trusted partner on this critical plan for Key West's future. As the project manager and principal in charge, we commit to the City a dedicated team of experienced professionals and our personal involvement.

Sincerely,



Angela Biagi, PLA, LEED BD+C

Director, Urban and Community Planning | Project Manager




Michael Davis, MS

Senior Vice President/Chief Strategy Officer | Principal in Charge

PRIME PROPOSER

WGI, Inc.

2035 Vista Parkway
West Palm Beach, FL 33411

CONTACT

Angela

Biagi, PLA, LEED BD+C

Project Manager

p. 561.269.2173

e. Angela.Biagi@wginc.com



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Information Page

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CITY OF KEY WEST
RFQ #22-001

INFORMATION PAGE



PROJECT NAME

Comprehensive Adaptation and Resilience Implementation Plan
RFQ #22-001

PRIME CONSULTANT SUBMITTING THE RESPONSE

WGI, Inc.

AUTHORITY TO MAKE REPRESENTATIONS FOR THE FIRM

Michael Davis, MS

Senior Vice President and Chief Strategy Officer
2035 Vista Parkway
West Palm Beach, FL 33411
p. 561.687.2220 | f. 561.687.1110
Michael.Davis@WGInc.com

PROJECT MANAGER

Angela Biagi, PLA, LEED BD+C

Director, Urban and Community Planning
2035 Vista Parkway
West Palm Beach, FL 33411
p. 561.687.2220 | f. 561.687.1110
Angela.Biagi@WGInc.com



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Organization Chart 3

CITY OF KEY WEST
RFQ #22-001

LEGEND

● WGI, Inc.

● Moffatt & Nichol

● K2M Design

● Annalise Mannix

● Lewis, Longman & Walker, PA

● ecoPreserve

● CHA Consulting

● Redevelopment Management Associates

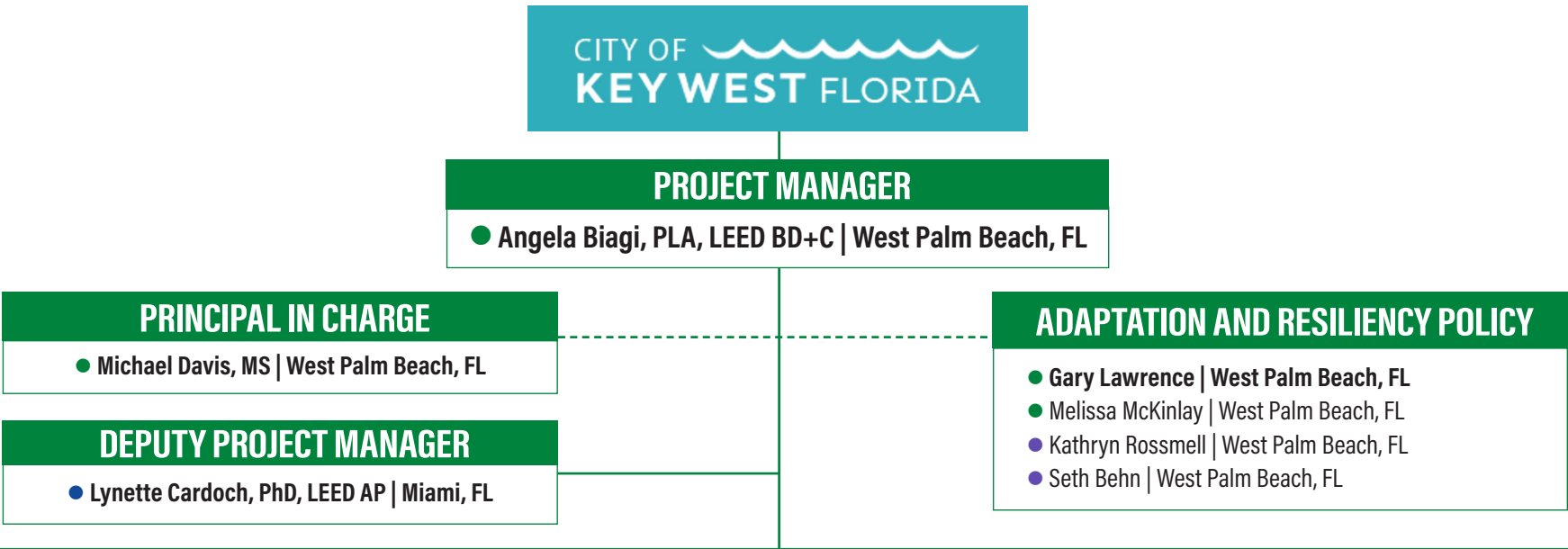
● Two Oceans Digital


● Bender & Associates Architects, PA

● Stafford Gordon Consultants

 Key West Local

Resumes included for bold names





ENGINEERING

● Annalise Mannix, MS, PE, PMP, Envision SP
TASK LEAD
Key West, FL

INFRASTRUCTURE PLANNING AND DESIGN

● Jeffrey Bergmann, PE
West Palm Beach, FL

● Chris Holmes, PE
West Palm Beach, FL

● John Cerreta, PE
West Palm Beach, FL

COMMUNICATIONS INFRASTRUCTURE

● Acey Roberts, PE
Tampa, FL

DRAINAGE

● Jerry Saval, PE, CFM
West Palm Beach, FL

MODELING

● Pete Singhofen, PE
Winter Park, FL

● Johnny Martin, PE
Raleigh, NC

● Andrew Shillingsford Jr., EIT, CFM
Tampa, FL

FACILITY ASSESSMENT

● Mark Wutz, PE, CEM, CPMP, LEED AP, CDSM, CPM
Cleveland, OH


● Lisa Helmstetter, PE, CEM, LEED AP
Charlotte, NC

● Reza Motarjem, PE, SE
Cleveland, OH

● Eddie Blanco, EIT
Key West, FL

POWER AND WATER INFRASTRUCTURE

● Doug Hammann, PE
Fort Lauderdale, FL



PLANNING

● Angela Biagi, PLA, LEED BD+C
TASK LEAD
West Palm Beach, FL

LAND USE CODE/ COMPREHENSIVE PLANS

● Kristen Nowicki, AICP
Fort Lauderdale, FL

● Maryann Kwok, AICP, LEED AP
West Palm Beach, FL

ECONOMIC REDEVELOPMENT

● Lynn Dehlinger
Pompano Beach, FL

● Sharon McCormick
Pompano Beach, FL

● Adriane Esteban, LEED AP
Pompano Beach, FL

HOUSING

● Scott Maloney, AIA, LEED AP BD+C
Cleveland, OH

● Lisa Helmstetter, PE, CEM, LEED AP
Charlotte, NC

● Reza Motarjem, PE, SE
Cleveland, OH

FUNDING


● Keenan Campbell, IPEM
Orlando, Florida

GREEN INFRASTRUCTURE

● Cheryl Callender, PLA, SITES AP
Fort Lauderdale, FL

HEALTH AND EQUITY

● Kaylee Halberg LEHP, REH/RS, EHLR, CERC, HSEEP, PIO
Sheffield, Illinois



ENGAGEMENT

● Heather Carruthers
TASK LEAD
Key West, FL

ENGAGEMENT

● Angela Biagi, PLA, LEED BD+C
West Palm Beach, FL

● Lynette Cardoch, PhD, LEED AP
Miami, FL

● Rae Lark
Key West, FL

● Veronica Stafford
Key West, FL

WEBSITE DESIGN

● Clint Barras
Key West, FL


HISTORIC AND CULTURAL PRESERVATION

● Bert Bender, RA, LEED AP
TASK LEAD
Key West, FL

HISTORIC AND CULTURAL PRESERVATION

● Bert Bender, RA, LEED AP
Key West, FL

● David Salay, RA, LEED AP
Key West, FL



ENVIRONMENTAL


● John Abbott, PG, CEP
TASK LEAD
West Palm Beach, FL

NATURE-BASED ADAPTATION

● Amanda Montgomery, PWS, WEDG
Fort Lauderdale, FL

● Jason Hignite
Fort Lauderdale, FL

● Jackie Brower, PhD, PE
Fort Lauderdale, FL



GEOSPATIAL/GIS

● Brian Mayfield, CP, GISP
TASK LEAD
Huntsville, AL

GEOSPATIAL/GIS


● Jorge Kappa
Fort Lauderdale, FL

DATA COLLECTION

● Christian Stewart
West Palm Beach, FL

INTERACTIVE MAPPING

● Amy Mindick, PE, PMP
Raleigh, NC



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Key West Weather Station

If Coconut, she is...

Wet... Rainy.
Swaying... Windy.
Hot... Sunny.
Cool... Overcast.
Floating... High Tide
Gone... Hurricane!

Please No Littering of Coconuts,
dispose of your Coconut in Trash

Have a Great Day



CITY OF KEY WEST
RFQ #22-001

Company Information

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COMPANY INFORMATION

WGI's 600-plus associates bring a full-service firm that provides the City of Key West with comprehensive management and technical leadership in planning, civil engineering, mobility, stormwater management, landscape design, sustainability, and resilience. Our teaming partners help us expand our local knowledge and specific capabilities in public participation, resiliency planning, historic preservation, social wellness, and economic development. With extensive national and Florida municipal, resiliency, and complete streets experience, WGI provides the City with highly qualified professionals—delivering the most dedicated, competent, and efficient service and deliverables from our team.

Introduction to WGI

WGI has grown over the last 50 years into one of Florida's and the nation's most successful consulting firms. WGI has evolved into a nationally recognized design and professional services firm with a strong specialty in urban planning and real estate development. An award-winning firm, we are recognized for exceptional service, a commitment to providing superb work products, and continuing a five-decade tradition of being engaged, passionate, responsive, accountable, creative, and inspired. WGI is committed to remaining at the forefront of innovation, investing in the tools and the people necessary to remain constantly agile and able to deliver tomorrow's possibilities today.

1972 Year WGI was Founded

600+ WGI Employees

350+ WGI Employees in Florida

24 Offices Nationwide

11 Florida Offices (including Miami, Fort Lauderdale, and our headquarters in West Palm Beach)



2022 ENR Top 500 Design Firms List: WGI Ranks #167 (8 Ranks Higher than 2021!)

WGI Named ENR Southeast's 2021 Design Firm of The Year

WGI Named WTS Central Florida Chapter's 2021 Employer of the Year

WGI ranked #35 on the Zweig Group's 2020 "Hot Firm List"

ACEC 2022 Engineering Excellence Award Gala: WGI Receives Multiple National Recognition Awards

MAPPS 2020 Geospatial Products and Services Excellence Award

What you get with the WGI team...

- Fifty years of experience planning and designing infrastructure in coastal and waterfront communities.
- An integrated plan that addresses the key challenges and opportunities for the community—flooding, mobility, historic preservation, and business growth.
- A team that knows how to communicate by listening and engaging the community.

In addition, the team includes WGI's subsidiary, Florida-based software firm **Streamline Technologies, Inc.** Streamline is nationally recognized for its flagship water-modeling software, known as ICPR4. Streamline's ICPR4 modeling software is used by WGI and over 1,000 clients, including many ENR 500 firms and countless federal/state/local agencies and universities. With WGI, the City has access to real-time flood forecasting software, which can predict flooding at the street, building, and parcel level in advance with a reasonable degree of accuracy, giving communities the power to prepare, mitigate, and recover from a catastrophic event.



Introduction to Our Teaming Partners

MOFFATT & NICHOL (M&N)

Role: Deputy Project Management | Modeling | Environmental | Interactive Mapping | Engagement

As leaders in infrastructure, M&N has provided resilient design for over 75 years in some of the most challenging, at-risk environments. The firm is a leader in waterfront planning, vulnerability assessments, hazard mitigation, coastal engineering, and stormwater management, providing resilient solutions from the tropics of the Caribbean to the arctic reaches of Alaska. M&N's planners, engineers, environmental scientists, and economists provide a team that practices resilience daily. Their experts are skilled at delivering forward-looking estimates ranging from sea level rise investigations to forecasting market trends that impact future economic use. At the same time, they bring proven resilient design, which leads to long-lasting, economical solutions and can include green infrastructure and blueways for additional environmental and social benefits. Their team is intimately involved in resilience initiatives across South Florida—from the Climate Compact to Urban Land Institute adaptation panels—providing insight into existing conditions, data, studies, and programs that we can leverage for the City of Key West.

ANNALISE MANNIX - WBE

Role: Engineering (Task Lead)

Annalise Mannix, MS, PE, PMP, Envision SP established a sole proprietor engineering firm in Key West, Florida, in 2001. Annalise has decades of experience in civil, coastal, and structural engineering, focusing on municipal engineering and small commercial and residential single and multi-family development. Annalise's career included over 20 years with the City, and past projects include wind and flood mitigation, Americans with Disabilities Act (ADA) compliance, environmental studies, coastal engineering, water resources, stormwater National Pollutant Discharge Elimination System (NPDES)/MS4 compliance, climate change vulnerability, sustainability, mitigation and adaptation planning, and environmental permitting. Annalise focuses on delivering sensible solutions that can be realized given the permitting and budgeting limitations. Her experience includes numerous City of Key West projects on Navy, City, and County properties such as the stormwater injection wells, pump station, seawalls, beaches, Key West Fire Service Building, Key West Police Public Service Facility, Douglass Square Affordable Housing (52 units), and the Key West Ferry Terminal construction. She also managed Fort Lauderdale and Miami-Dade County engineering teams. She developed the first Key West Sustainability Plan, Local Hazard Mitigation Plan, Stormwater Utility, and NPDES program. Annalise Mannix is a woman-owned small business.



K2M DESIGN (K2M)

Role: Engagement (Task Lead) | Facility Assessment | Housing

K2M is a dynamic, high-growth architecture, engineering, and interior design firm with a multidisciplinary facility assessment division. K2M has completed thousands of projects in the Florida Keys in the civic, educational, hospitality, educational, and residential sectors over the past 20+ years. K2M is recognized for listening to clients, being flexible and nimble, and developing the unique character of each project to create innovative design solutions that respect their clients' sensibilities and budgets. Most importantly, the firm's principals and discipline leaders oversee all work, assuring clients that K2M's senior staff are engaged in the design and assembly of their projects.

BENDER & ASSOCIATES ARCHITECTS, PA (BAA)

Role: Historic and Cultural Preservation (Task Lead)

BAA was established in 1975 in Flagstaff, Arizona, and relocated to Key West, Florida, in 1985. During their 47 years of service, they have become recognized as experts in historic preservation, producing projects throughout the States of Florida, Arizona, Montana, South Carolina, and Washington, D.C. Since moving to Key West 32 years ago, BAA has completed hundreds of projects in renovating existing buildings in historic coastal districts. They have worked on historic structures on the water, in low-lying areas with frequent flooding issues, on sensitive archaeological sites, and in Federal Emergency Management Agency (FEMA) Zone "X" areas. They have also used numerous tools to preserve and adapt historic buildings, including those required for analyzing and documenting historic sites, buildings, structures, ruins, and archaeological sites. Lastly, BAA has developed a unique understanding of the Key West landscape, geology, topography, and vulnerabilities associated with climate change and sea level rise. Decades of work completed in Key West, means they have been observing and addressing sea level rise daily since 1985.

REDEVELOPMENT MANAGEMENT ASSOCIATES (RMA)

Role: Economic Redevelopment

RMA is a full-service economic (re)development firm passionately reinventing cities to bring hidden assets and unrecognized value to the forefront. They have a proven track record of assessing, developing, and implementing plans/programs that improve communities by utilizing a realistic, comprehensive, and practical approach—resulting in over one billion dollars in private sector investment within their client areas. Headquartered in Pompano Beach, Florida, they provide consulting and management services to governments in urban redevelopment and placemaking, regionally, nationally,

and internationally. RMA's expertise includes economic development, business attraction, branding and marketing, real estate development and public-private partnerships (P3), urban design and planning, government administration, and community consensus building. RMA's staff have led some of the most successful economic development efforts in Florida cities during the last 30 years, transforming many areas throughout Florida into thriving business/entertainment districts, including Delray Beach, Fort Lauderdale, Hollywood, Pompano Beach, and West Palm Beach.

STAFFORD GORDON CONSULTANTS - WBE

Role: Engagement

For more than 30 years as the principal of Stafford Gordon Consultants, Veronica Stafford has been working and partnering with many private, political, governmental, and non-governmental organizations in Key West and the Florida Keys, focusing on producing events, publishing tabloids, magazines, and newsletters, and running marketing, public relations, and media campaigns all representing the minority, voiceless, and immigrant communities. Working as a registered Disadvantaged Business Enterprise (DBE) outreach consultant and administrator for the Federal Aviation Administration and Department of Transportation projects has allowed Stafford Gordon Consultants to understand government contracting and reach minority contract goals for large-scale projects. Bahama Village people and the well-being of this area in Key West is Stafford Gordon Consultants' interest and life work. Their team has all lived here for many years or grew up in the community. They understand the difficulties, idiosyncrasies, and tribalism as they exist and how to work through them.

LEWIS, LONGMAN & WALKER, PA (LLW)

Role: Adaptation and Resilience Policy

For over 25 years, the attorneys at LLW have helped the individuals, businesses, and governments that have shaped Florida's future. They offer solutions to complex local, state, and federal laws and regulations by providing policy oversight, guidance, and review of statutory compliance. They focus on the specific, technical, and ever-changing areas of environmental, land use, and legislative and governmental law. The LLW team comprises well-known and respected attorneys with the experience and skill to quickly resolve complex legal challenges. LLW is a top-ranked law firm by Martindale-Hubbell, with the highest rating for Martindale-Hubbell awards. To make this list, at least 10% of a firm's attorneys must have achieved an AV Preeminent rating. At LLW, nearly half of the attorneys have achieved this rating. Additionally, LLW is one of only three law firms in Florida to receive the top-tier Band 1 ranking in environmental law by Chambers and Partners. Their offices are in Jacksonville, St. Petersburg, Tallahassee, Tampa, and West Palm Beach.

CHA CONSULTING, INC. (CHA)

Role: Power and Water Infrastructure | Environmental

CHA is an innovative, full-service engineering consulting and construction management firm established in 1952, delivering sustainable, integrated solutions to the world's most challenging infrastructure projects. With decades of experience, they bring inspired talent, forward-leaning technology, and essential partnerships to meet their clients' evolving needs. They provide a wide range of technology-enhanced design and planning services to clients across five markets: government, industry, utility, education, and commercial development. They bring our team the resources of 1,500 multi-disciplined staff across more than 40 offices globally.

TWO OCEANS DIGITAL

Role: Website Design

As the largest full-service digital marketing provider and Google Partner in Monroe County, Two Oceans Digital's dedicated staff continues to strive for excellence in technical knowledge, graphical design skills, and web-enabled database application programming. As the local, leading digital agency, they understand the importance of tourism to the local economy, and as residents, they understand the dynamics of local decision-making. They are inherently motivated to provide the best service to help every client's unique mission. Their team of qualified digital experts offers innovative communication solutions to cut through today's social media and online congestion.

ECOPRESERVE, LLC (ECOPRESERVE) - WBE

Role: Funding | Health and Equity

Since 2009, ecoPreserve has proudly optimized efficiencies, reduced greenhouse gas emissions, and improved health and wellness in over 50 million square feet of building space, impacting 100 million people. ecoPreserve programs support economic viability, operational excellence, natural resource conservation, and positive social impact. Their expertise will help the team evaluate the impact proposed efforts may have on community health. Their experts have written for and won millions of dollars in grant funding for local municipalities for a variety of programs, including infrastructure, water protection, emergency operations center builds, mosquito control, and food safety. With over a decade of sustainability planning and implementation experience, they understand the balance between strategy and implementation and the importance of regular and open performance measurement and reporting. ecoPreserve uses data trending and analysis for decision-making and to provide insight into innovative service delivery options. ecoPreserve is a certified WBE with a mission to solve complex environmental problems.



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CITY OF KEY WEST
RFQ #22-001

**Methodology, Approach
and Timeline**

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METHODOLOGY AND APPROACH

Our approach is geared to the City of Key West. Small cities especially can be assisted by development of clear decisive vulnerability plans and hardening guidelines to reduce the “training” of multiple consultants working on city infrastructure years into the future. We will provide results geared for the City staff and community users, be it plans and maps for ease of use or simple modifiable GIS platforms for users.

VULNERABILITY ASSESSMENT

VULNERABILITY ASSESSMENT AND ADAPTION STRATEGIES

Our team has a proven collaborative and transparent process that applies the latest science and modeling capabilities. We approach climate hazard analyses with multiple lenses aided by our power-house modeling capabilities and resources. The WGI team has a wealth of resources to assist this project, including a supercomputer and computer cluster to conduct advanced modeling techniques. This computing power allows us to carry out climate modeling faster and more affordably than standard systems.

Due to the nature and location of the coastal, low-elevation Key West community, combined modeling of upland and coastal flooding hazards will be critical to holistically assess the cumulative impacts of a combined coastal/rainfall storm event. Our team will evaluate flood risks from recurring (nuisance flooding) and extreme (hazardous flooding) conditions based on the flooding sources. Compound flooding combines tidal, storm surge, and rainfall-induced flooding. A Monte-Carlo analysis helps determine risk as this approach statistically analyzes combinations of future tidal levels given climate change-associated sea level rise and storm surge scenarios, revealing the more likely scenarios.

Our team will conduct an Exposure Analysis to identify hazards caused by sea level rise, current and future storm surges, rainfall-induced flooding, or a compound flood scenario. The Exposure Analysis will follow the requirements for minimum tested scenarios and standards outlined in 380.093, F.S. We will incorporate all information into the draft and final vulnerability assessment. In addition, we will package and send all geographic information systems (GIS) data and metadata (with raw data sources referenced), complying with Federal Geographic Data Committee compliance and Resilient Florida Requirements.

Tidal flood modeling will assess current and future conditions. Sea level rise will be incorporated into future scenarios for time-horizon planning and will align with the Monroe County ordinance on planning elevations. The number of flood days for each scenario and planning horizon will be geographically reported, per Florida Department of Environmental Protection (FDEP) recommendations. King tide events and nuisance flooding inundate portions of Key West; therefore, capturing these events and their likelihood to increase in severity will be essential.

Hurricane storm surge modeling will be utilized to identify potential storm surge flooding. First, the project team will look at existing FEMA storm surge estimates for the 10-, 25, 50-, 100-, and 500-year events. If recent FEMA estimates are inadequate, the team will use the MIKE21 or DELFT model outlined above to develop more accurate storm surge estimates. The in-house Monte-Carlo simulation tool will also be used to estimate how these storm surge levels may change over time and help the City make informed decisions about acceptable or non-acceptable risks in their operations and infrastructure.

Our team takes a holistic approach to understand the threat of flooding hazards. In addition to coastal hazard modeling, we can study rainfall-induced flood modeling using our experienced hydrologic and hydraulic modeling team. Meteorological data—primarily precipitation—and watershed conditions drive watershed hydrologic behavior. Various data will be collected and synthesized to conduct the hydrologic and hydraulic analyses using stormwater management modeling software such as XPSWMM 1D/2D, InfoWorks ICM, or MIKE SHE/MIKE 11. M&N has extensive experience using XPSWMM 1D/2D, InfoWorks ICM, MIKE SHE/MIKE 11, and other modeling platforms to represent physical processes and systems. Other available modeling solutions will be evaluated collaboratively with the City to determine the most appropriate methods of analysis to best simulate the complex flood risks specific to Key West. We then take our technical data analysis and conduct a Sensitivity Analysis to quantify the impact of the modeled flood scenarios on those critical assets. For each asset type and tested scenario, a flood severity value will be assigned based on the percentage of the land area inundated and the number of critical assets affected within that asset type. We use this flood severity value to assign a risk level. With this analysis, coupled with a review of existing plans and stakeholder feedback, we can evaluate the residual risks and determine a desired level of protection based on a realistic cost to benefit analysis.

Identifying focus areas within the City of Key West will help rank and prioritize critical assets for adaptation. We will use two sources of information when identifying focus areas: (1) critical assets particularly valuable to stakeholders and the community and (2) hot spots of critical assets. The first type of focus area will be established using the public outreach feedback and steering committee guidance. These can be assets which are important and used by the community in their everyday lives, not just in the worst case scenarios.

Preferred alternatives are screened and ranked based on holistic selection criteria, such as:

- **Ecological enhancement**
- **Short- to long-term success**
- **Transportation mobility**
- **Mitigation of projected flooding hazard**
- **Cost**
- **Avoided damages**
- **Site constraints**
- **Maintenance**
- **Environmental impact**
- **Enhanced recreation opportunities**
- **Equity**
- **Public support**
- **Permit feasibility**
- **Constructability**
- **Land acquisition needs**

previous tasks. Integrating GIS systems and Microsoft Excel will develop a matrix of sea level rise and storm surge to include a discussion of hazard impacts, such as temporary impacts, minor structural damage, or complete failure/loss. The outcome of this task will highlight impact thresholds where the vulnerabilities of assets, facilities, infrastructure, and property significantly increase. These thresholds are a crucial element of the analysis and set the stage for developing adaptation strategies to mitigate these vulnerabilities.

Our team will work with the City to determine adaptive capacity based on changing conditions. At a minimum, this will include a discussion on moderating potential damages, taking advantage of opportunities, and coping with hazard-related consequences. We will work with the City to establish meaningful criteria for determining critical thresholds and levels of uncertainty inherent in each asset type.

This process identifies risk by asset by evaluating the asset type, priority, existing conditions, and relative hazard threat in a weighted matrix developed with the City. The matrix then leads to the development of potential mitigation alternatives directly associated with risk and vulnerability.

The second focus area will involve geospatial analyses to optimize hazard reduction efforts by identifying clusters of flood-impacted critical assets. If critical assets are in close proximity to each other, we can design a single, strategically located solution. Leveraging this approach will allow the City to focus its limited resources in areas where the most significant impact can be realized.

A preliminary impact and prioritization report is developed based on the critical or regionally significant assets impacted by the affected area or immediate need. Flood risk maps and tables of results will help determine the extent to which flood hazard projections intersect with City resources and infrastructure. The intersection of coastal hazards and City assets will produce coastal hazard maps identifying where and under which scenario the specific assets become vulnerable. The inventory of vulnerable assets, facilities, infrastructure, and properties is generated from the work performed under

DATA COLLECTION METHODS

Good data is critical for a robust vulnerability assessment and resiliency master planning, and our team is aware of the historic and ongoing City initiatives that should be evaluated as part of this project. We will utilize existing data and resources, such as the City's Resiliency Action Plan and 2021 Strategic Action Plan *Key West Forward*, and Local Hazard Mitigation Pla to save resources and create efficiencies by leveraging past and ongoing City efforts. Using these projects as stepping stones, our team will develop a robust database of information, review any potential research, and compile the three data categories needed to perform the vulnerability assessment as defined in s. 380.093, F.S. These three categories of data include:

- Critical and regionally significant asset inventory
- Topographic data
- Flood-scenario-related data

We will organize the data inventory to present a comprehensive land use and infrastructure map, providing City officials and decision-makers with the necessary information to understand current and future risks to City assets. Our team can produce sophisticated mapping and analysis products that provide ease of use. GIS data and metadata (with raw data sources referenced) will be compiled compliant with the Resilient Florida Program's requirements. By defining the data into these categories in alignment with Florida Statutes, our team is organizing assets and prepping the stage for future state-level funding opportunities for implementing the resiliency plan.

We will provide the City with more than just a final report and recommendations. Throughout the project, we will build a comprehensive database comprised of GIS and Excel matrices to document the research, analysis, and concept design efforts. This database will compile the assessment efforts into a valuable tool and training manual for the City to use for future planning efforts and parallel City initiatives.

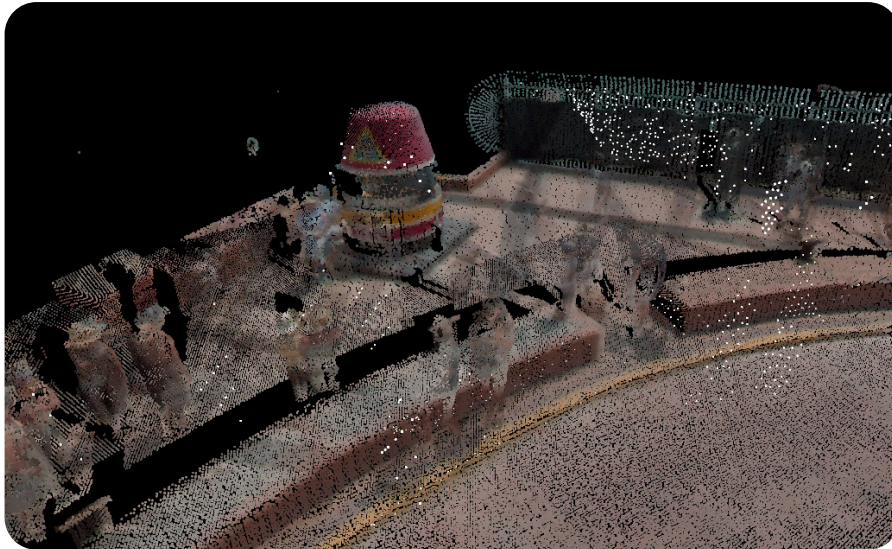
ICPR4 MODELING TOOL

The team includes WGI's subsidiary, Florida-based software firm **Streamline**. Streamline is nationally recognized for its flagship water-modeling software, known as ICPR4. Streamline's ICPR4 modeling software is used by WGI and over 1,000 clients, including many ENR 500 firms and countless federal/state/local agencies and universities. With WGI, the City has access to real-time flood forecasting software, which can predict flooding at the street and house level in advance with a reasonable degree of accuracy, giving communities the power to prepare, mitigate, and recover from a catastrophic event.

OUR WORK HAS ALREADY BEGUN

WGI has already begun to collect survey data for the project using terrestrial mobile LiDAR. On May 5, 2022, the WGI team surveyed a portion of the city limits, collecting

millions of 3D data points in real-time with roadway imagery, including sidewalk locations, safety features, bike routes, ADA ramps, signage, and pedestrian control features, while traveling at the posted speed. This data can be integrated into ArcGIS and assessed in conjunction with population projection data, future development, the existing capacity of transportation systems, and level of service data for all modes of transportation. This effort gives WGI and the City a jumpstart on the project, which often results in milestones being reached ahead of schedule. With our mobile, static, backpack, and hydrographic LiDAR gathering technology, we can gather more accurate data for the City to complete a high-quality digital terrain model.



WGI LiDAR Scan in Key West on May 5, 2022

ADAPTATION PLANNING

We bring our substantive knowledge, decades of experience, and forward-thinking, creative problem-solving to our clients to help them address the many facets of resiliency planning. Our long history with infrastructure projects, environmental law, government law, land use and zoning matters, affordable housing, utilities, legislative needs, community outreach, project funding, and compliance with local, state, and federal mandatory and voluntary programs have put the WGI team at the forefront of every aspect of this field. This depth of experience also enables us to think strategically about how each of the separate issues will impact the effort, allowing our clients to craft cohesive plans for long-term success. Our team's local adaptation experience will bring significant strength to this project.



UNDERSTANDING KEY WEST'S HISTORY

The WGI team has developed a unique understanding of the Key West Florida landscape, geology, topography, and vulnerabilities associated with climate change and sea level rise. With several of our team members living in Key West, we have been dealing with sea level rise on a daily basis for decades. We watched as increased areas of the City have been affected by flooding, and we have been called upon to address those issues for historic structures and sites.

The Resilient Design Institute, on December 14, 2013, defined resilient design as "the intentional design of buildings, landscapes, communities, and regions in response to disaster and disruption of normal life." Historic districts, buildings, structures, landscapes, sculptures, and archaeological resources present a unique challenge. These resources are valuable in more ways than the value of bricks and mortar used in their construction. While our cultural resources have a quantifiable economic value regarding jobs, taxes, and heritage tourism, our historic buildings, districts, and other resources also have an intrinsic worth that cannot be calculated. How we treat these resources will determine how history views us as a society. How we address the challenges that face us, such as global warming, climate change, hurricanes, and rising sea levels, is of particular importance to those of us who live and work in Florida, and particularly to Key West as Ground Zero. We have an obligation to protect and provide for future generations and to leave a legacy for those who will follow.

IMPLEMENTATION

Our approach to an implementation plan is grounded on a few foundational principles:

- The recommendations need to be actionable with a roadmap for implementation. Stakeholders need to support the mitigation strategies and projects such that the plan becomes financeable, buildable, and consistent with City priorities.
- The plan needs to communicate the risk reduction in the near and long term so we can adequately evaluate trade-offs. The WGI team has a strong track record of constructable projects that maintain design integrity throughout.
- The plan should look for opportunities to engage with system-wide drainage strategies to protect people and property from localized flooding due to sea level rise and storm surge. In conjunction with the current citywide drainage master plan, we will coordinate with the engineering assessments regarding present infrastructure vulnerability to water flows and uplift.
- The private sector must undertake some aspects of implementation that need to be encouraged, supported, or mandated via regulations and governmental incentives. For example, implementation may involve elevating structures during renovation and new construction. We will guide these efforts through careful policy development

with a keen sensitivity to the burdens this may place on residents and private property owners. It will be essential to couple the identification of vulnerabilities with practical strategies to mitigate risks and thus minimize the potential negative impact on property values.

HARDSCAPE ENGINEERING

INFRASTRUCTURE ADAPTATION

The Adaptation Plan will address all the issues and lessons we learned during Hurricanes Georges, Wilma, Irma, and Ian. Multiple strategies will be required and managed by the guidelines, all of which the WGI team has experience with. Evaluated strategies will include, but not be limited to, raising historic buildings above the flood level, relocation of historic buildings, reconstruction of historic site features such as the Indian Block Wall at a historic home near the Southernmost Point, hardening buildings to withstand rising flood waters and to serve as an EOC, and restoration of parks, beaches, roads, and infrastructure.

The response to these issues is a phenomenon that has been around for a while. For example, **BAA** has worked on numerous historic structures that have dealt with these issues, including the Cape Florida Lighthouse on Key Biscayne, constructed in 1846. With the advent of screw pile technology and the construction of Fowey Rocks Lighthouse on the reef, Cape Florida Lighthouse became obsolete and was decommissioned in 1878. While in 1886, the lighthouse stood 800 feet from the island's tip, seas and wind have continually reduced the shoreline. In 1926, a severe hurricane eroded the island further, destroying an 1895 stone seawall. The current riprap revetment and breakwater installed in the 1960s and 1970s is a strategy still in use. In 1845, a hurricane destroyed the Key West Lighthouse and adjacent cemetery. By 1848, the lighthouse was reconstructed on a new site further inland, and the remaining graves were relocated to the island's center. These are strategies that are still valid and available today.

STORMWATER ENGINEERING

WGI's highly qualified team addresses complex stormwater quantity and quality, sedimentation, drainage, and flood-control issues. Our Certified Floodplain Managers provide floodplain management from simple flood map revisions to complex floodplain modeling, including bridges, culverts, and 1D and 2D modeling. Our stormwater design experts offer clients the latest models and technology, including the latest ICPR4 program, SWMM5, HEC-RAS/HEC-HMS, the Florida Department of Transportation (FDOT) pipe design and drainage program, and design techniques to provide cost-effective and resilient design solutions. We can also use our mobile, static, backpack, and hydrographic LiDAR technology to obtain accurate data for improved modeling results. With proven expertise

in environmental regulatory processes and a sound understanding of the natural systems impacting natural water resources, WGI professionals deliver quality projects within the requirements of regulatory and permitting constraints. Our stormwater designers have modeled and designed systems ranging from simple street culvert crossings to large extensive interstate highway projects.

Sea level rise, coupled with older storm sewer systems sized and designed to lower tailwater conditions, creates challenges and often requires "out of the box" solutions. Our clients have experienced unique needs and constraints for several project types and goals. These clients (and WGI) have benefited by sharing ideas and solutions. For example, the City of Delray Beach selected our team to address Marine Way's severe flooding during King Tide multiple times a year. The project location had two critical subaqueous facilities (a 16-inch water main supplying the barrier island and a primary fiber optic bank), which needed to provide uninterrupted service. WGI proposed using a high-strength "Jet Grout" technology to maintain the continuity of the proposed seawall. This construction technique is typically used in deep excavations and constructed bottom-up, allowing both utilities to remain in service, minimizing the disturbance and allowing for the continuity of the seawall. Our team member **Annalise Mannix** was the first City of Key West Stormwater Utility Manager and managed the Miami-Dade Water and Sewer Planning Division and Fort Lauderdale Engineering Department, bringing valuable and detailed experience to this project.

POWER AND WATER ADAPTATION

In cooperation with the City and local utilities, we will create a GIS database for power and water assets within the community. Information from the vulnerability assessment will reveal focus areas for power (generation and transmission) and water (potable, stormwater, wastewater) utilities. We will identify data gaps and address them through coordination with the appropriate entities and residents to include the entire service area in the completed summary report integrated into the comprehensive plan or code of ordinances. We will work with local stakeholders and the general public through strategic outreach efforts to develop recommendations for appropriate adaptive measures (including planning-level costs, costs of doing nothing, and expected results) while prioritizing the most critical areas to develop the anticipated projects list, associated timelines, and cost of implementation.

ENVIRONMENTAL ADAPTATION

Environmental adaptation will focus on the environmental and ecological impacts of climate change in Key West and explore natural design/environmental engineering adaptation strategies. We will gather information to add to the City's GIS database and develop appropriate response options. We believe there are opportunities for living

shorelines, tree canopy enhancement, and other nature-based adaptation, green infrastructure, and low-impact design.

STRUCTURAL SOLUTIONS

The WGI team earned the reputation as the go-to team for design and construction in Florida, which features 1,350 miles of shoreline and numerous other bodies of water. WGI staff members have been involved in the design of 14 major pier structures. Our depth of experience perfectly complements the local knowledge of our subconsultants, who are well-regarded in their areas of expertise. WGI's structural engineers have experience managing marine construction projects throughout Florida. These undertakings range from miles of Intracoastal sea wall replacement projects, new and replacement sea wall projects along the ocean, marina and port projects, and miles of canal erosion protection projects, including sea wall replacement and repair projects adjacent to historic and sensitive structures.

While working on these projects, WGI consistently meets the federal design criteria and review processes by agencies such as the United States Army Corps of Engineers (USACE), Engineering Manuals, and Naval Facilities Engineering Systems Command Design Manuals. Outside of federal projects, WGI has worked with State organizations on marine and coastal projects, including the FDEP, FDOT, and South Florida Water Management District for the design and construction of sea walls, jetties, ocean piers, and flood control structures, designed per the federal design criteria previously mentioned as well as per American Association of Highway and Transportation Officials, Load Resistance Factor Design Bridge Design Specifications, and the Florida Building Code. Our mitigation solutions exceed the minimum standards of basic codes to provide for local needs and reduce specific vulnerabilities.

ALIGNMENT WITH NAVY INITIATIVES

The WGI team includes **Jason Hignite** with **CHA**, a Navy veteran (eight years) with aviation and environmental experience who will serve as a liaison for cooperating with the staff at Naval Air Station (NAS) Key West. Jason was a flight operations specialist as well as a divisional environmental compliance coordinator working aboard the USS Saratoga (Mayport, FL), NAS Cecil Field (FL), and NAS Glenview (IL). He also served as a civilian environmental contractor at NAS Oceana (VA), Chambers Field-Norfolk (VA), Crane Naval Surface Warfare Center (IN), and Grissom Air Force Base (IN). Jason's background will help us to effectively collaborate with NAS Key West.

POLICY

We have experience navigating the unique challenges presented by both the regulatory and the natural environment in the Florida Keys, operating within the Florida Keys Protection Act, and handling the additional state-coordinated review process requirements attached to the Keys by virtue of their status as an Area of Critical State Concern.

LAND USE AND CODE

On the land use side, in addition to representing both public and private clients on land use and zoning matters, our team has also drafted entire comprehensive plans, complete sets of land development regulations, and countless amendments and policies on land use and zoning matters. For example, **LLW**, acting as counsel for community redevelopment agencies, has helped design incentive programs to encourage compliance with best practices, support economic redevelopment, and bring in affordable housing. In addition, Principal in Charge **Michael Davis**, Environmental Lead **John Abbott, PG, CEP**, and Engagement Task Lead and Key West local **Heather Carruthers** with **K2M** worked together on the Monroe County Comprehensive Plan, bringing our team valuable additional relevant and local experience. We support our public clients in their efforts to update infrastructure and secure funding for those efforts. Our legislative team helps cut through red tape and create new laws that open doors to solutions that would not otherwise be available.

LONG-RANGE PLANNING

Across the southeastern United States, we work daily with comprehensive plans, land development regulations, large and small-scale comprehensive plan amendments, feasibility studies, and planning reports. Our team has the advantage of working with local governments, either as a consultant or as an applicant, from Jacksonville to the Florida Keys. Our experience and skill sets include planning and implementation consulting services to over 300 public, private and community-based clients across the country, up-to-date and reliable community and market information (market analysis for governmental authorities), extensive community outreach coordination, forecasting and modeling, economic development, market and financial feasibility, fiscal analysis, and impact assessment. Resiliency best practices include updating how elevations are measured based on increased base flood elevation requirements and implementing solutions to reduce flood risk. We stay current on the trends and, most importantly, the legislative changes that impact comprehensive plan requirements. Our team member **Annalise Mannix** has developed numerous City long-range plans and implemented many Key West projects—this experience will provide truly actionable and realistic solutions.

HISTORIC AND CULTURAL PRESERVATION

The WGI team has worked on historic structures on the water, in low-lying areas with frequent flooding issues, on sensitive archaeological sites, and in FEMA Zone "X" areas. Following the flooding in Key West from Hurricane Wilma on October 24, 2005, **BAA** were called upon to address storm damage for numerous properties. Various techniques required included elevating existing structures, renovating to accommodate flooding using flood gates, and floodproofing buildings.

USE OF CUTTING-EDGE AND ADVANCED TECHNOLOGIES

We have used numerous tools to preserve and adapt historic buildings, including those required for analyzing and documenting historic sites, buildings, structures, ruins, and archaeological sites. We used laser scanning technology and ground penetrating radar at Dummet Mill in Volusia County, converting those to AutoCad files to provide preservation documents. Laser scanning was also used at the Kosciuszko Tunnel at the Ninety Six National Historic Site in South Carolina, a Revolutionary War Era earthen star redoubt fort, to develop a stabilization plan for the tunnels. We have used petrographic analysis to analyze the composition of historic mortar and masonry. And, of course, we have used and are familiar with numerous traditional materials testing methods.

GUIDELINES AND REGULATIONS

BAA has been involved with developing historic district guidelines since the earliest years of its practice. Key West-local **Bert Bender, RA, LEED AP** authored the Flagstaff Historic District Design Manual, Flagstaff's first set of guidelines, in 1984. Most recently, he assisted Dominique Hawkins of the Preservation Design Partnership with a preservation master plan for the City of St. Augustine. BAA staff have experience in creating and advancing guidelines and regulations, and several of their historic structure reports have been instrumental in modifying or promoting evaluations of existing regulations or comprehensive plan issues, as was the case recently with the MacDonald House Historic Structure Report in Ormond Beach.

ECONOMIC DEVELOPMENT

The WGI team's approach to a project is centered upon realistic, market-driven strategic planning, and recruitment and is always grounded in the unique character of a place and the people that live there. The City's brand, personality, and uniqueness are extremely well-defined, providing a solid foundation for continued growth and prosperity. Simply put, an economic strategy for Key West will only succeed if it recognizes the inherently social and personalized nature of Key West's situational challenges.

We understand your commitment to preemptively addressing vulnerabilities and appreciate the City's dedication to preserving the island's unique character. Our methodology and approach to this assignment will include identifying market trends and best practices for fostering a diverse, resilient economic environment for Key West by reviewing land, labor, capital, regulations, and market conditions. While the pandemic accelerated specific trends in the industry already in place, we understand these trends are part of a cyclical market and new concepts will be introduced to satisfy the customer's constantly changing demands. During the pandemic, we also saw many people moving to Key West and working remotely. This has a significant impact on local businesses—we must consider what businesses support remote work and see what other industries could thrive in Key West. While there is an emphasis on tourism, there is also a common desire in the community to diversify the local economy as much as possible. This is just one aspect we must address with this project. With proper planning and proactive measures, the City can capture the new concepts that are appropriate for the community's character while continuing to be a destination attraction. Understanding the pulse of the market, with recent brick-and-mortar trends and how they influence consumer behavior, media, omnichannel solutions, and pop culture, is the most important part of devising an economic strategy for Key West. Our team is on the cutting edge of this market shift and understands the importance of incorporating new and proven retail and commercial strategies to retain and attract businesses. Quantitative and qualitative gap analyses are important in our study; however, more than those figures are needed to provide meaningful solutions to help adapt to changing market conditions in Key West. Additionally, due to our experience, we are sensitive to the fact that identifying a vulnerable area can depress property values. Therefore, it is our responsibility to preserve the value of the primary asset of homeowners, residents, and property owners.

For real solutions, we will need to look to where commercial businesses continue to thrive (emerging niches, hyper-luxury consumption, low-impact tourism, and bespoke experiences in exceptionally well-planned commercial environments), and identify opportunities to bring those concepts to life on the island. We also look holistically at the city's conditions to provide synergistic results. This includes looking at the workforce in place and what is needed, diversification of the economy, existing and future employment opportunities, educational facilities, and housing and transportation conditions for the labor force.

NATURE-BASED ADAPTATION, GREEN INFRASTRUCTURE, LID

Sustainability, resilience, and adaptation (SRA) awareness are key to our vision. SRA calls for multidisciplinary approaches, so improvements in one system also create improvements in nested or adjacent systems. With resource scarcity—natural, financial,

and intellectual capital—we will strive to maximize co-benefits. To do so, solutions must focus on optimizing the suite of built amenities, ecosystem services improvements, and use of performance assessment tools to maximize water capture and filtration, while managing flood risk to residents and infrastructure. Wherever possible and cost-effective, we must utilize building and infrastructure materials that are certified to have in their production and application the lowest energy intensity, waste stream impacts, and greenhouse gas consequences to reduce energy demand and urban heat island effects and improve public health. We must engage the local community in meaningful conversations that build trust and foster climate equity in the projects. We must also recognize that present-day decision-making will affect future generations of Key West residents, underlining the need to develop projects whose value compounds over time. We will focus on the following initiatives and collaborate with City leadership to implement action steps as well as those with a broader community benefit.

- Reduce transportation energy consumption
- Promote biodiversity and a healthy ecosystem
- Increase infrastructure resiliency
- Enhance emergency management and community preparedness
- Promote, restore, and protect green infrastructure

COMMUNITY ADAPTATION

Key West, Florida, is facing increasing risks and challenges due to the impacts of climate change, including rising sea levels, more frequent and severe storms, and other natural disasters. These challenges threaten the safety and well-being of the community, as well as the local economy and infrastructure. Key West must have a comprehensive climate adaptation, health, and emergency planning program to prepare for and respond to these risks effectively. Such a program would help protect lives and property and ensure that the community has the resources and resilience to weather the impacts of climate change and other emergencies.

The WGI team is dedicated to addressing the complex and interconnected issues of sustainability, climate policy, public health, and racial equity in Key West. Climate and environmental impacts disproportionately affect marginalized communities, and addressing these issues requires a holistic approach that considers the interconnected nature of these challenges. While the public is often aware of the direct impacts of climate hazards such as rising sea levels and extreme weather events, they may need to be aware of the secondary dangers that can result from these events, such as displacement, power outages, and water contamination. These secondary hazards can have severe and disproportionately negative impacts on low-income residents, including increased risk of

infection, injury, and exacerbation of chronic illness. To protect and support all community members, we must address these issues comprehensively and equitably.

To address these challenges, we recommend following a six-step approach to health and social wellness in Key West:

1. Engage with the community
2. Conduct a needs assessment
3. Identify and prioritize interventions
4. Develop a plan for implementing the selected interventions
5. Implement the interventions
6. Monitor and evaluate the interventions

HEALTH AND SOCIAL WELLNESS TOOLS

Our team recommends using a tool such as the National Oceanic and Atmospheric Administration's (NOAA) Steps to Resilience (StR) to help local Key West leaders make informed and evidence-based decisions that aim to prevent loss of life, property, and essential functions in the face of climate change and other natural disasters. In addition to StR, our team also suggests utilizing different resources such as the U.S. Centers for Disease Control and Prevention's Social Vulnerability Index (2018), which provides data on the social and economic factors that can increase a community's vulnerability to climate and other hazards. The United States Department of Agriculture (USDA) Food Access Research Atlas is another valuable resource that can help to identify areas where access to healthy food may be limited, particularly in the aftermath of a disaster. Finally, the Climate and Economic Justice Screening Tool developed by the Council on Environmental Quality is valuable for evaluating the potential impacts of climate and environmental policies on marginalized communities. By utilizing these and other resources, our team will see that the project team interventions are targeted and effective in addressing the community's specific needs and challenges in Key West.

FUNDING OPPORTUNITIES

WGI links plans, policies, and projects to potential funding sources. We help clients identify projects for American Rescue Plan Act funds in the near term while preparing for new funding criteria within federal, state, and regional funding programs. New criteria apply to traditional infrastructure and main street planning projects, as well as new topics such as resilience, equity, and new mobility. We look for ways to shape funding-ready plans and projects by addressing criteria and design elements critical to shaping solid proposals. WGI understands the project is funded with federal and state dollars and the critical importance of complying with the federal and state grant rules and deliverables.

Our team's resilience funding outcomes since 2016:

- \$387M Community Development Block Grant funds awarded for resilience plans (including National Disaster Resilience)
- \$182M FEMA-funded projects constructed or underway
- \$27M Hazard Mitigation Grant Program funds awarded for plans and projects

FEMA funding can be a valuable resource for supporting climate adaptation and resilience efforts in Key West. We recommend a four-step approach to FEMA for funding:

1. **Research** the available funding programs to identify those aligned with the project goals and needs.
2. **Submit** a grant application that outlines the project goals, objectives, and budget and demonstrates how the project aligns with FEMA's priorities and will address the challenges and vulnerabilities faced by the community in Key West.
3. **Engage** with FEMA and other local and state stakeholders to gain support for the project and to ensure it is aligned with the broader goals and priorities of these organizations.
4. **Report** on the project's progress to ensure it meets its goals and objectives. This will also help demonstrate the project's impact on FEMA and other stakeholders, which may help in securing future funding.

By following these steps, the City can effectively approach FEMA for funding to support its climate adaptation and resilience efforts and help to build a more resilient and sustainable community.

INTERACTIVE MAPPING

Our team uses many different platforms to communicate information to the public. One example is the ArcGIS Hub, an easy-to-configure online mapping, community engagement, and open data platform that can help the City easily convene stakeholders, organize, share project data, and publish elements from reports. It can include online interactive maps and is designed to interface with the existing City ESRI GIS systems. The map presents key data themes (including vulnerability modeling results) across all municipalities. Data would be normalized and classified into easy-to-understand quantitative or qualitative groups. The interactive mapping tool lets stakeholders toggle layers on/off, zoom in/out, identify features, and add comments. Project stakeholders can easily access geospatial content to support decision-making and engagement efforts and facilitate more effective project communication.

Another ESRI platform we can use is the Project Story Map. Concurrent with the mapping and analysis task, our team develops map-driven digital narratives, called Story Maps,



that quickly orient a user to key data findings and illustrate spatial relationships (using interactive maps, infographics, text, photos, charts, etc.) while adding visual appeal and credibility to the results that emerge. We anticipate mapping and analyzing valuable data and stakeholders need to understand what they are viewing without being overwhelmed. Embedding curated storytelling content besides interactive maps allows the project team to introduce thematic datasets (and their relationships with one another) in the context of the overall vulnerability assessment and adaptation process.

PUBLIC FACILITATION

Adaptation and resiliency planning is complex, making it a challenging topic to communicate. We must consider several factors, including the value of assets (economic, historical, human, cultural, natural); the lifespan of existing infrastructure; demographic changes; predictions of future climate and environmental conditions; the cost of taking action versus not taking action. We must be sensitive to public perceptions of the potential impacts of our actions on the value of assets the community currently holds, and couple identification of vulnerabilities with reasonable mitigation strategies in our communications. The benefits of resiliency planning are fully realized over years and decades – and an effective Public Participation Plan (PPP) must be careful, consistent, and continuing. It cannot be an afterthought; in our plan, building the widespread and long-lasting support this effort will require for success is essential.

WE WORK LOCAL

Our team includes leading subject matter experts able to communicate complex issues in a way that laypeople can understand. **We are multi-lingual.** Many of us are local. With backgrounds in science, government, planning, engineering, marketing, and communications, we are uniquely poised to develop a PPP that will provide continuous learning for the team and education for the public over the project's life. We will create a "brand" that will communicate the essence of the work and help build a sense of ownership within the community.

This will only be achieved through listening to constituencies, finding common ground, and continually seeking input through an open and dynamic development process. The effective outreach strategy will include a variety of traditional and social media. Given Key West's tight-knit and engaged community, person-to-person, face-to-face communication will be vital. It must be two-way: the public must understand the process, and the process must consider public input to ensure support when it comes to paying for and implementing the plan.

We will publish our approach to planning, communication strategy, guiding principles, and contact information. Understanding that Key Westers keep abreast of what's happening in

various ways, we will utilize local media like The Citizen, Keys Weekly, Morning Magazine on US1Radio, Pirate Radio, and others. If the City allows, we will create a short video for KWCTV. Our partner and Key West-local **Veronica Stafford** with **Stafford Gordon Consultants** will connect with the Bahama Village community, the historic neighborhood that suffered significant losses during Hurricane Ian. We will post information on social media, including Facebook pages like Reimagining Key West and Key West Locals.

THE COCONUT TELEGRAPH

Several members of our team live and work in Key West. They are involved in civic groups, attend local events, and socialize with many residents and business owners. They will be ambassadors and researchers, sharing project progress and collecting feedback through the Coconut Telegraph. As the project continues, we will be flexible, adapting our outreach strategies to meet the community where it works, lives, and plays.

Working with our subconsultant, **Two Oceans Digital**, we will create a website that will be a crucial conduit of information throughout the project:

- Solicit public comment
- Post regular updates on the project, including
 - Schedules
 - Meeting announcements and agendas
 - Meeting minutes
 - Status reports
 - Budget and financing projections for alternative plans
 - Diagrams and narrative to explain the implications of each option
- Include an Interactive Map to:
 - Indicate FEMA flood zones
 - Capture specific points of inundation identified by users
 - Map adaptation areas and planned projects

DATA COLLECTION

We also intend to use real-time smart technology to gather input from citizens. Using a platform similar to Key West Connect (if not that app itself), we will ask residents to snap photos or shoot short videos of areas that currently experience high water after rainstorms, during extreme high tides, or at other times to augment our understanding of sea level rise impacts on daily life. We will use this tool throughout the entire planning process.

WE LISTEN

Listening must be a vital part of this project from the planning and decision-making, ultimately through implementation over the following decades. As we develop the

vulnerability assessment and adaptation plan, we may schedule charettes and formal and informal meetings with key user groups and staff. We will attend local events and luncheons to continually check in with stakeholders, share progress, and gather feedback. This is essential to build trust and ensure buy-in from the community and ultimate success. Regular online and social media surveys and casual, everyday interactions with neighbors and friends will help us make sure we are on the right track. We will use plans, renderings, diagrams, and illustrative samples to spell out the plan's key aspects.

We will need to communicate what we hear from the community to the City. We will do this with reports of our findings at preplanned intervals, sometimes presented graphically and sometimes through narratives. We will schedule in-person and virtual meetings and more formal presentations appropriate to each phase of the project. When it makes sense, we will use audio and video recordings. When it comes to prioritizing projects and funding them, we will solicit input from residents and key stakeholders to inform the decisions the City Commission will ultimately make.

Difficult decisions will have to be made during this process, balancing the protection of physical assets and enhancing our quality of life with financial realities. Our job is to create a plan to preserve Key West's uniqueness in a way we all can live with. That only happens when we listen.



Project Manager Angela Biagi, PLA, LEED BD+C Facilitating Community Outreach in Fernandina Beach, FL

TIMELINE

We will meet the timing requirements of the FDEO and FDEP grants. Upon award, Project Manager Angela Biagi, PLA, LEED BD+C, will schedule a kick-off meeting to present the proposed methodology and schedule.

TASK #	TASK	MONTH (PHASE 1)																								MONTH (PHASE 2)					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	Administration																														
0.1	Kick Off																														
0.2	Assemble Steering Committee																														
0.3	Conduct Steering Committee Meeting																														
1	Mobile LiDAR Acquisition																														
2	Climate Vulnerability Assessment																														
2.1	Convene Vulnerability Assessment Working Group																														
2.2	Outreach Meeting 1																														
2.3	Acquire Background Data																														
2.4	Exposure Analysis																														
2.5	Sensitivity Analysis																														
2.6	Outreach Meeting 2																														
2.7	ID Focus Areas																														
2.8	Final Vulnerability Assessment																														
2.9	Public Presentation																														
2.10	Interactive Mapping Tool																														
3	Infrastructure Adaptation Chapter																														
4	Environmental Adaptation Chapter																														
5	Land Use and Code Adaptation																														
6	Historic and Cultural Adaptation																														
7	Power And Water Adaptation Chapter																														
8	Economic Adaptation Chapter																														
9	Housing and Shelter Chapter																														
10	Health and Equity Chapter																														
11	Final Adaptation Plan																														
12	Post-Plan Assistance																														

Ongoing
(As Needed)



CREATIVELY TRANSFORMING HOW OUR WORLD IS
envisioned + designed + experienced

Personnel 6

CITY OF KEY WEST
RFQ #22-001



**Angela Biagi, PLA,
LEED BD+C**

Project Manager

WGI

Angela is a director at WGI, leading the firm's urban and community planning department. She heads a talented team of planners and designers who are dedicated and experienced in shaping the public realm. Her project experience involves master plans, complete street design, site and landscape design for the corridor and open space design, and extensive project coordination, including comprehensive plan and zoning code updates.

REGISTRATIONS

Professional Landscape Architect: Florida #LA6666787

EDUCATION

Bachelor of Landscape Architecture—University of Illinois

RELEVANT EXPERIENCE

- **Coconut Creek Vulnerability Assessment, Coconut Creek, FL - Project Manager**
- **City of Delray Beach Marina and Veteran's Park, Delray Beach, FL - Public Outreach Services**
- **Marine Way Resiliency Project, Delray Beach, FL - Public Outreach Services**
- **Clearwater Greenprint, Clearwater, FL - Project Manager**
- **SR 5 (US 1) Cudjoe Key, FDOT District 6, Monroe County, FL - Phase Manager**
- **Banyan Boulevard Complete Streets, West Palm Beach, FL - Landscape Architect of Record**
- **N. Swinton Avenue Complete Street, Delray Beach, FL - Landscape Architect of Record**
- **Neptune Beach Vision Plan, Neptune Beach, FL - Quality Control**



Michael Davis, MS

Principal in Charge

WGI

Michael is a senior vice president and chief strategy officer of WGI. He leads the formulation of WGI's strategic planning and growth initiatives. He has four decades of high-level experience in strategic planning, water resources, environmental policy and planning, transportation policy and planning, legislation, and governmental relations, including National Environmental Policy Act (NEPA) and USACE planning and regulatory processes.

EDUCATION

Master of Science, Biology—Austin Peay State University

Bachelor of Science, Environmental Sciences and Biology—Austin Peay State University

RELEVANT EXPERIENCE

- ***Monroe County Comprehensive Plan Update, Monroe County, FL - Principal and Senior Project Manager**
- **Banyan Boulevard Complete Streets, West Palm Beach, FL - Principal**
- ***Review of Navy's Draft Environmental Impact Statement (EIS) for Naval Air Station, Key West, Monroe County, FL - Project Manager**
- ***South Miami-Dade Watershed Study Plan, Miami-Dade County, FL - Senior Project Manager**
- ***Monroe County Coastal Barrier Resources Act Policy Analysis, Monroe County, FL - Principal**
- **South Dixie Highway Urban Streetscape, West Palm Beach, FL - Principal**

*Prior to WGI



**Lynette Cardoch,
PhD, LEED AP**

Deputy Project Manager

M&N

Lynette is M&N's director of resilience and adaptation, leading collaborative efforts to deliver comprehensive resiliency solutions and adaptation services in the coastal zone. She is a coastal ecologist with more than 20 years of experience in regulatory and water policies, coastal restoration, and urban and coastal resiliency. She is an active Miami-Dade resident, having served on the Biscayne Bay Task Force, and serving on the County's Planning Advisory Board.

EDUCATION

Doctorate, Oceanography—Louisiana State University

Fulbright Scholar, Ecological Economics—Universitat Autònoma de Barcelona

Master of Marine Affairs and Policy—Rosenstiel School of Marine and Atmospheric Science, University of Miami

RELEVANT EXPERIENCE

- **Urban Land Institute Advisory Services Panel for the Delaware River Waterfront, Philadelphia, PA - Invited Subject Matter Expert/Panelist**
- **Back Bay Coastal Storm Risk Management, Miami, FL - Resiliency Specialist**
- **Preliminary Design of Resilience Infrastructure, Environmental Impact Bond, City of Hampton, VA - Resiliency Specialist**
- **Resilient Housing Living with Water® Design Workshop, (Partnered with WBAE) City of Houston, TX - Subject-Matter Expert**
- **Review and Evaluation of FEMA's Coastal Flood Risk Study, Palm Beach County, FL - Technical Reviewer**



Gary Lawrence

Adaptation and
Resiliency Policy

WGI

Gary provides thought leadership for strategic urban development. Gary has more than 20 years of experience assisting public sector, private sector, and non-governmental organizations with research, analysis, strategic planning, and implementation toward the integration of sustainable development and risk management in urban development. His experience includes solving sustainability problems and delivering sustainable outcomes for entities locally and globally.

EDUCATION

Master of Public Administration—University of Georgia

Bachelor of Arts—Central Washington University

AFFILIATIONS

Board Member, Safe America Foundation

Fellow, Global Adaptation Institute

Fellow, Design Futures Council

RELEVANT EXPERIENCE

- ***Tulsa Master Plan, City of Tulsa, OK - Strategic Advisor**
- ***Angwin Master Planning, Napa County, CA, Pacific Union College - Sustainability Consultant**
- ***City of Seattle Comprehensive Plan, City of Seattle, WA - Planning Director**
- ***Long Island 2035 Regional Comprehensive Sustainability Plan, Suffolk and Nassau County's Executives, Long Island, NY - Senior Advisor**
- ***Alaskan Way Redevelopment, City of Seattle, WA - Strategic Advisor**

**Prior to WGI*



Annalise Mannix, MS, PE, PMP, Envision SP

Engineering (Task Lead)

Annalise Mannix

Annalise has more than 35 years of experience from conception to completion in design, construction contract management, program management, and department management. Her experience includes numerous City of Key West projects on Navy, City, and County properties such as the Key West Fire Service Building, Key West Police Public Service Facility, Douglass Square Affordable Housing (52 units) and the Key West Ferry Terminal construction. She developed the First Key West Sustainability Plan, Stormwater Utility, and NPDES program.

REGISTRATIONS

Professional Engineer: Florida #57533

EDUCATION

Bachelor of Engineering, Naval Architecture—SUNY Maritime College

RELEVANT EXPERIENCE

- **Annalise has served as the engineer in charge for countless design of structures, utilities, beach nourishment, piers, parks and roadway transportation systems, including:** sewer force main/gravity hydraulic design; pump station hydraulic design and layout; sewer and water hydraulic capacity analysis; single-family residences; foundations; Cozumel Park rehabilitation; Smathers Beach Dune System planting design and construction; Louie's Backyard seawall replacement; Key West Sidewalk Replacement; Key West Roadway Repaving; Stormwater Outfall Tide Valves; and Reynolds Street End Reconstruction.



Jeffrey Bergmann, PE

Infrastructure Planning
and Design

WGI

Jeffrey has vast experience in managing civil and structural engineering projects in the public sector related to regulatory compliance, structural and civil engineering design and construction, construction administration, and contract management. Jeffrey's technical expertise includes structural engineering and inspection, forensic building assessments, and roofing design and detailing, building and special structure design forensic analysis, and finite element analysis. He is also proficient in the design and permitting of roadways and highways, design and permitting of water distribution and sanitary sewer collection systems, and design and permitting of reuse and irrigation quality water systems.

REGISTRATIONS

Professional Engineer: Florida #50159

EDUCATION

Bachelor of Science, Civil Engineering—University of New Mexico

RELEVANT EXPERIENCE

- **Boca Water Treatment Plant Building No. 2 Hurricane Hardening, Palm Beach County, FL - Senior Project Manager**
- **Boca Water Treatment Plant Building No. 29 Hurricane Hardening, Palm Beach County, FL - Resiliency Specialist**
- **Boca Water Treatment Plant Buildings 25, 33, and 52 Hurricane Hardening, Palm Beach County, FL - Senior Project Manager**
- **PBCWUD Western Facilities Hurricane Hardening, Palm Beach County, FL - Senior Project Manager**



**Jerry Saval, PE,
CFM**
Drainage
WGI

Jerry has more than 40 years of experience in the planning, design, permitting, and construction of water, wastewater, drainage, and roadway-related projects for municipal and private clients. He has performed all aspects of drainage design, including stormwater management system design and analysis. His responsibilities have included supervising staff engineers on design and plan preparation. He works closely with the project design team, including subconsultants and permitting agencies, to ensure that final design plans meet client needs and industry criteria.

REGISTRATIONS

Professional Engineer: Florida #PE36168

EDUCATION

Bachelor of Science—Civil Engineering, University of Florida

RELEVANT EXPERIENCE

- **Banyan Boulevard Improvements from Tamarind Avenue to Olive Avenue - Phase I, City of West Palm Beach, FL - Senior Drainage Engineer**
- **Binks Pointe Pathway LAP Design, Village of Wellington, FL - Senior Drainage Engineer**
- **SW 157th Avenue from SW 26th Street to SW 8th Street Roadway Improvements, Miami-Dade County, FL - Drainage Task Manager**
- **NW 29th Street Complete Streets, FDOT District 4 - Senior Drainage Engineer**
- **E-3 Canal Bank Stabilization, City of Port St. Lucie, FL - Senior Drainage Engineer**
- **Drainage Design of Four Flooding Locations, City of Miami, FL - Task Manager**



Pete Singhofen, PE
Modeling
WGI

Pete is the founder and chief technology officer of Streamline Technologies, a wholly-owned subsidiary of WGI. He is a widely recognized water resources expert in Florida with more than 40 years of experience. He specializes in stormwater management, drainage, water resources, flood risk modeling, and mitigation design. His expertise include real-time flood forecast modeling, impacts of sea level rise surface and subsurface infrastructure, water quality modeling, and holistic modeling approaches. Pete is the developer of the widely used and nationally FEMA-accepted ICPR4 stormwater modeling software.

REGISTRATIONS

Professional Engineer: Florida #PE33245

EDUCATION

Bachelor of Science in Engineering—Environmental Engineering, University of Central Florida

RELEVANT EXPERIENCE

- **Visualizing Sea Level Rise (Key West), Presentation at the AWRA National Conference, Orlando, FL - Author**
- **Quantifying Infrastructure Vulnerability Due to Sea Level Rise Impacts on Groundwater Levels in Coastal Florida, Presentation at the AWRA Annual Conference, Orlando, FL - Author**
- **Logan Boulevard Regional Floodway Drainage, City of Bonita Springs, FL - Chief Modeler**
- **Real-Time Flood Forecasting System for the Orlo Vista Neighborhood, Orange County, FL - Chief Modeler**
- **ICPR4 Modeling for the Southern Lee County Flood Mitigation Plan, Lee County, FL - Chief Modeler**



**Mark Wutz, PE,
CEM, CPMP, LEED
AP, CDSM, CPM**
Facility Assessment
K2M

Mark, K2M's director of engineering, is a proven team leader, mentor, and motivator. He is a seasoned professional with technical expertise in overall mechanical system design, commissioning, troubleshooting, cost estimating, construction supervision, the identification and implementation of energy optimization strategies and more. Mark has extensive engineering expertise, having served as the lead engineer for renovation and new construction projects, as well as serving as commissioning agent for individual buildings.

REGISTRATIONS

Professional Engineer: Florida #67284

EDUCATION

Bachelor of Science in Industrial Engineering—State University at Buffalo

RELEVANT EXPERIENCE

- **Affordable Housing - Conch Key and Big Pine Key, Key West Housing Authority, FL - Lead MEP Engineer**
- **Frederick Douglass Community Center, Expansion, City of Key West, FL - Lead MEP Engineer**
- **Upper Keys Campus of the College of the Florida Keys, New Construction, Key Largo, FL - Commissioning Agent**
- **Reverse Osmosis Facility, New Construction, Florida Keys Aqueduct Authority, Key West, FL - Lead MEP Engineer**
- **NASA Continuing Services Contract, Multiple Locations - Lead Assessor**



Doug Hammann, PE

Power and Water
Infrastructure

CHA

Doug is a principal engineer with 34 years of experience in the planning, design, permitting, and engineering services during the construction of water, wastewater, and reclaimed water projects for various municipal and private clients. His project expertise includes utility system master planning, water distribution systems, sanitary sewer collection and transmission systems, sanitary pump stations, vacuum sanitary collection/pumping systems, additions/rehabilitation of water treatment plants and wastewater treatment facilities, industrial wastewater pre-treatment systems, and reclaimed water treatment and distribution systems.

REGISTRATIONS

Professional Engineer: Florida #50589

EDUCATION

Master of Engineering, Environmental and Water Resources Engineering—Florida Atlantic University

Bachelor of Science in Civil Engineering Technology, Civil Engineering—Southern Illinois University

RELEVANT EXPERIENCE

- **Islamorada Wastewater Collection and Transmission Design-Build-Operate, Village of Islamorada, FL - Project Manager**
- **Stock Island Pump Stations Design/Build Distribution and Back Pump Improvements, and Cudjoe Regional Wastewater Collection System Outer Islands, Florida Keys Aqueduct Authority - Project Manager**
- **MBR System and Reverse Osmosis System Improvements, North Key Largo Utility Corporation - Project Manager**



Kristen Nowicki, AICP

Land Use Code/
Comprehensive Plans

WGI

Kristen is a senior project manager specializing in urban planning, community outreach, development services, public speaking, and leadership. Her planning experience includes development review, transportation, writing and revising comprehensive plans, Community Redevelopment Area plans, and land development regulations. Kristen has consistent success in implementing planning processes that align with projected trends to promote sustainable growth and redevelopment.

REGISTRATIONS

American Institute of Certified Planners: #023382

EDUCATION

Master of Arts, Urban and Regional Planning—University of Florida

Bachelor of Science, Environmental Science—University of Florida

RELEVANT EXPERIENCE

- **Seminole Tribe of Florida Comprehensive Plan, Seminole Tribe of Florida, FL - Project Manager**
- **Greenacres Comprehensive Plan Update, City of Greenacres, FL - Project Manager**
- ***Comprehensive Plan Update, City of Miami Beach, FL - Senior Planner**
- ***Comprehensive Plan Update, City of Lauderdale Lakes, FL - Senior Planner**
- ***Development Review Services, Town of Cutler Bay, FL - Senior Planner**

*Prior to WGI



Lynn Dehlinger

Economic
Redevelopment

RMA

Lynn's accomplishments include commercial development projects throughout Florida and Georgia, including award winning redevelopment projects. She was recently named one of the region's Most Influential Women in Business. In her 25 years of experience, she has negotiated major land development projects with municipalities, including developments of regional impact, public-private partnerships and local development agreements. Her experience in negotiating complex agreements, in all aspects of business development including planning, branding and recruitment, position her well for effective leadership and management in today's complex business environment.

EDUCATION

University of Georgia and Purdue University

RELEVANT EXPERIENCE

- **Economic Development and Market Analysis, Team Volusia Initial Strategic Plan, Holly Hill Economic Development Plan, Alachua Downtown Business Attraction Plan, Titusville Economic Development Plan, Deltona Strategic Five-Year Economic Development Plan, Cape Coral Redevelopment Plan, Wilton Manors Real Estate and Market Analysis**
- **Real Estate Development and Brokerage, P3, Retail and Mixed-Use Planning and Implementation, Portland Industrial Park and Amazon (Deltona), The Market (Holly Hill), Multiple Projects as Regional Director of New Development and Regional Development Director for Weingarten**



Keenan Campbell, IPEM

Funding

EcoPreserve

Keenan is a highly motivated and goal-oriented professional with extensive experience as an emergency manager. He brings the invaluable experience he attained as a director with Bureau County EMA, Illinois. His work there included designing an emergency management program from the ground up; providing guidance to department head and elected officials; assisting the County with day-to-day issues as they arise; representing EMA and assist others with policies and procedures of EMA programs; and serving as homeland security advisor to the Bureau County Board Chairman.

REGISTRATIONS

Institute for Environmental Management and Assessment
Certified Hazardous Materials Instructor

Illinois Professional Emergency Manager Certification

AFFILIATIONS

Department of Homeland Security Communications Unit
Leader; Situation Unit Leader; Planning Section Chief

RELEVANT EXPERIENCE

- **Emergency Preparedness Planning and Response,** *Bureau County, IL - Emergency Manager*
- **Emergency Operations Center Design and Construction,** *Lee County Emergency Management Agency, IL - Planning Consultant*
- **FEMA Emergency Management Performance Grant Management,** *Bureau County Emergency Management Agency, Princeton, IL - Emergency Manager*
- **FEMA American Rescue Plan Act Grant Management,** *Bureau County Emergency Management Agency - Emergency Manager*



Kaylee Halberg, LEHP, REHS/RS, EHLR, CERC, HSEEP, PIO

Health and Equity

EcoPreserve

Kaylee is a driven and passionate leader contributing over 11 years of experience in grant writing, program management, regulatory compliance, permitting, workforce development and emergency preparedness. Kaylee has won over millions in grant funding for various local municipalities and has an array of knowledge regarding local government.

REGISTRATIONS

Registered Environmental Health Specialist/Registered Sanitarian

EDUCATION

Bachelor of Science—Environmental Health, Illinois State University

AFFILIATIONS

National Association of City/County Health Officials Food Safety Subject Matter Expert

National Environmental Health Association Environmental Health Leadership Academy

RELEVANT EXPERIENCE

- **Public Health Emergency Preparedness Planning and Response,** *Lee County Health Department, IL - Planning Section Chief/Emergency Preparedness and Response Coordinator*
- **Cities Readiness Initiative Metropolitan Statistical Area Planning,** *Marshall County Health Department, IL - Emergency Preparedness and Response Coordinator*
- **Local Emergency Planning Committee and Land Development Board,** *Henry and Stark County Health Departments, IL - Director of Environmental Health*



Heather Carruthers Engagement (Task Lead)

K2M

Heather is a respected business and community leader with a diverse background in market research, hospitality, government and real estate, and served as a Monroe County Commissioner and Mayor before joining K2M. She serves as the principal in charge for all Keys projects. Heather is committed to open communication and client satisfaction. She understands that building consensus requires trust and transparency and will lead the team to ensure long-term support for the project.

EDUCATION

Bachelor of Arts—Wells College

RELEVANT EXPERIENCE

- **Affordable Housing Conch Key and Big Pine Key,** *Monroe County, FL - Principal in Charge*
- **Habitat for Humanity, Lower Keys, FL - Principal in Charge**
- **Frederick Douglass Community Center Expansion,** *Key West, FL - Principal in Charge*
- **College of the Florida Keys, Key Largo, FL - Principal in Charge**
- ***Higgs Beach Master Plan, Key West, FL - County Commissioner, District III**
- ***Monroe County 2020 Comprehensive Plan, Monroe County, FL - County Commissioner, District III**
- **631 Greene Street Redevelopment, Key West, FL - Principal in Charge**
- **Key West Women's Club, Key West, FL - Principal in Charge**
**Prior to K2M*



John Abbott, PG, CEP
Environmental (Task Lead)

WGI

John has diverse experience in environmental consulting, including contamination remediation, wetland mitigation, wildlife surveys, environmental planning, NEPA, and permitting. He has been a project manager on multi-million-dollar environmental projects. John is active in the environmental community; he serves on the Board of Directors of the South Florida Association of Environmental Professionals.

REGISTRATIONS

Professional Geologist: Florida #PG2401

Certified Environmental Professional

EDUCATION

Master of Science—Geology, New Mexico Tech

Bachelor of Science—Geology, Virginia Tech

RELEVANT EXPERIENCE

- ***Monroe County Comprehensive Plan and LDRs**, *Monroe County BOCC, FL - Environmental Scientist*
- ***Coastal Barrier Resources Act Policy Analysis**, *Monroe County BOCC, FL - Environmental Planner*
- ***Navy Draft EIS/OEIS for Atlantic Fleet Training and Testing**, *Monroe County BOCC, FL - Environmental Scientist*
- **Districtwide Environmental Permitting Consultant**, *FDOT District 6 - Environmental Scientist*
- ***South Miami-Dade Watershed Study and Plan**, *South Florida Regional Planning Council - Environmental Scientist*

*Prior to WGI



**Bert Bender, RA,
LEED AP**
Historic and Cultural
Preservation (Task Lead)

BAA

Bert established his firm in Flagstaff, Arizona in 1975 and ten years later, moved his practice to Key West, Florida. Bert's internship with visionary architect Paolo Soleri in 1971/72 infused the firm's philosophy of environmentally sensitive and ecologically responsible design. Historic preservation is the natural expansion of this philosophy: sustainability through protection of our existing buildings and historic resources. Bert has been recognized for his architectural contributions and talent with numerous project awards and has had his work published in "Preservation News" a National Trust for Historic Preservation publication, several books on light houses, and numerous newspapers and magazines across Florida.

REGISTRATIONS

Registered Architect: Florida #AR0011082

EDUCATION

Bachelor of Architecture—University of Illinois at Urbana

RELEVANT EXPERIENCE

- **Key West City Hall at Glynn Archer**, *City of Key West, FL - Historic Restoration*
- **Key West Custom House**, *Key West Art and Historical Society, FL - Historic Restoration*
- **Keys Energy Services Building**, *Keys Energy Services, FL - Building Remodel*
- **Historic Gainesville Depot Building**, *City of Gainesville Community Redevelopment Agency, FL - Rehabilitation and Adaptive Re-Use*
- **Hacienda Hotel**, *City of New Port Richey, FL - Restoration and Historic Preservation*



**Brian Mayfield, CP,
GISP**
Geospatial/GIS (Task Lead)

WGI

Brian has more than 25 years of experience, developing a diverse range of geospatial technology. Combining his expertise with leading-edge remote sensing technology, he develops cost-effective methods and real-world solutions to meet geospatial needs on the most challenging of projects. He is a catalyst that drives the team to commit to understanding and changes the expectations of our clients through innovative geospatial data solutions. He routinely consults with clients on technical and business issues and is widely recognized as an industry subject matter expert in the areas of photogrammetry, LiDAR, and QA/QC.

REGISTRATIONS

Professional Photogrammetric Surveyor: Virginia #000182

GIS Boundary Land Surveyor: South Carolina #24181

EDUCATION

Bachelor of Arts—Geography, University of Kentucky

RELEVANT EXPERIENCE

- **Franklin US98 Shoreline Rehabilitation**, *Franklin County, FL - Project Principal*
- **IDIQ Surveying and Mapping**, *USACE, St. Louis District - Principal in Charge*
- **Geospatial Products and Services Contract v.3 IDIQ**, *US Geological Survey - Principal in Charge*
- **Reclamation Wide Aerial Photography IDIQ**, *US Department of Interior Bureau of Reclamation - Principal in Charge*
- **LiDAR Data Acquisition**, *Idaho National Laboratory - Principal in Charge*



CREATIVELY TRANSFORMING HOW OUR WORLD IS
envisioned + designed + experienced

Qualifications **7**

CITY OF KEY WEST
RFQ #22-001

QUALIFICATIONS

VULNERABILITY ASSESSMENT

Our vulnerability assessments follow the Florida Adaptation Planning Guidebook. WGI provides technically feasible, economically viable, ecologically sound, socially beneficial, and politically acceptable solutions, successfully assessing the vulnerabilities of cities throughout Florida and beyond. We have partnered with M&N and CHA to round out our resiliency team. M&N is a part of a recently selected team for the Village of Key Biscayne and is executing a multi-year Resilient Infrastructure Program Strategy and Integrated Implementation Plan and Supporting Program Management and Execution contract, whereby **Dr. Lynette Cardoch** of **M&N** is leading the early phases of the program with strategy development. This includes similar requirements of identifying vulnerabilities and proposing solutions with multiple benefits.

VILLAGE OF KEY BISCAYNE VULNERABILITY ASSESSMENT (M&N)

M&N is on the team working with the Village of Key Biscayne, Florida, to design a strategy that will tackle environmental threats confronting the Village. This strategy comprehensively addresses infrastructure vulnerabilities to reduce residents' risks in the coming years. With flooding already a problem in Key Biscayne, the strategy takes on protecting shorelines, upgrading stormwater systems, improving roadways, and hardening utilities while modifying regulations, zoning codes, and building standards. Working with community, government, and industry partners, this is an example of how municipalities can address sea level rise, groundwater elevation, and more severe and frequent storms in a holistic and collaborative approach.

CITY OF COCONUT CREEK VULNERABILITY ASSESSMENT (WGI)

WGI worked with the City of Coconut Creek, Florida, to prepare a Vulnerability Assessment per the Florida Adaptation Planning Guidebook. The team conducted an inventory of critically significant assets and utilized available topographic and flood scenario data to focus on areas with a substantial risk of flooding. Special attention was given to the City-operated utilities, transportation infrastructure, and environmentally sensitive areas. In addition, the team conducted a Heat Vulnerability Analysis to identify those areas most vulnerable to extreme heat.

AVALON, CA, SEA LEVEL RISE AND CLIMATE CHANGE ADAPTATION PLAN (M&N)

Like many of our island communities, the City of Avalon, California, sits on Catalina Island and is at risk from sea level rise. Our engineering-informed Sea Level Rise and Climate Change Adaptation Plan provided a thorough evaluation of adaptation concepts and alternatives to mitigate vulnerabilities of coastal infrastructure to sea level rise and other climate-driven hazards while also considering beneficial or adverse impacts to other critical coastal resources. It also spotlights our emphasis on multiple lines of defense where a series of mitigation actions work together to reduce flood risk, including building scale applications.

NEW BERN, NC, RESILIENCY AND HAZARD MITIGATION PLAN (M&N)

The plan's overall goal was to increase community resilience to natural hazards, sea level rise, and climate change through an engaged stakeholder process, paying particular attention to underserved populations, historic and cultural resources, green infrastructure, and nature-based solutions. A detailed vulnerability and risk assessment were conducted to identify, quantify, and communicate existing threats to the City through maps, data figures, and supporting narrative. Existing planning data evaluation, public and stakeholder input, and vulnerability and risk assessment helped develop mitigation and adaptation strategies.



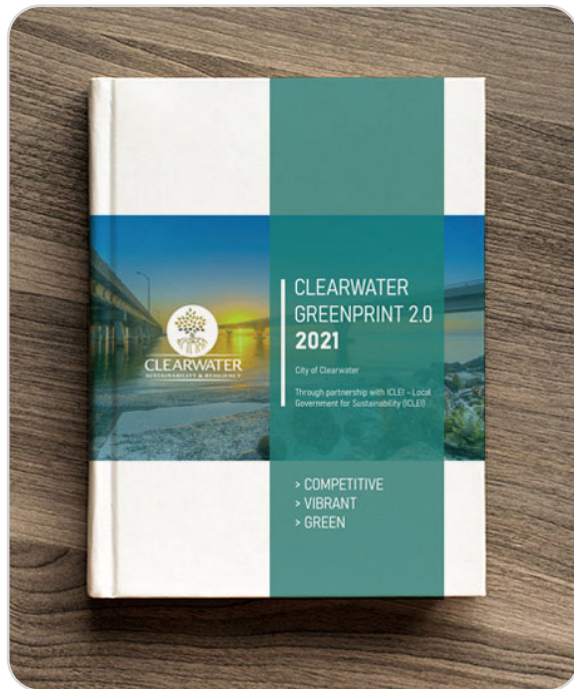
New Bern, NC, Resiliency and Hazard Mitigation Plan (M&N)

ADAPTATION PLANNING

Our team has had significant involvement in multiple large-scale complex adaptation plans and partnered with municipalities around the United States to create resiliency master plans that evaluate climate threats and other potential hazards. We provide the City of Key West with a team that has experience overseeing projects assessing, prioritizing, and budgeting adaptation options similar to this project. We aim to use our lessons learned from our project experience to not just have the City survive and recover quickly from the next big storm. We hope to also maintain and improve the everyday quality of life impacted by slow-onset long-term damage from repetitive events and persistent flooding. Our team's valuable experience also includes M&N's work providing supporting consulting services to the Mallory Square Master Planning team, led by Sasaki. Their participation includes a resiliency review, waterfront reviews for the cruise operation, and environmental permitting review, amongst other tasks. Engineering Lead **Annalise Mannix, MS, PE, PMP, Envision SP** has 20 years of experience in adaptation design, grants projects for the City of Key West, as well as developing adaptation programs for the City of Fort Lauderdale and Miami-Dade County Water and Sewer Department. This participation will provide the City with additional project synergies.

WELLESLEY, MA, SUSTAINABLE MOBILITY PLAN (WGI)

The Town of Wellesley, Massachusetts, hired WGI to develop a sustainable mobility plan and a 5-year to a 10-year roadmap to reduce transportation-related greenhouse gas emissions. The Town listed several areas for meeting its aggressive goals to reduce overall emissions by 30% in 2030 and to net zero by 2050, focusing on connectivity, multimodal transportation, safety, school travel, and grant opportunities. WGI led community engagement and surveys, infrastructure, and new mobility. Conducting outreach, WGI discovered non-traditional topics that affect vehicle miles traveled: childcare, the future of work-from-home, e-bicycle trends, e-commerce deliveries, and the "15-minute city." This plan links Wellesley to grant opportunities and identifies priority projects that align with the recently signed infrastructure bill.



Clearwater, FL, Greenprint 2.0 (WGI)

HAMPTON, VA, DESIGN OF RESILIENCE INFRASTRUCTURE AND ENVIRONMENTAL IMPACT BOND (M&N)

M&N has been engaged with the City of Hampton's flooding concerns for several years, including as subject matter experts during the Dutch Dialogues in 2015. Following that event, the City launched Resilient Hampton as a citywide initiative to improve resilience. As part of the flood mitigation efforts arising from the Resilient Hampton planning phases, the City of Hampton is engaged in developing stormwater pilot projects in the Newmarket Creek watershed. M&N is leading the consultant team to advance conceptual designs previously developed by the City and others and documented in the Resilient Hampton Newmarket Creek Pilot Project Area Water Plan. M&N led the team that advanced the conceptual designs level to validate design extents and constraints and the stormwater volume capture achievable within those constraints. The analyses include green infrastructure, blueway stream improvement, and raising of a critical transportation corridor—all of which will provide additional volume capture capacity and are included in the technical information needed for the environmental impact bond, issued in late 2020.

CLEARWATER, FL, GREENPRINT 2.0 (WGI)

The Clearwater Greenprint 2.0 document serves as a sustainability plan that identifies a series of tangible actions across eight topic areas that have the potential to reduce energy consumption, pollution, and greenhouse gas emissions while stimulating the local economy and improving quality of life. It sets forth goals, objectives, target timelines, and strategies, supported by detailed Measurement Methodologies in an Appendix. Greenprint 2.0 provides the City of Clearwater with a roadmap to plan for adaptation, mitigation, and resilience in the face of ongoing climate change impacts and applies innovative strategies for quantifying impacts and measuring success over time.

HARDSCAPE ENGINEERING

The WGI infrastructure team brings valuable expertise in hardscape engineering and resilient solutions to address sea level rise in our Florida communities with low ground elevations and high water tables. Our team focuses on planning, procuring, funding, and implementing infrastructure projects ranging from water, wastewater, and drainage facility management to state, county, and federally funded highway systems and everything in between. WGI conducts more than \$50M of hardscape engineering in Florida annually, including seawalls, roads, bridges, pump stations, and other infrastructure.

CITY OF DELRAY BEACH, FL, MARINA AND VETERAN'S PARK (WGI)

As part of the City of Delray Beach's effort to provide resilient solutions to sea level rise in coordination with capital improvements to address structural deficiencies in their aging seawall and public docks at their City Marina, WGI was awarded the planning, design, and construction administration contract to upgrade these facilities in the City's municipally owned parcels along the intra-coastal waterway. WGI's scope of services included survey, geotechnical, civil, structural, mechanical, electrical, and plumbing engineering, landscape architecture, and public outreach services for a raised seawall, new floating and marginal dock system, and the installation of in-line check valves. The City Marina, Veteran's Park, and Marine Way improvements represent more than 90% of the City-owned seawalls.

CITY OF DELRAY BEACH, FL, MARINE WAY RESILIENCY PROJECT (WGI)

This sustainability project for the City of Delray Beach is the final piece of the Veteran's Park to City Marina seawall and dock improvements and the third for WGI. The project is designed to adapt to climate change and rising sea levels while providing a stormwater pump station that serves the drainage basin. There are approximately 600 linear feet of new seawall and 900 feet of docks. WGI provided utility and drainage infrastructure improvements, roadway improvements, and a promenade for connectivity from the northern to southern limits. WGI was the lead engineer for design, permitting, and post-design services. WGI also provided an extensive public outreach program to notify, coordinate, and listen to the stakeholders/residents within the Marine Way project limits. Outreach activities included personal interviews with stakeholders, public meetings, City Commission meetings, and updating the project website.

GALLAUDET UNIVERSITY MICROGRID (CHA)

CHA is evaluating the potential for a microgrid system to serve the campus with renewable and efficient district energy services supplying electricity, hot/chilled water for building space heating/cooling, and domestic hot water for the entire campus. At the project's onset, CHA was the owner's engineer, defining potential generation technologies and their respective configuration(s), considering the challenges and opportunities of the campus's existing utility infrastructure. This subsequently led to CHA optimizing a selected array of distributive energy resources to formulate a business case for the microgrid project. CHA extensively evaluated potential roof-mounted solar photovoltaic (PV) installations at 23 locations. CHA used Helioscope 2016 design software to create a PV array layout and simulation for each roof structure.

CUDJOE REGIONAL WASTEWATER COLLECTION SYSTEM—OUTER ISLANDS (CHA)

CHA provided design and construction services for the Florida Keys Aqueduct Authority's Cudjoe Regional Wastewater Collection System (Outer Islands) project. This project converted septic tank systems to a central collection system that conveyed wastewater from neighborhood lift stations to the Cudjoe Wastewater Treatment Plant via master repump stations. CHA's portion of the project included the design of over 55,000 linear feet of transmission force main, and four master repump stations spread between Lower Sugarloaf Key, Ramrod Key, Little Torch Key, and Big Pine Key. The design included slip-lined pipe, aerial crossings, open-cut installation, and a one-mile-long directional drill under Niles Channel, featured in Underground Construction magazine.



City of Delray Beach Marina and Veteran's Park (WGI)

NATIONAL PARK SERVICE ENGINEERING SERVICES CONTRACT, SOUTH FLORIDA (M&N)

Under an indefinite delivery/indefinite quantity contract with the National Park Service (NPS), M&N is working as a subconsultant. This contract has provided a variety of services over multiple task orders, including resilience and sea level rise planning, waterfront planning and shoreline improvements, marine and coastal engineering design, public engagement and community outreach, permitting, code compliance, and cost estimating. The projects from this contract include:

- **Everglades NPS Marjory Stoneman Douglas Visitors Center**—M&N is leading the waterfront design effort (bulkhead, marina, living shoreline, boat ramp, and dredging with beneficial reuse) and the permitting consultation efforts.
- **Dry Tortugas/Everglades NPS Replacement of Damaged Docks at Loggerhead Key, Everglades City, and Key Largo**—Completing schematic design for this design-build project to replace facilities damaged during Hurricane Irma in three locations. M&N led the marine design and resilience planning for damaged dock facilities in all three areas. At Loggerhead Key, M&N provides coastal engineering, structural, and resilience design services to assess and plan for the sustainable management of the Loggerhead shoreline and pier.
- **San Juan NHS**—M&N provides coastal, resilience, and structural design services to restore eroded shorelines at Fortin San Juan de la Cruz (El Cañuelo). This UNESCO World Heritage Site was damaged during the 2017 hurricane season, and M&N has completed the design to restore the shoreline and enhance the coastal protection system, aligned with the cultural and historic fabric of the historic site, to mitigate future coastal storm damages.

STOCK ISLAND PUMP STATIONS DESIGN/BUILD DISTRIBUTION AND BACK PUMP IMPROVEMENTS (CHA)

CHA provided engineering services for the project design-build team. The project addressed pumping system improvements at two existing potable water pump stations, the Distribution Pump Station and the Back Pump Station. The project addressed the removal and replacement of several pumps, meters, piping/valves, electrical and supervisory control and data acquisition improvements, and minor HVAC and architectural/structural improvements.

NATURE-BASED ADAPTATION, GREEN INFRASTRUCTURE, LOW-IMPACT DESIGN

WGI conducts more than \$2M of nature-based adaptation, green infrastructure, and low-impact design annually. This includes living shorelines, mangrove restoration, beach and dune enhancements, seagrass and coral mitigation, swales, urban forestry, tree canopy enhancement, wetland design, and other environmental services. Below we have provided just a few samples of our successful projects with nature-based adaptation, green infrastructure, and other low-impact design services.

BANYAN BOULEVARD COMPLETE STREET (WGI AND RMA)

WGI, in conjunction with RMA, designed this gateway streetscape into downtown West Palm Beach, Florida. The corridor provides access to the waterfront and a connection to the heart of the entertainment district. The goal of this corridor redevelopment was to create a vibrant street and a downtown gateway, prioritizing pedestrians and cyclists, and designed with alternative mobility infrastructure, as well as safe accommodation of automobiles. Typical roadway sections were developed to transform the corridor into a bicycle and pedestrian-friendly link. This alternative protects cyclists from vehicular conflicts and reduces the width of pavement which lends itself to slower driving speeds. The use and placement of the canopy trees create a sense of enclosure and visual order, which needs to be improved. Due to the urban setting, soil cells installed underneath the sidewalk were a key component of the overall design and ensured the canopy trees would have enough soil and water to thrive. Bioswales planted with a native ground cover alleviated drainage issues throughout the corridor.



Banyan Boulevard Complete Street (WGI and RMA)

CURRIE PARK GREEN INFRASTRUCTURE (WGI)

WGI performed survey, civil engineering, and landscape architecture services to accommodate new infrastructure associated with the Currie Park Green Streets project in West Palm Beach, Florida. The scope of work included a design to reduce flooding, improve water quality, and provide streetscape improvements incorporating the benefits of low-impact design. The design included the development of a self-sustaining bioswale that assisted in the purification of stormwater runoff while enhancing the aesthetic of the corridor.

USACE BACK BAY COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY: RE-INITIATION PHASE (M&N)

M&N is teamed with the Miami Dade County's Office of Resilience to assist staff and local stakeholders in formulating new natural and nature-based features to be included in the overall Back Bay plan. M&N developed a nature-based structural solution with multiple lines of protection while providing environmental benefits, other public access, stormwater improvements, water quality upgrades, and maintained local property values and views. The system consisted of low-crested oyster breakwaters, elevated structural breakwaters planted with mangroves, dedicated seagrass-wetland protection zones, secondary structural revetment system upland seat walls, bioswale stormwater areas, and localized building protection.

TOWN OF HILLSBORO BEACH, FL, COASTAL ENGINEERING (M&N)

M&N has continuously provided beach management consulting services to the Town of Hillsboro Beach, Florida, since 2016 through multiple task contracts. Services included beach nourishment design; permitting; technical specifications, bid documentation, and construction administration; physical and biological monitoring of the beach and marine resources; post-storm assessments and response; coastal ordinance implementation; and securing grant and funding opportunities at the state and federal levels. Currently, M&N is assisting the Town in executing \$4.3M in FEMA and State funding for a beach renourishment project as a result of 2019 damages from Hurricane Dorian. The assistance includes pursuing additional funding through FEMA's Hazard Mitigation Grant Program to help protect the beach from future storm erosion events. M&N continues to advise the Town in resilience measures, including in helping develop the Town's tidal flood barrier ordinance that was adopted unanimously by the Commission in 2021, ensuring compliance with the Broward County ordinance and initiative to address rising sea levels and resilient infrastructure.

HISTORIC AND CULTURAL PRESERVATION

The unique challenges associated with resiliency and adaptation of our historical resources to rising sea levels require special expertise across several disciplines, particularly experts in historic preservation. The WGI team comprises the best available talent for the City to address this challenge. Our historic and cultural preservation lead, **Bert Bender of Bender & Associates (BAA)** has raised and relocated historic buildings in Key West and around the state, hardened and floodproofed historic buildings, redeveloped parks, and consulted with others on resilient design for historic structures. The following projects demonstrate their expertise for providing both historic and cultural preservation and resiliency solutions for public and private clients throughout Florida. BAA recognizes the paramount importance that the "Historic District Resiliency and Adaptation Guidelines" incorporates, honors, and respects the requirement of the "Secretary of the Interior's Standards and Guidelines for Rehabilitation."

725 CAROLINE STREET RETAIL SPACE (BAA)

The metal building at 725 Caroline Street flooded during Hurricane Wilma in 2005. When the Cornfeld Group purchased the building in 2014, it considered a resilient design compliant with historic district guidelines. The adaptive use program included floodproofing of the building and a requirement for maximum glazing to accommodate retail tenants. Understanding that passive floodproofing is preferable to active systems that require human intervention, we designed the glass curtain wall to withstand the hydrostatic pressure of flood waters. The project retained the industrial character of the building and the surrounding neighborhood while using contemporary materials and design elements that met FEMA flood zone requirements, and the Key West Historic District Guidelines.

HISTORIC GAINESVILLE, FL, DEPOT BUILDING (BAA)

This project is the rehabilitation and adaptive reuse of the Historical (the 1860s) Gainesville Depot Building. BAA provided the Depot building rehabilitation, including site memorialization and the site context coordinated with the overall park design. Through the years, the various additions and modifications to the Depot failed to respect the property's significant architectural

features and spatial relationships; this was corrected with the renovation/restoration. The Historic Structure Report included a sustainability section. Upon completion, the Gainesville Depot Building received Leadership in Energy and Environmental Design (LEED) Certification at a Gold Level and multiple awards for restoration and LEED (sustainable) design.

KEY WEST CITY HALL AT GLYNN ARCHER (BAA)

The Key West City Hall involved the restoration of the historic exterior envelope and the construction of an entirely new state-of-the-art facility within the historic shell. One of the main objectives of this project was to bring all the functions of the City of Key West under one roof. We worked closely with City staff to develop adjacency diagrams, space needs, work surface requirements, storage requirements, IT and infrastructure requirements, and public service space needs. We also worked closely with a pre-selected furniture manufacturer to ensure all spaces would perform as intended and meet the objectives of the City of Key West. Construction is complete, and the project received LEED Platinum certification.

KEY WEST CUSTOM HOUSE (BAA)

The Key West Custom House is one of the most significant historic buildings in the Florida Keys. The project includes the historic restoration of the 1891 Richardsonian Romanesque building to its original appearance and adaptive reuse as a museum and offices of the Key West Art and Historical Society. Located in downtown Key West, the restoration involves brick, brownstone, terra cotta, plaster, metal, wood, and timber. The firm was commissioned for the complete project, from programming and historic structure report to completion of construction.



Key West Custom House (BAA)

ECONOMIC DEVELOPMENT

The WGI team has the experience, in-house expertise, and financial stability to complete and implement projects of all sizes. We have a proven track record assessing, developing, and implementing plans/programs that improve communities by utilizing a realistic, comprehensive, and effective approach—resulting in over \$1B in private sector investment within our client areas. We will share with you some of the most creative strategies and best practices implemented within the industry. These strategies highlight how we must continue to “think differently” to develop new approaches to retail in a constantly changing landscape. Imagination and case study “best practices” from these existing and emerging success stories are the best way to solve the retail dilemma.

WILTON MANORS, FL, MARKETING AND BRANDING STRATEGIC PLAN (RMA)

The City of Wilton Manors, Florida, retained RMA to develop a marketing and branding strategy for the five major commercial corridors within the City. This project was part of the State of Florida’s Department of Economic Development’s Incentive Program. With a population about half the size of Key West, the developed Wilton Manors’ strategies were specific to commercial corridors. The objectives, methods, and tactics outlined the activities recommended to reach the City’s goals to create corridor-specific brand identities under the umbrella of the City’s brand, attract private investment, retain existing businesses, promote tourism, and recruit corporate, industrial, and retail companies. Boutique shopping and small-town charm create a specialty retail experience. With a unique tourism market, Wilton Manors benefits from its evolution as a destination for the LGBTQ+ visitor submarket, another parallel similar to Key West.

GREENACRES, FL, VISIONING AND STRATEGIC ACTION PLAN (RMA)

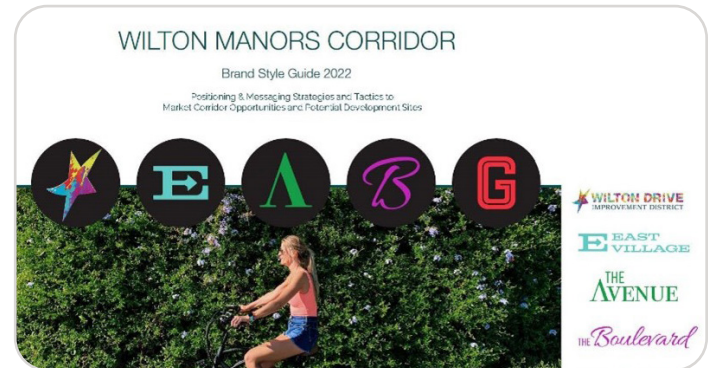
RMA’s team of professionals took a holistic approach to develop an authentic vision and strategic action plan for Greenacres RMA’s tasks included a market analysis, public input, and in-depth online research on the city’s reputation. The plan addressed redevelopment opportunities and public-private partnerships, form-based zoning codes, pedestrian-friendly connectivity, multimodal transit, housing, infrastructure, history, culture, and community connections. RMA identified various funding sources to connect initiatives to realistic implementations.

COMMUNITY ADAPTATION

Changing climate conditions are bringing communities closer to the potential for a natural disaster. Our team is prepared to support the City in developing an actionable, emergency preparedness hazard mitigation plan and access federal aid before and after an emergency. Organizations that plan and prepare for the effects of climate change reduce disaster recovery costs, maintain business continuity, and improve community resiliency.

COMMUNITY HEALTH NEEDS ASSESSMENT (WGI)

WGI assisted the Health Planning Council of Northeast Florida in preparing the Community Health Needs Assessments (CHNA) for five hospital systems and 13 hospital campuses serving northeast Florida. The reports identify the health needs of communities that risk not receiving adequate medical care because of various inequities. As part of the project development, WGI prepared five county profiles, including county maps, infographics of various county characteristics, a map series to show the geographic distribution, and a community survey throughout the five-county areas. WGI was responsible for leading survey development that analyzed race, ethnicity, income, poverty, education, and crime rates to evaluate the effects on healthcare availability and equity. Following the data collection, WGI assembled the overall CHNA Report and best practices.



Wilton Manors Marketing And Branding Strategic Plan (RMA)

CLAY COUNTY, FL CONSOLIDATED PLAN PREPARATION (WGI)

The Consolidated Plan assesses the needs of Clay County's low- and moderate-income residents. It offers solutions in the form of accessibility to affordable housing, community development needs, infrastructure investment, market conditions, and public services. WGI collaborated with the County's Planning and Zoning Department, the Health Planning Council, and Carras Community Investment Inc. on the project's public outreach program. WGI developed the Citizen Participation Plan that guides how the project engages the local community and receives feedback from the County's residents. Other elements that WGI utilized its planning expertise in included preparing the stakeholder engagement charrette, developing public surveys, launching the project's official website, and facilitating a virtual community workshop.

WGI's work ensures that the citizens of Clay County have a direct role in crafting the Consolidated Plan and influencing how the funds from this project are reinvested into their community. The Consolidated Plan ensures transparency, equity, and public advocacy for the residents of the County.

VILLAGE OF YELLOW SPRINGS, OH COMMUNITY GENTRIFICATION AND EQUITY—BEST PRACTICES REPORT (WGI)

Over time, the Village of Yellow Springs observed a decline in its original population, particularly long-time black residents. AARP engaged WGI to develop a Best Practices Report on how to combat the village's gentrification, displacement, and equity issues. The team also identified other factors affecting equitable access to resources, such as transportation, housing availability, and cost of living. WGI conducted an existing conditions assessment and provided case studies with best management practices for gentrification in similar rural towns. The current conditions assessment reviewed population, racial/ethnic demographic characteristics, housing statistics, land use, measures of economic opportunity, and transportation infrastructure and accessibility. It also examined ongoing trends over the last three decades resulting in observations such as the declining populations of black and other non-white residents within the village. The case studies contained in the report each outlined best practices employed by the government, citizens, or institutions that helped mitigate the effects of gentrification within the municipality.

BUREAU COUNTY, IL, EMA FEMA EMERGENCY MANAGEMENT PERFORMANCE GRANT (ECOPRESERVE)

ecoPreserve obtained a \$6.6M grant for community infrastructure upgrades, mass vaccination planning, infectious disease response planning, and facility upgrades in Bureau County, Illinois.



ILLINOIS DEPARTMENT OF PUBLIC HEALTH-COMPREHENSIVE LOCAL HEALTH PROTECTION GRANT (ECOPRESERVE)

ecoPreserve successfully secured multi-year/multi-counting funding for infectious disease surveillance and response, safe drinking water, vector control, food safety, groundwater protection, onsite wastewater regulation, land development, and all-hazard planning.

POLICY

Across the southeastern United States, we work daily with comprehensive plans, area and downtown plans, urban studies, land development regulations, large and small-scale comprehensive plan amendments, feasibility studies, and planning reports. Our experience and skill sets include planning and implementation consulting services to over 300 public, private, and community-based clients across the country.

HARDEEVILLE, SC, COMPREHENSIVE PLAN UPDATE (WGI)

WGI established and led a team to update the comprehensive plan for the City of Hardeeville, South Carolina, consistent with the South Carolina Comprehensive Planning Enabling Act. After the full review, four of the nine elements were updated: Community Facilities, Future Land Use, Transportation, and Priority Investment (Capital Improvements). Additionally, the City of Hardeeville was provided with a set of financially feasible implementation plans for its future growth. The future land use element analyzed development trends; evaluated existing conditions; and formulated goals, objectives, and policies. The WGI team addressed utilities; public safety and municipal services; and county, state, and private services. We analyzed the freight network, including rail, passenger rail, local and regional transit, hurricane evacuation routes, and existing and future road capacity. We prioritized capital improvements based on population and nonresidential growth projections; a detailed financial analysis; long-range forecasts for tax and user-fee revenues; goals, objectives, and policies; and a short-, medium-, and long-term capital investment program.

CLAY COUNTY, FL, LAND DEVELOPMENT CODE REVISION (WGI)

The WGI team completed a revision of the County's code, focusing on Article III: Zoning and Land Use and Article VIII: Sign Regulations. WGI thoroughly reviewed the existing code and provided changes aligned with the County's comprehensive plan and state statutes. In addition, we integrated best practices to encourage new industries, redevelopment incentives, and incorporating green building standards for compliance with sustainable design standards.

CITY OF LIGHTHOUSE POINT, FL, CODE REWRITE (WGI)

WGI worked with the City of Lighthouse Point, Florida, to undertake a complete review and, where applicable, rewrite the City's Municipal Code. Best practices included language to address future trends, resiliency, and performance-based zoning. Policy for future trends included pro-active low-impact development stormwater standards to face future challenges of sea level rise. Plus, Green Building incentives steer future development toward more sustainable models. Resiliency best practices included updating how elevations are measured based-off increased base flood elevation requirements and implementing a series of solutions to reduce flood risk. Performance-based zoning best practices included introducing mixed-use planned developments that protected natural areas and provided maximum impervious surfaces.

TRIBAL GOVERNMENT COMPREHENSIVE PLAN SUPPORT (WGI)

WGI provided peer review and oversight of draft comprehensive plans for several Tribal Reservations and Settlements. Our work included a review of each plan's goals, objectives, and policies. WGI provided review and recommendations for the plans, stakeholder presentations, and outreach survey questionnaires. These efforts assisted the Tribe in preparing its first comprehensive plan, one that is representative of the goals of the Tribe, supported by Tribal members, and directs action to carry the Tribe into the next decade.

OUTREACH

Our proven community engagement processes increase communication and risk comprehension to spur mitigation action. We focus on presenting information equitably and dynamically with various tools to engage the audience, leading to greater participation and exchange of ideas. We also have extensive experience incorporating multi-lingual resources when needed to ensure our outreach is as inclusive as possible. Our iterative process leverages input from the community to foster buy-in from project inception. There is no team with more proven experience delivering resilience planning outcomes through our process of virtual outreach capabilities, in addition to design workshops and charrettes.



Port of Fort Pierce Master Plan (M&N)

FERNANDINA BEACH, FL, COMMUNITY OUTREACH (WGI)

As part of WGI's role in developing the City of Fernandina Beach's 2045 Vision Plan, meaningful public engagement was incorporated and continued through the plan's development. The WGI team created a social media strategy consisting of Instagram posts, Facebook stories, tweets, hashtags, and a comprehensive schedule to coordinate among the different platforms. The online surveys allowed the team to reach over 1,000 Fernandina Beach citizens and gather their input and ideas for the Vision Plan. The WGI team attended the Juneteenth Homecoming Celebration to gather in-person information from the residents. We chose the event to increase the project's outreach to Fernandina Beach's African American community. In addition, specific outreach was conducted with the Hispanic community with a Spanish language survey. This strategy allowed our team to engage with overlooked and under-represented demographics in planning and community visioning projects.

PORT OF FORT PIERCE, FL, MASTER PLAN (M&N)

M&N successfully engaged diverse groups of stakeholders in their planning efforts for the Port of Fort Pierce Master Plan. The community engagement campaign involved regular meetings with the client and key team members, one-on-one outreach with landowners, businesses, and community interest groups, one-on-one meetings with elected officials, and engagement with the general public via outreach periods throughout the project. Community awareness is fostered, and feedback is gathered utilizing the project website, virtual and in-person meetings, community surveys, and poster galleries. Public input was successfully secured at the beginning of the pandemic using mostly virtual methods obtaining 8,940 views; 624 participants; 7,513 responses; 702 comments; and 356 subscribers across two engagement periods, reaching nearly 95,361 households. All of the information was synthesized and helped shape the master plan.

DELRAY BEACH, FL, COMMUNITY OUTREACH (WGI)

The Delray Beach Parking and Curbside Management Plan was launched in 2020 to address two main goals: (1) maximize the use of existing parking and curb space, and (2) address impacts related to emerging trends and technologies such as e-commerce and microtransit services. WGI developed a GIS-based survey tool to inventory parking supply and curb use for valet, bike storage, and shuttles. With attention to robust stakeholder engagement, WGI facilitated meetings with neighbors and the business community to gather data on parking demand and supply, employee needs, and future development. Through the survey results and analysis, WGI proposed a performance-based approach to management since underutilized parking was identified on the periphery of downtown. This approach builds on the City's technology investments to develop a system that actively monitors, manages, and communicates parking system elements in real-time.

INTERACTIVE MAPS

WGI has dedicated, highly trained, and qualified geospatial specialists experienced in providing all services anticipated in this contract. Our team has worked extensively with many agencies, including departments of transportation, water management districts, and environmental protection. Providing mapping services to private and public sector entities has given WGI the skills necessary to accommodate various visualization needs and customize project-specific solutions.



DELRAY BEACH, FL, COMMUNITY REDEVELOPMENT AGENCY PROPERTIES DASHBOARD (WGI)

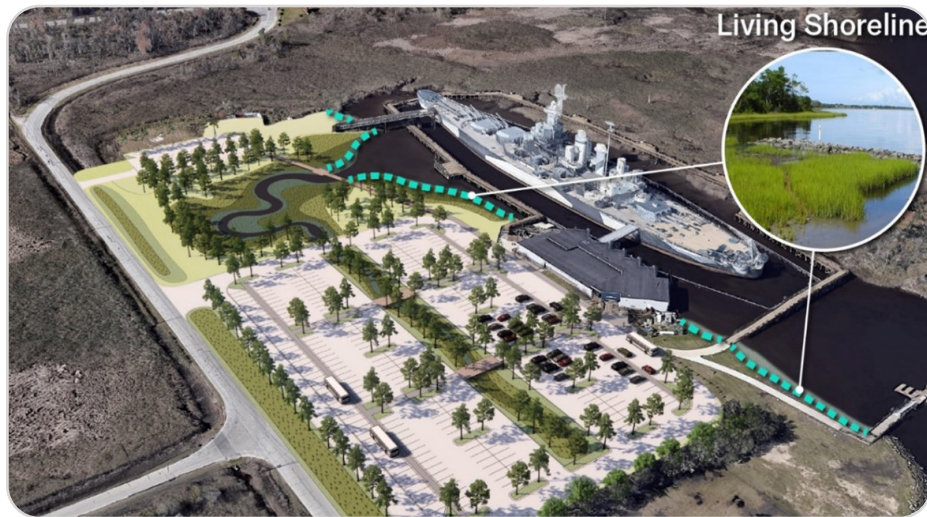
Historically managing more than 100 properties via a tracking spreadsheet, the Delray Beach Community Redevelopment Agency approached WGI to develop an operations dashboard to leverage the technology and acquire a comprehensive and dynamic tool. Cadastral and ancillary data were researched, retrieved, and processed via extract, transform, and load methods, classifying the properties by existing categories, zones, in-progress, and future projects and adding several City of Delray Beach datasets, including land use, zoning, public parks, parking lots, and garages to a working WebMap underlying the dashboard. The dashboard offers tools to delve into property information of interest with agility and precision, and, as part of the service, key staff were trained in the efficient operation and maintenance of the product. The dashboard is hosted by the City's enterprise portal in coordination with Delray Beach GIS.

PALM BEACH COUNTY, FL, AFFORDABLE HOUSING SITE SELECTION TOOL (WGI)

The WGI GIS team provided analytical support for a public-private partnership project involving a countywide workforce and affordable housing initiative led by the Business Development Board of Palm Beach County. Publicly owned properties by all municipalities and government-associated agencies were evaluated for suitability based on cadastral and ancillary data utilizing multiple criteria methods. Palm Beach County Property Appraiser's parcel data was queried by ownership, vacant land use, and size. Upon verification of environmental conditions, including preserves, wetlands, and other natural considerations, the process of selection and elimination continued by verifying the existence of construction permits under processing affecting the properties. Additional geographic characteristics were studied, including adjacencies of individual and mixed ownerships, to determine clusters, isolation, and distance to business centers. Visual inspection utilizing aerial imagery and input from local experts assisted in determining utility implications such as stormwater retention, detention, wellfield zones, and easements. Results were presented to stakeholders through web GIS visualization, applications, and cartographic products, including web maps and dashboards. The dashboard cataloged selections and eliminations by geographic area, ownership, and supporting considerations validating the datasets and assisting in the client's decision-making.

ORANGE COUNTY, FL, ORLO VISTA FLOOD FORECASTING PROJECT (WGI)

An interactive mapping and dashboard system that forecasts floods in the Orlo Vista neighborhood of Orange County, Florida up to three days in advance at the street and house level. The system is used as a flood warning system and aid for decision making for the operation of a 35,000 GPM pump station by County staff. It runs 24/7 and was used to issue an evacuation notice before Hurricane Ian in late September 2022.



Battleship North Carolina Living Shoreline (M&N)

BATTLESHIP NORTH CAROLINA LIVING SHORELINE (M&N)

The Project Story Map for the BATTLESHIP North Carolina conveys the climate risks, while the site serves as an "outdoor classroom" for yearly visitors. While the project aims to address nuisance flooding, stormwater retention, and foraging habitat for endangered sturgeon, our planning and design focused on optimizing the site such that it can serve as an "outdoor classroom" to educate 300,000 Battleship Memorial visitors about the benefits of natural approaches to climate change adaptation. The Story Map helps educate on the climate risks and the projects being used to protect this National Historic Landmark.

The ArcGIS Hub can also serve as the backdrop for an interactive discussion of site-specific impacts, known/potential resiliency limitations, and county-critical priorities. The team can utilize break-out sessions, web-based surveys/polling, the Hub Site, and other complementary tools to promote participation and maximize meeting outcomes.



CREATIVELY TRANSFORMING HOW OUR WORLD IS
envisioned + designed + experienced

Representative Vulnerability Assessment and Adaptation Plan Experience and Client References

8

CITY OF KEY WEST
RFQ #22-001

REPRESENTATIVE VULNERABILITY ASSESSMENT AND ADAPTATION PLAN EXPERIENCE AND CLIENT REFERENCES

WGI

TOWN OF WELLESLEY, MA
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 Project: Sustainable Mobility Plan

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M&N

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 Project: USACE Coastal Storm Risk Management Study

CITY OF HAMPTON, VA
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 Project: A multi-phase planning, design, and public engagement effort to direct redevelopment and address flooding

CITY OF NEW BERN, NC
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 Project: New Bern Resiliency and Hazard Mitigation Plan

CHA

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 Project: Stock Island Pump Stations Design/Build

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 Project: Cudjoe Regional Wastewater Collection System

RMA

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Jeri Muoio, Ph.D—President and CEO, Great Cities for All (Former City of West Palm Beach Mayor)
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 Project: CRA Management—Design charrettes/public input, historic building renovations, economic development plan, retail/residential market potential and demand analysis, public-private partnerships, business attraction/marketing/special events



*Please feel free to contact any of our references for testimonials on our successful partnerships.
 For more details on our representative experience, please refer to tab 7, "Qualifications."*

WGI, A FULL-SERVICE FIRM

Bringing you a full-service team tailored to your project needs.

- Fifty years of experience with the planning and design of infrastructure in coastal and waterfront communities.
- A realistic, actionable, and practical grant-funded plan that can be phased and addresses Key West's challenges for the future.
- A team that knows how to communicate and how to listen—engaging the community.



Photo Credit: Felix Mizionnikov



LET'S TALK



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