RESILIENT JACKSONVILLE

CITY OF JACKSONVILLE
October 2023

SYSTEMS

Adaptation Approaches and Actions that work across multiple sites at a neighborhood, corridor, landscape, or regional scale.

GROW RESILIENTLY	Guide safe and connected development to areas of low flood risk and high resilience potential.
TRANSFORM	Redesign infrastructure and the built environment to make space for water, reduce urban heat, and improve connections between places.
PRESERVE	Conserve and enhance valuable open space and ecosystems and limit development in areas of high flood risk.
PROTECT	Fortify critical city systems against future threats.
PREPARE	Plan in advance of a threat to improve the response of city systems during an emergency.

SITES

Adaptation Approaches and Actions that can be implemented at the scale of a single asset or site.

ACCOMMODATE	Alter or retrofit vulnerable buildings and the built environment at the parcel level to adapt to heat and manage water.
RELOCATE	Offer voluntary, incentivized, or gradual retreat where fortification and accommodation are not efficient or effective.

PEOPLE

Resilience Approaches and Actions that focus on residents, communities, businesses, organizations, and partnerships.

SUPPORT	Invest in the health and quality of life of Jacksonville residents.
THRIVE	Ensure shared prosperity for Jacksonville's people and businesses for the long-term.
COLLABORATE	Strengthen partnerships and coordination among city departments, between government agencies, with civic organizations, and in support of regional coalitions.

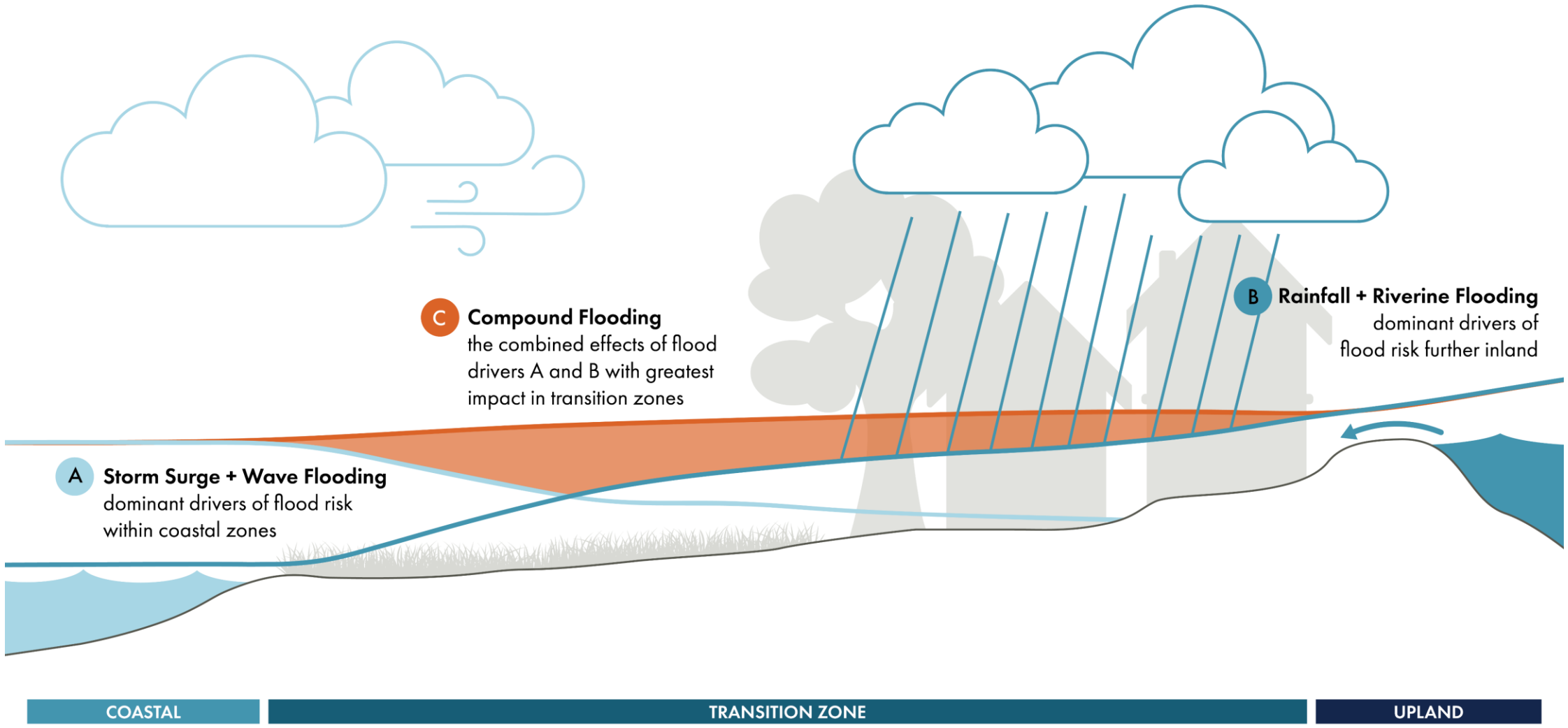
Hurricane Irma is an important example of compound flooding in Jacksonville.

Downtown Jacksonville at the height of storm surge flooding [Hurricane Irma]. Image credit: Bob Self / Florida Times Union.

Image credit: City of Jacksonville.

COMPOUND FLOODING

IN COASTAL TRANSITION ZONES



Compound flooding occurs when rainfall, riverine flooding, and coastal flooding interact to produce combined flood hazards.

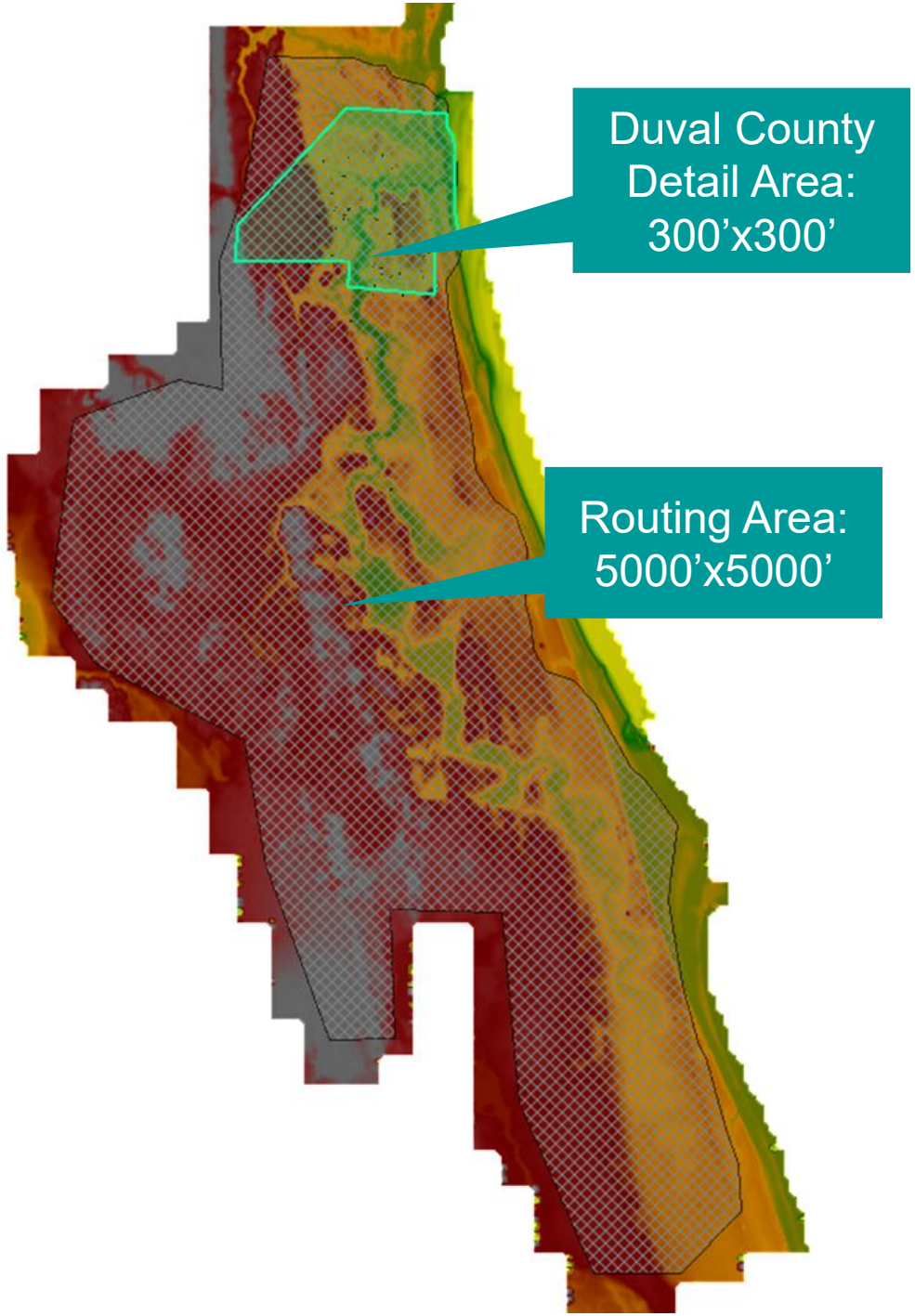
HEC-RAS 2D MODEL

Routing Area:

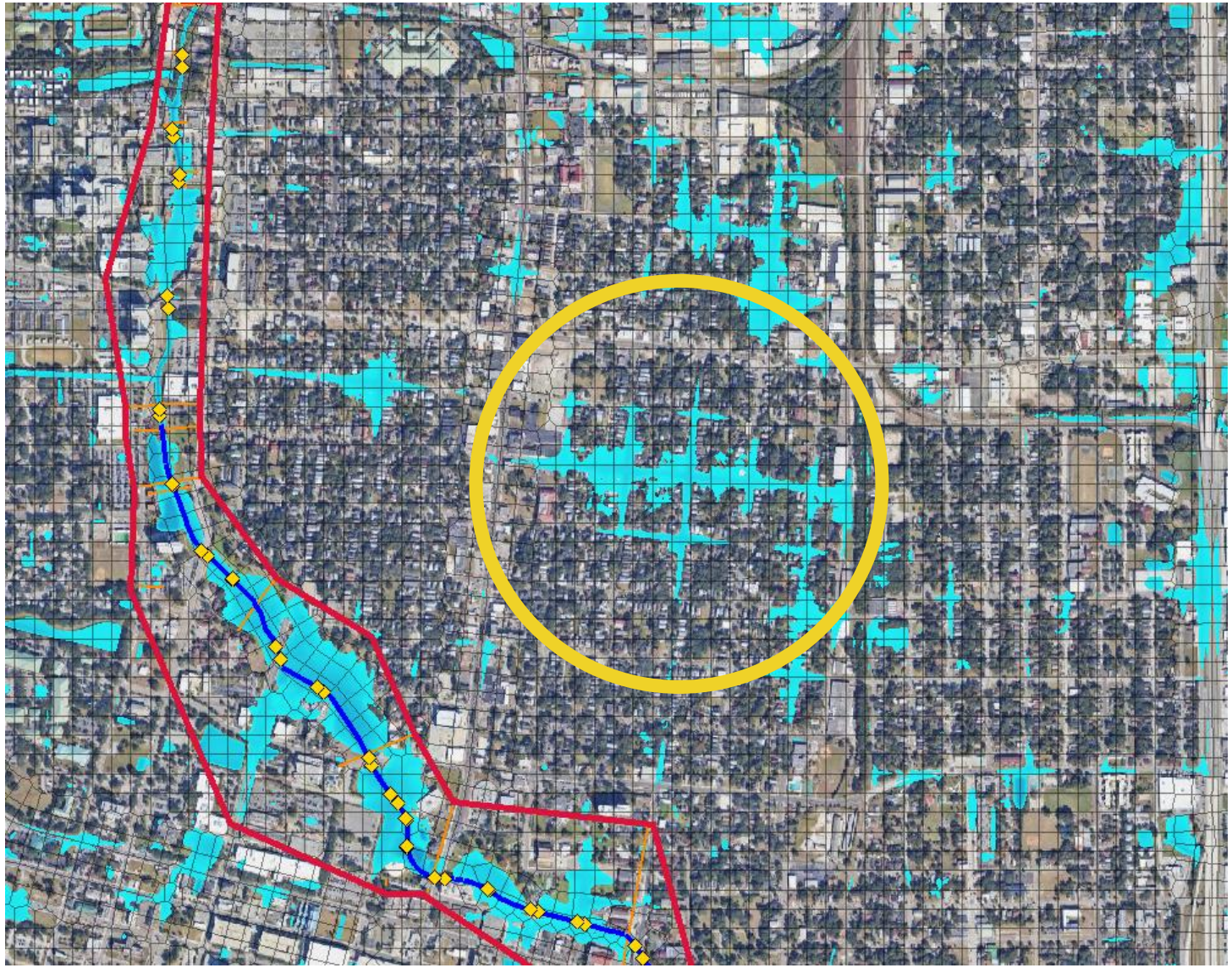
- 5000’x5000’ Mesh
- Used to route flow to the City of Jacksonville
- Mesh size kept large to optimize model run time

Detail Area:

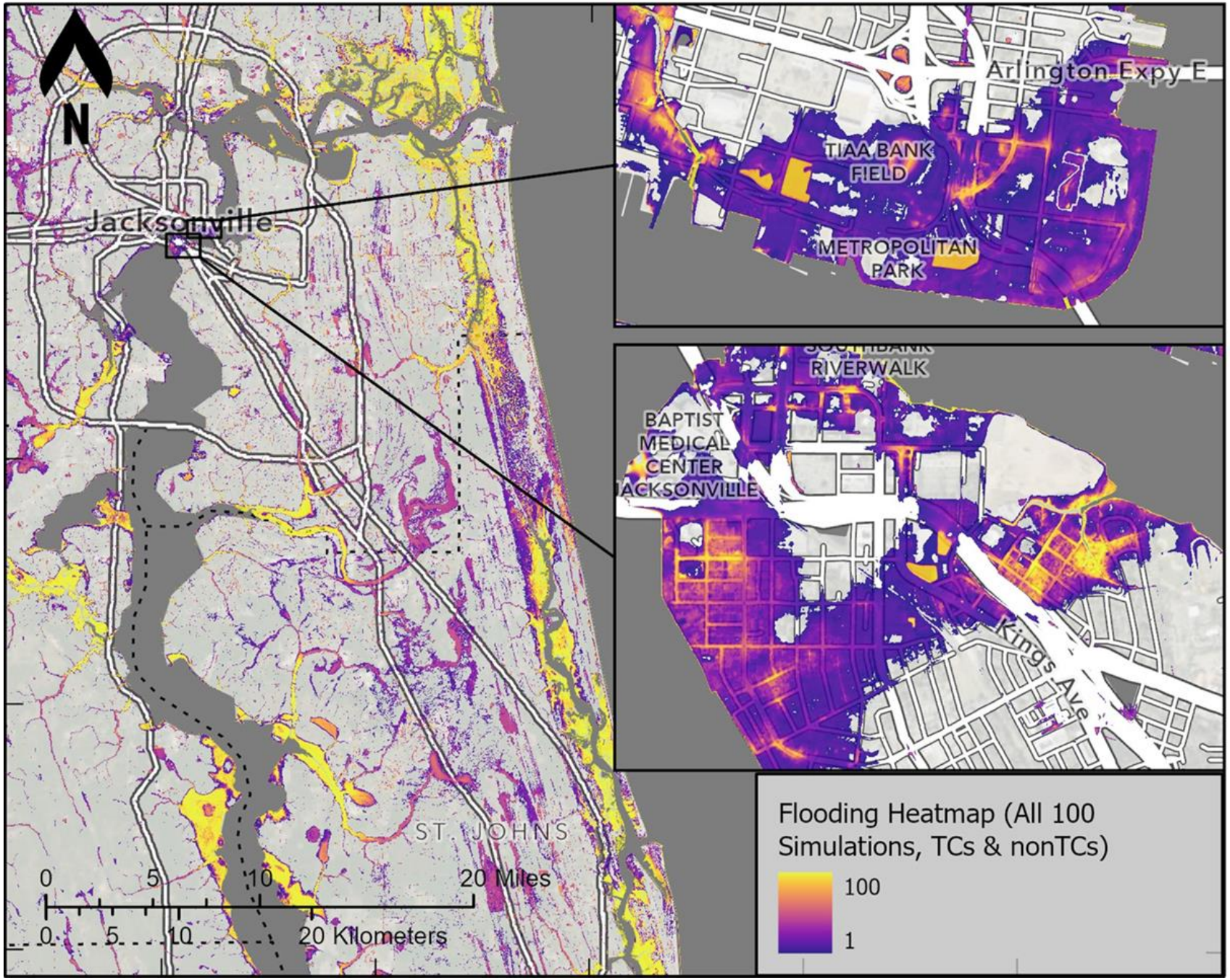
- 300’x300’ Mesh
- Results require high level of accuracy
- Allows for accurate tidal wave propagation
- Additional regions of refinement (150’) of frequently flooded areas



Compound flood model captures localized flooding not included in existing flood data

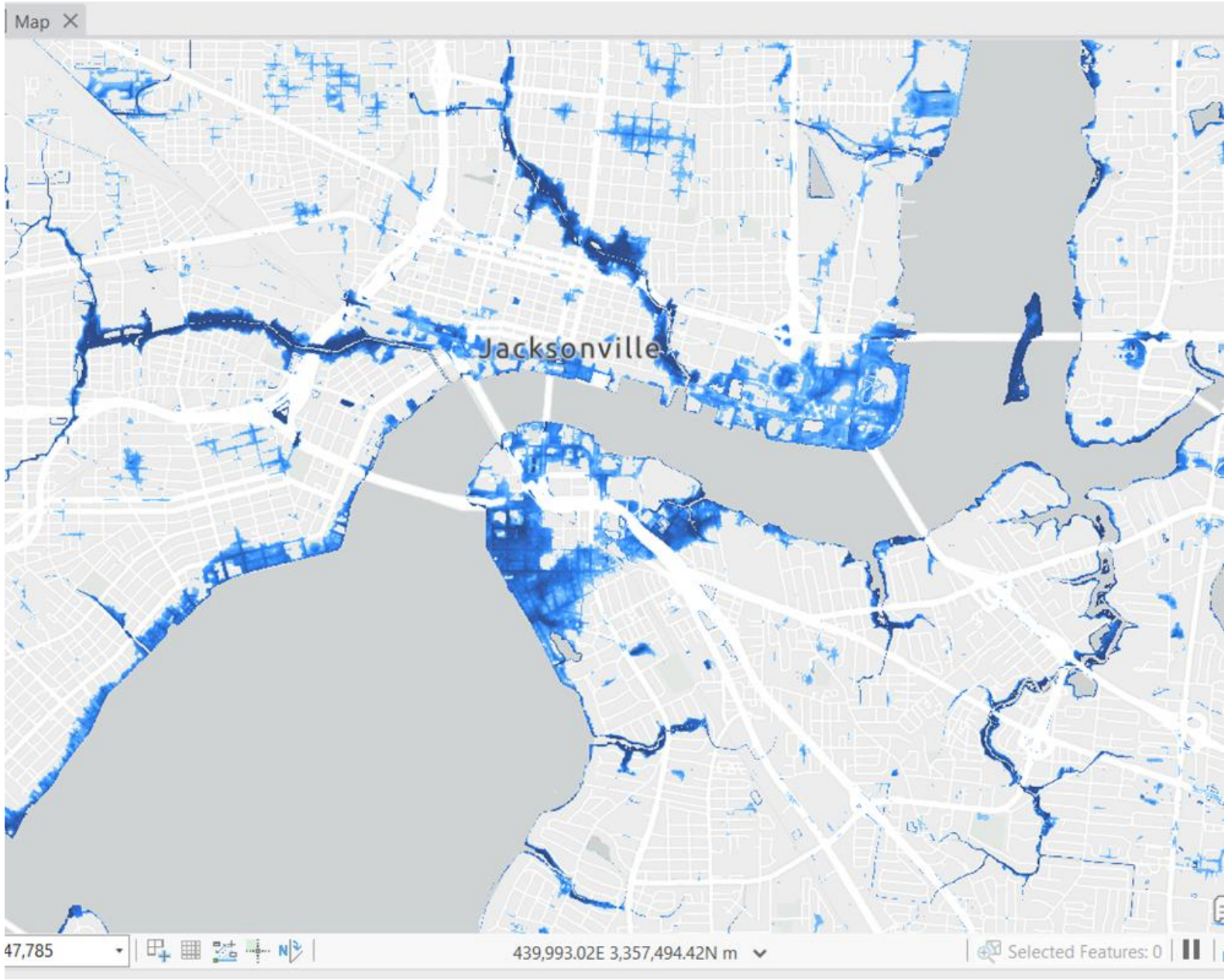


VISUALIZING RESULTS



PLANNING APPLICATION:

Guiding future growth in areas that are low risk and well-connected to infrastructure



1 | Guide future growth in areas that are at low risk and well-connected to infrastructure.

Resilience and growth can be complementary goals if new development is guided to areas that are at lower risk of flooding and other climate threats and well-connected to the existing infrastructure necessary to support thriving communities, such as various modes of transportation and energy and water utilities. Multiple interrelated dynamics shape decisions around where growth and development happen, making it challenging to advance resilience objectives alongside other economic and social considerations. Jacksonville can guide growth in a resilient way by using a suite of planning, regulatory, and incentive-based tools in concert toward a common vision for the city's future. By guiding growth in locations well-suited for low-risk development, the City can avoid increasing the number of homes, critical facilities, and people located in flood-prone areas and thus avoid further increasing potential damages from flood events.

Resilient strategies for growth, like infill development, can also provide additional benefits. Infill development focuses growth on underutilized sites, such as parking lots or vacant properties, within an already developed area. It is a model of growth that "fills in," rather than expands from the existing urban fabric and supports increased density in areas where infrastructure and resources already exist. Infill development can reduce the distance that people need to travel to jobs and services; enable diverse modes of transportation, like public transit and bicycles; reduce urban sprawl and protect ecologically and recreationally valuable open spaces from development; make multi-unit housing options accessible for more residents; increase the return on investment in existing infrastructure; and reduce the extent and cost of infrastructure and services the City needs to provide and maintain.[1]


Credit: Halff

Shocks and Stressors Addressed

Flooding / Sea Level Rise / Chronic Flooding / Housing Instability

Implementation Partners

Planning & Development / JEA / JTA / North Florida TPO / Development Community

Potential Funding Mechanisms

CIP / Modified Fee Structure

Implementation Timeframe

Immediate (2025) | Short-Term (2030) | Medium-Term (2035) | Long-Term (2050)

Relative Cost

$ (10,000s) | **$$** (100,000s) | $$$ (1,000,000s) | $$$$ (10,000,000s)

SUB-ACTIONS

1.1 Update the City's land development regulations.

The City's land development regulations govern multiple aspects of where and how land is developed, including allowable uses, site requirements, and building and construction standards. Jacksonville's land development regulations include the Zoning Code, the Code of Subdivision Regulations, and the Floodplain Management Ordinance. Jacksonville's current land development regulations were written when climate threats were not a major consideration and do not account for the full range of current and future conditions that climate change brings. New homes, businesses, services, and subdivisions are permitted in a manner that may be inconsistent with the goals of *Resilient Jacksonville*, placing residents at greater risk from climate hazards. Projections for how climate change will increase flood risks to certain areas of the city are now available and can be used to regularly update regulatory tools to reflect the best available data and science in a way that serves Jacksonville residents for generations to come. The City is working on updating its land development regulations over the coming year to account for future flood risk projections in where and how land and buildings are developed. Land development regulations will also be regularly updated to account for changes in the environment and exposure to risk over time.

1.2 Facilitate strategic infill development in areas of low flood risk.

The City of Jacksonville, in partnership with Jacksonville Transportation Authority (JTA), JEA, the development community, and other partners, will explore and implement a range of tools to encourage infill development that is resilient to increasing climate impacts and located in high, dry, and connected areas. These tools may include incentivizing redevelopment of vacant properties in high, dry, and connected areas; thoughtfully and strategically increasing allowable densities or providing density bonuses in those areas; partnering with developers to transfer development rights from one property to another; reducing utility connection fees in target areas; and reducing parking minimum requirements for new developments. City Council passed legislation in 2022 that expands where accessory dwelling units (ADUs), small housing units built on the same lot as a single-family home, are allowed in Jacksonville. This is another important tool that will support affordable infill development in Jacksonville. The City will combine tools for infill development with approaches for maintaining and expanding affordable housing (see Action 4) to ensure that making room for new neighbors improves conditions for existing residents and minimizes displacement.

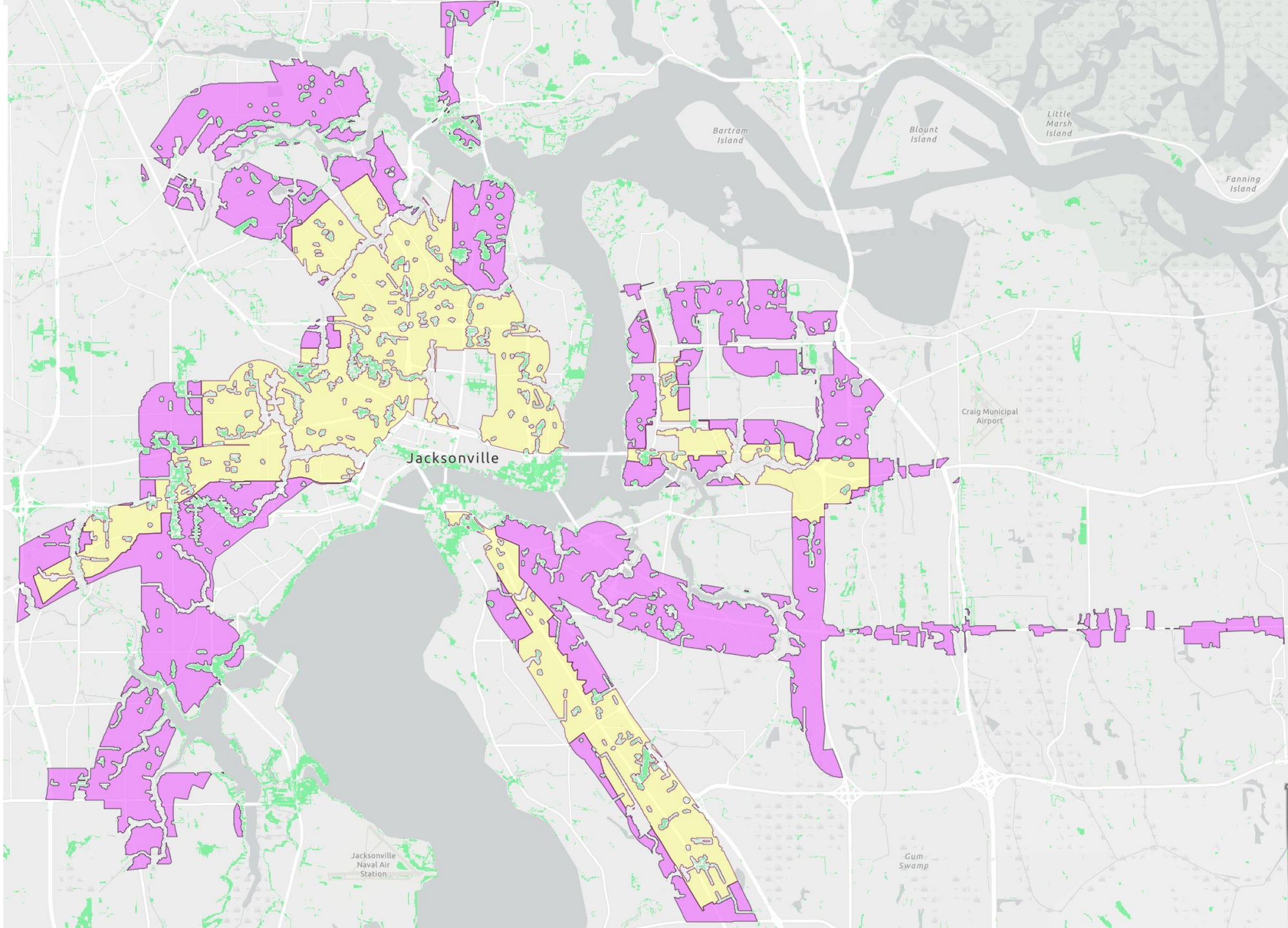
1.3 Incorporate resilience considerations into future land use planning.

Jacksonville's 2030 Comprehensive Plan is a policy document required by Florida Statutes and the City's Code of Ordinances. This plan guides future growth and development with the goal of promoting public health, safety, and welfare. The plan also guides updates to the City's land development regulations. Jacksonville will incorporate resilience goals, climate threats, and risk considerations into updates of the Comprehensive Plan, including the Future Land Use Element and Future Land Use Map that describe the land uses and physical characteristics intended for all areas of the city.

Proposed Land Development Regulation Update

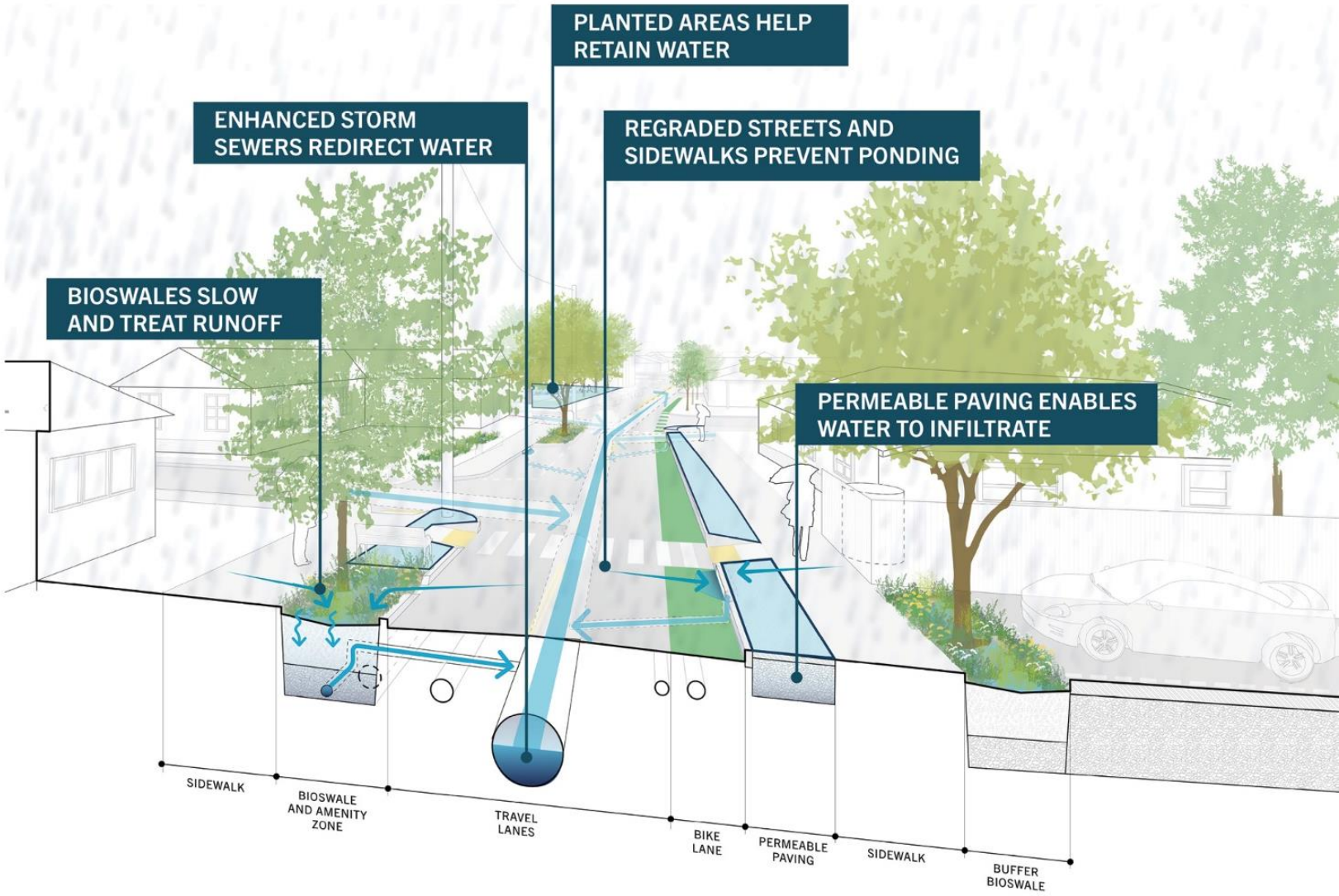
Proposed Target Growth Areas are areas that…

- Did not fall in the Higher Risk Areas (Compound Flood Model)
- Did not fall in the FEMA Higher Risk Insurance Areas
- Have a 100 ft set back from Higher Risk Areas
- Exclude accidental potential zone
- Include existing zoning overlays that did not conflict with the proposed incentive structure



ENGINEERING & DESIGN APPLICATION:

Supporting resilient infrastructure design



5 | Update public works design standards to account for climate change impacts and support resilient infrastructure development.

Public works design standards set a precedent for the safety and resilience of public infrastructure and establish a baseline of resilience for any city investment. Prioritizing the resilience of infrastructure is critical, not only to avoid costly repairs but also to minimize the wide-ranging consequences of natural disasters for the livelihoods and well-being of residents.[4] Integrating climate change data into public works design standards and the Capital Improvement Plan prioritization process will ensure that retrofits and new construction performed by the Department of Public Works are resiliently designed and built to withstand flooding, high winds, heat, and other extreme weather.

Resilient design standards will also guide the development of community services, jobs, retail, and affordable housing in low-risk areas with existing infrastructure, transit networks, and underutilized sites, and reduce the amount of capital spent on repairing infrastructure. In addition, actions intended to improve infrastructure resilience—for example, a park that is "designed to flood" and provide additional water storage capacity during heavy rainfall events—can often yield additional benefits during non-emergency conditions.[5] The multiple benefits derived from interventions like this are often referred to as the "resilience dividend," which represents the many benefits that accrue by investing in actions that strengthen the city's resilience. Extensive research from the National Institute of Building Sciences has repeatedly shown that investments in mitigation provide substantial benefits over cost. Their study of federal mitigation grant programs found a $6 benefit for every dollar invested.[6]

Credit: Montgomery County DEP

Shocks and Stressors Addressed

Flooding / Sea Level Rise / Chronic Flooding / Urban Heat Island Effect

Implementation Partners

Public Works / JEA / Subdivision Standards and Policy Advisory Committee / Context Sensitive Streets Committee

Potential Funding Mechanisms

Resilience Office / Fuse Fellows

Implementation Timeframe

Immediate (2025)	Short-Term (2030)	Medium-Term (2035)	Long-Term (2050)

Relative Cost

$ (10,000s)	**$$** (100,000s)	$$$ (1,000,000s)	$$$$ (10,000,000s)

5.1 Align above-ground and below-ground infrastructure specifications and review processes.

To ensure consistency in design for above- and below-ground infrastructure, it's important that the committees setting these standards are in close coordination. The City will facilitate the merging of the Subdivision Standards and Policy Advisory Committee (SSPAC) and the Context Sensitive Streets Committee to allow for holistic planning and streamlined decisionmaking. Additionally, to save on costs and materials and improve sustainability citywide, the City and JEA will closely coordinate projects and maintenance, collaborate to improve standards and specifications, and implement resilient standards where applicable.

5.2 Update the standard details and specifications for City of Jacksonville street designs.

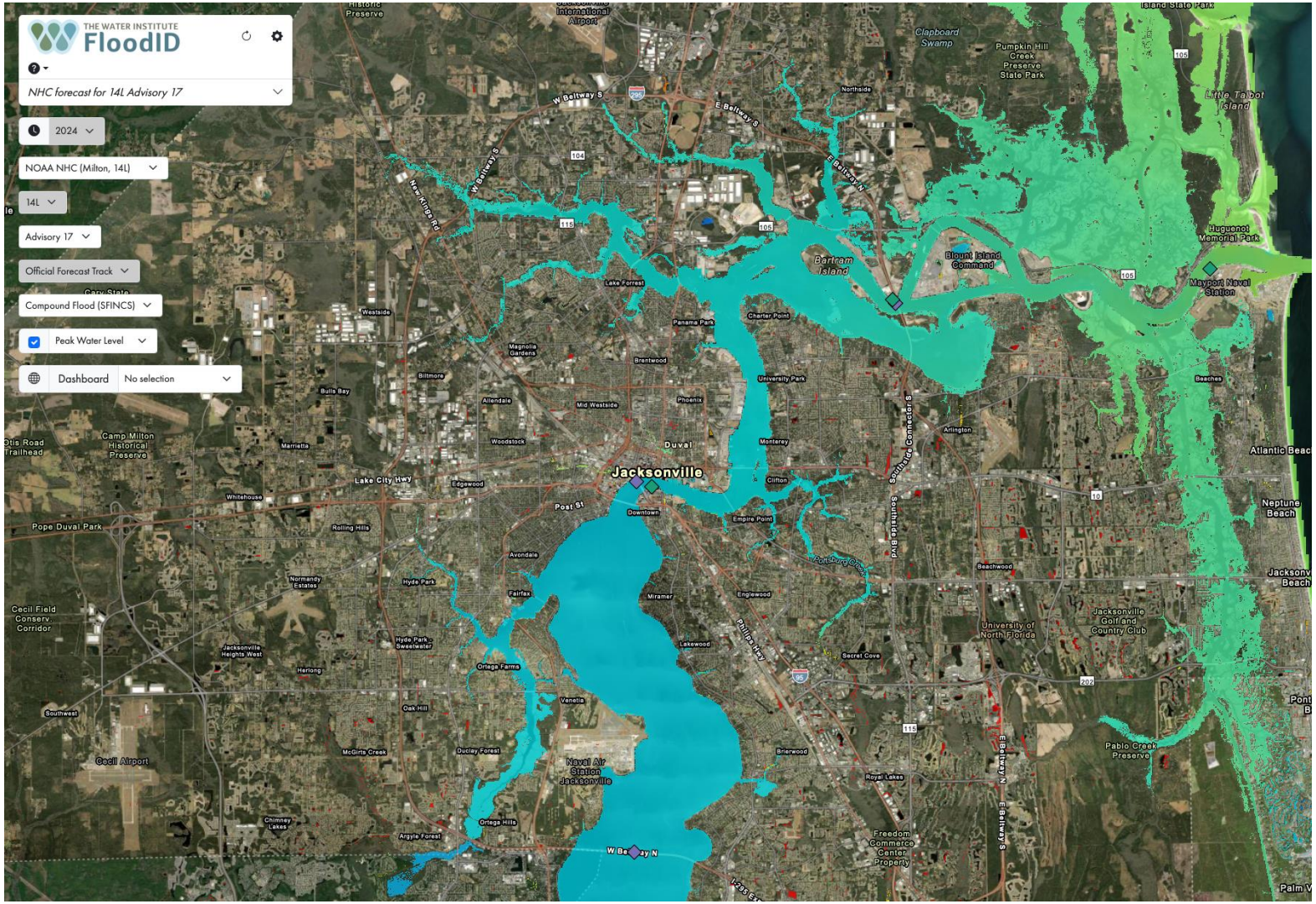
If you laid all of Jacksonville's City-managed roads in a straight line, you could get from Downtown to Los Angeles and halfway back—a total of over 3,400 miles. Each road has the potential to provide significant resilience benefits beyond transportation. The City will undergo a streetscape design update that will comprehensively look at the various types of roadways in Jacksonville and provide standards for roadway design and upgrades that provide additional quality of life, stormwater management, and urban heat reduction benefits. These redesigns could include multiple components, such as multimodal active transportation with lanes and pavement markings for buses and bicyclists. They could also include light-colored roadways to reduce urban heat absorption and additional street trees to provide shade, absorb stormwater, and lower air temperatures. Redesigns could both benefit pedestrians through the installation of safe and accessible sidewalks and include permeable paving to reduce runoff and promote infiltration. Updating the City's streetscape design standards is an opportunity to make significant improvements to meet resilience goals.

5.3 Incorporate green infrastructure features into drainage specifications.

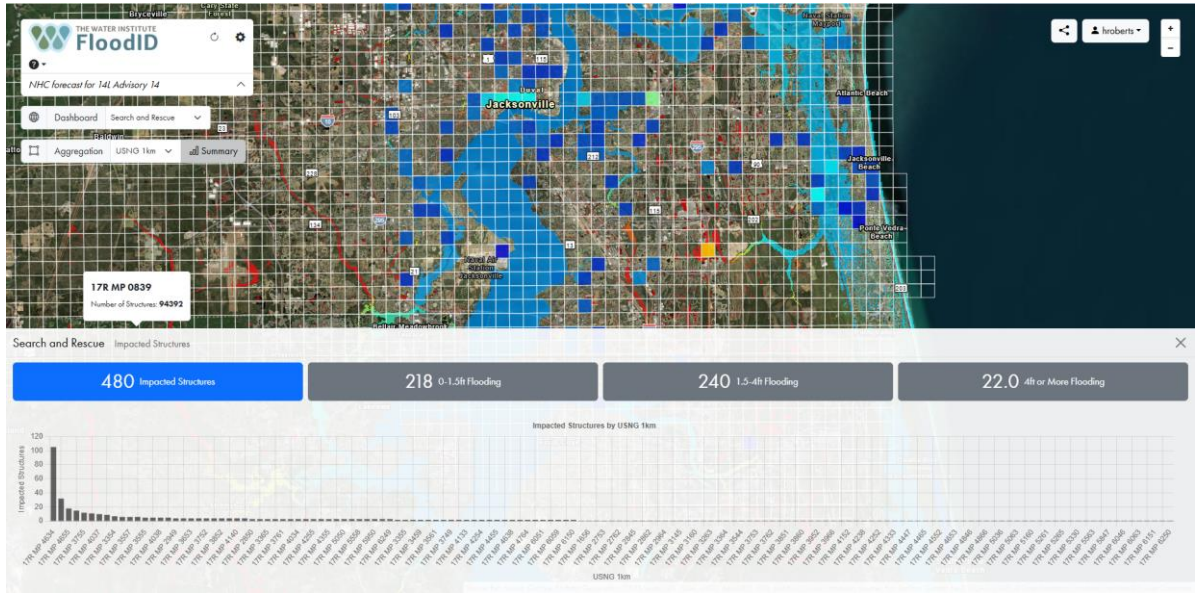
Though not a catch-all solution for drainage, green infrastructure features can take pressure off the city's drainage system while simultaneously providing multiple benefits by filtering, storing, and even infiltrating stormwater (the process by which water flows into and through the soil). Development of design guidelines for green infrastructure features as part of a drainage guidebook is one mechanism that can be used to implement citywide standards around green infrastructure installation (e.g., determining what an urban bioswale should look like in specific parts of the city). In addition to establishing design guidelines and standard details—and separate from the regular flow capacity the city relies on from the traditional drainage system—the City can set targets for how much water different parts of Jacksonville should be able to temporarily retain during and after one or more major rainfall events.

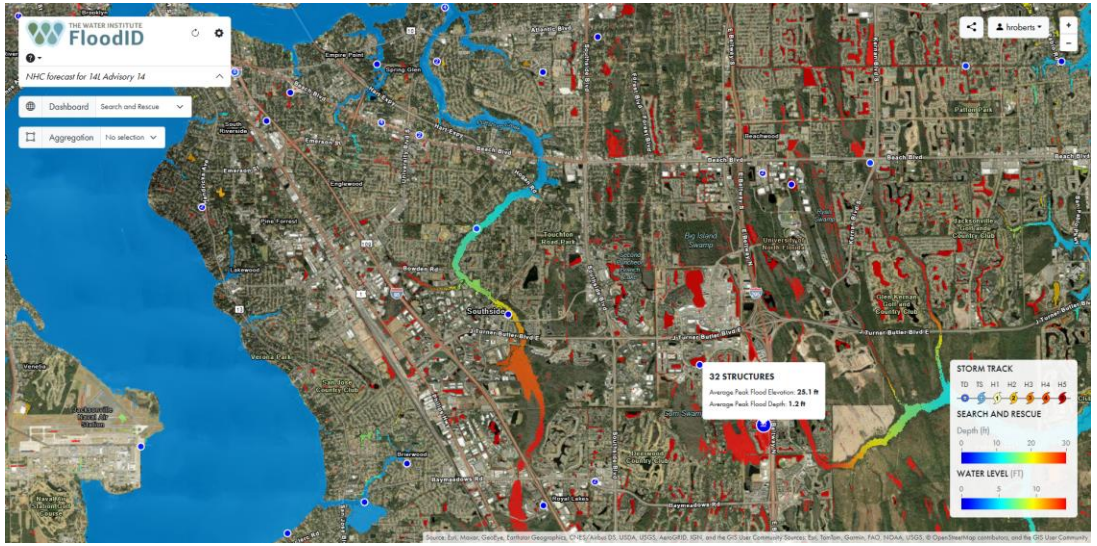
EMERGENCY APPLICATION:

Providing real-time flood forecasting to guide decision-making



DECISION SUPPORT DASHBOARDS





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