Florida Resilient Cities:

The Panhandle After Hurricane Michael

Port St. Joe

Parks in Port St. Joe

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Executive Summary

Port St. Joe is a bayfront town in the Florida panhandle with a population of around 3,500. It is known for its beautiful and economically beneficial location on the St. Joseph Bay. This same location though, is the source of its major problem which is recovery from the damages of Hurricane Michael in October of 2018. Hurricane Michael was a Category 5 hurricane, the most powerful hurricane to strike the panhandle in recorded history. Storm surge forced the bay all the way into the downtown area of Port St. Joe and then rushed back to sea as the Hurricane passed. The bay that gave rise to Port St. Joe, is also the bay that nearly destroyed Port St. Joe.

When we visited Port St. Joe in March 2020, there was still much recovery that needed to be accomplished. Housing was a prominent issue, as people struggled to rebuild their homes in a location that seemed to have broken their trust. Downtown had some vibrant shops that rebounded, but the presence of destroyed interiors and barricaded space still colors the downtown. Locals believe that a significant portion of the population have left and will not return. Everywhere, in broken trees, still fallen steeples, the community narrative, a diminished economy and in damaged buildings, there is evidence of this storm.

But still, there is a remaining culture that is resilient and loves the character of Port St. Joe and its beautiful location on the Bay. We saw hope in this culture, an attitude that will foster recovery. Many residents are rebuilding, maintaining their place, re-establishing a business or establishing a new business, and many have plans for a vibrant future. It is this social component of resilience that our team has identified as one of the towns' biggest strengths and it is this appreciation that we wish to cultivate with our project.

We strategically identified a core asset of Port St. Joe that, when improved, could strengthen this social value. This is the Bayfront park that is a combination of George Core Park, Maddox Park and the Lighthouse. It is the place where the land meets the sea in Port St. Joe, the location of the Lighthouse, it is an impressively beautiful landscape that catches amazing sunsets and this landscape embodies the pride and connection to place that we experienced in the community narrative.

From our meetings with community members and stakeholders, we found a common thread in the community narrative that was the need for a stage, a theatre, or a place to gather and have events. We saw that with simple and strategic placement and construction of a permanent outdoor stage within George Core Park, this collective need could be feasibly met. A stage performs many functions: a music venue, an event venue such as weddings, a place where local leaders can speak, and with a drop down screen and projector, it could also function as an outdoor movie theater. With each event, Port St. Joe would be restored just a bit more, both in spirit and economy.

The solutions we are providing are designed to be feasible and fall within available Hurricane relief funding. We are advocating for (1) historic preservation of certain park elements (2) re-establishment of a continuous walking path with seating (3) an improved runoff canal for environmental responsibility and aesthetics and finally (4) the construction of a permanent stage.

We believe that the improvements made to this park would embody the appreciation of Port St. Joe that exists in the community narrative and also has the power to uplift the spirit and economy of Port St. Joe.

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Introduction & Background

Introduction

The University of Florida works with the city of Port St. Joe to complement FEMA's short-term recovery efforts and develop long-term resilience strategies (Carney, O'Dell, Volk, Larkin, & Breder, 2019). This research is based on the Florida Resilient Cities (FRC) projects supported by Jessie Ball DuPont Fund, which aims to help communities across Florida develop the capacity to be more prepared for and more resilient to increased risk (Carney et al. 2019). This report sets sights on the enhancement of community resilience through city parks and greenspaces.

Context Analysis

Port St. Joe (Port St. Joe) is located on the Florida panhandle in Gulf County, on the St. Joseph Bay. It was struck by Hurricane Michael in October 2018, which was a category 5 hurricane (NOAA, n.d.) and the strongest hurricane ever making landfall in the Florida panhandle. The storm caused catastrophic damage particularly from Panama City Beach to Port St. Joe and along Cape San Blas. Impacts on Port St. Joe include infrastructure loss, road and building damage and destruction, erosion along the St. Joseph's peninsula and power loss, inland flooding and tree-downing, etc.

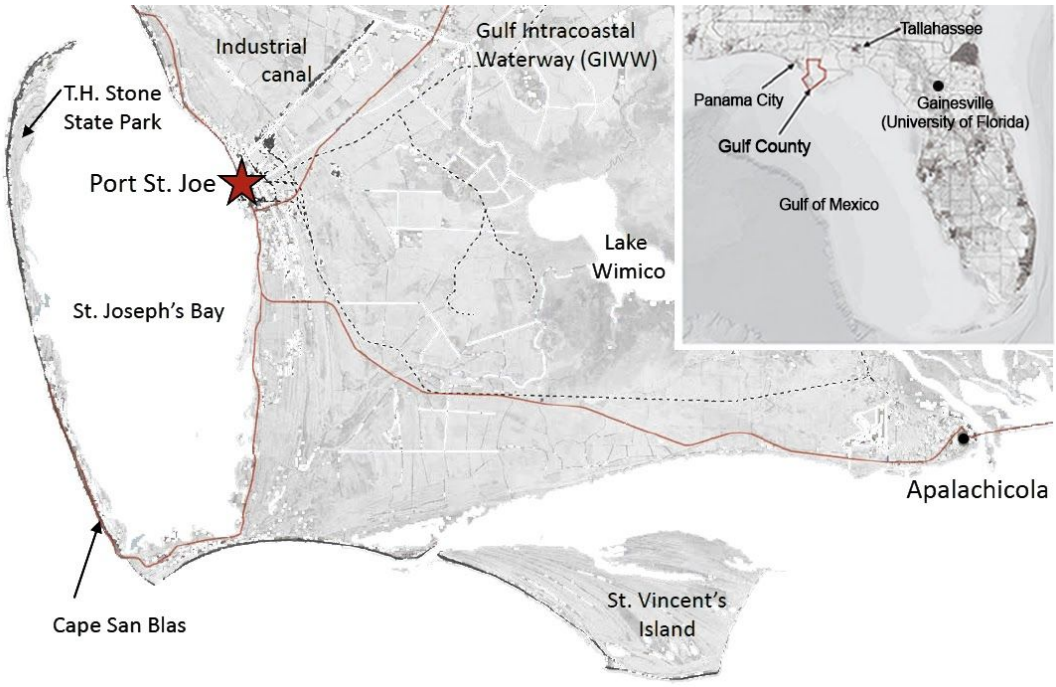


Figure 1. Location map of Port St. Joe. Adapted from Florida Institute for Built Environment Resilience (FIBER), 2019

History

The City of St. Joseph was founded in 1812 as a Spanish colony. After the US government bought the land of Florida from the Spanish, St. Joseph was chartered on January 11, 1836. In December of 1938 the St. Joseph convention was held to determine the future of Florida's statehood. Delegates from all of Florida's major cities at the time like Tallahassee, Pensacola, and Jacksonville arrived to vote on the

referendum. This referendum also made Tallahassee the Capital of Florida, and was officially adopted in 1845, making Florida the 27th state in the Union. As a popular seaport during the 19th century, the area had a lighthouse built to facilitate safe sea travel. The lighthouse was destroyed by a storm in 1856, then rebuilt during the Civil War in the 1860s. During the war, the Confederates knocked down the lighthouse which resulted in construction of a new one being delayed until 1865. The lighthouse was eventually constructed on Cape San Blas, where it stayed until 2013. In 2013, the lighthouse returned to Port Saint Joe.

After the Civil War, St. Joe became a popular port. So popular that it was being compared to cities like New Orleans and Savannah for its industry along with "grace and charm". Industry expanded to shipyards, cotton, bricking, banks, and hotels. The rail going right to the bay was unique compared to many other large ports like Jacksonville.

The St. Joseph company opened up a paper mill in 1936, which brought in thousands of jobs and made St. Joe a company town. In 1998, the company sold the plant along with a majority of its 200,000 acres of land in Gulf County. In 2003 the mill closed forever.

Community Demographics

The town of St. Joe has 3450 residents, of which over 99% are American citizens. 57% of the population is white, 33.7% Black or African American, 5% Hispanic or Latino, and 4% others. The median age is 43 years old. Median property value of a home in Port St. Joe is $158,700, with a home ownership rate of 73%, much higher than the national average. Median income is $41,673. St. Joe also has a proportionally large veteran population. For jobs, most people commute about 20 minutes away from the city. Citizens of Port St. Joe work in industries like Construction, healthcare, retail, manufacturing, and public administration.

Community Narrative

Over a year and a half after Hurricane Michael, many community members are proud of the recovery work that has happened to date, and some remain disgruntled. The word "resilience" resonates strongly with many individuals we spoke to.

Many of the parks have historical or cultural significance. Peters Park, named after former county commissioner Nathan Peters, was North Port St. Joe's first park with functional amenities, according to the park's namesake. Many neighborhood kids play basketball and other sports. Elderly folks can walk the short circle, which Peters said intentionally has benches placed around it for when he got old.

Constitution Park, as one resident described, is a traditional picturesque spot. The park is popular for prom pictures and weddings. These cultural associations have an important value to residents, and parks, even through disaster, remain important gathering places.

Many of the parks in Port St. Joe exist because of individuals taking ownership of the space. One member has designed and constructed a disc golf course within an existing park. One man, Nathan Peters advocated for and built a park in the north neighborhood. Community members are proud of their parks and express this by utilizing them for events and by making physical improvements to the park system.

Perhaps the strongest expressed need is that for housing. Houses are the fundamental unit of community and demand the highest priority for reconstruction, but many houses remain in a disappointing state of disrepair. Some comments were made that these houses were in bad shape prior to the hurricane.

Another major need that members expressed was a shared, public and permanent venue. One woman was pleading for a theatre so she wouldn't have to drive an hour and a half one way for her children to see a movie. They envision a place for watching films, for multiple churches to have shared events, and for larger community festivals.

Benchmark Analysis

We studied the parks and/or open spaces which are tagged with "resilience" from the Case Study Investigation (CSI) of the Landscape Architecture Foundation (LAF), and three adaptation projects which have had some resilient strategies dealing with flood resiliency. Details about these exemplary studies are attached as appendix B. The CSI program, which started in 2011, aims to evaluate built landscape projects and partner researchers and practitioners to conduct performance research. As of January 2020, LAF has published 156 case studies on its website, with park/open spaces being the most popular project type, including 67 projects. 14 tags and 22 features are used to describe these 67 parks. Based on our study, we selected 8 cases which are tagged as "resilience" as references for our Port St. Joe study. These parks are either riparian or coastal parks/open spaces. The three adaptation projects include Treasure Island Development Project (Figure 2), New York City Coastal Protection Plan (Figure 3), and Hoboken Adaptation Project (Figure 4).

The treasure land is a 300-acre artificial island located in San Francisco Bay, which is under threat of sea level rise. Its adaptive strategies include: 1) raising the altitude level for new development, 2) improving the perimeter protection and interior drainage, 3) raising the shoreline embankment, 4) constructing a series of embankments, 5) extending the shoreline and creating beaches or marshes. The New York City Coastal Plan was put forward by the Dept. of Housing and Urban Development with the coeffect of sea level rise and some storm surge issue being more severe in New York, U.S. Its adaptation strategies include: 1) increasing the elevations of coastal edges, 2) minimizing the upland wave zones, 3) protecting against storm water, and 4) improving coastal governance and design. Hoboken is located near Hudson River and at the north of the Jersey city. 2/3 of the area are in FEMA flood zones. The adaptation project proposed four levels of resilient strategies for the city land: resist, delay, store, and discharge. The resisting facilities include terraced edge, bulkhead, and deployable flood wall; the delaying facilities include parkland/terraced edge, green roof, and bioswale; the storing facilities include cistern, bioretention basin, and constructed wetlands.

Figure 2: The treasure land

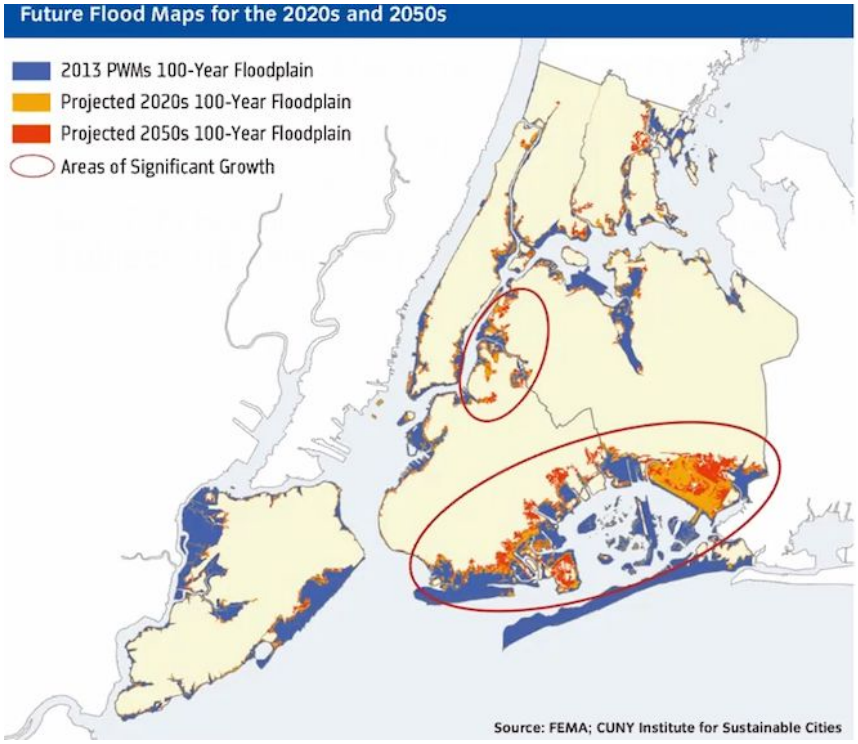


Figure 3: New York city coastal protection plan

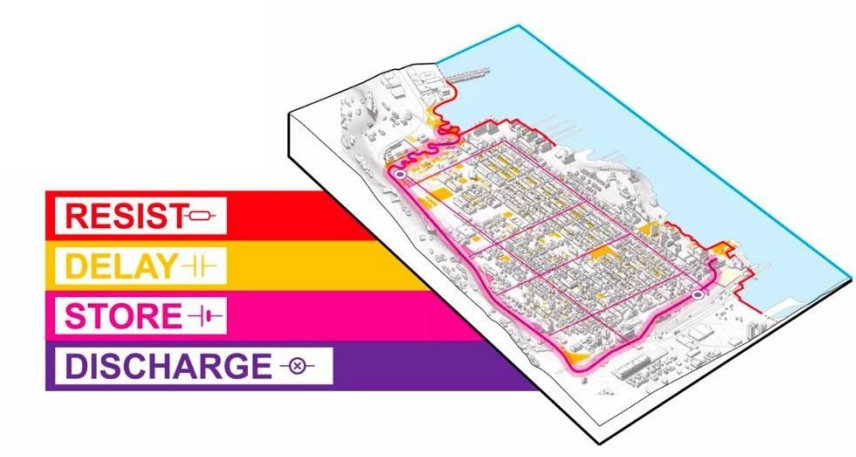


Figure 4: Hoboken adaptation project

The commonly used flood resiliency strategies in parks/open spaces are more detailed than those strategies in a city scale. The main goals include reinforcing infrastructure, improving water storage capacity, increasing water infiltration, improving water quality, preserving ecological integrity, etc. The design strategies learned from our case studies are listed as follows：

1) Prioritizing flood infrastructure
2) Customizing site fixtures and furnishings
3) Stabilizing riparian bank
4) Soil excavation
5) Permeable pavement
6) Designing more bioswales and bioretention areas, such as lawns and impervious surface
7) Biofiltration swale
8) Expanding capacity of the river channel
9) Evaluating ecological quality
10) Decreasing existing sub-watershed floodplain
11) Restoring historic wetlands
12) Improving water conveyance capacity
13) A specific design idea: a lawn is surrounded by a sloping retaining wall and it's graded to slope down to the river

Based on all the case studies and literature, some iconic flood resiliency strategies for protection, accommodation, and retreat can be shown as below (Figure 5) (Meng, 2020).

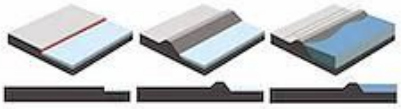
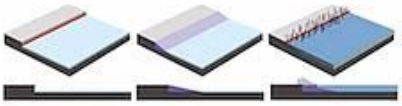
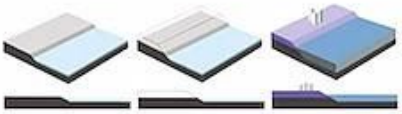
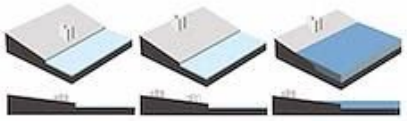
Strategies		Features	Methods	Site Advantages	Diagrams
Protection (Defense)	Hard	Dikes Levees Sea Walls Groins	Build physical barriers to block water	For hard-to-move facilities and infrastructure on flat ground	
	Soft	Mangroves Wetlands Sand dunes Tidal Flats	Create buffer with vegetation or landforms	For maintaining shoreline at sites with existing coastal forest or sand dunes	
Accommodation		Raising level Desalination Drainage Alarm system	Upgrade functions while maintaining location	For redevelopment projects or facilities at sites without high ground nearby	
Retreat		Relocation Abandonment	Relocate facilities to low-risk uplands	For residential and public facilities at sites with low-risk uplands nearby	

Figure 5: Embankment strategies for flood resiliency (Meng, 2020)

Problem Statement, Challenges, and Concerns

Sources and types of current flooding, areas flooded, future flooding projections

According to the Snapshot of Port St. Joe, Port St. Joe ranked high for flood and tropical cyclones (tropical storms and hurricanes) in both probability and magnitude (Carney et al. 2019, p. 65). The following historical impacts (as of 2015) were cited from the Gulf County Emergency Management (Figure 6) for a better understanding of the current flooding potentials for Port St. Joe. Hurricane Michael in October, 2018 should be added in the table. The flooded areas and the flooding severity in Port St. Joe during Hurricane Michael include but not limited to: many of the stores along downtown's main road, Reid Avenue. Several buildings lost their roofs and siding. The south side of the street was impacted more than the north. Port St. Joe's marina was severely damaged. Forty homes along stately Constitution Drive that were valued at $ 400,000 and higher had to be gutted or demolished.

Date	Event	Impacts
9/2/98	Hurricane Earl	Hurricane Earl made landfall over Panama City in Bay County, which neighbors Gulf County. Earl produced over 12 inches of rainfall over a two day period, flooding much of the inland parts of Gulf County. Cape San Blas experienced moderate amounts of beach erosion. Throughout Gulf County, high winds and coastal flooding damaged 216 homes and businesses. Significant wind and flood damage was reported at Live Oak Island, Spring Creek, Ochlocknee, Oyster Bay, Panacea, Medart, Sopchoppy, and St. Marks. Power was disrupted for 1,000 customers and the St. Marks Wastewater facility was offline. The event caused $775K in damages to Gulf County.
9/28/98	Hurricane George	Hurricane George was a Cat 2 event Landfalling in Biloxi, Mississippi. The effects of George were felt in Gulf County. Cape San Blas experienced a storm surge of 10 feet, and the bay shore communities of Port St. Joe experienced the same effects, causing flooding of US 98, and many downtown businesses and homes. Across Gulf County, strong winds and flooding damaged 300 homes and disrupted power for 8,700 customers. At Port St. Joe, storm surge flooding damaged 14 businesses and caused a water main break at the Lighthouse Utilities facility.
2004	Hurricane Ivan	Hurricane Ivan made landfall near Gulf Shores Alabama, yet the impacts were felt in Gulf County. Over 7 inches of rainfall caused localized flooding of several homes . Large swells caused severe beach erosion along the entire Cape San Blas and surrounding areas. Area wide, over 165,000 customers were without power. It is estimated Ivan impacted over 50% of the housing in Gulf County. Downed trees blocked some roads until they could be removed.
7/9/05	Hurricane Dennis	Dennis made landfall in Gulf Breeze, Fl. Its impacts were felt in Gulf County. Gulf County experienced a storm surge of over 8 feet, impacting Cape San Blas, and Port St. Joe, Mexico Beach. Over 8 inches of rainfall fell flooding many local roadways and washing out dirt roads. Gulf County had numerous homes damaged. The County was included in the Presidential Disaster Declaration..
2005	Hurricane Katrina	Hurricane Katrina impacted South Florida, then again in Louisiana. As it passed by Gulf County, it dropped over 3 inches of rainfall, flooding many lowlying areas in the south part of the County. Gulf County experienced a 7 foot storm surge, which inundated many coastal roadways.
8/22/08	TS Debbie	Resulted in heavy rainfall and gusty winds in Gulf County. A 6 foot storm surge occurred, washing out Indian Pass Road on the eastern edge of the County. Rainfall caused localized flooding, power outages, and some damages to businesses and homes.

Figure 6: Historical Hurricane Impacts in Gulf County (Gulf County Emergency Management, 2015)

Figure 7-15 were obtained from different sources including U.S. Geological Survey, National Oceanic and Atmospheric Administration (NOAA), University of Florida GeoPlan Center, Federal Emergency Management Agency (FEMA), and Meng (2020). We used these figures as references for our study.

There are sea level rise projections in 2040, 2060, 2080, and 2100, with sea level rises as 1 foot, 1.8 feet, 2.8 feet, and 4 feet, respectively. From the elevation figure, we can find that the seashore and the linear spaces in the middle of the city are at a relatively low elevation and are vulnerable to future flooding. The linear space in the middle of the city now serves as an open green space, which is a right choice based on its elevation conditions. The seashore has beautiful scenery and is always appreciated by the community in Port St. Joe, especially the George Core Park (the Lighthouse Park) is highly rated by people. This park is located at a relatively high elevation in the seashore, and thus we can consider preserving it as an iconic park for the city. The park is the focus of the design section of this report.

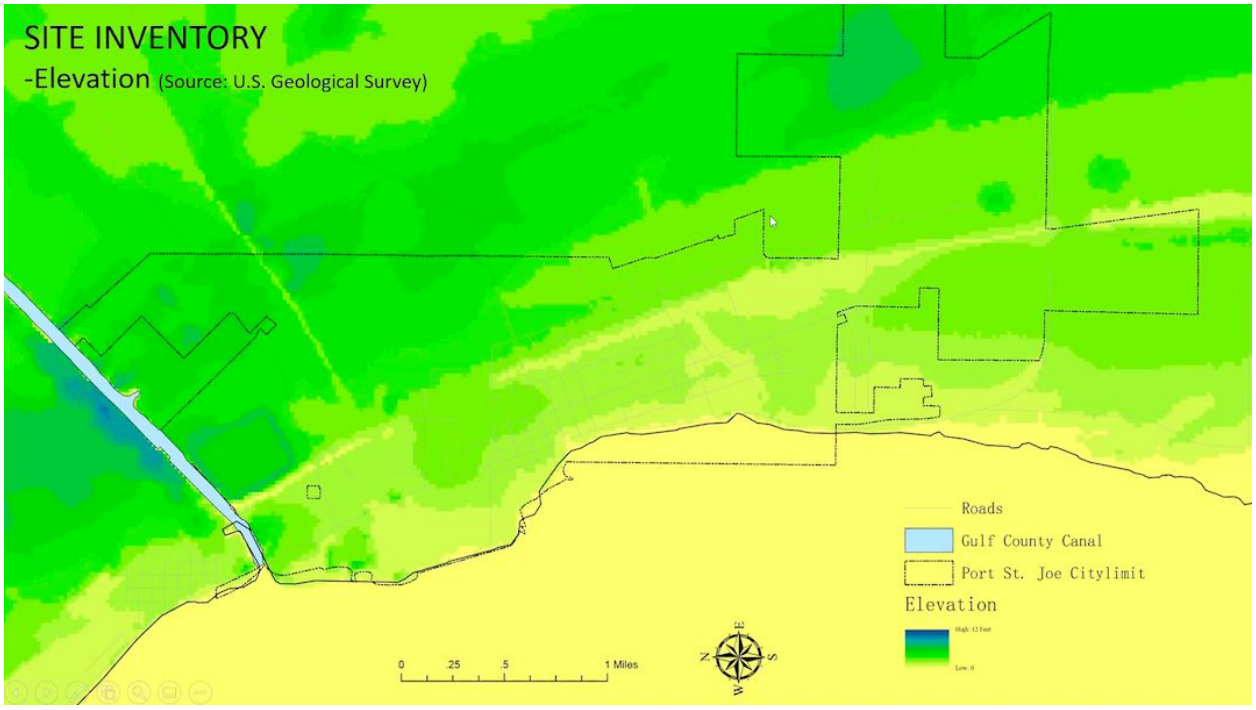


Figure 7: Elevation of Port St. Joe

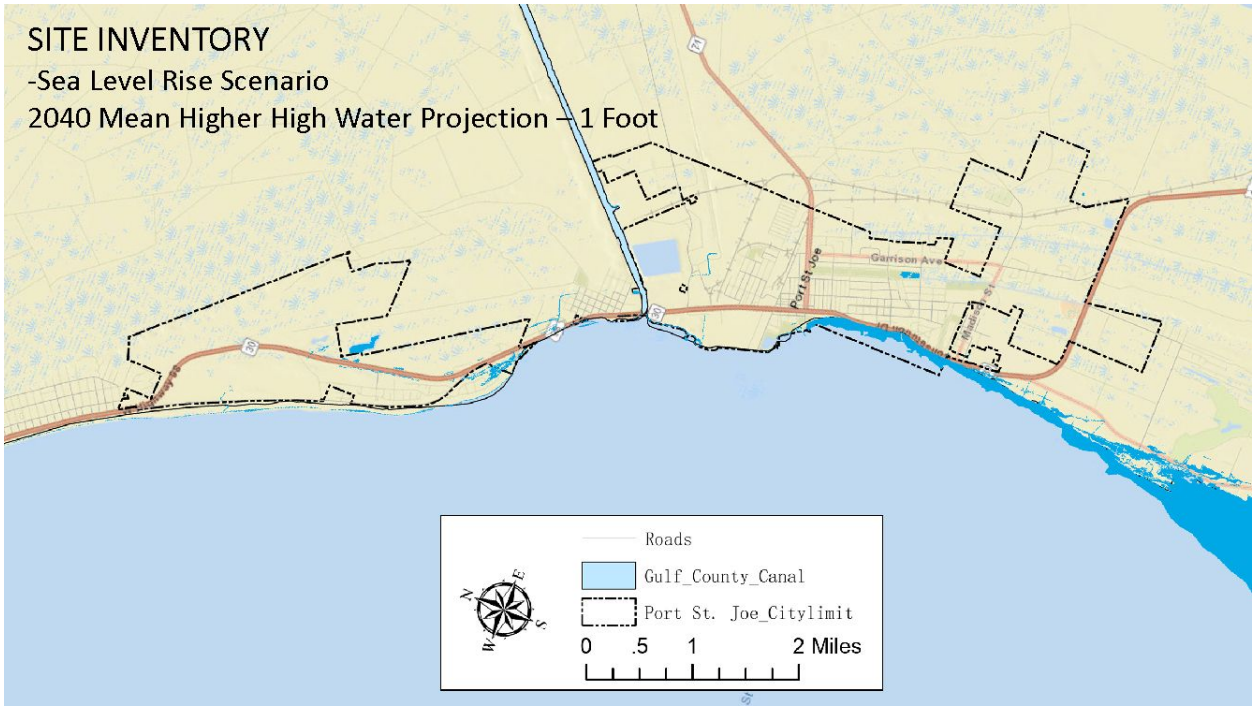


Figure 8: 2040 Sea Projection in Port St. Joe

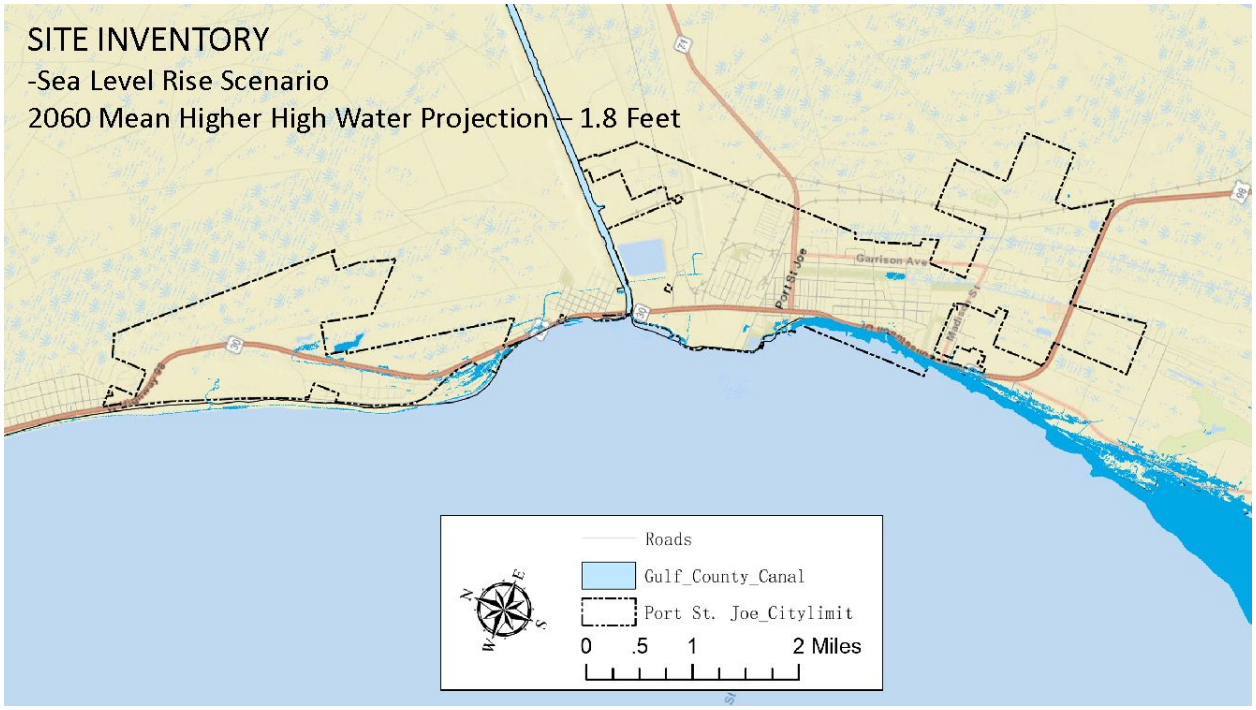


Figure 9: 2060 Sea Projection in Port St. Joe

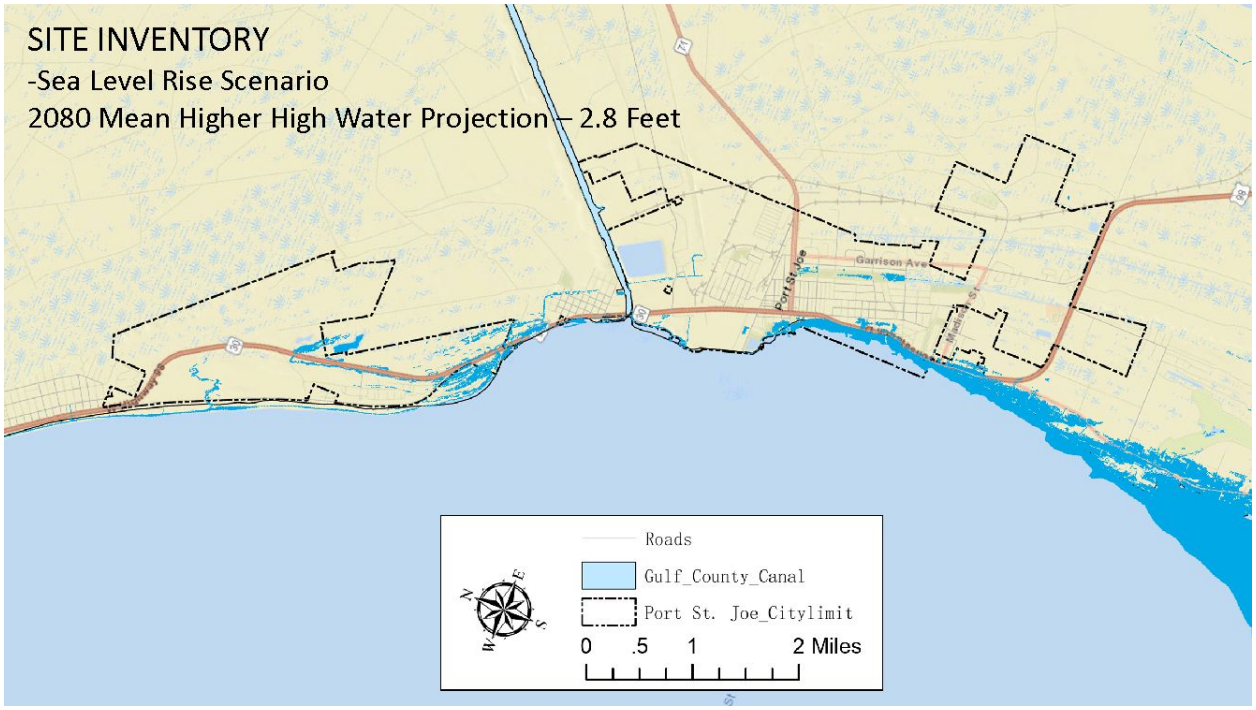


Figure 10: 2080 Sea Projection in Port St. Joe

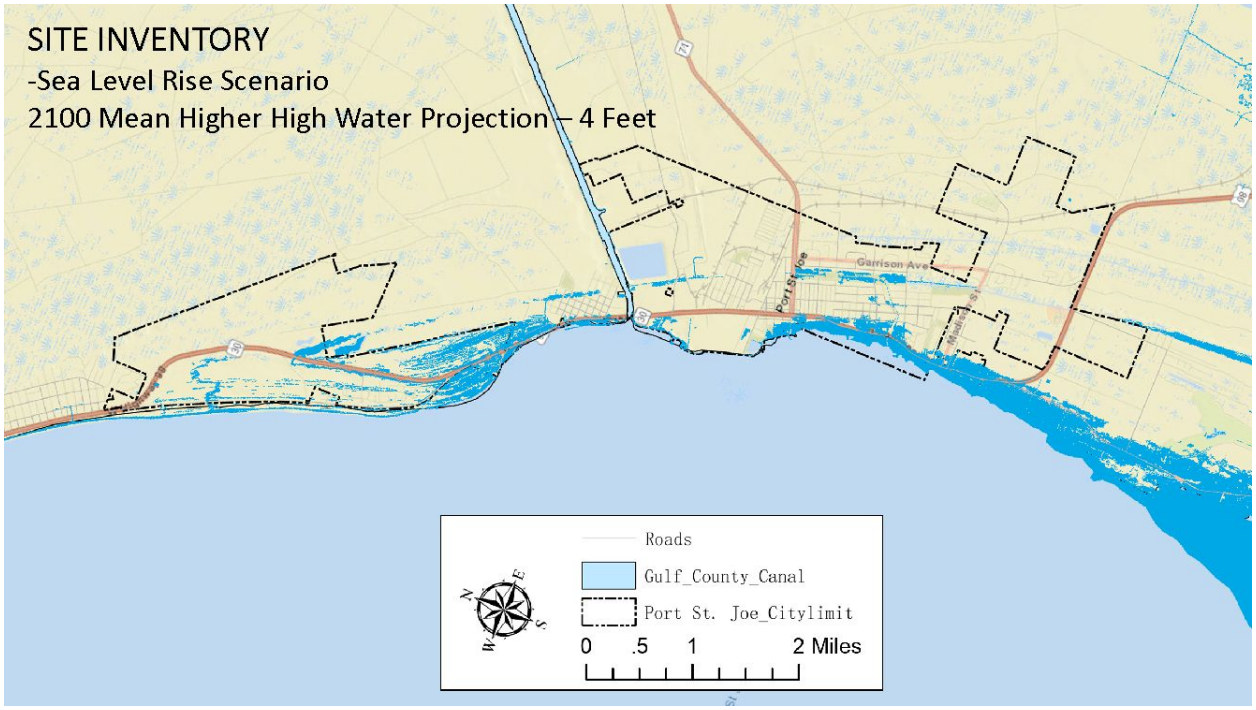


Figure 11: 2100 Sea Projection in Port St. Joe

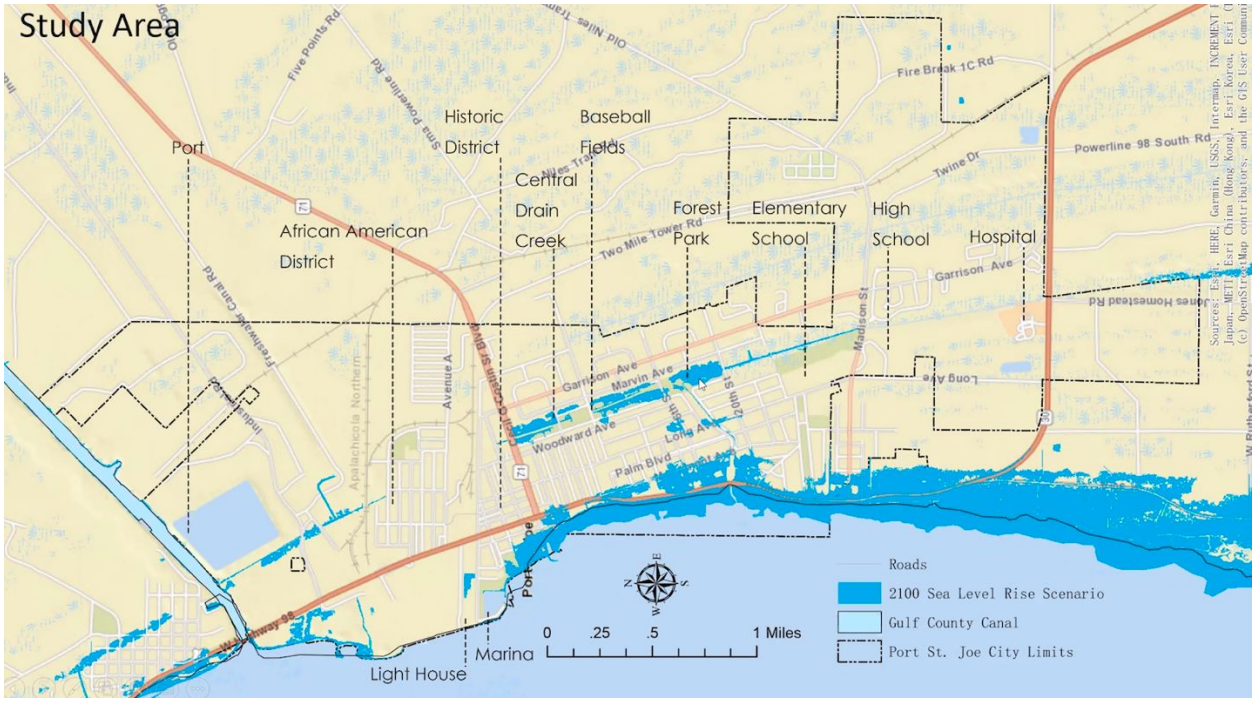


Figure 12: Iconic city elements and 2100 Sea Projection in Port St. Joe

Vulnerable structures, infrastructure, and natural areas

Port St. Joe's infrastructure was hit hard during Hurricane Michael, including buildings, parks, roads, water, and sewer. The biggest hit was the wastewater management system. In addition, Fifteen lift stations were down, well beyond the city's available funds.

The vulnerability assessment of a site is generally based on three components: exposure, sensitivity, and adaptive capacity. In Port St. Joe, we should consider two main factors for this vulnerability issue, which includes vulnerability to flood, and vulnerability to the future sea-level rise. The basic principles for infrastructure planning in coastal areas include: a) population and population development should be located away from high-risk zones, b) Critical facilities such as hospitals and police and fire stations should be located outside of high-risk locations, c) Coastal land use patterns should emphasize the benefits of green infrastructure over conventional infrastructure that will be more likely to fail in disasters, d) coastal land use patterns and community design should incorporate direct access to nature and natural systems, e) essential community lifelines and infrastructure should be designed and integrated into a community's land use to reduce exposure and vulnerability, and to ensure operability during and after community disruptions.

According to figure 13-15, the infrastructure that is under the impact of flood in Port St. Joe includes: buildings near water; underground utilities; water, wastewater, energy; transportation infrastructure.

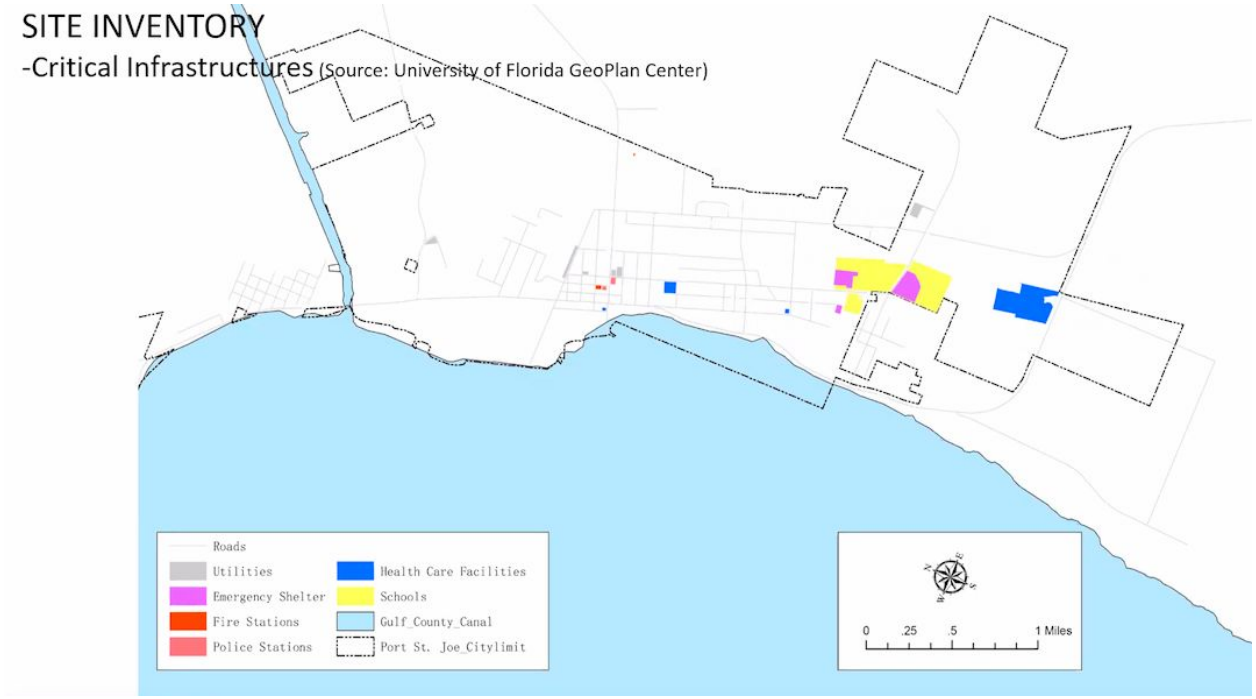


Figure 13: Critical infrastructure in Port St. Joe

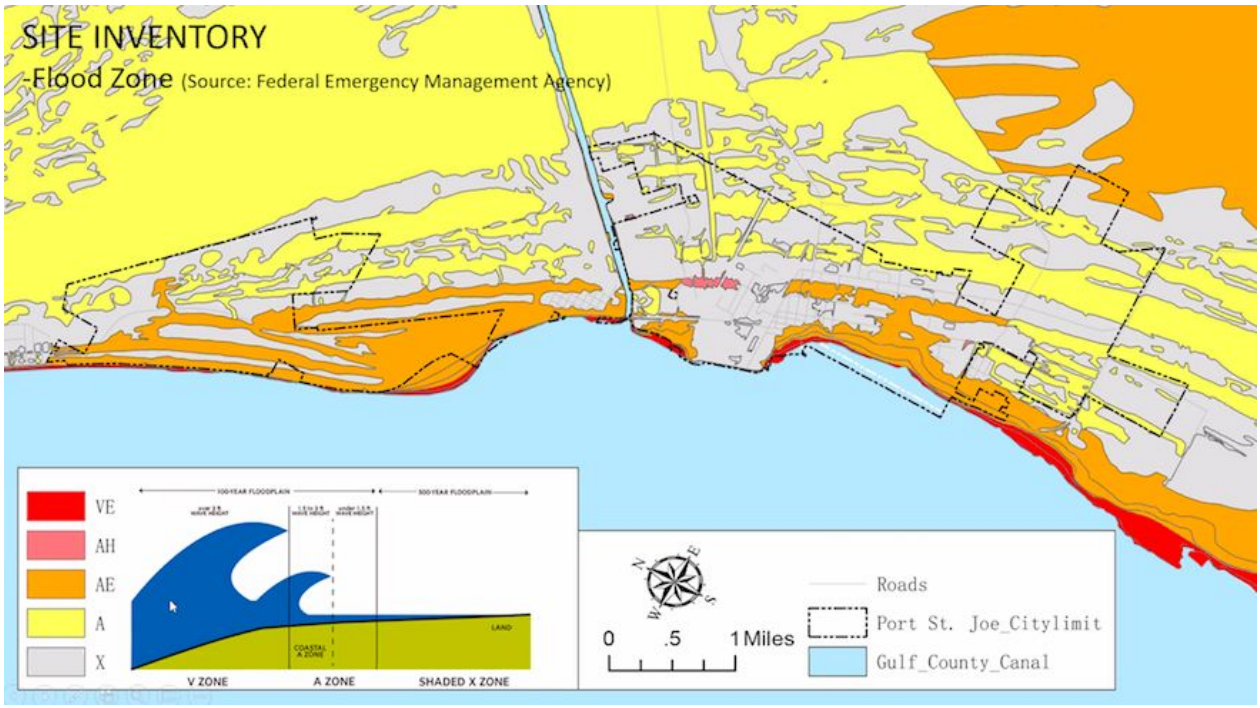


Figure 14: Flood Zone by FEMA in Port St. Joe

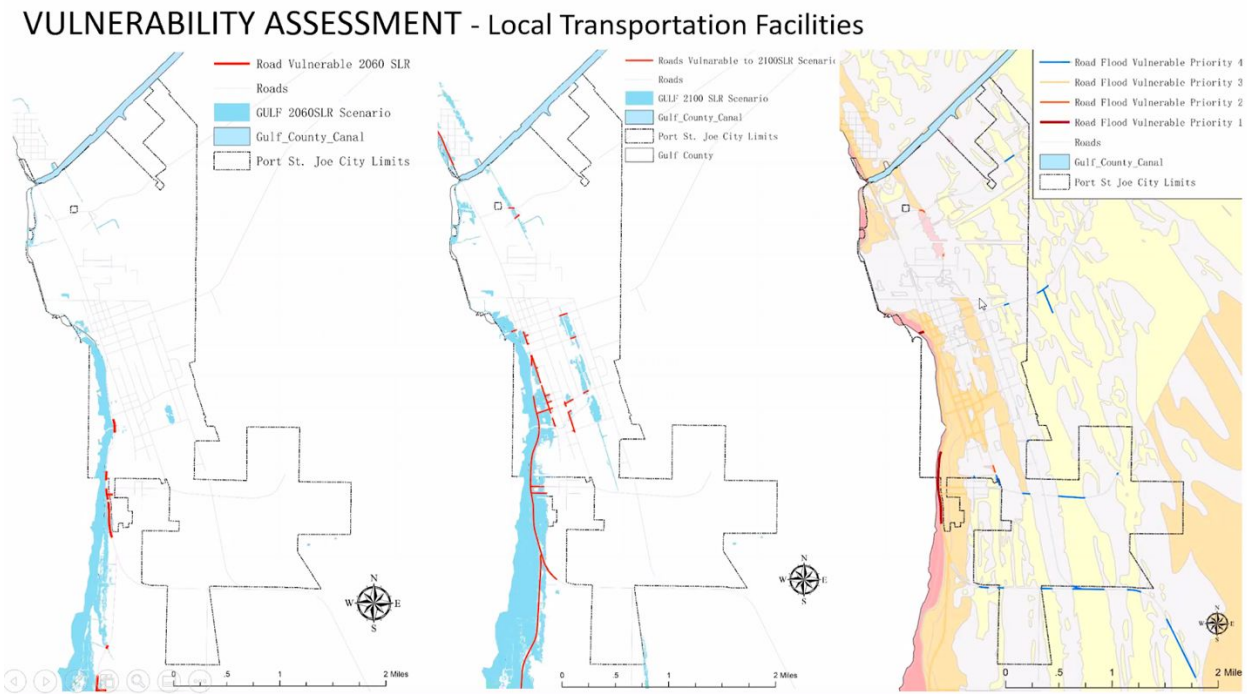


Figure 15: Vulnerability assessment of local transportation facilities

Policy and Legal Constraints

Gulf County's 2011 Comprehensive Plan includes goals such as land development that supports health, safety, and socio-economic well-being and to ensure that the character and location of land uses in Gulf County minimize the threat to the natural environment or public health, safety, and welfare (Carney et al. 2019). Goals for infrastructure and coastal management policies include: 1) To promote sanitary sewer, solid waste, drainage, potable water, and aquifer protection services to meet the needs of current and future residents of Gulf County in accordance with adopted level of service standards; 2) to form a working alliance with the Northwest Florida Water Management District, the City of Port St. Joe, City of Wewahitchka and other water distribution suppliers to implement the recommendations of Regional Water Supply Plan for Region V that will promote a reliable water supply through 2020, 3) to guide development in such a manner that coastal resources will not be damaged or destroyed, 4) to protect human life and limit public expenditures in areas subject to destruction by natural disasters.

The City's Comprehensive Plan was being updated in 2018. Local comprehensive plans address development and redevelopment in coastal areas, including a redevelopment component outlining the principles to be used to eliminate inappropriate and unsafe development in the coastal area when opportunities arise (FDEO). The City's Comprehensive Plan defines the Coastal High Hazard Areas (CHHA) as those below the elevation of a Category 1 storm surge. It directs population concentrations away from these high hazard areas. The Port Planning area lies within CHHA Zones A, B, and C (Figure 16). The Master Plan states that designating this area as industrial will aid in keeping residents out of high hazard areas.

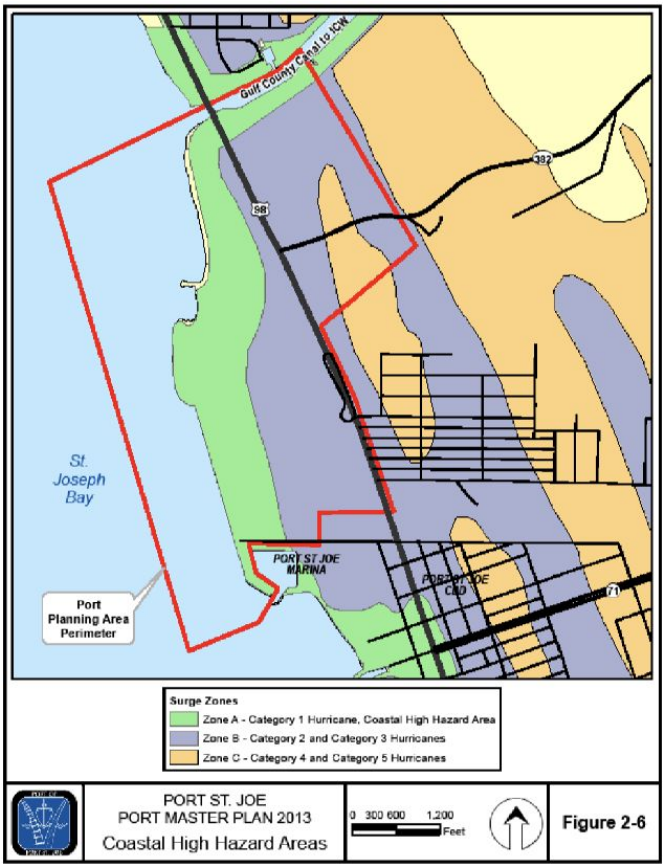


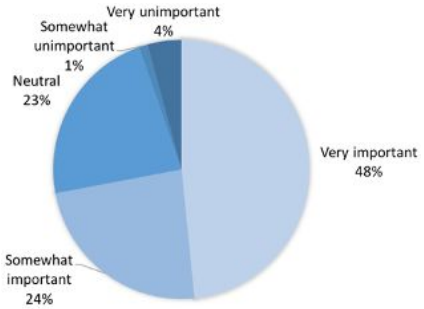
Figure 16. Coastal High Hazard Areas. Port St. Joe Port Authority, 2013

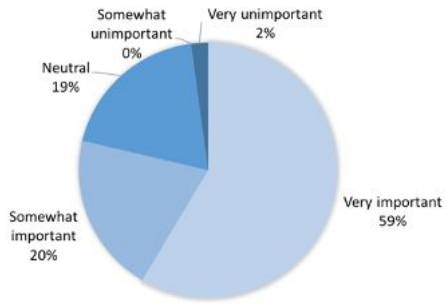
Residents' Concerns and Public Input

To understand how the community in Port St. Joe uses the park and trail system and to explore the social functions that parks can provide to improve community resilience, a park visitor survey was conducted during March 1-6, 2020. Since the city only has 3,562 residents (2020 Census data), a questionnaire was distributed in local parks, on the streets, and near the local supermarkets to people who gave a positive answer about if they have visited parks in Port St. Joe at first. The questionnaire contains four parts, which includes a) 5 questions about park visit, including park visit frequency, most visited parks/trails, reasons to select visiting parks, transportation, and travel time, b) 4 questions about park use, including park staying time, reasons for visiting a park, mostly used facilities, and public events attendance, c) 6 questions about park functions, which focus on resilience, and d) two questions about park satisfaction and suggestions, and 2 questions about races and living zones in Port St. Joe. Because the city has an obvious racial segregation between its north and south areas, these two questions aims to explore the park visitors' distribution within the city scope. 97 responses (2.7% of the 2020 Census data of Port St. Joe) were retrieved in total. From the 84 responses to our demographics question about living zones, we found that 72.6% of respondents are local residents in Port St. Joe, 20.2% are from other areas in Gulf county, 1.2% are from the nearby Bay county, and 6.0% are out-of-state tourists.

The most noteworthy results of the survey are as follows. The survey respondents' recognition of importances of parks and resilient design strategies are higher than our expectations. 72% of respondents think parks are important in a hazard area with 48% think parks are very important (Figure 14). Meanwhile, 79% of respondents think the resilient strategies in park design are important with 59% think they are very important (Figure 15). Regarding the particular flood issue in Port St. Joe, 65% of respondents declare that they are aware that park facilities can contribute to flood resiliency and/or stormwater management (Figure 16). The respondents would like to be educated about flood resiliency through signs (60.0%), events (50.5%), pamphlet (43.2%), and online activities (40.0%), as well as social media, email, newspaper, and hand talk.

Furthermore, we asked people to select all the options that apply to "which of the following social functions that parks can provide you think are useful to improve community resilience?" The listed options of social functions were based on literature review of social resilience. We conducted archival research in order to explore the typical park functions that contribute to social resilience and, by doing so, to highlight these functions and provide guidance on future park design especially in hazard vulnerable areas. We took reference from the previous studies on social resilience indicators, extracted those indicators that are relevant to park functions, and modified them into the forms that can be applied in a park scale. According to our study, we categorized the park functions that contribute to community resilience into six main categories, including access to resources (information, knowledge, and technology), public spaces (training, organization), cultural services (recreational, educational, place attachment), social capital (social networks and connections), provisioning services, and economia capital (Godschalk, 2003; Tierney & Bruneau, 2007; Norris et al., 2008, Cutter et al., 2008 & 2014; Oxfam, 2013; Simonovich & Sharabi, 2013; Cox & Hamlen, 2015; Suckall et al., 2018). 15 typical indicators were selected for people to rank the indicators' importance for social resilience. The results of the indicators range from 20.0% to 44.4% based on 90 responses, with local disaster training, mental health training and psychosocial support, public organizations, and job positions in park management and/or tourism being the most popular options by the respondents (Figure 17). That being said, we need to consider providing spaces or relevant services and facilities for realizing these functions in the future park design and construction in a hazard area such as Port St. Joe.





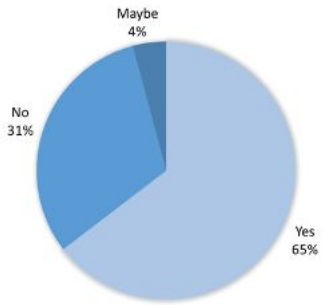


Figure 14 (left): The importance of parks in a hazard area
Figure 15 (medium): The importance of resilient strategies in park design
Figure 16 (right): Awareness of that park facilities can contribute to flood resiliency

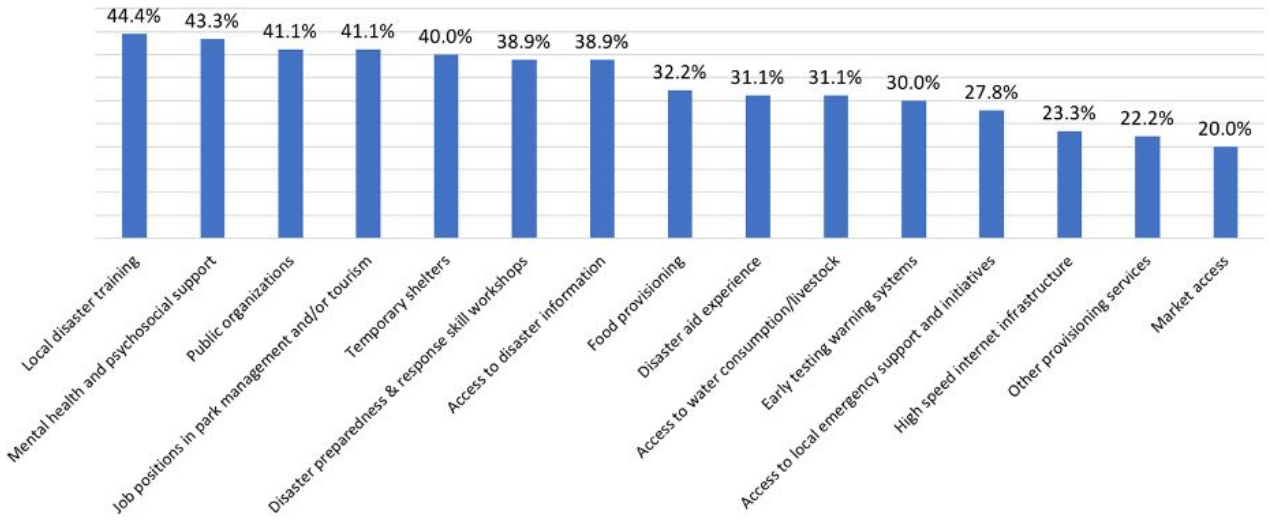


Figure 17: Importance ranking of social resilient functions that can be provided by parks

Adaptation Objectives

For our park system proposal, our objectives are the same ones that we mentioned in our presentation. The designs are a realization of our goals, as the parks serve as a physical manifestation of them. Our three primary objectives are to integrate the city's history and nature with parks, understand the utilization of parks and trail by the local community, and provide suggestions that contribute to the long-term resilience of the region. When visiting a park, people will spend time with friends or family and share their experiences. Giving more reasons to go out gives people more ways to interact with each other and the city itself.

The City of Port St. Joe has a rich history for the state of Florida and the people there. This city hosted the Florida Constitutional convention in 1838, which eventually led to Florida joining the union. Many prominent African American athletes and musicians also made transit, practiced, and sometimes performed in the city. Parks can enhance the historical awareness and value people place on their community by engaging the public. An example of this is how the building which the first constitutional convention was held is on the city's bike trail. This is a simple way to connect the past to the present. It can also provide health and educational activities to the residents of the city. Simple things like the names of structures in the park or a dedicated garden enhance these types of connections. This also has the additional benefit of making the city's history with nature more prominent. The more people can connect the city's nature with the city's great historical value, the more people care about both the city and the environment. This makes the city a place people will want to stay in and come back to. This is a great area for parks because the very nature of parks is interaction.

The population of Port St. Joe is small, but highly involved and active. Sports at all ages are some of the most popular events in the town. Many people get involved in athletics at a young age because of summer programs like the Stack House. To many Port St. Joe residents, sports and outdoor(ing) are an essential part of life. Part of our design is to reduce the impacts of said recreational activities. The most effective way to achieve this is by educating the public. The city already has done an great job at this, with their linear park network. It appears that the city planners did have environmental impact in mind when creating these parks. Education of the (common) citizen would be the next step in this. Creating school or community volunteer days will help to increase engagement and this will not be foreign to Port St. Joe as the schools have their garden.

Parks can serve to promote the knowledge, and appreciation for resilience. The community will greatly benefit from having increased park structure that serves them and their environment. Port St. Joe already has a great outdoor culture. Both historically and in the modern day, people frequent going outside, utilizing bike trails, and doing other activities in the parks. Also, parks took damage from the storm, but also were still standing and functional after the disaster. Engaging the public, holding events in spaces, and allowing the citizens and guests of Port St. Joe to have better public facilities would be incredibly beneficial to the city.

Recovery and Adaptation Opportunities and Design Solutions

Physical Design Solutions

A major community narrative was the need for a shared, public and permanent venue. Many community members desire a place to watch films (that isn't a 1.5 hour drive), members of fallen churches desire an open and dignified place to gather, members of the chamber are in need of an improved venue space to bring much needed events to Port St. Joe. Another major community narrative is the deeply felt connection to the Bay of Port St. Joe. For many, it is the entire reason to be in Port St. Joe, both economically and culturally and for some, there is a deeply felt, lifelong draw to be close to the bay.

In response to catastrophic events that leave a place reeling, one of the most oft-overlooked recovery strategies is the opportunity to create recreational and event spaces. These strategies can bring much needed life and activity back to a place and citizens can find common ground in enjoying recreation. By recognizing and supporting the need for an uplifting of the human spirit, recreational spaces target the social component of resilience.

Port St. Joe has a beautiful open space already: the bayfront property that is a combination of George Core Park and Maddox Park. The land here faces Westward towards the bay with Cape San Blas on the horizon. Stands of pine trees and cabbage palms offer much needed afternoon shade and afford framed views of the setting sun. The central feature of the park is the Cape San Blas Lighthouse which was relocated to the site in 2014. A paver promenade was built for an enjoyable walk from downtown to the lighthouse. The park also exhibits resilient stormwater management strategies including ponds and canals. It is the ideal space for an improved park.

While the beauty of this space is still entirely apparent, the space was previously an even more beautiful park with walking/biking trails, seating, a stage, a pavilion and a historic building. In 2018, Hurricane Michael brought storm surge that flooded the park and intense winds that destroyed much of the trees and other park assets. The park still has benches that were previously cemented in ground now scattered and fallen. Half broken trees make a symbolic effort to regrow, while other trees hold strong but contorted. The lighthouse stands proud but its oil house has half a roof. Walking the park, sitting on its contorted benches, gazing at the bay, any visitor can’t help but to be inspired to imagine the now quiet bay turning into a wrath of a storm. It is this quality of contrast, between the serene and the catastrophic, that makes this park so entirely unique and beautiful.

This space is where hurricane Michael entered the city of Port St. Joe. It is where dark clouds were first viewed, where the surge breached the shoreline, where the winds were funneled and first felt, and ultimately, it is where the flood left the city and where the calm bay was viewed once again. This location is where the land meets the sea in its most unobstructed way.

A place with such symbolic value, with a lighthouse that stands proud where the land meets the sea, is a place that has the power to uplift and renew the social scene at Port St. Joe. This landscape embodies the values of a place that stands proudly where the land meets the sea, a place that will remain despite

the destructive force of the occasional storm, it is beautiful and it is central to the town. This space has the power to generate a celebration of life in the wake of destruction.

For this, we believe that a permanent, public stage would be of the highest value. A stage not only provides a space where citizens can enjoy performances, it also provides a space where citizens can perform. Foreseeably, this would be where the mayor will speak, where churches will gather if their buildings have faltered, where school bands will play and where event organizers will host events. A stage provides a space where people will be empowered to "take the stage" and lead the efforts of recovery, or simply have a really good time.

Furthermore, the stage would spur economic growth as events attract visitors to Port St. Joe. Just as a place can be reconfigured by destructive events like a hurricane, a place can be reconfigured by positive events such as a music festival. As the city prepares for such an event, cleanups will occur, seating will be established, businesses will improve with expected influx of customers and, like a hurricane, these changes will be lasting though the event is temporary.

Our proposed concept design features these elements:

1. An outdoor stage that is permanent and open to public access. This stage will have the following features:
    - A permanent roof that can be dismantled in case of an approaching storm
    - Set on pile-ons like a dock for aesthetics and in case of flooding or surge
    - A pull down screen for projecting films, drive-thru theatre style
    - An open grassy lawn for seating/standing audiences
    - Permanent utility hook up (already existing in the chosen location)
    - South facing stage to project sound across Maddox Park and Centennial Park Jetty
    - Truck access for stage and sound set-up

2. Footbridges to connect George Core Park with Maddox Park
    - Set over the existing weir to prevent illegal vehicle access to area and subsequent damage to weir
    - Ecological engineering of the stormwater outflow canal for pollutant removal and aesthetics
    - Would recommend weathered bowstring truss bridges to match with the town brand. Alternatively, a more economical dock-like bridge would suit the maritime theme.

3. Continuous foot/bike path through park
    - Crushed shell path to fit sense of place and is also a superior material for biker safety when compared to gravel
    - Continuous walking path is more likely to qualify for grants based on public health component
    - Connectivity between parks, lighthouse, promenade to downtown for easy pedestrian or bicycle access

4. Historic preservation
    - Preservation of bench seating contorted by Hurricane Michael (see other section on this bench)
    - Homage to Money Bayou embodied by the stage
    - Signage honoring the Maddox family contribution of the land

Historic Preservation

The land that comprises George Core and Maddox Park in Port St. Joe already displays a rich maritime history. The crown of the park is the lighthouse, which was amazingly moved from Cape San Blas to Port St. Joe prior to hurricane Michael. This was a remarkable feat of historic preservation and it defines the park as a place of historical value. It is our hope that we can identify some other elements of significant historical value to add or preserve in the park.

The first, is the contorted bench that faces the bay. It is a bench made of wood and metal, cemented into place, and appears to be one of many previous benches along a previous gravel pathway. Most of the other benches were uprooted and can be seen on their side throughout the park and there was one even in the waters of the bay that could be seen at low tide. This bench though is unique because it stayed in place but with its metal bent all the way backwards, presumably from the extraordinary force of Hurricane Michael, its storm surge and debris that flooded over the area in 2018. It is so flattened that there is still a portion of the bench that is agreeable to sit on. It is a small element, but has powerful symbolic value and would also be a feasible preservation.

The value of this bench is that it is a symbolic reminder of the power of the bay. Living near the Gulf, a bay or the Ocean, residents experience a huge spectrum of weather from the serene to the catastrophic. Sitting on this bench on a serene day, the visitor would be inspired to think of the Bay, silent as it may be then, turning into a raging wall that once broke over its shore and persuaded this metal bench into its contorted state. As a visual element, a passerby may notice that it is twisted similarly to the live oaks nearby, and that there is a unity between them as they are both extremely hard materials that have been shaped by the forces of the bay. The bench is an embodiment of resilience because it weathered the storm, it was reconfigured, but it can still be used for exactly the same purpose as before but is now more unique and inspiring.

This bench is special and it should not be viewed as broken, or something to be removed. It should remain and it should serve the purpose of reminding and inspiring people about the power of the bay. It is like a sculpture shaped by the hands of Hurricane Michael. It is still functional and it is far more aesthetically valuable than any bench that could take its place. It is our strongest recommendation that this bench be preserved in its current location.

Secondly, homage to the history of Port St. Joe could exist with the construction of the waterfront stage. When visiting Port St. Joe, we heard a community narrative of the previous musical venue in Port St. Joe called Money Bayou. This was a musical venue located in the historical African –American side of town and was known to host some high profile performers and generally a really good time. There is no available historic information about this venue online, but it is within the community narrative and imagination that Port St. Joe was once a place that people would go to dance to music and have events that proceeded well into the night.

By building a stage on the waterfront, community members may have the opportunity to live out the legend of Money Bayou. It could very well become the next “Money Bayou” as the park gains a reputation for hosting really great events. It is our recommendation that this historic element, contained in the oral tradition of Port St. Joe, be expressively embodied in the building of a waterfront stage.

The third historical element is the Maddox house remains. It is tragic that the house was lost to the hurricane, but it is a blessing that the Maddox family designated the park as a place to enjoy for decades to come. Simply signage that recognizes the late Maddox family would add very much to the parks overall character. It gives the impression that this was once a family backyard, and now it is part of the "collective backyard" that is a park. The act of honoring a previously loved citizen (Miss Zola, who was a teacher in the school system) by naming a street after them (Miss Zolas drive) can have a strong impact on community ideals. Miss Zola still exists as a person to admire simply because the street is named after her.

It is our recommendation that signage be added to this park honoring the Maddox family for contributing this beautiful land to collective ownership by the people in Port St. Joe.

Proposed Policies & Legal Analysis

This site already has approved zoning for a park development. Previously, there was a stage located (in a less desirable location) and all elements we are proposing are essentially re-builds so it is unlikely that there will be any legal battles surrounding this project.

Communications Strategy for Public Education and Engagement

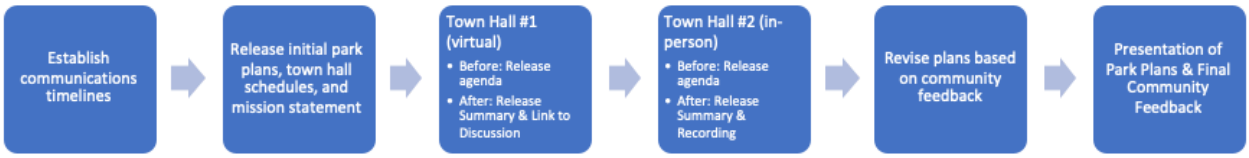
Our communications strategy is defined by two principles: two-way communication and transparency. Leadership should seek feedback and monitor conversation to inform decision-making and foster community empowerment and inclusion, values that Port St. Joe residents find extremely important. Additionally, transparency of the project process, including how community feedback will be used, will create a sense of inclusion and spark ownership of the project, a trait that has proven successful in Port St. Joe parks development.

It's important to note that city communications strategies are only as successful as the leadership style and decision-making processes. To implement this project, we recommend utilizing iterative processes that allow for community feedback and input.

Public Announcements. Upon beginning this project, establish the communications plan timeline and utilize traditional city methods for disseminating important and official information to deliver the announcement of the project and timeline to the community. While some of our remaining recommendations may be different than traditional communications methodologies, using existing infrastructure is important to manage community expectations. Essentially, if residents are expecting official announcements via the city website, then all progress reports should be listed there. The initial announcement should include a mission about the desire for inclusive and iterative community engagement.

Ambassadors. Consider creating a committee or ambassador group for the park project. This group—in partnership with project leadership—would lead town hall discussions and also disseminate messaging in their respective micro-communities: to friends, school groups, clubs, workplaces, etc.

Town halls. Consider holding town halls, both in-person (if safe to do so) and virtually. People are likely to bring up different concerns in-person than online, and some demographics may have difficulty accessing or utilizing virtual resources. Having both spaces allows for the most diverse set of voices. Leveraging the Facebook Group "Port St. Joe Strong (All 32456 Info Sharing Group)," city officials or park leaders could lead a discussion board or host a live Q&A session.



Community Communications Structure

Once the project is successfully approved and a construction timeline is established, an external communications plan is recommended to begin marketing the stage as a rental space, if city officials desire to profit directly from the stage usage.

Appoint a park/rentals manager. Staff will be needed to utilize this stage for profit. Charge this person with booking responsibilities, including marketing the space to potential renters.

Tourism Guides. Include the stage and park mock-ups or plans in tourism guides produced by the county or city. This will market the space early.

Alert nearby communities. Ensure that the rental opportunity is announced at county meetings and consider sending an ambassador to nearby towns' city meetings.

Hold a ribbon-cutting festival. Invite local and regional performers to be featured in an initial celebration and market the event to nearby towns. Obtaining a large audience at this initial event will help leverage word-of-mouth communications to spread the rental opportunity. Have printed materials about rental agreements on hand and make several announcements.

Statement of Economic Viability

The improvements we are suggesting are designed to be economically feasible. All elements existed previous to the storm and so would qualify as a reconstruction effort. Recreational elements such as the continuous path and footbridges could qualify for FRDAP grants. The stage, presented as both a reconstruction of the previous stage and as a necessary component of reconstructing the town given our arguments in this paper, could qualify for FEMA funding. When we met with city administration and previous city administration, they informed us that funding was definitely available for the space and that the only reason it hadn't been acted upon is that nobody had yet made an attempt.

Implementation

Management and Organization

This project could be divided into phases easily, as the various components/elements are physically separated.

The footbridges and the ecological restoration of the runoff channel would be the most complicated portion of this project, but this is what we, as students, would imagine to be the general outline.

Ecological Restoration of runoff estuary

Prior to construction, assemble 30 4'x4' Gabions filled with medium sized limerock and enclosed with saltwater resistant Gabion mesh. These would ideally be on site along with a large pile (five large truckloads) of native lime rock from construction debris.

1. Use a venturi siphon to Siphon the pond so that the drainage canal is dry and workable.
2. Use an excavator to perform earthworks on the drainage canal. The excavator could also be utilized to remove tree stumps or transplant palm trees in this time.
3. Place the Gabion Jetties in their desired locations.
4. Form the cement water retention walls and seating walls.
5. Place Large limerocks with the excavator. This stage can be rough but place with the intention of filtering water. Once large rocks are in place, fill in areas with smaller limerock as per the design.
6. Once the cement is dry and set, allow the pond to recharge and overflow.into the canal. The final step would be planting the banks with native grasses and estuary plants.
7. Estuary plants can be gathered from a donor site. Salt Marshes are readily available and can be harvested with insignificant damage to the existing ecosystem. Other plants such as Muhly grass and Fakahatchee grass are commonly available at nurseries.
8. Utilize the existing irrigation system in George Core Park to establish the plantings, or alternatively pump irrigation out of the pond.
9. The final step is to build the two footbridges. It is our recommendation that the footbridges be made like docks which would fit the maritime theme and also be resilient if storm surge should happen again.

Continuous foot/bike path

The continuous footpath is a low-hanging fruit in this park re-establishment. All that is required is community input, crushed shell, some herbicide and edging if it is preferred.

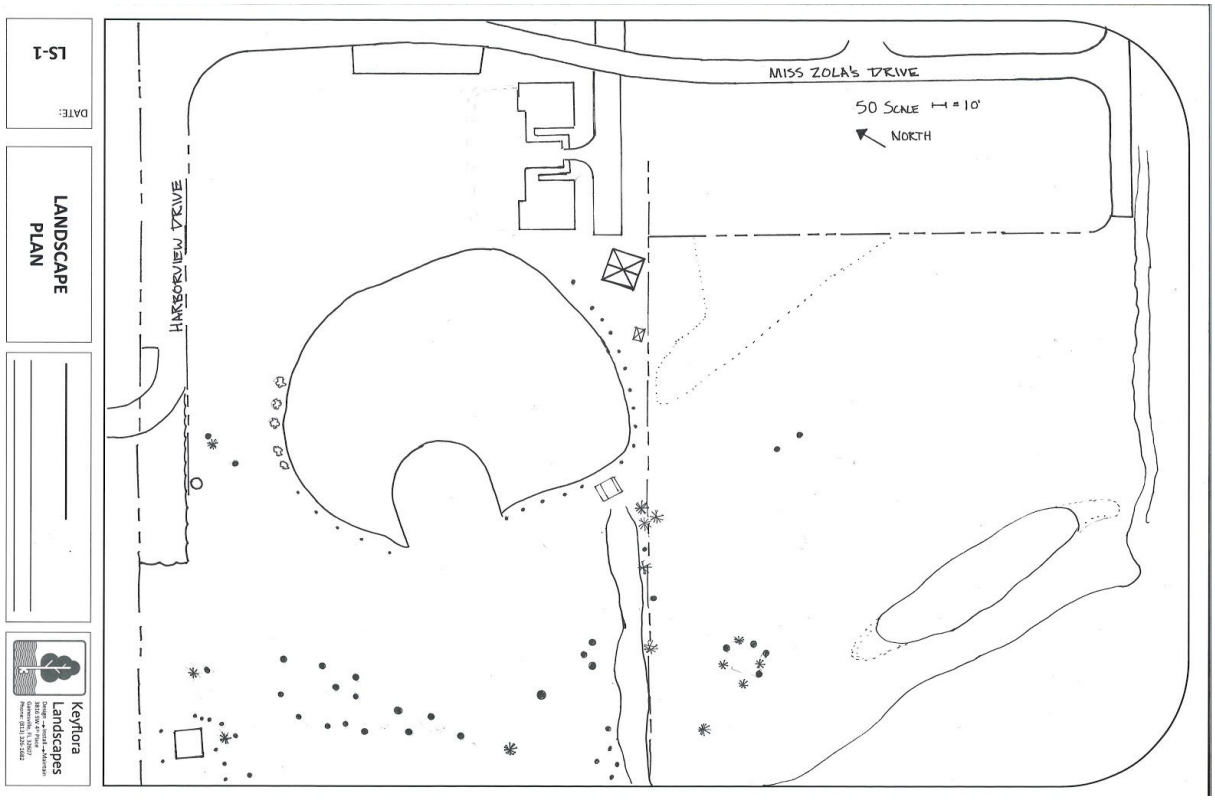
1. Community input or professional design could be utilized to determine the best footpath. The previously designed and implemented footpath worked just fine and could be used again.
2. Mark the path and hire a contractor to install the crushed shells.
3. Install desired signage along the path to orient visitors.
4. Host an event such as a one-mile or 5K race to open the park.

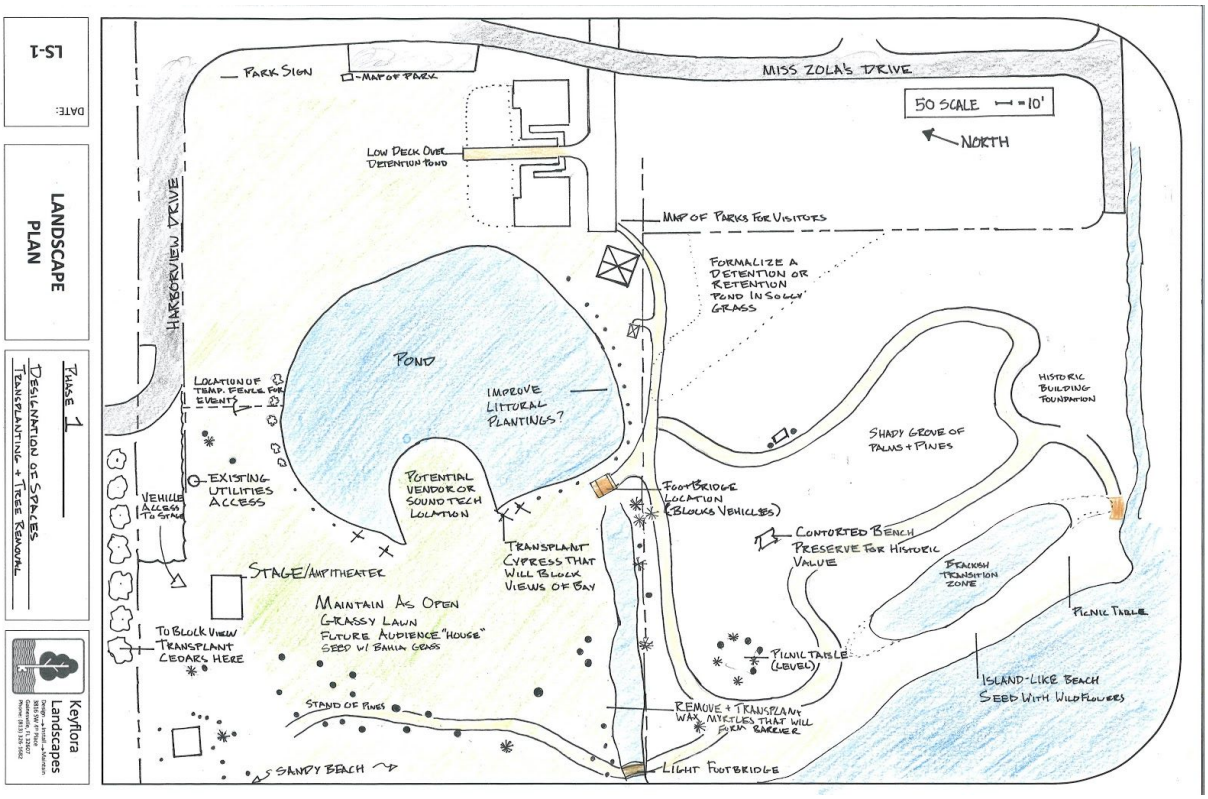
Construction of the stage

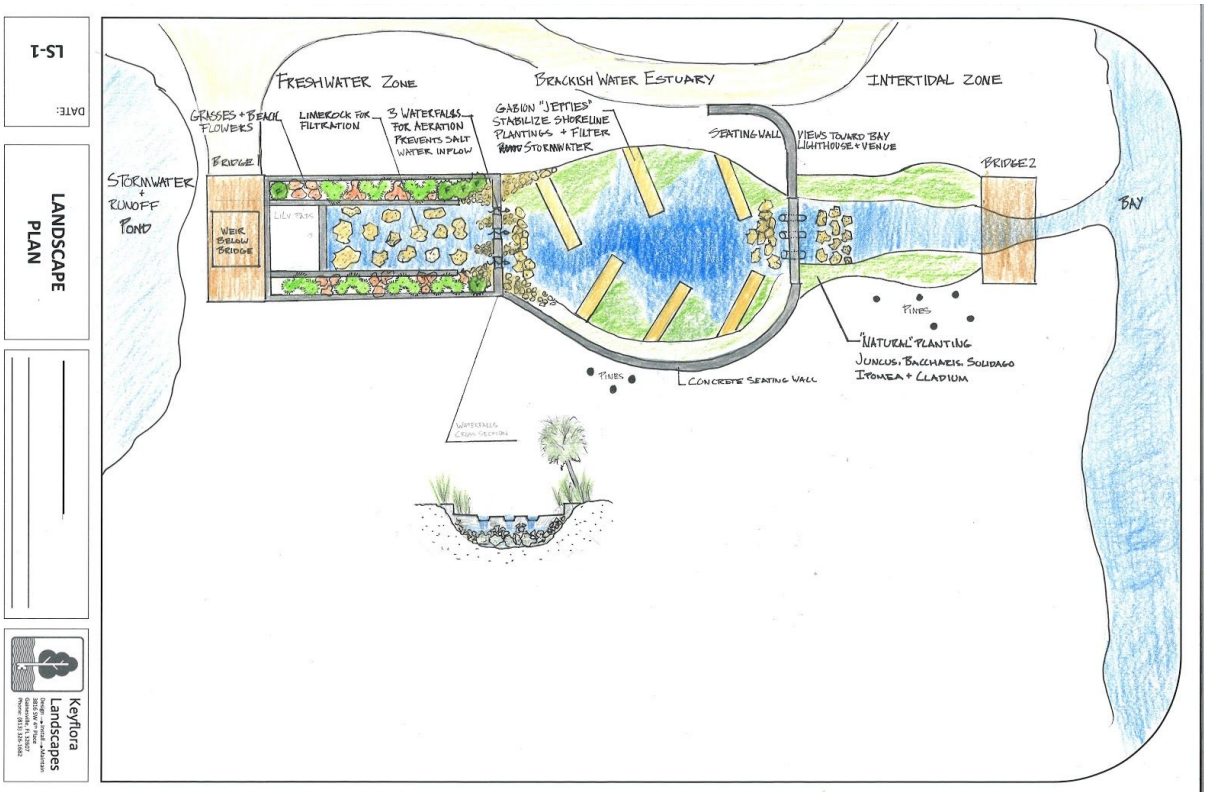
The logistics and design of stage construction are beyond our skillset. A stage designer ought to be hired for the design and subsequently a contractor for the construction. It is a stand alone element in the park and so could be made at any point in the construction process.

Beachside Wildflower Beautification

As an addition, this park project has the opportunity for a show of wildflowers along the bayfront. Seeding wildflowers is easy and can be done in January or early february and consists of simply broadcasting wildflower seeds in target areas. Call and order a custom seed blend and receive detailed instructions for seeding from Terry Zinn at Florida Wildflowers Cooperative. His recommendations for beachside planting include: Goldenrod, Blanket Flower and Coreopsis. Roughly ten pounds would be necessary for dramatic and lasting results and results would improve with irrigation which is available at George Core Park. It could be of high aesthetic value and low cost to seed with wildflowers at this park.




LS-1
DATE:
LANDSCAPE PLAN
PHASE 1
DESIGNATION OF SPACES
TRANSPLANTING + TREE REMOVAL
Keyflora Landscapes
PARK SIGN
MAP OF PARK
MISS ZOLA'S DRIVE
50 SCALE 1" = 10'
NORTH
LOW DECK OVER DETENTION POND
HARBORVIEW DRIVE
MAP OF PARKS FOR VISITORS
FORMALIZE A DETENTION OR RETENTION POND IN SOLID GRASS
POND
IMPROVE LITTORAL PLANTINGS?
LOCATION OF TEMP. FENCE FOR EVENTS
EXISTING UTILITIES ACCESS
VEHICLE ACCESS TO STAGE
POTENTIAL VENDOR OR SOUND TECH LOCATION
FOOTBRIDGE LOCATION (BLOCKS VEHICLES)
HISTORIC BUILDING FOUNDATION
SHADY GROVE OF PALMS + PINES
CONTORTED BENCH PRESERVE FOR HISTORIC VALUE
BRACKISH TRANSITION ZONE
PICNIC TABLE
TRANSPLANT CYPRESS THAT WILL BLOCK VIEWS OF BAY
STAGE/AMPITHEATER
MAINTAIN AS OPEN GRASSY LAWN FUTURE AUDIENCE "HOUSE" SEED W/ BAHIA GRASS
TO BLOCK VIEW TRANSPLANT CEDARS HERE
PICNIC TABLE (LEVEL)
ISLAND-LIKE BEACH SEED WITH WILDFLOWERS
STAND OF PINES
REMOVE + TRANSPLANT WAX MYRTLES THAT WILL FORM BARRIER
SANDY BEACH
LIGHT FOOTBRIDGE


LS-1
DATE:
LANDSCAPE PLAN
Keyflora Landscapes
FRESHWATER ZONE
BRACKISH WATER ESTUARY
INTERTIDAL ZONE
GRASSES + BEACH FLOWERS
LIMEROCK FOR FILTRATION
3 WATERFALLS FOR AERATION PREVENTS SALT WATER INFLOW
GABION "JETTIES" STABILIZE SHORELINE PLANTINGS + FILTER POND STORMWATER
SEATING WALL
VIEWS TOWARD BAY LIGHTHOUSE + VENUE
BRIDGE 1
BRIDGE 2
STORMWATER + RUNOFF POND
WEIR BELOW BRIDGE
BAY
PINES
"NATURAL" PLANTING
JUNCUS, BACCHARIS, SOLIDAGO ITOMEA + CLADIUM
CONCRETE SEATING WALL
WATERFALLS (CROSS SECTION)

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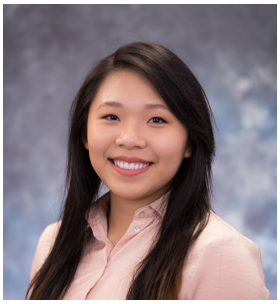
Meet the Team

Kanglin Chen | College of Design, Construction & Planning
Ph.D. Student in Landscape Architecture
Kanglin Chen is a Ph.D. student in the Department of Landscape Architecture at the University of Florida. She obtained a Bachelor of Landscape Gardening and a Master of Geography (Urban and Regional Planning). Her research interest includes resilience, landscape performance, social media analysis, world heritage, and national parks in the U.S. and China.



Amy Fu | College of Journalism & Communications
Master of Arts in Mass Communications
Amy has an eye for details, which comes in handy with content creation and strategic communications. She received her Bachelor of Science degree in Advertising from the University of Florida.

Isaac Graham | College of Design, Construction & Planning
Bachelor's of Science in Sustainability in the Built Environment
Isaac Graham is a Bachelor's student in the Sustainability in the Built Environment degree, with a minor in Geography. His background includes work with Geodesign and has worked on a number of GIS projects. Isaac has an acute interest in Green Infrastructure.

Brandon McKinley | College of Journalism & Communications
Master of Arts in Mass Communications
An aspiring musician, storyteller, and videographer, Brandon focuses on utilizing strategic communications to activate change. He holds bachelor's degrees from the University of Florida in music and public relations, and currently serves as the Public Relations Specialist at the UF College of the Arts.

Blake West | College of Design, Construction & Planning
Master of Urban and Regional Planning
Blake is a student and owner of a landscape design and installation company in Gainesville. He has a B.S. in Botany. His specific interest in planning is parks and recreation which stems from a love of the outdoors.

Conclusion

This paper outlines the first steps towards revamping this park. We identified this park to be of high importance to the PSJ community and also to be the ideal location for a stage that would address multiple community desires. The building of a permanent outdoor stage would bring much needed social and economic uplift as events are created and held at the waterfront and with each event we believe PSJ will take steps toward a more full recovery from Hurricane Michael. This park also has high capability for resilient functions, as it already has a stormwater retention pond, a living shoreline and social value. Along with the stage, we have proposed recreation, ecological and historic improvements to this site. We believe that this park could become a true gem of the Florida Panhandle.

Appendix A

Acknowledgements

Our team would like to thank all of the members of Port St. Joe for their hospitality.

We'd like to extend a special thanks to the following residents for their time and sharing of information.

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Jon Dillard

Jera Horton

Bill Kennedy

Mel Magidson

Michael Lacour

Nathan Peters

Stanley Peters

Charlotte Pierce

All of the survey respondents

Thanks to our core faculty members at the University of Florida Jeff Carney, Cleary Larkin, and Alyson Larson, as well as to all of our guest speakers and lecturers.

Appendix B

Park & Open spaces	Completion date	size	Resilient strategies	Strategy effects
Buffalo Bayou Park, Houston, TX	2015	169 acres, 2.3 miles long	14) Custom-designed site fixtures and furnishings: Trail light poles, stair handrails and guardrails with higher material strength and thickness. 15) Riparian bank stabilization: banks were stabilized with vegetation at a 2:1 slope where wetland species would occupy the portion of the bank that would occasionally submerge with a native grass mix, with coir lifts. 16) Planting new trees	1) Withstood significant flooding and avoided an estimated $2 million in damages from Hurricane Harvey 2) Avoided an estimated $735,900 in flood repair costs from Hurricane Harvey 3) Intercept more stormwater runoff by newly planted trees. 4) Coir lifts performed extremely well during Hurricane Harvey. (Unsuccessful influence: The vegetational covered area has much greater slope failure during flood events, which needs repair and costs fees.)
Buffalo Bayou Promenade, Houston, TX	2006	23 acres	Soil excavation	1) increases the flood storage capacity 2) Improves the channel's ability to withstand stormwater velocity
Historic Fourth Ward Park, Phase 1, Atlanta, GA	2010	5 acres		1) reduce stormwater peak flow 2) provides flood protection in extreme rain events for adjacent properties (no flooding at neighboring market during 3 days of intense rain in July 2013 totaling 5.3 inches, as compared to catastrophic flooding of the market in Sept 2009 totaling 8.1 inches)
Hunter's Point South Waterfront Park, Phase 1, Long Island City, NY	2013	9.5 acres	1) permeable pavers and biofiltration swale 2) The central oval lawn surrounded by a sloping retaining wall and it's graded to slope down to the river	1) intercepts, infiltrates, and evaporates average annual rainfall 2) provide temporary water storage and it allows the collected water to recede back into the river.
Tom Hanafan River's Edge Park, Phase 1, Bluffs, Lowa	2013	85 acres	1) Bioswales and bioretention areas, lawns, 24% impervious surface, 29% lawn, 7% meadow, 39% forest 2) Prioritized the integration flood infrastructure, $50 million repair cost for the area along the levee,	1) Reduces annual rainfall onsite 2) Protects 33% of the area damaged by the flood, avoiding millions of damage cost for a major flood event

			a protected area boundary was first established	
Westerly Creek at Stapleton, Denver, Colorado	2004	75 acres	1) Decreases existing sub-watershed floodplain 2) Improves water conveyance capacity 3) Increases stormwater infiltration 4) Improves water quality	
Napa River Flood Protection project (1993-2012), Napa, California	2015	1011 acres	1) Expanded capacity of the river channel 2) Restored historic wetlands	1) Accommodate the 100-year flood 2) Presence of migratory and resident birds
Chicago Riverwalk, Phases 2 & 3, Chicago, IL	2016	3.5 acres	Used ecological quality as demonstrated by an increase in Floristic Quality Index (FQI) to evaluate the ecological integrity of the native plant communities on site	

References

APA Style