



NORTH CAROLINA
RESILIENT COASTAL COMMUNITIES PROGRAM

TOWN OF HOLLY RIDGE RESILIENCE STRATEGY

May 2024

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SUMMARY

Summary

The North Carolina Climate Risk Assessment and Resilience Plan (June 2020) called for a statewide North Carolina Resilient Communities Program. Initiated in 2021, the Division of Coastal Management is supporting the advancement of coastal resiliency work through the Resilient Coastal Communities Program (RCCP). In its second round of Phase 1 and Phase 2 for 2023-2024, the Program’s objectives are to support a proactive, locally driven, and equitable approach to coastal resilience by:

- Addressing barriers to coastal resilience at the local level
- Assisting communities in the preparation of risk and vulnerability assessments
- Helping communities develop a portfolio of well-planned and prioritized projects
- Advancing priority projects to “shovel-ready” status
- Linking communities to funding streams for project implementation



Project Portfolio Focus

- Emergency Operations Center / Feasibility Study
- Multi-Use Greenway with Green Stormwater Infrastructure
- Stormwater Master Plan
- Suitability Analysis for Green Stormwater Infrastructure
- Stormwater Education & Outreach

The Town of Holly Ridge, North Carolina was selected to complete Phase 1 and Phase 2 of the RCCP simultaneously in 2023. Kleinfelder, Inc. (‘Project Team’) was matched with Holly Ridge to provide technical assistance throughout both phases. Phase 1 involves establishing a Community Action Team (CAT) to guide the entire effort, creating a common vision, and set of goals for the Program, and preparing a Risk and Vulnerability Assessment with public engagement. Phase 2 builds from the Risk and Vulnerability Assessment by identifying a long list of potential solutions to address challenges, prioritizing solutions with CAT and public feedback, and presenting a Portfolio of project profiles each with supporting information that can be used in applications for funding.

Using the Risk and Vulnerability Assessment and knowledge of previous flooding events, the CAT identified areas throughout Holly Ridge at risk for flooding. While flooding from major storm events such as hurricanes and tropical storms cause disruption and damage, more frequent, short-duration heavy rainfall events impact the Town as well. Holly Ridge is also becoming a desirable destination and attracting more development, with its proximity to Camp Lejeune, Topsail Island, and the greater Wilmington area, highlighting the importance of ensuring appropriate development regarding stormwater best management practices and employing natural and nature-based solutions where feasible.

Based on feedback from the community and the CAT, an Emergency Operations Center feasibility study was determined as desirable to addressing current preparedness and capacity challenges.

Ultimately, the CAT identified five projects for the RCCP project portfolio, which may be implemented under later phases of the RCCP or under other funding strategies. **This report is intended to be a tool for Holly Ridge to understand local climate hazards and associated risks and use in support of funding applications.**

Background



Holly Ridge is located in the southwest corner of Onslow County, bordering Pender County, approximately 20 miles south of Jacksonville and less than 6 miles the Atlantic Ocean, with two regional highways (NC Highway 50 and US Highway 17) that bisect the town. Interstate I-40 is located 45 minutes west of the town limits, providing convenient access to other areas. Holly Ridge spans portions of the

Cape Fear and White Oak Watersheds. The Town jurisdiction includes some coastal shoreline along Stump Sound, with Morris Landing Pier affording recreational opportunities on the water.



Sept. 14, 2018: A tree is down on an occupied trailer on S. Dyson Street in Holly Ridge; N.C. Minor injuries were reported. [[The Florida Times-Union](#) via Holly Ridge Police Department; Facebook]

Holly Ridge is the home of historic Camp Davis, which originally served primarily as an anti-aircraft artillery training center for the Army, predating the neighboring Marine base which became Camp Lejeune.¹ The Camp's presence increased the population of Holly Ridge during the 1940s to 100,000 people – however by the 1950s, many of the Camp's residents had moved on, reducing the population of Holly Ridge. The Town is also just a few miles inland of Topsail Island, a popular destination for North Carolinians and tourists alike. Holly Ridge draws people with its small-town charm and proximity to the ocean, which provides ample opportunities for recreation and work.

In 2018, Hurricane Florence passed through eastern North Carolina, causing major precipitation and flooding throughout the state. Holly Ridge experienced strong, damaging winds that brought trees down on power lines, roads, and roofs, damaged siding, and downed the canopy of a gas station. The Town received high rainfall total amounts, with about 244 properties impacted by

¹ [A Rich History, A Promising Future](#) (2021)

flooding; however, the Town was less impacted overall than neighboring jurisdictions, such as Topsail Island and Wilmington.

Community Action Team

The RCCP process requires each community to establish a multidisciplinary group of stakeholders, referred to as a Community Action Team (CAT), to provide local perspectives and to engage the community. Holly Ridge’s CAT was created through input from Town staff and includes members can best represent the community. Various stakeholder groups were considered, including Town departments, residents, emergency services, transportation services, vulnerable populations, and environmental agencies. **Table 1** lists active CAT members that participated throughout the duration of program.

Table 1. Community Action Team Members

Name	Title	Organization
Heather Reynolds	Town Manager	Town of Holly Ridge
Kimmee Frankenfield	Grants Administrator	Town of Holly Ridge
Marsha-Gray Kircher	Community Development Administrator	Town of Holly Ridge
Greg Lawrence	Building Code Administrator	Town of Holly Ridge
Mike McFann	Public Works Director	Town of Holly Ridge
Mike Sorg	Police Chief	Town of Holly Ridge
Ken Bradshaw	Resident	Town of Holly Ridge
Carter Metcalf	Director	Onslow County Planning Department
Stacie Miles	Deputy Director	Onslow County Emergency Services
Clay Calhoun	Director	Onslow County Senior Services
Danny Ferucci	Executive Director	Onslow United Transit Systems
Tammy Proctor	Director	Topsail Chamber of Commerce
Kirsten Spirakis	Engineering Supervisor	North Carolina Department of Transportation
Carlton Gideon	Senior Community Planner	Eastern Carolina Council of Governments
Ricky Maready	District Vice President	Jones Onslow Electric Membership Corporation
Kerri Allen	Coastal Advocate	NC Coastal Federation
Paula Farnell	Coastal Recreation Fishing License Project Coordinator	NC Division of Marine Fisheries
Mariko Polk	Coastal Processes Specialist	North Carolina Sea Grant
Sarah Spiegler	Coastal Processes Specialist	North Carolina Sea Grant

² [Photos: Scenes from the front lines of Hurricane Florence](#), The Florida Times-Union (9/14/18)

³ [Holly Ridge Flood Factor – Risk Factor](#) (2024)

The Project Team held a series of six CAT meetings from October 2023 through May 2024, in a combination of in-person and virtual settings. The Kickoff meeting with CAT members introduced the RCCP steps and objectives, providing an overview of involvement, and general timeline. Subsequent meetings will be detailed below.

Review of Existing Local & Regional Efforts

To comprehensively evaluate planning efforts at the local and regional level, a review of existing plans and ordinances helped document completed projects, ongoing efforts, and previously identified needs still waiting to be addressed. **Table 2** provides a summary of relevant information that supported the RCCP.

Table 2. Existing Local and Regional Plans

Year	Title	Asset Locations	Hazard Information	Potential Resilience Projects	Resilience Strategies in Place	Link
2023	NCDOT Climate Strategy Report			X		Link
2023	Stump Sound Watershed Protection and Restoration Plan	X	X	X	X	Link
2022	Climate Change and Natural Hazards Vulnerability Assessment for the Eastern Carolina Region		X	X	X	Link
2022	Climate Resilience Projects for the Eastern Carolina Region		X	X		Link
2022	Comprehensive Economic Development Strategy (Eastern Carolina Council)	X		X		Link
2021	Holly Ridge Flood Damage Prevention Ordinance			X		Link
2021	Holly Ridge Parks, Trails, & Open Space Master Plan	X		X		Link
2021	Southeastern NC Regional Hazard Mitigation Plan		X	X	X	Link
2020	Holly Ridge Comprehensive Land Use Plan	X	X		X	Link
2020	North Carolina Climate Resilience Plan		X			Link
2020	Onslow County Flood Ordinance		X			Link
2017	Hurricane Matthew Resilient Redevelopment Plan – Onslow County	X	X	X	X	Link

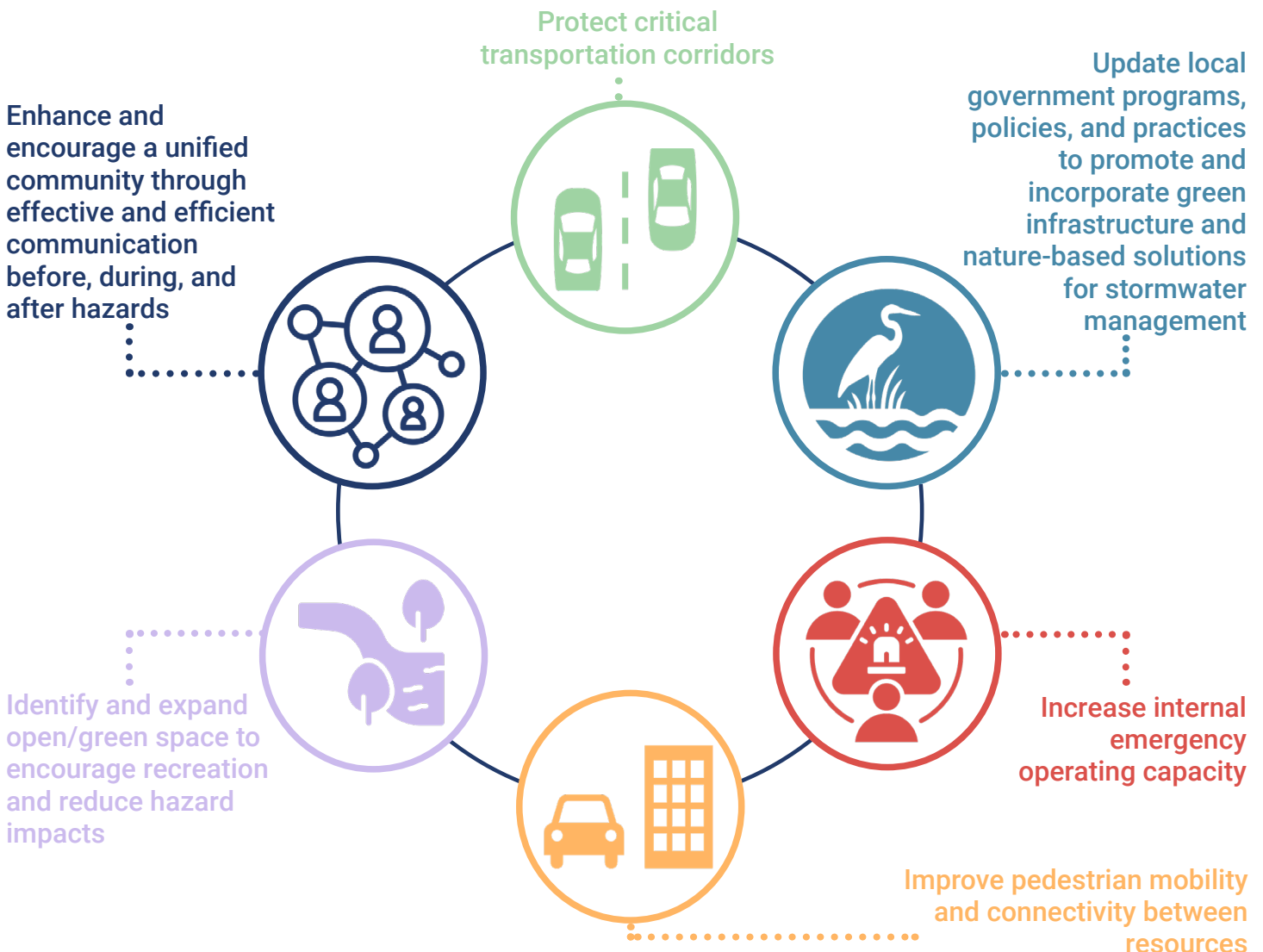
Vision and Goals

During CAT Meeting #1, the group brainstormed a vision and supporting goals for what a Resilient Holly Ridge will be. Aware of the current changes and challenges the Town has faced, the group was in agreement about the importance of looking forward and preparing for future challenges. Building from existing visions identified in the review of existing planning documents, the CAT determined Holly Ridge’s vision is to strive to be a peaceful and friendly place for residents and visitors and commit to being self-sustaining and resilient to natural hazards to protect its people, assets, and environment.

Community Vision

Holly Ridge is a small-town coastal community with rich cultural history and growing industry. The town strives to be a peaceful and friendly place for residents and visitors. Holly Ridge is committed to being self-sustaining and resilient to natural hazards to protect its people, assets, and environment.

To support the vision, the CAT reflected on potential actions and steps taken to achieve the vision. Goals are meant to be broad and actionable, and specifically relate to increasing resiliency of the Town. The CAT worked collaboratively in virtual breakout rooms to finalize six goals for the RCCP.



Engagement Strategy

The engagement strategy outlines actions and goals the Town of Holly Ridge, Community Action Team, and Kleinfelder engaged in to comprehensively gather and evaluate local knowledge and experiences with natural hazards. The approach included a series of meetings with the CAT, community workshops, attendance at the Holly Ridge Bee Festival, and a website. The purpose of an engagement strategy is to ensure inclusivity in the planning process, particularly by involving members of vulnerable and historically underrepresented communities, and to make participation as convenient and meaningful as possible. Additional engagement activities are detailed in the **Appendix**.

CAT Meetings

Following the CAT Kickoff Meeting, a series of six virtual and in-person meetings were held monthly from October 2023 through May 2024. A matrix of meeting topics can be found in **Engagement Strategy** in the **Appendix**. Most CAT meetings were discussion-based and included review and confirmation of findings.

In December, following CAT Meeting #2, the Town hosted a site visit for interested members to gain a visual understanding of problem areas throughout Holly Ridge. During the site visit, the CAT observed critical assets and natural infrastructure, such as industrial parks, recreation areas, roadways, and neighborhoods.



Photo Credit: Julia Maron, Kleinfelder, 2024

Public Engagement

Public engagement efforts included two online surveys – the first gathered responses to background information and personal experience with natural hazards; the second asked respondents to rank their preference for projects identified in the Portfolio. The surveys were hosted online and cascaded via the Town’s newsletter, Facebook, via CAT members, to places of worship, and posted as a QR code around town.

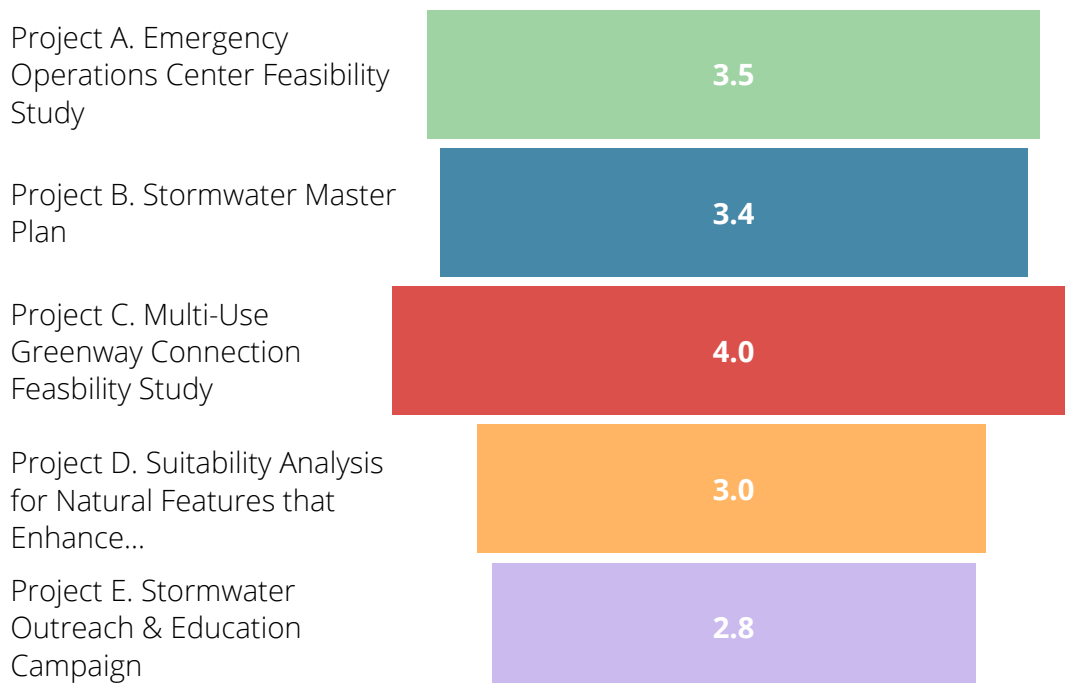
A project website was designed to encourage consistent engagement with the RCCP and disseminate information about upcoming events: [Resilient Coastal Community Program – Holly Ridge](#). Additionally, Kleinfelder designed a logo (see right) based on the Town’s current colors and symbols to encourage connection to the project. Stickers were created and handed out at public events, with the goal of messaging about Holly Ridge’s involvement in RCCP and the steps the Town is taking to become a Resilient Holly Ridge.



Survey #1 was published in January 2024 and a total of 11 responses were received. Hurricanes, tropical storms, and severe weather were most common and most concerning impacts to community members. Impacts directly resulting from storm events included power/internet loss, property damage, and limited access to services. Respondents noted locations throughout Town that had experienced weather-related issues, most notably flooding and utility disruptions.

Survey #2 received 68 responses from April – May 2024. Respondents were asked to indicate their preference on a scale one (1 – least favored) to five (5 – most favored) for each of the final five projects identified in the Project Portfolio. Survey results indicated most favorable support for the multi-use greenway connection feasibility study and the emergency operations center feasibility study.

Community Survey - Project Preferences



On January 31st, 2024, a public workshop was held in the Holly Ridge Community Center. The workshop was set up as a 'passport'-type activity, where participants were encouraged to visit four different stations (each occupied by a CAT member), to learn more about RCCP and provide feedback on challenges and solutions. Stations included representation from NC Division of Coastal Management, the Town of Holly Ridge, the NC Coastal Federation, and Kleinfelder. As participants visited each station, they would receive a stamp on their resilience 'passport' and would return to the sign-in table to receive their participation sticker and fill out Survey #1. In total, about 15 community members attended.

RESILIENT HOLLY RIDGE

HOW DO YOU PREPARE FOR EXTREME WEATHER EVENTS?

IN WHAT WAYS HAVE YOU BEEN INCONVENIENCED BY STORMS?

Come and share your challenges and concerns about weather-related hazards and learn about what Holly Ridge is doing to prepare for the future!

Hosted by Kleinfelder and the Holly Ridge Community Action Team as part of the Resilient Coastal Communities Program (RCCP)

PUBLIC WORKSHOPS TO ADDRESS FLOOD EVENTS

North Carolina
RESILIENT COASTAL COMMUNITIES PROGRAM

To learn more about the RCCP Program, visit:
<https://www.deq.nc.gov/about/divisions/coastal-management/coastal-adaptation-and-resiliency/nc-resilient-coastal-communities-program>

PUBLIC WORKSHOP

Wednesday, January 31st, 2024
Drop in 11:00AM - 2:00PM
Holly Ridge Community Center
(404 Sound Rd. Holly Ridge, NC 28445)
Food will be provided!

Sign up for workshops here:
(<https://bit.ly/resilient-holly-ridge-workshop>)

Logos: N.C. DIVISION OF COASTAL MANAGEMENT, KLEINFELDER

The Project Team designed a flyer to promote the public workshop on January 31, 2024

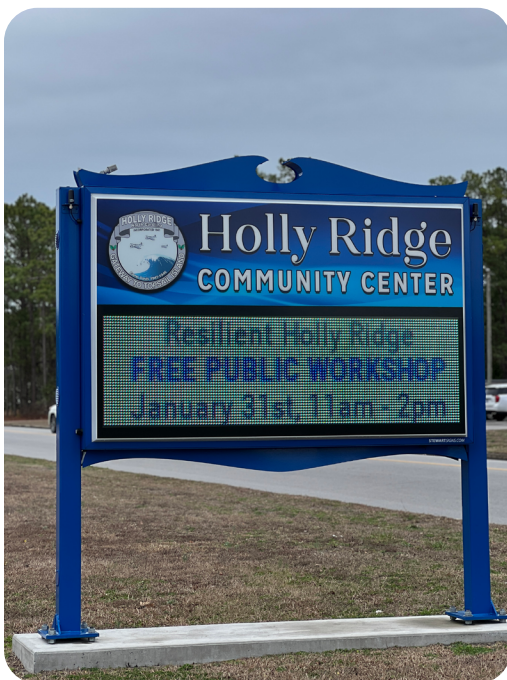


Photo Credit: Julia Maron, Kleinfelder, 2024

The Project Team attended the Holly Ridge Bee Festival, held on April 27th, 2024 in downtown Holly Ridge. As community members stopped by the table, they were asked which one of the five projects identified in the Project Portfolio would they most like to see implemented in the near future. They would then fill out the survey with their preferences and could learn more about the RCCP and efforts the Town was taking regarding resiliency. Throughout the duration of the community event, about 50 people engaged with the Project Team and voted on their most preferred project.



Photo Credit: Julia Maron, Kleinfelder, 2024





**RISK AND
VULNERABILITY
ASSESSMENT
REPORT**

Risk and Vulnerability Assessment

To build long-term resilience to current and future impacts of hazards and a changing climate, Holly Ridge needs to know who and what is vulnerable to maximize resources and minimize future risks. A key component to this effort is the Risk and Vulnerability Assessment, which evaluates risks to people, critical assets, natural infrastructure, and ecosystems from coastal and climate hazards like flooding and severe weather. The RCCP Handbook (August 2023) provides a framework for assessing the risk and vulnerability of Holly Ridge’s assets. The following section is organized based on the three steps outlined in the Handbook:

1



Identify Critical Assets and Map Hazards

Collect spatial data for critical built and natural assets. Review Southeastern North Carolina Hazard Mitigation Plan (2021) and incorporate additional input from Community Action Team. Map assets and hazard data and create geodatabase.

2



Assess Vulnerability

Vulnerability is a function of exposure, sensitivity, and adaptive capacity. Examine the likelihood that an asset will be affected by natural hazards. Assign sensitivity scores based on asset function. Evaluate an asset’s ability to adjust to disruptions. Develop an index to assign vulnerability scores to estimate the susceptibility of an asset to relevant hazards.

3



Eliminate Risk

Determine potential risk to assets to prioritize actions that increase resilience to future hazards. Assign risk scores to estimate potential impacts on the surrounding community.

This assessment intends to focus on natural hazards, including those specific to coastal environments, and potential impacts to Holly Ridge. The RCCP Handbook considers the following potential hazards: sea level rise, flooding (rainfall, tidal, and riverine), damaging storms, tornadoes and winds, storm surge, shoreline erosion, heat waves, wildfire, and drought. Additional non-climate stressors include aging or potentially undersized infrastructure, population dynamics, economic shifts, increased subsidence, altered drainage patterns, and land cover change.

Flooding is a spatially defined hazard, meaning there is variability in the locations where it is likely to occur. Given Holly Ridge’s proximity to the Atlantic Ocean and Stump Sound, flooding was identified as the most concerning hazard to evaluate. Other hazards evaluated in the assessment may be more spatially homogeneous, meaning their exposure is likely to be more evenly distributed across the Town.

A primary goal of the RCCP is to support the identification and implementation of resilience projects in participating communities. To support this goal, this assessment focuses on potential impacts to critical built assets and natural assets, defined as follows:

Critical Built Assets

The FEMA Community Lifelines Framework identifies assets that provide fundamental services for the community. These are assets that “enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security.” For this assessment, Critical Built Assets include:

- Roads/Evacuation Routes
- Water/Sewer Lines (including Lift/Pump Stations and Generators)
- Community Government Service Offices
- Schools/Emergency Shelters
- Economic Assets
- Health Services
- Public Safety/Emergency Services
- Historic/Cultural
- Day Care
- Provisions
- Place of Worship
- Mobile Home Park

Natural Assets

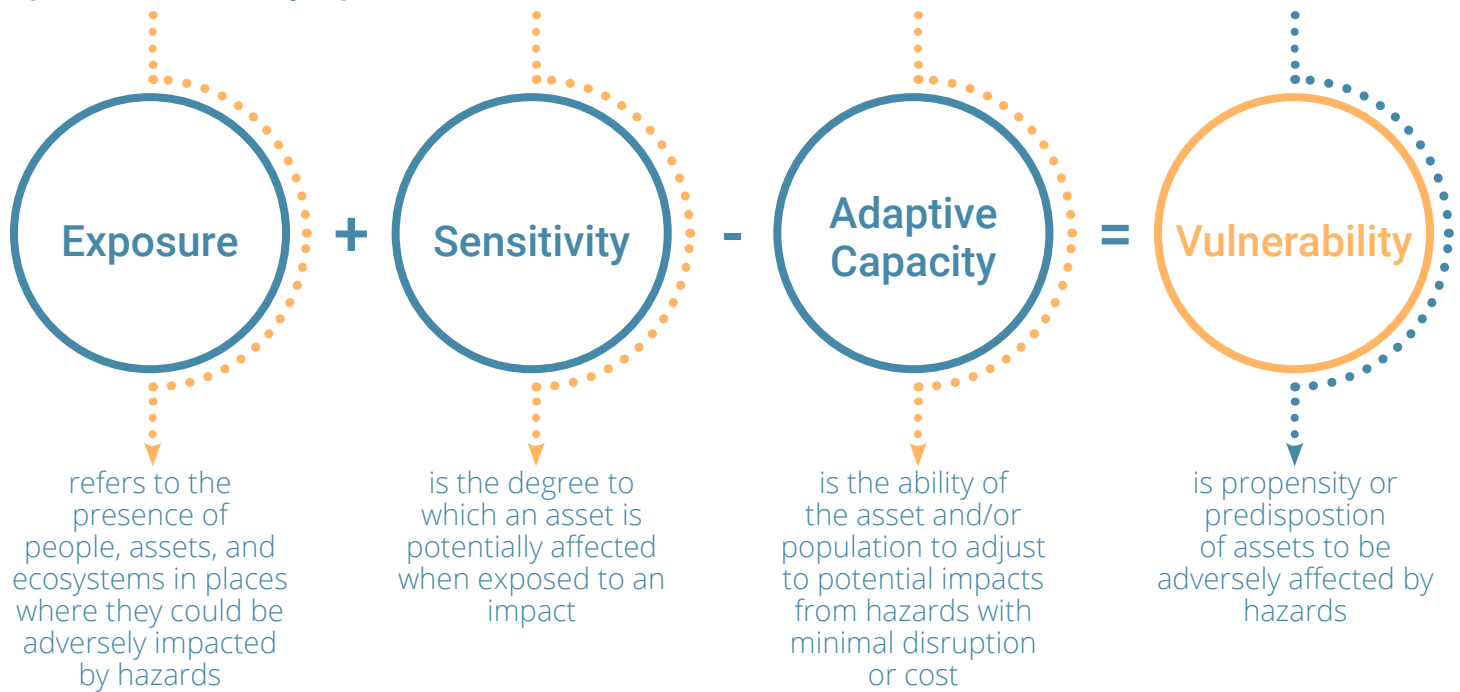
Natural assets include landscapes and systems that perform ecosystem services that benefit nearby communities, like flood protection, erosion control, and water purification. For this assessment, Natural Assets include:

- Open Space
- Parks
- Game Land
- Wetlands
- Natural Areas
- Managed Areas

After mapping hazards, the assessment determines which critical built assets and natural assets are vulnerable – the degree to which they are expected to experience adverse impacts – to flooding. This framework considers three components that contribute to vulnerability: exposure, sensitivity, and adaptive capacity.

Metrics are developed for each component and a Vulnerability Index helps assign assets a score from zero to three. **Figure 2** describes how a Vulnerability Score is determined.

Figure 2. Vulnerability Equation



Asset Identification

Critical Built Infrastructure

Critical built infrastructure refers to physical structures that house or perform functions that enable continuous operation of government and business functions and are essential to human and environmental health and safety or economic safety. Beyond operational functions, this assessment includes built infrastructure that is community-specific and considered essential by community members for cultural, ecological, public health, social, and/or economic value to the community. The assessment identified critical built infrastructure assets using multiple datasets available on NC One Map and Onslow County GIS Online. For this assessment, the Project Team identified assets as building-level structures and the parcel the structure(s) sit on. This method was selected to account for any exposure a hazard might have to an asset, including the land around it. The Federal Emergency Management Agency's (FEMA) Community Lifeline framework and the FEMA Resilience Analysis and Planning Tool (RAPT) served as starting points to identify and categorize critical built infrastructure assets.

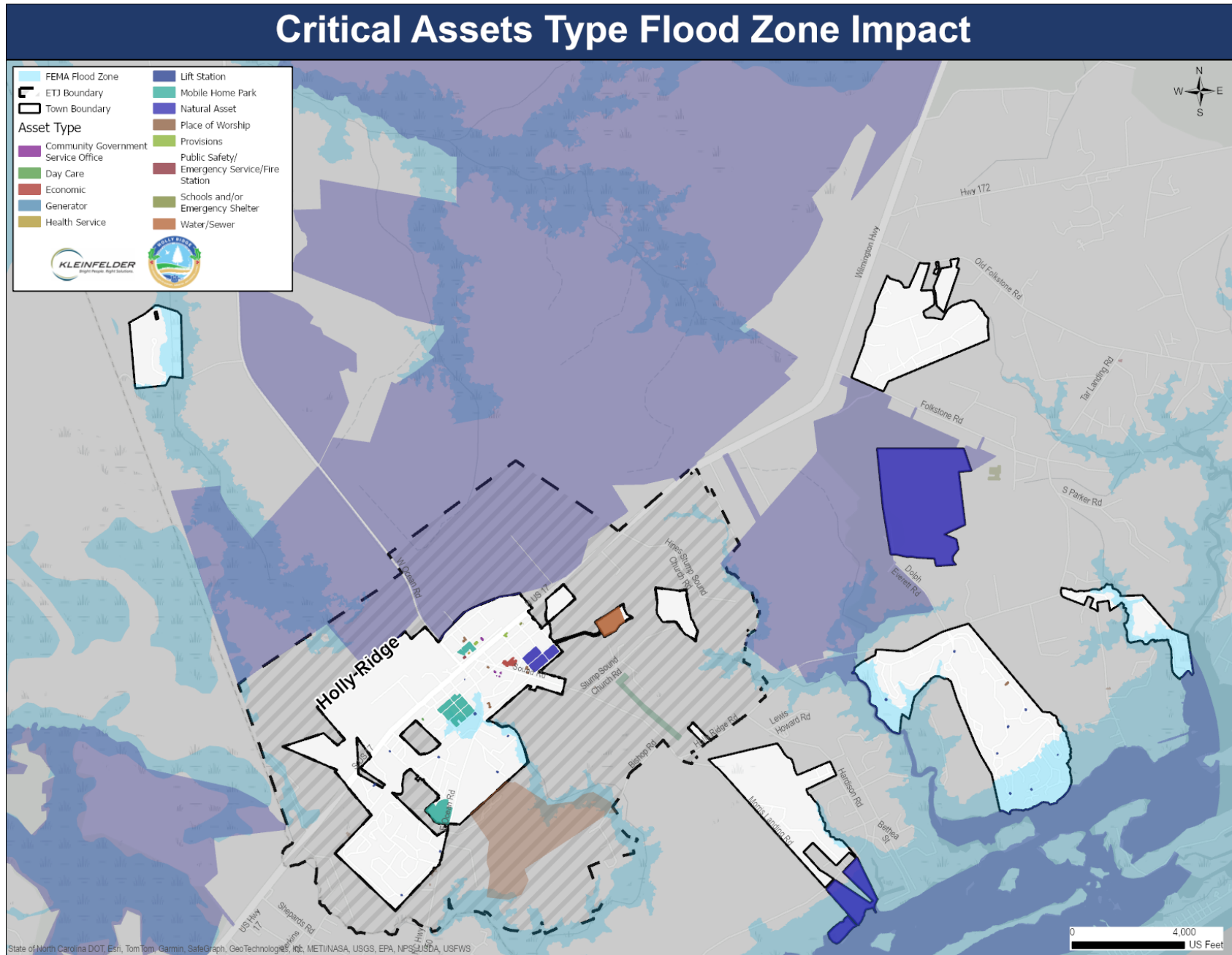
Table 3 summarizes the individual sites examined within Holly Ridge.

Table 3. Summary of Critical Built Infrastructure by Type

Asset Type	Includes...	No. of Assets
Community Government Service Office	Locations of government services, town center, public works, board of education, etc.	8
Day Care	Locations of pre-school and day care facilities	6
Economic	Locations of major employers	3
Generator	Locations of generators that provide backup power	4
Health Service	Locations of hospitals, doctor's offices, pharmacies, dialysis, aging/ memory care facilities	2
Lift Station	Locations of lift stations	17
Mobile Home Park	Locations of mobile homes and RV parks	216
Place of Worship	Locations of churches	21
Provision	Locations of gas stations, grocery stores, convenience stores	5
Public Safety/Emergency Service	Locations of emergency medical services, fire, police, public safety	2
Roads	Identified evacuation routes	2
School / Emergency Shelter	Location of elementary school; Schools are also identified as temporary shelters during disasters or emergencies	3
Water / Sewer	Locations of stormwater inlets, pump stations, water lines, water and wastewater treatment facilities	2
Transportation	Includes Holly Ridge Airpark	1

Figure 3 identifies all critical built and natural assets inventoried for this risk and vulnerability assessment in the Town of Holly Ridge. For this assessment, a one-mile buffer was applied to capture information just outside of the Town's jurisdiction and ETJ and is noted accordingly. The Project Team and CAT determined this would best capture critical assets used most by the community that may technically be outside of the Town's jurisdiction.

Figure 3. Critical Assets



Natural Infrastructure

Natural assets include landscapes and systems that perform ecosystem services that benefit nearby communities, like flood protection, erosion control, and water purification. Areas such as open space, parks, game land, wetlands, natural areas, and managed areas were identified from the North Carolina Natural Heritage Program, National Wetlands Inventory, and Holly Ridge GIS data.

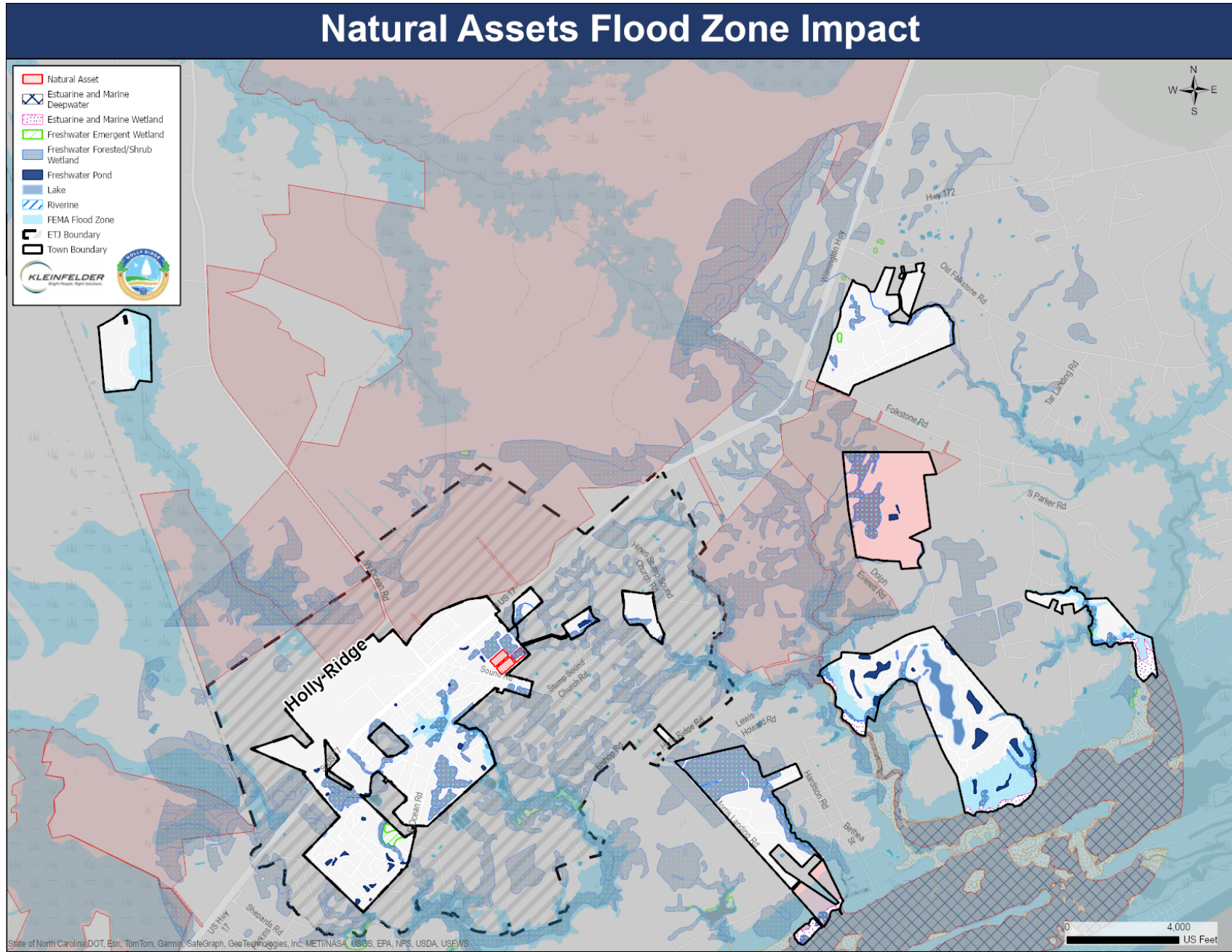
Table 4. Natural Infrastructure near Holly Ridge

Asset Name	Property Address
Holly Ridge Municipal Park	417 Kraft St.
Town of Holly Ridge Open Space	Folkstone Rd.
Stump Sound Outstanding Resource Water	Waterbody
Camp Lejeune	US Highway 17
Sages Ridge Preserve	US Highway 17 N.
Holly Shelter Game Land	US Highway 17 N.
North Carolina Coastal Federation Preserve – Morris Landing	Hardison Rd.
NC Land and Water Fund Project	Folkstone Rd.
Stones Creek Game Land Dedicated Nature Preserve	Folkstone Rd.
Town of North Topsail Beach Open Space	Folkstone Rd.
Onslow Water & Sewer Authority	NC Highway 50
Onslow Water & Sewer Authority	Folkstone Rd.

Wetlands function like bathtubs during rain events, filling with water and holding it before slowly releasing it back into the ground and recharging the water table. They also provide co-benefits beyond flood mitigation, such as habitat for fish and wildlife, carbon storage, and recreation. Within and around Holly Ridge, there are seven wetland types totaling approximately 8,191 acres.

Figure 4 below depicts natural assets and wetland areas identified within the Town of Holly Ridge and the one-mile buffer in relation to the FEMA 100-year and 500-year flood zone.

Figure 4. Natural Assets and Wetland Areas



Hazard Identification

Local Hazard Mitigation Planning

The RCCP Handbook stipulates the most recent hazard mitigation plan for Holly Ridge should serve as the primary reference for the risk and vulnerability assessment. Holly Ridge participated in the 2021 Southeastern North Carolina Hazard Mitigation Plan (Onslow County) and identified the primary hazards for the area as hurricanes and coastal hazards, tornadoes/thunderstorms, flooding, and wildfires. These primary hazards were used to determine the final list of hazards that will be used for the Vulnerability Assessment.

Hazards Identified for the Vulnerability Assessment

The RCCP Handbook requires that, at a minimum, flooding (rainfall, tidal, and riverine), storm surge, and 30-year sea level rise projections be identified and included in the Risk and Vulnerability Assessment. To create a comprehensive and locally relevant list of hazards, the project team supplemented the Hazard Mitigation Plan findings with input from the Community Action Team. For Holly Ridge, flooding was the primary hazard included in the assessment. The present exposure and future projections of the following hazards are also discussed qualitatively:

- Sea Level Rise
- Extreme Heat
- Wind / Severe Weather
- Drought
- Wildfire

For the purposes of this Vulnerability Assessment, flooding was the only hazard given an exposure score, as the additional hazards are more spatially homogenous across the Town and no additional modeling was performed as a part of this assessment. Holly Ridge is mostly an inland community with some jurisdiction adjacent to Stump Sound. Most of the town is not directly susceptible to sea level rise, storm surge, tidal flooding, or shoreline erosion – however, information is included about sea level rise as it pertains to nearby waterways and potentially impacted property.

Flooding



According to data from Risk Factor,⁴ about 664 properties in Holly Ridge are at risk of flooding over the next 30 years. About 249 properties are in the FEMA Special Flood Hazard Area (Zone A or V) and about 244 properties were impacted by flooding during Hurricane Florence. The Risk Index for Riverine Flooding according to the FEMA National Risk Index⁵ is Relatively Moderate.

For this assessment, the FEMA 100-year and 500-year floodplain data and validated Hurricane Matthew and Hurricane Florence data was used to assign an exposure score based on the intersection of critical built

⁴ [Holly Ridge Flooding Risk – Risk Factor](#)

⁵ [FEMA National Risk Index – Holly Ridge Census Tract](#)

assets with the flood zones. FEMA 100-year and 500-year flood mapping data provide present conditions for riverine flooding for the 100-year and 500-year frequency events. Validated Hurricane Matthew and Hurricane Florence flood data captures flood exposure for those storm events in areas that may be outside of presently designated FEMA flood zones.

Exposure Scores are referenced from low to high exposure, as summarized in **Table 5**.

Table 5. Flood Exposure Score

Asset Exposure	Exposure Score	Description
High	3	100-year and 500-year flood zone
Medium	2	Outside FEMA 100-year and 500-year flood zone; within Hurricane Matthew and/or Hurricane Florence flood extent
Low	1	500-year flood zone
N/a	0	No FEMA flood zone or Hurricane flood extent

Precipitation



Flooding vulnerability approximates the potential impact of future rainfall and storm events. The North Carolina Climate Science Report projects an increase in precipitation across the state as greenhouse gases increase throughout the 21st Century. Across the state, there has been an upward trend in the number of heavy rainfall events (3 inches or more in a day), and it's very likely that extreme precipitation frequency and intensity will increase.⁶

Climate projections from Climate Mapping for Resilience and Adaptation⁷ for mid-century (2035-2064) under a higher emissions scenario (RCP 8.5) predict Holly Ridge will experience about 55.2 inches of average total precipitation annually – which is approximately 1.7 inches more than baseline data from 1976-2005 (**Table 6**).

Table 6. Climate Projections for Flooding in Holly Ridge

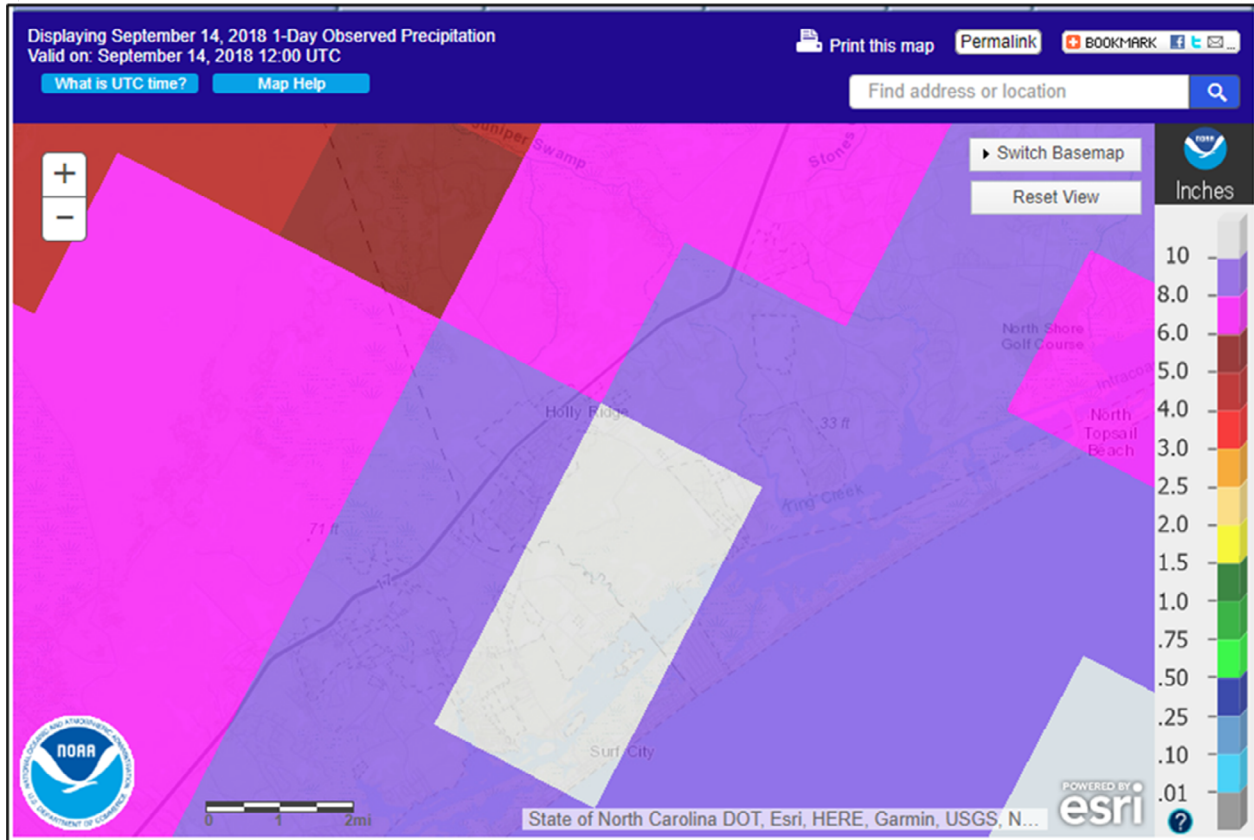
Metric	Time Horizon	Baseline (1976-2005)	Projection - Higher Emission Scenario	Change from Baseline
Average annual total precipitation (inch)	Early Century (2015-2044)	54.8	56.6	1.8
	Mid Century (2035-2064)		57.1	2.4
	Late Century (2070-2099)		58.2	3.5
Days per year with precipitation (wet days)	Early Century (2015-2044)	189.7	187.7	-2.0
	Mid Century (2035-2064)		186.1	-3.6
	Late Century (2070-2099)		182.5	-7.2
Annual days with total precipitation > 1 inch	Early Century (2015-2044)	9.3	10.3	0.9
	Mid Century (2035-2064)		10.7	1.4
	Late Century (2070-2099)		11.7	2.4

⁶ NC Climate Science Report (2020)

⁷ Climate Mapping for Resilience and Adaptation – Holly Ridge Census Tract

Due to limited available data, rainfall-driven flood hazards were not included in the spatial exposure assessment. As a proxy, data from NOAA National Weather Service Observed Precipitation details the historic precipitation that Holly Ridge experienced during Hurricane Florence (2018). The National Weather Service sensor located at Back Island/Holly Shelter Swamp recorded 20.87" inches of total rainfall from September 14th – 18th, 2018.⁸ However, unlike nearby communities such as Topsail Island, Wilmington, and Sneads Ferry, Holly Ridge was not as impacted by flooding despite the high levels of rainfall.

Figure 5. Hurricane Florence 1-Day Observed Precipitation (9/14/2018)



Sea Level Rise



The jurisdictional areas within Holly Ridge town limits that are most at risk of sea level rise include the Summerhouse Neighborhood and the Morris Landing preserve, as they are adjacent to Stump Sound. The NOAA Sea Level Rise Viewer provides data on projected impacts from a range of present day current mean high highest water to ten feet of sea level rise.⁹ **Figure 6** depicts the risk of two feet, four feet, and six feet of sea level rise to areas within and close to Holly Ridge. The Town should remain mindful of projected sea level rise risks along Stump Sound as areas are annexed and permitted for development.

⁸ [National Weather Service - Hurricane Florence \(2018\)](#)

⁹ [NOAA Sea Level Rise Viewer](#)

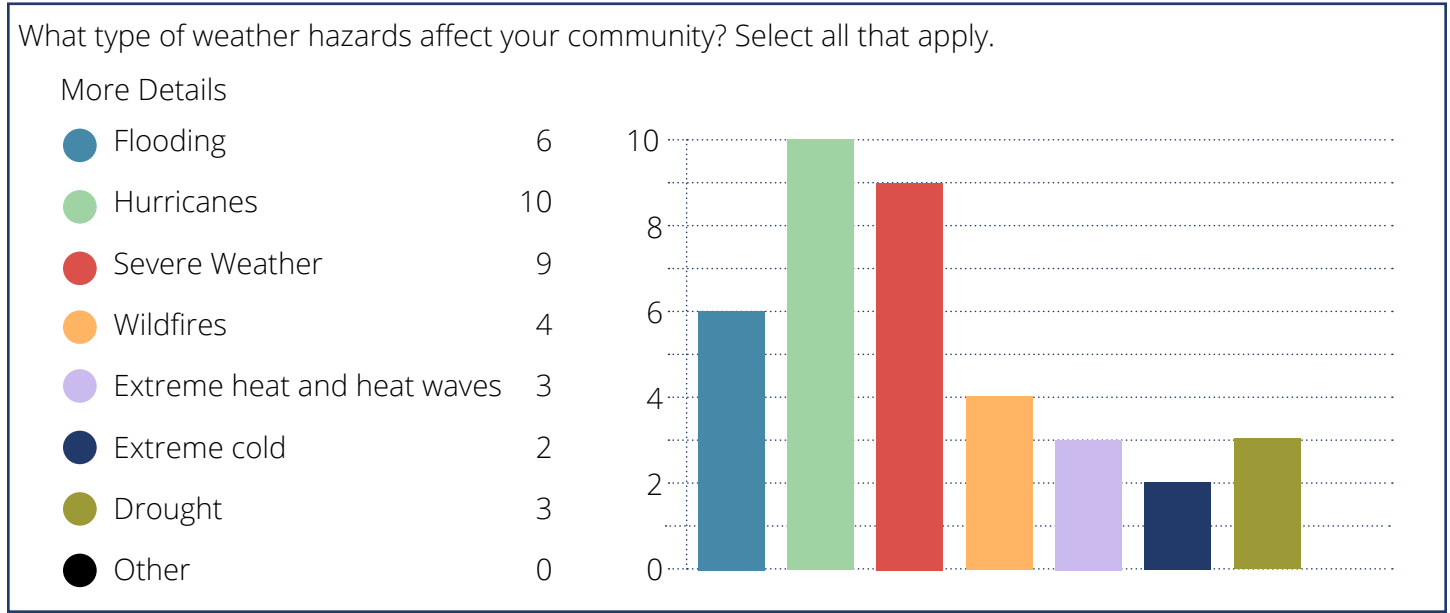
Figure 6. NOAA Sea Level Rise Projections - Holly Ridge



Additional Hazards

In a public online survey, community members answered the question, “What type of weather hazards affect your community? Select all that apply.” Most respondents indicated that hurricanes and tropical storms, and severe weather (thunderstorms, wind, lightning, tornadoes) were most frequent threats to Holly Ridge, however some answers also included flooding, wildfires, extreme heat/heat waves, extreme cold, and drought.

Figure 7. Community Survey Responses - Hazards



Tools such as Risk Factor,¹⁰ FEMA National Risk Index (NRI),¹¹ Climate Mapping for Resilience and Adaptation (CMRA)¹², and the Southeastern North Carolina Regional Hazard Mitigation Plan provide risk information for additional hazards that were not directly incorporated into the Vulnerability Assessment. These data sources help comprehensively assess Holly Ridge’s climate hazard Vulnerability Assessment. Information about exposure and future projections are detailed in the following sections for wind, extreme heat, drought, and wildfire.

¹⁰ [Risk Factor](#) (2024)

¹¹ [FEMA NRI](#)

¹² [Climate Mapping for Resilience and Adaptation](#) (2024)

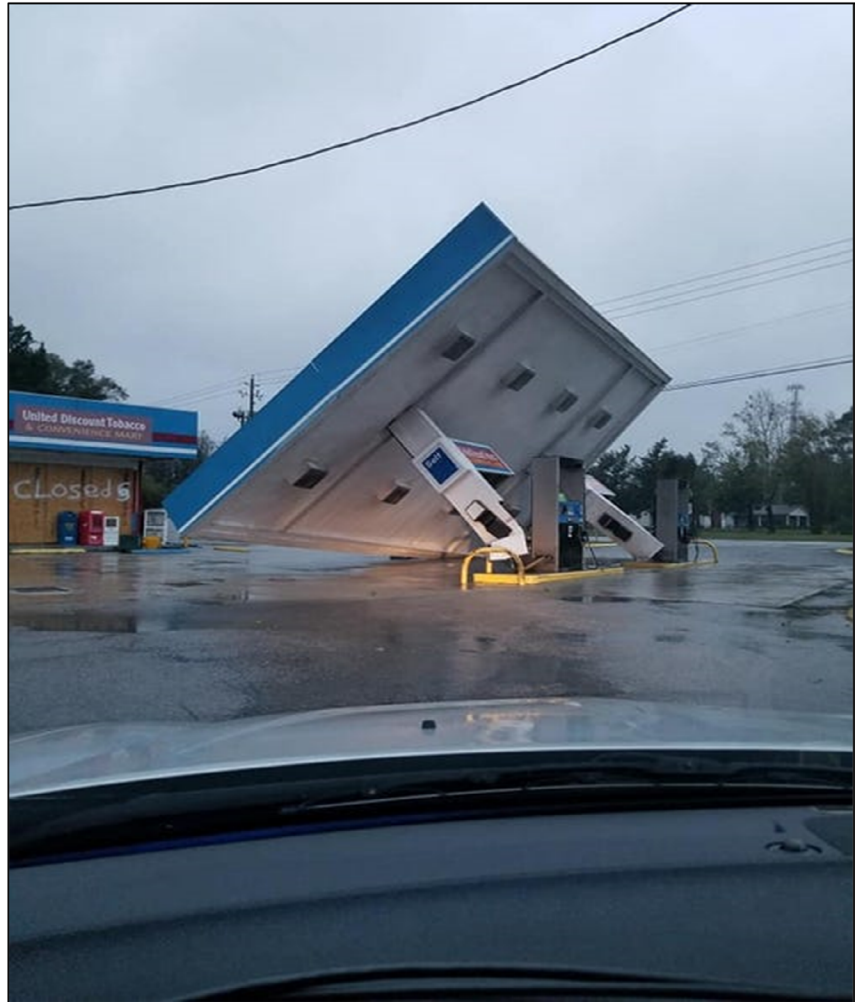
Wind



Risk Factor indicates that Holly Ridge has an extreme wind risk based on the projected likelihood

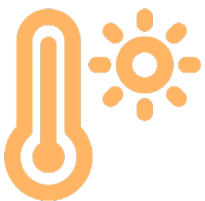
and speed of hurricane, tornado, or severe storm winds impacting the Town.¹² Hurricanes present the greatest risk of severe wind and average maximum wind speeds are higher now than they were 30 years ago. Wind can damage properties, knock down trees, bring down utility lines, and scatter debris. Strong wind gusts during Hurricane Florence brought down trees and downed the canopy of the United Discount Tobacco and Convenience Mart in Holly Ridge (**Figure 8**). Thunderstorms may also spur gusty wind conditions and tornadoes, which may occur without much notice. As of 2021, Holly Ridge does not have any documented thunderstorm-related wind events since 1956.¹³ It is highly likely that Holly Ridge will experience future wind events.

Figure 8.



Sept. 14, 2018: The canopy of United Discount Tobacco and Convenience Mart is blown down during Hurricane Florence, in Holly Ridge, N.C. [[The Florida Times-Union](#) via Holly Ridge Police Department, Facebook]

Heat



Extreme heat is responsible for the highest number of annual deaths among all weather-related hazards.¹⁴ Changes in daily high temperatures and humidity levels will have compound effects on heat indices and pose greater risk to vulnerable populations like older adults, children, and those with medical conditions. Risk Factor indicates that Holly Ridge and properties within Town have an extreme risk from heat due to the “feels like” temperatures increasing.¹⁵

¹² [Holly Ridge Wind Risk – Risk Factor](#)

¹³ [Southeast North Carolina Regional Hazard Mitigation Plan](#) (2021), 5:34

¹⁴ [Extreme Heat – Ready.gov](#)

¹⁵ [Holly Ridge Heat Risk – Risk Factor](#)

The FEMA National Risk Index (NRI) classifies the Holly Ridge census tract as having a Relatively High risk of heat waves.¹⁶ By mid-century under the higher emissions scenario, Holly Ridge is likely to experience about 94 days per year where temperatures are greater than 90°F, an increase of 49.5 days since 1976-2005.¹⁷ A heat wave is considered as a period of abnormally hot weather generally lasting more than three days and has the potential to impact a large geography.¹⁸ Impacts of extreme heat to infrastructure can deteriorate and buckle pavement, increase electricity usage and cause a strain on transmission capacity, and cause damage to crops. There have been at least 13 excessive heat events reported across southeastern North Carolina (including Holly Ridge) between 1996 and 2019, and future occurrences are **likely**.¹⁹

Drought



Drought is a normal occurrence throughout a climatic region and is a consequence of the reduction in precipitation over an extended period of time, generally a season or more in length.²⁰ Droughts are a slow-onset hazard that can be exacerbated by high temperatures, high winds, and low humidity – over time, drought can damage agriculture, water supply, recreational uses, and wildlife. In Southeastern North Carolina, the most intense period of drought occurred in December 2007. During this period, Onslow County was declared a disaster area due to losses of important crops like corn, soybeans, and hay and pasture.

The FEMA National Risk Index (NRI) classifies the Holly Ridge census tract as having Relatively Low risk of drought, however future drought occurrences are still likely. By mid-century under the higher emissions scenario, Holly Ridge is **likely** to experience 180 days per year with no precipitation, and a maximum of up to 13 consecutive dry days.²¹

16 [FEMA NRI – Heat Wave](#)

17 [Climate Mapping for Resilience and Adaptation – Extreme Heat \(Mid Century, Higher Emissions\)](#)

18 [NOAA National Weather Service – During a Heat Wave](#)

19 [Southeast North Carolina Regional Hazard Mitigation Plan](#) (2021), 2:15

20 [Southeast North Carolina Regional Hazard Mitigation Plan](#) (2021), 5:6

21 [Climate Mapping for Resilience and Adaptation – Drought \(Mid Century, Higher Emissions\)](#)

Wildfire



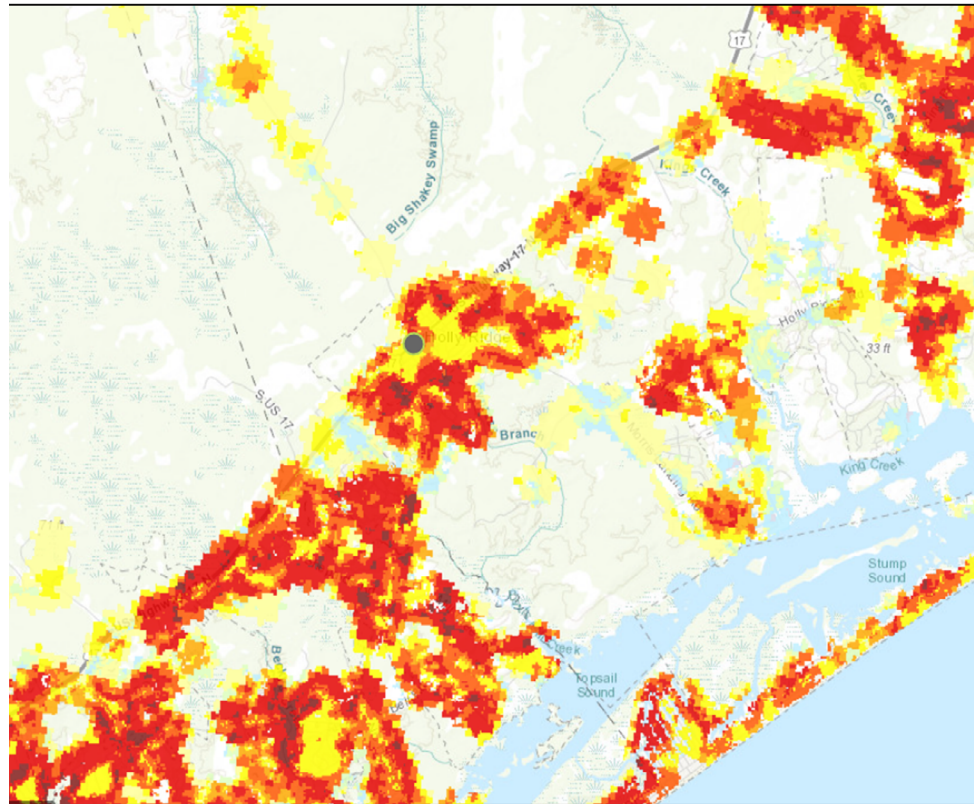
A wildfire is generally any outdoor fire (i.e., forest, grassland, brushland)

that is not under control, supervised, or managed under a prescribed burn.²² Wildfires are often a useful forest ecosystem management option, however negligent human behavior is responsible for more than 98% of wildfires in North Carolina. Dependent on local weather conditions, outdoor activities like campfires, construction, and other natural hazards are likely to produce fuel and may increase the probability

of wildfires occurring. Drought conditions may make fire more likely in those areas and high winds may increase the risk of fire spreading. Individual homes, cabins, recreational areas, and industries are located within high wildfire hazard areas and an increasing demand for outdoor recreation may put people who are unprepared in areas where wildfires are more likely to occur.

From 2001 to 2018, there have been 6 wildfire incidents recorded for Holly Ridge with a total of 16 acres burned.²³ The FEMA National Risk Index (NRI) classifies the census tract within Holly Ridge as having Relatively High risk of Wildfire.²⁴ Risk Factor indicates the Town has an overall moderate risk of wildfire and there are approximately 3,106 properties in Holly Ridge that have some risk of being affected by wildfire over the next 30 years.²⁵ It is **likely** that wildfire events will occur in the future, and the frequency may increase during drought and abnormally dry conditions.

Figure 9. FEMA NRI - Wildfire A



The Wildland Urban Interface (WUI) Risk Index is a rating of the potential impact of a wildfire on people and their homes. Darker red indicates major impacts and yellow indicate moderate impacts ([SGSF Wildfire Risk Assessment Portal](#))

22 [Southeast North Carolina Regional Hazard Mitigation Plan](#) (2021), 5:66

23 [Southeast North Carolina Regional Hazard Mitigation Plan](#) (2021), 5:74

24 [FEMA NRI - Wildfire](#)

25 [Holly Ridge Fire Risk - Risk Factor](#)

Vulnerability

Critical Built Assets

Critical built assets were assigned a vulnerability score Exposure, Sensitivity, and Adaptive Capacity to calculate the Overall Vulnerability of an asset. This is a simple additive model (**Exposure + Sensitivity – Adaptive Capacity = Overall Vulnerability**) combining the scores into a single Overall Vulnerability score.

Exposure

Critical built assets were scored 0-3 for exposure to the 100-year and 500-year flood zone and validated flood extents from Hurricane Matthew and Hurricane Florence. A score of 3 represents the highest level of exposure to flooding, while a score of 0 represents the lowest level of exposure to flooding.

Sensitivity

A sensitivity score evaluated the degree to which an asset is potentially affected when exposed to a hazard. The Project Team determined scoring (1-3) based on the categories of asset types and their criticality to remain functioning before, during, and after a hazard to serve the community. A score of 3 represents the most sensitive types of assets that are most critical to remain functioning to serve the community, while a score of 1 represents lesser sensitive types of assets that are still critical to the community but less so to remain functioning for health and safety during a hazard.

Adaptive Capacity

The ability of an asset to adjust to potential impact is based on differences in location, structure design, and cost to repair. Adaptive capacity scores an asset 1-3 based on the ability of that asset to adjust to the impacts from a hazard with little disruption or cost. The Project Team also considered structural integrity of the critical built assets when assigning a score for adaptive capacity. A score of 3 represents the greatest level of adaptive capacity, meaning an asset may already have components that increase its resilience to hazards, while a score of 1 represents a lesser level of adaptive capacity, meaning the asset will likely need modification to make it more resilient.

Vulnerability Matrix

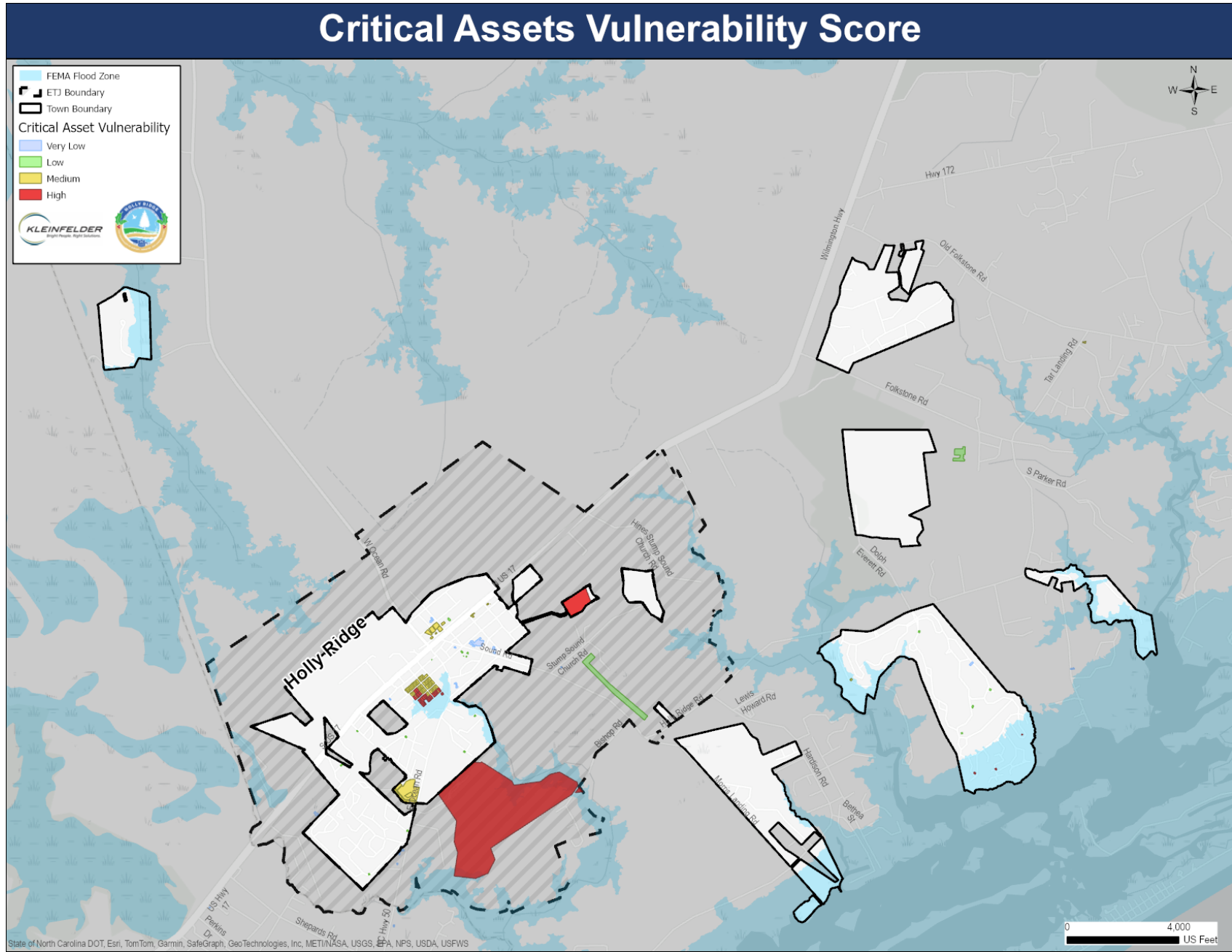
The Vulnerability Matrix (**Table 7**) details how built assets were assigned a score. Each building on a given parcel was scored independently to determine a more accurate vulnerability to flooding. Using the Vulnerability Equation (Exposure + Sensitivity – Adaptive Capacity), each critical built asset in Holly Ridge received a score ranging from -2 (Very Low) to 4 (High) for Overall Vulnerability.

Table 7. Vulnerability Matrix

Year	Exposure + (Flood)	Sensitivity + (Asset Type)	Adaptive Capacity - (Adjust to Impact)	Overall Vulnerability
3	100-year and 500-year flood zone	<ul style="list-style-type: none"> • Health Service • Provision • Public Safety • Emergency Shelter 	Adjust to impacts with little disruption or cost (greatest structural integrity)	3-4 (High)
2	Outside FEMA 100-year and 500-year flood zone; within Hurricane Matthew and/or Hurricane Florence flood extent	<ul style="list-style-type: none"> • Community Government Service Office • Lift Station • Water/Sewer • Generator • Mobile Home Park • Transportation 	Adjust to impacts with some disruption or cost (moderate structural integrity)	1-2 (Medium)
1	500-year flood zone	<ul style="list-style-type: none"> • Place of Worship • Historic/Cultural • Day Care • Economic 	Adjust to impacts with greatest disruption or cost (least structural integrity)	0 (Low)
0	No FEMA flood zone or Hurricane flood extent			<0 (Very Low)

Figure 11 displays the Overall Vulnerability score for all built assets identified as critical to the Town overlaid with the FEMA 100-year and 500-year flood zones.

Figure 11. Critical Built Asset Overall Vulnerability



Full Critical Asset List in the **Appendix** describes all critical built assets, locations, hazard exposure, and their given vulnerability scores.

The assets scoring High Overall Vulnerability are described in **Table 8**.

Table 8. High Vulnerability Critical Built Assets

Asset Name	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Dyson St (Mobile Home Park)	3	2	1	4 (High)
Mill Creek (Mobile Home Park)*	3	2	1	4 (High)
Batts Rd (Mobile Home Park)*	3	2	1	4 (High)
Roland Ave (Mobile Home Park)*	3	2	1	4 (High)
Holly Ridge Wastewater Treatment Plant	2	2	1	3 (High)
Jenkins (Lift Station)	3	2	2	3 (High)
Summerhouse4 (Lift Station)	3	2	2	3 (High)
Summerhouse5 (Lift Station)	3	2	2	3 (High)
Lake Willow Way (Lift Station)	3	2	2	3 (High)

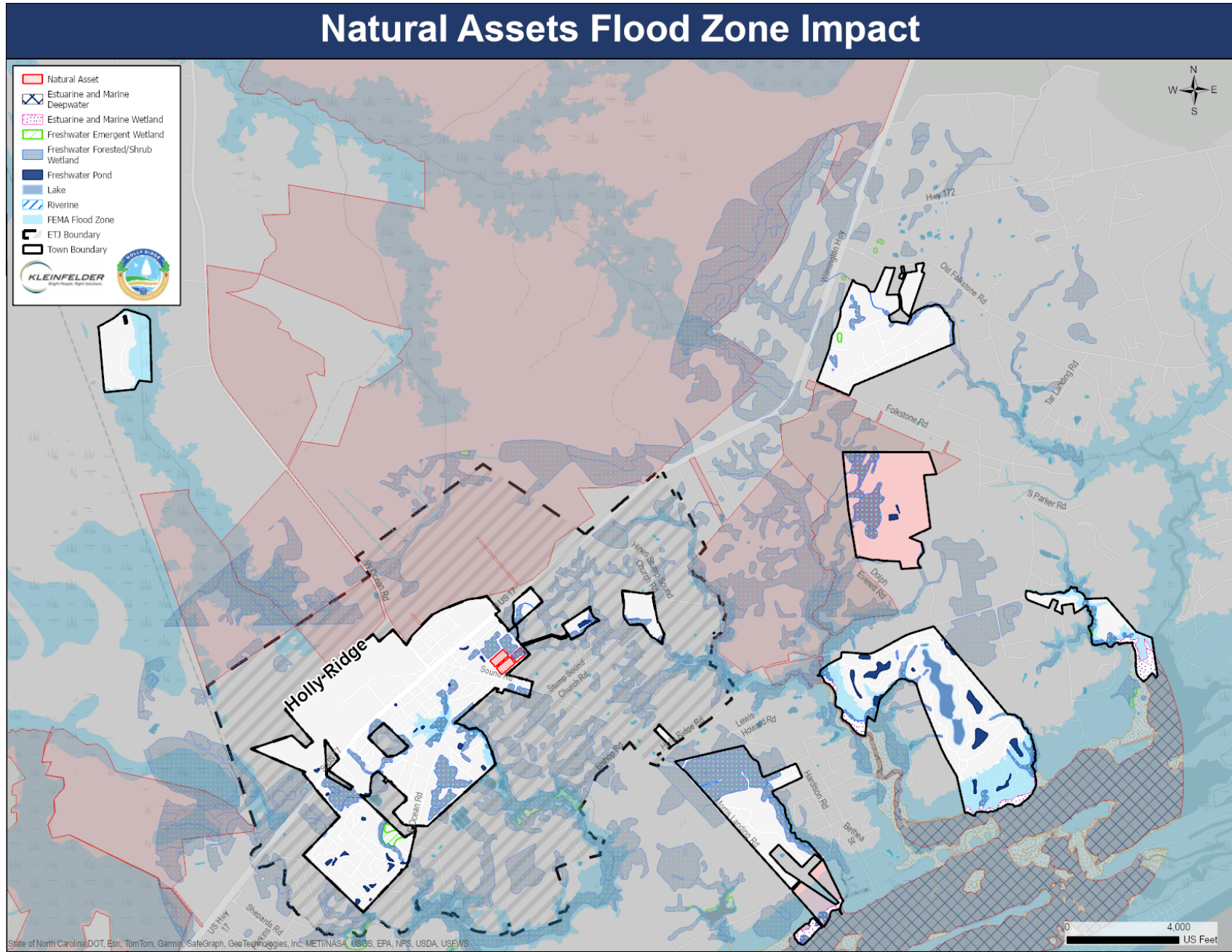
*Assets are outside of Holly Ridge jurisdiction but within project buffer area.

Critical Natural Assets

To understand the vulnerability of natural assets within Holly Ridge, the Project Team analyzed the percentage of the asset parcel that intersected the FEMA 100-year or 500-year flood zone. Existing natural assets in Holly Ridge include open space, parks, preserves, game land, and Stump Sound. Evaluating the vulnerability of natural ecosystems requires complex models that consider multiple factors which affect an ecosystem’s ability to adapt to changing conditions. This assessment aims to evaluate the vulnerability of natural infrastructure by estimating the percentage of land that may be exposed to flooding. **Figure 12** details the percentage of each natural asset exposed to the 100-year or 500-year flood zone and **Table 8** describes the name of the asset and its relative location (property address).

This information is useful to understand potential locations to site stormwater best management practices, such as rain gardens, enhanced wetlands, or other natural features that can mitigate the effects of precipitation and flooding. Green spaces and natural infrastructure provide ecosystem services and can provide valuable opportunities for resiliency strategies to mitigate risk.

Figure 12. Natural Asset Flood Vulnerability



Some natural assets are outside of the Town’s jurisdictional boundaries however they are included for reference. The CAT noted that many community members utilize the natural areas outside of Holly Ridge for recreation. Due to the piecemeal nature of Holly Ridge’s jurisdiction, natural assets close to town boundaries were captured in this assessment.

Table 8. Natural Asset Flood Zone Impact

Asset Name/ Owner	Property Address	Flood Zone	Flood Zone Percent Coverage
Morris Landing Preserve	Hardison Rd	100-Year	84%
NC Land & Water Fund Project	Folkstone Rd	100-Year	14%
Stones Creek Game Land / Nature Preserve	Folkstone Rd	100-Year	9%
Onslow Water & Sewer Authority	NC Highway 50	100-Year	25%
Onslow Water & Sewer Authority	NC Highway 50	100-Year	55%
Sages Ridge Preserve	US Highway 17 N	100-Year	21%
Holly Shelter Game Land	US Highway 17 N	100-Year	93%
Camp Lejeune	US Highway 17	100-Year	15%

Evacuation Route & Roadway Vulnerability

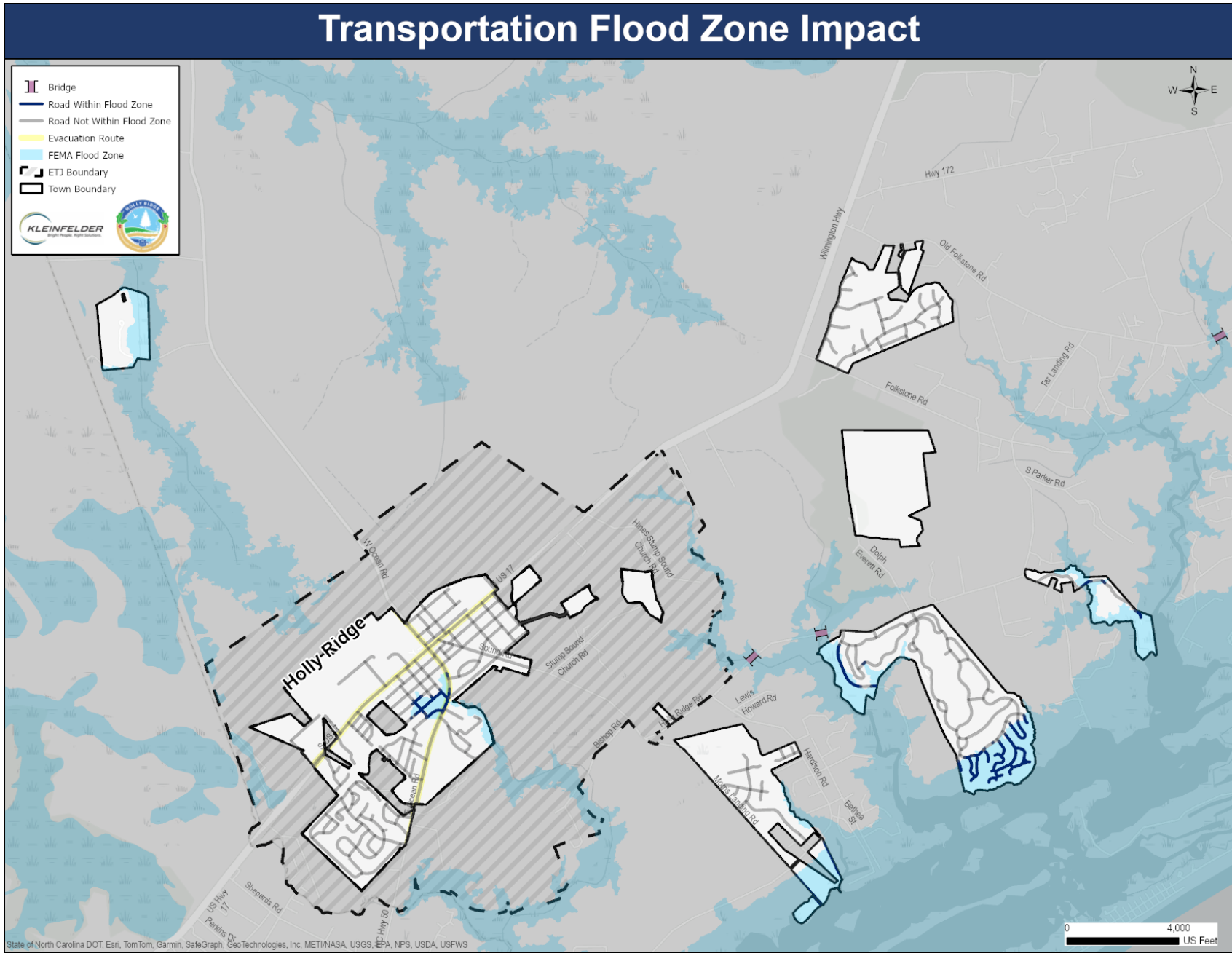


Holly Ridge has two evacuation routes through the center of Town – US Highway 17 that runs south- north, and NC Highway 50 that runs east- west. NC Highway 50 is particularly important for evacuating people off of Topsail Island (particularly from Surf City and Topsail Beach) across Stump Sound in the event of an emergency, as there are only two bridges on and off Topsail Island. To understand areas of potentially vulnerable roadway, the Project Team analyzed the intersection of the FEMA 100-year and 500-year flood zone and roads within Holly Ridge. **Figure 13** distinguishes roads within the flood zone in blue and the evacuation routes (US Highway 17 and NC Highway 50) in yellow.

A portion of NC Highway 50 between N. Smith St. and S. Smith St. is within the floodplain, which may pose challenges in the event of severe weather and associated flooding. A community member survey response also noted a concern about safety and transportation if flooding were to impact the two roads – Hardison Rd. and Morris Landing Rd. – leading into the Preserve at Morris Landing neighborhood. Neighborhood roads in the Summerhouse development are also within the flood zone, which could pose an additional risk during

severe weather events. North Carolina Department of Transportation (NCDOT) is actively working on projects to increase transportation resiliency in the region, such as ongoing work on I-40 (due to its classification as an evacuation route) and assisting Pender County with NC Highway 210 hurricane evacuation route resiliency. The NCDOT Climate Strategy Report (2023) highlights resilience projects that NCDOT is working on that implement strategies identified in the North Carolina Climate Risk Assessment and Resilience Plan (2020). A statewide Resilience Improvement Plan (RIP) is also undergoing development to identify areas of concern due to exposure to natural threats and to develop a criticality map to identify the criticality of the state's highway network. NCDOT also owns a majority of the roads and canals/ditches that border those sections in Holly Ridge, meaning Holly Ridge does not have direct control to address issues arising on these sections. However, NCDOT actively seeks to collaborate with towns and their respective NCDOT divisions to identify projects to include on the State Transportation Improvement Plan (STIP), which prioritizes projects for allocation of state funding.

Figure 13. Transportation System Flood Vulnerability



Water and Sewer System Vulnerability

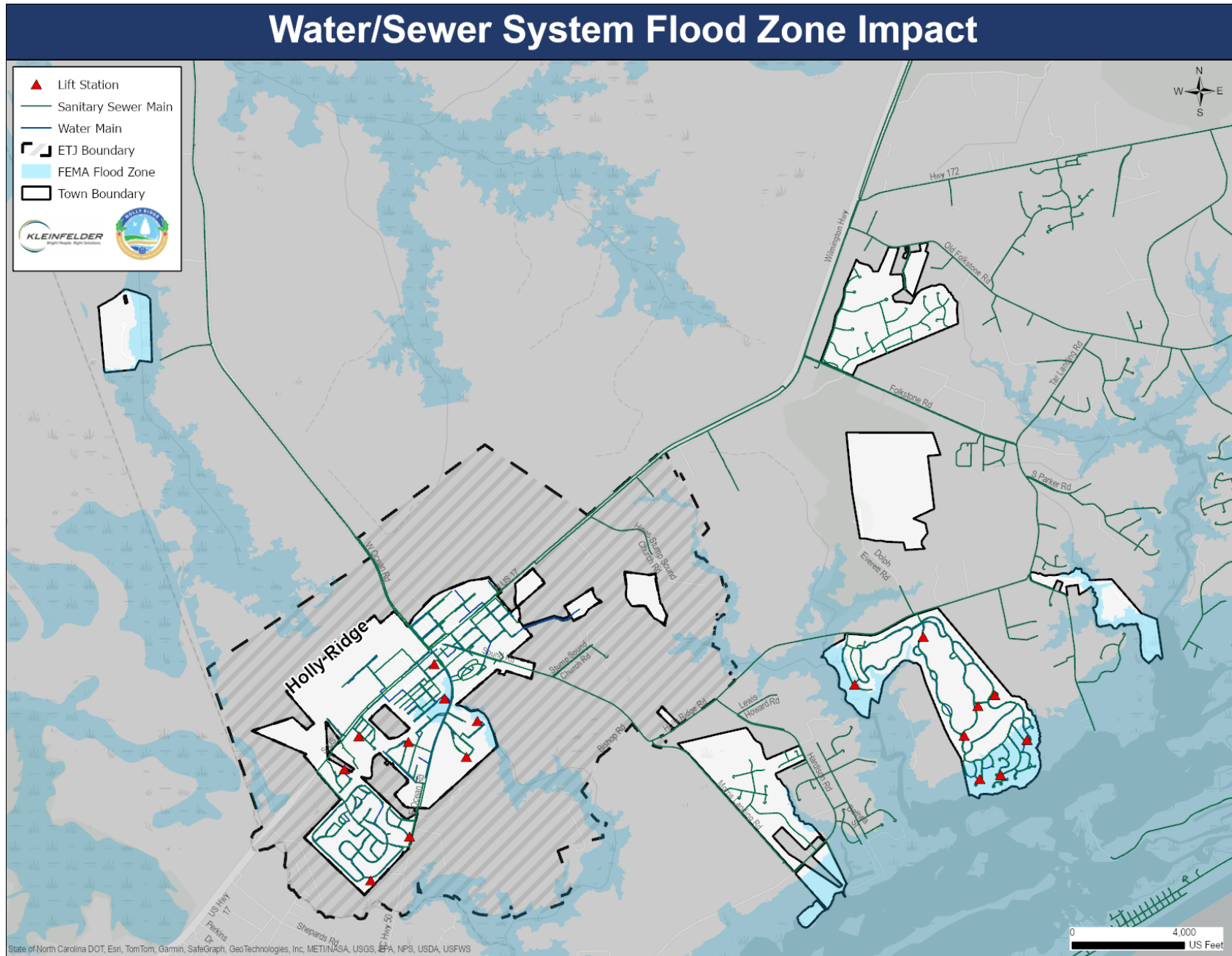


The water, stormwater, and sewer system can be particularly vulnerable to hazards like flooding. Onslow Water and Sewer Authority (ONWASA) supplies the Town of Holly Ridge with water service, acquiring the Town's water and sewer facilities in 2005. Drinking water for Holly Ridge residents is sourced from various groundwater wells in the area. Wastewater flow is treated at two different wastewater treatment plants (WWTP) – Holly Ridge WWTP and Summerhouse WWTP. Stormwater inlets and pump/lift stations are at or above ground infrastructure potentially susceptible to floodwaters. Lift stations

and wastewater treatment plants were included as critical built infrastructure and given a vulnerability score.

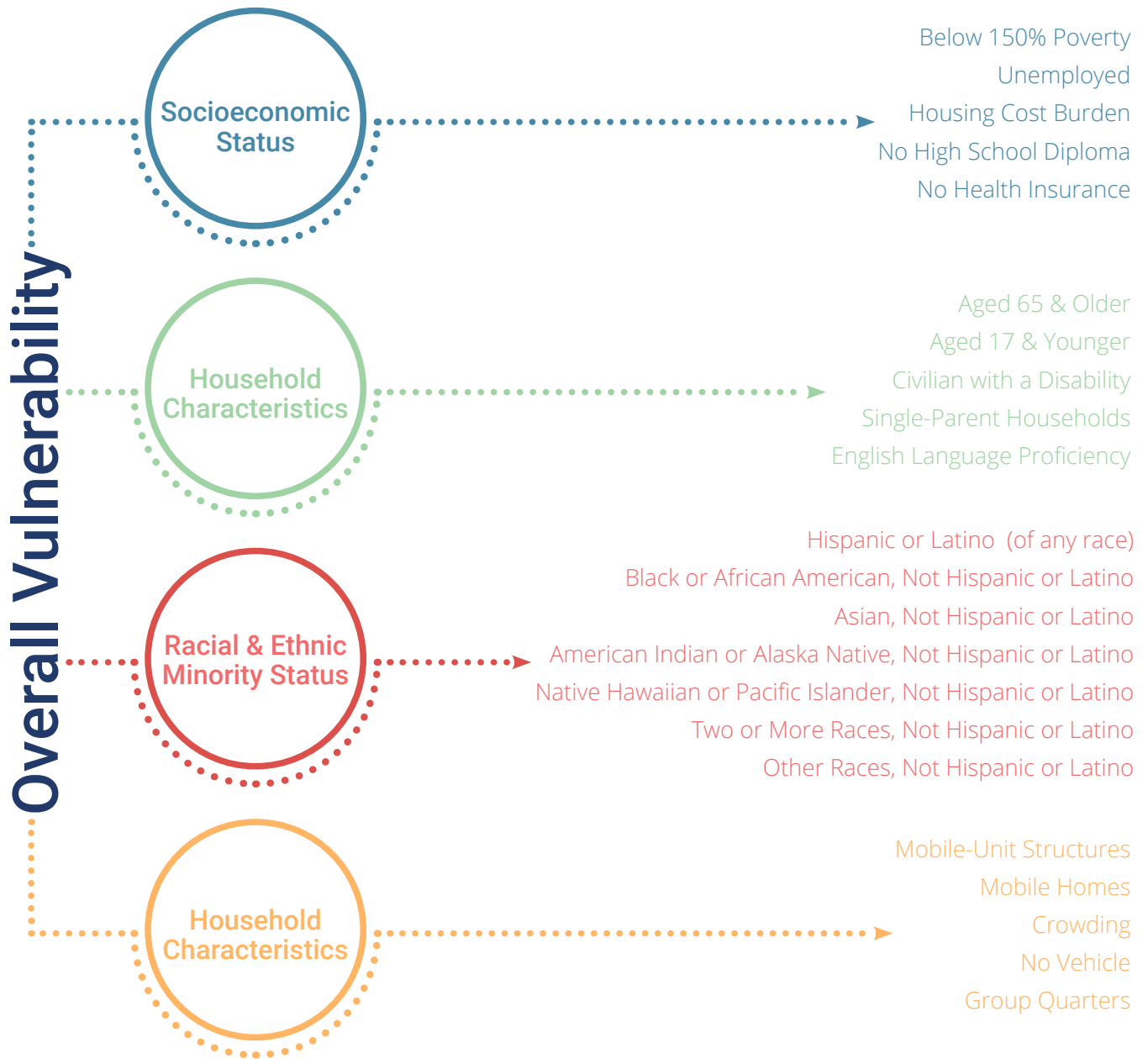
Figure 14 describes the water and sewer system in relation to the FEMA 100-year and 500-year flood zone.

Figure 14. Water & Sewer Flood Vulnerability



Social Vulnerability

Socially vulnerable people are often those who can be impacted “first and worst” by climate hazards given a variety of social factors. The degree to which a community exhibits certain social conditions may affect that community’s ability to prevent human suffering and financial loss in the event of a disaster.²⁶ The Center for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry Social Vulnerability Index (SVI) uses U.S. Census data to determine the social vulnerability of census tracts based on 16 social factors, grouped into four themes.



26 [CDC/ATSDR Social Vulnerability Index \(2020\)](#)

Figure 15 below depicts the overall social vulnerability score, using data downloaded from the CDC/ATSDR SVI tool, for the census tract within Holly Ridge (tract 37133000401). Yellow indicates low social vulnerability.

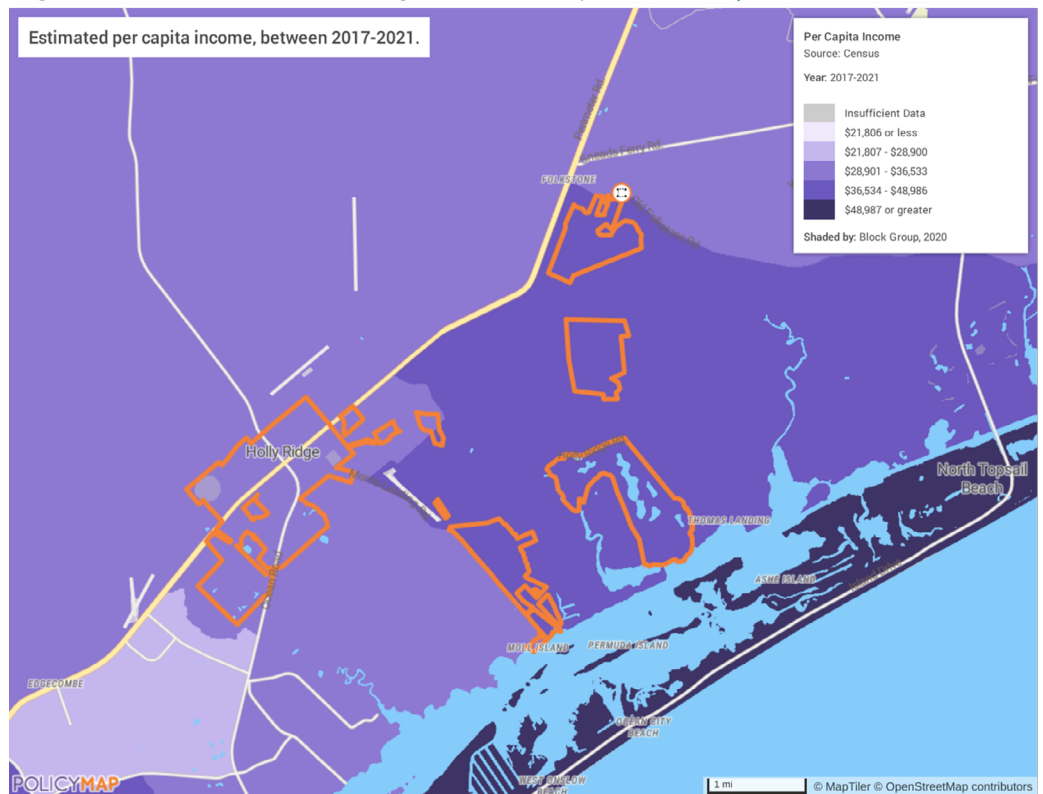
The 2022 American Community Survey 5-year estimates Holly Ridge’s total population at 4,236, up from 3,888 in 2021, and much greater than the 2010 estimate of 667. Holly Ridge Town staff believe a more accurate population estimate for 2024 is actually closer to 6,000. **Table 10** details Census data often used to determine social vulnerability.

Table 10. Demographic Information for Holly Ridge, NC

Indicator	Estimate	Percent (of total population)
Total Population (2022)	4,236	-
Below age 17	740	17%
Above age 65	469	11%
Speak language other than English	325	8%
With a disability	294	8%
Below poverty level (past 12 months)	76	2%

Figure 16. Estimated Per Capita Income (2017-2021)

An additional social vulnerability tool created by the U.S. Council on Environmental Quality is the Climate and Economic Justice Screening Tool (CEJST). This tool supports the Justice40 Initiative, a Federal government goal of ensuring 40% of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution.²⁷



The CEJST highlights disadvantaged census tracts using datasets as indicators of burdens. A community is considered disadvantaged if a census tract is 1) at or above the threshold for one or more environmental, climate, or other burdens, and 2) at or above the threshold for an associated socioeconomic burden. In addition, a census tract that is completely surrounded by disadvantaged communities and is at or above the 50% percentile for low income is also considered disadvantaged.²⁸ Categories of burdens include:

1. Climate Change
2. Energy
3. Health
4. Housing
5. Legacy Pollution
6. Transportation
7. Water and Wastewater
8. Workforce Development

CEJST is an indicator tool that municipalities can use in grant applications to demonstrate they are overburdened and underserved. Despite variations in indicators like estimated per capita income within the town, Holly Ridge is not classified as a disadvantaged census tract according to CEJST data. **Figure 16** depicts distinctions in estimated per capita income for areas within Holly Ridge, which may be useful when describing potentially vulnerable groups at a scale smaller than block groups.

²⁷ [Justice40 Initiative](#) (2022)

²⁸ [Climate and Economic Justice Screening Tool](#) (2024)

Risk

Understanding the financial loss communities experience when hazards occur is critical in determining what level(s) of risk call for immediate action. Risk is defined as the overall potential for negative consequences. The Southeastern North Carolina Hazard Mitigation Plan (2021) provides approximate numbers of parcels and the value of buildings exposed to 100-year and 500-year flood zones (**Table 11**).

Table 11. Estimated Exposure of Parcels to the Flooding Hazard

100 Year (1% Annual Chance) Flood Zone				500 Year (0.2% Annual Chance) Flood Zone		
Location	Approx. Number of Parcels	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings	Approx. Improved Value of Buildings	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings
Holly Ridge	163	13	\$3,468,300	417	67	\$10,307,270

Southeastern NC Hazard Mitigation Plan, 2021

The FEMA National Risk Index (NRI) provides information at the census-tract level for Expected Annual Loss (EAL), which represents the average economic loss in dollars resulting from natural hazards each year.²⁹ This value is calculated through a multiplicative equation that includes exposure to a natural hazard, the annualized frequency of the hazard, and the historic loss ratio of a hazard (FEMA NRI, 2024).

Table 12 describes the Expected Annual Loss for relevant potential hazards across the census tract within Holly Ridge.

Table 12. Expected Annual Loss Estimates by Hazard

Census Tract	Riverine Flooding	Hurricane	Wildfire	Tornado	Strong Wind	Heat Wave	Drought	Coastal Flooding
37133000401	\$106,009	\$10,903,898	\$529,051	\$279,023	\$16,645	\$94,437	\$2,764	\$1,426

Risk and Vulnerability Assessment Conclusions

Key Findings

- Critical assets exposed to flooding in and near Holly Ridge include the Holly Ridge Wastewater Treatment Plant, mobile home parks, and lift stations.
- Approximately 163 parcels are located in the 100-year flood zone with a total improved value of \$3.5 million, which are at a greater risk of flooding and damage.
- Minimal portions of roadways through the middle of town are currently within the FEMA 100-year and 500-year flood zones, notably an evacuation route, and flood events may impede mobility during severe weather events.

²⁹ FEMA Expected Annual Loss (2024)

- As development increases, stormwater will need to be comprehensively managed to ensure there is no further risk to critical built and natural assets and neighborhoods within Town.
- Extreme heat events and heat waves are likely to increase over the next decades and vulnerable populations such as older adults, children, and people with medical conditions will likely be at greater risk of negative impacts.
- Holly Ridge is generally considered to have low social vulnerability.

Implications

The final vulnerability scores serve as guidance to developing the Project Portfolio, where Holly Ridge identified solutions to challenges highlighted through the Assessment, in previous planning documents, and through discussions with the CAT and community. By applying a vulnerability score for critical assets, the Town can better understand where to direct efforts first as capacity and funding allows.

Considerations for Future Assessments

This assessment may serve as a starting point for future analyses and research efforts. Key areas to consider in future work include:

- Hazard Projections – consider how future projections for climate hazards such as extreme heat, precipitation, and drought can be integrated into the vulnerability and risk equation.
- Natural Infrastructure – incorporate ecosystem modeling to understand the impact of hazards to ecosystem services such as diminishing water quality, damaging forests, and impacting agricultural yield.
- Building Characteristics – specific building characteristics such as base floor elevation (BFE), construction year, foundation type, and other site-specific information can be incorporated into the Vulnerability Assessment to supplement adaptive capacity determinations.
- Rainfall Analysis – conduct H&H modeling of precipitation-driven flooding that considers varying intensities, durations, and return frequencies to understand localized future exposure to critical infrastructure.
- Social Vulnerability – consider how to capture socially vulnerable populations at a scale smaller than the census-tract level to more accurately account for differences across the community.

An aerial photograph of a road winding through a dense forest, overlaid with a semi-transparent teal filter. The road is a light color, contrasting with the dark green of the trees. The text 'PROJECT PORTFOLIO' is positioned in the lower right quadrant, with a vertical white line to its left.

**PROJECT
PORTFOLIO**

Project Portfolio

Utilizing feedback from the CAT, existing planning documents, and results of the Risk and Vulnerability Assessment, a long list of potential solutions to address hazards was developed over the course of the RCCP. This project list was then refined through iterative working sessions with the CAT and a prioritization methodology was applied to determine the final five highest priority projects to include in the Project Portfolio..

Projects identified include both structural and non-structural mitigation techniques that have co-benefits beyond hazard resiliency. Project prioritization was first performed by the CAT, where the group was asked during a meeting to rank their preferences for projects under four categories of solutions: infrastructure, nature-based, policy-based, and outreach/education. Following this meeting, Kleinfelder applied components of the [STAPLEE method](#) to top ranking projects, taking into account attributes of cost-benefit, internal capacity, RCCP goal alignment, and identification of a project sponsor/champion. Community members then contributed their feedback at the Holly Ridge Bee Festival and through the online Public Survey #2.

Full Project List in the **Appendix** details the projects that were identified throughout the process but were not selected for inclusion.

Each Project Profile provides information intended to support development of applications for funding opportunities. The Proposed Project Summary (**Table 13**) highlights the top five project priorities included in the Portfolio.

Table 13. Proposed Project Summary

Project	Description	Estimated Cost	Needs Addressed	Source
Emergency Operations Center Feasibility Study	Conduct a feasibility study for constructing a new building that would serve as a municipal complex encompassing the Town Hall, Police Department, newly established municipal fire department and double as the local Emergency Operations Center. The building will be built and rated for up to a Category 5 hurricane and elevated above future projected floodplain, considering NC Department of Administration’s (NCDOA) updated design and construction requirements for resiliency for public buildings and structures (as appropriate ³⁰).	\$150,000	Internal Capacity, Communication, Emergency, Preparedness	CAT
Stormwater Master Plan	Inventory existing municipality stormwater resources, conduct gap analysis of needs and current shortfalls, and planning/prioritization of future actions to address those needs (i.e., water quality, maintenance tracking, flood mitigation or floodproofing, public messaging, etc.)	\$100,000	Stormwater Management, Flooding	CAT / Holly Ridge Comprehensive Land Use Plan (2020)
Multi-Use Greenway Connection Feasibility Study	Conduct a feasibility study for designing a multi-use path/sidewalk from Holly Ridge Town Hall on N Dyson St along Ocean Rd/Hwy 50 towards Surf City. Consider feasibility of tying in to proposed Pender County portion of the East Coast Greenway Corridor. Sidewalk would include green stormwater infrastructure where suitable/feasible.	\$100,000 - \$150,000	Accessibility/Mobility, Stormwater Management, Extreme Heat	CAT

30 [NC Department of Administration Releases New Policy for State-Owned Property Development in Flood-Prone Areas to Increase Climate Resiliency](#) | NC DOA

Project	Description	Estimated Cost	Needs Addressed	Source
Green Infrastructure Suitability Analysis	<p>Perform a suitability analysis to identify parcels that are good locations for projects such as natural features, green infrastructure, or other stormwater best management practices (e.g., constructed wetlands, rain gardens, etc.), and environmental practices (e.g., community gardens, green space, increased tree canopy, etc.). Parcels within and around town will be assessed on factors like land cover, soil type, heat risk, flood risk, and other environmental factors, and conceptual design for the final select sites will be completed.</p> <p>Consider developing a partnership with the Town’s Busy Bee Committee, NC Sea Grant, and NC Coastal Federation to carry out elements of this project. The lot next to the Holly Ridge Town Hall on N Dyson St. was identified as a potential site.</p>	\$50,000 - \$150,000	Stormwater Management, Extreme Heat, Education	CAT / Stump Sound Watershed Restoration and Protection Plan (2023)
Stormwater Education & Outreach Campaign	<p>Collaborate with entities such as NC Sea Grant, NCSU Cooperative Extension, NC Coastal Federation, NC National Estuarine Research Reserve and NC Coastal Reserve, etc. to conduct a public education and outreach campaign regarding community floodplain management activities, flood insurance policies, disaster assistance in Special Flood Hazard Areas, and other site-scale ways to mitigate flooding. Outreach should also include information and resources for property owners related to ditch/ canal maintenance and options for native landscaping. This is also considered a creditable FEMA Community Rating System (CRS) activity. Consider engaging HOAs about stormwater best management practices within neighborhoods.</p>	\$35,000 - \$45,000	Stormwater Management, Education	CAT / Stump Sound Watershed Restoration and Protection Plan (2023)

30 [NC Department of Administration Releases New Policy for State-Owned Property Development in Flood-Prone Areas to Increase Climate Resiliency | NC DOA](#)

Project A.

Emergency Operations Center Feasibility Study

Project Description

The Town seeks to establish an emergency operations center (EOC) for southwestern Onslow County in Holly Ridge, to be located in a new Town municipal complex proposed at a location outside of the FEMA regulated flood zone. A feasibility study will determine scoping requirements and site suitability. Additional design, permitting, and construction are to follow. The project requires coordination with Onslow County, which is the primary entity responsible for emergency operations for the county.

Location	To be determined by feasibility study findings
Source	CAT/ Town Staff
Scoping Questions	<ul style="list-style-type: none"> • Is this project identified in a Capital Improvement Plan (CIP)? • Has Onslow County considered an alternative emergency operations center (EOC) site near Holly Ridge?
Hazard(s) Addressed by the Project	<ul style="list-style-type: none"> • Infrastructure deficiency/capacity • All Hazards: Provide emergency operational continuity during hazard events
Supporting Function	<ul style="list-style-type: none"> • Communication • Emergency preparedness • Town capacity
Type of Solution	Infrastructure improvements
Project Estimated Timeline	Feasibility study (Phase 1): 1 year <ul style="list-style-type: none"> • In future phases: • Site identification / design / permitting (Phase 2): 24-30 months; • Construction (Phase 3): 18-24 months • 4 – 5 years to complete Phases 1-3
Responsible Entity	<ul style="list-style-type: none"> • Town of Holly Ridge • Onslow County Emergency Management/EMS
Potential Partners	Onslow County Emergency Management/EMS
Existing Funding	None identified by CAT

Potential Funding Sources	<ul style="list-style-type: none"> ● Resilient Coastal Communities Program ● NC Emergency Management, Division of Emergency Management Capacity Building Competitive Grant ● Town CIP ● Onslow County CIP ● Golden Leaf ● Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) [implementation]
Project Estimated Cost	<ul style="list-style-type: none"> ● Phase 1 Feasibility Study & Site Identification - \$150,000 ● Phase 2 Design & Permitting - \$500,000 - \$1M ● Phase 3 Construction - \$10M - \$50M
Anticipated Benefit	<p>High</p> <p>The building would house multiple municipal services, reduce reliance on county support, increase local emergency capacity, etc.</p>
Priority Rating	<p>CAT: 1st / 3rd Public: 3.5/5.0 Overall: High</p>

Project B.

Stormwater Master Plan

Project Description

Inventory existing municipality stormwater resources, conduct gap analysis of needs and current shortfalls, and planning/prioritization of future actions to address those needs (i.e., water quality, maintenance tracking, flood mitigation or floodproofing, public messaging, etc.)

Location	Town-wide
Source	Holly Ridge Comprehensive Land Use Plan (recommended action 3.1.D.2) / CAT
Scoping Questions	<ul style="list-style-type: none"> • What is the current status of the stormwater program? • What are the major stormwater-related issues facing the Town and residents? • What is the Town hoping to obtain through a stormwater master plan?
Hazard(s) Addressed by the Project	<ul style="list-style-type: none"> • Stormwater runoff • Flooding • Heavy rainfall
Supporting Function	<ul style="list-style-type: none"> • Public buy-in • Public input: determine what issues are most important • Funding
Type of Solution	<ul style="list-style-type: none"> • Infrastructure • Plans and policies • Ordinances • Non-regulatory programs • Capital improvement programs • Permitting programs
Project Estimated Timeline	1+ year
Responsible Entity	Town of Holly Ridge with consultant
Potential Partners	<ul style="list-style-type: none"> • Neighboring communities • NC Coastal Federation • NC Sea Grant
Existing Funding	None identified by CAT

Potential Funding Sources	<ul style="list-style-type: none"> ● Resilient Coastal Communities Program ● NCDEQ Local Assistance for Stormwater Infrastructure Investments Program (LASII) for planning and/or Stormwater Utilities ● Other Federal and state grants (EPA, FEMA, NRCS) ● Local tax base
Project Estimated Cost	\$100,000 - \$1M+ depending on scope and project focus; may be phased to span multiple years / focuses to fit within budgetary restrictions
Anticipated Benefit	<p>High</p> <p>With no plan in place for improvements, issues can only be addressed on a case-by-case basis, limiting community impact. A stormwater master plan can provide short and long-term planning for maximum benefit.</p>
Priority Rating	CAT: 2nd / 8th Public: 3.4 / 5.0 Overall: High

Project C.

Multi-Use Greenway Connection Feasibility Study

Project Description

Conduct a feasibility study for designing a multi-use path/sidewalk from Holly Ridge Town Hall on N Dyson St along Ocean Rd/NC-50 towards Surf City, NC. The approximate length of the multi-use path varies based on the proposed start and end points.

The multi-use path will provide a critical connection between socially vulnerable populated neighborhoods and grocery stores, jobs, recreation opportunities, and other local amenities. The multi-use path will incorporate bioswales and green stormwater infrastructure where possible.

Consider tying the study into the proposed Pender County portion of the East Coast Greenway Corridor.

Location	Proposed segments are from Town Hall (N Dyson St), south along NC-50 to the Onslow-Pender County line, and beyond to the intersection of Highway 210; and from Town Hall along Sound Rd south to Morris Landing, NC. See image below.
Source	CAT
Scoping Questions	<ul style="list-style-type: none"> • What preliminary scoping has already been done for this project? • Will the cross section for the path fit within the available ROW and if not, can sufficient ROW be acquired to support the project and meet its intent? • Can the roadway cross section be modified in addition to adding the multi-use pathway to decrease speeding behavior? • Can this multi-use corridor serve alternative community needs such as serving as a utility corridor for future needs (electricity capacity, data conduits, etc.)?
Hazard(s) Addressed by the Project	<ul style="list-style-type: none"> • Stormwater • Flooding • Extreme heat
Supporting Function	<ul style="list-style-type: none"> • Multimodal transportation and access • Safety • Reduced heat island effect • Active living and recreational opportunities • Stormwater management
Type of Solution	<ul style="list-style-type: none"> • Feasibility Study and Planning • Transportation infrastructure

Project Estimated Timeline	<ul style="list-style-type: none"> • Feasibility study and planning: 9 – 12 months • In future phases: <ul style="list-style-type: none"> • Engineering & Design: 18 – 24 months • Construction: 24 – 26 months
Responsible Entity	<ul style="list-style-type: none"> • Town of Holly Ridge • Onslow County Planning Department (with consultant and town support)
Potential Partners	<ul style="list-style-type: none"> • Eastern Carolina Council of Governments • NC Division of Federal Highway Administration • Cape Fear Cyclists • Greater Topsail Area Chamber of Commerce • NC Department of Transportation Integrated Mobility Division • Surf City, NC • Morris Landing, NC • Pender County
Existing Funding	Town of Holly Ridge is committed to providing an approximate 30% match of \$4.2M to advance planning, preliminary and final engineering, public bidding, and contractor selection.
Potential Funding Sources	<ul style="list-style-type: none"> • Resilient Coastal Communities Program • Federal Highway Administration (FHWA) Safe Streets 4 All (SS4A) Planning and Implementation Grants • USDOT Rebuilding American Infrastructure with Sustainability and Equity (RAISE) • USDOT Reconnecting Communities and Neighborhoods Grant • USDOT Rural Surface Transportation Grant • USDOT INFRA Grant • North Carolina Land and Water Fund
Project Estimated Cost	<p>Planning (only): \$100,000 - \$150,000</p> <p>In future phases:</p> <ul style="list-style-type: none"> • Engineering: \$1.5M-\$2M • Construction: \$14M-\$16M • Maintenance: \$100K-\$150K
Anticipated Benefit	<p>High</p> <p>A new path will create a safe passage for pedestrians who are currently using state roads to get to work, school, and recreation. Using alternative modes of transportation reduces vehicular traffic and tailpipe emissions, increases mobility options, expands access to amenities, and promotes a healthy lifestyle.</p> <p>The project will incorporate stormwater runoff mitigation measures to alleviate some flooding.</p>
Priority Rating	<p>CAT: 4th / 7th</p> <p>Public: 4.0 / 5.0</p> <p>Overall: High</p>

Project D.

Green Infrastructure Suitability Analysis

Project Description

Perform a suitability analysis to identify parcels that are good locations for projects such as natural features, green infrastructure, or other stormwater best management practices (e.g., constructed wetlands, rain gardens, etc.), and environmental practices (e.g., community gardens, green space, increased tree canopy, etc.). Parcels within and around town will be assessed on factors like land cover, soil type, heat risk, flood risk, and other environmental factors, and conceptual design for the final select sites will be completed.

Consider developing a partnership with the Town’s Busy Bee Committee, NC Sea Grant, and NC Coastal Federation to carry out elements of this project. The lot next to the Holly Ridge Town Hall on N Dyson St. was identified as a potential site.

Location	The suitability analysis will be completed at a town-wide scale to identify locations that would benefit from a natural feature or environmental practice. Once the initial desktop analysis is completed, site investigations will occur for specific parcels that were identified as candidates for development.
Source	CAT / Stump Sound Watershed Restoration and Protection Plan
Scoping Questions	<ul style="list-style-type: none"> • What type of information is readily available (flood, heat risk, stormwater infrastructure, etc.)? • How will community input be gathered and incorporated into the analysis?
Hazard(s) Addressed by the Project	<ul style="list-style-type: none"> • Flooding • Extreme heat • Severe weather, hurricanes, heavy rainfall, drought
Supporting Function	<ul style="list-style-type: none"> • Stormwater management • Urban heat island reduction • Community space and recreation
Type of Solution	Planning & concept design
Project Estimated Timeline	1 year
Responsible Entity	Town Planning Department with consultant

Potential Partners	<ul style="list-style-type: none"> • Planning Board • Holly Ridge Public Works Department • NC Coastal Federation
Existing Funding	None identified by the CAT
Potential Funding Sources	<ul style="list-style-type: none"> • Resilient Coastal Communities Program • NC DEQ 205(j) WQ Management Planning Grant • EPA/NCDEQ 319 Grants • NCDEQ/DWI Water Resources Development Grant Program • North Carolina Land and Water Fund • NC Wildlife Resources Commission Partners for Green Growth program • Golden Leaf Foundation
Project Estimated Cost	\$50,000 - \$150,000
Anticipated Benefit	<p>Medium</p> <p>Projects will be advanced to a conceptual stage that will promote nature-based solutions with a variety of co-benefits. These may include:</p> <ul style="list-style-type: none"> • Flood mitigation • Urban heat island reduction • Water quality treatment for stormwater runoff • Community space development • Increased green space
Priority Rating	<p>CAT: 1st / 2nd</p> <p>Public: 3.0/5.0</p> <p>Overall: Medium</p>

Project E.

Stormwater Outreach & Education Campaign

Project Description

Collaborate with partners such as NC Sea Grant, NCSU Cooperative Extension, NC Coastal Federation, NC National Estuarine Research Reserve, and NC Coastal Reserve to develop and conduct a comprehensive outreach and education campaign regarding community floodplain management and stormwater management.

The campaign would focus on 1) raising awareness about flood risks, 2) providing materials and tools to prepare for and recover from a flood event (i.e., developing a flood preparedness plan, information on flood insurance policies and disaster assistance in Special Flood Hazard Areas, etc.) and 3) sharing site-scale methods to mitigate flooding (i.e., ditch/canal maintenance, native landscaping).

During this process, the Town and partnering organizations will identify stakeholders (homeowners, renters, business, advocacy groups) and deploy specific strategies for education and outreach. An educational & outreach campaign qualifies as a Community Rating System (CRS) activity.³¹

Location	Town-wide and regional
Source	CAT
Scoping Questions	<ul style="list-style-type: none"> • Has any organization or Town conducted an outreach campaign on stormwater in the past? • What is an effective method for communication? • What are topics that residents are interested in specifically?
Hazard(s) Addressed by the Project	<ul style="list-style-type: none"> • Flooding • Hurricanes / tropical storms • Severe weather and heavy rainfall
Supporting Function	<ul style="list-style-type: none"> • Communication • Preparedness • Public Education
Type of Solution	Educational & outreach program
Project Estimated Timeline	12 months to capture seasonal messaging and educational components throughout the year.

³¹ [FEMA Community Rating System](#)

Responsible Entity	Town of Holly Ridge, with consultant support
Potential Partners	<ul style="list-style-type: none"> • NC Sea Grant • NC Coastal Federation • NCSU Cooperative Extension • NC National Estuarine Research Reserve • NC Coastal Reserve
Existing Funding	None identified by the CAT
Potential Funding Sources	<ul style="list-style-type: none"> • Resilient Coastal Communities Program • EPA Environmental Education grants • NCDNJ Environmental Enhancement Grant (EEG)
Project Estimated Cost	\$35,000 - \$45,000
Anticipated Benefit	<p>Medium-High Benefit.</p> <p>A community that is well-informed about the risks of flooding and the tools available for mitigation and recovery is better suited to recover after a flooding event. Building community is a key part of resilience.</p>
Priority Rating	<p>CAT: 1st / 2nd</p> <p>Public: 2.8/5.0</p> <p>Overall: Low</p>

Conclusions

The Town of Holly Ridge has actively engaged in many previous planning efforts and continues to demonstrate that passion by participating in the 2023-2024 Resilient Coastal Communities Program. By understanding the exposure and future projections for climate hazards, in addition to identifying assets and areas that might be particularly vulnerable to its effects, Holly Ridge has a clear pathway forward to implement projects that will increase resiliency of the Town.

The strategic Project Portfolio will guide the Town in seeking funding sources and grant opportunities to move projects that meet community needs forward. Phases 3 and 4 of the RCCP provide funding opportunities for engineering, design, and construction – however, many additional sources of funding are suitable for projects identified in the Portfolio.

The Risk and Vulnerability Assessment provides baseline information from reputable data sources about present natural hazard exposure and future projections, and it draws conclusions that are pertinent to the Town. The Assessment provides a foundation for developing the Project Portfolio, a list of actions that will address challenges the Town currently faces and may face in the future.

This complete Resilience Strategy for the Town of Holly Ridge is intended to be a helpful tool that should be actively referenced in years to come in order to create a Resilient Holly Ridge.

Appendix

Engagement Strategy

Community Engagement Timeline

Activity	Description	Date	Purpose
Community Action Team Kickoff	Kick-off meeting with Community Action Team group members	October 24, 2023	Introduce the program, steps, and objectives.
CAT Meeting #1	Meeting with community representatives to review information and establish sequential actions.	November 15, 2023	Discuss weather-related challenges experienced in the community and brainstorm visions and goals for the community.
CAT Background Survey	Online survey cascaded to CAT members.	November 2023	Gather input on natural hazard concerns and experiences, and visions and goals for the community.
CAT Meeting #2	Meeting with community representatives to review information and establish sequential actions.	December 20, 2023	Discuss results of the background survey, finalize the vision and goals, review critical and natural asset locations, and discuss hazards and stressors to the community.
Project Website	Website to publicly disseminate information on the program and project.	January 2024	Establish online presence to inform the public on the community's involvement in the program and project objectives.

Activity	Description	Date	Purpose
Public Surveys	Online survey cascaded to the public.	February 2024; April 2024	Gather information to define project goals and objectives, identify critical assets, hazard risks, and opportunities for adaptation and resilience; collect feedback about project preferences
Public Workshop Flyer	Flyer to advertise the 1st public meeting/workshop.	January 2024	Advertise information about the 1st public meeting/workshop and encourage public attendance.
Public Meeting / Workshop #1	Interactive meeting with the public through a series of stations.	January 31, 2024	Publicly introduce the program and project objectives, and gather feedback on natural hazard concerns, challenges, and solutions.
CAT Meeting #3	Meeting with community representatives to review information and establish sequential actions.	February 21, 2024	Discuss results of the public meeting, preliminary results of the risk and vulnerability assessment, and initial review of potential project list.
CAT Meeting #4	Meeting with community representatives to review information and establish sequential actions.	March 12, 2024	Review and rank list of potential projects.
Community Event / Holly Ridge Bee Festival	Interactive meeting with the public through tabling at a Town event (Holly Ridge Bee Festival).	April 27, 2024	Publicly present the final list of prioritized projects and gather feedback on projects of high interest.

Activity	Description	Date	Purpose
CAT Meeting #5	Meeting with community representatives to review information and establish sequential actions.	May 7, 2024	Discuss results of the public meeting and address actions for the final project products.

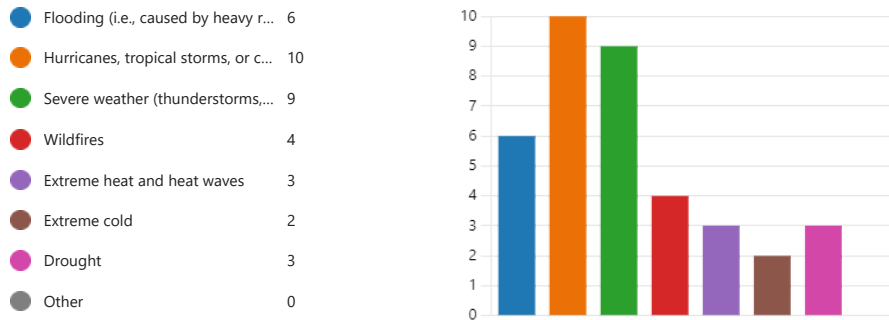
Holly Ridge Resilience Strategy - Public Survey

11 Responses

07:53 Average time to complete

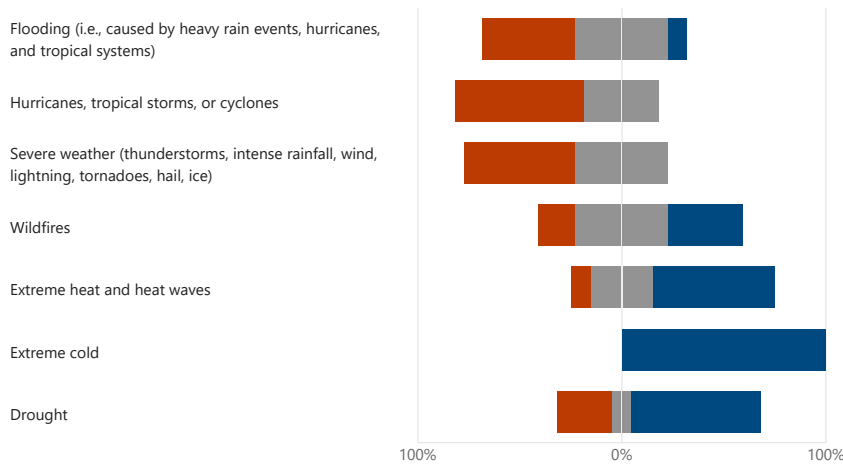
Closed Status

1. What type of weather hazards affect your community? Select all that apply.

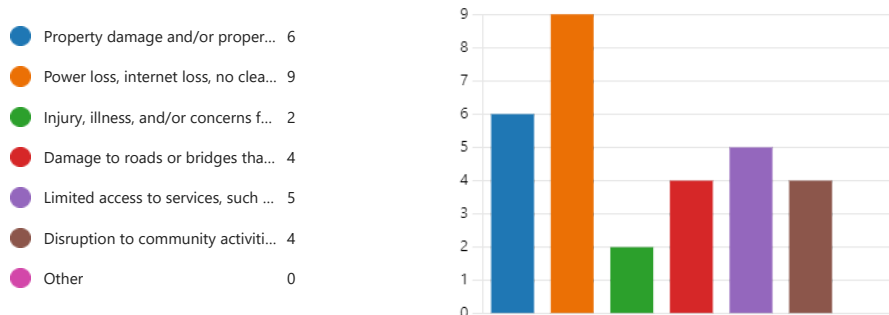


2. How concerned are you about the possibility of your community being impacted by each of these hazards?

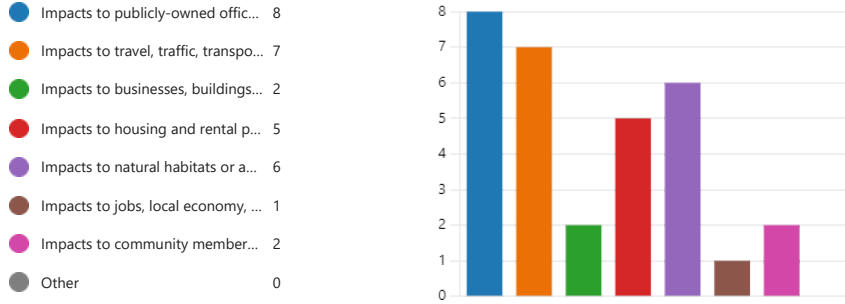
■ Very concerned ■ Somewhat concerned ■ Not concerned



3. What impacts have you experienced as a direct result of weather hazards or storm events?



4. Which weather-induced impact(s) would be most devastating to your community?



5. Which facilities or buildings, roads/bridges/intersections, or neighborhoods have experienced weather-related issues (i.e., repeated flooding, downed trees, building damage, etc.)? Please specify. We appreciate your local knowledge!

5 Responses

Latest Responses

"Onslow County"

"Evidently, Holly Ridge Plaza Apartment and then it was not properly repaired..."

"Any of the properties with waterfront. Also, the wind has knocked down trees..."

2 respondents (40%) answered **roads** for this question.

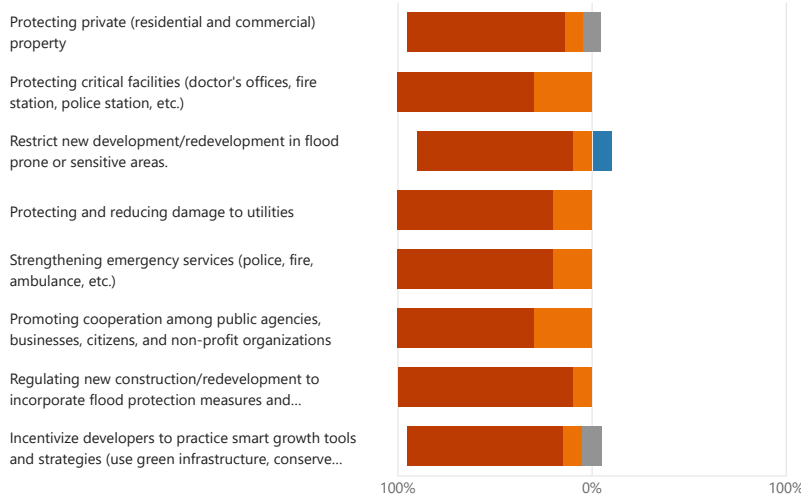
Plaza Apartment
Onslow County
issues on Hwy

roads

Morris Landing
neighborhood - Hardison

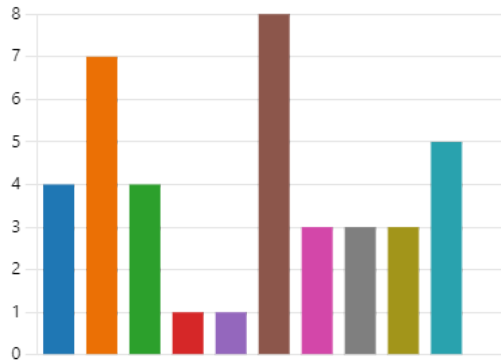
6. Weather hazard planning actions can help lessen the impact of severe weather events. Your responses to the following statements will help us determine the community's priorities when planning for future climate hazards in Holly Ridge. Please tell us how important each statement is to you.

Very Important Somewhat Important Neutral Not Very Important Not Important



7. What are your preferred ways to receive information about how to make your home, business, and community more resilient to severe weather events? Select all that apply.

- Online websites 4
- Text messages/alerts 7
- Public meetings or workshops 4
- Brochures or flyers in public spa... 1
- Word of mouth 1
- Social media 8
- Town newsletters 3
- Print newspaper or mail (includi... 3
- Listservs or email lists 3
- Community events (e.g., farmer'... 5
- Other 0



8. Select the statement that best describes you.

- I am a permanent resident of H... 8
- I live in Holly Ridge part-time. ... 1
- I am a visitor of Holly Ridge. 1
- I own property in Holly Ridge b... 1
- Other 0



9. How long have you lived in Town?

- 0-2 years 4
- 3-10 years 2
- 11-15 years 0
- 15+ years 5
- N/A 0



10. What is your age range?

- 18-35 1
- 36-53 4
- 54-69 5
- 70 or older 1
- Prefer not to answer 0



Holly Ridge Community Survey - Resilient Project Preferences

68 Responses

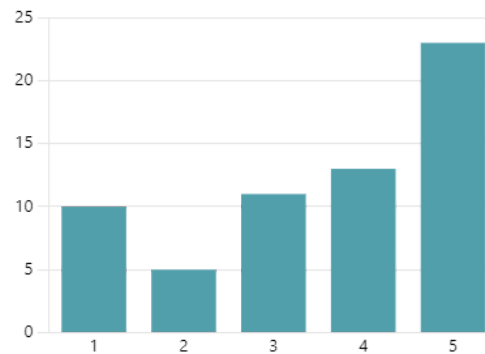
05:52 Average time to complete

Closed Status

1. Project A. Emergency Operations Center Feasibility Study

Description: Establish an emergency operations center (EOC) for southwestern Onslow County in Holly Ridge, to be located in a new Town municipal complex proposed at a location outside of the FEMA regulated flood zone. A feasibility study will determine scoping requirements and site suitability. Additional engineering design, permitting, and construction are to follow.

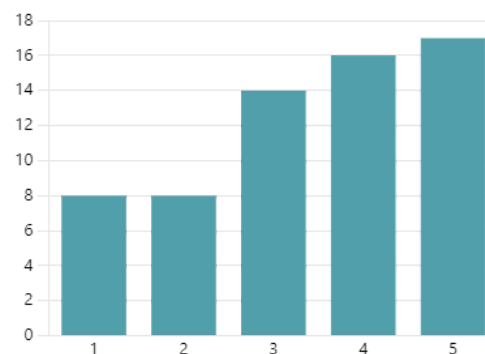
3.55
Average Rating



2. Project B. Stormwater Master Plan

Description: Inventory existing municipality stormwater resources, conduct a gap analysis of needs and current shortfalls, and engage planning and prioritization of future efforts to address those needs (i.e., water quality, maintenance tracking, floodproofing, public messaging, etc.)

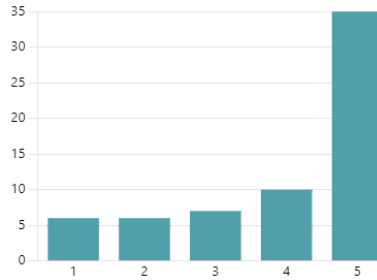
3.41
Average Rating



3. Project C. Multi-Use Greenway Connection Feasibility Study

Description: Conduct a feasibility study for designing a multi-use path/sidewalk from Holly Ridge Town Hall on N Dyson St along Ocean Rd/Hwy 50 towards Surf City. Consider feasibility of tying in to proposed Pender County portion of the East Coast Greenway Corridor. The multi-use pathways will incorporate bioswales and green stormwater infrastructure where possible.

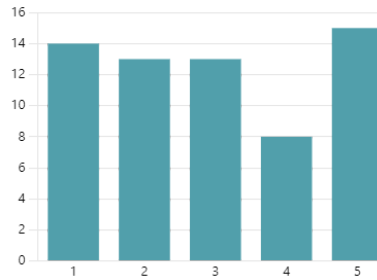
3.97
Average Rating



4. Project D. Suitability Analysis for Natural Features that Enhance Community Resilience to Climate Change

Description: Perform a suitability analysis to identify parcels that are good locations for projects such as natural features, stormwater best management practices (e.g., constructed wetlands, rain gardens, etc.), and environmental practices (e.g., community gardens, green space, increased tree canopy, etc.). Following the suitability analysis, conceptual plans and a funding opportunity analysis will be completed for each of the proposed projects.

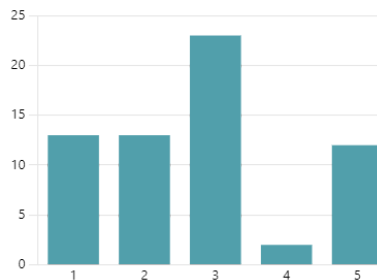
2.95
Average Rating



5. Stormwater Outreach & Education Campaign

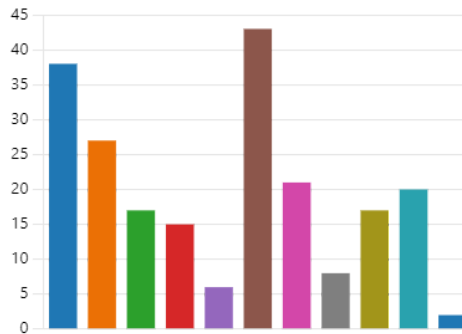
Project Description: Collaborate with partners such as NC Sea Grant, NCSU Cooperative Extension, NC Coastal Federation, NC National Estuarine Research Reserve, NC Coastal Reserve, etc. to develop and conduct a comprehensive outreach and education campaign regarding community floodplain management and stormwater management. The Town and partnering organizations will identify local stakeholders and deploy specific strategies for education and outreach about flood risk awareness, materials and tools to prepare for and recover from a flood event, and site-scale methods to mitigate flooding.

2.79
Average Rating



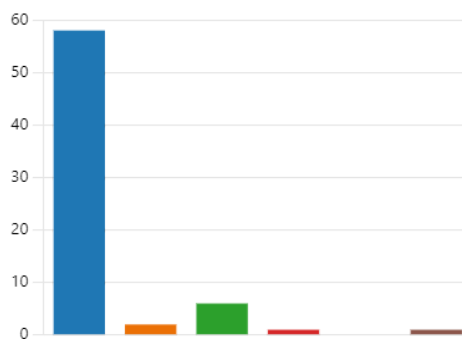
6. What are your preferred ways to receive information about how to make your home, business, and community more resilient to severe weather events? Select all that apply.

● Websites	38
● Text messages/alerts	27
● Public meetings or workshops	17
● Brochures or flyers in public spa...	15
● Word of mouth	6
● Social media	43
● Town newsletters	21
● Print newspaper or mail (includi...	8
● Listservs or email lists	17
● Community events (e.g., farmer'...	20
● Other	2



7. Select the statement that best describes you.

● I am a permanent resident of H...	58
● I live in Holly Ridge part-time. ...	2
● I am a visitor of Holly Ridge.	6
● I own property in Holly Ridge b...	1
● I do not live in Holly Ridge.	0
● Other	1



8. How long have you lived in Town?

● 0-2 years	17
● 3-10 years	39
● 11-15 years	4
● 15+ years	2
● N/A	6



9. What is your age range?

● 18-35	8
● 36-53	27
● 54-69	27
● 70 or older	4
● Prefer not to answer	2



Community Action Team Report

Kickoff Community Action Team Meeting

October 24, 2023

Holly Ridge, NC / Virtual

Attendees

- Kerri Allen – Coastal Advocate, NC Coastal Federation
- Ken Bradshaw – Resident, Town of Holly Ridge
- Paula Farnell – Project Coordinator (Coastal Recreation Fishing License), NC Division of Marine Fisheries
- Kimmee Frankenfield – Grants Manager, Town of Holly Ridge
- Carlton Gideon – Senior Community Planner, Eastern Carolina Council of Governments
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Ricky Maready – District Vice President, Jones Onslow Electric Membership Corporation
- Mike McFann – Public Works Director, Town of Holly Ridge
- Carter Metcalf – Director, Onslow County Planning Department
- Tammy Proctor – Director, Topsail Chamber of Commerce
- Heather Reynolds – Town Manager, Town of Holly Ridge
- Nate Rhue – Community Development Director, Town of Holly Ridge
- Mike Sorg – Chief, Town of Holly Ridge Police Department
- Sarah Spiegler – Coastal Resilience Specialist, NC Sea Grant
- Mackenzie Todd – Coastal Resiliency Coordinator, NC Division of Coastal Management
- Kasen Wally – Coastal Resiliency Specialist, NC Division of Coastal Management
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder
- Keely Lane – Project Manager, Kleinfelder

Agenda

1. Introductions
2. North Carolina Resilient Coastal Communities Program
 - a. Background
 - b. Program Objectives & Goals
3. Program Steps & Deliverables
4. Next Steps

Minutes

- New additional CAT participants

- Next meeting, consider breakout rooms for discussion
- Check with community to understand what community wants and what kinds of efforts people think are feasible (what will get more interest)

Community Action Team Meeting #1

November 15, 2023

Virtual

Attendees

- Stephen Adams – Transportation Planner, City of Jacksonville
- Kerri Allen – Coastal Advocate, NC Coastal Federation
- Clay Calhoun – Director, Senior Services, Onslow County
- Paula Farnell – Project Coordinator (Coastal Recreation Fishing License), NC Division of Marine Fisheries
- Kimmee Frankenfield – Grants Manager, Town of Holly Ridge
- Carlton Gideon – Senior Community Planner, Eastern Carolina Council of Governments
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Ricky Maready – District Vice President, Jones Onslow Electric Membership Corporation
- Stacie Miles – Deputy Director, Onslow County Emergency Services
- Tammy Proctor – Director, Topsail Chamber of Commerce
- Kirsten Spirakis – Engineering Supervisor, NCDOT District 1, Division 3
- Mackenzie Todd – Coastal Resiliency Coordinator, NC Division of Coastal Management
- Kasen Wally – Coastal Resiliency Specialist, NC Division of Coastal Management
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder
- Keely Lane – Project Manager, Kleinfelder

Agenda

1. Introductions
2. Review North Carolina Resilient Coastal Communities Program
3. What is Resilience?
4. Challenges & Problems
5. Define Vision + Goals + Objectives
6. Visioning Exercise
7. Group Discussion
8. Next Steps

Minutes

- Challenges for Holly Ridge
 - Stormwater runoff
 - Improper growth will increase loss of green space and cause flooding and runoff issues
 - Impervious areas, ponding, and loss of green space (Piney Green, near Richlands, Gum Ranch Rd, near Swansboro, Sneads Ferry, Turkey Pond Rd, creeks, etc.)
 - No EOC/shelter
 - Shelters in Onslow County are minimal, the animal-approved shelter is located in Jacksonville and at the middle school
 - 4 shelters during Hurricane Florence were not opened due to high windspeed
 - Two shelters are rated for Category 4 hurricanes and are operational when needed
 - Onslow County is working to upgrade 2 shelters to increase wind rate (Swansboro and outside of Jacksonville)
 - Category 3 and below shelter can accommodate 531 people
 - Category 4 can accommodate 350 people
 - Lack of pedestrian options or greenways when the road floods
 - Lack of community space for emergency workers
 - Overwhelmed stormwater systems and surrounding coastal waters
 - Difficulty taking people to shelter on buses
 - Difficulty getting resources into the area during a major storm from main thoroughfares
 - Highway 70 north of Jacksonville
 - Interstate 40
 - Issues in Pender County
- Discussion
 - Establish a local EOC response and distribute local resources
 - Pender County EOC is in Burgaw; Onslow County EOC is in Jacksonville
 - Per NCGA statute, municipality is responsible for their own jurisdiction
 - Increasing Holly Ridge's capacity and capabilities will help Onslow County
 - Make sure EM services include swift water rescue
 - Holly Ridge also needs a municipal fire department
 - Currently only have volunteer, but a municipal fire department could benefit Hampstead and Sneads Ferry
 - First step to establish a municipal fire department would be to site a building, acquire a tanker, hire staff (21 people), etc.
 - No local stormwater management
 - Holly Ridge follows state stormwater management rules
 - Other localities can write their own stormwater management practices
 - Interest in ordinances that prioritize nature-based solutions and green infrastructure in development

- No current mapping/modeling of stormwater at the local (Town) level
- Hudiburg St. off of NC Highway 50 near Holly Plaza Apartments has had flooding in the past; no good ditches and issues with pavement
- Need to incorporate green space as Town grows
 - Ensure green space management happens because it will help with stormwater and floodplain management
 - Protect existing resources and/or incorporate more green space moving forward
 - Identify conservation parcels for acquisition that can store stormwater
- No property buyouts that the Town is aware of at this time
 - VOAD for Onslow County
 - Need to identify a distribution point for emergency food, water, and supplies
 - Has partnered with United Way in the past
 - A nutrition site in Sneads Ferry can be utilized by the County as a site for seniors (15 miles from Holly Ridge)
 - 2 dialysis center locations in Onslow County
 - Parks and Recreation plan goals for sustainability and pedestrian accessibility (sidewalks)
 - Interest in sidewalks connecting Holly Ridge to Surf City
 - Holly Ridge lacks a grocery store
 - Interest in nature-based stormwater projects that alleviate localized flooding and protect/enhance water quality
 - Need to enhance communication during a disaster
 - Convey points of distribution, safety messages, shelter info specific to Holly Ridge

Community Action Team Meeting #2

December 20, 2023

Holly Ridge / Virtual

Attendees

- Stephen Adams – Transportation Planner, City of Jacksonville
- Kerri Allen – Coastal Advocate, NC Coastal Federation
- Ken Bradshaw – Resident, Town of Holly Ridge
- Paula Farnell – Project Coordinator (Coastal Recreation Fishing License), NC Division of Marine Fisheries
- Kimmee Frankenfield – Grants Manager, Town of Holly Ridge
- Carlton Gideon – Senior Community Planner, Eastern Carolina Council of Governments
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Ricky Maready – District Vice President, Jones Onslow Electric Membership Corporation
- Mariko Polk – Coastal Processes Specialist, NC Sea Grant
- Mike Sorg – Chief, Town of Holly Ridge Police Department
- Stacie Miles – Deputy Director, Onslow County Emergency Services
- Tammy Proctor – Director, Topsail Chamber of Commerce
- Kirsten Spirakis – Engineering Supervisor, NCDOT District 1, Division 3
- Mackenzie Todd – Coastal Resiliency Coordinator, NC Division of Coastal Management
- Kasen Wally – Coastal Resiliency Specialist, NC Division of Coastal Management
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder

Agenda

1. Review survey results
2. Review vision & goals
3. Finalize vision & goals
4. Review locations of critical assets and natural infrastructure
5. Discuss hazards and stressors
6. Next Steps: Public Meeting

Minutes

- Discussion
 - Remove Glencare nursing home from critical asset map – no nursing facilities within Town jurisdiction (used to be Meadows of Holly Ridge)
 - No schools within Town jurisdiction
 - Add to list

- Holly Ridge Healthcare (119 Holly St.)
- Holly Ridge Community Center (404 Sound Rd.)
- Holly Ridge Town Hall and Public Works
- J&J Snacks and industrial park
- Dollar General
- Circle K
- Walmart in Surf City
- Hudiburg St. floods heavily
 - Neighborhood road but it is not the only access point
 - Culverts/ditches lack maintenance
- Hazards and stressors
 - Old terracotta pipes throughout Town from former Camp Davis
 - Nobody can find the plans for where the pipes are located
 - Residents experience sinkholes when they fail
 - Clay pipes have been identified near Highway 17 and past the Community Center
 - The remedy to personal property sinkholes is to fill with concrete, rocks, and dirt
 - Most of Holly Ridge bedrock is karst (limestone)
 - Some sinkholes are natural, and some are due to rain that causes erosion
 - Remnants of Camp Davis stormwater system can be found along Chubb St.
 - New stormwater systems have been mapped
 - Towns at Holly Ridge neighborhood
 - Issues with standing water
 - Rapid growth and development
 - Multifamily development is coming in the future within Town limits (Drag Strip Rd, townhomes beside Highway 17, 800–900-acre property to be developed near the water, scattered requests for annexation)
 - Estimates of 10,000 people within the next 4 years (current population estimate from the Town is about 6,000)
- Project Ideas
 - Stormwater UDOs could be beneficial
 - Map terracotta pipes
 - Address sinkhole maintenance
- Public Workshop Ideas
 - Location – Community Center
 - Put link on Town website and Facebook page
 - Consider Bee Fest in late April

Community Action Team Meeting #3

December 20, 2023

Holly Ridge / Virtual

Attendees

- Stephen Adams – Transportation Planner, City of Jacksonville
- Clay Calhoun – Director, Senior Services, Onslow County
- Ken Bradshaw – Resident, Town of Holly Ridge
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Danny Ferucci – Executive Director, Onslow United Transit Systems
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder
- Ariel Patterson – Resiliency Planner, Kleinfelder
- Quinn Harrison – Project Specialist, Kleinfelder

Agenda

1. Discuss Results of Public Workshop #1
2. Review Preliminary Risk & Vulnerability Results
3. Brainstorm Project Ideas
4. Next Steps: CAT Meeting #4

Minutes

- Risk and Vulnerability Assessment
 - Map results reflect assets that are at-risk
 - Future development of new apartments and Camp Davis Industrial Park may pose future challenges with stormwater management
 - Camp Davis Industrial Park construction is underway. Phase 1 is built out and is entering Phase 3. Camp Davis Industrial Park is town-owned land which stretches across 2 municipalities. This area will have heavily concentrated commercial and 438 units of residential development.
 - There is a storm water permit for new development, but there is a concern with the amount of development (commercial and residential) and how it will compound to contribute to the amount of runoff.
 - Currently, water seems to run north and there are already concerns of flooding near Ken's neighborhood and other surrounding areas.
 - There is a need to better understand the flow of water in these areas.
- Risk and Vulnerability Results (Fire Risk)
 - In 2019, there was a large fire near Sneads Ferry. Measures which impacted vegetation were taken to protect development in proximity.

- Several years ago, there was another large fire in Holly Shelter.
- Surrounding base-owned properties conduct controlled fires. This is due to the large pine tree population, which precipitates wildfires issues and requires controlled burns.
- Risk and Vulnerability Results (Heat Risk)
 - Extremely hot days are increasingly becoming a concern in the past year.
- Nature-Based Solutions
 - Using nature-based solutions is not necessarily a town priority for resiliency but more a priority for town beautification and revitalization. There is little resistance to using NBS, but it has not been a conversation.
 - Beautification can tie-into economic resilience, economic development, and tourism.
 - There is activity from several volunteer/grassroots organizations to implement natural infrastructure.
 - Holly Ridge just became a “Bee Town”
 - Kiwanis Club /Cub Scouts may be another organization that take on grassroots greening.
 - There is a desire for diversifying the types of trees in town. This could tie into a project building out the town’s tree canopy.
- Planning / Policy / Development
 - Holly Ridge does not have as strict/restrictive development requirements as other larger areas. Currently, most developers do adhere to these requirements. Board does not believe there would be resistance from developers to changing these requirements.
 - New developments have certain open space/ greenspace requirements, but these requirements do not include vegetation specifications; Therefore, developers have completely cleared their lots of existing vegetation before construction.
 - The percentage of open/greenspace is based on acreage of development.
 - Developers often travel into Holly Ridge from Charlotte, Raleigh, or Wilmington.
 - Currently, there are currently no requirements for landscaping or permeable pavement.
 - Stormwater is the biggest concern here, especially considering the amount of rapid new development.
 - Increased development is especially a concern post-Hurricane Florence because there is a higher potential for increased impacts during a large storm event. “Now there are more roofs.”
 - Support for developing a Stormwater Master Plan
- Emergency Management
 - There are several facilities in/near Holly Ridge which may be used as emergency shelters.
 - Coastal School: New school located outside of Holly Ridge city limits; Equipped to withstand a CAT 3 hurricane; Equipped with generators.
 - Police Department
 - Town Hall: Equipped with a generator.
 - Holly Ridge does not have a formal EOC.

- Infrastructure
 - Interest in H&H study
 - A potential location for a H&H study is Hudiburg St. and the nearby pond: heavy flooding is experienced here.
 - Another potential location for a H&H study is the satellite annexation Villages at Folkstone/ Landing at Folkstone: the town receives complaints about flooding. Currently, this space is developer-owned.
 - There are concerns about the location of drainage ponds at Villages at Folkstone/ Landing at Folkstone due to proximity of drainage ponds to properties.
 - Concern surrounding the increasing consistency at which the drainage ponds flood
 - All developments are under state-wide stormwater permit. Holly Ridge does not have jurisdiction when it comes to subdivision's detention/retention ponds.
 - There are subdivisions currently in violation of their development permit; Holly Ridge cannot manage these violations.
 - One subdivision has several retention ponds that are in violation of permit.
 - When a new building permit is issued, there are certain stormwater requirements that must be met. Holly Ridge ensures that town-owned parcels are within BUA permits but is not responsible for privately-owned parcels.
 - Holly Ridge does not own most of the land within town-limits. Most of the land is owned by private property owners and developers.
 - Town-owned properties include Town Hall, Municipal Park, a few small parcels near Hwy 17
 - The town owns some Camp Davis Industrial Park lots. These lots are currently being sold individually to developers.
 - Camp Davis's aging infrastructure poses challenges. A culvert is clogged near Highway 17 post office and dollar general.
 - The HOA has jurisdiction over ditches and culverts; Holly Ridge ONLY has easements for ditches/ culverts if they are on a town-owned street, which is rare.
 - Hwy 17 and NC 50 are DOT owned.
 - Utility Corporation (Duke Energy) or NCDOT has property easements.
 - Currently, there is an [unmapped?] system of terra cotta pipes installed by Camp Davis in Holly Ridge. This causes standing water and sinkholes.
 - ONWASA has water and sewer system maps available, but it is unclear if this data goes back to when the pipes were installed.
 - Standing water exacerbates problems caused by pipes.
 - Stormwater Utility
 - It is up to the state to issue the permit, and the subdivision to renew it.
 - There is no town stormwater fee, and there have been no discussions of this.

Community Action Team Meeting #4

March 12, 2024

Virtual

Attendees

- Kerri Allen – Coastal Advocate, NC Coastal Federation
- Ken Bradshaw – Resident, Town of Holly Ridge
- Clay Calhoun – Director, Senior Services, Onslow County
- Paula Farnell – Project Coordinator (Coastal Recreation Fishing License), NC Division of Marine Fisheries
- Carlton Gideon – Senior Community Planner, Eastern Carolina Council of Governments
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Ricky Maready – District Vice President, Jones Onslow Electric Membership Corporation
- Stacie Miles – Deputy Director, Onslow County Emergency Services
- Sarah Spiegler – Coastal Resilience Specialist, NC Sea grant
- Tammy Proctor – Director, Topsail Chamber of Commerce
- Mackenzie Todd – Coastal Resiliency Coordinator, NC Division of Coastal Management
- Kasen Wally – Coastal Resiliency Specialist, NC Division of Coastal Management
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder
- Ariel Patterson – Resiliency Planner, Kleinfelder
- Quinn Harrison – Project Specialist, Kleinfelder

Agenda

1. Quick Recap
2. Project Review & Ranking
3. Next Steps

Minutes

- Discussion
 - Both nature-based projects should be included
 - Stormwater ordinances have not been favored by Town Council in the past
 - Additional regulations would mean the Town would get involved when the State already handles them
 - Town Council has generally been more in favor of pedestrian/bike plan instead of stormwater ordinances
 - Community and energy resilience program
 - Energy infrastructure in Holly Ridge is divided between Duke Energy and Jones Onslow Electric; most is Duke Energy
 - Jones Onslow is constantly doing maintenance and updating portions of line

Community Action Team Meeting #5

May 7, 2024

Virtual

Attendees

- Kerri Allen – Coastal Advocate, NC Coastal Federation
- Ken Bradshaw – Resident, Town of Holly Ridge
- Carlton Gideon – Senior Community Planner, Eastern Carolina Council of Governments
- Marsha-Gray Kircher – Community Development Administrator, Town of Holly Ridge
- Greg Lawrence – Building Code Administrator, Town of Holly Ridge
- Ricky Maready – District Vice President, Jones Onslow Electric Membership Corporation
- Sarah Spiegler – Coastal Resilience Specialist, NC Sea grant
- Tammy Proctor – Director, Topsail Chamber of Commerce
- Kirsten Spirakis – Engineering Supervisor, NC DOT District 1, Division 3
- Julia Maron – Climate Resiliency Planner, Kleinfelder
- Montanna Weitzel – Project Specialist, Kleinfelder

Agenda

1. Overview of Vulnerability Assessment Results
2. Holly Ridge Bee Festival
3. Final Project Portfolio
4. Next Steps – RCCP Phase 3
5. Now What?

Minutes

- Discussion
 - Helpful to have vulnerability assessment results at the local level
 - Might consider clarifying sea level rise projection
 - Project portfolio
 - Confirm funding sources for projects that are not part of Phase 3 funding
 - Long list of projects will be in the final Resilience Strategy appendix
 - Repost survey once more on Facebook
 - Town interested in submitting 2 applications for Phase 3 funding – EOC and Greenway
 - Beyond RCCP Phase I and II
 - Town is interested in continuing CAT/working meetings
 - Involvement may go up if another major storm event occurs

Full Project List

Table 14 details the full project list that was presented to the CAT for prioritization.

Table 14. Full Project List

Project Type	Project Name	Project Summary	Source	Rank
Policy-Based Solution	Update Comprehensive Plan with Resiliency & Sustainability Elements	Develop an updated Comprehensive Plan that includes Resiliency and Sustainability Elements to continue supporting ongoing efforts. Provide supplemental model language for sustainability- and resiliency-focused ordinances for new development (and re-development).	Comprehensive Economic Development Strategy (CEDs)	1st
Infrastructure - Study	Upgrade Stormwater Infrastructure at Selected Permit Locations	Work with permit holders and the Town to retrofit any pre-2017 stormwater infrastructure to the current standards to yield a significant impact to water entering Stump Sound. Previously identified permit holders include Holly Ridge Town Park, Coastal Shooting Sports, Buckhorn Development, Shopping and Office Park Holly Ridge, Dollar General Holly Ridge, Pine Ridge Townhomes, among others.	Stump Sound Watershed Restoration and Protection Plan	1st
Emergency Management	Backup Power Generator for Police Department	Purchase and install backflow wiring and/or temporary generator and transfer switches at the Police Department. Identify other critical facilities that lack permanent backup power. Elevate any generators currently below BFE.	Hurricane Matthew Resilient Redevelopment Plan	2nd

Project Type	Project Name	Project Summary	Source	Rank
Outreach/Education	Educate HOAs about Stormwater Best Management Practices	Engage HOAs about stormwater best management practices and explore potential assessment of stormwater/retention ponds in HOA subdivisions throughout the Town.	CAT	2nd
Infrastructure - Study	Retrofit Critical Facilities	Identify critical facilities (municipal buildings, emergency shelters, etc.) that require retrofits to withstand repetitive flooding, wind, and future climate conditions. Retrofits may include installing generators, structural reinforcement, installing storm shutters, safe room designs, etc.	Hurricane Matthew Resilient Redevelopment Plan	2nd - tied
Infrastructure - Study	Stormwater and Drainage Improvements at Select Locations	Assess stormwater infrastructure and repair or replace undersized culverts/pipes/other facilities as appropriate. Identify locations that need snagging to improve drainage	Holly Ridge Capital Improvement Plan	2nd - tied
Policy-Based Solution	Develop New Stormwater Ordinance	Review current Unified Development Ordinances (UDO) for stormwater language. Develop a set of regulations with stricter standards than the State of North Carolina requires to manage stormwater runoff, including provisions for public outreach, use of green infrastructure, and integrating requirements for climate resiliency (i.e., green space, open space, pavement types, etc.). Ordinances can include language for development incentives regarding low-impact stormwater control measures (SCM).	Kleinfelder	3rd

Project Type	Project Name	Project Summary	Source	Rank
Emergency Management	Update Emergency Management Protocols and Plan	Review existing local Emergency Management Plan and identify opportunities for updates. Consider opportunities for Volunteer Organizations Active in Disasters (VOAD) to coordinate efforts between Onslow County and Holly Ridge.	CAT	3rd
Policy-Based Solution	Pedestrian and Bicycle Master Plan	Develop a Pedestrian and Bicycle Master Plan that guides expansion of sidewalks and bike lanes throughout the Town to improve safety, connectivity, and accessibility. Consider working with Jacksonville Urban Metro Planning Organization and Onslow United Transit System.	Holly Ridge Parks & Recreation Plan	4th
Infrastructure - Study	Townwide Hydrologic & Hydraulic (H&H) Study	Conduct a comprehensive assessment of the Town's H&H characteristics and assess vulnerabilities to flooding, identify areas at risk, develop strategies for mitigating flood risk, and improve drainage infrastructure. The study can include focus on known hot spots of flooding such as Burns St., Smith St., Kraft St., Hudiburg St, and Landing at Folkstone, among others.	Kleinfelder	5th
Policy-Based Solution	Conduct Long Range Water Resources Plan	Establish a long-range water resource plan to provide a roadmap and guide development of water supply and management solutions to understand behaviors or residential and commercial water demand which influence the future need for water supply and wastewater management facilities.	Holly Ridge Land Use Plan	5th

Project Type	Project Name	Project Summary	Source	Rank
Infrastructure - Study	Water Flow Study at Camp Davis Industrial Park	Conduct a study of the water flow at Camp Davis Industrial Park to determine if the stormwater flows as designed.	CAT	4th
Policy-Based Solution	Community Wildfire Protection and Action Plan	Work with Onslow County Ranger to develop a Community Wildfire Protection and Action Plan and assess vulnerability and mitigate risk to wildfires.	Climate Change and Natural Hazards Vulnerability Assessment for the Eastern Carolina Region	6th
Policy-Based Solution	Develop Townwide Heat Action Plan	Develop a townwide Heat Action Plan using CDC guidance to define response procedures for emergency managers and other relevant officials when a heat wave is forecasted. The plan can also provide educational materials to inform the public about available resources and actions to take before and during extreme heat events.	Kleinfelder	7th
Infrastructure - Study	Community Energy Resilience Program	Conduct an assessment of community energy needs and potential impacts of hurricanes and large storm events on the electric grid. Identify opportunities for generating and storing renewable energy and implement strategies for recovering from disruptions to the electric grid.	Hurricane Matthew Resilient Redevelopment Plan	7th

Project Type	Project Name	Project Summary	Source	Rank
Policy-Based Solution	Develop Tree Manual and Tree Protection Ordinances	Develop a townwide Tree Manual to provide policy, standards, and guidelines regarding the planting, maintenance, removal, protection, pruning and preservation of trees in Town right-of-way and on Town-owned property. In addition, consider creating tree protection and preservation ordinances to mitigate heat and improve stormwater quality.	CAT	8th

Table 16. Full Asset List

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1151	Lift Station	Bel Lift Station	34.47329291	-77.56214495	Public	No FEMA Flood Zone	Low
1151	Generator	Belvedere Drive	34.47326645	-77.56211407	Public	No FEMA Flood Zone	Low
1190	Place of Worship	Born Again Baptist Church	34.53293467	-77.43470197	Private	No FEMA Flood Zone	Very Low
1268	Lift Station	Bream Lift Station	34.48873024	-77.54929281	Public	No FEMA Flood Zone	Low
275	Natural Asset	Camp Lejeune	34.60179889	-77.53669054	Public	100-year	
1189	Place of Worship	Chapel of Peace Church of God	34.49492339	-77.54687178	Private	No FEMA Flood Zone	Very Low
1189	Place of Worship	Chapel of Peace Church of God	34.49537052	-77.54696891	Private	No FEMA Flood Zone	Very Low
1189	Place of Worship	Chapel of Peace Church of God	34.49521838	-77.54676575	Private	No FEMA Flood Zone	Very Low
1269	Day Care	Coastal Cottage Preschool	34.49047842	-77.55935768	Private	No FEMA Flood Zone	Very Low
1168	Schools and/or Emergency Shelter	Coastal Elementary	34.5137541	-77.49116372	Public	No FEMA Flood Zone	Low
1142	Place of Worship	Creed Church	34.49312854	-77.49016928	Private	No FEMA Flood Zone	Very Low
1265	Lift Station	Cypress Lift Station	34.48675536	-77.55753229	Public	No FEMA Flood Zone	Low
1265	Generator	Cypress St	34.48678003	-77.55744797	Public	No FEMA Flood Zone	Low
1008	Provisions	Dollar General	34.44192121	-77.55752662	Private	No FEMA Flood Zone	Medium
1161	Provisions	Dollar General	34.49786271	-77.55292525	Private	No FEMA Flood Zone	Medium
1016	Place of Worship	Faith Harbor United Methodist Church	34.4367924	-77.55584045	Private	100-year	Medium
1003	Provisions	Food Lion	34.4466727	-77.56210217	Private	No FEMA Flood Zone	Medium
1000	Place of Worship	Gethsemane United Holy Church of Hampstead	34.47023715	-77.58117956	Private	No FEMA Flood Zone	Very Low
1166	Place of Worship	Grace Free Will Baptist Church	34.49831866	-77.55421611	Private	No FEMA Flood Zone	Very Low
1166	Place of Worship	Grace Free Will Baptist Church	34.49807603	-77.55436474	Private	No FEMA Flood Zone	Very Low
1271	Lift Station	Green	34.49432129	-77.55430923	Public	No FEMA Flood Zone	Low
1163	Transportation	Holly Ridge Airpark	34.49126395	-77.53280113	Private	No FEMA Flood Zone	Low

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1192	Place of Worship	Holly Ridge Church of God	34.47564677	-77.55814616	Private	No FEMA Flood Zone	Very Low
1192	Place of Worship	Holly Ridge Church of God	34.47545425	-77.55844828	Private	No FEMA Flood Zone	Very Low
1192	Place of Worship	Holly Ridge Church of God	34.47521147	-77.55850418	Private	No FEMA Flood Zone	Very Low
1159	Health Service	Holly Ridge Healthcare	34.49691323	-77.55377272	Private	No FEMA Flood Zone	Medium
1184	Natural Asset	Holly Ridge Municipal Park	34.49619053	-77.54593101	Public	No FEMA Flood Zone	
1188	Natural Asset	Holly Ridge Municipal Park	34.49686976	-77.5440252	Public	No FEMA Flood Zone	
1169	Schools and/or Emergency Shelter	Holly Ridge Quality Childcare & Preschool	34.49969753	-77.54757312	Private	No FEMA Flood Zone	Medium
1169	Schools and/or Emergency Shelter	Holly Ridge Quality Childcare & Preschool	34.49970286	-77.54730113	Private	No FEMA Flood Zone	Medium
1183	Government Service Office Community	Holly Ridge Town Hall	34.49456675	-77.55021414	Public	No FEMA Flood Zone	Low
1183	Government Service Office Community	Holly Ridge Town Hall	34.49462843	-77.55053076	Public	No FEMA Flood Zone	Low
1183	Government Service Office Community	Holly Ridge Town Hall	34.49496749	-77.55002153	Public	No FEMA Flood Zone	Low
1183	Government Service Office Community	Holly Ridge Town Hall	34.49503018	-77.55073235	Public	No FEMA Flood Zone	Low
1183	Government Service Office Community	Holly Ridge Town Hall	34.4948555	-77.55000862	Public	No FEMA Flood Zone	Low
1183	Government Service Office Community	Holly Ridge Town Hall	34.49490454	-77.55011652	Public	No FEMA Flood Zone	Low

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1185	Public Safety/ Emergency Service/ Fire Station	Holly Ridge Volunteer Fire & Rescue	34.49648177	-77.55430496	Private	No FEMA Flood Zone	Medium
1193	Water/Sewer	Holly Ridge Wastewater Treatment Plant	34.49972888	-77.53695196	Public	No FEMA Flood Zone	High
1193	Generator	Holly Ridge Wastewater Treatment Plant	34.49952583	-77.53693799	Public	No FEMA Flood Zone	Low
1273	Natural Asset	Holly Shelter Game Land	34.4951569	-77.63449239	Public	100-year	
1154	Lift Station	Homeplace	34.48412963	-77.56518797	Public	No FEMA Flood Zone	Low
1157	Economic	J&J Snacks	34.49608964	-77.5497106	Private	No FEMA Flood Zone	Very Low
1157	Economic	J&J Snacks	34.49586084	-77.54984249	Private	No FEMA Flood Zone	Very Low
1157	Economic	J&J Snacks	34.49590594	-77.54888508	Private	No FEMA Flood Zone	Very Low
1181	Lift Station	Jenkins Lift Station	34.49094614	-77.55315023	Public	100-year	High
1149	Lift Station	Lake Catherine Drive	34.48890128	-77.49008037	Public	No FEMA Flood Zone	Low
1150	Lift Station	Lake Willow Way	34.4860719	-77.48426532	Public	100-year	High
1195	Place of Worship	Liberty Baptist Church	34.47931745	-77.56836224	Private	No FEMA Flood Zone	Very Low
1023	Day Care	Little Pirates Daycare	34.46816773	-77.55929574	Private	No FEMA Flood Zone	Very Low
1004	Mobile Home Park	Mobile Home Park - #2	34.44703183	-77.56052422	Private	No FEMA Flood Zone	Medium
1006	Mobile Home Park	Mobile Home Park - #2	34.44435195	-77.55908492	Private	No FEMA Flood Zone	Medium
1007	Mobile Home Park	Mobile Home Park - #2	34.44468714	-77.55882309	Public	No FEMA Flood Zone	Medium
1009	Mobile Home Park	Mobile Home Park - #2	34.44584775	-77.55978892	Private	No FEMA Flood Zone	Medium
1020	Mobile Home Park	Mobile Home Park - #2	34.44321932	-77.5587115	Private	No FEMA Flood Zone	Medium
1020	Mobile Home Park	Mobile Home Park - #2	34.44361264	-77.55887911	Private	No FEMA Flood Zone	Medium
1020	Mobile Home Park	Mobile Home Park - #2	34.44367954	-77.55860012	Private	No FEMA Flood Zone	Medium
1020	Mobile Home Park	Mobile Home Park - #2	34.44381194	-77.55829722	Private	No FEMA Flood Zone	Medium
1020	Mobile Home Park	Mobile Home Park - #2	34.44372703	-77.55798967	Private	No FEMA Flood Zone	Medium
1002	Mobile Home Park	Mobile Home Park - #3	34.44209476	-77.5605203	Private	No FEMA Flood Zone	Medium
1019	Mobile Home Park	Mobile Home Park - #3	34.44258507	-77.5608409	Private	No FEMA Flood Zone	Medium
1001	Mobile Home Park	Mobile Home Park - Batts Rd.	34.43662117	-77.56082254	Private	100-year	High
1153	Mobile Home Park	Mobile Home Park - Dyson St	34.49126065	-77.5573502	Private	No FEMA Flood Zone	Medium



Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1162	Mobile Home Park	Mobile Home Park - Dyson St	34.49194129	-77.55526156	Private	No FEMA Flood Zone	Medium
1172	Mobile Home Park	Mobile Home Park - Dyson St	34.49089565	-77.55673929	Private	No FEMA Flood Zone	Medium
1173	Mobile Home Park	Mobile Home Park - Dyson St	34.49117592	-77.55449294	Private	No FEMA Flood Zone	Medium
1196	Mobile Home Park	Mobile Home Park - Dyson St	34.49135609	-77.5572134	Private	No FEMA Flood Zone	Medium
1197	Mobile Home Park	Mobile Home Park - Dyson St	34.49144807	-77.55708157	Private	No FEMA Flood Zone	Medium
1198	Mobile Home Park	Mobile Home Park - Dyson St	34.49153886	-77.55694872	Private	No FEMA Flood Zone	Medium
1199	Mobile Home Park	Mobile Home Park - Dyson St	34.49163542	-77.5568175	Private	No FEMA Flood Zone	Medium
1200	Mobile Home Park	Mobile Home Park - Dyson St	34.49172327	-77.55668781	Private	No FEMA Flood Zone	Medium
1201	Mobile Home Park	Mobile Home Park - Dyson St	34.49181372	-77.55656503	Private	No FEMA Flood Zone	Medium
1202	Mobile Home Park	Mobile Home Park - Dyson St	34.49189968	-77.55643462	Private	No FEMA Flood Zone	Medium
1203	Mobile Home Park	Mobile Home Park - Dyson St	34.49198878	-77.55631019	Private	No FEMA Flood Zone	Medium
1204	Mobile Home Park	Mobile Home Park - Dyson St	34.49207508	-77.5561816	Private	No FEMA Flood Zone	Medium
1205	Mobile Home Park	Mobile Home Park - Dyson St	34.49218104	-77.55604679	Private	No FEMA Flood Zone	Medium
1206	Mobile Home Park	Mobile Home Park - Dyson St	34.49238558	-77.55575909	Private	No FEMA Flood Zone	Medium
1207	Mobile Home Park	Mobile Home Park - Dyson St	34.49247244	-77.55563053	Private	No FEMA Flood Zone	Medium
1208	Mobile Home Park	Mobile Home Park - Dyson St	34.49256147	-77.55550354	Private	No FEMA Flood Zone	Medium
1209	Mobile Home Park	Mobile Home Park - Dyson St	34.49265047	-77.55537663	Private	No FEMA Flood Zone	Medium
1210	Mobile Home Park	Mobile Home Park - Dyson St	34.49271456	-77.55503919	Private	No FEMA Flood Zone	Medium
1211	Mobile Home Park	Mobile Home Park - Dyson St	34.49099628	-77.55660089	Private	No FEMA Flood Zone	Medium
1212	Mobile Home Park	Mobile Home Park - Dyson St	34.49108639	-77.55647087	Private	No FEMA Flood Zone	Medium
1213	Mobile Home Park	Mobile Home Park - Dyson St	34.49119722	-77.55631304	Private	100/500-year	High
1214	Mobile Home Park	Mobile Home Park - Dyson St	34.49133167	-77.55612575	Private	100/500-year	High
1215	Mobile Home Park	Mobile Home Park - Dyson St	34.49144365	-77.55596813	Private	No FEMA Flood Zone	Medium
1216	Mobile Home Park	Mobile Home Park - Dyson St	34.49153252	-77.55584337	Private	No FEMA Flood Zone	Medium
1217	Mobile Home Park	Mobile Home Park - Dyson St	34.49162134	-77.55571758	Private	No FEMA Flood Zone	Medium
1218	Mobile Home Park	Mobile Home Park - Dyson St	34.49171958	-77.55557824	Private	No FEMA Flood Zone	Medium
1219	Mobile Home Park	Mobile Home Park - Dyson St	34.49058337	-77.55641737	Private	100/500-year	High
1220	Mobile Home Park	Mobile Home Park - Dyson St	34.49068395	-77.55627604	Private	500-year	Medium
1221	Mobile Home Park	Mobile Home Park - Dyson St	34.49077478	-77.55615143	Private	100/500-year	High
1222	Mobile Home Park	Mobile Home Park - Dyson St	34.49088397	-77.5559904	Private	100/500-year	High

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1223	Mobile Home Park	Mobile Home Park - Dyson St	34.49102009	-77.55580138	Private	100/500-year	High
1224	Mobile Home Park	Mobile Home Park - Dyson St	34.49113137	-77.55564277	Private	No FEMA Flood Zone	Medium
1225	Mobile Home Park	Mobile Home Park - Dyson St	34.491221	-77.5555188	Private	No FEMA Flood Zone	Medium
1226	Mobile Home Park	Mobile Home Park - Dyson St	34.49130918	-77.55539399	Private	No FEMA Flood Zone	Medium
1227	Mobile Home Park	Mobile Home Park - Dyson St	34.49140613	-77.55525691	Private	No FEMA Flood Zone	Medium
1228	Mobile Home Park	Mobile Home Park - Dyson St	34.49204594	-77.55510871	Private	No FEMA Flood Zone	Medium
1229	Mobile Home Park	Mobile Home Park - Dyson St	34.49213671	-77.55498351	Private	No FEMA Flood Zone	Medium
1230	Mobile Home Park	Mobile Home Park - Dyson St	34.49222495	-77.55485287	Private	No FEMA Flood Zone	Medium
1231	Mobile Home Park	Mobile Home Park - Dyson St	34.49231105	-77.55472572	Private	No FEMA Flood Zone	Medium
1232	Mobile Home Park	Mobile Home Park - Dyson St	34.49241193	-77.55458247	Private	No FEMA Flood Zone	Medium
1233	Mobile Home Park	Mobile Home Park - Dyson St	34.49162321	-77.5549423	Private	No FEMA Flood Zone	Medium
1234	Mobile Home Park	Mobile Home Park - Dyson St	34.49172871	-77.55478825	Private	No FEMA Flood Zone	Medium
1235	Mobile Home Park	Mobile Home Park - Dyson St	34.49181852	-77.55466191	Private	No FEMA Flood Zone	Medium
1236	Mobile Home Park	Mobile Home Park - Dyson St	34.49190728	-77.55453634	Private	No FEMA Flood Zone	Medium
1237	Mobile Home Park	Mobile Home Park - Dyson St	34.49199391	-77.55440543	Private	No FEMA Flood Zone	Medium
1238	Mobile Home Park	Mobile Home Park - Dyson St	34.49209774	-77.55426381	Private	No FEMA Flood Zone	Medium
1239	Mobile Home Park	Mobile Home Park - Dyson St	34.49007272	-77.55567048	Private	100-year	High
1240	Mobile Home Park	Mobile Home Park - Dyson St	34.49015673	-77.55553333	Private	100-year	High
1241	Mobile Home Park	Mobile Home Park - Dyson St	34.49032021	-77.55545441	Private	100-year	High
1242	Mobile Home Park	Mobile Home Park - Dyson St	34.49056981	-77.55535553	Private	100/500-year	High
1243	Mobile Home Park	Mobile Home Park - Dyson St	34.49067918	-77.55519853	Private	100/500-year	High
1244	Mobile Home Park	Mobile Home Park - Dyson St	34.49076913	-77.5550724	Private	100/500-year	High
1245	Mobile Home Park	Mobile Home Park - Dyson St	34.49085814	-77.55494529	Private	500-year	Medium
1246	Mobile Home Park	Mobile Home Park - Dyson St	34.4909574	-77.55480814	Private	No FEMA Flood Zone	Medium
1247	Mobile Home Park	Mobile Home Park - Dyson St	34.49036292	-77.55486916	Private	100-year	High
1248	Mobile Home Park	Mobile Home Park - Dyson St	34.49045102	-77.55474251	Private	100/500-year	High
1249	Mobile Home Park	Mobile Home Park - Dyson St	34.49054049	-77.55461551	Private	100/500-year	High
1250	Mobile Home Park	Mobile Home Park - Dyson St	34.49063809	-77.55448119	Private	100/500-year	High
1251	Mobile Home Park	Mobile Home Park - Dyson St	34.49127914	-77.55434299	Private	No FEMA Flood Zone	Medium
1252	Mobile Home Park	Mobile Home Park - Dyson St	34.49136892	-77.55421906	Private	No FEMA Flood Zone	Medium



Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1253	Mobile Home Park	Mobile Home Park - Dyson St	34.49145794	-77.5540897	Private	No FEMA Flood Zone	Medium
1254	Mobile Home Park	Mobile Home Park - Dyson St	34.49154781	-77.55396182	Private	No FEMA Flood Zone	Medium
1255	Mobile Home Park	Mobile Home Park - Dyson St	34.49165026	-77.55381504	Private	No FEMA Flood Zone	Medium
1256	Mobile Home Park	Mobile Home Park - Dyson St	34.4908548	-77.55417092	Private	100/500-year	High
1257	Mobile Home Park	Mobile Home Park - Dyson St	34.49095908	-77.55402081	Private	100/500-year	High
1258	Mobile Home Park	Mobile Home Park - Dyson St	34.49104938	-77.55389679	Private	100/500-year	High
1259	Mobile Home Park	Mobile Home Park - Dyson St	34.49113811	-77.55377034	Private	100/500-year	High
1260	Mobile Home Park	Mobile Home Park - Dyson St	34.49122738	-77.55364153	Private	No FEMA Flood Zone	Medium
1261	Mobile Home Park	Mobile Home Park - Dyson St	34.49133086	-77.55349485	Private	100/500-year	High
1158	Mobile Home Park	Mobile Home Park - Holly St	34.4976446	-77.55375339	Private	No FEMA Flood Zone	Medium
1164	Mobile Home Park	Mobile Home Park - Holly St	34.49733463	-77.55331246	Private	No FEMA Flood Zone	Medium
1178	Mobile Home Park	Mobile Home Park - Holly St	34.49727789	-77.55421641	Private	No FEMA Flood Zone	Medium
1263	Mobile Home Park	Mobile Home Park - Holly St	34.49698645	-77.55467514	Private	No FEMA Flood Zone	Medium
1021	Mobile Home Park	Mobile Home Park - Mill Creek	34.45556503	-77.54125367	Private	No FEMA Flood Zone	Medium
1024	Mobile Home Park	Mobile Home Park - Mill Creek	34.45654975	-77.54250544	Private	No FEMA Flood Zone	Medium
1025	Mobile Home Park	Mobile Home Park - Mill Creek	34.45628052	-77.54217289	Private	No FEMA Flood Zone	Medium
1026	Mobile Home Park	Mobile Home Park - Mill Creek	34.45641008	-77.54233533	Private	No FEMA Flood Zone	Medium
1027	Mobile Home Park	Mobile Home Park - Mill Creek	34.45678585	-77.54217197	Private	No FEMA Flood Zone	Medium
1028	Mobile Home Park	Mobile Home Park - Mill Creek	34.45616363	-77.54201739	Private	No FEMA Flood Zone	Medium
1029	Mobile Home Park	Mobile Home Park - Mill Creek	34.45604331	-77.54186559	Private	No FEMA Flood Zone	Medium
1030	Mobile Home Park	Mobile Home Park - Mill Creek	34.45593013	-77.541721	Private	No FEMA Flood Zone	Medium
1031	Mobile Home Park	Mobile Home Park - Mill Creek	34.45666796	-77.54199993	Private	No FEMA Flood Zone	Medium
1032	Mobile Home Park	Mobile Home Park - Mill Creek	34.45654164	-77.54184798	Private	No FEMA Flood Zone	Medium
1033	Mobile Home Park	Mobile Home Park - Mill Creek	34.45642565	-77.54170238	Private	No FEMA Flood Zone	Medium
1034	Mobile Home Park	Mobile Home Park - Mill Creek	34.45703048	-77.54167954	Private	No FEMA Flood Zone	Medium
1035	Mobile Home Park	Mobile Home Park - Mill Creek	34.45570495	-77.54143227	Private	No FEMA Flood Zone	Medium
1036	Mobile Home Park	Mobile Home Park - Mill Creek	34.45582187	-77.54158059	Private	No FEMA Flood Zone	Medium
1037	Mobile Home Park	Mobile Home Park - Mill Creek	34.45630384	-77.54155256	Private	No FEMA Flood Zone	Medium
1038	Mobile Home Park	Mobile Home Park - Mill Creek	34.45618808	-77.54141193	Private	No FEMA Flood Zone	Medium
1039	Mobile Home Park	Mobile Home Park - Mill Creek	34.45690429	-77.54153335	Private	No FEMA Flood Zone	Medium

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1040	Mobile Home Park	Mobile Home Park - Mill Creek	34.4567826	-77.541392	Private	No FEMA Flood Zone	Medium
1041	Mobile Home Park	Mobile Home Park - Mill Creek	34.45722933	-77.54140657	Private	No FEMA Flood Zone	Medium
1042	Mobile Home Park	Mobile Home Park - Mill Creek	34.45595761	-77.54112911	Private	No FEMA Flood Zone	Medium
1043	Mobile Home Park	Mobile Home Park - Mill Creek	34.45607686	-77.54127516	Private	No FEMA Flood Zone	Medium
1044	Mobile Home Park	Mobile Home Park - Mill Creek	34.45648179	-77.5410454	Private	No FEMA Flood Zone	Medium
1045	Mobile Home Park	Mobile Home Park - Mill Creek	34.45663062	-77.5412158	Private	No FEMA Flood Zone	Medium
1046	Mobile Home Park	Mobile Home Park - Mill Creek	34.4571123	-77.54128879	Private	No FEMA Flood Zone	Medium
1047	Mobile Home Park	Mobile Home Park - Mill Creek	34.45693532	-77.54111473	Private	No FEMA Flood Zone	Medium
1048	Mobile Home Park	Mobile Home Park - Mill Creek	34.45581654	-77.54095807	Private	No FEMA Flood Zone	Medium
1049	Mobile Home Park	Mobile Home Park - Mill Creek	34.45624849	-77.54077624	Private	No FEMA Flood Zone	Medium
1050	Mobile Home Park	Mobile Home Park - Mill Creek	34.45636887	-77.54091634	Private	No FEMA Flood Zone	Medium
1051	Mobile Home Park	Mobile Home Park - Mill Creek	34.45679745	-77.5409134	Private	No FEMA Flood Zone	Medium
1052	Mobile Home Park	Mobile Home Park - Mill Creek	34.45672726	-77.54072723	Private	No FEMA Flood Zone	Medium
1053	Mobile Home Park	Mobile Home Park - Mill Creek	34.45734856	-77.54076267	Private	No FEMA Flood Zone	Medium
1054	Mobile Home Park	Mobile Home Park - Mill Creek	34.45785976	-77.54096916	Private	No FEMA Flood Zone	Medium
1055	Mobile Home Park	Mobile Home Park - Mill Creek	34.45794748	-77.54075067	Private	No FEMA Flood Zone	Medium
1056	Mobile Home Park	Mobile Home Park - Mill Creek	34.45598183	-77.54047101	Private	No FEMA Flood Zone	Medium
1057	Mobile Home Park	Mobile Home Park - Mill Creek	34.45611446	-77.5406245	Private	No FEMA Flood Zone	Medium
1058	Mobile Home Park	Mobile Home Park - Mill Creek	34.4566292	-77.54059279	Private	No FEMA Flood Zone	Medium
1059	Mobile Home Park	Mobile Home Park - Mill Creek	34.45651608	-77.54044888	Private	No FEMA Flood Zone	Medium
1060	Mobile Home Park	Mobile Home Park - Mill Creek	34.45714141	-77.5405217	Private	No FEMA Flood Zone	Medium
1061	Mobile Home Park	Mobile Home Park - Mill Creek	34.45766739	-77.54039716	Private	No FEMA Flood Zone	Medium
1062	Mobile Home Park	Mobile Home Park - Mill Creek	34.45802104	-77.54053475	Private	No FEMA Flood Zone	Medium
1063	Mobile Home Park	Mobile Home Park - Mill Creek	34.45626622	-77.54013715	Private	No FEMA Flood Zone	Medium
1064	Mobile Home Park	Mobile Home Park - Mill Creek	34.45639035	-77.54029251	Private	No FEMA Flood Zone	Medium
1065	Mobile Home Park	Mobile Home Park - Mill Creek	34.45706214	-77.54030895	Private	No FEMA Flood Zone	Medium
1066	Mobile Home Park	Mobile Home Park - Mill Creek	34.45695281	-77.5401617	Private	No FEMA Flood Zone	Medium
1067	Mobile Home Park	Mobile Home Park - Mill Creek	34.4575609	-77.54022405	Private	No FEMA Flood Zone	Medium
1068	Mobile Home Park	Mobile Home Park - Mill Creek	34.45743	-77.5400717	Private	No FEMA Flood Zone	Medium
1069	Mobile Home Park	Mobile Home Park - Mill Creek	34.45799097	-77.54018437	Private	No FEMA Flood Zone	Medium



Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1070	Mobile Home Park	Mobile Home Park - Mill Creek	34.45656118	-77.53966299	Private	No FEMA Flood Zone	Medium
1071	Mobile Home Park	Mobile Home Park - Mill Creek	34.45683347	-77.54001071	Private	No FEMA Flood Zone	Medium
1072	Mobile Home Park	Mobile Home Park - Mill Creek	34.45669959	-77.53983825	Private	No FEMA Flood Zone	Medium
1073	Mobile Home Park	Mobile Home Park - Mill Creek	34.45708321	-77.53967258	Private	No FEMA Flood Zone	Medium
1074	Mobile Home Park	Mobile Home Park - Mill Creek	34.45730804	-77.53993295	Private	No FEMA Flood Zone	Medium
1075	Mobile Home Park	Mobile Home Park - Mill Creek	34.45719869	-77.53980634	Private	No FEMA Flood Zone	Medium
1076	Mobile Home Park	Mobile Home Park - Mill Creek	34.4579696	-77.53981687	Private	No FEMA Flood Zone	Medium
1077	Mobile Home Park	Mobile Home Park - Mill Creek	34.45641387	-77.5394763	Private	No FEMA Flood Zone	Medium
1078	Mobile Home Park	Mobile Home Park - Mill Creek	34.45681452	-77.53934801	Private	No FEMA Flood Zone	Medium
1079	Mobile Home Park	Mobile Home Park - Mill Creek	34.45695267	-77.53951401	Private	No FEMA Flood Zone	Medium
1080	Mobile Home Park	Mobile Home Park - Mill Creek	34.45728715	-77.53915084	Private	No FEMA Flood Zone	Medium
1081	Mobile Home Park	Mobile Home Park - Mill Creek	34.45750437	-77.53945307	Private	No FEMA Flood Zone	Medium
1082	Mobile Home Park	Mobile Home Park - Mill Creek	34.45793522	-77.53949681	Private	No FEMA Flood Zone	Medium
1083	Mobile Home Park	Mobile Home Park - Mill Creek	34.45666815	-77.53917177	Private	No FEMA Flood Zone	Medium
1084	Mobile Home Park	Mobile Home Park - Mill Creek	34.45715195	-77.53898567	Private	No FEMA Flood Zone	Medium
1085	Mobile Home Park	Mobile Home Park - Mill Creek	34.45701676	-77.5388205	Private	No FEMA Flood Zone	Medium
1086	Mobile Home Park	Mobile Home Park - Mill Creek	34.45757963	-77.53894183	Private	No FEMA Flood Zone	Medium
1087	Mobile Home Park	Mobile Home Park - Mill Creek	34.45768007	-77.53908368	Private	No FEMA Flood Zone	Medium
1088	Mobile Home Park	Mobile Home Park - Mill Creek	34.45798865	-77.5393279	Private	No FEMA Flood Zone	Medium
1089	Mobile Home Park	Mobile Home Park - Mill Creek	34.45806891	-77.53918732	Private	No FEMA Flood Zone	Medium
1090	Mobile Home Park	Mobile Home Park - Mill Creek	34.45688156	-77.53865533	Private	No FEMA Flood Zone	Medium
1091	Mobile Home Park	Mobile Home Park - Mill Creek	34.45672682	-77.53851348	Private	No FEMA Flood Zone	Medium
1092	Mobile Home Park	Mobile Home Park - Mill Creek	34.45728992	-77.5385879	Private	No FEMA Flood Zone	Medium
1093	Mobile Home Park	Mobile Home Park - Mill Creek	34.45748306	-77.53882385	Private	No FEMA Flood Zone	Medium
1094	Mobile Home Park	Mobile Home Park - Mill Creek	34.45738649	-77.53870587	Private	No FEMA Flood Zone	Medium
1095	Mobile Home Park	Mobile Home Park - Mill Creek	34.45798232	-77.53872565	Private	No FEMA Flood Zone	Medium
1096	Mobile Home Park	Mobile Home Park - Mill Creek	34.45659162	-77.53834832	Private	100-year	High
1097	Mobile Home Park	Mobile Home Park - Mill Creek	34.45696135	-77.53823369	Private	No FEMA Flood Zone	Medium
1098	Mobile Home Park	Mobile Home Park - Mill Creek	34.45719335	-77.53846992	Private	No FEMA Flood Zone	Medium
1099	Mobile Home Park	Mobile Home Park - Mill Creek	34.45709678	-77.53835194	Private	No FEMA Flood Zone	Medium

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1100	Mobile Home Park	Mobile Home Park - Mill Creek	34.45760208	-77.53826134	Private	No FEMA Flood Zone	Medium
1101	Mobile Home Park	Mobile Home Park - Mill Creek	34.45789182	-77.53861549	Private	No FEMA Flood Zone	Medium
1102	Mobile Home Park	Mobile Home Park - Mill Creek	34.45779522	-77.53849729	Private	No FEMA Flood Zone	Medium
1103	Mobile Home Park	Mobile Home Park - Mill Creek	34.45769865	-77.53837932	Private	No FEMA Flood Zone	Medium
1104	Mobile Home Park	Mobile Home Park - Mill Creek	34.45818121	-77.53849303	Private	No FEMA Flood Zone	Medium
1105	Mobile Home Park	Mobile Home Park - Mill Creek	34.45808723	-77.5383821	Private	No FEMA Flood Zone	Medium
1106	Mobile Home Park	Mobile Home Park - Mill Creek	34.45682615	-77.53806852	Private	100-year	High
1107	Mobile Home Park	Mobile Home Park - Mill Creek	34.45731237	-77.53790741	Private	No FEMA Flood Zone	Medium
1108	Mobile Home Park	Mobile Home Park - Mill Creek	34.45750551	-77.53814336	Private	No FEMA Flood Zone	Medium
1109	Mobile Home Park	Mobile Home Park - Mill Creek	34.45740894	-77.53802538	Private	No FEMA Flood Zone	Medium
1110	Mobile Home Park	Mobile Home Park - Mill Creek	34.45779753	-77.53802817	Private	No FEMA Flood Zone	Medium
1111	Mobile Home Park	Mobile Home Park - Mill Creek	34.45799066	-77.53826413	Private	No FEMA Flood Zone	Medium
1112	Mobile Home Park	Mobile Home Park - Mill Creek	34.45789409	-77.53814615	Private	No FEMA Flood Zone	Medium
1113	Mobile Home Park	Mobile Home Park - Mill Creek	34.4572158	-77.53778943	Private	No FEMA Flood Zone	Medium
1114	Mobile Home Park	Mobile Home Park - Mill Creek	34.457109	-77.53762506	Private	100-year	High
1115	Mobile Home Park	Mobile Home Park - Mill Creek	34.45750898	-77.53767277	Private	No FEMA Flood Zone	Medium
1116	Mobile Home Park	Mobile Home Park - Mill Creek	34.45770116	-77.53790985	Private	No FEMA Flood Zone	Medium
1117	Mobile Home Park	Mobile Home Park - Mill Creek	34.45760507	-77.53779131	Private	No FEMA Flood Zone	Medium
1118	Mobile Home Park	Mobile Home Park - Mill Creek	34.45818726	-77.53779639	Private	100-year	High
1119	Mobile Home Park	Mobile Home Park - Mill Creek	34.45809165	-77.53767958	Private	No FEMA Flood Zone	Medium
1120	Mobile Home Park	Mobile Home Park - Mill Creek	34.45700381	-77.53743606	Private	100-year	High
1121	Mobile Home Park	Mobile Home Park - Mill Creek	34.45686861	-77.53727089	Private	100-year	High
1122	Mobile Home Park	Mobile Home Park - Mill Creek	34.45741289	-77.53755422	Private	No FEMA Flood Zone	Medium
1123	Mobile Home Park	Mobile Home Park - Mill Creek	34.4573168	-77.53743568	Private	No FEMA Flood Zone	Medium
1124	Mobile Home Park	Mobile Home Park - Mill Creek	34.4579023	-77.53744483	Private	No FEMA Flood Zone	Medium
1125	Mobile Home Park	Mobile Home Park - Mill Creek	34.45780669	-77.53732572	Private	No FEMA Flood Zone	Medium
1126	Mobile Home Park	Mobile Home Park - Mill Creek	34.45799689	-77.53756345	Private	No FEMA Flood Zone	Medium
1127	Mobile Home Park	Mobile Home Park - Mill Creek	34.45673342	-77.53710572	Private	100-year	High
1128	Mobile Home Park	Mobile Home Park - Mill Creek	34.4570766	-77.53704611	Private	100-year	High
1129	Mobile Home Park	Mobile Home Park - Mill Creek	34.4572685	-77.53695326	Private	100-year	High



Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1130	Mobile Home Park	Mobile Home Park - Mill Creek	34.45762372	-77.53708897	Private	100-year	High
1131	Mobile Home Park	Mobile Home Park - Mill Creek	34.45748879	-77.53697094	Private	100-year	High
1132	Mobile Home Park	Mobile Home Park - Mill Creek	34.45771108	-77.53720661	Private	100-year	High
1133	Mobile Home Park	Mobile Home Park - Mill Creek	34.45816787	-77.53907319	Private	No FEMA Flood Zone	Medium
1134	Mobile Home Park	Mobile Home Park - Mill Creek	34.45826838	-77.53896001	Private	No FEMA Flood Zone	Medium
1135	Mobile Home Park	Mobile Home Park - Mill Creek	34.45836871	-77.53884667	Private	No FEMA Flood Zone	Medium
1136	Mobile Home Park	Mobile Home Park - Mill Creek	34.45846904	-77.53873333	Private	No FEMA Flood Zone	Medium
1137	Mobile Home Park	Mobile Home Park - Mill Creek	34.45856937	-77.53861999	Private	No FEMA Flood Zone	Medium
1138	Mobile Home Park	Mobile Home Park - Mill Creek	34.45867045	-77.53850848	Private	No FEMA Flood Zone	Medium
1139	Mobile Home Park	Mobile Home Park - Mill Creek	34.45847697	-77.53815033	Private	No FEMA Flood Zone	Medium
1140	Mobile Home Park	Mobile Home Park - Mill Creek	34.4583804	-77.53803235	Private	No FEMA Flood Zone	Medium
1141	Mobile Home Park	Mobile Home Park - Mill Creek	34.45828383	-77.53791437	Private	100-year	High
1022	Mobile Home Park	Mobile Home Park - NC 50	34.46431391	-77.56240374	Private	No FEMA Flood Zone	Medium
1010	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43386516	-77.55535628	Private	100-year	High
1011	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43421726	-77.55528372	Private	100-year	High
1012	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43406629	-77.55510661	Private	100-year	High
1013	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43391543	-77.55492959	Private	100-year	High
1014	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43425674	-77.55487515	Private	100-year	High
1015	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43444708	-77.55464306	Private	100-year	High
1017	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43497525	-77.5540142	Private	100-year	High
1018	Mobile Home Park	Mobile Home Park - Roland Ave.	34.43419756	-77.55330482	Private	100-year	High

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1171	Natural Asset	NC Land And Water Fund Project	34.50425374	-77.51406491	Public	100/500-year	
1177	Place of Worship	New Life Christian Center	34.47425941	-77.5587962	Private	No FEMA Flood Zone	Very Low
1175	Natural Asset	North Carolina Coastal Federation Preserve - Morris Landing	34.47208562	-77.50895858	Public	100/500-year	
1266	Place of Worship	North Topsail Shores Baptist Church	34.52433868	-77.45088691	Private	No FEMA Flood Zone	Very Low
1155	Natural Asset	Onslow Water & Sewer Authority	34.50718999	-77.57085162	Public	100-year	
1165	Natural Asset	Onslow Water & Sewer Authority	34.50383026	-77.58056085	Public	100-year	
1274	Natural Asset	Onslow Water & Sewer Authority	34.52297239	-77.50874711	Public	No FEMA Flood Zone	
1186	Place of Worship	Providence Baptist Church	34.49176855	-77.55146033	Private	No FEMA Flood Zone	Very Low
1156	Mobile Home Park	RV Park	34.48137715	-77.55742513	Private	No FEMA Flood Zone	Medium
1264	Mobile Home Park	RV Park	34.48102112	-77.55725344	Private	No FEMA Flood Zone	Medium
1143	Lift Station	Sage	34.4873902	-77.56331047	Public	No FEMA Flood Zone	Low
1272	Natural Asset	Sages Ridge Preserve	34.48206223	-77.59032386	Public	100-year	
1179	Place of Worship	Sneads Ferry Presbyterian Church	34.55690192	-77.44647892	Private	No FEMA Flood Zone	Very Low
1160	Provisions	Speedway	34.49861502	-77.54938457	Private	No FEMA Flood Zone	Medium
1160	Provisions	Speedway	34.49875397	-77.54949357	Private	No FEMA Flood Zone	Medium
1170	Lift Station	Spicer Lake Drive	34.48630102	-77.49141743	Private	No FEMA Flood Zone	Low
1187	Place of Worship	St Philips Episcopal Church	34.49250639	-77.47798586	Private	No FEMA Flood Zone	Very Low
1187	Place of Worship	St Philips Episcopal Church	34.4924721	-77.47827088	Private	No FEMA Flood Zone	Very Low
1174	Natural Asset	Stones Creek Game Land Dedicated Nature Preserve	34.51173482	-77.50549532	Public	100/500-year	
1262	Place of Worship	Stump Sound Church	34.49338727	-77.53892529	Private	No FEMA Flood Zone	Very Low



Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1270	Natural Asset	Stump Sound Outstanding Resource Water	34.46472409	-77.50494673	Public	100/500-year	
1144	Lift Station	Summerhouse1	34.49174444	-77.50449754	Public	500-year	Medium
1145	Lift Station	Summerhouse2	34.4963604	-77.49631236	Public	No FEMA Flood Zone	Low
1146	Lift Station	Summerhouse3	34.49054049	-77.48796462	Public	No FEMA Flood Zone	Low
1147	Lift Station	Summerhouse4	34.48235632	-77.48995957	Public	100-year	High
1148	Lift Station	Summerhouse5	34.48271604	-77.48744369	Public	100-year	High
1005	Health Service	Surf City Urgent Care And Family Medicine	34.44840712	-77.56180541	Private	No FEMA Flood Zone	Medium
1194	Water/Sewer	Surf City Wastewater Treatment Plant	34.47928115	-77.54701332	Public	100/500-year	High
1152	Lift Station	The Reserves	34.47752315	-77.55752045	Public	No FEMA Flood Zone	Low
1192	Day Care	Topsail Tots Christian Preschool	34.47521147	-77.55850418	Private	No FEMA Flood Zone	Very Low
1192	Day Care	Topsail Tots Christian Preschool	34.47569828	-77.55833262	Private	No FEMA Flood Zone	Very Low
1192	Day Care	Topsail Tots Christian Preschool	34.47564677	-77.55814616	Private	No FEMA Flood Zone	Very Low
1192	Day Care	Topsail Tots Christian Preschool	34.47545425	-77.55844828	Private	No FEMA Flood Zone	Very Low
1267	Natural Asset	Town of Holly Ridge Open Space	34.5111714	-77.49979286	Public	No FEMA Flood Zone	
1180	Natural Asset	Town of North Topsail Beach Open Space	34.51541293	-77.49322603	Private	No FEMA Flood Zone	
1182	Lift Station	Trout Lift Station	34.48521494	-77.55060902	Public	No FEMA Flood Zone	Low
1182	Generator	Trout Pump Station Portable	34.48519589	-77.55057619	Public	No FEMA Flood Zone	Low
1191	Public Safety/ Emergency Service/ Fire Station	Turkey Creek Fire And Rescue Station 1	34.52459683	-77.47611963	Public	No FEMA Flood Zone	Medium

Asset ID	Asset Type	Asset Name	Lat	Long	Ownership (Private/Public)	Floodzone Exposure	Overall Vulnerability
1176	Community Government Service Office	United State Postal Service	34.49825248	-77.55219697	Private	No FEMA Flood Zone	Low
1176	Community Government Service Office	United State Postal Service	34.49839658	-77.55231599	Private	No FEMA Flood Zone	Low
1167	Place of Worship	Victory Baptist Church	34.4954901	-77.55154174	Private	No FEMA Flood Zone	Very Low



