

CHAPTER IV ATLANTIC COAST CASE STUDIES

Introduction

To varying degrees, each of the case study cities—Elizabeth City, North Carolina; Alexandria, Virginia; and St. Augustine, Florida—currently apply adaptations to mitigate flooding, erosion, and storm surges. Due to low-lying locations along tidal estuaries on the Atlantic coast, they are vulnerable to the projected effects of sea level rise. The natural hazards these cities face today will worsen as sea level rise incrementally reaches one meter by 2100.

As some of the earliest settlements along the Atlantic coast, the case study sites include historically and culturally significant properties representing early development in the United States. Historic districts have been documented in each city and are listed in the National Register or Historic Places. All representative historic districts prominently define the areas' character, contributing to quality of life.

For each case study, I will document the development history and describe the historic districts. The chapter will continue with an analysis of current risks. Future risks are mapped for 2050 at 42 centimeters and for 2100 at one meter. Each case study evaluation will conclude with an examination of implemented and proposed adaptations and the decision-makers and stakeholders involved.

Elizabeth City, North Carolina

Elizabeth City, North Carolina was founded in 1793 along the banks of the Albemarle Sound, a tidal estuary sheltered from the Atlantic Ocean by the Outer Banks barrier islands. The city is the county seat for Pasquotank County and is located at the “narrows” of the Pasquotank River. (Fig. 1) Sea level rise is projected to have an effect on the city since it is sited at elevations ranging from three to fifteen meters above sea level.¹ Six National Register historic districts are located in close proximity to each other, within the densely developed city.



Fig. 1. Low-lying Elizabeth City, North Carolina is sited at the “Narrows” of the Pasquotank River. Pasquotank County’s population and building density are highest in Elizabeth City. Wetlands, forests, and agricultural land dominate the landscape.

[Photograph from City of Elizabeth City, North Carolina, 2013, <http://www.cityofec.com/>]

Lush forests and fertile agricultural land drew lumberman and farmers to the Elizabeth City areas in early colonial times. The city was not incorporated until 1793 when construction began on the Great Dismal Swamp Canal. Seventy-seven lots were platted on fifty acres and established as the town of Redding. (Figure X) The town was renamed Elizabeth City in 1801. It has served as the county seat since 1800.² The development of the Great Dismal Swamp Canal influenced periods of rapid growth in Elizabeth City from its inception until the 1920s.³ Because of the city's geography

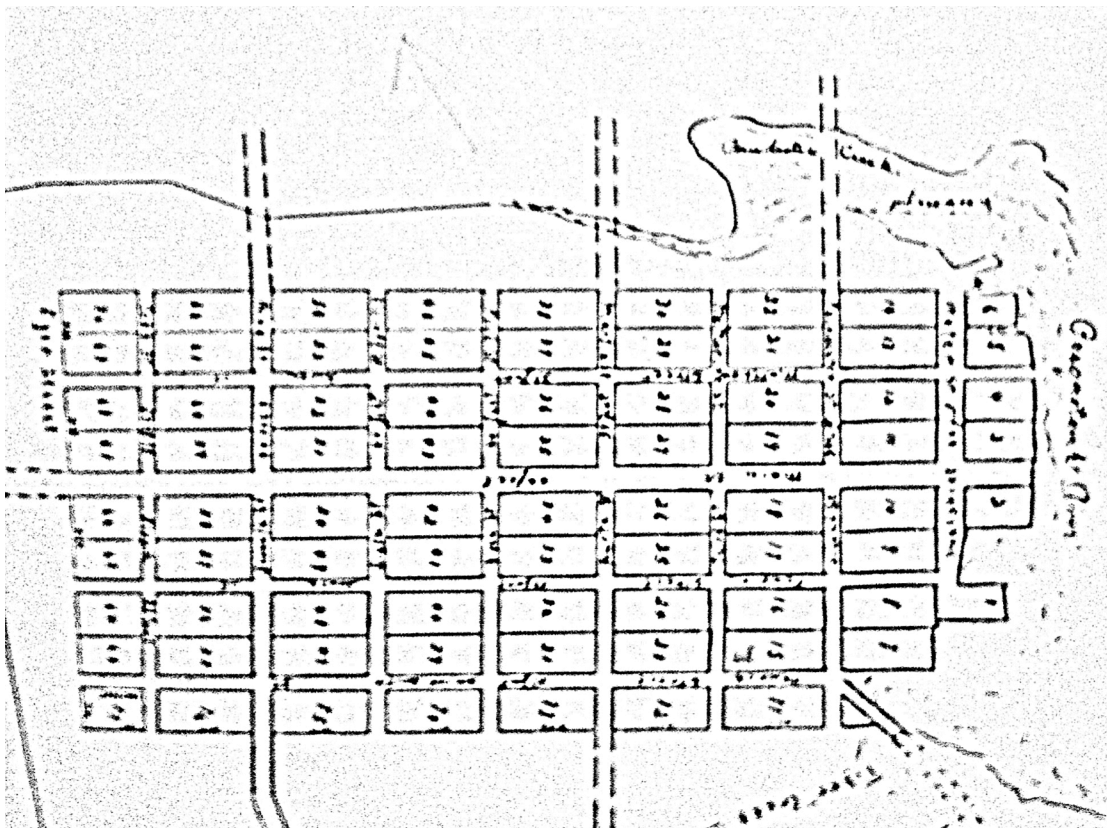


Fig. 2: The town of Redding, later Elizabeth City, was platted as a grid in 1793 on the Pasquotank River. This area remains the downtown center and is the core of the Elizabeth City Historic District. [from *Ante-Bellum Elizabeth City: The History of a Canal Town*, William A. Griffin, 1970]

dominated by water, the area lacked surface roads to northern trade markets. The city's harbor and the Pasquotank River, however, were too shallow to accommodate large trading ships. Smaller ships could travel the river to the Albemarle Sound, but then encountered the treacherous waters of the Outer Banks. The profitability of the agriculture and lumber industries was stifled by the lack of access to other regions.

Trading routes opened when the Great Dismal Swamp Canal was constructed to connect the Albemarle Sound with the Chesapeake Bay at Norfolk, Virginia. From the deep-water harbor at Norfolk, products from Elizabeth City were transported to Norfolk, Charleston, South Carolina, New York, and New England. Overseas routes to England and the West Indies also became destinations for goods produced in Pasquotank County.

The founding of Elizabeth City coincided with the year construction began on the Great Dismal Swamp. With each canal improvement, the population grew, buildings were constructed, and commercial prosperity. The city emerged as the region's trade center after completion of the canal in 1805.⁴ Stagecoach, steamboat, and rail lines advanced the city's position as a regional hub for social, political, and economic activity. Economic diversification and prosperity led residents to boast that Elizabeth City was the "Eastern Emporium of North Carolina, where . . . [purchasers] can be suited with a cambric needle to a sheet anchor."⁵ Industry and manufacturing developed in areas associated with fishing, shipping, and lumbering. Retail establishments opened to accommodate the rise in local incomes.⁶

Elizabeth City's economy stagnated during the Civil War and the post war period of Reconstruction. Recovery came in 1881 with the introduction of the Norfolk and Elizabeth City Railroad, taking the place of the canal as a means of commercial

transportation connecting to northern routes.⁷ At the same time, Daniel S. Kramer, a lumberman from Pennsylvania, formed a successful lumber and construction company that evolved into a major industrial employer.⁸ Rapid growth occurred up to the 1920s, with the population tripling between 1880 and 1900. Adjacent land was annexed for neighborhoods and for commercial and industrial enterprises.⁹ The present day city structure reflects Elizabeth City during the 1920s when it was the region's commercial and social center.¹⁰

Since then, the city gained new institutions and businesses that remain prominent employers today. The Coast Guard established a major base in 1938. Elizabeth City State University, College of the Albemarle, and Roanoke Bible College are located within the city. Service, government, and agriculture are the city's dominant economic sectors. The city aims to develop its tourism potential by showcasing the area's natural, cultural, and historic resources.¹¹

The city's population is 18,597 with 40,438 residing in Pasquotank County. The city is 11.63 square miles and is densely settled with 1,607 people per square mile. In comparison, rural Pasquotank County has 179 people per square mile. The city's median household income is \$32,303, almost \$14,000 below the state average. Approximately 32% of city residents live below the poverty level, double the state average.¹²

National Register Historic Districts

The Elizabeth City's six historic districts, consisting of 1,248 buildings, are evidence of the major growth periods from 1793 to the 1920s. (Fig. 3) The districts are located in close proximity to each other with individual buildings constructed on narrow

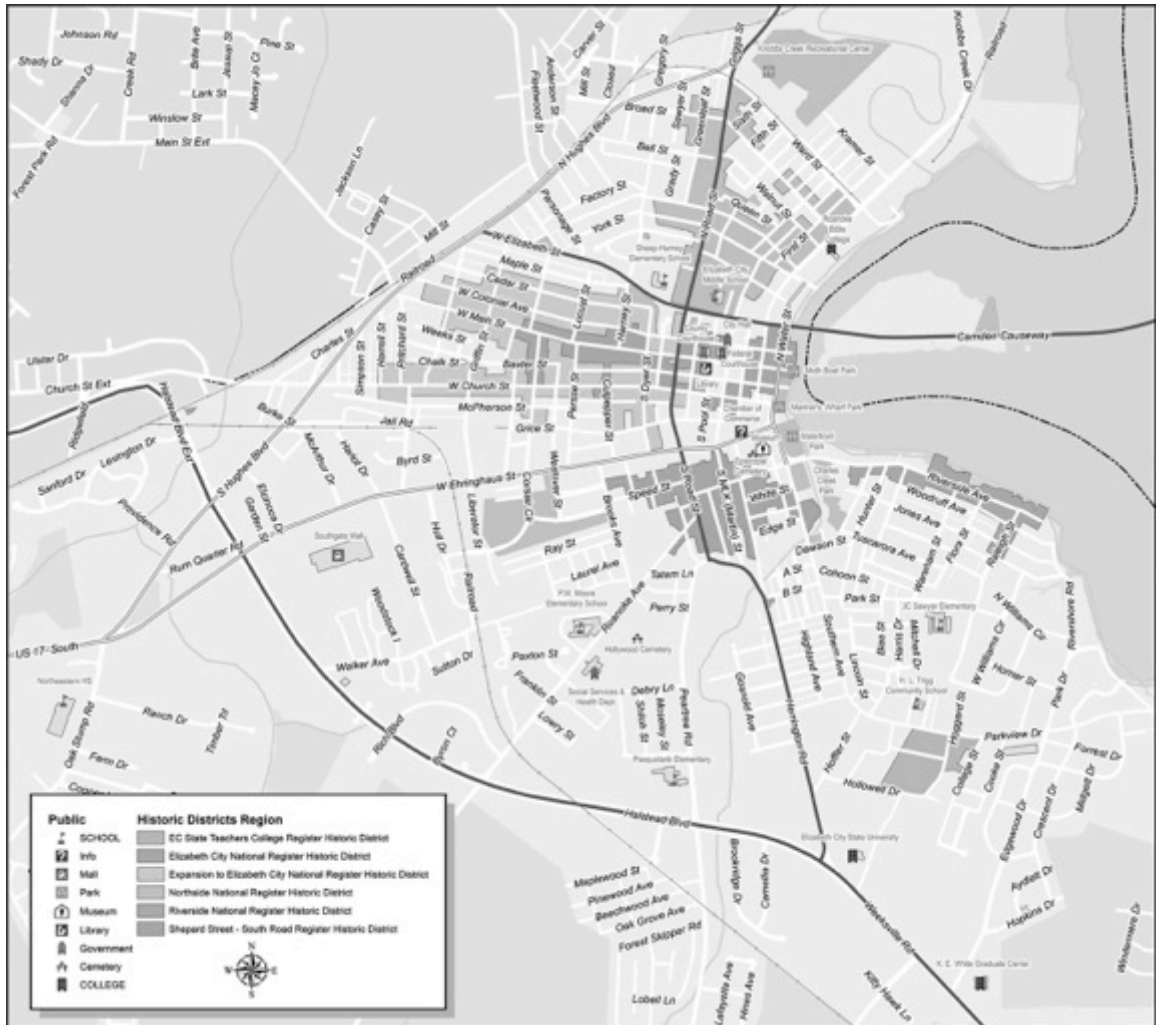


Fig. 3: Elizabeth City’s six National Register Historic Districts reflect the area’s development patterns from the 19th–early 20th centuries. The uncommon density of historic districts provides the city with its unique sense of place. [from Elizabeth City Convention and Visitors Bureau, 2012, <http://www.discoverelizabethcity.com/pdf/HistoricDistrictRegion.pdf>]

lots. This development pattern illustrates the unique dense, urban nature of the city, uncharacteristic of southern coastal communities.¹³

Each district displays a variety of architectural styles. Residential neighborhoods include homes for all income levels. Rather than featuring one distinct building design, the historic districts portray an array of architectural trends popular during the time of

development. This heterogeneous mix of styles and building size provide Elizabeth City with a distinct sense of place. The antebellum styles of Federal, Greek Revival, Gothic Revival, and Italianate are present in districts constructed during years when the Great Dismal Swamp Canal brought prosperity to the city. During the city's most robust period of growth between 1880-1920, examples of Queen Anne, Eastlake, Craftsman Bungalow, American Foursquare, Neo-classical Revival, and Colonial Revival buildings, are prevalent in the districts. Victorian millwork details are common characteristics adorning buildings throughout all the historic districts.

The Elizabeth City Historic District is the city's first National Register listed historic district. (Fig. 4) This 30-block area incorporates the earliest settled area in Elizabeth City. The Pasquotank River borders the 190-building district on the east. Brick and masonry commercial buildings are concentrated in the center of the district along Main Street. Residential buildings, primarily wood frame, emanate from Main Street. The developed area reflects the 19th century architectural styles that were popular during the Great Dismal Swamp Canal era. From the city's original settlement, platted in 1793, only two Federal style buildings remain. Antebellum properties are prominent, comprising the largest collection in the state.¹⁴ The majority of these buildings were constructed after the Great Dismal Swamp Canal expanded in 1828.¹⁵

In 1994, the Elizabeth City Historic District was expanded in the National Register of Historic Places. (Fig. 5) To the north, south, and west of the original district. 423 buildings and one site were added. The expansion area represents the first suburban development in the city. Originally farmland, the area was developed as residences when the city economically thrived in the 19th–early 20th centuries.



Fig. 4: Main Street in Elizabeth City Historic District is part of Elizabeth City Downtown, Inc. The former Chesson's Department Store is now an arts center and tourist destination. The Chesson Building suffered wind and flood damage after Hurricanes Floyd and Isabel. [photograph by Ann Horowitz, January 2013]

South of the Elizabeth City district is the Shepard Street Historic District. (Fig. 6)

One hundred and sixty one buildings contribute to the historic district. Residences are mainly wood frame buildings while institutional buildings are brick. It encompasses the neighborhood representing the African American social and cultural center. Originally farmland, the Shepard Street Historic District was the first area developed outside the original city limits. It emerged in the mid 1850s, rapidly growing through the late 19th and early 20th centuries. A self-sufficient neighborhood of modest homes emerged with



Fig. 5: Elizabeth City Historic Expansion District features residential architectural design from the 19th -20th century. Elizabeth City's characteristic building density is evident in this neighborhood. [photograph by Ann Horowitz, January 2013]



Fig. 6: The Shepard Street Historic District represents the city's first African American neighborhood. [photograph by Ann Horowitz, January 2013]

six churches, three schools, and commercial, fraternal, and entertainment establishments.¹⁶

In the antebellum era, both freed blacks and slaves lived in the area. By 1860, 34% of the African Americans in Elizabeth City were free. This unusually high number for the region has been attributed to the employment opportunities for laborers and to the anti-slavery beliefs established by early Quaker settlers.¹⁷ After the Civil War, African Americans were drawn to the district for the access to schools and religious institutions the neighborhood provided. In 1892, one of the earliest colleges for African Americans in the state opened in the district. The State Colored Normal School educated African Americans to become teachers for segregated schools. Due to its success, the college expanded, was renamed the Elizabeth City State Teachers College, and moved south of the district in 1910. It became Elizabeth City State University in 1969, representing another National Register Historic District.¹⁸

The Elizabeth City State Teachers College Historic District embodies the educational opportunities made available to African Americans in the early 20th century. In addition to being a teachers college, the institution granted high school diplomas to African American students when no other county in the region provided this opportunity. Six buildings and one structure comprise the 19-acre district. With the exception of one frame Craftsman Bungalow, the remaining buildings are frame or brick Colonial Revival properties.¹⁹

On the opposite side of the city, the arrival of the railroad shaped the development of the suburban Northside Historic District. (Fig. 7) For years, Poindexter Creek to the south had separated the area from the original city district. The neighborhood is



Fig. 7: The Northside Historic District illustrates early suburban development patterns. Decorative millwork, a distinguishing building feature throughout Elizabeth City, enhances front porches in this neighborhood. [photograph by Ann Horowitz, January 2013]

composed of 398 buildings, primarily of wood frame construction. Rapid growth occurred between 1890-1910, resulting in orderly rows of wood frame houses, many of them constructed by descendants of the lumberman Daniel Kramer. Residents worked in the nearby Kramer mills or were commercial and professional leaders in the city. Today, the city schools are centered in the district.²⁰

The most recently developed district is the Riverside Historic District. Located along the southern shore of the Pasquotank River east of the original city limits, the area was settled by farmers in the late 17th century and remained as farmland until 1893. The residential district, constructed between 1894 and 1942, consists of 68 brick and wood frame buildings and one structure. In addition to the architectural styles popular in

Elizabeth City, Tudor Revival homes were constructed here in the 1930s. Homes of a grand scale, built by the city's industrialists, are located along the river while more modest homes of city professionals and small shop owners are sited on the district's south side.

Social, Economic, and Environmental Benefits of Historic Districts

The city of Elizabeth City and its preservation organizations support the historic preservation of the area's historic resources. In the "2004 Advanced Core Land Use Plan for Pasquotank County and Elizabeth City," the city clearly acknowledges the economic, social, and environmental benefits of historic preservation. Historic preservation is cited as an integral part of the downtown, waterfront, housing, and economic revitalization goals. The city values its collaborative programs with the Historic District Commission, the Elizabeth City Historic Neighborhood Association, Elizabeth City Downtown, Inc., Museum of the Albemarle, and Preservation North Carolina.²¹

Economically, the city recognizes that historic districts can stabilize property values and spur reinvestment in existing, historic neighborhoods.²² Elizabeth City Downtown, Inc., the city's Main Street Program, is responsible for downtown reinvestment projects that rehabilitate vacant buildings.²³ For 2011-2012, public and private reinvestment in the downtown area was \$4,754,308. This figure accounts for six new businesses, eight façade renovations, nine building renovations, and four business expansions. Thirteen new jobs were created as a result of the reinvestment in downtown Elizabeth City.²⁴

Expanding the city's tourism industry is another economic recovery program outlined in the land use plan. As a result, tourist spending increased 5% in the county from 2010 to 2011. Part of the increased tourism is linked to the city's historic districts. Historic district walking tours, the Historic Ghost Walk, the North Carolina Potato Festival, and the recent commemoration of the Civil War Sesquicentennial drew tourists to the historic districts in record numbers. The Historic Ghost Walk, a yearly event sponsored by Elizabeth City Historic Neighborhood Association, attracted 1,400 people in 2012, earning it a North Carolina Main Street Award for best downtown special event. The Potato Festival brought 30,000 tourists to the Elizabeth City Historic District last year.²⁵

The city's plan to incorporate the historic districts in its waterfront development goals indicates additional support for heritage tourism.²⁶ North Carolina Secretary of Cultural Resources, Linda Carlisle, recently recognized the city's commitment to heritage tourism. At the annual meeting of the Chamber of Commerce, she said, "I see a community that values what they have, that are exploring and exposing what they have to the greater community, who are building on those assets."²⁷

The closely grouped and densely developed historic districts have strengthened social ties by bringing together city residents in support of preservation. The Elizabeth City Historic Neighborhood Association, formed in 1985, raises funds through events and programs, such as the Historic Ghost Walk, to fund preservation grant programs. Nine preservation projects within the historic districts have been completed using grant funds. In addition, the group funds a college scholarship to promote preservation education among young residents.²⁸ Civic support for historic preservation also thrives among

volunteers in Elizabeth City Downtown, Inc. From 2011-2012, 1,610 volunteer hours were donated at a value of \$30,268.²⁹

The city acknowledges the environmental importance of “‘recycling’ or otherwise maintaining the existing usable housing stock, especially historically significant structures.”³⁰ Rehabilitating vacant residences in the historic districts, instead of demolishing them, will “re-use” quality building materials and maintain the cohesive and compact character of the neighborhood.

In a historic property is demolished, the Elizabeth City Historic Neighborhood Association salvages and sells the building materials at its store. Rather than adding to overused landfills, the building materials are recycled for construction or rehabilitation projects. Store profits contribute to the organization’s preservation grant program.

While these practices benefit the environment, they also contribute to sustainability. The city as a sustainable community is evident in the attributes of its neighborhoods. The characteristic dense building pattern in Elizabeth City reduces heat loss in buildings while the ubiquitous porches provide shade during the hot summers.³¹

Natural Hazard Risks

The location of Elizabeth City on the tidal Pasquotank River and its proximity to water within its boundaries contributes to its flooding, storm surge, and erosion vulnerability. Thirty-three percent of the county’s land area is water.³² Combined with the city’s low elevation, 46% of the county’s land area is susceptible to flooding and storm surge.³³ The Pasquotank County Multi-Jurisdictional Hazard Mitigation Plan categorizes flooding as a “significant threat” in Elizabeth City.³⁴

Currently, neighborhoods in Elizabeth City adjacent to bodies of water or built on landfill experience nuisance flooding during short and long periods of heavy rainfall.³⁵ The Shepard Street and Riverside Historic Districts encounter the most frequent flooding. Street signs warning of “High Water” are permanently placed in these neighborhoods. (Fig. 8) The southern portion of the Northside Historic District regularly floods due to the covering of Poindexter Creek with a viaduct in the 1920s. East Elizabeth Street, built over Poindexter Creek, now separates the Elizabeth City Historic District from the Northside neighborhood.³⁶



Fig. 8: A water line, approximately one meter above the foundation, on a historic residence in Shepard Street Historic District indicates the possibility of a past flood. Permanent “High Water” street signs in the district provide additional evidence of frequent flooding. [photograph by Ann Horowitz, January 2013]

Summer hurricanes and winter nor'easters cause flooding, erosion, and storm surges along the Atlantic Coast, including North Carolina. Ninety-four hurricanes have impacted North Carolina between 1851-2012. Tropical storms affect North Carolina every 1.72 years.³⁷

Hurricanes pose a moderate threat to Elizabeth City.³⁸ Although tropical storms can be severe in the city, the impacts are not as harsh as those experienced directly on the North Carolina coast. In recent years, Hurricane Floyd and Hurricane Isabel caused significant damage throughout North Carolina. Hurricane Floyd generated winds reaching 193 kilometers per hour and 2.7-3 meter storm surges along the coast. Rainfall amounts ranged from 25-48 centimeters. In Elizabeth City, wind gusts of 103 kilometers per hour and rainfall of 6.7 centimeters were reported.³⁹ The storm surge left residual water lines of nearly one meter high in commercial businesses along the Pasquotank.⁴⁰ The North Carolina State Historic Preservation Office reported on building devastation and flooding in Elizabeth City. In the Elizabeth City Historic District, The Carolina Theater was severely damaged and the Chesson Building's roof was destroyed.⁴¹

The North Carolina State Historic Preservation Office documented damage again in Elizabeth City when Hurricane Isabel struck the mid-Atlantic coast in 2003. Storm surges were 1.8-2.4 meters along the North Carolina coast with 10-18 centimeters of rain. In Elizabeth City, the storm surge measured 1.5 meters with rainfall of 12 centimeters.⁴² Wind gusts were reported up to 148 kilometers per hour.⁴³ Wind and flooding damaged buildings in the city's historic districts. Roof, door, and window damage due to high winds was recorded for numerous historic properties. The Antioch Presbyterian Church, a

Gothic Revival wood frame building, collapsed. The Chesson Building once again suffered roof damage.⁴⁴

Near waterways and exposed to severe storms, Elizabeth City is also vulnerable to the impacts of sea level rise due to its elevation at three to twelve meters. The low-lying Albemarle and Pamlico Sounds are projected to be one of the three areas in the United States most impacted by sea level rise.⁴⁵ Although within the highly susceptible Albemarle Sound, Elizabeth City's sea level rise projections are more optimistic than surrounding cities and towns. Its elevation is comparably higher than many North Carolina coastal areas, commonly with land elevations of less than one meter.⁴⁶

Projected risks: 2050 and 2100

As sea level rise intensifies, the risks for flooding, storm surge and erosion will incrementally increase in Elizabeth City. Based on a one-meter sea level rise projected for 2100, an estimated 42-centimeter rise is expected by 2050.⁴⁷ (Fig. 9) In 2050, some city areas will be permanently inundated by water. (Figure X) Land surrounding Knobbs Creek, northeast of the Northside Historic District, is extensively impacted. Riverfront areas east of the Northside and Shepard Street Historic Districts will be permanently flooded. Portions of the Elizabeth City and Riverside Historic Districts will be inundated.

With a one-meter sea level rise, the effects of sea level rise become more expansive by 2100. (Fig. 10) Water inundation broadens on the land around Knobbs Creek, directly impacting the northern portion of the Northside Historic District. Inundation to the south of the Northside Historic District extends westward from the river, inundating the southern section of the Northside neighborhood. Sections of the



Fig. 9: Sea level rise is estimated to be 42 centimeters in Elizabeth City by 2050. The nearest data figure available of 40 centimeters is reflected in the map. Solid black shapes indicate areas in Elizabeth City inundated by a 40 c.m. sea level rise. [Map data for sea level rise from North Carolina Coastal Atlas, Eastern Carolina University, 2009, <http://nccohaz.ecu.edu/flex/>. Historic district map from Elizabeth City Convention and Visitors Bureau, 2012, <http://www.discoverelizabethcity.com/pdf/HistoricDistrictRegion.pdf>

Elizabeth City Expansion District are inundated, less than a block from the original city settlement.

Without adaptation, permanently inundated historic properties could be threatened by removal through demolition or relocation. Although many historic blocks are free

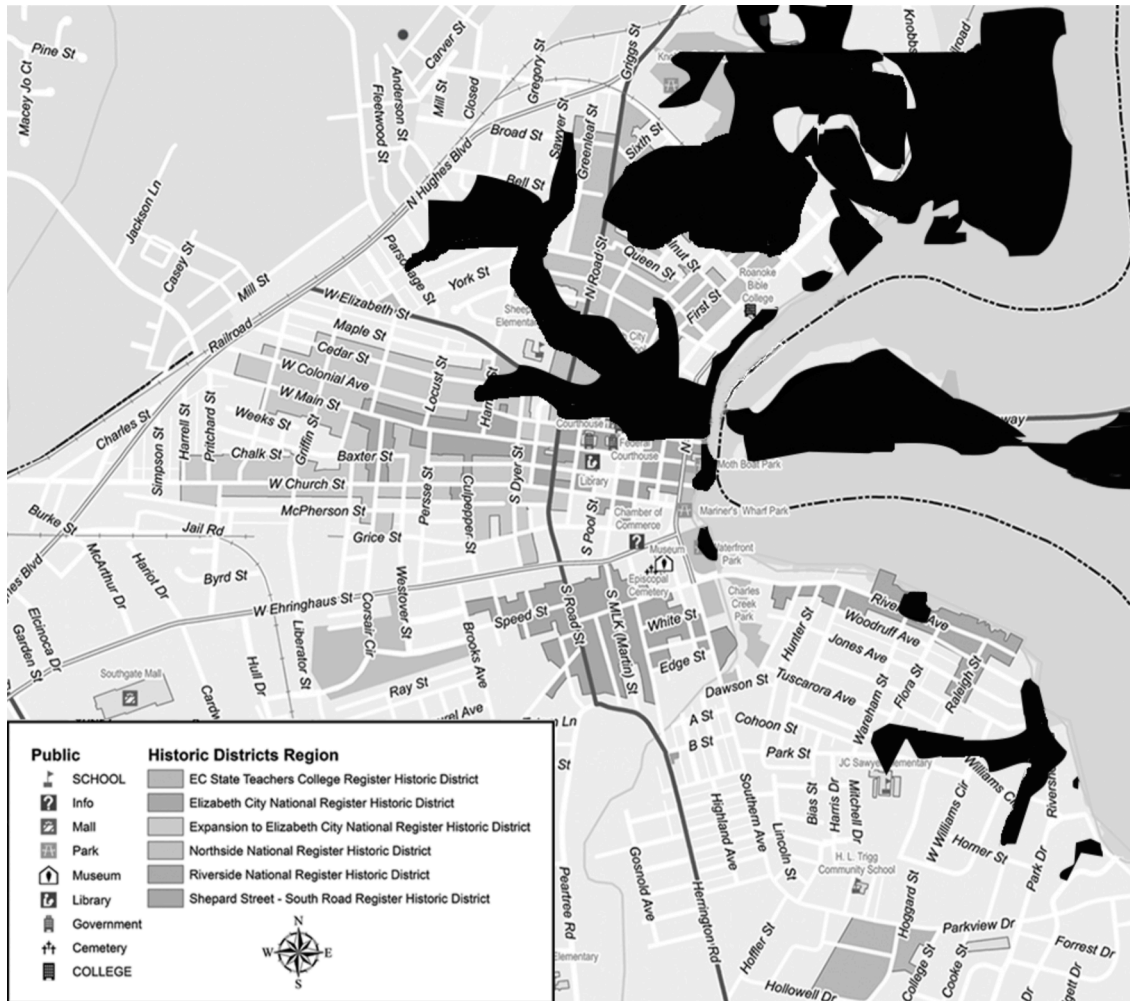


Fig. 10: Sea level rise is estimated to be one meter in Elizabeth City by 2100. Solid black shapes indicate areas in Elizabeth City inundated by this change in water level. [Map data for sea level rise from North Carolina Coastal Atlas, Eastern Carolina University, 2009, <http://nccohaz.ecu.edu/flex/>. Historic district map from Elizabeth City Convention and Visitors Bureau, 2012, <http://www.discoverelizabethcity.com/pdf/HistoricDistrictRegion.pdf>]

from inundation, the 1,248 historic properties within them will be exposed to more frequent flooding, storm surges and land erosion as the river's shoreline merges closer to the built environment.

Scientists at Climate Central, an independent organization studying climate change, analyze storm surge impacts and probabilities for coastal cities and counties.

Their data indicate a 16% chance by 2030 that sea level rise, a storm surge, and a high tide will converge to create five foot water levels in Elizabeth City. At this water height, all of the city's historic districts will be temporarily inundated by water. Thirty two percent of the city will be impacted. This encompasses 40% of the population and 46% of the homes in the city.⁴⁸

Adaptations implemented and proposed

Elizabeth City and Pasquotank County have planned and implemented projects to minimize flooding, storm surge risks, and erosion. These non-structural and soft adaptation projects from the "2004 Advanced Core Land Use Plan" were planned with sea level rise in mind.⁴⁹ At the present time, an extensive non-structural adaptation is underway. Sewer and water lines are being replaced along Elizabeth Street to minimize flooding. (Figure X) The construction work is taking place between the Elizabeth City Expansion and the Northside Historic Districts.

Also directed by the land use plan, the city has incorporated flood mitigation into its zoning ordinances. The Elizabeth City Flood Hazard District Overlay, a non-structural adaptation, requires that new development in flood prone areas adhere to strict flood mitigation standards. Within flood hazard areas, the lowest floor of new construction must be elevated at least 30.5 centimeters above base flood elevation or flood proofed so the foundation is watertight.⁵⁰ If altered, historic properties are exempt from this mandate as long as proposed alterations maintain historical significance. (Figs. 11, 12) If significance is compromised, elevation and flood proofing must be applied to the historic building. In addition, the ordinance disallows the construction of new buildings in

floodways or along bodies of water. New or replacement water and sewer systems must perform as intended under flood conditions.⁵¹

Elizabeth City's Storm Water Management Ordinance is a non-structural adaptation designed to manage and control the runoff from storms. Runoff can compromise water quality and cause erosion. Before city approval is granted for new subdivision construction, a storm water management plan, accompanied by a landscape plan, must be submitted and approved by the city before a building permit is granted. The importance of vegetation in the surrounding landscape to control erosion, sediment and water quality is acknowledged in the ordinance. A storm water management proposal may include storm water detention and retention structures.⁵²



Fig. 11: Few historic homes are elevated in the city. This example is in the Shepard Street Historic District. [photograph of Ann Horowitz, January 2013]



Fig.12: The Beveridge House, constructed in 1926, is an example of an elevated home in the Riverside Historic District. [photograph of Ann Horowitz January 2013]

Wetlands preservation and restoration, a soft adaptation, is a priority in the land use plan. To minimize urban flooding and protect water quality, the Charles Creek Park Wetlands were reconstructed in 2007.⁵³ (Fig. 13) Owned by the city, the original wetlands had been filled to create a city park. The area is in downtown Elizabeth City, east of the Shepard Street Historic District. To construct the soft adaptation, fill was removed and native vegetation was restored to the 1.93 acre site. The restored area was found to be functioning appropriately as a wetland in a 2008 assessment.⁵⁴ It is unclear if the restored wetland has minimized flooding in the Shepard Street neighborhood.



Fig. 13: Charles Creek Park, site of the wetlands restoration project, is in downtown Elizabeth City. The Shepard Street Historic District is located across the street from the park. [photograph of Ann Horowitz, January 2013]

Additional adaptation proposals are included in the city’s land use plan, although not yet executed. These also focus on soft and non-structural adaptations and include wetlands preservation and restoration, open space acquisition, and vegetative buffers along bodies of water. The city’s proposed improvements to storm water management and sewer and water systems are non-structural proposals related to infrastructure. Storm water management plans incorporate the reduction of impervious surfaces to promote the drainage of rainwater. Sewer and water system upgrades will be designed to function adequately under more frequent and intense flood conditions.⁵⁵

The waterfront plan incorporates the development of a canal to collect and divert floodwater. This soft adaptation will also benefit the community as an outdoor amenity.⁵⁶

In addition to adaptations outlined in the land use plan, Elizabeth City citizens proposed methods to minimize the effects of sea level rise at one of the “Public Listening

Sessions: Sea Level Rise and Population Growth” meetings. The event, one of seven, was co-sponsored by the Albemarle-Pamlico Conservation and Communities Collaborative (AP3C) and the Albemarle-Pamlico National Estuary Program (APNEP) in 2008. APC3 is an association of government and environmental groups fostering economic and environmental resilience and sustainability in the Albemarle-Pamlico region.⁵⁷ Climate change is one the APC3’s study areas. The APNEP is a collaborative project of the North Carolina Department of Environment and Natural Resources, the North Carolina Environmental Protection Agency, and the Virginia Department of Conservation and Recreation. The APNEP’s goal is to encourage local communities to develop environmental preservation and rehabilitation programs. Assisting municipalities with the development of adaptations in response to sea level rise is one of the organization’s goals.

The purpose of the public listening sessions was to inform residents about sea level rise and population growth projections. The meetings were designed to facilitate discussion and to register opinions at the grassroots level. Residents at the Elizabeth City sessions expressed their interest in learning more about sea level rise impacts projected for their area. Program participants recognized that sea level rise adaptation planning required “many departments to try and view the possible solutions to this problem” and “more participation by our local elected officials.”⁵⁸

From the public listening sessions, citizen suggestions for adaptations reflected the natural hazard and environmental protection goals in Elizabeth City’s land use plan. They favored soft adaptation and non-structural solutions or “nature-based solutions.”⁵⁹ The preferred adaptations included additional vegetation bordering waterways, restored

and preserved wetlands, and the cultivation of oyster beds to buffer wave effects during storms. Hard adaptation solutions were unpopular. Participants believed hard adaptations were poor investments, providing only short-term benefits.⁶⁰

At the state level, adaptation and mitigation support for communities is available. The North Carolina Department of Environment and Natural Resources (NC DENR) established the “Climate Change Initiative Strategy Framework.” in 2010 to address climate change. Adaptation to sea level rise is a sub-category of the plan. Support for local adaptation includes risk identification and informational assistance on adaptation development. The plan also encourages local governments to include projected sea level rise conditions in future land use plans.

Decision-makers and Stakeholders

A broad-based group of local Elizabeth City individuals were involved as decision-makers in the development of adaptations. Elected leaders, city employees, and citizen representatives were responsible for the strategies outlined in the land use plan. The Planning Department and the Planning Committee developed the plan in cooperation with resident stakeholders. Ultimately, the Pasquotank County Board of Commissioners and the Elizabeth City Council adopted the plan on January 9, 2012.⁶¹

Although not directly decision-makers, the APC3, APNEP and NC DENR, provided the informational, educational, and scientific framework necessary for sound adaptation planning. The work of these groups cultivates decision-making expertise within local communities.

Presently, the city’s historic preservation community—the Historic Preservation Division, the Main Street Program, and the Elizabeth City Historic Neighborhood Association—has not become involved in adaptation planning. The North Carolina State Preservation Office offers exceptional advice for hurricane preparedness and disaster recovery, although adaptation is not addressed.⁶²

ENDNOTES

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