



**US Army Corps
of Engineers®**

Charleston District

CHARLESTON PENINSULA, SOUTH CAROLINA, A COASTAL FLOOD RISK MANAGEMENT STUDY

Charleston, South Carolina

PLAN FORMULATION APPENDIX

APRIL 2020

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Overview of the Historical Development of the Charleston Peninsula

The Charleston peninsula contains the heart of the city's historic areas, and its diverse architecture reflects the historical and cultural development of the city from its beginnings in the late-1600s to the present. In 1670, English colonists established the settlement of Charles Town on the west bank of the Ashley River, but moved it shortly thereafter to the peninsula to provide greater defense for the settlement as it grew. Settlers constructed a network of fortifications – walls, cannon, moats – that encircled the town and protected its habitants from attacks by the French, Spanish, Native Americans and pirates (Figure XX). Most of the above ground evidence of these fortifications was demolished after the Revolutionary War. The new settlement officially became known as Charleston in 1783. The peninsula contains numerous buildings dating to the late eighteenth century – the mid nineteenth century that document the city's growth into a major seaport, trade center, and one of the wealthiest cities in the American colonies.



Crisp Map of Charles Town 1711, from *Complete Description (Map) of the Province of Carolina*

Preservation efforts at the local level in the early 1900s helped save many of the city's oldest buildings from demolition and raised awareness of the role Charleston played in the nation's history as told through its architectural resources. The Powder Magazine, constructed in 1713, is the state's oldest public building and has been designated a National Historic Landmark, our nation's highest level of recognition of historical significance. This structure, purchased in 1902 by the National Society of Colonial Dames of America in South Carolina, is considered the first historic preservation project in the city and was the catalyst for the preservation of hundreds of other buildings in Charleston.



Old Powder Magazine, ca. 1902 Source: American Memory, Library of Congress <http://memory.loc.gov/ammem/>

Zoning regulations and architectural review boards established by the city in the late 1930s, coupled with efforts by organized preservation groups and individuals, helped prevent razing of many historic structures as the city experienced periods of economic growth and social change. These preservation efforts helped Charleston retain one of the largest and most diverse assemblages of eighteenth – twentieth century architecture in the Southeast.

The National Register of Historic Places (NRHP) is the official list of our nation's historically significant buildings, districts, sites, structures and objects worthy of preservation, and it contains 76 NRHP-listed resources, including historic districts, individual listings, and cemeteries for Charleston's peninsula. These resources are recognized at the national, state and local levels for their historical significance. Charleston Old and Historic District, the largest historic district on the peninsula (approximately 1.4 square miles), is designated as a National Historic Landmark (NHL) and includes over 1400 buildings and structures. Through local historic preservation efforts, this NHL district was established in 1960 to address the historic significance of the city from 1700 to 1899. Several boundary increases have occurred since the original designation to expand the geographic limits of the district, and the last boundary increase in 1984 extended the period of significance to 1941 to include the city's twentieth century development. The district is comprised mainly of residences, but also contains commercial and governmental buildings, and places of worship. There are 34 NHLs within or adjacent to the district. These resources help tell the role Charleston played in the Colonial era, the Revolutionary War, the antebellum period and post-Civil War through both the architecture and the ties to significant events. A

variety of architectural styles such as Georgian, Regency, Federal, Adamesque, Classical Revival, Greek Revival, Italianate, Gothic Revival, and Queen Anne, among others, are found in the district.

The William Gibbes House. This house, constructed circa 1772 and located at 64 South Battery, is an excellent example of Georgian architecture. The home was built by William Gibbes, one of the city's wealthiest merchant-planters during the Colonial era and a patriot. Due to his political ideologies, Gibbes was imprisoned by the British in St. Augustine, Florida. In his absence, the house was used as an army hospital during the British occupation of the city beginning 1780 until 1782. Gibbes and his family returned to the home after the British departed and he resided there until his death in 1789. The property was designated a National Historic Landmark in 1970 because of the excellent Georgian architecture. Georgian architecture was popular from 1714-1830 and coincides with the reigns of British monarchs George I – George IV. The style is marked by symmetry and proportion based on the classical architecture of Greece and Rome. The property also contains one of the first gardens attributed to Loutrell Briggs in Charleston. Briggs, a landscape architect based in New York City, was hired by Mrs. Washington Roebling in 1928 to restore the grounds based on remnants of an earlier garden design. Briggs is credited with creating a distinct garden style for Charleston's eighteenth and nineteenth century homes.



Figure. 64 South Battery – Gibbes House (Source: <http://www.nationalregister.sc.gov/charleston/S10817710015/pages/S1081771001501.htm>)



Figure 1. Garden at 64 South Battery designed by Loutrell Briggs as seen in 1937. (Source http://www.historic-structures.com/sc/charleston/william_gibbes_house3.php)

The Exchange and Provost Building. Built from 1767-1771, the Exchange and Provost Building served a variety of purposes during eighteenth century Charleston. In 1774, the building housed confiscated tea from the East India Company as well as meetings by the Provincial Congress of South Carolina. During the Revolutionary War, the British used the building as a barracks and military prison from 1780-1782. George Washington greeted the city's inhabitants from the steps of the building during his southern tour in 1791. Although badly damaged during the Civil War and by an earthquake in 1886, the building was repaired and used by the Federal government as offices until 1913 when the building was deeded to the Daughters of the American Revolution of the State of South Carolina for preservation purposes. The building was designated a National Historic Landmark in 1973. The Exchange and Provost Building is constructed in the Georgian architectural style. Excavations in the basement of the building in 1965 discovered that the building is sited on portions of the Half-Moon Battery, the Charles Town city wall completed in 1701.



Figure 2. Exchange and Provost Building, E. Bay and Broad Streets. (Source: <http://www.nationalregister.sc.gov/charleston/S10817710010/index.htm>)

Governor William Aiken House. The best preserved complex of antebellum domestic structures in Charleston is the Governor William Aiken House. Located at 48 Elizabeth Street, it was home to William Aiken, the owner of South Carolina Canal and Railroad Company and, later to his son, William Aiken, Jr., a governor of South Carolina. The house was built in 1820 by John Robinson, a merchant. William Aiken acquired the home in 1827 when Robinson was forced to sell after losing several of his ships at sea two years earlier. Extensive renovations in the 1830s by William Aiken, Jr. resulted in one of the most impressive residences in nineteenth century Charleston. The younger Aiken was a rice planter who served in the State House of Representatives and Senate. He was Governor from 1844-1846. The Aiken house reflects a variety of architectural styles – Federal, Greek Revival and Victorian. The house was listed on the National Register of Historic Places in 1977 and is considered significant for both its architecture and persons associated with historic events. Included in the nomination are several outbuildings - a large kitchen building, workrooms, servant quarters, a stable, brick privies and two shed structures. The house remained in the Aiken-Rhett family for 142 years until 1975 when it was acquired by the Charleston Museum and opened to the public.



Figure 3. Governor William Aiken House (Source: <http://www.nationalregister.sc.gov/charleston/S10817710098/pages/S1081771009801.htm>)

In addition to the residential and public buildings, Charleston contains numerous historic churches and cemeteries. Early Charles Town was founded on the principals of religious freedom and tolerance which helped create the diverse assortment of places of worship in Charleston. During the eighteenth century French Huguenots, Baptists, Congregationalists and Presbyterians settled in the city. In the early 1700s 12 Scottish families formed the Scots Kirk, now the First Scots Presbyterian Church. A Jewish congregation formed in 1750, followed shortly by a Lutheran Church and Methodist assembly. The first Roman Catholic mass was held in Charleston in 1786.



Figure 4. Gothic Style Outbuilding. (Source: <http://www.nationalregister.sc.gov/charleston/S10817710098/pages/S1081771009809.htm>)

The Huguenot Church. This church, also called the French Huguenot Church or the French Protestant Church, located at 136 Church Street, is an excellent example of the Gothic Revival style. Built in 1844 and designed by architect Edward Brickell White, it is the oldest Gothic Revival church in South Carolina, and was designated a National Historic Landmark and listed on the National Register of Historic Places in 1973. The congregation it serves traces its origins to the 1680s and is the only independent Huguenot church in the United States.



Huguenot Church (Source: <http://www.nationalregister.sc.gov/charleston/S10817710068/pages/S1081771006802.htm>)

(Beth Elohim Synagogue) Kahal Kadosh Beth Elohim. Located at 90 Hasell St., Kahal Kadosh Beth Elohim is the nation's second oldest synagogue and the oldest with continuous use. In 1824, the synagogue became the birthplace of Reform Judaism in America. The congregation was established in colonial Charleston in 1749 and is now the nation's fourth oldest Jewish community. The building reflects the history of Jewish worship in colonial Charleston. This synagogue was built in 1840 in the Greek Revival style on the site of the congregation's first synagogue which was destroyed in the Charleston fire of 1838. The synagogue was listed in the National Register of Historic Places in 1978 and designated as a National Historic Landmark in 1980.



Figure 5 (Beth Elohim Synagogue) Kahal Kadosh Beth Elohim (Source: <http://www.nationalregister.sc.gov/charleston/S10817710102/pages/S1081771010203.htm>)

First (Scots) Presbyterian Church. Known locally as "First Scots", this historic church is located at 53 Meeting Street. The congregation was established in 1731 when a dozen Scottish residents left the Independent Church of Charles Towne. The current building was constructed in 1814, making it the fifth oldest church building in the city. St. Mary's Cathedral in Baltimore, Maryland, designed by Benjamin Latrobe, is thought to be the inspiration for the design. The seal of the Church of Scotland is displayed in the stained glass window over the main entrance. The decorative wrought iron grilles contain thistles, the symbol of Scotland. In 1999, the congregation installed an English bell from 1814 in the north tower to replace the bell given to the Confederate army to make cannons. The graveyard contains more than 50 stones from the eighteenth century.



Figure First Scots Presbyterian Church circa 1933. (Source: Library of Congress).

Charleston Cemeteries Historic District. The district is located along Huguenin Avenue, north of the downtown area, and encompasses 23 cemeteries with a total of 103 contributing resources (buildings, sites, structures, and objects) (Figures XXX – XXX).



Figure 6 Masonic Gate, Magnolia Cemetery (Source: <http://www.nationalregister.sc.gov/charleston/S10817710101/pages/S1081771010112.htm>)



Chapel in Bethany Cemetery (Source: <http://schpr.sc.gov/index.php/Detail/properties/42953#>)

The oldest cemetery in the district is Magnolia Cemetery, which was chartered in 1850. The most recent cemetery is the Brown Fellowship Society cemetery (relocated in 1956). The cemeteries rest on the grounds of the former Magnolia Umbra Plantation and encompass approximately 107 acres. The historic district is significant because of its social history and the funerary art and landscape architecture. The social history illustrates a variety of burial practices from 1850-1956. The district was listed on the National Register in 2017. Magnolia Cemetery, which encompasses nearly 92 acres, was listed on the National Register in 1978 as an individual property. It is the only cemetery in the district that was listed previously in the National Register. When Magnolia Cemetery was listed on the National Register in 1978, its condition was noted as poor. In 2011, the Preservation Society of Charleston initiated a campaign to restore the cemetery's Receiving Tomb which is one of the cemetery's original structures.



Receiving Tomb in Magnolia Cemetery prior to restoration. (Source: <http://www.nationalregister.sc.gov/charleston/S10817710101/pages/S1081771010113.htm>)

Nonstructural Measures Assumptions

First, the PDT identified residential structures in areas not enclosed by the storm surge wall with first floor elevations below 12 feet NAVD88. This elevation was chosen because it is also the elevation to model the storm surge wall for the alternatives evaluation and comparison process. While all nonstructural measures are on the table for consideration, the team used the cost of raising structures as a proxy for all nonstructural measures. This assumption was used because raising a home is more expensive than other floodproofing measures and the team could obtain existing reliable information on the cost of raising homes in the Charleston area.

To develop a rough order of magnitude (ROM) cost estimate for the nonstructural measures, the PDT obtained ROM cost guidelines from a local contractor through the City of Charleston (see table 1). The cost guidelines were applied to residential structures identified for nonstructural treatment. One chimney per structure was assumed because some homes have multiple chimneys and some have none. Costs were increased by 40% to account for tight exterior work space conditions, height of the crawl space, and additional porch costs. To complete the ROM cost estimate, a 20% contingency was added. Based on the approximately 100 structures identified for treatment, the ROM cost is \$6,725,000. During Feasibility Level Design, the PDT will conduct a structure by structure assessment to determine the most appropriate treatment for each structure and refine the cost estimate.

Table 1. Rough Order of Magnitude costs to raise a home in Charleston, SC.

House Footprint/Story	Base Cost
2,215sf - 1 Story	\$45,000.00
2,295sf – 2 Story	\$57,000.00
2,050sf – 3 Story	\$62,000.00
Additional Costs	
Lift Height (up to 8')	\$0.50/sf
Wood Deck / Porch	\$10/sf
Masonry Fireplace (3'x6')	\$3,000
Masonry Chimney	\$1,000
Tight Exterior Working Space	+20%
Less Than 4' Crawl	+10%
Less Than 2' Crawl	+30%

Public Meeting Feedback

ID	In Attendance at 1/31/2019 Public Meeting	Feedback (To Help Inform the Study Process)	Additional Comments	Organization
1	Yes	Live in a 140 year old house at Tradd and New. 2015 Joaquin, 2016 Matthew and 2017 Irma all brought substantial flooding to our street. We get around in inflatable boat w/ prop! The last issue was 1989 Hugo. Now, it seems every year. Florence would have been a disaster if the course was different. With Matthew and Irma, the water was lapping at the front door and buckled the floor boards. If there is a high tide over 6' and a rain, I have to move my car off the street and plan for alternate routes to get off Peninsula. This has become way of life. Many people left during the named storms, but we stayed. Many are not aware of how bad it gets, because you can't tell unless its in your house and you see. We do not leave in Sept or Oct anymore because we will likely have to move our entire first floor to the second to prepare for flooding. We moved here from Chicago and are small employers with over 80 employees. We love Charleston, but this is not a sustainable lifestyle.	You need younger middle class working people living on the Peninsula to support a thriving economy and City. We cannot sustain fighting flooding to our homes and our businesses. Not only will the tourist stop coming but the people who support the tourism are going to go where they are supported.	Resident
2	Yes	So many words. So little commitment. Common sense says there are going to be some proposed solutions that will cost money. Where is the upfront commitment from the city to start setting aside funds, NOW and over the THREE (3) !!! years of the study?		
3	Yes	I live on Tradd Street in an 1870's house that has flooded three years in a row. I've done everything I could to prevent water from entering my home, to no avail. I lose everything on the first floor: walls, appliances, carpets, all the furniture, bedding, etc. The rooms have to be completely gutted and it takes at least 4 months to rebuild and replace everything that was lost. It would be nice if some funds could be made available to address this problem and plans to actually do something to help.		
4	No	Hard infrastructure is important but it's also important to look at the function of the land. Multiple of the worst flooding areas used to be marsh. At some capacity we can't fight nature. Soft infrastructure and green infrastructure must be considered. Linear wetland design detention and retention, swales. Establishing wetlands can be designed to make these areas functional and well enjoyed by the public.		Design Works/Landscape Architect

ID	In Attendance at 1/31/2019 Public Meeting	Feedback (To Help Inform the Study Process)	Additional Comments	Organization
5	Yes	<p>I feel Charleston needs to incorporate water into the city setting, think Amsterdam. It is not feasible to displace water here, clearly. For instance, if we were to turn the cross town and perhaps the market into a channel which would allow water to drain into. Of course we would have to create a flyover from 26 but didn't we just approve a sales tax for road improvements. Otherwise you might as well start planning a Venice of the South approach if you can't figure out how to create channels throughout the city to hold and move the water. Not sure what our other options are....perhaps stop developing and creating many more impervious surfaces without any low impact development requirements. It's probably too late for us, we really don't have THREE years to complete a study on how we might mitigate flooding that will get substantially worse by the close of the study. Horrible city planning, very short cited vision, but that is politics. Sorry for the rant and thanks for your time.</p>		Concerned Citizen
6	Yes	<p>Houston, Texas experienced record flooding during Hurricane Harvey because they overdeveloped the area and destroyed the surrounding wetlands that naturally protect inland. If we continue to destroy the natural barriers in Charleston, we will certainly experience the same. New Orleans experienced their catastrophe because their levee system was not built properly and did not spend money to reinforce them. We have nothing in place to protect us. Charleston has always been smarter and progressive so I hope that we will do the right thing for both nature and the civilians.</p>		

ID	In Attendance at 1/31/2019 Public Meeting	Feedback (To Help Inform the Study Process)	Additional Comments	Organization
7	Yes	<p>I am both a resident of, and business owner on, the lower downtown peninsula. There is no more important issue facing our community than flooding. So long neglected by the previous mayor, flooding threatens downtown Charleston as a place to live and raise a family; it threatens downtown Charleston as a place to make a living; it threatens downtown Charleston as the primary attraction of the huge tourism industry that funds not only the local economy, but also the State's economy; it threatens downtown Charleston as the huge property tax base that funds the local governments; it threatens downtown Charleston and the largest medical complex in the State; it threatens nationally important downtown Charleston which has probably the largest collection in the Country of remaining historical buildings from every era of the Country's history. All other infrastructure issues pale beside the need to construct infrastructure to stop the flooding. Thank you for pursuing this goal.</p>		Personal
8	Yes	<p>Have reported flooding west peninsula and downtown flooding for 2 years. Still no action or preventive measures in place</p>	<p>Have contact with 15 year veteran on flooding prevention on west coast. He is instrumental in knowing about flood barriers, types, materials and everything related to flood prevention from surge, wave, sea level rise.</p>	Groundswell
9	No	<p>Very interesting presentation by the Colonel, and I enjoyed speaking with Brian Williams. We who live on the peninsula are grateful for your efforts and attention to the flooding issues we face.</p> <p>My question: Is the Coast Guard and its facility off of Murray Boulevard cooperating with the study you are doing?</p> <p>It seems to me that their facility is at special risk, which perhaps could be construed as a national defense hazard if it should become inaccessible by land because of water inundation.</p> <p>Thank you again for your good work on our behalf.</p>		Groundswell

ID	In Attendance at 1/31/2019 Public Meeting	Feedback (To Help Inform the Study Process)	Additional Comments	Organization
10	No	The city continues to approve clear-cut/muck/fill developments on Johns Island, some of which have clear violations of environmental regulations. It is nearly impossible to get enforcement involved, whether USACE or others. These will be the subject of similar studies in the future, yet they continue to be encouraged.		
11	No	Thank you for your help. I look forward to positive results. Thank you for sustaining our future. This is so important.		Coldwell Banker Realtors
12	Yes		Interested researcher cheering the city on.	Harvard Law School
13	Yes	While I appreciate a higher low battery, that is not the main cause of flooding on the southwest of the peninsula. I lived on Colonial Street during the last three major flood events but have recently moved. During each event, I explored during peak flooding times. The water flooding the southwest part of the peninsula is overflowing out of the Broad Street side of Colonial Lake and pouring like a water pitcher onto Ashley, Colonial, and Rutledge Streets. This water is flowing over to the low battery from Colonial Lake. It is not coming over the low battery and moving toward the lake. Some major pumps/hoses should be designed into the low battery (above flood level) and utilized during these flooding events. Also Colonial Lake should have been better designed during recent renovation to push water out to the Ashley River or at least not allow water to come in from the river to the lake during flood events.		

ID	In Attendance at 1/31/2019 Public Meeting	Feedback (To Help Inform the Study Process)	Additional Comments	Organization
14	Yes	<p>I believe flooding is the number one issue facing the City of Charleston and the Lowcountry, especially James and Johns Island. I doubt we need to spend millions of dollars studying the problem, we need to implement measures that have been studied and those suggested by experts locally and internationally. If the local governments really cared about flooding, they would stop building in flood plains and wetlands. We don't need a study to make this common sense decision! In addition, we are currently unable to repair and maintain the roads we have. Instead of spending money we don't have on projects like the proposed 526, let's agree to Fix Flooding First! The construction of infrastructure and the paving over of the Lowcountry has significantly contributed to the flooding crisis, so take care of what we have instead of creating more impervious surfaces by destroying wetlands and forests that are needed to absorb the water.</p>		Citizen
15	Yes	<p>I strongly recommend that the SPA be required to create a permeable parking surface at their cruise terminal—regardless of where the terminal is located. This would be of tremendous help in that area, which already suffers from frequent flooding!</p>		Charleston Communities for Cruise Control
16	No	<p>I'm writing to ensure Gadsden Creek is accounted for in the Corps' analysis in the Charleston peninsula flood risk management study. A 404 permit application is currently before the Corps, proposing to fill and destroy what remains of this natural and valuable drainage feature. Three interagency comment letters (i.e. SCDNR, USFWS, NOAA NMFS) have been submitted subsequent to the permit application, urging the denial of the permit as the activity proposed in the application will exacerbate flooding. Based on the applicant's own engineering documents, the piped culvert system proposed to replace the drainage functions of Gadsden Creek will have a 3.5x reduction in holding capacity. This rough calculation is obtained by comparing the volume of fill material proposed to be placed in Gadsden Creek and her wetlands (up to grade) to the volume of the piped culvert system proposed to replace Gadsden Creek and her wetlands. I hope and I urge that Gadsden Creek's ecosystem functions and flood mitigating properties are fully accounted for and identified through this study.</p>		Resident

Historic Coastal Storms

The Charleston Peninsula has been subjected to intense coastal storm events throughout its history. Climate records for the area began in 1851. Table 1 displays the major coastal and tropical storm events affecting the Charleston Peninsula since 1950.

Table 1. Historic Coastal and Tropical Storms.

Date	Storm Name	Storm Impacts
Aug 30-31, 1952	Able	Landfall near Beaufort, SC as a Cat 2 hurricane with winds near 100 mph and minimum central pressure of 980 mb. Produced 90 mph winds at Beaufort, heavy rainfall over eastern SC and 2 deaths and \$3 million in damage in SC.
October 1, 1954	Hazel	Landfall near the SC/NC border as a Cat 4 hurricane with 115 knot (~130 mph) winds and minimum central pressure of 938 mb. One of the most severe storms to ever hit SC with significant damage, mainly from Pawleys Island northward. Occurred during the highest astronomical tide cycles of the year which led to a storm surge ~ 18 feet. Produced \$27 million in damage.
July 7-9, 1959	Cindy	Landfall just north of Charleston, SC near Bulls Bay as a Cat 1 hurricane with winds near 75 mph winds. 56 knot (64 mph) winds were recorded at McClellanville along with 1 death. Storm tides were ~4 feet above normal and heavy rain fell.
September 28-29, 1959	Gracie	Landfall near Beaufort, SC as a Cat 4 hurricane with winds near 130 mph. Moved northwest past Columbia and weakened into a TS before moving into NC producing heavy rainfall which led to significant flooding as well as severe crop damage. The minimum central pressure was 951 mb at landfall with tides 6 feet above normal (~12 feet above MLLW). Fortunately, the highest storm surge occurred during low tide or else the flooding would have been much worse. Extensive damage occurred across southeast SC, mainly in the Beaufort to Charleston corridor, along with 10 deaths in GA and SC.
September 10-11, 1971	Tropical depression	Storm made landfall around Charleston, SC from the east and dissipated before moving into GA.
August 20-21, 1976	Dottie	Landfall near Charleston, SC as a TS before dissipating north of Lake Moultrie.
September 5, 1977	Clara	Developed into a TD near Charleston and moved northeast away from the area but not before producing some heavy rainfall near the coast (3.53 inches at Beaufort, SC).
July 24-25, 1985	Bob	Landfall near Fripp Island, SC as a Cat 1 hurricane. Produced a 44 mph wind gust in downtown Charleston, SC and a 48 mph gust at Folly Beach, SC. 5 inches of rain was recorded at the Charleston Airport.
September 21-22, 1989	Hugo	Landfall at Sullivan's Island, SC as a Cat 4 hurricane, the first major hurricane to make landfall in SC since Gracie in 1959. The strongest sustained winds (~140 mph) mainly occurred in northern Charleston County. At the Charleston Airport in North Charleston, winds were 78 mph with gusts to 98 mph, downtown Charleston recorded a wind gust of 108 mph and the Coast Guard Cutter "Rambler" in the Cooper River reported a 138 mph gust. Storm tides ~20 feet above mean sea level occurred near Cape Romain and around were 10-12 feet above mean sea level in Charleston Harbor. Rainfall was mainly 5-10 inches across southeast SC into southeast GA with the highest total at Edisto Island (10.28 in).
July 11-12, 1996	Bertha	Stayed offshore and made landfall at Cape Fear, NC as a Cat 2 hurricane. Produced gusts to 59 mph at Buoy 41004, 58 mph in downtown Charleston, 60 mph at the Folly Beach C-MAN station and 45 mph at the Charleston Airport.
August 14, 2004	Charley	Landfall at Cape Romain, SC as a Cat 1 hurricane. Produced a peak wind gust of 38 mph and 1.02 inches of rain at the Charleston Airport.
August 29-30, 2004	Gaston	Landfall near Awendaw, SC as a Cat 1 hurricane. Produced a peak wind gust of 55 mph and 4.05 inches of rain at the Charleston Airport and 4.63 inches in Downtown Charleston.
May 28-30, 2014	Bonnie	Developed north of the Bahamas and strengthened into a TS as it move northwest toward the GA/SC coasts, eventually weakening to a TD before making landfall near Charleston. Produced heavy rainfall (widespread 3-7 inches with local amounts over 10 inches), mainly north of I-16, which led to significant flooding.

September 1-3, 2016	Hermine	Made landfall around the Big Bend area of FL as a Cat 1 hurricane and then moved northeast just inland through southeast GA and SC as a TS. Produced widespread tropical storm force wind gusts (60+ mph near the coast), heavy rainfall (widespread 3-5 inches with locally higher amounts over 8 inches toward the SC Midlands), and 2 EF-1 tornadoes (1 in Liberty County, GA and 1 in Chatham County, GA).
October 7-8, 2016	Matthew	Moved north and then northwest through the Caribbean Sea and then through the Bahamas while strengthening to a Category 4 hurricane. Tracked just off the east coast of FL and GA while weakening to a Category 1 storm before making landfall near McClellanville, SC with winds near 85 mph. Produced hurricane force wind gusts along the entire coast, significant coastal flooding from high storm tides (including a record level at Fort Pulaski), and very heavy rainfall (widespread 6 to 12 inches with locally higher amounts near 17 inches) which led to significant freshwater flooding.
August 30 – September 11, 2017	Irma	Formed just west of the Cape Verde islands, tracked across the Atlantic with the eye sliding just north of Puerto Rico, causing catastrophic damage to the northeastward Leeward Islands, then along the Cuban coast and finally made a northerly turn toward Florida on Sunday, September 10. Hurricane Irma had maximum sustained winds of 185 MPH at its peak in the Atlantic Ocean, which it maintained for over 35 hours, making it one of the strongest storms on record in the Atlantic basin as well as the longest lived storm of that intensity anywhere in the satellite era. Hurricane Irma's first continental U.S. landfall occurred at Cudjoe Key in the Florida Keys with maximum sustained winds of 130 MPH (category 4) at 9:10 AM EDT on Sunday September 10, the climatological peak of the Atlantic hurricane season. At 3:35 PM EDT that same day, Irma made its second continental U.S. landfall over Marco Island, FL with maximum sustained winds of 115 MPH (category 3). ^{1,3} A peak wind gust of 142 MPH was reported at Naples Municipal Airport (KAPF) during Irma's eyewall passage. After making its second continental U.S. landfall, Irma slowly weakened as it continued north-northwestward across north Florida and southwest Georgia through Monday September 11. Irma had decayed to a tropical storm by 11 AM EDT September 11 but had a very large wind field, with tropical storm force winds extending up to 415 miles from the center of the storm.
September 14-15, 2018	Florence	Made landfall near Wrightsville Beach, NC as a Category 1 hurricane before slowing down and weakening to a TS. The storm then moved southwest near the northern SC coast before shifting west toward the SC Midlands and weakening to a TD. Produced some tropical storm force wind gusts and several inches of rain, mainly north of Charleston.
October 10-11, 2018	Michael	Made landfall near Mexico Beach, FL as a Category 4 hurricane and then moved northeast through southwest GA as a hurricane before weakening to a TS before reaching central SC. Produced tropical storm force winds and several inches of rainfall across much of southeast SC/GA which led to many fallen trees and some power outages.