CHAPTER 23: TOWN OF WACHAPREAGUE

TOWN PROFILE

Wachapreague was originally a Native American fishing village settled by the Matchapungos, a subdivision of the Algonquin Tribe. Nathaniel Bradford first patented the land in 1662 for 1,000 acres. The Town settlement wasn't developed until the early 1800s. The Town's wharf was used to ship goods to other American cities in 1825. The late 1800s saw a successful fish oil and fertilizer company and a booming reputation as a tourist destination. The Wachapreague Hotel in 1902 attracted hunters and fisherman from all over the country until it burned down in 1978. Wachapreague has seen a history as a town that capitalized on its location for shopping, natural beauty, and fishing (*Town of Wachapreague Comprehensive Plan*, 2016).

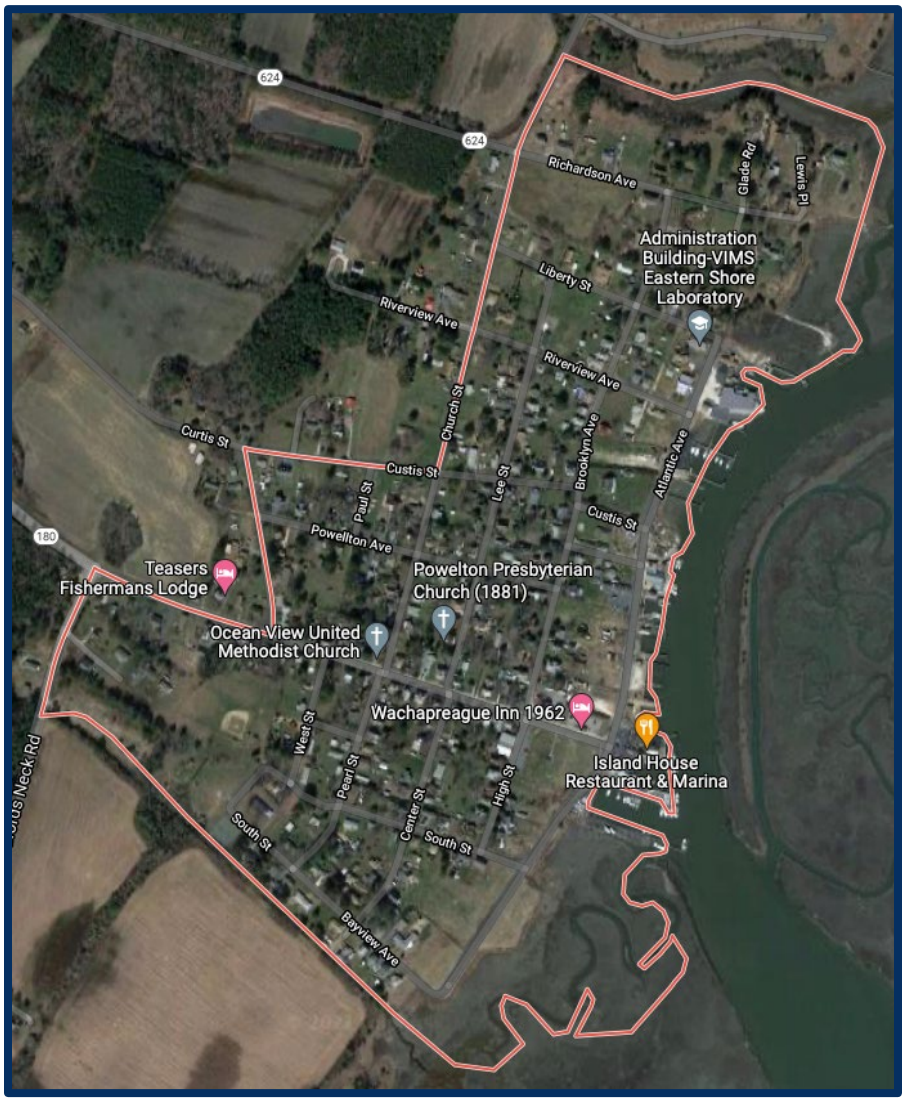


Figure 1: Wachapreague Context and Google Map

SOCIO-ECONOMIC

Part of assessing hazards in relation to their risk is understanding the people affected. Not all people are affected equally. Some are affected by factors that relate to their ability to understand risks posed by hazards, and some by their ability to remove themselves from harm's way. Those factors include age, mobility, income and the languages individuals speak and the languages in which individuals are able to access information.

DEMOGRAPHICS

According to Table 1, the population in Wachapreague has remained relatively stable since 2000. The American Community Survey five-year estimates for 2019 indicate the population dropped from 232 in 2014 to 192 in 2019; however, Town officials believe the population is more accurately depicted in 2010 Census data and is actually around 246 (Personal communications, Robert Williams, Councilman and Floodplain Administrator/CRS Coordinator, March 17, 2021). Like many towns along the Shore, Wachapreague experiences an increase in transient populations during the warm seasons due to tourism. This is an important aspect to consider in response to emergency situations and mitigating hazards, as larger populations require more response and aid. Also, visitors often do not know where emergency facilities are located and are usually less familiar with local weather patterns and hazard potentials.

Town officials confirmed that 100% of residents in Wachapreague speak English (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021), which indicates that all residents should be able to access information regarding hazards by some means.

Table 1: Wachapreague Demographics

	2020	2014**	2013**	2010***	2000****
Population	257	232	182	232	236
Median Age	61.5*	63.1	63.2	57.9	55.6
Disability	39*	31	24	NA	NA
Income					
Median Household Income	$42,386*	$26,250	$40,625	$54,688	$36,625
Poverty Level	5.2%*	16.4%	17.0%	24.2%	18.0%
Language					
Only English	100.0%*	87.0%	83.0%	92.0%	97.8%
Other	0.0%*	13.0%	17.0%	8.0%	2.2%
Spanish	0.0%*	NA	14.8%	8.0%	0.0%
Ind-Euro	0.0%*	NA	2.2%	0.0%	0.4%
Asian	0.0%*	NA	0.0%	0.0%	1.8%

Source: U.S. Census 2020, *ACS, 2014-2019, **ACS, 2009-2014, ***U.S. Census 2010, ****U.S. Census 2000

WORK FORCE

Employment patterns are important to examine for two reasons. They can help to identify concentrations of people for hazard information dissemination or hazard rescue and evacuation. They can also identify where disruptions in employment and income might occur in the aftermath of a disaster.

The majority of the workforce in Wachapreague is employed in retail trade, construction, administrative support and waste management services, and accommodation and food services. Many residents in Town work part-time and the low number of the total civilian employed population is thought to be accurate due to a high number of residents retiring (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021).

Table 2: Wachapreague Local Workforce Industry

Civilian Employed Population								
Industry	**2019***		**2014****		**2010*****		**2000******	
	Count	**Percent**	**Count**	**Percent**	**Count**	**Percent**	**Count**	**Percent**
Agriculture, forestry, fishing/hunting, or mining	5	5.6%	2	2.4%	16	13.6%	3	2.4
Construction	12	13.5%	4	4.8%	22	18.6%	11	8.8%
Manufacturing	2	2.2%	14	16.9%	4	3.4%	7	5.6%
Wholesale trade	4	4.5%	5	6.0%	9	7.6%	8	6.4%
Retail trade	18	20.2%	9	10.8%	14	11.9%	13	10.4%
Transportation and warehousing, and utilities	2	2.2%	2	2.4%	0	0.0%	17	13.6%
Information	1	1.1%	1	1.2%	7	5.9%	0	0.0%
Finance, insurance, real estate, and rentals	2	2.2%	2	2.4%	10	8.5%	5	4.0%
Professional, scientific, waste management	12	13.5%	7	8.4%	8	6.8%	14	11.2%
Educational, health care, social services	11	12.4%	16	19.3%	20	16.9%	20	16.0%
Arts, entertainment, recreation, food	12	13.5%	11	13.3%	3	2.5%	14	11.2%
Public Administration	4	4.5%	5	6.0%	0	0.0%	13	10.4%
Other	4	4.5%	5	6.0%	5	4.2%	0	0.0%
TOTAL CIVILIAN EMPLOYED POPULATION	89	-	83	-	118	-	125	-

Source: *ACS, 2014-2019, **ACS, 2010-2014, ***U.S. Census Bureau Center for Economic Studies (OnTheMap), ****U.S. Census 2000

BUSINESSES

Wachapreague's surrounding natural beauty means that most of its economic vitality stems from fishing, hunting, boats, and tourism. Wachapreague has a working waterfront and navigable waterways. This allows the local fishing and recreation facilities of the Town to support a variety of businesses consisting of marinas, tackle shops, restaurants, and lodging services. The Wachapreague Inlet enables access to the Atlantic Ocean and its opportunities for commercial and recreational seafood. The Town's economy is also heavily dependent on tourism. In 2015, there were a reported 24 town business licenses relating to lodging, restaurants, artisan/crafts, tourism, construction services, and commercial seafood enterprises (*Town of Wachapreague Comprehensive Plan*, 2016). The industries and number of establishments shown in Table 3 for 2013 is thought to still be accurate (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021).

Table 3: Wachapreague Business Establishment Types

Industry Code Description	**Total Establishments**			
	2021	**2013**	**2011**	**2009**
Construction	1	1	1	2
Retail Trade	1	1	1	1
Transportation and warehousing	1	1	1	1
Professional, Scientific, and Technical Services	1	1	1	1
Arts, Entertainment, and Recreation	1	1	1	1
Accommodation and Food Services	2	2	2	2
Total, All Establishments	7	7	8	10
Total Employees	-	65	68	NA

Source: Personal Communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021; Census Zip Code Business Patterns, 2009, 2011, 2013

BUILT INFRASTRUCTURE

§201.6(d)(3) Housing units, community facilities, and transportation are all important factors when considering hazard resiliency. They provide the social services necessary during hazardous scenarios, safe cover for those wanting to stay, and a way to leave towards safety.

HOUSING UNITS

According to the American Community Survey five-year estimates, there is a total of 267 housing units in Wachapreague; however, this number may be too high and is probably more accurately depicted in 2010 Census data displayed in Table 4 (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). Like many towns on the Eastern Shore, the high number of vacant housing units is likely due to the high volume of transient occupants, particularly seasonal residents and fisherman. Generally, Wachapreague's housing is in good condition; however, with the decreasing population and a steady increase in seasonal residences, there are housing units that are in a poor state of repair (*Town of Wachapreague Comprehensive Plan*, 2016).

Table 4: Wachapreague Housing

	2019*	2014**	2010***	2000****
Total Housing Units	267	249	230	225
Occupied	113	112	124	133
Vacant	154	137	106	92
Owner-Occupied	90	84	95	107
Renter-Occupied	23	28	29	26
Median Housing Value	$127,500	$138,900	NA	NA

Source: *ACS, 2014-2019, **ACS, 2009-2014, ***US Census 2010, ****US Census 2000

TRANSPORTATION

Wachapreague has approximately 5.6 miles of state-maintained roads, including primary and secondary roads. The primary roads are Route 180 and Route 180-Y. Route 180 connects Wachapreague to U.S. Route 13. Route 180-Y provides an alternate route through Town and connects to Route 624. All other roads are secondary roads. STAR Transit and Shore Ride serve up and down the Eastern Shore, but STAR Transit does not go into Wachapreague Town limits. With the abundant amount of waterfront activity and residents utilizing the park as well as walking, fishing, and launching vessels, in combination of the increased population in the summer months, there is a concern about the speed of vehicles entering Town and about sufficient parking (*Town of Wachapreague Comprehensive Plan*, 2016). Individuals with personal vehicles can most often remove themselves and their families from harm's way in the event of an emergency. According to Table 5, there are five occupied housing units without a vehicle. Star Transit will operate during incoming hazardous events to help assist those without a vehicle and citizens with functional access needs evacuate; however, operations will cease once the hazard reaches a certain level.

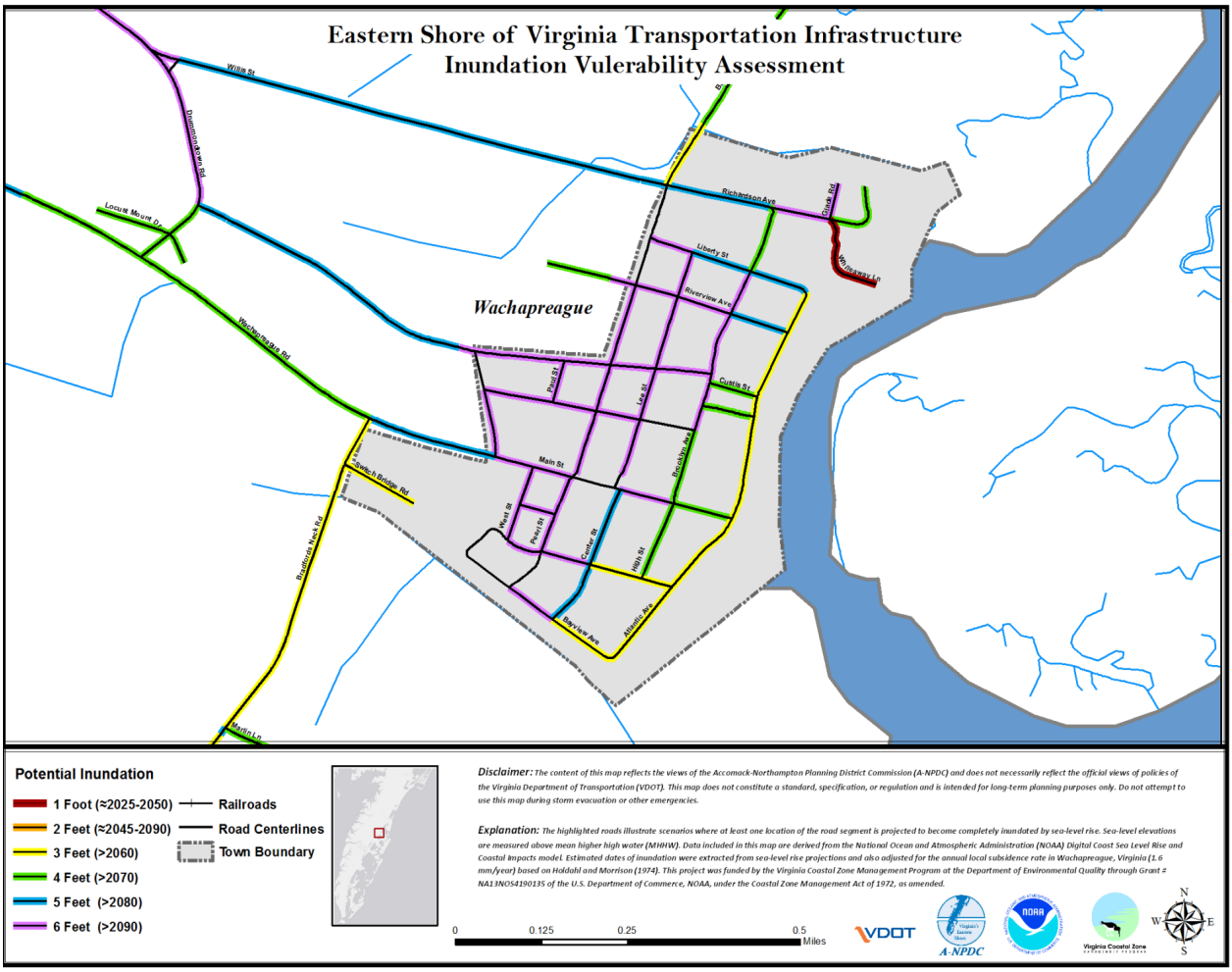
Table 5: Wachapreague Vehicles Available per Household

Vehicles Available	2019*	2014**	2010***	2000****
None	5	12	11	12
One	47	25	42	48
Two	51	64	57	60
Three or more	10	12	15	11

Source: *ACS, 2014-2019, **ACS, 2009-2014, ***U.S. Census 2010, ****US Census 2000

With only two feet of sea level rise (SLR), it is estimated that Atlantic Avenue, the main waterfront commercial street, will be at least partially inundated with water. This is important to note, as it also indicates that with two feet of flooding at mean high tide, this section of the road would also be inundated. Fortunately for the Town, the majority of the residential area roads will not likely experience flooding unless storm surge or SLR reaches six feet. Much of Wachapreague Road, the main access road to the Town and its evacuation route, is within the floodplain as well, which can be seen in Figure 2.

Figure 2: Town of Wachapreague Transportation Infrastructure Inundation Vulnerability



COMMERCIAL AREAS

The commercial center is found along Main Street and Atlantic Avenue and consists of lodging, a Post Office, marinas, restaurants, and the Virginia Institute of Marine Science Eastern Shore Laboratory facilities. The majority of the Town has already been developed. There are remaining undeveloped lots gradually being filled up with new buildings. The Town is looking into future development and revitalization of the Waterfront Business District; however, septic issues have been preventing this. The Town is looking into connecting to the Hampton Roads Sanitation District (HRSD) sewer line in the future to help mitigate this issue.

Figure 3: Wachapreague Waterfront Commercial Area. Photo by Elaine Meil

COMMUNITY SERVICES AND FACILITIES

Community facilities are facilities required to support the services and functions provided by the Town government or in coordination with other public and private entities. These facilities enhance the overall quality of life for the Town and its citizens. It's important to note what facilities are available in case of a hazard, and it's important to make an inventory of facilities that could be affected by a hazard.

PUBLIC SAFETY

Police protection is provided by the Accomack County Sheriff's Department and Virginia State Police. The Volunteer Fire Company is located at 1 High Street and also serves as the Town polling place. The Fire Company is all volunteer and no longer provides rescue services. The Town has two ambulances stationed out of Painter to provide Emergency Medical Services which are staffed by the Accomack County Department of Public Safety. The Town's fire station features five engine bays to house an engine, tanker, brush unit, and utility/support vehicle. There are about 25 volunteers and no paid firefighting or non-firefighting personnel (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). Due to the current Station being located in a flood plain, the Town has purchased property on higher ground just outside of Town limits with the intent to relocate.

Figure 4: Wachapreague Volunteer Fire Company

WATER SUPPLY AND WASTEWATER

Wachapreague residents rely on private wells for their water supply. There is no central sewage collection or treatment in the Town; however, the Town is hoping to connect to the new HRSD line in the future and is currently seeking funding options. Wastewater disposal is by septic systems. In addition, residential water supplies can be threatened by failing septic systems. In the past, flooding that has damaged homes and destroyed possessions has also caused failed septic systems (*Town of Wachapreague Comprehensive Plan*, 2016). Also see the Hazards of Local Significance section in reference to salt water intrusion.

SOLID WASTE DISPOSAL

There is a private waste disposal service located within Wachapreague. The Accomack County Convenience Center on Wachapreague Road in Grangeville is just over 2.5 miles from Town.

PARKS AND RECREATION

The 15-acre Powell Memorial Park has two tennis courts, a baseball field, a recently added dog park in addition to a pet waste station, picnic facilities, and playground equipment. The Park also serves as the storage location for the Town vehicles (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). The 1.5-acre Wachapreague Seaside Park, which was completed in December 2010, sits on the parcel on Atlantic Avenue where the historic Wachapreague Hotel once stood and boasts native plants, beneficial in water retention. Nearby, the fairgrounds bring a significant amount of traffic to the Town and the Wachapreague Fireman's Carnival located there provides much of the funds for the Volunteer Fire Company.

Water access is of vital importance for watermen, recreational fishermen, birders, marine research, outdoor enthusiasts, special events, and fishing tournaments, such as the Marlin Tournament. In addition to the private Wachapreague Marina, LLC, there is also the Town Marina, which offers free use of the boat ramp for all Wachapreague taxpayers and offers transient and monthly slip rentals for boats up to 44' length over all. This facility provides access to paddle sport enthusiasts with a floating dock and a launch site on the Eastern Shore Seaside Water Trail.

DRAINAGE DITCHES

The Town's drainage system is maintained by VDOT and Accomack County. The Town has developed and implemented a bi-annual ditch-cleaning plan. This involves a commercial grade vacuum system and two part-time Town employees to rake and pull the vacuum with the Town tractor, which may take up to two weeks to complete (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021).

POWER AND COMMUNICATIONS INFRASTRUCTURE

Mobile service in the Town is inconsistent and often unreliable. This has been and continues to be a major issue for the Town. Although there is a cell tower located at the Fire Department, there have been unsuccessful attempts at getting a provider to set up antennas on the tower (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). This is a huge vulnerability for the Town, as residents and visitors without access to Wi-Fi or cellular service would be unable to call for emergency services, as well as individuals out on the water or at the marinas.

SCHOOLS

There are no schools within the Town boundaries. The Virginia Institute of Marine Science Eastern Shore Laboratory is located on the northern side of Town and has multiple buildings, including dormitories, and will soon be expanding.

NATURAL ENVIRONMENT

Wachapreague lies within the geological region known as the Coastal Plain. All of the Eastern Shore is included in the Coastal Plain geological region, which is a low-lying region composed of sands, silts, and clay deposited by glacial melt water. Some of the soils in Wachapreague are generally not suited for conventional septic tank drain fields; however, due to alternative on-site wastewater treatment systems such as mound systems, it is now possible to develop on some of these soils (*Town of Wachapreague Comprehensive Plan*, 2016).

HAZARD PREPAREDNESS & COMMUNITY CAPABILITIES

PREVIOUS HAZARD MITIGATION PLANS

§201.6(b)(3), §201.6(c)(3), §201.6(d)(3) The Town has participated in the Hazard Mitigation Planning process since 2006. The Town's primary risk is associated with coastal flooding. Wachapreague's comprehensive plan was last updated in 2016.

Table 6: Town of Wachapreague Hazard Mitigation Resources

	Ordinances, Plans, & Publications															Resources, Committees			
Authority	Building Code	Chesapeake Bay Act	SWMP	Hazard Mitigation Plan	Comprehensive Plan	Ordinance	Storm Water Regulations	Transportation Infrastructure Inundation Vulnerability Report	All Hazards Preparedness	Emergency Operations Plans	Mutual Aid Agreements/Documents	Neighborhood Emergency Help	Viginia Hurricane Evacuation	Oil & HazMat Response Plan; HazMat Commodity Flow		Ground Water Committee	Navigable Waterways Committee	Climate Adaptation Working Group	ES Disaster Preparedness Coalition
Local	*				*	*													
County			*																
Regional				*				*	*	*	*			*		*	*	*	*
State		*					*						*						
Federal		*																	

NATIONAL FLOOD INSURANCE PROGRAM & HAZARD MITIGATION GRANT PROGRAM

NFIP

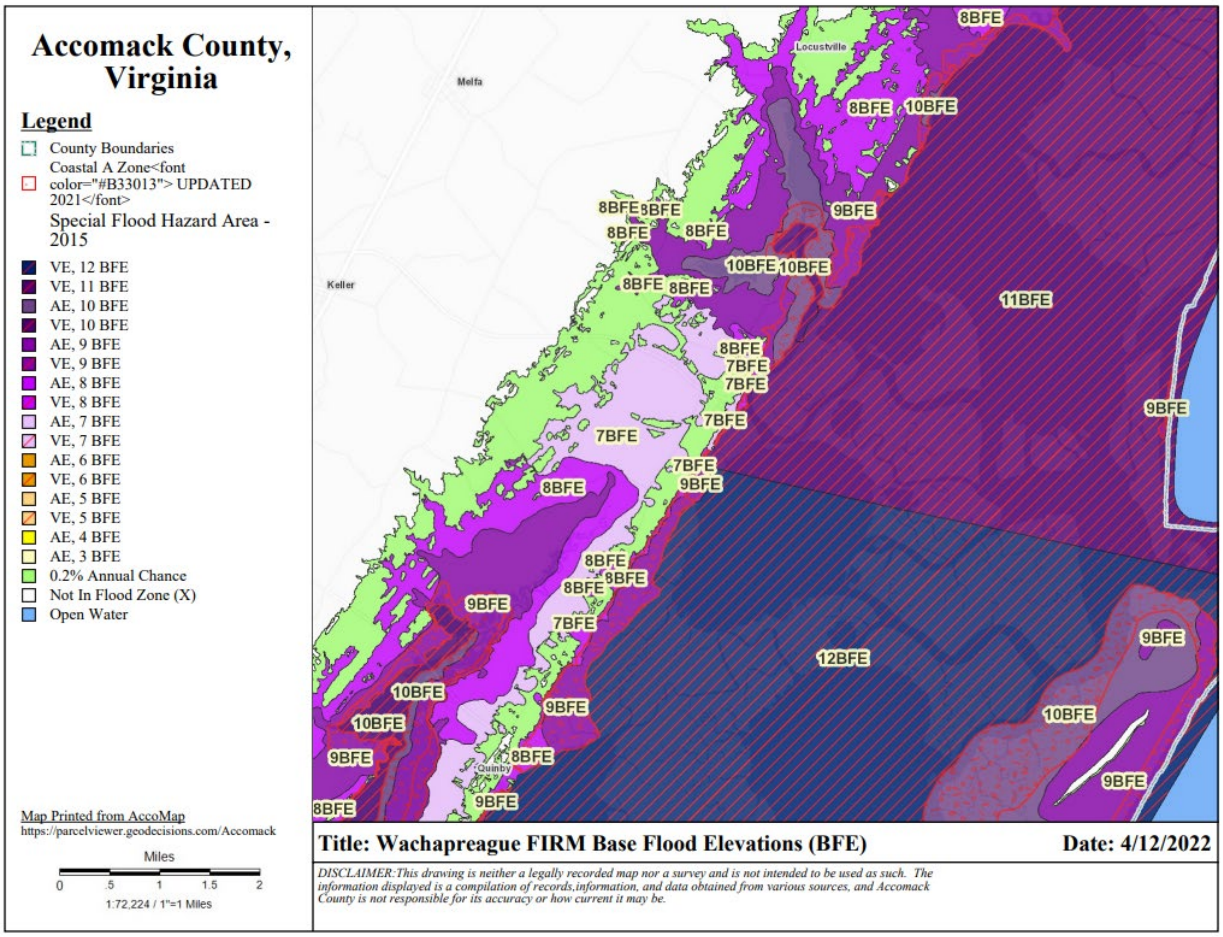
§201.6(c)(2)(ii), §201.6(c)(3)(ii), §201.6(d)(3) The Town has been a participant in the NFIP program since 1982. Every year, there are a few policies for structures that were not located in the 100-year floodplain, which potentially indicates a stormwater flooding problem. Most of the Town lies in the 100-year flood plain with the remainder lying in the 500-year floodplain. There are currently 72 policies in the Town with 29 claims to date (FEMA NFIP Data Report, 2022). More information on repetitive loss properties, NFIP policies and claims, and the CRS program can be found in Chapter 6: Coastal Flooding and Chapter 9: The Region.

Resilience Adaptation Feasibility Tool - RAFT (virginia.edu) From the RAFT Resilience Action Workshop August 2018:

- Upgrade and improve Town emergency response and communications
- Develop emergency response system, which includes: identify vulnerable populations (senior and disabled), emergency evacuation plan, identify responsible authorities and contact lists, identify shelter center (fire department, homes, churches), volunteer help list.
- Develop/create a coastal resilience resource list
- Create a list to help the Town quickly and effectively identify resources for emergencies, funding, planning, etc. when needed.
- Work collaboratively to install cell phone towers/broadband internet in our communities
- Work collaboratively with other localities to place additional pressure on cell companies and prompt a response from companies or leverage resources from state government. Wachapreague Resilience Action Checklist.pdf (virginia.edu)

Wachapreague also participates in the voluntary Community Rating System (CRS), which encourages the community to establish sound programs to recognize and encourage floodplain management activities that exceed the minimum NFIP requirements (*Town of Wachapreague Comprehensive Plan*, 2016). The Town previously had a rating of 9, but was able to lower this rating to an 8 in 2018. This new rating qualifies policy holders in Wachapreague an average of $94.00 in savings on their annual premiums, as well as additional discounts for policy holders located in the SFHA (FEMA, 2018).

Figure 5: Town of Wachapreague FEMA Base Flood Elevation (BFE)



HMGP

The Town received funding following Hurricane Isabel in 2003 to elevate six homes that had been impacted during the storm. One house was elevated in 2016 as a result from a 2012 grant.

HAZARD PROFILE

PANDEMIC RESPONSE AND READINESS

The Town responded to the COVID-19 pandemic in several ways. Wachapreague received a $40,000 grant, which they used to help local businesses as well as to purchase sanitizer, masks, and a screen projector to assist with social distancing during meetings. The Town rented space from the Wachapreague Volunteer Fire Department in order to continue Town Council meetings twice a month to review and update ordinances. Plexiglass was donated from the County to hold elections. Town officials believe they are better prepared if a similar pandemic were to occur again (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021).

HIGH WIND

§201.6(c)(2)(i), §201.6(c)(2)(ii), §201.6(d)(3) No parts of Town lie in the wind-borne debris hazard area. This area extends one mile inland from the barrier islands. The Town lies in the 110-120 mph design wind zone (Accomack County Building Code). According to the Hazus® model, about $36,800 in damages would be sustained from winds from a 100-year probabilistic scenario storm, with the waterfront buildings being the most at risk to higher levels of damages. Most of the residential areas are older and have mature trees in and around the homes. During a high-wind event, falling branches or trees may damage some structures. During Hurricane Isabel, more trees were downed than in any other event in the past twenty years.

Figure 6: Wind Damage from the Hurricane of 1933. Photo Credit-Unknown

Figure 7: High winds from Hurricane Isabel in September 2003 downed trees in Wachapreague including this tree which damaged a car. Photo by Dan Bilicki

COASTAL EROSION

No structures appear to be at immediate risk to coastal erosion. The constantly shifting barrier islands and extensive marshes have historically protected the Town from the wave energies of the Atlantic Ocean. For Wachapreague, the erosion of Cedar Island is a major concern, as this island provides their primary protection from Atlantic storms. The images in Figure 8 partially reveal the rate and intensity of Cedar Island erosion. This rate has continued to increase, as by the summer of 2016 the entire southern end of Cedar Island, including all land shown in both images in Figure 8, are entirely submerged at all stages of the tide (*Town of Wachapreague Comprehensive Plan*, 2016 and Personal communications, Robert Hodgson, Town Council, November 10, 2016).

Not only are the man-made structures in the Town at increased risk with the loss of the protections that the barrier island afforded, but the marsh is also vulnerable to damages and erosion from increased storm surge exposure. The marsh is vital in reducing flooding risks and as habitat to a variety of commercially valuable harvest species.

Figure 8: Aerial Comparison Photos for Cedar Island 2006 & 2013. By the summer of 2016, the entire area represented in both photos is entirely under water at all tidal levels. Photo Courtesy of Gordon Campbell, At Altitude Gallery

An ongoing Continuing Authorities Program (CAP) project by the U.S. Army Core of Engineers (USACE) for Cedar Island will help to mitigate the growing concerns of erosion on the island. Beneficial-use dredged materials will be used for enhancement, expansion, and protection of shoreline wetlands and marsh islands. The project intends to enhance existing shorelines for the Town through wetland and marsh island creation, enhancement, and protection. For more information on the project, visit Cedar Island Dredging (2019). Projects to protect navigation of waterways in the area as well as further mitigate coastal erosion have been in the works over the last few years as well.

There are the remains of a Works Progress Administration earthen protection dike along the east side of Finney Creek and Atlantic Avenue. This was built in summer 1934 in response to the previous year's hurricanes. It has not been maintained and no longer provides much protection from floodwaters; however, this is Town-owned property and the Town is investigating its use as a spoil location site, and more importantly, an area to build up to serve as a wave break for the Town (Personal communications, Former Mayor John Joeckel, April 19, 2016 & Personal communications, Robert Hodgson, Town Council, November 10, 2016).

COASTAL FLOODING

The Flood Insurance Study (FIS) for Wachapreague identifies that the greatest threat of flood inundation comes from nor'easters and hurricanes.

The Special Flood Hazard Area (SFHA) boundaries have changed based on new LiDAR-based topographic data, there was a decrease of 0.1 mi^2 and thus 150 buildings. Within the Coastal High Hazard Areas (CHHA) the Town of Wachapreague has two A Zones within the corporate limits where the Base Flood Elevations range from base flood

elevation of 7- to 8-feet. The 2015 FIRM shows approximately 91 structures within those zones (See Figure 10). Although the FIRM does not show the V Zone exceeding the immediate shoreline, it is thought that there would be damage from the wave action of floodwaters further inland. This is particularly of concern as the berm or break water opposite the channel from the waterfront has been settling and does not provide the same protection as it did years ago. Additionally, the southern end of Cedar Island has eroded significantly in the last several years, vastly increasing the size of Wachapreague Inlet, therefore increasing the vulnerability of the interior marsh system and the Town to incoming wave action from the Atlantic during a wind or storm event.

According to the 2000 Census, 211 (92%) of all houses were built prior to the Town adopting the NFIP ordinance. In the event of a 100-year flood, it was estimated in 2006 that the Town would have $6.5 million in building and content loss (*Eastern Shore of Virginia Coastal Flood Vulnerability Assessment*, 2006). In 2011, it was estimated that the Town could experience $12.5 million in damages, which was nearly a $6 million increase over the previous five years (*Eastern Shore of Virginia Coastal Flood Vulnerability Assessment*, 2011). An assessment done by Hazus® Version 5.0 reveals a total economic loss of $8.14 million and the total building-related losses at 3.14 million. Although the VIMS construction standards are extremely high, the Hazus® model estimates substantial (about 13%) building damage. The loss from inventory and contents of the VIMS facility far exceeds the cost of damages to the buildings, however, and makes up a large portion of the total loss.

The Hazus® model estimates that a total of 121 tons of debris would be generated during such a storm. This would require 5 truckloads (at 25 tons/truck) to remove the debris generated by the flood. This debris along the rack line often interferes with vehicular travel and creates a burden on the local residents. Additionally, the model estimates that 18 households will be displaced due to the flood, and that 2 people from these households would seek temporary public shelter.

Figure 9: The Wachapreague Waterfront Commercial Area during Hurricane Isabel in 2003. Photo by Dan Bilicki

The Town's Fire Department and Town Hall are located in the floodplain as is the commercial center; however, the Town hopes to relocate in the near future to avoid potential flooding (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). Wachapreague's economy is based on the businesses centered on the waterfront. There are seven main docking facilities located in the Waterfront Business District consisting of the Wachapreague Town Marina, Wachapreague Seaside Marina, Island House Dock, Fisherman's Lodge, Coast Guard Dock, the clam house, and the Virginia Institute of Marine Sciences (VIMS) campus. The Eastern Shore VIMS Lab will be expanding and built to anticipate 100+ years of flood conditions. Most other businesses are also located close to Atlantic Avenue. This flood prone area represents most of the commercial activity that occurs in the Town as previously emphasized in Figure 2.

The Town has purchased the parcel where the Wachapreague Hotel was once located and maintained the Wachapreague Seaside Park there since 2010. The parcel's waterfront and central location within the Town made it very desirable for development. Maintaining the parcel as a park eliminates any potential flooding hazards that would be problematic were any development to occur there.

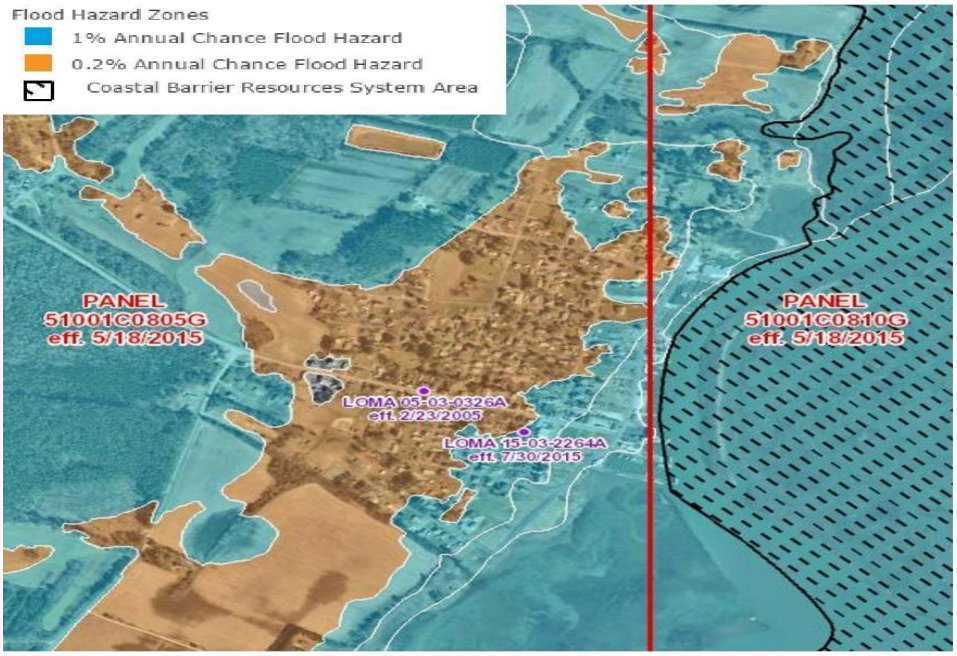


Figure 10: FEMA's National Flood Hazard Layer (effective May 18, 2015) Source: Accomack.mapsdirect.net

Figure 11: Town of Wachapreague Flood Hazards to Infrastructure

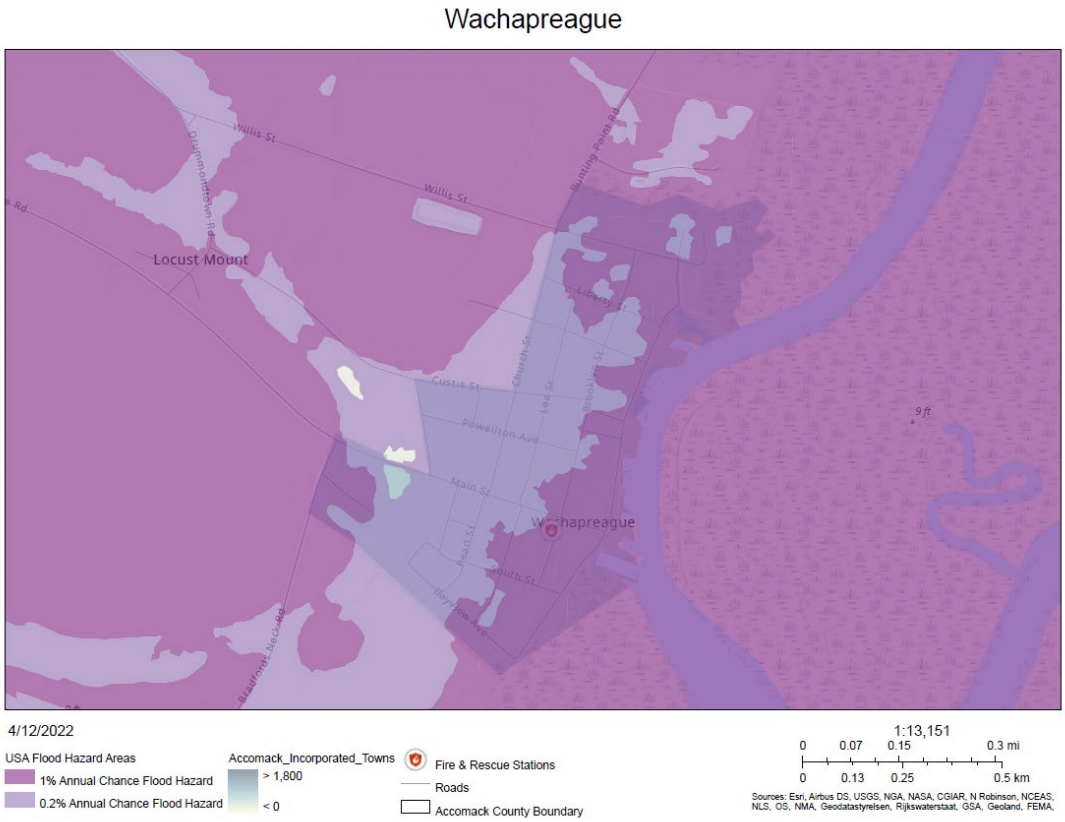


Figure 12: Surge impacting the location of the Seaside Park, marina, and Island House Restaurant during a storm event in October 2005. Photo by Dan Bilicki

Figure 13: Photograph showing the surge from Hurricane Isabel in September 2003 impacting the same area depicted in Figure 11. Photo by Dan Bilicki

STORM WATER FLOODING

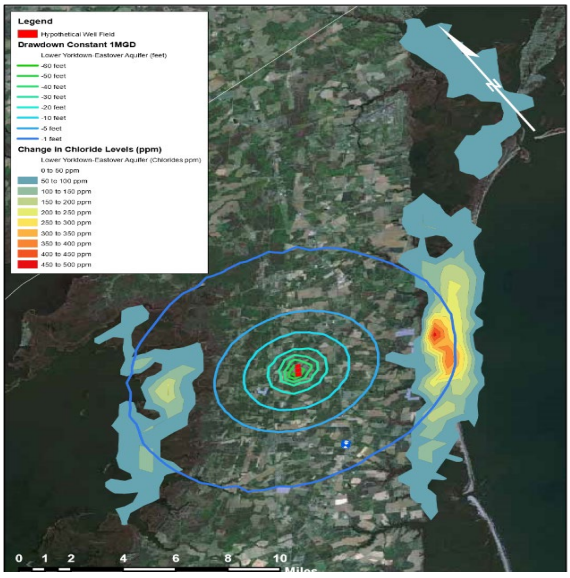


Figure 14: Hypothetical Withdrawal Effects

The Town is divided into three drainage sheds. One of these runs along the waterfront and expands to include most of the southern portion of the Town. Storm water in this area drains onto Atlantic Avenue and is caught by storm sewers and diverted into Wachapreague Channel and Finney Creek (*Wachapreague Town Plan*, 1983). The second drainage basin includes most of the remainder of the Town and lies just behind the waterfront drainage basin. This basin has the largest amount of development within it. The lowest point is the intersection of Riverview Avenue and Lee Street. Areas in the Town Park south of the baseball field is also an area that water will sit until it drains into the soil or evaporates. The majority of the soil in the Town is sandy loam (fine, Dragston, Magotha, and Bojac), which typically drains well, but generally doesn't hold a significant amount of water (*Town of Wachapreague Comprehensive Plan*, 2016). Portions of a third basin are within the Town. The area affected includes western pieces of Town centered on Main Street. The water from this area drains west out of the Town. The land south of the ball field holds surface water. Like many coastal areas, tides can have an impact on the storm water flooding, as when the tide is high, water cannot readily drain.

On the corner of South and Center Street, there is an empty lot that frequently floods due to the lot next to it being raised and containing a mount septic tank (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021). Town officials noted that the south ditch needs maintenance; however, the County is unable to provide maintenance for the ditch without a permanent easement. Renegotiations are currently in progress and the Town has implemented a new Drainage Improvement Plan (Personal communications, Robert Williams, Floodplain Administrator/CRS Coordinator, March 17, 2021).

Figure 15: The carnival grounds in Wachapreague are at risk to coastal flooding and were inundated with flood waters from Hurricane Isabel in 2003. High winds and lightning also threaten these structures. Photo by Dan Bilicki

HAZARDS OF LOCAL SIGNIFICANCE

In addition to the four primary hazards described above, the Town has various other potential threats. These are described below; however, additional hazards may exist.

GROUND WATER CONTAMINATION

Wachapreague's location on the Wachapreague Channel and its direct connection to the Atlantic Ocean causes the Town to be vulnerable to two types of ground water disturbances. Excessive fresh water removal from the waterfront could cause saltwater intrusion. Wells further inland could lead to vertical movement of brackish water found below the lens of potable water (*Town of Wachapreague Comprehensive Plan*, 2016). Because all of the Town residents rely on wells for their water, this is of high concern.

Figure 13 to the right models a hypothetical withdrawal near the center of the peninsula and the devastating effects that would most likely occur on the Bay and Seaside adjacent coastal areas. Although Wachapreague is just to the south of the area represented in the map, similar effects would occur around the Town if a large withdrawal were to be installed in the area west of the Town.

FIRE

In 1978 the Town's hotel was destroyed in a fire. In 2010, the VIMS Eastern Shore Laboratory's Seaside Hall was a total loss of all the contents. The replacement Seaside Hall was built elevated and to much higher construction standards than the dated destroyed building. Due to the aging housing stock, the risk for fire could be higher due to aging electric wiring.

WATER QUALITY

Since many people rely on the fisheries and aquaculture industries, both commercial and recreational, the health of the seaside bays and the Atlantic Ocean is fiscally and culturally vital. Pollution, nutrients, and oxygen levels need to be maintained at healthy levels, and monitoring for invasive species and diseases needs to be a high priority to prevent damaging fisheries and the scenic coastal ecosystem.

Even potential offshore activities such as shipping or oil exploration could threaten the health and livelihood of the community.

HINDERANCES TO WATERWAY NAVIGATION

Shoaling of nearby inlets and channels could negatively impact flushing and water quality in addition to creating a hazard for boaters. As a major access point to the seaside, and with events like the Marlin Tournament, ensuring the safe and easy navigation of channels surrounding the Town is economically imperative. In addition, shoaling and shifting aquatic sediments could have a negative impact on clam and oyster aquaculture, both of high economic importance to the Region and to the Commonwealth. An application was accepted recently for Wachapreague Inlet 2020 VPA Waterway Maintenance Fund effort in order to address navigation and other issues.

CRITICAL FACILTIIES

The following table lists the critical facilities and their relative importance to the Town. Although lightning is not included as a primary hazard in this Plan, it is important to note that the Town has three tall structures that are vulnerable to lightning, the Ferris wheel and two churches.

Table 7: Town of Wachapreague Critical Facilities

Facility	HMP 2006	HMP 2011	HMP 2016	HMP 2021	Hazards	No of People Affected	Loss potential	Relocation Potential	Retrofit Potential
Town-Owned Facilities									
Town Marina	-	-	X	X	Flooding, Wind	200+	Devastating	No	Yes
Dredge Spoil Basin	-	-	X	X	Erosion	200+	Devastating	No	No
Parks	-	-	X	X	Flooding, Fire	200+	Major Disruption	No	Yes
Town Vehicles	-	-	X	X	Flooding, Wind, Fire	200+	Inconvenience	Yes	Yes
Town Hall	-	-	-	X	Flooding, Wind	200+	Major Disruption	Yes	Yes
Other Facilities (Not Town-Owned)									
Coast Guard Station	-	X	X	X	Wind	10,000+	Devastating	No	No
Fire Station	-	X	X	X	Flooding, Wind	11,885+	Devastating	Yes	Maybe
Churches	-	X	X	X	Flooding, Wind	50+	Inconvenience	No	Maybe
Commercial Area	-	X	X	X	Flooding, Wind	200+	Devastating	No	No
VIMS Campus and Dock 50’	-	X	X	X	Flooding, Wind	200+	Devastating	No	Maybe
Carnival Grounds	-	X		X	Flooding, Wind	1,000+	Major Disruption	No	No
Post Office	-	-	X	X	Flooding, Wind	200+	Major Disruption	Yes	Yes
Potential New Fire Department Location	-	-	-	X	Wind	11,885+	Major Disruption	No	Yes
Phone Tower	-	-	-	X	Wind	1,000+	Major Disruption	No	Yes

FINDINGS

1. Most structures in the Town are in the 1%-annual-chance floodplain, including its entire commercial area, which does not require a 1%-annual-chance flood to suffer damages. Coastal flooding is the greatest imminent threat to the Town. Hazus® estimates a total loss of $6.5 million, including building content, inventory, and business interruption should this 1%-annual-chance flood event occur.

2. The southern end of Cedar Island has eroded significantly in the last 5 years, vastly increasing the size of Wachapreague Inlet, thus increasing the vulnerability of the interior marsh system and the Town to incoming wave action from the Atlantic during a wind or storm event. In addition, the long-ago created berm opposite the channel from the waterfront has been settling and does not provide the same protections. Due to these issues, it is thought that the Town is more susceptible to damage from wave action during a storm event than indicated by the FIRM V Zone. Mitigation projects are underway to help keep the Town more resilient to erosion and flooding.

3. Approximately 92% of all homes were built before the NFIP building code requirements were adopted. After a 1%-annual-chance event there will be significant damage and many structures may trigger the substantial damage regulation that requires the structures to be elevated above the base flood elevation. Not all structures at risk are insured and those that are insured will not likely receive enough money to comply with these requirements. Currently, Increased Cost of Compliance insurance is included in NFIP flood insurance, but the maximum amount is $30,000. This will, in most cases, not be enough to comply with elevating the older homes in Wachapreague.

4. The local fire station that responds to Wachapreague and the surrounding area is located in the floodplain very close to the waterfront. The firehouse does not require a 1%-annual-chance flood to have water in the buildings. Its lack of elevation means much less significant events imperil the residents of Wachapreague and surrounding areas of Accomack County. The fire house is a cinderblock building that holds up fairly well in floodwaters. This is a major problem since FEMA's Benefit Cost Analysis is solely based on damage to structures and does not take into account the importance of the structure. During flood conditions and in the recovery period, it is more important to have a safe, working fire station than elevating or purchasing a single house, approximately the equivalent in project cost. Yet the Benefit Cost Analysis will make the house look better on paper aiding a single family versus the entire community. It is a failure not to take into account all benefits in the Benefit Cost Analysis. The Town has plans to relocate the Fire Department out of the floodplain, but the timeline of this project is unknown.

5. The Town now has a CRS score of 8, down from 9 during the 2016 HMP. This allows policy holders to save an average of $94.00 on their annual premiums. The Town is

working to continue lowering their CRS score and allow residents to receive discounted rates.

6. The Town has noted several stormwater flooding problems within its limits.

7. Several Wachapreague residents are proactively trying to protect themselves from flood damage by purchasing flood insurance, even though it is not mandatory.

8. As could be seen in Hurricane Isabel in 2003, mature trees and strong sustained wind can cause massive destruction. Wachapreague, not in the direct path of Isabel, may also be in line for extensive damage from falling branches and trees in a strong wind event. Since so many buildings are in the flood plain in Wachapreague, it is likely that fallen trees will substantially damage structures. If a tree damages a house in this manner, then owners will have to meet the NFIP's elevation requirement; however, homeowner's policies usually will not cover this expense. Although Hazus® estimates only $36,800 in damages from a 1%-annual-chance wind event, this value does not take into account any flooding damages.