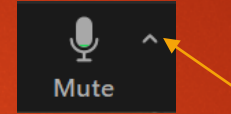


Welcome, the meeting will begin shortly!

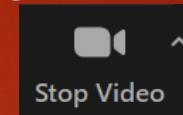
- ▶ Difficulty with your audio? *Click the up arrow by the "Mute" mic symbol*

- ▶ *You can also click the mic symbol to mute & unmute yourself!*



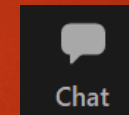
- ▶ Please turn your video **ON** so we can see the face that goes with the voice. *You can do this by clicking the video camera symbol*

- ▶ *If you are having difficulty with your video, click the up arrow by the video cam symbol*



- ▶ **INTERRUPT US!** *We want to have an interactive meeting & welcome questions, ideas, suggestions, & comments!*

- ▶ Use the Chat feature to communicate with participants & hosts!



If you are having any difficulty, or know someone who is, please email or call Jessica Steelman at jsteelman@a-npdc.org or 757-787-2936 x114

Housekeeping

This meeting is being recorded.

Eastern Shore of Virginia Regional Hazard Mitigation Plan

Kick Off Meeting Agenda

- ▶ **Welcome and Introductions**
- ▶ Brief Hazard History of the Shore
- ▶ Hazard Mitigation Planning – Requirements & Process
- ▶ BREAK
- ▶ Planning Activity 1: Steering Committee & Planning Council
 - ▶ Participant Expectations
 - ▶ Establish dates & times for monthly Steering Committee meetings
- ▶ Planning Activity 2: Review ES Hazards & Ranking Process



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Hazard History of the Eastern Shore of Virginia



Jessica Steelman, Coastal Planner
Accomack-Northampton Planning District Commission



Pre-recorded history

The mother of all hazards:

a bolide bulls' eye



Pre-recorded history

- ▶ Early inhabitants adapted around naturally-occurring hazards, mostly hurricanes.
- ▶ It was not until natural events began to impact permanently established properties and economies that they began to be considered hazards.
- ▶ Shipwrecks are themselves records of hazards.
- ▶ Surviving ships' logs offer glimpses of encounters with storms at sea before 1600.

Hurricanes of the 1600's affecting Virginia's Eastern Shore

- ▶ August 24, 1635
- ▶ September 6, 1667: The Dreadful Hurricane of 1667
- ▶ The Accomack Storm of 1693

First recorded reference to a major storm that could have affected Virginia coast

Caused the bay to rise 12'

Demolished colony of Jamestown

"There happened a most violent storm in Virginia which stopped the course of ancient channels and made some where there never were any." Letter by a "Mr. Scarborough", Transactions of Royal Society of London, 1694

Storms/hurricanes of the 1700s affecting Virginia's Eastern Shore

- ▶ October 1703
- ▶ Great Gust of August 1724
- ▶ September 1747
- ▶ October 1749 – “The Tremendous Hurricane”
- ▶ October 1761

Perhaps one of the most severe storms ever in the mid-Atlantic. Storm surge estimated at 15 feet.

A storm of this magnitude would be devastating for the Eastern Shore.

Who says early hurricanes were unnamed?

- ▶ The Great Chesapeake Bay Hurricane of 1769
- ▶ The Independence Hurricane of 1775
- ▶ Great Hurricane of 1780
- ▶ The Great Coastal Hurricane of 1785

Great September Gust of 1821 (Norfolk and Long Island Hurricane)

- ▶ For most of Eastern Shore, worst disaster in recorded history.
- ▶ Possible tsunami triggered by storm passing offshore.
- ▶ Unlikely any home on Chincoteague survived this event.

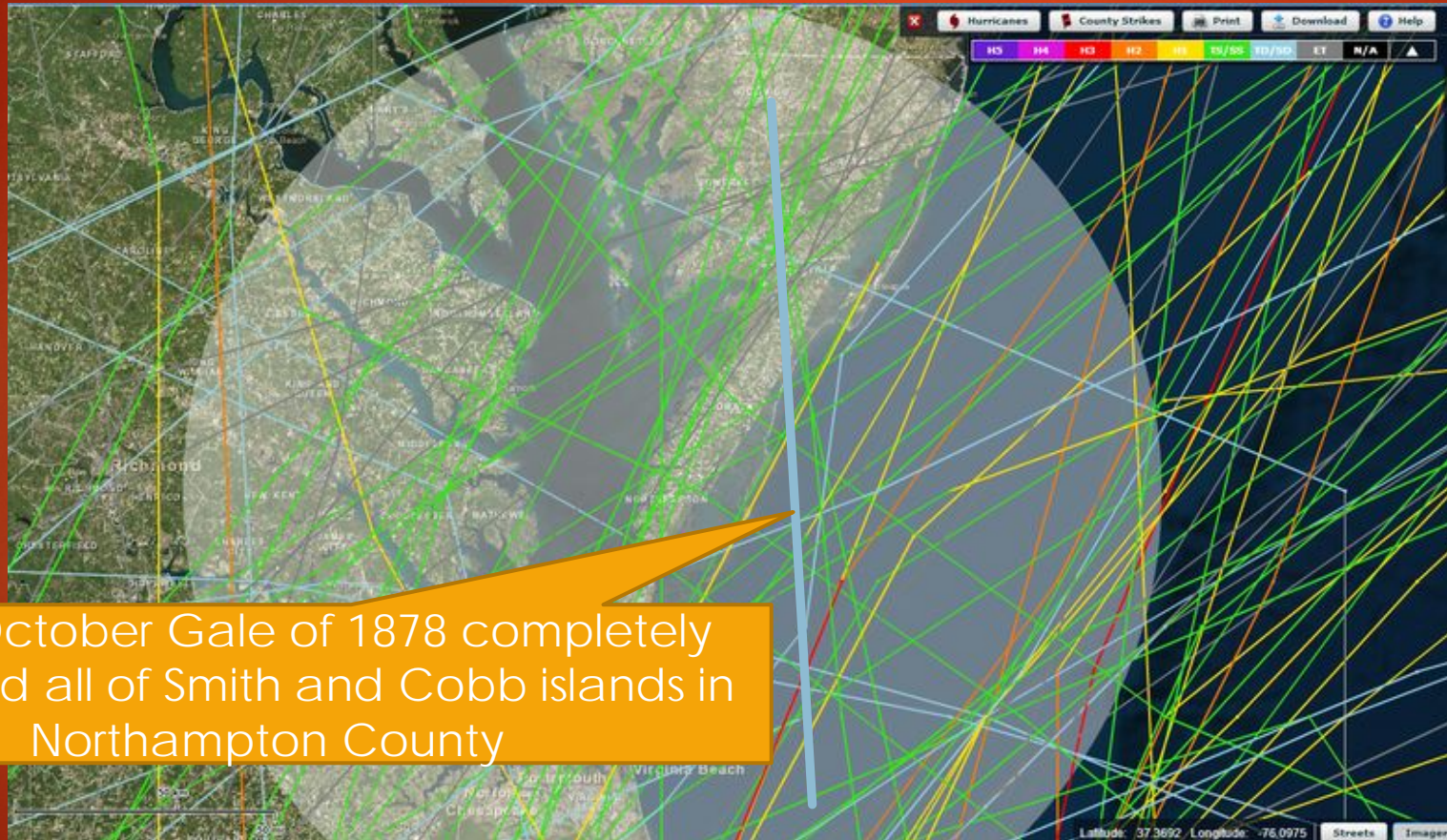
Miles of sandbar lay bare to the gloomy light, as the bottom of the Red Sea to the Israelites, then how a dull roar came nearer and nearer...

A monstrous wall of inky waters rushed with the speed of lightning toward the island... the next instant it struck Chincoteague...carrying away men and ponies like insects; rushing up the island, tearing its way through the stricken pine woods.

Andrews...was borne up the island on the waters, and the next morning was discovered hanging in a pine tree by his waistband twenty feet from the ground.

Source: Scribner's monthly, April 1877

Paths of Hurricanes/Tropical Storms 1856 – (early) 2012



Great October Gale of 1878 completely inundated all of Smith and Cobb islands in Northampton County

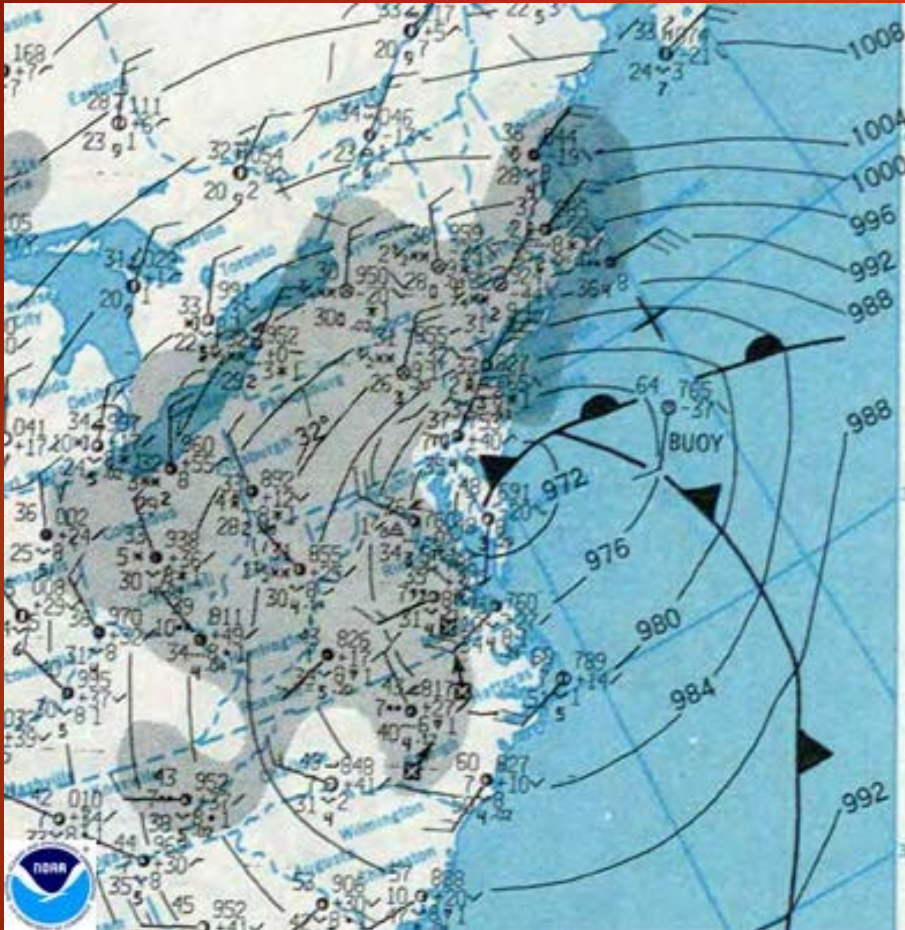
- A look at more hurricane and tropical storm paths
- Not all were direct hits to Eastern Shore but many still posed hazards

Notable 20th Century Storms

- ▶ Chesapeake-Potomac Hurricane – August 1933 (The August Storm)
- ▶ September 1936 Hurricane
- ▶ Hurricane Hazel – October 1954
- ▶ Northeastern of October 1957
- ▶ Hurricane Donna – September 1960
- ▶ Ash Wednesday Storm – March 6-8, 1962



Notable 20th Century Storms



Northeaster of 1984

- ▶ Northeaster of March 28-29, 1984 –worst flooding since Ash Wednesday storm of 1962
- ▶ Hurricane Gloria – September 1985 (did not directly strike the Eastern Shore)
- ▶ Halloween Northeaster, October 1991
- ▶ Hurricane Fran – September 1996 (tropical storm when it reached the Eastern Shore)
- ▶ Twin Northeasters – February 1998
- ▶ Hurricane Floyd – September 1999

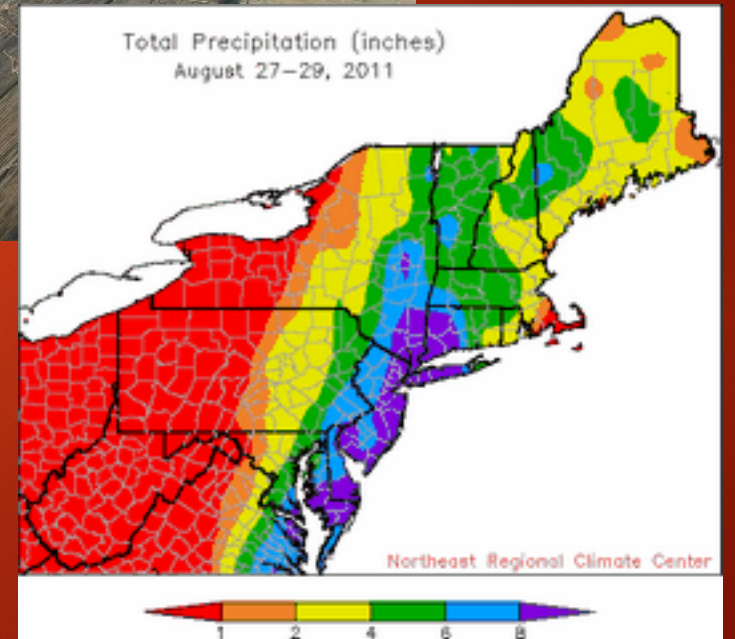
21st Century Storms

- ▶ Hurricane Isabel – September 2003
- ▶ Tropical Depression Ernesto – September 2006
- ▶ Northeasters of November and December 2009



Wachapreague during Hurricane Isabel

Irene - 2011



Sandy - 2012



Oct. 22 – 18th Atlantic depression of 2012 forms, 30 mph winds.

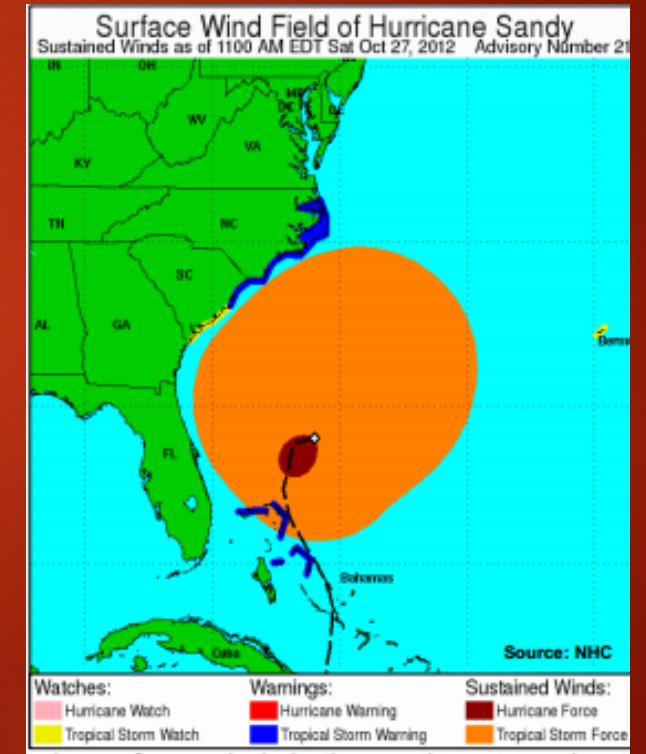
Oct. 23 – Tropical Storm Sandy forms, picks up strength. Max. sustained winds 45 mph. Located 325 miles SSW of Jamaica.

Oct. 24 – Winds 70 mph. Hurricane warnings posted.

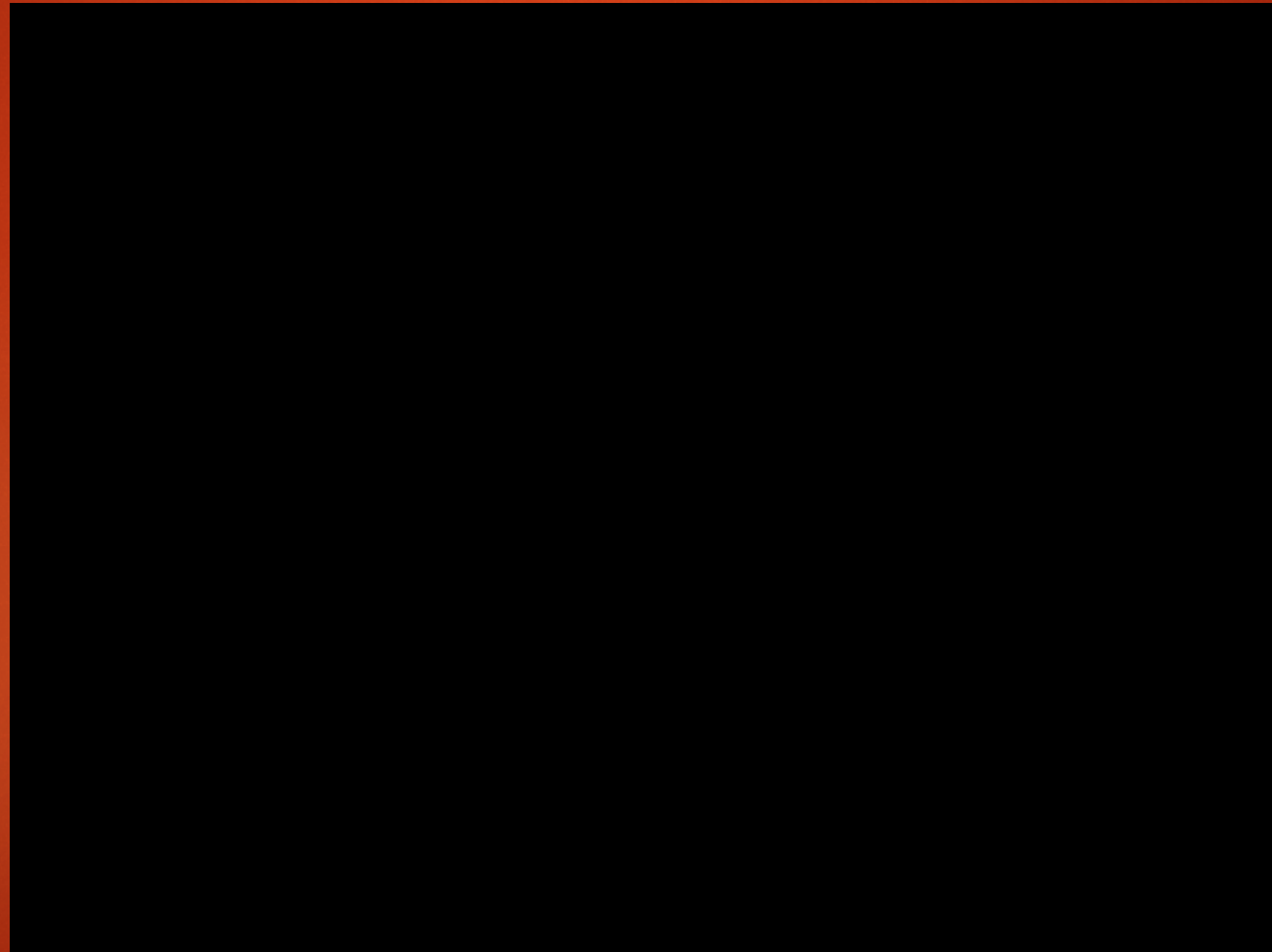
Oct. 25 – Sandy is a Category 2 Hurricane as it nears the Bahamas.

Oct. 26 – “Bride of Frankenstorm” Sandy expected to merge with powerful cold front approaching east coast and an Arctic air mass.

Oct. 27 – Briefly weakened to tropical storm before resuming hurricane force. Tropical storm wind field 1000 miles.



Sandy – Birth to Death

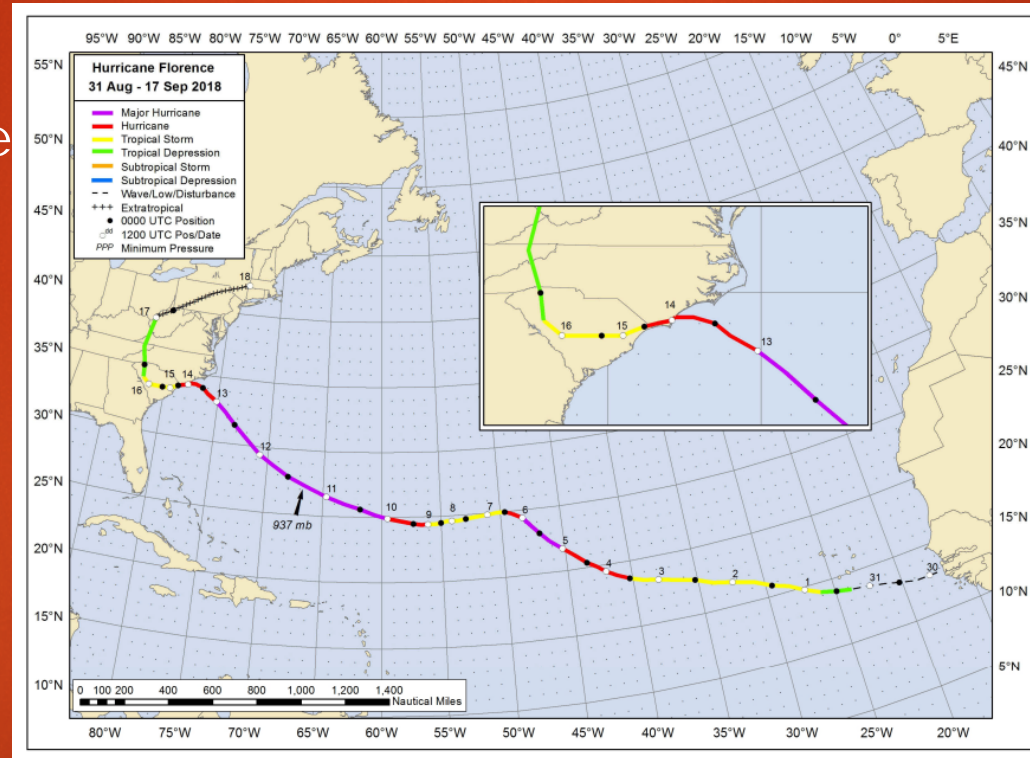


Hurricane Florence

August 31 – September 17, 2018

CBBT (8638901-CHBV2)

- ▶ Sustained max surface wind speed = 31 knots (~35mph)
- ▶ Gusts = 35 knots (~36mph)
- ▶ Storm Surge = 2.13ft
- ▶ Est. Flooding = 2ft



Wachapreague (WAHV2)

- Sustained max surface wind speed = 26 knots (~29mph)
- Gusts = 31 knots (~35mph)
- Storm Surge = 1.95ft
- Storm Tide = 3.57ft
- Est. Flooding = 1.7ft

Source: [NOAA](https://www.noaa.gov)

Hurricane Florence

August 31 – September 17, 2018

“Gov. Ralph Northam issued a mandatory evacuation for people living in Zone A of the state hurricane evacuation zones. The evacuation order affects roughly 245,000 people...the evacuation zone includes the most flood-prone coastal areas.”

([Delmarva Now](#))



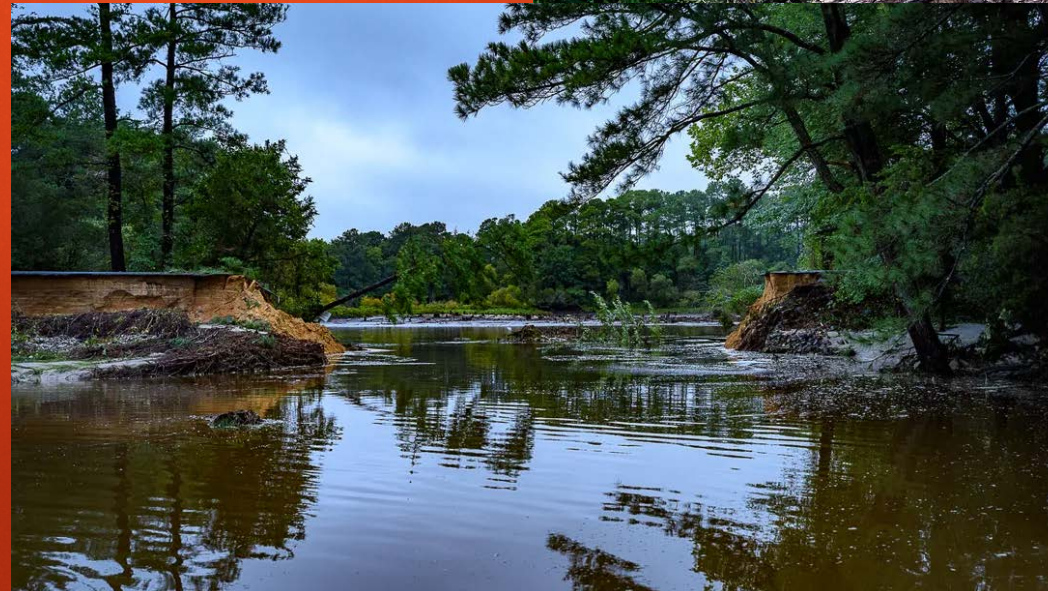
Only road leading to Hillsborough neighborhood, Belle Haven

Photo: Phillip Spohn



Wardtown Road

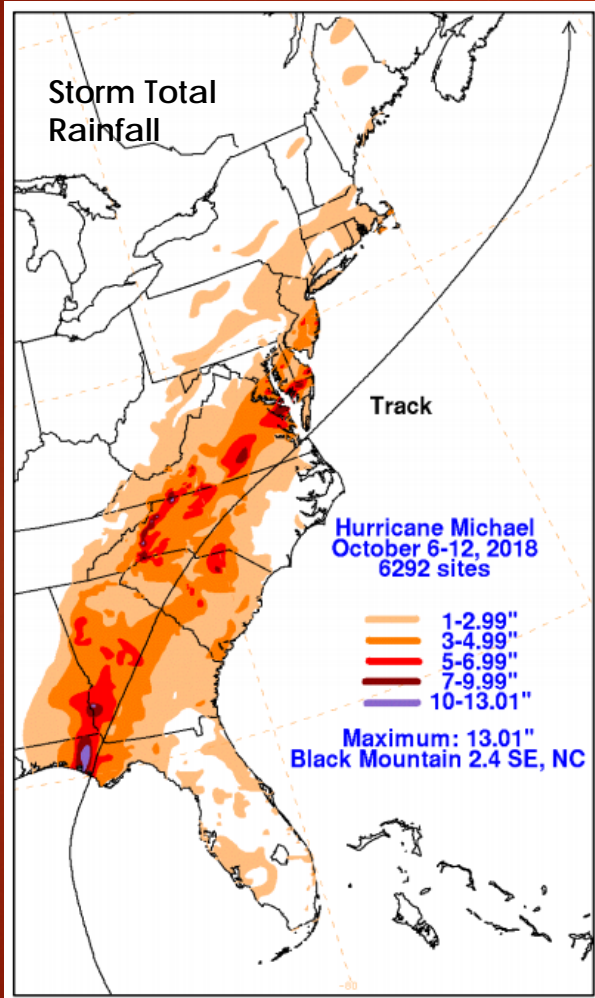
Photo: Roberta Kellam



Source: [Delmarva Now](#)

Hurricane Michael

October 7 – 11, 2018



CBBT (CHBV2)

- ▶ Sustained max surface wind speed = 55knots (~63mph)
- ▶ Gusts = 68knots (~78mph)
- ▶ Storm Surge = 2.22ft
- ▶ Est. Flooding = 2.35ft

Kiptopeke (KPTV2)

- Sustained max surface wind speed = 58knots (~67mph)
- Gusts = 69knots (~79mph)
- Storm Surge = 1.94ft
- Est. Flooding = 1.84ft

Onancock (XHAK)

- Sustained max surface wind speed = 49knots (~56mph)
- Gusts = 63knots (~72mph)
- Storm Surge = 2.13ft
- Est. Flooding = 2ft

Hurricane Michael

October 7 – 11, 2018



Broadway Road,
Onancock
Photo: Carol Vaughn



Cherrystone
Campground
Photo: Cherrystone Family Camping
Resort



Cape Charles
Photo: Phillip Spohn

Other high wind hazards

- ▶ Average of one episode of non-tropical winds gusting 50-60 mph reported in Accomack County in 2003 and every year 2006-2013.
- ▶ Similar events reported in Northampton in 2003, 2006-2009, and 2012
- ▶ 17 tornadoes recorded on the Eastern Shore by NOAA since 1950.
 - ▶ About evenly split between the counties



Erosion

- ▶ Effects can be apparent immediately



Or over time



Barrier island erosion is not necessarily bad

Model of Hog Island evolution



Other hazards

- ▶ **Sewage spills**
- ▶ Hazmat incidents
- ▶ Bio hazards
- ▶ Wildfires
- ▶ **Groundwater contamination**
- ▶ **Surface water quality impairment**
- ▶ Blizzard
- ▶ Ice Storm
- ▶ Extreme Cold
- Earthquake
- Tsunami
- Blast zone
- Air quality/Smoke
- **Fish kills**
- **Pandemic**
- Heatwave
- Drought



Thank You!

Jessica Steelman, Coastal Planner

Accomack-Northampton Planning District Commission

jsteelman@a-npdc.org