

Hurricanes and Virginia

Virginia is at risk for high winds, coastal flooding, rainfall flooding and tornadoes.

During the past century, all sections in the eastern half of the state have experienced hurricane force gusts, if not sustained hurricane strength winds. High wind events of the past hundred years occurred in 1933, 1936, 1944, 1954, 1955, 1960, 1985, 1996 and 2003. Hurricane Isabel in 2003 was the last tropical cyclone to bring significant coastal and interior tidal section flooding. The remnants of Hurricane Floyd in 1999 deluged southeastern Virginia and is among the periodic tropical cyclones that have generated double-digit rainfall and severe flooding. Many tropical systems have spun off tornadoes.

The following are some of Virginia's significant tropical cyclones:

1769 On September 7-8, a hurricane lashed the lower Chesapeake region with high winds and tides, as well as torrential rain. It caused extensive crop losses. The storm also caused widespread moderate to extreme damage. This ranks as one of the bay region's most destructive hurricanes of the century.

1788 *George Washington's Hurricane.* The remnants of a hurricane passed through Washington's estate at Mount Vernon on July 23-24, an event recorded in his journal. The storm whipped eastern Virginia with strong gales, heavy rain and severe flooding in tidal areas. (This event seems much like Hurricane Isabel in 2003.)

1821 A hurricane tracked inside the coast on September 3. One of eastern Virginia's most destructive windstorms. A "tidal wave" was observed at Chincoteague. Damage to Norfolk was "incalculable," according to one account. This storm became legendary in coastal Virginia.

1825 **Virginia's earliest of hurricane season significant tropical cyclone struck on June 3-4. The storm was notable along the coast, with prolonged gales and damaging tides.**

1876 The *Centennial Gale* caused the highest tide in generations through the Chesapeake Bay region and blew damaging winds throughout the eastern half of Virginia on September 16-17. It left considerable crop losses and uprooted trees--a pruning similar to that from Hurricane Isabel in 2003.

1877 A remnant hurricane system on October 4 caused severe flooding in the Shenandoah Valley. This ranks as one of the valley's historic floods. The loss of woodland for fuel and construction, as well as erosive agricultural practices, added to the runoff and subsequent destruction.

1878 A strong hurricane raced through eastern Virginia on Oct. 23 bringing crop losses, as well as considerable structural damage to many dwellings. Hurricane force gusts lashed the Chesapeake Bay, generating 15 to 20 foot waves. The schooner *A.S. Davis* foundered off Virginia Beach, with the loss of 19 crew members.

1879 Norfolk was battered by an intense hurricane on August 19. Hurricane force winds and considerable property losses made this event almost the equal of the 1821 hurricane. The storm was severe throughout the southeastern Virginia.

1896 One of Virginia's most destructive windstorms. On September 29, a band of hurricane-force winds, 50 miles wide, swept through the middle third of the state, from the North Carolina border to Maryland. Richmond, Fredericksburg and Alexandria received unprecedented wind damage. (A similar event today would rank among the state's most expensive disasters.)

1925 The latest hurricane on record to strike the United States (Dec.1) tracked off the VA shore on December 2-3. It pelted southeastern Virginia with several inches of rain. Cape Henry clocked a 5-minute wind speed of 60 mph.

1928 Two tropical systems, on August 11-12 and August 16-17, brought Virginia one of its wettest months. Flooding occurred throughout the eastern half of the state.

1933 The storied *Chesapeake and Potomac Hurricane*. Hurricane force gusts were recorded in southeastern Virginia and gusts of 50 to 70 mph howled throughout the eastern half of the state on August 23. Significant coastal and Chesapeake Bay flooding. Additional flooding from heavy rains. A second significant hurricane brushed the coast on September 16, causing damage in eastern Virginia.

1935 The *Great Labor Day Hurricane* raked the Old Dominion with gales, tornadoes and flooding rain on September 6. It was particularly severe in the Northern and Middle Neck regions. Rainfall totals included (Sept. 4-6): Tappahannock, 12.24 inches, Dahlgren, 11.85 inches, and Fredericksburg, 8.13 inches.

1936 A Category 2 hurricane passed 25 miles east of Virginia Beach. It caused damaging winds and tides on September 8. It nearly made landfall in Hampton Roads. The storm is among several big Virginia coastal hurricanes during the 1930s and 1940s.

1942 Record flooding plagued northwestern Virginia as a dying tropical storm stalled over the area during the middle of October. Nearly 17 inches of rain fell at Riverton. This storm caused Fredericksburg's worst flood. It produced benchmark flooding along the Rappahannock and Potomac rivers.

1944 The *Great Atlantic Hurricane* stayed just offshore on September 14, causing moderate coastal damage. A sustained wind of 134 mph was recorded at Cape Henry, with a gust estimated at 150 mph. It gave Cape Hatteras the lowest barometric pressure of 27.97 inches but Richmond recorded a low of 29.43 inches along with 3.38 inches of rain. The James river crested at 22.4 feet on the 21st.

1954 On October 15, *Hurricane Hazel* raced through the state bringing hurricane force winds to the eastern third and flooding rains to the Blue Ridge region. Hazel lashed Suffolk in southeastern Virginia with a 108 mph gust. 100+ mph gusts were recorded in Norfolk. Other gust included 79 mph in Richmond and 98 mph in Washington, D.C.

1955 In August, hurricanes *Connie* and *Diane* swept through the state bringing flooding rains to the eastern half of Virginia. *Connie* tracked over the Chesapeake Bay with tropical storm-force winds on August 12. A daily record rainfall of 8.79 inches pelted Richmond that day. *Diane* dumped up to 10 inches of rain on the Shenandoah Valley on the 18th, with much flash flooding.

1960 *Hurricane Donna* brought hurricane force winds to the Virginia coast on September 12. An estimated gust of 138 mph was reported 17 miles off Virginia Beach on the Chesapeake Lightship. An 89 mph gust was reported at Virginia Beach.

1964 The remnants of *Hurricane Cleo* dropped over 10 inches of rain on the Virginia coast. Norfolk collected 11.40 inches in 20 hours on August 31 and September 1. Virginia Beach tallied a 24-hour rainfall of 13.70 inches. *Hurricane Dora* arrived later in the month and dumped additional torrential rain.

1969 The remnants of *Hurricane Camille* on August 19-20 dumped at least 27 inches of rain in about five hours on part of Nelson County. Deadly flash flooding and mudslides resulted from the epic deluge. Flooding was severe along the James River and elsewhere throughout central Virginia. More than 150 people died in the state's deadliest hurricane disaster.

1972 *Hurricane Agnes* brought extreme flooding throughout much of the Old Dominion on June 21-22. It ranks as one of Virginia's most destructive and costly floods; an environmental calamity for the state's waterways, particularly the Chesapeake Bay.

1979 *Hurricane David* tracked through on September 5. Gales swept an area from the Blue Ridge to the coast. A tornado outbreak caused several deaths and significant damage, especially in the Tidewater and Northern Virginia regions.

1985 *Hurricane Gloria* on September 27 pummeled coastal areas. An offshoot of *Hurricane Juan* brought tidal flooding on the Chesapeake Bay, as well as severe stream and river flooding in northwestern Virginia and sections of West Virginia on November 4-5.

1996 *Hurricane Fran* brought widespread power outages, gales and heavy rain to much of the state on September 5. The Shenandoah Valley was particularly hard hit by immense flooding. Earlier, on July 12, Hurricane Bertha swept through the state causing modest damage.

1998 *Hurricane Bonnie* on August 27 lashed the Tidewater region with several hours of 50+ mph gusts. The high winds caused widespread power outages and property losses.

1999 *Hurricane Floyd* brought more than 10 inches of rain to part of the Tidewater region and Eastern Shore on September 16. Franklin in southeastern Virginia was devastated as more than 15 inches fell. Epic rainfall caused one of the state's historic natural disasters. 16.57 inches of rain deluged Newport News from September 14-16.

2003 *Hurricane Isabel* struck on September 18. About 10 hours of high winds resulted in an immense loss of trees in the eastern third of the state and record power outages. Peak gusts included Norfolk Naval Station, 83 mph, Quantico 78 mph, Langley AFB 76

mph and Richmond International Airport, 73 mph. Gusts flirted with 100 mph in the Middle and Northern Neck regions, adjacent to the Chesapeake Bay.

2004 Hurricane Gaston briefly stalled near Richmond in late August, then began to strengthen with its center over land. As with other tropical cyclones that re-intensified over land in Virginia (the Labor Day Hurricane of 1935, Cleo, Camille, Agnes) rainfall rates soared, with over 10 inches in some sections of the Richmond metropolitan area. Most fell within two hours, causing devastating flash flooding.

2011 Hurricane Irene tracked along the coast on August 27. Heavy rain, including some totals more than 10 inches, fell on eastern sections of Virginia. Irene lashed the eastern third of Virginia with tropical storm and isolated hurricane force gusts. In early September, the remnants of Tropical Storm Lee produced flash flooding in some sections of eastern Virginia, with the Washington, DC, suburbs particularly hard hit.

Virginia Weather Links

Virginia hurricane history: www.hpc.ncep.noaa.gov/research/roth/vahur.htm

Storm preparation and safety: www.ReadyVirginia.gov

Unisys offers maps of hurricane tracks beginning in 1851: <http://weather.unisys.com>

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