How will global warming of 2°C affect Virginia?

Observed and projected changes in climate and their impacts
“To prevent dangerous interference with the climate system, the scientific view is that the increase in global temperature should be below 2°C [relative to pre-industrial levels]”.

- United Nations Framework on Climate Change, 2010
How will global temperatures change in the future?

The global average temperature has already increased by about 1°C (1.8°F) relative to pre-industrial levels.

Current CO₂ emissions are tracking the ‘higher emissions’ scenario; unless emissions are reduced, the 2°C threshold will be crossed before 2050.
The annual mean temperature in VA has increased by about 1.1°F (0.6°C) since 1895.

In 17 out of the last 18 years, the annual mean temperature in VA exceeded the 20th-century average.

Source: NOAA
Warming in Virginia

PROJECTIONS

In the next 50-60 years, when global warming crosses the 2°C threshold, VA average summer and winter temperatures are projected to increase by over 4°F (2.2°C) relative to pre-industrial levels.

Source: produced by CSRC, UMass Amherst
Warming in Virginia

How warm will Winter and Summer temperatures become?

**PROJECTIONS**

**Observed**

**Modeled**

**Winter**

- Higher Emissions
- Lower Emissions

- The coldest winters in future will be like the warmest of recent years

**Summer**

- hottest summers ...
- ...will become the coolest

Source: USGS
Rain and Snow in Virginia

OBSERVATIONS

Annual total precipitation (rain + snow) has increased over the last few decades.

Source: NOAA
Very Heavy Rainfall

OBSERVATIONS

The amount of precipitation falling during intense multi-day events has increased in the Northeast and Mid-Atlantic US.

Observed increase in very heavy precipitation* from 1958 to 2012
(* the top 1% of storm totals)

Source: NCA 2014
Flash Flooding

Flash flooding submerges cars in Reston, VA, 2011

Flash floods and heavy rains submerge streets in Alexandria, VA, 2015

Source: Karen Goff/ Patch

Source: RedBrickTown.com
Rain and Snow in Virginia

Due to increasing temperatures, there will be more rain and less snow.

PROJECTIONS

Winter precipitation is projected to increase through the 21st century.

Source: USGS

Projected changes in rainfall in summer are uncertain.
Over the last century, sea level has risen by about 1.2 feet around Norfolk, VA.

Seemingly small increases in sea level can have large impacts along the coast due to storm surges and exceptionally high tides.

Communities in Norfolk are now seeing more days with tidal flooding.
Sea Level Rise

Sea level will continue to rise throughout this century.

Recent studies indicate that we are likely to experience more than 1m (3.3ft) of sea level rise by 2100.

Source: Climate Central
An immediate action on local and global scales is required to limit the global mean temperature increase to 2°C (3.6°F).

Average warming (°C) projected by 2100

- If countries do not act: 4.5°C
- Following current policies: 3.6°C
- Based on Paris pledges: 2.7°C

Source: Climate Action Tracker, data compiled by Climate Analytics, ECOFYS, New Climate Institute and Potsdam Institute for Climate Impact Research.
Strategies and Actions

**National Climate Assessment:**

The National Climate Assessment summarizes the impacts of climate change in the US, now and in the future.

**Integrating Climate Change into State Wildlife Action Plan (SWAP):**

The goals of SWAP are to generate proactive, comprehensive wildlife conservation strategies that assess the health, challenges, and potential actions each State would like to accomplish during the coming decade and beyond.

**Climate and Health Assessment:**

This scientific assessment examines how climate change is already affecting human health in the US and the changes that may occur in the future.

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