



Climate Change Projections & Vulnerability SALISBURY, MARYLAND



★ Climate Projections

What future changes do scientists expect to occur?

★ Community Vulnerability

How susceptible to harm is the community as a result of those changes?





Higher average temperatures and more extreme heat





Increased frequency/intensity of extreme precipitation and flooding



Possible increases in hurricane frequency and intensity



Sea level rise and increase in storm surge and coastal flooding

Climate Explorer Projections

☆ The Climate Explorer



I About the data ▼

Climate Explorer Projections



About this site

Q

The Climate Explorer

Wicomico County, MD

Select one of the following for Wicomico County, MD



Climate Explorer Projections



Important Considerations



- Trend direction
- Magnitude of change



Maximum temperature



- Shifts in timing and/or variability
- Scientific uncertainty



Important Considerations

- Trend direction
- Magnitude of change



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Observed historical 1961–1990

Mid-Century 2040–2049

> Late-Century 2070–2099



HIGHER AVERAGE TEMPS

- Minimum temperature
 +4.3°F by 2050; +9.7°F by 2100
 (historical: 46.2°F)
- Maximum temperature
 +4.5°F by 2050; +9.6°F by 2100
 (historical: 66.9°F)







MORE EXTREME HEAT

Days over 90°F
 59.6 days by 2050;
 105.6 days by 2100
 (historical: 20.2 days)







Source: Climate Explorer

Precipitation







SHIFTS IN TIMING/AMOUNT OF RAINFALL

Annual precipitation
 +6.5% by 2050; +12.9% by 2100
 (historical: 43.0 in)

Source: Climate Explorer







SHIFTS IN TIMING/AMOUNT OF RAINFALL

 \checkmark V Changes in seasonality

Significant increase in winter (+13.6% by 2100) and spring rainfall (+8.1%)

Slight increases in summer (1.8%) and fall (3.8%) precipitation

Source: USGS National Climate Change Viewer

Source: Climate Explorer; Easterling et al. 2017

Extreme Precipitation

MORE EXTREME PRECIPITATION

- Precipitation total for 20-year storm event
 - +22% in the Northeast US by 2100
- Days with at least 2 inches of rain in 24 hours
 +33% by 2050; +89% by 2100 (historical: 0.9 days per year)







Sea Level Rise

HIGHER SEA LEVELS

- ▲ ▲ 50% probability of 1.4 ft by 2050 (5% probability of exceeding 2.1 ft)
 - 50% probability of 3.0 ft by 2100 (5% probability of exceeding 5.4 ft)

(Compared to sea levels in 2000)







Hurricanes

INCREASED HURRICANE IMPACTS

- ▲ +8% per decade in global hurricane intensity from 1979–2017
- -16% rate of forward motion for Atlantic hurricanes from 1949–2016
- +100% probability of an active hurricane season from 1982–2020
- Likely increase in the U.S. landfall frequency of Category 4/5

Source: Kossin 2018; Kossin et al. 2020; Pfleiderer et al. 2022; Knutson et al. 2022













STORM SURGE

▲ ▲ 100-year coastal flooding event will occur every 7 years by 2100



Questions?



NEXT UP: What kind of impacts will these climate changes have on Salisbury?







VULNERABILITY is the degree to which natural, built, and human systems are susceptible to harm



- LIKELIHOOD is the degree to which a community is exposed to significant climate changes
- CONSEQUENCE is the degree to which a community is affected by exposure to changes
- ADAPTIVE CAPACITY is the community's ability to adjust to climate change to minimize potential damages, take advantage of opportunities, or cope with consequences







Climate change vulnerability is not evenly distributed across communities!

Understanding disproportionate impacts is critical to ensuring just distribution of adaptation benefits





- People of Color
- Low-Income Residents
- Children under 5
- Seniors over 65
- Individuals with Disabilities
- Individuals with Limited English Skills
- At-Risk Workers
- Individuals with No Vehicle Access



https://ejscreen.epa.gov/mapper/



- Low-income individuals: Lack of financial resources/insurance to respond to extreme events
- Children, elderly, people with chronic health conditions: Difficulty regulating body temp; increased vulnerability to severe illness/disease



• Individuals with limited mobility: Reduced ability to evacuate during emergencies or access shelters





Examples:

- People with limited English: Less able to benefit from resources or access information and receive alerts
- People of color, individuals with disabilities: Less able to utilize emergency shelters or other community spaces
- At-risk workers: Increased exposure to hazards, often without adequate precautions or paid time off





Housing





DIRECT IMPACTS OF CLIMATE STRESSORS

INTERACTIONS WITH PRE-EXISTING CONDITIONS



Housing:

- Increased risk of damage to housing and critical infrastructure following storms, floods, and extreme heat
- Increased heat stress in developed areas, exacerbated by impervious surfaces and lack of vegetation
- Increased energy demand during heat waves, straining electrical grids
- Exacerbation of existing patterns of inequity for vulnerable communities





S Transportation:

- Damage to transportation infrastructure following storms, floods, and extreme heat events
- Road blockages & loss of access due to extreme events and sea level rise
- Slower travel or road closures due to melting asphalt overheating engines, and other extreme heat impacts
- Loss of electricity, limiting use of electric vehicles and public transit





Open Space:

- Reduced growth and productivity of native vegetation due to heat stress and increases in evapotranspiration
- Expansion of non-native invasive plants, insect pests, and diseases
- Increased risk of harmful algal blooms, impacting water quality and survival of aquatic organisms
- Increased flooding/erosion, impacting native plants and access to open space





What additional climate change impacts are you concerned about?



Important Tools and Resources

Projected Trends % CHANGE BY 2100



OBSERVED/PROJECTED CLIMATE CHANGES AND ASSOCIATED IMPACTS FOR SALISBURY, MARYLAND



Observed/Projected Climate Changes & Associated Impacts



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Workshop

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Salisbury Climate Change Adaptation Workshop

What's New What We're Doing What We're Thinking Donate

April 24 and 25, 2023 • Salisbury University

About Team Programs Partners Library

Overview

This workshop focuses on understanding community vulnerabilities to climate change in Salisbury, MD, and developing adaptation strategies to address those vulnerabilities. Participants will also learn how to use tools that are available for communities to enabl ... [show full overview]



Workshop Agenda

Reading & Resources

Climate Change Adaptation and Certification (CCAC) Tool

Rapid Vulnerability and Adaptation Tool (RVAT)

Observed/Projected Climate Changes and Associated Impacts for Salisbury

Data sources and more information:

- U.S. Climate Resilience Toolkit Climate Explorer
- Northeast Chapter of the 4th National Climate Assessment
- FEMA's National Flood Map Hazard Viewer
- Wicomico County Hazard Mitigation and Resilience Plan
- EPA's Environmental Justice Screening and Mapping Tool
- What Will Climate Look Like in 60 Years? (climate analogue tool)
- Equity emphasis areas for transportation investments: Mapping traditionally under-served communities in the Chattanooga TPO area
- Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts (includes fact sheets that summarize impacts for specific communities)
- Cleveland Racial Equity Tool (an accessible screening tool to help people assess whether adaptation strategies they are

Questions?



CAN'T STAND THE HEAT

Winter 2014-2015 Temperature Percentiles Record Warmest Record Coldest



Adapted from NOAA National Climatic Data Center, State of the Climate Global Analysis for February 2015, published online March 2015. http://www.ncdc.noaa.gov/sotc/global

