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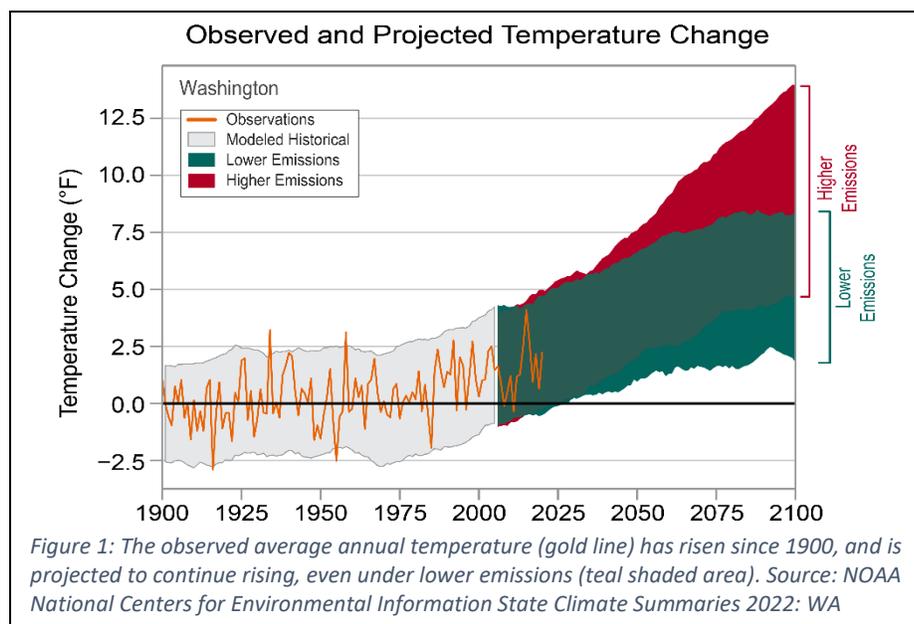
A Changing Climate and Washington's Health

As human activity drives global climate change, our communities will continue to experience more frequent extreme weather events and other climate-related disasters. These events have the potential to drastically impact the health of Washington residents.

According to a recent NOAA report, the three biggest climate-related challenges facing Washington State in the coming decades are higher temperatures, more rapid snowpack melting, and more frequent and severe wildfires.

Washington is Getting Warmer

Since 1900, the average temperature in Washington has risen nearly 2°F, and this warming trend is projected to continue, even if greenhouse gas emissions are cut dramatically (Figure 1). This means that extreme weather events like the Pacific Northwest heat dome during June 26 through July 2, 2021 will become more common.



Scott Lindquist, MD, MPH
State Epidemiologist,
Communicable Disease

Marcia J. Goldoft, MD
Scientific Editor

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WA State Dept. of Health
Communicable Disease Epi
1610 NE 150th Street
Shoreline, WA 98155
206-418-5500

The 2021 heat dome was the deadliest weather-related event in Washington’s history. At least 100 people died from heat-related causes during the extended heat wave, most (67%) in adults over the age of 65 years. The heat dome was also associated with increased morbidity: An MMWR report found heat-related emergency room visits in the region were 69 times higher during the hottest days of the heat wave (June 25-30) compared to previous years without heat warnings. In addition, adults 75 and older were most likely to visit the ER for heat-related illness during this time.

Along with older adults, other people who might be at higher risk for heat related illness and death include very young children, people with heart and respiratory illnesses, and people who take medications that may limit their ability to adapt to high temperatures. Social and economic factors can also increase people’s risk for heat illness as well: People who live alone, people who lack of access to transportation or air-conditioned spaces, and people who work outdoors are also at higher risk (see the Lancet article about health risks of heat).

The good news is that heat-related morbidity and mortality can be largely be prevented with appropriate planning, public health action, and outreach to high risk groups.

Melting Snow, Raging Rivers

A warming Washington also means that our mountain snowpack and glacial ice mass is diminishing. The University of Washington’s Climate Impacts Group recently released a brief called *Shifting Snowlines and Shorelines*, where they explore the impact that climate change will have on Washington (Figure 2).

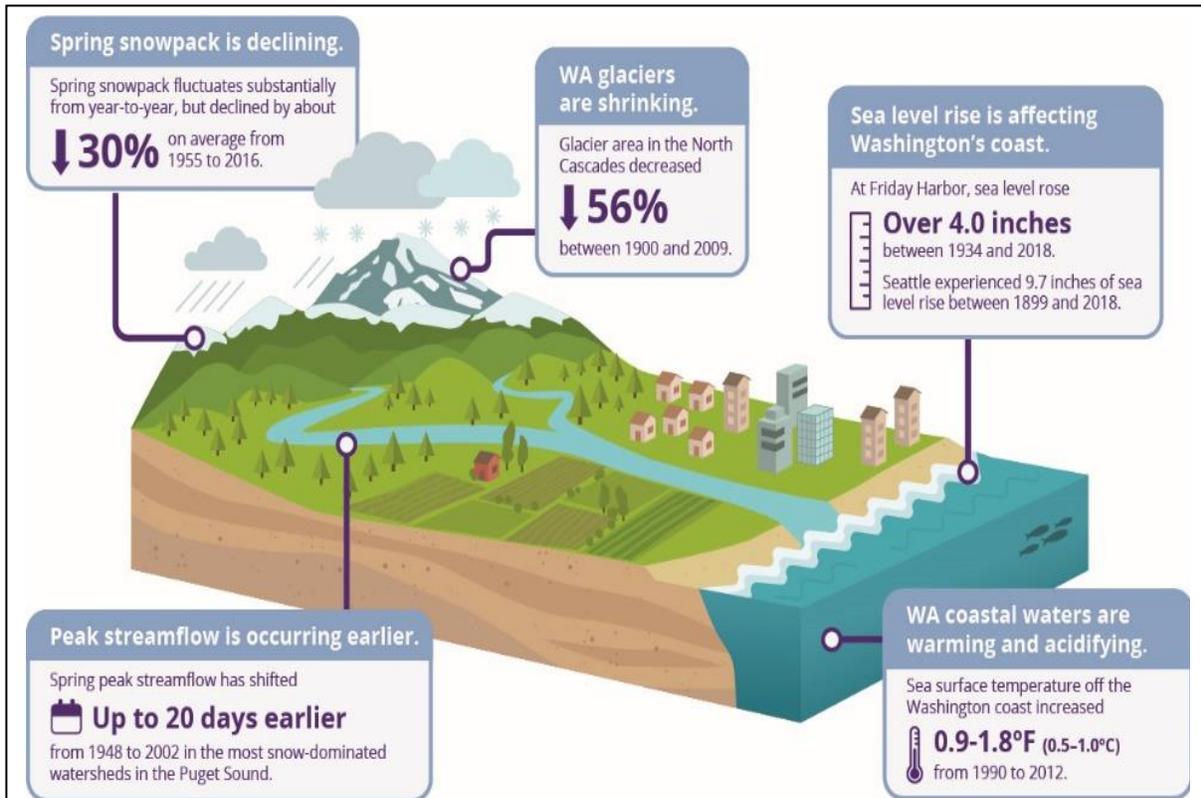


Figure 2: Image source - *Shifting Snowlines and Shorelines: The Intergovernmental Panel on Climate Change’s Special Report on the Ocean and Cryosphere and Implications for Washington State.* Briefing paper prepared by the Climate Impacts Group, University of Washington

Increased snow and ice melt is already causing streams and rivers in Washington to rise earlier, and sea levels have already risen several inches. These trends can put coastal communities and people who live and work in low-lying areas of the state at increased risk for flooding.

There is considerable evidence of the dangerous impacts of flooding on human health and well-being: In November of 2021, northwestern Washington experienced massive floods that displaced hundreds people, damaged homes, and destroyed farmlands. The health risks of flooding events extend beyond the immediate dangers caused by rising floodwaters: contact with water contaminated by chemicals, microbial contamination in drinking water, mold and mildew in flood-damaged buildings, and injuries sustained during cleanup after flood waters recede. In addition, the mental health impacts of evacuation, losing a home or business, or losing loved are also major concerns.

Some communities are responding to the threat of flooding or rising sea levels. For example, the Quinault Indian Nation has begun relocating their village, Taholah, approximately half a mile inland from its current location on the Pacific Coast.

Wildfires and Wildfire Smoke

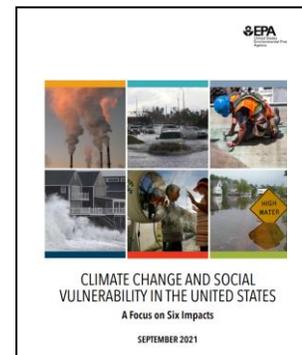
Finally, hotter, drier summers put Washington at risk for another massive challenge to public health: increasing duration and frequency of wildfires. Not only was 2021 Washington’s hottest year on record – it was also the driest. Wildfire season began in March of 2021 and continued for most of the year. Nearly 675,000 acres burned during 2021 in Washington. Aside from immediate risks to human and animal lives posed by advancing wildfires, evidence suggests that wildfire smoke can damage human health; wildfire smoke can travel hundreds of miles due to wind and weather patterns, so large groups of people can be exposed to the smoke.

Wildfire smoke contains several compounds that are known to harm human health, including small particulate matter, known as PM2.5. These fine particles are known to irritate lungs, and are associated with poor lung function, increased risk of asthma attacks, and increased risk of heart attack, stroke, and premature death. (Read more at [EPA.gov](https://www.epa.gov)) A study of wildfire smoke events in Washington found increased odds for mortality after wildfire smoke events.

Similar to extreme heat events, wildfire smoke events are most harmful for people who have heart or respiratory disease; children, pregnant women, and older adults are also at increased risk. People who live in low-quality housing or are living homeless are also at greater risk, as well as people who work outdoors. (Read more about these risk factors at [EPA.gov](https://www.epa.gov).)

Hope in Action

While it is clear that climate change will bring many challenges to people in Washington, there are also steps that we can take now to prepare for these challenges. Several projects are underway to help map climate risk vulnerability, so that public health and emergency preparedness can better understand where to focus resources when an extreme weather or other hazardous event occurs. Tools also exist to help people monitor their risk based on upcoming heat forecasts, and visualize their risk for flooding. The U.S. Climate Resilience Toolkit has tools, case studies, and funding opportunities to help communities adapt to the realities of our changing climate.



Resources

NOAA National Centers for Environmental Information State Climate Summaries 2022: Washington – State Climate Summaries <https://statesummaries.ncics.org/chapter/wa/>

WA DOH: Heat Wave 2021 <https://doh.wa.gov/emergencies/be-prepared-be-safe/severe-weather-and-natural-disasters/hot-weather-safety/heat-wave-2021>

MMWR: Heat-Related Emergency Department Visits During the Northwestern Heat Wave — United States, June 2021
https://www.cdc.gov/mmwr/volumes/70/wr/mm7029e1.htm?s_cid=mm7029e1_w

The Lancet: Hot weather and heat extremes: Health risks
<https://www.sciencedirect.com/science/article/pii/S0140673621012083?via%3Dihub>

Intergovernmental Panel on Climate Change Sixth Assessment Report: Impacts, Adaptation and Vulnerability <https://www.ipcc.ch/report/ar6/wg2/>

Lancet Countdown 2021 annual report:
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01787-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01787-6/fulltext)

U.S. Environmental Protection Agency, 2021. Climate Change and Social Vulnerability in the United States. https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf

U.S. EPA Health Effects Attributed to Wildfire Smoke <https://www.epa.gov/wildfire-smoke-course/health-effects-attributed-wildfire-smoke>

Taholah Village Relocation: <https://www.quinaultindiannation.com/planning/projectinfo.html>

Interactive Sea Level Rise Data Visualizations <https://cig.uw.edu/projects/interactive-sea-level-rise-data-visualizations/>

2021 Wildfire Season Summary: <https://www.wfpa.org/news-resources/blog/2021-wildfire-season-summary/>

U.S. Environmental Protection Agency, 2022. Which Populations Experience Greater Risks of Adverse Health Effects Resulting from Wildfire Smoke Exposure? <https://www.epa.gov/wildfire-smoke-course/which-populations-experience-greater-risks-adverse-health-effects-resulting>

Shifting Snowlines and Shorelines: The Intergovernmental Panel on Climate Change’s Special Report on the Ocean and Cryosphere and Implications for Washington State.” Briefing paper prepared by the Climate Impacts Group, University of Washington:
<https://cig.uw.edu/projects/shifting-snowlines-and-shorelines/>

Washington Environmental Health Disparities Map:
https://deohs.washington.edu/sites/default/files/images/Washington_Environmental_Health_Disparities_Map.pdf

U.S. Climate Resilience Toolkit <https://toolkit.climate.gov/>

National Weather Service HeatRisk Map: <https://www.wrh.noaa.gov/wrh/heatrisk/?wfo=sew>

Mortality associated with wildfire smoke exposure in Washington state
<https://ehjournal.biomedcentral.com/articles/10.1186/s12940-020-0559-2>