



## CLIMATE CHANGE: PUBLIC HEALTH IMPACTS

Long-term environmental conditions on our planet are changing at a faster rate than humans have seen in the past. We call this climate change, and it can affect agriculture, water resources, infrastructure, natural resources, and human health. Climate change impacts global systems, so the effects of climate change are different depending on where you are in the world. In Delaware, the most prominent climate change impacts are sea level rise, increased temperatures, and changes in precipitation patterns (including extreme weather and flooding). We are already seeing these effects and they are expected to worsen in the future.

As Earth's climate warms in some locations, glaciers and ice sheets are melting, adding water to the oceans. The volume of the ocean also expands as the water warms. Using satellites and tide gauges, scientists measure how much and how quickly sea level is rising across Earth as a whole and in specific locations. Delaware is a relatively flat state with a low mean elevation. It is also located on the East Coast on a tectonic plate that is naturally sinking compared to the land level of the surrounding tectonic plates. These and other factors make our state particularly vulnerable to the effects of sea level rise. Delaware has already experienced over one foot of sea level rise at the Lewes tide gauge since 1900, and the sea level there is expected to rise another nine to 23 inches by 2050.

As sea level rises, saltwater moves further inland and can make irrigation wells, groundwater, freshwater rivers and streams, and soil saltier. The amount of salt affects whether water is safe to drink, what crops farmers can grow, and what life can live in and around the water. If an area of land is permanently inundated with seawater, it cannot absorb as much precipitation as it would if it was drier.

Precipitation is any form of water – liquid or solid – that falls from the atmosphere (the air around Earth) and reaches the ground. Types of precipitation include rain, snow, hail, sleet, and ice crystals. Due to climate change, Delaware is expected to experience more precipitation overall and more frequent and intense heavy precipitation events.

Delaware is also becoming hotter. From 2010 to 2019, Delaware faced its hottest decade in recorded history. Evidence suggests that average temperatures will continue to rise and extreme temperature events (such as days above 95 degrees F) will happen more often. Increased temperatures and high heat events can raise the risk of heat exhaustion, heat stroke, and various respiratory issues. Milder winters create conditions for increased mosquito and tick populations that can carry diseases such as West Nile virus and Lyme disease.

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Sea level rise, higher temperatures, and changes in precipitation patterns each have their own public health impacts and they can be especially damaging and dangerous when they occur in the same place at the same time.

Both sea level rise and increased precipitation have a large influence on flooding events. Flooding can make roads unusable, stress water treatment systems, and cause issues with the electric grid. When water systems are overwhelmed, there is a higher risk of septic failure and exposure to waterborne diseases and contamination. Flooding has the potential to damage public recreational areas, pavements, and structural supports. Higher temperatures, flooding, and greater precipitation can raise overall moisture levels, making it easier for mold to grow. Mold is known to aggravate allergic reactions and respiratory conditions.

In addition to the direct human health impacts associated with decreased water quality and failing infrastructure, residents living in areas that frequently flood can experience stress, anxiety, and despair. Their emotional well-being is strained due to the need to repeatedly evacuate from hazardous conditions, replace lost or damaged belongings, and repair or adapt homes. Residents who make the difficult decision to leave their homes may lose a sense of community with neighbors and friends. Relocation may be stressful if people have difficulty finding alternative places to live that are affordable and have accessible jobs, schools, and other resources nearby.

Know how your area may be affected by climate change. Follow these recommendations:

- Make safety and communication plans before emergencies happen. Visit [www.ready.gov/plan](http://www.ready.gov/plan).
- Be aware of the nearest shelters and evacuation routes. Have a plan for where you will stay during an evacuation. Visit [preparedede.org/evacuation-info/#additional-resources](http://preparedede.org/evacuation-info/#additional-resources).
- Pay attention to emergency notifications and follow recommended actions. The federal government sends Wireless Emergency Alerts (WEA) to all mobile devices whose carriers participate in the program. State and local authorities deliver Emergency Alert System (EAS) warnings to television and digital audio services. The National Oceanic and Atmospheric Administration's (NOAA) Weather Radio All Hazards (NWR) broadcasts hazard information 24 hours a day, seven days a week directly from the nearest National Weather Service office. You do not need to sign up for any of these federal alert services.

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- Sign up for Delaware's emergency alerts at [preparedede.org/stay-informed/](https://preparedede.org/stay-informed/).
- Create and maintain accessible emergency kits that include: non-perishable food for three days, for humans and pets; drinking water (at least one gallon per person per day) for three days, for humans and pets; battery-powered or hand crank radio, extra batteries, flashlight, utility knife, and pliers; First Aid Kit and medicines; towels or rags, plastic sheeting, and duct tape; and other essential supplies. Keep these in your household, vehicles, and worksites. For recommended supply lists, visit [preparedede.org](https://preparedede.org) and [Ready.gov](https://ready.gov), or use the Federal Emergency Management Agency (FEMA) app.
- Prepare for floods with the [Delaware Flood Planning Tool](#) and the [Delaware Homeowner's Handbook to Prepare for Natural Hazards](#). For more information, call the Delaware Department of Natural Resources and Environmental Control's Floodplain Management Program at 302-739-9921.
- When outside, avoid insect bites by covering your skin and tucking your shirt into your pants and pants into socks. Only use insect repellents registered by the U.S. Environmental Protection Agency and follow label directions closely. Visit [www.epa.gov/insect-repellents](https://www.epa.gov/insect-repellents).

## Resources

<https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/Delaware-Climate-Action-Plan-2021.pdf>

<https://dnrec.alpha.delaware.gov/climate-plan/impacts/>

[https://dnrec.alpha.delaware.gov/watershed-stewardship/wetlands/and-sea-level-rise/#:~:text=Meanwhile%2C%20Delaware%20\(and%20the%20east,of%20the%20surr,ounding%20tectonic%20plates.](https://dnrec.alpha.delaware.gov/watershed-stewardship/wetlands/and-sea-level-rise/#:~:text=Meanwhile%2C%20Delaware%20(and%20the%20east,of%20the%20surr,ounding%20tectonic%20plates.)

<https://scijinks.gov/precipitation/>

<https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level>

[Sea-Level Rise Planning Scenarios for Delaware Technical Report](#)

<https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/statewide/time-series/7/tavg/ann/11/1895-2022>

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