NORTH COAST

REGION 1

Observed & Projected Climate Changes

Air & Water Temperature

Observed	
Annual Air	• +1.2-1.5°C (2.2-2.7°F) from 1895-2019, with the most recent decade (2010-2019) the warmest on record. • Annual temperature has increased more in the southern part of the region.
Seasonal Air	• Most warming has been observed in summer, particularly for minimum temperatures.
Extreme Heat	• No change in the frequency of extreme daytime temperatures. • Increased frequency of extreme overnight temperatures in summer.
Streams	• Long-term monitoring sites in the region indicate historical warming rates of ~0.30°C/decade (0.54°F/decade) during summer months. • Many streams and rivers in the region do not currently meet water quality temperature criteria during summer months.
Projected by 2100	
Annual Air	• +2°C (3.6°F) to +3.9°C (7.0°F).
Seasonal Air	• Projected increases in all seasons, with the greatest amount of warming projected in summer (+4.3°C/7.7°F) and the least amount of warming in spring (+3.3°C/5.9°F). • A 4°C (7.2°F) increase at high elevations (e.g., Mary's Peak) would increase mountain temperatures to levels comparable with current temperatures in lowland areas (e.g., Willamette Valley).
Extreme Heat	• Longer, more frequent, and more intense heat waves. • Increase in the annual number of days >90°F (32°C) by mid-century (+4 to +14 days) compared to 1971-2000.
Streams	• Increased average surface-water temperatures during summer months. • +2.36°C (4.3°F) for mean August stream temperature.

Precipitation & Drought

Observed	
Annual	• No trend over the past 90 years. • Recent years have been dry compared to the 20th-century average; e.g., Newport received 12-15% less annual precipitation during the last 20 years.
Seasonal	• In recent decades, spring precipitation has been 5-10% above the 20th-century mean while summer, fall, and winter have had below-average precipitation. • Summer has been the most anomalously dry at 79% of normal 20th-century amounts.
Snowpack	• Number of days with snow cover has decreased by 10-12 days/decade.
Drought	• The 21st century has been anomalously dry across the region.

Projected by 2100

Annual	• +2%, although precipitation projections are more uncertain and variable.
Seasonal	• Winter, Summer: Increased winter precipitation (+8 to 10%) and decreased summer precipitation (-28%). • Fall, Spring: Most models project a small decrease or no change in precipitation.
Extreme Precipitation	• Increased intensity of atmospheric rivers. • Increased number of days with an atmospheric river present.
Snowpack	• Further reduced high-elevation snowpack.
Drought	• Increased frequency and duration of drought. • Increased probability of more extreme droughts than those observed in the past century. • Climatic water deficit (a measure of drought stress) is projected to at least double under a high-emissions scenario. • Increased soil drought in the inland, southern portions of the region.

Hydrology & Sea Level Rise

Observed

Sea Level Rise & Storm Surge	• Relative sea level in northern Oregon (Cannon Beach and north) is falling or slightly stable; relative sea level rise rates in central Oregon have been 1-3mm/year since at least the 1970s.

Projected by 2100

Sea Level Rise & Storm Surge	• Rising sea level and increased storm surges. • Increased frequency of major and moderate high-tide flood events. • Sea level at Astoria projected to increase by 2.6-17 inches from 2016-2050. • Sea level at Newport projected to rise by 9-19 cm (3.5-7.5 in) by 2040 and 25-187 cm (9.8-73.6 in) by 2100.
Streamflows	• Overall increase in late fall and winter streamflow. • Slight increases in the size of average peak flows, with some watersheds increasing as much as 24% in average peak flows relative to historical conditions. • Increased frequency of peak flows. • Earlier median center of timing of flow. • 5-25% decrease in spring, summer, and early fall streamflow. • Decreased summer streamflows, with some watersheds declining 20-28% from historical conditions. • Compared to other parts of the Pacific Northwest (e.g., inland mountain ranges), future reductions in average summer streamflows are modest for this region. • Increased duration of low-flow events.

Disturbances

Projected by 2100

Wildfire	• Slight increases in suitability for large wildfires for the Coast Range. • +5% increase in suitability for large forest fires, with suitability highest in inland, southern portion of region. • Increased fire frequency. • Uncertainty regarding fire severity; some studies suggest an increase in burn severity while others project either no change or potential reductions in fire severity.

	• Increased number of high fire danger days in summer and fall (e.g., Tillamook: 7 days in 2020s, 14 days by 2050s).
Insects & Pathogens	• Increased pathogen activity in areas where they typically infect drought-stressed host species. • Increase in Swiss needle cast in response to warmer, wetter conditions; increase in drought may inhibit spread of disease. • Altitudinal and latitudinal range expansion of some forest pathogens. • Warmer winters and hotter droughts may enable some insects to increase reproductive rates and move into previously unsuitable habitat. • Increased tree mortality from insects and pathogens as trees are exposed to more stress associated with growing-season drought.
Invasive Plants	• Altered distribution and spread of non-native plant species. • Warm, dry sites with increased topographic exposure may be particularly susceptible to nonnative species.

Information from the following references and the citations therein:

1. Halofsky, J.E., D.L. Peterson, and R.A. Gravenmier, eds. 2023. Climate change vulnerability and adaptation in Coastal Oregon. Gen. Tech. Rep. PNW-GTR-XXX. U.S. Dept of Ag., Forest Service, Pacific Northwest Research Station. XXX p.

2. Dalton, M. and E. Fleishman, eds. 2021. Fifth Oregon Climate Assessment. Oregon Climate Change Research Institute, Oregon State University. 183 p.

3. Fleishman, E., ed. 2023. Sixth Oregon Climate Assessment. Oregon Climate Change Research Institute, Oregon State University. 248 p.

4. Department of Land Conservation and Development. 2023. Climate Change Vulnerability Assessment Workshops, Regional Climate Change Projections Fact Sheets. https://www.oregon.gov/lcd/CL/Pages/Vulnerability-Assessment.aspx