

# Region 1

POTENTIAL EFFECTS OF CLIMATE CHANGE ON OREGON'S COAST



SEA LEVEL RISE

Sea level at Astoria projected to increase by 2.6-17 inches from 2016-2050

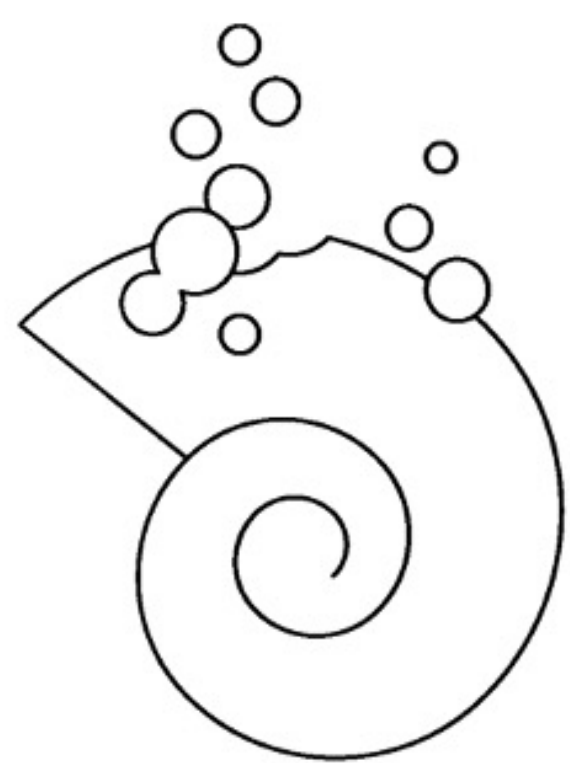
- Salt water intrusion
- Coastal flooding and erosion
- Less-efficient port operations
- Loss of cultural resources
- Changes in estuarine food web



WARMING OCEAN WATER

Northwest open-ocean surface temperature +1.2±0.5°F since 1900, +5.0±1.1°F by 2080

- Altered marine food webs
- Reduced growth and survival of some marine species
- Lower estuarine water quality
- Increased probability of dead zones



OCEAN ACIDIFICATION

pH at Newport currently 8.1, projected to be 7.8-7.9 by 2100

- Negative effects on reproduction of some shellfish (oysters, crabs, pink shrimp)
- Declines of some populations of cold water fishes (salmon, halibut)



WILDFIRES

Number of high fire danger days in summer and fall in Tillamook: 7 in 2020s, 14 by 2050s

- More days with smoke
- Higher concentrations of fine particulate matter
- Higher risk of landslides
- Increased sedimentation



WATER SECURITY

Increase in late fall and winter streamflow; 5-25% decrease in spring, summer, and early fall streamflow

- Greater number of harmful algal blooms
- Higher fecal coliform loads
- Salt water intrusion
- Winter flooding and erosion in estuaries



POPULATION GROWTH

Tillamook County population projected to increase by 24% from 2010-2050

- Pressure on existing resources and services
- Increase in volume of freshwater withdrawals
- Increased risk of fire ignitions



Projected changes in climate variables are from similar global climate models and reflect continued emissions of relatively high levels of greenhouse gases (RCP 8.5). Projected changes in natural hazards are derived from multiple sources that extended projections to different dates.



# Region 2



Annual number of dry days in Portland: 135 in 1990s, 141 by 2050

- Reduction in quality and quantity of water for domestic and agricultural use
- Dry vegetation increases wildfire risk
- Water stress in ecosystems



Annual number of days >90°F in Portland: 14 in 2020s, 31 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



Increase in frequency and magnitude of floods due to more-intense rainfall and shift from snow to rain

- Higher risk of landslides, mudslides
- Disruption of transportation infrastructure, such as roads, bridges, and railroads
- Flooded airport runways



Number of high fire danger days in summer and fall in Portland: 15 in 2020s, 20 by 2050s

- More ignitions at the wildland-urban interface
- Adverse public health effects
- Lower wine quality
- Damaged homes, infrastructure



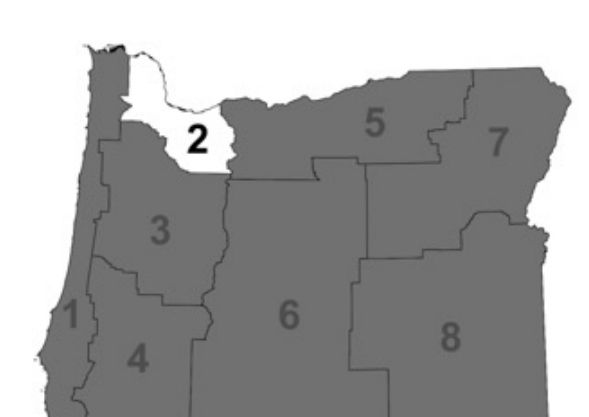
Higher concentrations of pollen and fine particulate matter from wildfire smoke

- Adverse public health effects
- Lower solar radiation constrains crop growth, generation of solar power
- Economic losses from tainted wines, reduction in tourism



Portland metropolitan area population projected to increase by 50% from 2015-2060

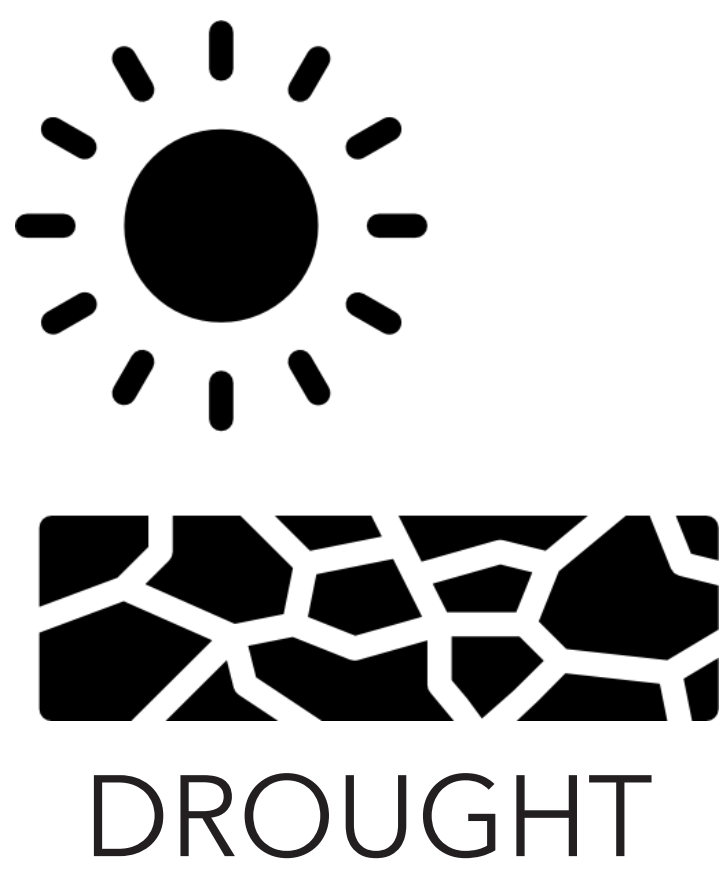
- Larger unhoused population
- Increasing food needs
- Increasing demand for water
- Strain on healthcare system





# Region 3

POTENTIAL EFFECTS OF CLIMATE CHANGE IN THE MID TO SOUTH WILLAMETTE VALLEY



Annual number of dry days in Eugene: 133 in 1990s, 140 by 2050

- Reduction in quality and quantity of water for domestic and agricultural use
- Dry vegetation increases wildfire risk
- Water stress in ecosystems



Annual number of days >90°F in Eugene: 19 in 2020s, 38 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



Increase in frequency and magnitude of floods due to more-intense rainfall and shift from snow to rain

- Higher risk of landslides, mudslides
- Disruption of transportation infrastructure, such as roads, bridges, and railroads
- Flooded airport runways



Number of high fire danger days in summer and fall in Eugene: 12 in 2020s, 16 by 2050s

- More ignitions at the wildland-urban interface
- Lower wine quality
- Damaged homes, infrastructure
- Displacement of residents



Higher concentrations of pollen and fine particulate matter from wildfire smoke

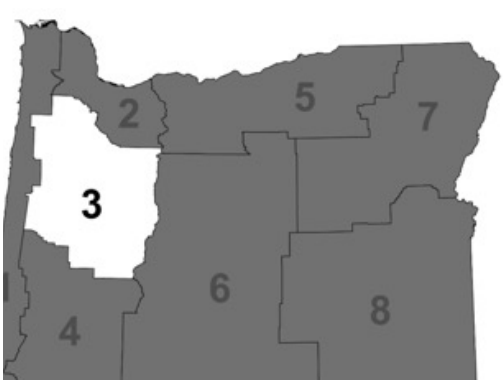
- Adverse public health effects
- Lower solar radiation constrains crop growth, generation of solar power
- Economic losses from tainted wines



Mean maximum daily temperature in Eugene: 82°F summer, 50°F winter in 2020s, +6°F summer, +4°F winter by 2050s

- Warmer nights
- Longer fire seasons
- Unmet chilling requirements
- Expansion of some pests, diseases, invasive species

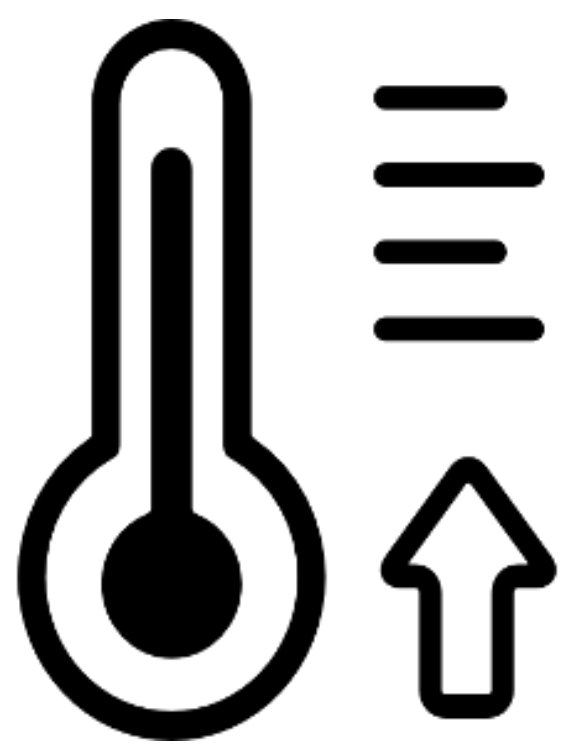
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# Region 4

POTENTIAL EFFECTS OF CLIMATE CHANGE ON SOUTHWESTERN OREGON



MEAN TEMPERATURE

Mean maximum daily temperature in Medford: 89°F summer, 51°F winter in 2020s, +3°F summer, +2°F winter by 2050s

- Warmer nights
- Longer fire seasons
- Unmet chilling requirements
- Expansion of some pests, diseases, invasive species



HEAT WAVES

Annual number of days >90°F in Medford: 43 in 2020s, 65 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



DROUGHT

Annual number of dry days in Medford: 181 in 1990s, 188 by 2050

- Reduction in quantity and quality of water for domestic and agricultural use
- Drier natural vegetation increases wildfire risk
- Loss of topsoil



WILDFIRES

Number of high fire danger days in summer and fall in Medford: 12 in 2020s, 16 by 2050s

- More ignitions at the wildland-urban interface
- Adverse public health effects of wildfire smoke
- Lower wine quality and associated economic losses
- Damaged homes, infrastructure



WARMER WINTERS

Annual mean snowfall in Jackson County: 3.81' from 1981-2010, 2.08' from 2025-2049

- Earlier springs
- Earlier peak streamflow
- Longer wildfire season
- Expansion of some pests, diseases, invasive species
- Unmet chilling requirements



EXTREME PRECIPITATION

Increase in frequency and intensity of floods due to stronger storms and a shift from snow to rain

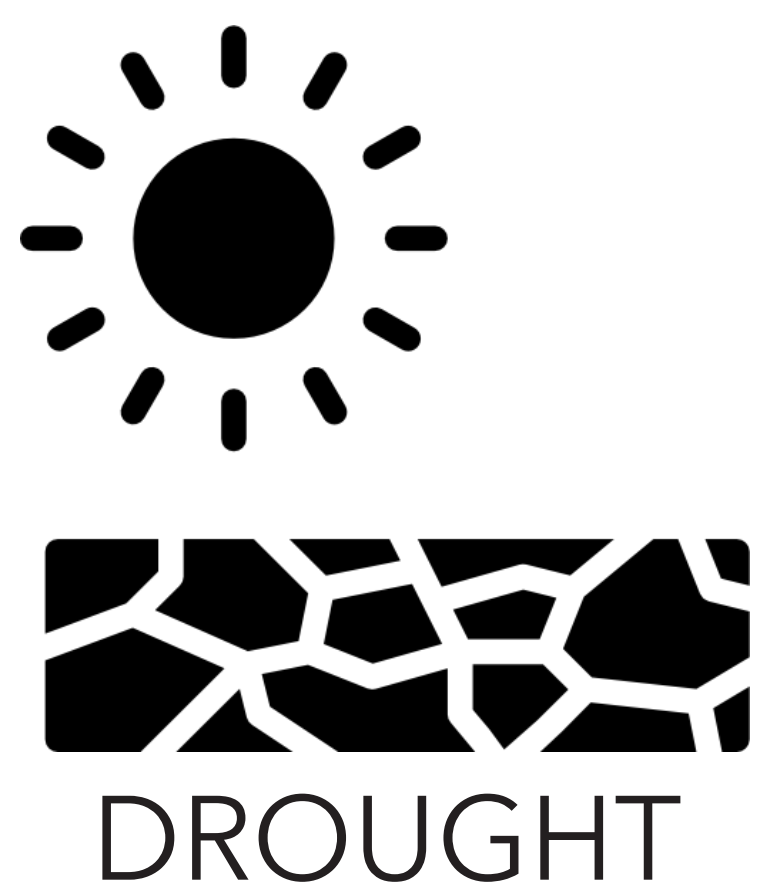
- Higher risk of landslides, mudslides, and hillside and streambank erosion
- Disruption of transportation infrastructure, such as roads, railroads, and airport runways

Projected changes in climate variables are from similar global climate models and reflect continued emissions of relatively high levels of greenhouse gases (RCP 8.5). Projected changes in natural hazards are derived from multiple sources that extended projections to different dates.



# Region 5

POTENTIAL EFFECTS OF CLIMATE CHANGE ON THE MID-COLUMBIA REGION



Annual number of dry days in Pendleton: 174 in 1990s, 179 by 2050

- Reduction in quantity and quality of water for domestic and agricultural use
- Drier natural vegetation increases wildfire risk
- Loss of topsoil



Annual number of days >90°F in Pendleton: 37 in 2020s, 56 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



Higher concentrations of pollen and fine particulate matter from wildfire smoke

- Adverse public health effects
- Lower solar radiation constrains crop growth, generation of solar power
- Economic losses from tainted wines, reduction in tourism



Number of high fire danger days in summer and fall in Pendleton: 15 in 2020s, 21 by 2050s

- More ignitions at the wildland-urban interface
- Adverse public health effects of wildfire smoke
- Lower wine quality
- Damaged homes, infrastructure



Annual mean snowfall in Umatilla County: 1.77' from 1981-2010, 0.84' from 2025-2049

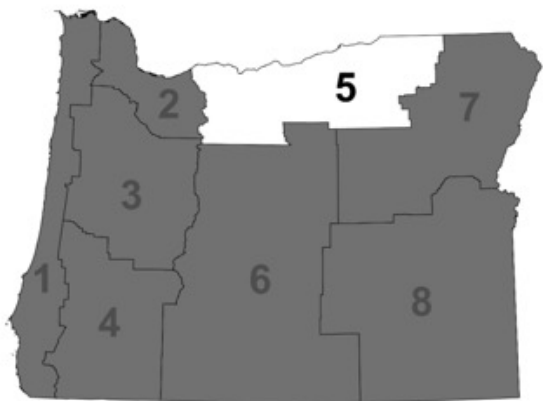
- Earlier springs
- Earlier peak streamflow
- Unmet chilling requirements
- Longer wildfire season
- Expansion of some pests, diseases, invasive species



Increase in frequency and intensity of floods due to stronger storms and a shift from snow to rain

- Higher risk of landslides, mudslides, and hillside erosion
- Disruption of transportation infrastructure, such as roads, bridges, and railroads
- Flooded airport runways

## EXTREME PRECIPITATION



Projected changes in climate variables are from similar global climate models and reflect continued emissions of relatively high levels of greenhouse gases (RCP 8.5). Projected changes in natural hazards are derived from multiple sources that extended projections to different dates.



# Region 6



Annual number of dry days in Bend: 186 in 1990s, 192 by 2050

- Reduction in quantity and quality of water for domestic and agricultural use
- Drier natural vegetation increases wildfire risk
- Loss or lower abundance of some plant species



Annual number of days >90°F in Bend: 12 in 2020s, 26 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



Higher concentrations of pollen and fine particulate matter from wildfire smoke

- Adverse public health effects
- Lower solar radiation constrains crop growth, generation of solar power



Number of high fire danger days in summer and fall in Bend: 11 in 2020s, 15 by 2050s

- More ignitions at the wildland-urban interface
- Adverse public health effects of wildfire smoke
- Loss of timber, livestock forage
- Damaged homes, infrastructure



Annual mean snowfall in Deschutes County: 7.4' from 1981-2010, 5.4' from 2025-2049

- Earlier springs
- Earlier peak streamflow
- Longer wildfire season
- Expansion of some pests, diseases, invasive species

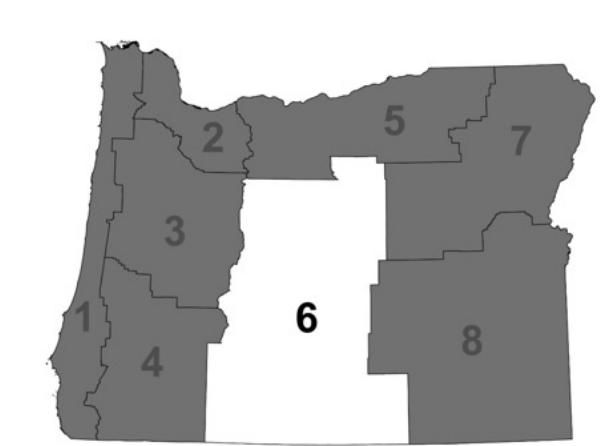


Increase in frequency and intensity of floods due to stronger storms and a shift from snow to rain

- Higher risk of landslides, mudslides
- Disruption of transportation infrastructure, such as roads, bridges, and railroads
- Increased risk of erosion

## EXTREME PRECIPITATION

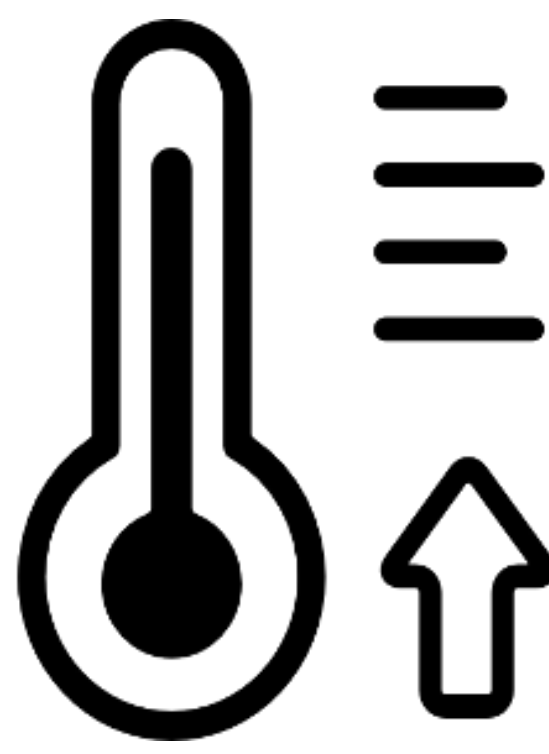
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# Region 7

POTENTIAL EFFECTS OF CLIMATE CHANGE ON NORTHEASTERN OREGON



MEAN TEMPERATURE

Mean maximum daily temperature in LaGrande: 85°F summer, 42°F winter in 2020s, +4°F summer, +2°F winter by 2050s

- Warmer nights
- Longer fire seasons
- Unmet chilling requirements
- Expansion of some pests, diseases, invasive species



HEAT WAVES

Annual number of days >90°F in LaGrande: 20 in 2020s, 39 by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



DROUGHT

Annual number of dry days in Union County: 157 in 1990s, 163 by 2050

- Reduction in quantity and quality of water for domestic and agricultural use
- Drier natural vegetation increases wildfire risk
- Mortality of crop plants, trees



WILDFIRES

Number of high fire danger days in summer and fall in LaGrande: 14 in 2020s, 20 by 2050s

- Adverse public health effects of wildfire smoke
- Damaged homes, infrastructure
- Lower solar radiation constrains generation of solar power



WARMER WINTERS

Annual mean snowfall in Union County: 5.0' from 1981-2010, 3.0' from 2025-2049

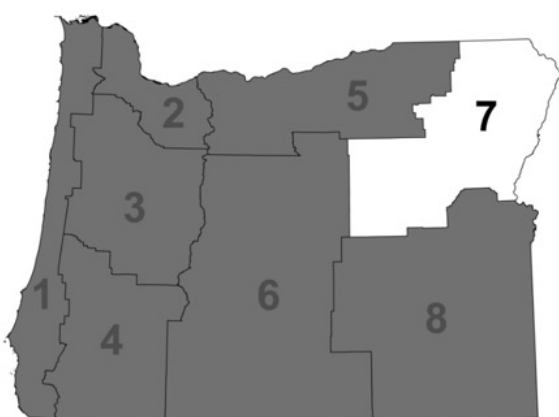
- Earlier springs
- Earlier peak streamflow
- Longer wildfire season
- Expansion of some pests, diseases, invasive species



EXTREME PRECIPITATION

Increase in frequency and intensity of floods due to stronger storms and a shift from snow to rain

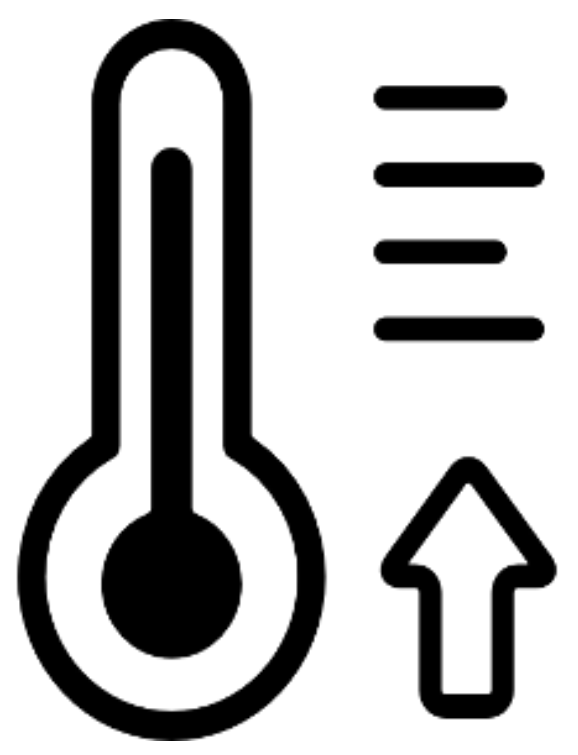
- Higher risk of landslides, mudslides, and hillside and streambank erosion
- Disruption of transportation infrastructure
- Risk of dam failure





# Region 8

POTENTIAL EFFECTS OF CLIMATE CHANGE ON SOUTHEASTERN OREGON



MEAN TEMPERATURE

Mean maximum daily temperature in Burns: 85°F summer, 50°F winter in 2020s, +2°F in summer and winter by 2050s

- Warmer nights
- Longer fire seasons
- Unmet chilling requirements
- Expansion of some pests, diseases, invasive species



HEAT WAVES

Warmest summer day in Burns: 100°F in 2020s, 104°F by 2050s

- Adverse effects on health of urban residents, outdoor workers
- Negative effects on some crops, dairy cows
- Higher seedling mortality
- Plants become heat-scorched



DROUGHT

Annual number of dry days in Burns: 133 in 1990s, 140 by 2050

- Reduction in quantity and quality of water for domestic and agricultural use
- Drier natural vegetation increases wildfire risk
- Loss or lower abundance of some plant species



WILDFIRES

Number of high fire danger days in summer and fall in Burns: 13 in 2020s, 19 by 2050s


- Adverse public health effects of wildfire smoke
- Damaged homes, infrastructure
- Loss of crops, timber, housing
- Lower solar radiation affects generation of solar power



WARMER WINTERS

Annual number of frost-free days in Burns: 179 in 2000s, 224 by 2050s

- More rain, less snow
- Earlier peak spring streamflow
- Higher probability of late frost
- Intensified summer drought
- Longer wildfire season



EXTREME PRECIPITATION

60% increase in number of extreme rainfall events in Burns from the 1990s to the 2050s

- Increased risk of flash floods
- Disruption of transportation infrastructure, such as roads, bridges, and railroads
- Increased soil erosion