OREGON
Department of Land Conservation & Development

Clatsop NHMP Update: OCCRI Report Scoping Discussion

AGENDA & MEETING NOTES

with Meghan Dalton of Oregon Climate Change Research Institute (OCCRI)

Tuesday August 13th 2-3pm

Join Zoom Meeting: https://us04web.zoom.us/j/764085478

Call in: (408)638-0968, Enter: 764085478#

Agenda

Introductions	2:00 pm
Short presentation by Meghan Dalton	2:10 pm
Local Climate Planning (all)	2:30 pm
Climate Planning Needs (all)	2:40 pm
Discussion	until 3 pm

Attendees:

Meghan Dalton, OCCRI, PRESENTER
Pam Reber, DLCD, FACILITATOR
Vincent Aarts, Clatsop Co. EM
Gail Henrikson, Clatsop Co. CD
Michael McNickle, Clatsop Co. PH
Alejandro Bancke, Clatsop Co. PW
Terry Hendryx, Clatsop Co. PW
Matt Phillips, Clatsop Co. Sheriff
Brett Estes, Astoria
Rosemary Johnson, Astoria
Jeff Harrington, Astoria
Barbara Fryer, Astoria
Dan Crutchfield, Astoria Fire
Jeff Adams, Cannon Beach
Carole Connell, Gearhart
Krysti Ficker, Gearhart
Kevin Cupples, Seaside
Anne McBride, Seaside
Collin Stelzig, Warrenton
Matt Benedict, CB Fire
JoAnn Zahn, Clatsop CC
Stephanie Homer, Clatsop CC
Charles Dice, Falcon Cove
Susan Transue, Port
Gary Kobes, Port
Jeff Golightly, L&C Fire
Jeff Hazen, SETD
Paul Lewicki, SETD
Lisa Phipps, DLCD
Meg Reed, DLCD

Meeting Notes

The purpose of this meeting is to ensure that the Clatsop NHMP Steering Committee understands that this climate projection report work is being done, to daylight the research approach being used, and to provide an opportunity to influence the process with comments and locally-specific information.

Advance Materials:

- DRAFT Excerpt from: Future Climate Projections Clatsop County, OCCRI
- Clatsop County NHMP Climate Change References, DLCD
- Climate Change Information for Oregon's County Natural Hazard Mitigation Plans, DLCD

Online climate sources:

- www.climatetoolbox.org has 17 tools for projecting climate impacts on four sectors: agriculture, climate, wildfire, and water.
- https://www.climatecentral.org/ has news and reports of climate trends at a national and international scale and is a reference used in the report.

Presentation by Meghan Dalton, OCCRI:

The Oregon Climate Change Research Institute (OCCRI) based at Oregon State University, is the leading climate research group in Oregon. In 2017, the Oregon Department of Land Conservation and Development contracted with OCCRI to create future climate projection reports for eight counties working on their mitigation plan updates so that local governments could adequately plan and prepare for changing conditions. OCCRI is under contract to complete four more reports (Clatsop, Lincoln, Baker, Grant) by 2020. Expect the final draft of the Clatsop Future Climate Projections Report to come out by October 2019.

The Climate Projection Report presents scientific and statistical findings about the projected changes to the climate and likely outcomes of these changes. The basis of the research are 10-20 global climate models. This work is made 'locally relevant' by assembling a number of climate metrics for current conditions and then comparing this baseline to two future carbon emission scenarios. See the handout "Climate Change Information for Oregon's County Natural Hazard Mitigation Plans" or the OCCRRI website and reports for more information.

Comments/Questions:

Will previous climate work be included in the Clatsop NHMP?

Previous climate reports completed for Clatsop County were not considered for the OCCRI report, but Meghan will review for any missing components. Pam will utilize them for the NHMP update, primarily for informing the mitigation strategy and action items.

How will the OCCRI report be used for the Clatsop NHMP?

The OCCRI climate report will be used to inform the Clatsop NHMP Risk Assessment, likely via the addition of a climate section for each hazard to address whether and how climate change will modify anticipated impacts from legacy hazards.

Per our discussion at this meeting, the OCCRI climate report will likely be used to inform a new "Climate Change" hazard. This and possibly other new sections will allow for more of the OCCRI report to be

brought into the Clatsop NHMP, in lieu of appending the report to the NHMP update. The SC committee will be asked to comment on this once the plan draft is available for review.

Why integrate hazards into other plans, isn't that the purpose of THIS plan?

While hazards will be covered in detail in the NHMP, integration of natural hazards into other plans allows jurisdictions to apply the authorities empowered by those plans to hazard mitigation. Unfortunately, NHMPs are somewhat limited on the depth of implementation that they can undertake. However, they can be a strategy with a clear set of actions with recommendations for updates to other existing plans.

Issue discussions included gorse and wildfire. Here are two good references.

Comprehensive Multi-Level Gorse Management Plan for the Southern Oregon Coast

NPR series on wildfire: https://www.opb.org/news/series/livingwithwildfire/

Future Climate Change Projections to Support Clatsop County Natural Hazard Mitigation Planning

Meghan Dalton, Oregon Climate Change Research Institute

August 13, 2019

OCCRI

Oregon Climate Change Research Institute
www.occri.net

Created by Oregon state legislature (HB3543) in 2007 to:

- Foster climate change research
- Provide information on climate change & effects
- Assess state of knowledge
- Assist local adaptation efforts

~7 staff & students + ~80 collaborators

Based at College of Earth, Ocean, & Atmos Sci, OSU

Home of Oregon Climate Service

Home of NOAA Climate Impacts Research Consortium

OCCRI

What I Do at OCCRI:

Regional/State Climate Assessments:

- Northwest chapter of Fourth National Climate Assessment co-author (2018)
- Third Oregon Climate Assessment Report lead author (2017)
- Northwest Climate Assessment Report lead editor (2013)

Applied Climate Research & Data To Support:

- State/County NHMPs
- Tribal Climate Adaptation Planning
- Ag-Econ-Climate Decision-Support Tool
- Public Utility Planning
- Et al.

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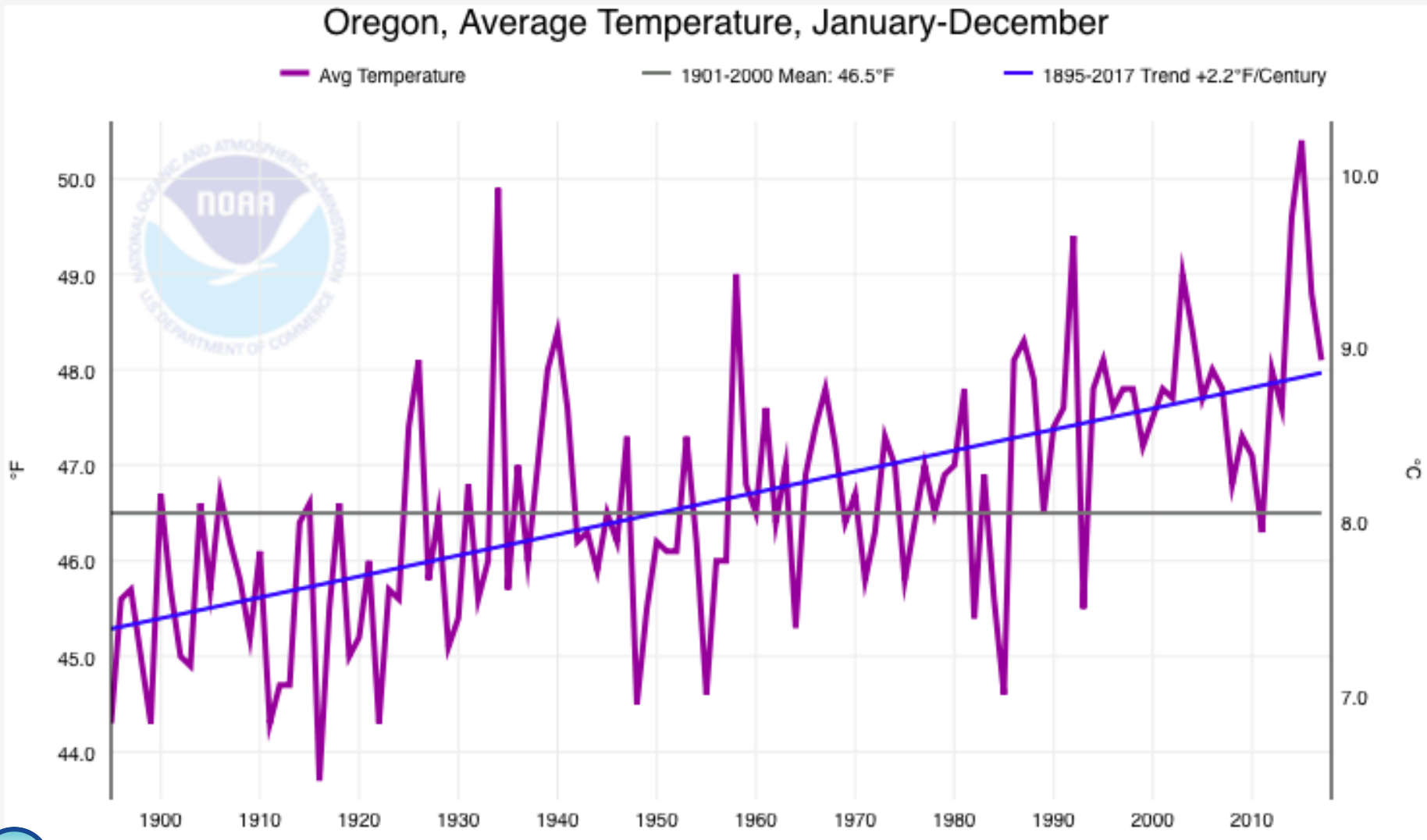
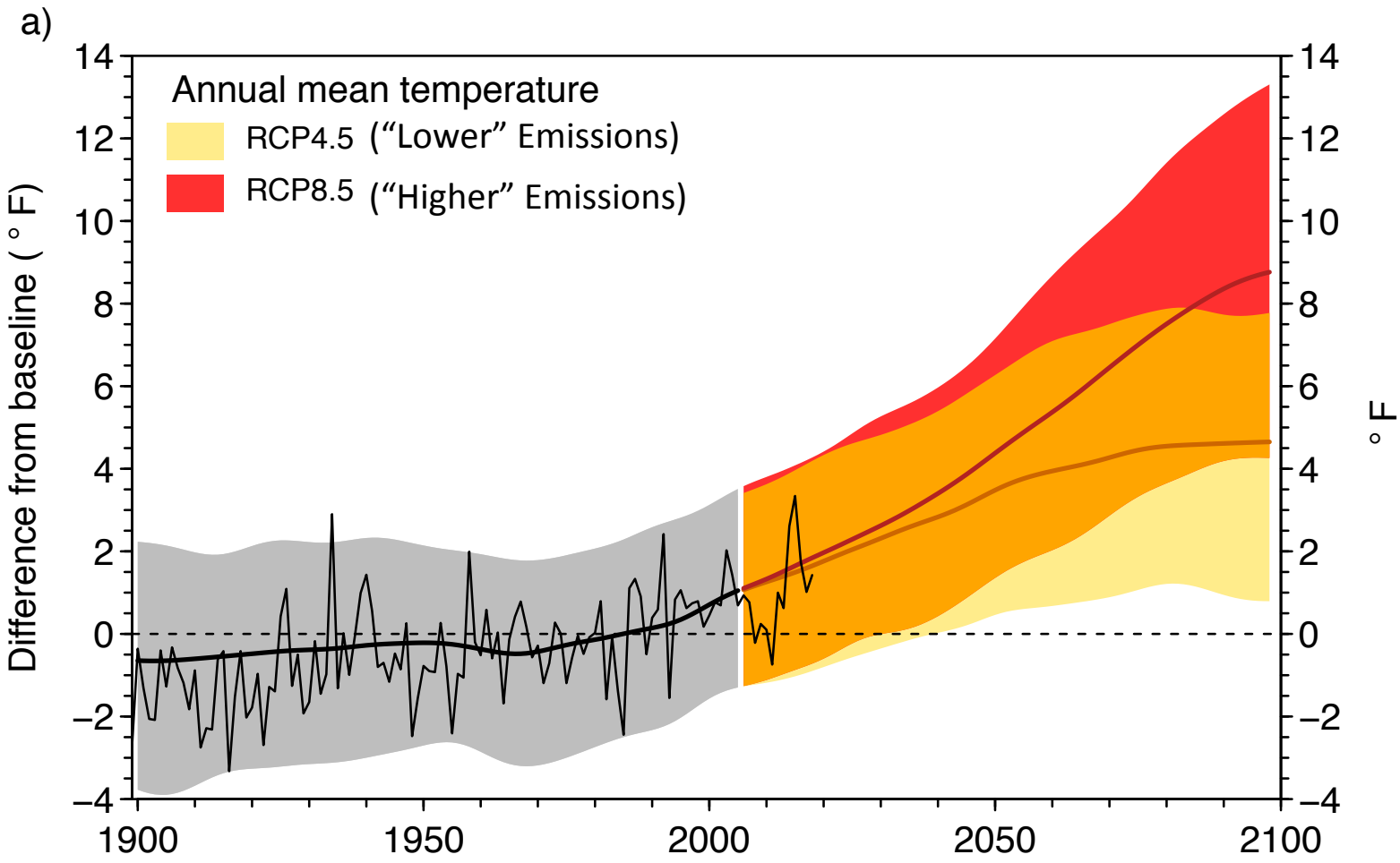
Oregon's Average Temperature



Source: NOAA NCEI Climate at a Glance, https://www.ncdc.noaa.gov/cag/

Oregon Annual Mean Temperature Future Projections & Observations



Source: OCAR4, updated

Climate change expected to increase climate-related natural hazards

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©Scott Olson/Getty Images

OSU

- Heat Waves
- Heavy Rains
- Flooding
- Drought
- Wildfire
- Air Quality
- Coastal Hazards

ODOT

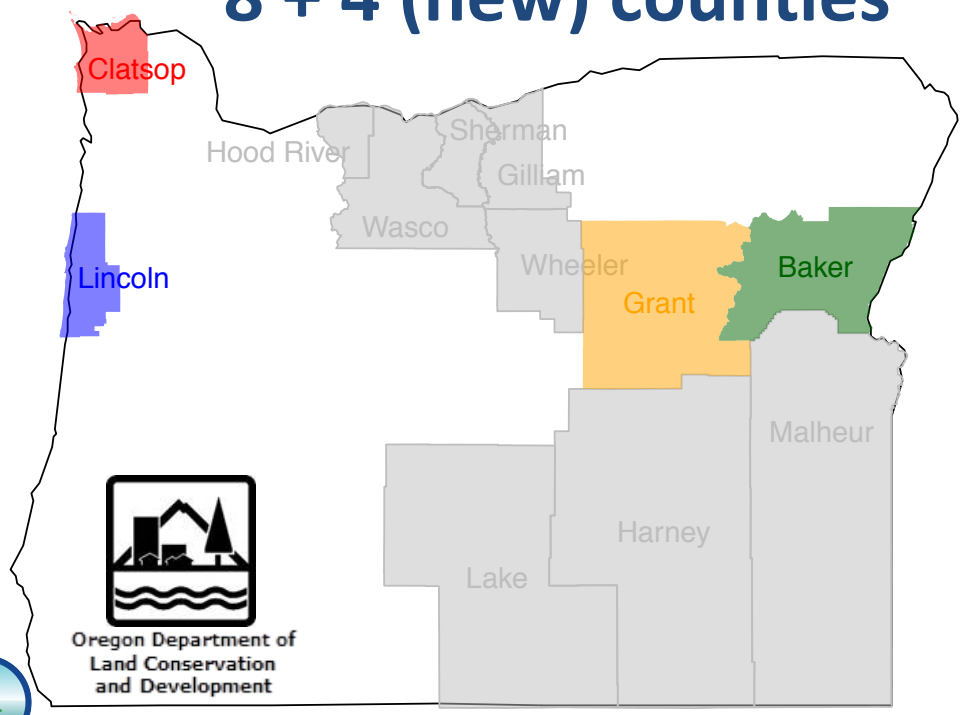
BLM

OCCRI

OCCRI-DLCD Scope of Work

Perform analysis of the influence of climate change on natural hazards and provide county-specific data, graphics, and text.

8 + 4 (new) counties



13 climate-related natural hazards

Heat Waves • Cold Waves
Heavy Rains • River Flooding
Drought • Wildfire • Air Quality
Coastal Erosion & Flooding
Ocean Temperature & Chemistry
Windstorms • Dust Storms
Increased Invasive Species & Pests
Loss of Wetland Ecosystems

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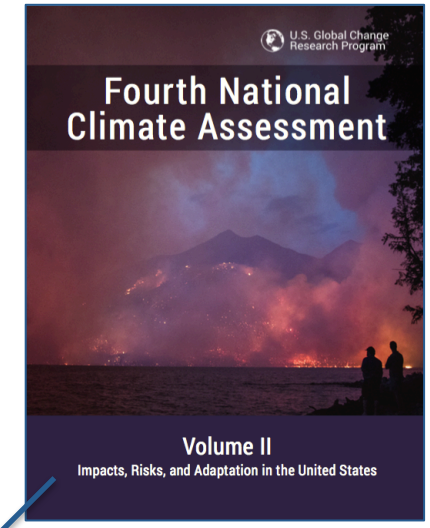
Key Resources

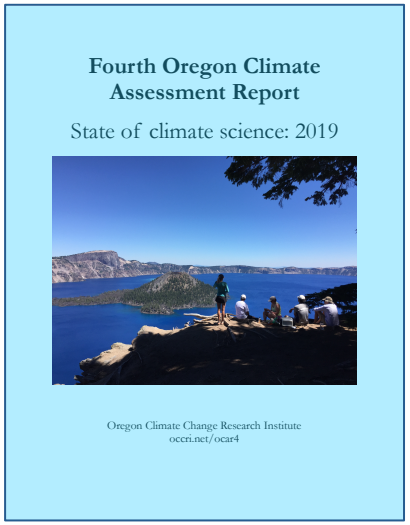
NCA4, Vol. 1 (2017)

NCA4, Vol. 2 (2018)



OCAR3 (2017)

OCAR4 (2019)



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How to Use this Information

- Explore a range of plausible future outcomes taking into consideration the climate system's complex response to increasing greenhouse gases
- These are NOT weather predictions
- Envision how current systems may respond under climate conditions different from those the systems were designed to operate under
- Evaluate potential mitigation actions to accommodate future conditions (e.g., NHMP)
- Should NOT be used for engineering/design
- Influence the assessment of likelihood of a particular climate-related hazard risk

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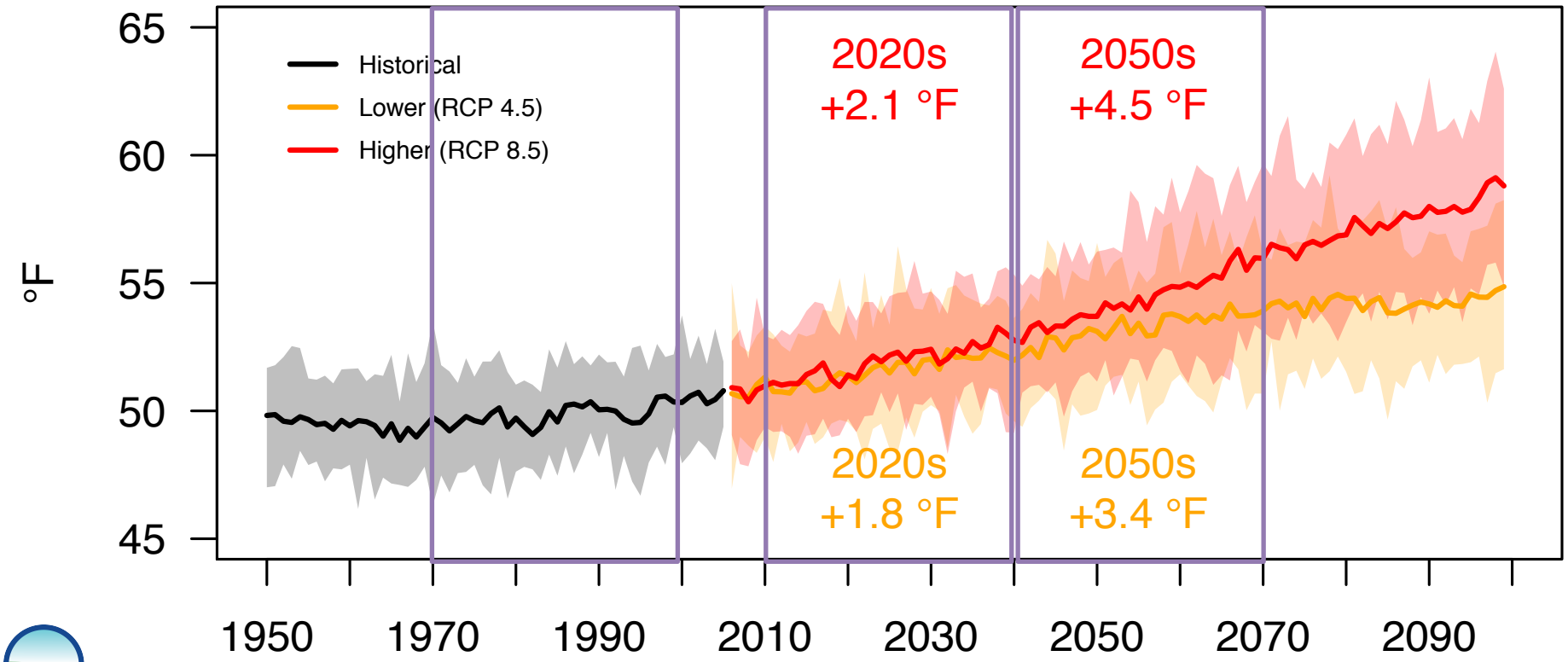
Historical Baseline	Early 21st Century "2020s"	Mid 21st Century "2050s"
1971–2000	2010–2039	2040–2069

Annual Average Temperature Projections
Clatsop County



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Climate Metrics

Table 1 Natural hazards and related climate metrics evaluated in this project.

Heavy Rains Wettest Day • Wettest Five Days Landslide Threshold Exceedance	**Heat Waves** Hottest Day • Warmest Night "Hot" Days • "Warm" Nights
River Flooding Annual maximum daily flows Atmospheric Rivers Rain-on-Snow Events	**Cold Waves** Coldest Day • Coldest Night "Cold" Days • "Cold" Nights
Drought Summer Flow • Spring Snow Summer Soil Moisture Summer Precipitation	**Air Quality** Unhealthy Smoke Days
Wildfire Fire Danger Days	**Coastal Erosion & Flooding** Sea Level Rise • Waves
Ocean Temperature & Chemistry	**Windstorms** **Increased Invasive Species & Pests** **Loss of Wetland Ecosystems**

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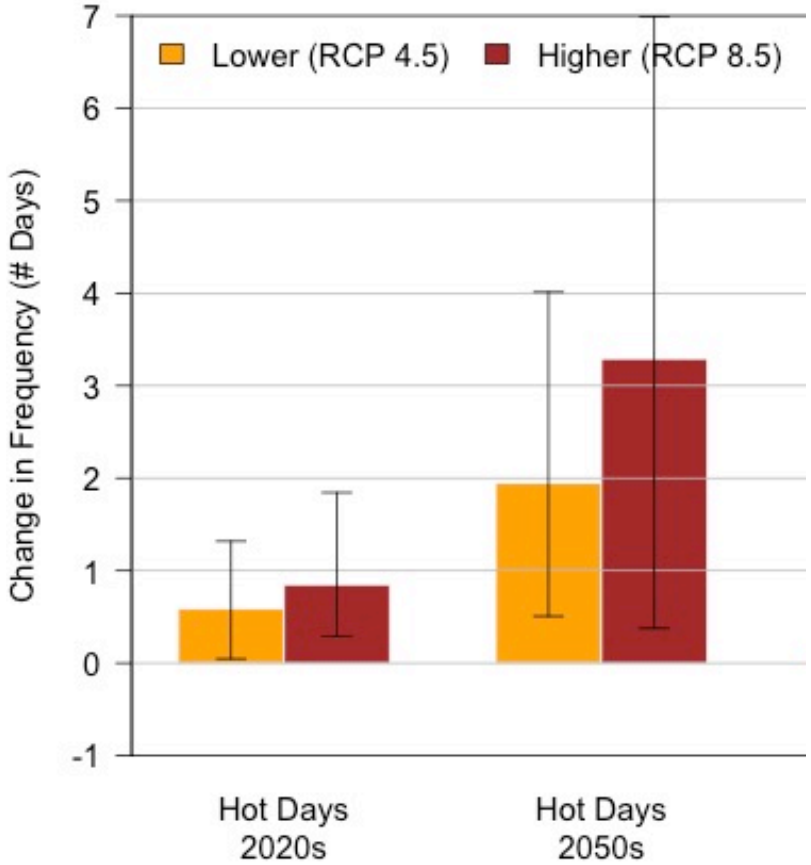
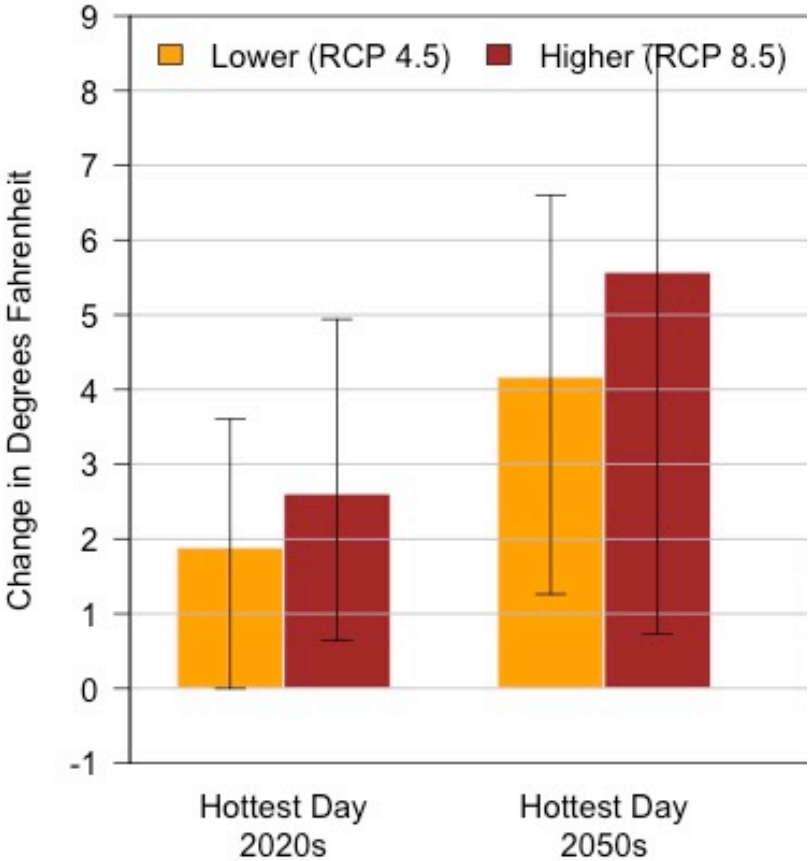
Heat Waves

Extreme heat events are expected to increase in frequency, duration, and intensity.

Clatsop County



 # Days w/ Max Temp ≥ 90°F



Annual Maximum of Max Temp

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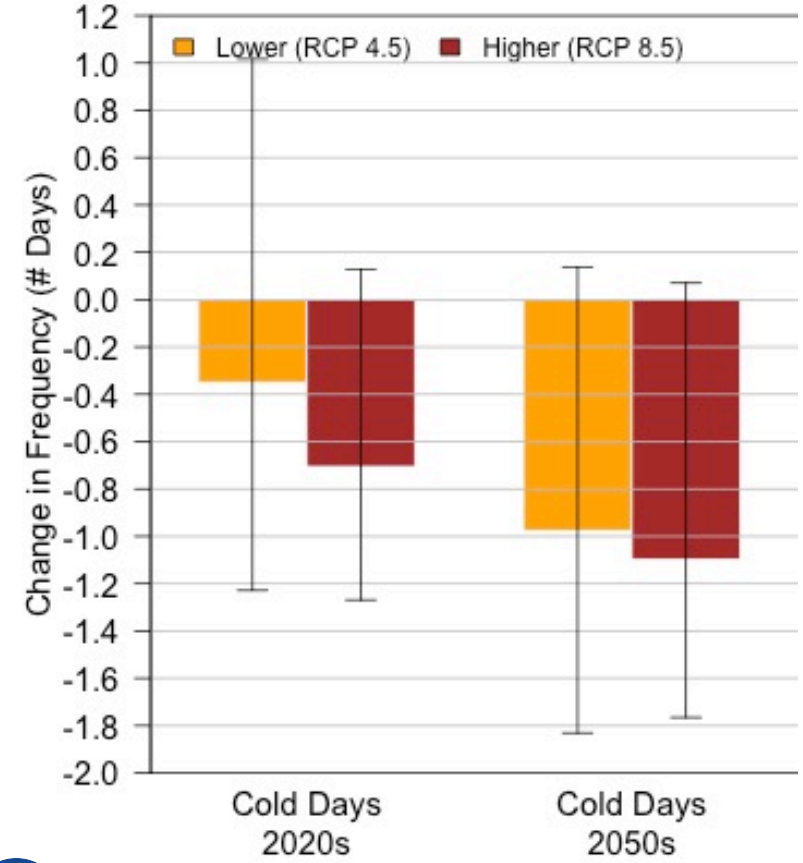
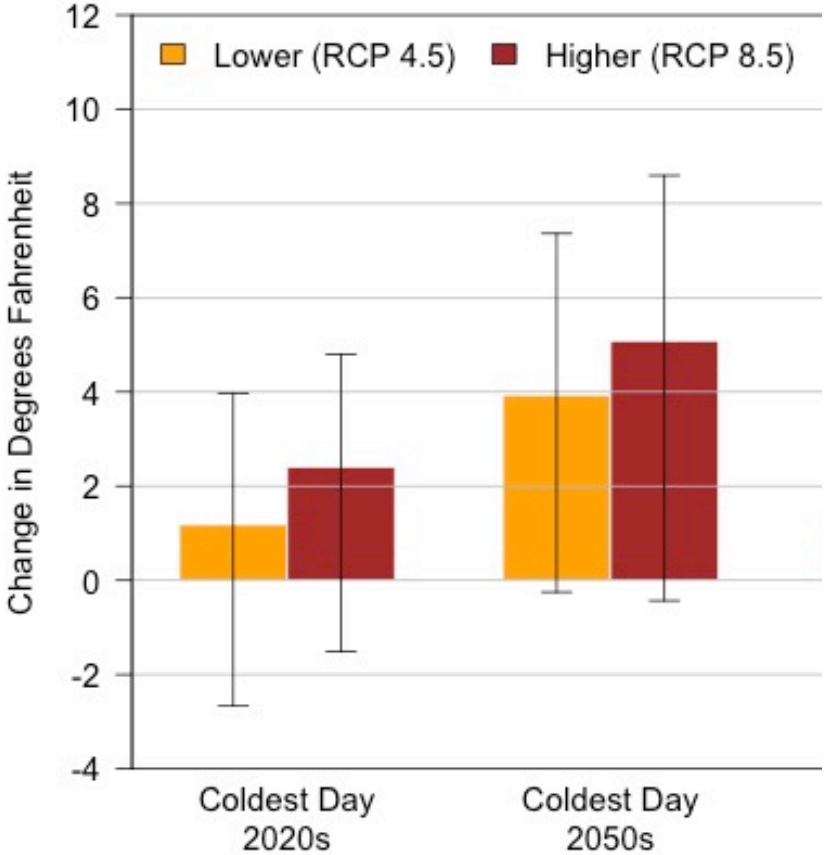
Cold Waves

Cold extremes are still expected to occur from time to time, but with less frequency and intensity as the climate warms.

Clatsop County



 # Days w/ Max Temp ≤ 32°F



Annual Minimum of Max Temp

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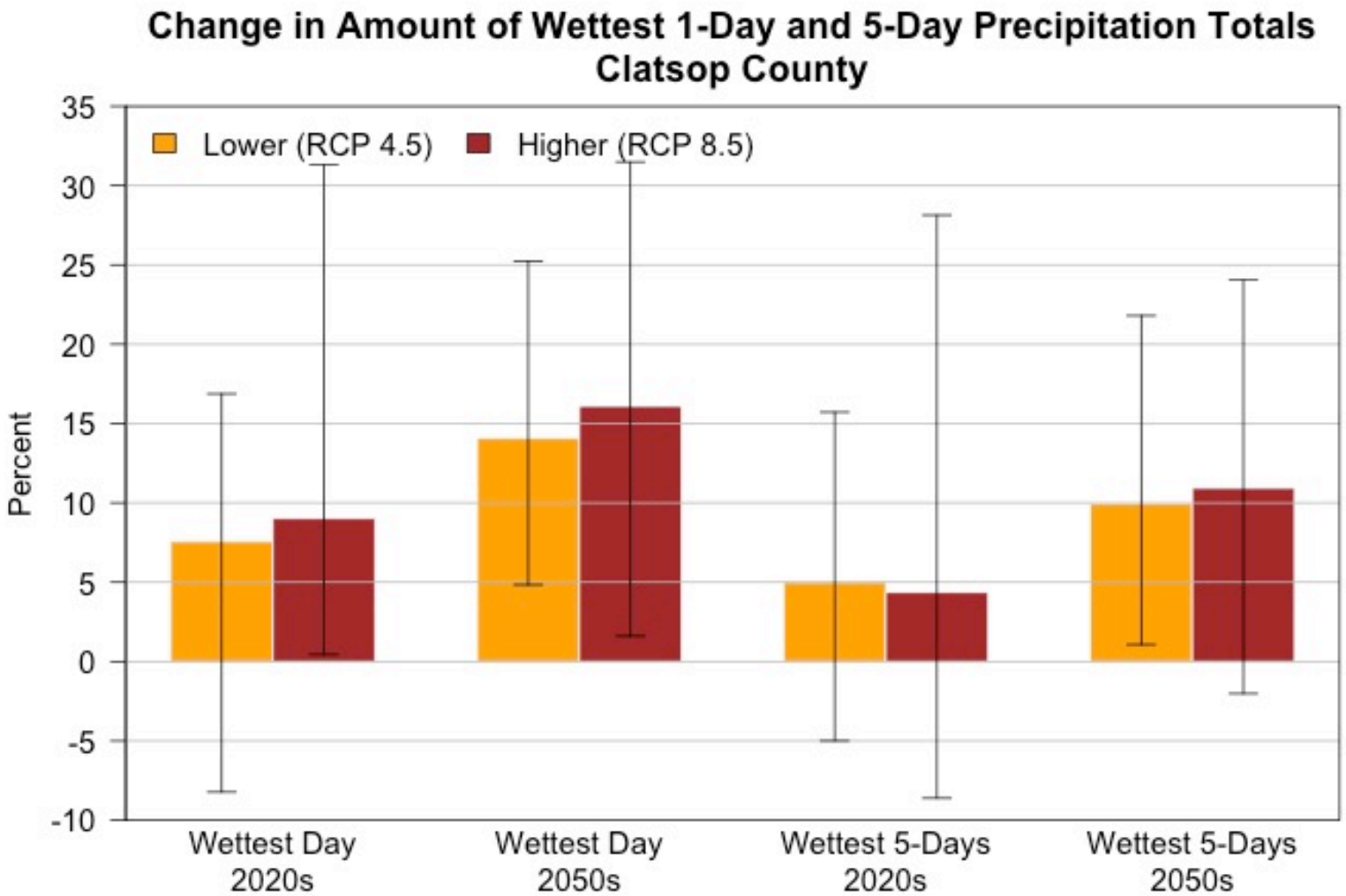
Heavy Rains

As the atmosphere warms and is able to hold more water vapor, the frequency and intensity of extreme precipitation events is expected to increase.



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River Flooding

Coastal rain-dominated watersheds, such as the Nehalem River, may experience an increase in winter flood risk due to projected greater winter precipitation and warmer winter temperatures causing precipitation to fall more as rain and less as snow.

Table 10 Percent change in the 100-year and 25-year recurrence interval flows for the Nehalem River between 2070–2099 and 1971–2000 and the return period in 2070–2099 of the flow with a magnitude equal to that of the 100-year and 25-year flow as determined fro 1971–2000. (Source: Maurer et al., 2018, personal communication)

Return Period (Probability in a given year)	Percent Change in N-Year Peak Flow 2070–2099 vs. 1971–2000	Return Period of N-Year Peak Flow (2070–2099)
25-Year (4%)	21.38% (p-val=0.792)	10.64-Year (9.4%)
100-Year (1%)	25.96% (p-val=0.4)	29.01-Year (3.4%)

*Note: Projected changes are NOT statistically significant for the Nehalem River

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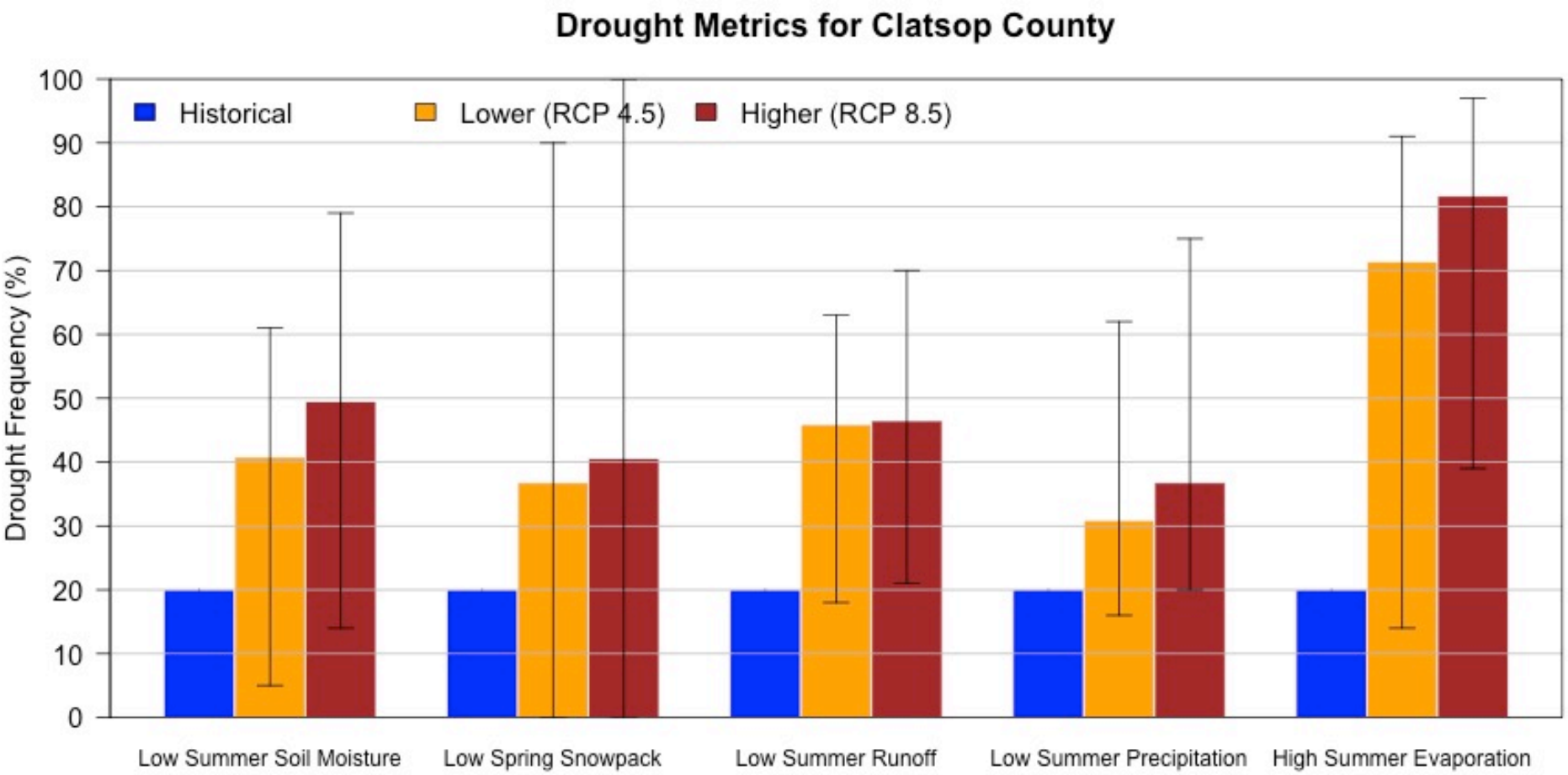
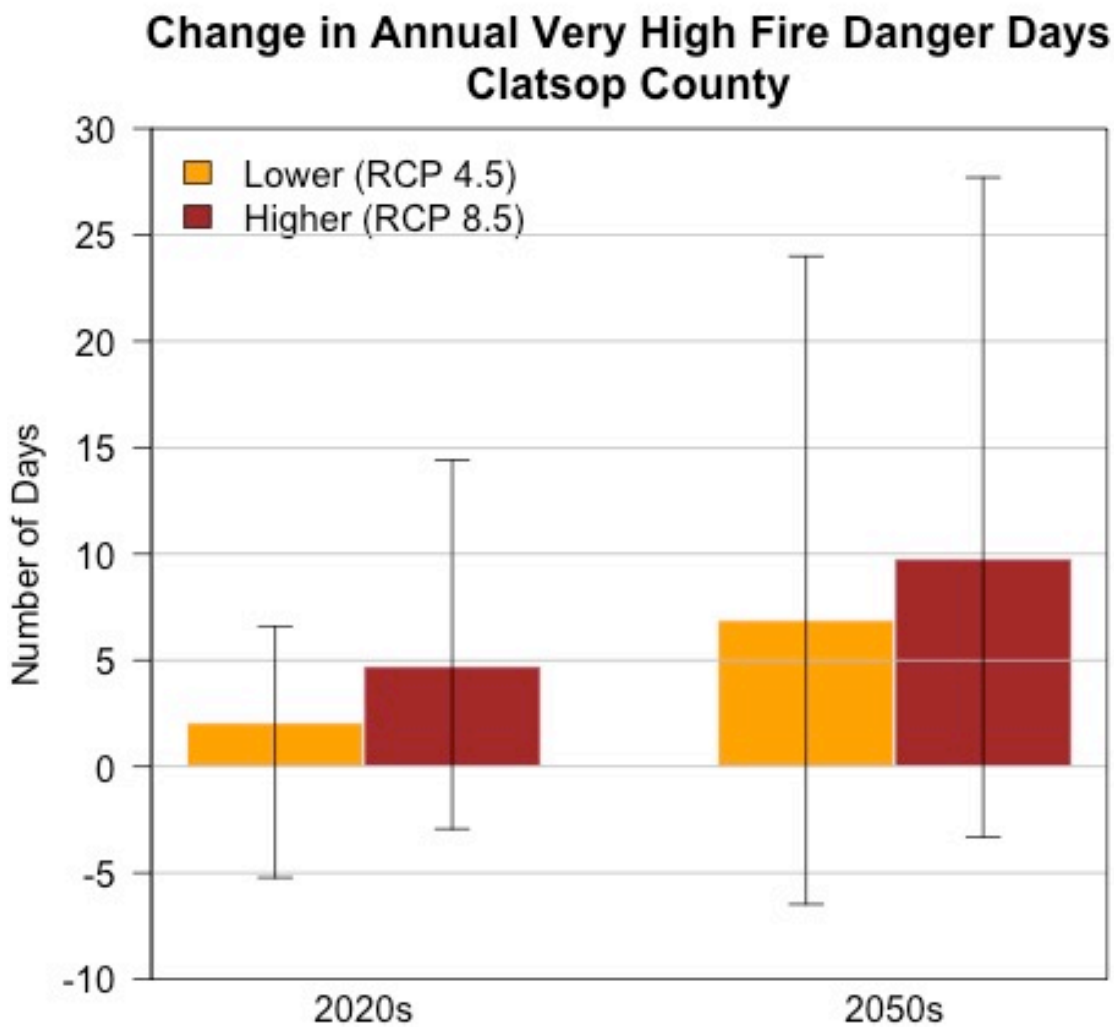
Drought

Drought conditions are projected to become more frequent.



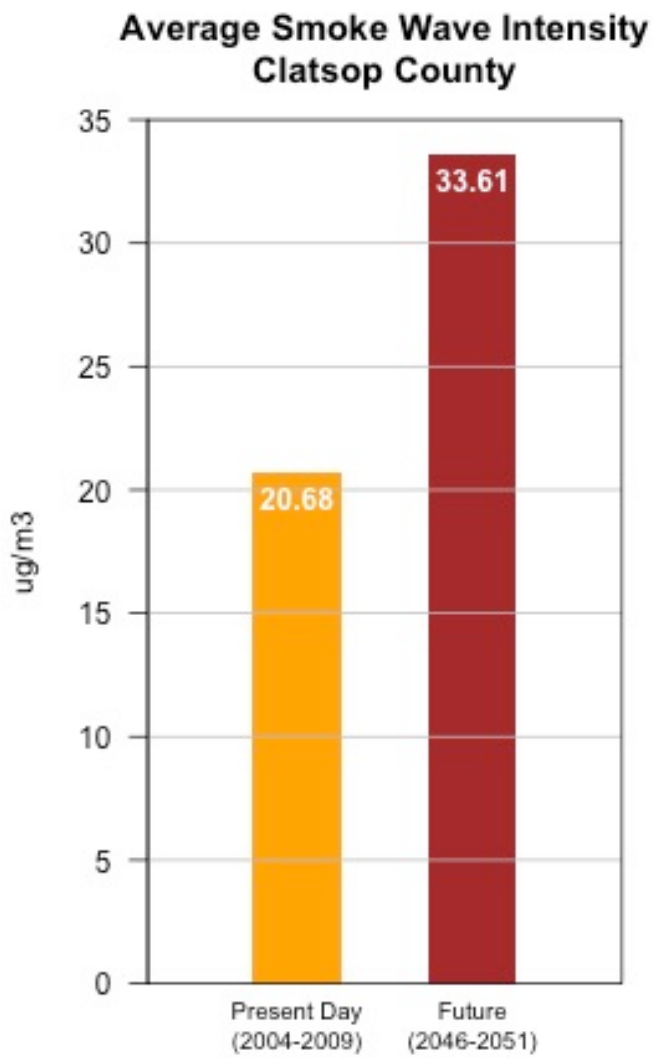
Wildfire

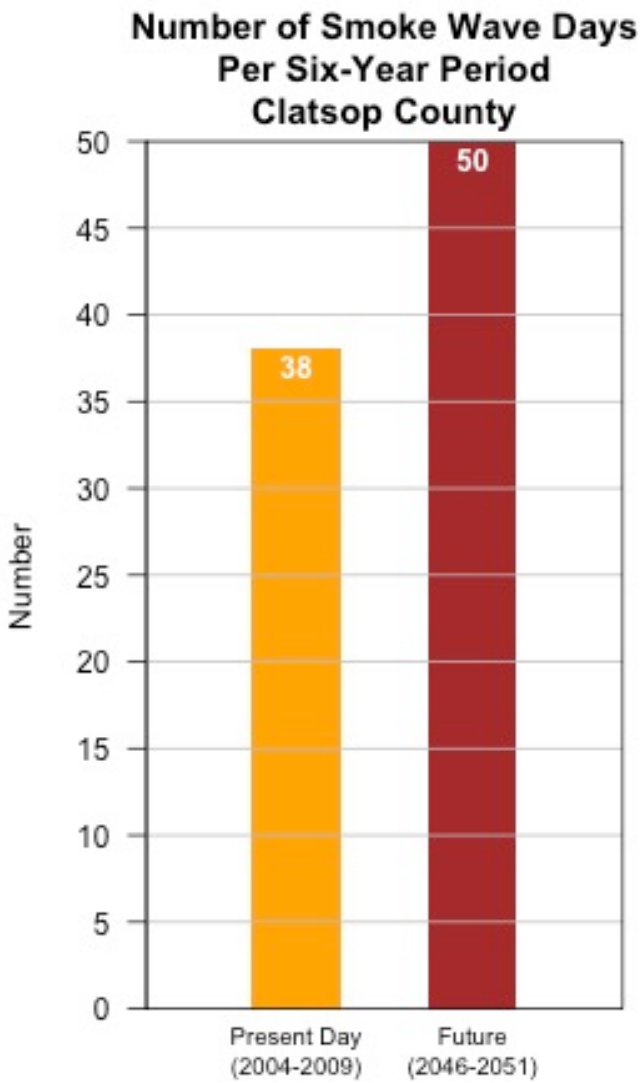
Wildfire risk, as expressed through the frequency of very high fire danger days, is projected to increase under future climate change.



Air Quality

Under future climate change, the risk of wildfire smoke exposure is projected to increase.





Coastal Hazards

The risk of coastal erosion and flooding hazards on the Oregon coast is expected to increase with climate change due to sea level rise and changing wave dynamics.

In Clatsop County, local sea level is projected to rise by 0.8 to 4.8 feet by 2100 based on the Intermediate-Low and Intermediate-High global sea level scenarios.

At these levels, the multi-year likelihood of a 4-foot flood event—water reaching four feet above mean high tide—ranges from 4%–38% by the 2030s, 19%–100% by the 2050s, and 98%–100% by 2100.

Other Climate-Related Hazards

Ocean Temp & Chemistry

As a result of increasing atmospheric CO_2, oceans are warming, acidifying, and deoxygenating leading to alterations in marine ecosystems affecting Oregon coastal communities.

Windstorms

Limited research suggests very little, if any, change in the frequency and intensity of windstorms in the Pacific Northwest as a result of climate change.

Increased Invasive Species & Pests

TBD

Loss of Wetland Ecosystems

TBD

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Summary of Projected Changes

	Low Confidence	Medium Confidence	High Confidence
Risk Increasing ↑	Poor Air Quality Increased Invasive Species & Pests??	Heavy Rains Flooding Drought Wildfire Loss of Wetland Ecosystems?? Ocean Temp & Chemistry Changes	Heat Waves Coastal Hazards
Risk Unchanging =	Windstorms		
Risk Decreasing ↓			Cold Waves

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