climate change in Oregon and why it matters

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key findings from 2017 report

- climate change will continue to impact the health of Oregonians, especially vulnerable populations,
- Oregon will continue to warm; we can now attribute some regional trends to human activity
- declining mountain snowpack is, and will have significant impacts on water resources
- increased coastal flooding and erosion
- ocean acidification
- shifting climates plus disturbances (fire, insects, diseases) will drive forest change
- short-term gains for agriculture, but long-term dependent on adaptations to heat and water
- recent climate events a practice run for the future
Source: Rupp et al. (2016), adapted for Oregon; Integrated Scenarios project

+1.8° to +6.9°F by the 2050s

−6.0% to +11.4% by the 2050s
Local Projections: Growing Season
High Future Emissions

Springfield, or (44.05° N, 123.02° W)

<table>
<thead>
<tr>
<th>Period</th>
<th>First Freeze / Last Freeze</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000s</td>
<td>Nov 12 / Mar 26</td>
<td>231 days</td>
</tr>
<tr>
<td>2025s</td>
<td>Nov 23 / Feb 28</td>
<td>267 days</td>
</tr>
<tr>
<td>2055s</td>
<td>Dec 13 / Feb 4</td>
<td>312 days</td>
</tr>
<tr>
<td>2085s</td>
<td>Dec 20 / Jan 16</td>
<td>337 days</td>
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</tbody>
</table>
Eagle Creek Fire, September 2017

Kathie Dello, photo
OR summer precip departures v temp departures, 1895-2017

Dello, 2017 (unpublished)
Difference from baseline (°F)

1900 1950 2000 2050 2100
−6 −4 −2 0 2 4 6 8 10 12 14 16 18

Summer mean temperature
RCP4.5
RCP8.5

a) +2.2°F to +8.9°F by the 2050s

Summer precipitation
RCP4.5
RCP8.5

b) Source: Rupp et al. (2016), adapted for Oregon; Integrated Scenarios project
Projected Change in "Extreme Fire" Danger Days (100 Hour Fuel Moisture Below 3 Percentile), Summer (Jun-July-Aug)

RCP8.5 2010-2039 vs. historical simulation 1971-2000, mean change
Downscaled multi-model (18 models) mean from CMIP5
Projected Change in "Extreme Fire" Danger Days (100 Hour Fuel Moisture Below 3 Percentile), Summer (Jun-July-Aug)

RCP8.5 2040-2069 vs. historical simulation 1971-2000, mean change

Downscaled multi-model (18 models) mean from CMIP5
Fire smoke risk for present and mid century

Western US: Fine particulate matter from wildfires to increase 160% by mid-century.

adapted from Liu et al. 2016
Decreasing summer flow in snowmelt watersheds

NCA 2014
Obs & model: 90% decline

a) April 1 Observed SWE Trends 1955-2016
b) April 1 VIC SWE Trend 1955 to 2014
c) April 1 VIC SWE Trend (Detrended) 1955 to 2014
Role of warming

b) April 1 VIC SWE Trend 1955 to 2014  
c) April 1 VIC SWE Trend(Detrended) 1955 to 2014

Observed climate

Warming removed
Projected Changes in April 1st Snow Water Equivalent
RCP8.5 2040-2069 vs. 1971-2000
Data Source: Hydrology: VIC, Multi-Model Mean

Source: NW Climate Toolbox
Projected Change in Winter (Dec-Jan-Feb) Mean Temperature (°F)

RCP8.5 2040-2069 vs. 1971-2000

Multi-Model Mean

Source: NW Climate Toolbox
Projected Change in Winter (Dec-Jan-Feb) Precipitation (% of Normal)

RCP8.5 2040-2069 vs. 1971-2000

Multi-Model Mean
summary

• climate change will continue to effect Oregonians

• Oregon will continue to warm in all seasons, especially summer
  • fire, snow, agriculture - temperature sensitive, cascading social, economic, and ecological effects
  • reducing global emissions will reduce warming

• big fire seasons in past 15 years tend to be hot, dry summers

• coastal impacts with global sea level rise and coastal flooding, crucial infrastructure at risk

• frame questions to “did climate change make this event/season more likely”