

# Focus on Impacts of Climate Change in Washington State

In February of 2009, two separate studies were released detailing the projected impacts of climate change on Washington's environment and economy. The Climate Impacts Group (CIG) at the University of Washington<sup>1</sup> and the Climate Leadership Initiative (CLI) at the University of Oregon<sup>2</sup> produced these reports. Each shows that without additional action to reduce carbon emissions, the severity and duration of the impacts due to climate change will be profound and will negatively affect nearly every part of Washington's economy. Below is a summary of the key findings:

## Findings from the Climate Impacts Group

This study provides a comprehensive assessment of climate change impacts on the State of Washington, as the 2007 Washington State Legislature mandated in House Bill 1303. Using global climate models scaled to the Pacific Northwest, CIG projects that even with moderate reductions in the rate of current global greenhouse gas (GHG) emissions; Washington can expect these climate impacts:

- **Higher temperatures** - Increases in annual temperature of, on average, 2.2°F by the 2020s, 3.5°F by the 2040s, and 5.9°F by the 2080s (compared to 1970 to 1999).
- **Changes in precipitation patterns** - Wetter autumns and winters, drier summers, and small overall increases in annual precipitation in Washington (+1 to +2 percent), as well as increases in extreme high precipitation in western Washington.
- **Lower water supply in summer months** - Decreases in spring snowpack by nearly 30 percent are projected across the state by the 2020s, 40 percent by the 2040s and 65 percent by the 2080s. Earlier snowmelt and earlier peak river flow are projected to affect municipal water supplies and agricultural water availability.

Changes in temperature, precipitation, and water availability are projected to result in the following:

- **Risks to human health** - Significantly more heat- and air pollution-related deaths are likely in Washington. By 2025, projected warming would likely result in 101 additional deaths during heat events, and by mid-century, King County will likely experience 132 additional deaths between May and September annually due to worsened air quality caused by climate change.
- **Risks to forestry** - The area burned by fire regionally is projected to double from current levels by the 2040s and triple by the 2080s. Mountain pine beetle outbreaks are projected to increase in frequency and cause increased tree mortality.
- **Benefits and risks to agriculture** - The impact of climate change on agricultural production in Eastern Washington is projected to be mild over the next two decades. Elevated carbon dioxide levels could offset some of the direct effects of climate and result in yield gains for some crops. The impacts are projected to be increasingly detrimental with time, with potential yield losses reaching 25 percent for some crops by the end of the century.
- **Risks to salmon habitat** - Rising stream temperatures will likely reduce the quality and extent of freshwater salmon habitat.
- **Risks to coastal areas** - Medium projections of sea level rise for 2100 are 2 to 13 inches (depending on location) in Washington State. Sea level rise will shift coastal beaches inland and increase erosion of unstable bluffs, and endanger coastal structures. Shellfish will possibly be negatively impacted by

increasing ocean temperatures and acidity, shifts in disease and growth patterns, and more frequent harmful algal blooms.

- **Decrease in summer hydropower production** - Summer production is projected to decrease 9 to 11 percent by the 2020s, with winter production projected to increase by 0.5 to 4 percent by the 2020s.
- **Increase in demand for energy** - Warmer temperatures and population growth will increase energy demand substantially in the summer, by 240 percent by the 2020s. Energy demand in the winter is projected to increase more modestly, by 22 percent by the 2020s, primarily due to population growth.
- **Stormwater Infrastructure** - Potential increases in extreme high precipitation over the next half-century may place stress on our existing stormwater infrastructure.

**Findings from the Climate Leadership Initiative**

CLI’s report illustrates the potential costs to Washington’s families, businesses and communities if we do nothing more to reduce greenhouse gas emissions than what has already been implemented. CLI found that each household in Washington will pay an additional \$1,250 each year by 2020. The increased costs due to climate change are projected to include:

<b>Potential Economic Costs in Washington If no additional actions are taken to reduce greenhouse gas emissions</b>			
	<b>2020</b>	<b>2040</b>	<b>2080</b>
Continued use of less efficient energy technologies	\$1.4B	\$1.6B	\$2.2B
Increased health-related costs	\$1.3B	\$2.2B	\$4.4B
Reduced salmon populations	\$531M	\$1.4B	\$3.0B
Increased energy costs (reduced hydro supply, higher energy demand)	\$222 M	\$623M	\$1.5B
Increased wildland fire costs	\$102M	\$208M	\$462M
Lost recreation opportunities	\$75M	\$210M	\$612M
Increased coastal and storm damage	\$72M	\$150M	\$352M
Reduced food production	\$35M	\$64M	\$364M
<b>Total increased costs</b>	<b>\$3.8B</b>	<b>\$6.5B</b>	<b>\$12.9B</b>
<b>Average increased costs per household per year</b>	<b>\$1,250K</b>	<b>\$1,800K</b>	<b>\$2,750K</b>

These projections of economic costs are consistent with the “State Economic and Environmental Costs of Climate Change” reports published recently by the National Conference of State Legislatures, in collaboration with the University of Maryland (<http://www.ncsl.org/programs/enviro/ClimatePubs.htm>).

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<sup>1</sup> “The Washington Climate Change Impacts Assessment,”: [http://www.ecy.wa.gov/climatechange/scientific\\_forecast2009.htm](http://www.ecy.wa.gov/climatechange/scientific_forecast2009.htm)  
<sup>2</sup> “An Overview of Potential Economic Costs to Washington of a Business-As-Usual Approach to Climate Change,”: [http://www.ecy.wa.gov/climatechange/economic\\_impacts.htm](http://www.ecy.wa.gov/climatechange/economic_impacts.htm)