

Regional Highlight: Pacific Northwest

The US Economic Impacts of Climate Change and the Costs of Inaction

A Review and Assessment by the Center for Integrative Environmental Research (CIER) at the University of Maryland

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Background

As science continues to bring clarity to present and future global climate change, policymakers are beginning to respond and propose policies that aim to curb greenhouse gas emissions. Although these policies are gaining momentum, their importance is not fully understood by many. All too frequently, inaction is motivated by the perceived high cost of reducing greenhouse gas emissions. The costs of not taking on the challenge posed by climate change are frequently neglected and typically not calculated. Throughout the United States, individuals and communities depend on sectors and systems that are expected to be greatly affected by the impacts of continued climate change.

- The **agricultural sector** is likely to experience uneven impacts throughout the country. Initial economic gains from altered growing conditions will likely be lost as temperatures continue to rise. Regional droughts, water shortages, as well as excess precipitation, and spread of pest and diseases will negatively impact agriculture in most regions.
- Storms and sea level rise threaten extensive **coastal infrastructure** – including transportation networks, coastal developments, and water and energy supply systems.
- Current **energy** supply and demand equilibria will be disrupted as electricity consumption climbs when demand grows in peak summer months. At the same time, delivering adequate supply of electricity may become more expensive because of extreme weather events.
- Increased incidence of asthma, heat-related diseases, and other respiratory ailments may result from climate change, affecting **human health** and well-being.
- More frequent and severe **forest fires** are expected, putting ecosystems and human settlements at peril.
- The reliability of **water supply networks** may be compromised, influencing agricultural production, as well as availability of water for household and industrial uses.

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The greatest threats from climate change come from increased temperatures and decreased precipitation in summer, contributing to water shortages and increased forest fires. Although the picture is incomplete because of data limitations, a valuable glimpse of the extent to which climate change will affect these economic sectors can be gleaned from the summary below.

Water supply

- Declining snowpack levels would lead to a 10% reduction in annual average stream flows and reduced peak spring flows across the region. One study suggests that by 2090 snowpack will fall 72% below the 1960-90 average, which would not only diminish water supplies but could lead to a loss of lower elevation skiing destinations. The secure supply of water to the region may fall by as much as 6.1 million gallons per day for every ten years of climate change.
- As supplies decrease, water demand will continue to grow because of continued population and economic growth in the region. Growth in demand will be exacerbated by climate change, which will add another 5-8% on to the already large 50% projected increase in demand for summer municipal water supplies by 2050. All together, impacts from climate change will alter water storage in the state by 1.3 billion gallons annually. With the projected demand for water increasing by 1.5 billion gallons annually, a 2.8 billion gallon per year increase in storage capacity will be required. This number could jump to 5.5 billion gallons in a particularly dry year. Combined with increases from population growth, the total increase in water demand may be as large as 8.0 billion gallons in 2020 and 9.6 billion gallons in 2040.

Other impacts

- **Forestry** is expected to be greatly impacted as increased incidence of fire is expected. Already climate change effects, such as increases in spring and summer temperatures and earlier melting of snowpacks, contributed to the six-fold spike in the area of **forest burned** since

1986, compared with the 1970–1986 period. Moreover, the average duration of fires increased from 7.5 to 37.1 days since 1986. In 1987, 1.2 million acres of forest burned throughout the US, the first time since 1919 that more than one million acres burned in one year. As a result of similar fires in 1988, 1994 and 1996, and a record 2.14 million acre fire in 2000, fire suppression costs increased to \$1 billion, or about \$480 per acre.

- A 50% increase in the number of acres burned is expected by 2020, and a 100% increase by 2040, raising the fire suppression bill to \$124 million.
- The region's **coastal infrastructure** is likely at risk from sea level rise, the effects of which will be compounded by land subsidence. Currently, land in the Puget Sound is subsiding 0.3–0.8 inches per year. A two-foot rise in sea level would inundate approximately 56 square miles in Washington, affecting more than 44,000 people. This kind of change could happen in Tacoma within the next 50 years. In order to protect coastal settlements, expensive infrastructure will need to be designed and re-designed, built and re-built. One estimate of the costs of redesigning the Alaskan Way seawall increases project costs 5–10% (\$500 million) when protection from sea level rise is considered.
- **Agriculture** in the Pacific Northwest may benefit from a longer growing season, but these benefits may be offset by higher maximum temperatures and water shortages. Expected annual crop losses from water shortages are projected to rise from \$13 million at present to \$79 million by mid-century (1.4 to 8.8% of \$901 million total output).
- **Human health** may be affected by increased air pollution that increases asthma and other respiratory diseases; warmer weather may also support the introduction of infectious diseases into previously unaffected areas.

Nationwide

An assessment of the possible impacts of inaction is presented in the University of Maryland report, *The US Economic Impacts of Climate Change and the Cost of Inaction*. The range of climate changes anticipated in the United States will have real impacts on the natural environment as well as human-made infrastructure and its ability to contribute to economic activity and quality of life. The assessment suggests a need for immediate national policy to cut emissions, and a federally-funded set of region- and sector-specific studies to guide climate policy and investment.

For the complete report, The US Economic Impacts of Climate Change and the Cost of Inaction, see: <http://www.cier.umd.edu/climateadaptation>. We thank Environmental Defense for support of this research.



Five key lessons from the complete report:

1. Economic impacts of climate change will occur throughout the country.
2. Economic impacts will be unevenly distributed across regions and within the economy and society.
3. Negative climate impacts will outweigh benefits for most sectors that provide essential goods and services to society.
4. Climate change impacts will place immense strains on public sector budgets.
5. Secondary effects of climate impacts can include higher prices, reduced income and job loss.

SOURCES

As documented in the full report, data sources for the Pacific Northwest region include:

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