

## Regional Highlight: Alaska

### 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.

#### Alaska

The majority of Alaska's population resides along the southern coast, including Anchorage, the largest city and the only one with a population greater than 100,000. Unlike the arctic interior of the state, these coastal regions (and almost 34,000 total miles of tidal shoreline including the islands) are vulnerable to sea level rise and storms. 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.

#### Public Infrastructure

- In total, climate change is expected to add \$5-10 billion to an already \$32-56 billion infrastructure maintenance budget through 2080 for the state.
- The 800-mile, 48-inch diameter warm oil Trans-Alaska Pipeline crosses nearly the entire state. The pipeline cost approximately \$8 billion to construct, and approximately \$800 million of those construction costs were due to the need to elevate the pipeline above permafrost over half its length. Since its construction, the thawing of permafrost has reduced structural integrity, which leads to spills.
- Significant impacts are predicted for human settlements, particularly coastal towns and villages vulnerable to sea level rise and more frequent and intense storms. Cost estimates of shoreline protection and village relocation continue to rise. The most recent estimates by the US Army Corps of Engineers are up to \$450 million in relocation costs for Shismaref, Kivalina and the village of Newtok.

### Other

- **Forests** are expected to be negatively affected by climate change. Short-term vulnerabilities pose significant costs resulting from thawing permafrost and unstable soils, increased fire and insect outbreaks. Increased occurrence of fire and pest outbreaks put both natural and managed forests at risk. In 1992, the largest documented bark beetle outbreak in North America damaged over 2.3 million acres on Kenai Peninsula. Additional insect outbreaks in the 1990s damaged over 800,000 acres of forest. If an outbreak of this scale were to hit the state's commercial forests, upwards of 50% of the harvestable land area could be lost, causing an \$332 million loss to the industry.
- **Forest fires** have also been increasing in recent history, their intensity associated with warm and dry periods in the climatic record. As of 1970, approximately 2.5 million acres burned each year. This number jumped to 7 million acres per year by the 1990s. In 1996, a 37,000 acre forest and peat fire caused \$96 million in direct losses and destroyed 450 structures, including 200 homes. Based on a median housing value of about \$200,000 today, damage of this magnitude would cost nearly \$40 million.
- The total value of **fisheries** in Alaska is approximately \$2.8 billion and employs over 20,000 workers. Changes in ocean temperatures, expected to be slower than temperatures over land, may affect spawning and migratory behaviors of many commercially valuable species. Sea level rise may impact harbor infrastructure, requiring retrofits and upgrades to docks. Higher temperatures may increase cooling needs for storage and processing of catch. All of these impacts are likely to add cost to an already vulnerable industry and will likely negatively impact the state economy.

### 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 Alaska include:

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