



Protecting Alaska's Economy, Communities, and Environment from Global Warming

Global warming is already affecting Alaska and will continue to do so for decades to come. A successful comprehensive climate and energy bill will invest significant new revenue in protecting communities and local economies across America. It will help states make renewable energy more affordable and create jobs that protect natural resources, including fisheries and subsistence species, from the effects of global warming. The passage of The American Clean Energy and Security Act is a critical first step; however, strong and decisive action in the Senate is necessary in order to protect Alaska and its people from the impacts of climate change.

Critical Issues for Alaska:

- Warming and drying
- Coastal erosion
- Rural energy costs
- Fisheries & hunting
- Cultural impacts

How is Global Warming Affecting Alaska?

Alaska is warming at more than twice the rate of the rest of the United States. In the past century, Alaska's average annual temperature across the state has **risen approximately 3.4°F, while winters have warmed by 6.3°F.**¹ The draft report to the Alaska Governor's Sub-cabinet on Climate Change indicates that **significant warming will continue to occur across Alaska, especially during winter months.** Precipitation is predicted to increase during summer and winter months as well.²

Projections show Alaska will experience the greatest temperature increases in the Arctic.³ Already, permafrost is warming and melting, and snow cover has decreased by about 10%.⁴ With the predicted changes in temperature and precipitation, permafrost, a key factor in both infrastructure and habitat stability, will continue to degrade.⁵ And although precipitation may increase, it may not be enough to offset drying of rivers and wetlands, and to protect the abundance of carbon stored in Arctic and boreal soils.⁶

Increasing temperatures have already had detrimental effects on Alaska's coasts. Melting sea and land ice has resulted in Arctic sea levels rising between 4 and 8 inches in various regions.⁷ The combination of retreating sea ice and sea level rise is threatening communities across Alaska's coasts with erosion and inundation. Atmospheric warming has also affected sea surface temperatures, causing northward shifts of Pacific weather patterns that could have detrimental impacts on fisheries and marine mammals which are central to Alaska native cultures.^{8,9}



Comprehensive climate and energy legislation will ensure that places like the Kenai National Wildlife Refuge remain resilient in a warming world.

What is at Stake?

Changes brought on by global warming are disrupting the balance of natural resources and having significant impacts on communities and businesses across Alaska.

- **Community Safety:** Coastal erosion due to sea-ice decline, sea-level rise, and thawing permafrost is very likely to force the relocation of Alaska native coastal villages, adding financial and cultural stresses to more than 46% of Alaska's population.¹⁰ According to the U.S. Army Corps of Engineers, cost projections to relocate the native villages of Shishmaref, Kivalina, and Newtok have reached \$450 million.¹¹ Near-term estimates for infrastructure damage due to intensifying storms and coastal erosion are as much as \$6.1 billion.¹²
- **Marine-based Economy:** Intensifying storms in recent years have interfered with barge operations and commercial fishing fleets.¹³ Additionally, Alaska's northern fisheries are under increasing stress due to warmer waters, ocean acidification, and salinity changes from increasing carbon dioxide levels and melting ice caps.¹⁴ As fisheries become more vulnerable, the state of Alaska is at risk of losing a \$3 billion industry that provides jobs to more than 20,000 Alaskans¹⁵—and nearly 50 percent of the seafood Americans consume each year.¹⁶
- **Tourism and Outdoor Recreation:** Outdoor activities, including camping, fishing, hunting, snow sports, and wildlife viewing will be at risk as warming temperatures lessen snowpack and alter landscapes. The outdoor industry accounts for \$2.5 billion of Alaska's economy, providing 28,000 jobs across the state.¹⁷
- **The Native Way of Life:** Sharp declines in both marine and ice-dependent species, such as walruses, polar bears, and seals will heighten challenges to hunters and threaten the food security and traditional lifestyles of indigenous peoples in Alaska. On land major shifts in habitat will impact important subsistence and game species such as moose, caribou, and furbearers.¹⁸



Protecting our climate from global warming pollution safeguards Alaska's cold, wild environment which nourishes salmon and the people and wildlife that depend on them.

Protecting Oil Reserves, Developing New Sources of Energy

Passing comprehensive energy and climate legislation will help us transition away from wasteful use of fossil fuel sources and lead the world in developing renewable energy technologies. America's oil and gas reserves should not be burned to fuel inefficient vehicles or heat poorly constructed buildings. Rather, these irreplaceable resources need to be reserved and conserved for future use.

Developing non-polluting renewable energy will ensure Alaskans can afford and enjoy their individual lifestyles. Rural Alaskan communities need affordable, local energy sources in order to survive. Alaska is already leading the way toward less polluting energy through the development of wind and geothermal sources. Investing in these types of local energy production also creates jobs that keep Alaskan families together, at home.

Protecting Natural Resources, Creating Jobs

Protecting ecosystem health helps ensure species have the best possible chance to adapt to the effects of global warming. Ecosystem adaptation projects, such as establishing wildlife corridors for animals migrating in search of needed habitat, are critical to the survival of many species and will also create long-term jobs for Alaskans.

Investing now in natural resource protection is the most cost-effective way to sustain the clean water, well-paying jobs, and other valuable services Alaska's natural areas provide.

Of the total allowance value generated from an energy and climate bill, at least 5% should be invested in protecting communities and local economies across America by shielding natural resources from the effects of global warming. This funding will allow Alaska's wildlife and land management agencies to ramp up important conservation projects.

Dedicated funding will allow scientists, engineers, construction crews, and others to be employed across Alaska:

- Repairing damaged watersheds to ensure clean water for communities and habitat for fish by removing impediments and deteriorating structures, restoring eroding river banks, and repairing in-stream habitat
- Managing migration corridors for caribou, waterfowl and other species to ensure survival as the climate changes
- Monitoring local wildlife, habitat and climate, and developing appropriate adaptation responses.
- Training Alaskans for natural resource monitoring and management jobs.



Dedicated funding will create restoration jobs that protect Alaska's natural areas, such as Eyak Lake.

This work will create new jobs, providing new skills and income to both rural and urban Alaskans and their families, and helping revitalize economies.

Investing in Solutions for Families, Businesses and the Planet

The risks to Alaska and the nation from global warming are significant and require an extensive and sustained commitment to reducing heat-trapping pollution. Doing so will protect our natural resources and the communities that rely on them. A cap-and-invest system that reduces pollution and auctions emission allowances will provide billions of dollars for combating the climate crisis.

Revenues from a cap-and-invest system must be directed to three primary purposes:

- **Invest in renewable energy development, job training, and business assistance**, which will aid businesses and communities in transitioning to a clean energy economy, while creating jobs and reducing heat-trapping pollution.
- **Offset increased energy costs for at-risk consumers** by allocating a percentage of allowance auction revenues to consumers through existing mechanisms.¹⁹
- **Invest at least 5% of the total allowance value generated in annual dedicated funding for natural resource protection** in order to create jobs while increasing resiliency across landscapes, protecting important natural services and safeguarding communities.

Alaska and the nation need your support for reducing carbon pollution and protecting communities by safeguarding our natural resources.

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Photo Credits: Thanks to the U.S. Fish and Wildlife Service for the picture of Kenai National Wildlife Refuge, the U.S. Environmental Protection Agency for the picture of the salmon fishery, and to NOAA for the picture of Eyak Lake restoration.

¹ Fitzpatrick, J., R.B. Alley, J. Brigham-Grette, G.H. Miller, L. Polyak, and M. Serreze. 2008. "Preface: Why and how to use this synthesis and assessment report." In: *Past Climate Variability and Change in the Arctic and at High Latitude*. Synthesis and Assessment Product 1.2. U.S. Climate Change Science Program, Washington, DC.

² Scenarios Network for Alaska Planning. 2008. "Preliminary Report to the Governor's Sub-Cabinet on Climate Change." University of Alaska. Available from: http://www.snap.uaf.edu/files/Draft%20Report%20to%20Governor%27s%20Subcabinet%209-08_0.pdf

³ Ibid.

⁴ Arctic Climate Impact Assessment (ACIA). 2004. "Executive Summary, "Impacts of a Warming Arctic." Cambridge University Press. Available from: <http://amap.no/acia/>. Date of access: July 23, 2009.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Yin, J.H., 2005: A consistent poleward shift of the storm tracks in simulations of 21st century climate. *Geophysical Research Letters*, 32, L18701, doi:10.1029/2005GL023684 Available from: http://www.cgd.ucar.edu/~jyin/IPCC_paper_GRL_Jeff_Yin_final.pdf; Salathé, E.P., Jr., 2006: Influences of a shift in North Pacific storm tracks on western North American precipitation under global warming. *Geophysical Research Letters*. 33, L19820, doi:10.1029/2006GL026882. Available from: <http://www.agu.org/pubs/crossref/2006/2006GL026882.shtml>. Date of access: July 23, 2009.

⁹ Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver, and Z.-C. Zhao, 2007: Global climate projections. In: *Climate Change 2007: The Physical Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, UK, and New York, pp. 747-845.

¹⁰ Values calculated from U.S. Census Bureau Population data. Available from: <http://www.census.gov/>. Date of access: July 23, 2009.

¹¹ Larsen, P., S. Goldsmith, O. Smith, M. Wilson, K. Strzepek, P. Chinowsky and B. Saylor. 2007. *Estimating Future Costs for Alaska Public Infrastructure at Risk from Climate Change*. Institute of Social and Economic Research. University of Alaska, Anchorage. Available online at: <http://www.iser.uaa.alaska.edu/Publications/JuneICICLE.pdf>. Date of access: July 23, 2009.

¹² Ibid.

¹³ USGCRP. 2009. "Global Climate Change Impacts in the United States. Alaska." United States Global Change Research Program. Available from: <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts>

¹⁴ Arctic Climate Impact Assessment (ACIA).

¹⁵ Parson, E.A., L. Carter, P. Anderson, B. Wang and G. Weller. 2001b. *Potential Consequences Of Climate Variability And Change For Alaska*. Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. Ch. 10, pp 283-312. Report for the US Global Change Research Program. Cambridge University Press, Cambridge, UK. Available at: <http://www.usgcrp.gov/usgcrp/nacc/alaska-mega-region.htm>. Date of access: July 23, 2009.

¹⁶ Department of Commerce. No date. "Alaska Seafood Industry: Fish Facts." State of Alaska. Available from: <http://commerce.alaska.gov/oed/seafood/pub/fishfacts.pdf>. Date of access: July 23, 2009.

¹⁷ Outdoor Industry Association. 2007. "The Active Outdoor Recreation Economy: Alaska." *State by State Active Outdoor Recreation Economy Report*. Available from: http://www.outdoorindustry.org/research.php?action=detail&research_id=52. Date of access: July 23, 2009.

¹⁸ Arctic Climate Impact Assessment (ACIA).

¹⁹ Stone, Chad and Hannah Shaw. 2009. "Extending "Climate Rebates" to Include Middle-Income Consumers." *Center on Budget and Policy Priorities*.