

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

Global warming is already affecting Arizona, 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 by creating jobs that protect wildlife and landscapes from the effects of global warming. The American Clean Energy and Security Act takes a critical first step, however, given the scale and duration of the threat, more funding will be needed.

Critical Issues for Arizona:

- Decreasing water availability
- Drastically changing landscapes
- Increasing temperatures
- Increased health risks

Is Global Warming Affecting Natural Resources in Arizona?

Yes. Arizona is warming. Since mid-century, temperatures across the state have **risen approximately 3°F and are expected to rise an additional 7°F by 2060.**¹ Although the state has seen a precipitation rise in some areas, it will likely be coupled with longer periods of drought and ultimately a 15% drier climate statewide by 2060.² These changes are significant, and the impacts are already being felt.

Across the U.S., more than 80% of plant and animal species studied are shifting their ranges in reaction to less than 1°F of average nationwide warming in the last century.³ The Intergovernmental Panel on Climate Change predicts additional warming could result in **up to 30% of known species becoming extinct**, and the disappearance of more than one-fifth of the world's ecosystems.⁴

With temperatures rising, the entire southwest United States' snowpack is decreasing, causing streamflows to decrease by 20% since 1900.⁵ The Colorado River, one of Arizona's main water sources, depends on this snowmelt for 70% of its streamflow.⁶

Natural Resources Adaptation Funding Will:

- Create and protect jobs
- Preserve treasured landscapes
- Revive the rural economy
- Provide clean air and water for future generations



Dedicated funding to safeguard natural resources from the impacts of climate change will help landscapes and species cope with reduced water levels and other effects of global warming.

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 the state.

- **Water Availability and Floods:** The decade-long drought Arizona is currently experiencing has left the state's freshwater reservoirs nearly depleted. A lack of streamflow, especially within the Colorado River, is likely to put more pressure on the state by reducing freshwater storage by 40% and hydroelectric power by 56%.⁷ As a result of temperature increases, more rapid rates of snowmelt will also pose an increased flash flood threat, putting communities and natural resources at risk.⁸
- **Agriculture:** In Arizona, agriculture production revenue is \$2.4 billion annually, half of which comes from cattle ranching and dairy production. These industries are especially vulnerable to temperature rise and precipitation decreases, demanding additional water for irrigation and risking the health of the livestock.⁹ Because Arizona's agricultural sector uses 80% of its Colorado River freshwater allocations for crop irrigation, the industry is likely to be affected as streamflow rates decrease.¹⁰
- **Health:** Temperature increases and large accumulations of air pollutants in metropolitan areas such as Phoenix are likely to result in more heat-related deaths, asthma attacks, and other respiratory disorders.¹¹ Temperature changes may also create a greater risk for malaria transmission, due to the high likelihood of Arizona's mosquitoes to carry the infectious disease.¹² In 2000, the World Health Organization estimated that 150,000 deaths per year were linked to climate change and its related health risks¹³, and predicted that amount to double by 2030.¹⁴
- **Landscapes:** As climates continue to change in Arizona, wildlands will face mounting threats such as drought and heat waves. During the 2002-2003 drought, the piñon-juniper woodland in northern Arizona experienced tree population declines of nearly 90% in just a year and a half.¹⁵ Additionally, climate change threatens both the Sonoran Desert and the Saguaro National Parks and their iconic saguaro cactus, altering Arizona landscapes permanently.¹⁶

Economy at Risk:
\$2.4 Billion
*Annual contribution of
agriculture to the state's economy*



Land management agencies need additional resources to protect public lands like the Saguaro National Park from the effects of global warming.

Protecting Natural Resources, Creating Jobs

Restoring 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 create long-term American jobs. **Investing now in natural resources is the most cost-effective way to protect our treasured landscapes and the clean water, clean air and jobs they 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 protecting natural resources from the effects of global warming. This funding will allow Arizona's wildlife and land management agencies, as well as the Land and Water Conservation Fund and the Forest Legacy Program, to ramp up important conservation projects.

This dedicated funding will allow scientists, engineers, construction crews, and others to be employed across Arizona:

- Repairing damaged watersheds to ensure clean water for communities by removing impediments and deteriorating structures, restoring eroding river banks, and repairing in-stream habitat.
- Acquiring land and establishing migration corridors to increase species' survival as climates change.
- Monitoring wildlife, habitat and local climate and developing appropriate adaptation responses.
- Restoring native landscapes to increase resiliency in a warming world by removing unnecessary roads and barriers, constructing buffer strips along river corridors, and removing invasive species.

This work will protect and create American jobs—providing new skills and income to workers and their families across the state and revitalize rural economies.



Restoring river habitats protects ecosystems, jobs, and drinking water

Investing in Solutions for Families, Businesses and the Planet

The risks to Arizona and the nation from global warming are significant—and require an extensive and sustained commitment to reducing heat-trapping pollution, and to protecting 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 solutions:

- **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.
- **Offset increased energy costs for at-risk consumers** by allocating a percentage of allowance auction revenues to consumers through existing mechanisms.¹⁷
- **Invest in areas such as clean energy choices, 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.

Arizona 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 Arizona Department of Water Resources for the picture of the Colorado River, the National Park Service for the picture of the Saguaro National Park, and the State of Massachusetts for the picture of the river restoration.

¹ NOAA National Climatic Data Center. 2009. "U.S. Climate at a Glance – Statewide." Available from: <http://www.ncdc.noaa.gov/oa/climate/research/cag3/state.html>; The University of Washington and The Nature Conservancy. 2009. Climate Wizard. Available from: <http://www.climatewizard.org/index.html>

² NOAA National Climatic Data Center. 2009. "U.S. Climate at a Glance – Statewide." Available from: <http://www.ncdc.noaa.gov/oa/climate/research/cag3/state.html>

³ Sagarin, Raphael. 2002. "Historical Studies of Species' Responses to Climate Change." In: *Wildlife Responses to Climate Change: North American Case Studies*. Ed: Terry L. Root and Stephen H. Schneider. Island Press. Washington, DC.

⁴ Intergovernmental Panel on Climate Change. 2007. "Summary for Policy Makers." In: *Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Pg 792.

⁵ Field, C.B., et al. 2007. In: North America. In *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

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⁷ Association of California Water Agencies and Colorado River Water Users Association Conferences. "Colorado River Basin Climate: Paleo, Present, Future." November 2005. Available from: http://wwa.colorado.edu/colorado_river/docs/Colorado_River_Basin_Climate.pdf

⁸ Adger, N., et al. 2007. Summary for policy makers, In *Climate Change 2007: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)] pp.7-22. Cambridge University Press, Cambridge, UK and New York City, NY, USA.

⁹ National Agriculture Statistics Service. 2002. *Census of agriculture*. United States Department of Agriculture, Washington D.C..

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¹¹ Patz JA, McGeehin MA, Bernard SM, et al. The Potential Health Impacts of Climate Variability and change for the United States: Executive Summary of the Report of the Health Sector of the U.S. National Assessment. *Environ Health Perspect*. 2000; 108(4): 367-376.

¹² U.S. Environmental Protection Agency (U.S. EPA), *Climate Change and Arizona* (Washington, D.C.: U.S. EPA, Climate and Policy Assessment Division, 1997), Available from: www.epa.gov/globalwarmingimpacts.

¹³ World Health Organization. 2002. *The world health report 2002: reducing risks, promoting healthy life*. World Health Report, World Health Organization, Geneva, Switzerland.

¹⁴ McMichael, A., et al. 2004. Global climate change. In Ezzati, M., A. Lopez, A. Rodgers, and C. Murray. (eds.) *Comparative quantification of health risks: Global and regional burden of disease attributable to selected major risk factors*. pp. 1543-1649. World Health Organization, Geneva.

¹⁵ Breshears, D.D., N.S. Cobb, P.M. Rich, K.P. Price, C.D. Allen, R.G. Balice, W.H. Romme, J.H. Hastens, M.L. Floyd, J. Belnap, J.J. Anderson, O.B. Myers, and C.W. Meyer, 2005: Regional vegetation die-off in response to global-change drought. *Proceedings of the National Academy of Sciences*, **102**(42), 15144-15148.

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¹⁷ Stone, Chad and Hannah Shaw. 2009. "Extending "Climate Rebates" to Include Middle-Income Consumers." *Center on Budget and Policy Priorities*.