



FACTS MONTANA

A M E R I C A N S E C U R I T Y P R O J E C T

Pay Now, Pay Later: Montana

Montana's \$2.4 billion agriculture sector is expected to lose up to \$79 million a year due to climate change by 2050.¹

In 2008, Montanans spent \$50 million fighting wildfires;² the state now faces a 175-400% increase in wildfire burn areas due to increasing global temperatures and drier lands.³

Leasing 20 acres of land to wind energy producers—about 1% of a typical Montanan farm—can earn the renter more than \$100,000.⁴

According to a new study, a failure to mitigate the effects of climate change could begin to cause serious gross domestic product and job losses as early as 2010 through 2050. Montana is expected to make small gains as an adequate water supply attracts migrants from other states, translating to an increase in economic activity. Montanans could gain \$900 million in GDP and nearly 13,000 jobs.*

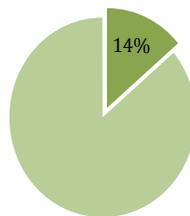
**Possibly eclipsing the positive projections, the study's calculations do not include snowfall and icepack melt, which Montanans and Montanan farmers depend on for much of the water supply. GDP numbers are based on a 0% discount rate. Job losses are measured in labor years, or entire years of fulltime employment. Backus, George et al., "Assessing the Near-Term Risk of Climate Uncertainty: Interdependencies among the U.S. States," Sandia Report (Sandia National Laboratories, May 2010), 21, 137, 141. https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate_Risk_Assessment.pdf (accessed March 23, 2011).*

Admittedly, the effects of climate change, a complex and intricate phenomenon, are difficult to predict with precision. Informed scientific and economic projections, as we have used in our research, however, allow us to see that Montana faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows Montana is poised to benefit from the research, development, and distribution of renewable energy technologies. The Big Sky State can realize tremendous economic growth by exploiting its vast green energy potential, particularly wind power.⁵ Should we fail to take action against climate change, Montana has much to lose.

Pay Later: The Costs of Inaction

Montanan Labor Force Projected to be Directly Affected



Source: U.S. Census Bureau⁶

Average temperatures in Montana have increased 3°F since 1950 and are expected to increase a further 6-7.5°F by 2050.⁷ Montana's two

largest sectors—recreational activities and agriculture—are especially vulnerable to rising temperatures. These sectors each account for roughly 15% of the gross state product, \$35.9 billion in 2008.⁸ Furthermore, rising temperatures will directly affect Montanan health, access to vital natural resources, and job security. The tourism, recreation, and agriculture industries will be directly affected by climate change.

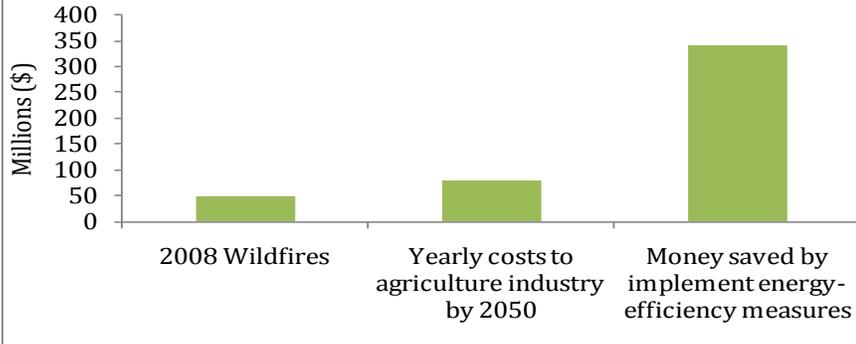
Threatened National Parks

Approximately 10 million out-of-state tourists visit Montana every year to take advantage of its beautiful national parks and abundant wildlife.⁹ The state's \$2.5 billion hunting, fishing, and outdoor recreation industries indirectly and directly support over 34,000 Montanans. Tourism in Montana centers primarily on outdoor activities such as hiking, camping, hunting, and fishing. Climate change, however, threatens to affect each of these pastimes.¹⁰

Rising temperatures will force animals to seek colder climates and will therefore reduce the state's attractiveness to anglers, fishers, and hunters. By 2060, for example, the state's coldwater trout and salmon population are expected to lose 34% of their suitable habitat in the state.¹¹

In 2007, Glacier National Park generated over \$101 million for the local

Estimated Costs of 2008 Wildfires Compared to Climate Change - Related Costs



Sources: Center for Health and the Global Environment; National Resources Defense Council

economy. However, of the 150 original glaciers that gave the park its name, only 27 remain large enough to be considered glaciers. **The park has already lost 82% of its ice fields, and scientists predict that the park will be completely devoid of glaciers by 2022.**¹²

Agriculture under Stress

Montanans could lose \$79 million a year in crop losses, as a result of climate change by 2050. Agriculture generates approximately \$2.4 billion in revenue per year and employs about 31,000 Montanans.¹³

In the future, the state's farms will be hard-pressed to satisfy their water demands. Eastern Montana currently receives 10% less precipitation than it did 100 years ago; water supply in the state is already strained and predicted to worsen. Furthermore, snowpack, which acts as a reservoir and keeps streams flowing year-round, has begun to melt earlier in the season and has decreased in size by 60% over the last 50 years. As the agricultural sector uses more than 95% of the state's

water supply, farmers will be significantly affected.¹⁴

Montana's microbreweries will also likely be threatened by climate change. The barley, hops, water, and yeast that are necessary for beer production are vulnerable to the same shifts that threaten the rest of the agricultural industry. For example, the 2006 European heat wave destroyed barley crops and raised barley prices by 40%.¹⁵ It would certainly be detrimental to both consumers and producers should Montanan breweries face this fate as well.

A rise in global temperatures will also cause droughts, floods, and an increase in the prevalence of pests like locusts and rodents, which will further negatively impact agricultural yields and profits.¹⁶

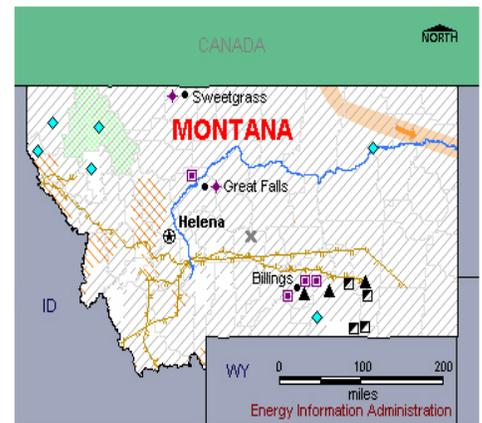
Costs to the Montanan Family

The effects of rising temperatures will also be felt at home. If Montana does not adjust current policies, the state will face a tremendous water shortage in the coming years, which will affect all residents.

As a land-locked state, Montana is shielded from the direct effects of hurricanes and rising sea levels. However, it is particularly susceptible to wildfires. **Montana spends approximately \$18 million each year on wildfire suppression—this figure spiked to nearly triple this amount, \$50 million, in 2008.**¹⁷ The rise in temperatures will begin drying out wide sections of the state, thus placing more and more of the population and property in especially vulnerable and susceptible regions—an increase of 175% in wildfire burn areas, according to environmental models.¹⁸

Pay Now: The Benefits of Taking Action

Montana will benefit tremendously from maximizing its renewable energy potential. For example, economic models predicted that the 2003



| Coal Mine, Surface | Major Electric Power Plants (>=100 MW) | Renewable Energy Potential |
|---|--|---|
| Coal Mine, Underground | Coal | Biomass (>= 60 tons/sq km/yr) |
| Natural Gas Hub | Geothermal | Geothermal (>= 80 milliwatts/m ²) |
| Petroleum Refinery | Hydroelectric | Solar (>= 6.0 kWh/m ² /day) |
| Oil Import Site | Natural Gas | Wind (>= 3 Power Class) |
| Oil Seaport | Nuclear | Wood (>= 3 Power Class) |
| Electricity Transmission Line (>= 345 kV) | Petroleum | Other Renewable |
| Natural Gas Flow (1 mile band width = 100 million cubic feet/day) | Solar | |
| Oil and Gas Active Leases | Wind | |
| | Wood | |
| | Other Renewable | |

McCain-Lieberman Climate Stewardship Act, which was voted down, would have generated 1,400 new jobs by 2015, reaching roughly 2,300 ten years later.¹⁹

Moreover, Montana ranks 2nd in the nation in wind energy potential; harnessing this potential would pay great dividends to the state's economy. **An investment sufficient to produce 12.4 million megawatt-hours of electricity per year can generate 1,050 permanent jobs and contribute \$150 million to the local economy.**²⁰ A 2,000-acre farm, the standard in Montana, could bring in over \$100,000, leasing only 20 acres to wind energy producers.²¹ Ultimately, Montana can create up to 6,000 jobs by realizing its renewable energy potential.²² **Efficiency measures to cut natural gas usage by 10% and electricity usage by 15% by 2020 would cut state costs by \$342 million each year, saving each resident \$350 annually.**²³

Conclusion

Montana must consider action on climate change not just in terms of cost, but also in terms of opportunities. If we give Montana's population, businesses, and investors clear and consistent signals by properly offering initiatives and cultivating demand, investment and innovation in renewable technologies will follow.

Montana will have to pay for the effects of climate change. The only remaining question is whether they will pay now, or pay later and run the risk of paying significantly more.

(Endnotes)

- 1 Center for Health and the Global Environment, Harvard University, *Climate Change and Health in Montana*, November 2009, 2. <http://chge.med.harvard.edu/programs/policy/factsheets/Climate%20Change%20and%20Health%20in%20Montana.pdf> (accessed August 10, 2010); Shannon Furniss, "Global warming: unexpected impacts on Montana's economy," *Entrepreneur*, 2007. http://www.entrepreneur.com/tradejournals/article/172012560_2.html (accessed July 11, 2010).
- 2 Center for Health and the Global Environment, 1.
- 3 Science Daily, *Scientists Expect Wildfires To Increase As Climate Warms In Coming Decades*, July 29, 2009. <http://www.sciencedaily.com/releases/2009/07/090728123047.htm> (accessed September 14, 2010).
- 4 Environmental Entrepreneurs, *Effects of Global Warming on the State of Montana*, April 2005, 2. http://www.e2.org/ext/doc/e2_montana.pdf (accessed July 11, 2010).
- 5 National Resources Defense Council, *A Clean Energy Economy for Montana*, March 2010, iv. <http://www.nrdc.org/energy/cleanmt/files/cleanmt.pdf> (accessed September 8, 2010).
- 6 Included here are members of the following industries: agriculture, food and accommodation, historical sites and museums, gambling and recreation. U.S. Census Bureau, *Statistics of Businesses: 2006 All Industries: Montana*. <http://www.census.gov/epcd/susb/2006/mt/MT--.HTM#table3> (accessed September 29, 2010).
- 7 Center for Health and the Global Environment, 1.
- 8 Ibid., 2; U.S. Energy Information Administration, *State Energy Profiles: Alabama*, 2010. http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=AL (accessed August 3, 2010).
- 9 Betsy Cohen, *Selling Missoula—Missoula Convention and Visitors Bureau CEO Barb Neilan talks the business of tourism*, 2003. <http://mtinbusiness.com/inbiz-0610/bus03.php> (accessed August 10, 2010).
- 10 Center for Health and the Global Environment, 2.
- 11 Ibid.
- 12 Ibid.

13 Ibid.

14 Ibid.

15 Cassandra Gugoff, *Beer and Climate Change*, October 2007. <http://www.climate.org/topics/climate-change/beer-climate-change.html> (accessed August 10, 2010).

16 Center for Health and the Global Environment, 2.

17 Ibid., 1.

18 Science Daily.

19 Environmental Entrepreneurs, 1.

20 National Resources Defense Council, vii.

21 Environmental Entrepreneurs, 2.

22 Environmental Defense Fund, *Montana Will Benefit from Clean Energy Legislation that Limits Carbon Production*, May 1, 2010. http://www.edf.org/documents/10501_CleanEnergyJobs-MT.pdf (accessed July 11, 2010).

23 National Resources Defense Council, 20; U.S. Census Bureau. <http://quickfacts.census.gov/qfd/states/30000.html> (accessed September 8, 2010).