The Impact of Climate Change on Montana’s Outdoor Economy

An economic report by Power Consulting Inc.
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Donovan S. Power, MS
Dave Chadwick
Executive Director, Montana Wildlife Federation
Donovan Power
Power Consulting Incorporated
Annual Temperature Changes

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
Seasonal Temperature Changes

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
Number of days
Tmin < 32 F

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
Number of consecutive days where Tmax > 95 F

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
Precipitation Changes

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
Seasonal Precipitation Changes

Source: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment Part 4. Climate of the U.S. Great Plains
The percentage changes in the area burned by wildfire for a one degree Celsius (1.8 degrees F) increase in global average temperatures. Change measured relative to the median annual area burned during 1950-2003. Source: National Research Council, 2011, *Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia*. Washington, DC, National Academies Press. Figure 5.8, p. 180.
Sectors of the Montana Outdoor Economy Impacted by Climate Change

- Outdoor recreation including
  - Wildlife watching and sightseeing
  - Visits to Yellowstone and Glacier National Parks
  - Angling and sport fishing
  - Big game hunting
  - Winter sports, especially
    - Alpine skiing and snowboarding
    - Snowmobiling

- Forest-based activities including
  - The cost of wildfire control
  - The impact of wildfires and the smoke they create on outdoor activity, health, and quality of life.

- The impact of catastrophic wildfire on residences within the Urban-Wildland Interface
  - Homes lost
  - Value of property destroyed
  - Cost of fighting wildfires
  - Discouragement of in-migration to Montana
Tom Power

Power Consulting Incorporated
The Common Default Economic Cost of Carbon Pollution

- A very precise, quantitative value: $Zero
- We *know* that economic cost is wrong. Yet is implicitly used in almost all discussions of the economic costs associated with controlling carbon pollution.
- We use the best science available combined with expert judgment to provide a quantitative cost estimate in place of the $Zero value regularly used.
Montana's Economic Base
Earnings in Basic Industries, 2012-2014
Percent of Total

- Federal Government: 24%
- Energy: 16%
- Ag. and Related: 15%
- Nonresident Travel: 13%
- Transportation: 11%
- Other Manufacturing: 11%
- Mining: 7%
- Wood Products: 3%

Source: Bureau of Business and Economic Research, University of Montana
**Summary of Montana Recreation-Tourist Relative Economic Importance: 2011-2014**

<table>
<thead>
<tr>
<th>Estimates of the Total Montana Importance</th>
<th>Jobs</th>
<th>Labor Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana Non-Resident Visitors ITRR</td>
<td>53,280</td>
<td>$1,565,440,000</td>
</tr>
<tr>
<td>Montana Outdoor Recreation-Southwick</td>
<td>89,000</td>
<td>$2,262,275,000</td>
</tr>
<tr>
<td>&quot;MT Non-Resid Tourist &amp; Recreation&quot; Total</td>
<td>33,977</td>
<td>$998,283,648</td>
</tr>
</tbody>
</table>

**Components of Montana Tourism and Recreation Activity**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jobs</th>
<th>Labor Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glacier-Yellowstone NPs Visitation</td>
<td>9,992</td>
<td>$281,247,800</td>
</tr>
<tr>
<td>Wildlife Viewing</td>
<td>11,102</td>
<td>$245,218,783</td>
</tr>
<tr>
<td>Hunting Activities</td>
<td>11,140</td>
<td>$281,270,023</td>
</tr>
<tr>
<td>Sport Fishing</td>
<td>5,375</td>
<td>$147,910,383</td>
</tr>
<tr>
<td>MT Skiing / Snowboarding</td>
<td>2,850</td>
<td>$83,148,800</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>1,544</td>
<td>$27,787,470</td>
</tr>
<tr>
<td>SubTotal of Listed Components</td>
<td>42,003</td>
<td>$1,066,583,259</td>
</tr>
<tr>
<td>Activity</td>
<td>Jobs</td>
<td>Labor Earnings ($millions)</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Glacier-Yellowstone NP Visitation</td>
<td>3,331</td>
<td>$94</td>
</tr>
<tr>
<td>Wildlife Watching &amp; Sight-Seeing</td>
<td>2,775</td>
<td>$61</td>
</tr>
<tr>
<td>Hunting</td>
<td>1,560</td>
<td>$39</td>
</tr>
<tr>
<td>Sport Fishing</td>
<td>1,792</td>
<td>$49</td>
</tr>
<tr>
<td>Skiing, Snowboarding, Snowmobiling</td>
<td>1,465</td>
<td>$37</td>
</tr>
<tr>
<td><strong>Total Economic Losses in Recreation and Tourism</strong></td>
<td><strong>10,922</strong></td>
<td><strong>$281</strong></td>
</tr>
</tbody>
</table>
### Economic Costs Associated with More Destructive Wildfires

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Cost or Impact ($millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Homes (replacement cost, 2014$)</td>
<td></td>
</tr>
<tr>
<td>Annual Loss of Homes 2016-2050</td>
<td>$53</td>
</tr>
<tr>
<td>Cumulative Loss of Homes</td>
<td>$1,900</td>
</tr>
<tr>
<td>Increased Cost of Controlling Wildfire (annual, 2014$)</td>
<td>$261</td>
</tr>
<tr>
<td>Decreased Rate of In-Migration to Montana</td>
<td></td>
</tr>
<tr>
<td>Average Annual Labor Earnings Reduction 2016-2050 (2014$)</td>
<td>$858</td>
</tr>
<tr>
<td>Number of Jobs</td>
<td>1,700</td>
</tr>
</tbody>
</table>
Scott Nicolarsen
Owner, Montana Topwater Fly Fishing Outfitters
33% fewer angling days
1,800 jobs lost
$49 million lost in labor earnings
33% Decline in Snow Sports

1,500 Jobs Lost

$37 Million Lost in Labor Earnings
Dave Chadwick

Executive Director, Montana Wildlife Federation
15% decline in big game hunting

1,600 jobs lost

$39 million lost in labor earnings
To download the report and for more info, go to: www.montanawildlife.org
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Thank You