

**Aspen Skiing Company's
Testimony to the U.S. House of Representatives
Committee on Natural Resources, Subcommittee on Energy
and Mineral Resources
Oversight Hearing: "Towards a Clean Energy Future: Energy
Policy and Climate Change on Public Lands."**

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The mountain resort economy in the West is as endangered as the Polar Bear but a heck of a lot more valuable.

You could say the ski industry is the Canary in the coal mine for climate change. If there's one business sector that is going to suffer most and earliest, it's skiing. And that's not good for the economy: the ski and winter recreation industry in Colorado alone accounts for over \$2 billion in revenue annually and is responsible for 8% of employment in the state.¹ To understand the impact of the snowsports industry on a national scale, roughly quintuple that revenue number. That's why, in response to growing media coverage, scientific consensus, and observed climate changes on our mountains, we decided to explore the science. It turns out that the cities of Aspen, CO and Park City, UT independently commissioned studies to determine what, exactly, the future might look like, because that information is obviously critical to future planning. The Aspen and Park City studies focused exclusively on peer-reviewed science, and found that the consequences for Aspen were dire. According to the study "climate models indicate that if global greenhouse gas emissions are reduced, Aspen is projected to experience about 6°F of additional warming by 2100, giving it a similar climate to that of Los Alamos, New Mexico. If global emissions continue their rapid rise, Aspen is projected to warm 14°F by the end of this century, giving it a similar climate to that of Amarillo, Texas."² For Park City, consequences were even worse, because they are at a lower altitude.

Aspen Skiing Company is the owner and operator of four major destination winter recreation complexes located in the central Rocky Mountain region of Colorado, spanning over 5,200 acres of public and private land on four mountains: Aspen, Buttermilk, Highlands and Snowmass, as well as two hotels, a golf course, and 15 restaurants. We host 1.4 million skiers annually and employ 3,400 people in winter. Aspen Skiing Company, along with the rest of the ski industry, is a reluctant warrior on

¹ The data comes from Colorado Ski Country USA, Economic Impact Study, March 2004.

² <http://www.aspenglobalwarming.com/westerncoloradodata.cfm>

the climate issue. Our entire business model is threatened by the problem. It's a difficult message for us, because global warming forces the questions: "Why teach your children to ski?" "Why invest in a slopeside condo?"

But the ski industry is also particularly sensitive to climate: skiers start banging down the doors around Halloween, so opening earlier than Mother Nature dictates (though use of artificial snow) has become part of the business. At the same time, our (and most) ski resorts operate in deficit until March, when we make most of our profit. If you shorten our season on either end—take away March, for example—we go out of business. The problem: a shortened season is a consistent predication of the climate modeling and science. A second prediction of the models is that we'll see warmer nights. In fact, we're seeing these already. The problem: in order to stay open later, and open early enough for customer demand, we need to make snow. And with warm nights, it becomes exponentially more expensive to make artificial snow. This fall and early winter, it was actually so warm that on many nights in December it was impossible to make snow at all.

In some ways, focusing on the ski industry when thinking about climate change is trivial. The declining snowpacks we're seeing affect skiing for certain, but more importantly they affect water supply in the west and in particular California. The Colorado River supplies water to 25 million people in 6 western states and California, according to the Arizona Dept. of Environmental Quality. But scientific models predict the Colorado River basin will lose 24% of its snowpack by 2010-2039.³ This is for a system that is fully allocated today and already "at the brink of failure."⁴

Nonetheless, the ski industry is a good early indicator of the scope and scale of change we expect to see. And there are four major reports, published recently, that predict significant economic harm to the American ski industry and the region as a result of climate change. They are: *Less Snow, Less Water: Climate Disruption in the West*, by Stephen Saunders and Maureen Maxwell of the Rocky Mountain Climate Organization; *Climate Change: Modeling a Warmer Rockies and Assessing the Implications*, by Gregory Zimmerman, Caitlin O'Brady, and Bryan Hurlbutt of Colorado College; *Climate Change and Aspen: An Assessment of Impacts and Potential Responses*, by the Aspen Global Change Institute; and *Save Our Snow: Climate Change in Park City* by Stratus Consulting Group. Each of the studies relies on the best third party science available, and the best modeling and experts in the field. This testimony cites specific text from these reports related to the predicted economic impact of climate change on Aspen Skiing Company and the Colorado ski industry.

First, it should be noted that the generally lower altitude *European* ski industry—itsself a coal mine Canary for what we might expect here in the West—is already suffering direct economic impact of climate change. And skiing is an even greater economic driver

³ N.S. Christensen, A.W. Wood, N. Voison, D.P. Lettenmaier, and R.N. Palmer, "The Effects of Climate Change on the Hydrology and Water Resources of the Colorado River Basin," *Climatic Change* 62(2004): 337-363, 349-350.

⁴ T. Barnett, R. Malone, W. Pennell, D. Stammer, B. Semtner, and W. Washington, "The Effects of Climate Change on Water Resources in the West: Introduction and Overview," *Climatic Change* 62(2004): 7.

in Europe than in the U.S. This year, the Office for Economic Cooperation and Development released a study warning that climate change was threatening Europe's skiing trade.⁵ And this year, several January World Cup races were cancelled due to rain or lack of snow, even though officials tried to salvage the events by *helicoptering-in snow*. Meanwhile several Scottish resorts have shut down, and, according to a European chamber of commerce member who asked to remain anonymous, 47 ski resorts in the Alps simply did not open last year from lack of snow, warm glaciers that were out of condition for skiing, or long periods of rain. "We don't expect to have snow in low lying resorts such as Klosters for more than the next 10 years," said Werner Schmultz, from the World Radiation Centre in Switzerland. And in July 2006, "Swiss researchers from the University of Zurich concluded that the Alps will lose 80 percent of their glaciers by the end of the century. (That's the average temperature rise scenario of 3 degrees Celsius. The high end projections—a 5 degree C increase—will result in the loss of all Alpine glaciers.)"⁶ In response, some Swiss resorts are wrapping their glaciers in reflective blankets to try to protect them.

"Temperatures have risen to the point where artificial snow is melting faster than the snow machines can churn it out," Bill Wright of the Cairngorms Campaign environmental group told Reuters. "The Scottish skiing situation is verging on crisis," he said. "It's hard to resist the conclusion that global warming is a factor."⁷

Resorts in Scotland are moving away from ski-based economies. Some are successfully transitioning to non-winter-sports economies; others are going out of business.⁸

A growing concern in Europe is the *financing* of the ski industry. In Switzerland, for example, "Banks have stopped lending to resorts below 1,500 meters, worried that they will never get their money back."⁹

Back to the American West, the Colorado College report analyzed climate modeling data to try to predict ski country April 1 snowpack loss, from 1976 to 2085. Some areas, like the Utah resorts of Alta and Snowbird, are predicted to see 84% snowpack loss. Southern resorts like Taos will see 89% loss, essentially putting them out of business. (In the winter of 2005-6 New Mexico resorts received virtually no snow, and, by all accounts, had a catastrophic season.) Aspen's resorts—Highlands, Aspen Mountain and Snowmass, are predicted to see a 43% loss in April 1 snowpack. The reports notes that "Most ski counties in Colorado are predicted to lose around 50% [of April 1 snowpack.] Predictions

⁵http://www.swissinfo.org/eng/front/detail/Climate_change_threatens_ski_resorts_in_Europe.html?siteSect=105&sid=7347238&cKey=1166083840000

⁶ From the Save Our Snow website, <http://www.saveoursnow.com/facts.htm>. Accessed August 11, 2006. Harrison, Pete. "Scottish Skiing Meets Global Warming," Reuters. January 2, 2004. Available online at http://www.zapworld.com/about/news/watch_scottishskiing.asp. Accessed February, 2006.

⁷ Seenan, Gerard. "Global warming forces sale of Scottish winter sports resorts," The Guardian Saturday February 14, 2004. Available online at <http://sport.guardian.co.uk/news/story/0,10488,1148094,00.html>

⁸ Harrison, Pete. "Scottish Skiing Meets Global Warming," Reuters. January 2, 2004. Available online at http://www.zapworld.com/about/news/watch_scottishskiing.asp. Accessed February, 2006.

⁹ Ibid.

for future mountain climate are warmer winters and shorter snow seasons. Winter sports dependent upon snow: downhill skiing, cross-country skiing, snowshoeing, and snowmobiling, are expected to decrease in popularity with warming because of worsening conditions, *potentially becoming unviable as soon as 2050*. According to Aspen Skiing Company CEO Patrick O'Donnell...if climate change shortens the ski season, 'it is going to be an economic disaster.'"¹⁰

The report *Less Snow, Less Water: Climate Disruption in the West* predicts that by the end of the century, with a mid-range estimate of predicted warming, Aspen would have the climate of Colorado Springs, a desert community in southern Colorado with no ski business. The report also predicts smaller snowpacks and earlier snowmelt. In fact, new data already shows declining snowpacks, and increased warming, particularly *at night and in winter*,¹¹ with consequent impacts on snowmaking that have been previously described.

The 150-page study *Climate Change and Aspen: An Assessment of Impacts and Potential Responses* reports that "sometime between 2030 and 2100, Aspen climate will work against its reputation as a destination ski resort....The scenarios do imply greater costs and effort in terms of mountain and visitor management. If season delay or poor conditions do shave 5 to 20 percent off of skier numbers by 2030, then the economic consequences could be significant, ranging from losses of \$16m to \$56m in total personal income (in today's dollars.) Though it cannot be reliably quantified, poorer ski conditions are likely to affect the resort real estate market in Aspen, thus adding to losses."¹²

Most strikingly, according to the report: "High greenhouse gas emissions scenarios (A1FI) are likely to end skiing in Aspen by 2100, and possibly well before then, while low emission path scenarios preserve skiing at mid- to upper mountain elevations. In either case, snow conditions will deteriorate in the future."¹³

The Park City study reports that by 2075, Thanksgiving will no longer be a ski holiday, and midseason snow depths will be 15 to 65 percent lower—meaning an end to Utah's famous champagne powder. Throughout the Rockies, atmospheric warming will increase

¹⁰ Zimmerman, Gregory, O'Brady, Caitlin, and Hurlbutt, Bryan. *Climate Change: Modeling a Warmer Rockies and Assessing the Implications*. p. 99. From *The 2006 Colorado College State of the Rockies Report*. April 10, 2006.
<http://www.coloradocollege.edu/stateoftherockies/06ReportCard/Climate%20Change,%20updated%2005-01-05.pdf> Accessed August 11, 2006.

¹¹ Saunders, Stephen, and Maxwell, Maureen. *Less Snow, Less Water: Climate Disruption in the West*. September, 2005. pp 13-15. Available online at
<http://www.rockymountainclimate.org/website%20pictures/Less%20Snow%20Less%20Water.pdf>. Accessed August 11, 2006.

¹² Katzenberger, et al. *Climate Change and Aspen: An Assessment of Impacts and Potential Responses*. A Report of the Aspen Global Change Institute. July, 2006. pp 71-81. Available online at
<http://www.agci.org/aspenStudy.html>. Accessed August 11, 2006.

¹³ *Ibid*, Katzenberger, et al. P. xvi, Executive Summary.

roughly a third faster than the global mean temperature, which means that snowmaking won't be possible, in most years, until the end of November.¹⁴

According to a Deseret News report, the Park City study “painted a bleak picture for Utah, where the tourism industry relies on the winter ski and snowboarding season. By 2100, the ski season could extend only from Christmas to Presidents Day, under the best-case scenario. Even a small 4- to 5-degree warming could be disastrous for the resorts — and winter. ‘We only maintain snow under the low-emission scenario through midwinter. Remember, that’s a 10- to 15-degree increase,’ said Brian Lazar of Stratus Consulting, which conducted the study with the Institute of Arctic and Alpine Research at the University of Colorado in Boulder. ‘Under the high-emission scenario, we don’t get snow.’ The report used a snow-modeling computer program to estimate the climate changes and snow levels for 2030, 2075 and 2100 under three different emission scenarios. Lazar said global warming will even affect the quality of the snow, turning the current Utah powder into skiers’ cement.”^{15 16}

In short, there is compelling evidence that the ski industry stands to suffer significant financial losses from global warming induced changes such as shorter seasons, warmer nights, and reduced snowpack, and that impact is just one indicator of later, broader impacts of climate change. In a worst-case scenario, the industry will be gone by 2100. In a best case scenario, the cost of doing business will increase exponentially and profit margins will drop precipitously, along with the quality of the product offered to guests. The irony is that this threatened industry operates mostly on public lands...and how the United States chooses to use other public lands will affect the future of our industry.

At the same time, in CO in particular, we see the response to climate change—and even how public lands are used in this effort—as an economic opportunity. In fact, this is a major piece of our current Governor’s platform. A great example of the potential for our state is the Grand Junction, CO based ski lift manufacturer Poma, which is moving towards manufacturing wind turbines. This could be an indigenous business in Colorado that provides manufacturing jobs while helping ranchers and farmers, who can install turbines, making their land do double duty. Might it be possible to make BLM lands easier to lease for wind farms? Would a federal fee for fossil fuel extraction help address the impacts of burning that fuel? We’re not experts in public lands solutions to climate change, but in the end, global warming is clearly both a challenge and opportunity for Colorado and the West.

¹⁴ An executive summary of the study, which isn’t public yet, is available at http://www.saveoursnow.org/Executive_Summary.pdf

¹⁵ <http://deseretnews.com/dn/view/0,1249,650221809,00.html>

¹⁶ http://www.saveoursnow.org/Executive_Summary.pdf.