

**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, and by extension the entire country, 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 \$2 billion in revenue annually and employs fully 8% of the state's population, or 31,000 people. On a national scale, roughly quintuple that number. That's why, in response to growing media coverage, scientific consensus, and observed climate changes on our own mountains, we decided to explore the science. In fact, in addition to our own explorations, the cities of Aspen and Park City independently commissioned studies to determine what, exactly, the future might look like, because that information is critical to planning for the future in mountain resort economies. The Aspen and Park City studies focused exclusively on peer reviewed science, and found that the consequences for Aspen were dire—we'd look like Colorado Springs by 2050 and Amarillo by 2100—and for Park City even worse, because they are at a lower altitude.

The ski industry is a reluctant warrior on 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?"

The ski industry is an odd beast: skiers start banging down the doors around Halloween, so starting earlier than mother nature might want us to 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—and we go out of business. The problem: a shortened season is one of the most reliable predications of the climate modeling and science. A second prediction of the models is that we'll see warmer nights. In fact, we're seeing this 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 California. The Colorado River supplies water to 10 million people in 5 western states including California. But scientific models predict the Colorado river basin will lose 24% of its snowpack by 2010-2039.¹ This is for a system that is fully allocated today and "at the brink of failure."²

There are four major reports, published recently, that predict significant economic harm to the American ski industry 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 available third party science available, and the best modeling and experts in the field. This brief will cite 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 *European* ski industry is already suffering direct economic impact of climate change. This year, the OECD released a study warning that climate change was threatening Europe's climate trade, ³Several Scottish resort has 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 due to climate change. (Meaning there was no snow, glaciers were not serviceable for skiing, or long periods of rain make skiing impossible.) "We don't expect to have snow in low lying resorts such as Klosters for more than the next 10 years," said Werner Schmoltz, 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 C increase—will result in the loss of all Alpine glaciers.)"⁴

"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

¹ 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.

² 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.

³http://www.swissinfo.org/eng/front/detail/Climate_change_threatens_ski_resorts_in_Europe.html?siteSect=105&sid=7347238&cKey=1166083840000

⁴ From the Save Our Snow website, <http://www.saveoursnow.com/facts.htm>. Accessed August 11, 2006.

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.’”⁵

Resorts in Scotland are moving away from ski-based economies. Some are successfully transitioning to non-winter-sports based economies; others are going out of business.⁶

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.”⁷

Back to the American West, the Colorado College report analyzed the best available 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. (Last winter all the 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 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.’”⁸ The reason for this is that most ski resorts don’t start to make money until March—they are still operating in deficit. With a slightly shorter ski season, the business may no longer be profitable.

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*.⁹ Night warming is problematic for ski resort operators because artificial

⁵ 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.

⁶ 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>

⁷ “Scottish Skiing Meets Global Warming.” [1] Accessed February, 2006.

⁸ 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.

⁹ Saunders, Stephen, and Maxwell, Maureen. *Less Snow, Less Water: Climate Disruption in the West*. September, 2005. pp 13-15. Available online at

snowmaking requires low temperatures for maximum efficiency. Raise the temperature a few degrees, and snowmaking is either impossible or exponentially more expensive.

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.”¹⁰

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.”¹¹

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 bottomless powder. Throughout the Rockies, atmospheric warming will increase 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.

According to a Deseret News report, “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.”^{12 13}

In short, there is compelling evidence that the ski industry stands to suffer significant financial losses from climate change induced changes such as shorter seasons, warmer

<http://www.rockymountainclimate.org/website%20pictures/Less%20Snow%20Less%20Water.pdf>.

Accessed August 11, 2006.

¹⁰ 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.

¹¹ Katzenberger, et al.[6] p. xvi, Executive Summary.

¹² <http://deseretnews.com/dn/view/0,1249,650221809,00.html>

¹³ An executive summary of the study, which isn’t public yet, is available at http://www.saveoursnow.org/Executive_Summary.pdf.

nights, and reduced snowpack. 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 for climate change solutions 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. A great example of this is how the ski lift manufacturer Poma 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. In the end, climate change is both a challenge and opportunity for us.