

## It's a slippery slope for ski resorts facing climate change

By Ashley Mateo

LAST DECEMBER, VISITORS ARRIVING IN VAIL, Colo., ready to kick off the winter ski season immediately noticed something missing: the snow. The town was lush and green; only Vail Pass, at 10,617 ft. above sea level, was dusted in the champagne powder Colorado is known for.

Climate change has had a direct and aggressive effect on winter tourism—and not just in Vail. In 2016–17, the first frost came two weeks later than the 20th century average, according to data from the National Oceanic and Atmospheric Administration (NOAA), and the last one nine days earlier. The season was nearly a month shorter than expected, a trend that's been worsening since the 1980s. NOAA's outlook for winter 2018–19 predicts warmer, drier and milder conditions across the U.S.

Those working in ski towns and at resorts don't need meteorologists to tell them that; they can see the effects in their business. "Last year, we had radically less snow—our lowest snow year in 50 years," says Auden Schendler, the Senior Vice President of Sustainability at Aspen Skiing Company in Aspen, Colo. "In low-snow years, you see about a billion dollars less in revenue." Those years also cost ski regions 17,400 jobs, according to the 2018 economic report from Protect Our Winters, a nonprofit environmental organization.

It's not just that there's less snow; it's that snow patterns are so unpredictable, ski towns, resorts and businesses can't count on conditions necessary for financial stability. To be considered "snow reliable," a ski area must have more than 30 cm of snow depth (natural and man-made) during 100 days or during the entire Christmas through New Year's holiday period in at least seven out of 10 years. By those standards, all of the northeastern states (except Vermont) are projected to lose at least half of their ski areas, according to a review in the journal *Current Issues in Tourism*. And if climate change continues apace, 90% of ski resorts in the U.S. won't be able to open by Christmas by 2090.

European ski areas have similar problems. By 2099, the Alps could lose up to 70% of their snow cover, according to research published by the European Geosciences Union—and just two to three weeks of operating at a loss could tank a ski area's financial season.

In North America, multiresort ski passes like the Epic Pass and Ikon Pass can help somewhat. "People can book last-minute trips to the resort with the best snow," says Schendler. "But obviously, last-minute bookings make it harder to plan—for marketing, for occupancy and for projected revenue."

One type of resort is actually benefitting from the sporadic snowfall: higher-altitude ski areas that get more consistent



▲ Skiers above the Dolomites, an Alpine range in Italy that has felt the heat of climate change

snow coverage like Breckenridge, Snowmass and Telluride in the U.S., as well as some in eastern Switzerland and northern Italy. "We've had new clients booking last-minute trips to British Columbia and Alaska to avoid exceptionally poor conditions in Vail, Aspen and Jackson Hole," says Andy Culp, CEO and co-founder of Heli, a travel tech company that provides helicopter skiing experiences. And more remote locations are getting a boost too, Culp says, because that's where fresh snow sticks around for days or weeks after a storm.

Ironically, too much snow can also impact ski resorts. If a massive storm hits, as has happened more frequently, if unpredictably, in recent years, the sudden heavy snowfall can raise the threat of avalanches, leading resorts to shut down runs or even keep patrons indoors.

Fluctuating snow patterns haven't completely derailed ski tourism—yet. In fact, tourism numbers have remained static for two decades, Schendler says. But scientists and industry veterans feel like they can see a dark future. "At the current rate of warming, the ski industry is probably done by midcentury," Schendler says. "We're not acting like we are in crisis, but we are." □