

# Beyond GoPro: Skiers and snowboarders can measure everything with apps, hardware

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At the end of a long day on the slopes, there's only one reward as sweet as a cold beer and a fireplace to warm your toes - recounting your epic moves through the powder.

"You won't believe the air I caught!"

"Did you see how fast I took that tree run?"

But with a growing number of mobile apps, high-tech goggles and other digital devices that can measure with precision all the moves down a mountain, old-fashioned storytelling with friends and family may not cut it anymore. GoPros and iPhones have long helped athletes record their mountain adventures, but more serious skiers are pushing their limits with gadgets - possibly even Google Glass - that offer skiers a wealth of data about their technique on the trail.

The "quantified self" movement, which emerged as smartphones became more ubiquitous and wearable devices such as the Fitbit grew in popularity, has invaded resorts across the globe, adding competitive aspects and measurable performance gains to the sport. Although many embraced skiing for the chance to be in the mountains, disconnected, alone at the crest of an untracked bowl, even these snow-sport athletes are adopting technology to measure every turn and trick in hopes of quantifying a sport that has for so long been measured by gut feelings.

"You get this emotional feeling, like 'Wow, that might have been the

best powder run I've ever done.' But then you think, 'A lot of runs feel that way, and they can't all be the best,'" said David Lokshin, co-founder of AlpineReplay, a Southern California company that makes Trace, an app to track ski performance and a sensor that sticks to a ski or snowboard and can identify and record airborne tricks

The data the Trace app collects can then be examined and shared, offering new potential bragging rights and quantifiable improvement.

"People in other sports like soccer and baseball and basketball have stats - you know how many goals you've scored, how many rebounds you've had or what your batting average is," Lokshin said. "But in skiing and snowboarding, I couldn't even tell if I was getting better."

The thirst to measure athletic performance isn't just for the pros - although Olympic skiers are adopting such tools - because it can benefit the casual skier looking to improve or groups of competitive friends eager to show who is fastest on the slopes. A 2013 survey by Pew Internet Research found that 19 percent of smartphone owners use apps to track their health, with more than a third accessing fitness and workout-related apps, and the market for wearable technology is an estimated \$330 million, according to NPD Group industry analyst Ben Arnold.

Sensing the growing demand, Vail Resorts, which owns 11 resorts, poured resources into developing its EpicMix app, the centerpiece of the company's digital offerings. The app, which rolled out five seasons ago and has been upgraded every year since, uses a radio-frequency identification chip that knows each skiers' exact location, and tracks how much distance and vertical feet they cover, and which lifts they take on a Vail-owned mountain. EpicMix has hundreds of thousands of users each year, according to the company.

"It was about trying to, for the first time, offer some real data around the skiing experience," said Robert Urwiler, executive vice president and chief information officer for Vail Resorts. "It's another life metric that's becoming relevant in this digital age."

Andrei Morozov, a finance researcher, and Sergey Petrov, a software engineer, in 2010 released the snowEdge app, which tracks speed, airtime and distance, but goes beyond that to measure the acceleration of turns, and rates them with a score of 0 to 1,000. The faster the acceleration, the stronger and sharper the turn, and the higher the score.

"That is the key to determine how well you're skiing, not just how fast you're skiing," Morozov said. "From the data you can analyze your progress, and you can see that today is better than yesterday."

And that is exactly the point, say winter athletes. They are using this technology to set quantifiable goals and measure in feet and miles per hour their improvement, with data that holds them accountable, not just feelings.

For writer and skier Billy Brown, a favorite toy to measure his mountain adventures is the Garmin Fenix2, a multisport watch that tracks speed, distance, vertical drop, and has an automatic run counter, GPS radio, compass and altimeter.

"It's ridiculous, it'll track just about every stat you can imagine," Brown said.

And with advances in Internet-connected wearables, such as Google Glass, the technology is becoming almost as extreme as a double-black chute in the French Alps.

The Snow2 ski goggles by Recon Instruments deliver - in real-time -

speed, vertical descent, altitude and airtime to a skier's sight line. The Vancouver-based tech company makes software that is installed in Oakley, O'Neill and Smith brand goggles, with the Snow2 selling for about \$650, or three to five times a regular pair of performance goggles.

"We see people using the data and skiing more, pushing themselves to ski a longer day, ski more vertical feet and get after it a little bit more aggressively," said Tom Fowler, Recon Instrument's chief marketing officer.

For those who already spent money on eyewear that beams information, Squaw Valley is launching this season the ski industry's first Google Glass app, which will allow Glass wearers initially to access real-time information about lift and trail openings, with more features added later, a representative said.

The company did not say how many skiers they expected to wear Glass, which aren't designed to protect against gusts of wind and snow.

Some ski enthusiasts, however, caution that all the gadgets and apps shouldn't get in the way of what [skiing](#) has always been about - you, snow, cold air and a mountainside waiting.

"You know, it's a good sport," Morozov said. "It doesn't need changing."

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