

Climate change making mountaineering more dangerous

By Devon O'Neil, Outside

In July 2011, Arnaud Temme and three friends were climbing the Rottalgrat, a tough route on the west side of the Jungfrau in Switzerland's Bernese Oberland, when rocks began to rain down from above. Temme, an experienced alpine climber, took a rock to the shoulder and a handful more hit his helmet, but the team eventually completed the route unharmed.

That night, the climbers evaluated their experience in the warm comfort of the Mönchsloch Hut. Their guidebook, which was a decade old, described the route as relatively safe with only minor rockfall danger. "But the more recent guidebook, which we didn't have, said to stay away from this route because of very high rockfall danger," Temme says.

The disparity struck Temme, a 37-year-old assistant professor at the Netherlands' Wageningen University who is also an affiliate of the Institute for Arctic and Alpine Research (INSTAAR) at the University of Colorado at Boulder. How could two guidebooks describe the same route in such different ways when they were written less than a decade apart? That question served as the impetus for Temme's three-year study into the effects of climate change on alpine climbing danger, the results of which were recently published in the international scientific journal *Geografiska Annaler*. Temme says the two are "very probably related."

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