

The Rise and Fall of Sierra Nevada Glaciers

Dr. Greg Stock, National Park Service

Glaciers are more than a playground for skiers and climbers; they are significant to the world, and it's vital to pay attention to what's happening to them. For 85 years, the park service has conducted annual surveys of the Lyell and Maclure Glaciers. The results of the most recent studies are shocking. The glaciers have lost about 80 percent of their surface area.

"The reason glaciers are good indicators of climate change is because they are simple. Snowfall and temperature are the only two things that control a glacier's health. So if you have less snow or warmer temperatures, the glaciers are going to retreat," explains Greg Stock, a Yosemite National Park glaciologist.

In Yosemite, the Lyell and Maclure Glaciers form the headwaters of the Tuolumne River, providing drinking water to more than two million people in the Bay Area. Once the glaciers disappear, the ecosystems downstream are bound to change. In other places in the world, like China, Bolivia, and the Alps, melting glaciers provide a significant source of freshwater for large communities. Globally, the loss of glaciers means many communities will lose their water source.

"The other part," Stock says, "is more philosophical. Glaciers were foundational in creating this landscape that's so famous. When the glaciers disappear, we'll lose the physical links to the past and the tangible link to the past study of glaciers from John Muir on—the hundreds of people involved in studying these glaciers over a century and a half."

Biography: Greg Stock is the first-ever Park Geologist at Yosemite National Park. He has B.S. and Ph.D. degrees in geology and earth science (U.C. Santa Cruz), and was a researcher at the University of Michigan prior to accepting the job at Yosemite in 2006. His research interests are primarily in geomorphology and include glacial erosion, river dynamics, and hillslope processes such as rockfalls and debris flows.