

WARMING UP, UP

One of the cool things about the Eastern Sierra is how you can get up on any of a thousand high vantage points and look over vast valleys and huge ranges. On a hilltop halfway into the sky, you can see the ocean of air drifting across from infinity and out to forever, look over a hundred miles of terrain, and get the perspective that we humans live in scattered islands of vitality linked by slender threads of highway and wires—mere scratches in a world that is far larger than any flatland imagination.

When I look around from one of those perches it makes me ponder the scope of things. Now, apparently, I'm supposed to worry that the energy coming out of those islands and threads of humanity is heating up the whole globe.

Yes, the buzz about global warming has shifted to where the jury is in and the movies are out. Well, if it's really happening, are we seeing it here in the Eastern Sierra?

Just a few scientists have been looking at climate change around here, but so far their answer is: You bet things are warming up. First of all, it's interesting to note that our region's ancient trees, the bristlecone pines and giant sequoias, have played a key role in the climate hubbub, because their growth rings have delivered some of the most detailed records available on conditions of the past hundred centuries.

When climate sleuths juxtaposed the ring patterns with other data, the results displayed the now-famous "hockey-stick" curve—the widely-accepted appraisal that temperatures have warmed so much in recent years that the 1990s were the Northern Hemisphere's warmest decade in the millennium. Thermometer archives from around the West also show the warming trend, especially warmer nights. So far, the world at large has warmed up just a degree or so Fahrenheit since about seventy years ago. But scientists say that nights in, for instance, Yosemite Valley, now average five degrees warmer—and warmer nights are exactly what you'd expect if greenhouse gases are trapping heat.

And how is this showing up on the ground? First of all, the snow is shrinking upward. Ski pioneers like Dave McCoy could count on snow every winter at seven thousand feet on McGee Mountain, Rattlesnake Hill and other slopes along the U.S. Hwy. 395 corridor. But for at least twenty years now, winter snow has only erratically covered the sagebrush in those places.

The Sierra snowpack is also melting earlier in the spring. The California Climate Change Center estimates that dry ground is emerging, on the average, one to three weeks or more earlier than it did in the 1970s—an estimate that's consistent with stream gauge data from all over the West.

Earlier springs mean longer summers, and longer, drier, and hotter fire seasons. An analysis from around the West shows that, beginning in 1985, wildfires have started earlier, burned much bigger and burned later into the fall—and the correlation is more with climate than with any other factor.

At the University of Nevada, Las Vegas, scientists have found an unfortunate, parallel problem: an increase in carbon dioxide in the air directly benefits weedy grasses, especially cheat grass and red brome, and these aggressive, alien plants are famous for making a landscape that burns more easily. Look at the recent fire scars along the base of the Sierra above Bishop now, and you'll see that red brome and cheat grass have moved in.

BY ANDY SELTERS

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As warmer temperatures rise up the mountainsides, the plants and wildlife are moving higher as well.

In the White Mountains, recent aerial photographs compared with ones from the 1960s show that bristlecone pines and limber pines have expanded onto higher slopes and into colder basins. Derham Giuliani has been monitoring critters in the Whites for decades, and recently he's seen ground squirrels living at noticeably higher elevations.

In Yosemite, Jim Patton of the University of California, Berkeley, has been comparing today's wildlife to what the biologist Joseph Grinnell catalogued in the World War I era. In the same meadows and forests where Grinnell worked a century ago, Patton is finding clear evidence that animals have moved into the higher realms.

Alpine chipmunks and ground squirrels now chatter and peep a full 1,700 feet higher than they did in Grinnell's day. Teals and mallards are now breeding in subalpine lakes, where Grinnell mentioned none, and he certainly would have had they been present. Patton and his graduate students have been capturing piñon mice (desert critters distinctive for their oversized, heat-draining ears) as high as ten thousand feet in the canyons above Tuolumne Meadows. In Grinnell's day, piñon mice scurried about only east of the Sierra crest, below seven thousand feet.

John Smiley of the White Mountain Research Station has been studying willow leaf beetles in the Sierra for some twenty-five years, and up Big Pine Creek, he's found that they're no longer in the forest at 8,500 feet. Instead, now they're gnawing willows and giving off their perfumey smell up at the timberline lakes. The wasps that eat those beetles have shifted to the higher elevations now too.

Another recent finding comes from Lake Tahoe; scientists measuring the lake's temperature say that the giant pool of chilly water has warmed a whole degree in the same last two decades.

The local animal that could be most in trouble is the pika. If you've hiked past a talus slope around treeline, you've probably heard a pika ring out, "Cheep, cheep!" Pikas are cold specialists, sporting thick fur, high metabolism and habits that keep them going beneath the snow throughout the winter. But these same adaptations kill them off if the temperature gets over 77 degrees F for very long.

Pikas have been moving to higher elevations because they have to. While a century ago, Grinnell found them down to 7,800 feet, Patton finds them only above 9,500 feet today. Dr. Erik Beever has been following pikas on peaks in Nevada, and since just 1994 he's watched thirty-six percent of his study populations die off. The surviving ones have moved upslope by an average of 430 feet. He's worried that pikas have already started fleeing uphill, to the point where there's no more uphill left.

If there's any single business that's worried about a warmer Sierra, it's Mammoth Mountain Ski Area. Lisa Isaacs, the MMSA environmental programs director, says that they are lucky to have a fairly high-altitude hill, but that she is very worried for the future of snow. Last November, for instance, the mountain was sweating bullets in the disturbingly pleasant autumn air, because it was "touch and go" whether it would be cold enough for the cannons to spray snow in time for the scheduled opening.


Isaacs and the rest of the ski industry are not waiting around for federal leadership. They are convinced the future of skiing is in jeopardy unless people dramatically reduce the amount of greenhouse gases going into the air. The National Ski Areas Association is pushing for awareness and national legislation, and ski areas around the country are doing things like offering discounts to carpools and hybrid vehicles, going out of their way to purchase "green" electricity, and even generating their own wind power, on site.

Isaacs points out that about twenty percent of the ski area's electricity now comes from renewable sources, mostly from Mammoth's local hydro and geothermal power. They're hoping to install wind turbines up on the mountain, but so far they haven't found a tower design that's stout enough to handle the occasional super-winds up there. Mammoth Mountain Ski Area also is researching the possibility of tapping into the mountain's geothermal energy, but that looks awfully pricey.

What to do? Well, as much as we can, because it's scary to think that we are unconsciously tinkering with the big, broad world. Me, well, I don't drive any more than I have to, I use new-tech lighting, and I hike up to hilltops to look over the world and think.

A Sierra without pikas? Decembers without skiing? Forest fires in May? In the Alps it's really bad already. There, whole chunks of the world's most famous peaks are calving off because there's no more ice to hold them together. Alpine buildings are listing toward collapse as the ground under them thaws, and the big glaciers are fairly disappearing. And how about those whole little island nations in the South Pacific that are probably going under water?

Okay, a skeptic might say, how about last winter in Mammoth? That was a real winter—no sign of global warming then.

Hey, when it comes to climate, like any big pattern, it's all about the panoramic overview, the broader trends that stand above this week's forecast and last month's storm cycle. Sometimes, to see what's really going on, it helps to get onto a hilltop halfway in the sky. 

Andy Selters is a mountaineer and author whose latest book is "Ways to the Sky: A Historical Guide to North American Mountaineering."