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Climate Connections: Signs

Hotter, Drier Climate Moves Up Sky Islands' Slopes

by Ted Robbins

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Mark Skroch

The Animas Mountains, located in the boot heel of New Mexico, form part of a group of small isolated mountain ranges called the sky islands.

Weekend Edition Saturday, July 21, 2007 · If you look at a topographic map of North America, you'll see two huge spines in the West: the Rocky Mountains which stretch from Canada to the desert in the Southwest, and the Sierra Madre of Mexico.

In between are relatively small, isolated mountain ranges rising from the desert, much as islands rise from the ocean. This is why the ranges — with names like the Huachucas, the Chiricahuas, and the Catalinas — are called the Sky Islands. And they are home to unparalleled diversity.

"Believe it or not, there are more mammals here in southeastern Arizona than anywhere else in the United States," says Matt Skroch, head of the Sky Island Alliance.



The northern goshawk is one of the many animal species that live in the southern range of the Sky Islands, which span 70,000 square miles across southeastern Arizona, southwestern New Mexico and northern Mexico. Corbis

The group is trying to protect the intersection between tropical species on the northern end of their range, such as jaguars, ocelots, greyhaws, Mexican possums, and temperate species on the southern end of the Sky Islands' range, like the black bear and the northern goshawk — not to mention 20 species of hummingbird. But, just like oceans are rising and claiming some seaside habitat, hotter and drier conditions brought about by global warming are moving up the slopes.

Scorching Conditions

Driving from the heat of Tucson to the top of the Santa Catalina Mountains takes less than an hour. Yet, the 7,000-foot climb is the ecological equivalent of going from the desert to northwestern Canada. You pass giant saguaro cactus, then oak woodlands. Then, about halfway up, there's the first sign of a cooler climate — ponderosa pines in a small canyon. Matt Skroch says it's the perfect place to see change.

A look across the canyon shows, he says, "that about 80 percent of the pines are dead, and that's because it's getting hotter."

This is gradual change creeping up the mountainside like a rising tide. The farther up the mountain, the fewer trees there are alive.

This hillside burned in two swift, hot fires in the last five years — the Bullock fire and the Aspen fire. More than 100,000 acres burned in the Catalina range. Very few pine, spruce, or fir are growing back. Instead, species that adapted to a warmer climate — like oaks and grasses — were starting to come in.



Mark Skroch

Hikers explore along the spruce-tree forest of the Pinaleno Mountains in southeastern Arizona. As the elevation increases, so does the plant and animal diversity.

A Change of Scenery

Carol Mack owns the Mt. Lemmon General Store in Summerhaven, Ariz., a village near the top of the Catalinas. She says she's starting to see animals she's never seen here.

"We've seen a roadrunner up here," Mack says. "Now how far out of their element could a roadrunner be?"

Even if you've only seen them in Warner Bros. cartoons, you know the roadrunner belongs in the desert, but they appear to be climbing the mountain to Summerhaven.

Carol Mack's first store burned in the Aspen fire, along with nearly 350 other buildings. Now, above the new store and town, she says there's little forest cover.

"I've heard from so many people who have rebuilt that the winds are so bad now," she says. "The sun is just so much more intense. It just feels hotter to us."

Mack says it has begun to not only feel hotter, but drier.

"The Southwest is in the middle of a six-year drought, but drought is a natural occurrence," she says.

Back in Tucson, scientists in the University of Arizona Tree Ring lab slice and polish cross-sections of ancient trees to study climate change. Lab director Tom Swetnam shows a sample from the Chiricahua Mountains. It has a band of thinner rings — indicating a drought that lasted not six years, but six decades.

"And so a 60-year drought in the Colorado River Basin would exceed anything we've seen in the modern period, so far" Swetnam says.

Triggering More Problems?

Swetnam says scientists are beginning to think that the combination of normal drought with human-caused higher temperatures might tip the region into another mega-drought.

"The effects of global warming might be a trigger to those sorts of extended drought periods," he says.

As the Sky Islands shrink, people are working on ways to protect what's left with more prescribed burns and tree thinning to prevent cataclysmic fires. There is more protection for animals that migrate between the Sky Islands. And, ultimately, working to find ways to save those at the very top — stranded, with no place to go.

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