

The Washington Post

Dust Storms Escalate, Prompting Environmental Fears

Increase in Dirt Affects Ecosystems
In Western States

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Thursday, April 23, 2009

Nestled in the San Juan Mountains at 9,300 feet, and surrounded by 13,000-foot peaks, Silverton, Colo., seems an unlikely place for a dust

storm, especially with two feet of snow on the ground. So Chris Landry was alarmed on the afternoon of April 3 when he spotted a brown haze on the horizon; an hour later, a howling wind had engulfed the town in a full-fledged dust storm, turning everything from the sky to the snow a rusty red.

"It was almost surreal," recalled Landry, executive director of the Center for Snow and Avalanche Studies. The landscape looked like Mars after the storm passed, he said: "You could feel the dust, you could taste the dust."

The scene Landry witnessed that day was the most severe example of a phenomenon that has overtaken parts of the West this year, one that could exacerbate a slew of environmental problems there in the years to come. The Colorado Rockies, including the headwaters of the Colorado River and the Rio Grande, have experienced 11 serious dust storms this year, a record for the six years researchers have been tracking them.

More important, an increasing amount of airborne dust is blanketing the region, affecting how fast the snowpack melts, when local plants bloom and what quality of air residents are breathing.

The dust storms are a harbinger of a broader phenomenon, researchers say, as global warming translates into less precipitation and a population boom intensifies the activities that are disturbing the dust in the first place. Jayne Belnap, a research ecologist at the U.S. Geological Survey who has studied the issue, predicts that by

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midcentury, the fragility of the region's soil "will be equal to that of the Dust Bowl days."

"We're headed for this massive soil movement, these massive dust storms on a frequency we're not used to, and it's going to have enormous ecosystem impacts," Belnap said. "No one has an appreciation for the scope of the calamitous impacts."

Dust storms are not new in the West, but the fact that so much dust is on the move reflects that across vast areas, soil is being loosened by off-road vehicles, livestock grazing, and road development for oil and gas production, much of it on public land. A Washington Post analysis of federal data from areas managed by the Bureau of Land Management found that between 2004 and 2008, off-road vehicle use rose 19 percent, the number of oil and gas wells increased 24 percent and grazing acreage climbed 7 percent.

The trends have sparked an intense debate between interests being blamed for loosening the soil and those calling for controls on those activities.

Advocates for off-road vehicle users, for example, charge that environmentalists have seized upon the dust issue as a political club in their efforts to curb the increasingly popular recreational sport.

"A lot of the public land in the West is a very dusty place. What human uses make it more dusty, and to what extent, is unknown," said Brian Hawthorne, public lands policy director for the BlueRibbon Coalition, which represents off-road enthusiasts. "There's just no studies on it."

Scientists are trying to get better measurements of how much soil is getting stirred up -- and the consequences.

People tend to think of arid regions as inherently dusty, but research by the U.S. Geological Survey and others has shown that even dry soil, if undisturbed, stabilizes plant life and can provide a critical, albeit fragile, crust.

Once disturbed by off-road vehicles, grazing, plowing or other forces, however, the dust can travel long distances on the wind.

According to several studies, a vehicle traveling at 27.5 miles per hour over a dirt road composed of 20 percent silt can kick up five to 30 pounds of dust with every mile it drives.

By studying sediment cores from high-elevation lakes in the San Juan Mountains,

Jason Neff, a geological sciences professor at the University of Colorado at Boulder, has estimated that the amount of dust falling back to Earth now is up to five times as much as the amount before Europeans arrived. Dust deposition was even greater around the turn of the last century, before the government put restrictions on grazing.

"Nobody could deny all this activity is causing more dust," Neff said, adding that the phenomenon is depositing more nutrients at higher elevations, changing what plants grow there and disrupting ecosystems.

The groups most frequently cited for stirring up Western soils -- cattle growers, oil and gas companies, and off-road vehicle users -- all challenge the charge that their activities are to blame.

Tom Field, director of production education for the National Cattlemen's Beef Association, said his members have improved their land-management practices, and he argued that "without the ranching industry in the Western U.S., much of the accessible private and public land would be converted to housing developments and recreational sites, which would diminish open space and create ecosystem disturbance."

Tim Sampson, manager for exploration and production at the American Petroleum Institute, questioned whether oil and gas exploration has worsened the dust problem: "We have high winds, and we have dust storms. They've been there since before Texas was a state."

One of the biggest problems, scientists say, is that each storm deposits a layer of dark material on the mountain snowpack; that layer absorbs the sun's heat and causes the snow to melt earlier. Thomas H. Painter, a University of Utah cryospheric science professor, has calculated that dust deposition significantly reduces snow's reflectivity.

"It's effectively like turning up the sun 50 percent and putting that energy into the snow," he said.

The earlier snowmelt changes the blooming and growing times of vegetation, triggering ripple effects that hurt Colorado farmers. Steve Vandiver, general manager of the Rio Grande Water Conservation District, said farms in the valley are getting the snowmelt runoff two to four weeks earlier each year, making it difficult to keep grain and potato crops irrigated.

"A lot of the water's gone by the time the crops need it," he said.

Snowpack melt is not the only effect: Many Southwestern communities are struggling with poor air quality, and dust is making it worse. Arizona's Maricopa County, which

includes Phoenix and Scottsdale, has failed to meet federal air quality standards and is cracking down on off-road vehicles and unpaved roads to limit dust.

Lawrence Odle, director of the Maricopa County Air Quality Department, said officials have little choice.

"We have vehicles that just tear across the desert," he said, adding that the county stands to lose \$7 billion in federal transportation funds if it does not improve its air quality. "Do you allow for recreational activity, or do you try to get into compliance with federal health standards?"

Researchers say a shift in policy could help avert some of the worst impacts in the coming years.

"We can do something about it," USGS's Belnap said. "We just have to decide it's important."

But the Bureau of Land Management says it sees no reason to change its rules for issuing permits for dust-generating activities on the land it controls.

"It's something we look at," said Scott Archer, a senior air resource specialist at the bureau. "In the big scheme of things, no, it's not that big a deal."

Database editor Sarah Cohen contributed to this report.

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