

Air pollution from other countries drifts into USA

By Traci Watson, USA TODAY

WASHINGTON — Americans drive imported cars, wear imported clothes and chug imported beers. Now scientists are discovering another, less welcome import into the USA: air pollution.



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By Guang Niu, Getty Images

Mercury from China, dust from Africa, smog from Mexico — all of it drifts freely across U.S. borders and contaminates the air millions of Americans breathe, according to recent research from Harvard University, the University of Washington and many other institutions where scientists are studying air pollution. There are no boundaries in the sky to stop such pollution, no Border Patrol agents to capture it.

Pollution wafting into the USA accounts for 30% of the nation's ozone, an important component of smog, says researcher David Parrish of the National Oceanic and Atmospheric Administration. By the year 2020, Harvard University's Daniel Jacob says, imported pollution will be the primary factor degrading visibility in our national parks.

While the United States is cutting its own emissions, some nations, especially China, are belching out more and more dirty air. As a result, overseas pollution could partly cancel out improvements in U.S. air quality that have cost billions of dollars.

Among the efforts that could be undermined: the Environmental Protection Agency's new drive to cut power plants' emissions of ozone-forming chemicals and particle pollution, specks of chemicals that damage health. The EPA finalized the rule Thursday.

The EPA will announce limits Tuesday on mercury emitted by U.S. power plants. But the agency estimates that 40% of the mercury that sinks out of the air and lands in the USA comes from overseas.

"A number of things are getting here that we're worried about," says David Streets, an environmental scientist at Argonne National Laboratory in Chicago. "Some of these (pollutants) are not easy to control. ... I don't expect things to get better in the next 10 years or so, and some things will get worse."

Almost every place in the USA has suffered from the effects of imported air pollution, at least occasionally. Some of the most serious impacts:

- Mercury emitted by power plants and factories in China, Korea and other parts of Asia wafts over to the USA and settles into the nation's lakes and streams, where it contributes to pollution that makes fish unsafe to eat.
- Dust from Africa's Sahara Desert blows west across the Atlantic Ocean and helps raise particle levels above federal health standards in Miami and other Southern cities.

- Haze and ozone from factories, power plants and fires in Asia and Mexico infiltrate wilderness spots such as California's Sequoia National Park and Texas' Big Bend National Park, clouding views and making the air less healthy.

Scientists who study air quality have long known that air pollution seeps into the USA from abroad. But only recently have they realized that the problem has an enormous reach — an idea that at first met with resistance.

"A lot of scientists were skeptical," says Daniel Jaffe of the University of Washington at Bothell, recalling the reaction to his early findings. "There was a lot of, 'Oh, come on now.' "

But aerial and ground-based sensors that detected the chemical fingerprints of pollutants floating across oceans helped erase doubts. So did new satellites that in the last 10 years gave scientists a bird's-eye view of clouds of pollution drifting from continent to continent.

From Africa to Alabama

When dust from the Gobi Desert in China and Mongolia headed for North America in 1998, "you could actually see it like yellow ink snaking across the Pacific," says Rudolf Husar, who studies atmospheric chemistry at Washington University in St. Louis.

The dust cloud was so thick that when it reached the USA, officials in Washington and Oregon issued warnings about unhealthful air quality, Husar says. Other Asian dust storms have polluted the skies in Savannah, Ga., and Maine.

African dust doesn't migrate as far into the USA as its Asian cousin. But it can get to places such as northern Alabama and southern Tennessee, which suffer from significant homegrown emissions. The combination of local and imported pollution causes particle levels to soar above federal health limits, Husar says.

Human health suffers when dust plumes drift into town. Clouds of dust or smoke contain microscopic particles that, when inhaled, penetrate deep into the lungs. Studies in publications such as *The New England Journal of Medicine* have found that cities with chronically high levels of particles have higher death rates, mostly from heart and lung disease. And emergency-room visits and death rates rise in the days following a spike in particle pollution.

In 1998, a plume of smoke drifted north from fires that had been set by farmers in Central America to clear fields. It blanketed cities from Austin, Texas, to Altoona, Pa., and "undoubtedly increased mortality" there, says John Bachmann, a science and policy director for the EPA. The plume was so thick that it caused partial closure of the main airport in St. Louis.

Ozone that comes ashore in the USA isn't as easy to spot as dust, because satellites can't see it. It's a colorless gas that burns the lungs and exacerbates heart disease. It forms in the presence of sunlight when emissions from the burning of fossil fuels mix with vapors from substances such as paint, solvents and even fingernail polish. Ozone is the main ingredient in smog.

Though ozone is hard to trace, scientists have learned enough to realize that every gust of air that blows into the USA has more ozone in it now than it did 20 years ago.

Some of the ozone in that air originated in the USA and returns here after circling the globe. But U.S. emissions did not cause the recent rise in global ozone — U.S. air pollution restrictions have decreased the emissions that produce ozone. Debate continues on what did cause the worldwide increase. It could be higher emissions from Asian industries. Or it could be from commercial ships, which lack pollution controls.

Whatever the cause, the higher ozone level affects air quality, especially in cities often hit by air currents from overseas.

The EPA's Bachmann says the base-line ozone content of the world's air has at least doubled since the Industrial Revolution. That means base-line ozone alone gets U.S. air uncomfortably close to being unhealthy. "That's pretty spooky," he says.

'You don't see anything'

The outlook for the future is even spookier. Asian pollution, scientists say, has the potential to help negate the United States' work to clean up its air.

Asked if he's concerned about the rising emissions from Asia's growing industry, the EPA's Bachmann answers, "You bet."

He cites Los Angeles as an example of a potential problem spot. The city has some of the worst ozone in the nation, and it's not clear how to make the air healthy.

Los Angeles may get as much as 50 parts per billion of its ozone from overseas, on top of the ozone created by local vehicles. A "Code Orange" alert warning — indicating the air is unhealthy for sensitive people — is issued when ozone levels average 80 parts per billion

Growth in imported pollution could also undermine a new rule to limit power-plant emissions. Issued Thursday, it's intended to force power plants in the eastern USA to eliminate 61% of the emissions of ozone-forming chemicals by 2015.

Streets estimates that Asian emissions of those chemicals doubled from 1985 to 2000 and are still rising. That will reduce the benefit of the new power plant rule.

Jacob also worries about foreign pollution's effect on views in U.S. national parks. U.S. law requires the restoration of natural visibility in places such as Arizona's Glen Canyon National Recreation Area. But haze caused by Asian dust storms sometimes obscures the landscape in the parks. The haze could make it difficult, if not impossible, to reach visibility goals and also is bad for people's health.

Even today, "if you go to the Western national parks during the springtime, you're very likely to have your visibility decreased by Asian dust," Jacob says. "In a big (dust) storm, you don't see anything."

Despite the influx of dirty air from abroad, the bulk of USA's air pollution comes from U.S. tailpipes and smokestacks. So scientists such as Jaffe say cleaning up domestic emissions is still the most important step the United States can take to clean up its air.

Europeans probably would approve of that advice, because air pollution from the USA crosses the Atlantic to choke the Old World.

In 2001, for example, a cloud of fumes from the eastern USA traveled far enough to cause high levels of ozone in the Alps, according to a study in the January issue of the *Journal of Geophysical Research*.

Aware that it gives as well as gets air pollution, the United States has taken steps to address the two-way flow. In 2000, Canada and the United States signed a treaty requiring both nations to reduce ozone-forming gases. Air-quality managers from El Paso, and Juarez, Mexico, work on how to control ozone and particle pollution that crosses the border both ways.

But at talks in the past year, the U.S. government opposed a stringent treaty to control

mercury, which is emitted by coal-burning power plants and factories. Several European countries support mandatory mercury limits. The United States argued instead for technical aid to teach countries how to control their mercury emissions.

As for the national parks, Bachmann says the United States wants "to work with the international community" to clean up pollution. But no global binding treaties are in the works.

That will have to change, some scientists say. The recent research "really points to the need for global cooperation," Jaffe says. "It's only one planet, and we've got to learn to live on it."