

As Great Salt Lake dries up, Utah air quality concerns blow in

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Benjamin Zack/THE STANDARD-EXAMINER

Wind picks up dust, sand and particulates off the dried lakebed of the Great Salt Lake and blows it towards the Wasatch Front on Saturday, Sept. 5, 2015. As the lake levels drop, more light sand and minerals become exposed to the open air.

The sky above Ogden turned pallid as a white haze crept along the Wasatch Front around 2 p.m., Sept. 4.

The winds that day blew in from the south, as they often do, rolling across a largely dry Farmington Bay past Antelope Island (<http://stateparks.utah.gov/parks/antelope-island/>). The mountains faded. Views of the valley vanished. Drivers found their cars speckled with a fine, white silt. State air monitors reported elevated particulate pollution in Ogden — all from dust

blown in from the exposed bed of the [Great Salt Lake](https://en.wikipedia.org/wiki/Great_Salt_Lake) (https://en.wikipedia.org/wiki/Great_Salt_Lake). Air quality experts aren't sure what's in that dust or what it's doing to our lungs.



(<http://www.standard.net/Great-Salt-Lake>)

The Great Salt Lake has dropped to near-record lows. A changing climate and proposed water projects for a growing Wasatch Front population mean a lower lake could become the new normal. A growing urban population also means more people could be exposed to health harms from lakebed dust.

WHERE THE DUST BLOWS

The Wasatch Front already sees dust plumes linked to late winter and springtime storms, said Seth Arens, a scientist with the [Utah Division of Air Quality](http://www.airquality.utah.gov/). (<http://www.airquality.utah.gov/>)

Story continues below photos

Most of that dust usually blows in from miles away. Milford Flats, about 250 miles south in Beaver County, is often a source. It's [the site of a 2007 wildfire](http://www.researchgate.net/publication/257522219) (<http://www.researchgate.net/publication/257522219> Meteorological characteristics of dust storm the largest in Utah history, which burned the vegetation that would normally keep sediment on the ground.

(<http://www.standard.net/environment/2015/10/11/Millions-of-birds-face-dire-future-as-Great-Salt-Lake-shrinks.html>)

A lot of dust also comes from Sevier Lake, about 200 miles south, a dry lakebed and a source of dust since the 1880s.



"However, with all the growing salt flats around the Great Salt Lake itself, it's (also) going to start generating dust," Arens said.

Dust from the Great Salt Lake's bed is particularly problematic. Because it only blows a few miles before it reaches Wasatch Front cities, it carries finer particulates that can enter the respiratory tract and embed in lungs. Although it's formed from a different source, fine particulate pollution is also what causes breathing problems during [winter inversions](http://www.standard.net/Environment/2015/01/24/Eight-things-you-should-know-about-inversions-in-the-Top-of-Utah) (<http://www.standard.net/Environment/2015/01/24/Eight-things-you-should-know-about-inversions-in-the-Top-of-Utah>).

Arens said his department “isn’t in the business of scaring people.” He doesn’t want dust fears to become overblown.

Story continues below photos

The Great Salt Lake in 1985 versus 2015.

“We don’t get very many of these events. This isn’t going to be this apocalyptic dust cloud that’s coming over the valley,” he said.

But anecdotally, he said, Division of Air Quality forecasters saw more dust events blowing from the lake this season. Arens figures it’s because the exposed lakebed is parched.

“April was the first time I’d seen a (dust storm) that was so pronounced. Since I’ve been out on the lake this summer, I’ve seen two or three more,” he said. “We had such a dry, warm winter ... the lake’s really low. If you look at satellite images, it’s just a narrow strip.”

If the lake stays low, or keeps losing water, meteorologists studying wind patterns and dust chemistry are particularly about future consequences for people living along the Wasatch Front.

“If the lake were to completely dry up, we’ve got decades of nasty chemicals, mercury and other toxins that have built up in the lake bed,” said Erik Crosman, a researcher in atmospheric science at the [University of Utah \(http://www.utah.edu/\)](http://www.utah.edu/). “I think it’d be a situation where they’d have to divert water back on the playa. It’d be a big health hazard.”

THE LAKEBED’S ‘UNCHARTED TERRITORY’

Like Arens, Crosman said Utah doesn’t experience enough powerful wind storms where dust would be a perpetual problem. But it’d be problematic enough.

“I already see the nasty white dust,” he said. “It doesn’t feel good to me, to breath that air. So you could imagine, a few days of that could be pretty bad. I don’t think you could argue that it’s no more than a nuisance.”

And if dust blowing in from dry lakes and scorched land 200 miles south can blow in and spike particulate levels along the Wasatch Front, it’s hard to think having a dry lake bed right along the Wasatch Front wouldn’t cause at least occasional major problems with whiteouts along the Interstate 15. Even for only a short time, visibility could be bad for planes, too. [Salt Lake International Airport, \(http://www.slairport.com/\)](http://www.slairport.com/) the [Ogden-Hinckley Airport \(http://flyogden.com/\)](http://flyogden.com/) and [Hill Air Force Base \(http://www.hill.af.mil/\)](http://www.hill.af.mil/) are all less than 10 miles from the lake.

If dust becomes a perpetual problem, potentially caustic, toxic dust would land on vegetation, cars and structures. It's hard to think it wouldn't cause breathing problems.

"We're kind of uncharted territory with lake being near record lows now," Crosman said. "I don't think anyone really knows what would happen."

But there's a gloomy precedent for fallout from dry lakes in the U.S., starting with California's Owens Lake, which dried up in the 1920s.

In 1989, the L.A. Times wrote of a caustic blowing dust (http://articles.latimes.com/1989-04-02/news/mn-1380_1_owens-lake-dust) that caused bloody noses, watery eyes and irritated lungs. The airborne sediments were also laden with cancer-causing heavy metals from decades of mining the Sierra Nevada mountains.

Owens Lake dust also had an economic fallout. Dust storms caused major whiteouts. Plumes shut down operations at the China Lake Naval Weapons Center, 70 miles south, for five to 10 days at a time. It cost the military millions.

In 1990s, the U.S. Geological Survey reported visibility issues (<http://geochange.er.usgs.gov/sw/impacts/geology/owens/>) at nearby national parks, forests and wilderness areas.

After some drawn-out lawsuits, the air problem cost the City of Los Angeles (<http://mynewsla.com/government/2014/11/14/dwp-reaches-deal-air-quality-managers-dust-pollution-owens-lake/>) \$1.3 billion in mitigation efforts. Each year, the city releases around 25 billion gallons of water onto the dry lakebed, which is becoming increasingly difficult as California grapples with a crippling drought.

It's not hard to see parallels between the Owens Valley and Great Salt Lake Valley. But there are differences, too. Owens Lake covered an area about one-sixth the size of the Great Salt Lake. The Owens Valley is also fairly rural, and the dry lake dust threatens the health of around 40,000 residents. The Great Salt Lake stretches along an urban area with a population of over 2 million.

Mercury pollution is another looming problem unique to the Great Salt Lake, and mercury contamination is largely tied to the state's own mining history.

Samples collected from the Great Salt Lake's depths show some of the highest mercury levels recorded (<http://learn.genetics.utah.edu/content/gsl/monitor/>) in the U.S. The water mostly keeps humans from becoming exposed to the toxin. It has, however, moved up the lake food chain from brine shrimp to birds. In 2005, the Utah Department of Health began warning against eating several species of duck (<http://waterfowladvisories.utah.gov/>) found on the lake.

The Utah Division of Forestry, Fire and State Lands owns the lakebed and minerals in the waterbody. While the division has funded mercury research on the lake for several years, this is the first year [they requested studies on lakebed dust \(http://www.ffsl.utah.gov/index.php/grant-programs/state-lands-research-grants\)](http://www.ffsl.utah.gov/index.php/grant-programs/state-lands-research-grants).

STATE-FUNDED STORY

A state grant of around \$40,000 went to Greg Carling, an assistant professor in geological sciences at Brigham Young University. His research will provide the state's first glimpse into what's blowing around in the lakebed dust.

"We have anecdotal evidence that dust from the Great Salt Lake is making its way to the Wasatch Front, but we don't have any quantitative measures on dust plumes from the lake, and we don't know anything about what's in the dust," he said. "There's potentially a problem there, but we don't know what it is."

Carling's PhD work found that dust storms can raise the levels of mercury, uranium and lead that settle on Wasatch Mountain snowpack by a factor of five. But he conducted that research several years ago, before the Great Salt Lake dropped and exposed several square miles of lakebed.

For his Great Salt Lake study, Carling will provide the state's first glimpse of what trace metals and minerals are found in the lakebed. He'll develop a fingerprint tied to the unique chemistry found at different dust sources. With those chemical fingerprints, he'll tease out how much dust blowing along the Wasatch Front comes from the Great Salt Lake.

"When we get these dust storms we see on our cars, and we see on the windows, the big question is, where did that dust come from?" he said. "Depending on where you're at, the answers might be a little different."

At least when it comes to mercury, Carling is cautiously optimistic. The contaminant loses its toxicity as it's exposed to the air and baked by the sun.

"I'm assuming that's probably what happens," Carling said. "We may have slightly higher mercury concentrations in (Great Salt Lake) dust, but hopefully it's not going to be a huge problem."

Carling will send his dust study results to the Division of Forestry, Fire and State Lands by the end of June 2016.

While part of Carling's study will help unearth what kinds of metals and minerals are embedded in the lakebed, he said understanding the health impacts is another matter.

"That's going to be a lot of years of study and looking at local health records over time," he said. "We're just getting a first look of what's there."

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[Explore the project](http://www.standard.net/Great-Salt-Lake) (<http://www.standard.net/Great-Salt-Lake>)

- [We're losing the Great Salt Lake; Here's why you should care](http://www.standard.net/environment/2015/10/11/We-re-losing-the-Great-Salt-Lake-Here-s-why-you-should-care.html) (<http://www.standard.net/environment/2015/10/11/We-re-losing-the-Great-Salt-Lake-Here-s-why-you-should-care.html>)
- [Millions of birds face dire future as Great Salt Lake shrinks](http://www.standard.net/environment/2015/10/11/Millions-of-birds-face-dire-future-as-Great-Salt-Lake-shrinks.html) (<http://www.standard.net/environment/2015/10/11/Millions-of-birds-face-dire-future-as-Great-Salt-Lake-shrinks.html>)
- [Is drought to blame for drop in Utah's Great Salt Lake? Not likely](http://www.standard.net/environment/2015/10/11/Is-drought-to-blame-for-drop-in-Utah-s-Great-Salt-Lake-Not-likely.html) (<http://www.standard.net/environment/2015/10/11/Is-drought-to-blame-for-drop-in-Utah-s-Great-Salt-Lake-Not-likely.html>)
- [Déjà vu: is Lake Urmia's demise a warning for Great Salt Lake?](http://www.standard.net/environment/2015/10/11/Deja-vu-is-Lake-Urmia-s-demise-a-warning-for-Great-Salt-Lake.html) (<http://www.standard.net/environment/2015/10/11/Deja-vu-is-Lake-Urmia-s-demise-a-warning-for-Great-Salt-Lake.html>)
- [Why is the Great Salt Lake so smelly? That's a trick question](http://www.standard.net/environment/2015/10/11/Why-is-the-Great-Salt-Lake-so-smelly-That-s-a-trick-question.html) (<http://www.standard.net/environment/2015/10/11/Why-is-the-Great-Salt-Lake-so-smelly-That-s-a-trick-question.html>)
- [Marinas in jeopardy as Great Salt Lake continues to dry up](http://www.standard.net/environment/2015/10/11/Marinas-in-jeopardy-as-Great-Salt-Lake-continues-to-dry-up.html) (<http://www.standard.net/environment/2015/10/11/Marinas-in-jeopardy-as-Great-Salt-Lake-continues-to-dry-up.html>)
- [As Great Salt Lake shrinks, fate of nesting pelicans unknown](http://www.standard.net/environment/2015/10/11/As-Great-Salt-Lake-shrinks-fate-of-nesting-pelicans-unknown.html) (<http://www.standard.net/environment/2015/10/11/As-Great-Salt-Lake-shrinks-fate-of-nesting-pelicans-unknown.html>)