

# US scientists study impact of uranium in Grand Canyon region

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U.S. scientists knew little about the impact of uranium mining in the Grand Canyon region before an Obama-era decision shut down new mining claims.

Uranium first was discovered near the [national park](#) in the late 1940s and has been subject to boom-and-bust cycles.

Mines opened as prices soared for the radioactive element used for Cold War weaponry and now nuclear power and were then put on standby or closed as prices tanked.

The 20-year ban on new mining claims went into effect in 2012 to slow the flurry of claims and over concern that a water source used by 30 million people in the West could become contaminated. The mining industry asked the Supreme Court last week to review the ban, and President Donald Trump's administration is reviewing a portion of it.

Scientists with the U.S. Geological Survey have been gathering soil samples, testing wells and springs, and collecting toads, rodents and other things to better understand mining's impact. The studies are being done under budget constraints and a Trump administration proposal to cut off funding entirely.

Here's a look at the [scientists'](#) work:

STATUS OF MINING

No sites are actively being mined within the sparsely populated 1 million-acre area north and south of Grand Canyon National Park. The closest to opening is the Canyon Mine, about six miles south of the entrance to the park's popular South Rim. The company that owns it, Energy Fuels Inc., has been digging the mine and ventilation shafts, and says it will mine it only when prices for [uranium](#) rise enough to make the effort profitable.

Others sites are being reclaimed or not yet developed.

The uranium is found in cylinder-shaped deposits of broken sedimentary rock.

At high levels of exposure, uranium can cause health problems such as cancer. It can also affect the ability of plants and animals to grow, survive and reproduce.

Scientists say they'll be able to document effects on water, soil and wildlife during the life of a mine but not necessarily at a single site.

## HOW THE WATER FLOWS

Before the ban, the U.S. Geological Survey gathered historical data and found 7 percent of water samples from 430 sites had elevated levels of uranium and other metals. Hydrologist Fred Tillman said nothing showed the levels were directly tied to mining activity, even where concentrations of uranium were the highest.

Scientists want more extensive data to figure out where water that comes into contact with uranium flows. They're looking at fractures, faults, sinkholes and other pathways to see if it could end up in groundwater.

Funding hasn't allowed for deep wells at each mine site. The U.S. Geological Survey has one well that doesn't reach into the regional

aquifer at the Canyon Mine site, and scientists have been testing other wells owned by mining companies and springs.

## WHAT'S IN THE SOIL

Scientists are looking at how dust settles on vegetation and top soil to see if occasional campers might breathe it in and if concentrations of uranium are different upwind or downwind from mining sites over time.

They've set up dust collection poles at three mine sites and at a stock tank for comparison. The scientists have collected soil around the Canyon Mine and two undeveloped mine sites to establish baseline levels, and will gather more soon at a site north of the Grand Canyon that's being reclaimed.

"There's a lot of anecdotal information about what might be happening but not a lot of data to show things, and that's our objective," said Katie Walton-Day, a member of the Grand Canyon study team.

## AMPHIBIANS, BIRDS, SMALL MAMMALS

The risk to wildlife is relatively unknown, and the threat isn't limited to uranium, scientists say.

They found 200 plant and animal species when they surveyed the Canyon Mine, including toads that were breeding in an evaporation pond at the mine site. Tadpoles had higher concentrations of arsenic and selenium than those at an off-site stock tank. The scientists have been doing quarterly sampling at the Canyon Mine pond.

The scientists also gather small rodents such as field mice, gophers and chipmunks that spend most of their time near the mine site to see if they're breathing in or ingesting contaminated dust, said Jo Ellen Hinck,

another member of the study team. Then, they analyze the animals' kidneys, liver and lung tissue for abnormalities. Lab results haven't been published.

Some birds also were tracked.

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