

Tapping into the power of the Yellowstone Supervolcano.

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The striking colors of the landscape make it easy to forget that Yellowstone National Park springs is a supervolcano way past its eruption due date. Photo: Russell Pearson/Barcroft Images/Barcroft Media via Getty Images

Yellowstone National Park is boiling. The Wyoming park is filled with hot springs, geysers and steam vents — all fueled by a simmering supervolcano.

Yellowstone sits on top of a massive magma chamber. Scientists agree the Yellowstone supervolcano is not likely to blow anytime soon. But if it does erupt, it would be a disaster. The eruption would be so powerful it would expel enough rock and ash to cover most of the United States except Alaska and Hawaii. There could be so much smoky ash in the air that the sun would be blocked, plunging Earth into a volcanic winter.

In 2017, NASA scientists began trying to figure out a way to avoid a future super-eruption. The study was led by Brian Wilcox, an engineer at the Jet Propulsion Laboratory, which sometimes works with NASA. Wilcox and his team came up with the idea of drilling a series of wells around the edge of the park and pumping cold water down into the hot rock. This would cool down Yellowstone's magma chamber and prevent a disaster.

As a bonus, the system would provide enough geothermal energy to power the entire country. Geothermal energy is energy that is built up and stored beneath the surface of the Earth. It can be used to create electricity and to heat buildings.

But Wilcox's idea has reached a standstill.

Look What Happened In New Zealand

Yellowstone and other national parks have long been protected from energy development to ensure that these regions remain protected and unspoiled.

Indeed, even many geothermal experts agree that Yellowstone should remain untouched. Geothermal energy has enormous potential, but it does come with serious risks. One is the possibility of causing damage to the environment.

Nowhere has geothermal energy taken a greater toll on the environment than in New Zealand. The country's Wairakei Basin was once a bubbling landscape where 70 geysers fired jets of water into the air. Then in 1958, a geothermal power plant was developed nearby.

Today, Wairakei does not have a single geyser. The power plant destroyed all 70 of them, along with 240 hot springs. Today, the region is silent and cold.

The issue is that geothermal power plants use the water beneath the Earth's surface, then put it back. This water is one of the main ingredients to create a geyser. Disrupting the water can cause the geysers to disappear.

Geothermal Power Is Working In Iceland

Supporters of geothermal energy use argue that scientists have learned how to reduce such harmful impacts. Scientist Helen Robinson points to Iceland, a northern European country that has been able to harness volcanic power with little environmental harm. Roughly 90 percent of Iceland's residents live in geothermally heated homes. Twenty-five percent of the country's electricity is produced by geothermal power.

Robinson says this has been possible because Iceland's geothermal power companies carefully consider where to drill. They keep wells far away from geysers. Doing this ensures that the water feeding the geysers is not within the same system as the one feeding the power plant.

Furthermore, geothermal engineers around the world are beginning to pursue a new approach to geothermal engineering that avoids water systems altogether. They are drilling tens of thousands of feet until they hit hot bedrock where there is no water. Then they inject cold water to make steam, which in turn generates geothermal power.

Is Careful Drilling The Answer?

Taking that approach at Yellowstone would leave the park's surface features untouched, says geothermal energy expert Maria Richards.

However, Richards still does not want to see drilling anywhere near Yellowstone. Even if a geothermal power plant did not destroy the park's geysers and hot springs, it would still pose a problem.

Simply put, the power plant would be ugly. It would transform a dramatically beautiful park full of wildlife into an industrialized zone crisscrossed with power lines. For that reason alone, many people dislike the idea.

There is no doubt that geothermal power is an excellent alternative to oil and gas. These energy sources have created more greenhouse gasses, which have been causing global warming. What's more, unlike wind or solar power, geothermal power does not require storage to cover times when the wind is still or the sun is down. It can produce energy all the time. It's even cheap, once the power plant is up and running.

Yellowstone Is Too Beloved For Drilling

Yet, many places choose not to use geothermal power. In Hawaii, the Big Island's active volcanoes have enormous geothermal potential, but remain largely untapped. Only one geothermal plant has been built on the island, and it has long been opposed by many residents. They argue that drilling by the plant, which draws power from the Kilauea volcano, undermines their worship of the volcano goddess Pele and weakens her powers.

For many people, Yellowstone holds a similar sacred power. Even Wilcox, the NASA engineer, is torn.

"I've been to Yellowstone many times myself — I love it," he says. "I certainly would like to see my grandchildren have the same experience that I had. So, I'm not in favor of doing anything to threaten those features. But I am interested in preventing a global calamity that could very possibly wipe out most of humanity."

Quiz

1 Which two of the following sentences from the article include CENTRAL ideas of the article?

1. *Geothermal energy has enormous potential, but it does come with serious risks.*
2. *The power plant destroyed all 70 of them, along with 240 hot springs.*
3. *It would transform a dramatically beautiful park full of wildlife into an industrialized zone crisscrossed with power lines.*
4. *But I am interested in preventing a global calamity that could very possibly wipe out most of humanity."*

- (A) 1 and 2
- (B) 1 and 4
- (C) 2 and 3
- (D) 3 and 4

- 2 Read paragraphs 3 and 4 from the section "Look What Happened In New Zealand."

Nowhere has geothermal energy taken a greater toll on the environment than in New Zealand. The country's Wairakei Basin was once a bubbling landscape where 70 geysers fired jets of water into the air. Then in 1958, a geothermal power plant was developed nearby.

Today, Wairakei does not have a single geyser. The power plant destroyed all 70 of them, along with 240 hot springs. Today, the region is silent and cold.

How is the CENTRAL idea developed in these two paragraphs?

- (A) They show how geothermal power plants can affect both the environment and the traditions of the local population.
- (B) They show how scientists in Yellowstone National Park have learned from poor experiences with geothermal power.
- (C) They show how geothermal power production techniques have evolved to preserve the local environment.
- (D) They show that the environmental effects of geothermal power production can be ruinous to natural ecosystems.
- 3 According to the article, why did Brian Wilcox develop a plan for geothermal power in Yellowstone National Park?
- (A) to find a way to prevent a future violent eruption from the supervolcano beneath the park
- (B) to develop a clean, renewable source of power to replace the rampant use of fossil fuels
- (C) to ensure that the natural beauty of the park is protected for generations to come
- (D) to suggest that geothermal power would negatively affect the natural environment of the park
- 4 How are Brian Wilcox's opinions and Maria Richards' opinions connected to each other?
- (A) Both believe that safe geothermal power generation is not possible in Yellowstone.
- (B) Brian supports the use of geothermal power in Yellowstone, but Maria does not.
- (C) Both believe that safe geothermal power generation is possible in Yellowstone but should not be done lightly.
- (D) Maria supports the use of geothermal power in Yellowstone, but Brian does not.

