Geologists in China find unexpectedly large water sources in Xinjiang region beneath China's largest desert

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The discovery offers an answer to sand control and agricultural demands along the arid region's edge

Geologists in China have discovered two large water sources beneath China's largest desert, potentially offering the northwestern region of Xinjiang a vital new tap for sand-control projects and agriculture.

The desert region has drawn attention for its ongoing, extensive afforestation and anti-desertification efforts taking place around its edges under the Great Green Wall initiative, alongside a rainfall trend that is transforming arid western China.

The groundwater discoveries were made as part of a water-finding project in the Taklamakan Desert conducted in the Xinjiang Uygur autonomous region by the region's geological bureau, according to a report by *CCTV* Finance on Monday. The findings challenge the perception that "there is only stagnant water and salt water underground in the desert", according to the report.

Stagnant groundwater is a source that has slowed or stopped moving, allowing bacteria and chemicals to build up and making it unsuitable for drinking and food production.

One of the new sources was found at the southern edge of the Taklamakan Desert – which is also the world's second-largest shifting sand desert – in Andir township in Minfeng county. The second was discovered south of the Mazartag Mountains, within the desert's interior.

As part of the water-finding project, researchers also built a test station to use brackish water – which has more salt than fresh water but less than seawater – for irrigation and desertification control along the desert's edge.

Fresh water makes up only a few per cent of the Earth's total water supply. Brackish water is seen as an underutilised resource that could help meet growing water demands, such as crop irrigation and cooling artificial intelligence data centres.

According to the United Nations Food and Agriculture Organisation, non-conventional water resources, including brackish water, could be used to meet irrigation needs but are used in limited amounts and require an understanding of the local climate, soil and crops. Researchers around the world, including in China, have been testing the use of brackish water for growing salt-tolerant crops, though desalination may still be required for certain applications.

Located in Xinjiang's Tarim Basin, the Taklamakan Desert covers an extensive area of 337,600 sq km (130,350 square miles), about the size of Germany. The desert has been dubbed the "sea of death" due to its shifting dunes and harsh climate.

In 2015, researchers from the Chinese Academy of Sciences' Xinjiang Institute of Ecology and Geography discovered that an underground ocean with a volume greater than all five Great Lakes in North America combined could lie below the basin.

The Taklamakan Desert has historically had little annual precipitation and extreme evaporation. However, global warming has caused a rise in intense recent rainfall and unprecedented flooding that threaten local infrastructure.

China's largest desert has been a major site for the country's afforestation and anti-desertification efforts under the broader Great Green Wall initiative. In 2024, a 3,050km (1,900-mile) green belt of trees, shrubs and sand-blocking solar panels surrounding the desert was completed in a bid to prevent sandstorms and safeguard regional infrastructure.

Alongside these barrier projects, China is also cultivating crops along the desert's periphery to boost food security. These efforts include a desert wheat farm built in the county-level city of Kunyu at the southern edge of the desert.

Although water-saving measures such as pivot or drip irrigation methods have been employed in China's arid regions to support sand control and agriculture, water supply continues to be a concern for the desert crop initiatives.