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Satellites unlock secret of India's vanishing water

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Groundwater levels have fallen 20 per cent more than expected in northern [India](#), Nasa satellite images have revealed.

A team of experts has found the underwater supply in the region is being pumped and consumed by the burgeoning population, and could spark a major food and water crisis.

The study, led by Matthew Rodell from Nasa said groundwater across three states, including the New Delhi region, dropped at a rate of 1.6 inches per year between 2002 and 2008.



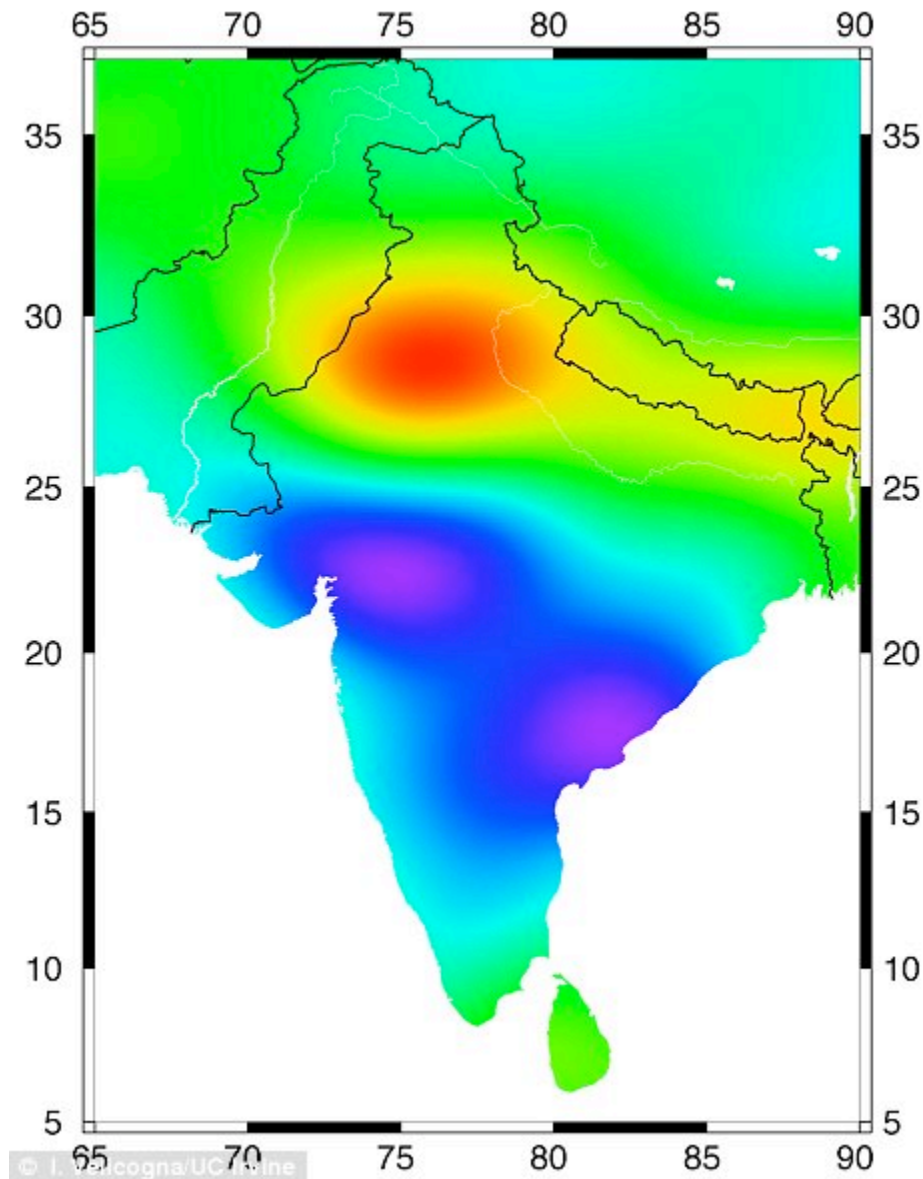
A woman labourer collects water to take to her village, 80miles from Amritsar, India. Excessive irrigation has caused groundwater levels in north India to drop

That depletion is double the capacity of India's largest reservoir and is around 20 per cent higher than previous estimates by Indian authorities. More than 110 million people live across the three states, or nearly twice the population of Britain.

The findings, published in the journal Nature, are based on data from Nasa's Gravity Recovery and Climate Experiment (GRACE).

A pair of satellites orbiting 300 miles above Earth's surface sense changes in Earth's gravity field. Changes in underground water masses affect gravity enough to provide a signal that can be measured by the GRACE spacecraft.

Groundwater levels respond slowly to changes in weather and can take months or years to replenish once pumped for irrigation.



The map shows groundwater changes in India during 2002-08, with losses in red and gains in blue, based on GRACE satellite observations.

'GRACE provides strong evidence that current rates of water extraction are not sustainable,' said Rodell.

'If measures are not taken to ensure sustainable groundwater usage, the consequences for the 114 million residents of the region may include a collapse of agricultural output and severe shortages of potable water.'

The trend is particularly alarming because it came in years where there was no shortage of rainfall.

The Indian government released an environmental report this week that said a growing percentage of its groundwater was neither drinkable nor could be used for irrigation.

'This illustrates that degraded water quality can contribute to water scarcity as it limits its availability for both human use and the ecosystem,' the Indian report said.

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it is state level politicians in states of punjab and haryana who are largely to blame.they provide free or nearly free electricity to farmers to pump out as much water as they please.in the summer months paddy is sown which requires water in huge quantities.

- dhiman., morinda punjab india, 16/8/2009 14:48

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Mark of USA.... Haven't you ever heard of China's 'one child' policy? You can't get much more draconian than that, with even forced abortions! Just think how you in the USA would respond to such a policy!
Don't blame the 'population either for water shortages. It's industry, and heavy industry in particular, which consumes vastly more water than people, animals, and even agriculture. And who buys all those goods resulting from steel, cement, and electronics manufacture? Yes, that's right, those of us in the wealthy western world!
Population growth DOES need to be controlled but first and foremost we should be limiting our own gross consumerism and consumption and finding ways to live which are REALLY sustainable.

- Adrian, Breil, France, 16/8/2009 07:14

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I would be interested to see a similar map for the UK. This country is even more densely populated than India (especially SE England which is also the driest part of the UK).

We have a population more than Canada and Australia combined and it seems Alan Johnson (Home Secretary) countenances more and more immigration with the population rising to 70 million.

If Southern England becomes warmer and drier as climate change experts predict then problems usually associated with distant poorer countries will start showing themselves here.

- PeterLancs, Lancaster England, 14/8/2009 17:05

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It is not the people who are over-pumping the aquifers, it is the numerous Coca-cola and Fanta factories which use two to three liters of water to produce one liter of Coke or Fanta.

- Vierotchka, Geneva, Switzerland, 13/8/2009 21:01

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there is no secret, its called overpopulation. To think this is caused by anything else is just plane stupid and ignorant. India's population growth has skyrocketed in the last 10 years and with no limits enforced by its govt so population can FALL, not explode, resources will become scarce among its people.

No one else is to blame other than the Indian Govt and the Indian people who seem to think they can fit any amount of population they want within its borders without any consequences. India is not the only country with this problem, China and the US are also guilty of their sins for not controlling their population.

its time to grow up and realize 8 billion people on the planet is simply too many. Its time for India to grow up and realize 1.4 billion people in their small territory, is too many. Wake up!

- Mark, USA, 13/8/2009 19:05

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They should control there population growth .

- GAVIN, london, 13/8/2009 14:27

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