

# Groundwater depletion detected from space

By Felicity Barringer, New York Times

IRVINE – Scientists have been using small variations in the Earth's gravity to identify trouble spots around the globe where people are making unsustainable demands on groundwater, one of the planet's main sources of fresh water.

They found problems in places as disparate as North Africa, northern India, northeastern China and the Sacramento-San Joaquin Valley in California, heartland of that state's \$30 billion agricultural industry.

Jay S. Famiglietti, director of the University of California's Center for Hydrologic Modeling here, said the center's Gravity Recovery and Climate Experiment, known as Grace, relies on the interplay of two nine-year-old twin satellites that monitor each other while orbiting the Earth, thereby producing some of the most precise data ever on the planet's gravitational variations. The results are redefining the field of hydrology, which itself has grown more critical as climate change and population growth draw down the world's fresh water supplies.

Grace sees "all of the change in ice, all of the change in snow and water storage, all of the surface water, all of the soil moisture, all of the groundwater," Dr. Famiglietti explained.

Yet even as the data signals looming shortages, policy makers have been relatively wary of embracing the findings. California water managers, for example, have been somewhat skeptical of a recent finding by Dr. Famiglietti that from October 2003 to March 2010, aquifers under the state's Central Valley were drawn down by 25 million acre-feet – almost enough to fill Lake Mead, the nation's largest reservoir.

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