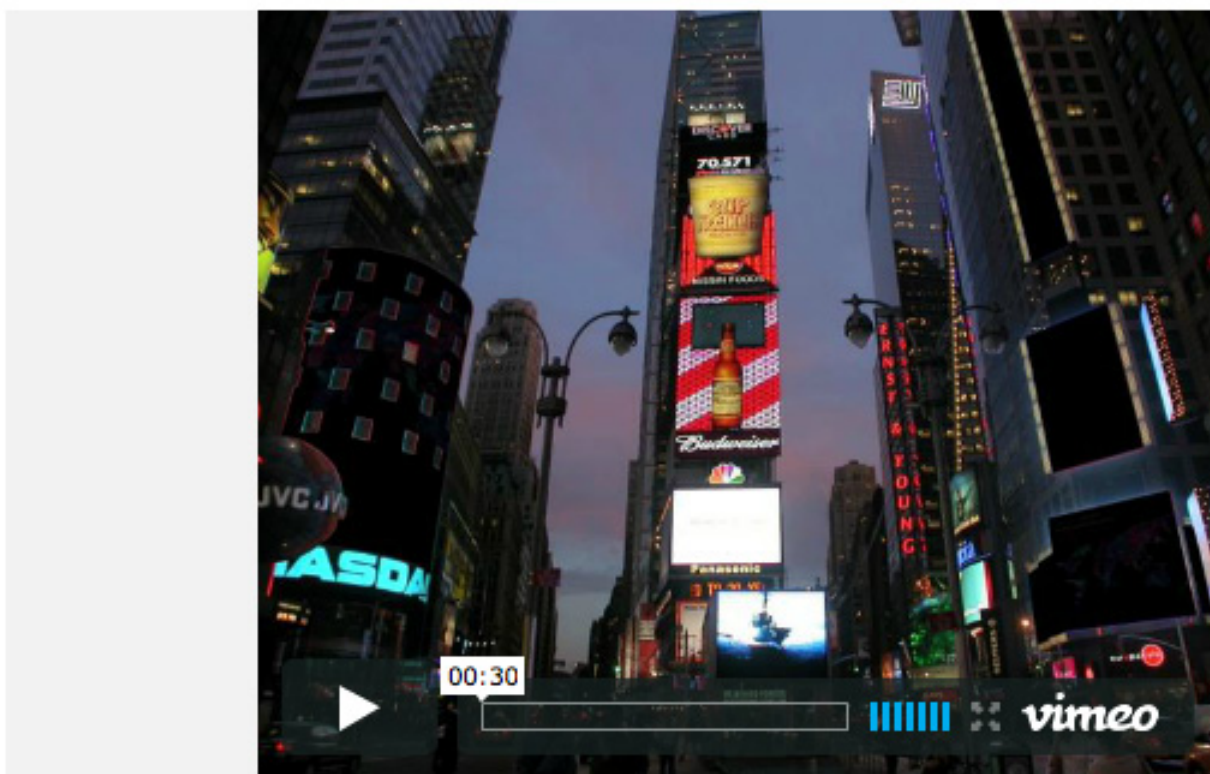
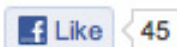


Good to the Last Drop: What Will We Do When the Wells Run Dry?

Posted by [Jay Famiglietti](#) of University of California, Irvine in Water Currents on March 22, 2012



HeadsUp! from Heads Up! 2012 on Vimeo.

Video: Video of NASA GRACE groundwater depletion visualization on Times Square

Visualizing seasonal and long-term changes in groundwater levels by Richard Vijgen. Data from Jay Famiglietti, UC Irvine, and Leonard Konikow, USGS. Courtesy of Richard Vijgen, Peggy Weil and Heads Up! 2012

Since today is World Water Day, I thought that I would kick off my contributions to the Water Currents blog with a renewed wake-up call. It's one that you've heard before, from me and from many, many others — that groundwater is being depleted at a rapid clip in many of the world's major aquifers — but one that demands a fresh look and immediate action...and here's why.

Groundwater depletion is emerging as a global phenomenon, as well as one of the key socioeconomic-environmental challenges of our time. Our research with NASA's [Gravity Recovery and Climate Experiment \(GRACE\)](#) mission is making this abundantly clear. The GRACE satellites can help monitor groundwater storage changes from space by accurately measuring changes in Earth's gravity field that result from mass changes at the surface – for example from removing trillions of gallons of water from an aquifer.

The picture that is emerging is one of a profound fingerprint of human water management on global groundwater storage. Groundwater is disappearing on 6 of the 7 continents as we continue to pump it from greater and greater depths to irrigate crops for our ever-growing population. Most of this depletion is occurring in the world's arid and semi-arid regions, where renewable surface water sources are less available. Unfortunately, climate change and population growth will greatly impact these areas, triggering an overreliance on groundwater and pushing this already stressed resource to its limits.

Most climate change scenarios indicate that dry regions will only continue to get drier, further limiting already scarce groundwater recharge. Moreover, since we love to live in sunny, dry climates, population will continue to grow in these regions, increasing demand for available water resources. The bottom line: we should fully expect that depletion of our groundwater reserves in the world's arid and semi-arid regions will accelerate in the coming decades.

It is time for us to consider what we will do when the wells run dry... or if we ever even want to get to that point. I'm sure we don't. I don't have the answers, but I hope to explore the issues from a scientific perspective in my future posts.

I am crystal clear on a few things however. First, we can no longer afford to pump the world's groundwater with reckless abandon. Those days are gone. In addition to depleting a finite supply, as water tables drop, so too does the quality of the extracted groundwater. The situation is simply unsustainable in both the developed and undeveloped world.

Second, the time to begin planning is now. Much groundwork needs to be laid to cope with the changing water landscape of our future. I fear that the global, international policy, legal, civil and perhaps even technological infrastructure is not yet in place to peaceably share, use and reuse water across political boundaries. These are no small problems. Inaction is no longer an option

Finally, the ball is in the court of scientists like myself to communicate key findings, in plain and understandable terms, to the general public. I'm doing my best to get the message out – by communicating our research findings here in Water Currents, and by giving as many [university and public lectures](#) as is humanly possible this year. I hope that you will follow my posts and those of my Water Currents colleagues as we, together, work to elevate the critical water issues that we face to the level of everyday understanding.

Perhaps one of the biggest messages that I can send is happening, on World Water Day, 2012. In collaboration with [design professionals](#), our GRACE-based analyses of groundwater depletion were rendered for display on the giant, [electronic billboards on Times Square](#). The animations of our data, and data from the U. S. Geological Survey, portray a compelling picture of a looming crisis that can no longer be ignored. Starting today, the message is being broadcast loud and clear, all over the world. I hope that someone is paying attention.

Keywords: [GRACE](#) [groundwater](#) [NASA](#) [water](#)