VISUALIZING.ORG

groundwater - Visualizing

Published: 2018-03-05 · **Project:** Seasonal and Longterm Groundwater Levels
Original URL: https://www.visualizing.org/groundwater/
Archived copy (01-04-2023): http://web.archive.org/web/20230401051027/https://www.visualizing.org/groundwater/

Visualize Global Groundwater Trends

Groundwater is an important but often overlooked natural resource. Flowing in vast aquifers beneath the surface of the earth, it is a major source of fresh water for drinking, agriculture and industry, as well as a critical component in the ecosystem's water cycle. Under natural conditions it is a renewable resource, but groundwater reserves are currently threatened by our over use. As Payal Sampat of the World Watch Institute notes, "On nearly every continent, groundwater in aquifers is being drained faster than the natural rate of recharge." While there is ample data monitoring groundwater levels, from local sensors to satellite data, it is formatted for expert hydrologists rather than concerned citizenry. Underground, out of sight and encoded, the public lacks a clear and credible indicator of changing groundwater levels.

HeadsUp! and Visualizing.org challenge you to design an animated, data-driven indicator that alerts the public to current groundwater trends and conditions and brings this issue into focus.

See your work across 19,000 square feet of signboard in Times Square. The venue for the winning visualization is a 30 second motion graphic on the TS^2 signs in NYC's Times Square. The spot will premiere on World Water Day, March 22, 2012, and run for one month. Your visualization must be appropriately legible, striking, and contextualized to impact a casual pedestrian on the ground. Your challenge submission should be a functioning version of the data visualization or indicator, supplemented by storyboards of the motion graphic spot (see details below).

This Visualizing.org challenge is a collaboration with HeadsUp! and TS^2, a Thomson Reuters/NASDAQ alliance.

Design Specifications and Production

Times Square Squared combines the eleven synchronized digital displays of the Thomson Reuters sign with the NASDAQ Tower. We encourage designers to incorporate the interactive capacity of TS^2 that allows viewers, local and global, via the TS^2 webcam, to interact with the sign.

Challenge submissions should include:

- **a working data visualization**, designed for the Times Square venue but compelling as a standalone project on the web
- **a link to storyboards** (supplementary PDF, images, or web page) that outline the motion graphics spot containing the visualization OR a video of the produced motion graphics

Challenge entries will be judged based on the effectiveness and impact of the visualization, especially how well it would work as a public display in Times Square. The winning designer will then work with TS^2 producers to prepare the visualization and animation for the multiple screens of the TS^2 display.

TS^2 Webcam
TS^2 Sign Specs
TS^2 Sign Templates
TS^2 Pomegranate: Interactive API Documentation

The Data

There are many ways to measure groundwater and accurately predicting trends is a difficult task. The estimated depletion rates compiled by Leonard Konikow of USGS bring together a number of estimation methods into a single, standardized table of trends, providing a long-term summary view of groundwater trends. Provided by James Famiglietti of the UC Center for Hydrologic Modeling, the GRACE data is more fine-grained and raw by comparison, but still global in reach. You may use either one or both data sets in your visualization.

Decadal Average Rates of Groundwater Depletion 1900-2008
Note: file updated 10/11/2011. Combining 8 different methods of estimation, this data set presents the average rate of groundwater depletion for 50+ major water systems around the world. Estimated depletion rates are given in cubic kilometers / year, by decade from 1900 – 2008. The water systems included are aquifers, regions, and regional summaries (including global totals).

- Source: Leonard F. Konikow, U.S. Geological Survey
- Research Paper: Konikow, Leonard F, “Contribution of global groundwater depletion since 1900 to sea-level rise,” Geophysical Research Letters, Vol. 38, L17401, doi:10.1029/2011GL048604, 2011. Published 2011 by American Geophysical Union. Reproduced/modified by permission of American Geophysical Union.

GRACE Satellite Monthly Data 2002-11
Using an innovative twin-satellite technique to measure the Earth’s gravity field, the GRACE project detects changes in water mass without interruption by borders, boundaries, or adverse conditions on the ground. This data set contains GRACE’s monthly grids for the span of the mission to date. Each cell in the grid shows the water height anomaly for that location compared to its long-term average (in cm of equivalent water height). Each monthly grid comprises 360 x 180 cells, with latitude and longitude tables to geolocate each position.

- Source: Jay Famiglietti, Professor and Director, UC Center for Hydrologic Modeling
- Famiglietti, J. S., M. Lo, S. L. Ho, K. J. Anderson, J. Bethune, T. H. Syed, S. C. Swenson, C. R. de Linage and M. Rodell, 2011, Satellites Measure Recent Rates of Groundwater Depletion in California’s Central Valley, Geophys. Res. Lett., 38, L03403, doi:10.1029/2010GL046442

- Rodell, M., I. Velicogna and J. Famiglietti, 2009, Satellite-based estimates of groundwater depletion in India, Nature, doi:10.1038/nature08238
- GRACE Mission home page
- "Groundwater Depletion Detected From Space," New York Times, May 30, 2011
- GRACE: Tracking Water from Space (video)
- An Indian Hotspot (video)

More Information

Deadlines

Submission Deadline: 14 November 2011 by 11:59 pm EST
Winner Announced: 7 December 2011
Production period (winner works with TS^2): December 2011 – March 2012
World Water Day Premiere: 22 March 2012
Motion Graphic Runs in Times Square: 22 March 2012 – 22 April 2012

Jury

Adam Bly, Seed Media Group
James Famiglietti, UC Center for Hydrologic Modeling
Dale Herigstad, Possible Worldwide
Camille Kubie, GE
Sylvia Lee, Skoll Global Threats Funds
Alex McDowell – RDI, creative director, 5D | Immersive Design
Stephen Sonnenfeld, Thomson Reuters
Peggy Weil, HeadsUp!

Prize

- The winning entry will be showcased on TS^2 for a month beginning at the HeadsUp! Event to be held on World Water Day, March 22, 2011
- The Grand Prize winner will receive US$ 2,500 courtesy of GE.
- Up to two additional entries may be chosen for display.

Results

The winning visualization:

Seasonal and Longterm Changes in Groundwater Levels by Richard Vijgen.

The Wayback Machine has not archived that URL.

Read the

recap to see the Honorable Mentions and see all of the entries.

Challenge Updates

Receive challenge updates and announcements directly: sign up for our Challenge News mailing list.
Note: this is separate from our normal mailing list.