

Groundwater Data Delivery and Visualization

Using Web Applications and Digital Platforms to Deliver Data to Stakeholders, Cooperators and the General Public



U.S. Department of the Interior U.S. Geological Survey

TAGD Groundwater Summit August 29, 2018

Modernization



"When scientists... explain their work simply—and more effectively, public communication increases the impact of science in multiple dimensions." — Mónica I. Feliú-Mójer, Scientific American



"... by 2020 customer experience will overtake price and product as the key brand differentiator." — Walker Customer Intelligence, Customers 2020



Expectations

- Mobile Tech and Geolocation
- Readily available imagery and nearreal-time data
- Open Source
- Infographics (New York Times)
- Social Media





Focus on communicating to both technical and non-technical audiences

Expectations

Intuitive Visually Appealing Focused Dynamic Content Innovative "Clean, simple, modern"

Geospatial Science + Cyber Innovation





Geospatial Science + Cyber Innovation



Infrastructure to sustain growth (servers and networks) R&D to add new tools and capabilities (research to ops) Collaboration: Looking to connect and deliver science



Water Resources Mission –

...to provide (deliver) hydrologic information and understanding needed by others to achieve the best use and management of the Nation's water resources. USGS accomplishes this mission in cooperation** with State, Local, and Other Federal Agencies.

**Ask us about the Cooperative Water Program

USGS Data Handling and Delivery

Publications

- Pubs Warehouse (USGS Report Series)
- Journal Articles
- Proceedings
- Data Delivery
 - ScienceBase
 - Digital data warehouse (w/metadata)
 - NWIS

Websites and Web Applications*



Why web applications?

- Broader perspective
- Add geospatial into the mix
- Decision support
- Open data, transparency
- Increased communication
- Rapid development





Modernizing Delivery of GW Data Real-time Groundwater Data for Texas (2016) Texas Water Dashboard GW Data Explorer (2017) USGS Houston Subsidence Program **Big Data Delivery** (2017) National repository for GeoLogs Hydrogeologic Data Explorer (2018) Decision support for GCDs in Texas **MODFLOW Data Visualization (2018)** NEW **GWWebFlow**





At its core, Twitter is a real-time public broadcast channel. These characteristics make Twitter a natural platform for public safety communication

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New App Shows Aquifer Level Change and Subsidence in Relation to Groundwater Withdrawals in Houston-Galveston Area



Release Date: JULY 19, 2017

A new interactive web application illustrates how groundwater, sediment compaction and land-elevation change are related in the Houston-Galveston region in Texas. The new app was developed by the U.S. Geological Survey and is available online.



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USGS GeoLog Locator

The U.S. Geological Survey (USGS) GeoLog Locator is a web-based tool for storage and retrieval of borehole-geophysical logs and related data files. USGS scientists can upload, format, and transfer borehole-geophysical logs and data files to the GeoLog Locator database which can then be searched and explored by users through this web page.

Find Out More »

Watch the following video to learn more about the GeoLog Locator and how to use it.



Searching the GeoLog Database

Searching the GeoLog database is done through a map interface. Site and log file criteria can be chosen to narrow your search. Log data files matching your criteria can be viewed directly or downloaded

Science for a changing world



South Plains

GWWebFlow from USGS

- Groundwater Model Visualization tool
- Helps users visualize the inputs (e.g. aquifer properties) and outputs (e.g. gw levels and flow direction) of complex groundwater models across the country
- Supports most MODFLOW-based groundwater models
- MODFLOW to netCDF via https://water.usgs.gov/ogw/flopy/



System Components/Workflow







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USGS Releases New Web-Based Groundwater Model Visualization Tool



Release Date: APRIL 12, 2018

A new U.S. Geological Survey groundwater model visualization tool is now available to help users visualize the inputs and outputs of complex groundwater models across the country.

Groundwater models are computer codes that simulate the physics of groundwater motion within an aquifer system. This new webbased mapping tool, called GWWebFlow, allows water managers and the public to visualize complex groundwater models in a more understandable way.

"This web-based platform gives water managers the ability to easily visualize groundwater model inputs and results," said Jeremy White, USGS scientist and GWWebFlow team lead. "This was not previously possible for those without specific knowledge of and access to groundwater modeling software."

The tool allows users to quickly and easily view computer model inputs, such as information about aquifer properties, as well as the outputs, such as groundwater levels and flow direction. Easy access to this information will help resource managers make informed decisions about resources.

"This is a new tool for water resource managers to better understand and work with complex groundwater models," said Susan Roberts,

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Benefits and Results...

- Currently 6 models (25 more in FY19)
- Allows for broader use of models by stakeholders and the public
- USGS considering next steps at a national-level for model archiving and publishing
- Provide hosting and serving capacity for cooperators
- Libraries accessed via
 Https://txthredds.usgs.gov



Questions?

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