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New Online System Available for Well Owners

Posted on June 20th, 2019

The University of Iowa Center for Health Effects of Environmental Contamination (CHEEC), in collaboration with the UI Hydroinformatics Lab (UIHI Lab) and the Iowa Geological Survey (IGS), has developed an information system to assist the management of private wells in Iowa. IIHR—Hydroscience & Engineering (IIHR) also provided support to the project.

The Iowa Well Forecasting System (IWFOs) is a publicly accessible web platform that allows users to view spatial information on groundwater aquifer depths and groundwater quality in Iowa. IIHR's Ibrahim Demir, who is also an assistant professor of civil and environmental engineering, developed the system with assistance from graduate student Muhammed Sit and support from Rick Langel of IGS. IWFOs integrates publicly available data on well geology from the IGS' GeoSam database with water-quality data from the Private Well Tracking System (PWTS) managed by the Iowa Department of Natural Resources. IWFOs is available at:

<https://www.iihr.uiowa.edu/igs/wellforecasting>

IWFOs was designed as a public resource for well users. Aquifer and water-quality information can be used to make decisions during well construction to ensure a safe drinking water supply. The IGS has a tradition of providing this information, called a well forecast, to the public, but well forecasts are only available during normal business hours.

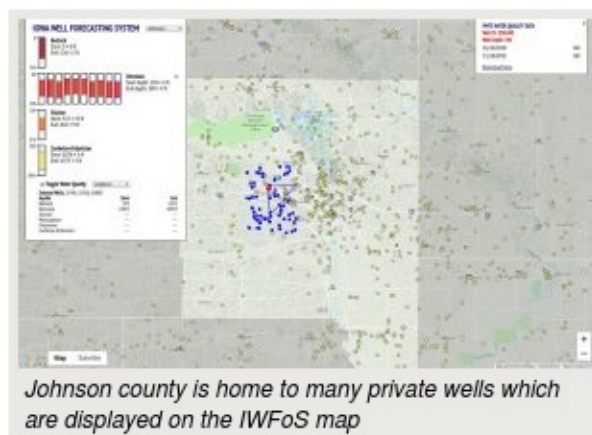
"IWFOs uses many of the same datasets that the IGS uses in producing well forecasts," Langel says. "However, IWFOs is available 24/7. Well contractors and homeowners can access geologic and water-quality information at any Iowa location and make decisions necessary to create a safe drinking water supply at their leisure."

IWFOs allows users to select a potential location for a new well in Iowa. Using available information from adjacent wells, the user then receives estimates on the depths of the subsurface aquifers at that location.

"The system analyzes data from nearby wells and provides top 10 nearest well triangulation with relevant aquifer information out of millions of combinations under a second," says Demir, who directs the UIHI Lab.



Ibrahim Demir is one of the developers of IWFOs.



Johnson county is home to many private wells which are displayed on the IWFOs map

The user is also able to explore the levels of nitrate, arsenic, and bacteria present in nearby wells.

"There is a wealth of private well water-quality data available in Iowa as a result of testing conducted through the state's Grants to Counties program," says CHEEC Director David Cwiertyny, an IIHR research engineer and a professor of civil and environmental engineering at Iowa. "We wanted to make this data more readily accessible to all Iowans, not only to better inform the installation of new wells, but also to increase awareness about the quality of Iowa's groundwater, which provides drinking water for about 60 percent of all Iowans. That includes roughly 300,000 or so who rely on water from private wells."

CHEEC supports and conducts environmental health research relating to environmental toxins. Its mission is "to determine the levels of environmental contamination which can be specifically associated with human health effects." The development of IWFOs aligns with two of CHEEC's priorities: increasing access to publicly available data through interactive platforms and student training and professional development.

A member of the UIHI Lab, Sit was the first CHEEC Data Fellowship recipient, a new program created to support and enhance CHEEC's longstanding role in maintaining databases on environmental quality for use in public health research.

"For CHEEC, IWFOs is a win-win," Cwiertyny says. "We get to provide what we hope will be a valuable resource to the state of Iowa, while supporting the training and professional development of graduate students that will go on to become leaders in 'big data' and emerging fields such as environmental informatics."

For more information, visit cheec.uiowa.edu or email cheec@uiowa.edu.



David Cwiertyny is the director of the IWFOs system

CHEEC is part of the University of Iowa Office of the Vice President for Research, which provides researchers and scholars with resources, guidance, and inspiration to secure funding, collaborate, innovate, and forge frontiers of discovery that benefit everyone. More information is available at <http://research.uiowa.edu>. And follow CHEEC on Twitter: [@DaretoDiscover](https://twitter.com/DaretoDiscover).