

Survey of nation's largest cities finds water supplies not as threatened as believed

January 31 2013, by Mickie Anderson

(Phys.org)—Although reports of drought conditions, water wars and restrictions have often painted a bleak picture of the nation's water availability, a new University of Florida survey finds that conditions aren't quite so bad as believed.

Jim Jawitz, a UF soil and [water](#) science professor, and Julie Padowski, who earned her doctoral degree from UF and is now a postdoctoral researcher at Stanford University, knew that previous assessments of [urban water](#) supplies typically used what is known as a "runoff-based approach," which takes into account factors such as river flows and rainfall amounts.

Jawitz and Padowski knew that those assessments did not consider the infrastructure used to maintain urban [water supplies](#), such as water stored in aquifers, lakes, reservoirs or water that's pumped in to an area and stored. So for 225 U.S. metropolitan areas with populations of more than 100,000, that's what they did, and their findings have been published online by the journal *Water Resources Research*.

When assessing cities using the runoff-based approach, the UF study found that 47 percent of the total U.S. population is vulnerable to [water scarcity](#) issues, however, when infrastructure was accounted for, the number dropped to just 17 percent of the population. Residents in the top 225 metropolitan areas make up the bulk of the U.S. population.

Jawitz, a faculty member with UF's Institute of Food and Agricultural

Sciences, said they expected to find fewer areas vulnerable to [water shortages](#) than past studies had because of the different methodology, but some of their findings surprised them.

"We have people who live in the desert and they have water and it's because of their infrastructure. If you live in a city that has a large of reservoir of water stored and there's a drought, it doesn't have the same effect on you as if you live in a city where there's a drought and you don't have a large reservoir," he said.

They didn't expect Atlanta – where legal battles over water rights with neighboring states initially prompted the researchers to tackle the survey – to fall near the middle among the 225 cities they studied for water access and vulnerability.

Another unusual finding: Miami, with its lush, tropical landscape, landing in the top 10 most vulnerable cities. Jawitz, a South Florida native, said although the Miami area generally enjoys an abundance of rain, it's not stored anywhere. That means during periods of drought, the area becomes vulnerable.

A website that ranks the 225 largest U.S. urban areas based on [water availability](#) and vulnerability can be found at soils.ifas.ufl.edu/hydrology/cities. The list is a combination of results of where each city falls on a 0-to-100 water-accessibility scale as well as a water-vulnerability rating of low, medium or high.

The researchers also had a modern twist to their study. Padowski created a media-text analysis to search online news archives for reports for each city, looking for stories about water restrictions or [drought conditions](#).

They found that the media reports backed up their method of analysis but did not correlate significantly with estimates made using the runoff-

based approach.

Padowski said despite the good news about water, she fully expects water conservation should and will be a front-and-center topic for many years to come.

"As population growth increases, we don't have more resources to tap – we can't just find another lake or another river to dam," she said. "It's going to come down to sharing, conservation and efficiency."

Rob McDonald, senior scientist for sustainable land use with The Nature Conservancy, said the study adds to what scientists know about urban water use in the U.S. and raises intriguing questions about whether large cities' infrastructure will be ready for conditions brought on by climate change.

"To me, it shows that infrastructure matters," he said. "Do cities go out even further for water? If a city is dependent on snow melts from the mountains for its water, what happens if it gets warm enough that there isn't a snowpack?"

Provided by University of Florida

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