Testimony of Dr. Sharon Megdal
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On behalf of the National Institutes for Water Resources to the
Committee on Appropriations, Subcommittee on Interior, Environment and Related Agencies, March 18, 2015

Chairman Calvert and Ranking Member McCollum:

Good afternoon. I am Sharon Megdal, Director of the University of Arizona Water Resources Research Center. Thank you for this opportunity to testify on behalf of National Institutes for Water Resources (NIWR), in support of the Water Resources Research Act program, a program funded as part of the U.S. Geological Survey's budget. I specifically want to thank you for this Subcommittee's strong continuing support for the Water Resources Research Act.

The Water Resources Research Act, enacted in 1964, is designed to expand and provide more effective coordination of the Nation's water research. The Act establishes water resources research institutes (Institutes) at lead institutions in each state, as well as for Washington D.C., Guam, Puerto Rico, the Virgin Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands and American Samoa.

Congress created the Institutes to fulfill three main objectives:

- Develop, through research, new technology and more efficient methods for resolving local, state and national water resources challenges;
- Train water scientists and engineers through on-the-job participation in research; and
- Facilitate water research coordination and the application of research results through the dissemination of information and technology transfers.

Since 1964, the Water Resources Research Institutes have fulfilled these three objectives in partnership with the U.S. Geological Survey. The Institutes, managed by a director in each state, promote water-related research, education, and technology transfer at the national, state, and local level through grants and sponsored projects. The program is the only federally-mandated research network that focuses on applied water resource research, education, training, and outreach.

The Water Resources Research Institutes program is a state-based network dedicated to solving problems of water quantity (supply) and quality in partnership with universities, local governments, the water industry, and the general public. Each state contributes a minimum of a

2:1 match, thus ensuring that local and regional priorities are addressed and the impact of federal dollars is maximized. The Institutes are a direct, vital link between federal water interests and needs and the expertise located within the states' research universities.

The Water Resources Research Institutes program also provides a mechanism for ensuring state, regional and national coordination of water resources research, future water professionals' education, and the proper utilization of results and outcomes. In fact, the Institutes collaborated with 150 state agencies, 180 federal agencies, and more than 165 local and municipal offices.

There are two grant components of the USGS Water Resources Research Institutes program. The first component is the base grant program, which is divided equally among the Institutes. Institutes use these funds to leverage research and/or student training through a state-wide competitive grants process. NIWR requests the Subcommittee provide continued funding for the base grant program, which supports research focused on water supply and quality, technology transfer, education, and outreach to the water-user community by the Institutes. The base program provides seed grants, which are used to develop future research proposals and secure additional external funds.

The second grant component is a national competitive grants program, supporting research on water resources problems that are regional or national in nature. In 2014 this program received 68 applications, which underwent rigorous peer review from a national panel. The national review panel selected a total of 4 grants. The agency awarded grants for research addressing water supply and quality issues facing our Nation to Purdue University, the University of Iowa, the University of Maryland, and the University of Nebraska.

The Institutes specialize in identifying problems within their states, developing solutions to those problems, and engaging with the public to implement those solutions. One of the program's greatest strengths is that the research funded by each Institute is tailored to that state's needs, based on priorities set through consultation with an advisory panel. While these projects usually focus on state needs, they also address water issues relevant to our Nation. The following are several examples of research conducted by Institutes across the country.

My Institute, the **University of Arizona Water Resources Research Center (WRRC)**, is an Extension and research unit in the College of Agriculture and Life Sciences. Groundwater has been and continues to be a critical water resource for Arizona and the Nation. Over the years, Water Resources Research Act (WRRA) funding has supported considerable work on groundwater quantity and quality. Projects have looked at specific contaminants to determine their potential distribution and impacts, to then develop innovative and affordable methods of remediation.

- A 2013 project continued development and testing of a novel approach that uses multiple models to quantify uncertainty in future hydrologic conditions, along with economic cost models to quantify the risk associated with water resource scarcity.
- A 2014 project investigates groundwater governance practices in order to examine how they contribute to improved groundwater management. For this project, WRRA funding, which was highly leveraged by considerable state funding, supported case study research

by a graduate student, who also helped prepare the journal article, "Groundwater Governance in the United States: Common Priorities and Challenges".

- In addition, WRRA funding is critical to the University of Arizona Water Resources Research Center's highly regarded information transfer activities, which focus on making water resources science and information accessible to stakeholders in Arizona, nationally, and beyond.

The **California Water Center** is working with fruit and wine growers to help maximize crop yields with a minimum amount of irrigation. As this Subcommittee knows, competition for water resources in California is increasing between urban and agricultural entities, necessitating the need for more accurate information on the water requirements of important crops. Knowledge of a crop's water footprint allows for informed irrigation management decisions. The research funded by WRRA investigates the drought responses, water footprint, and wine quality through the imposition of water deficits to increase understanding of water use and fruit quality for specific cultivars, therefore allowing growers to apply a minimum amount of irrigation water to sustain profitable production levels.

The **Minnesota Water Resources Center** has funded a number of research projects that address important, nationally-relevant water resources issues with USGS/WRRA funding over the last 4 years. This funding has been highly leveraged with University funds and the Minnesota Environmental Trust Fund. Researchers have addressed critical issues, including determining the biogeochemical variables that can be used to predict how much arsenic will get into groundwater used for drinking water, and determining the degree of antibiotic resistance in wastewater treatment plant effluent.

Researchers with the **Idaho Water Resources Research Institute** have collaborated with Idaho Department of Water Resources scientists to develop technology for assessing crop-water usage over large areas using satellite based remote-sensing information. This technology is now used routinely within the Idaho Department of Water Resources for investigating and resolving water rights conflicts, for aquifer depletion modeling and for stream flow management. This technology is also being adopted by 10 western states and parts of Africa, Europe and Australia.

In **Oklahoma**, WRRA support led to funding of a research team at Oklahoma State University looking into challenges faced by communities that draw water resources from Lake Altus-Lugert. As of October 1, 2014, Lake Altus-Lugert, the primary water supply for southwest Oklahoma, was only 10% full and recovering from a golden algae bloom that killed all fish in the lake. The lake also has not contained enough water to produce an irrigated cotton crop since 2010. The OSU team is investigating the relative importance of various contributing factors to help local officials better manage this regionally-significant watershed.

Researchers at the **Utah Center for Water Resources Research** have developed a computer code that automates the acquisition and use of Landsat satellite imagery to produce a spatially detailed record of actual evapotranspiration from irrigated croplands. The system is currently operational for approximately 50,000 acres of agricultural land in the lower Sevier River Basin in south-central Utah, and state officials are looking to expand the technology for use state-wide.

Researchers at the **Nevada Water Resources Research Institute** are researching issues associated with water reuse--a water supply strategy of particular importance to water-scarce regions. Work includes identifying contaminants, evaluating existing and emerging treatment technologies, assessing potential public health and environmental health impacts, and outreach to the public.

The **West Virginia Water Research Institute** has focused over the last few years on the Mon River and its major tributaries. The Institute helped develop a novel approach that combined water science with stakeholder collaboration to restore the river in less time than a traditional regulatory process might have taken. Researchers were able to gather the data, diagnose the problem and recommend a treatment strategy for the Mon that produced results. Grants from the Colcom Foundation and the U.S. Geological Survey aided the Institute's endeavors, creating a voluntary, science-based, non-regulatory, watershed-wide program to address the sulfate problem.

Lake Auburn is the drinking water source for both Lewiston and Auburn, Maine. Recent algal blooms have caused numerous problems in the lake, including consumer taste and odor complaints. Engineering new water treatment systems will cost the water utilities millions of dollars. The work being funded through the **Maine Water Resources Research Institute** will help lake managers and drinking water providers control the algae and avoid extra costs while helping keep the water safe to drink.

In New York State, Long Island sources all potable water from coastal aquifers confined by the Atlantic Ocean and Long Island Sound. Due to their limited recharge areas, these coastal aquifers are highly susceptible to changing precipitation, evapotranspiration, and sea level rise. The **New York State Water Resources Institute** supported a study undertaken by a Lehman College researcher that modeled these three threats on the aquifer yields. Proactive management of groundwater is essential to protect the source water for more than 7 million Long Island residents.

For five decades the Institutes, in partnership with USGS, have provided significant research results and services to our Nation and proven successful at bringing new water professionals into the work force. The National Institutes for Water Resources **recommends the Subcommittee provide $8,800,000 to the USGS for the Water Resources Research Institute program for FY 2016.** We respectfully submit that, even in times of fiscal challenges, investing in programs at USGS focused on data collection and the reliability and quality of water supplies is critically important to the health, safety, quality of life, and economic vitality of communities across the Nation.

Thank you, on behalf of all the Institute directors, for the opportunity to testify and for the Subcommittee's strong support of the Water Resources Research Institutes program.