

**210**

SPONSORED RESEARCH PROJECTS  
FROM 54 MEMBER INSTITUTES



**NIWR**  
THE NATIONAL INSTITUTES  
FOR WATER RESOURCES



**\$7.9 M**

IN MATCHING FUNDS TO  
RESEARCH PROJECTS

**\$4.3 M**

IN FUNDS TO PROGRAM PROJECTS



The National Institutes for Water Resources (NIWR) plays a major role in addressing water-related concerns by providing a platform for research, training, and collaboration at the state level. Housed in the nation's land-grant universities, the 54 NIWR member institutes leverage university expertise in research, education and outreach to find solutions for the water management challenges we face. With our funding and educational services, water-related professionals and researchers receive support for the creation of local tools and policies to better manage our water. These successes start at the local level and have the ability to grow and make an impact across the United States.

In FY 2019, Congress appropriated \$6.5 million in Water Resources Research Act (WRRRA) grant funding, enabling cutting-edge research on the nation's most pressing water issues. This financial source requires matching from non-federally sourced funds from the public and private sector. This local financing significantly leverages available federal dollars for water research.

turning water challenges  
**INTO WATER SOLUTIONS**



# LET THE KNOWLEDGE FLOW

## Fish habitat response to streamflow augmentation in northern California

Declining water levels can degrade or eliminate fish habitat during California's dry summer season. Storing water off-channel during the rainy season – and then releasing it in the dry season – can help reduce demands on instream flows. These kinds of innovative flow augmentation projects are of growing interest to land owners who would like to protect endangered salmon during critical low-flow periods. However, they are seeking guidance on the appropriate timing, volume, and duration of flows to release each year.

Researchers at the University of California, Berkeley, evaluated the benefits of a streamflow augmentation project that was aimed at sustaining habitat conditions for endangered salmon. They analyzed water depth, water quality, and fish behavior both before and after stored water was released at different rates into a stream in Sonoma County, California.

The team, led by Dr. Ted Grantham, found that flow augmentation increased stream connectivity and had a beneficial effect on water depths and fish health. The flow treatments definitively prevented the mortality of endangered fish trapped in isolated pools that would have dried up in the late summer season. Findings of the study are being used to develop an operations plan which will establish recommendations for the timing and rate of flow releases in future years.

*Above: Ted Grantham takes a velocity measurement with a current meter. Photo by Jim Block.*



## Wastewater Monitoring for COVID-19

The Ohio Water Resources Center is collaborating with the Ohio EPA, Ohio Department of Health (ODH), US EPA, 5 state universities, and one commercial laboratory to monitor wastewater in Ohio for SARS-CoV-2 gene fragments. This project couples research to overcome the barriers to using the technique with the necessary management framework to simultaneously build a useful monitoring tool.

The wastewater monitoring network includes twice weekly sampling from over 60 facilities that are located in 46 different counties in Ohio. This represents wastewater flows from about 5 million Ohio residents. Wastewater is a pooled sample that is analyzed within two days of collection, providing a leading indication of the trend of COVID-19 infections in a sewered community. The wastewater data are published on the Ohio coronavirus dashboard. Increases in viral gene copies prompt notifications to local health jurisdictions giving them additional time to alert the community and prepare. This data is entered into the CDC database as part of pilot state participation in the National Wastewater Surveillance System.



# Harnessing the wellspring of research and innovation

## Collecting hydrological data using stereo imaging

### Critical Water Problem

Obtaining hydrological data in Alaska using traditional methods can be expensive and time-consuming due to the state's vastness and remoteness, so these data in Alaska are limited. The immense logistical efforts currently needed to gather hydrological information could be reduced by applying remote measuring methods.

### Scope of Study & Benefits

This study uses a method called Stereo Imaging Large-Scale Particle Image Velocimetry (SI-LSPIV) to collect data from the Tsina River. Simultaneous video imagery is obtained using multiple cameras and is then stitched to form a single image. That image is specially processed to estimate water discharge and is compared with physical discharge measurements collected at the same time to ground truth the process. The methodology used in this study could allow researchers to expand data sets in remote locations.



## National Competitive Grants

The 104(g) National Competitive Grants program funds research in water issues that are of a regional or interstate nature or relate to a specific program priority identified by the Secretary of the Interior and the Institutes. Approximately \$1 million is available each year. In FY 2019, 104(g) funding was awarded to four research projects studying important national priority issues in water quality and quantity. These projects were:

- Per- and polyfluoroalkyl substances (PFAS): An emerging environmental and human health concern for the Great Lakes? (Indiana)
- Mapping and modeling of interbasin water transfers within the United States (Kansas)
- Characterizing transformation products of organic micropollutants in groundwater and hydrologically connected water supplies impacted by onsite wastewater treatment systems (New York)
- Microbial drivers of mercury methylation in freshwater eutrophic systems (Wisconsin)

*These research highlights are only some of many WRRRA projects positively impacting water research across the nation. To learn more about current or past WRRRA research, visit the State Water Resources Research Act Program website, [water.usgs.gov/wrri](http://water.usgs.gov/wrri).*

# Annual Base Grants

The largest of the USGS-NIWR research grant programs is the 104(b) Annual Base Funding grant program. Approximately \$4 million in 104(b) grants are awarded annually to NIWR member institutes and help each institute plan and conduct applied and peer-reviewed research, education and outreach activities focused on water.

# Future Leaders

NIWR supports learning opportunities for students with funded research projects. Both undergraduate and graduate students explore new ideas and learn new skills. Research and internships foster successful entry into a competitive water resources job market and allows students to make lifelong and positive impacts on water resource issues.

# 10-Year USGS Water Resources Research Act Program Vision

NIWR features cross-cutting elements, including research, outreach and engagement, and education and training. By combining these elements into a cohesive whole, NIWR is able to serve our nation on a day-to-day basis, while fulfilling its federal mandates.

The future will bring new challenges, but also new opportunities, surrounding our nation's water resources. NIWR will continue to support effective management and stewardship of our water resources through new ideas supported by the best science available and implemented by a US workforce trained in water-related disciplines. The vision outlines priority research, outreach and engagement, and educational strategies leading to reliable and sustainable water in support of economic development, environmental health, water-related hazard resilience, and social equity and well-being.

