

Bringing Research To Life



THE
Water
Research
FOUNDATION®

Multi State Salinity Coalition Conference

February 29, 2024

Julie Minton & Sydney Samples





ABOUT WRF

 advancing the science of water®

BY THE NUMBERS

AS OF 8/31/2023

SUBSCRIBERS



963

UTILITIES



129

SOLUTION PROVIDERS
*Manufacturers &
Consultants*



49

WRF STAFF

FUNDED RESEARCH



\$81

MILLION



\$49

MILLION CASH
*Contractually Funded
Research*



\$32

MILLION
COST SHARE

RESEARCH PORTFOLIO



264

ACTIVE
PROJECTS



66

CO-FUNDED PROJECTS
137 CO-FUNDERS

9

FEDERAL/STATE GRANTS

3

FEDERAL CONTRACTS

2

PRIVATE GRANTS

\$.78

OF EVERY DOLLAR SUPPORTS PROGRAM SERVICES

963 UTILITIES
67 MANUFACTURERS
62 CONSULTANTS

\$81M
RESEARCH CONTRACTED
IN CASH & COST-SHARE

264
ACTIVE PROJECTS

\$.78
OF EVERY DOLLAR
SUPPORTS PROGRAM SERVICES

1.4B
MEDIA REACH

69,926
SOCIAL MEDIA
FOLLOWERS

Most Viewed Research Project Pages

1. [PFAS One Water Risk Communication Messaging for Water Sector Professionals: One Water Toolkit \(5124\)](#)
2. [Residential End Uses of Water, Version 2 \(4309\)](#)
3. [Guidelines for Optimizing Nutrient Removal Plant Performance \(4973\)](#)
4. [Standardizing Methods with QA/QC Standards for Investigating the Occurrence and Removal of Antibiotic Resistant Bacterial/Antibiotic Resistance Genes \(5052\)](#)
5. [An Enhanced Source Control Framework for Industrial Contaminants in Potable Reuse \(4960\)](#)

Most Viewed Website Resources

1. [Greenhouse Gas Emissions in the Water Sector: Let's Uncover the Basics! *Webcast*](#)
2. [PFAS One Water Risk Communication Messaging for Water Sector Professionals: One Water Toolkit \(5124\)](#)
3. [PFAS One Water Risk Communication Messaging for Water Sector Professionals: UCMR5 Toolkit \(5124\)](#)
4. [Residential End Uses of Water, Version \(4309\) Report](#)
5. [Standardizing Methods with QA/QC Standards for Investigating the Occurrence and Removal of Antibiotic Resistant Bacterial/Antibiotic Resistance Genes \(5052\) Report](#)

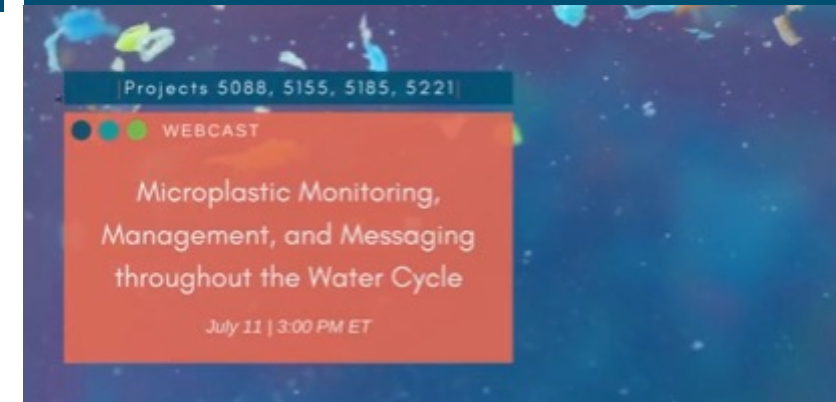
Top Visitor Countries

1. United States
2. Canada
3. China
4. India
5. United Kingdom
6. Australia
7. Germany
8. Philippines
9. Netherlands
10. Mexico

Most Popular Topics

1. PFAS
2. Advanced Treatment
3. Climate Change
4. Lead & Copper
5. Integrated Planning & Water Management
6. Biosolids
7. Energy Optimization
8. Resource Recovery
9. Utility Management
10. Water Use & Efficiency

Most Popular Webcast



WRF in the News

[How dangerous was the Ohio chemical train derailment? An environmental engineer assesses the long-term risks](#)

64M Reach



Top Social Media Post

[Dr. William Tarpeh Receives 2023 Paul L. Busch Award](#)



21K Impressions

Research Programs

60%

Research
Priority
Program

10%

Unsolicited
Program

20%

Tailored
Collaboration
Program

10%

Emerging
Opportunities
Program

Subscriber/
Partner
Funded

Facilitated
Research
Program

Grant
Funded

Sponsored
Research

\$100,000

Paul L. Busch
Award



Healthy Communities & Environment

- Holistic Watershed Management & Integrated Planning
- Monitoring Tools at Watershed & Sewershed Scale
- Receiving Water Quality Management



Treatment Innovation & Optimization

- Treatment & Process Optimization
- Nature-based Solutions
- Diversifying Water Systems



Efficient Resource Use & Recovery

- Energy Efficiency, Intensification & Resource Recovery
- Climate Change Mitigation
- Nutrient Removal & Recovery
- Solids Management



Resilient Infrastructure

- Asset Management
- Distribution System Integrity & Water Quality
- Collection Systems Integrity & Water Quality Impacts



Utility Operations & Management

- Water Resources Planning
- Workforce Management
- Financial Management

Climate Risk Assessment & Adaptation, Communication, Environmental Justice, Digital Transformation



Julie's contact info



WRF'S REUSE RESEARCH

 advancing the science of water®



Reuse

☰ 263 Projects

🔧 8 Web Tools

📄 4 Case Studies

📷 15 Webcasts

Reuse: Potable



Reuse:
Nonpotable



Reuse:
Direct
Potable



Reuse:
Indirect
Potable



Reuse:
Membrane
Technology



Reuse:
Agricultural



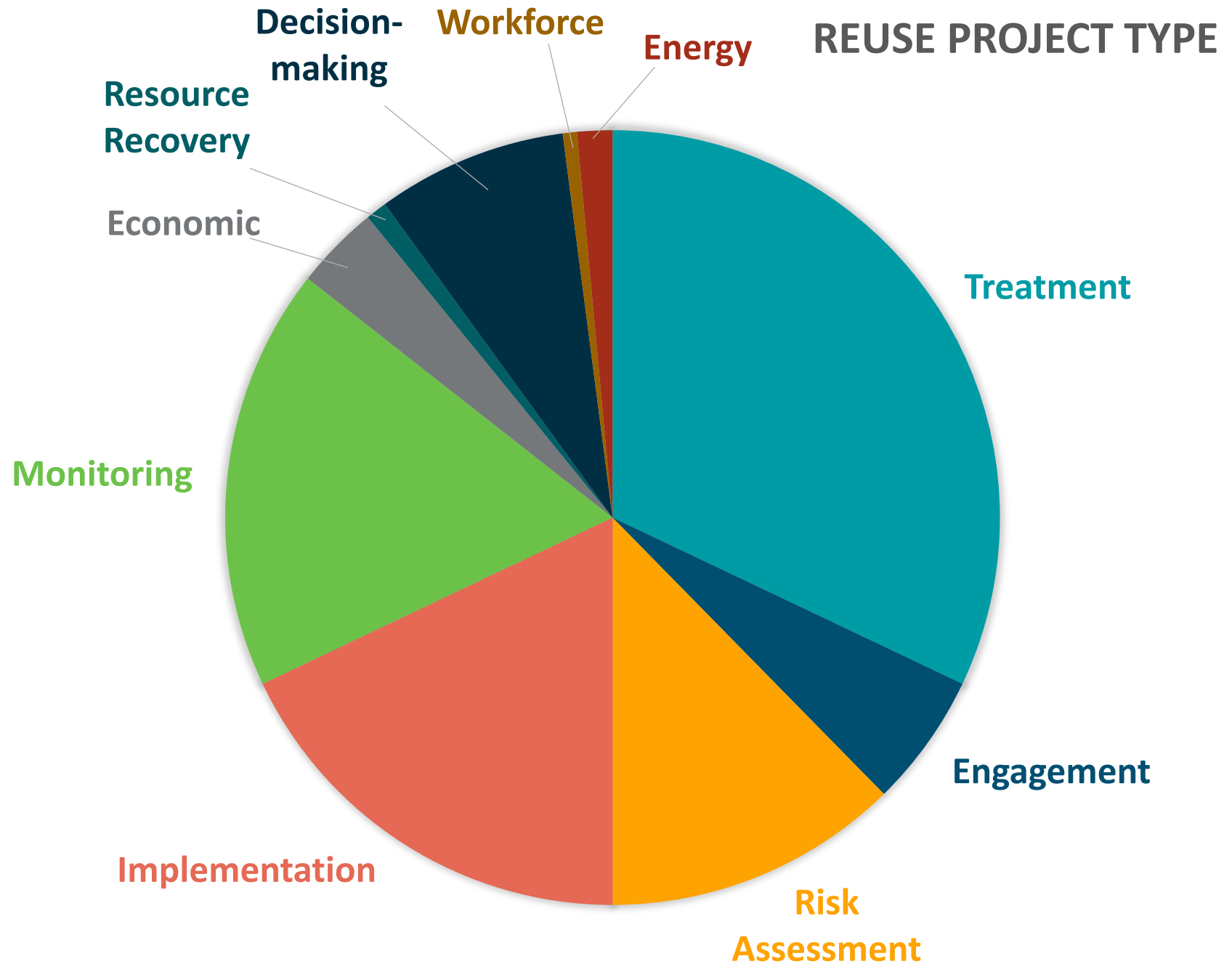
Water
Supply
Planning



THE
**Water
Research**
FOUNDATION

A Comprehensive Water Reuse Research Portfolio

286 Projects
30 years of Research



State Water Board Grants for Recycled Water Research with support from MWD



2018-2024

GRANT 1

FUNDING LEVEL: \$1.4M

TIMELINE: 2018-2020

PROJECTS: 5

Recommended by the Expert Panel for Developing DPR Regulations in CA

GRANT 2

FUNDING LEVEL: \$3.1M

TIMELINE: 2019-2024

PROJECTS: 20

Recommended by WRF's Water Reuse Advisory Committee and SWB

California Legislation – AB 574 (2017):

Established deadline for
DPR legislation of 2023

Leveraging of Grant Funds

- \$975,000 from Metropolitan Water District (CA) for 7 projects
- \$1M from other contributing utilities and firms

Partnership with CA State Water Board

Grant 1 - \$1.4M

Grant 1 (\$1.4M) funded 5 projects which were recommended by the SWB Expert Panel in their report on the feasibility of developing criteria for DPR. Each of these studies have been completed:

- **DPR-1 Tools to Evaluate Quantitative Microbial Risk and Plant Performance/Reliability** ([4951](#))
- **DPR-2 Pathogen Monitoring in Untreated Wastewater** ([4989](#))
- **DPR-3 Feasibility of Collecting Pathogens in Wastewater During Outbreaks** ([4990](#))
- **DPR-4 Defining Potential Chemical Peaks and Management Options** ([4991](#))
- **DPR-5 Evaluating Analytical Methods for Detecting Unknown Chemicals in Recycled Water** ([4992](#))

<https://www.waterrf.org/research/topics/reuse>

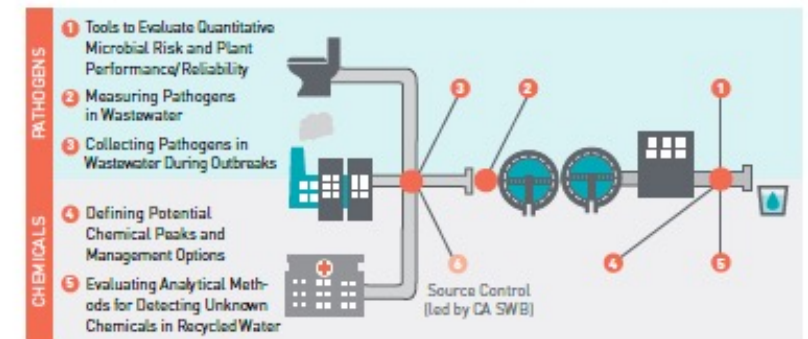
COMPLETION OF DIRECT POTABLE REUSE RESEARCH

In early 2021, WRF will publish results of direct potable reuse (DPR) research funded by a \$1.3 million grant from the California State Water Resources Control Board (SWB), along with additional funding from Metropolitan Water District of Southern California. SWB is relying on this research to aid in the development of uniform water recycling criteria for DPR that are protective of public health.

This research is key for the State of California. It is also applicable to stakeholders around the world who are considering or implementing potable reuse. The tools and findings developed through this research advance the state of knowledge to better address potential public health risks associated with microbial and chemical constituents of concern.



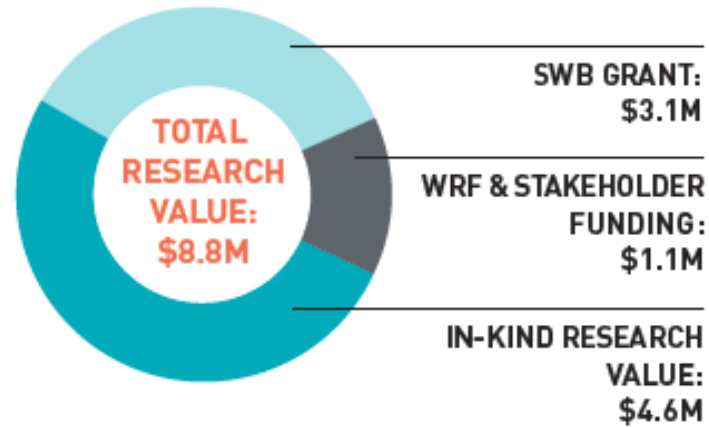
PROJECTS TO INFORM THE DEVELOPMENT OF DPR REGULATIONS



Partnership with CA State Water Board

Grant 2 - \$3.1M

20 projects on potable (~14) and non-potable (6) reuse



more than **100** publications & presentations



7 live webcasts (now available on demand)



5 web tools



WATER REUSE RESEARCH COLLABORATIVELY FUNDED RESULTS

Through a pair of research grants provided by the California State Water Resources Control Board (SWRB), The Water Research Foundation (WRF) has worked to deliver a robust body of water reuse science. Grant 2 research, which focuses on critical potable and non-potable reuse issues, will be completed in 2024. Initially funded at \$3.1M, the research was leveraged by WRF and other key partners into a research portfolio with a total value of more than \$8.8M.



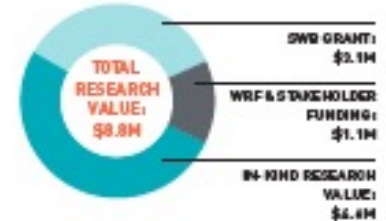
THE PATH TO CRITICAL RESEARCH

Over a seven-year period, WRF worked closely with SWRB in a comprehensive effort to deliver high-priority reuse research to the water sector. This collaboration capped into WRF's Research Priority Program process, using WRF resources and management expertise, including oversight from WRF's Water Reuse Advisory Committee. Once the research was complete, the partnership continued to provide value, providing the guidance and tools needed in the field, as well as research dissemination and outreach.



LEVERAGING FUNDING

During the course of the research effort, SWRB's initial grant of \$3.1M was leveraged into a body of science valued at nearly three times that amount. Once the project concepts were developed, WRF, the Metropolitan Water District of Southern California, and other stakeholders, including utilities across the United States, engineering firms, and manufacturing companies, raised an additional \$1.1M to address the need. In-kind research brought the total value of this research to more than \$8.8M.



<https://www.waterrf.org/california-state-water-board-grant>



National Research Strategy for Water Reuse

EPA WRAP Action 7.2

WRF Project 5262: Developing a Coordinated National Research Strategy for Water Reuse

Principal Investigator: Eric Rosenblum

Project Objectives

- Develop an integrated national strategy for communication and prioritizing water reuse research that supports the needs of ongoing and planned reuse projects.
- Synthesize identified research needs from existing WRF reuse research and previously completed stakeholder engagements.
- Coordinate with key stakeholder groups to produce an accessible roadmap document for the water sector, including prioritized research needs across various water reuse applications and source water types.



March 2022 WateReuse Symposium WRF workshop:
Potable Reuse Research Needs



Join us for WRF's Reuse Workshop at the 2024 WateReuse Symposium on Monday, March 3 at 1:30 pm MT



National Priorities Grant: Unlocking the Nationwide Potential of Water Reuse, 2023-2026



PUBLIC HEALTH (Task A)

- Risk Assessment
- Risk Mitigation

- ✓ **Outbreak Readiness Response Plan**
- ✓ **Risk Assessment Tool for All Reuse Water Types**



DECISION-MAKING (Task D)

- Sustainability Assessment
- Pathways to Successful Adoption

- ✓ **Interactive Case Study Map**
- ✓ **Pathways to Adoption of Water Reuse Report**
- ✓ **Sustainable Implementation Characteristics Report**



TECHNOLOGY (Task B)

- Process & Performance Modeling
- Real-time Monitoring



- ✓ **Water Reuse Treatment Plant Model**
- ✓ **Real-Time Risk Mitigation Model**

COMMUNITY (Task C)

- Public Perception
- Community Engagement
- Mapping Water Reuse Potential



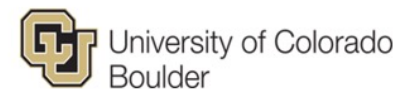
- ✓ **Compendium of Community Engagement Best Practices**
- ✓ **Index for Assessing Reuse Potential**

Co-PIs:

Karl Linden, University of Colorado Boulder

Eric Dickenson, Southern Nevada Water Authority

Tzahi Cath, Colorado School of Mines

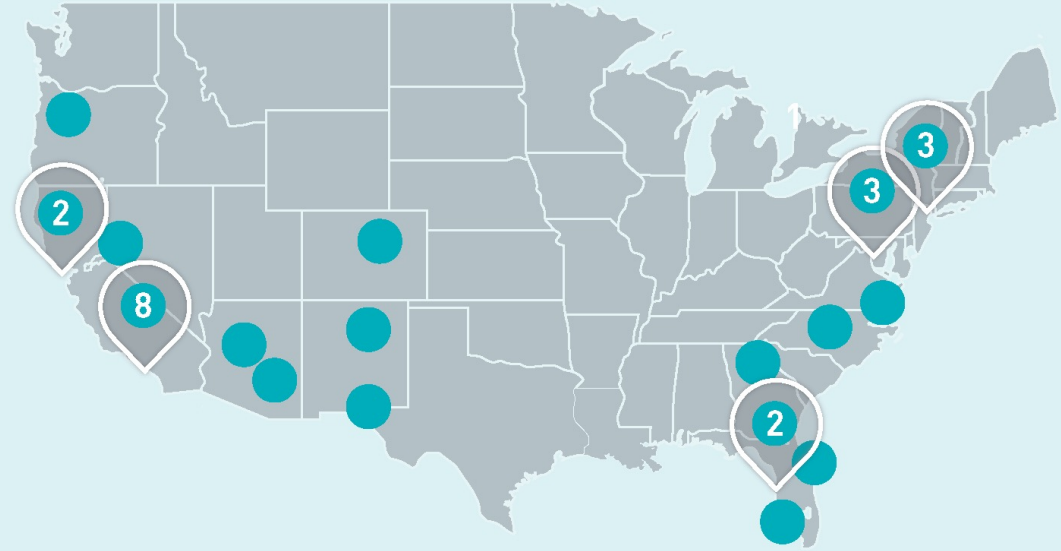


Collaborative engagement

UTILITY ENGAGEMENT

Part of our integrated research approach is partnering with local utilities for pilot demonstrations, case studies, and general project oversight. Our team is working with utilities with a diverse range of system sizes, geographic locations, and reuse applications.

ENGAGING
30 UTILITIES
REPRESENTING
12 STATES



PROJECT PARTNERS

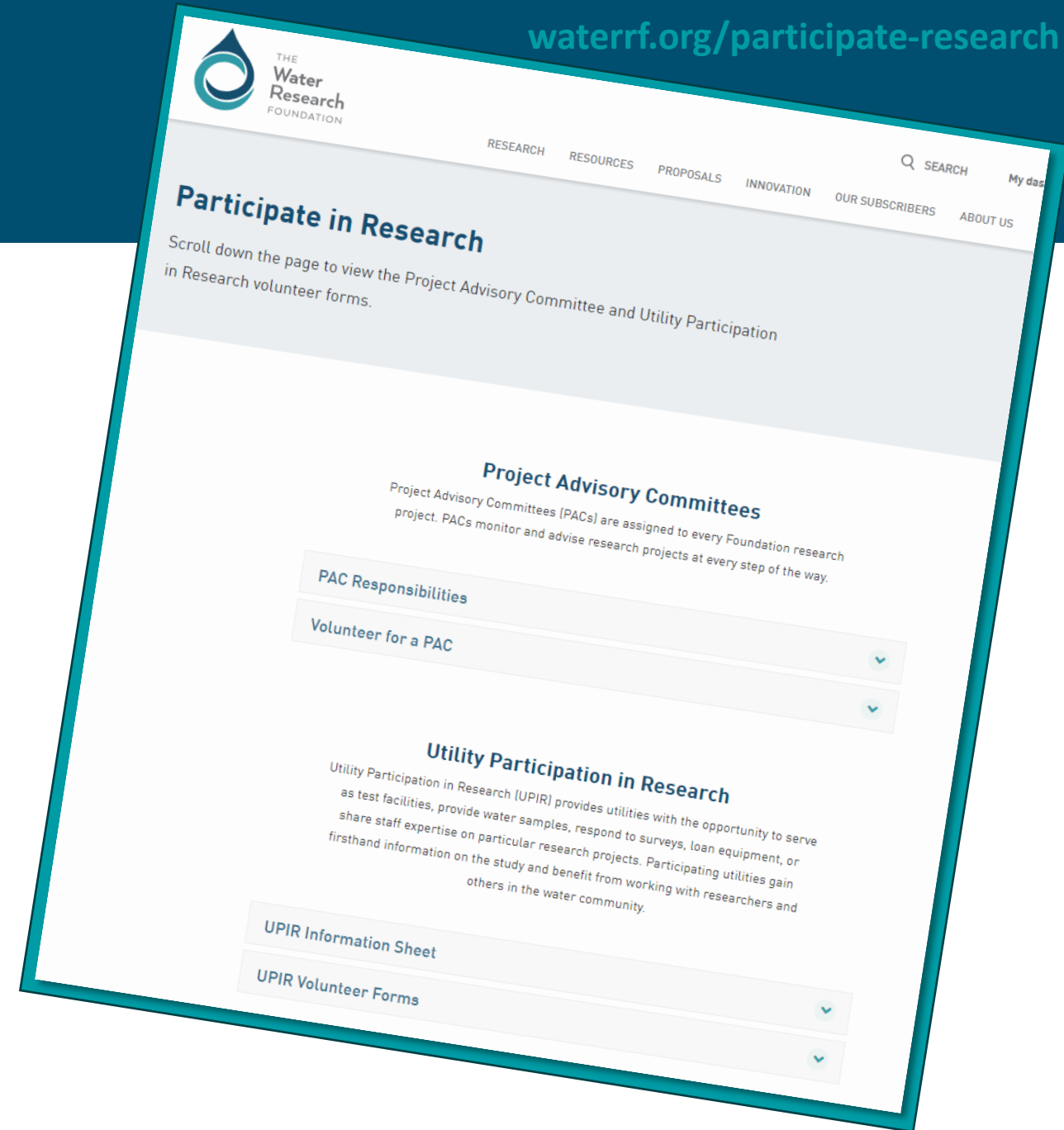




Where are we going next? It's up to you.

Upcoming Opportunities To Support WRF Research Planning & Projects

1. Volunteer to participate in WRF projects
2. Submit proposals to our open RFPs
3. Submit proposals to our Tailored Collaboration or Unsolicited Programs
4. Keep an eye out for WRF workshops at industry events





Additional WRF Resources



Get Involved in Research



- **Project Advisory Committees (PAC)**
- **Utility Participant in Research (UPIR)**
- **Research Planning Committees**

www.waterrf.org/participate-research



Upcoming & On-Demand Webcasts



SEARCH

BECOME A SUBSCRIBER

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RESEARCH RESOURCES PROPOSALS INNOVATION OUR SUBSCRIBERS ABOUT **WEBCASTS & EVENTS**

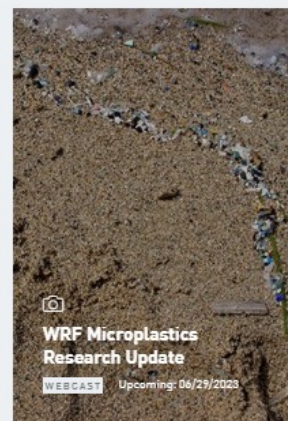
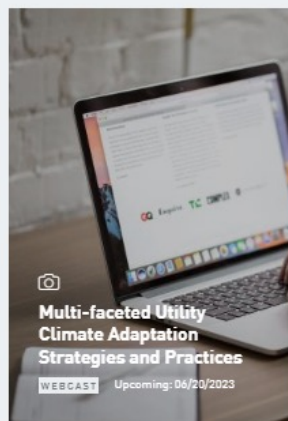
Webcasts & Events

WRF hosts and participates in events that focus on critical water issues. From webcasts to industry conferences, these events provide opportunities for you to learn about new research from our experts.



Webcasts

Visit the [webcast page](#) for more information about CEUs and to see the full list of webcasts.



www.waterrf.org/webcasts-events



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Paul L. Busch

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3. Scroll to the bottom of the page

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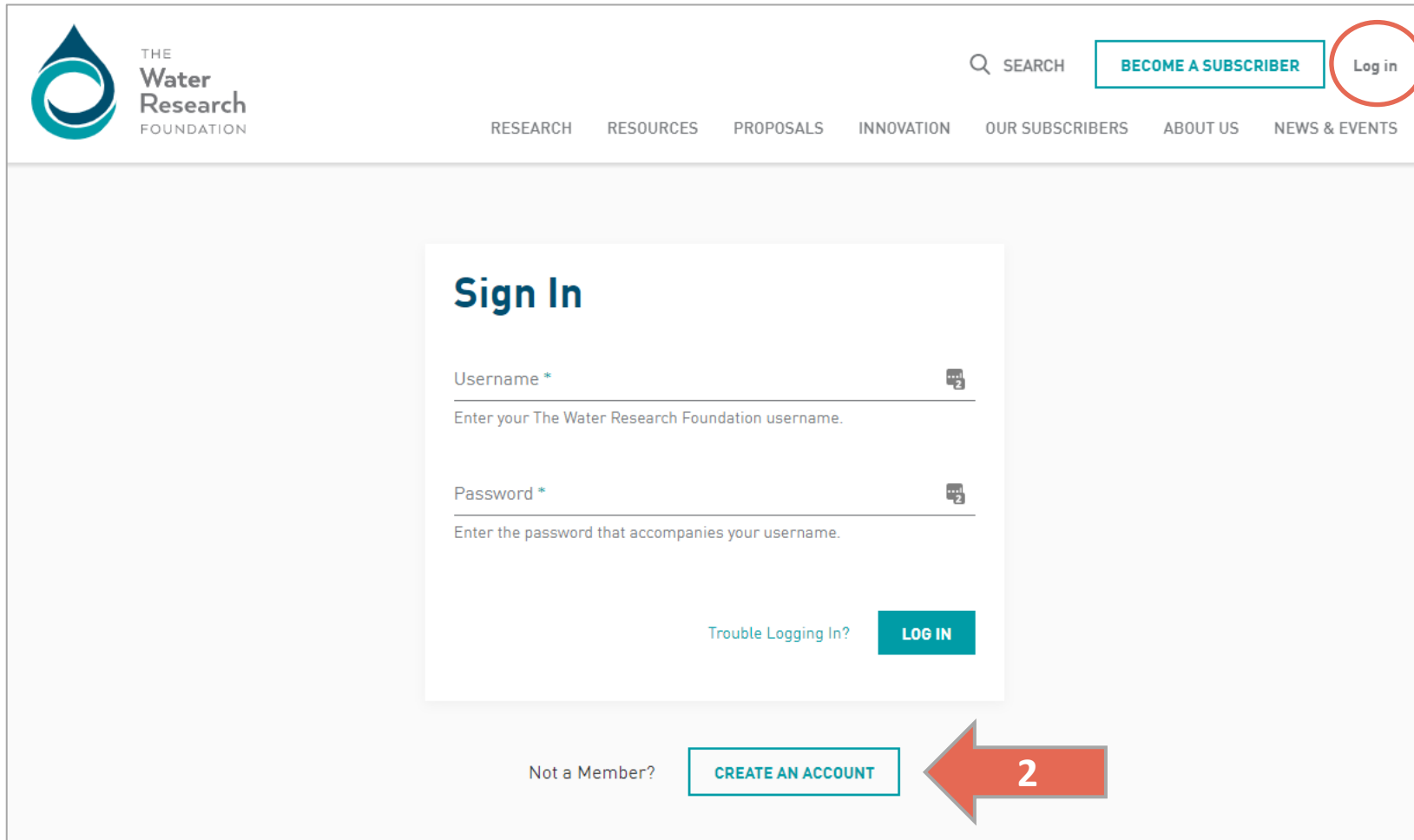


Last Name *

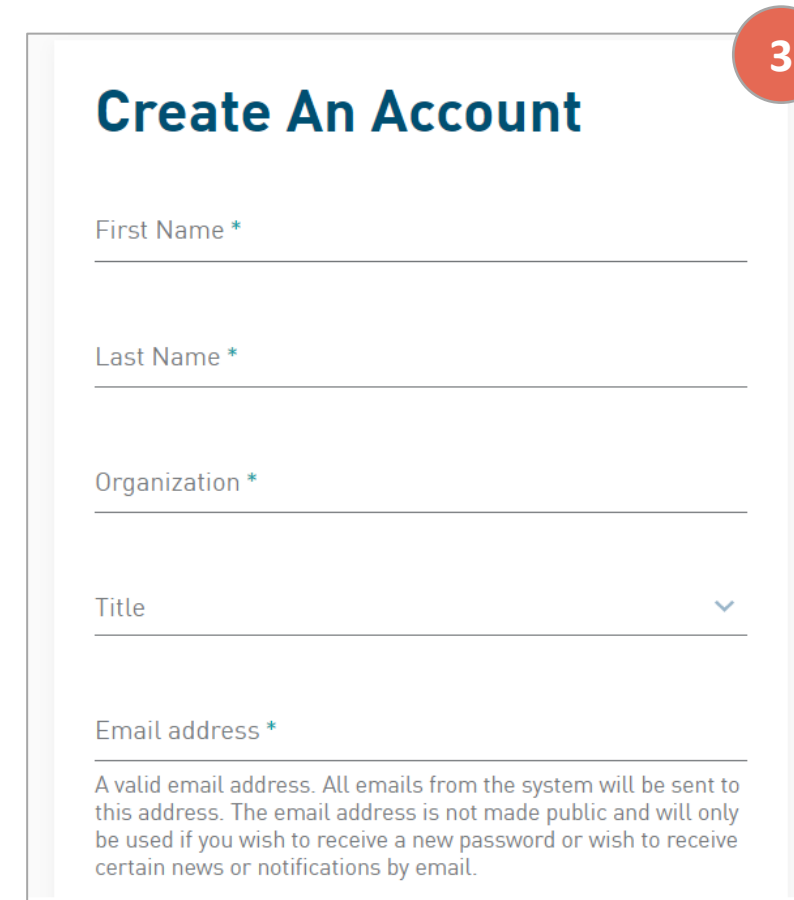
Email *



www.waterrf.org/enews



The screenshot shows the top navigation bar of the Water Research Foundation website. On the left is the logo with the text "THE Water Research FOUNDATION". To the right of the logo are navigation links: RESEARCH, RESOURCES, PROPOSALS, INNOVATION, OUR SUBSCRIBERS, ABOUT US, and NEWS & EVENTS. Further right are a search icon and the text "SEARCH", a "BECOME A SUBSCRIBER" button, and a "Log in" link circled in red with a red arrow labeled "1" pointing to it. Below the navigation bar is a "Sign In" form with fields for "Username *" and "Password *", each with a "show" icon. Below the password field is a "LOG IN" button and a "Trouble Logging In?" link. At the bottom of the form area, there is a "Not a Member?" link and a "CREATE AN ACCOUNT" button with a red arrow labeled "2" pointing to it.



The "Create An Account" form is shown on the right side of the page, with a red circle labeled "3" in the top right corner. The form title is "Create An Account". It contains the following fields: "First Name *", "Last Name *", "Organization *", "Title" (with a dropdown arrow), and "Email address *". Below the email address field is a note: "A valid email address. All emails from the system will be sent to this address. The email address is not made public and will only be used if you wish to receive a new password or wish to receive certain news or notifications by email."



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WaterResearch



The Water Research Foundation



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