



THE  
**Water  
Research**  
FOUNDATION



# 2019

ANNUAL REPORT



advancing the science of water<sup>®</sup>





# A Message to Our Subscribers

Our subscribers are the sustaining force of The Water Research Foundation (WRF). We are very proud of, and humbled by, the special relationships and trust we have built with our subscribers and partners across the globe.

Our commitment remains steadfast—we are diligently focused on unlocking opportunities for all of our subscribers by conducting world-class research to provide innovative solutions to the challenges you face today and those you anticipate for the future.

At the beginning of 2019, Dennis Doll became the Chair of the WRF Board of Directors, and Peter Grevatt joined WRF as our Chief Executive Officer. This new team provided a unique opportunity for us to strengthen WRF's relationships with our visionary board members, subscribers, and partners. Throughout the year we connected with our subscribers across the globe, and we were constantly inspired by their passionate commitment to excellence in protection of public health and the environment. Nothing is more important to us than meeting our subscribers' needs and understanding their priorities for WRF and their vision for the future of the water sector.

Our commitment to our subscribers is reflected throughout our 2019 strategic plan. Our strategic planning process was focused on how we could help make their vision for the future of the water sector a reality, and our dedication to them is woven throughout the plan. Our new strategic goals and objectives support our mission of advancing the science of water to improve the quality of life, and will allow us to continue to provide outstanding scientific and technical leadership to the water sector when it is needed most.

All of us at WRF are grateful for the opportunity to work with so many outstanding and diverse water professionals! Thank you for all you do to serve your communities. It is the work you do,

the services you provide to your customers, and the support you give to WRF that have allowed us to grow into the world's leading One Water research collaborative.



Dennis W. Doll  
Chair, Board of Directors



Peter Grevatt, PhD  
Chief Executive Officer



# Launching a New Subscriber Experience

In 2019, WRF released an exciting new website, providing a state-of-the-art platform that delivers the tools, resources, and research subscribers need to help move the water sector forward.

At the time of the 2018 merger, The Water Research Foundation operated using three legacy websites, [waterrf.org](http://waterrf.org), [werf.org](http://werf.org), and [werf.org/lift](http://werf.org/lift), each with a distinct site experience that made the content extraordinarily difficult to access. In 2019, WRF prioritized combining these three sites into one cohesive platform that would serve subscribers and the water community—delivering the research and innovation needed to address their most pressing water issues.

When conceiving this new website, the main goals were to improve subscriber value and the user experience and to increase WRF's visibility as the nation's leading water research organization—to create a space that showcases all of our best-in-class science WRF is known for and make it readily accessible to our subscribers.

The new and improved [waterrf.org](http://waterrf.org) site launched in August 2019, and features an easy-to-navigate platform and offers a host of advanced benefits.



The value that WRF has to the water sector as a whole is huge. I don't think we can actually put a price tag on it... We need that hub, we need that leader, to lead the projects and then make sure that they get done.

**Cathy Bailey**, Director, Greater Cincinnati Water Works Department

- **Enhanced Search** helps users quickly find the precise resources and information they need
- **Personalized Dashboard** allows users to follow topics and projects of interest
- **Topic Pages** serve as a hub for more than 75 research areas, highlighting projects, resources, events, and more
- **Upgraded Project Pages** offer subscribers more transparency into the impact of their investment and research results
- **Public Plus User Accounts** increase engagement, raising awareness of the value of WRF's research for a broader audience



The new home for One Water research:  
[www.waterrf.org](http://www.waterrf.org)



# Research Successes

Our focus is on delivering applied research and innovative processes and technologies that unlock opportunities for our subscribers, anchored in a comprehensive and competitive project selection process, proven quality control measures, and a nationally recognized expert review system.

WRF’s comprehensive One Water research strategy is grounded in five individual research programs, which provide flexible funding and partnership opportunities to advance water research and innovation. The research programs listed below provide unique opportunities for subscribers, partners, volunteers, and other stakeholders to address their research priorities, grow from interaction with the world’s top water leaders and innovators, and lend their expertise to further advance the science of water.

- **Research Priority Program:** A strategic research program broadly relevant to the water sector.
- **Tailored Collaboration:** A matching program that supports utility-specific/regional issues.
- **Emerging Opportunities:** A program to address emerging and time-critical issues, while also supporting partnership opportunities and add-ons to current projects.
- **Unsolicited Research:** Focuses on novel, transformative research.
- **Facilitated Research:** Utilizes WRF’s research management experience at cost to subscribers.

In 2019, WRF published nearly 70 research reports and funded numerous projects that continue to showcase our One Water research approach. These projects cover topics such as adaptive strategies for working in conditions of drought and climate change, integrated water resource planning, workforce development, agricultural use of recycled water, nutrient management, treatment, energy optimization, and many more. Here is a small sample of the projects completed by WRF in 2019.

*Evaluation and Recommendations for Functional Assessment of Stream Restoration for Water Quality Benefits in Urban Watersheds* (SIWM16R16/4838) summarizes the current science on factors limiting stream function in urban watersheds, and provides recommendations for improving stream assessment tools by incorporating watershed processes that control the functional potential of urban streams.

*Guidance on Implementing an Effective Water Loss Control Plan* (4695) builds on the basic approaches

for situational analysis and water loss control program planning described in AWWA M36 to provide utilities with cutting-edge techniques to evaluate their practices, fill data gaps, analyze trends in key performance indicators, develop a water loss control plan, and communicate the plan to stakeholders.

*Food Waste Co-Digestion at Water Resource Recovery Facilities: Business Case Analysis* (ENER19C17/4792) provides insight into successful business strategies water resource recovery facilities (WRRFs) have used to manage the risks of adopting co-digestion of food waste—including fats, oils, and grease; food manufacturing residuals; and food scraps—with wastewater solids to enhance recovery of biogas, soil amendments, and valuable nutrient products. The report presents a framework that can be used to develop long-term business strategies that WRRFs can use to advance their missions and long-term goals.

*Nutrient Removal Challenge Synthesis Report* (NUTR5R14g/4827g) summarizes findings from the

multi-year Nutrient Removal Challenge, which set out to develop credible scientific information about nutrients in the environment and their fate during treatment to address pressing needs of regulators and dischargers facing increasingly stringent nutrient limits. Research from the Challenge is documented in 44 reports, conducted by 36 principal investigators.

*Agricultural Use of Recycled Water: Impediments and Incentives* (Reuse-15-08/4775) examines a number of real and perceived impediments to agricultural reuse of water and discusses incentives for recycled water use that can help foster sustainable production of food crops in water-scarce urban areas, especially for children and disadvantaged communities. This

project will help to keep water recycling on the global agenda to address the increasing scarcity of reliable water supplies around the world.

WRF’s unique research programs allow us to work steadfastly to provide innovative solutions, methodologies, and technologies that address the most pressing needs for water in communities across the globe. Through our research and innovation programs, we work together with the global community to solve the largest water challenges to public health and the environment. In all of our activities, WRF remains committed to our subscribers and the communities that we all serve.

## A Snapshot of WRF’s 2019 Research Accomplishments

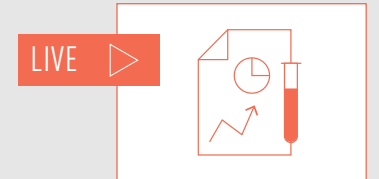
NEARLY  
**70**  
Research Reports  
Published



**40** TOTAL  
New Research Projects  
Funded This Year



**18**  
Webcasts  
Reaching Nearly  
6,000 Live Viewers



### Top 5 Webcasts of 2019 (By Number of Viewers)

- 1 Use of Flushing as a Corrective Action Under the Revised Total Coliform Rule
- 2 Processes Controlling the Development of Effective Lead Corrosion Control with Orthophosphate
- 3 Community-enabled Lifecycle Analysis of Stormwater Infrastructure Costs (CLASIC)
- 4 Managing Intracellular Cyanotoxin Release During Oxidation Processes in Drinking Water Treatment Plants
- 5 Phosphorus Recovery and Management



# 2019 LIFT Highlights

The Leaders Innovation Forum for Technology (LIFT) implemented in partnership with the Water Environment Federation (WEF) helps to accelerate the adoption of innovation in the water sector. LIFT is an interactive forum that supports collaboration, evaluation, and testing of new technologies and innovations.



## LIFT Link

The LIFT Link online platform reached a milestone in 2019 by averaging 500 users per month and continually growing to create more collaborative innovation opportunities. WRF began a new partnership with the Water Research Commission (WRC) in South Africa, serving as a LIFT Link hub. Hubs are international partners to LIFT that help connect water innovation interests, activities, and resources. WRF and WRC will collaborate on the identification of innovative technologies, data sharing and reporting, demonstrations, and communications. In September 2019, LIFT Link was featured in South Africa at WRC's Water Research Symposium.



## Intelligent Water Systems Challenge

LIFT organized the second annual Intelligent Water Systems Challenge (IWS Challenge) and the \$10,000 prize was awarded to a team from the City of Boulder, Colorado School of Mines, Baylor University, and Carollo Engineers. Their team focused on new approaches to removing nitrogen and phosphorus from wastewater to meet stringent regulatory limits, completing a side-by-side comparison of dissolved oxygen (DO) and ammonia-based control (ABAC) systems and using advanced statistical methods to assess process variability in response to various set points. The team's strategy demonstrated the functionality and superior process stability of ABAC compared with DO and created a new level of confidence in the application of statistical and data-driven process control approaches.



## SEE IT

The Scholarship Exchange Experience for Innovation and Technology (SEE IT) enables utility personnel to visit other utilities with innovations of interest and share their experiences with peers. In its third year, SEE IT awarded travel scholarships to 17 staff members from eight utilities to learn about new technologies and processes, as well as novel approaches to service, operations, and finance.



## LIFT Strategic Plan

The LIFT steering committee and staff commenced discussions to draft a new strategic plan for the LIFT program. The plan was finalized in 2020.

# 17

## SEE IT Travel Scholarships Awarded

to help water professionals learn about new processes and technologies



# 500

## LIFT Link Users Per Month

working together to create innovation opportunities



# 52

## Intelligent Water Systems Challenge Participants



The value of having the LIFT program is that we can quickly see what other utilities are working on, what technologies they've piloted, how those pilots have turned out, and how we can apply that to our utility to solve our challenges.

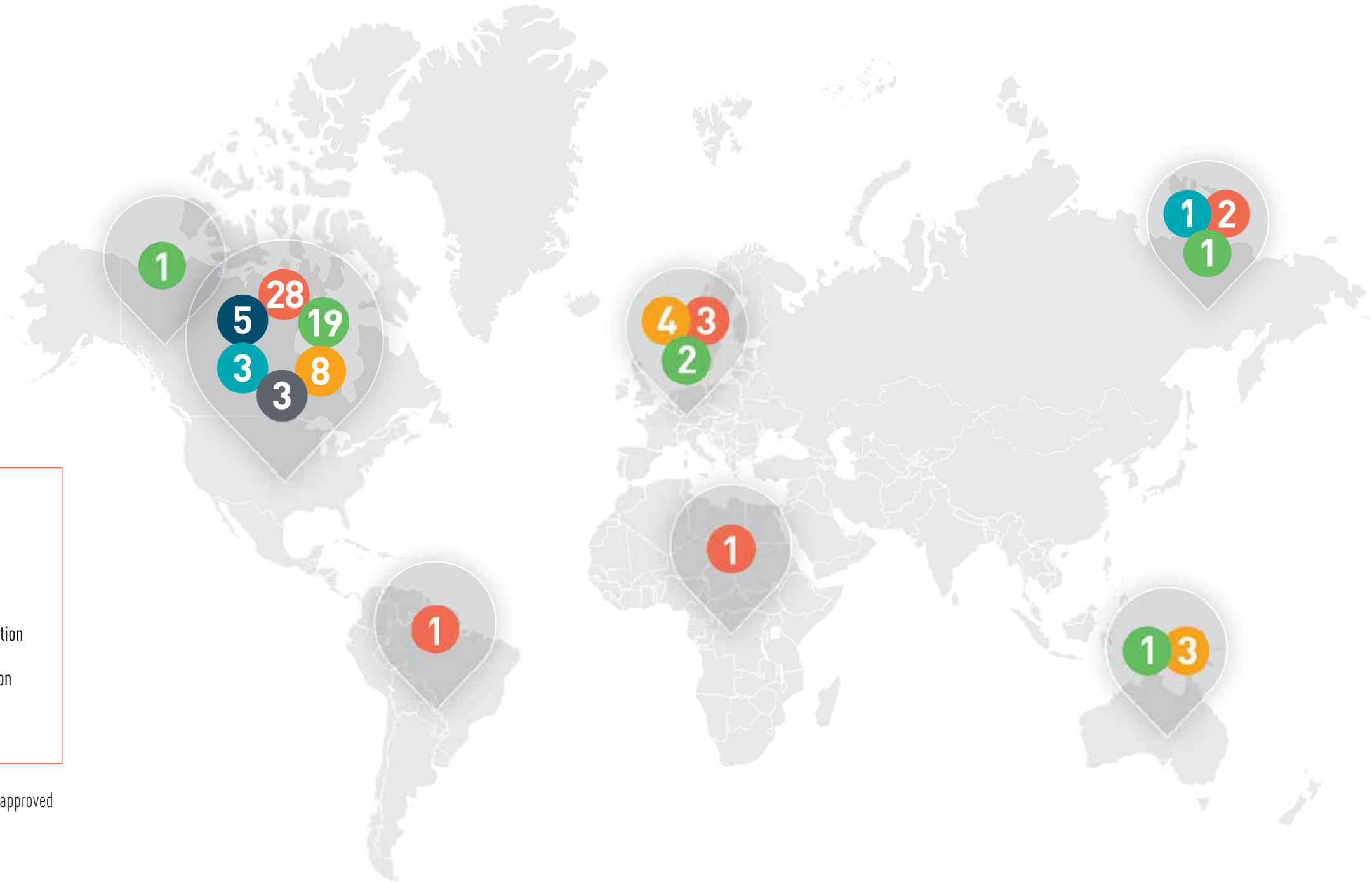
**Keith Tyson**, Director of Innovation and Research, Washington Suburban Sanitary Commission





# Strategic Global Partners

WRF has carefully curated partnerships that span the globe, building meaningful relationships that add value and resources. With more than 80 key partners around the world, we lead international efforts to facilitate independent, unbiased water research.



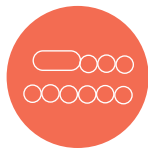
- Corporation
- Government
- Innovation Cluster
- Philanthropic Organization
- Professional Association
- Research Cooperative

This map includes all 52 board-approved research partners.



# Congressional Briefings

Legislators need access to the latest scientific information available from experts across the water sector as they seek to craft policy solutions that protect human health and the environment. To fulfill this need, in 2019 WRF hosted two Congressional briefings and dozens of Congressional educational meetings, providing the latest science surrounding cyanobacterial harmful algal blooms (cHABs) and per- and polyfluoroalkyl substances (PFAS) and numerous other topics. The briefings were livestreamed via Twitter, and the recordings are available on Periscope.



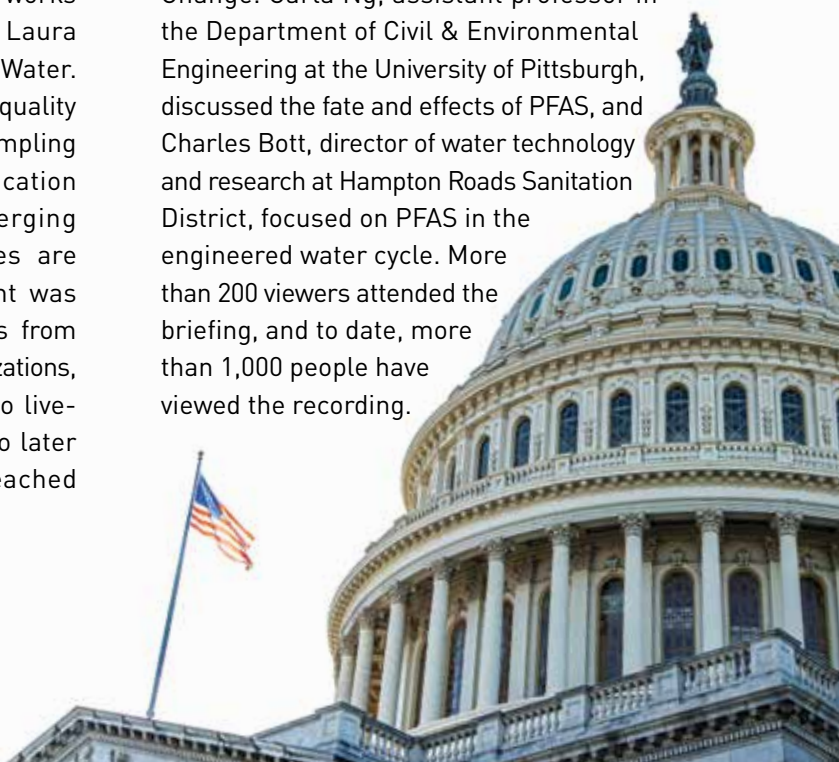
## Cyanobacteria

WRF chaired a cHABs Congressional briefing in June of 2019, focused on the threat cHABs pose to human health and the environment, as well as measures that can be taken to effectively manage algal blooms in the future. The briefing, sponsored by Ohio Representatives Marcy Kaptur and David Joyce, featured a diverse panel of speakers, including Frank Greenland, director of watershed programs at Northeast Ohio Regional Sewer District, Alex Margevicius, commissioner of Cleveland Water, Peter Fernandez, public works director for the City of Salem, OR, and Laura Weinrich, principal scientist at American Water. Speakers discussed algal growth and water quality issues resulting from excess nutrients, sampling and monitoring programs, public education and outreach, and efforts to pilot emerging treatment technologies to ensure utilities are well prepared for cHAB events. The event was attended by more than 60 representatives from federal agencies, utilities, water sector organizations, and Congress, as well as 250 viewers who live-streamed the event. Including viewers who later accessed the briefing, the webcast reached an audience of over 1000 people.



## Per- and Polyfluoroalkyl Substances

The PFAS Congressional briefing was held in September of 2019, and helped raise awareness of PFAS as constituents of emerging concern and showcased WRF's role in developing a scientifically sound, integrated water management approach to address PFAS. The briefing was sponsored by Representatives Paul Tonko (NY) and John Shimkus (IL), chair and ranking member, respectively, of the House Committee on Energy and Commerce Subcommittee on Environment and Climate Change. Carla Ng, assistant professor in the Department of Civil & Environmental Engineering at the University of Pittsburgh, discussed the fate and effects of PFAS, and Charles Bott, director of water technology and research at Hampton Roads Sanitation District, focused on PFAS in the engineered water cycle. More than 200 viewers attended the briefing, and to date, more than 1,000 people have viewed the recording.





# Awards

Each year WRF recognizes some of the most influential utility and research partners through several awards. WRF is proud to announce our 2019 award winners.

## Dr. Pankaj Parekh Research Innovation Award

The Dr. Pankaj Parekh Research Innovation Award was given to Dr. Karl Linden, Mortenson Professor in Sustainable Development at the University of Colorado Boulder. This award honors researchers and research teams who made significant contributions to advancing the science of water through WRF-sponsored research. Dr. Linden has served as a Principal Investigator on WRF research projects for over 20 years, including several significant ultraviolet (UV) disinfection-related projects. Most recently, he led a team that developed action spectra correction factors for UV inactivation of *Cryptosporidium* and other pathogens. Dr. Linden's research has led to breakthroughs in UV science and application, specifically mechanisms by which polychromatic UV sources can result in enhanced inactivation of viruses.

## Outstanding Subscriber Award for Applied Research

Three utilities were honored with the Outstanding Subscriber Award for Applied Research: San Francisco Public Utilities Commission (SFPUC),

Southern Nevada Water Authority (SNWA), and Tampa Bay Water (TBW). This award recognizes subscribing utilities that made notable improvements to their treatment, delivery, and/or management processes through the successful application of WRF research. All three of this year's award winners have been subscribers to The Water Research Foundation for more than 20 years, underscoring their long-term dedication and leadership in supporting WRF. Since that time, the winning utilities have participated in over 200 WRF projects in every capacity, including as participating utilities, Project Advisory Committee members, research partners, and Principal Investigators. SFPUC has made significant contributions to innovative research on direct potable reuse, including safety, blending requirements, and building-scale treatment and real-time performance monitoring. SNWA's research and development team collaborates with other utilities to explore research priorities for drinking water, reuse, and wastewater, and mentors post-doctoral students by placing them in leadership roles at utilities. TBW's commitment to applied research to support diversification of its water supplies has supported environmental recovery, and ensures a reliable supply of clean, safe drinking water for the Tampa Bay region, now and for future generations.



The Dr. Pankaj Parekh Research Innovation Award celebrates how innovative research serves the water industry and helps transform it. The award is for all the hard work and the little things that get done day to day to make research happens and to create new knowledge that will benefit the water industry.

**Karl Linden, PhD**, Mortenson Professor in Sustainable Development, University of Colorado Boulder



## Paul L. Busch Award

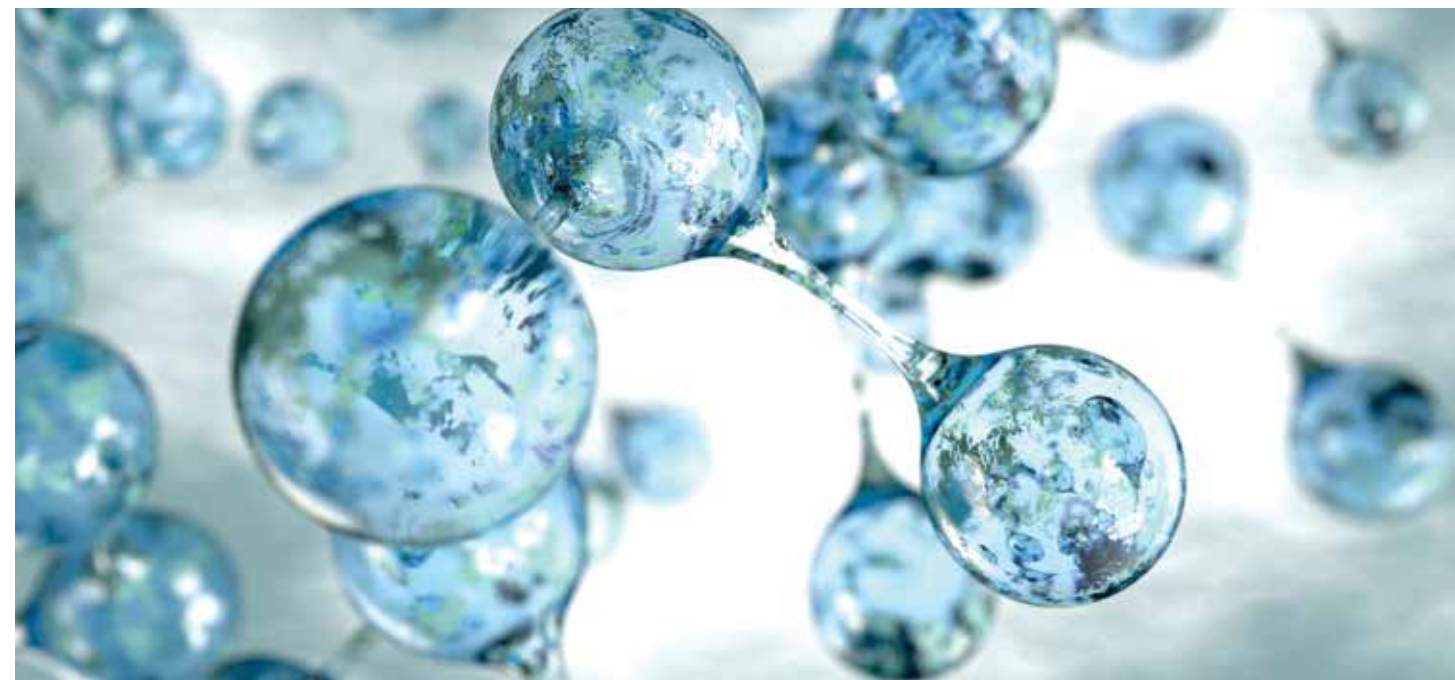
The 2019 Paul L. Busch Award recipient is Dr. Ameet Pinto, assistant professor in the Civil and Environmental Engineering Department at Northeastern University. The award recognizes an individual for innovative research, focusing on those who are successfully bridging research and its practical applications. With the \$100,000 prize, Dr. Pinto will develop a low-cost, real-time platform to characterize microbial communities in engineered water systems. The goal of this research is to make high-resolution microbial monitoring tools (i.e., miniaturized microscopy and portable DNA sequencing) accessible to all water utilities. The results could radically transform how the water sector measures, manages, and manipulates microbial communities—ultimately paving the way for safer, more sustainable water systems and the development of innovative biotechnology.

The Paul L. Busch Award is made possible through the Endowment for Innovation in Applied Water Quality Research. We sincerely thank the individuals who have supported the Endowment.



While the recognition for my research group's work feels good, what makes me feel better is that the Foundation sees value and impact for the water industry in the ideas that we are perceiving.

**Ameet Pinto**, Assistant Professor, Civil and Environmental Engineering, Northeastern University







# Volunteers

WRF is grateful for the support of our many volunteers who enable us to be a driving force to support other professionals, organizations, and communities. Our volunteers are the lifeblood of WRF and allow us to continue to develop research and tools that have a lasting impact on the water sector.

## Board of Directors

Members of our Board of Directors are WRF subscribers and leaders in the water community. Our Board provides leadership, strategic direction, policy setting, and operational oversight to ensure that our organizational goals are achieved, and resources are deployed wisely. For more information, contact Lucy Dickhoff at [ldickhoff@waterrf.org](mailto:ldickhoff@waterrf.org).

### Executive Committee



Dennis Doll (Chair)  
President and CEO,  
Middlesex Water Company



Michael Markus (Vice-Chair)  
General Manager,  
Orange County  
Water District



Paul Rush (Treasurer)  
Deputy Commissioner,  
New York City Dept. of  
Environmental Protection



Cathy Bailey  
(Member-at-Large)  
Director, Greater  
Cincinnati Water Works



Julie Hunt  
(Member-at-Large)  
Assistant Regional Manager,  
Trinity River Authority



Jim Lochhead  
(Member-at-Large)  
Manager/CEO,  
Denver Water



Douglas Owen  
(Member-at-Large)  
Program Manager,  
Stantec

Martin Adams  
Chief Operating Officer, Los Angeles  
Dept. of Water and Power

Hardeep Anand  
Deputy Director, Capital  
Improvement Program,  
Miami-Dade Water and  
Sewer Dept.

Jeanette Brown  
Research Assistant Professor,  
Manhattan College

Michael Carlin  
Deputy General Manager,  
San Francisco Public  
Utilities Commission

Julius Ciaccia, Jr.  
Trustee and Former CEO, Northeast  
Ohio Regional Sewer District

Alexander Coate  
General Manager, East Bay  
Municipal Utility District

Randy Conner  
Commissioner, Chicago Dept.  
of Water Management

Shayne Cunis  
Executive Programme Director  
for the Central Interceptor,  
Watercare Services Limited

Glen Daigger  
Professor, Department of Civil  
and Environmental Engineering,  
University of Michigan

Dominique Demessence,  
President, Environmental  
Services and Advanced Solutions,  
SUEZ North America

Lou Di Gironimo  
General Manager,  
Toronto Water

Scott Dyer  
Assistant Professor of Biology,  
LaTourneau University

John Entsminger  
General Manager, Las Vegas  
Valley Water District and Southern  
Nevada Water Authority

Ufuk Erdal  
Senior Vice-President and  
Water Reuse Technology  
Director, Arcadis

Jim Fiedler  
Jim Fiedler Consulting

Russell Ford  
Vice President & Global  
Solutions Director – Drinking  
Water & Reuse, Jacobs

Christopher Hill  
Market Technical Leader – Water,  
Mead & Hunt

Mark Knudson  
Chief Executive Officer, Tualatin  
Valley Water District

Jonathan Lanciani  
President and Chief Executive  
Officer, Sustainable Water, Inc.

Ron Lovan  
President/CEO, Northern  
Kentucky Water District

Ken Lykens  
Director of Water & Wastewater  
Operations, Centennial Water  
and Sanitation District

Walter Lynch  
Chief Operating Officer,  
American Water

Alex Margevicius  
Commissioner, Cleveland  
Water Department

Patricia Mulroy  
Climate Adaptation & Environmental  
Policy, Brookings Institution

Fred Nenninger  
Director, Policy Planning &  
Analysis, Liquid Waste  
Services, Metro Vancouver

Gary ReVoir  
Vice President, Tetra Tech

Kathryn Sorensen  
Director, City of Phoenix  
Water Services Dept.

Lisa Sparrow  
President & CEO, Corix

Brian Steglitz  
Manager, Water Treatment  
Services, Ann Arbor Water  
Utilities Dept.

John Stomp  
Chief Operating Officer,  
Albuquerque Bernalillo County  
Water Utility Authority

John Sullivan  
Chief Engineer, Boston Water  
and Sewer Commission

Diane Taniguchi-Dennis  
Chief Executive Officer,  
Clean Water Services

Robert Teegarden  
Water Policy & Research  
Officer, Orlando Utilities  
Commission

Eric Thornburg  
President & Chief Executive  
Officer, San Jose Water Group

Gilbert Trejo  
Chief Technical Officer –  
Technical Services Division  
El Paso Water Utilities

Rhodes Trussell  
Chief Executive Officer,  
Trussell Technologies, Inc.

Peter W. Tunnicliffe  
Executive Vice-President  
and President, International  
Unit, CDM Smith, Inc.

Cindy Wallis-Lage  
President, Water Business,  
Black & Veatch

Bart Weiss  
Director, Reclaimed Water and  
Discharge Elimination Division,  
Hillsborough County Public  
Utilities Dept.

## Research Advisory Council

The Board appoints the Research Advisory Council (RAC), which provides technical recommendations to the Board regarding the issues and challenges to be addressed under the Research Priority Program. The RAC is also responsible for selecting and funding those projects. For more information, contact John Albert at [jalbert@waterrf.org](mailto:jalbert@waterrf.org).



*(left to right)*

Pinar Balci  
*Assistant Commissioner,  
New York City Department of  
Environmental Protection*

Fred Nenninger  
*Director, Metro Vancouver*

Alex Margevicius  
*Commissioner, City of  
Cleveland Division of Water*

Donald Gray  
*Manager, Process Engineering,  
East Bay Municipal Utility District*

Mark Knudson (Co-Chair)  
*CEO, Tualatin Valley Water District*

Randy Conner  
*Commissioner, Chicago Dept.  
of Water Management*

Chance Lauderdale  
*Vice President, HDR, Inc.*

Rhodes Trussell (Co-Chair)  
*CEO, Trussell Technologies, Inc.*

Robert Teegarden  
*Water Policy and Research Officer,  
Orlando Utilities Commission*

Ron Lovan  
*President/CEO, Northern  
Kentucky Water District*

John Willis  
*Vice President, Brown & Caldwell*

Per Henrik Nielsen  
*VCS Denmark*

Phil Zahredine  
*Senior Technical Advisor, U.S. EPA*

Shahla Farahnak  
*Assistant Deputy Director, California  
State Water Resources Control Board*

*(not pictured)*

Cathy Bailey  
*Director, Greater Cincinnati Water Works*

Alexander Coate  
*General Manager, East Bay  
Municipal Utility Dist.*

Kyle Dreyfuss-Wells  
*CEO, Northeast Ohio  
Regional Sewer Dist.*

Yvonne Forrest  
*Deputy Director, City of Houston  
Water & Wastewater Utility*

Jim Pletl  
*Director, Water Quality,  
Hampton Roads Sanitation Dist.*

Phil Rolchigo  
*Vice President, Technology  
& Innovation, Pentair*

Martha Shimkin  
*Chief, Policy & Regulatory  
Services Branch, U.S. EPA*

Lisa Sparrow  
*President & CEO, Corix*

Art Umble  
*Global Wastewater Practice  
Leader, Stantec*

Whit Wheeler  
*Assistant Public Utilities Director,  
City of Raleigh Public Utilities*

Ken Williamson  
*Director, Regulatory Affairs,  
Clean Water Services*

## Tailored Collaborative Review Committee

The Board appoints the Tailored Collaboration Review Committee (TCRC). Members of the TCRC must be from utilities that are WRF subscribers. The TCRC is responsible for selecting and funding projects under the Tailored Collaboration Research Program, which addresses issues important to subscribers on a regional or national level. For more information, contact John Albert at [jalbert@waterrf.org](mailto:jalbert@waterrf.org).



*(left to right)*

John Albert (Staff Liaison)  
*Chief Research Officer,  
The Water Research Foundation*

Abhay Tadwalkar  
*Manager – Operations Efficiency,  
Toronto Water*

Joan Arthur  
*Asset Manager, Tulsa Metropolitan  
Utility Authority City of Tulsa  
Public Works*

Cheryl Norton (Chair)  
*President, New Jersey  
American Water*

Andrew Linard  
*Assistant Director of Water  
Engineering, Los Angeles  
Department of Water & Power*

Brenley McKenna (Staff Liaison)  
*Chief of Subscriber Services,  
The Water Research Foundation*

Kenan Ozekin (Staff Liaison)  
*Research Unit Leader,  
The Water Research Foundation*

*(not pictured)*

Colin Chapman  
*Innovation, Research, &  
Development Coordinator,  
Queensland Urban Utilities*

## Academic Council

The Board appoints the Academic Council (AC), which consists of representatives from the academic community. The AC advises the Board on the academic perspective on emerging topics and potential research areas; ways for WRF to better engage the academic community and potential partners; and also provides input on research programs, initiatives, and activities. AC feedback is also provided to the RAC to help inform the research agenda. For more information, contact John Albert at jalbert@waterrf.org.



*(front row)*

Daniel Van Abs  
*Associate Professor, Rutgers*

Michael Markus  
*General Manager, Orange  
County Water District*

*(back row)*

Charles Haas  
*LD Betz Professor of Environmental  
Engineering, Drexel University*

Carol Miller  
*Professor, Civil & Env. Engineering,  
Director, Healthy Urban Waters,  
Wayne State University*

Michael Stenstrom  
*Professor, Dept. of Civil and  
Environmental Engineering,  
University of California at Los Angeles*

*(not pictured)*

Nicholas Ashbolt  
*Professor, School of Public Health,  
University of Alberta*

Jorg Drewes  
*Chair Professor, Technical  
University of Munich*

David Stensel  
*Professor, Dept. of Civil &  
Environmental Engineering  
University of Washington*

Amy Childress  
*Professor, University of  
Southern California*

Richard Luthy  
*Professor, Dept. of Civil  
Engineering, Stanford University*

George Tchobanoglous  
*Professor, University of  
California at Davis*

Glen Daigger  
*Professor, Dept. of Civil and Env.  
Engineering, University of Michigan*

Robert Pitt  
*Cudworth, Professor of Urban Water  
Systems, University of Alabama*

Manuel Teodoro  
*Associate Professor, Texas  
A&M University*

Andrea Dietrich  
*Professor, Dept. of Civil & Env.  
Engineering, Virginia Polytechnic  
Institute & State University*

Sybil Sharvelle  
*Associate Professor,  
Engineering Research Center,  
Colorado State University*

## LIFT Steering Committee

The Leaders Innovation Forum for Technology (LIFT) Steering Committee is responsible for the development and implementation of goals and the strategic plan for LIFT, with the purpose of accelerating water technology demand and adoption and engaging the entire water sector in all phases of the innovation process. Members are appointed by the WRF Board of Directors and the WEF Board of Trustees.



Jim McQuarrie (Chair)  
*Chief Innovation Officer,  
Metro Wastewater  
Reclamation District (Denver)*



Erika Bailey (Vice-Chair)  
*Plant Process Engineer,  
City of Raleigh, NC*

John Arena  
*Business Outreach Manager,  
Metropolitan Water District  
of Southern California*

Charles Bott  
*Chief of Research and Development,  
Hampton Roads Sanitation District*

Paul Bowen  
*Director, Coca-Cola*

Colin Chapman  
(International Liaison)  
*Innovation Research and Development  
Manager, Queensland Urban Utilities*

Nancy Love  
*Professor, University of Michigan*

Sudhir Murthy  
*CEO, NEWhub Corp.*

Jeff Peeters  
*Senior Product Manager, SUEZ  
Water Technologies and Solutions*

Mark Poling  
*Business Operations Director,  
Clean Water Services*

Tanja Rauch-Williams  
*Senior Technologist,  
Carollo*

David Rexing  
*Water Quality Research  
and Development Manager,  
Southern Nevada Water  
Authority*

