Talking to Customers and Communities About PFAS

Katie Henderson, Allison Deines, Kenan Ozekin,
Jeff Moeller, Alice Fulmer, and Stefani McGregor

Key Takeaways

Scientific research on PFAS is ongoing, but risk communication guidance can be used by drinking water utilities to protect public health and establish trust with customers.

Risk communication strategies enable utilities to be timely, credible, and respectful in addressing customer concerns about PFAS risks from drinking water.

In an uncertain time, proactive messaging can ensure a water utility responds to customer inquiries about PFAS with empathy and transparency.

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Thanks to improvements in analytical methods over the past few decades, new compounds are being detected in our watersheds, but often we become aware that these compounds are present long before we understand their potential health effects. Communicating to customers about these unfamiliar compounds is an important responsibility, and often a significant challenge, for water and water resource recovery utilities. This is certainly the case today with per- and polyfluoroalkyl substances, or PFAS. Scientific and regulatory uncertainty around PFAS make speaking about them challenging, but proactive messaging ultimately benefits utilities and the customers they serve. Risk communication research conducted by The Water Research Foundation (WRF) has identified best practices that can be applied to utility messaging about PFAS.

PFAS Releases and Drinking Water Treatment

PFAS are a group of man-made compounds with unique chemical properties that make them resistant to heat, oil, grease, and water (CDC 2017). Unfortunately, these properties also make them very difficult to remove from the water cycle. PFAS are stable in the environment and can be transported over long distances, and many of them bioaccumulate.

> **The single biggest problem in communication is the illusion that it has taken place.**
> **—George Bernard Shaw**

Starting with nonstick coating in 1949 (Lindstrom et al. 2011), PFAS have been used in applications ranging from raincoats to polymers, but they're now also being found in soil, plants, and animals, including humans. Virtually all people living in the industrialized world have detectable levels of PFAS in their blood, and PFAS have been detected in wildlife, even in remote areas of the world (Giesy & Kannan 2001).

In animal studies, PFAS have been found to be toxic to the liver, immune system, endocrine system, and reproductive systems, as well as to developing fetuses. The Centers for Disease Control and Prevention's (CDC's) National Health and Nutrition Examination Survey and the C8 Health Study sampled nearly 70,000 people exposed to higher levels of perfluorooctanoic acid (PFOA, also known as C8) in Ohio and West Virginia. The study observed correlations between PFOA and elevated cholesterol and obesity, some forms of cancer, and immune suppression (Post et al. 2017, Barry et al. 2013). Conventional drinking water treatment does not remove these compounds (Boone et al. 2019), although they can be removed by granular activated carbon, ion exchange, and high-pressure membranes (USEPA 2018).

Many communities affected by releases of PFAS into the environment are concerned about the safety of their water supplies. In the United States, federal and state agencies are moving simultaneously to create regulations, so while PFAS are not federally regulated at the time of this writing, this may change in the future. In addition to regulatory uncertainty, removal of PFAS can be quite expensive. Coming up with feasible solutions to address PFAS will require utilities to cooperate with manufacturers and industry stakeholders, government agencies, advocacy organizations, and the public. Utilities that already have robust engagement programs and relationships with these organizations and partners will have an advantage as they tackle this issue.

Methods for Communication and Engagement

In addition to research on the health impacts of PFAS and mitigation strategies, WRF has published considerable research on how utilities can improve their customer communication and stakeholder engagement. Table 1 lists 10 WRF-published research reports that draw together results, including from other peer-reviewed literature, and compile findings from these studies that can be applied to the challenge of communicating about water quality and risk.

These research findings align with the CDC's Crisis and Emergency Risk Communication (CERC) framework (CDC 2019, Reynolds & Seeger 2005). The recommendations from WRF research are presented in the following six sections and based on the principles of CERC: be first, be right, be credible, express empathy, promote action, and show respect (summarized in Figure 1).

Be First

When hearing about a new risk, people's perceptions are often shaped by the first message they hear, regardless of the information source (Macpherson et al. 2015, Reynolds & Seeger 2005). If utilities wait to communicate about PFAS until it becomes a bigger issue, they cede any early advantage to information sources that could be

inaccurate or misleading. Research also shows that early exposure to messages has an inoculating effect against misleading or fearful messages later. Utilities should keep in mind that if they are not the first to communicate to customers about these issues, someone with a different agenda will frame the issues for them.

Communicating early and often about risks is the foundational principle upon which all other risk and crisis communication best practices are built (CDC 2019, Macpherson et al. 2015). Risk communication is an important part of a robust customer satisfaction program, which is one of the 10 attributes of an effectively managed utility (USEPA 2017) and should be embedded in a utility's community engagement program (Dean et al. 2016, Mobley et al. 2006).

Utilities should be transparent about the potential for PFAS in their source water or finished water and the risks that these compounds pose according to the most current research. Utilities should also communicate what they are doing to address those risks. However, utilities shouldn't reach out to their customers only when there's a problem. Communication and community engagement should be ongoing—these are how customers develop awareness of, and trust in, the utility, and past efforts and goodwill can provide a buffer in times of crisis (Kotsantonis et al. 2019), forestall conflict, and build confidence in the utility (Salveson et al. 2016, Reutten 2004).

Be Right

Use Accurate, Plain Language

WRF research has shown that customers want to be informed, and they want technical information about their water quality and infrastructure (Macpherson et al. 2015). While information needs to be easy to understand, customers do not want it to be "dumbed down." The balance point is "simple enough to understand, yet technically advanced enough to trust" (Macpherson & Slovic 2011).

Rundblad (2019) offers guidance on accurate but accessible ways to describe different constituents, how they get into the water, and any health effects of potential concern. The guidance provides suggested language for describing PFOA (see Table 2).

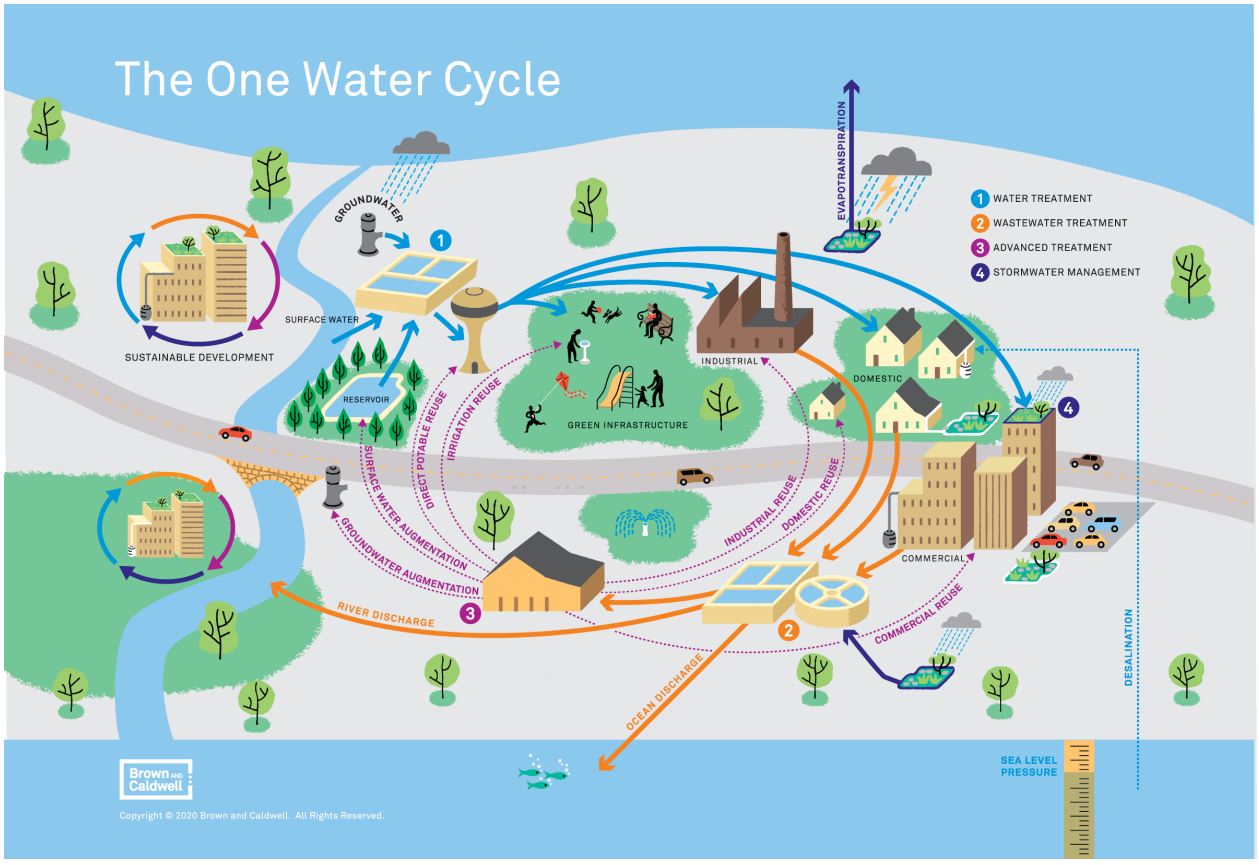
Water Research Foundation Reports on Water Quality and Risk Communication

Year Published	Report Title
2019	*Forging Powerful and Sustainable Relationships Between Clean Water Agencies and the Community* (Kotsantonis et al.)
2019	*Terminology Guidance for Water Professionals (or, What You Say is Not What People Hear)* (Rundblad)
2016	Public Communication, chapter 4 in *Guidelines for Engineered Storage for DPR* (Salveson et al.)
2015	*Model Communication Plans for Increasing Awareness and Fostering Acceptance of Direct Potable Reuse* (Millan et al.)
2015	*Core Messages for Chromium, Medicines, and Personal Care Products, NDMA, and VOCs* (Macpherson et al.)
2014	*Effective Climate Change Communication for Water Utilities* (Raucher et al.)
2013	*Consumer Perceptions and Attitudes Toward EDCs and PPCPs in Drinking Water* (Rundblad et al.)
2013	*Downstream: Context, Understanding, Acceptance—Effect of Prior Knowledge of Unplanned Potable Reuse on the Acceptance of Planned Potable Reuse* (Macpherson & Snyder)
2011	*Talking About Water: Vocabulary and Images That Support Informed Decisions About Water Recycling and Desalination* (Macpherson & Slovic)

DPR—direct potable reuse, EDCs—endocrine disrupting chemicals, NDMA—*N*-nitrosodimethylamine, PPCPs—pharmaceuticals and personal care products, VOCs—volatile organic compounds

Table 1

Brown and Caldwell One Water Cycle Graphic



Source: One Water Cycle graphic provided by Brown and Caldwell, © 2020 Brown and Caldwell. All rights reserved.

Figure 1

Carefully Choose Words That Convey the Appropriate Level of Risk

Words shape the way people think because they create feelings that affect attitudes and decisions. Water utilities often use terms that carry strong negative associations without providing the necessary context (Rundblad et al. 2013, Macpherson & Slovic 2011). The answer isn't to sugarcoat reality or avoid discussing an issue, but rather to be intentional about choosing language to match an emotional response to an appropriate level of risk.

Rundblad et al. (2013) found that certain common water industry terms are highly negative, especially terms that are poorly understood or highly technical. For example, the term "unregulated contaminants" is a common phrase in the water industry, but to people outside the industry, it has a very negative connotation. An equally accurate but less alarming phrase is "substances under study for future regulation."

The report *Terminology Guidance for Water Professionals (or, What You Say Is Not What People Hear)* (Rundblad 2019) describes how to refer to contaminants and amounts as well as how to talk about risk and safety. It also includes descriptions of 127 contaminants in easy-to-understand language; Table 3 contains an excerpt. Chapter 6 in *Talking About Water* (Macpherson & Slovic 2011) contains a glossary of common terms and definitions that utilities can use in their communications, especially for websites

How to Refer to PFOA

Contaminant	What is it?	How does it get into water?	Are there health effects?
Perfluorooctanoic acid (PFOA)	PFOA is a perfluoroalkyl carboxylate that is produced synthetically as a salt.	PFOA is resistant to decomposition. As a result, it is widely distributed and can be found in soil, air, and groundwater across the United States.	PFOA accumulates mainly in the serum, kidney, and liver. Studies on animals show potential developmental, reproductive, and systemic effects.

Source: Rundblad 2019

PFOA—perfluorooctanoic acid

Table 2

where definitions can be hyperlinked from a term; utilities developing messages around PFAS can refer to both guides for terminology help.

Provide Context

How we contextualize risk is as important as the specific words and phrases we use. It can be difficult to visualize differences between large figures, like millions and billions, so describing a risk as "one in a million" may lead to confusion and often overestimation of the risk. A more effective strategy is to reframe the risk in a nonprobabilistic way—for example, "You'd have to drink 8,000 glasses in a day in order for the water to make you sick" (Macpherson et al. 2015, Purchase & Slovic 1999).

Another way to properly contextualize risks is to improve customer understanding of the water cycle. Typical visual depictions of the water cycle that most people have seen since elementary school tend to leave out human

Terminology Guidance on Common Water Sector Terms

Terms	How are they understood?	What should you do when communicating with the public?
Contaminants of emerging concern Endocrine disrupting compounds Emerging contaminants Endocrine disruptors	These expressions contain several words that have very strong negative associations. There is nothing good or acceptable about these expressions to the general public, regardless of whether the public understands the science and risk behind them. In addition, these expressions are rarely used in the media, so the public may not even be familiar with them.	Avoid using these expressions. If you must use these terms, then you must make it clear it is a professional term and explain its relationships to terms that are likely to be more familiar to the reader. Example: *You might have read about things like hormones and certain medicines in the water supply having an effect on river wildlife and fish. In the water industry, these are sometimes referred to as endocrine-disrupting compounds.* Note that you should not persist in using these terms; in this case, it is better to talk about hormones. Please recall that hormones are naturally occurring, but there is nothing natural sounding about endocrine disruptors.

Source: Rundblad 2019

Table 3

Figure 2

impacts (Abbott et al. 2019). Improving people's understanding of the water cycle through visual communication tools helps contextualize and build support for water reuse (Macpherson & Snyder 2013, Macpherson & Slovic 2011). It may also provide context for understanding how chemicals like PFAS end up in our waterways. Paulson et al. (2017) developed a One Water Cycle diagram (Figure 2), which shows how water moves through an urban watershed, and a poster-sized file is available for download on the WRF website.

For those who seek technical details, utilities can provide context by describing the types of treatment systems they use. For example, Millan et al. (2015) found that describing the science and technology involved in advanced treatment effectively built support for direct potable reuse.

Be Credible

WRF research has shown that a region's customers typically believe that their utility is the entity most responsible for maintaining safe and clean water, and that their utility is a credible source of information (Macpherson et al. 2015, Raucher et al. 2014). Customers' trust in the media appears to be low by comparison. While there are vocal critics or skeptics of water utilities, they make up a very small minority (around 8%, according to Raucher et al. 2014).

Being a credible source of information is a great asset. For example, when discussing PFAS with customers, utilities might worry about a lack of credibility; according to WRF research, however, utilities are generally perceived as credible sources. This trust is a critical factor in effective risk communication, so building and maintaining the public's confidence is worth utilities' time and investment. Mistakes and bad news can spread quickly, but if utilities build trust with their customers through effective and ongoing communication beforehand, these relationships can provide a buffer during a crisis (Kotsantonis et al. 2019, Macpherson et al. 2015).

For example, research on building trust regarding potable reuse (Millan et al. 2015, Reutten 2004) has identified best practices for communicating about water quality, summarized in the following checklist (a more complete checklist can be found on the WRF website):

- **Step 1: Establish your water quality values.** Make sure you articulate the utility's values or commitments to water quality. Always connect your actions and decisions to your values when you communicate.
- **Step 2: Be the trusted source of information.** Don't let someone else communicate about important water quality issues before you do. Be

meaningful by describing the benefits of your decisions, actions, and investments.

- **Step 3: Be the trusted source of quality.** Regularly remind your audiences that it is your values, diligence, process management, and commitment to investment that create water quality, not the physical source of the water or regulations.

One way to understand credibility is in terms of the utility's brand, which is defined by the associations and values that its customers assign to the utility (Godin 2009, Reutten 2004). Communications experts talk about the ABCs of communication: assessment, branding, content, and strategy (Zavala 2019). Branding should be a core component of a utility's communications program; it is the process of aligning the utility's values and mission with how people view the utility. If a utility has spent decades trying to stay out of the public eye and avoid headlines, its brand will likely require earnest investment. A strong brand lends credibility to utility communications (Millan et al. 2015, Reutten 2004).

Work With Partners to Create Consistent Messages

Utility customers do not passively consume messages about PFAS and other risks. When they learn about a risk, most people actively seek out information through a variety of channels, and they are more likely to believe information when it is confirmed by multiple credible sources. Water and water resource recovery utilities should work with each other as well as with health departments and other agencies to make sure their messages around PFAS are consistent (Macpherson et al. 2015, Parkin et al. 2006). Millan et al. (2015) found that plant tours, face-to-face contact, and community advisory groups were effective ways of fostering relationships with community partners.

Advancing Collaborations for Water-Related Health Risk Communication (Parkin et al. 2006) provides drinking water utilities with a framework for developing ongoing relationships with local public health and medical communities. Following the steps outlined in the report can align communication messages and ensure coordination during a crisis.

Social Proof

One key finding from Kotsantonis et al. (2019) is that customers have positive feelings about utility actions if community members are consulted. This phenomenon is called *social proof* and describes how people respond to unfamiliar scenarios by assuming that their peers possess more knowledge about the situation. Utilities should consider seeking input from community members on how to address PFAS, and then give credit to these folks for their participation when communicating the final plans.

Express Empathy

One of the principles of the CERC framework is expressing empathy, noting that messages are more influential when they convey openness and empathy. Clearly explaining what is known and what isn't, outlining the scientific processes employed to develop the information, and validating the concerns of the audience are empathetic communication strategies. An empathetic message could be as simple as "We understand that it's alarming to hear that PFAS have been detected in our watershed. We are dedicated to providing you with safe drinking water. Here are the actions we are taking to learn more about and address the PFAS in our watershed."

Empathetic communication about PFAS makes connections to local values. Messages should be targeted or delivered to certain customers on the basis of their specific values and needs. Some utilities employ software that can use customer data to more easily develop personalized communications (Kotsantonis et al. 2019). Raucher et al. (2014) recommend a message mapping approach that explicitly identifies and segments different audiences and the key messages, actions, and communication channels appropriate for each one. Audience segments are groups that share certain qualities, like knowledge, concerns, or beliefs, that can be reached through similar communication channels. For example, if a utility is targeting communication to young families about the potential PFAS exposure risks to infants, the utility may consider working with pediatricians and hospitals to develop and share messages that will resonate, like handouts a family can receive during a doctor's visit. Social media applications like Nextdoor can be leveraged to provide targeted messages to certain neighborhoods.

Utilities that are new to this kind of approach to communicating with their customers may find it awkward. As one person interviewed in Kotsantonis et al. (2019) joked, "In the water industry, emotion is something that disappeared in engineering school." However, utilities are beginning to understand that empathetic communication more effectively informs and empowers their customers. As one utility leader put it, "You can't connect with people's heads until you have connected with their hearts" (Kotsantonis et al. 2019).

Promote Action

Whenever possible, messages should provide practical steps to mitigate exposure to PFAS. The degree to which

these steps are perceived as effective and feasible is a concept known as *efficacy* in the literature. In risk communication about PFAS, this means that if utility messages are too simplistic, too confusing, or fail to outline an actionable step, they won't be effective.

For PFAS, the most important type of efficacy is *system efficacy*, or the ability of the utility and its partners to protect consumers or mitigate impacts from PFAS (Macpherson et al. 2015). For this reason, messages on PFAS should focus on what the utility is already doing (like system monitoring and response) and planning to do (testing removal technologies, source tracking, or working with industrial sites nearby) to address PFAS.

Show Respect

Being respectful, open, and honest in utility communications to the public is critical. Transparency and honesty are crucial, and agencies should acknowledge when they do not have all the answers. More harm is done when officials try to avoid panic by withholding information or over-reassuring the public (CDC 2019, Millan et al. 2015). Respect for the utility's customers should be present throughout the process of developing and delivering communication messages.

Macpherson et al. (2015) developed the following recommendations for water utilities developing messages about water quality risks:

- Highlight the role of the local water utility.
- Provide technical/scientific information without using technical jargon/terms.
- Explain the regulatory process so people understand that the government and local utilities are actively and consistently pursuing the best science for future regulation.
- Present health-based guidelines/context for understanding the risk.
- Avoid words with strong negative associations (*contaminant*, *unknown*).
- Use words with strong positive associations (*safety*, *regulation*).
- Pay attention to message transference by providing a positive context message before specific messaging about risk.
- Describe the risk nonprobabilistically.
- Include "inoculation" messages that present counterarguments to common misperceptions.

Raucher et al. (2014) recommend a message mapping approach based on the communication strategies outlined by Vincent Covello from the Center for Risk Communication. A rule of thumb: people can only remember 27 words that are stated in nine seconds or fewer and contain three or fewer facts (Covello et al. 2011). Raucher (2014) includes a message mapping worksheet that helps users develop messages and tailor them to key audiences.

Macpherson et al. (2015) developed core message sheets on a several contaminants, including chromium, medicines and personal care products, *N*-nitrosodimethylamine, and volatile organic compounds. The core message sheets are structured in four parts: (1) a message about the water system, (2) information about the specific contaminant, (3) information about existing solutions, and (4) a recommended information source. WRF has developed a new core message sheet for PFAS, which can be downloaded from the WRF website (www.waterrf.org).

Breaking the Silence

PFAS are a critical concern for the water sector. A lot more still needs to be understood about this group of chemicals, and while developing additional science will take time, WRF is actively engaged in PFAS research on sources, impacts, and management and treatment alternatives. Water and wastewater utility customers have valid concerns about PFAS that deserve to be met with empathetic, transparent, and ethical communication. The research clearly recommends a proactive communication strategy. The water and wastewater utility sectors can no longer follow the model of the "silent utility." More than ever, utilities require the trust and goodwill of their customers to meet the challenges ahead, whether it's PFAS or deteriorating infrastructure. WRF will continue to provide research, outreach, and communications to assist utilities with successfully meeting these challenges.

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About the Authors

Katie Henderson is program manager with the US Water Alliance, Oakland, Calif.; khenderson@uswateralliance.org.

Allison Deines is senior policy analyst with Alexandria Renew Enterprises, Alexandria, Va.

Kenan Ozekin is research services unit leader with WRF, Denver.

Jeff Moeller is research services unit leader with WRF, Alexandria, Va.

Alice Fulmer is regional liaison–mid-Atlantic and southeastern US (Raleigh, N.C., office) with WRF, Denver.

Stefani McGregor was a research manager with WRF, Alexandria, Va., at the time of this article's preparation.

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AWWA Resources

- **How Should Water Professionals Talk About Tap Water? Burlingame G. 2018. *Opflow.* 44:12:6. https://doi.org/10.1002/opfl.1109**
- **Consider the Importance of Risk Communication. Elliott M, Villegas S. 2019. *Journal AWWA.* 111:12:64. https://doi.org/10.1002/awwa.1416**
- **The PFAS Problem: How Regulators Are Responding and What It Means for Drinking Water. Stewart A, Morales M, Zaleski J. 2019. *Journal AWWA.* 111:10:52. https://doi.org/10.1002/awwa.1380**
- **Develop Effective Communications About Emerging Contaminant Risks. Reekie L, Fulmer A. 2015. *Opflow*. 41:8:22. https://doi.org/10.5991/OPF.2015.41.0048**
- **Effective Risk Communication During a Crisis. Elliott M, Villegas S. 2020. *Journal AWWA.* 112:2: 76. https://doi.org/10.1002/awwa.1451**

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