



The **AQUIFER**

Educating people and inspiring action to ensure sustainable, clean groundwater for future generations.

Communicating Risk

How Do We Get the Reaction We Need?

by Cindy Kreifels,
The Groundwater Foundation



Communicating information about environmental risk to the people most affected by it can be a real challenge for water operators, community leaders, the media, etc. Changing human behavior is a truly difficult endeavor especially if you are trying to get people to change their behaviors before a true crisis occurs. In other words, you want them to be proactive.

Getting people to buy into an issue, change their behaviors, or actually act as a community to protect their drinking

water when there is no imminent threat can be next to impossible. However, that is just what many of us are working towards each day. So how can we best accomplish our mission?

Last week, during the Nebraska Wellhead Protection Network meeting, I had the opportunity to hear Steven Wolf, Community Engagement Director for JEO Consulting Group in Omaha speak to the topic of risk communication as a tool for wellhead protection awareness and outreach. Steve shared some great information which helped me to

understand that what people perceive is real to them. Our task is to help them understand a new reality.

Perception is real! When people perceive that there is a probability of them losing something of value, suddenly the risk is very personal and real to them. There are two different approaches to thinking about risk. The scientific community is interested in presenting information in an objective manner: quantitative, macro, and population based. The public looks at risk from a subjective, micro, and

► See *RISK*, p. 8

INSIDE...

2 This and That | **4** 11 Ways to Conserve Water During Summer Fun | **5** Corrosive Groundwater | **6** Creating an Inclusive Learning Environment | **7** Voices: Was It Kismet? | **9** Resource Library Now Online | **10** Test Yourself!



Nebraska MEDS Coalition

Medication Education for Disposal Strategies

Drug Take-back Program Gains Momentum

The Nebraska Medication Education for Disposal Strategies (MEDS) Coalition is a group of state and community partners dedicated to educating consumers about proper disposal of prescription and over-the-counter medications. The Coalition was formed in response to studies by the U.S. Geological Survey and others that found traces of pharmaceutical and personal care products in drinking water supplies across the United States. It advocates for public education and simple, cost-effective, year-round options for the safe and legal disposal of unused medications in all Nebraska communities.

Since 2012, the Nebraska MEDS Coalition has worked with pharmacies across the state to collect and properly dispose of leftover medications. Pharmacies participating in the Nebraska MEDS project accept leftover, unused, and expired medications to help divert pharmaceutical waste from

landfills and water sources by offering an alternative to flushing or trashing. Public health is protected through this project by removing medications from patients' homes as a potential source of poisoning and overdose.

Currently, 292 pharmacies across the state of Nebraska participate in the collection program, thanks to initial grants from the Nebraska Department of Environmental Quality and Nebraska Environmental Trust. Under Nebraska MEDS, pharmacies collected and returned 1,826 boxes and envelopes containing 15,814 pounds of unwanted medications between January and June 2016. The program collected more unwanted drugs throughout the first three months of 2016 than in all of 2015. Since the take-back project began in August 2012, 33,176 pounds of medications have been collected and properly disposed.

A grant from the Nebraska Environmental Trust will support collection containers, shipping, and disposal costs to expand statewide efforts to address collection of both non-controlled and controlled medications in 2016. A legislative appropriation

will fund the remainder of this project, including a robust marketing and educational program to reach as many residents of Nebraska as possible; to date, most advertising for the program has taken place by word-of-mouth.

Individuals and families are all likely to find a variety of unused, expired and unneeded medications in their homes. Any left-over medications should be disposed of properly for the following reasons:

- It is unsafe to reuse medications. If a person thinks a prescription medication is needed, they should contact a doctor.
- Unused medications are often ineffective because they have been kept past their expiration date or they have been stored improperly.
- Unused medications can make a person's home the target of burglary or theft by drug abusers.
- Unwanted medications can be found and ingested by children or pets, resulting in accidental poisoning.
- Unneeded or expired medications that are flushed down the drain can contaminate water supplies.

The Groundwater Foundation has been a member of the Nebraska MEDS Coalition since it formed in 2007. Other Coalition members include Dillon's House, Lincoln-Lancaster County Health Department, Lincoln Police Department, Lincoln Public School Nurses, LiveWise Coalition, Nebraska Department of Environmental Quality, Nebraska Department of Health and Human Services, Nebraska Pharmacists Association, Nebraska Regional Poison Control Center, Safe Kids Lincoln-Lancaster County, and WasteCap Nebraska.

The Nebraska MEDS Coalition's message is simple: take back your leftover, unused, and expired medications to a participating pharmacy today. Learn more about proper pharmaceutical disposal at www.leftovermeds.com. ♦

Program Offers Free In-Person Well Assessments

The Private Well Class recently developed a new private well assessment tool and is partnering with the Rural Community Assistance

Program (RCAP) staff to conduct free assessments for well owners. They are seeking additional well owners to participate in the program and have an in-person assessment completed at their well using the new tool.

The assessments are basically a vulnerability assessment, evaluating the well construction, geology, and nearby land use to provide the well owner with information and recommendations about what risks they might have, and what things they should be concerned about.

Well owners are often unaware of the possible causes of contamination to their water. Older wells may not be sealed properly near the surface or their source of water may be shallow and influenced by potential pollutant sources like feedlots, septic systems, and other land uses.

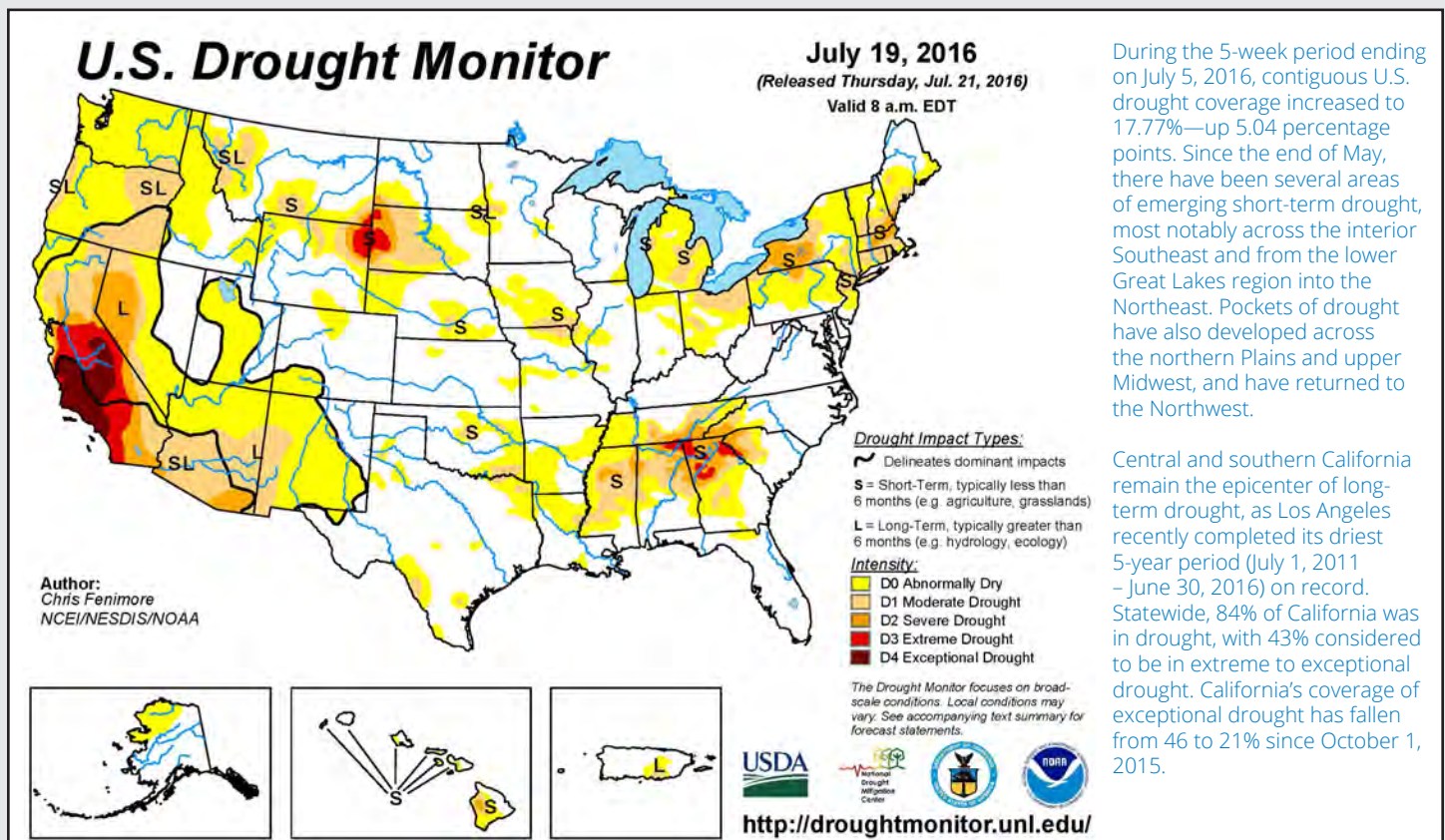
In partnership with an expert workgroup, the assessment tool was developed to provide a well owner with a comprehensive evaluation of the possible sources of contamination at or near their well. The tool is designed to be administered by water and environmental health professionals as a service to well owners. RCAP is currently working in roughly half of the states to complete 720 assessments by January 2017.

The assessment process will help a well owner understand the potential risks and vulnerabilities that might impact their drinking water. It considers site conditions, geology, land use practices, well construction, and maintenance to provide a well owner with a list of possible concerns, if any are found. Additionally, recommendations and best practices will be provided to help them keep their well and family safe from well contamination. RCAP staff will not be opening the well or sampling from the home's tap.

To nominate your well for an assessment, please send an email to Steve Wilson at sdwilson@illinois.edu with the following information (please note that the assessments are free, but may be limited to certain geographic areas; the Private Well Class will forward submissions to the appropriate RCAP region upon receipt):

Well Owner Name:
Well Owner Email:
Well Owner Phone:
Well Location:

The Private Well Class is happy to answer any questions potential participants may have prior to submitting a nomination. Contact them at 1-866-522-2681 or email info@privatewellclass.org. ♦



11 Ways to Conserve Water During Summer Fun

by Jennifer Wemhoff, The Groundwater Foundation



Kids are out of school and the heart of summer is upon us. The mercury is rising, and we're all looking for ways to beat the heat and stay cool.

Many times summer fun involves water, so try these 11 easy ways to conserve water.

1. If you want to beat the heat by running through the sprinkler, make it have a purpose! Periodically move the sprinkler around the lawn to give it all a good watering.

2. Position your sprinkler to water your garden or landscape while the kids splash and play.

3. Install a rain barrel on one of your home's downspouts. Let your kids paint and decorate it for a colorful, unique addition to your landscape.

4. If you're lucky enough to have a backyard pool, use a pool cover and keep the water cool to help reduce water lost to evaporation.

5. Stay cool by placing a wet cloth around your neck instead of using misters, where most of the water evaporates immediately.

6. Spend more time having fun and less time on yardwork - mow your grass less often and cut it longer. Less water

will evaporate from taller grass, and you'll save time and energy by mowing less.

7. On your family vacation, reuse your hotel towels throughout your stay to conserve water and save on detergent added to water.

9. Take the kids to the pool and skip the bath. Swimming counts as a bath during the summer, right?

10. Fill reusable water bottles instead of disposable plastic bottles during sporting events and summer road trips.



8. When eating out on your vacation, decline the frequent water refills if you don't plan to drink it for less water wasted down the drain.

11. Keep a pitcher of water in the fridge for a refreshing drink after fun in the sun.💧

Study Shows Potential for Corrosive Groundwater Across U.S.

USGS analysis of over 20,000 wells shows 25 states have groundwater that has potential to become corrosive

A new U.S. Geological Survey assessment of more than 20,000 wells nationwide shows that untreated groundwater in 25 states has a high prevalence of being potentially corrosive. The states with the largest percentage of wells with potentially corrosive groundwater are located primarily in the Northeast, the Southeast, and the Northwest.

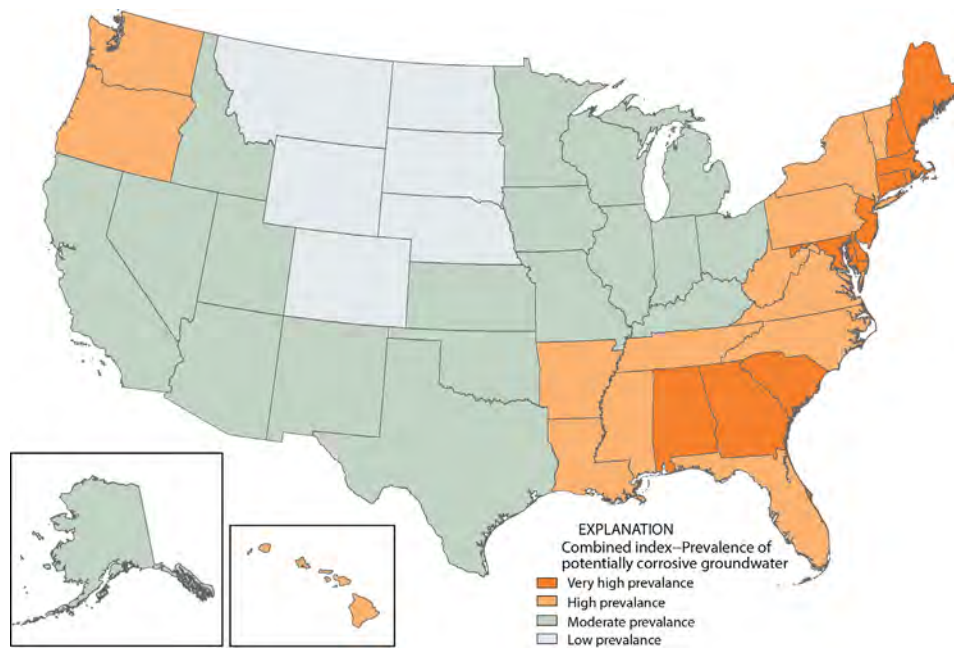
This report is unrelated to the drinking water problems experienced in Flint, Michigan. The problems in Flint were related to treated surface-water from the Flint River, whereas this report focuses on untreated groundwater nationwide.

Two indicators of potential corrosivity were combined to determine that corrosive groundwater occurs in all 50 states and the District of Columbia. Corrosive groundwater, if untreated, can dissolve lead and other metals from pipes and plumbing fixtures.

"The corrosivity of untreated groundwater is only one of several factors that may affect the quality of household drinking water at the tap," said Stephen Moulton II, chief, USGS National Water-Quality Program. "Nevertheless, it is an essential factor that should be carefully considered in testing for water quality in both public and private supplies nationwide."

Public water supplies are regulated by the U.S. EPA, but maintenance, testing and treatment of private water supplies are the sole responsibility of the homeowner. About 44 million people in the U.S. get their drinking water from private wells, yet surveys indicate many homeowners are unaware of some basic testing that should be done to help ensure safe drinking water in the home.

"Fortunately, in most areas of the country and with appropriate safeguards, the majority of homeowners can get good quality drinking water from private wells," said Moulton. "But this study is a good reminder that prudent, routine testing of the water, including its interaction with the water supply system, is an essential first step so homeowners and their families can confidently drink water from their faucets."



▲ Map showing the potential for groundwater corrosivity in wells in all 50 states.

Naturally corrosive water is not dangerous to consume by itself, however it can cause health-related problems by reacting with pipes and plumbing fixtures in homes. If plumbing materials contain lead or copper, these metals may be leached into the water supply by corrosive water. Signs of corrosive water causing leaching of metals may include bluish-green stains in sinks, metallic taste to water, and small leaks in plumbing fixtures.

Potential sources of lead in homes include lead pipes or fittings used in homes built prior to 1930; lead solder used in copper fittings in homes built prior to the late 1980s; "lead-free" brass components, which, in all states, except California, may have contained up to 8 percent lead, prior to 2014; galvanized steel that contained 0.5 to 1.4 percent lead, prior to 2014.

"USGS has consistently monitored the water quality of the Nation's groundwater for over three decades by analyzing representative water samples," said Moulton. "Recent public health and water quality issues underscore the responsibility for us

to report the possibility that regional geologic characteristics of groundwater could potentially affect household water systems resulting in significant implications for public health."

For concerns about potential health effects of household drinking water, the USGS looks to federal and state agencies to provide an indication of the potential scope of the problem.

The USGS report, "Assessing the Potential Corrosivity of U.S. Groundwater" can be found online at <https://pubs.er.usgs.gov/publication/sir20165092>.

Additional information on groundwater quality monitoring and modeling is available on the USGS National Water-Quality Assessment project website at <http://water.usgs.gov/nawqa/>. In addition, a new USGS online mapper (found at <http://nawqatrends.wim.usgs.gov/Decadal/>) provides a decadal look at groundwater quality.▲

Creating an Inclusive, Positive Learning Environment

Tools for Working With Students With Special Needs

by Jessica Wheeler, The Groundwater Foundation

Groundwater education is for everyone. Part of helping everyone understand groundwater's importance and what they can do is making education programs inclusive and part of an overall positive learning environment. This can prove challenging, particularly in working with special needs students and for those of us who are not trained classroom teachers.

In May, as part of a meeting of the Informal Educators Network, the Lincoln Public Schools' (LPS) Special Education Staff delivered a presentation on working with students with special needs.

The Groundwater Foundation is a member of the Informal Educators Network. This group is made of

of PBiS is to create a positive, inclusive environment that supports learning and good behavior.

The key principles of PBiS are that behavior is a form of communication, occurs in patterns, and has a function and purpose. Identifying what the student is trying to communicate is vital to determining how to best move forward in addressing their behavior. Using these principles and positive intervention strategies, educators can successfully address behavioral issues that occur in educational settings.

PBiS begins with a solid foundation of defined expectations that are clearly stated and taught to students. This includes clearly stating expectations both verbally and visually. Expectations are positive, short and memorable statements.

For example, common expectations at many Lincoln schools include be safe, be respectful, and be responsible.

Students are taught specifically what these expectations mean, see the expectations on posters in the hallway, and see them modeled by educators. It is important to acknowledge students when they are fulfilling expectations. This helps motivate students to continue making good decisions and creates a positive, supportive environment. Educators

can acknowledge appropriate behavior in a number of ways: verbally praising a student ("Great job!"), giving treats, stickers, etc. PBiS encourages using the 4:1 ratio, four positive remarks for every one negative remark about a student's behavior.

WHAT TO DO WHEN A STUDENT IS BEHAVING INAPPROPRIATELY

PBiS encourages educators to assess the environment or events and ask: "Have I established clear expectations? Have the expectations been thoroughly taught? Am I consistently using strategies to encourage desired

behavior?" These questions give the educator time to pause and consider how they are reacting to negative behavior, allowing for a more deliberate, thoughtful approach.

By using simple techniques like nonverbal gestures (sustained eye contact or a hand gesture), redirecting the student to another activity, providing options, or re-teaching the expectation, an educator can successfully help a student fulfill expectations and behave appropriately.

WORKING WITH STUDENTS WITH SPECIAL NEEDS

Intensifying universal supports like using visuals to define and teach expectations is a great way to help students with special needs. Using a visual schedule is also beneficial, it provides predictability, structure, and routine. Another strategy to support students with special needs is to acknowledge students fulfilling expectations more frequently and provide specific feedback ("I appreciate how you used walking feet in the hallway").

LPS Special Education staff reviewed common triggers for misbehavior:

- Task demands
- Being told "no"
- Quick transitions, unable to stop an activity before moving on
- Too many tasks/directions in a row
- Difficulty processing verbal directions

To respond to escalating behavior:

- Stay calm, monitor how other adults are responding, and avoid power struggles
- Remove the trigger
- Offer options
- Use wait time
- Use visuals

The LPS Special Education Staff provided the Informal Educators Network with the knowledge and skills to cultivate positive, inclusive environments for learning during our educational programming. Find out more about PBiS at <http://wp.lps.org/pbis/>. 💧



▲ Establishing clear expectations, using nonverbal gestures, redirecting students to another activity, providing options, or re-teaching the expectations are tools educators can use to maintain a positive learning environment.

organizations from around our hometown of Lincoln, Nebraska that are involved in youth education, including the Nebraska State History Museum, University of Nebraska State Museum, Lincoln Children's Museum, the Sheldon Art Museum, Nebraska Game and Parks, Pioneers Park Nature Center, and many others. This network provides opportunities for collaboration and professional development.

This session explored basic concepts of communication and behavior and then dove into the Positive Behavior Interventions and Supports (PBiS) approach to education. The overall goal

Was it Kismet?

The Impact of Groundwater Education

By Jamie Kelley, Naturalist, Pioneers Park Nature Center and Former Groundwater Foundation Program Manager

The Groundwater Foundation has seemed to weave in and out of my life since I was young. As a girl in elementary school, the first time I heard of The Groundwater Foundation, or anything about groundwater for that matter, was when my class was invited to attend the Children's Groundwater Festival. This was a special opportunity, not all classes got to go. It was like we had won the lottery. We arrived to school early that day to get on the bus and traveled to Grand Island. It was a big deal to be spending the day learning about groundwater.

Fast forward to my senior year of high school, I was doing a project for class. My partner and I wanted to find out about local groundwater issues so we interviewed Susan Seacrest, the founder and then president of The Groundwater Foundation. We met at her house and jotted down notes about the importance of motivating others to care for and about groundwater. Her enthusiasm for the cause was invigorating.

The next time The Groundwater Foundation crossed my path was in college. A small sign posted in my advisor, Bob Kuzelka's, office jumped out to me. The Groundwater Foundation

was looking for an intern. Was it fate that all those years ago I attended The Children's Groundwater Festival and then interviewed Susan for a class project in high school?

Four years of college flew by, interning at The Groundwater Foundation was a huge part of those years. My spring breaks were spent in Grand Island at The Children's Groundwater Festival, my summers were spent at The Groundwater Foundation office, and my senior thesis was focused on community asset mapping and behavior change, studying Groundwater Guardian Communities. As my college career came to an end, my time with The Groundwater Foundation was just beginning. After I graduated I was offered a full time job with The Groundwater Foundation. The fresh faced young college graduate excited about environmental education and about inspiring others to make a difference gladly accepted the opportunity to continue to work for a great organization.

I spent over 11 years working at The Groundwater Foundation and saw many times how the work being done made a difference. Was it a coincidence that The Groundwater Foundation impacted many lives, just like it had mine? An encounter with a young girl at the Outdoor Adventures in H2O summer camp is just one of these examples. On the first day of camp she arrived wearing a white sweater. We were puzzled by this, the camp's name pretty clearly explains that we will be outside, going on adventures. So we asked her if she had another shirt, something more comfortable for the hot June day. It was then that she told us that it was not her idea to come to camp, that she did not like nature, and that her mom signed her up. Although she didn't pretend to be enthused the

first day, she came back, and each day she was more adventurous, more willing to dig into the exploration activities. By the end of the week she was having a good time...success! But then camp was over and summer came to an end. You don't know what impact those days at camp might have on the young students. Maybe they raise their hand in science class to answer a groundwater related question, maybe they told a parent not to water the lawn as much to conserve groundwater. We usually don't know the impact. However, this camper's story continued on to the next year. The first day of camp, there she was, ready, looking forward to the adventures of the week, and not wearing white or a sweater. Not only was she prepared and enthusiastic about the week ahead but she had brought friends along and they too were eager for what was to come.

Her story, my story, maybe its kismet how our lives were changed because of our interaction with The Groundwater Foundation. Maybe enthusiasm is spread through groundwater... No, is not luck or fate or some magic in groundwater. It is a passionate founder, Susan Seacrest, it is successful projects, it is innovative ideas, it is a dedicated and committed staff, board members, and Groundwater Guardians. It is all of these reasons that The Groundwater Foundation reaches so many lives, impacts so many communities, and makes a difference throughout the nation. It was not kismet at all. It is The Groundwater Foundation.💧

ABOUT THE AUTHOR

After attending the Nebraska Children's Groundwater Festival as a 5th grader, then graduating from the University of Nebraska-Lincoln, Jamie Kelley served as a Program Assistant and Program Manager at The Groundwater Foundation. She is currently a Naturalist at the Pioneers Park Nature Center in Lincoln, Nebraska. She can be reached at jkelly@lincoln.ne.gov or 402-441-8708.



◀ Jamie Kelley poses with a camper during the Outdoor Adventures in H2O Summer Day Camp. The camp provided five days of hands-on groundwater education and field trips focused around groundwater.

JOIN OR RENEW! WWW.GROUNDWATER.ORG/ACTION/MEMBER.HTML

individual basis. Recognizing this difference will help you to consider how the information you present will be perceived by the audience.

As Theodore Roosevelt once said “People don’t care what you know until they know you care.” This statement is paramount to risk communication. There must be a “we’re all in this together” mentality. You have to develop trust and credibility with your audience. You must first deal with the perceptions of risk before the audience will be able to deal with the facts. Some of the barriers to risk communication include: risk (threat) perception, mental noise, negative dominance, and trust determination. Figure 1 provides the barrier/theory, the effect, and the solution to dealing with each.

Steve shared three main reasons to use risk communication techniques. These include:

1. To create an environment based on trust and credibility that persuades the audience to follow best scientific information.
2. To produce an informed audience; giving them enough information that they can make better and more informed decisions.
3. To involve the audience in the process.

Because a level of trust and credibility are essential to this process, it is important to determine who will make the best messenger. Who can deliver the message in such a way that it will be well received? Consider the following: expertise does not equal communication skill; preparation is paramount; nonverbal communication also makes the messenger; and, be honest with yourselves and select the messenger wisely. Also be sure to include those in the community who are trusted and well-respected. Once they buy in, others will follow.

SEVEN CARDINAL RULES OF RISK COMMUNICATION:

1. Accept and involve the public as a legitimate partner.
2. Plan carefully and evaluate efforts.
3. Listen to the public’s specific concerns.
4. Be honest, frank, and open.
5. Coordinate and collaborate with other credible sources.
6. Meet the needs of the media.
7. Speak clearly and with compassion.



The importance of nonverbal communication in determining trust cannot be overstated. Nonverbal will override verbal communication everytime! Nonverbal communication – graphics, charts, pictures, etc. – should provide 50 to 75 percent of your message content. These pieces are what grab the audience’s attention and help to get everyone on the same page. The important thing is to be sure the information contained within these nonverbal pieces is interpreted correctly. If something can be interpreted incorrectly, it will be, so test your messages with someone before going public. Make sure what you think you are saying is what the reader is seeing/ understanding.

You can control most communication environments. Be sure to involve community leaders and opinion leaders throughout the process. Identify solutions and not just problems. And, speak with one voice and show a common picture to all.

Finally as Steve reminded us “We are all part of the problem, we must all be part of the solution. All of us are in this together.”

ADDITIONAL TRAINING

The Groundwater Foundation is gauging interest in additional training on the topic of risk communication, such as a one or two-day workshop.

The training would provide in-depth information for water operators, city/town council members, resource managers, and other community representatives to:

- Understand the effectiveness of this science-based approach to communicate complex technical information on emotionally charged issues to lay audiences
- Identify strategies for more effective advocacy for your program, policies and operations
- Demonstrate best management practices for public meetings and answering tough questions
- Help develop models for key messages for public information materials and news media relations

Please contact Cindy Kreifels at ckreifels@groundwater.org if you are interested in additional training, or if you have questions or suggestions.💧

RISK COMMUNICATION SUMMARY

Theory	Effect	Solution
Mental noise	Blocks communication	Use clear, concise messages and active listening
Trust determination	Enhances or detracts from message	Show that you care
Risk (threat) perception	Frustration and outrage	Recognize and respond to RP factors
Negative dominance	Distorts communication	Develop positive messages

◀Figure 1

Resource Library

Now Online

Searchable Library Features Activity Guides, Curricula, and More

The Groundwater Foundation is excited to announce the availability of a new tool for groundwater educators: an online resource library.

Found on The Groundwater Foundation's website at www.groundwater.org/resources-for-educators.html, the resource library puts nearly 70 educational resources in one easy-to-access place.

The library includes a variety of high quality, easy to use groundwater education activities to use in the classroom, extracurricular activities, and beyond. The library makes them available in a searchable, online format, allowing educators to search for an activity or other tool that suits their particular needs.


The library includes activities with complete instructions and supply lists; tools like educational apps, curricula, activity sheets (coloring sheets, word searches, etc.) and other resources.

The search function allows educators to search by a number of criteria, including:

- Age
- Key topics (i.e. aquifer, groundwater, recharge, etc.)
- Activity duration
- Category (hands-on, arts and crafts, messy, outdoor, etc.)

Users can also search by an activity directly by name, such as "Aquifer in a Cup."

Results display an image of the activity in action, the activity name, a description and link to how-to video (if available), and a link to additional details and to download the instructions.

Support for the development and launch of the online resource library provided by the National Academy of Sciences and Nebraska Environmental Trust. 

Resources for Educators

Select as many of the filters that apply, or click "View All" for a complete list of activities and resources.

[Search Form](#) [View All](#)

Activity Name

Age

- ☐ Grades K-1
- ☐ Grades 2-3
- ☐ Grades 4-5
- ☐ Grades 6-8
- ☐ Grades 9-10
- ☐ Grades 11-12
- ☐ Adults

Key Topics

- ☐ Aquifer
- ☐ Climate and weather
- ☐ Contamination/pollution prevention
- ☐ Earth science/geology
- ☐ Groundwater
- ☐ Human health
- ☐ Irrigation
- ☐ Recharge
- ☐ Recycle
- ☐ Runoff
- ☐ Scientific method
- ☐ Surface water
- ☐ Water availability/water use
- ☐ Water conservation
- ☐ Water cycle

- ☐ Water management
- ☐ Water quality
- ☐ Wells
- ☐ Wildlife

Duration

- ☐ ≤ 30 minutes
- ☐ ≤ 1 hour
- ☐ Multiple sessions

Category

- ☐ Arts and crafts
- ☐ Critical thinking/problem solving
- ☐ Educational apps
- ☐ Festival materials
- ☐ Girl scouts
- ☐ Guides & Curriculum
- ☐ Hands-on
- ☐ Indoor
- ☐ Investigation
- ☐ Make and take
- ☐ Messy


Resources for Educators

Select as many of the filters that apply, or click "View All" for a complete list of activities and resources.

[Search Form](#) [View All](#) [Reset Results](#)

Search Activity Name

Displaying 1 to 8 of 8 items

Image	Activity Name	Description	Details
	Growing with Groundwater	Learn about the water cycle and the importance of groundwater in growing plants. Take a sneak peak of this activity here.	Details
	Edible Aquifers	Follow the recipe to make an edible aquifer model! Watch a how-to video.	Details
	Aquifer in a Cup	Create a mini aquifer model in a cup! Watch a how-to video.	Details

Aquifer in a Cup

www.groundwater.org

What is groundwater?

Groundwater is the water we drink and the water that grows our food. It is found underground in the cracks and spaces between sand and soil. These underground formations are called aquifers.

Key Topic: Aquifer, Groundwaters, Recharge

Grade Level: This activity can be adapted for many age groups and settings.

Duration: 15 - 20 Minutes

Objectives:

Learn groundwater concepts by building a model aquifer. It's sometimes easier to understand groundwater if you can "see" it.

Activity Steps:

1. Start by filling a clear cup with sand/gravel.
2. Add water. Fill the cup until half of the sand/gravel is saturated. Where did the water go?
3. The water filled in the spaces between the particles of sand/gravel. This represents groundwater. It is stored in formations called aquifers.
4. Look closely at the line created by the water. This line is called the water table. The area below the water table is called the saturated zone. The unsaturated zone is above the water table.
5. Add more water. Pretend the water is rain from a storm cloud. Why is the water table? The groundwater supply has been recharged. This is what happens when it rains (soaks into the ground).
6. Continue to fill the cup with water until the water covers the gravel surface water. It includes rivers, lakes, and oceans.


For More Fun:

- Use a clean soap or latex pump to simulate a well. Pump groundwater.
- Discuss the effects pumping has on groundwater.



Resources for Educators

Select as many of the filters that apply, or click "View All" for a complete list of activities and resources.

Activity Name	Aquifer in a Cup
Description	Create a mini aquifer model in a cup! Watch a how-to video .
Key Topics	Aquifer, Groundwater, Recharge.
Duration	≤ 30 minutes.
Category	Girl scouts, Hands-on, Indoor, Make and take, Outdoor.
Links	Instructions
Image	

[View All](#)



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The Groundwater Foundation
3201 Pioneers Blvd. Suite 105
Lincoln, NE 68502
Phone: 402-434-2740
Email: info@groundwater.org
Web: www.groundwater.org

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AQUIFER STAFF

Editor and design:

Jennifer Wemhoff

jwemhoff@groundwater.org

Editorial Contributors:

Jane Griffin, Cindy Kreifels

GROUNDWATER FOUNDATION STAFF

Jane Griffin, President

Cindy Kreifels, Executive Vice President

Lori Davison, Customer Account Manager

Doug Sams, Accountant

Jennifer Wemhoff, Program

Communications Manager

Jessica Wheeler, Program Manager

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Test Yourself!

Round 3

Of all the water on Earth that's useable by humans, how much is stored as groundwater?

- A. 25%
- B. 46%
- C. 82%
- D. 98%

How much water does the average person need per day to survive in a moderate climate?

- A. .5 gallons
- B. 1.3 gallons
- C. 3.5 gallons
- D. 5 gallons

True or false?

A person can live about a month without food, but only about a day without water.

The largest use of household water is:

- A. Taking baths
- B. Washing dishes
- C. Flushing toilets
- D. Cooking

True or false?

Nearly 3/4 of the water that comes in our homes goes down the drain.

A/an _____ layer is a layer of material, such as clay, in an aquifer through which water does not pass.

- A. Permeable
- B. Impermeable
- C. Porous
- D. Groundwater

True or false?

Groundwater is not part of the hydrologic cycle.

The _____ is the top of the zone of saturation; it is the level below which soil and rock are saturated with water.

- A. Water level
- B. Water table
- C. Water top
- D. Water line

True or false?

The age of groundwater can vary from less than a day to tens of thousands of years.

Water is called the universal solvent because it _____ more substances than any other liquid.

- A. Cleans
- B. Passes through
- C. Freezes
- D. Dissolves

True or false?

A watershed is the land area from which surface runoff drains into a stream, lake, or other body of water.

If spread across the entire U.S., the groundwater in the Ogallala Aquifer would cover all 50 states with how much water?

- A. 10 inches
- B. 1.5 feet
- C. 5 feet
- D. 10 feet

Water makes up what percentage of a single ear of corn?

- A. 40%
- B. 60%
- C. 70%
- D. 80%

For answers to these and to find other fun facts, visit our website at www.groundwater.org/get-informed/facts.html, like us on Facebook, follow us on Twitter, or download the free Water1der app on the App Store!

Answers: Column 1 - D, B, B, False, C, True, B, False, Column 2 - B, True, D, True, B, D