



Talk Nerdy to Me

Making Science Speak 'Human'

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- Paula Middlebrooks, Environmental Consultant, TDEC
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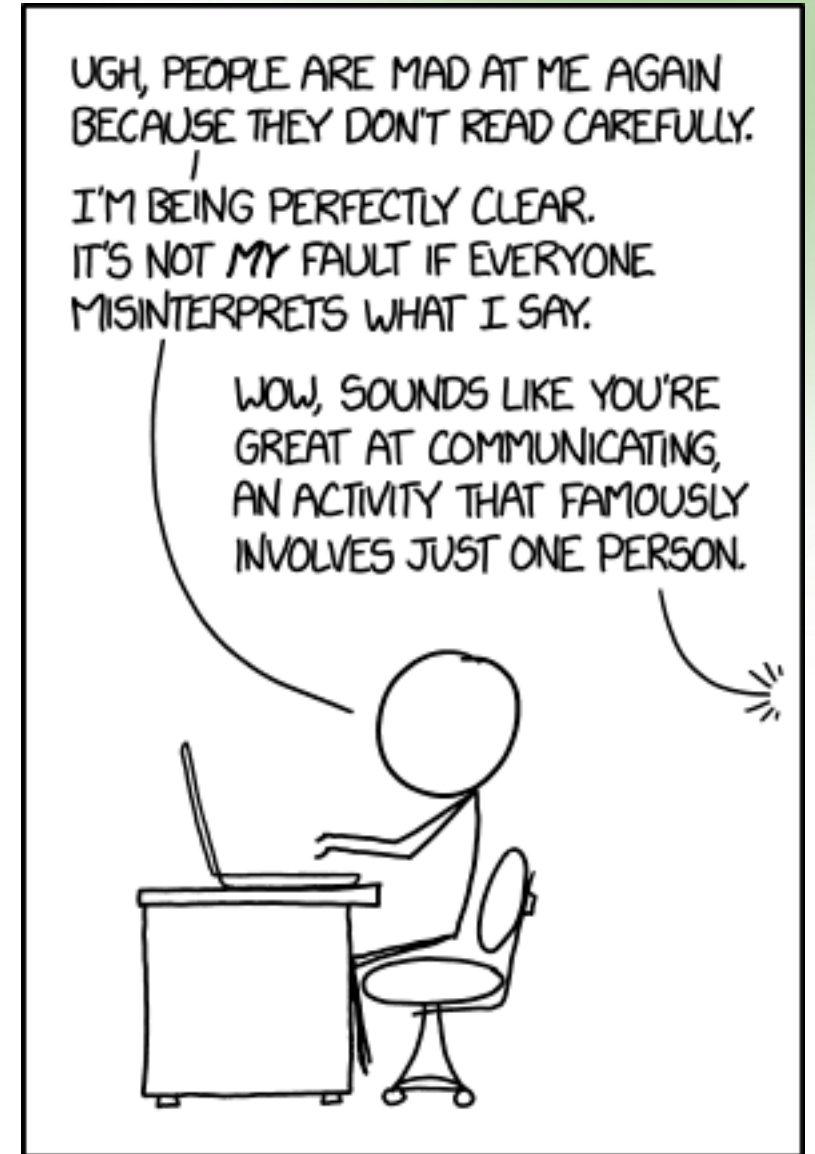


Talk Nerdy to Me:

Making Science Speak “Human”

February 26, 2026

David Foss, CPG, LSP
Massachusetts Statewide Brownfields Coordinator
MassDEP | Bureau of Waste Site Cleanup



Credit: [HTTP://XKCD.COM/](http://xkcd.com/)



Time is valuable

- Face-to-Face meeting time is precious
- Appreciate your audience giving you *their* time & attention
- Make the most of this resource



Time is the most valuable thing in life 🕒

When you give your time, you are giving a portion of your life that you'll never get back ⌚

That is why the most precious gift you can give someone is your time with your attention 🕒



@DrAhmedKalebi

Stuff Happens



AFFF

Aqueous Film Forming Foam



**After the response,
How do we
Communicate?**

Top TEN Tips for Science Communication

1. Start with the Most Important Information (BLUF)
2. Know your Audience
3. Identify the Goals of the Communication
4. Talk about the Scientific Process
5. Focus on the Bigger Impact Topics
6. Avoid Jargon & Acronyms
7. Be Relatable
8. Provide Visuals
9. Stick to 2 or 3 KEY Points
10. Develop an Elevator Pitch

BLUF

**Bottom
Line
Up
Front**

BLUF is a standard in U.S. military communication whose aim is to make military messages precise and powerful. It differs from a more-traditional style in which conclusions and recommendations are included at the end, following the arguments and considerations of facts. The BLUF concept is not exclusive to writing since it can also be used in conversations and interviews.



TOO MANY WORDS

1. Start with the Most Important Information (BLUF)
2. Know your Audience
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Focus on Key Points

BLUF

Bottom

Line

Up

Front

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No Jargon

Monoxide

Effective Communication

1. Know your audience
2. Use visuals to tell your story
3. Focus on key points



Three examples of slides that **DON'T** help “tell your story”

X. Too many words

Y. Unclear visualization

Z. Dizzying graphics or animations



Example of “dense” slide

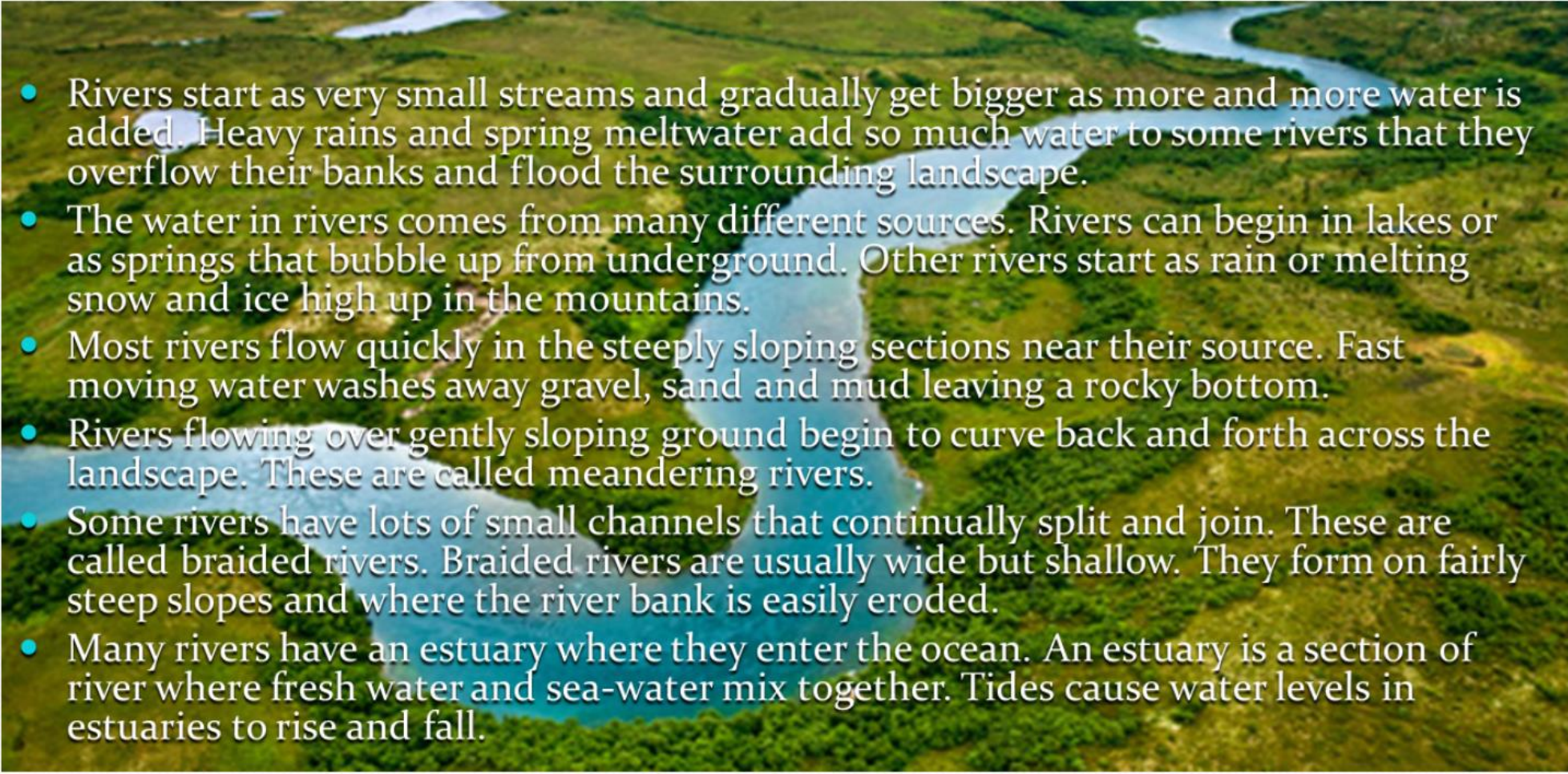
Here’s an example with a longer title

- This is called **Death-by-Bullet-Point**.
- Don’t do this because you don’t want your audience reading when they should be listening.
- Remember the Redundancy Principle.
- Don’t read what is on your slide.
- It is very painful if you are in the audience.
- If you really want to confuse your audience, start to make the font smaller
 - And then indent your bullet points
 - Try to fit everything on one slide
- Then go back to regular bullet points but change your font
- And you will have essentially killed your audience with too much text and thoughtless **BULLET** points!



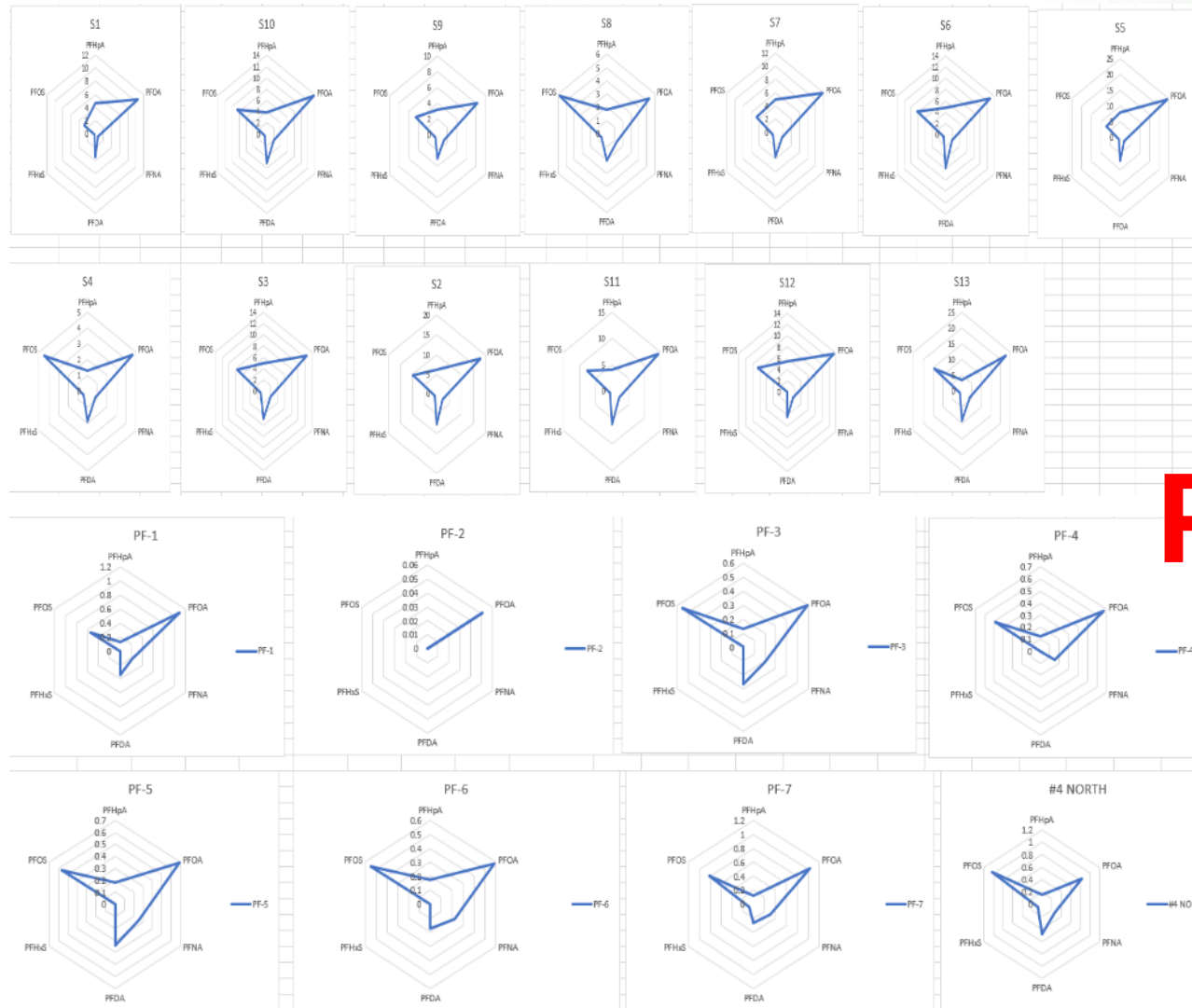
What do you expect
your audience to learn?

How Rivers Are Formed

- 
- Rivers start as very small streams and gradually get bigger as more and more water is added. Heavy rains and spring meltwater add so much water to some rivers that they overflow their banks and flood the surrounding landscape.
 - The water in rivers comes from many different sources. Rivers can begin in lakes or as springs that bubble up from underground. Other rivers start as rain or melting snow and ice high up in the mountains.
 - Most rivers flow quickly in the steeply sloping sections near their source. Fast moving water washes away gravel, sand and mud leaving a rocky bottom.
 - Rivers flowing over gently sloping ground begin to curve back and forth across the landscape. These are called meandering rivers.
 - Some rivers have lots of small channels that continually split and join. These are called braided rivers. Braided rivers are usually wide but shallow. They form on fairly steep slopes and where the river bank is easily eroded.
 - Many rivers have an estuary where they enter the ocean. An estuary is a section of river where fresh water and sea-water mix together. Tides cause water levels in estuaries to rise and fall.

The Graphics SHOULD Illustrate Your Point

Source Material
Data Set #1



Receiving Site
Data Set #2

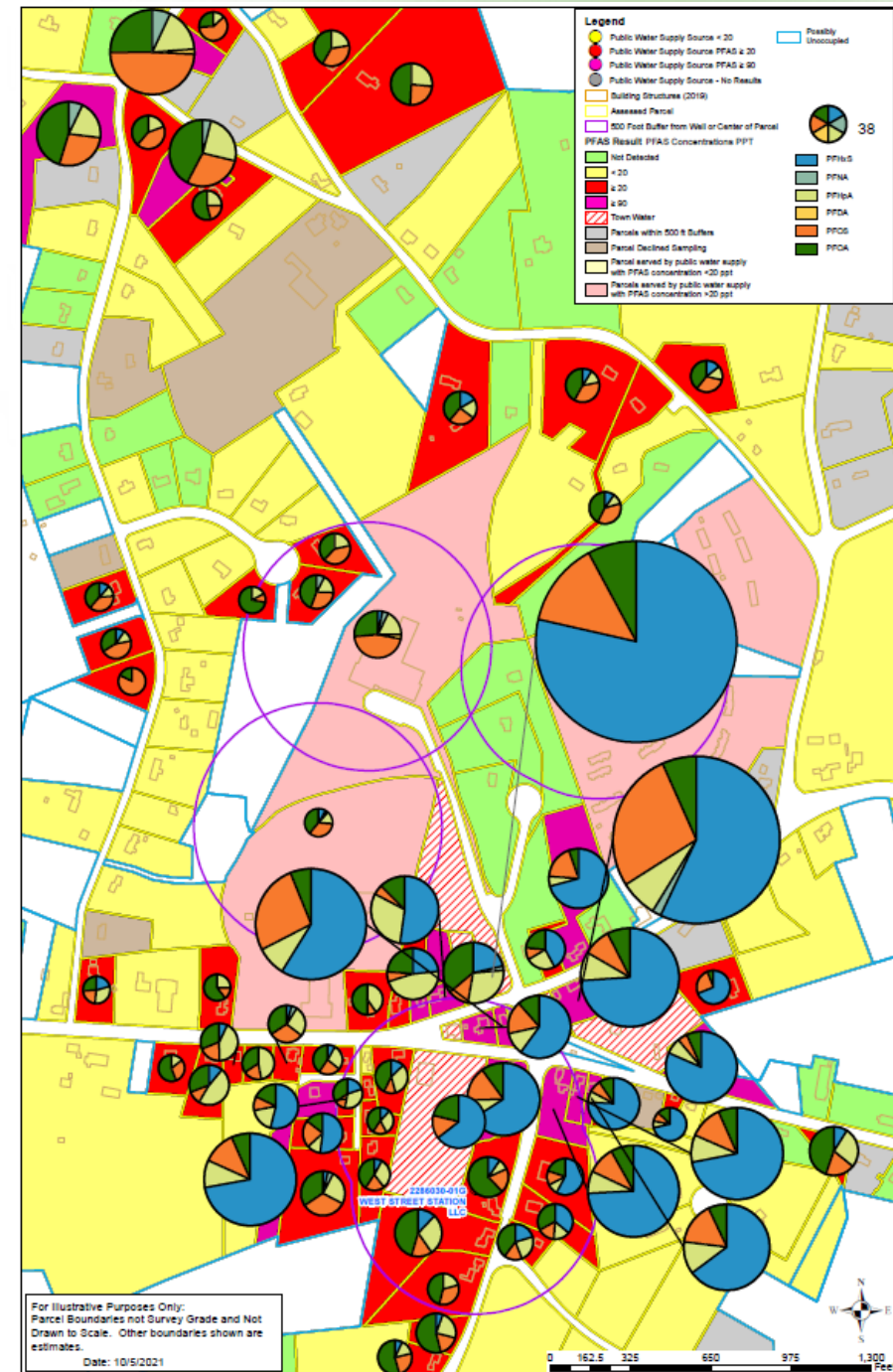
ANY
SIMILARITIES?

PERHAPS?



More Effective Communication

- Know your audience
- Use visuals to tell your story
- Focus on key points



Goal of Effective Communication = Connection

Who do people believe?

Random Stranger

Talking Head on TV

Family / Friend

Qualified Expert

Trusted advisor

Long Term Goal
(requires multiple contacts)

Short Term Goal
Today



Establish Relationships

- Long Term → Build Relationships
- Short Term → Establish Credentials & Identify one or more key **TRUSTED Allies**

If you don't have time to build relationships

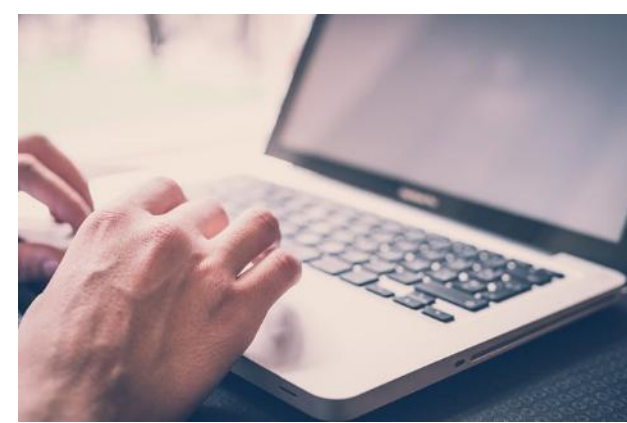
- Neighborhood Association Leader
- Church Leader
- Municipal Health Director / Health Clinics / Pediatricians Offices
- Local Translator



Trust takes time

Communication is about the listener receiving information, learning & understanding.

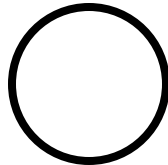
- Think about your audience
- Different people
[generations / cultures]
receive information differently



Try to Connect with Your Audience

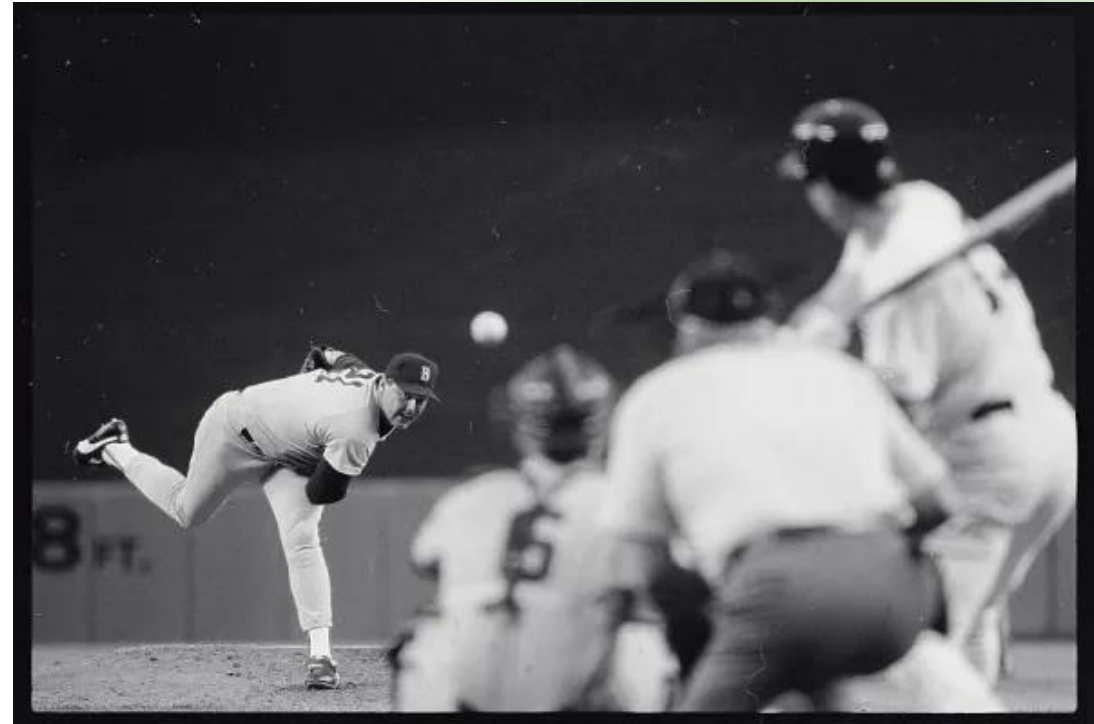
Historic dry cleaner in a residential neighborhood
Worcester MA

- 32% of Students in ELL program
- 70 different languages in the public schools



How to Make Connections

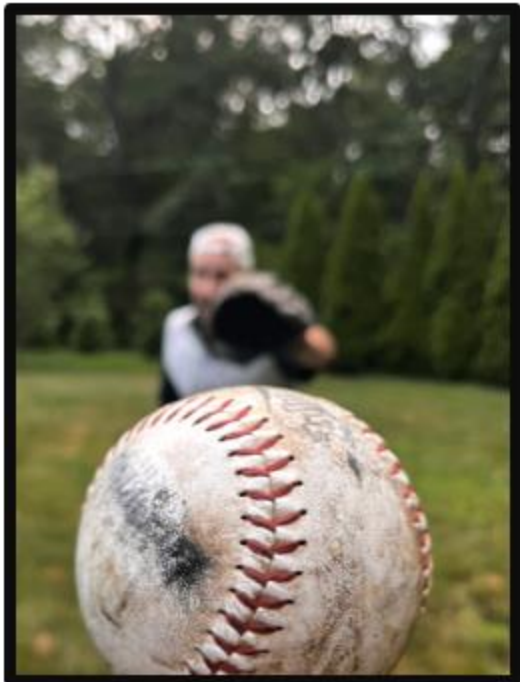
- Plan ahead: anticipate your attendees
- Craft your message for **this** audience
- Understand the technical background of your audience



Roger Clemens
Sports Illustrated Vault
Copyright SI.com



**Major
League
Catcher**



Uncle Jim

Communication = when the listener understands

- Lead with your conclusion
- Focus on 2 or 3 key points
- Use visuals and graphics
- Make data and resources available

**Conclusion &
Key Take-aways**

No Jargon Monoxide

Communication skills can be learned

- Find your voice ... practice
- Tell a story to make connections
- Watch & Listen to your Favorites



Rachel Carson



Hank Green



Neil deGrasse Tyson



Nova

Make Connections

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Introductions & Pitches

Paula Middlebrooks, MS

TDEC, Environmental Consultant

Tennessee Department of Environment and
Conservation





Introductions & Pitches



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About Me...



- **20 years environmental experience**
- **Science education (BA, MS)**
- **From SD, and lived in several states**




Introduction



Paula Middlebrooks has worked for the State of Tennessee for 20 years. Paula serves as a Brownfields Coordinator specific to federal brownfields funding in the Department of Environment and Conservation. Paula has consistently proven herself to be a champion for public health and the environment as a skilled leader and dedicated public servant. She is responsible for developing relationships at the local level that have successfully facilitated and secured EPA Brownfields Grants worth more than \$20 million for Tennessee communities. These grants allow contaminated properties to be addressed by cleaning up and reinvesting in them, which increases local tax bases, facilitates job growth, and improves and protects the environment. In 2017, Paula received an Excellence in Service Award from Governor Haslam. While her professional focus is improving public health and the environment, Paula also gives back to her community as a volunteer leader for the Historic Belcourt Theater and volunteers with A Step Ahead. A native of South Dakota, Paula earned a Bachelor's Degree in Biology from Dakota Wesleyan University and a Master's Degree in Environmental Health from the University Of Minnesota School Of Public Health.



Introduction

- **Brief**
- Interesting
- Connect with audience

 **About Me...**



- 20 years environmental experience
- Science education (BA, MS)
- From SD, and lived in several states



Introduction

- Brief
- **Interesting** →
- Connect with audience



About Me...



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Introduction

- Brief
- Interesting
- **Connect with audience**



About Me...



- 20 years environmental experience
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Get to the Point





Elevator Pitch Goal

**Pique listeners
interest enough
for them to act.**

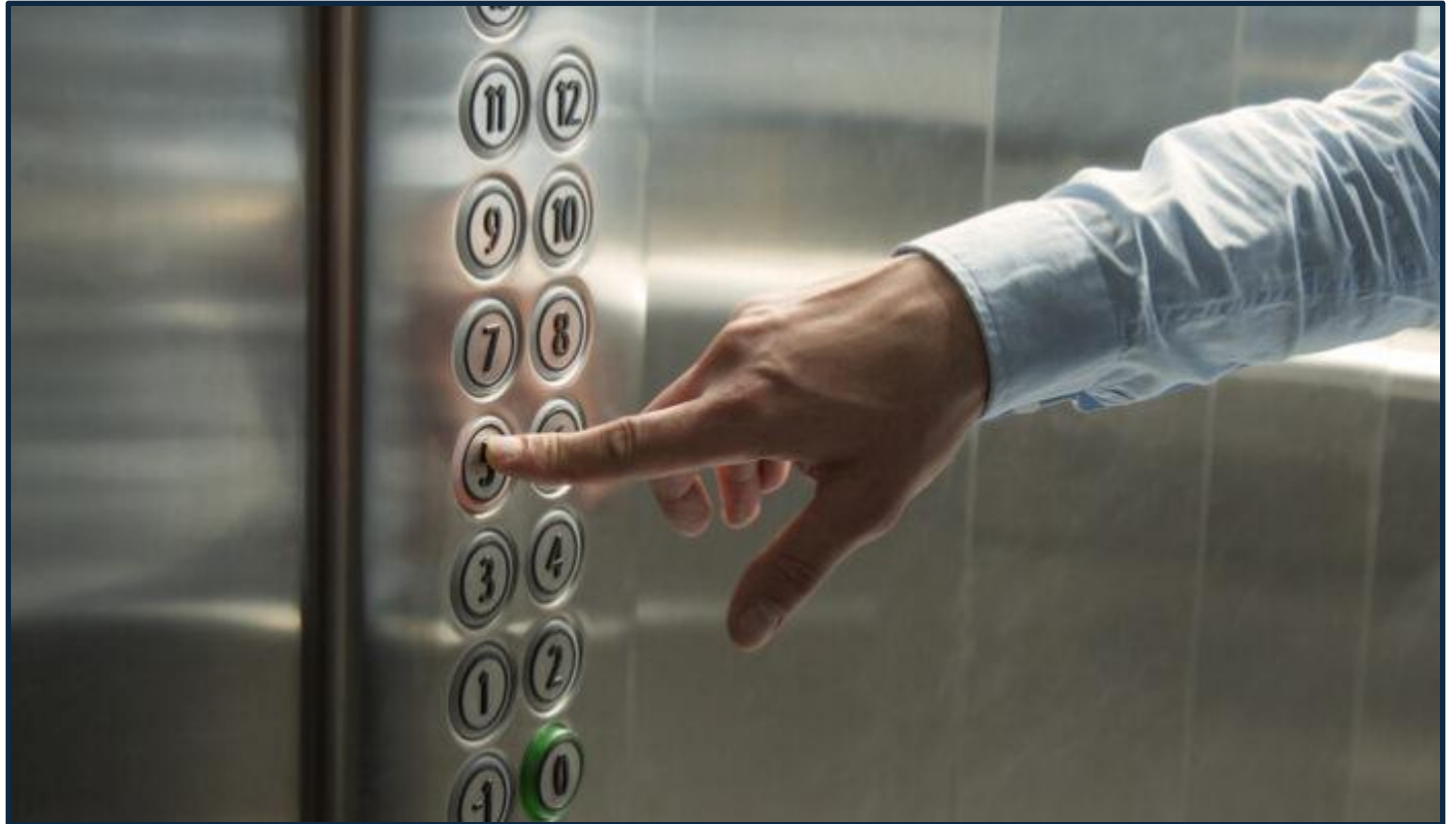




Elevator Pitch Goal

Actions the listener can take:

- Asking for more information
- Scheduling a follow-up conversation
- Asking for your business card
- Missing their stop on the elevator...





Elevator Pitch: Components

A project I'm working on is re-purposing a former railway into a trail between the most economically distressed communities in Appalachian Tennessee, addressing contamination for safe reuse.

What?



Elevator Pitch: Components

A project I'm working on is re-purposing a former railway into a trail between the **most economically distressed communities in Appalachian Tennessee**, addressing contamination for safe reuse.

Where?



Elevator Pitch: Components

A project I'm working on is re-purposing a former railway into a trail between the most economically distressed communities in Appalachian Tennessee, addressing contamination for safe reuse.

The Big Picture



Elevator Pitch: Follow Up



A project I'm working on is repurposing a former railway into a trail between the most economically distressed communities in Appalachian Tennessee, addressing contamination for safe reuse.



Getting to the Point

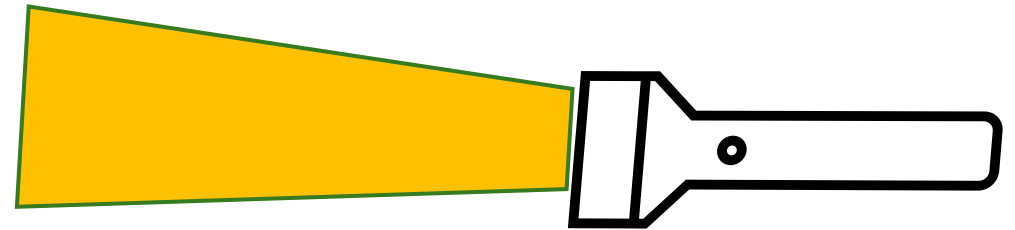




Preparation is Key

Know your presentation

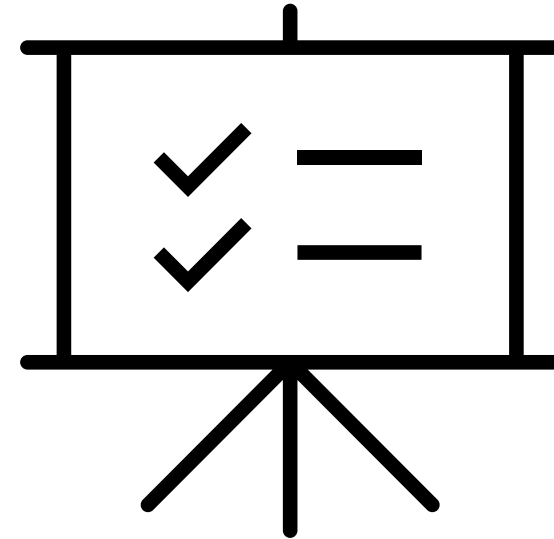
- **Technology can fail.**
- **It's fine if you don't know something that you are asked.**





Preparation is Key

- Invest in your introduction
- Don't bury the lede
- Develop a pitch
- Practice! Practice! Practice!



IMPLEMENTING SCIENCE COMMUNICATION



Randi Mendes, Ph.D.
UConn TAB
Executive Director





LET'S MAKE A PEANUT BUTTER AND JELLY SANDWICH

Case Study





Step 1:



Step 2:



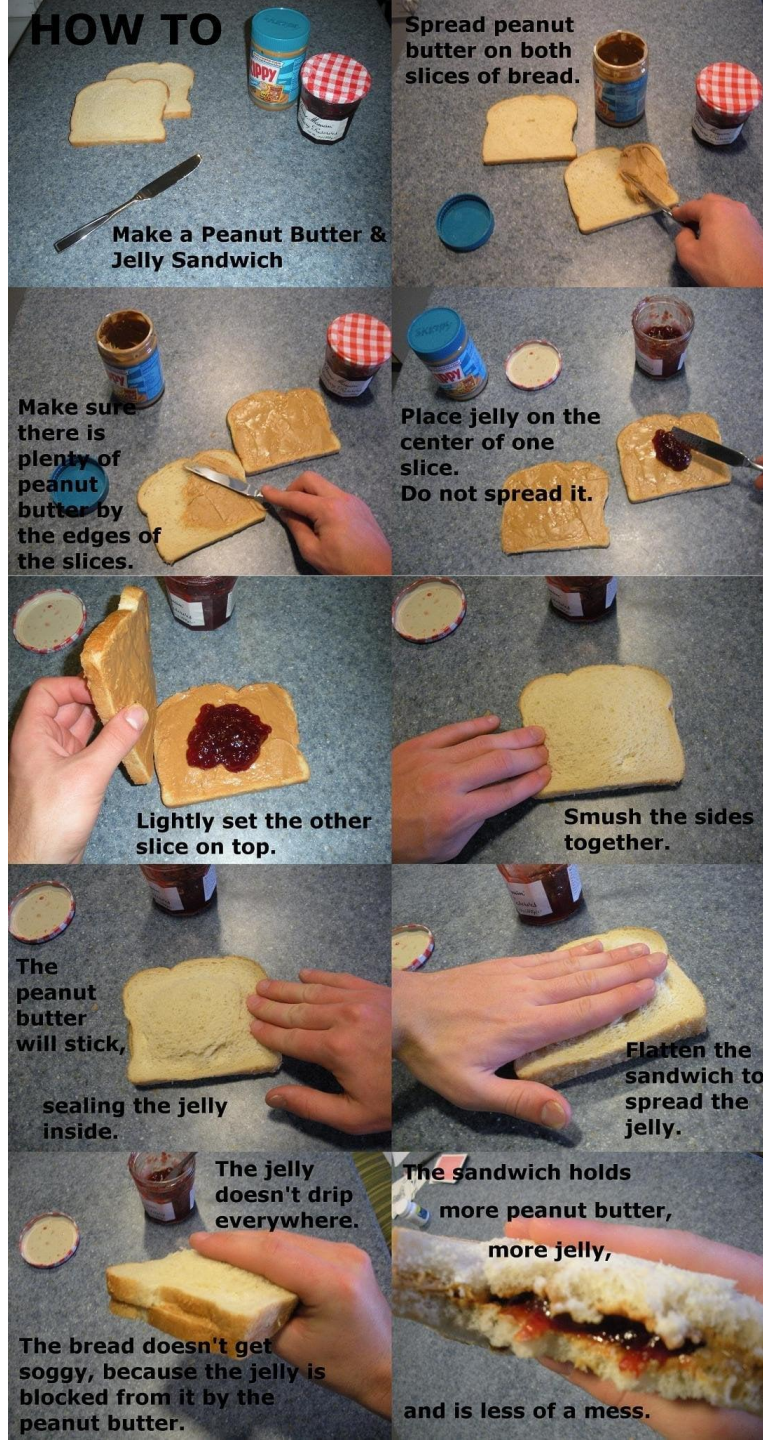
Step 3:



Step 4:



HOW TO



Preparing a Peanut Butter and Jelly sandwich

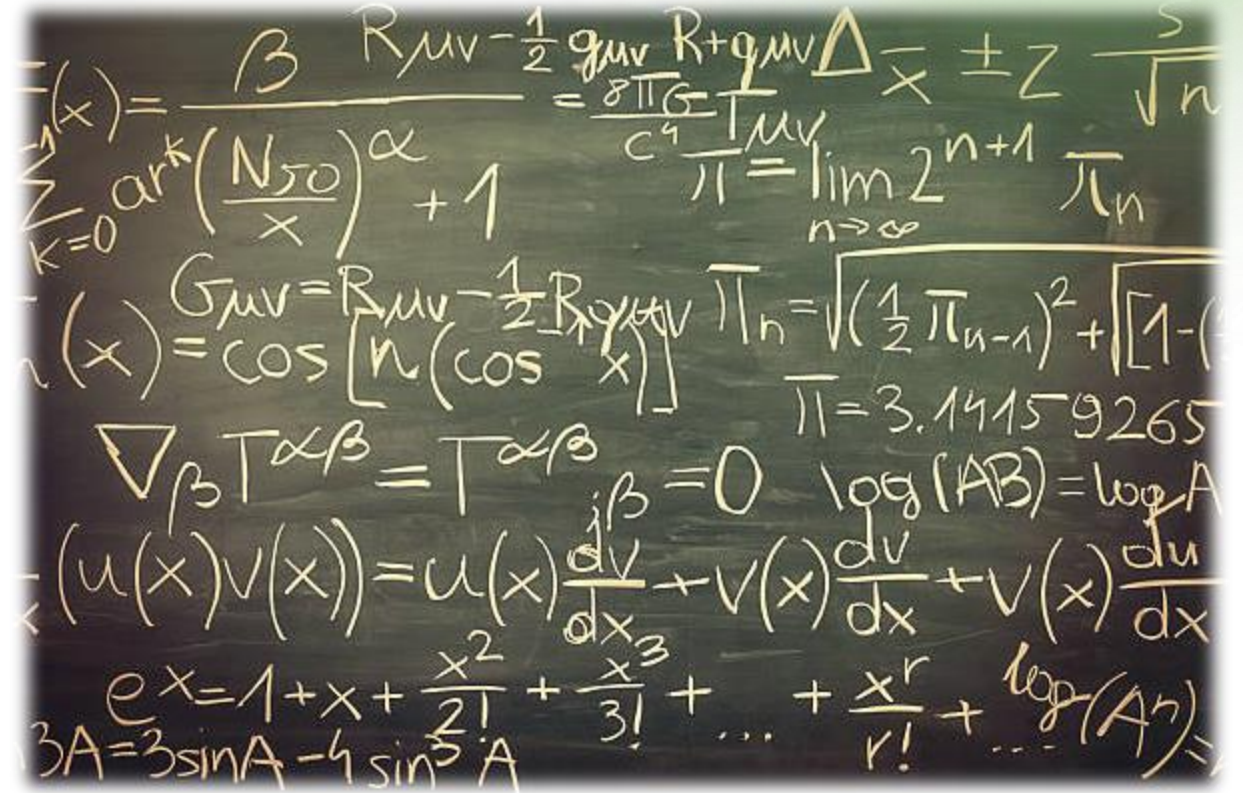
- Step 1, open the loaf of bread and, remove two slices of bread.
- Step 2, place the two slices of bread on a flat surface, such as a plate.
- Step 3, now open the peanut butter take is on the spoon on one of the slices of bread.
- Step 4, now scoop with a spoon some peanut butter (make sure your peanut butter fill's the spoon completely)
- Step 5, place the

**So Which Way is the
Right Way?**



THERE IS NO EXACT FORMULA

- Think about your audience – How do they best learn and understand?
- Get feedback and work on improving every time -
- Have others review
- Remember that what might work for some groups might not work for others



**RESOURCES TO HELP
YOU PREPARE & TO BE
SUCCESSFUL**



PLANNING: IDENTIFYING YOUR AUDIENCE & STAKEHOLDERS

- This can be the hardest step
- Who do you bring to the table?
- Are they representative of the community you are helping?
- What are their roles once they are there?



What is a Stakeholder Analysis?

In brownfields redevelopment, a stakeholder analysis is the process of collecting and understanding information about the people and organizations that:

- Have the interest and power to impact your project
- Will be impacted by your project

A power-interest grid, which you can find below, is a useful tool for stakeholder analyses.

Who are Stakeholders?

Primary Stakeholders: beneficiaries or targets of the redevelopment project

Secondary Stakeholders: people whose jobs or lives will be impacted by the redevelopment project

Key Stakeholders: people or organizations who can influence others, hold power, or have an interest in the outcome of the redevelopment project

When Should a Stakeholder Analysis be Completed?

A stakeholder analysis should be completed as early as possible when considering redeveloping a brownfield site. Conducting a stakeholder analysis is an important component to community engagement.

Why is a Stakeholder Analysis Important?

Brownfields redevelopment should be a participatory effort that involves as many diverse stakeholders as possible.

Engaging stakeholders effectively has many benefits:

- Gaining buy-in and support for the project
- Strengthening your project against opposition
- Building participation that is inclusive, fair, and equitable
- Increasing credibility and chances of success
- Understanding stakeholders can save your project from being blindsided with concerns later on in the process

PLANNING: SETTING UP SUCCESSFUL MEETINGS

- How will you get people to your meetings?
- Is the meeting accessible to all that you've invited and want to be there?
 - Location, language, timing, ADA, advertisement, setting, etc.
- **UConn TAB provides a community meeting checklist that follows the before, during, and after**



- Determine the meeting's purpose and intended audience
- Draft a meeting agenda
- Maximize participation by picking a time that takes work schedules and other responsibilities into account
- Select a location that is accessible and convenient. Consider transportation options and make sure there is plentiful parking if attendees will be driving
- Make arrangements to provide childcare or ensure that the meeting is child-friendly
- Communicate frequently with any speakers/presenters at the event and confirm they are available for the selected meeting time
- Notify the community of the event through whichever channels / mediums are most effective
- Invite key stakeholders in the brownfields redevelopment process
- One week prior to the event:
 - ⇒ Confirm speaker/presenter availability
 - ⇒ Print and distribute agenda

ACTION: PROVIDE AN ACRONYMS AND JARGON REFERENCE GUIDE

- Avoid as much as possible but sometimes it's not possible!
- **Provide your audience with a cheat sheet – sometimes we forget.**
- It's helpful to not only include acronyms but also jargon or terms
 - For example, ESA = Environmental Site Assessment but what is that?

Environmental Acronyms Quick Reference Guide

AAI	All Appropriate Inquiry	NFA	No Further Action
ACM	Asbestos Containing Materials	NAPL	Non-Aqueous Phase Liquid
AST	Above-ground Storage Tank	OSHA	Occupational Safety and Health Administration
ASTM	American Society for Testing Materials	PCBs	Polychlorinated Biphenyls
AUL	Activity Use Limitation	PFAs	Per- and Polyfluoroalkyl Substances
BGS	Below Ground Surface	PNAs	Polynuclear Aromatic Compounds
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes	PPB	Parts Per Billion
CAP	Corrective Action Plan	PPM	Parts Per Million
DRO	Diesel Range Organics	RBCA	Risk Based Corrective Action
EDR	Environmental Data Resources	RBSLs	Risk Based Screening Levels
EP	Environmental Professional	REC	Recognized Environmental Condition
EPA	United States Environmental Protection Agency	TMW	Temporary Monitoring Well
ESA	Environmental Site Assessment	TPH	Total Petroleum Hydrocarbons
GPR	Ground Penetrating Radar	TSD	Treatment Storage and Disposal Facility
GRO	Gasoline Range Organics	SSD	Sub-Slab Depressurization
GSI	Groundwater/Surface Water Interface	UST	Underground Storage Tank
LBP	Lead Based Paint	VISLs	Environmental Protection Agency Vapor Intrusion Screening Levels
LUST	Leaking Underground Storage Tank	VOCs	Volatile Organic Compounds
MW	Monitoring Well	VI	Vapor Intrusion

ACTION: MAKE INFORMATION ACCESSIBLE

- Avoid information overload!
- Consider how you are communicating both in person and as a takeaway.
- What is it important for the audience to know?
- Who is the audience?
- **Let others review that are within your audience or have no background in the topic. Can they understand?**



PCBs

Polychlorinated Biphenyls (PCBs)

PCBs are synthetic chemicals once used in electrical equipment, caulks, paints, and other construction materials, and are a common contaminant at brownfield sites. Even though they were banned in the U.S. in 1979, PCBs still linger in the environment, posing ongoing health and environmental challenges.

Environmental Impacts:

Water Contamination: Industrial dumping and wastewater runoff allows PCBs to settle into waterways by binding to sediments thus, contaminating fish. **Soil Pollution:** Landfills, dumping site, leaking electrical equipment and dust/debris from building materials can cause chemicals to leach into the surrounding soil. This can pose risks to crops and livestock.

How are PCBs Impacting Rural Communities?

Fishing and Waterways: PCBs in rivers like the Housatonic River (MA/CT) and Penobscot River (ME) have led to long-term contamination of ecosystems, killing wildlife, and making fish unsafe to eat.

Agriculture: Farms located near industrial sites or old landfills may have PCB contamination in soil from dust or runoff, which can impact crops & livestock.

Schools and Homes: Many older schools and homes still contain PCB-laden building materials. When these materials deteriorate, they release PCBs into the air, creating potential health risks.



Original Sources:

- Electrical equipment (transformers and capacitors) in the oil
- Construction materials (caulk, paint, and finishes)
- Industrial machinery and adhesives

HEALTH RISKS

Exposure: PCBs can enter the body through inhalation, ingestion of contaminated food or water, or skin contact

Health Effects: Exposure to PCBs is associated with cancer, immune system suppression, liver damage, and reproductive health issues.

Groups at Highest Risk: Children and pregnant mothers

EPA BANS ONGOING USES OF PCBs



ACTION: TAKE TIME TO MAKE PRESENTATIONS ENGAGING

- Tell a story to engage your audience
- Utilize captivating visuals
- Avoid text heavy slides
- Avoid graphs and heavy data slides
- Use titles that indicate what the takeaway message should be
- Use 'Slide Master' and 'Design' feature in PowerPoint to help!
- Frame the content in terms of impact – why does it matter to them?





ACTION: INFORM WITHOUT OVERWHELMING, AND ENGAGE WITHOUT OVERSIMPLIFYING

- Practice your talk!
- Don't read everything directly off the slide
- Be mindful of time – nothing worse than going over
- Make eye contact and be yourself
- Engage with audience through relating and story telling – analogies and metaphors
- Check in throughout for questions, understanding, and feedback.





TALK NERDY TO ME TAKEAWAYS

PLANNING:
IDENTIFYING YOUR
AUDIENCE &
STAKEHOLDERS

PLANNING: SETTING
UP SUCCESSFUL
MEETINGS

ACTION: PROVIDE AN
ACRONYMS AND
JARGON REFERENCE
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ACTION: MAKE
INFORMATION
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WITHOUT
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Brownfields Bites and Insights

Upcoming Webinars

➤ **12:00 pm March 19, 2026**

Enhanced Community Engagement: Not Just Checking a Box

Presenters: Jamilah Harris, Rebecca Wells-Albers, Abigail Anderson

➤ **Coming in April 2026**

History of the CERCLA BFPP Liability Defense, Current State Implementation, and What's Next



ASTSWMO CaBS

Brownfields Focus Group

Thank you for joining us