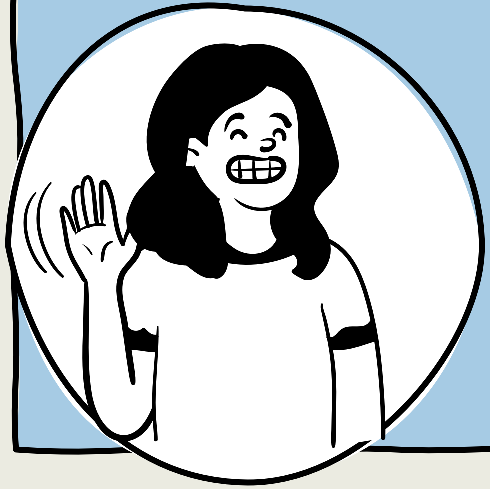
Best practices in science communication



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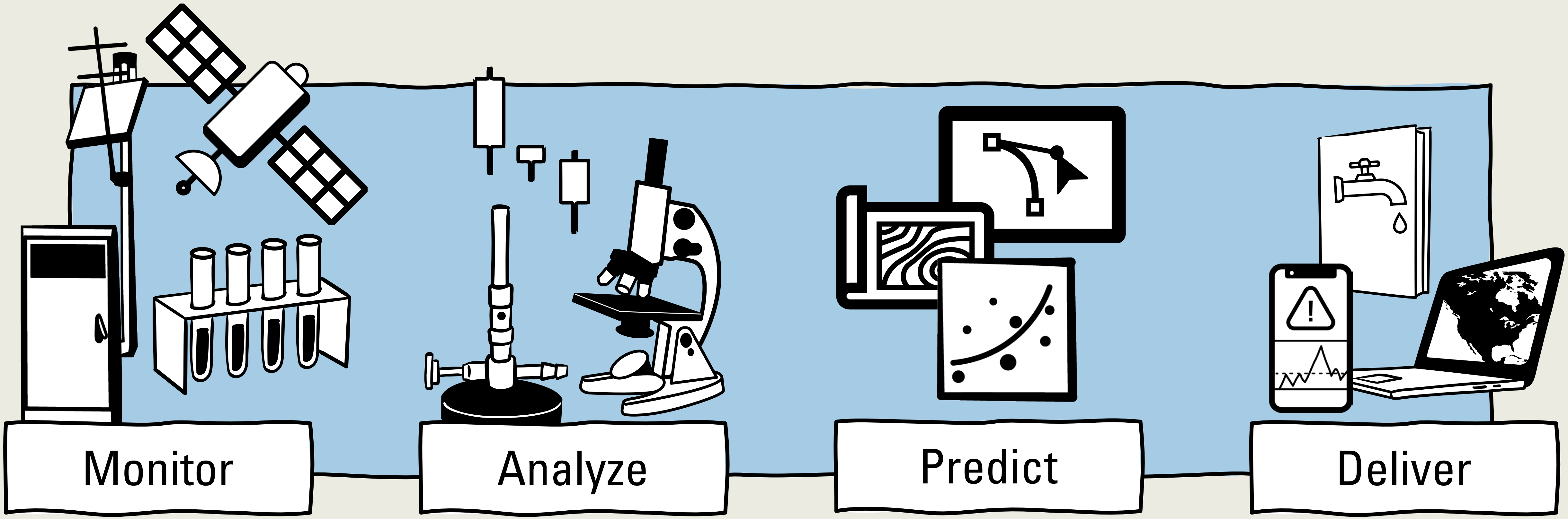
Science Communicator, USGS Water Resources Mission Area

February 13, 2024

USGS: science for a changing world



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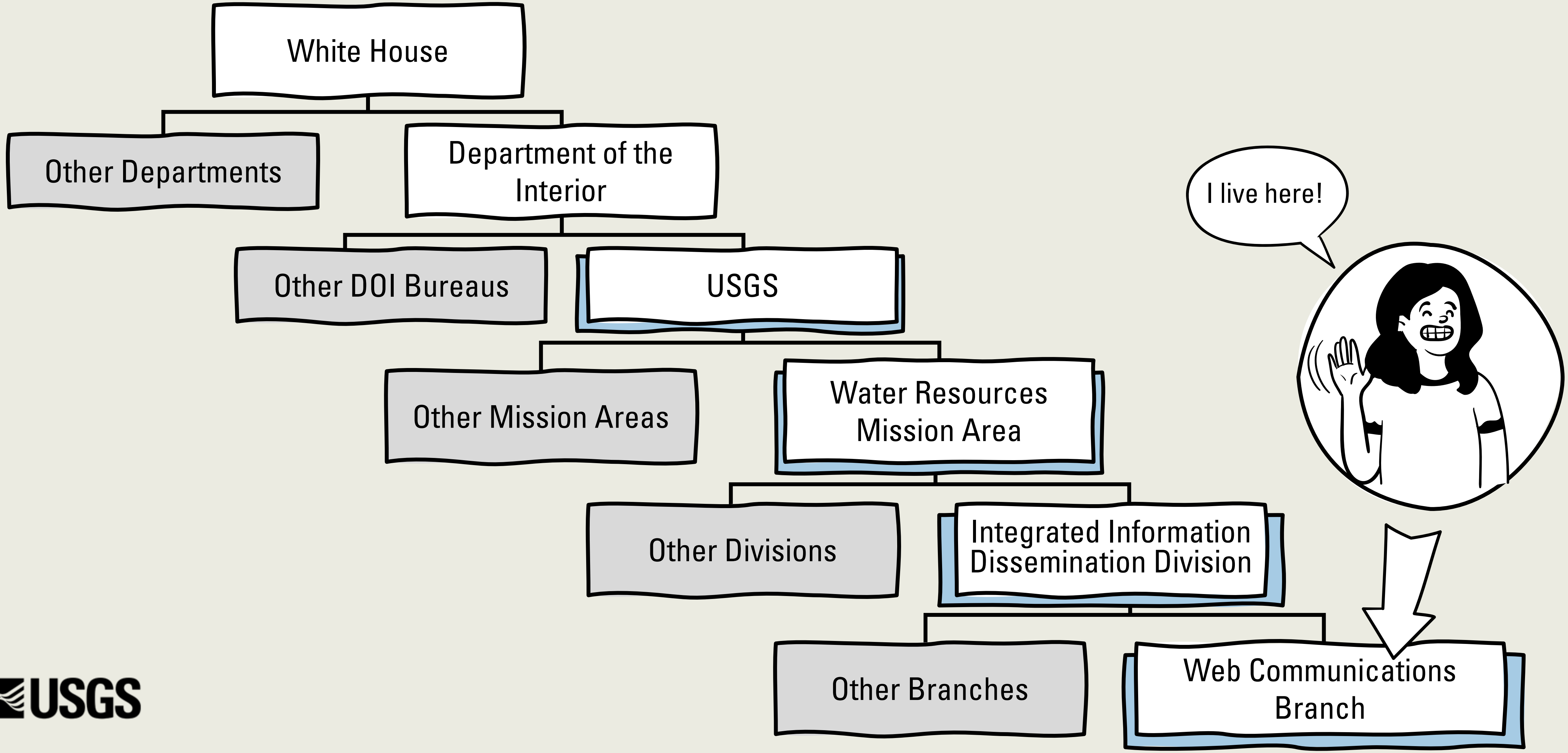
Where water communication happens



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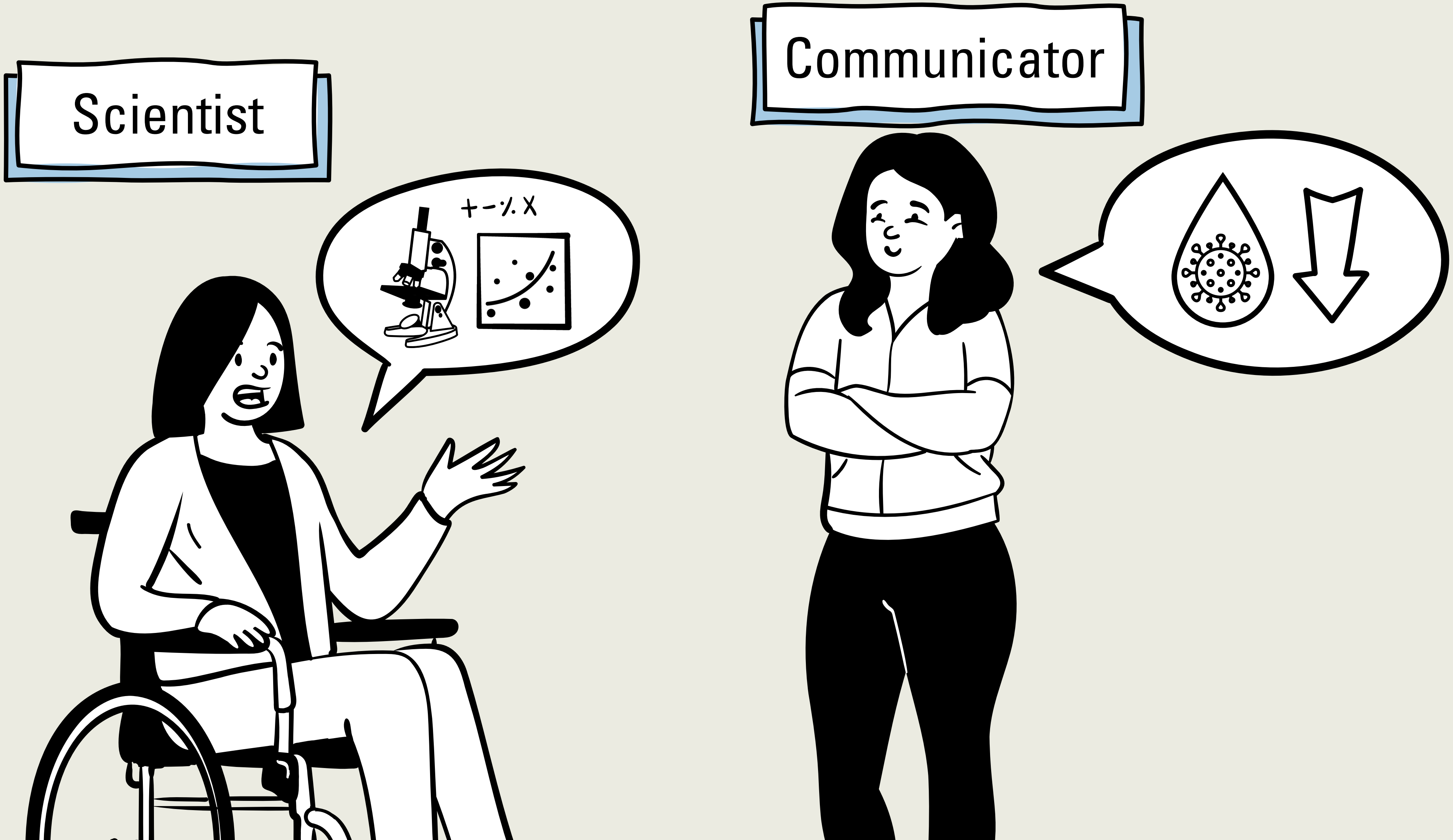
My role as a science communicator



What good is science without good communication?

“**Effective communication is an essential part of science** for at least two reasons. First, if nobody hears about your work, you might as well have never done it. And second, especially in today’s world, if you don’t communicate your research effectively, there are many people around who will communicate it for you, and when they do, it will probably be skewed in order to support whatever agenda they have.”

- Randy Olson, *Don’t Be Such a Scientist*

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Keys to good science communication

1. Define your goals
2. Know your audience
3. Set your tone
4. Identify your messages
5. Choose your tools
6. Assess your success

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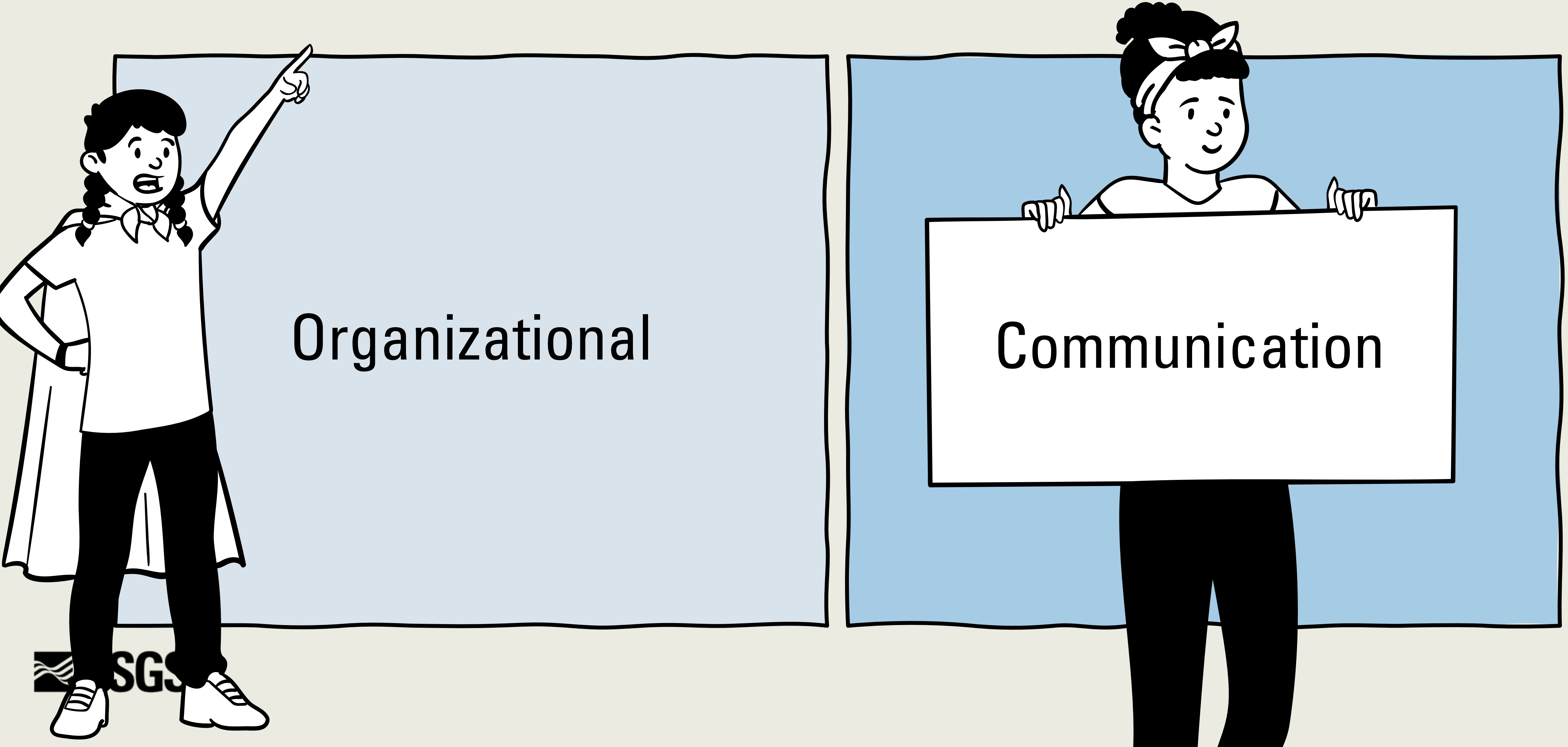
1. Define your goals



Organizational goals for USGS Water

Provide society the information it needs regarding the amount and quality of water in all components of the water cycle at high temporal and spatial resolution, nationwide

Advance understanding of processes that determine water availability

Predict future changes in the amount and quality of water in response to changing climate, population, land use, and water management

Anticipate and respond to water-related emergencies and conflicts

Deliver timely hydrologic data, analysis, and decision-support tools seamlessly across the nation to support water-resource decisions

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Communication goals for USGS Water

Examples

Increase awareness of the role of humans in the water cycle

Encourage teachers to use the updated water cycle diagram in their lesson plans

Help consumers **make informed decisions** about bottled water use

Improve the ability of city planners to design sustainable stormwater treatment systems

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2. Know your audience

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Audiences of USGS Water communications

Examples

- USGS employees
- Other Federal agencies
- Municipalities and localities
- State governments and agencies
- Public
- Members of Congress
- Media
- Education
- Tribes
- Private sector
- Non-governmental organizations

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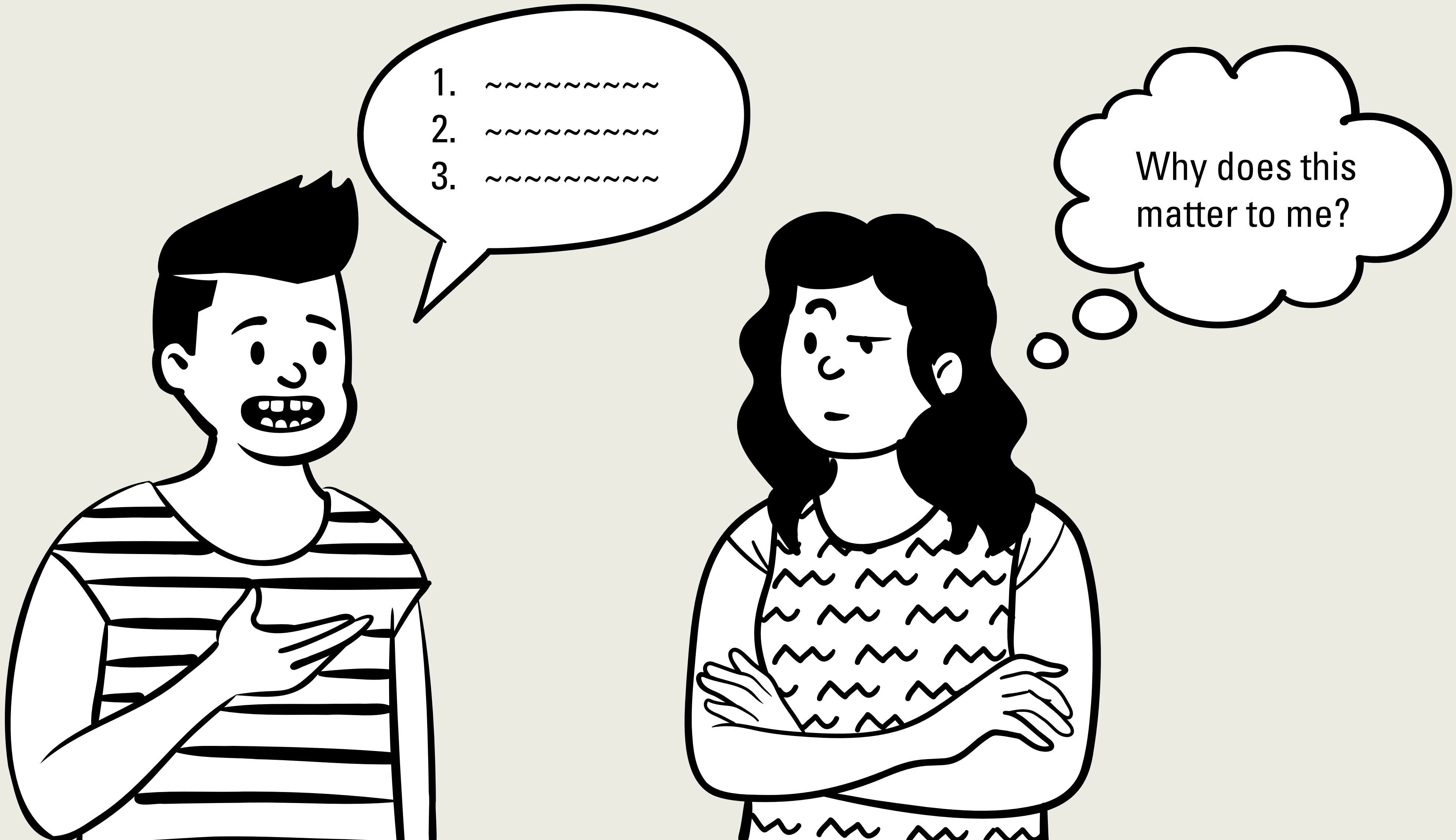
3. Set your tone

When speaking on behalf of USGS Water, the tone should be:

- Authoritative
- Unbiased
- Valuable
- Necessary
- Foundational
- Innovative
- Beneficial to society
- Responsive

4. Identify your messages



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Key messages of USGS Water

Examples

The USGS is working to provide an improved understanding of water movement, storage, and quality **so that informed decisions can be made** about how to best manage water into the future.

Real-time water data allows the USGS to better predict changes in water availability and quality.

During hazard events the data the USGS provides can help emergency managers make informed decisions.

USGS data collection and delivery methods are constantly being improved for better coverage of water information in more places and times.

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5. Choose your tools

USGS Water communications tools

Examples

- Website content
- Blog posts
- Social media
- Digital newsletters
- Press releases
- Conference booths
- Seminars
- Town hall meetings

6. Assess your success

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Metrics of success for USGS Water communications

Examples

The amount of positive feedback — solicited and unsolicited — that is received in response to USGS Water communication efforts

The number of pickups of USGS public affairs products by media outlets and the number of requests for interviews on the USGS Water goals

The total engagement (likes, shares, retweets, replies, responses to polls, etc.) on social media posts about USGS Water goals

Web traffic to pages that share content relevant to USGS Water goals

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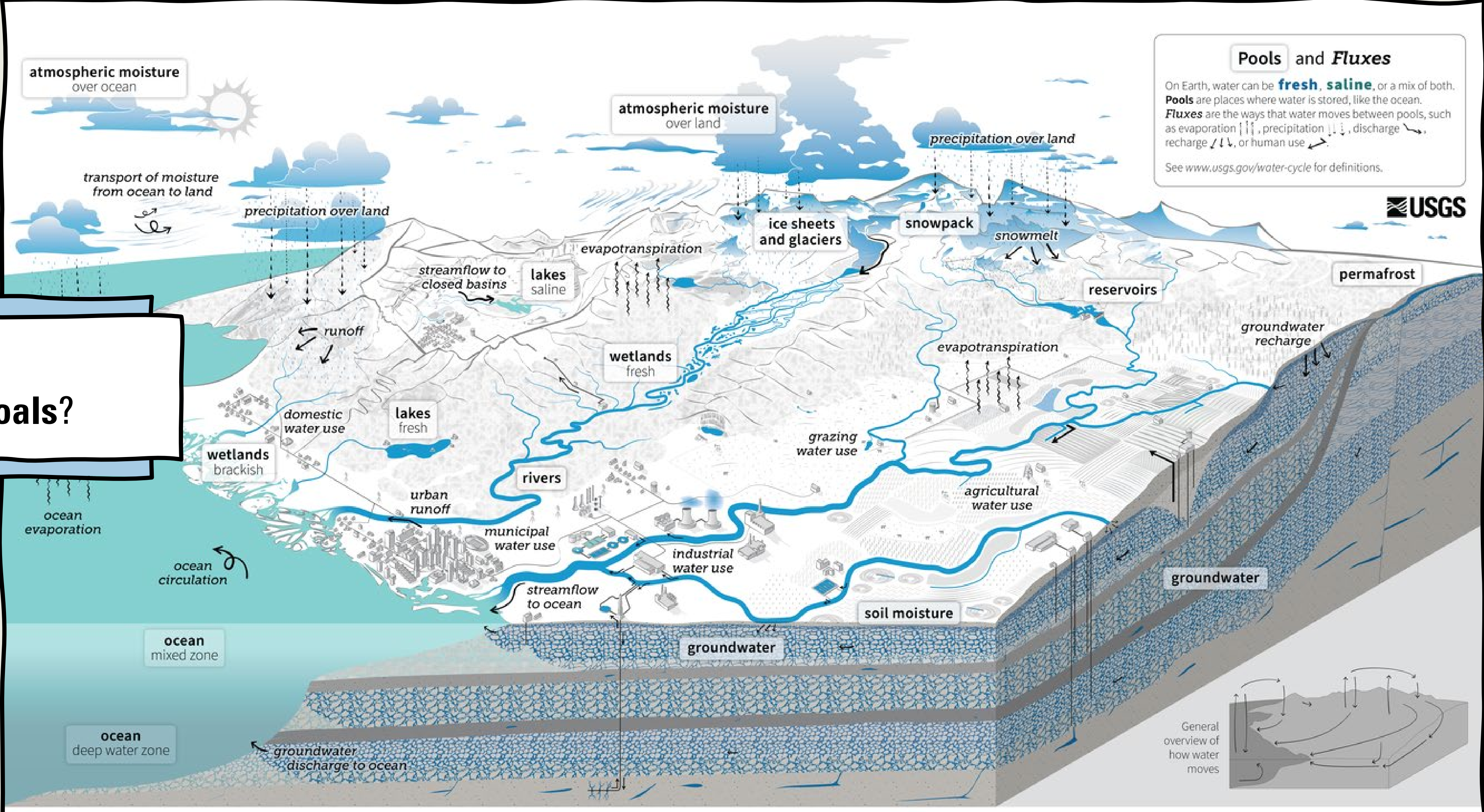
Practice

What are the **communication goals**?

What change do we want to see because of this communication?



The Water Cycle

The water cycle describes where water is found on Earth and how it moves. Water can be stored in the atmosphere, on Earth's surface, or below the ground. It can be in a liquid, solid, or gaseous state. Water moves between the places it is stored at large scales and at very small scales. Water moves naturally and because of human interaction, both of which affect where water is stored, how it moves, and how clean it is.

Liquid water can be fresh, saline (salty), or a mix (brackish). Ninety-six percent of all water is saline and stored in **oceans**. Places like the ocean, where water is stored, are called **pools**. On land, saline water is stored in **saline lakes**, whereas fresh water is stored in liquid form in **freshwater lakes**, artificial **reservoirs**, **rivers**, **wetlands**, and in soil as **soil moisture**. Deeper underground, liquid water is stored as **groundwater** in aquifers, within the cracks and pores of rock. The solid, frozen form of water is stored in **ice sheets**, **glaciers**, and **snowpack** at high elevations or near the Earth's poles. Frozen water is also found in the soil as **permafrost**. Water vapor, the gaseous form of water, is stored as **atmospheric moisture** over the ocean and land.

As it moves, water can transform into a liquid, a solid, or a gas. The different ways in which water moves between pools are known as **fluxes**. **Circulation** mixes water in the oceans and transports water vapor in the atmosphere. Water moves between the atmosphere and the Earth's surface through **evaporation**, **evapotranspiration**, and **precipitation**. Water moves across the land surface through **snowmelt**, **runoff**, and **streamflow**. Through infiltration and **groundwater recharge**, water moves into the ground. When underground, groundwater flows within aquifers and can return to the surface through **springs** or from natural **groundwater discharge** into rivers and oceans.

Humans alter the water cycle. We redirect rivers, build dams to store water, and drain water from wetlands for development. We use water from rivers, lakes, reservoirs, and groundwater aquifers. We use that water (1) to supply our **homes** and **communities**; (2) for **agricultural** irrigation and **grazing** livestock; and (3) in **industrial** activities like thermoelectric power generation, mining, and aquaculture. The amount of available water depends on how much water is in each pool (water quantity). Water availability also depends on when and how fast water moves (water timing), how much water is used (water use), and how clean the water is (water quality).

Human activities affect **water quality**. In agricultural and urban areas, irrigation and precipitation wash fertilizers and pesticides into rivers and groundwater. Power plants and factories return heated and contaminated water to rivers. Runoff carries chemicals, sediment, and sewage into rivers and lakes. Downstream from these types of sources, contaminated water can cause harmful algal blooms, spread diseases, and harm habitats. **Climate change** is also affecting the water cycle. It affects water quality, quantity, timing, and use. Climate change is also causing ocean acidification, sea level rise, and extreme weather. Understanding these impacts can allow progress toward sustainable water use.

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What are the communications goals?

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Practice

Who is the **audience**?

Who needs to know this information?

Who wants to know?

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Who is the audience?

ⓘ Start presenting to display the poll results on this slide.

Practice

How could we **assess** if our communication was successful?

What metrics could we use?

Welcome to WaterAlert

Get notifications for changes in water conditions based on thresholds you choose.

It's free to use!

Notifications sent to your email or phone

Simple to create, edit and remove subscriptions

Check out the User Guide

Start using WaterAlert

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How could we assess if our communication was successful?

ⓘ Start presenting to display the poll results on this slide.

Good science needs good communication!

Best practices:

1. Define your goals
2. Know your audience
3. Set your tone
4. Identify your messages
5. Choose your tools
6. Assess your success

Resources:

- AGU SciComm Toolkits
- USGS Public Affairs (examples)
- COMPASS (training and resources)
- PlainLanguage.gov

Reach out! Mandie Carr, ancarr@usgs.gov

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