



# Communicating Your Science

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NCEAS Learning Hub  
*for*  
Delta Science Program  
October 2023

# Learning Objectives

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- Discuss about the importance of science communication.
- Distinguish between how scientist communicate science vs how the rest of the world communicates.
- Introduce and practice using the Message Box as a tool to communicate science to a specific audience.

# Communicating Science

- There are many different reasons and ways to engage and practice science communication.



# Communicating Science

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“As scientist, it is **important to spread the word of our discoveries**, engage with non-scientist audiences, and build empathy and trust on what we do ([PLOS SciCom](#)). This way **make sure the world understand how important, necessary and meaningful science is.**”

# Scholarly Publication

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- Budden and Michener (2017) provide guidance on approaches and best practices for communication and disseminating research findings to technical audiences.
- Their guidance and advices are summarized in “10 Simple Rules” for writing research papers.

# #1 Make it a Driving Force

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“Design a project with an ultimate paper firmly in mind”



## #2 Less is More

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“Fewer but more significant papers serve both the research community and one’s career better than more papers of less significance”

## #3 Pick the Right Audience

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“This is critical for determining the organization of the paper and the level of detail of the story, so as to write the paper with the audience in mind.”

## #4 Be Logical

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“The foundation of “lively” writing for smooth reading is a sound and clear logic underlying the story of the paper.”

## #5 Be Thorough and Make It Complete

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- Present the central underlying **hypotheses**
- Interpret the **insights gleaned from figures and tables** and discuss their implications
- Provide sufficient **context** so the paper is self-contained
- Provide **explicit results** so readers do not need to perform their own calculations
- include **self-contained figures and tables** that are described in clear legends

## #6 Be Concise

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- “The delivery of a message is more rigorous if the writing is precise and concise”

## #7 Be Artistic

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- “concentrate on spelling, grammar, usage, and a “lively” writing style that avoids successions of simple, boring, declarative sentences”

## #8 Be Your Own Judge

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- Review, revise and reiterate. “...put yourself completely in the shoes of a referee and scrutinize all the pieces—the significance of the work, the logic of the story, the correctness of the results and conclusions, the organization of the paper, and the presentation of the materials.”

## #9 Test the Water in Your Own Backyard

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- “...collect feedback and criticism from others, e.g., colleagues and collaborators.”



## #10 Build a Virtual Team of Collaborators

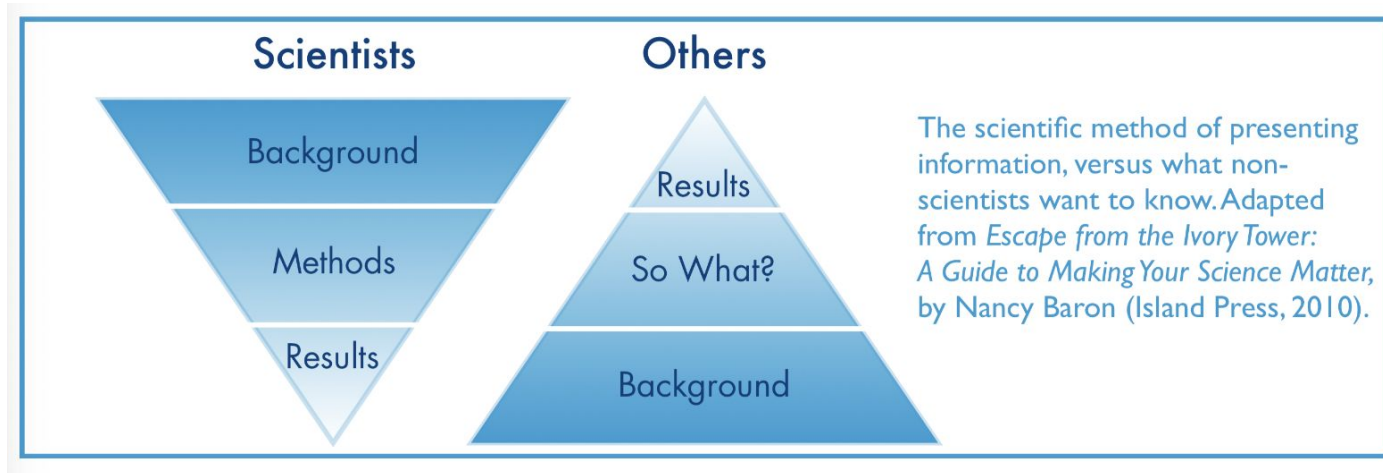
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- Treat reviewers as collaborators and respond objectively to their criticisms and recommendations. This may entail redoing research and thoroughly re-writing a paper.

# From a scientific audience to all other audiences

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- In a scientific paper, we establish credibility in the introduction and methods, provide detailed data and results, and then share the significance of our work in the discussion and conclusions. But the rest of the world leads with the impact, the take home message



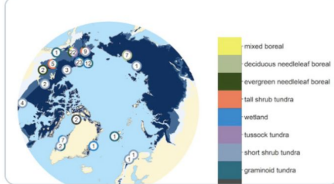
# Other communications outlets

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- Communicating your research outside of peer-reviewed journal articles is increasingly common, and important.
- These non academic communications can reach a more broad and diverse audience than traditional publications

# Other communications outlets

**Heather Kropp** @DrHeatherKropp · Nov 12  
I'm excited for my first synthesis to be published after 4 years of work! My coauthors and I found that shallow soil temperatures were higher under tall shrubs and trees around the permafrost region after controlling for air temperature. [doi.org/10.1088/1748-9...](https://doi.org/10.1088/1748-9...)



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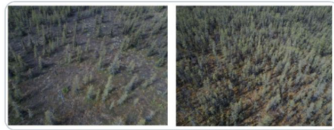
**Heather Kropp** @DrHeatherKropp · Nov 12  
This synthesis of 106 plots also changed my perspective in how we think about spatial scales and plot-scale research.

1 3

**Heather Kropp** @DrHeatherKropp · Nov 12  
Most studies of vegetation on soil temperature in the permafrost region focus on ecosystems or regional scales. In this synthesis, we brought together many of these studies to look at the entire permafrost region.

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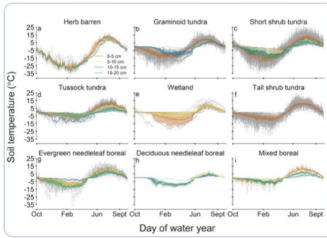
**Heather Kropp** @DrHeatherKropp · Nov 12  
This is critical for contextualizing observations. In my study plots in northeastern Siberia pictured below, soil temperatures are lower as tree density increases in forests. This might lead me to the conclusion that trees = ↓ soil temperature.



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**Heather Kropp** @DrHeatherKropp · Nov 12  
Not so! Soil temperature is higher in both of these forests compared to short shrub or graminoid tundra after


**Heather Kropp** @DrHeatherKropp  
Replying to @DrHeatherKropp  
I also gained a lot of perspective in how we measure soils in these ecosystems. I initially compiled observations from 235 plots, but only 106 plots could be fully harmonized for the scope of the study. You can find the full, raw dataset used in analysis at [@arcticdatacenter](https://arcticdatacenter.org).



4:18 PM · Nov 12, 2020 · Twitter Web App

1 Quote Tweet 5 Likes

**Heather Kropp** @DrHeatherKropp · Nov 12  
Replying to @DrHeatherKropp  
A lot of individual field studies set up soil sensors at depths that are specific to a hypothesis or field site. In the picture below from my Siberia sites, you can see where I collected samples in the organic soil just above a frozen mineral soil layer.



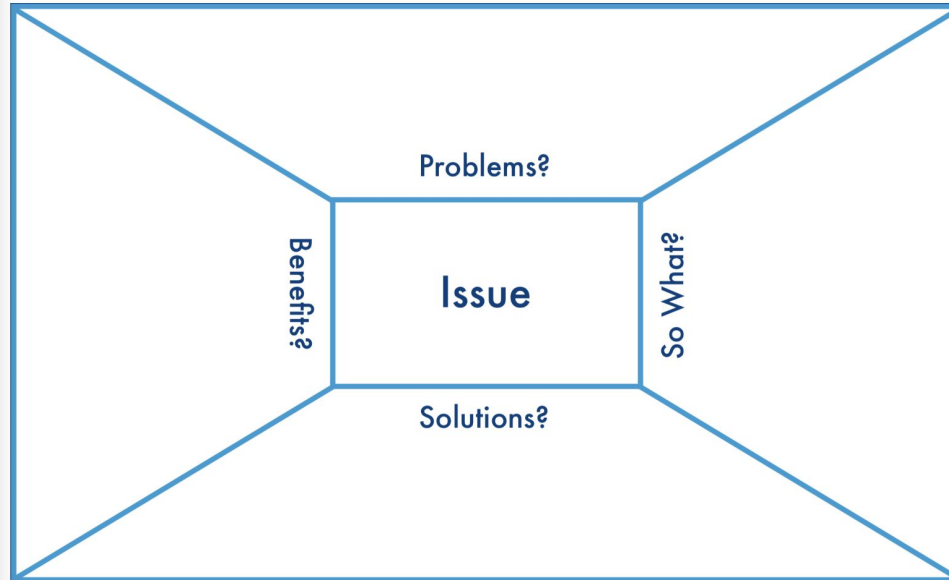
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**Heather Kropp** @DrHeatherKropp · Nov 12  
The soil sensors at this site were set up to span both the

# The Message Box

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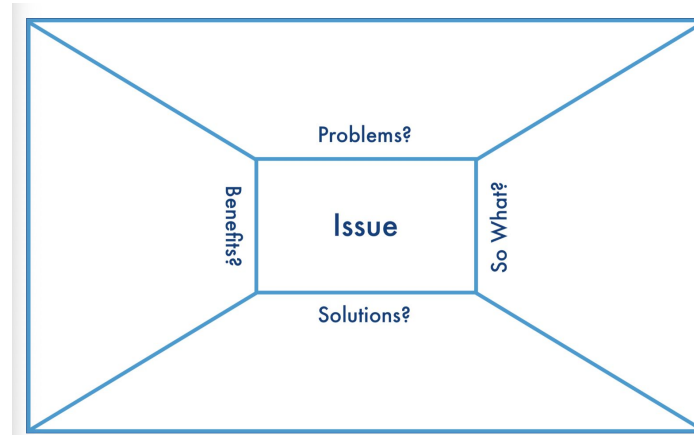
# CÔMPASS



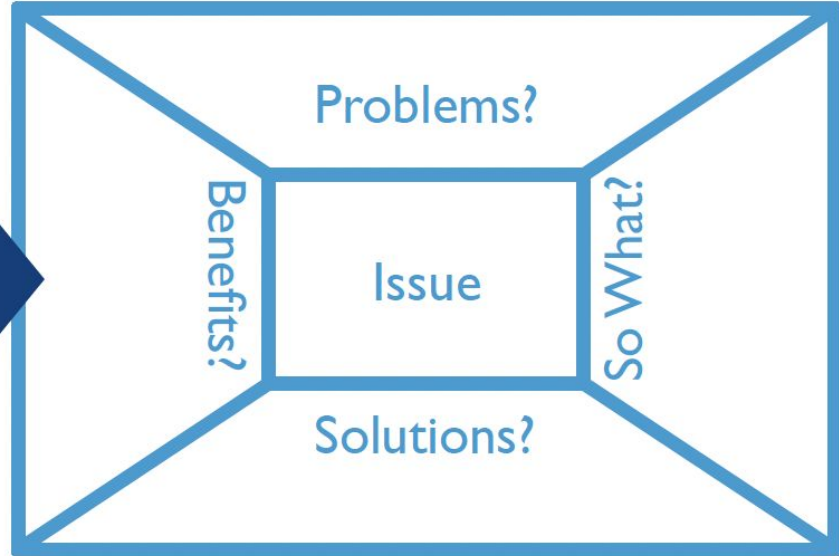
# The Message Box

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Take the information scientists hold about their research and communicate it in a way that resonates with the **chosen audience**.



# The Message Box



# Audience

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- Critical first step is to identify your Audience.
- Avoid using 'the general public'. This generic term comprised of many different groups of people, with different interests, motivations and values.
- The bottom line is who are you trying to communicate with?
- Why? What do they care about?



# The Issue

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- Overarching topic
  - Describes the overarching issue or topic: Big Picture
  - Broad enough to cover key points
  - Specific enough to set up what's to come
  - Concise and clear
  - 'Frames' the rest of the message box

# The Problem

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- The Problem is the chunk of the broader issue that you're addressing in your area of expertise.
  - The part of the broader issue that your work is addressing
  - Builds upon your work and expert knowledge
  - Try to focus on one problem per audience
  - Often the *Problem* is your research question
  - This section sets you up for *So What*

# The So What?

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- One of the most important components of the Message Box.
  - The crux of the message box
  - Why should you audience care?
  - What about your research is important for them to know?
  - Why are you talking to them about it?



The "So What?" Prism. Adapted from *Escape from the Ivory Tower: A Guide to Making Your Science Matter*, by Nancy Baron (Island Press, 2010).

# The Solution

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- Outlines the options for solving the problem you identified.
  - Outlines the options for solving the *Problem*
  - Can your audience influence or act upon this?
  - There may be multiple solutions
  - Make sure your *Solution* relates back to the *Problem*. Edit one or both as needed

# The Benefit

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- Benefits of addressing the Problem — all the good things that could happen if your Solution section is implemented
  - What are the benefits of addressing the *Problem*?
  - What good things come from implementing your *Solution*?
  - Make sure it connects with your *So What*
  - *Benefits* and *So What* may be similar

# Finally...

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- To make your message more memorable you should:
  - Support your message with data
  - Limit the use of numbers and statistics
  - Use specific examples
  - Compare numbers to concepts, help people relate
  - Avoid jargon
  - Lead with what you know

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**Audience:** Who is impacted by this? Who can change this? Who cares about this?

