



Highlight: Delta region educators launch canoes and paddle the Cosumnes River.

Delta Science Plan

2026

RESOURCE C

Science communication

Introduction

Science communication is vital to addressing each of the **grand challenges**¹ to science in the Sacramento-San Joaquin Delta and Suisun Marsh (collectively referred to herein as Delta; California Water Code § 85058), the San Francisco Bay-Delta (Bay-Delta) system, and the broader San Francisco Estuary. In a world where future environmental conditions and regulations may look very different and traditional science struggles to keep pace with constant change, we need ways to share information as efficiently and effectively as possible among Delta scientists and decision-makers. At the same time, we must ensure that science communication is an inclusive exchange of ideas – connecting Delta communities to the science in their regions and connecting traditional ways of

knowing to decision-making. By fostering dialogue, building trust, and creating spaces for meaningful engagement and knowledge co-production, science communication can strengthen connections between science, communities, and decision-making.

Science communication is a broad, complex, and evolving field that can have multiple meanings for different individuals. At its core, however, it is the process of ensuring that scientific knowledge is not merely produced but is also understood, trusted, and acted upon (Kappel & Holmen, 2019). As such, science communication, as used in the

1. <https://deltascienceplan.deltacouncil.ca.gov/sites/default/files/2024-11-20-grand-challenges-in-delta-science-essay.pdf>

context of the Delta Science Plan, means more than simply publishing academic articles in journals or presenting at conferences. It requires thinking deeply and strategically about the reasons for communicating and how best to engage audiences in ways that support effective decision-making. The Delta Stewardship Council's (Council) Delta Science Program recognizes this need and increasingly encourages research proposals to include a strategic communication and engagement plan. This helps to ensure that science communication is not merely an afterthought.

The purpose of this resource is to: 1) highlight general principles of effective science communication; 2) provide a few examples of Delta-specific audiences and communication methods; and 3) share helpful information for interested readers to learn more. While the resource cannot be comprehensive in every way, we hope it will help advance the conversation about effective science communication in the Delta.

Effective science communication principles

In the words of Bawah (2019), effective strategic communication can be boiled down to “getting the right message, through the right media, to the right audience at the right time.” Knowing who your audience is, how scientific research can inform their needs, and your reasons for communicating will generally determine the nature of the message you want to convey and the best method to use for delivery. Furthermore, it is important to recognize that science communication is an ongoing process of two-way communication, and not something that happens only at the end of a project when you package up and deliver your results.

The three core science communication components – audience, message, and delivery – overlap and interact with each other and cannot be fully understood in isolation or without context. However, some general principles are worth bearing in mind.

AUDIENCE

First, and perhaps most important, identifying and understanding your audience is key. Different audiences have different values, experiences, knowledge, and interests. They also differ in how they prefer to receive information, whom they trust to deliver it, and the kinds of information they are more likely to accept or reject. Listening to, and building trust with, your audience is vital. When identifying potential audiences, consider who is affected by the topic, who is interested in it, and who can take action. Targeting small, tightly connected groups of people can be more effective than broadcasting to large networks of weak ties (Toomey, 2023). Here in the Delta, there are many ways to group audiences. In this resource, we use the following broad groups: scientists, decision-makers, tribes, and local communities. We will discuss these in more detail in the next section, Science Communication in the Delta.

MESSAGES

It is also vital to know precisely what you want to communicate and why. Your message content might be, for example, the factual results of a study, management recommendations based on interpretation of those results, or a solicitation for input. Your reasons for communicating can be similarly varied and may include informing, influencing, or engaging your audience. A good message is clear, concise, relevant, and aligned with the needs and characteristics of your audience. It should avoid unnecessary jargon and not assume too much (or too little) prior knowledge.

DELIVERY

Ultimately, your approach or method for delivering communications should align well with both the message and the audience. Academic papers and conference presentations are important for scientists; however, decision-makers concerned with policy development may prefer one-page briefs, while members of the public may find less formal media like podcasts or videos more engaging.

Approaches that incorporate storytelling, interactivity, and provide actionable information are often more persuasive or compelling than presenting facts alone (Kolandai-Matchett & Armoudian, 2020; Toomey, 2023). Interactive approaches, such as ArcGIS StoryMaps or data visualization dashboards, can help communicate complex information in ways that are more accessible to diverse audiences. Participatory approaches, such as community workshops, can be an effective way to engage with and learn from other interested parties. These approaches reflect a broader shift toward viewing effective science communication as an ongoing, two-way exchange of information, rather than a one-way transmission of facts (Druckman et al., 2025).

Science communication in the Delta

Science communication in the Delta is a complex issue. There are myriad producers and consumers of scientific information with multifaceted interests and priorities, belonging to different groups with varying levels of overlap and alignment. It is impossible to keep track of everything that is happening, and the system itself is changing in response to intensifying environmental and social pressures. This Delta-specific complexity overlays the structural challenges of a 21st-century media ecology that is characterized as “post-truth,” hyper-partisan, fractious, and contemptuous of scientific expertise (Druckman et al., 2025). As such, we must work to improve science communication in the Delta. This section will highlight some science communication audiences and delivery methods that are important in the Delta.

DELTA AUDIENCES

As mentioned earlier, science communication audiences in the Delta can be broadly divided into scientists, decision-makers, tribes, and local communities. We acknowledge that this categorization is arbitrary and reductive, and that these groups are nebulous and overlapping in

nature. However, such groups can be helpful as a structured starting point for considering Delta audiences.

Scientists

Researchers conducting studies or monitoring activities to address Delta-relevant questions. This audience includes members from many disciplines affiliated with a wide range of institutions, including academia, non-profits, consulting firms, other non-governmental organizations, tribes, and local, state, and federal agencies.

Decision-makers

Professionals who develop and/or implement Delta management and policy may require differing levels of scientific detail or context, including:

- Program staff who rely on science to execute everyday operational decisions in the Delta (often referred to as “environmental managers”).
- Lawmakers, policy-level staff, and governing boards concerned with advancing state policy, governance, agency mission, and/or shaping strategic direction.
- Those interested in applied science and what it means for Delta policy and management.

Local communities

People or groups with some level of personal relationship to the Delta. Local communities may require less technical information but are also strongly invested in the topic and its role in decision-making. Their values, knowledge, interests, and other characteristics vary greatly. Examples of members of this audience include:

- Residents and community groups.
- Agricultural interests, commercial interests, and business owners.
- Environmental justice or other advocacy groups, interest groups (e.g., duck hunters, fishers, boaters).
- General members of the public.

Tribes

Tribes, tribal communities, and Traditional Knowledge-holders have their own unique knowledge systems, priorities, and decision-making processes. Federally recognized tribes are sovereign governments with inherent authority to govern their people and resources and should be engaged as governmental partners, not interested parties (Delta Stewardship Council, 2025). When consulting and engaging with tribal partners, consider:

- Management decisions may affect tribal resources, communities, and culture.
- Communication should go beyond “transmitting knowledge” and be an iterative and meaningful process of ongoing engagement and co-production that recognizes the value of Traditional Knowledge and is built on trust, respect, humility, and reciprocity.

EXAMPLES OF COMMUNICATION PRODUCTS AND METHODS

This section presents some general Delta-relevant communication methods, venues, and platforms, along with a few specific examples of how each is related to various audiences. These examples are merely illustrative and are not intended as a definitive list of communication methods, venues, or approaches in the Delta.

Scientific journals and publications

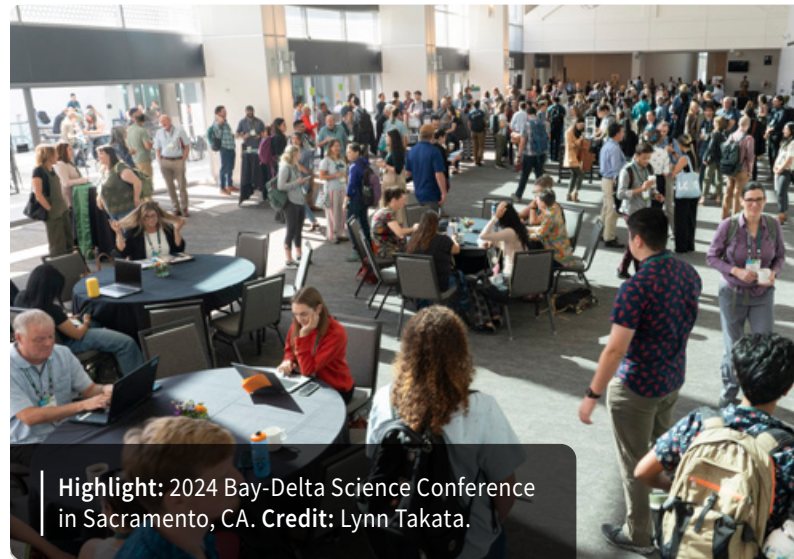
Historically, peer-reviewed articles in scientific journals have served as the primary means of communicating science to scientific audiences, such as researchers and other scientists. Peer review is also an important criterion for best available science, ensuring that scientific information has undergone rigorous evaluation by independent experts to ensure its credibility (Delta Stewardship Council, 2015). Peer-reviewed articles can also be an appropriate vehicle to reach decision-makers who use applied science to direct or otherwise inform their work – most commonly for program-level managers, but this may also include policy-focused decision-makers.

- **San Francisco Estuary and Watershed Science**² (SFEWS) – open-access journal with a large Bay-Delta science and policy audience; published with support from UC Davis and the Council.
- **The State of Bay-Delta Science**³ (SBDS) – periodically released sets of peer-reviewed articles synthesizing recent science on management-relevant topics (e.g., extreme events in the Delta) to inform decision-making; coordinated by the Council’s Delta Science Program.

Conferences, symposia, and webinars

Conferences and other organized events in the Delta frequently focus on sharing applied science and its impact on Delta management and policy. These venues provide important opportunities for dialogue among Delta scientists, decision-makers, and other interested parties. Such events can facilitate cross-pollination among many groups working in the Delta and catalyze new ideas and collaborations.

- **Bay-Delta Science Conference**⁴ (BDSC) – biennial in Sacramento (typically held in years ending in an even number), co-sponsored by the Council and the U.S. Geological Survey.



2. https://escholarship.org/uc/jmie_sfews

3. <https://sbds.deltacouncil.ca.gov/>

4. <https://www.baydeltascienceconference.com/>

- **State of the San Francisco Estuary Conference⁵** – biennial in the San Francisco Bay Area (typically held in years ending in an odd number), organized by the San Francisco Estuary Partnership.
- **Council’s Delta Science Program and UC Davis Coastal and Marine Sciences Institute joint symposia⁶** – regular free events that synthesize and share emerging science on a priority management topic (e.g., microplastics in the Bay-Delta).

Digital platforms

There are numerous online platforms and tools devoted to Delta science communication, many of which serve multiple audiences. Data dashboards and visualizations (e.g., **Shiny applications⁷** such as **those hosted by the Council’s Delta Science Program⁸**) are particularly useful because often users can engage with them at various levels: viewing visualizations of pre-selected data, interacting with that data via a graphical interface, or downloading the underlying data to analyze elsewhere. These tools enable a wide range of audiences to explore scientific data and information, regardless of their experience with data analysis tools.

- **Delta Science Tracker⁹** – a website hosting profiles of scientific activities conducted in the Delta aimed at enhancing transparency and providing access to associated products (e.g., publications, reports, news articles, fact sheets, and videos); valuable for researchers looking for collaborators, program managers seeking insight on key topics, policy-focused decision-makers assessing the funding landscape, among other uses; hosted by the Council.

- **Bay-Delta Live¹⁰** – a decision support tool that federates and displays spatially explicit water and environmental data from hundreds of sources to facilitate analysis, monitoring, reporting, and resource management in the Bay-Delta; supported by the State Water Contractors.
- **Flood risk mapping tool¹¹** – a tool that allows users to explore flood risk across the Delta in response to specified sea level rise scenarios and map other data layers of interest, including social vulnerability index and critical infrastructure; produced as part of **Delta Adapts¹²** by the Council.
- **Vulnerable Communities Platform¹³** – a map that allows users to look at the intersection of current and projected climate impacts with relevant social and demographic factors; produced by the California Governor’s Office of Land Use and Climate Innovation.

Policy briefs, ‘glossy summaries’, and fact sheets

Numerous institutions produce policy-focused reports, or higher-level summaries of technical information, that are useful for decision-makers who may be time-limited and focused on synthesizing the big picture from multiple disparate sources.

- **Priorities for California’s Water¹⁴** – well-designed and clearly written policy brief that highlights actionable takeaways for managers and policymakers, includes information aimed to be understood by informed lay audience, and provides links to further information for readers who need more specifics; produced by the Public Policy Institute of California.

5. <https://www.sfestuary.org/about-soe/>

6. <https://marinescience.ucdavis.edu/events/cmsi-and-delta-stewardship-council-symposia>

7. <https://shiny.posit.co/>

8. <https://deltascience.shinyapps.io/Home/>

9. <https://sciencetracker.deltacouncil.ca.gov/>

10. <https://www.baydeltalive.com/home/new-homepage>

11. https://deltascience.shinyapps.io/delta_flood_map/

12. <https://www.deltacouncil.ca.gov/delta-plan/climate-change>

13. <https://vcp.lci.ca.gov/>

14. <https://www.ppic.org/publication/priorities-for-californias-water/>

- **SBDS summaries**¹⁵ – peer-reviewed SBDS articles are summarized into different forms intended for lay audiences; these booklets and summary sheets distill the key science and management takeaways for decision-makers, the public, and scientists in other fields; produced by the Council.

Online media

Online media publications, blogs, and newsletters play a similar role in the science communication ecosystem, delivering a mix of accessible science and policy journalism, as well as explainers, to informed audiences. One particularly useful approach to science storytelling is provided by ArcGIS StoryMaps – interactive, multimedia communication tools that are relatively easy to create and can present complex information through an engaging website with maps, photos, and other embedded visuals. Other engaging media formats for science communication include short-form videos and podcasts, which can feel less formal and more personal and allow for different information consumption patterns. These formats can help broaden the reach of scientific information and engage audiences who may not interact with more traditional scientific products.

- **Maven's Notebook**¹⁶ – a comprehensive website and newsletter focused on providing information about California water; content includes original and curated news stories, stories/explainers, podcasts, and more; frequently considered essential reading for anyone involved with the Delta.
- **California WaterBlog**¹⁷ – a blog sharing perspectives on California water resources management aimed at policy and educated lay audiences; produced by the UC Davis Center for Watershed Sciences.

- **Aquaforia**¹⁸ – a newsletter curating a selection of top water news from California and the West each weekday; produced by the Water Education Foundation.
- **Weaving the Delta's Story: Research in Action**¹⁹ – a visually compelling StoryMap highlighting research projects funded by the Council's Delta Science Program's 2020-2021 Delta Research Awards; intended to share key research activities and findings in an engaging and accessible format for all audiences.
- **Exploring the Heart of California Water**²⁰ – an informative and engaging StoryMap guide to the Delta; considered an excellent primer for the public, journalists, and non-experts in the policy and legislative realms.
- **The Delta Dispatch**²¹ – a limited series podcast featuring conversations with experts to help explain the Delta Plan and its policies; produced by the Council in 2024-2025.

Participatory approaches

Participatory public workshops are an increasingly important venue for Delta science communication. Such workshops embrace a new paradigm of science and science communication that centers participation, engagement, and the co-production of knowledge by scientists and the audiences with whom they are communicating. This contrasts with more traditional top-down approaches, which view communication as the transmission of knowledge to less-informed parties to inform, reframe, or correct existing beliefs (Druckman et al., 2025). This bottom-up, participatory process of communication involves building relationships and actively soliciting and incorporating input from interested parties through ongoing dialogue throughout the project. It's essential to acknowledge that these interested parties can be anyone, including local community groups, tribes, decision-makers, and researchers.

15. <https://sbds.deltacouncil.ca.gov/sites/default/files/2025-09-19-sbds-information-sheet.pdf>

16. <https://mavensnotebook.com/>

17. <https://californiawaterblog.com/>

18. <https://www.watereducation.org/aquaforia>

19. <https://storymaps.arcgis.com/stories/2722fd9914404a26aacfcac8ed6da853>

20. <https://storymaps.arcgis.com/stories/d68f8152af374dbcaf9198f751e18473>

21. <https://viewperformance.deltacouncil.ca.gov/index.php/Delta-Dispatch>

- **Just Transitions in the Delta**²² – a multi-institutional collaborative research project that uses public workshops and events, interviews, surveys, and field work to engage with diverse Delta communities and work with them to explore equitable water management strategies under different drought, salinity, and sea level rise scenarios.
- **Science for Communities**²³ – facilitates and fosters partnerships among Delta communities, tribes, local public agencies, and subject matter experts to collaborate on projects in the Delta region. This Council initiative promotes the sharing of knowledge, tools, and data to support relationship building, collaboration in addressing social-environmental issues, and access to funding for further research and training.

Conclusion

Science communication is not something that happens only at the end of a project. Rather, it is an ongoing, iterative, and collaborative process pursued in partnership with audiences and those who might benefit from, or be affected by, the outcomes of a project. It requires thinking deeply and with great intentionality about who you are communicating with, why the communication matters, and how to best engage with those audiences. Conducting science in an open manner is itself a valuable act of science communication. This process requires listening, flexibility, and intellectual humility, and can help to build trust and shared values within and across Delta communities.

In doing so, science becomes embedded within a broader network of relationships that support effective decision-making and increase the likelihood of achieving meaningful real-world outcomes.

Resources for further exploration

A small selection of resources to learn more about science communication and the science of communication.

- **2025 Delta Research Engagement and Communication Plan Template**²⁴
- **Capital Science Communicators**²⁵, a professional society supporting science communicators in the Sacramento region
- **Reimagining Science Communication in the COVID Era and Beyond**²⁶ (PNAS Special Feature)
- **Message framing strategies for effective marine conservation communication**²⁷ (Kolandai-Matchett & Armoudian, 2020)
- **Communication Approaches and Specialists that Can Improve Fisheries Management**²⁸ (Robison et al., 2024)
- **Why facts don't change minds: Insights from cognitive science for the improved communication of conservation research**²⁹ (Toomey, 2023)
- **Escape from the ivory tower: A guide to making your science matter**³⁰

22. <https://delta-just-transitions-ucdavis.hub.arcgis.com/>

23. <https://deltacouncil.ca.gov/science-for-communities>

24. <https://caseagrant.ucsd.edu/sites/default/files/2025%20DSP%20Engagement%20and%20Communication%20Plan%20Template.docx>

25. <https://capscicomm.org/>

26. <https://www.pnas.org/topic/575>

27. <https://onlinelibrary.wiley.com/doi/10.1002/aqc.3349>

28. <https://academic.oup.com/fisheries/article/49/7/319/7899715>

29. <https://www.sciencedirect.com/science/article/pii/S0006320722004396?via%3Dihub>

30. <https://press.princeton.edu/books/paperback/9781597266642/escape-from-the-ivory-tower?srltid=AfmBOoqUjtjEDiPIBP0MC0ndB6Gpxw1NUtriE3-aaVALJ4eLcigTazWu4>

- **COMPASS**³¹ (including **the message box**³², a tool for crafting your message)
- **International Association for Public Participation**³³
- **Take Action Toolkit | American Association for the Advancement of Science (AAAS)**³⁴
- **Trust in Science - Research and data from Pew Research Center**³⁵

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Toomey, A. H. (2023). Why facts don't change minds: Insights from cognitive science for the improved communication of conservation research. *Biological Conservation*, 278, 109886.

31. <https://www.compasscomm.org/>

32. <https://www.compasscomm.org/leadership-development/the-message-box/>

33. <https://www.iap2usa.org/>

34. <https://www.aaas.org/resources/take-action-toolkit>

35. <https://www.pewresearch.org/topic/science/trust-in-science/>