

March 2025

# Governance for Adaptive Management

## Forum Summary Report



Delta Science Program

DELTA STEWARDSHIP COUNCIL

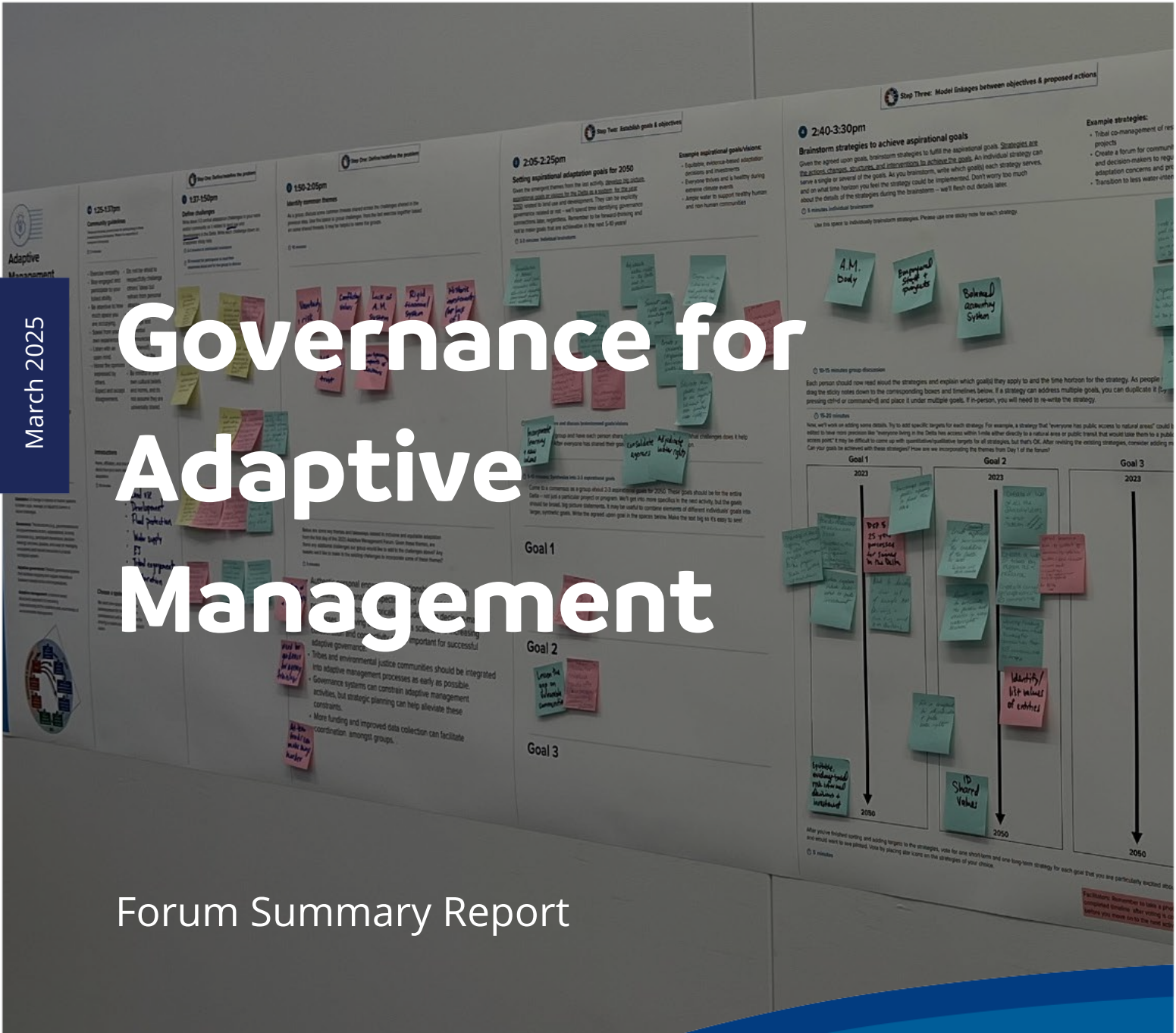


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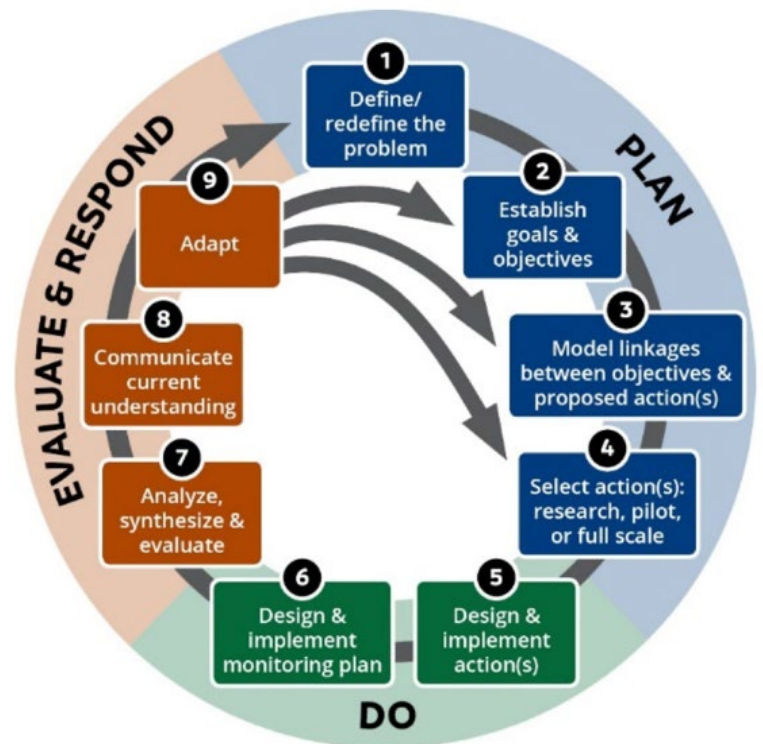
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## Background and Key Terms

The Delta Stewardship Council's (Council) Adaptive Management Forum (Forum) series is called for in the Council's Delta Science Plan and by the Delta Independent Science Board to promote coordination and learning around adaptive management in the Sacramento-San Joaquin Delta (Delta) (Delta Stewardship Council, 2019; Delta Independent Science Board, 2016). The event has been hosted every two years since 2019, and the 2023 Forum explored the role of governance in adaptive management implementation.

The Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act) defines "adaptive management" as "a framework and flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation leading to continuous improvement in management planning and implementation of a project to achieve specified objectives." (Wat. Code, § 85052). Adaptive management is a science-based process of project implementation that informs



decision-making. Three stages – *plan, do, and evaluate and respond* – iteratively guide adaptive management in the Delta.

Specifically, the Delta Reform Act articulates the need for adaptive management for ongoing ecosystem restoration and water management decisions in the Delta (*see e.g.*, Wat. Code, §§ 85086(c)(2), 85280(a) and (b), and 85308(f)). Appendix C of the Delta Plan<sup>1</sup> emphasizes that governance to support adaptive management in the Delta must be flexible and have the capability to make timely changes in policy and practices in response to newly learned information to be effective and that governance for adaptive management should provide a decision-making structure that fosters communication between experts, decision-makers, and interested actors (Delta Stewardship Council, 2013). To further explore this point, the 2023 Forum focused on how adaptive management strategies are influenced by governance. Governance of social-ecological systems like the Delta includes the *structures* (e.g., governmental and non-governmental actors, organizations, and forums); *processes* (e.g., participant interactions, decision-making); and *laws, policies, and rules* for managing ecosystems and natural resources (Lebel et al., 2006).

To learn more about governance in the Delta, you can review the 2023 Forum's [Governance of Adaptive Management Infosheet](#).

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<sup>1</sup> The Delta Plan is California's long-term sustainable management plan to ensure coordinated action in the Delta at federal, State, and local levels.

## Adaptive Management Forum Description and Findings

Lessons learned shared at previous Forums in 2019 and 2021 demonstrated that the success of adaptive management depends on the larger social, regulatory, and institutional context, or “governance system.” In recent years, there has been increasing momentum and institutional support at the Council around the social dimensions of the Delta in research and management. This has included the formation of the [Delta Social Science Taskforce](#), the [Delta Adapts](#) adaptation plan incorporating governance and equitable adaptation solutions, and the recently published draft of the [whitepaper on Tribal and Environmental Justice Issues in the Sacramento-San Joaquin Delta](#). These efforts highlight that a lack of social context and equity concerns in adaptive management planning and implementation could exacerbate social inequities and vulnerabilities (Wasley et al., 2023). Thus, the 2023 Forum provided a bridge between these Council efforts and adaptive management.

The 2023 Forum focused on governance for adaptive management, fostering learning and discussion around the need to support effective, equitable, and inclusive processes in the Delta. Day one featured storytelling, presentations, and panel discussions from a variety of governance perspectives. Day two was a workshop where participants co-produced visions of what a more equitable and effective governance system in the Delta could look like by 2050. Across the two days, more than 150 people participated in the Forum.

The objectives of the 2023 Forum were to:

- **Connect** people within organizations and across sectors to cultivate meaningful conversations on Delta governance and adaptive management;
- Share ideas about **equitable and inclusive adaptive management** processes that support and reflect diverse societal values; and
- **Highlight case studies** that demonstrate adaptive management success in the changing social and ecological context of the Delta.

To plan the Forum, the Council’s Delta Science Program staff incorporated feedback from a wide range of experts (including tribes, community-based organizations,

environmental non-profits, universities, and state and federal agencies) to inform the development of workshop objectives, format, and speaker list.

*The following summaries and conclusions represent perspectives that Forum participants shared across both days of the Forum, but they do not express or necessarily reflect the views of the Delta Stewardship Council and do not supersede any Council publications.*

*All quotes are used with permission of the individuals to whom they are attributed. All speaker and participant titles and affiliations reflect their status at the time of the Forum and may have since changed. Some of the proposed strategies in this summary would require governmental processes or actions and dedicated funding.*

### Day One: Summary of Presentations and Panel Discussions

The forum opened with a tribal welcome from Raquel Gonzales, Board Member of the Shingle Springs Band of Miwok Indians, and a traditional blessing song from tribal members, followed by a land acknowledgment from Delta Stewardship Council then-Chair **Virginia Madueño**. In the sessions that followed, **16 presenters** shared their experiences and insights on adaptive management and governance. A wide range of sectors were included among the speakers and panelists, including tribes, environmental justice (EJ) communities, universities, agriculture, environmental non-profits, local government, federal agencies, and state agencies.

#### *Keynote Presentation*

The keynote presentation from Delta Stewardship Council member and Contra Costa County **Supervisor Diane Burgis** focused on governance needs for equitable adaptation in a dramatically changing Delta watershed. Supervisor Burgis emphasized embracing the unknown with enthusiasm and an open mind, and thinking proactively about engagement with diverse perspectives.

#### *Storytelling Session*

The Storytelling session focused on the human dimension of adaptation and governance. **Dr. Don Hankins**, a professor at California State University, Chico, spoke about his cultural connection with the land and the need for greater respect

for tribal law and eco-cultural connections under current governance structures.

**Tama Brisbane**, the City of Stockton's Poet Laureate and Executive Director of With Our Words, Inc., a Stockton-based youth-focused non-profit, spoke about including young people in adaptive management and environmental justice efforts and better connecting communities of color and marginalized communities to work in the Delta.

*Panel 1: Governance Needs for Adaptation*

**Panelists:**

Dr. Cathy Marcinkevage  
*National Marine Fisheries Service*

Dave Mooney  
*US Bureau of Reclamation*

Gloria Alonso Cruz  
*Little Manila Rising*

Ivan Senock  
*Buena Vista Rancheria of  
Me-Wuk Indians*

Michael George  
*Retired Delta Watermaster*

**Moderator:**

Newsha Ajami, *Lawrence Berkeley National Laboratory*

The first panel explored governance needs for effective adaptive management across organizational scales related to equity, inclusiveness, and collaboration. Panelists discussed barriers to adaptive governance including bureaucratic limitations, aversion to risk-taking, uncertainty, and the exclusion of marginalized groups.

*"We have a regulatory and permit-granting system that strives to exclude environmental risk-taking, and yet adaptive management is specifically about trying something and seeing how it works... So, if we expect adaptive management to result in the incremental improvement of resource management over time, our governance system must adapt to a reasonable amount of taking the risks that can teach us what works and what refinements are required — in short, to help us learn."*

– Michael George, Delta Watermaster (retired)

*Panel 2: Adaptation Case Studies Across Scales*

**Panelists:**

Artie Valencia

*Restore the Delta*

Brett Milligan

*University of California, Davis*

Harriet Ross

*Delta Stewardship Council*

Jerred Dixon

*Conservation Farms and Ranch*

Krystal Moreno,

*Shingle Springs Band of*

*Miwok Indians*

**Moderator:**

Barbara Barrigan-Parilla, *Restore the Delta*

Panelists gave brief presentations on their case studies and shared insights and lessons learned. Case studies covered topics including tribal environmental management, restoration of peat soils through agriculture, levee improvement, climate resilience, and subsidence reversal.

*[On what is needed to bring more diverse voices into decision-making]*

*“Genuine intention to take action and creating a space for not just engagement with tribes, but that problem-solving, that collaboration – the action part.”*

– Krystal Moreno, Shingle Springs Band of Miwok Indians

*Panel 3: How can the Governance System Change to Enable More Effective and Inclusive Adaptation?*

**Panelists:**

Cintia Cortez

*Restore the Delta*

Krystal Moreno

*Shingle Springs Band of Miwok Indians*

Morgan Chow

*Delta Stewardship Council*

Dr. Rene Henery

*Trout Unlimited*

**Moderator:**

Dr. Tanya Heikkila, *University of Colorado, Denver;*  
*Delta Independent Science Board*



This panel took a forward-looking approach to discuss what could change about the current governance system to meaningfully address equity and environmental justice in Delta adaptive management. Key themes included decolonizing ways of thinking, building collaboration and community involvement, and thinking outside of existing institutional and cultural boundaries.

*“The speed at which we are moving does not match the urgency with which we should be adapting to climate change.”*

– Cintia Cortez, Restore the Delta

At the end of day one, major emergent themes from speakers and panel discussions included:

- Tribes and EJ communities should be integrated into adaptive management processes as early as possible.
- Governance systems can constrain adaptive management activities, but strategic planning can help alleviate these constraints.
- More funding and improved data collection and sharing can facilitate respectful coordination amongst groups.
- Authentic personal engagement, relationship building with coalitions, intentionality, respecting lived experiences and perspectives of those historically excluded from decision-making processes, increasing collaboration between groups, and improving connectivity are all important for successful adaptive governance.
- Governance is more than just government. Thus, creating space for a genuine diversity of perspectives to help guide decision-making across scales and institutional boundaries is important for equitable adaptive governance.

*“In my improved world, you have coalitions where government shows up as an interested party and participates in that regard.... But they are just another party.”*

–Dr. Rene Henery, Trout Unlimited



## Day Two: Co-producing Governance Visions

Day two of the Forum was a workshop where participants co-produced visions of governance approaches that could support more effective and equitable adaptive management processes by 2050. Each group brainstormed strategies of varying complexity and scope, selected one to two focal strategies, and explicitly described what governance pathways could lead to success. Participants included representatives from state and federal agencies, tribes, environmental non-profits, and academia. Summaries below capture each group's major challenges, aspirational goals for 2050, and potential strategies to achieve these goals. The summaries reflect a collaborative group effort and do not represent recommendations of any particular entity.

Several of the strategies that Forum participants co-produced aligned closely with recommendations from the Council's draft [Tribal and Environmental Justice Issues in the Sacramento-San Joaquin Delta whitepaper](#)<sup>2</sup>, and they are marked with an asterisk(\*). For more information, see the Council-Specific Recommendations section of the whitepaper.

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<sup>2</sup> As of the date of this summary, the draft Issue Paper has not been adopted by the Council's governing board.

*Group 1: Climate Adaptation 1*

The first Climate Adaptation group included representatives from state agencies, tribes, and local environmental justice communities. The major challenges they identified for climate adaptation included a lack of resources across institutions, temporal mismatches between rates of change and governance decisions, and a disconnect between governance actors in terms of ways of knowing, values, and trust. To address these challenges, the group developed three major goals and associated strategies:

1. Consistent, broadly accessible funding for long-term adaptation, which includes different ways of learning

*Example strategies:*

- Provide tribe-specific grant dollars, as set-asides, for activities that tribes have identified as necessary to meet needs of tribal communities
- Advocate to and educate Congress and the Legislature
- Develop diverse long-term adaptation funding programs
- and approaches (e.g., taxes, bonds, etc.)
- Determine metrics needed to inform long-term adaptive management and estimate costs through 2050
- Educate and engage youth at the local level in adaptation practices

2. Inclusive governance at all scales that reflects the values of all, including granting decision-making power to tribes and environmental justice communities

*Example strategies:*

- Use governor-appointed positions to get tribal and environmental justice groups in decision-making positions in the near term
- Establish decision-making seats for tribal representation in governance structures\*
- Create a tribal advisory body that selects representatives to participate in environmental decision-making groups\*
- Establish a united vision across governance actors that encourages different ways of knowing

- Use science, traditional ecological knowledge, and community group input to meaningfully inform adaptation planning
- Develop pilot gold standard examples of inclusive governance for larger-scale replication
- Amend legislation to explicitly include tribal involvement and decision-making

### 3. Equitable water rights system that is reflective of the current reality and historical injustices

*Example strategies:*

- Use science and policy to establish healthy flows to support endangered species
- Raise public awareness of broken water rights system to spur action
- Establish more restrictive regulations on water use for major water consumers in the Delta
- Establish State support to explore impacts (ecological, economic, and social) of changing pre-1914 water rights holdings
- Identify ongoing programs and create opportunities for tribes to reacquire ancestral homelands and attach water rights to those lands
- Reform water rights system with legal support and legal amendments

This group chose to explore the “Provide tribe-specific grant dollars” strategy in greater detail. To achieve this strategy, the group emphasized that the necessary *structures* included federal and state agencies and legislatures to provide funding with tribal government and tribal community organizations as the applicants and beneficiaries of the strategy. Relevant *processes* included grant and contracting processes, tribal consultation, and granting tribes autonomy to create and implement their own projects. The group highlighted that existing *policies and rules* make implementing this strategy more difficult, and that simplifying regulations to streamline this process to remove a barrier for tribes would be essential to making this strategy a success.

*Group 2: Climate Adaptation 2*

The second Climate Adaptation group included representatives from academia, tribes, non-profits, and state and federal agencies. The major challenges they identified included limited resources, regulatory obstacles, agency-landowner

collaboration, and the difficulty of aligning expectations between diverse actors with possible future conditions brought on by climate change. To address these challenges, the group developed two major goals and associated strategies:

*Example strategies:*

- Incentivize participation (e.g. for tribes and community groups) with financial compensation\*
- Make participation easy by providing virtual options for meetings\*
- Identify existing gaps in the Delta Adaptive Management program with respect to science, governance, and implementation of policies
- Fund specific positions from relevant entities to participate in guiding adaptive management
- Expand the oversight committees for Delta planning and implementation to involve tribes, landowners, farmers, and other Delta communities
- Establish a regular review of goals, objectives, understandings, and areas of concern relevant to governing the Delta
- Develop regional long-term programmatic plans/permits
- Develop a shared system of metrics to track change, native plant restoration, farmland management, and water quality that are shared throughout stakeholder groups

*Example strategies:*

- Recognize that the Delta is going to change in unpredictable ways and uncertainty is a large component of adaptation
- Identify risk areas associated with climate change to the Delta environment along different time horizons
- Use passive restoration to allow nature to lead ecosystem adaptation climate change
- Match the existing science and issues to the potential future climate change driven risks and gather more knowledge when needed

- Revise regulatory approaches to include uncertainty caused by climate change
- Evaluate processes against appropriate metrics and adapt when necessary

This group further explored the “identify existing gaps in the Delta Adaptive Management program in the science and implementation of policies” strategy. To achieve this strategy, participants highlighted that governance *structures* like a collaborative forum with equitable involvement would be necessary. Relevant *processes* included the development of a shared database so everyone could access the same information and to amend Delta Plan Interagency Implementation Committee (DPIIC) to include diverse representation (e.g., tribes, EJ groups, farmers). Relevant *rules/policies* included expanding existing rules that require projects to develop and demonstrate an adaptive management plan. Finally, participants acknowledged that connecting the dots to make this strategy a success would require an understanding of how those different groups work together and more staff explicitly focused on facilitating inter-institutional collaboration.

*Group 3: Ecosystems, Water, and Development Adaptation*

The Ecosystems, Water, and Development Adaptation group included participants from state and federal agencies. The group identified many major challenges, including uncertainty and risk, conflicting values, a lack of willingness and trust, non-synchronous impacts of decisions, a lack of an overarching adaptive management system, a rigid financial system, and historic investments (or lack thereof). To address these challenges, the group developed two major goals and associated strategies:

1. Achieve equitable, evidence-based, risk-informed decisions and investments

*Example strategies:*

- Fund the Science Action Agenda with contributions from public agencies
- Ensure that managers provide resources to technical staff
- Develop guidance documents on public engagement
- Develop guidance documents on how to budget in adaptive management contingencies
- Seek agency approval to alter project development at the project scale with briefing up

and down organizational hierarchy

- The Delta Science Program develops 5- and 25-year processes for science in the Delta
- Invest in the Delta using money from regional carbon capture

- Develop a clear set of example adaptive management decisions and processes
- Establish an adaptive management governing body
- File a complaint for adjudication of Delta water rights

## 2. Identify shared values

*Example strategies:*

- Create a list of all stakeholders and their missions, centered around a particular topic
- Create an inclusive process for envisioning the conditions of the Delta in 2050
- Establish a spatial framework that identifies current environmental justice communities for the Delta and their resource needs\*
- Create a list of tribes by region as a resource for agencies
- Establish a central spokesperson for environmental justice communities
- Require the State Water Resources Control Board to articulate the public trust service in every water rights decision
- Develop a funding mechanism to compensate environmental justice communities for engagement\*
- Identify and list values of governance entities

This group expanded on the “Establish an adaptive management governing body” strategy in more detail. They noted that the scale of the strategy would need to be across the entire Delta. They highlighted that this new governing body would interact with existing *structures* by advising DPIIC and that members of the adaptive management body could include DPIIC members as well as tribes, environmental justice groups, and other stakeholders to ensure this new governing body would be held accountable to a diversity of perspectives. An idea for a new *rule/policy* to support this strategy is that those with decision-making authority would be required to join the adaptive management governing body.

## Conclusions

Throughout the 2023 Adaptive Management Forum, speakers and participants shared a diverse range of perspectives on the state of adaptation governance in the Delta, discussed barriers, and co-produced a range of strategies to help achieve more equitable adaptive management processes in the Delta. The Forum **connected** more than 150 individuals from across organizations and sectors, emphasizing the significance that relationships play in facilitating effective collaboration and cooperation. Participants **shared and co-produced** ideas on the barriers and solutions to help achieve more effective and equitable adaptive management processes. The Forum **highlighted examples** from current case studies and possible future strategies to achieve aspirational goals for adaptive governance in the region. Through this collaborative and open forum, speakers and participants **demonstrated** what could help promote adaptive management success across spatial and temporal scales.

Several recurring themes came up across presentations, panel discussions, and small-group activities during the Forum. The most common theme was the **need to better incorporate a greater diversity of values and perspectives into adaptive management and adaptation decision-making processes**. Participants emphasized that **deliberate and thoughtful** steps from those in positions of greater power can help make room and elevate those who have been historically excluded. Establishing and maintaining **personal relationships across institutional boundaries** can make this process easier, allowing for more fruitful exchange of ideas and to coalesce around shared values and priorities.

This theme ties into another common barrier that was discussed: funding. Groups that have historically been excluded from many decision-making processes, like tribes and environmental justice communities, often do not have discretionary funds to participate in these processes. Thus, some Forum participants recommended decision-making organizations to **provide funding to outside groups** to bring their voices into the process in meaningful ways. However, securing this funding faces numerous logistical barriers, including but not limited to government budgets, agency missions, and contracting processes. Participants highlighted that even when the funding is available and approved, the associated processes can be tedious and cumbersome for everyone involved. These internal



barriers can make it difficult for funding to reach those who need it, highlighting the opportunity for context-specific institutional reform to **bolster and streamline the funding mechanisms** to support engagement with diverse governance actors.

A related barrier that came up throughout the Forum was the lack of **dedicated, sustainable, long-term funding to support adaptive management at the project scale**. Funding for project implementation and related science is most often available for short periods (<5 years), which is not compatible with the relationship building and stewardship required for robust, inclusive, adaptive management. Participants discussed the lack of funding for monitoring, implementing adaptive management strategies, and specific personnel to facilitate adaptive management and cross-institutional coordination. It is not enough to develop an adaptive management plan if there is no funding for implementation that allows adaptive management practitioners **to act on observations and feedback**. The inability to act on feedback and lessons learned can create frustration and distrust between governance actors and a sense that certain groups are being ignored, even if that is not the intention.

Another important thematic note highlighted at the Forum is that **governance is more than just governments**. An effective adaptive governance system includes a wide variety of actors communicating and collaborating, and all governance actors have strategies that they can enact to pursue change. Some strategies are simpler and don't require formal policy changes, like building personal relationships with people from different organizations or fostering a workplace culture that encourages learning and collaboration. Straightforward strategies like these can build on each other and enable more complex strategies in the future. Other strategies, like many of the strategies brainstormed by Forum participants, require more fundamental restructuring of laws and regulations. This requires strong coalitions of individuals and organizations with shared values and priorities working together to advocate for those policy changes. Workshop participants highlighted the importance of meaningful and respectful collaboration across organizational boundaries to create **adaptation pathways** that support broad societal values.

In this time of accelerating change, there is a clear and pressing need to adapt to a variety of challenges, including climate change, technological advancements,

pandemics, and more. To achieve the State's coequal goals<sup>3</sup> during such change requires flexibility to make timely decisions based on new and evolving knowledge. Adaptive management is one tool to help guide adaptation in the Delta. Ensuring that adaptation pathways are equitable prompts the question: **Adaptation for whom?** This question centers the perspectives of tribes, environmental justice communities, and others who have been historically excluded from decision-making spaces and empowers these groups to have meaningful sway over the decisions that affect them. Pursuing an adaptive governance system that reflects and includes diverse societal values could help the Delta adapt as an evolving place to create more positive and equitable futures.

The Delta Plan states that effective governance for adaptive management should provide a decision-making structure that connects and fosters communication between scientists and decision-makers with a balanced approach to involving interested stakeholders. This summary report documents perspectives from diverse governance sectors in the Delta, and a shared desire for a governance system that includes more voices in decision-making to help inform future adaptive management that best serves society.

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<sup>3</sup> The Delta Reform Act defined the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.

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## Citations

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## Next Adaptive Management Forum

The next Adaptive Management Forum will be held in 2025. For more information, please email [AdaptiveManagement@deltacouncil.ca.gov](mailto:AdaptiveManagement@deltacouncil.ca.gov). To receive updates on this event and other Delta Stewardship Council events, please subscribe to our [listserv](#).