

2021 ADAPTIVE MANAGEMENT FORUM

Closing reflections

#AMForum2021

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**Delta
Science
Program**

DELTA STEWARDSHIP COUNCIL

Adaptive management in the Delta

A living history

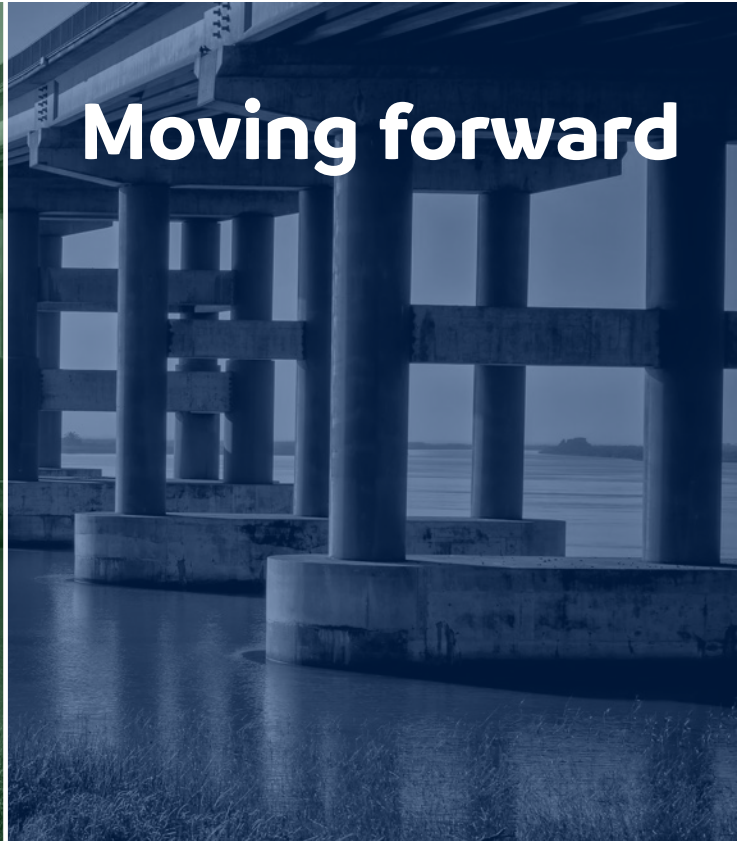
Looking back



Here and now

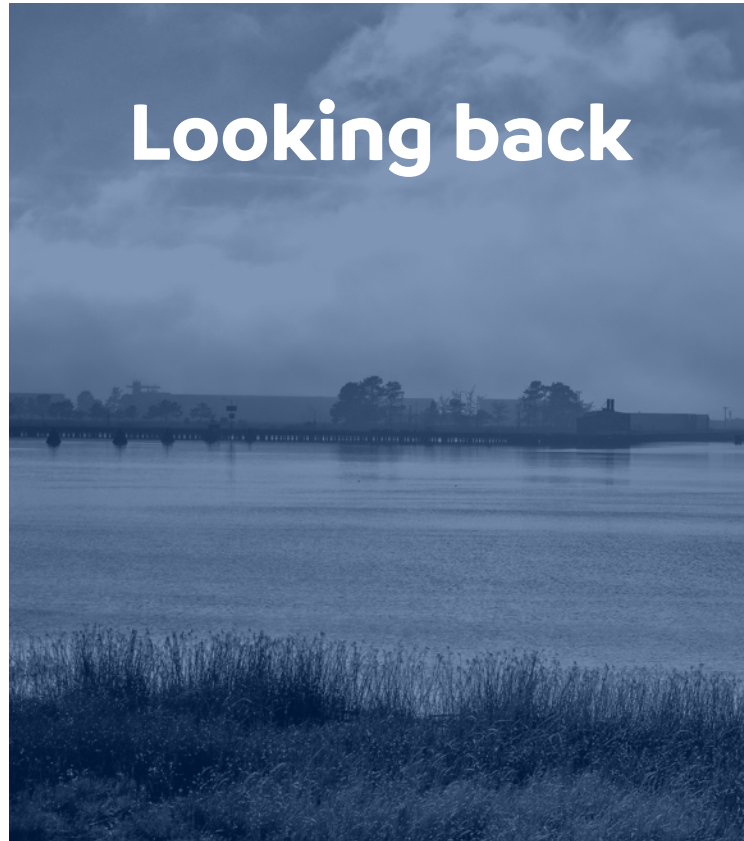


Moving forward



Adaptive management in the Delta

A living history



Evolution of adaptive management

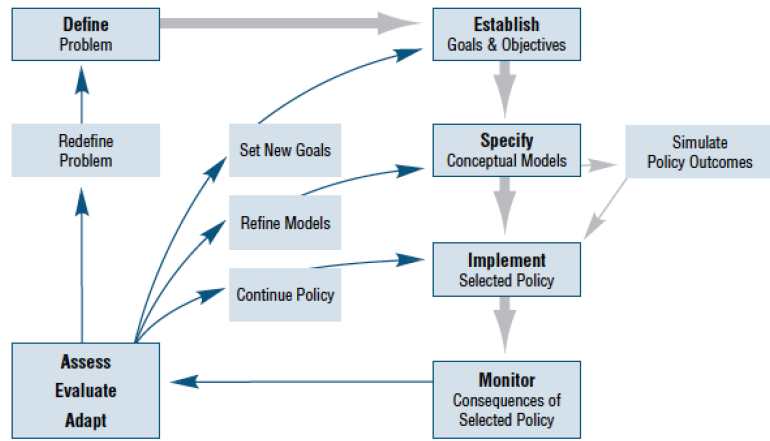
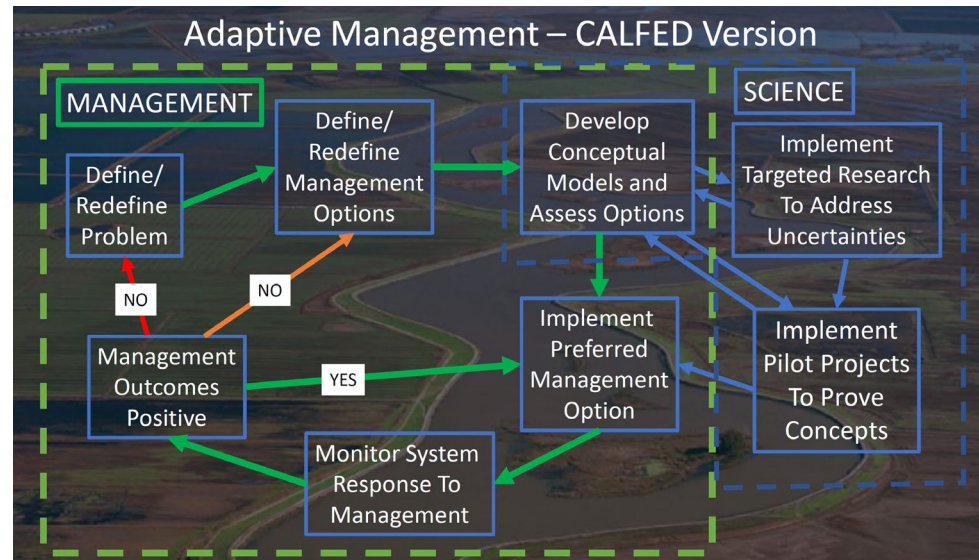
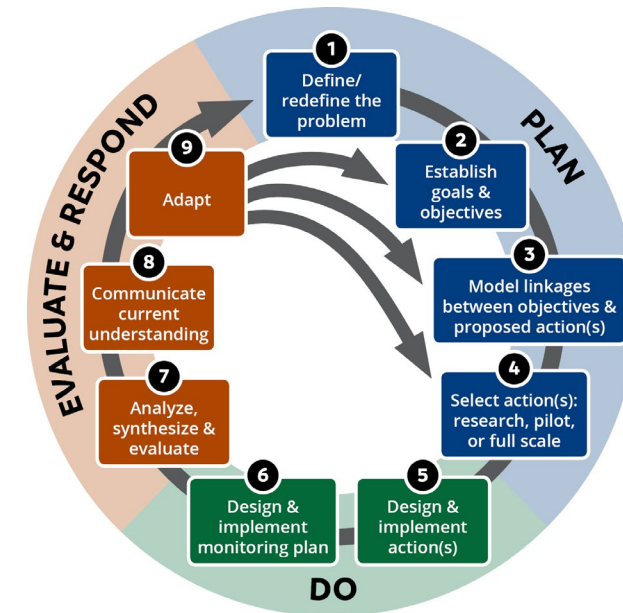


Figure 8.2. Conceptual model of the adaptive management cycle. (Source: Adapted from Ecosystem Restoration Program 2000)



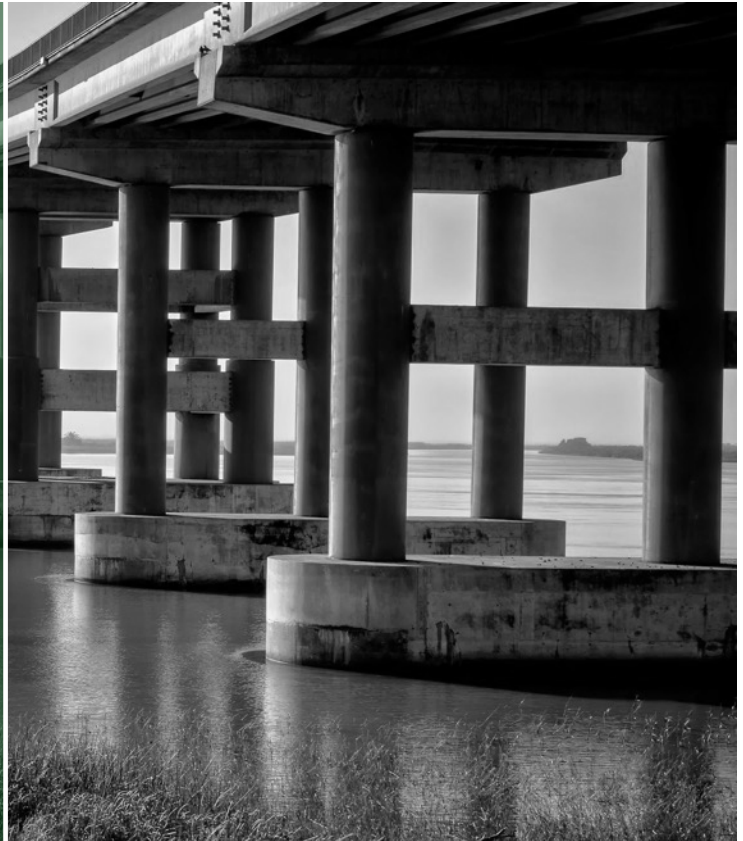
CALFED Bay Delta Authority (2008)

Delta Plan (2013)



Adaptive management in the Delta

A living history



What we learned along the adaptive management cycle

Planning for adaptive management

Delta Landscapes Scenario Planning Tool

Mechanisms of adaptive management

Permitting for adaptive management

Closing the adaptive management loop

Surprises and successes

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Adaptive Management Planning 101 Workshop

Setback Levee: This project will create off-channel habitats for fish species off the main stem of a river. The project will construct 200m of setback levee to address structural issues, leave remnant levee with connections open on both sides to create off channel habitat, and plant native riparian species to provide cover. The project will slow water speeds, allow for the accumulation of detritus, shade water to reduce temperatures, and increase food resources for native fish species.

Goals	Objectives (Fundamental Objectives)	Expected Outputs and Outcomes (Mean Objectives)	Monitoring Category	Monitoring Metrics	Trigger level (related to metrics)	Potential Management Response
Create off-channel habitats for fish species off the main stem of a river	200m of setback levee	slow water speeds	Hydrologic	Water velocity & temperature of main stem and off-channel	off-channel water velocity less than 5% of main stem	Add downed wood debris, plantings, etc. to increase channel roughness
	leave remnant levee with connections open on both sides to create off-channel habitat	allow for the accumulation of detritus shade water to reduce temperatures	Physical	Detritus accumulation, downed wood debris, levee changes (bathymetry)	off-channel water temperature within 1.5 °C of main stem	Plant additional riparian vegetation to increase shading
	plant native riparian species to provide cover	increase food resources for native fish species increase in native fish species	Biotic	Fish condition & nutritional status, food web, plant community, stream shading, aquatic vegetation	No difference in fish condition and nutritional status b/t off-channel and main stem 50% of off-channel plant community will be native riparian species	?? Conduct non-native species removal, plant native riparian species

Key takeaways

- Importance of communication
- Need for flexibility
- Benefit of early input
- Being methodical in collecting, managing, and sharing data
- Resources are available

Interagency Adaptive Management Coordination

Convened by the Delta Science Program, the Interagency Adaptive Management Integration Team (IAMIT) discusses and coordinates strategies for implementing adaptive management for conservation efforts in the Sacramento-San Joaquin Delta and related areas.

The IAMIT serves as a technical team - made up of scientific and technical staff from local, state, and federal agencies, and key stakeholder groups - that crosscuts individual agency missions and provides high-level input and guidance on current and future adaptive management. Its activities are guided by the [April 2019 Delta Conservation Adaptive Management Action Strategy](#). For more information on the group, [view the IAMIT's information sheet](#).

To learn more about the history of adaptive management in California's Delta, see the 2016 Delta Independent Science Board Review, "[Improving Adaptive Management in the Sacramento San-Joaquin Delta](#)," or contact adaptivemanagement@deltacouncil.ca.gov.

Adaptive Management Plan 101 | [Conceptual Models](#) | [Monitoring Resources](#) | [Environmental Data Resources](#) | [Example AM Plans](#)

Adaptive Management Plan Development 101

These resources are intended to assist project proponents with Adaptive Management Plan (AMP) preparation for consistency with the Delta Plan and other regulatory processes. Use of these resources does not guarantee consistency with any regulatory decision-making process.

Unlinked documents in the table below are available upon request via archives@deltacouncil.ca.gov.

Document	Description	Agency/Group
AMP Checklist (PDF)	Details what needs to be included in a basic AMP	IAMIT
Elements of Adaptive Management and Monitoring Plans with Examples	An outline of potential content to include in an AMP and examples of content from past Delta projects	IAMIT
Delta Plan Appendix C: Adaptive Management and the Delta Plan (PDF)	Description of AM and best available science in the context of the Delta Plan	DSC
Data Management Plan (PDF - coming soon)	Guide for managing data and developing data management plans	DSC
A Systems Approach to Ecosystem Adaptive Management : A US Army Corps of Engineers Technical Guide (PDF)	Implementation guidance for Sections 2036 and 2039 of WRDA 2007 and Section 1161 of WRDA 2016.	USACE
Adaptive Management: A U.S. Department of the Interior Application Guide (PDF)	Guide for applying adaptive management to restoration and other management projects	USDOI

<https://deltacouncil.ca.gov/delta-science-program/interagency-adaptive-management-coordination>

What we learned along the adaptive management cycle

Planning for adaptive
management

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Planning Tool

Mechanisms of adaptive
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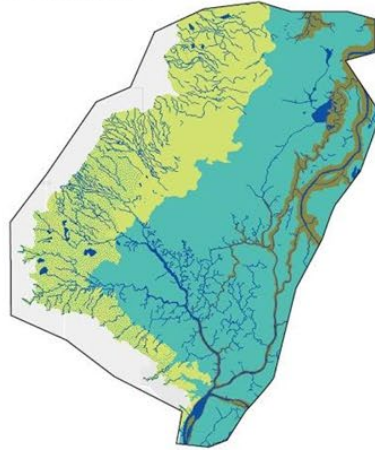
Permitting for adaptive
management

Closing the adaptive
management loop

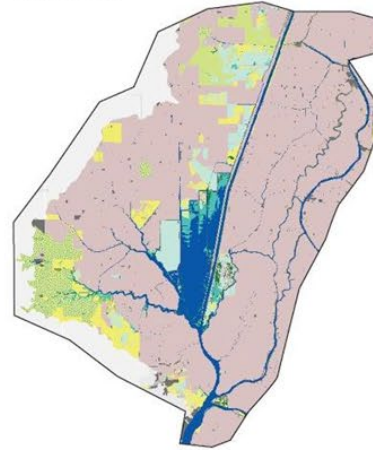
Surprises and successes

Scenario analysis & evaluation

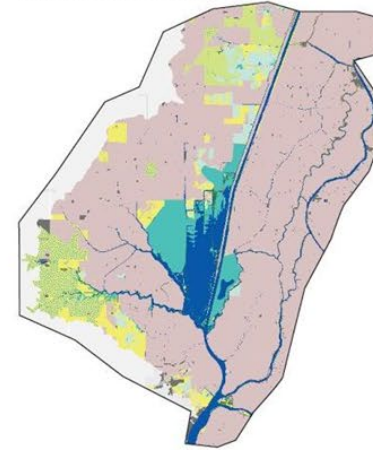
HISTORICAL



EXISTING



YOUR SCENARIO



<ul style="list-style-type: none"> MARSH to OPEN WATER RATIO 	<p>marsh = 27,186 ha open water = 2,760 ha ratio = 9.8</p>	<p>marsh = 997 ha open water = 5,300 ha ratio = 0.2</p>	<p>marsh = 3,250 ha open water = 5,500 ha ratio = 0.6</p>
<ul style="list-style-type: none"> TIDAL INUNDATION AREA 	27,186 hectares	997 hectares	3,250 hectares
<ul style="list-style-type: none"> MARSH PATCH SIZE DISTRIBUTION 	<p>100% of marsh situated in large patches (>100 ha)</p>	<p>25% of marsh situated in large patches (>100 ha)</p>	<p>55% of marsh situated in large patches (>100 ha)</p>
<ul style="list-style-type: none"> LINEAR EXTENT OF WIDE RIPARIAN HABITAT 	92.4 km	6.4 km	6.0 km
<ul style="list-style-type: none"> POTENTIAL PRIMARY PRODUCTION 	XX kcal per year	XX kcal per year	XX kcal per year
<ul style="list-style-type: none"> AREA IN AGRICULTURAL PRODUCTION 	0 ha	35,000 ha	33,500 ha

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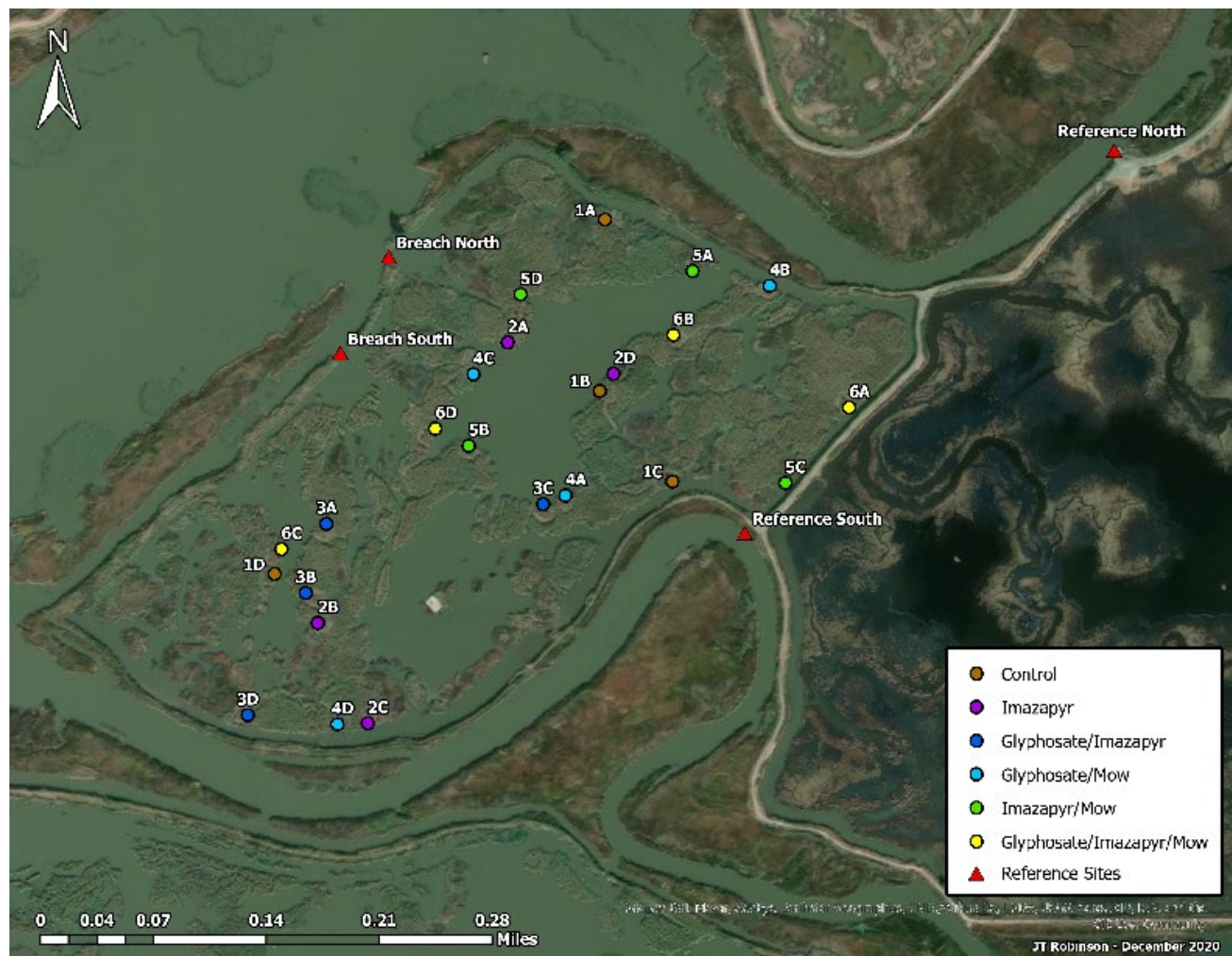
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Key mechanisms

- Structured decision-making
- Pilot studies
- Conceptual models
- Quantitative models
- Funding



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The Big Caveat: Nothing Gets Done without Permits! (Unless Nature Does it For You, its Way...)

State Agencies: BCDC, RWQCB, CDFW, DSC, SLC, SHPO, CVFPB, Caltrans
Federal Agencies: USFWS, NMFS, USACE, USEPA, USCG

Clean Water Act Section 401

Clean Water Act Section 402

Suisun Marsh Protection Act

McAteer-Petris Act

Magnussen-Stevens Act

Delta Reform Act

Federal Endangered Species Act

Title 23

Migratory Bird Treaty Act

Porter-Cologne Water Quality Control Act

Clean Water Act Section 404

Fish and Game Code

Rivers and Harbors Act

Clean Water Act Section 303(d)

California Endangered Species Act

Federal Navigation

National Historic Preservation Act

California Environmental Quality Act

State Leases and Encroachment

National Environmental Policy Act

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Putting These Opportunities to Use!

Stay focused – what do decision makers, planners, funders, regulators, project designers, community members need to know?

The world is imperfect - the universe of potential sites is not that large and the sites do not fall neatly along gradients of applied scientific interest.

In selecting places to examine:

- Consider how representative a site is for prospective future actions
- Consider sites with past and ongoing research to build a more robust and cost-effective understanding
- Use clear and concise conceptual models to select metrics that reflect ecological functions, climate change threats, etc.



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Surprises!



Successes!

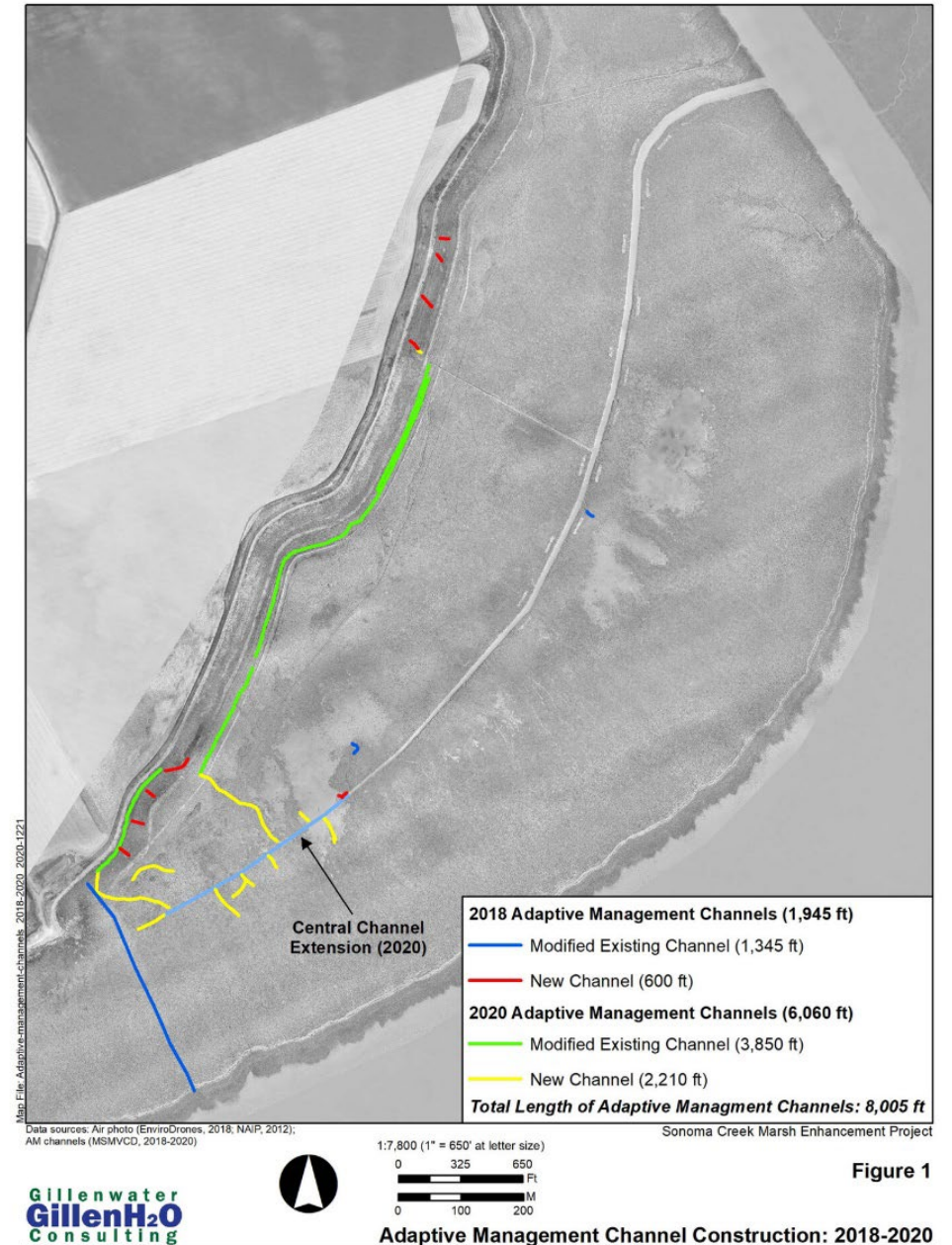
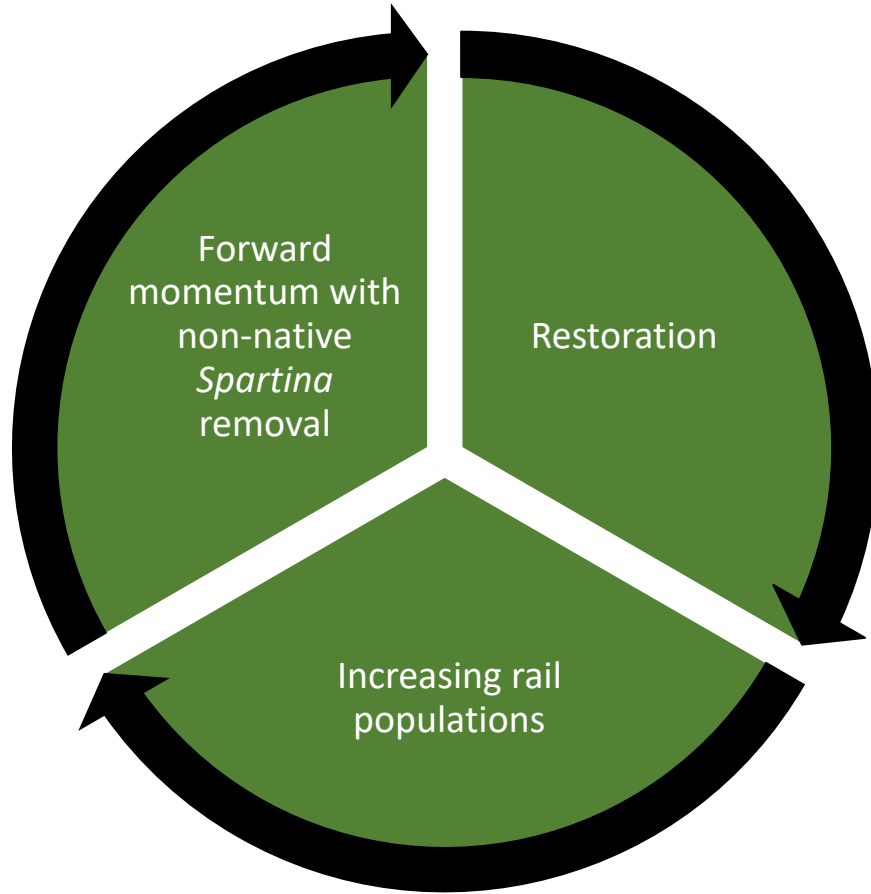
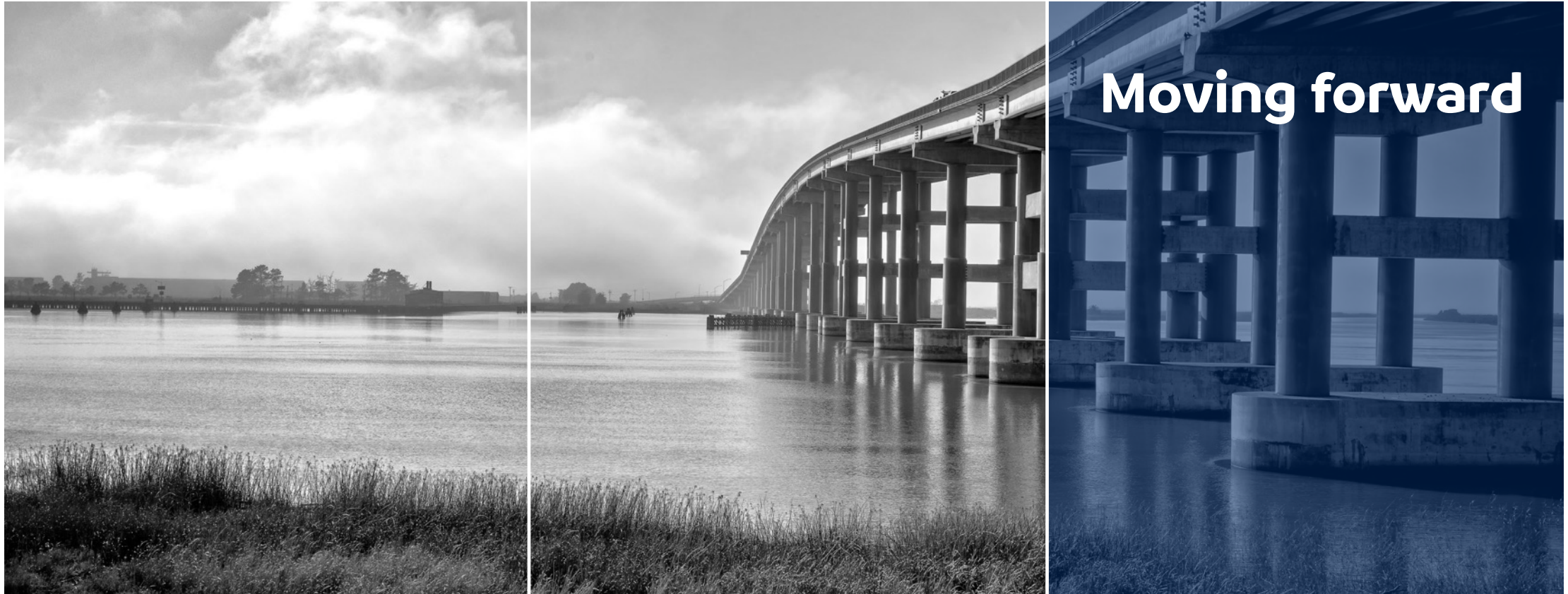


Figure 1

Adaptive management in the Delta

A living history



Five phases of adaptive management governance for socio-ecological systems

I. Building of social and scientific capital



II. Scaling up



III. Convergence



IV. Implementation and refinement



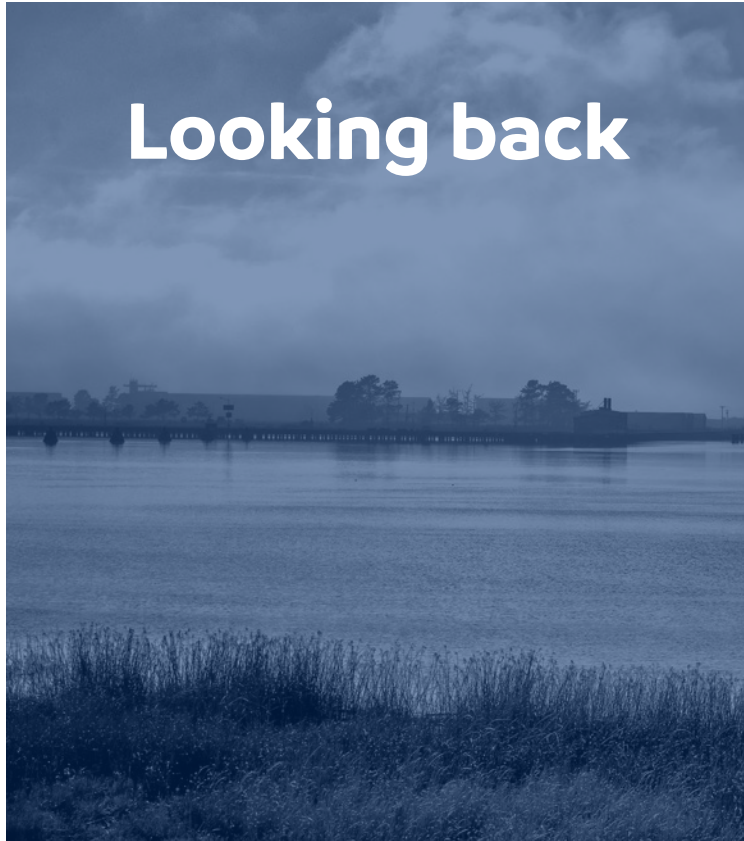
V. Rapid response

System-scale Adaptive Management

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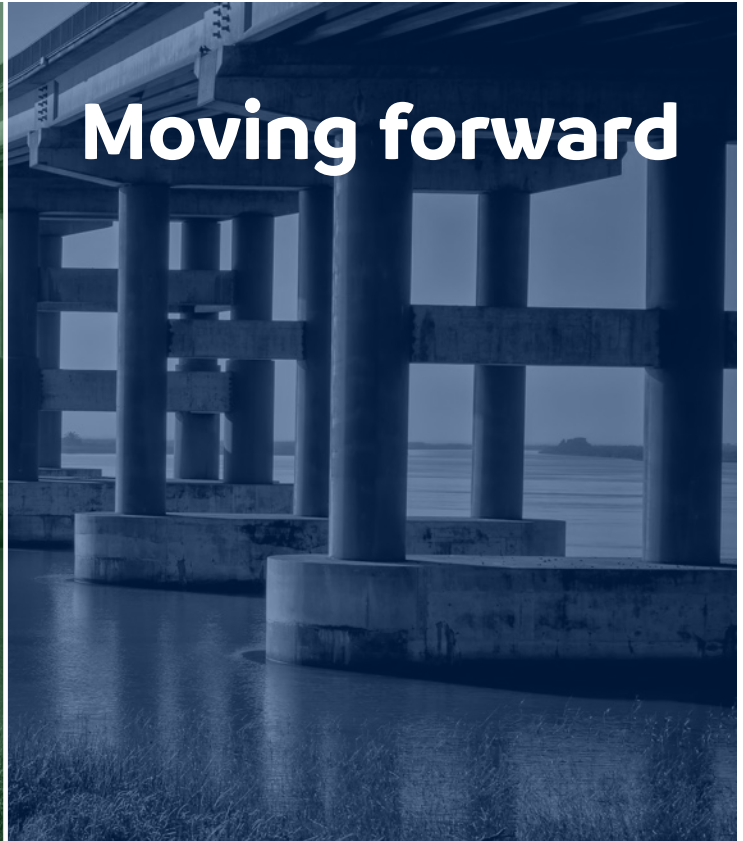
Looking back



Here and now



Moving forward



Acknowledgements

A large concrete bridge with multiple pillars spans across a wide body of water. The sky is overcast with grey clouds. The foreground shows some dry grass. The text "Acknowledgements" is overlaid in the center in a large, white, bold font.

ADAPTIVE MANAGEMENT FORUM PLANNING COMMITTEE

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U.S. Fish and Wildlife Service

Adjourn

A wide-angle photograph of a long, multi-lane concrete bridge spanning a large body of water. The bridge is supported by numerous thick, cylindrical concrete pillars. The sky is filled with heavy, grey clouds, and the water reflects the overcast light. In the foreground, there is a patch of dry, brown grass. The word "Adjourn" is written in a large, white, sans-serif font across the center of the image.