



What is at risk in the Sacramento-San Joaquin Delta as it faces climate change?

California relies on the Delta.

- Located at the confluence of the Sacramento and San Joaquin Rivers as part of the largest estuary on the west coast of North and South America, the Delta is a **main source of water supply** for the federally-managed Central Valley Project and the state-managed State Water Project. It moves water stored upstream to users that represent two-thirds of Californians – that's 27 million people.
- The Delta is a **unique biodiversity hot spot** in California, - one where freshwater from mountain runoff meets saltwater from the San Francisco Bay and Pacific Ocean. Its thousands of miles of meandering waterways and surrounding lands create habitat for more than 750 plant and animal species.

The Delta is California's **infrastructure hub for water, energy, and transportation**. It provides vital natural resources, agricultural products, and recreational opportunities that fuel California's \$3 trillion economy – the largest in the United State and the fifth largest in the world. **Nearly half a million Californians** live, work, and recreate in the region. Climate change puts the state's water supply, economy, biodiversity, and livelihood at risk—increasing stress on Delta levees protecting residents, farmland, and the state's network of public utilities from mass flooding, and the species who thrive in the region's ecosystems.

How is climate change affecting the Delta?

Even without the added stressors of climate change, the Delta is considered a flood-prone region, containing low-lying agricultural and urban land protected by a complex system of levees, all of which require ongoing maintenance and some of which need repair and improvement. In order to manage the Delta successfully now and in the future, it is imperative we understand how climate change affects the region.

Data shows that California is already experiencing warmer temperatures and more extreme heat, harsher storms that increase flood risks, and higher sea levels. Even though the Delta is inland, it is also vulnerable to rising seas. The stability of the levees protecting us are tested daily by tides, river inflows, and a rising sea level. The severity of these impacts will worsen over time unless we act. **Resiliency requires further innovation, stronger collaboration, and a toolkit of thoughtful adaptation approaches. We need to move quickly.**

Who is the Delta Stewardship Council, and how is it planning for climate change in the Delta?

As a California state agency of experienced planners, engineers, scientists, and communicators, the Delta Stewardship Council (Council) is uniquely equipped to steward the region toward resiliency. The Council regulates actions to ensure alignment with a reliable statewide water supply and resilient Delta ecosystem, and has the resources needed to guide climate adaptation in the region. Through strong working relationships with government agencies at all levels, the Council can influence action in the Delta and has the scientific and planning expertise to improve its resilience over time.

The Council is acting in the Delta in response to climate change through its two-part **Delta Adapts** initiative. Delta Adapts consists of a **vulnerability assessment** to improve understanding of regional vulnerabilities due to climate change in order to protect the vital resources the Delta provides to California and beyond, followed by an **adaptation plan** detailing strategies and tools that state, regional, and local governments can use to help communities and ecosystems thrive in the face of climate change.

What are the goals of Delta Adapts?

This initiative has four overall goals:

1. **Inform future amendments** to the Delta Plan— California’s comprehensive planning roadmap for the Delta region;
2. **Provide local governments with a toolkit** of information to incorporate into their planning and regulatory documents to be resilient to climate change;
3. **Integrate climate change into the state’s prioritization** of future actions and investments; and
4. **Serve as a framework** to be built upon by the Council and others in years to come.

What is the study area?

The Delta Adapts study area focuses on **the entirety of the Delta and Suisun Marsh**. Because so many Delta resources we value are affected by water entering, flowing through, and exported from the Delta, the water supply analysis considers the entire watershed that feeds into the Delta and provides information about water exported from the Delta to areas throughout the state.

What climate risks does the vulnerability assessment evaluate?

Exposure to flooding is the primary focus of the vulnerability assessment. Delta Adapts quantitatively addresses and models climate stressors related to: sea level rise (SLR), changes in precipitation (both average annual change and changes in variability across multiple years), and changes in air temperatures. Other climate stressors are addressed qualitatively, and not in as much detail, including wildfire risk (particularly smoke that causes poor air quality in the region), and fog (affecting agricultural production).

What assets does Delta Adapts evaluate?

Climate change affects many resources we value and need to live in our communities now and in the future. Delta Adapts evaluates climate change impacts to: communities including the most vulnerable populations; water supply; natural resources including ecosystems; agriculture; critical facilities such as hospitals and fire/police stations; community facilities including water, wastewater, and energy infrastructure; flood control infrastructure; transportation infrastructure; and parks and recreational amenities.

How is flood risk assessed?

The Council is **developing a set of tools to evaluate climate change risks** to the Delta that allow us to understand how a wide range of potential future conditions could influence the Delta.

The flood analysis evaluates overtopping of levees only and considers the combined effects of future SLR, tidal conditions, storm surge, and riverine flows. It considers SLR of up to 10 feet (consistent with 2018 Ocean Protection Council guidelines) in combination with a full range of Delta inflows from rivers (using CASCaDE2 and Central Valley Flood Protection Plan data and modeling).

Future conditions are highly uncertain. To address this, the flood inundation areas are shown on maps in two ways:

- 1) **Deterministic scenarios** that show impacts for a given condition of future climate change (e.g., 2 feet of SLR at 2050). Deterministic scenarios are used predominantly for communication because they are easy to understand, have been commonly used, and convey impacts concisely.
- 2) **Probabilistic scenarios** that show how likely flooding is to occur over a given time horizon. Probabilistic scenarios are used predominantly for risk-based planning and decision making, though they have also been shown to be very effective for conveying risk information to property owners and local stakeholders.

What doesn't the flood analysis include?

The flood analysis for Delta Adapts largely assumes existing regulatory, management, and physical conditions. It does not consider future levee investments or improvements, nor does it consider ongoing subsidence or degradation of levees. The analysis assumes flooding only from levee overtopping. It does not assume flooding from levee breaches or failures.

How is Delta Adapts being developed?

Delta Adapts **builds from best available scientific data and innovative modeling methods** to analyze impacts to assets, and is being developed in partnership with technical experts and federal, state, regional, and local partners, as well as community representatives. **While the Council is leading the process, many stakeholders are contributing.** The adaptation plan will be particularly collaborative as the Council works closely with state agencies, local governments, and Delta communities to identify a range of policy and management actions to improve regional resilience to climate change.

How can you participate in development of Delta Adapts?

The Council has established **several ways for stakeholders to provide input** on Delta Adapts. A **Stakeholder Work Group (SWG)** helps promote the exchange of information between stakeholders and fosters understanding across a wide range of interests. SWG members reflect a broad range of interests in the Delta, including community-based organizations, local and regional government agencies, state agencies, utility companies, water districts, and environmental organizations.

Council staff also provide periodic updates during monthly Council meetings throughout the plan development process. Members of the public have the opportunity to receive information and provide input during each of these public meetings.

Council staff are working with community-based organizations to develop an approach to engage Delta residents. We anticipate holding focused group meetings or larger workshops during the next phase of Delta Adapts to identify and discuss potential adaptation strategies.

Council staff regularly attend existing meetings of partner organizations and agencies to provide information and updates on the study, and to gather input that can be incorporated into the process.

A **Technical Advisory Committee (TAC)** provides expert knowledge, review, and guidance throughout the development of the initiative. The TAC includes experts from public agencies, academic institutions, non-profit organizations, the private sector, and individuals with particular knowledge of climate change, the Delta, and its resources.

How is Delta Adapts different from the other recent climate vulnerability assessments?

The State of California has led the country on climate change assessments and actions to mitigate climate change and is coordinating statewide climate change adaptation. Individual climate studies have been prepared by many cities and counties all over California, including in the Delta, containing detailed climate information for jurisdictions. Individual state agencies or service providers have also undertaken climate analyses; however, these typically focus on the assets they control or own.

Climate change resiliency requires cutting across regional boundaries and committing to collaboration with state, local, and regional entities to address impacts to all things we value. While some individual entities in the Delta have made progress in planning for climate change, climate impacts span jurisdictional boundaries. Effective planning can't be done piece-by-piece.

Delta Adapts leverages and expands on decades of statewide climate assessments and individual assessments prepared for smaller jurisdictions to develop a Delta-specific assessment of climate change impacts. Our study is regional in scale, reports results more broadly than individual cities and counties, and considers a more comprehensive list of assets than studies done for individual state agencies or service providers. Delta Adapts and these

studies are complementary and should be used together to get a complete picture of the Delta's climate vulnerabilities .

When will the results be available?

The Public Draft Vulnerability Assessment will be available later in 2020. We will begin Adaptation work after the Vulnerability Assessment is finalized in early 2021.

To learn more about Delta Adapts, visit deltacouncil.ca.gov/delta-plan/climate-change or contact climatechange@deltacouncil.ca.gov.