

NOV 2020

Delta Adapts: Creating a Climate Resilient Future



**Delta
Stewardship
Council**

A CALIFORNIA STATE AGENCY

Agenda

- Status and Overview
- Review Equity Analysis Results
- Review Flooding Key Findings
- Review Water Supply Key Findings
- Review Ecosystem Key Findings
- Questions for Discussion

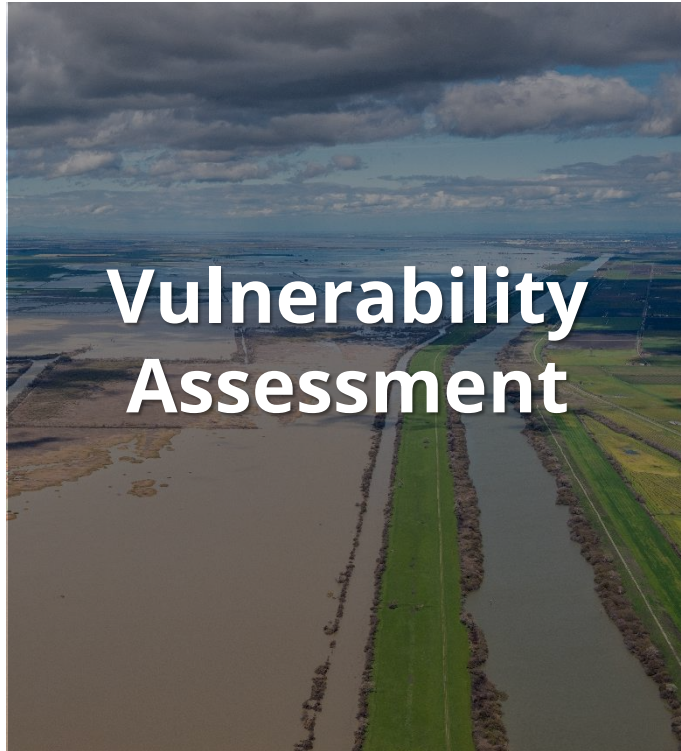


Council Updates

- February 2019: Council endorsed Resilience Goals
- November 2019: Council received update on Delta Adapts
- Summer/Fall 2020: Council briefing group updates



Delta Adapts =



+



Overarching goal is to build climate resilience in the Delta

Goals

- Inform future Council work
- Help State prioritize future actions and investments
- Provide a toolkit of information for local governments to use in their regulatory documents
- Serve as a framework to be built upon by the Council and others in the future

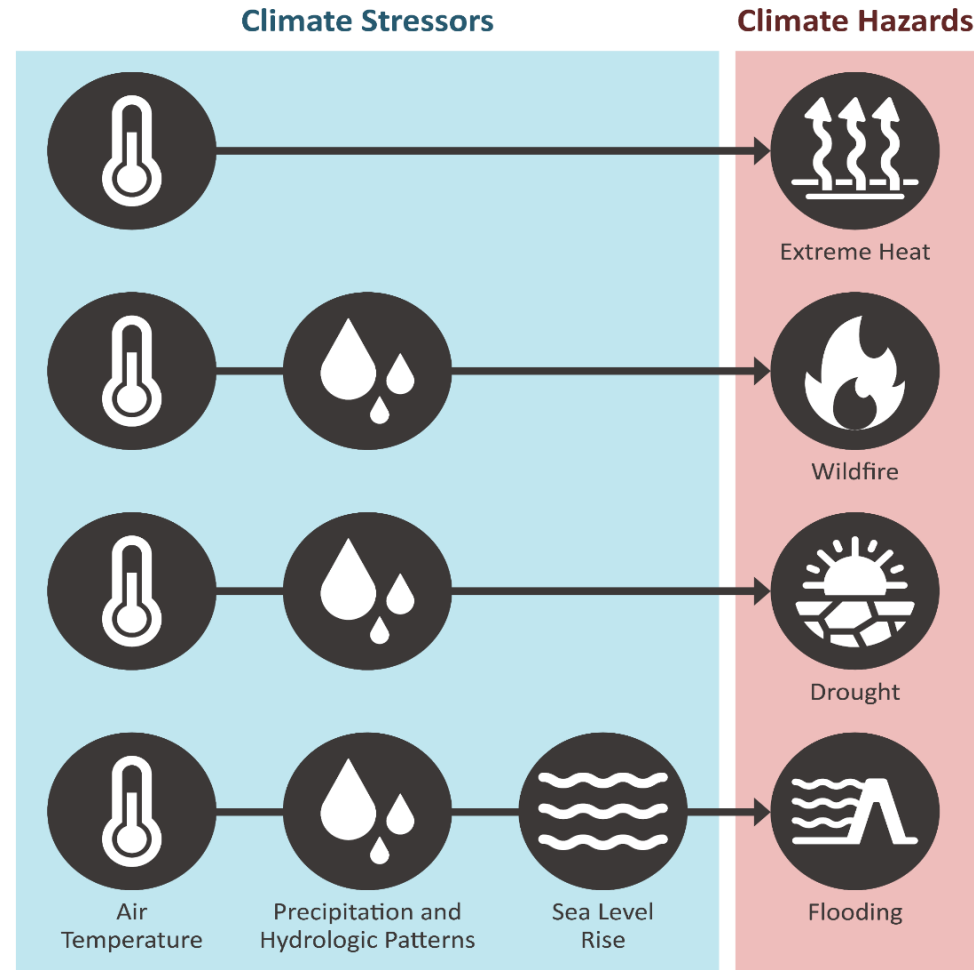


Regional Study

- Regional approach
- Planning level study
- Different from other climate vulnerability assessments completed
- Designed to be complementary with other efforts



Climate Stressors & Hazards



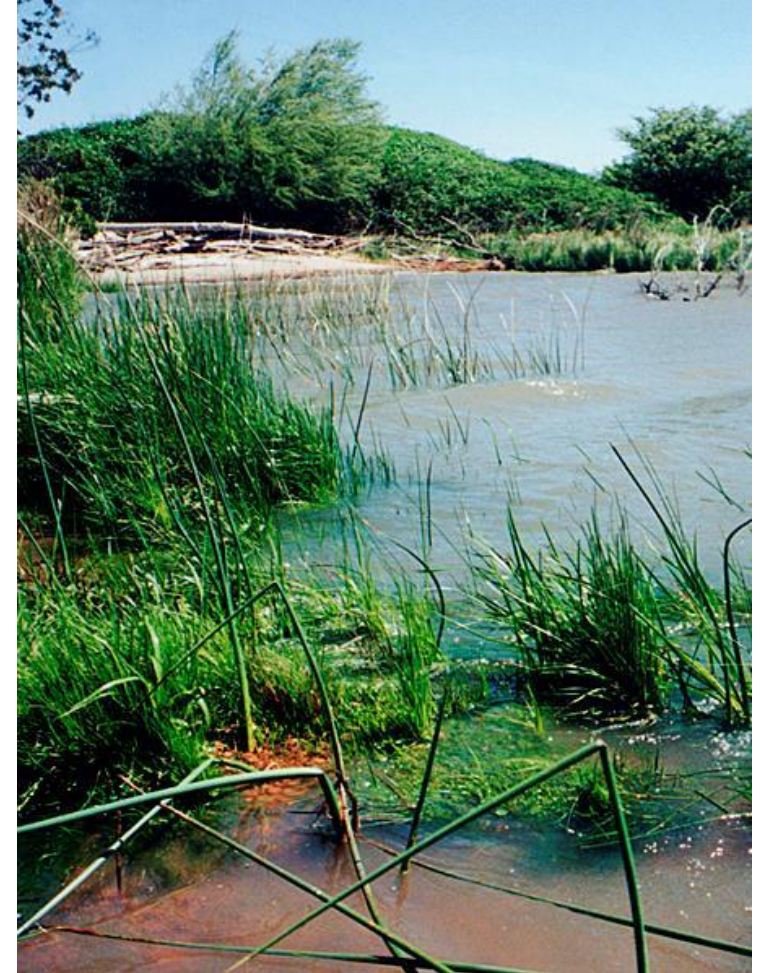
Engagement Opportunities

- Ongoing collaboration with agency partners
- Stakeholder briefings
- Outreach to community-based organizations
- Technical Advisory Committee
- Stakeholder Work Group



Results and Key Findings

- Equity
- Flooding
- Water Supply
- Ecosystem



Equity Analysis

FACTORS THAT INCREASE VULNERABILITY | VULNERABLE POPULATIONS

Factors that Increase Vulnerability

	Flooding	Extreme Heat Events	Wildfire
Exposure	<ul style="list-style-type: none"> People experiencing homelessness Emergency response workers Mobile home residents 	<ul style="list-style-type: none"> People experiencing homelessness Outdoor workers Young children Residents of dense, urban areas 	<ul style="list-style-type: none"> People experiencing homelessness Outdoor workers Residents of wildland-urban interface
Sensitivity	<ul style="list-style-type: none"> Preexisting health conditions 	<ul style="list-style-type: none"> Preexisting health conditions Age Ability status Pregnancy 	<ul style="list-style-type: none"> Preexisting health conditions Age Pregnancy Smokers
Adaptive Capacity	<ul style="list-style-type: none"> Access to information Ability to evacuate Access to healthcare Income or other resources to repair damage, procure shelter 	<ul style="list-style-type: none"> Access to information Access to air conditioning Access to healthcare Income or other resources to adapt living space 	<ul style="list-style-type: none"> Access to information Ability to evacuate Access to healthcare Income or other resources to adapt living space

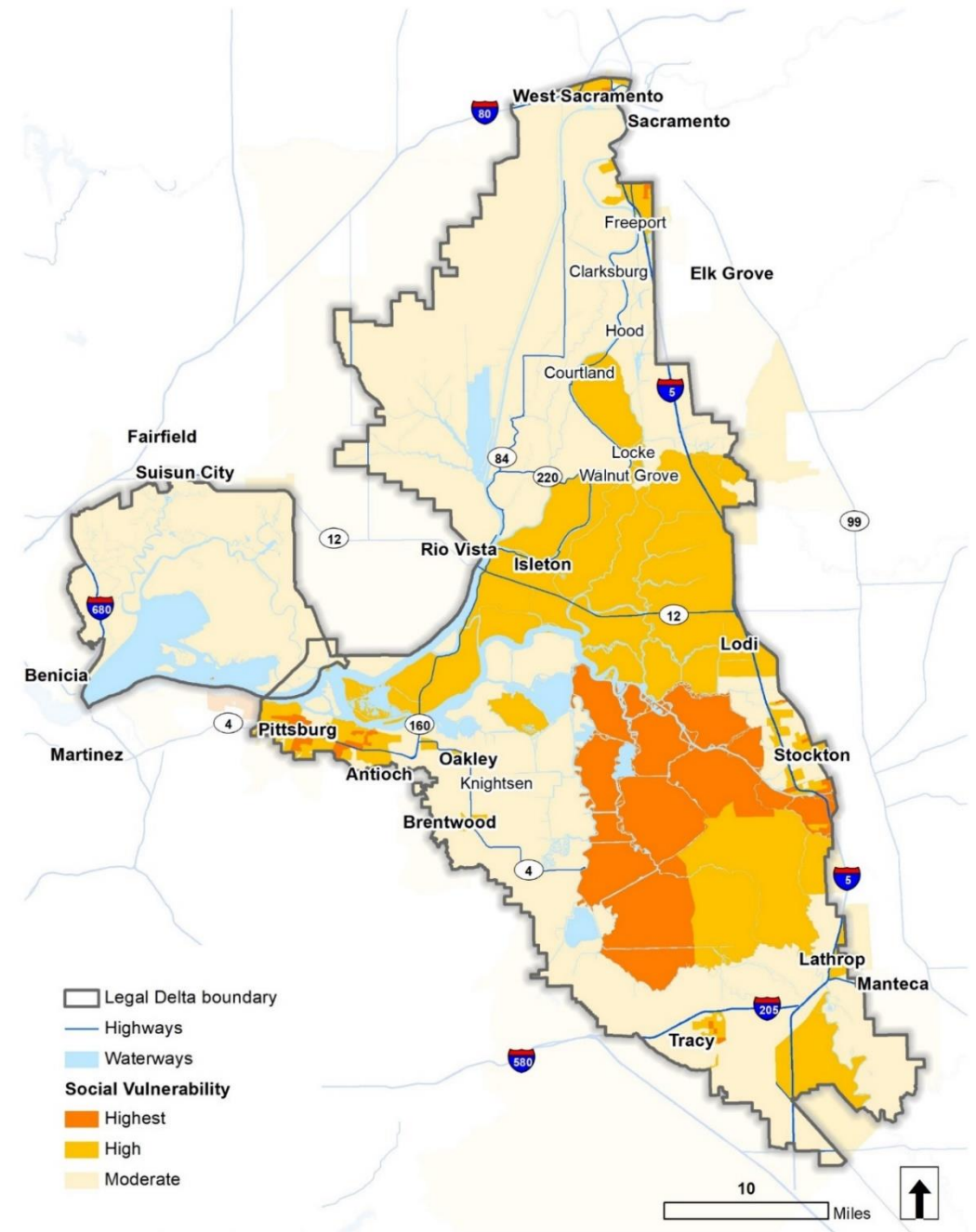
Vulnerable Populations

Social vulnerability index (comprised of 14 indicators):

- Young children
- Older adults living alone
- Ability status
- Educational attainment
- Linguistic isolation
- Poverty status
- Race and ethnicity
- Tenancy
- Vehicle access
- Access to health insurance
- Asthma rate
- Cardiovascular rate
- Low birth weight rate
- Food security

Other vulnerable populations:

- Outdoor workers
- Incarcerated populations
- Institutionalized populations
- People experiencing homelessness
- People living in mobile homes





Early Application

Delta Stewardship Council & U.S. Bureau of Reclamation

Delta Science Proposal Solicitation Notice

November 2020 - Solicitation #21000

This Delta Science Proposal Solicitation Notice is a collaborative effort between the Delta Stewardship Council's Delta Science Program and the U.S. Bureau of Reclamation to achieve the vision of "One Delta, One Science."



Vulnerability to Climate Change in the Delta

deltacouncil.shinyapps.io/sovi_map/

Interactive map | Data explorer | Methodology and Resources

Explore Social Vulnerability Indicators

Instructions:

Select the overall vulnerability rating or one of 14 indicators from the dropdown menu to view data by census block group.

Click a region on the map to get more information about that census block group.

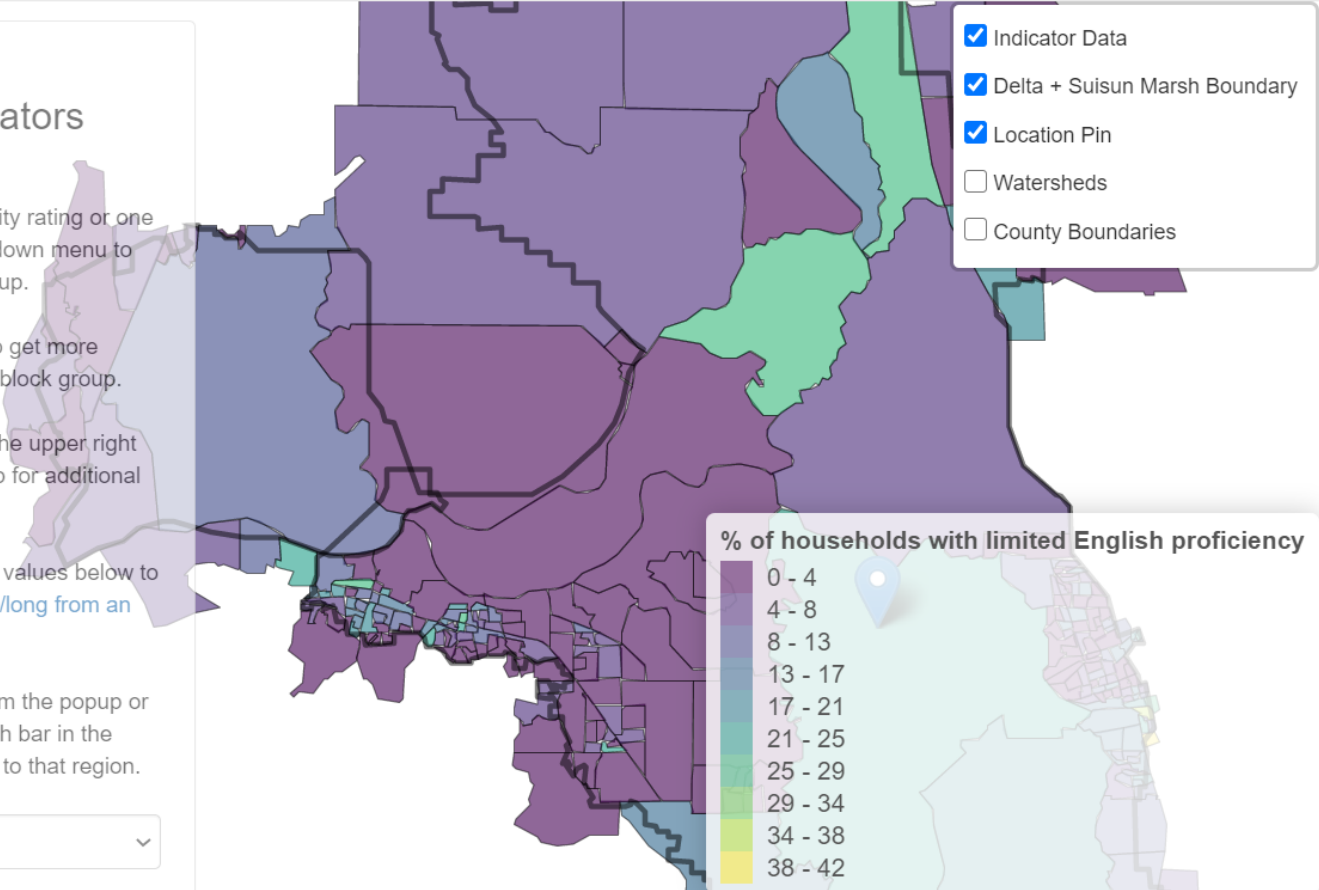
Toggle layers on and off in the upper right corner and hover over the map for additional information.

Enter latitude and longitude values below to place a pin on the map. [Get a lat/long from an address here.](#)

Copy the block group ID from the popup or enter a zip code into the search bar in the Data Explorer tab to filter data to that region.

Linguistic isolation

- Indicator Data
- Delta + Suisun Marsh Boundary
- Location Pin
- Watersheds
- County Boundaries



0 - 4
4 - 8
8 - 13
13 - 17
17 - 21
21 - 25
25 - 29
29 - 34
34 - 38
38 - 42

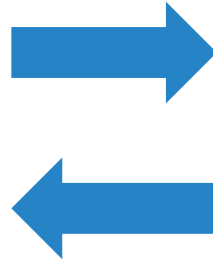
This map was created in support of the Delta Adapts initiative, a project of the Delta Stewardship Council (2020)

Leaflet | Maps by Mapbox

Outreach & Engagement

40+ Contacted

- Started with initial list from agency partners
- Asked “who else should we contact?” in each consultation



Organizations Consulted

- Alliance of Californians for Community Empowerment
- Common Ground
- Community Medical Centers
- Environmental Justice Coalition for Water
- Faith in the Valley – San Joaquin
- Fathers & Families of San Joaquin
- First 5 Association
- First 5 Yolo
- Little Manila Rising
- PUENTES
- Reinvent South Stockton Coalition
- Restore the Delta
- Rio Vista CARE
- Slavic Community Center
- Third City Coalition
- Yolo County Children’s Alliance

Flood Hazard Maps

MODELING + ANALYSIS APPROACH | CURRENT + FUTURE CONDITIONS

Modeling and Analysis Approach

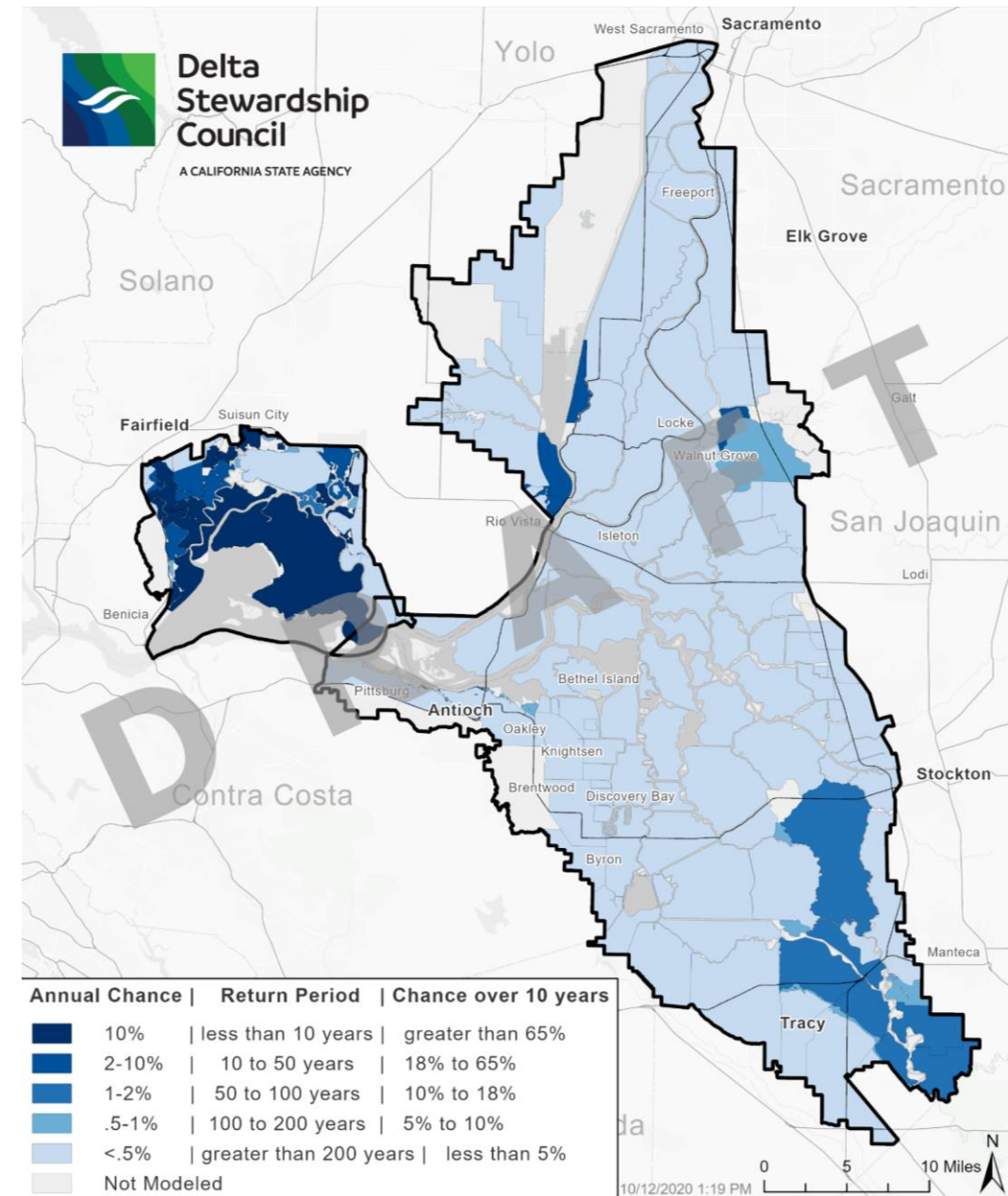
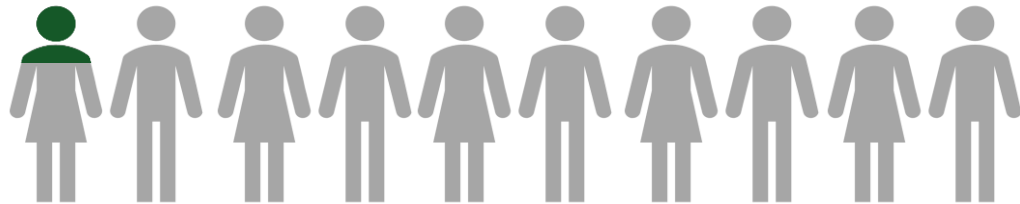
- Builds on and adapts previously developed tools
- Considers a wide **range of future climate changes**:
 - Tide and storm surge
 - Sea level rise
 - Delta inflows
- Improves system understanding
- Flexibility to changing climate change information



Current Conditions

10% of the Delta exposed during a 100-year flood

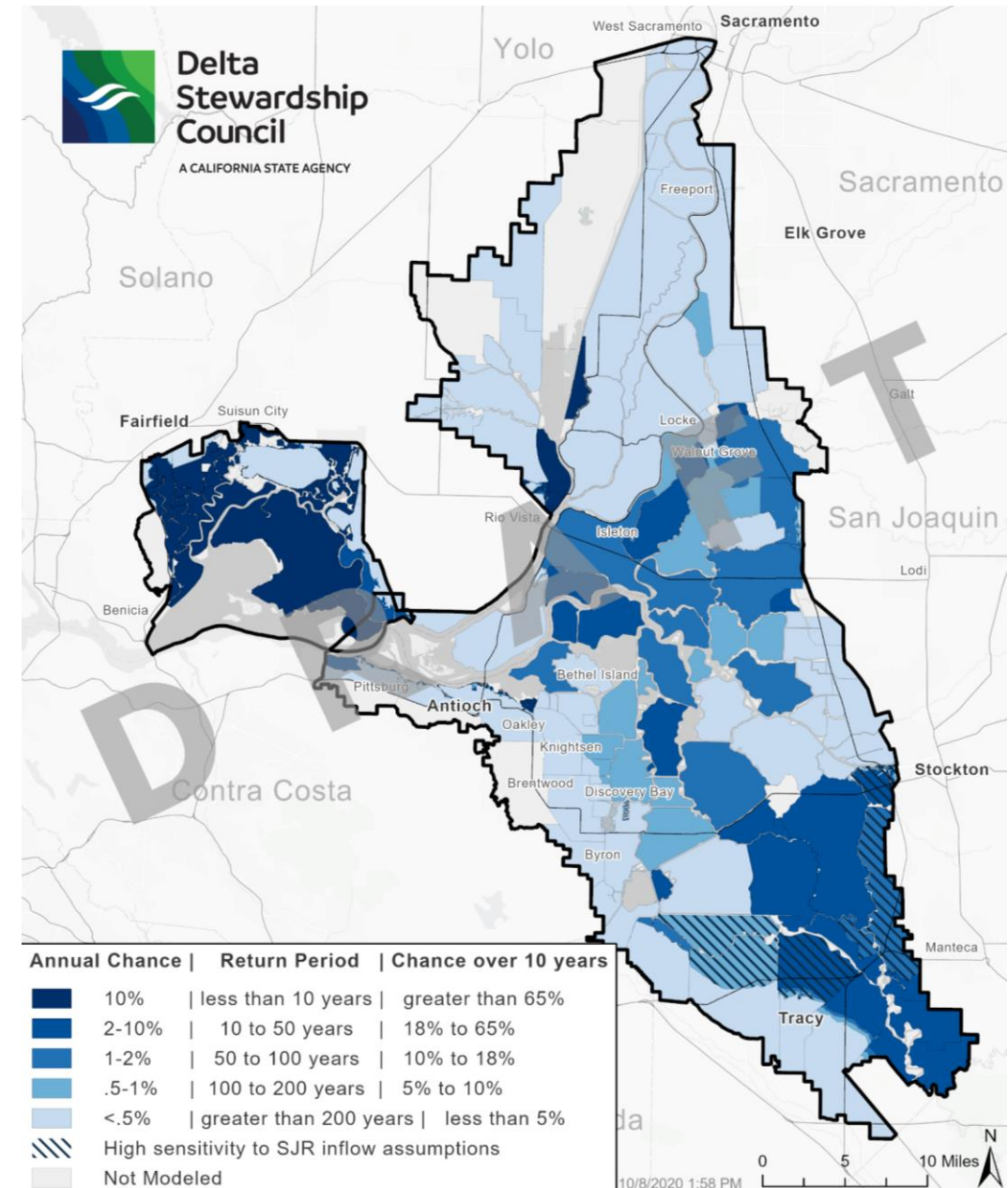
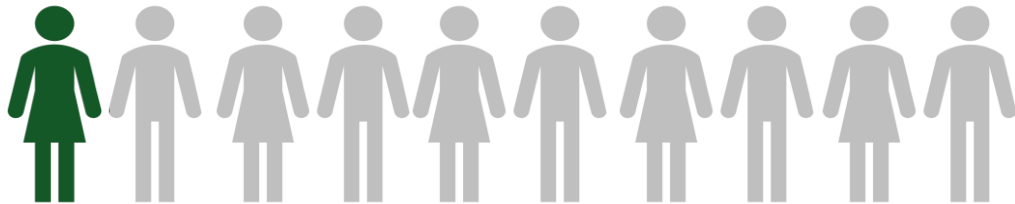
2% of Delta population exposed during a 100-year flood



2050 Conditions

35% of the Delta exposed during a 100-year flood

Over 10% of Delta population (**65,000 people**) exposed during a 100-year flood, including over **11,000** people living in communities with highest social vulnerability

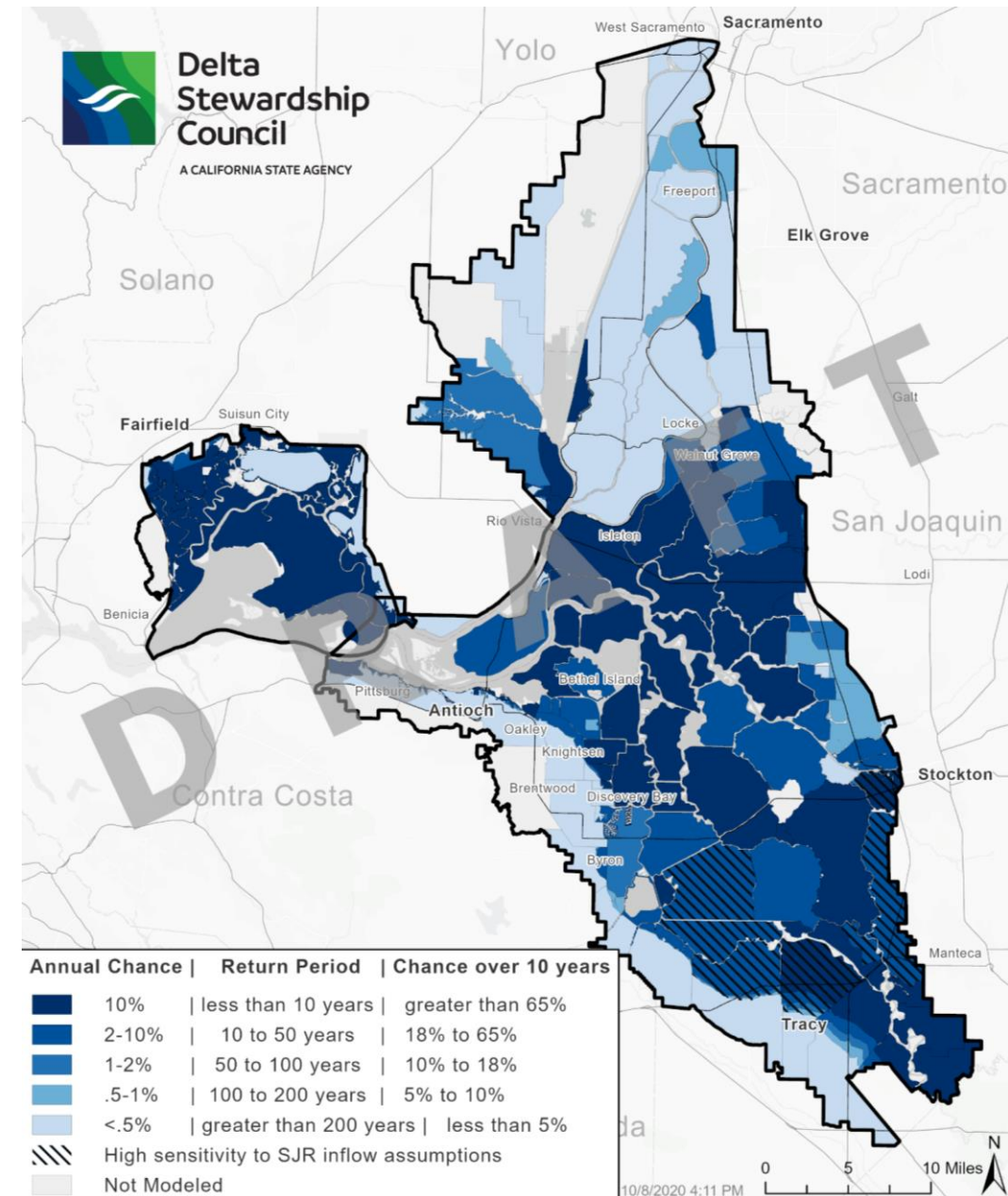
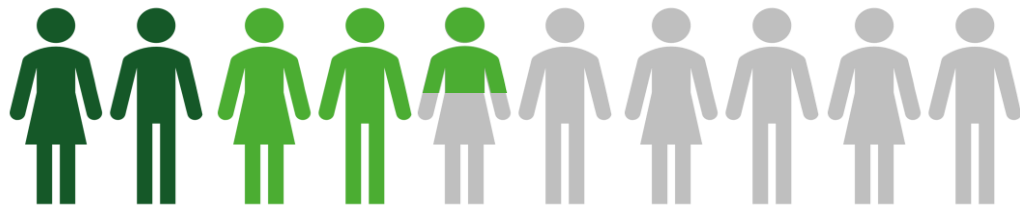


2085 Conditions

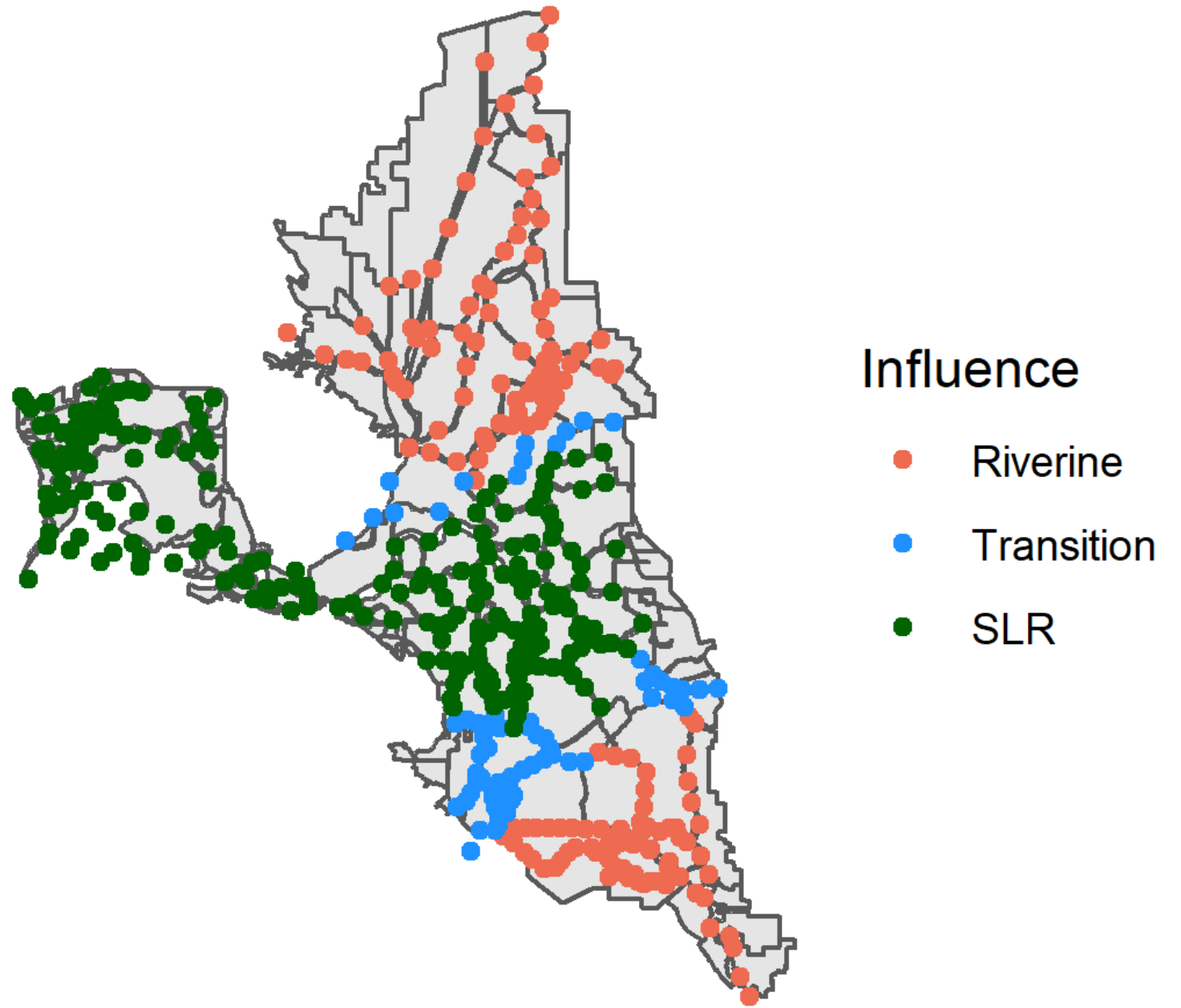
68% of the Delta exposed during a 100-year flood

20% of Delta population (over **120,000 people**) exposed during a 100-year flood, including over **20,000** people living in communities with highest social vulnerability

44% of Delta population exposed during a 200-year event (mostly in Stockton and Pocket)



Adaptation to
climate change
should focus on
the source of
vulnerability



What does this mean?

- Know where to target future levee investments
- Can estimate costs of keeping up with climate change
- Can test adaptation strategies



Water Supply

KEY FINDINGS

Key Findings

- Higher temperatures pose the greatest risk
- More variable precipitation is especially impactful during dry periods
- Sea level rise is of less concern



Key Findings

- Climate change will reduce Delta exports in all year types, but impacts will be disproportionately large in dry years, increasing drought vulnerability
- Droughts will get more common and worse



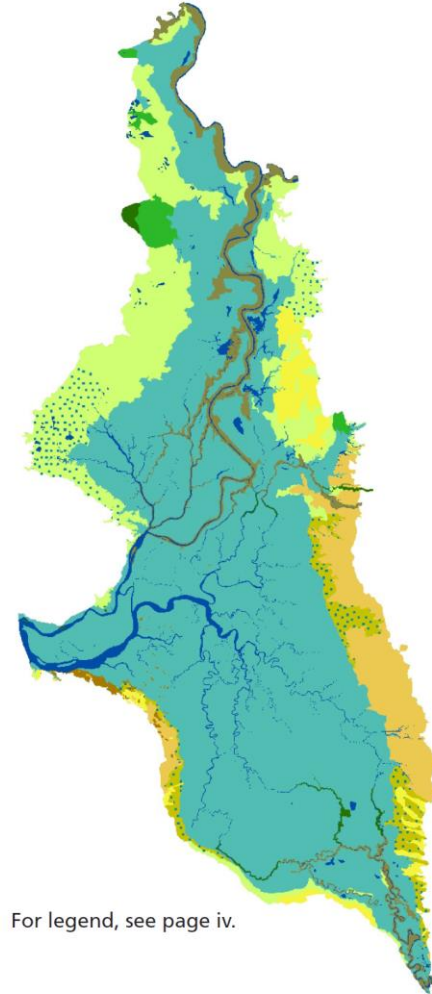
Ecosystem Analysis

ASSETS | SLR FINDINGS

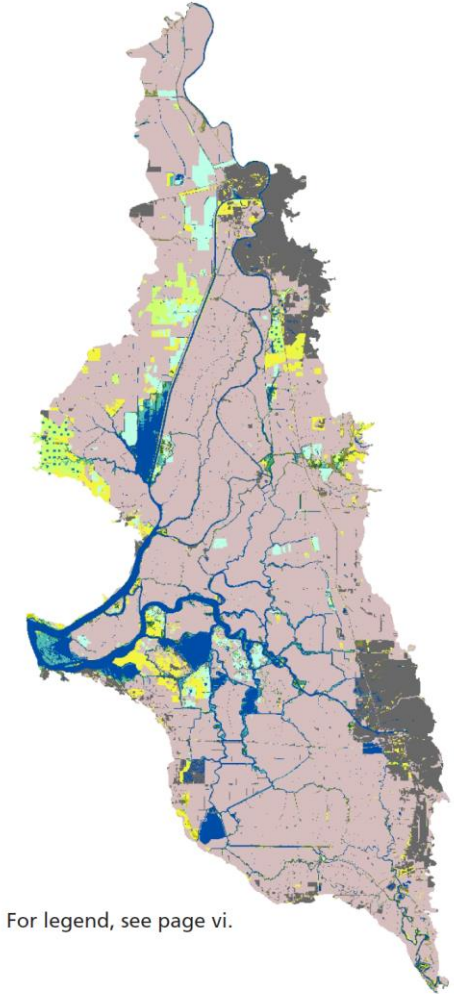
Historical Ecosystem Loss

- Delta ecosystems are already heavily compromised
- 98% of freshwater tidal wetland have been lost
- Climate change will further compromise ecosystem health without substantial investments

A HISTORICAL HABITAT TYPES



B MODERN HABITAT TYPES



Current Ecosystems: Un-leveed & Leveed

Un-leveed
38,250 Acres

Leveed
132,688 Acres

- Sea Level Rise (SLR) Scenarios
 - 6 inches
 - 1 foot
 - 2 feet
 - 3.5 feet
 - 6 feet (un-leveed)



Tidal Wetland SLR

- **53% of Delta Freshwater Wetland** at risk under **3.5 feet SLR**
- **100% of Delta Freshwater Wetland** at risk under **6 feet SLR**
- **100% of Suisun Marsh Brackish** wetlands at risk under **3.5 feet SLR**

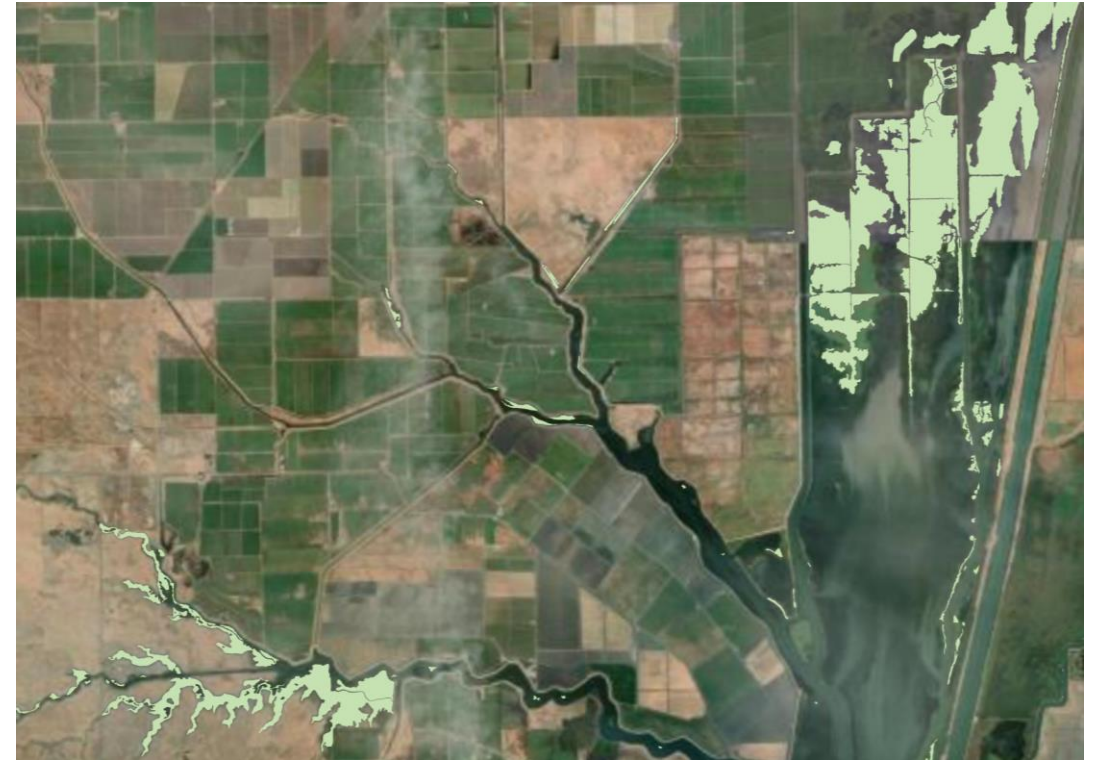


SLR Upland Transition Space

**Central Delta;
Browns Island and Sherman Lake
Wetlands:
No upland connection**



**Cache/Yolo Complex;
Lindsey Slough: Upland Connection
Liberty Island: Limited Upland
Connection**



Leveed Ecosystems

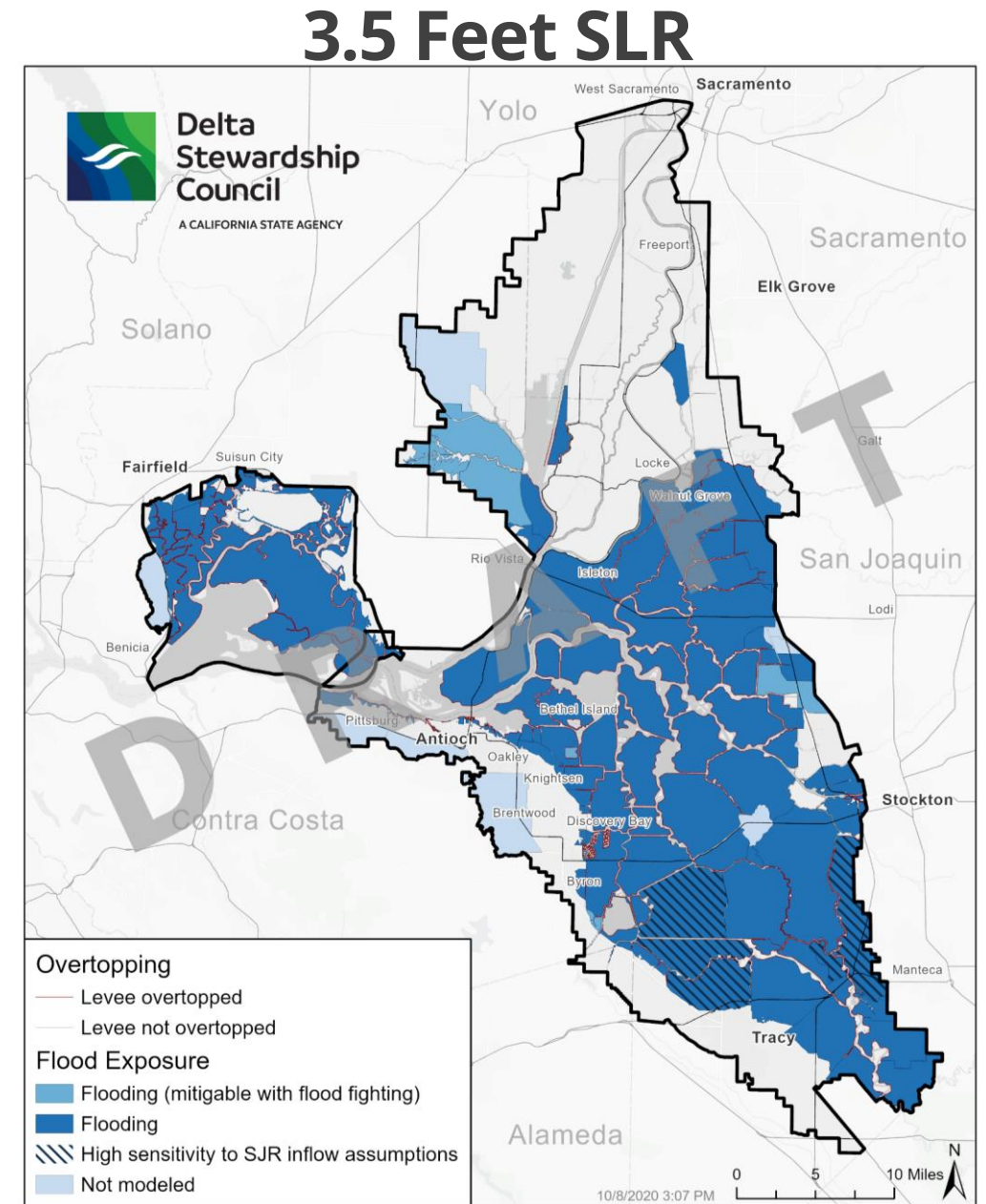
48% of Leveed Ecosystems at risk under **1 foot SLR** during a 100-year flood

63% of Leveed Ecosystems at risk under **2 feet SLR** during a 100-year flood

78% of Leveed Ecosystems at risk under **3.5 feet SLR** during a 100-year flood

Deeply subsided Central Delta islands and Managed Wetlands in Suisun have highest risk

Levee maintenance is key to protection

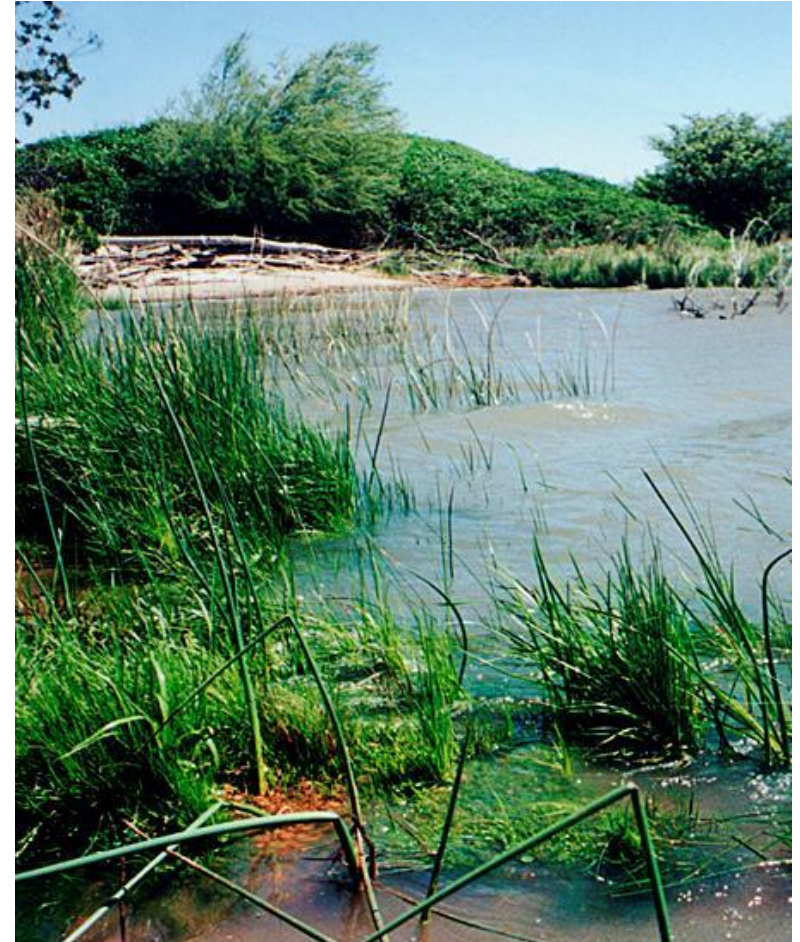


Significance and Next Steps

SIGNIFICANCE | NEXT STEPS | DISCUSSION QUESTIONS

Significance of Delta Adapts

- First comprehensive climate change study of the Delta
- Developed comprehensive flood and water supply models that can be replicated and updated
- Identifies most socially vulnerable communities
- Extensive community outreach
- Collaboration between partner agencies and complementary studies



Next Steps

- Public Draft Vulnerability Assessment
- Final Vulnerability Assessment
- Begin Adaptation Strategy

Questions for Discussion

- Given our authority, what is the role of the Council in addressing these climate vulnerabilities? What is the role of other agencies and organizations?
- What other uses are there for the equity results and the social vulnerability index?
- Based on these findings, what are some initial adaptation strategies to consider?

Thank you

Web: deltacouncil.ca.gov/delta-plan/climate-change

Twitter: @DeltaCouncil



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