

NOV 2020

# Delta Adapts: Creating a Climate Resilient Future



**Delta  
Stewardship  
Council**

A CALIFORNIA STATE AGENCY

# Delta Adapts =

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**Overarching goal is to build climate resilience in the Delta**

# Goals

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- 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

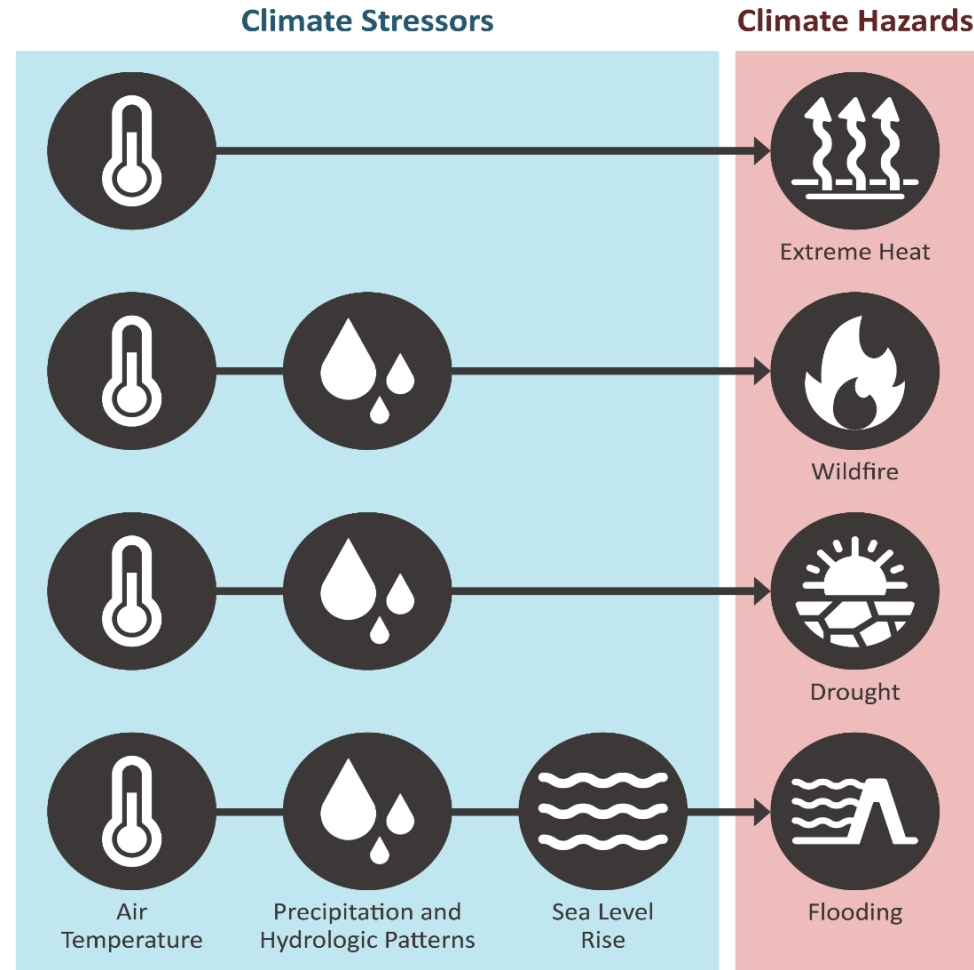


# Regional Study

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



# Climate Stressors & Hazards



# Engagement Opportunities

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



# Draft Results and Key Findings

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- Equity
- Flooding
- Ecosystem



# Equity Analysis

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FACTORS THAT INCREASE VULNERABILITY | VULNERABLE POPULATIONS



# Factors that Increase Vulnerability

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

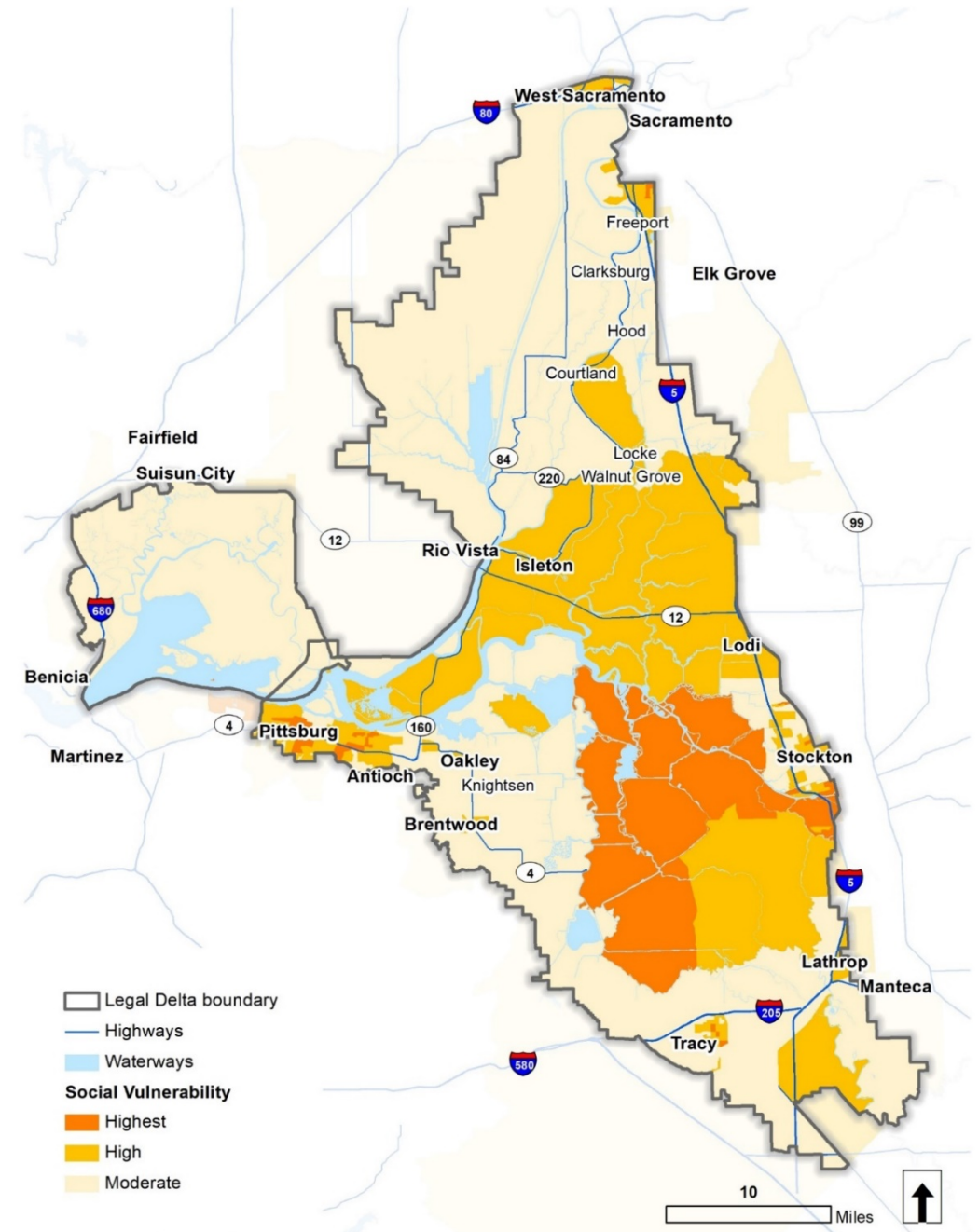
# Vulnerable Populations

## 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

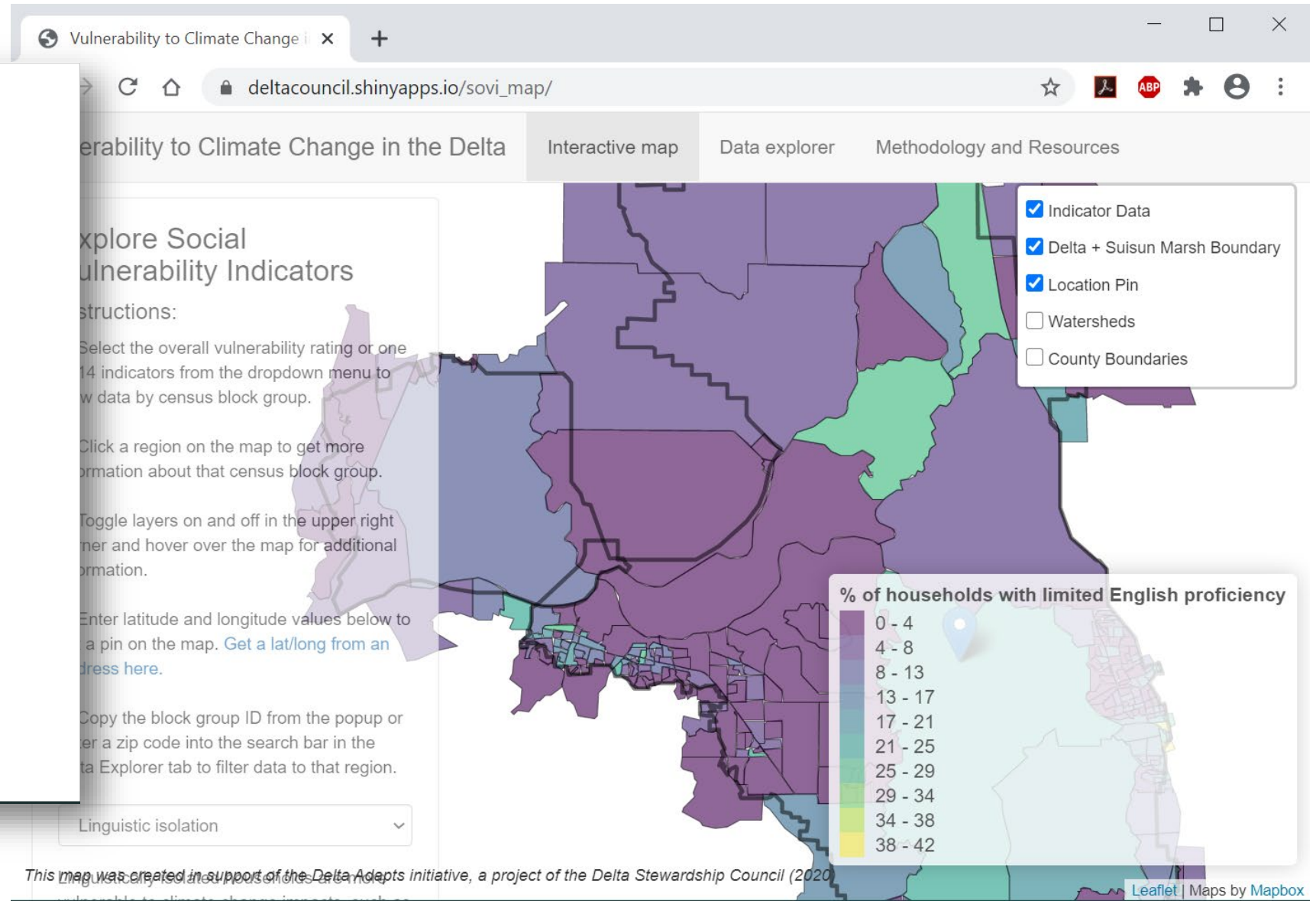
## Delta Science Proposal Solicitation Notice

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."*



DELTA STEWARDSHIP COUNCIL — BUREAU OF — RECLAMATION



# Outreach & Engagement

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## 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

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MODELING + ANALYSIS APPROACH | CURRENT + FUTURE CONDITIONS

# Modeling and Analysis Approach

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- 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

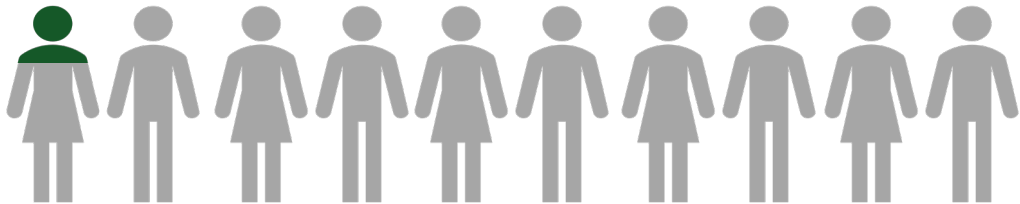


# Current Conditions

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

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

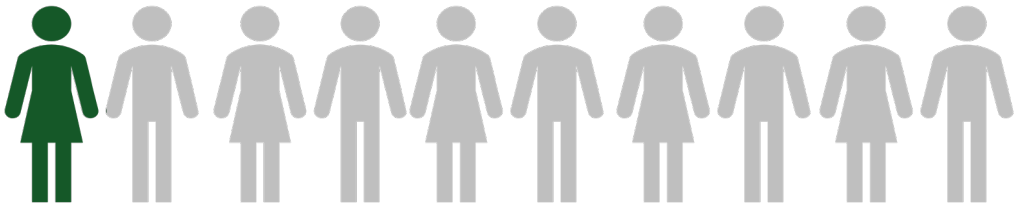


# 2050 Conditions

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**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





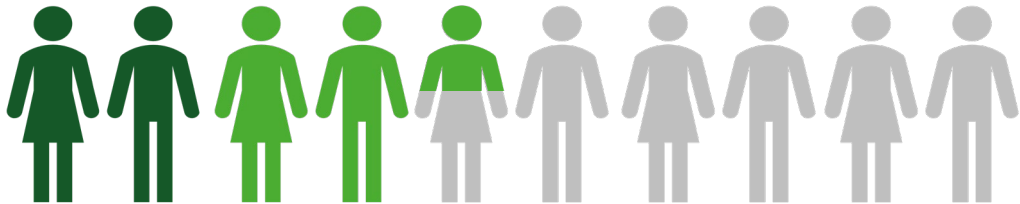
# 2085 Conditions

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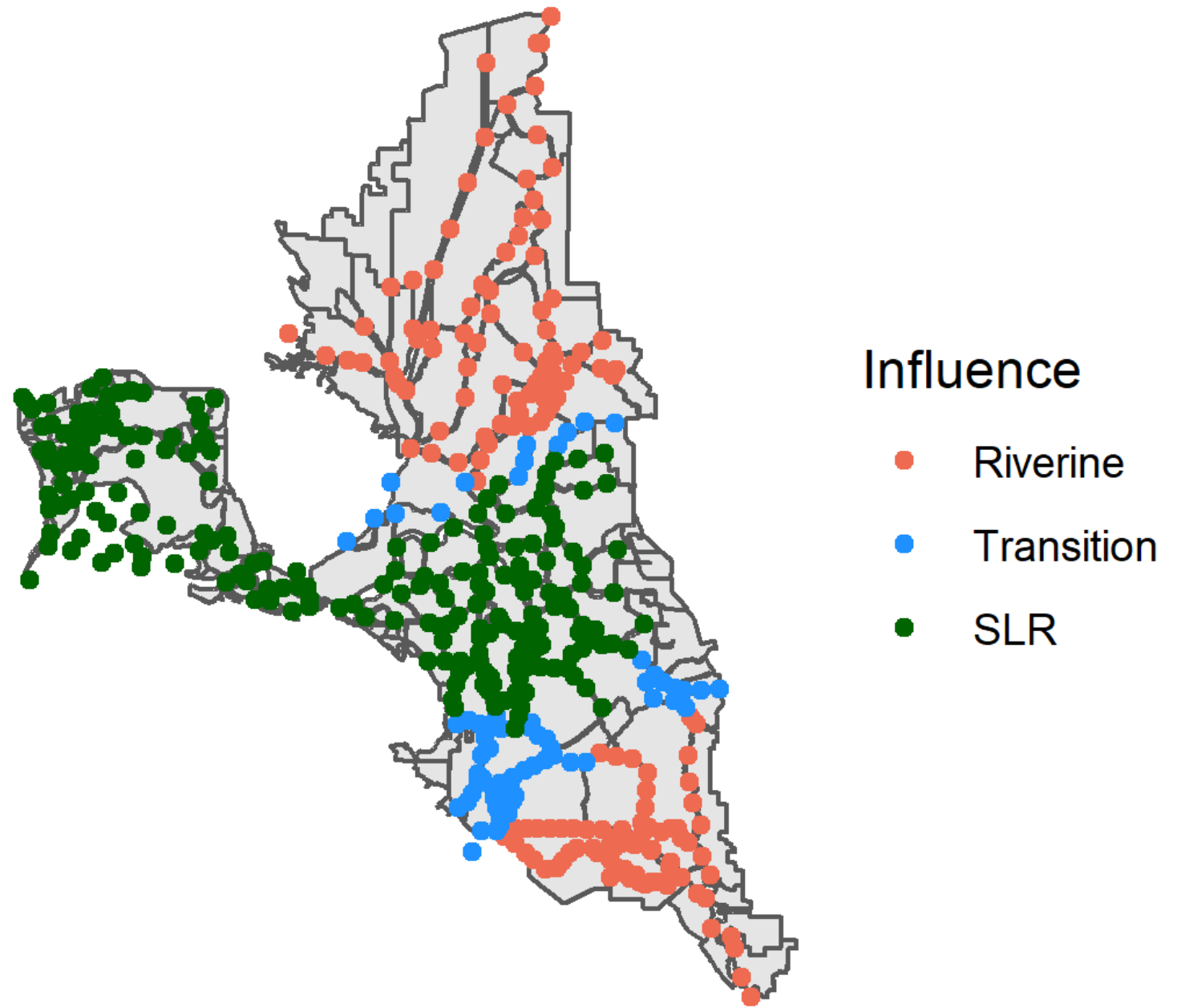
**68%** of the Delta exposed during a 100-year flood

**20%** of Delta population (**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?

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



# Ecosystem Analysis

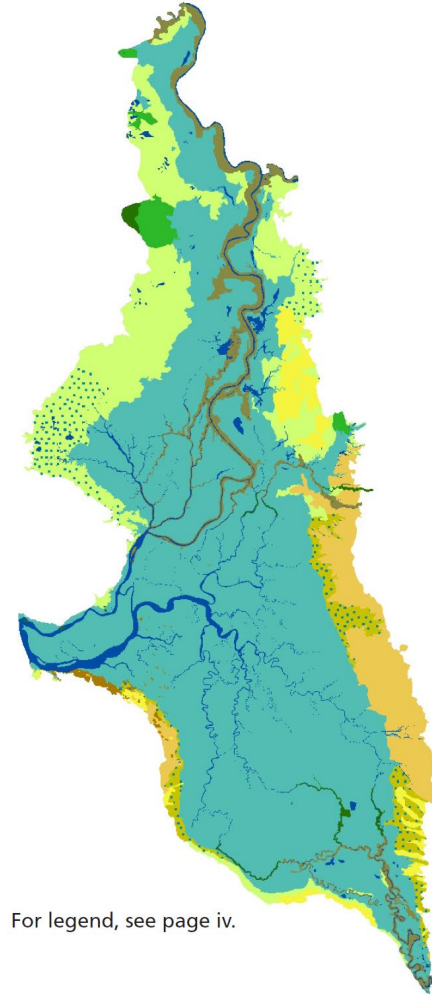
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ASSETS | SLR FINDINGS

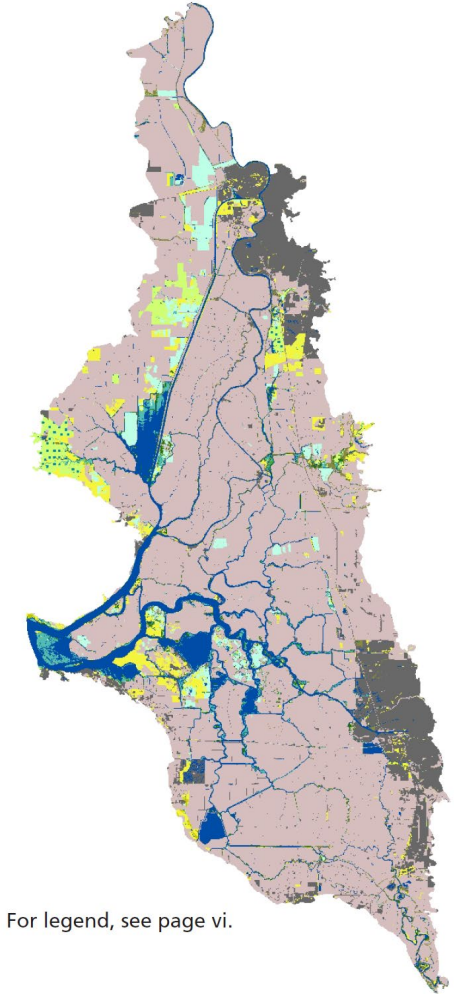
# Historical Ecosystem Loss

- 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

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**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

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- **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

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3.5 Feet SLR

**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 & Connections

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SIGNIFICANCE | CONNECTIONS TO BLUEPRINT

# Significance of Delta Adapts

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- 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

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

# Connections to Estuary Blueprint

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- 4** Identify, protect, and create transition zones around the Estuary
- 11** Develop processes for increasing carbon sequestration through wetland restoration, creation, and management
- 14** Demonstrate how natural habitats and nature-based shoreline infrastructure can provide increased resiliency to changes in the Estuary environment
- 15** Advance natural resource protection while increasing resiliency of shoreline communities in the Bay Area
- 23** Integrate water into the updated Plan Bay Area and other regional planning efforts

# Thank you

Web: [deltacouncil.ca.gov/delta-plan/climate-change](http://deltacouncil.ca.gov/delta-plan/climate-change)

Twitter: @DeltaCouncil



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