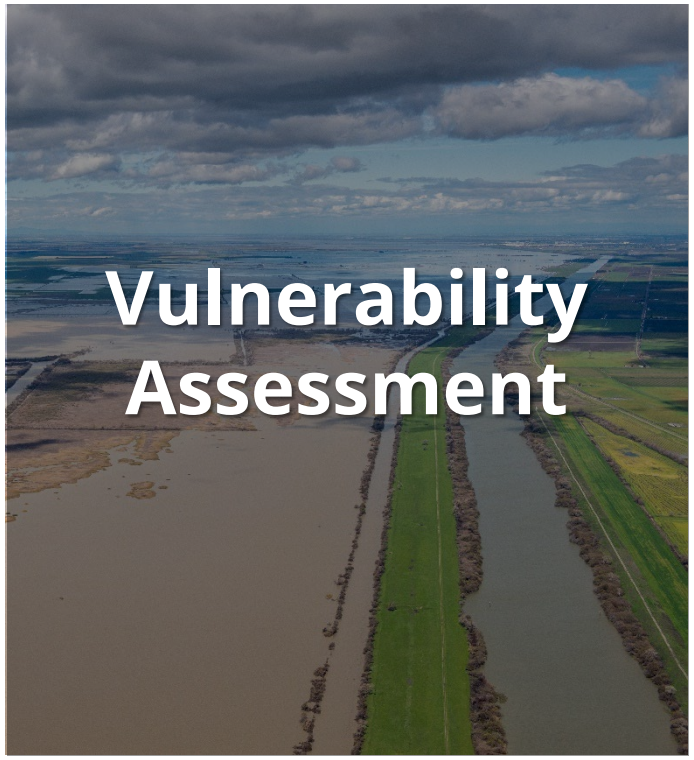
April 2024

Delta Adapts: Draft Adaptation Plan Overview

Delta Stewardship Council

A CALIFORNIA STATE AGENCY

Delta Adapts =



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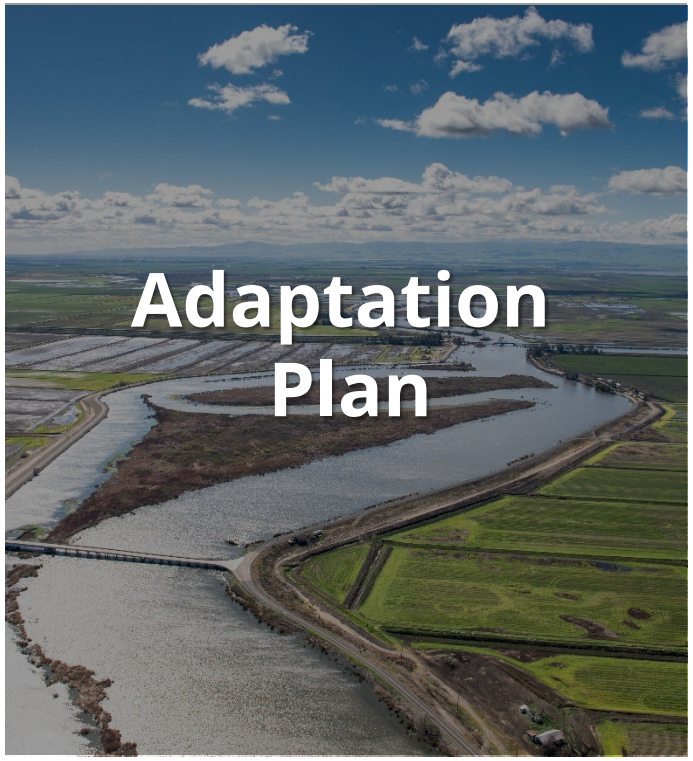
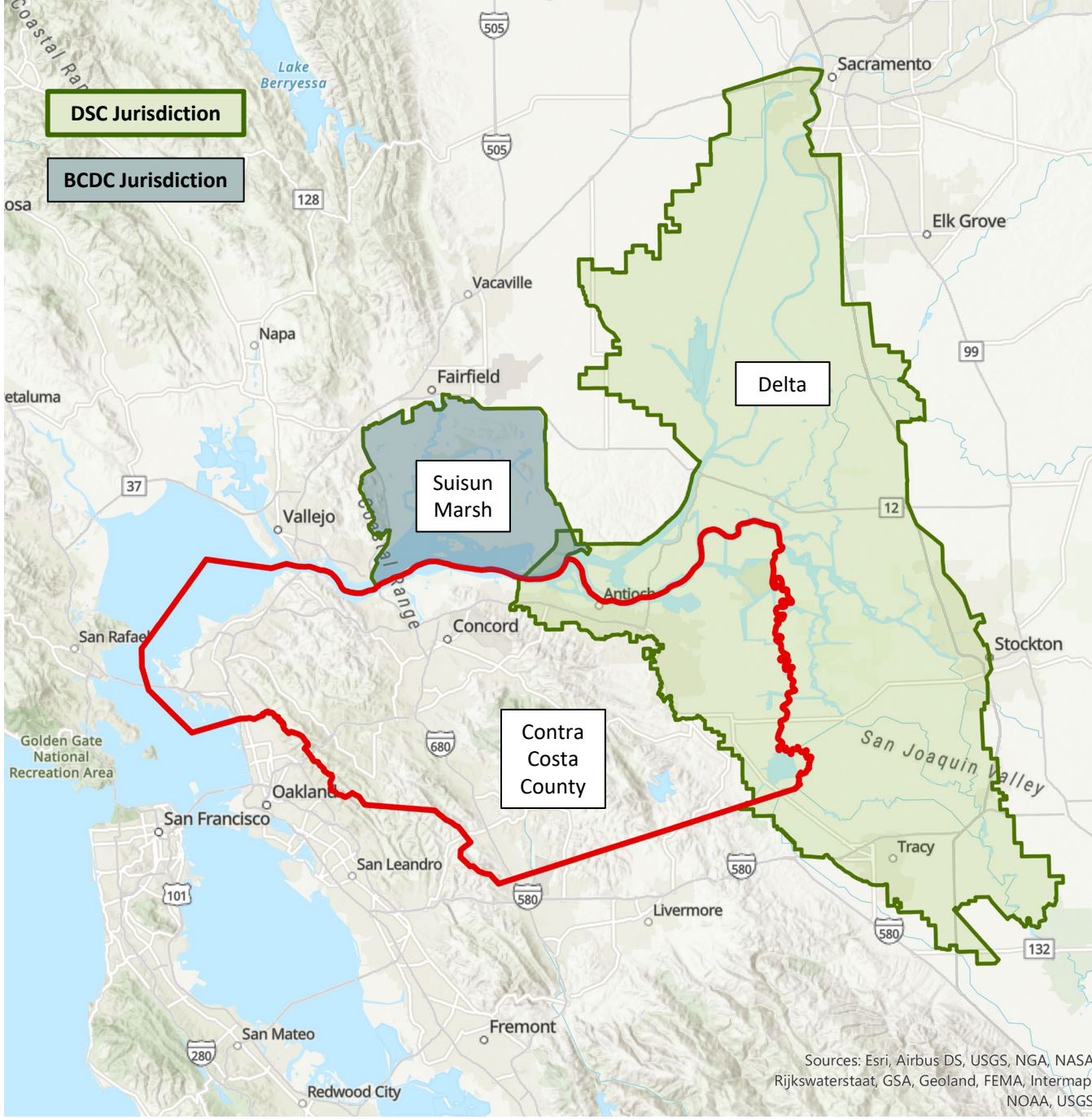


Overarching goal is to build climate resilience in the Delta

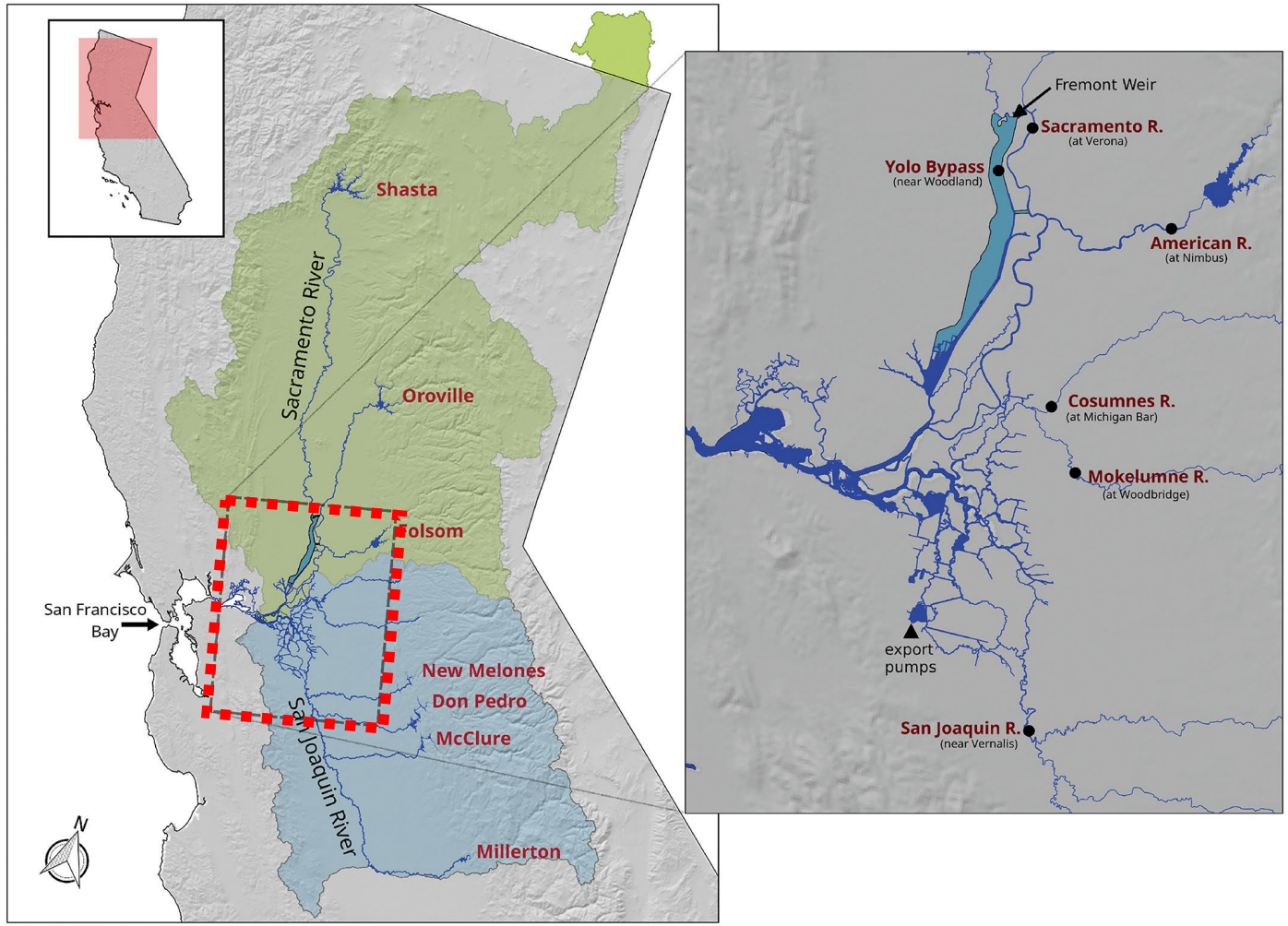
DSC Authority

- One Estuary
- BCDC and DSC have overlapping jurisdictions in Suisun Marsh



Flood Hazard Analysis

- Sea level rise
- Storm surge
- Tides
- Inflow from rivers
- Effects of climate change on river flood flows
- Possibility of high tide and storm surge occurring at same time as high inflow
- Flooding due to levee overtopping; no action scenario



Delta Adapts Modeling Analysis and Approach

- Adapt and improve upon approach developed and applied in prior work
- Considered a wide **range of plausible inputs** considering future climate change:
  - Tide and storm surge
  - Sea level rise
  - Tributary inflows
- Applied **DSM2 hydraulic model** to explore local water level dependence on input conditions
- Developed tool for rapid estimation of local water levels
- Apply **probabilistic** approach to estimate peak water levels throughout the Delta, considering uncertainty in effect of climate change on inputs

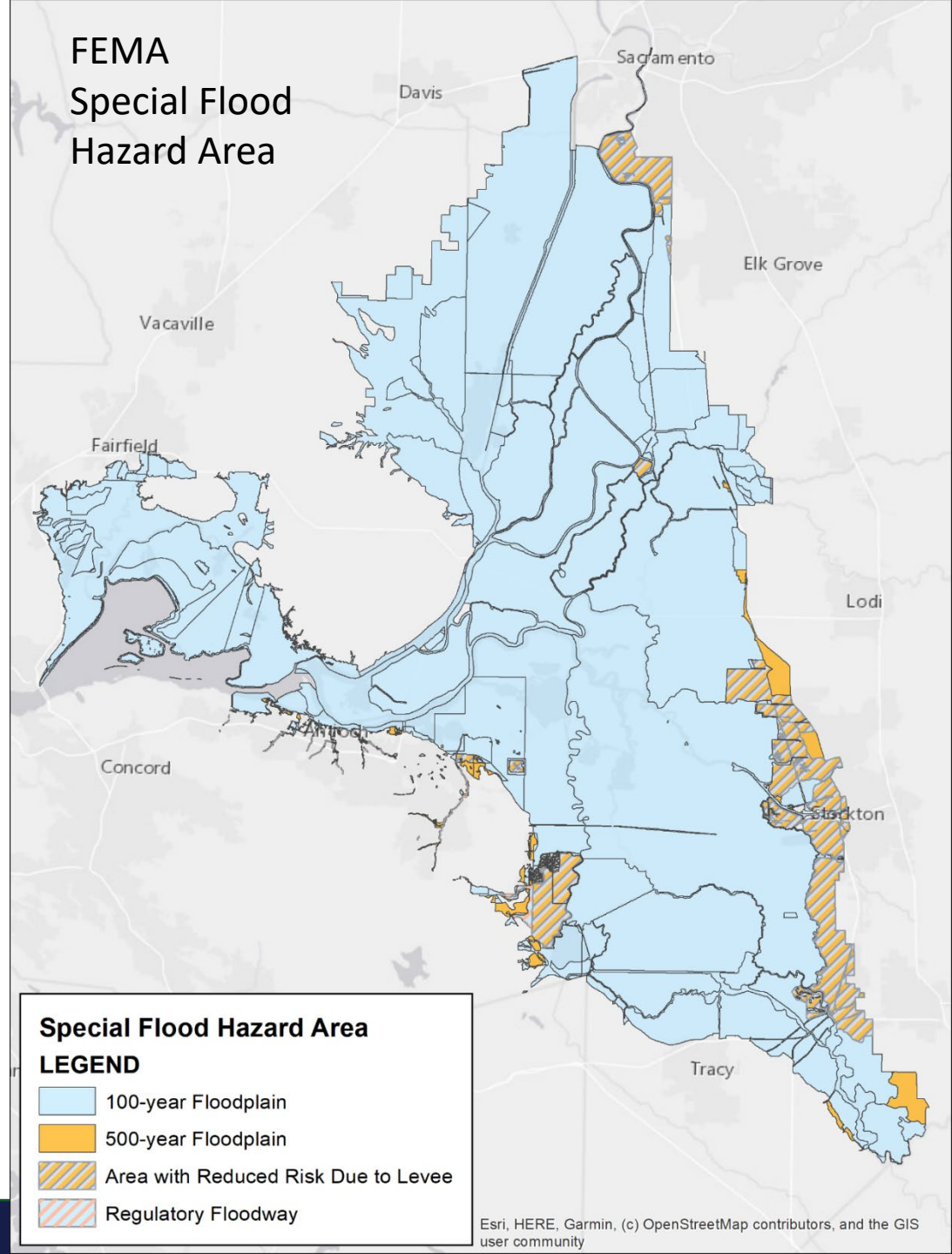
Traditional Floodplain Map

FEMA Flood Insurance Rate Map

- Flood exposure is “all-or-nothing” – in or out
- Some considerations for higher storm events and levees

Delta Adapts aims to provide more detailed understanding of flood risk

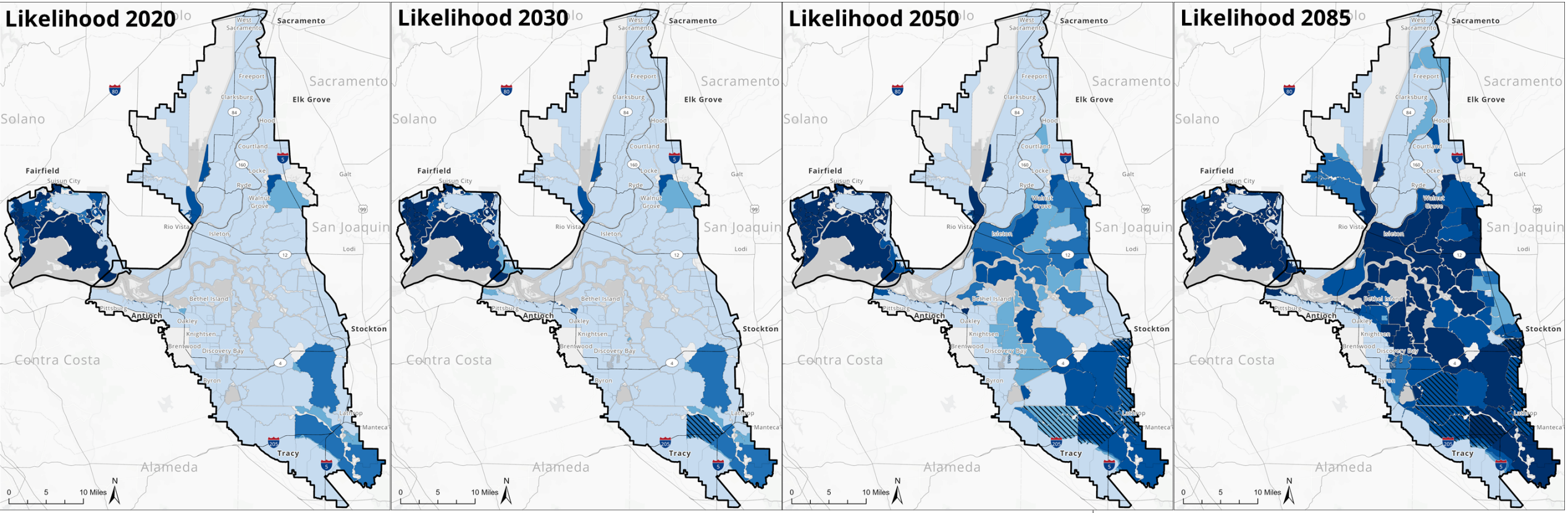
- Deterministic maps (e.g. FEMA)
- Probabilistic maps (likelihood of flooding)



Flood Hazard Scenarios

Planning Horizon	Sea Level Rise	Watershed Hydrology
Current Conditions	N/A	Historical
2030	2030 (0.2 to 0.8 ft)	Historical
2050	2050 (0.2 to 1.9 ft)	Mid-Century (2035-2064) RCP 8.5
2085	2085 (0.5 to 6.9 ft)	End-of-Century (2070-2099) RCP 8.5

Probabilistic Flood Exposure Maps



Annual chance: 10%, 2-10%, 1-2%, 0.5-1%, <0.5%

Return period: Less than 10 years, 10 to 50 years, 50 to 100 years, 100 to 200 years, Greater than 200 years,

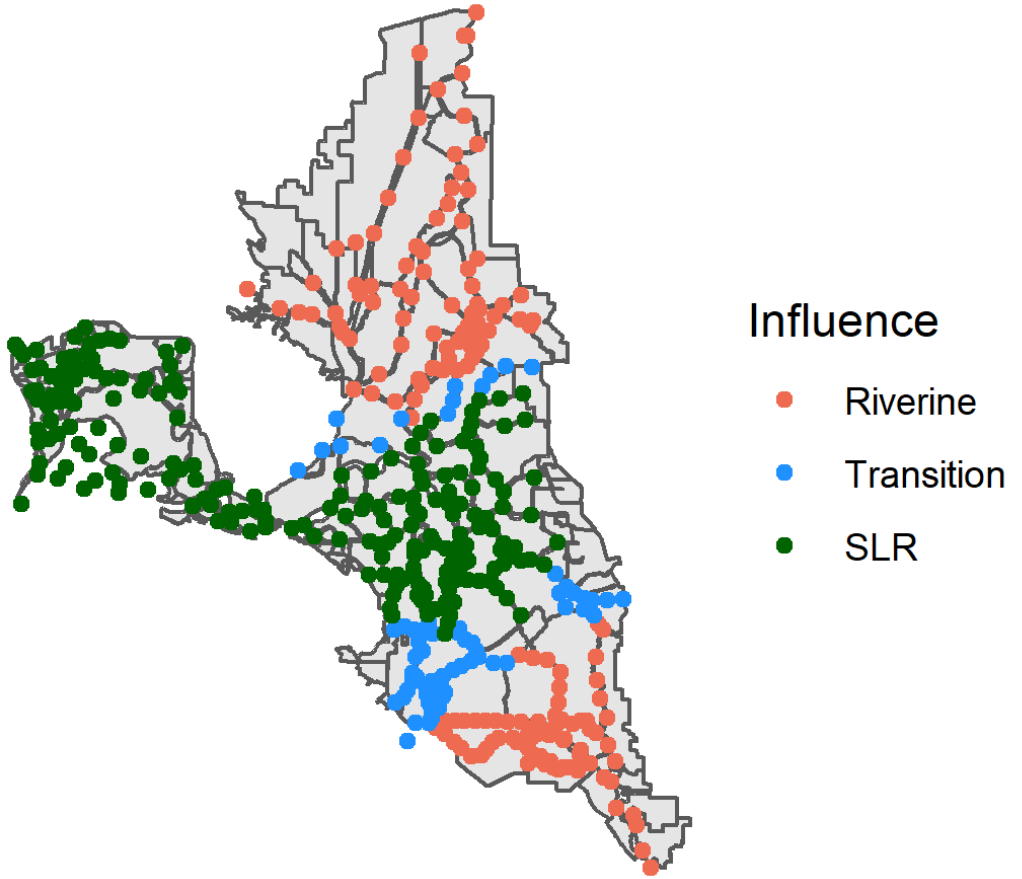
Chance over 10 years: Greater than 65%, 18% to 65%, 10% to 18%, 5% to 10%, less than 5%

Highly sensitive to SJR inflow assumptions,

Not modeled

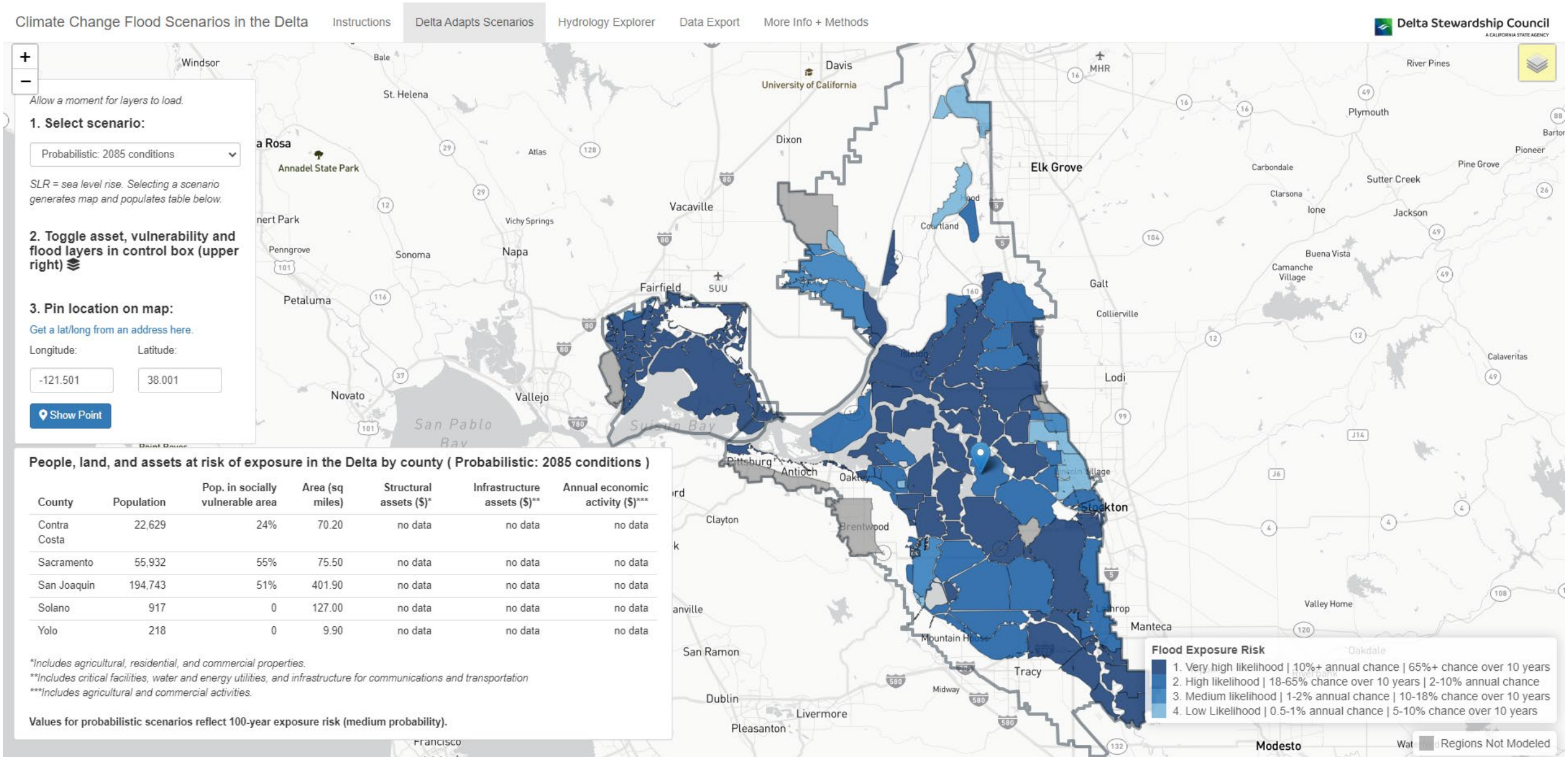
Delta Flood Dynamics: Understanding Regional Influences

Area of Strongest Climate Change Influence
Throughout the Delta



Shiny app

https://deltascience.shinyapps.io/delta_flood_map/



FLOODING

By 2050, a 100-year flood event in Contra Costa County could impact:

- **2,955** residents
- **80%** of exposed population in Antioch and Pittsburg live in areas with high social vulnerability

- **1** school
- **1** wastewater treatment plant
- **5** parks

- **1** solid waste facility
- **5** contaminated sites

Key Climate Vulnerabilities and Adaptation Priorities in Antioch and Pittsburg

Climate vulnerabilities:

Flooding: By 2085, at least 3,180 additional people in Antioch and Pittsburg will be exposed to flooding.

Extreme Heat: Antioch and Pittsburg will likely experience ~five times more extreme heat days by 2050 than what is currently experienced.

Wildfire: Antioch and Pittsburg will likely experience more poor air quality events due to increased frequency and severity of remote wildfires.

Key adaptation priorities

- Coordinate with other agencies on adaptation efforts.
- Prioritize adaptation for vulnerable communities.
- Protect shoreline infrastructure from sea level rise and climate hazards.
- Maximize public shoreline access and increase park resilience.
- Address drinking water issues, trash in waterways, and food insecurity.
- Train youth on climate impacts and adaptation.

SUMMER 2024

Water Supply Reliability

Ecosystem Restoration

Adaptation Plan

Agriculture

Flooding

- Adaptation strategies
- Responsible entities
- Funding and financing
- Governance best practices

FLOOD RISK REDUCTION

DELTA ADAPTS
Focus Area

Vulnerabilities

Climate-induced hydrologic variability and sea level rise are expected to **intensify flooding** across the entire Delta region

The Delta's **1,100 miles of levees** are designed to operate under historical conditions that did not consider climate change, which will stress the whole system

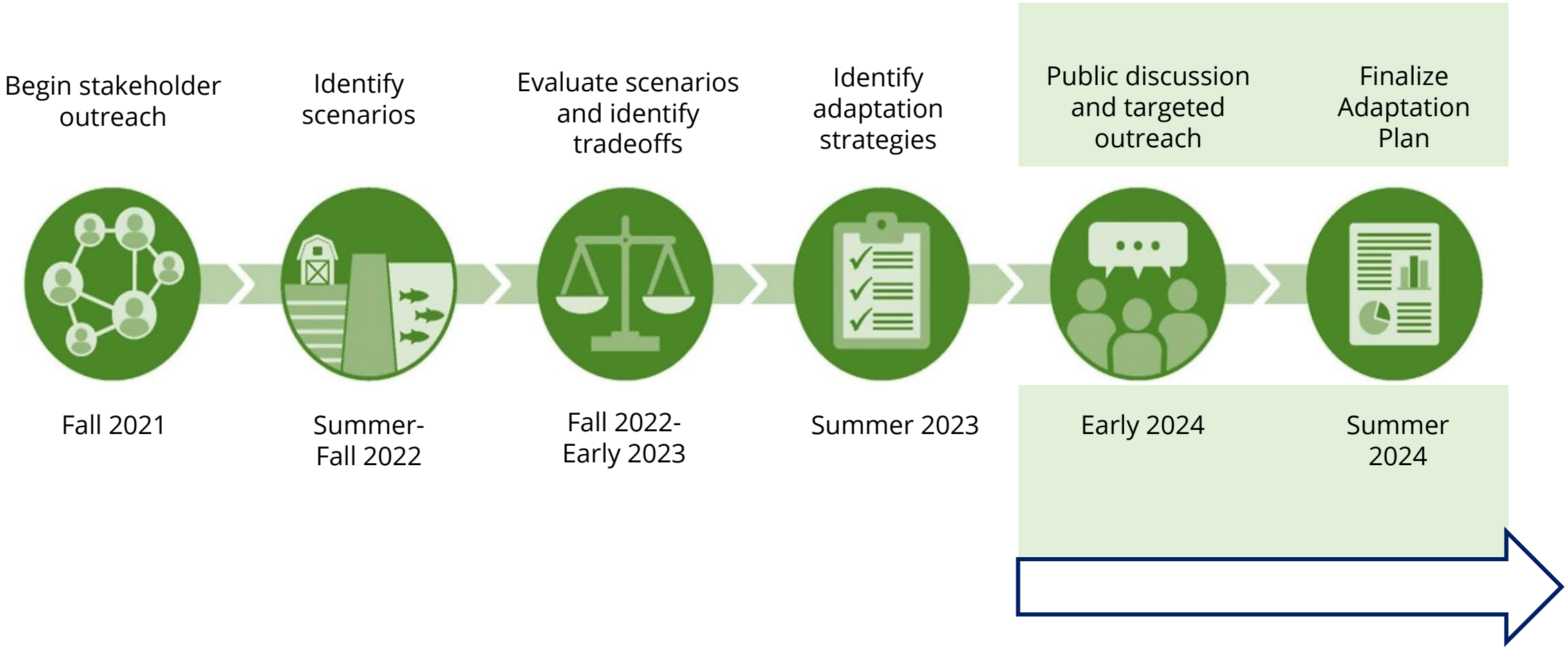
Strategies

- Develop climate-informed understanding Delta flood dynamics
- Strengthen and upgrade Delta levee system
- Restore ecosystems for flood mitigation
- Improve emergency preparedness and risk communication
- Manage and expand upstream water storage capability
- Use adaptive urban planning and farming practices to reduce risk

Example Actions

- Integrate climate change into risk assessment models (FL-1-1)
- Integrate climate risks and equity into the Delta Levees Investment Strategy (FL-2-2)
- Monitor and evaluate the effectiveness of multi-benefit projects for flood risk reduction (FL-3-2)
- Raise awareness about the availability and importance of flood insurance (FL-4-6)
- Use excess floodwater to recharge underground aquifers (FL-9-2)
- Limit development in flood-prone areas (FL-7-4)

Next Steps


Begin stakeholder outreach
Identify scenarios
Evaluate scenarios and identify tradeoffs
Identify adaptation strategies
Public discussion and targeted outreach
Finalize Adaptation Plan
Fall 2021
Summer-Fall 2022
Fall 2022-Early 2023
Summer 2023
Early 2024
Summer 2024

QUESTIONS AND DISCUSSION

Thank you

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