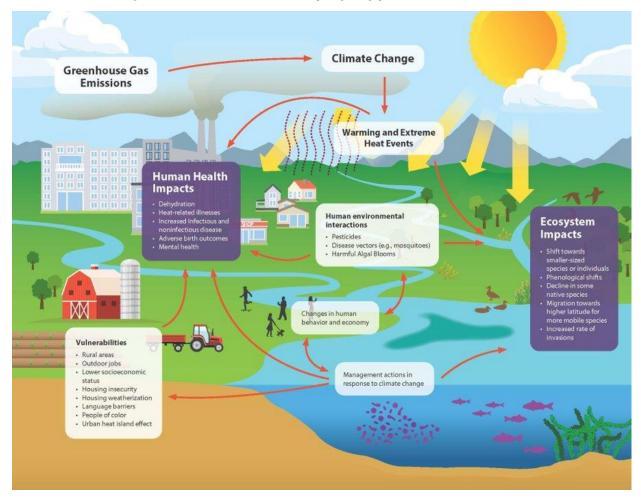
# Delta ISB Emerging Climate Research Symposium:

# Collection of Conceptual Models for the Bay-Delta

# State of the Bay-Delta Science 2025 (In prep)



# Herbold et al. 2022 Climate Change Impacts on San Francisco Estuary Aquatic Ecosystems: A Review

Climate change alterations to the timing, frequency, magnitude, and spatial extent of environmental drivers, and impacted ecosystems

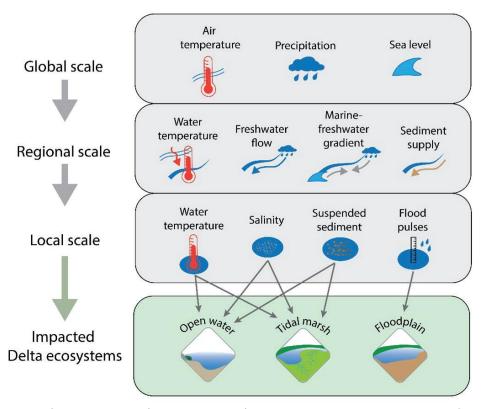


Figure 3 Schematic of the key climate change impacts on Delta ecosystems. Spatial down-scaling is represented with arrows from global, regional, and local scales (grey arrows and panels) to open water, tidal marsh, and floodplain ecosystems (green arrow and panel).

# **Delta Adapts: Creating a Climate Resilient Future 2021**

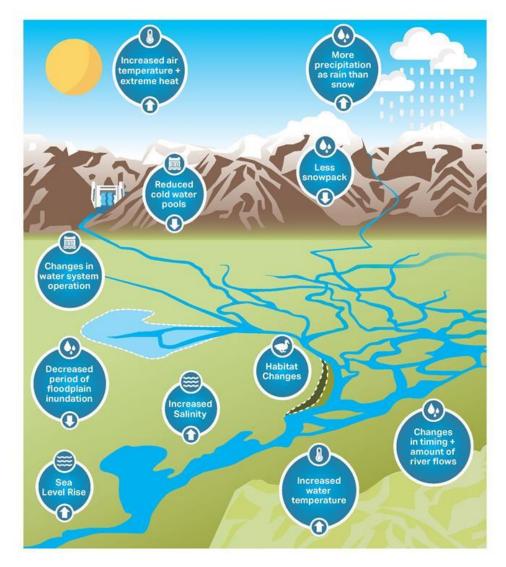


Figure 5-1. Changing Climate Stressors and Hazards in the Delta

# **Delta Adapts: Creating a Climate Resilient Future 2021**

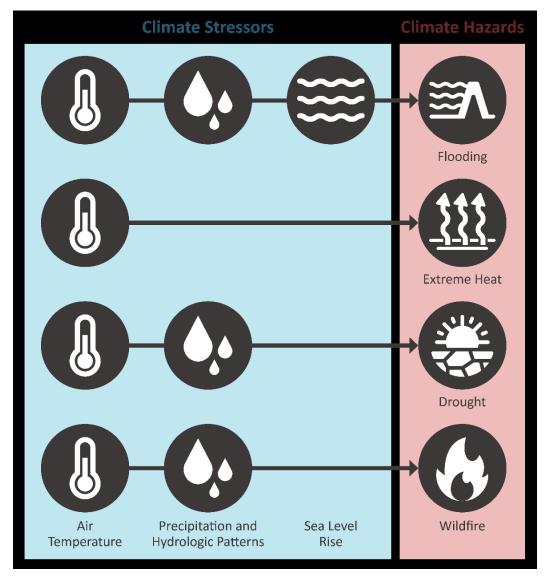


Figure 3-6. Relationship Between Climate Stressors and Hazards Evaluated in the Delta Climate Change Vulnerability Assessment

Synthesis of data and studies related to the effects of climate change on the ecosystem and biota of the Upper San Francisco Estuary 2022, IEP Technical Report 99

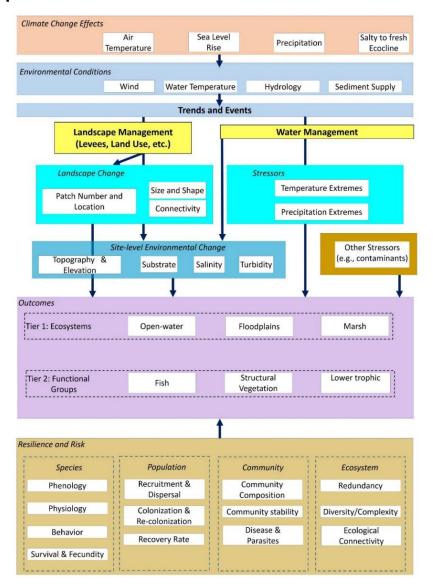
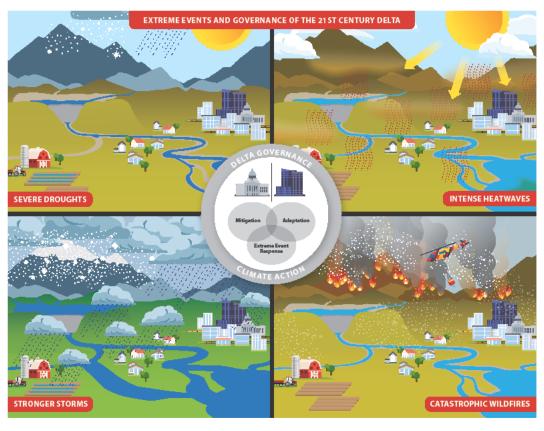
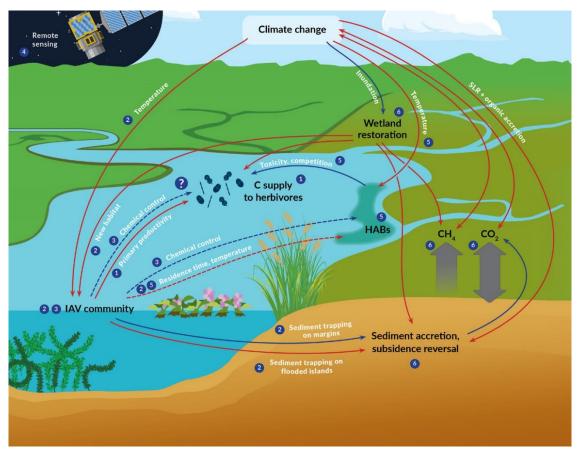


Figure 1. Conceptual model diagram for climate change impacts on estuaries

# State of the Bay-Delta Science 2025 (In prep)

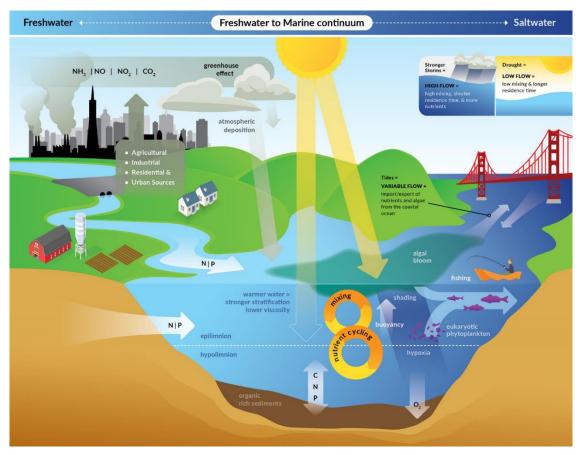


## State of the Bay-Delta Science 2022: Executive Summary



CAPTION: Diagram connecting major scientific messages across all the chapters forming this edition of The State of Bay-Delta Science. The circled numbers indicate the chapter or chapters in which the depicted relationship, process, or primary producer community is discussed: 1) Boyer et al.; 2) Christman et al.; 3) Conrad et al.; 4) Hestir et al.; 5) Kudela et al.; 6) Windham-Myers et al. Abbreviations: C, carbon; CH4, methane; CO2, carbon dioxide; HABs, harmful algal blooms; IAV, invasive aquatic vegetation; SLR, sea level rise

## State of the Bay-Delta Science 2022: Executive Summary



CAPTION: Diagram showing how many environmental variables and human influences can impact the occurrence of harmful algal blooms (HABs) across the freshwater to marine continuum. Abbreviations: C, carbon; CO2, carbon dioxide; HABs, harmful algal blooms; N, nitrogen; NO, nitric oxide; NO2, nitrogen dioxide; NH3, ammonia; P, phosphorus

#### References

Herbold, B., Bush, E., Castillo, G., Colombano, D., Hartman, R., Lehman, P., Mahardja, B., & Sommer, T. (2022). Climate change impacts on San Francisco estuary aquatic ecosystems: A review. San Francisco Estuary and Watershed Science, 20(2). https://doi.org/10.15447/sfews.2022v20iss2art1

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<u>Sacramento-San Joaquin Delta Climate Change Vulnerability Assessment.</u> Available from: https://www.deltacouncil.ca.gov/pdf/delta-plan/2021-06-25-delta-adapts-vulnerability-assessment.pdf

IEP, Interagency Ecological Program (2023). <u>Synthesis of data and studies related to the effect of climate change on the ecosystems and biota of the Upper San Francisco Estuary Year 2022</u>. IEP Technical Report #99. Available from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204625&inline