



# Planning Framework Summary

## Sea Level Rise Adaptation Plan for Eureka Slough Hydrographic Area, Humboldt Bay



March 12, 2020 1:00 pm – 4:00 pm

### Study Area

The Eureka Slough hydrographic area encompasses the land along the shoreline of Humboldt Bay draining through Eureka Slough. Places and critical resources within the study area include:

- Transportation corridor (Highway 101, railroad, future Humboldt Bay Trail)
- Jacobs Avenue area
- Murray Field airport
- Mid-City Motor World and Brainard
- Agricultural land and Fay Slough Wildlife Area
- Mud flats, salt marsh, riparian areas, slough channels
- Residential areas along Eureka Slough
- Local streets and roads, Eureka Waterfront Trail
- PG&E natural gas and electrical distribution systems
- City of Eureka and Humboldt Community Services District water systems

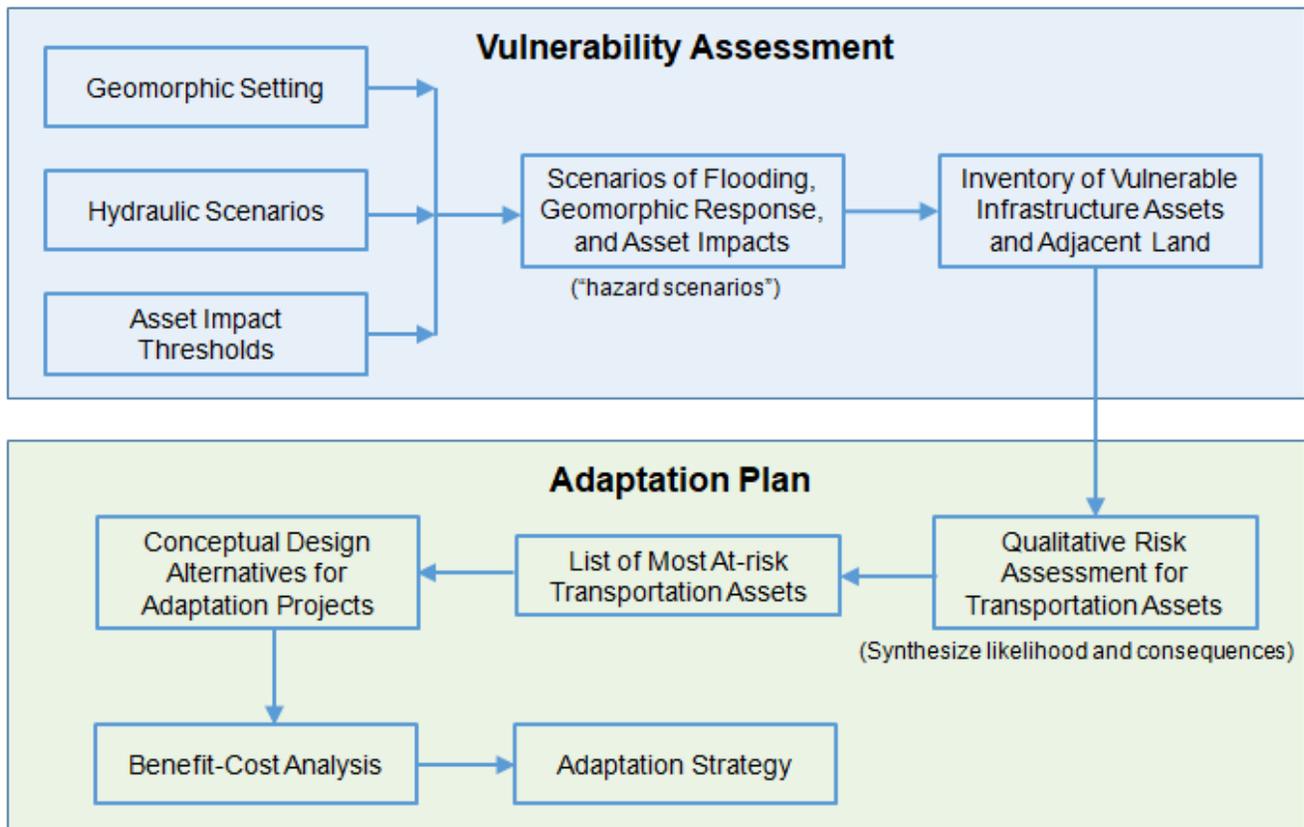
### Guiding Questions

1. What are the most significant risks within the study area?
2. What designs for adaptation projects could be feasible and effective?
3. How can collaborative efforts be advanced?

### Project Objectives

1. Build relationships and an organizing framework for advancing collaborative efforts among public and private landowners at a regional scale
2. Improve the collective understanding of risks to transportation infrastructure from flooding and inundation hazards associated with sea level rise in Humboldt Bay
3. Identify vulnerable populations and the interests of affected landowners and stakeholders, including non-transportation infrastructure (water, natural gas, electricity) and agriculture
4. Identify feasible conceptual designs that protect infrastructure and are compatible with adjacent land and develop an implementation strategy
5. Develop tools for evaluating the costs and benefits of investing in adaptation projects
6. Establish a methodology for developing adaptation plans that can be applied in other discrete watershed basins around the perimeter of Humboldt Bay

## Primary Tasks



## Vision Statement

1. Infrastructure, residences, businesses, agricultural operations, and natural areas are resilient to flooding under current and future sea level conditions.
2. The critical resources of the Eureka Slough hydrographic area are protected from flooding hazards by multiple lines of defense including natural features (mud flats and salt marsh) and built structures (such as levees and embankments).
3. Public officials, landowners, and residents are aware of flood hazards associated with Humboldt Bay and freshwater tributaries and incorporate the goal of reducing flood risk into all pertinent planning and management decisions.
4. Landowners and managers collaborate on implementing an integrated strategy of short-term and long-term actions to achieve and maintain an acceptable level of flood risk.
5. Diverse habitat types and healthy ecosystem functions are maintained.
6. Adaptation projects are led by local agencies and supported by federal and state funding.

## Guiding Principles

1. **Landscape-scale and process-based evaluation**  
The hydrographic area provides the optimal spatial framework to guide adaptation strategies for sea level rise planning around Humboldt Bay. The geomorphic and hydrologic processes that control the flow of water and sediment must be understood in order to plan and design effective adaptation measures.
2. **Risk management approach**  
Actions can be taken to reduce risk. The overarching goal is reducing risk to an acceptable level. A cardinal rule is to avoid transferring risk from one property to another property.
3. **Apply best available science**  
Planning efforts should make use of the best available science. The best available science will evolve incrementally over time. The appropriate level of understanding and tolerance for uncertainty will vary based on the potential consequences of a decision and the time frame available for making the decision. Science-based evaluation should identify data and methods and include clear statements of assumptions and limitations. The most credible scientific information undergoes an independent peer review process. Criteria for best available science include relevance, objectivity, and transparency.
4. **Engage stakeholders**  
Flooding hazards represent threats to people's livelihoods, public safety, the regional transportation network, economic prosperity, and public trust resources; everyone has a stake. There is a need for creative ideas for potential actions and feedback on what is feasible. Adaptation measures may need to span multiple ownerships. Success will depend on partnerships.
5. **Aim to maximize multi-benefit projects and nature-based solutions**  
The starting point for water resource planning in California is the paradigm of integrated regional water management and multi-benefit projects. Nature-based solutions, and hybrid measures that integrate nature with engineered structural approaches, may provide the optimal total benefits for coastal resilience and risk reduction. Nature-based solutions work with natural processes and landforms to provide protection for both ecosystems and the built environment.
6. **Multiple lines of defense**  
Properties along the shoreline of Humboldt Bay are protected from flooding by multiple lines of defense. Planning for flooding and sea level rise needs to consider how the lines of defense work together and how they can be improved to optimize protection.
7. **Adaptive Management**  
Adaptation will require demonstration projects, experimentation, trial-and-error, monitoring, and learning by doing.

### Key Assumptions

1. The Highway 101 transportation corridor between Eureka and Arcata will remain in its current location along the Humboldt Bay shoreline well into the 22<sup>nd</sup> century, for the following reasons:
  - a. The transportation corridor along the bay provides a direct connection between the segments of Highway 101 passing through the two cities.
  - b. Re-location inland would displace communities along Myrtle Avenue and Old Arcata Road and/or cause significant environmental impacts.
  - c. Re-location inland is most likely cost prohibitive.
  - d. Construction of a causeway along a portion of the Highway 101 corridor is technically feasible (although at a very high cost and with many design aspects to resolve).
2. SLR adaptation will require an incremental approach utilizing a combination of short-term actions to reduce immediate risk and gain time along with long-term actions to address future conditions.
3. Adaptation projects will need to minimize impacts to the extent practicable and comply with applicable laws and regulations.
4. Many adaptation projects will depend on the availability of state or federal funding and the willingness to participate of affected landowners.

### Conceptual Model for Dynamic Landscape Evolution and Flood Risk Change

