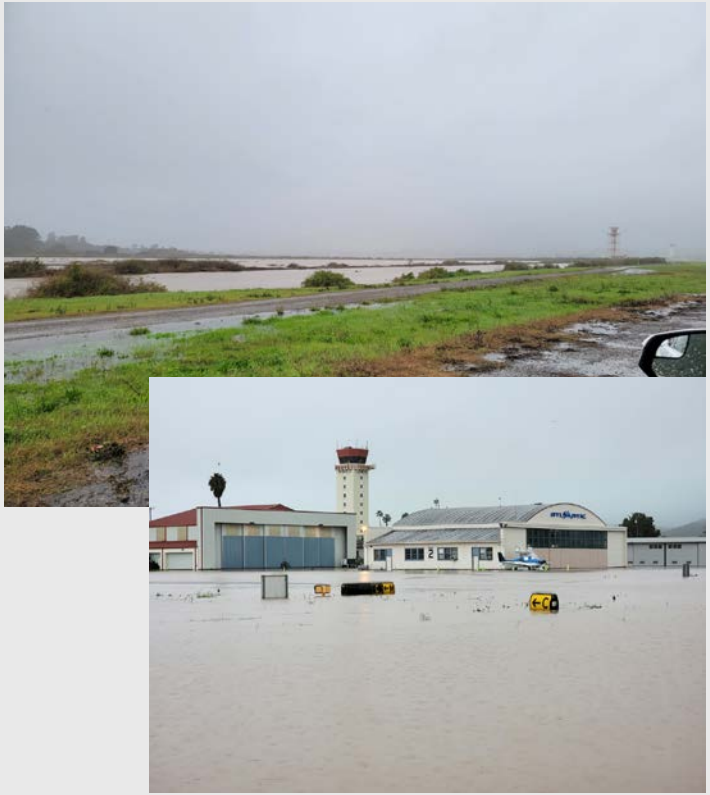
SANTA BARBARA AIRPORT

CLIMATE VULNERABILITY ASSESSMENT AND RISK EVALUATION

January 15, 2025

Overview & Purpose

- Hazard analyses results and asset exposure maps
- Asset vulnerability assessment
- Next steps

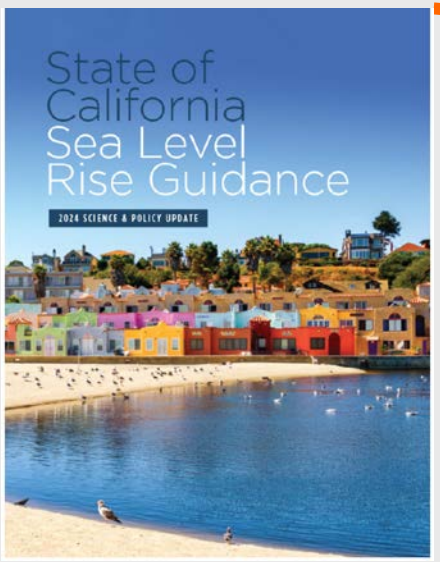


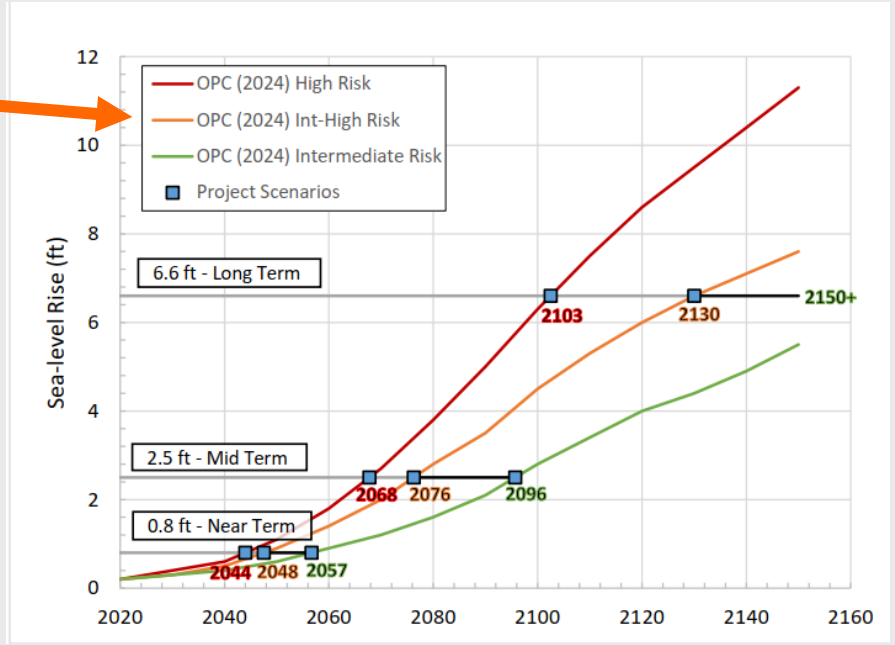
BACKGROUND AND FLOOD HISTORY

CVA focus of SLR and Climate Change

1. Historic and current flooding
2. Flood hazard analyses
3. SBA asset vulnerability
   - SBA economy
   - Habitat changes

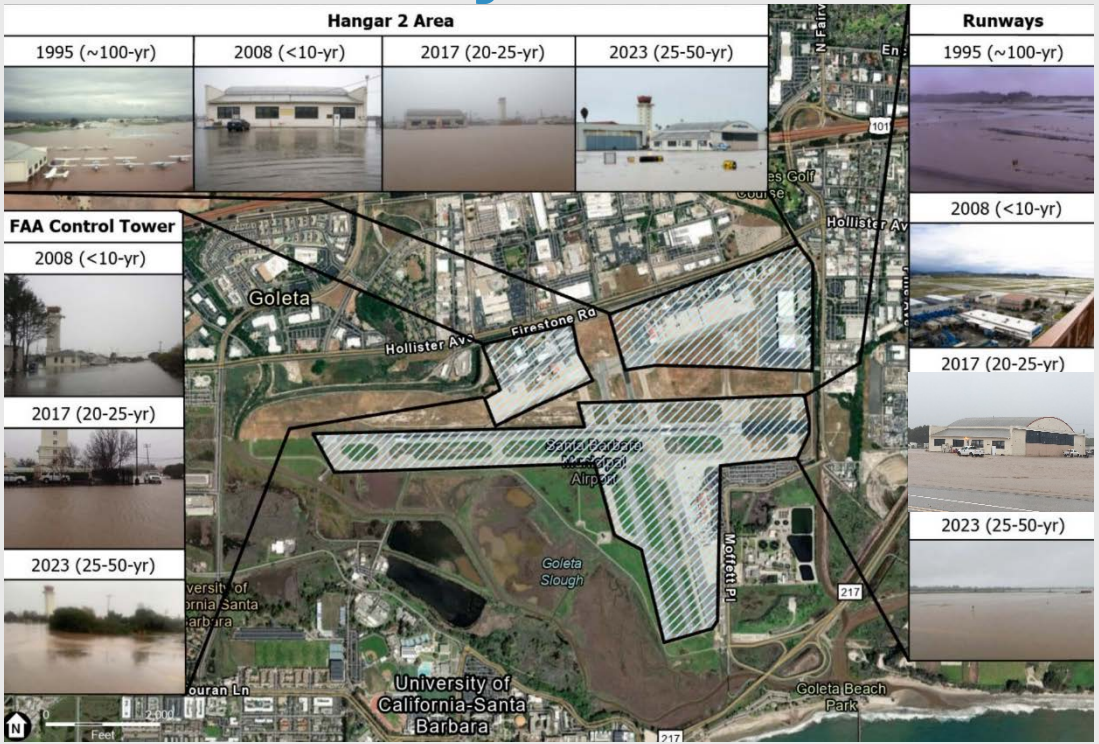
Sea Level Rise Scenarios





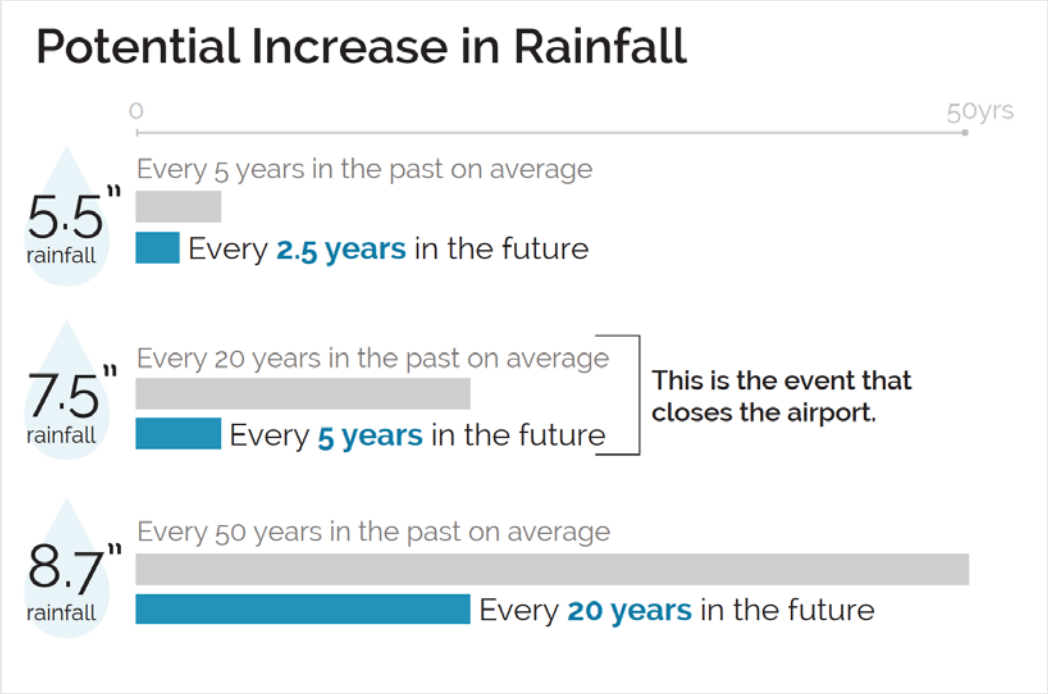
FLOOD HAZARDS ANALYSES RESULTS

Flood History and Flood Thresholds



1. Flooding of just the NW Quadrant near Carneros Creek
2. Flooding of the runways that causes airport closure
3. Flooding of the entire airport property (100-year flood)

Precipitation Modeling Results



Combined Flooding Results - Annual Probability Summary

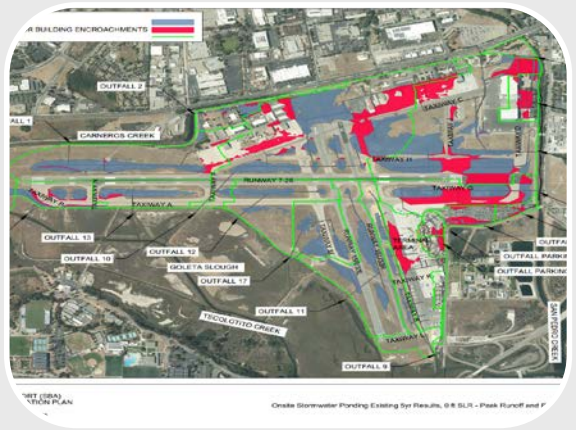
Flood Threshold Annual Probability Summary Table			
Sea Level Rise Scenario	**NW Quadrant & Edge of Runway Flooded**	**Runways Flooded, Airport Closed**	**Entire Airport Flooded**
0 ft, Past Precipitation	12%	7%	1%
0 ft, Future Precipitation	28%	21%	3%
0.8 ft (2048)	29%	21%	4%
2.5 ft (2076)	100%	61%	4%
6.6 ft (2130)	100%	100%	100%

Years are for the following scenarios:
(Intermediate High - Intermediate)
Annual probability is chance of the event occurring in **any given year**

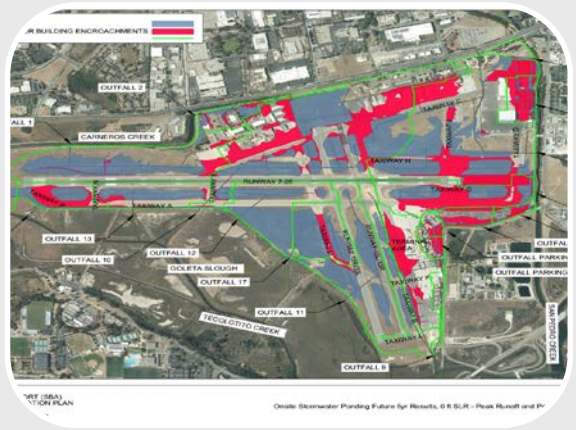
Bottom Line: Intense precipitation events are predicted to occur more frequently

Storm Drain Analysis

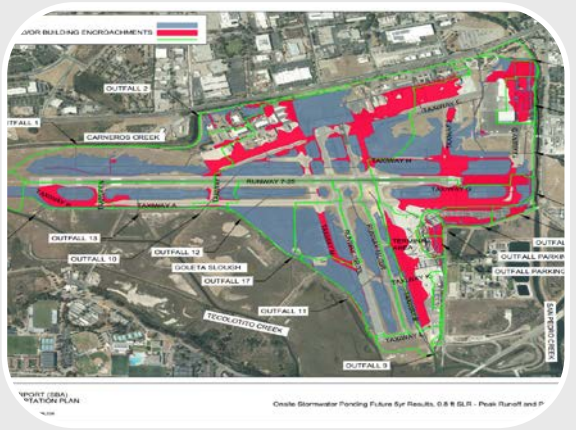
- Model uses water level data estimated for 5-year design storm
- SLR scenarios: 0 ft, 0.8 ft, 2.5 ft, and 6.6 ft
- Future 5-year storm: 20-year design event



Existing 5-yr, no SLR



Future 5-yr, no SLR

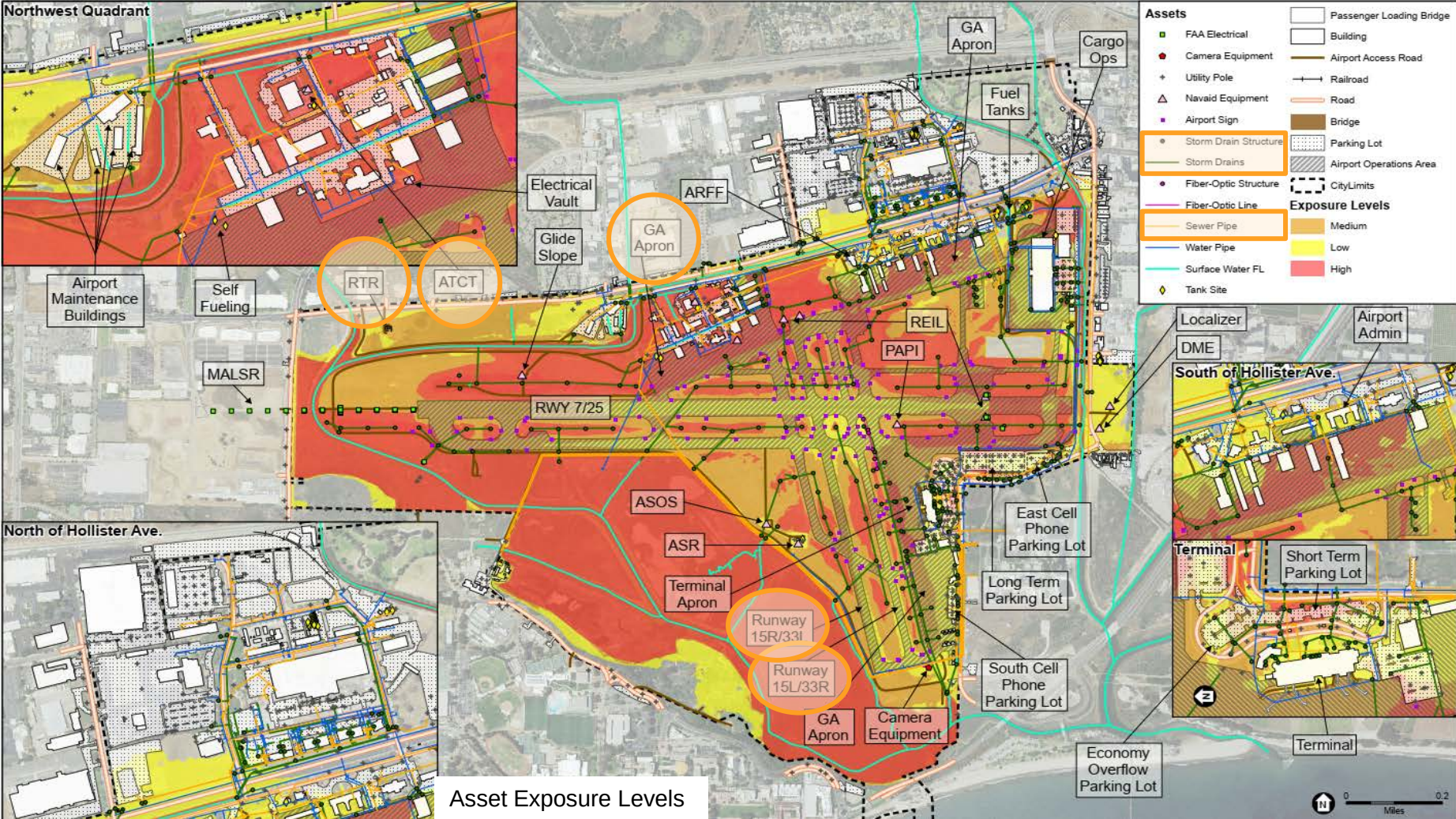


Future 5-yr, 0.8 ft SLR

Flood Hazard Results Summary

- Existing and historic flooding dominated by ***rainfall runoff and creek flooding***
- **Projected increase in precipitation increases flood risk (double to triple the risk)**
- **0.8 ft of SLR (2048) may not have a large effect on flood risk**
- **2.5 ft of SLR (2075) increases flood risk**
- 6.6 ft of SLR (2130): regular runway flooding and Airport closure due to tidal inundation and 100% annual chance of the entire airport flooding during storms

VULNERABILITY ASSESSMENT


Northwest Quadrant
North of Hollister Ave.
South of Hollister Ave.
Terminal
Assets
FAA Electrical
Camera Equipment
Utility Pole
Navaid Equipment
Airport Sign
Storm Drain Structure
Storm Drains
Fiber-Optic Structure
Fiber-Optic Line
Sewer Pipe
Water Pipe
Surface Water FL
Tank Site
Passenger Loading Bridge
Building
Airport Access Road
Railroad
Road
Bridge
Parking Lot
Airport Operations Area
CityLimits
Exposure Levels
Medium
Low
High
GA Apron
Cargo Ops
Fuel Tanks
Electrical Vault
ARFF
GA Apron
Glide Slope
RTR
ATCT
Airport Maintenance Buildings
Self Fueling
MALSR
RWY 7/25
REIL
PAPI
Localizer
DME
Airport Admin
ASOS
ASR
Terminal Apron
Runway 15R/33L
Runway 15L/33R
GA Apron
Camera Equipment
East Cell Phone Parking Lot
Long Term Parking Lot
South Cell Phone Parking Lot
Short Term Parking Lot
Terminal
Economy Overflow Parking Lot
Terminal
Asset Exposure Levels
0
0.2
Miles

Operations Vulnerability Summary

- **Airport Operations**
  - Very few asset flood impacts would restrict aircraft operations at the airport
- **Highest Operations Vulnerability**
  - Disembarking at the Terminal
  - Closure of Private Aviation Operations
  - Closure of Commercial Runway

ECONOMIC ANALYSIS

Economic Findings

- Average runway closure 21.6 hours, resulting in 21 cancelled flights
- Severe floods can lead to 25.5-hour closures and 34 cancellations
- Flooding-related costs will rise until 2.5 to 3.3 feet of SLR when the airport may become non-operational
- Estimated total losses from an average storm through 2075 could reach $68.5 million while severe storms might incur losses of $158.8 million

Economic Findings

- Passengers are projected to bear up to 71% of the losses while airlines face significant operational losses from increased costs
- Airport revenue losses during shutdowns are estimated at $120,000/day or $8,500/hour, losses calculated in 2024 dollars
- General aviation less affected due to flexibility and access to alternate airports

HABITAT CHANGE RESULTS

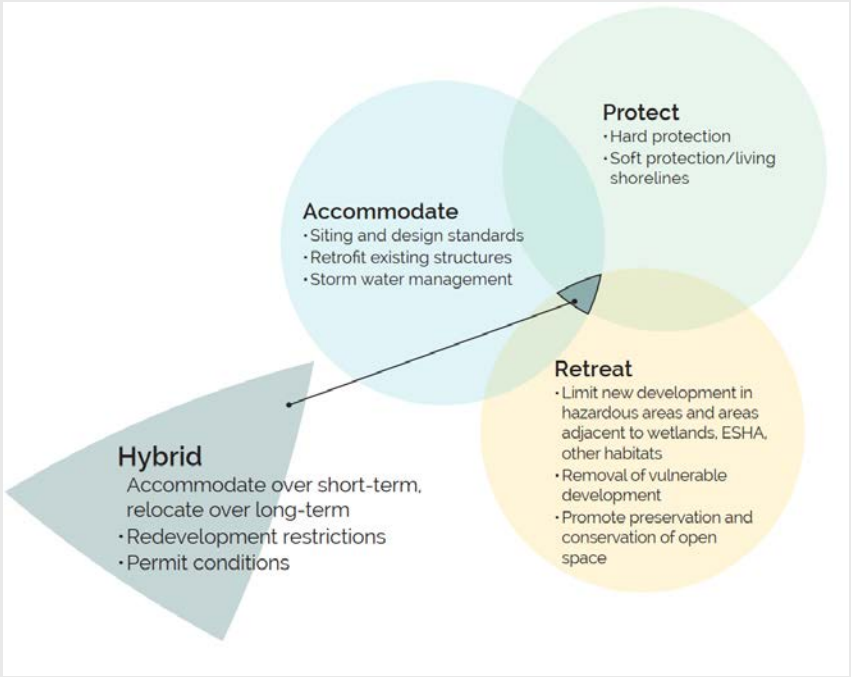
Vulnerability Summary

- **Habitat Change**
  - Low to mid marsh gradually increase with 2.5 ft of sea level rise as they migrate upslope into existing high marsh and transitional habitat areas
  - Habitats will be squeezed out because they will not be able to migrate upslope into the developed areas

Public Outreach

- Public Comment Period open December 11 - January 16
- Open House Held January 7

Next Steps



- Climate Adaptation plan
  - Develop adaptation measures and strategies
  - Conduct feasibility analysis of options to modify the airfield and existing buildings
- Community Engagement
- Local Coastal Plan update
  - Update the LCP to incorporate SLR-related policies identified from the vulnerability assessment and adaptation plan