

SEA LEVEL RISE ADAPTATION, MITIGATION AND SOCIAL EQUITY



IMPERIAL BEACH
California



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PRIORITY-BASIC/GREEN INFRASTRUCTURE



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PRIORITY: ADDRESSING CHILDHOOD POVERTY AND
CHRONIC STRESS/1 IN 3 CHILDREN LIVE IN POVERTY



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PRIORITY: STOPPING BEACH CLOSURES AS
A RESULT OF CROSS-BORDER POLLUTION



CITY SLR STUDY GOALS



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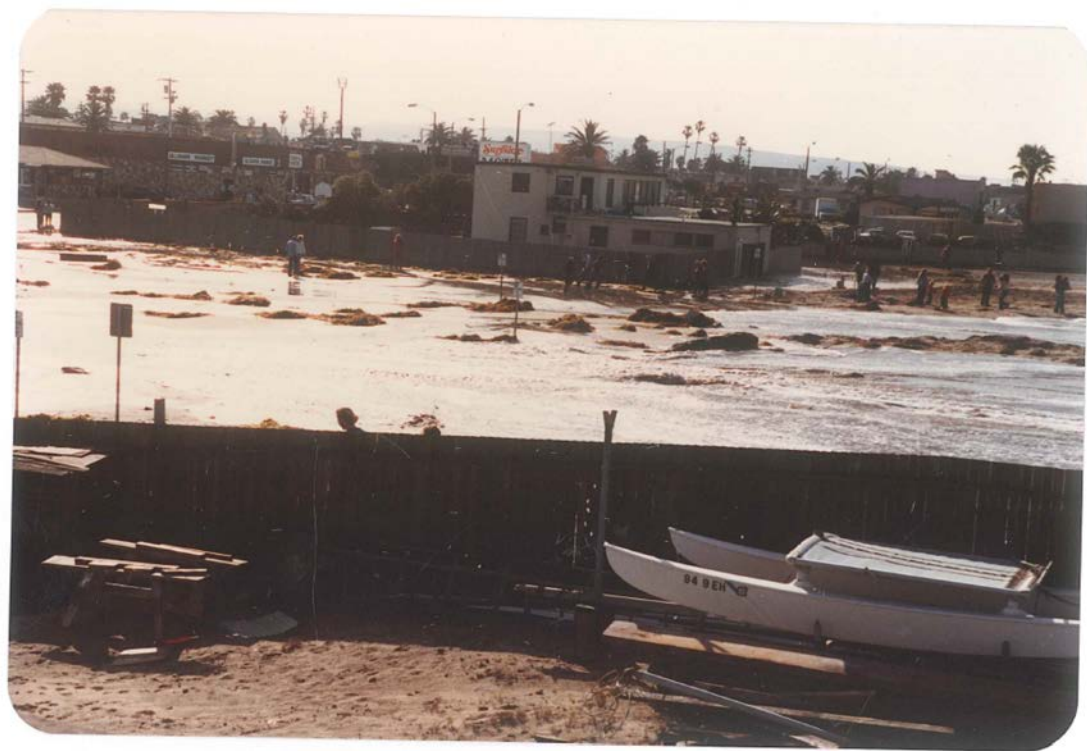
- Identify Imperial Beach-specific coastal vulnerabilities from sea level rise and coastal hazards
- Identify range of adaptation strategies including tradeoffs and economics
- Recommend strategies that are politically digestible and feasible





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JANUARY 1983 El Niño



COASTAL HAZARDS ANALYZED



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Erosion



Flooding



Inundation



Nuisance Flooding

VULNERABILITY ASSESSMENT SECTORS

- Land Use
- Roads
- Public Transp
- Wastewater
- Stormwater
- Schools and Parks
- Hazardous Materials

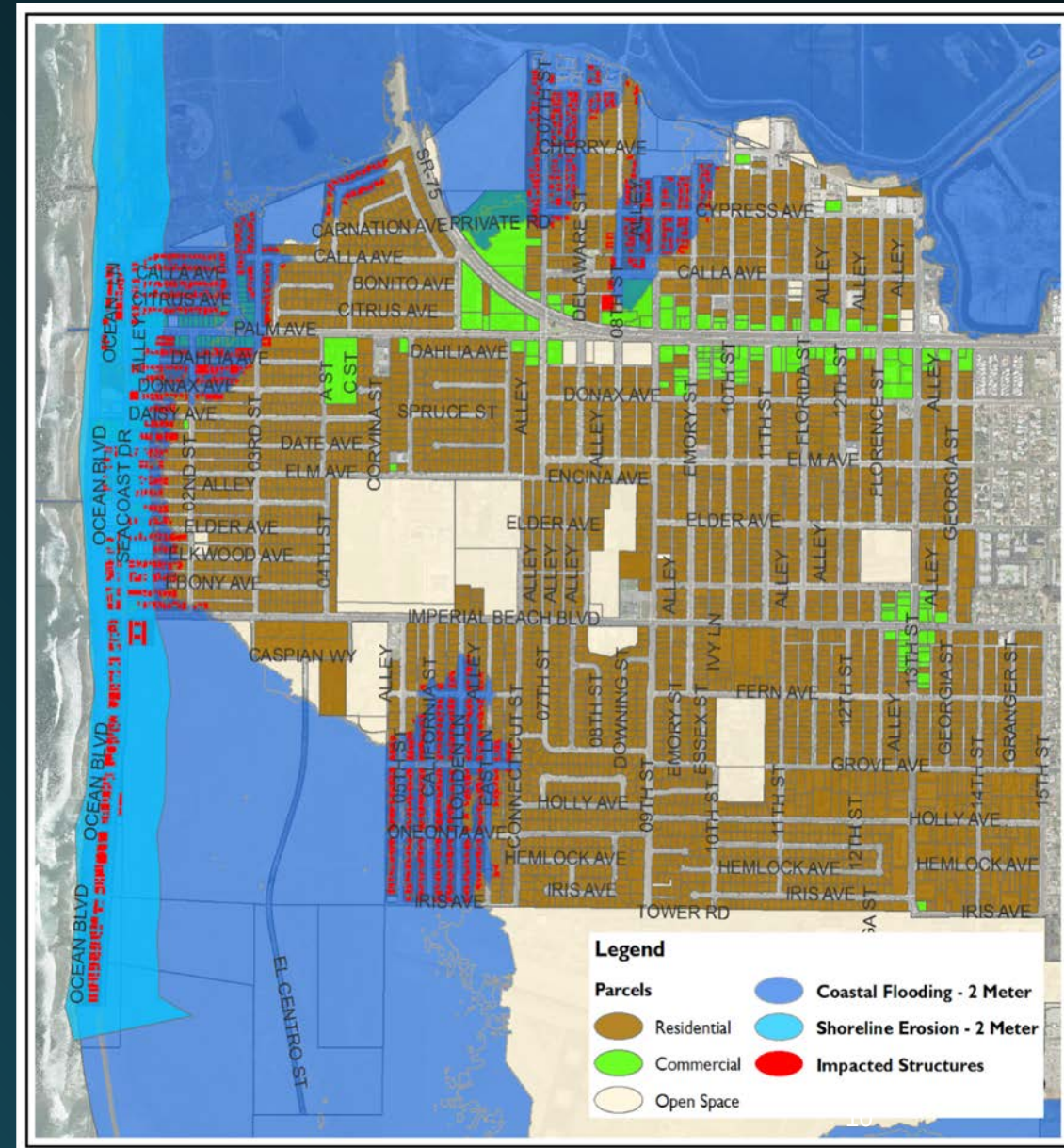


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COMMERCIAL-RESIDENTIAL 2100 – 2.0 METERS

- Number of parcels in existing Hazard Zones vs total
- Total = 5955
- Coastal Flooding = 2373
- Coastal Erosion = 683

All Coastal Hazards =
~30% of all parcels



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KEY FINDINGS

- Storm water – substantial decrease in stormwater capacity
- Land Use – parcels/buildings 30%
- Roads – 40% of roads impacted



Adaptation Strategies - Projects



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1. Fee Simple Acquisition:
2. Conservation Easements:
3. Transfer of Development
4. Rolling Easements
5. Managed Retreat
6. Structural or Habitat Adaption
7. Setback Development
8. Controlling Surface Run-off
9. Controlling Groundwater
10. Beach Nourishment
11. Harbor By-Passing
12. Back-Passing
13. Subaerial Placement
14. Artificial Seaweed
15. Geotextile Core
16. Nearshore Placement
17. Offshore Sand Deposits
18. Added Courser Sand than Native
19. Opportunistic Sand
20. Canyon Interception
21. Inter-littoral Cell Transfers
22. Berms/Beach Scraping
23. Perched Beaches
24. Groins
25. Breakwaters
26. Dune Nourishment
27. Delta Enhancement
28. Headland Enhancement
29. Geotextile Groins
30. Branch Box Breakwaters
31. Floating Breakwaters
32. Submerged Breakwaters
33. Dune Restoration
34. Beach Dewatering
35. Seawalls
36. Revetments
37. Gabions
38. Cobble Nourishment
39. Dynamic Revetments
40. Geotextile Revetment
41. Floating Reefs
42. Rubber Dams
43. Sand Fencing

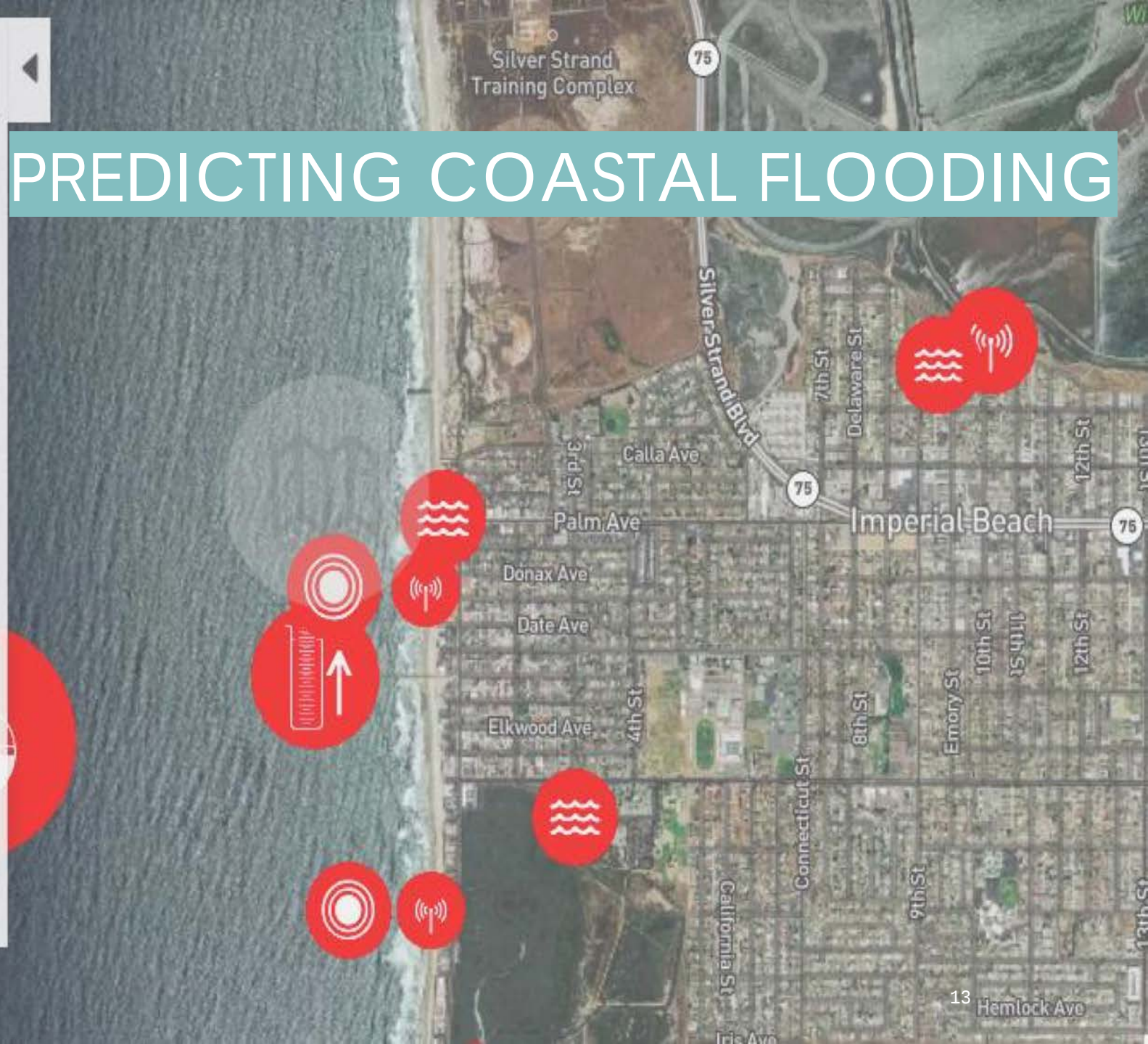


Resilient Futures: Imperial Beach

An integrated coastal observational network to track and forecast flooding events at Imperial Beach, California. Click on the map icons to learn more about the various components of the observational network.



PREDICTING COASTAL FLOODING

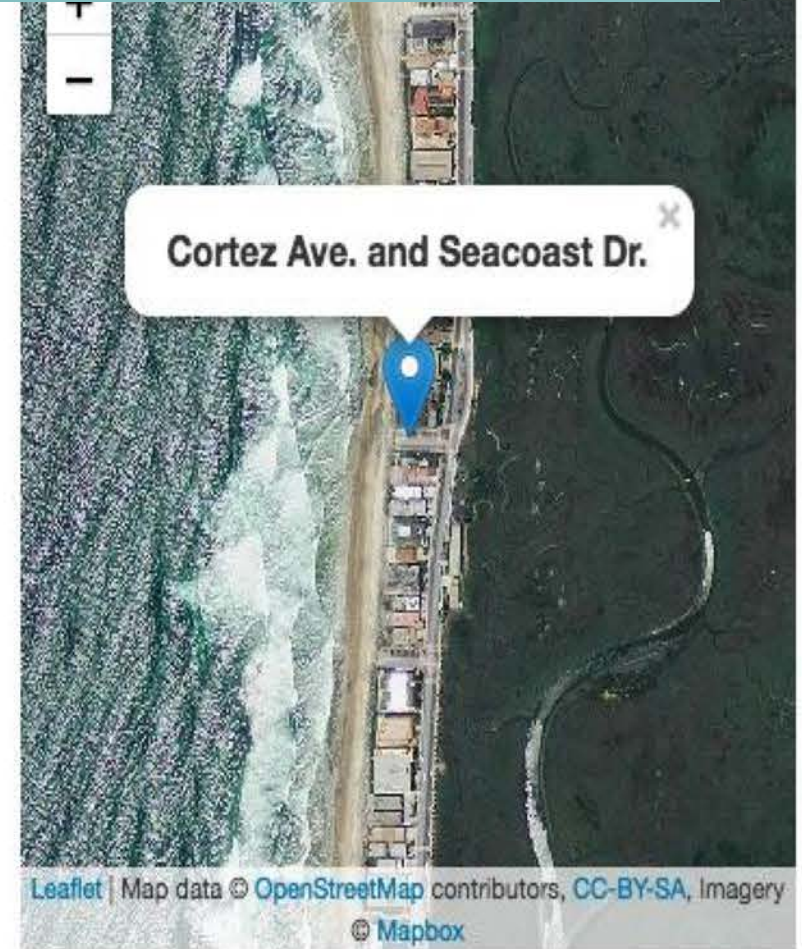
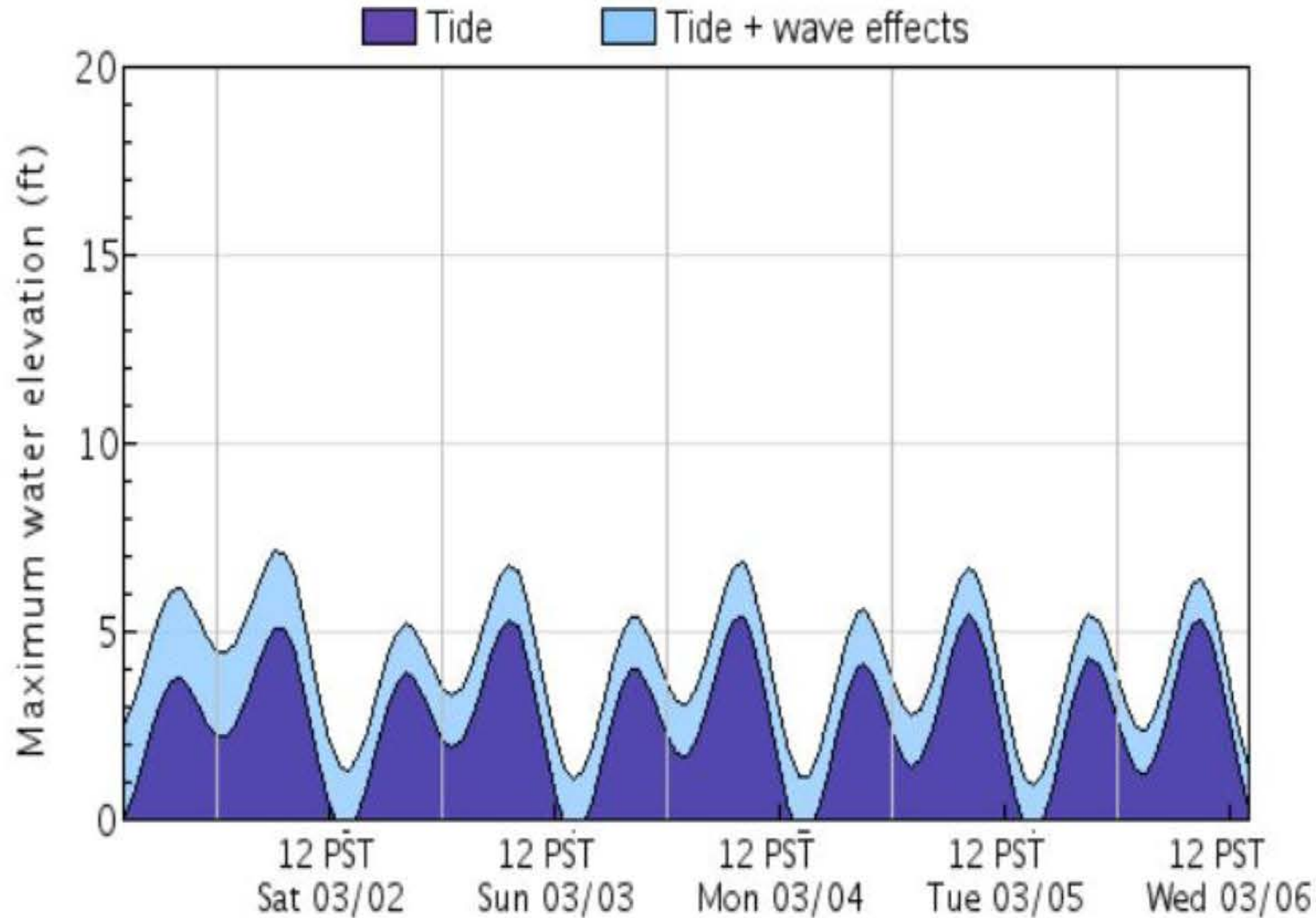


SITE SPECIFIC FORECASTING

CDIP/SIO

Water level elevation (relative to MLLW) forecasts for Stockton (2006), are HIGHLY experimental, and should not be used as your primary forecast information.

Potential Flooding Index – D0045



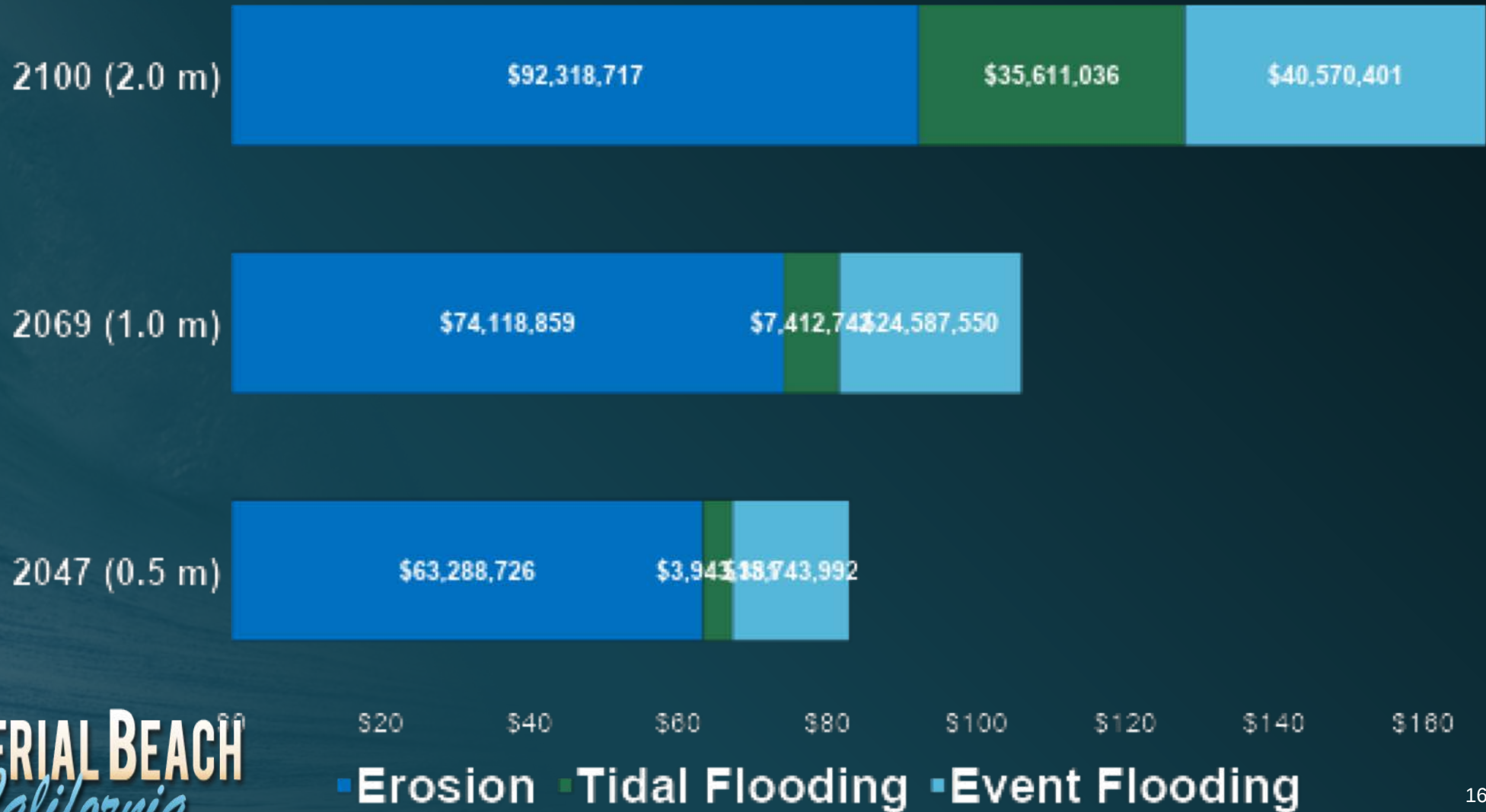


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THE COST



Losses and Damages to Private Property



FORECAST COSTS



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SCENARIO
Groins \$42.8 M
Retreat \$7.0 M
Nourish \$27.9 M
Hybrid Dune \$60.5 M
Armor \$43.6 M



WHO SHOULD PAY



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This Tiny California Beach Town Is Suing Big Oil. It Sees This as a Fight for Survival.

Imperial Beach can't afford seawalls, so it's trying to hold fossil fuel companies accountable for climate change as sea level rises and saltwater creeps in.

By David Hasemyer

JUN 27, 2018





ONE WORD:
#BLUE
CARBON



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MITIGATING CLIMATE CHANGE THROUGH COASTAL ECOSYSTEM MANAGEMENT

The International Blue Carbon Initiative is a coordinated, global program focused on mitigating climate change through the conservation and restoration of coastal and marine ecosystems. Coastal ecosystems are some of the most productive on Earth. They provide us with essential ecosystem services, such as coastal protection from storms and nursery grounds for fish. We also know that they provide another integral service - sequestering and storing "blue" carbon from the atmosphere and oceans and hence are an essential piece of the solution to global climate change.

CRITICAL STORAGE
OCEAN + COASTAL HABITATS

83% 2% 50%

GLOBAL CARBON

COVERAGE

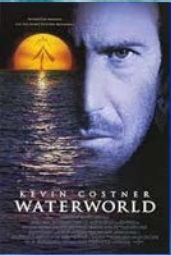
SEDIMENT CARBON

83% of the global carbon cycle is circulated through the ocean. Coastal habitats cover less than 2% of the total ocean area, but account for approximately half of the total carbon sequestered in ocean sediments.

BLUE CARBON ECOSYSTEM SERVICE PAYMENTS FOR MITIGATING CLIMATE CHANGE



WHAT IS OUR COASTAL FUTURE?



SOCIAL DARWINISM

OR



SOCIAL EQUITY