SEA-LEVEL RISE: WHAT IS THE STATE UP AGAINST?

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Sea-Level Rise and Its Impacts on Coastal Cities
Assembly Select Committee on Sea-Level Rise and the California Economy
December 3, 2019

UC San Diego | SCRIPPS INSTITUTION OF OCEANOGRAPHY
SEA-LEVEL RISE PROJECTIONS

Global Mean Sea Level

- Projections for RCP 8.5 and RCP 2.6 are calculated using the methodology of Kopp et al. (2014). Shaded areas bounded by the dashed lines denote the 5th and 95th percentiles.
- H++ scenario corresponds to the extreme scenario of Sweet et al. (2017) and represents a world consistent with rapid Antarctic ice sheet mass loss; there is not a probability associated with the H++ scenario.

RCP 2.6: Significant emissions reduction
RCP 8.5: Business as usual
H++: Rapid ice sheet melt
USGS COSMOS FLOOD MODEL: 10” SEA LEVEL RISE + ANNUAL STORM

Coastal property and infrastructure

Transportation

Ports and Commerce

A Proposed Sea Level Rise Preparedness Approach

San Diego Bay is home to 15 military facilities, the Port, Airport and other valuable businesses, recreational assets and ecosystems.

National Security

NABC Berm Failure March 5-7, 2016

Moderate astronomical tide (~NTFW)
Two minutes later
QUANTIFY RISK, ESTABLISH BASELINES

SCRIPPS’ PROGRAM FORECAST IMPERIAL BEACH FLOODING, HELPED CITY BRACE FOR IMPACT

System warned tides, swell would inundate streets

BY JOSHUA EMERSON SMITH

Massive waves crashed the Imperial Beach shores late at dusk Friday, flooding sections of Seaworld Drive all the way to the Tijuana River Estuary.

Many residents boarded up windows and put out sandbags in preparation for the 10-foot waves that caused the entire beach during high tide, inundating streets and yards.

However, the city would’ve been caught off guard had it not been for an experimental warning system to patrol seaside locations.

Residents, such as Bryce Glines, who lives along Westcoast Drive, were thankful for the heads-up.

“We put up plywood or we would have had broken windows,” said the 30-year-old.

“When it comes through, it’s like geysers, and it throws debris through the windows.”

Bet Arriaga, 68, who bought a home on Seaworld Drive about 40 years ago, was surprised by the magnitude of the event.

“Our neighbors got flooded, and we’ve had water up to our stuffing door,” she said. “I’ve never seen it flood this bad.

“Do not even be able to walk around the end of the beach.”

HONOR LINE

Joan Cassall shovel sand that was more than 2 feet deep and washed onto Cortez Avenue and flooded the street in Imperial Beach on Friday.
ESTABLISH TRIGGERS AND ADAPTIVE PATHWAYS

**Current pathway**

**Pathway A**

**Pathway B**

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**Imperial Beach Nourishment**

**Cardiff Living Shoreline Project**

*Developing signals to trigger adaptation to sea-level rise*


https://www.kpbs.org/news/
INNOVATIVE RESEARCH: LIDAR SURVEYS OF BEACHES AND CLIFFS

Scripps LIDAR Surveys
Grandview Beach, CA

Before Collapse
Vegetation
After: 3 August 2019
1 m
6 m

After Collapse
Lower Cliff Profiles
Before: 30 July 2019
Profile Location On Lower Cliff

Change (-1 m to 0 m)

Colorized LIDAR images

1 m
6 m

Lower Cliff Profiles

Vegetation

Before Collapse
After Collapse

Adam Young, Scripps Institution of Oceanography, UC San Diego
TO ADDRESS SEA-LEVEL RISE, WE NEED:

• Aggressive mitigation policies to lower emissions

• Baseline coastal information to help California prepare for present and future impacts

• Science-informed triggers and adaptive pathways to build resilience

• Research to improve predictive models of coastal change

• Demonstration projects to advance coastal defense strategies
THANK YOU