

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

Mark Merrifield Director, Center for Climate Change Impacts and Adaptation

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





### **SEA-LEVEL RISE PROJECTIONS**

**Global Mean Sea Level** 



RCP 2.6: Significant emissions reduction RCP 8.5: Business as usual H++: Rapid ice sheet melt **OPC-SAT** Working Group

- 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.



### USGS COSMOS FLOOD MODEL: 10" SEA LEVEL RISE + ANNUAL STORM







http://data.pointblue.org/apps/ocof/cms/index.php?page=flood-map

#### **Coastal property and infrastructure**



#### Transportation



#### **Ports and Commerce**



#### **National Security**





# 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 crushed the Imperial Beach shoreline at dawn Friday, flooding sections of Seacoast Drive all the way to the Tijuana River Estuary.

Many residents boarded up windows and put out sandbags in preparation for the 15-foot waves that covered the entire beach during high tide, inundating streets and garages.

However, the city would've been caught off guard had it not been for an experimental warning sys-



HOWARD LIPIN U-T Jon Caswall shovels sand that was more than 2 feet deep and washed onto Cortez Avenue and flooded the street in Imperial Beach on Friday.



Residents, such as Terye Rhea, who lives along Seacoast Drive, were thankful for the heads-up. "We put up plywood or we

would have had broken windows," said the 55-year-old. "When it comes through, it's like geysers, and it throws rocks through the windows."

bought a home on Seacoast Drive about 40 years ago, was surprised by the magnitude of the event. "Our neighbors get

flooded, and we've had water up to our sliding door," she said, "but I've never seen it flooded this bad. "To not even be able to walk around the end of Sea-





### **ESTABLISH TRIGGERS AND ADAPTIVE PATHWAYS**



Imperial Beach Nourishment

#### **Cardiff Living Shoreline Project**



Developing signals to trigger adaptation to sea-level rise Scott A Stephens et al 2018 Environ. Res. Lett. 13 104004 doi:10.1088/1748-9326/aadf96

https://www.kpbs.org/news/

### **INNOVATIVE RESEARCH: LIDAR SURVEYS OF BEACHES AND CLIFFS**



### 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



