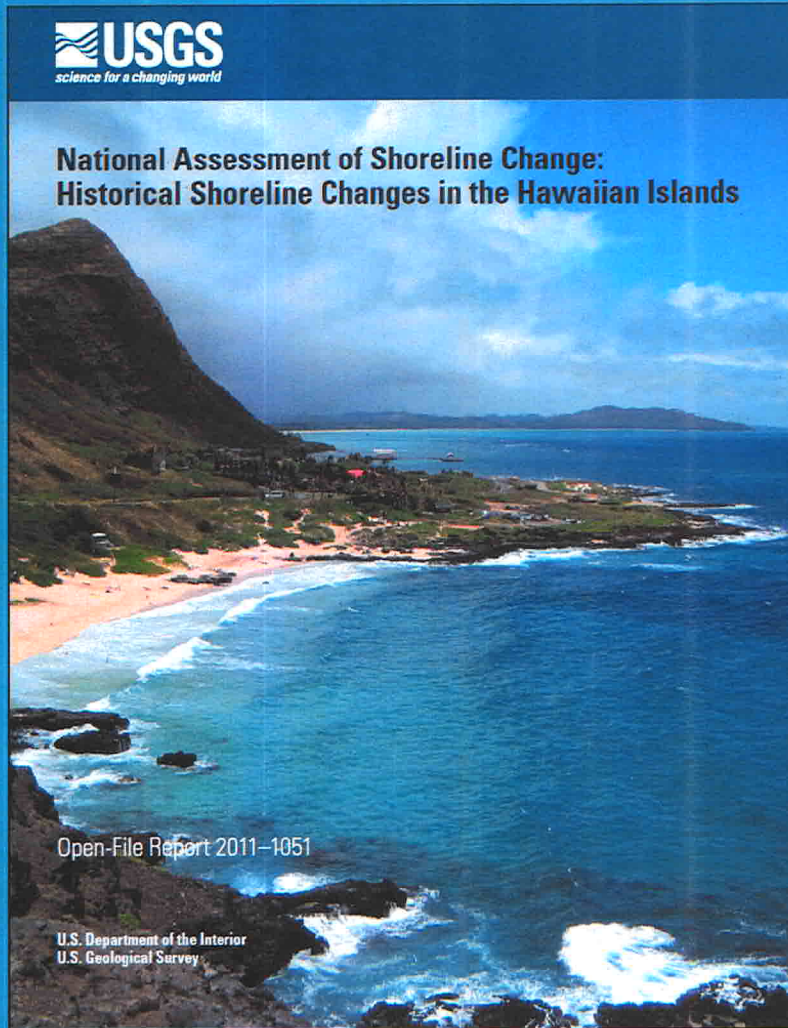


**CLIMATE CHANGE AND THE STATE OF OUR
COASTS UNDER THE TREAT OF SEA LEVEL RISE**

**SAM LEMMO, ADMINISTRATOR
Hawai'i Department of Land and Natural Resource (DLNR)
Office of Conservation and Coastal Lands (OCCL)**

APR 11 2002

70% of Hawaii Beaches Eroded Over the Past Century



<u>Island</u>	<u>% of Beaches Eroded</u>
Kauai	71%
Oahu	60%
Maui	85%
All	70%

- Average Shoreline Change Rate = 4 inches per year
- Beaches eroded 33 feet, on average over the past century

Fletcher *et al.* (2012) <http://pubs.usgs.gov/of/2011/1051/>

We have built too close to eroding and flood-prone shorelines.

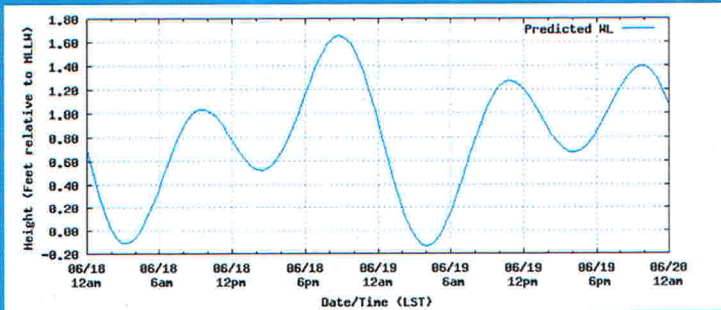


leaving our communities vulnerable and damaging coastal environments

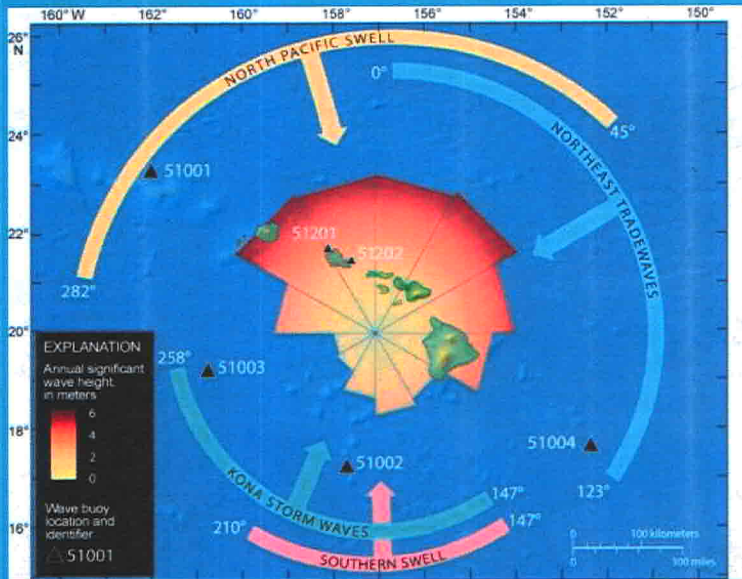
- Beach access lost**
- Cesspools drain into the ocean damaging our reefs**
- Marine animals adversely impacted**
- Severe property loss**
- Public infrastructure impacted**
- Our unique lifestyle changed forever**

Natural Drivers of Shoreline Change

Short-term (hours-months)



Tides

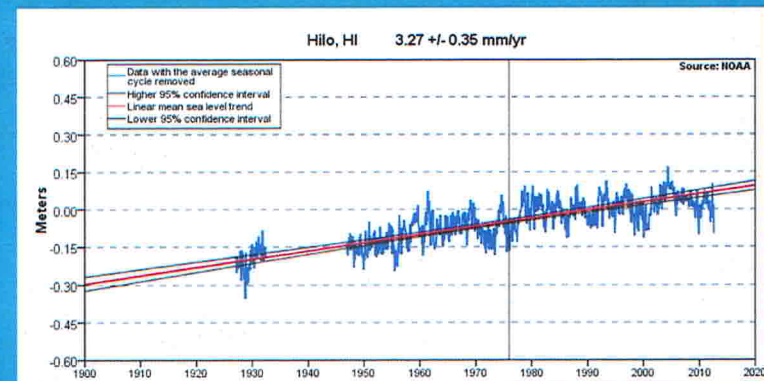


Seasonal Waves and Storms
- Waves drive sediment transport and erosion

Long-term (decades-centuries)



Geology
Sediment Availability



Sea Level Rise

Human Influences on Shoreline Change



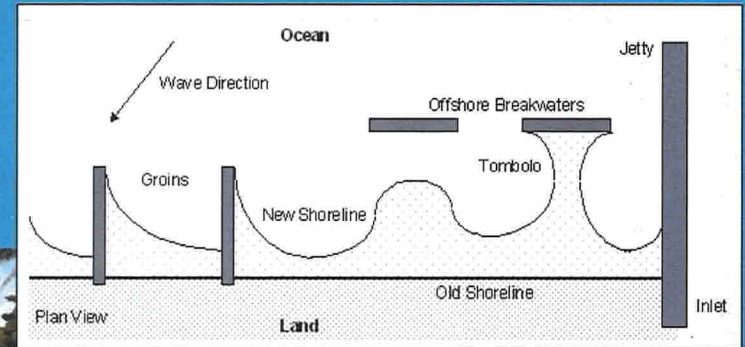
Sand Mining



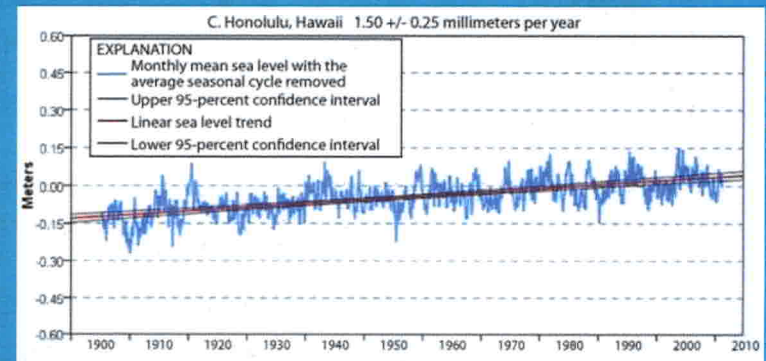
Coastal Armoring
(seawalls)



Beach Nourishment

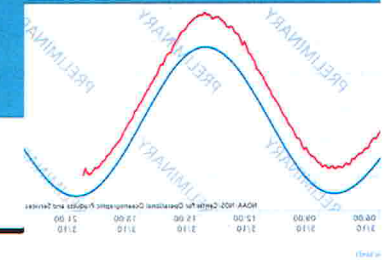


Erosion Control Structures
(jetties, groins, breakwaters)

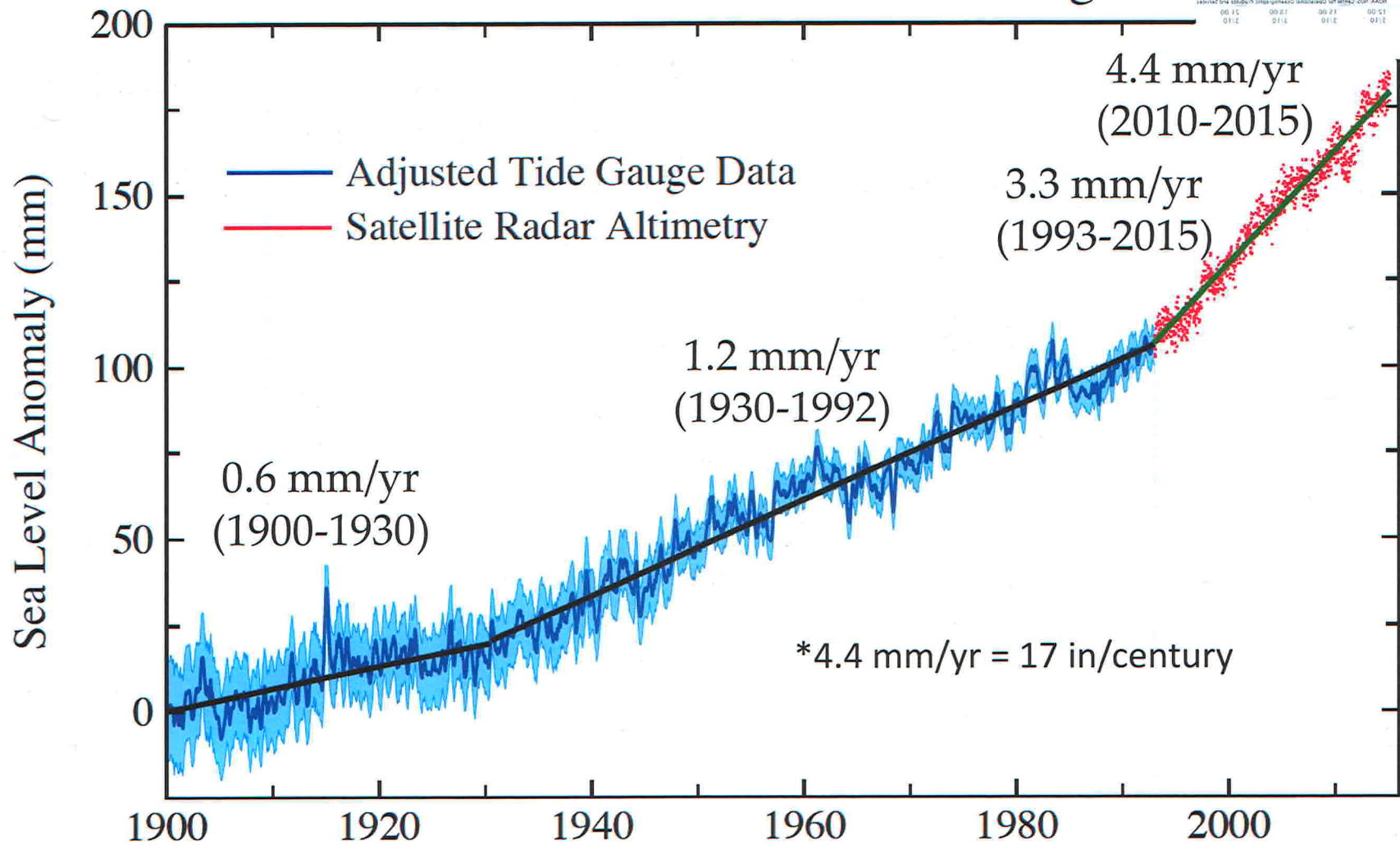


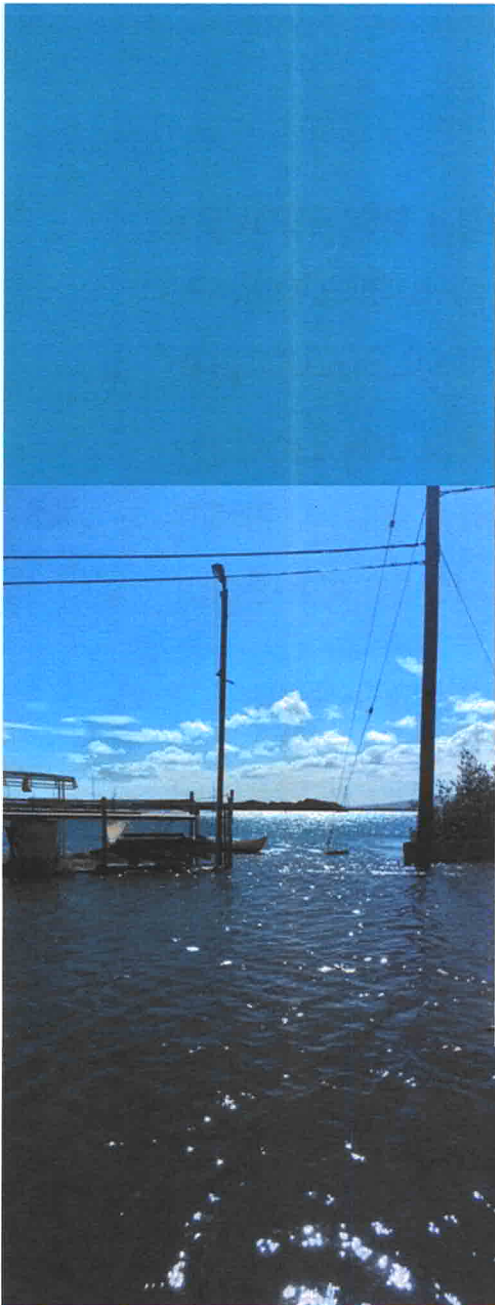
Sea Level Rise

The rate of global sea level rise is accelerating



Global Mean Sea Level Change





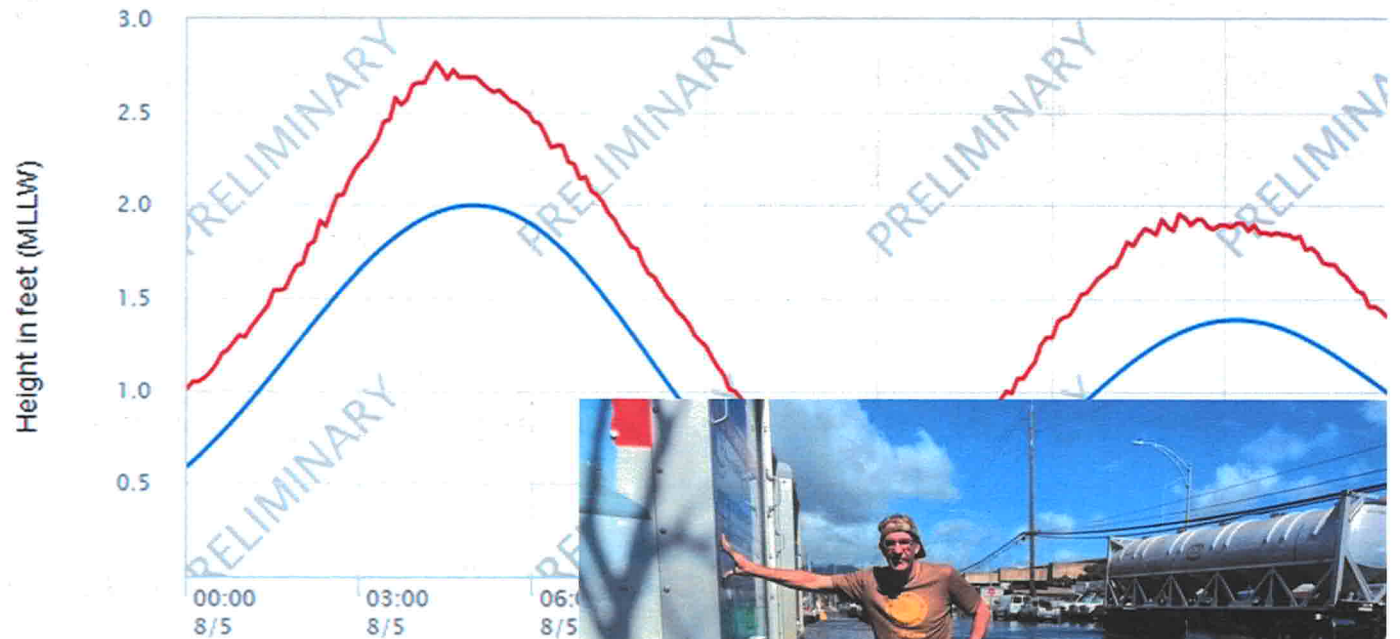
Station Info ▾

Tides/Water Levels ▾

Meteorological Obs.

Phys. Oceanography

Observed Wa
From 2019/08/05



<http://seagrant.soest.hawaii.edu/coastal-and-climate-science-and-resilience/ccs-projects/how-to-participate/>

HAWAI`I CLIMATE ADAPTATION INITIATIVE

(Act 83, 2014)

- **“Climate change is the paramount challenge of this century.”**
- Address the effects of climate change to protect the State’s economy, environment, and way of life.
- Establishes an **Interagency Climate Adaptation Committee (ICAC)**.
- Initial focus of this act is to develop a **Sea Level Rise Vulnerability and Adaptation Report for Hawai‘i**.
- Authorizes the Office of Planning to coordinate development of a **Statewide Climate Adaptation Plan**.



There Are Things We Can Do

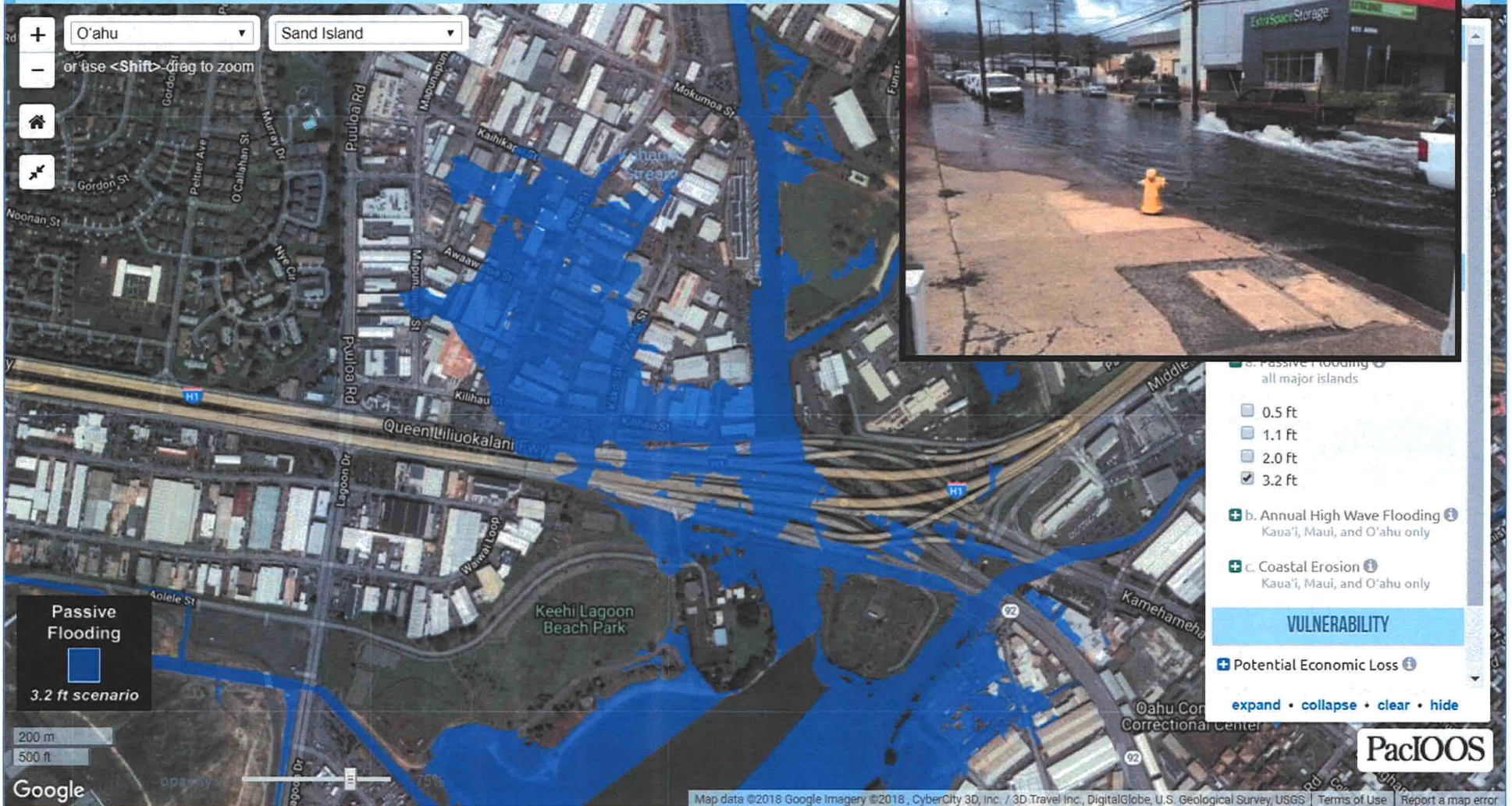
**Hawai'i
Sea Level Rise
Vulnerability and
Adaptation Report**



Hazards Modeled with Sea Level Rise

- Passive Flooding
- Annual High Wave Flooding
- Coastal Erosion

Sea Level Rise Hazard Modeling and Mapping: Passive Flooding



Passive Flooding
3.2 ft scenario

a. Passive Flooding
all major islands

- 0.5 ft
- 1.1 ft
- 2.0 ft
- 3.2 ft

b. Annual High Wave Flooding
Kaua'i, Maui, and O'ahu only

c. Coastal Erosion
Kaua'i, Maui, and O'ahu only

VULNERABILITY

Potential Economic Loss

expand • collapse • clear • hide

PacIOOS

Sea Level Rise Hazard Modeling and Mapping: Annual High Wave Flooding

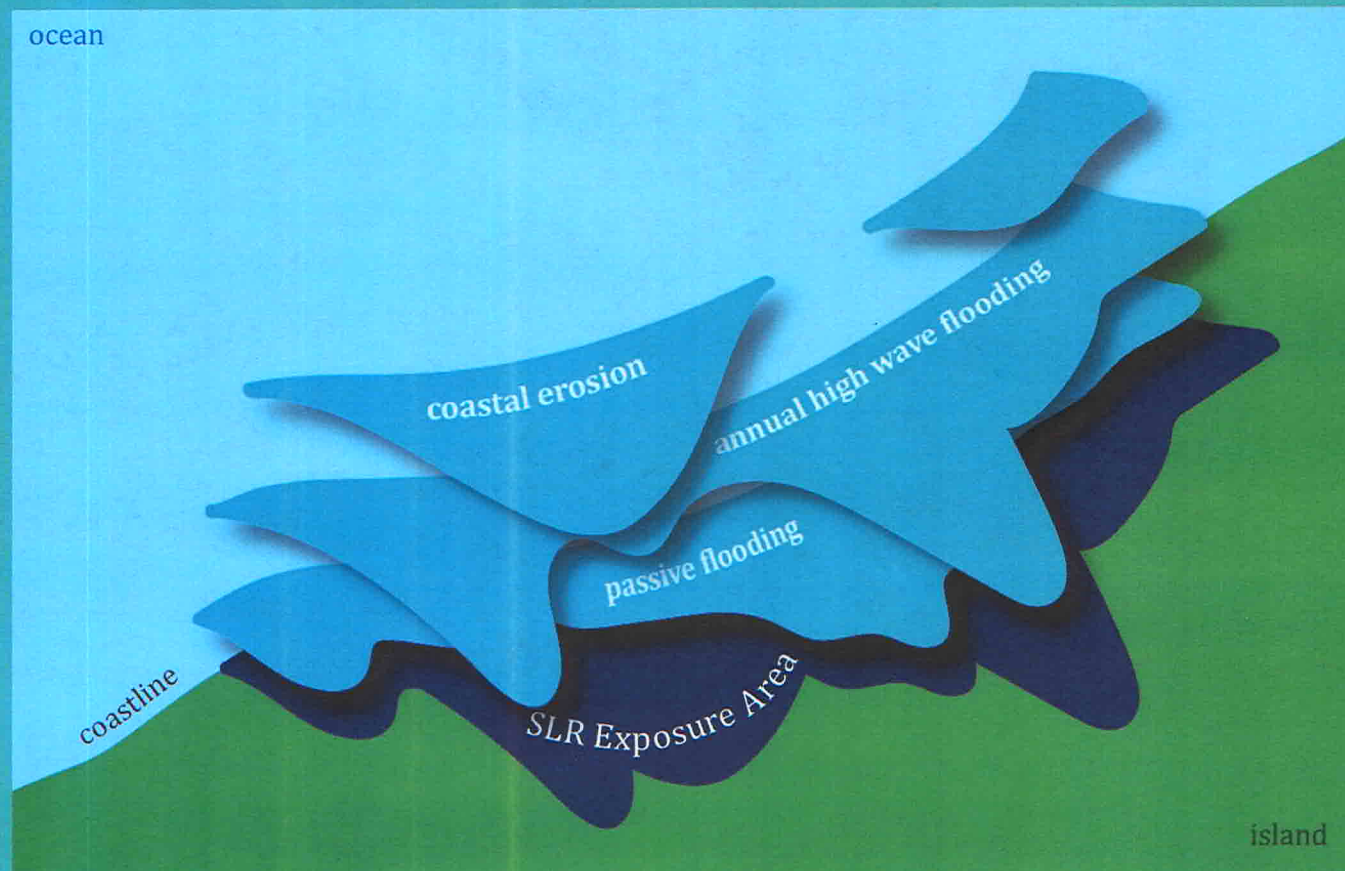


Sea Level Rise Hazard Modeling and Mapping: Coastal Erosion



Sea Level Rise Exposure Area (SLR-XA)

- Estimated area of exposure to sea level rise based on modeling future passive flooding, annual high wave flooding, and coastal erosion



CLIMATE READY PROGRAM



Maintain best available information and practices on SLR adaptation (Info Hub)



Provide guidance counties for planning and permitting (a Planner's Tool)

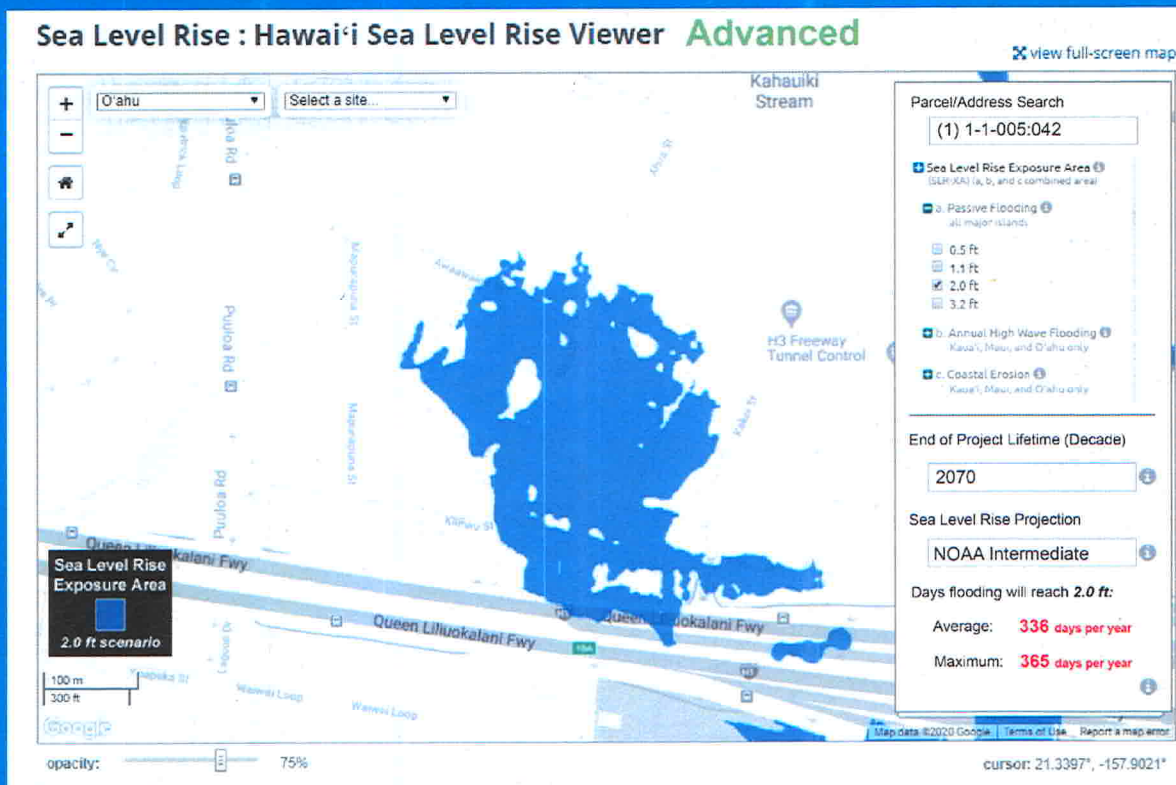


Conduct vulnerability assessments (a Decisionmaker's Tool)



Engage the community to help determine priorities

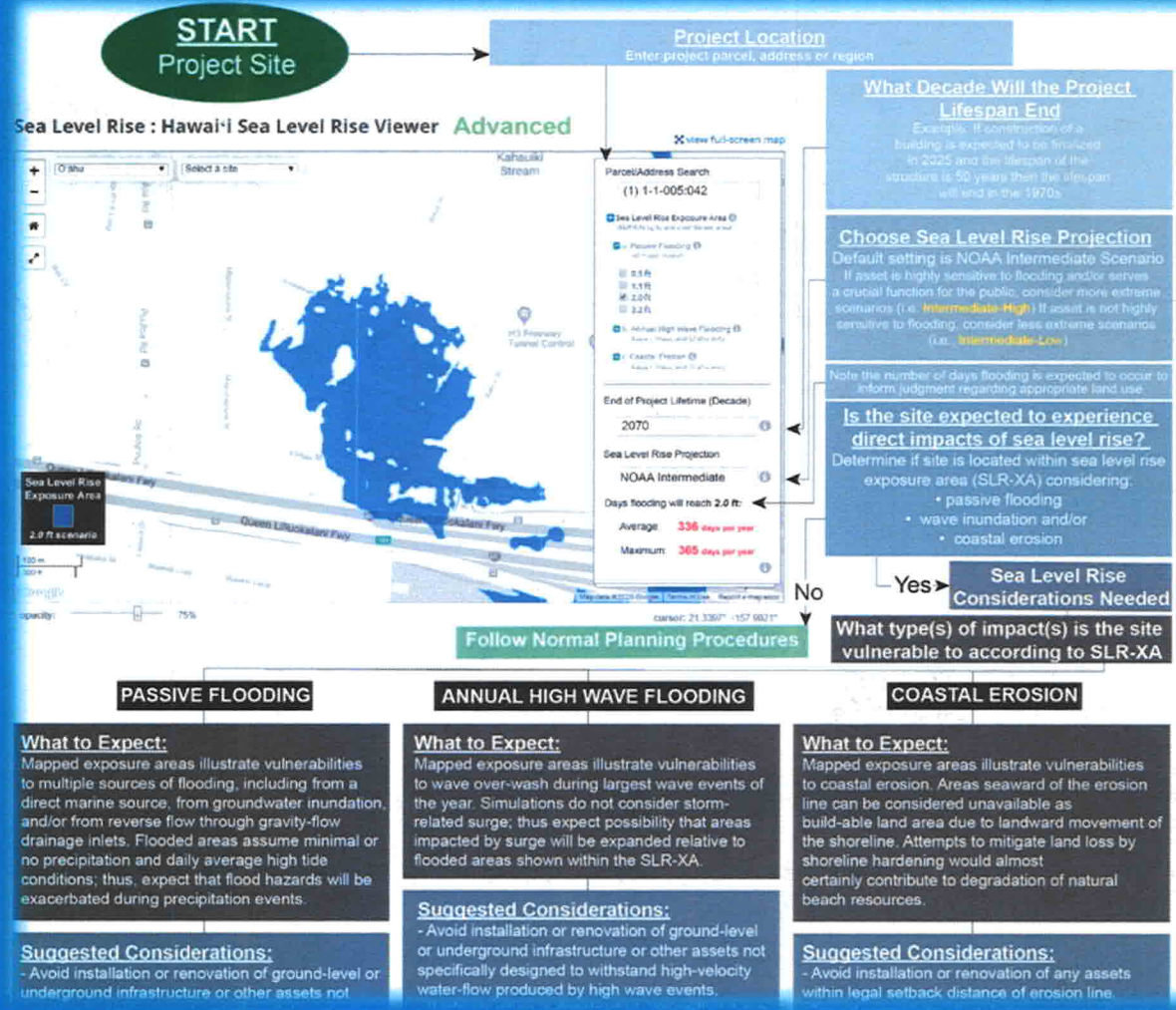
GUIDANCE FOR USE OF SLR-XA



Sea Level Rise Guidance

- Consists of updates to the State Sea Level Rise Viewer and instructions for use;
- Intends to assist agencies in the efficient application of sea level rise considerations into the permitting process;
- Projected updates to the Sea Level Rise Viewer would assist the user to:
 - 1) Identify various hazards at the site level;
 - 2) Identify projected flood frequencies over the project lifetime.

GUIDANCE FOR USE OF SLR-XA

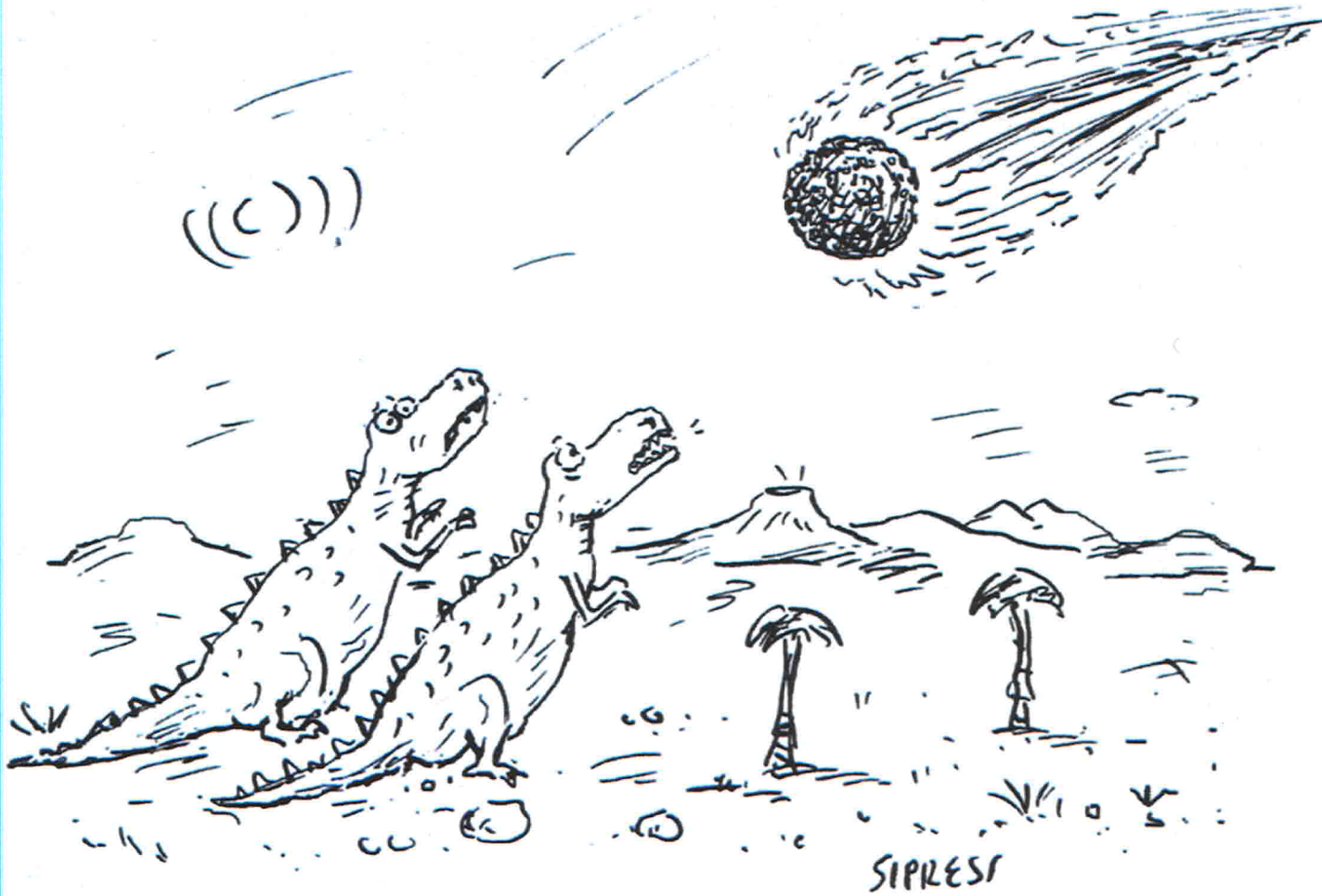


Sea Level Rise Guidance

Assists user to interpret mapped flood hazards and associated data;

Includes:

- Suggested considerations regarding permitting and other regulatory practices;
- Examples of current actions being taken by each county to date;
- Case studies in which guidance is applied to site-specific regulatory cases.



"Maybe it isn't going to be so bad."



Search this site

E KOMO MAI

WELCOME TO THE HAWAII CLIMATE CHANGE PORTAL

HERE YOU CAN FIND INFORMATION ON STATE OF HAWAII'S RESPONSE TO THE CLIMATE CHANGE CHALLENGE!

Hawai'i is a small state with big ambitions and big actions—especially when it comes to addressing climate change. In response to the [Paris Agreement](#), Hawai'i created the [Hawai'i Climate Change Mitigation and Adaptation Commission](#) (aka State Climate Commission). The Commission's priorities are captured in its two statements, on [ground transportation emissions reduction](#) and [adaptation to sea level rise](#). As a member of the [U.S. Climate Alliance](#), we believe that smart, coordinated State action can ensure that the U.S. continues to contribute to the global effort to address climate change.

See Commission's statements [here](#) and [here](#).

See Commission's 2019 Report to the legislature [here](#)

<https://climate.hawaii.gov/>