CAR.Committee

From: Tara Owens <taram@hawaii.edu>
Sent: Monday, June 15, 2020 4:06 PM
To: CAR.Committee
Cc: Michele McLean; Jeffrey Dack; James Buika; Nicole A. Siegel; Kasie M. Takayama
Subject: CAR-9: follow up re: storm inundation zone mapping
Attachments: Pages from 2018-State-HI-HMP-Update_1%ChanceFloodZoneWith3.2SLR.pdf

Hi Chair King and CAR Committee Members:

During the CAR-9 discussion this morning regarding approaches to regulating or minimizing hazardous land use in sea-level rise inundation zones, I was asked to share additional mapping that is available to show "storm inundation".

As mentioned this morning, in addition to the three models (passive flooding, annual high wave flooding, and erosion) that are currently available in the Hawaii Sea Level Rise Report and Viewer, there was also mapping of the 1% chance Coastal Flood Zone (CFZ) with 3.2 ft of Sea Level Rise. This represents event-based flooding on top of sea level rise, and is equivalent to a future version of the FEMA "V-zone". The V-zone is defined by FEMA as "coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves".

This CFZ data was not initially made available in the Hawaii Sea Level Rise Viewer; however, the data was later included in the 2018 update to the State Hazard Mitigation Plan. For your review, I have extracted and attached the relevant pages from the State Hazard Mitigation Plan, including a description of the CFZ, along with Table 4.2-1 showing land area in Maui County within the SLR-XA and the CFZ, and Figure 4.2-9 that is a map of the CFZ for Maui County.

The mapping scale of the figure isn't particularly useful, but the data itself can be made available and used for more detailed analysis in other County of Maui studies, including some of the upcoming vulnerability assessments being pursued by the various Departments.

Also, if you are interested in reviewing the State Hazard Mitigation Plan in entirety (1,379 pages), it can be found here: https://dod.hawaii.gov/hiema/files/2020/06/2018-State-HI-HMP-Update-100218.pdf

Thank you for the continuing dialogs,
Tara

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The 1% annual chance coastal flood zone (referred to as the 1%CFZ) will expand with sea level rise meaning that more land area will be exposed to damaging wave impacts from a 100-year flood event. The 1%CFZ with 3.2 feet of sea level rise (1%CFZ-3.2) was utilized to assess mid- to late century sea level rise on coastal event-based flooding. It is important to note that the event-based flood hazard discussed in Section 4.7 assesses the entire Special Flood Hazard Area (V- and A-zones). Sea level rise effects on event-based flooding only includes the coastal flood zones. The 1%CFZ-3.2 areas are shown in Figure 4.2-6 through Figure 4.2-9.

Table 4.2-1 shows the estimated square miles of potential land loss/impact due to 3.2 feet of sea level rise for each county. The State's total potential lost area due to chronic coastal flooding with seal level rise will amount to an estimated 0.5% of the State's total land area; however, it comprises of some of the most developed and valued land. When examining the 1% annual chance coastal flood event with 3.2 feet of sea level rise, 1.7% of the State's land will be impacted. The City and County of Honolulu, with its expansive coastal plains, will have the most land unusable due to sea level rise, followed by the Counties of Kaua'i and Maui.

Summary of Key Terms

SLR-XA – *The SLR-XA represents the area exposed to chronic coastal flooding and land loss based on modeling of passive flooding, annual high wave flooding and coastal erosion (refer to Section 4.0 for further details).*

Chronic Coastal Flood – *The SLR-XA with 1.1 feet of sea level rise (SLR-XA-1.1) approximates current or near-term exposure to chronic coastal flooding discussed in Section 4.2.*

SLR-XA-3.2 – *The SLR-XA with 3.2 feet of sea level rise was used to assess mid- to late century exposure to chronic coastal flooding.*

Event-Based Flood – *The 1% annual chance flood as depicted on the FEMA Flood Insurance Rate Maps, also known as the Special Flood Hazard Area (inclusive of V-zones, or wave velocity zones with waves 3 feet or greater, and A-zones or flooded areas not subject to waves greater than 3 feet), was assessed in Section 4.7.*

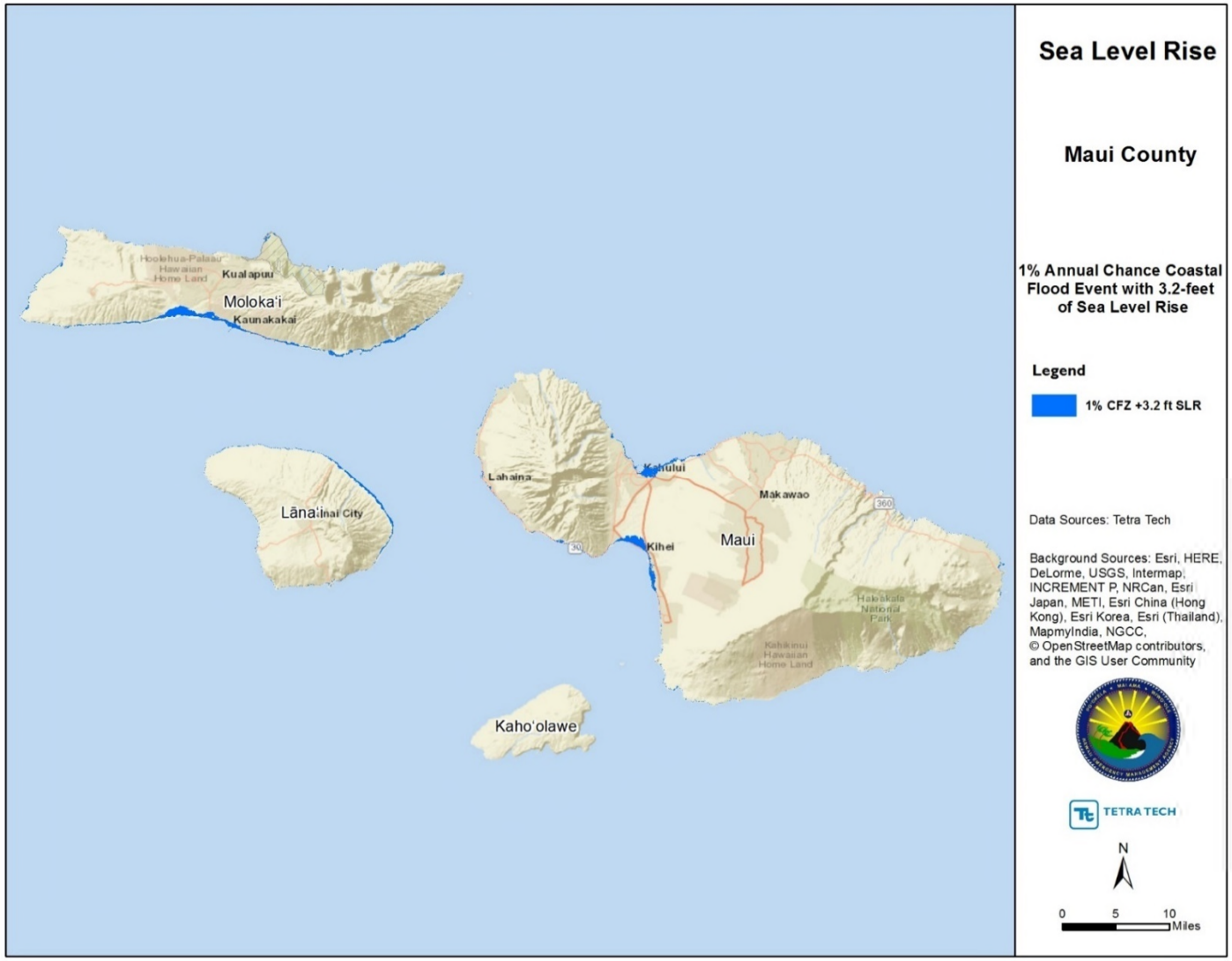
1%CFZ-3.2 *–The 1% annual chance coastal flood zone with 3.2 feet of sea level rise was used to assess mid- to late century event-based coastal flooding.*

Table 4.2-1. Sea Level Rise Hazard Areas by County

County	Area				
	Total Area (square miles)	SLR-XA-3.2 (square miles)	SLR-XA-3.2 as % of Total Area	1%CFZ-3.2 (square miles)	1%CFZ-3.2 Area as % of Total Area
County of Kaua'i	630.3	8.8	1.4%	32.8	5.3%
City and County of Honolulu	600.2	13.0	2.2%	41.2	6.9%
County of Maui	1,174.6	7.8	0.7%	15.7	1.3%
County of Hawai'i	4,027.8	4.3	0.1%	19.4	0.5%
Total	**6,432.9**	**33.9**	**0.5%**	**109**	**1.7%**

Source: Hawai'i Climate Change Mitigation and Adaptation Commission 2017; Tetra Tech Inc. and Sobis Inc. 2017
Note: Total area for each County calculated using coastline spatial layer downloaded from State of Hawai'i GIS Program Geospatial Data Portal
GIS Geographic Information System
SLR-XA-3.2 Sea Level Rise Exposure Area with 3.2 feet of sea level rise.
1%CFZ-3.2 1% Annual Chance Coastal Flood with 3.2 feet of sea level rise.

Figure 4.2-9. 1% Annual Chance Coastal Flood Event with 3.2-feet of Sea Level Rise (1%CFZ-3.2) for the County of Maui



Note: Kaho'olawe was not modeled