

[last update: August 28, 2019]

This document contains two tables that provide information on the arrival time and frequency of flooding due to higher sea levels during the 21st century. It was prepared for the Board of Water Supply (BWS), City and County of Honolulu, by the University of Hawai'i at Mānoa Coastal Geology Group. These tables supplement GIS data deliverables as part of the study "Modeling Sea Level Rise-Related Flood Components and Impacts on Infrastructure in the Primary Urban Center, O'ahu, Hawai'i. Further details describing the study can be found in the manuscript: Habel, S., Fletcher, C.H., Anderson, T.R., and Thompson, P. (In Review). Compound Flooding Related to Sea-Level Rise and Urban Infrastructure, *Nature Scientific Reports*.

Elevation above MHHW (ft.)	**NOAA SLR Scenario	*2010s Flooding Days Per Year		2020s Flooding Days Per Year		2030s Flooding Days Per Year		2040s Flooding Days Per Year		2050s Flooding Days Per Year		2060s Flooding Days Per Year		2070s Flooding Days Per Year		2080s Flooding Days Per Year		2090s Flooding Days Per Year	
		Ave	Max	Ave	Max	Ave	Max	Ave	Max	Ave	Max	Ave	Max	Ave	Max	Ave	Max	Ave	Max
1.1	Int-High	12	34	80	158	188	301	345	365	365	365	365	365	365	365	365	365	365	365
1.1	Int.	6	19	36	82	81	167	243	322	329	363	364	365	365	365	365	365	365	365
2.0	Int-High					2	11	71	167	259	365	363	365	365	365	365	365	365	365
2.0	Int.							5	19	43	115	204	295	330	365	365	365	365	365
3.2	Int-High									2	10	97	217	322	365	365	365	365	365
3.2	Int.													10	38	103	197	304	364

Table 1. Projections of the average and maximum number of flood days per year, per decade, for two NOAA sea level rise scenarios.

*Reference: Thompson, P.R., Widlansky, M.J., Merrifield, M.A., Becker, J.M., & Marra, J.J. (2019). A statistical model for frequency of coastal flooding in Honolulu, Hawaii, during the 21st century. *Journal of Geophysical Research: Oceans*, 124, 2787-2802.

<https://doi.org/10.1029/2018JC014741>

**NOAA Sea Level Rise Scenarios:

Intermediate (Int.): 1.0m (3.3 ft) global mean sea level rise by 2100; approximate current trajectory of emissions

Intermediate-High (Int-High): 1.5m (4.9 ft) global mean sea level rise by 2100; indicative of increased future emissions.

NOAA Reference: Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas (2017), *Global and Regional Sea Level Rise Scenarios for the United States*, NOAA Technical Report NOS CO-OPS 083, NOAA/NOS Center for Operational Oceanographic Products and Services

(TABLE 2 ON NEXT PAGE...)

[last update: August 28, 2019]

Elevation above MHHW (ft.)	**NOAA SLR Scenario	*First Year to Experience 5 Days of Flooding		First Year to Experience 10 Days of Flooding		First Year to Experience 20 Days of Flooding		First Year to Experience 50 Days of Flooding		First Year to Experience 100 Days of Flooding	
		Median	Likely Range (17-83% prob.)	Median	Likely Range (17-83% prob.)	Median	Likely Range (17-83% prob.)	Median	Likely Range (17-83% prob.)	Median	Likely Range (17-83% prob.)
1.1	Int.-High	2010	2010-2012	2012	2010-2015	2016	2012-2019	2021	2019-2023	2025	2022-2027
1.1	Int.	2011	2010-2014	2014	2012-2018	2020	2016-2022	2025	2023-2027	2034	2027-2037
2.0	Int.-High	2037	2034-2039	2039	2037-2040	2041	2039-2042	2043	2042-2045	2046	2045-2048
2.0	Int.	2043	2041-2046	2046	2043-2049	2050	2047-2053	2056	2054-2057	2059	2057-2060
3.2	Int.-High	2058	2057-2059	2059	2058-2061	2061	2059-2062	2063	2061-2064	2065	2064-2066
3.2	Int.	2074	2072-2076	2076	2074-2077	2078	2076-2079	2080	2079-2082	2084	2082-2085

Table 2. Projected first arrival times of flooding for specified numbers of flood days per year and NOAA sea level rise scenario.

*Reference: Thompson, P.R., Widlansky, M.J., Merrifield, M.A., Becker, J.M., & Marra, J.J. (2019). A statistical model for frequency of coastal flooding in Honolulu, Hawaii, during the 21st century. *Journal of Geophysical Research: Oceans*, 124, 2787-2802.

<https://doi.org/10.1029/2018JC014741>

**NOAA Sea Level Rise Scenarios:

Intermediate (Int.): 1.0m (3.3 ft) global mean sea level rise by 2100; approximate current trajectory of emissions

Intermediate-High (Int-High): 1.5m (4.9 ft) global mean sea level rise by 2100; indicative of increased future emissions.

NOAA Reference: Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas (2017), *Global and Regional Sea Level Rise Scenarios for the United States*, NOAA Technical Report NOS CO-OPS 083, NOAA/NOS Center for Operational Oceanographic Products and Services