

## Return periods of 10-yr, 100-yr, and 500-yr floods in the 2020s, 2050s, and 2080s.

Below we report the change in (Table 1) average return period and (Table 2) annual likelihood of 10-yr, 100-yr, and 500-yr floods in the future as sea levels rise. For each decade in the analysis, we consider the median predicted sea level rise and also the high-end estimate of predicted sea level rise.

The numbers in the second column of Table 1 are the current levels of the 10-yr, 100-yr, and 500-yr floods, or, in other words, approximately how high the floodwater would reach in a place that is at sea level. The numbers in the remaining columns show future return periods for these same flood heights, in years. The return period of a 10-yr flood is 10 years – the flood occurs on average one time in every 10 years. The 3<sup>rd</sup> column shows the return periods for each flood in the 2020s, assuming that the sea levels rise according to the median prediction. With the median sea level rise, a 10-year flood in 2015 becomes a 5.6-year flood in the 2020s, a 100-year flood in 2015 becomes a 53.6-year flood in the 2020s and a 500-year flood in 2015 becomes a 271.6-year flood in the 2020s. And so on for the other columns. These decreases in flood return periods are dramatic, and become more dramatic as we consider the high-end prediction for sea level rise for the 2020s in the 4<sup>th</sup> column, or any prediction for the 2050s and 2080s.

**Table 1: Flood return periods for median and high-end sea level rise (SLR) projections**

		Corresponding Flood Return Periods in Years					
Flood Return Period in Years	2015 Flood Height (meters NAVD88)	2020s Median-SLR	2020s High-SLR	2050s Median-SLR	2050s High-SLR	2080s Median-SLR	2080s High-SLR
10	2.57	5.6	<5	<5	<5	<5	<5
100	2.91	53.6	27.4	11.5	<5	<5	<5
500	3.16	271.6	139.9	58.6	8.1	11.8	<5

A 10-year flood does not necessarily happen once in 10 years, it can happen more times or none at all. A 10-year flood has a 1-in-10 (10%) chance of happening in any one year. The second table presents the same information, but in terms of the likelihood, or percent chance that the flood happens in any one year. The information behind the two tables is the same; it is just presented differently.

**Table 2: Annual chances of flooding under median and high-end SLR projections**

		Corresponding Annual Percent Chance of Flooding					
Annual percent chance of flooding	2015 Flood Height (meters NAVD88)	2020s Median-SLR	2020s High-SLR	2050s Median-SLR	2050s High-SLR	2080s Median-SLR	2080s High-SLR
10%	2.57	18%	>20%	>20%	>20%	>20%	>20%
1%	2.91	2%	4%	9%	>20%	>20%	>20%
0.2%	3.16	0.4%	0.7%	2%	12%	9%	>20%