Adapting to Rising Tides

BAY AREA

Climate Impacts & Scenarios

Impacts

More frequent flooding of existing flood-prone areas resulting in more frequent disruption of power, access to goods, services and jobs, and strain on regional and local disaster response and recovery resources.

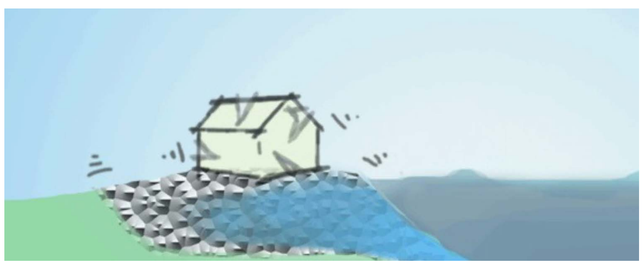
More extensive, longer-duration flooding that damages communities and infrastructure currently not in flood-prone areas, lengthens disruptions, and increases the demands on disaster response and recovery resources.

Shoreline erosion & overtopping of shoreline protection during storm events that flood inland areas, including communities and infrastructure that are currently protected.

Joint riverine and coastal flooding when higher tides push higher into the mouths of creeks and channels and a higher bay reduces the space for tidal creeks, channels and stormwater to flow into.

Elevated groundwater & increased salinity intrusion can damage below or at-grade assets, increase liquefaction susceptibility, and require pumping that increases operations and maintenance costs.

Permanent inundation of areas not currently exposed, resulting in the need to either protect or move people and infrastructure, and the loss of trails, beaches, vistas, and other shoreline recreation areas.



Scenarios

In order to understand how and when assets may experience these flood-related impacts, we need to investigate a range of possible future climate scenarios under which floods could occur. This investigation will be facilitated by a new set of locally-refined, nine-county sea level rise maps recently completed by ART and MTC.

The ART sea level rise maps apply the ART “One Map = Many Futures” approach, enabling the ART team to explore dozens of scenarios of combined sea level rise (SLR) and storm surge as summarized in this matrix (below).

By exploring the many climate scenarios connected to the ten water levels shown on the matrix, we are able to begin planning for current and future flooding, including temporary and permanent flooding.

This approach also keeps us adaptable to changes in scientific and regulatory guidance over time. For example, the State of California, Ocean Science Trust, “Update on SLR Science” (2017) states that the likely range for SLR in the Bay is between 7.2”-13.2” by 2050. We can explore this scenario by referring to our ART maps that fall into this range (MHHW+12” SLR).

Once the State’s SLR guidance report is released to accompany this science update, we may wish to dig further into another scenario. Following the “One Map = Many Futures” approach, this is a simple task as a wide range of climate scenarios will already have been explored.

Sea Level Rise Scenario	Daily Tide	Extreme Tide (Storm Surge)						
	+SLR (in)	1yr	2yr	5yr	10yr	25yr	50yr	100yr
	Water Level above MHHW (in)							
Existing Conditions	0	14	18	23	27	32	37	42
MHHW + 6”	6	20	24	29	33	38	43	48
MHHW + 12”	12	26	30	35	39	44	49	54
MHHW + 18”	18	32	36	41	45	50	55	60
MHHW + 24”	24	38	42	47	51	56	61	66
MHHW + 30”	30	44	48	53	57	62	67	72
MHHW + 36”	36	50	54	59	63	68	73	78
MHHW + 42”	42	56	60	65	69	74	79	84
MHHW + 48”	48	62	66	71	75	80	85	90
MHHW + 52”	52	66	70	75	79	84	89	94
MHHW + 54”	54	68	72	77	81	86	91	96
MHHW + 60”	60	74	78	83	87	92	97	102
MHHW + 66”	66	80	84	89	93	98	103	108

Note: Example Sea Level Rise Matrix shown is from Marin County. MHHW = Mean Higher High Water