City of Santa Monica

Los Angeles County

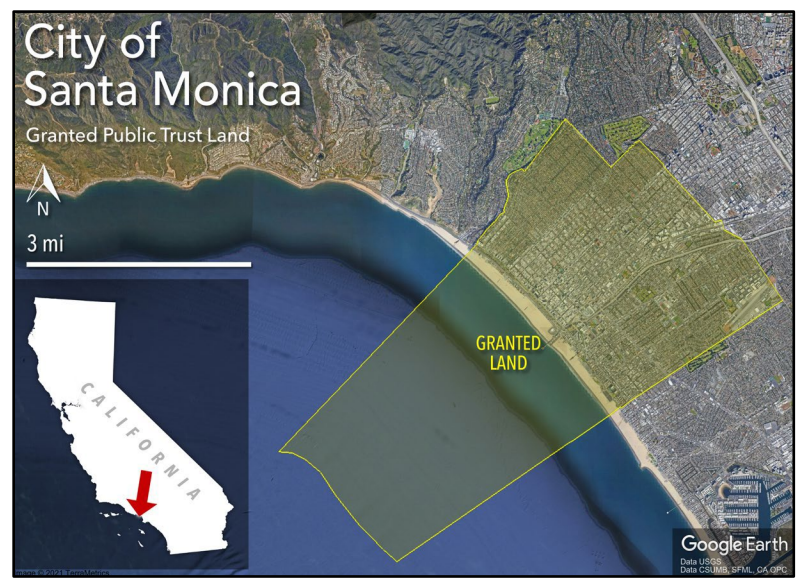
Granted Land Type:
Jurisdictions with Recreational Amenities

Public Trust Uses

Primary Uses: Recreation
Secondary Uses: Commerce, Navigation, Environmental Stewardship

Site Description

The City of Santa Monica, located on the eastern shore of Santa Monica Bay, was granted sovereign tide and submerged lands in 1917. The majority of the coastline consists of sandy beaches and includes a few man-made structures, such as the Santa Monica Pier and several groins. The city's granted lands include critical habitat for shorebird species and serve as public spaces for tourism, recreation, and gathering. Santa Monica State Beach, situated within the city's granted lands, plays an important role in providing coastal recreation for the greater Los Angeles region, with the Santa Monica Pier drawing approximately 8 million annual visitors. Climate change-induced sea level rise will cause erosion and narrowing of the city's beaches, leading to frequent flooding of public infrastructure and transportation networks, thus heavily impacting Public Trust resources and assets. Through careful planning and community engagement, the city has made a preference for natural, or soft, adaptation measures and managed retreat that would allow for the natural migration of the shoreline and would limit development in areas that become increasingly affected by onshore flooding.



Coastal Hazards considered:
tidal inundation, 100-year storm, storm wave run-up, shoreline change/erosion/retreat

Modeling system used for mapping:
In-house model

Sea level rise scenarios/elevations
LINK TO FULL ASSESSMENT

Vulnerable Public Trust Resources	
Built Facilities	Roads (up to 1,150 ft by 2100), bike paths (up to 1,857 ft by 2030, 16,540 ft by 2100), storm mains (up to 700 by 2030, 2,446 by 2050, 5,040 by 2100), storm drains (up to 9 by 2100) sewage mains (up to 2,270 ft by 2100), parking lots (up to 15,438 ft^2 by 2030, 316,547 ft^2 by 2050, 979,278 ft^2 by 2100), water mains (up to 157 ft in 2030, 312 ft by 2050, 6,360 ft by 2100) pump stations, public restrooms (2 by 2030, 3 by 2050, 5 by 2100), Annenberg Beach House and Community Center (2100), Santa Monica Breakwater
Natural Assets	Sandy beaches (up to 154 acres by 2030, 194 acres by 2050, 231 acres by 2100), wetlands (1 acre)

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Other Economic Vulnerabilities

The total value of vulnerable public assets exceeds $74 million not including the value of non-market services provided by the beach. An additional $115 million in private property is at risk, and the total annual non-market value of lost beach is $11 million. In 2017, tourism revenue was nearly $2 billion for the city. The range in costs for adaptation is large, with managed retreat being the least expensive proposed option, and hard protection being the most expensive. The range in losses in non-market value depend on the adaptation strategy selected, with accommodation involving the most losses, and natural protection allowing for lower losses.

Dune restoration pilot project

Proposed Adaptation and Mitigation Measures

Protect

Soft Protection: Create a living shoreline through dune restoration (see photo). Nourish beaches to prevent erosion.
Hard Protection: Harden pier and stabilize. Repair or replace the Santa Monica breakwater. Install dikes and groins to stall sea level rise.

Accommodate

Elevate or flood-proof existing and new buildings in flood zones. Increase stormwater pumping capacity and number of wells. Increase setback policy. Use adaptive redesign to flood-proof critical public infrastructure. Redesign bike pathways and walkways to withstand temporary inundation. Increase drainage at vulnerable roadways.

Managed Retreat

Limit new shoreline development. Regulate vulnerable infrastructure. Demolish and relocate public buildings and critical infrastructure. Relocate bicycle pathways. Purchase vulnerable private property and convert to public use.

Community Awareness
In 2016, the city installed two telescopic viewers on the Santa Monica Pier. In partnership with the USC SeaGrant, the U.S. Geological Survey and Owlized, Inc. “The Owls on the Pier” offered passersby the augmented reality experience into potential future scenarios of sea level rise impacts on Santa Monica’s beach. The Owls surveyed participants on their views and concerns about climate change and sea level rise and their preference for climate adaptation approaches. Over 10,000 people visited the Owls, and more than 2,500 of those participated in the survey. Additional community awareness campaigns on sea level rise impacts and flood risks are needed in order to inform the public of potential risks, as well as inform coastal property owners of options that they have.

Anticipated Costs of Sea Level Rise (millions)[*]

	Current	2030 (11.8 in.)	2050 (24 in.)	2100 (65.7 in.)
Assets at Risk or Repair and Replacement Costs		**$2.6**	**$2.7**	**$8.4[†]**
Losses in Non-Market Value		**$74.1**	**$260.8**	**$816.4**
Cost of Adaptation		**$2.7–$186.9**	**$2.7–$195.7**	**$28.9–$204.5**

[*] Repair/Replacement Costs Table 8, p. 36, public losses, NMV Losses Table 10, p.42; Adaptation Costs from Table 9, p. 39 to Table 12, p. 47. These tables lay out costs for different adaptation pathways.
[†] Does not include estimates of private losses, which are not a part of the Public Trust, but are included in this report. Private losses by 2100 are estimated to be approximately $22.72 million.