

California Coastal Commission (CCC), Climate Ready MB will help the City be more prepared for climate change, especially during a confluence of events such as sea level rise, extreme high tides, storm surges, heavy precipitation, and coastal erosion.

The City executed the grant contract with the CCC in March 2019, which includes work scope related to, but beyond the original Work Plan goals, such as a cutting-edge Multi-Hazard Confluence Modeling on Stormwater Infrastructure vulnerability, a Groundwater and Sea Level Rise Vulnerability Analysis, and novel public engagement including virtual reality visualizations.

In February 2020, the City executed a contract with Environmental Science Associates (ESA) to provide consultant services and analyses for the project. Concurrently, the City has formed a collaborative partnership between The Bay Foundation and Los Angeles County Department of Beaches and Harbors on a pilot dune enhancement and restoration project to increase the resiliency of the City's shoreline in the face of sea level rise and coastal storm erosion. The project is currently in the planning and design phase with ongoing public engagement activities.

DISCUSSION:

This update includes four components: 1) Sea Level Rise Vulnerability Assessment including groundwater, stormwater, and beach erosion analyses; 2) Pilot Beach Dune Restoration and Living Shoreline Project; 3) Climate Action and Adaptation Plan; and 4) Public Engagement Strategy.

In order to protect the City's coastline and infrastructure and comply with state mandates, the City is studying its vulnerability to sea level rise. The City is also identifying other local climate change impacts that could occur, such as an increase in extreme heat days and more severe storms. In collaboration with the community and stakeholders, the City will develop strategies to increase the community's resilience to climate change impacts and cut carbon emissions.

These studies and strategies will be documented in a series of technical reports and plans.

Sea Level Rise Vulnerability Assessment

Manhattan Beach is currently vulnerable to storm flooding, wave impact, and erosion. In the past, extreme coastal flood events have caused significant damage along the coastline. In the late fall and winter of 1982/83, California experienced an El Niño that produced significant precipitation, strong winds, and high surf along southern California. The storms damaged coastal structures and eroded beaches. Waves reached the Pier deck and eroded and damaged the iconic Manhattan Beach Pier. The Pier deck, Roundhouse, and lifeguard station at the beginning of the Pier were completely replaced. Other notable El Niño seasons occurred in 1982/83, 1998, 2010, and 2015.

To assess vulnerabilities for the City of Manhattan Beach, five sea level rise scenarios were selected in addition to existing conditions to bracket the range of potential impacts that the city may experience from coastal hazards. The scenarios were selected using state guidance.

Future sea level rise is expected to create a permanent rise in ocean water levels that will shift the water's edge landward. Higher water levels will increase erosion of beaches and result in a narrower beach, if no action is taken. Additionally, the combination of higher ocean water levels and beach erosion would mean that coastal storms will potentially cause greater flooding and damage, because reduced beach width is less effective at reducing wave energy, and waves positioned at a higher elevation allow for a deeper reach landward. For example, a small storm event under today's sea levels may not cause any damage, but with higher sea levels, the same event could potentially have

a much larger impact. Higher water levels at the coast also impact the stormwater drainage system during rainfall events, by backing up water into the system or delaying drainage until low tide. Sea level rise can also increase groundwater levels and the salinity of groundwater, which can cause flooding during rain events or impact drinking water resources.

Stormwater Flooding and Wave Impact: Analysis of impacts from sea level rise combined with a 100-year storm show that even under extreme conditions, most of the flood impacts are limited to the sandy beach area. Some impacts to the beach bike path and adjacent infrastructure could occur under the highest sea level rise scenarios and storm events. These impacts are associated with scenarios anticipated to occur towards the later end of the century. In addition to the beach being the most vulnerable to floods, the City’s stormwater outfalls are also at-risk.

Fully-funded by the CCC grant, Amir AghaKouchak, PhD, P.E. has lead the cutting-edge multi-hazard confluence scientific modeling role in the program. Dr. AghaKouchak helped develop California’s Fourth Climate Change Assessment Report and serves on the California Climate-Safe Infrastructure Working Group. Dr. AghaKouchak created a stormwater confluence model to assess the vulnerability of the City’s stormwater system to changes in ocean water levels and changes in extreme rain events due to climate change. The results indicate that by the end of the century, sea level rise combined with a 100-year storm would cause water to back up into the stormwater system and result in localized flooding. Future precipitation extremes are expected to be higher than current precipitation, indicating a higher likelihood of flooding in the future.

Beach Erosion: The average total beach width is expected to decrease to 260 feet by 2080 from its current width of 370 feet. This would reflect more than a 29% loss in beach width. By 2100, 200 feet of beach will remain if no action is taken. The table below identifies the beach width in feet and the percent lost from current conditions for future decades between now and 2100.

Table 1 Total Beach Width Evolution by Decades

Year	Beach width	% Loss
2020	370 ft	0%
2030	360 ft	2%
2040	350 ft	5%
2050	330 ft	11%
2060	310 ft	16%
2070	290 ft	22%
2080	260 ft	29%
2090	230 ft	37%
2100	200 ft	47%

There are adaptation strategies that can be effective in limiting this loss of beach. These strategies will be identified and brought forward to the Council at a later time.

Groundwater:

As sea levels rise, saltwater is likely to intrude into coastal aquifers. These coastal aquifers do not provide potable water to the City of Manhattan Beach. However, as this intrusion occurs, shallow

groundwater tables can also rise, leading to water tables closer to the land surface. This may result in ponding of groundwater in areas not currently expected to flood from overland flooding. Non-emerging water tables can also impact buried municipal infrastructure such as waste- and stormwater lines, power lines, and building structures, such as foundations and basements. The USGS, using its model, CoSMoS-groundwater, is assessing where rising groundwater tables may impact City assets. Findings will be incorporated in the full Sea Level Rise Vulnerability Assessment and support the development of adaptation strategies.

Manhattan Beach Pilot Beach Dune Restoration & Living Shoreline Project

The Manhattan Beach Dune Restoration Project aims to enhance approximately three acres of the existing back dunes at Bruce's Beach from approximately 36th Street to 23rd Street, within 0.6 miles of coastline. This project is a collaborative partnership between The Bay Foundation, City of Manhattan Beach, and Los Angeles County Department of Beaches and Harbors. The goal of this dune enhancement and restoration project is to increase the resiliency of the shoreline in the face of sea level rise and coastal storm erosion. The project will involve the removal of invasive non-native vegetation, seeding and planting of native vegetation, strategic installation of sand fencing and other features to help establish vegetation, installation of symbolic fencing, and installation of educational features like interpretive signage. This project demonstrates how Manhattan Beach can become more resilient to sea level rise and erosion, while engaging the public in a meaningful dialog about climate resiliency. It will show that retaining beach recreational activities, enhancing visitor experiences, and improving the ecology of the area are all compatible goals for achieving climate resiliency.

This project is fully funded by a grant from the California State Coastal Conservancy, and has had numerous supporters such as USC Sea Grant, Heal the Bay, Audubon Society, and members of the public. Additional public outreach efforts are ongoing, such as presentations to the American Shore and Beach Preservation Association National Conference, Los Angeles Regional Climate Collaborative, regional sea level rise planning workshop groups, and reaching out to offer presentations to local stakeholder groups.

The project is currently in the planning and design phase with ongoing public engagement activities. Recent progress includes hiring a consultant to conduct restoration design services (RIOS Clemente Hale Studios and Coastal Restoration Consultants, Inc.), releasing an interactive outreach video to encourage public comment on the project, and conducting baseline monitoring. RIOS and CRC will provide site plans, perspective renderings of the site after implementation, and graphics for future interpretive signs to be included in restoration activities. These tools will be included in the permitting process and will be used for public outreach. Permit applications will be submitted in early 2021, with project implementation likely to occur in late summer and fall 2021, pending permit approvals.

Climate Action & Adaptation Plan and MB's Contribution to Climate Change

The City is preparing a Climate Action and Adaptation Plan (CAAP) which will identify strategies to both reduce GHGs consistent with state targets and increase its resilience to climate change hazards.

Through a recent greenhouse gas emissions (GHG) inventory and policy gap analysis of the City's prior and current climate actions, the City has identified foundational climate actions and achievements, setting a baseline for a CAAP.

The City's largest contribution to GHGs is associated with on-road transportation, followed by energy,

water, solid waste, off-road transportation (construction vehicles), and wastewater. Community-wide emissions show a downward trend from 2005 to 2016, dropping significantly from 2012 to 2016 (in-part due to privacy laws leading to incomplete electricity data from commercial users). If no actions are taken to reduce GHGs, the City's emissions are expected to increase by more than 30% between 2016 (the date of the City's last emissions inventory) and 2050 based on expected growth in population, employment, and housing. State policies and regulations already in-place, such as mandates for cleaner electricity and vehicle emissions standards that require more fuel-efficient vehicles over time, will help to significantly mitigate this rate of growth in GHGs. However, in order to meet California state targets set for 2030 and 2050, the City will need to also take action to further reduce GHGs.

The CAAP will identify specific strategies the City and community will need to take to reduce emissions. After multiple discussions at the Sustainability Task Force meetings, including guidance and discussions with the STF's sub-committee on climate, the STF has identified a vision and CAAP approach with an emphasis on Community Benefits, including:

- GHG Emissions Reduction
- Healthy Community
- Resilience to Climate Change Impacts
- Prosperous Local Economy
- Green Jobs
- Engaged Community & Educated Youth.

In addition, the City is seeking to achieve a "Qualified CAAP" which would meet the requirements of CEQA Guidelines section 15183.5 (b) including: local GHG targets consistent with long term State targets, planning horizon and growth assumptions consistent with the General Plan, measures to achieve the reduction target, and for the plan to undergo environmental review. Objectives and outcomes developed by the STF and identified in the public engagement strategy to guide the CAAP include:

- Creating a positive sense of community empowerment around both the threats and opportunities for taking action on climate change together, as individuals, businesses, and the government.
- Increasing awareness of climate change hazards, including sea level rise, with community members, visitors, and stakeholders, including those most vulnerable to climate impacts.
- Educating residents on their own carbon footprint and the choices they can make to go climate positive.
- Collaborating with the community and stakeholders to develop strategies that increase resilience to climate change impacts, cut carbon emissions, and ensure compliance with state legislation.
- Fostering a greater understanding of climate science and how the City, State of California, and the nation can meet the growing threats of climate change, including various adaptation and mitigation strategies.

The City has made significant achievements in cutting municipal and community-wide GHGs and is a leader in environmental sustainability due to significant actions taken in the last 15 years. Some of the notable climate commitments the City has made include participation in the following initiatives,

which are consistent in terms of their stated emissions reduction targets:

- Carbon Disclosure Project (for which the City recently received “A-list” status for its transparency and action on climate change)
- Compact of Mayors initiative
- Paris Climate Agreement
- Joining the Clean Power Alliance and committing to powering municipal operations with 100% Green, renewable energy

There is scientific consensus that progressively more global warming is assured for decades to come, and that the level of warming will depend on our success in reducing GHGs. To avoid catastrophic changes and limit the damage to come, we must slow the pace of warming enough to allow society to adapt. This means that we have to accelerate our efforts to drastically cut carbon emissions.

Public Engagement Strategy

Climate Ready MB includes a robust public engagement strategy, created in collaboration with the City’s Sustainability Task Force. Engaging community and stakeholder voices throughout the process of this project is key to ensuring long-term success. In recognition that reducing GHGs and preparing for climate hazards can only be done in partnership with the Manhattan Beach community, the City aims to engage a representative cross-section of community members and stakeholders throughout the planning process. The City seeks diverse participation across socioeconomic, racial, geographic, and ethnic backgrounds. The target audience for the engagement process includes: residents; visitors; property owners and managers; regulators; business interests; interest groups; community leaders and organizations; local, regional, and state agencies; Native American tribal representatives; land trusts and other nonprofit groups; and others who have an interest or relationship with the City. It is also particularly important to engage communities that are disproportionately vulnerable to climate change hazards. These communities are often called frontline communities because they are susceptible to experiencing the impacts of climate change early and most severely as compared to other community groups. This requires careful identification, targeted outreach, and tailored engagement approaches. Additionally, communities that are disadvantaged, disenfranchised or otherwise typically underrepresented in planning processes warrant similar treatment as vulnerable communities (and often these communities overlap). The City’s public engagement strategies are intended to establish and strengthen communications and relationships in the community.

The COVID-19 Pandemic has created a difficult situation for public engagement during this period of social distancing. Although social distancing requirements may be relaxed during this planning process, we cannot predict when and how this may occur. The engagement strategy uses a multi-platform approach of online and traditional engagement to allow those that cannot participate in person to complete activities online, and those that can, to participate in person. A silver lining of the pandemic is that more of the public have grown accustomed with online tools.

The following includes a preliminary list of engagement strategies the City will employ throughout the planning process (virtually, and when safe to do so, in-person):

- **Focus group meetings** - Virtual or in-person meetings will be held with homogenous groups (e.g., business community, environmental groups, government agencies, public health, community-based organizations, utilities).
- **Look Ahead Manhattan Beach Virtual Reality (VR)**: In collaboration with Whitespace VR, USGS, and Climate Access, the City is using an immersive virtual reality experience to raise

awareness of the impacts of climate change while providing the public with survey questions regarding their support for different resilience and carbon reduction strategies. VR gives the public a 360-degree virtual tour of three locations along the city's coastline: Manhattan Beach Pier, Bruce's Beach, and El Porto. The virtual tour shows how the sites would look with flooding from sea-level rise and coastal storms, as well as identify what is possible at the sites if climate action is taken.

- **Community workshops.** Community workshops will be held throughout the public engagement process, virtually during COVID-19 Pandemic social distancing. The purpose of the workshops will be to collect input from the community to inform the City's climate plans as well as to educate community members on climate hazards, resilience strategies, and individual and collective changes that can be made to reduce greenhouse gas emissions.
- **Sustainability Task Force (STF).** The STF has been meeting on an as-needed basis throughout the project and is made up of community members, two councilmembers, and City staff members. The STF provides technical input to the project team and serves as a sounding board. Outreach, discussions, and presentations to the STF have occurred virtually during the pandemic.
- **Meetings with Appointed and Elected Officials.** Presentations will be made to various appointed and elected officials throughout the public engagement process, including to the City Council, Planning Commission, and City committees and programs such as the Sustainability Task Force, Senior Advisory Committee, Bruce's Beach Task Force, Parks & Recreation Senior Programs, and Parks & Recreation Youth Programs.

PUBLIC OUTREACH:

Following this City Council meeting, the City will launch the Climate Ready MB Website, Virtual Reality Look Ahead visualizations, and associated Survey. Over the winter, City staff will be contacting stakeholder groups, identifying interest in focus group meetings, identifying point of contact (phone calls, emails), and advertising and circulating the Look Ahead Survey and Virtual Reality visualizations. In January 2021, staff plans to conduct sea level rise and CAAP focus group meetings. In February-March 2021, the City will advertise and hold a sea level rise and CAAP workshop for the public.

In addition to STF meetings, and developing a comprehensive stakeholders list and public engagement strategy moving forward in 2021, public outreach on Climate Ready MB has already included the Mayor's Climate Change Townhall in March 2020 attended by over 100 community members; two Urban Tides beach walks with scientists in January and February 2020 collectively attended by over 50 community members; presentations to the Los Angeles County Beaches & Harbors Beach Commission; regular updates to the MBUSD Green Committee; presentations at meetings of AdaptLA (virtual), the Los Angeles Regional Climate Collaborative, the Heal the Bay Knowledge Drop program (virtual), the American Planning Association California Chapter Annual Meeting, and the American Shoreline and Beach Professionals Association Annual meeting (virtual).

ENVIRONMENTAL REVIEW:

The City has reviewed the proposed activity for compliance with the California Environmental Quality Act (CEQA) and has determined that the activity is not a "Project" as defined under Section 15378 of the State CEQA Guidelines; therefore, pursuant to Section 15060(c)(3) of the State CEQA Guidelines, the activity is not subject to CEQA. Thus, no environmental review of the contract award is necessary. The Climate Resiliency Project itself is subject to CEQA, and environmental review is included in the consultant's work scope.

LEGAL REVIEW:

The City Attorney has reviewed this report and determined that no legal analysis is necessary.