

City of Carmel-by-the-Sea
 Data Sources and Data Gaps
 February 20, 2020

Priority Hazard	Priority Assets at Risk from Hazard	Data Sources for Hazards			Data sources for assets at risk	Data Gaps
		Source	Data Precision	Reliability		
Sea Level Rise	<ul style="list-style-type: none"> - North Dunes - Carmel Beach - Visitors - Local businesses - Sanitary sewer system - PG&E underground infrastructure - Storm drainage system - Wastewater treatment facility - Transportation infrastructure - Scenic coastal trail, public restrooms and beach access infrastructure - Coastal roadways and parking - Seawalls and revetments - Private property 	<ul style="list-style-type: none"> - USGS CosMos - State of California Sea-Level Rise Guidance, 2018 Update - Cal-Adapt 	Regional	Moderate	<ul style="list-style-type: none"> - Del Mar Master Plan, 2009 - Shoreline Management Plan, 2003 (seawalls & revetments, Scenic Coastal Trail) - CAWD WWTP Sea Level Rise Study, 2018 (WWTP and sewer system) - North Dunes Restoration Plan, 2016 (North Dunes) - Storm Drain Master Plan, in process (Storm drainage system) - Conserving California's Coastal Habitats, A Legacy and a Future with Sea Level Rise (regional data, The Nature Conservancy) 	<ul style="list-style-type: none"> - PG&E infrastructure resilience and potential issues - Evaluation of coastal infrastructure based on new sea level rise modeling - Critical transportation infrastructure at risk
Ocean warming & acidification	<ul style="list-style-type: none"> - Marine Sanctuary - Carmel Beach - Visitors - Local businesses 				<ul style="list-style-type: none"> - Projected impacts of ocean warming/acidification on local marine life and health of Sanctuary 	
Wildfires	<ul style="list-style-type: none"> - Mission Trail Nature Preserve - Urban forest - Persons with disabilities - Elderly population - Visitors - Local businesses - Water supply - Electrical energy supply - Transportation infrastructure - Hospital and emergency medical care - Scenic coastal trail, rr, and beach access - Private property, incl. 2nd homes 	<ul style="list-style-type: none"> - California 4th Climate Assessment - Cal-Adapt - Climate Change and Health Profile Report, Monterey County, 2017 - Living with Fire in California's Coast Ranges, Promoting Fire-Resistant Communities and Landscapes in an Era of Global Change, Symposium Proceedings, May 2018 	Regional	Moderate	<ul style="list-style-type: none"> - MTNP Baseline Biological Assessment, 2016 - MTNP Master Plan - Forest Management Plan, 2000 - Climate Change and Health Profile Report, Monterey County, 2017 (sensitive populations) - City of Carmel-by-the-Sea Emergency Operations Plan, 2015 	<ul style="list-style-type: none"> - Water supply resilience to wildfires - PG&E infrastructure resilience - Emergency response and medical care resilience

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Stonger storms and higher windspeeds	<ul style="list-style-type: none"> - Mission Trail Nature preserve - Urban forest - Marine sanctuary - Carmel Beach - Persons with disabilities - Elderly population - Visitors - Local businesses - Electrical energy transmission - PG&E underground infrastructure - Storm drainage system - Transportation infrastructure - Hospital and emergency medical care - Landfill and waste management - Scenic coastal trail, public restrooms and beach access infrastructure - Coastal roadways and parking - Seawalls and revetments - Other city streets 	<ul style="list-style-type: none"> - California 4th Climate Assessment - Cal-Adapt 	Regional	Moderate	<ul style="list-style-type: none"> - MTNP Baseline Biological Assessment, 2016 - MTNP Stream Stability Study, 2019 - Storm Drain Master Plan, in progress - Shoreline Management Plan, 2003 	<ul style="list-style-type: none"> - Resilience of urban forest to stronger storms - Resilience of PG&E infrastructure - Resilience of waste management operations to stronger storms and variable rainfall - Emergency response and medical care resilience - Combined effects of erosion from stronger storms and sea level rise on coastal infrastructure
More variable rainfall	<ul style="list-style-type: none"> - Mission Trail Nature Preserve - North Dunes - Urban forest - Marine Sanctuary - Water supply - Sanitary sewer system - Storm drainage system - Wastewater treatment facility - Transportation Infrastructure - Landfill and waste management - Scenic coastal trail, public restrooms and beach access infrastructure - Coastal roadways and parking - Seawalls and revetments - Other city streets - Private property, incl. second homes 	<ul style="list-style-type: none"> California 4th Climate Assessment Cal-Adapt 	Regional	Low	<ul style="list-style-type: none"> - North Dunes Restoration Plan, 2016 - North Dunes Restoration Project Update, 2019 - Monterey Peninsula, Carmel Bay and South Monterey Bay Integrated Regional Water Management Plan Update, August 2019 (Water supply, habitats) - 2010 Urban Water Management Plan, Monterey County District, California American Water, September 2012 (Water supply) 	<ul style="list-style-type: none"> - Water supply resilience to droughts - Emergency response and medical care resilience - Combined effects of erosion from stronger storms and sea level rise on coastal infrastructure

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Increased temperature	<ul style="list-style-type: none"> - Mission Trail Nature Preserve - North Dunes - Urban Forest - Marine Sanctuary - Persons with disabilities - Elderly population - Electrical energy transmission - Water supply - Wastewater treatment facility - Hospital and emergency medical care - Scenic coastal trail, rr, beach access - Coastal roadways and parking - Private property 	Cal-Adapt Climate Change and Health Profile Report, Monterey County, 2017	Regional	Moderate	Climate Change and Health Profile Report, Monterey County (Persons w disabilities, elderly population, health & vector borne illness impacts)	- Urban forest resilience to increased temperature
Fog changes	<ul style="list-style-type: none"> - Mission Trail Nature Preserve - North Dunes - Urban Forest - Marine Sanctuary - Carmel Beach - Scenic coastal trail, rr, beach access 	California 4th Climate Assessment	Regional	Low		- Future fog patterns