



County of Santa Cruz

COMMISSION ON THE ENVIRONMENT

701 OCEAN STREET, SUITE 400, SANTA CRUZ, CA 95060-4073
(831) 454-2580 Fax: (831) 454-2131 TDD/TTY – Call 711

February 9, 2018

The Honorable Zach Friend, Chair
Santa Cruz County Board of Supervisors
701 Ocean Street, Fifth Floor
Santa Cruz, CA 95060

Subject: Climate Change Adaptation in Santa Cruz County

Dear Chair Friend and Members of the Board:

The Commission on the Environment (COE) wishes to express our appreciation to the Board of Supervisors (Board) for your attention to climate change issues, particularly in implementing community choice energy, the top emissions mitigation initiative in the County's Climate Action Strategy. Monterey Bay Community Power will enable all of its member jurisdictions to reach their climate goals within a year of its launch. With this major feat in regional emission reduction accomplished, it is now time to turn our attention to climate change adaptation; we appreciate the opportunity to respond to the Board's request for advice from the COE on this issue.

As you know, the COE participated in a joint commission meeting with the Water Advisory Commission and Fish and Wildlife Advisory Commission in late 2017 that focused on climate change adaptation. An outcome of that meeting was for each commission to develop a set of priority recommendations to forward to the Board. The COE has reviewed and discussed the set of climate change adaptation strategies detailed in the County's Climate Action Strategy Table 7-1. Of the 56 strategies identified, staff indicates that about one third are currently being addressed in some way and the remainder are either being addressed partially or not at all.

We are encouraged by the efforts to date on climate change adaptation. However, the scale of the problem is unprecedented and it is important to focus now on preemptive actions to address climate change impacts. While all strategies in Table 7-1 are valid, we write to recommend the nine most timely and highest priority strategies to be integrated with the current Vision Santa Cruz County strategic planning process and subsequent implementation. These generalized priority recommendations each include the estimated time horizon and brief notes on the COE's rationale for each's priority status.

Increase Infrastructure Resiliency:

1. Review every capital improvements project decision through a climate lens by requiring analysis of climate change impacts, referencing climate hazard maps and addressing how each project addresses climate hazards. Consider designing and siting all future County projects and infrastructure to account for sea level rise projections, stream flooding and fire vulnerability, considering the projected life span of projects. Include education briefing for staff to instruct how to provide this information.

Time to action: 1 to 2 years

Justification: With explicit information on the location, timing and handling of climate change impacts, the Board will be better prepared to consider climate change in its decision making.

Moreover, prevention is better and less expensive than repairing after damage.

2. Develop a detailed priority list for addressing public infrastructure that has been identified as vulnerable, and consider developing retreat or retrofit plans for high priority infrastructure subject to future damage. Initiate knowledge sharing and coordination with other jurisdictions specifically on minimizing vulnerabilities at shared high priority infrastructure, e.g., the Wastewater Treatment Facility at Neary Lagoon.

Time to action: 1 to 2 years

Justification: Critical and highly vulnerable infrastructure must be protected. A priority list will assist the County in prioritizing capital improvement projects aimed at improving protection of these assets. By increasing adaptation-focused attention toward high priority infrastructure and collaboration across jurisdictions, the County can better prevent damage at a lesser cost than responsive repair.

3. Consider a program to identify the key transportation infrastructure, communication infrastructure, utilities, beaches and other amenities that support tourism, agriculture and commercial activity in general, and prioritize them for protection or retrofit.

Time to action: 3 to 5 years

Justification: Critical and vulnerable infrastructure for economic vitality must be protected.

4. Continue to work with the U.S. Army Corps of Engineers, County of Monterey, and City of Watsonville to develop a feasible flood control alternative to reduce the potential overtopping of the Pajaro River levees within both Santa Cruz and Monterey counties, including widening or construction of setback levees to reclaim a portion of the floodplain while increasing the flood capacity.

Time to action: 5 to 10 years

Justification: Critical and highly vulnerable farmland and infrastructure must be protected.

Improve and Expand Climate Change Adaptation Planning:

1. Consider how climate-related goals and strategies can be incorporated into an amendment of the General Plan and its Safety Element, as required by SB 379. This may be coordinated with policies that flow from the Sustainable Santa Cruz County Plan and the Disaster Recovery Initiative-funded update of the Safety Element (underway).

Time to action: 1 to 5 years

Justification: Efficient and coordinated planning facilitates implementation of all adaptation strategies.

2. **Develop a forum for ongoing engagement with coastal private property owners and the California Coastal Commission to discuss frameworks for land use policies that respond to expected future losses. Topics would include post-disaster reconstruction, policies regarding engineered protective structures and legal instruments that would allow property owners to acknowledge and accept responsibility for future losses. Similar forums should be considered for fire and flood prone areas.**

Time to action: 1 to 5 years

Justification: Community interaction is important for cooperative action and to avoid legal barriers. Property owners should be aware that insurance companies are ahead of the game on climate change disaster costs, and will likely begin withdrawing coverages in the near future.

3. **Continue engagement with other agencies to develop fuel reduction approaches for fire protection in all areas, with special approaches for sensitive habitat areas.**

Time to action: 3 to 5 years

Justification: Increased intensity of fire events threatens lives, property and watersheds.

4. **Consider protecting, and/or assisting non-profit organizations that protect habitat that is essential to facilitating species adaptation to changing climate. This would include protecting potential refuge areas and large, interconnected habitat patches that achieve multiple conservation benefits, including riparian areas. Areas to consider include buffer areas around existing protected habitat, areas that facilitate connectivity between populations, representative areas of the County's diverse local climates, and areas that are more likely to be climatically stable or support species in the predicted hotter and drier climate, including streams, ponds, lakes, wetlands, springs, and north-facing slopes.**

Time to action: 3 to 5 years

Justification: Increased intensity of weather events threatens environment, tourism, water supplies.

5. **Support efforts aimed at effective use of groundwater storage through increased groundwater recharge and conjunctive use among agencies (Ongoing).**

Time to action: 1 to 5 years

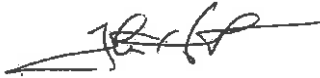
Justification: Water supply is critical and threatened by climate change.

We acknowledge the strain on the Public Works Department from recent storm damage and applaud their tireless efforts. These recommendations are submitted in part to help avoid such costly repair work in the uncertain future. Lastly, we are mindful of staff time and budget limits, and staffing challenges related to procuring and administering grant funds to help implement these climate change adaptation projects. We recommend that staff time be leveraged through cooperation with partners to identify and pursue grant opportunities and manage grant projects. Moreover, it is vital that the Climate Action Strategy and its climate change adaptation strategies be integrated into the County's strategic planning process and budget cycle for staff and resources. We urge the Board to frame every decision through a climate lens in order to achieve a climate resilient county, ensure public safety, and minimize extreme costs and damages over the coming decades.

Adapting to regional climate change will require coordinated action among the cities and counties of the Monterey Bay area. Please feel free to share these recommendations with supervisors and city councils as you feel most appropriate.

Thank you for considering these recommendations as part of the County Strategic Planning Process.

Sincerely,

A handwritten signature in black ink, appearing to read "John Hunt", written over a horizontal line.

Dr. John Hunt, Chair
Santa Cruz County Commission on the Environment

Cc: Water Advisory Commission
Fish and Wildlife Advisory Commission
County Administrative Officer

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
1. Continuing and accelerated sea level rise	Gradual Permanent inundation of low lying shoreline areas	<p>Consider designing and siting all future County projects and infrastructure to account for sea level rise projections, considering projected life span of project.</p> <p>Develop a detailed priority list for addressing public infrastructure that has been identified as vulnerable, and consider developing retreat or retrofit plans for high priority infrastructure subject to future inundation.</p> <p>Consider developing a plan to elevate E. Cliff Drive at Twin Lakes State Beach, Corcoran Lagoon, and Moran Lake to alleviate frequent coastal flooding and potential inundation.</p> <p>Develop a forum for ongoing engagement with coastal private property owners and the California Coastal Commission to discuss frameworks for land use policies that respond to expected future losses. Topics would include post-disaster reconstruction, policies regarding engineered protective structures and legal instruments that would allow property owners to acknowledge and accept responsibility for future losses.</p> <p>Consider a program to identify areas where high priority wetlands will be inundated, and evaluate options to allow wetland areas to migrate with the shoreline.</p> <p>Consider relocating coastal development away from areas that will be inundated to eliminate the risk of damage and the need for coastal protection. This concept is known as "managed retreat" and may only be technically, financially and legally feasible in limited situations.</p> <p>Consider limiting new engineered protection structures to infill in locations where the back beach is currently fixed.</p> <p>Consider a program to identify those areas where managed retreat should replace engineered protection structures, based on public benefit.</p> <p>Consider securing federal grant funding for the following drainage improvements within the Rio Del Mar Esplanade necessary to protect against a 10-year storm:</p> <ul style="list-style-type: none"> Construct pump station to include a new concrete vault at the southeast end of the parking lot centerline equipped with multiple pumps and associated control panels; establish new discharge outfall, provide new piping to connect to the existing storm drain systems and install a water quality treatment unit. 	<p>Not being addressed. Consider future sea level rise in CIP</p> <p>Not being addressed. Same</p> <p>Not being addressed. Same</p> <p>Partially being addressed. Part of GP/LCP Safety Element update in process</p> <p>Partially being addressed. Same</p> <p>Partially being addressed. Same</p> <p>Partially being addressed. Same</p> <p>Partially being addressed. Same</p> <p>Currently being addressed. Plans and permits approved</p> <p>Currently being addressed. Partially being addressed. Same</p>
	Gradual inundation of beaches where back edge of beach is fixed with a structure (beach loss)		
	Rise in groundwater table and channel surge at Rio Del Mar Esplanade backing up in drainage system		

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
		<ul style="list-style-type: none"> Install a closed gravity pipe system along Winfield Way that intercepts runoff along the ramped section of Aptos Beach Drive. Install a closed gravity pipe system near the Esplanade frontage that intercepts runoff flowing down the ramped section of Rio Del Mar Boulevard. Replace the undersized 12-inch pipes along Aptos Beach Drive with 24-inch diameter PVC, HDPE or RCP pipes. Relocate and replace the Esplanade parking lot storm drain system with 18-inch pipes. Rebuild the 12-inch storm drain lateral from the downstream end of the main storm drain up Venetian Road to Lake Court. Provide several inlet locations and a point of connection at Sand Street. Construct a new seawall within the Esplanade parking lot on County property rather than State Parks property. Alignment would likely divide the parking lot into two halves, with the interior side offering year-round use, and the beach side closed in the storm season only. 	<p>Currently being addressed. Same</p> <p>Currently being addressed. Same</p> <p>Currently being addressed. Same</p> <p>Currently being addressed. Same</p>
	<p>Rise in groundwater table at Neary Lagoon Wastewater Treatment Plant</p>	<p>Continue to improve wastewater collection system to reduce infiltration by groundwater or surface water. Monitor groundwater and increase efforts as necessary.</p> <p>Consider coordinating with the City of Santa Cruz on programs to minimize vulnerabilities at the Neary Lagoon plant.</p>	<p>Partially being addressed. Ongoing</p> <p>Not being addressed. Unknown status</p>
<p>2. Sea level rise in combination with winter storms</p>	<p>Increased impacts to residential development from wave run-up, storm surge and flooding.</p>	<p>Develop a forum for ongoing engagement with coastal private property owners and the California Coastal Commission to discuss frameworks for land use policies that respond to expected future losses. Topics would include post-disaster reconstruction, policies regarding engineered protective structures and legal instruments that would allow property owners to acknowledge and accept responsibility for future losses.</p> <p>Work with the engineering community to define a standard increment of additional height that should be added to the FEMA 100 year wave run up, storm surge, and flood levels when analyzing hazards in specific locations</p> <p>In consultation with the California Coastal Commission, consider revising regulations that address rebuilding structures that are repeatedly damaged by sea level rise and coastal storms</p>	<p>Partially being addressed. Part of GP/LCP Safety Element update in process</p> <p>Partially being addressed. Same</p> <p>Partially being addressed. Same</p>

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
		Consider relocating coastal development away from hazardous areas to eliminate the risk of damage and the need for coastal protection. This concept is known as "managed retreat" and may not be technically, financially or legally feasible in many situations.	Partially being addressed. Same
		Continue implementing and improve the FEMA flood hazard program. See "changing patterns of precipitation" for detailed recommendations.	Partially being addressed. Same
	Damage to Public infrastructure from storm surge	Develop a priority list for addressing public infrastructure that has been identified as vulnerable to storm surge and wave run up associated with 16.5-65.7 inches of sea level rise in 2100, and consider developing retreat or retrofit plans for high priority public infrastructure. This list should be updated periodically to reflect new information about the extent and timing of sea level rise.	Not being addressed. Consider future sea level rise in CIP
		Work with the County Office of Emergency Management to refine FEMA flood hazard mapping to account for climate change, as maps are the basis for evacuation notification in the event of anticipated flooding and/or a tsunami.	Not being addressed. FEMA maps do not incorporate climate change considerations
	Increase in coastal bluff erosion rates	Consider evaluating unprotected developed coastal bluff areas subject to future erosion, and develop plans and timeline for either armor placement, or retreat and relocation of existing public structures and/or infrastructure.	Partially being addressed. Part of GP/LCP Safety Element update in process
		Consider evaluating areas that are presently armored to determine whether additional armor or managed retreat is the most practical long-term approach.	Partially being addressed. Same
	Increase in landslides due to magnitude of storm events	Continue to require that the County Geologist review development in areas of suspected landsliding and require engineering geology reports when landsliding is identified or suspected.	Currently being addressed. Part of existing ongoing practice
		Continue to require that an engineering geologist and/or geotechnical engineer investigate the site of any proposed construction near landsliding and require mitigation of landslide hazards before issuing any building or grading permits.	Currently being addressed. Same
		Continue to require that an engineering geologist and/or a geotechnical engineer investigate any landslide damage to homes or roadways before repair of the landslide and reuse of the homes or roadways.	Currently being addressed. Same

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
<p>3. Changing patterns of seasonality of precipitation</p>	<p>Increased frequency and magnitude of winter flooding in response to more concentrated winter rainfall</p>	<p>Continue to work with the U.S. Army Corps of Engineers, County of Monterey, and City of Watsonville to develop a feasible flood control alternative to reduce the potential overtopping of the Pajaro River levees within both Santa Cruz and Monterey counties, including construction of setback levees to reclaim a portion of the floodplain while increasing the flood capacity.</p> <p>Amend the Safety Element of the General Plan and revise implementing regulations to increase the efficacy of the damage prevention and flood protection aspects of the National Flood Insurance Program. This would include revising the method of calculating "Substantial Improvement" in the floodplain, maintaining participation in the Community Rating System to improve floodplain management and reduce insurance costs for residents, and creating an online database of elevation certificates (LHMP).</p> <p>Consider increasing the freeboard above the projected 100 year flood level that is required for new development, in order to account for sea level rise and increased winter storms.</p> <p>Evaluate the effectiveness of current policies and ordinances designed to limit storm water runoff and flooding and, if needed, recommend revisions to improve the effectiveness of these policies and codes. Specifically, evaluate the effectiveness of current drainage plan requirements for new development to ensure that runoff from impervious surface does not contribute to flooding, and revise development permit conditions of approval if needed (LHMP).</p> <p>Prepare a "Storm Water Facilities Master Plan" for Flood Control Districts 5 & 6, which includes portions of Live Oak, Soquel, Aptos, Seacliff and Rio Del Mar. This will include an inventory of existing facilities, development of hydraulic and hydrologic modeling of these facilities, development of a prioritized Capital Improvement Program list, hydromodification analysis and development of generic best management practices and design standards (LHMP).</p>	<p>Partially being addressed. Ongoing</p> <p>Partially being addressed. GP/LCP Safety Element update in process</p> <p>Partially being addressed. Part of GP/LCP Safety Element update in process</p> <p>Currently being addressed. County Code Chapter 7.79 and revised Design Criteria adopted in 2012</p> <p>Currently being addressed. Completed in 2013</p>
	<p>Reduced water availability due to more frequent drought</p>	<p>Incorporate findings and recommendations of the integrated Regional Water Management Plan (forthcoming) into County water policy.</p> <p>Consider implementing additional water conservation programs, regulations and policies to conserve water supplies in the unincorporated area (See also E-8.1, Strategy for Emissions Reduction).</p>	<p>Currently being addressed. Ongoing</p> <p>Currently being addressed. Ongoing</p>

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
		<p>Support the Pajaro Valley Water Management Agency in continuing efforts to conserve groundwater supplies and mitigate salt water intrusion in the Pajaro Valley.</p> <p>Support the development of additional water supplies that meet environmental standards (LHMP).</p> <p>Promote more effective use of groundwater storage through increased groundwater recharge and conjunctive use among agencies (LHMP).</p> <p>Water supply plans should incorporate potential increases in water demand and reduced availability of supply that is projected as a result of climate change.</p> <p>Promote drought planning by 130 small water systems under County jurisdiction (LHMP).</p>	<p>Currently being addressed. Ongoing</p> <p>Currently being addressed. Ongoing</p> <p>Currently being addressed. Ongoing</p> <p>Currently being addressed. Ongoing</p> <p>Currently being addressed. Ongoing</p>
<p>4. Higher temperatures and lower rainfall</p>	<p>More intense heat waves (hotter, longer)</p>	<p>Consider developing or updating existing public health plans that address the health needs of chronically ill people and other vulnerable groups during extreme heat events, including designating emergency cooling centers.</p> <p>Consider a system for contacting home-bound or disabled residents and moving them to air conditioned shelters as needed.</p> <p>Consider updating emergency response plans for limited term and extended power outages.</p> <p>Consider planning for a greater influx of visitors to the County from hotter inland regions during extended and more frequent heat-waves.</p> <p>Review site design standards for new development, the Urban Forestry Master Plan, and Parks Department plans for public spaces for opportunities to increase tree canopy in the urban area and for continued emphasis on increasing the number of trees in the built environment.</p> <p>Encourage efforts by agricultural organizations such as the Santa Cruz County Farm Bureau and the U.C. Agricultural Extension to assist the agricultural sector to identify and adjust to changes in pest management, cropping patterns, water management and other on farm practices that may be required as precipitation and temperature patterns change</p>	<p>Not being addressed. Unknown</p> <p>Not being addressed. Unknown</p> <p>Not being addressed. Unknown</p> <p>Not being addressed. Unknown</p> <p>Not being addressed. Needs staff resources</p> <p>Currently being addressed. Ongoing</p>

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action		
Increased frequency and magnitude of wildfire	Increased frequency and magnitude of wildfire	Establish and maintain cooperative fire protection and fire prevention agreements with other agencies (<i>LHMP</i>)	Currently being addressed. Ongoing		
		Work with State and Federal natural resources agencies to standardize environmentally appropriate fuel reduction practices in sensitive habitats.	Currently being addressed. Publication "Living with Fire in Santa Cruz County"		
		Maintain early notification/warning of residents by technology based applications (<i>LHMP</i>)	Currently being addressed. Ongoing		
		Increase visibility and reduce response times with proper road and address markings (<i>LHMP</i>)	Currently being addressed. Ongoing		
		Enhanced support for interoperability communications systems with local, state and federal emergency services both inside and around the County (<i>LHMP</i>)	Currently being addressed. Ongoing		
		Reduce fire risks in the urban/wildland interface (WUI) through improved building materials and appropriate code enforcement including defensible space programs (<i>LHMP</i> and <i>Calgreen building code</i>)	Currently being addressed. Ongoing		
		Implement additional fire prevention education programs, to include school and commercial business (<i>LHMP</i>)	Currently being addressed. Ongoing		
		Develop fuel reduction approaches in all areas, with special approaches for sensitive habitat areas.	Partially being addressed. Some areas addressed		
		Increased threat to the County's biotic resources, biodiversity and ecological systems	Increased threat to the County's biotic resources, biodiversity and ecological systems	Consider protecting, and/or assisting non-profit organizations to protect habitat that is essential to facilitating species adaptation to changing climate. This would include protecting potential refuge areas and large, interconnected habitat patches that achieve multiple conservation benefits. Areas to consider include buffer areas around existing protected habitat, areas that facilitate connectivity between populations, representative areas of the County's diverse local climates, and areas that are more likely to be climatically stable or support species in the predicted hotter and drier climate, including streams, ponds, lakes, wetlands, springs, and north-facing slopes.	Not being addressed. Component of Regional Parks Initiative?
				Consider revising the Conservation and Open Space element of the General Plan to address the challenges of climate change and to update conservation policies, working with local scientists, conservation and environmental organizations	Not being addressed. Needs staff resources

Table 7-1: Possible Climate Change Adaptation Strategies for Santa Cruz County

Climate Change Process	Impact	Possible Adaptation Strategy	Action
		Support private and non-profit organizations efforts to promote community awareness of Santa Cruz County's rich biological systems and their vulnerability to climate change, as well as their role in mitigating climate change, and to track indicators of the effects of climate change on important biological systems.	Not being addressed. Component of Regional Parks Initiative?
5. Countywide strategies that address multiple impacts from climate change.	Many existing County policies and programs do not address climate change.	Consider how climate-related goals and strategies can be incorporated into an amendment of the General Plan. This may be coordinated with policies that flow from the Transit Corridors Plan for Sustainable Communities and the Disaster Recovery Initiative funded update of the Safety Element (underway).	Partially being addressed. Update of Safety Element in process, but only addresses part of this strategy.
		Consider incorporating the topic of developing resiliency in important sectors of the economy (such as agriculture and tourism) into the County economic vitality strategy that is currently being developed.	Not being addressed. Climate change not considered in EVS.
		Consider a program to identify the key transportation infrastructure, communication infrastructure, utilities, beaches, and other amenities that support tourism, agriculture and commercial activity in general, and prioritize them for protection or retrofit.	Not being addressed. Vulnerability Assessment completed. Risk Assessment and prioritization needed.
		Consider adding adaptation to climate change as a specific component of the next update of the LHMP.	Currently being addressed. Completed.

Note: LHMP indicates this strategy has been adopted as part of the Local Hazard Mitigation Plan.
 Source: County of Santa Cruz, 2013.

