LAW OFFICE OF MARC CHYTILO, APC

ENVIRONMENTAL LAW

November 2, 2018

Supervisor Das Williams, Chair
Santa Barbara County Board of Supervisors
105 E. Anapamu Street
Santa Barbara, California 93101

RE: Coastal Resiliency Plan, LCP Update, County Sea Level Rise Policy

Chair Williams and Supervisors,

This office represents, counsels and supports a number of families, individuals, businesses and non-governmental organizations in various local environmental and land use matters, virtually all of which have a keen interest in and concern for the County's leadership, or lack thereof, in forcefully considering and addressing all aspects of climate change. Needed actions include both reductions in emissions of greenhouse gases and efforts to moderate the effects of climate change on the community and our ecological systems. Ecological systems, including wetlands, native grasslands, forests, chaparral and properly managed agricultural lands provide a very significant economic inputs in the form of ecosystem services that are currently not valued overtly in our economy. These ecosystem services will begin to be recognized as we, as a society, start to pay the costs of trying to respond to the adverse effects of climate change. As a general rule in the field of air pollution control, the costs of responding to the environmental consequences of air pollution are typically around ten times the costs of controlling air pollution at its source. This general multiplier applies with equal vigor to greenhouse gas emissions and the responsive and adaptive actions that our community will be required to take in the future.

As a result, this office implores the Santa Barbara County Board of Supervisors to take every opportunity to strengthen each element of the Coastal Resiliency Plan. In this regard, we support the comments of the Coastal Commission staff and ask the Supervisors to direct County Planning staff to take the following actions:

A. Revise all sea level rise projections upwardly to the latest IPCC, California and Ocean Protection Council (OPC) projections using more aggressive sea level rise scenarios, including H++ and the RCP 8.5 scenarios, and
B. Revise sea level rise impact analysis to conform to the State, OPC and proposed CCC guidance, including risk aversion factors.

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1. The Latest Science Has Measured, Modelled and Predicted Much Faster and More Aggressive Sea Level Rise Scenarios that Should Modify the County's Timid Assumptions of Medium Level Risk

There is ample recent evidence that sea level rise is and will be happening faster than previously projected, and further that storms and extreme wave events will also happen sooner, result in higher surges and more impacts than previously recognized. The County proposes to set a timid policy based on earlier projections that will culminate in an inadequate response to our rapidly changing climate.

Additionally, the US government's abdication of leadership on resiliency and reversal of programs needed and adopted to reduce future emissions, much of which was relied on in previous climate change and sea level rise projections, will only hasten sea level rise increases. The election of a climate-denier as Brazil's President will likely result in habitat and ecosystems destruction in the Amazonian forests, which sequester relatively large amounts of biological carbon

The Board should direct staff to return with more aggressive assumptions of sea level rise to guide future policy and project decisions.

The Current SLR projections contained in the CRP are:

Table 1
Sea Level Rise Projections for Santa Barbara County (inches)

Time Period	Low Sea Level Rise	Medium Sea Level Rise Scenario	High Sea Level Rise
By 2030	0.04	3.5	10.2
By 2060	2.8	11.8	27.2
By 2100	10.6	30.7	60.2

Source: **Santa Barbara County, 2017*, Santa Barbara County Sea Level Rise and Coastal Hazards Vulnerability Assessment*.**

The April 2017 California Ocean Protection Council (OPC) Update on the Science of sea level rise contains more aggressive predictions:

Table 1. Projected sea-level rise (measured in feet) for three tide gauge locations in California: (a) Crescent City (b) San Francisco, Golden Gate, and (c) La Jolla.

Projections are based on the methodology of Kopp et al., 2014 with the exception of the H++ scenario. The 'likely range' is consistent with the terms used by the IPCC meaning that it has about a 2-in-3 chance of containing the correct value. All values are with respect to a 1991-2009 baseline. The H++ scenario is a single scenario, not a probabilistic projection, and does not have an associated distribution in the same sense as the other projections; it is presented in the same column for ease of comparison.

(a) Crescent City

Feet above 1991-2009 mean	MEDIAN	LIKELY RANGE	1-IN-20 CHANCE	1-IN-200 CHANCE
Year / Percentile	*50% probability SLR meets or exceeds...*	*67% probability SLR is between...*	*5% probability SLR meets or exceeds...*	*0.5% probability SLR meets or exceeds...*
2030	0.1	0.0 – 0.3	0.4	0.5
2050	0.4	0.2 – 0.7	0.9	1.5
2100 (RCP 2.6)	0.7	0.1 – 1.5	2.3	4.8
2100 (RCP 4.5)	1.0	0.3 – 1.8	2.6	5.0
2100 (RCP 8.5)	1.5	0.7 – 2.5	3.4	5.9
2100 (H++)	9.3			
2150 (RCP 2.6)	1.0	0.0 – 2.4	4.2	9.6
2150 (RCP 4.5)	1.6	0.3 – 3.2	5.0	10.4
2150 (RCP 8.5)	2.6	1.3 – 4.4	6.2	11.6
2150 (H++)	21			

(b) San Francisco, Golden Gate

Feet above 1991-2009 mean	MEDIAN	LIKELY RANGE	1-IN-20 CHANCE	1-IN-200 CHANCE
Year / Percentile	*50% probability SLR meets or exceeds...*	*67% probability SLR is between...*	*5% probability SLR meets or exceeds...*	*0.5% probability SLR meets or exceeds...*
2030	0.4	0.3 – 0.5	0.6	0.8
2050	0.9	0.6 – 1.1	1.4	1.9
2100 (RCP 2.6)	1.6	1.0 – 2.4	3.2	5.7
2100 (RCP 4.5)	1.9	1.2 – 2.7	3.5	5.9
2100 (RCP 8.5)	2.5	1.6 – 3.4	4.4	6.9
2100 (H++)	10			
2150 (RCP 2.6)	2.4	1.3 – 3.8	5.5	11.0
2150 (RCP 4.5)	3.0	1.7 – 4.6	6.4	11.7
2150 (RCP 8.5)	4.1	2.8 – 5.8	7.7	13.0
2150 (H++)	22			

Significantly, the OPR update predicted that Southern California would experience greater increases than San Francisco:

(c) La Jolla

Feet above 1991-2009 mean	MEDIAN	LIKELY RANGE	1-IN-20 CHANCE	1-IN-200 CHANCE
Year / Percentile	*50% probability SLR meets or exceeds...*	*67% probability SLR is between...*	*5% probability SLR meets or exceeds...*	*0.5% probability SLR meets or exceeds...*
2030	0.5	0.4 – 0.6	0.7	0.9
2050	0.9	0.7 – 1.2	1.4	2.0
2100 (RCP 2.6)	1.7	1.1 – 2.5	3.3	5.8
2100 (RCP 4.5)	2.0	1.3 – 2.8	3.6	6.0
2100 (RCP 8.5)	2.6	1.8 – 3.6	4.6	7.1
2100 (H++)	10			
2150 (RCP 2.6)	2.5	1.5 – 3.9	5.7	11.1
2150 (RCP 4.5)	3.1	1.9 – 4.8	6.5	11.8
2150 (RCP 8.5)	4.3	3.0 – 6.1	7.9	13.3
2150 (H++)	22			

The OPR then adopted revised sea level rise projections in 2018:

TABLE 1: Projected Sea-Level Rise (in feet) for San Francisco

Probabilistic projections for the height of sea-level rise shown below, along with the H++ scenario (depicted in blue in the far right column), as seen in the Rising Seas Report. The H++ projection is a single scenario and does not have an associated likelihood of occurrence as do the probabilistic projections. Probabilistic projections are with respect to a baseline of the year 2000, or more specifically the average relative sea level over 1991 - 2009. High emissions represents RCP 8.5; low emissions represents RCP 2.6. ***Recommended projections for use in low, medium-high and extreme risk aversion decisions are outlined in blue boxes below.***

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)				H++ scenario (Sweet et al. 2017) *Single scenario
		MEDIAN	LIKELY RANGE	1-IN-20 CHANCE	1-IN-200 CHANCE	
		50% probability sea-level rise meets or exceeds...	66% probability sea-level rise is between...	5% probability sea-level rise meets or exceeds...	0.5% probability sea-level rise meets or exceeds...	
			Low Risk Aversion		Medium - High Risk Aversion	Extreme Risk Aversion
High emissions	2030	0.4	0.3 - 0.5	0.6	0.8	1.0
	2040	0.6	0.5 - 0.8	1.0	1.3	1.8
	2050	0.9	0.6 - 1.1	1.4	1.9	2.7
Low emissions	2060	1.0	0.6 - 1.3	1.6	2.4	
High emissions	2060	1.1	0.8 - 1.5	1.8	2.6	3.9
Low emissions	2070	1.1	0.8 - 1.5	1.9	3.1	
High emissions	2070	1.4	1.0 - 1.9	2.4	3.5	5.2
Low emissions	2080	1.3	0.9 - 1.8	2.3	3.9	
High emissions	2080	1.7	1.2 - 2.4	3.0	4.5	6.6
Low emissions	2090	1.4	1.0 - 2.1	2.8	4.7	
High emissions	2090	2.1	1.4 - 2.9	3.6	5.6	8.3
Low emissions	2100	1.6	1.0 - 2.4	3.2	5.7	
High emissions	2100	2.5	1.6 - 3.4	4.4	6.9	10.2
Low emissions	2110*	1.7	1.2 - 2.5	3.4	6.3	
High emissions	2110*	2.6	1.9 - 3.5	4.5	7.3	11.9
Low emissions	2120	1.9	1.2 - 2.8	3.9	7.4	
High emissions	2120	3	2.2 - 4.1	5.2	8.6	14.2
Low emissions	2130	2.1	1.3 - 3.1	4.4	8.5	
High emissions	2130	3.3	2.4 - 4.6	6.0	10.0	16.6
Low emissions	2140	2.2	1.3 - 3.4	4.9	9.7	
High emissions	2140	3.7	2.6 - 5.2	6.8	11.4	19.1
Low emissions	2150	2.4	1.3 - 3.8	5.5	11.0	
High emissions	2150	4.1	2.8 - 5.8	5.7	13.0	21.9

**Most of the available climate model experiments do not extend beyond 2100. The resulting reduction in model availability causes a small dip in projections between 2100 and 2110, as well as a shift in uncertainty estimates (see Kopp et al. 2014). Use of 2110 projections should be done with caution and with acknowledgement of increased uncertainty around these projections.*

OPR's 2018 Sea Level Rise Guidance introduced the concept of a Project, Community or Planning Process's tolerance for risk of impact from sea level rise, discussed below. OPC Offered the following cautionary advice for the County of Santa Barbara and others

"The H++ scenario may also be relevant to communities considering regional or general plans, climate action plans, local hazard mitigation plans, regional transportation plans, and other planning efforts, due to the interrelated nature of critical infrastructure, homes, businesses, etc."

State of California Sea Level Rise Guidance, 2018 Update, Page 24, from How to Select Sea Level Rise Projections.

A critical unknown is how rising seas and sea temperature will affect global ice sheets – if worst case predictions are correct, sea level rise will accelerate quickly as these impacts occur.

The County is erring in embracing moderate predictions of future Sea Level Rise, and should require all county planning and permitting decisions consider and propose responses to the more aggressive predictions, including the State's H++ scenario and RCP 8.5.

2. The County Must Embrace and Incorporate Risk Aversion in Planning Decisions and Permitting Actions

The State's 2018 Guidance promulgated by the OPC and the Coastal Commission's proposed Guidance for Residential development each embrace consideration of a proposed development's aversion to sea level rise, or stated another way, its tolerance or adaptability.

The basis for this is that certain infrastructure may not easily adapt to rising sea levels, and this type of development should be sited as far from coastal hazards as is practicable, based on its design life.

The 2018 OPC Guidance includes the following:

> Risk tolerance is the level of comfort associated with the consequences of sea-level rise and associated hazards in project planning and design.[25] Risk aversion is the strong inclination to avoid taking risks in the face of uncertainty. State and local governments should consider the risks associated with various sea-level rise projections and determine their tolerance for, or aversion to, those risks
>
> Assessing risk requires evaluation of two dimensions: 1) uncertainty, which can be analyzed and assessed using a range of sea-level rise projections, and 2) impacts or consequences, which may require a combination of quantitative and qualitative assessments. The step-wise approach we provide guides decision makers through both dimensions of the risk analysis. Depending on the finite factors of location and project lifespan, decision makers will evaluate the potential impacts and adaptive capacity of the project across a spectrum of sea-level rise projections. This analysis will enable the decision maker to select the appropriate projection for the particular project while building in adaptation pathways and contingency plans should that projection be exceeded. These steps complement other State guidance documents that provide a step-wise approach to the analysis needed to incorporate sea-level rise into planning and decision making, such as the California Coastal Commission's Sea Level Rise Policy Guidance[26] and Draft Residential Adaptation Policy Guidance.[27]

3. Conclusion

Time constraints preclude further in depth analysis of differences between the Coastal Commission's approach and the County's, however we believe that the County Board of Supervisors, as the policy-setting body for the County, should direct staff to revise the County's approach to sea level rise and coastal resiliency as follows:

1. Utilize the H++ sea level rise predictions in this plan and all County policy documents with a continuing commitment to using the best available science to guide decisions in areas of County policy; and

2. Integrate a risk aversion factor into all County planning and permitting decisions.

Thank you for your consideration of our views.

Respectfully Submitted,

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