OCEAN PROTECTION COUNCIL

CALIFORNIA natural resources AGENCY

State of California

Sea-Level Rise Guidance

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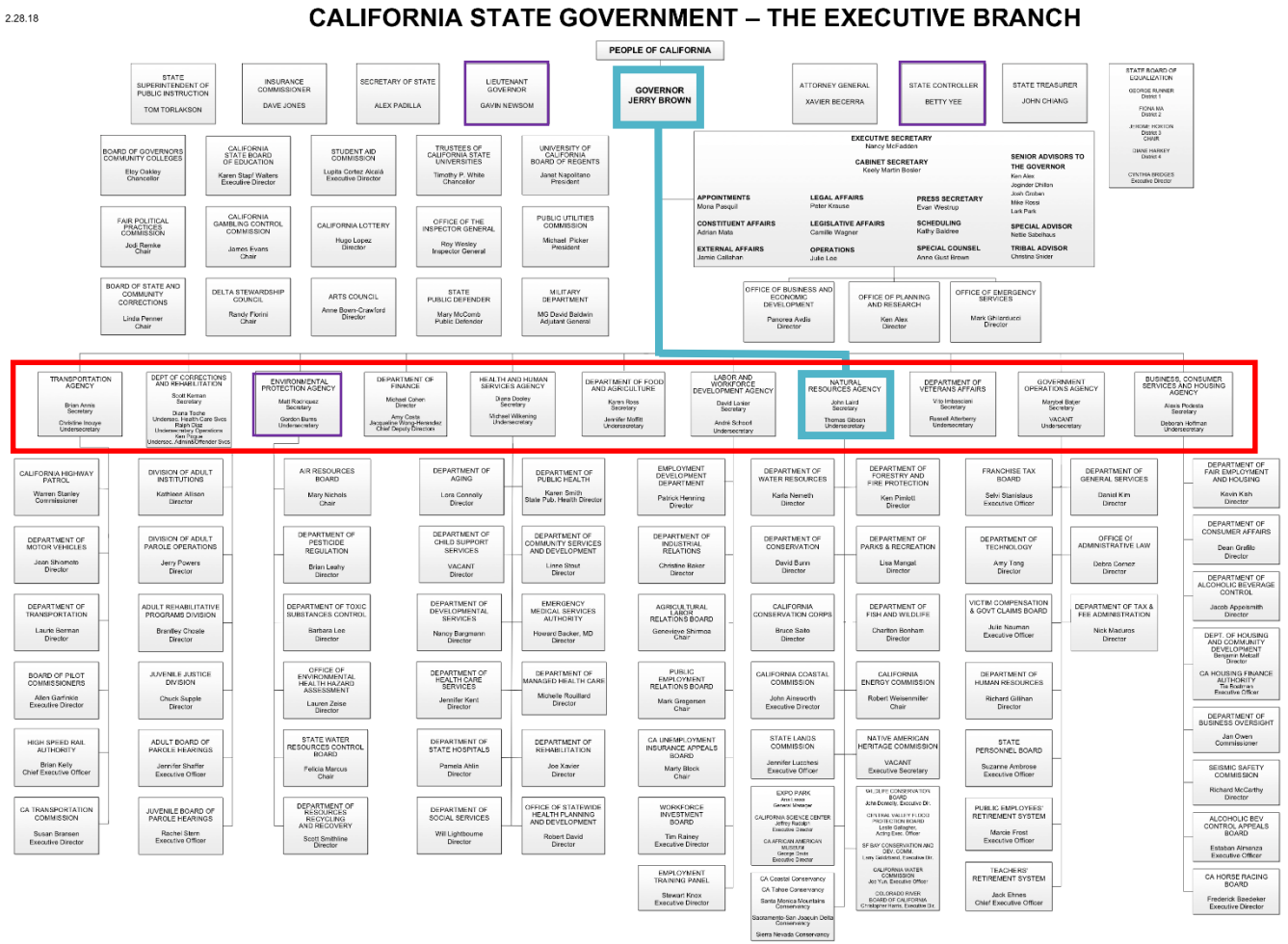
Item 6

Ocean Protection Council's Role



Our Mission and How We Work

Ensuring healthy, resilient, and productive ocean and coastal ecosystems in California.

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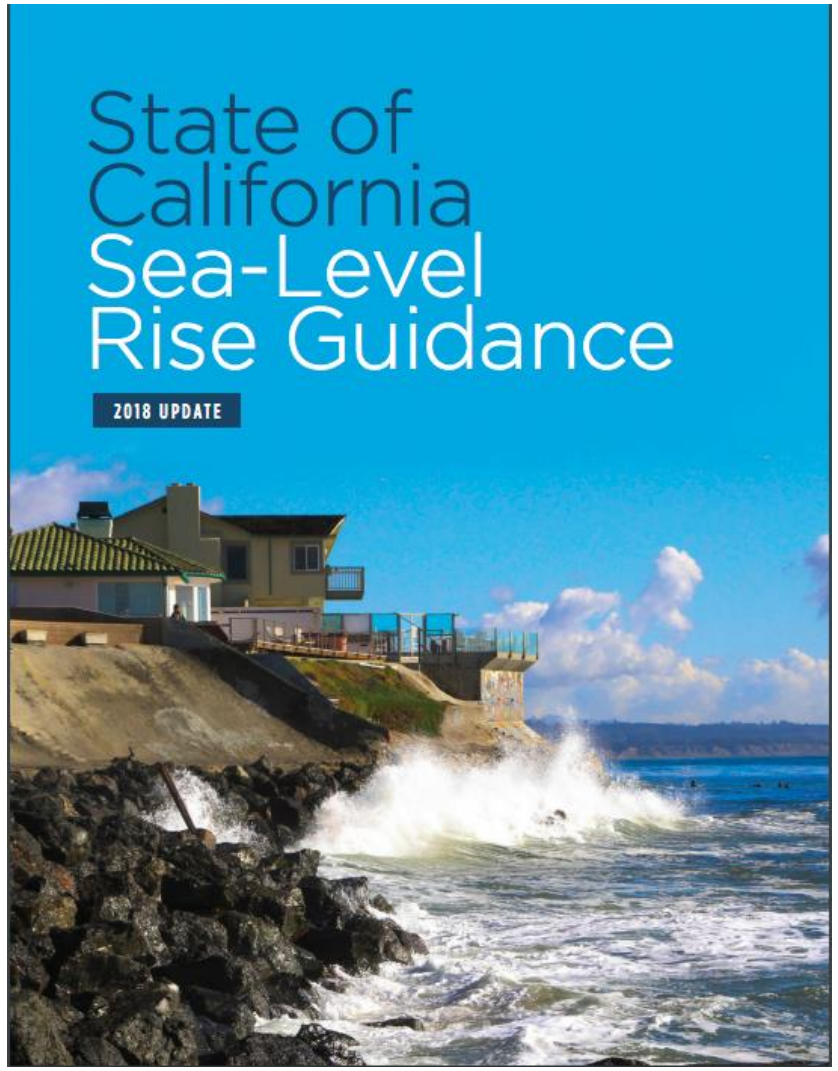
Content of Updated Guidance

- Updated projections based on best available science
- Stepwise approach for evaluating projections, associated risk, and adaptation pathways
- Recommended adaptation strategies
- Suite of geospatial and visualization tools

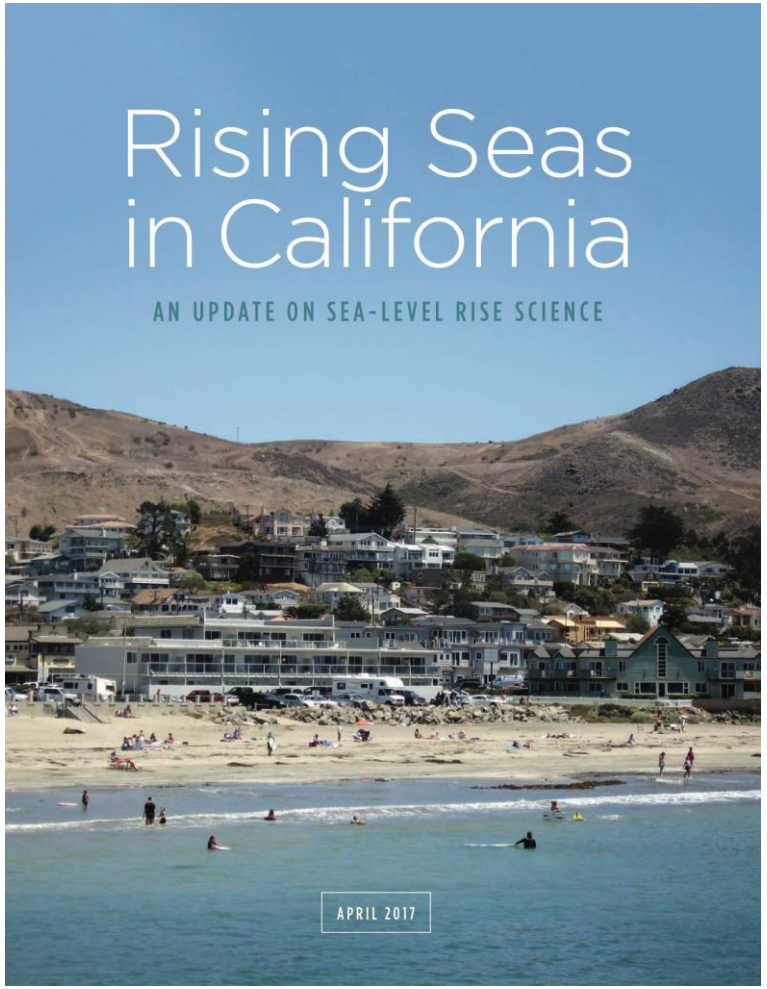


What Triggered this Update?

- Advances in sea-level rise science
- Need for guidance to help state *and* local governments plan for sea-level rise
  - Executive order B:30-15
  - SB 379 (Jackson)
  - SB 264 (Wieckowski)

Flooding of East Cliff Drive, Moran Lake, Santa Cruz County, January 20, 2010 King Tide (Photo credit: Dave Revell)

Rising Seas in California:
An Update on Sea-level Rise Science



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Risk Analysis Decision Framework

>> **STEP 1:** *Identify the nearest tide gauge.*

>> **STEP 2:** *Evaluate project lifespan.*

>> **STEP 3:** *For the nearest tide gauge and project lifespan, identify range of sea-level rise projections.*

>> **STEP 4:** *Evaluate potential impacts and adaptive capacity across a range of sea-level rise projections and emissions scenarios.*

>> **STEP 5:** *Select sea-level rise projections based on risk tolerance and, if necessary, develop adapation pathways that increase resiliency to sea-level rise and include contingency plans if projections are exceeded.*

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TABLE 13: 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 red boxes below.***

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)					H++ scenario (Sweet et al. 2017) *Single scenario
		Median *50% probability sea-level rise meets or exceeds…*	Likely range *66% probability sea-level rise is between…*		1-in-20 chance *5% probability sea-level rise meets or exceeds…*	1-in-200 chance *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	7.7	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.*

Planning & Adaptation Strategies

- Social equity
- Coastal habitats and public access
- Water-dependent infrastructure
- Acute increases in sea-level rise
- Community and regional planning
- Local conditions
- Adaptive capacity

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Implementing the Guidance

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Barriers to Implementation

1. There are too many different and sometimes conflicting sea level rise/flooding directives.
2. The level of resources available for local and regional planning continues to lag behind the need for action.
3. Some local governments have not prioritized sea level rise planning.
4. Changing science and guidance is a challenge to building understanding and support.
5. Socially vulnerable communities and tribal groups are often not “at the table” for planning and decision making.

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