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To: Coastal Commission staff and interested parties
From: Carey Batha, Statewide Planning Unit, Coastal Commission

Re: Rationale for using the "medium-high risk aversion" sea level rise scenario

The Coastal Commission Sea Level Rise Policy Guidance (2018) recommends that site-specific hazard reports for residential and commercial development include an analysis of the "medium-high risk aversion" sea level rise (SLR) scenario, which has an associated probability of 0.5%. A common question that arises regarding the use of this projection is:

> *The medium-high risk aversion scenario sounds very unlikely. There is only a 0.5% chance that SLR will reach or exceed those values, according to the climate models that informed the development of the probabilities. Why, then, does the Commission's guidance recommend using it to inform planning for commercial and residential development?*

The purpose of this memo is to respond to this common question. There are several components to the answer:

1. **Using this scenario is consistent with statewide guidance**. The recommendation to use SLR projections associated with the 0.5th percentile stems from the 2018 State Sea Level Rise Guidance, which was developed by the Ocean Protection Council at the direction of Governor Brown. This document provides statewide guidance on sea level rise projections and adaptation planning for use by state agencies and local jurisdictions, establishing a consistent statewide approach on sea level rise. It states that the medium-high risk aversion scenario is "a precautionary projection that can be used for less adaptive, more vulnerable projects or populations that will experience medium to high consequences as a result of underestimating sea-level rise (e.g. coastal housing development)." In other words, the combination of the relatively low adaptive capacity of homes and businesses and the high consequences that would occur if they were to flood make it appropriate to use a relatively high SLR projection within the range of possible future SLR amounts even though it has lower probability. The Coastal Commission Sea Level Rise Policy Guidance was updated to be consistent with the State Guidance, and that update was adopted by the Coastal Commission in 2018. In summary, by applying this recommendation, the Coastal Commission is being consistent with guidance from the State, and helping to ensure that local jurisdiction planning efforts are consistent as well.

2. **Using the medium-high scenario is a precautionary approach**. The Coastal Commission, in line with statewide guidance, generally advocates for a precautionary

approach to sea level rise adaptation planning. This approach stems from the overall importance of keeping development safe from coastal hazards and protecting coastal resources, consistent with the Coastal Act. It also derives from the fact that the costs and consequences associated with inadvertently underestimating SLR hazards could be quite high. To rephrase, we should use a relatively high projection even though it has lower probability because of the high consequences to precious coastal resources, valuable development, and life and safety that would occur if we underestimate future SLR.

Guiding Principle #4 in the Coastal Commission Sea Level Rise Policy Guidance states, "Use a precautionary approach by planning and providing adaptive capacity for the higher end of the range of possible sea level rise." This and the other Guiding Principles have been adopted by the Commission since 2015. Using the medium-high risk aversion scenario is consistent with this principle.

3. **Evaluating this SLR scenario does not necessarily mean a project must be *designed* for it**. It is important to remember that *evaluating* the medium-high risk aversion scenario does not necessarily mean that a project must be *designed and constructed* to completely avoid hazards associated with that exact amount of sea level rise. The Coastal Commission Sea Level Rise Policy Guidance states, "In some cases, it may be appropriate to *design* for the local hazard conditions that will result from more moderate sea level rise scenarios, as long as decision makers and project applicants *plan* for adaptation pathways that would allow for the implementation of alternative strategies if conditions change more than anticipated in the initial design."

   In other words, it may be appropriate to *design* for a lower amount of SLR, but ensure there is a *plan* in place to respond to the medium-high risk aversion SLR scenario. In line with this recommendation, it is common for Coastal Commission decisions to include reasonable siting and design requirements to minimize risks from hazards as much as is feasible, and also require the applicant to assume the risk of developing in an area that could be impacted by sea level rise and agree to triggers for removal of the development, or other types of adaptation options. (See the draft Adaptation Guidance for Residential Development for more detail on these potential conditions.)

4. **Developing science on extreme SLR was not accounted for in the development of the probabilities**. Emerging science on ice sheet melt (e.g., DeConto & Pollard 2016) has indicated that sea level rise may occur faster than previously thought. This emerging science was *not* incorporated into the climate models used to generate the probabilities in the State and Coastal Commission guidance documents. Therefore, the sea level rise projections that are assigned a 0.5% probability in the guidance documents may, in reality, be *more likely.* In fact, this finding was made in California's Fourth Climate Change Assessment, which *did* incorporate extreme ice sheet melt into probabilistic projections and found higher likelihoods for SLR projections similar to the medium-high risk aversion scenario.

Please consult the Coastal Commission's Sea Level Rise Policy Guidance for additional information about addressing SLR in Coastal Commission planning and regulatory actions.