

California Coastal Commission
c/o Sea Level Rise Working Group
45 Fremont Street, Suite 2000
San Francisco, CA 94105

July 10, 2015

Via email to SLRGuidanceDocument@coastal.ca.gov

Subject: Error in map depicting “bathtub model” of SLR effects in Half Moon Bay quadrangle

Dear members of the Coastal Commission and Sea Level Rise Working Group:

I write to draw your attention to an error in a map contained in reports cited by the May 27, 2015 public review draft of California Coastal Commission’s Sea Level Rise Policy Guidance. The map mistakenly uses a tsunami inundation map as a 100-year flood plain map. I have emailed and called one of the experts who participated in the creation of the map. I have not yet received a response, but am continuing to pursue this lead. Since the Coastal Commission has requested written comments be received no later than today, this letter cannot wait for the experts response.

A 2009 report from the Pacific Institute¹ is cited in several locations in the public review draft (e.g., in Appendix B, *Developing Local Hazard Conditions Based on Regional or Local Sea Level Rise Using Best Available Science*, Table B-4, page 230). The Pacific Institute report² references a collection of California coast quadrangle maps prepared by Phil Williams and Associates, Ltd. These maps illustrate a “bath tub” model of how sea level rise could increase areas at risk of inundation during a 100-year storm event. I applaud this effort to raise awareness of heightened risk.

Unfortunately, the Pacific Institute’s quadrangle containing the City of Half Moon Bay³ shows sea level rise impacts extending the boundary at risk for inundation by tsunami, not the 100-year storm event. That boundary

represents the maximum considered tsunami run-up from a number of extreme, yet realistic, tsunami sources. Tsunamis are rare events; due to a lack of known occurrences in the historical record, this map includes no information about the probability of any tsunami affecting any area within a specific period of time.⁴ [Emphasis added]

This tsunami map does not model 100-year storm events, and should not be substituted for a map that does. Starting from FEMA’s Flood Insurance Rate Map (FIRM),⁵ the bathtub model would show a

¹ Heberger M, H Cooley, P Herrera, PH Gleick, E Moore. 2009. *The Impacts of Sea-Level Rise on the California Coast*. Prepared by the Pacific Institute for the California Climate Change Center
<http://dev.cakex.org/sites/default/files/CA%20Sea%20Level%20Rise%20Report.pdf>

² “California Coastal Erosion Response to Sea Level Rise – Analysis and Mapping,” Pacific Institute, 2008.
http://www.pacinst.org/reports/sea_level_rise/maps/

³ *California Flood Risk: Sea Level Rise, Half Moon Bay Quadrangle*, Pacific Institute, Oakland, CA 2009,
http://www2.pacinst.org/reports/sea_level_rise/hazmaps/Half_Moon_Bay.pdf

⁴ “Purpose of this map,” *Tsunami Inundation Map for Emergency Planning, Half Moon Bay Quadrangle*,
http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanMateo/Documents/Tsunami_Inundation_HalfMoonBay_Quad_SanMateo.pdf, June 15, 2009.

⁵ *Flood Rate Insurance Rate Map, San Mateo County and Incorporated Areas, Panel 255 of 510*, Map Number 06081C0255E, Federal Emergency Management Agency, October 16, 2012. <https://msc.fema.gov/portal/>. See also the 100-year floodplain mapping shown in the City’s 1976 Storm Drainage Report.

smaller swath of land adjacent to Pilarcitos Creek at risk of inundation from 100-year storm events after the modeled sea level rise, much as the CalAdapt CoSMoS alternative model does.

I hold a doctorate in Management Science and Engineering from Stanford University, and have extensive experience using models for risk assessment. Inferences of risk depend heavily on the model's input data. I am very concerned that the data used in this Pacific Institute map does not model its stated assumptions.

Substituting the boundary of tsunami inundation for the 100-year flood boundary has significant implications for the perception of risk, for local planning and for property values in affected neighborhoods. As public awareness of SLR and these maps increase, the map is likely to frighten home buyers away from parts of Half Moon Bay's Casa del Mar neighborhood that are shown at heightened risk without justification.

The map data has also propagated into the Bathtub Passive Inundation Model shown in CalAdapt's Sea Level Rise: Threatened Areas Map⁶ which is also cited in the public review draft (Appendix 4, page 227).

For your convenience, copies of the Pacific Institute's Half Moon Bay quadrangle, the California Office of Emergency Services Half Moon Bay (tsunami) quadrangle, and the FEMA Half Moon Bay FIRM maps accompany this letter.

I have sought clarification from one of the authors, but to date have received no response. I ask that the anomaly in the data be reviewed, and errors be corrected in future drafts and the finalized versions of this document. I also ask that the Commission and the Working Group request correction of maps that propagate bathtub-style analysis of SLR impacts based on data from the tsunami run-up map.

Let me emphasize that I admire the Pacific Institute and the professionals with whom they consulted. If the Commission or its staff have any questions or would like additional information, I can be reached by email at [REDACTED], or at the address below.

Thank you for helping Californians better understand and prepare for sea level rise.

Sincerely,

James Benjamin

[REDACTED]
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⁶ <http://cal-adapt.org/sealevel/>