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California Energy Commission

Puente Power Project
Soil and Water Resources
Final Staff Assessment

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January 10, 2017
Puente FSA Workshop
Oxnard, CA

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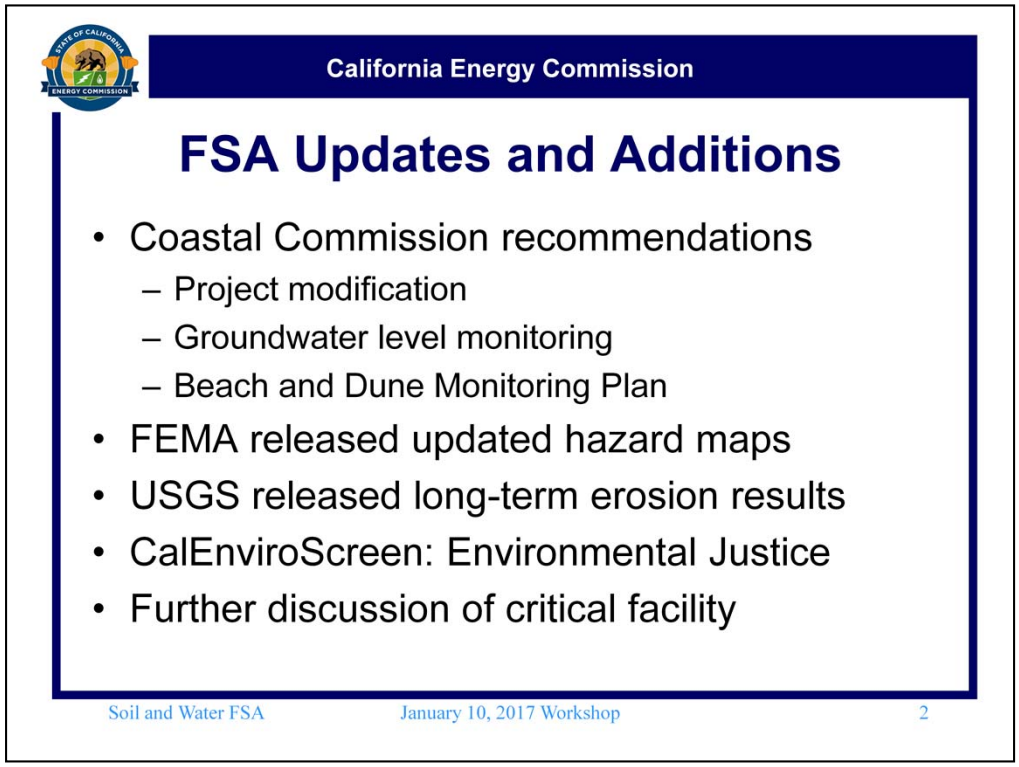


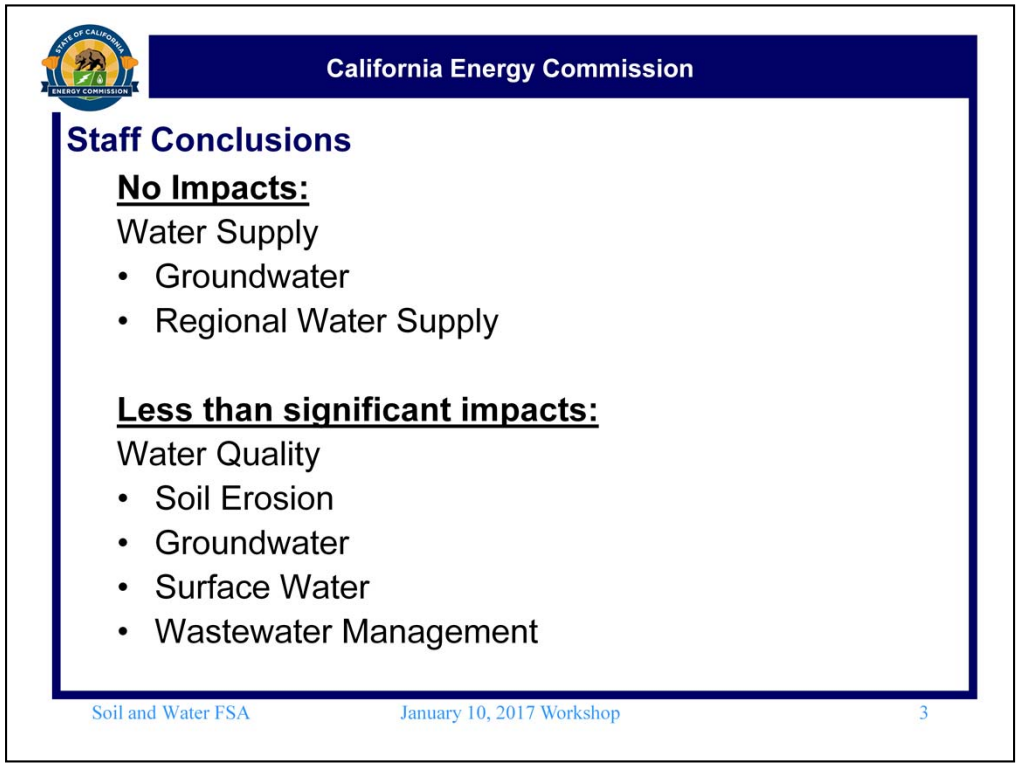
On September 15, 2016 the Coastal Commission submitted their conclusions about the project in, what is known as, the 30413(d) Report. The report concluded that the project should be built elsewhere because of concerns of flooding and wetlands impacts, among other concerns. If the Energy Commission determines that there is no feasible alternative site to relocate the project, the CCC report recommends several specific provisions for the Energy Commission to adopt as part of any final approval of Puente. When CCC released its report, the applicant indicated to staff their agreement to implement many of the CCC recommendations, including removal of the existing shoreline discharge outfall. Staff also incorporated CCC recommendations by modifying SOIL&WATER-3 to require groundwater monitoring as part of the dewatering plan, and adding SOIL&WATER-6 to prohibit shoreline protective devices and require beach and dune monitoring.

On September 30, 2016, FEMA released the Preliminary maps of coastal hazards in Ventura County.

In October 2016, USGS released Phase 2 of CoSMoS (Coastal Storm Modeling System) which shows projections of shoreline change in Ventura County due to sea level rise.

In response to several intervenors requesting a more robust environmental justice analysis, the FSA evaluated data using CalEnviroScreen.

On September 27, 2016 at the Committee Status Conference, the Commissioners asked for further discussion of staff's position regarding critical facility. The FSA includes further discussion, which I will cover later in this presentation.

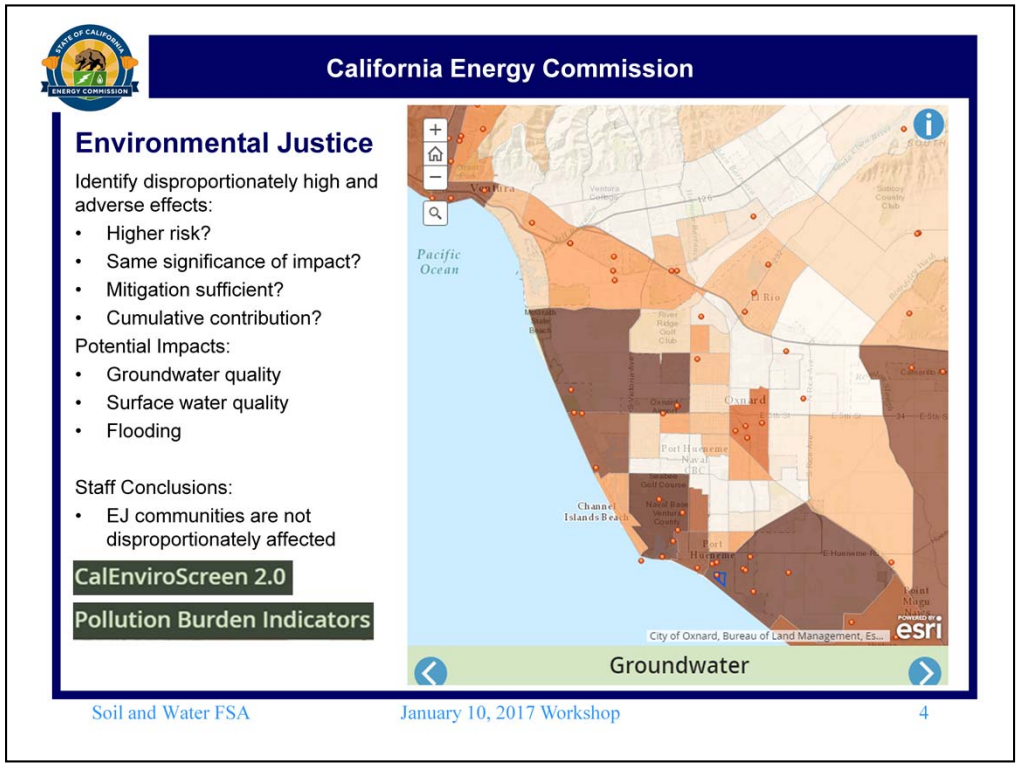


The updates and additions did not change my conclusions. My conclusions are that the proposed project would not result in significant adverse impacts that cannot be avoided or mitigated.

The project would not strain water supplies. Puente would not use any groundwater, and its potable water use would be less than Mandalay's current water use.

Impacts to water quality would be less than significant for all phases of the project. This includes the project modifications: demolition of the ocean outfall structure and wastewater discharge to the Edison Canal.

My conclusions on flooding haven't changed either. I will cover this later in my presentation.



The goal of my EJ analysis is to identify and address disproportionately high and adverse human health or environmental effects on minority communities and low-income communities. This is done by comparing risks and impacts on these populations with respect to the risks and impacts on the overall population. My approach for soil and water impacts is to answer these questions.

- Is risk high due to increased exposure or severity of consequence?
- Are methodologies or thresholds applicable to determine impacts' significance?
- Is mitigation sufficient to reduce impacts to less than significant?
- Does the project cumulatively contribute to an existing pollution burden?

CalEnviroScreen maps pollution burden from data collected across the state. Darker shading shows higher burden to disadvantaged communities. Slides show: drinking water contaminants, groundwater threats, impaired waters.

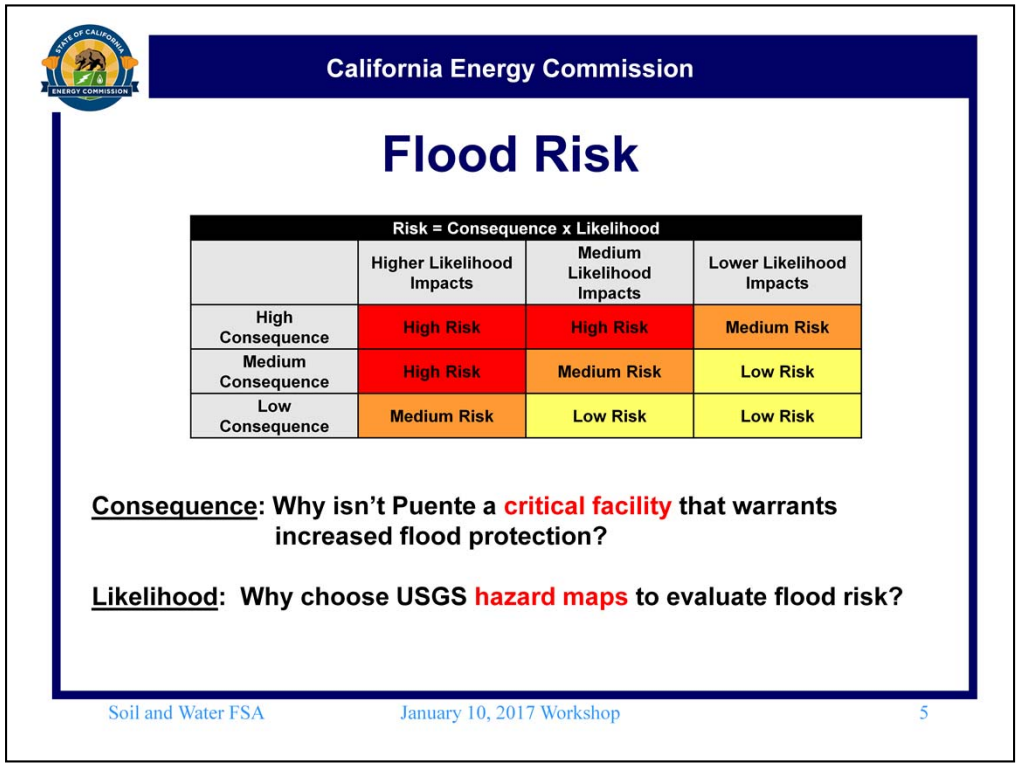
Note: Dots on map show locations of potential groundwater threats, but DOES NOT mean locations are actually polluting the groundwater.

The project would not impact drinking water.

The project would not contribute to pollutants identified for impaired waters.

CalEnviroScreen has no flooding data, but staff evaluated the project's impacts.

My conclusions for all of these potential impacts are that the project would not contribute to disproportionate impacts to Environmental Justice communities.



The difference in staff's conclusions with the CCC report stems from disagreement on the consequences and the likelihood of future flooding. The CCC believes flood risks are too high and the project should be relocated. Staff does not agree.

Risk is the **likelihood** of occurrence and the magnitude of **consequences** of a specified hazard.

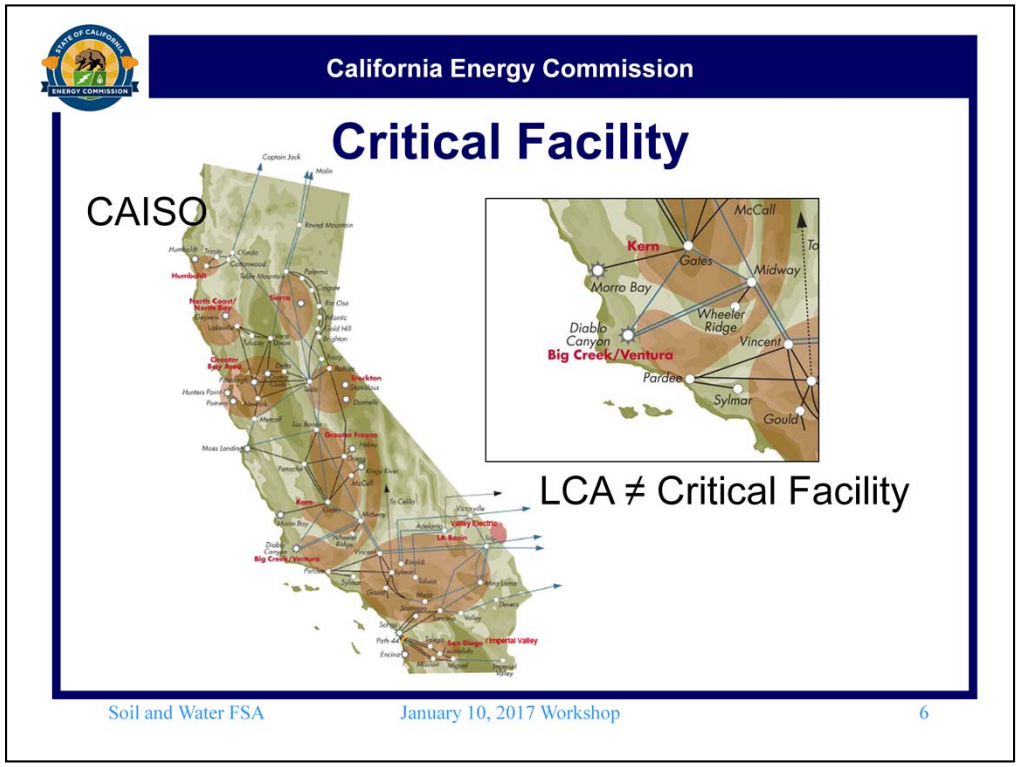
CCC report says:

- Critical facility with high consequences
- Flooding of the site would likely cause shutdown

Staff concludes:

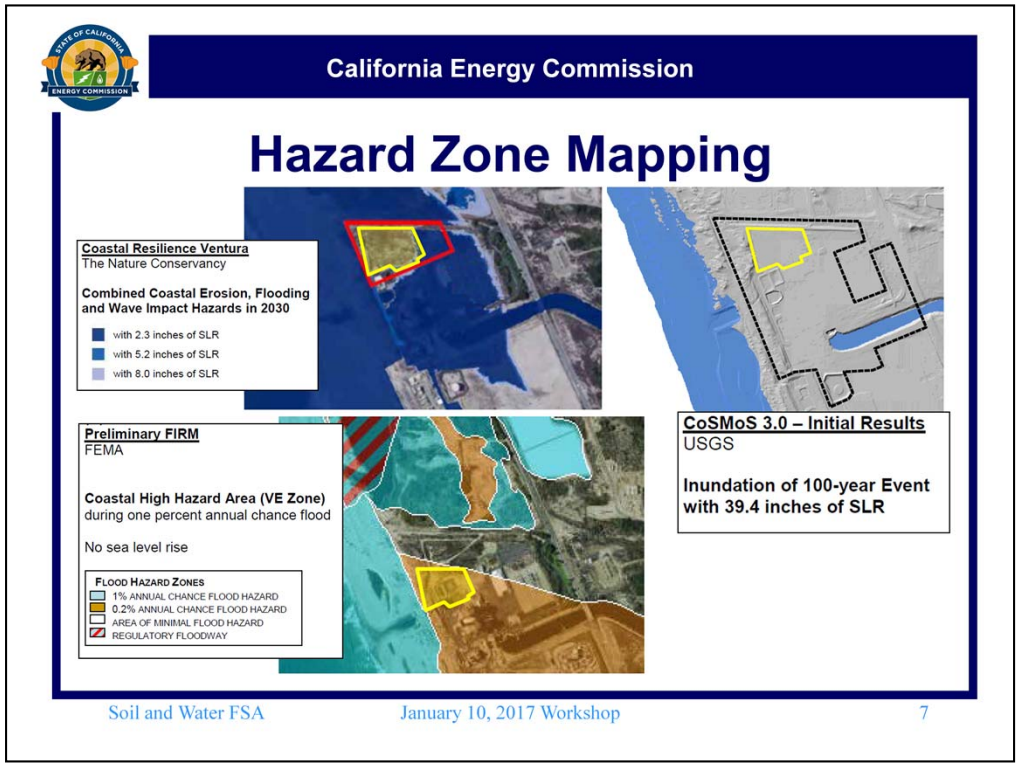
- Low consequences, so NOT a critical facility
- NOT high likelihood of flood large enough to cause shutdown

I will go over each aspect to summarize: why not a critical facility and why choose USGS hazard maps



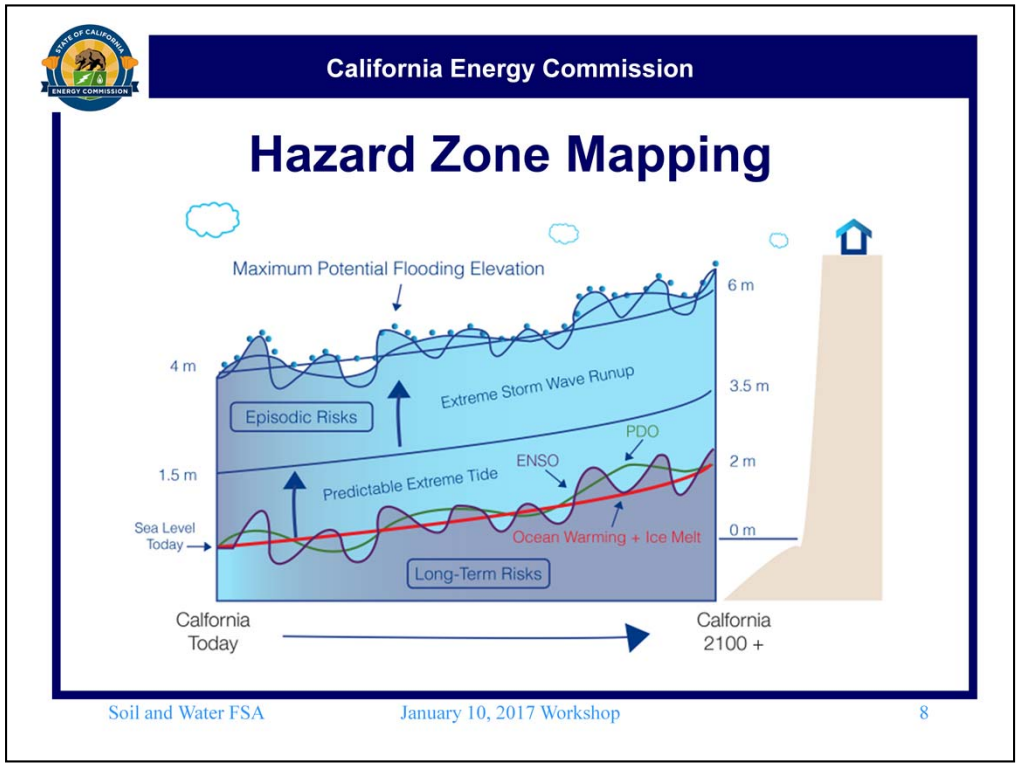
This slide shows the major transmission lines within CAISO's Balancing Authority Area. The electrical grid is an interconnected system designed to meet customer demand, even under certain adverse system conditions. The network of transmission lines allow areas to receive electricity through multiple paths, including electricity that is generated out-of-state. This map shows areas of Local Capacity Areas, which has more redundancies built in to meet reliability criteria. This LCA reliability criteria DOES NOT automatically mean that every power plant within a LCA is a critical facility.

The loss of Puente's generating capacity is a problem if it occurs simultaneously with this one-in-ten summer peak load and multiple transmission line failure.



Now for the flood hazard maps that staff reviewed. This slide shows that the maps from all three tools appear to present conflicting results.

The FEMA map does not incorporate any amount of sea level rise, but the area of flooding is larger than USGS map that includes almost 40 inches of sea level rise. The map by TNC shows almost complete flooding of the MGS property with only slightly over two inches of sea level rise. I read through the technical reports describing each of these tools to figure out why these results were so different. Appendix 1 of the soil and water section goes into detail to explain this, but I will highlight the main differences today.



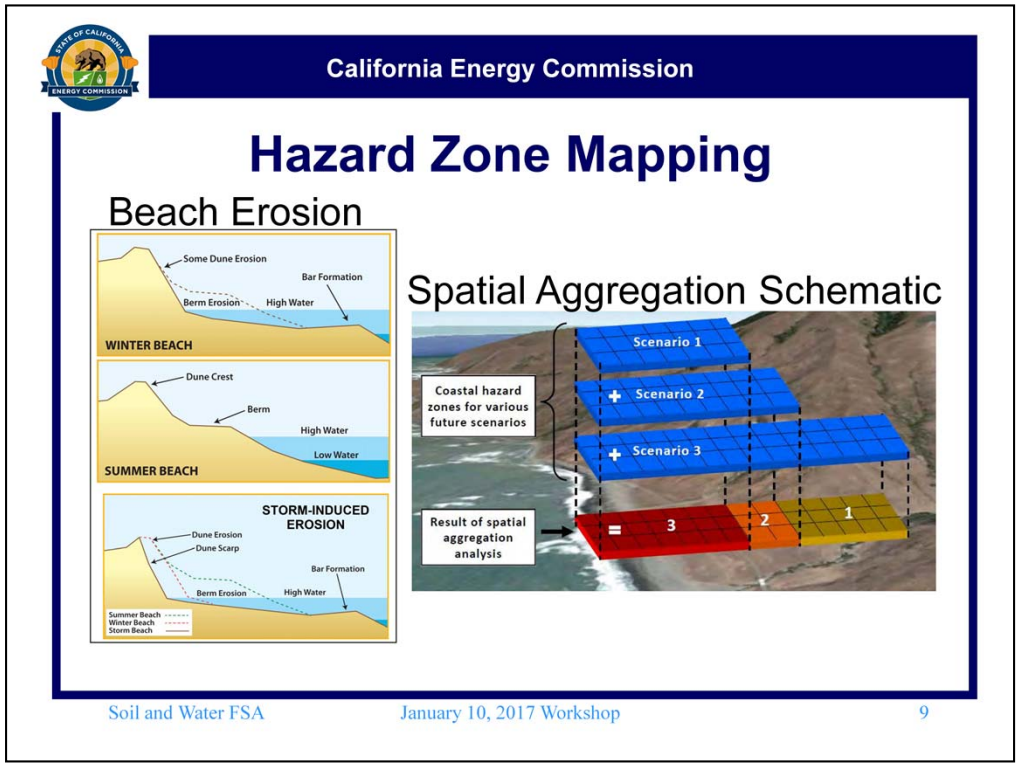
First a quick description of offshore waves.

Tides change throughout the year, but they are very predictable.

Other factors that also create waves are not as predictable: storms and El Niño. Sea level rise also contributes, but long-term projections are uncertain.

Most of the damage to California coast happens when large storms occur at the same time as other factors.

All three maps are conceptually similar. Computer modeling transforms these offshore waves as they travel nearshore and impact the coastline. The three maps have different results because they use different assumptions.

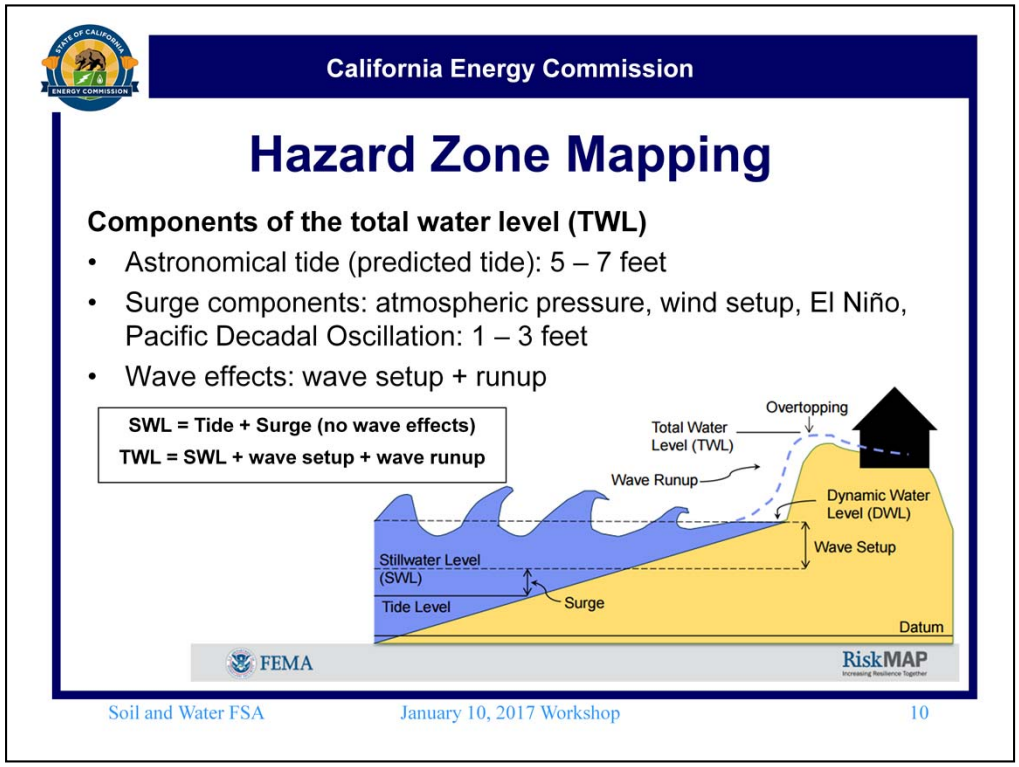


TNC's map is the most conservative of the three. Some of their assumptions are too conservative for siting purposes.

For example: Potential erosion projection assumed:

- Maximum storm = largest storm on record
- Maximum erosion = "unlimited duration"
- once the shoreline erodes, the sediment would be completely lost and no sandbar would help replenish the shore

TNC's mapping uses a process called "spatial aggregation" to show the combined hazard zones of a given location. This type of analysis does not take into account the probability of simultaneously occurring events. This is useful for planning purposes, but not appropriate for a project-level analysis in a 30-year timeframe.



FEMA does not assume the largest storm on record. Instead they evaluate the statistical 100-year flood event.
They model the nearshore impacts to evaluate for potential damage from:

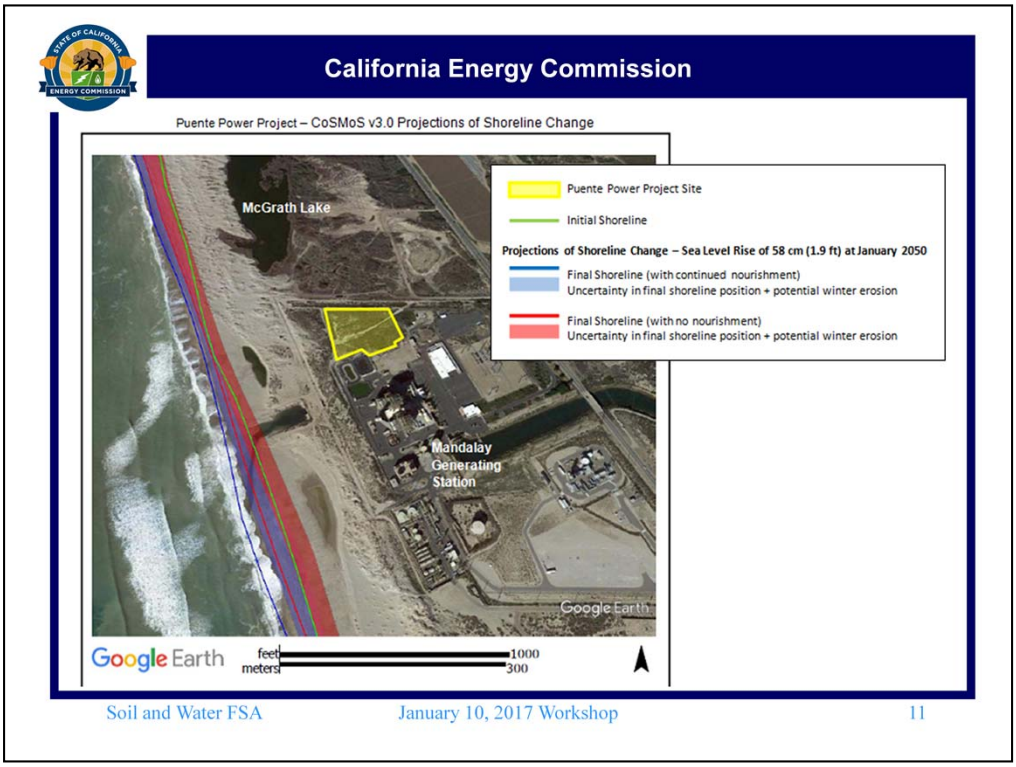
- Wave runup
- Overtopping splash
- Landward flow (if overtopping occurs)

FEMA's map shows that the Total Water Level (TWL) does not overtop the dunes. The boundary line shows the projected wave runup. FEMA does not include sea level rise.

USGS map has two major differences.

- Includes sea level rise: The statistical 100-year storm event incorporates a global climate model which includes regional and local factors and varying combinations of wave-wind conditions.
- The boundary line is based more on the dynamic water level (DWL) instead of TWL. It represents more persistent flooding (inundation of at least two minutes).

Water that splashes over the dunes but quickly drains… not expected to cause shutdown of facility.



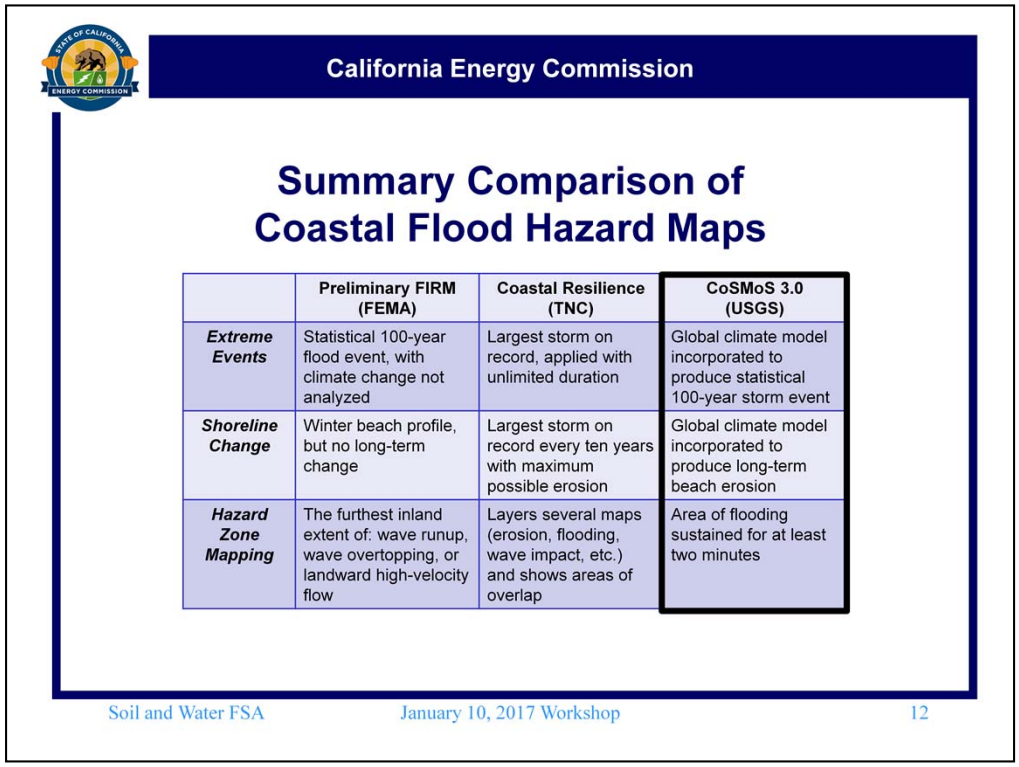
On my earlier slide that show all three maps, the USGS map included storm erosion but did not include long-term erosion. This is a comment that several intervenors had on the PSA.

In October, USGS released projections of long-term shoreline change in Ventura County due to sea level rise.

- Green line = Present day shoreline
- Blue line = Shoreline with 24 inches of SLR in the year 2050 (assumed continued sediment supply)
- Red line = Shoreline with 24 inches of SLR in the year 2050 (assuming zero sediment supply in the future)

This was reasonable to staff.

- The overall width of the beach has increased over the past 60 years. If sediment supplies do not change over the next 35 years, the beach is likely to widen (probably at a slower rate) despite sea level rise.
- If sediment supplies were to stop today (no dredging of Ventura Harbor and no sediment from the Santa Clara River), the dunes are not expected to wash away over the next 35 years. This is likely due to the abundant amount of sand currently at McGrath State Beach and the mouth of the Santa Clara River. The slow littoral drift southward would continue to provide sediment.

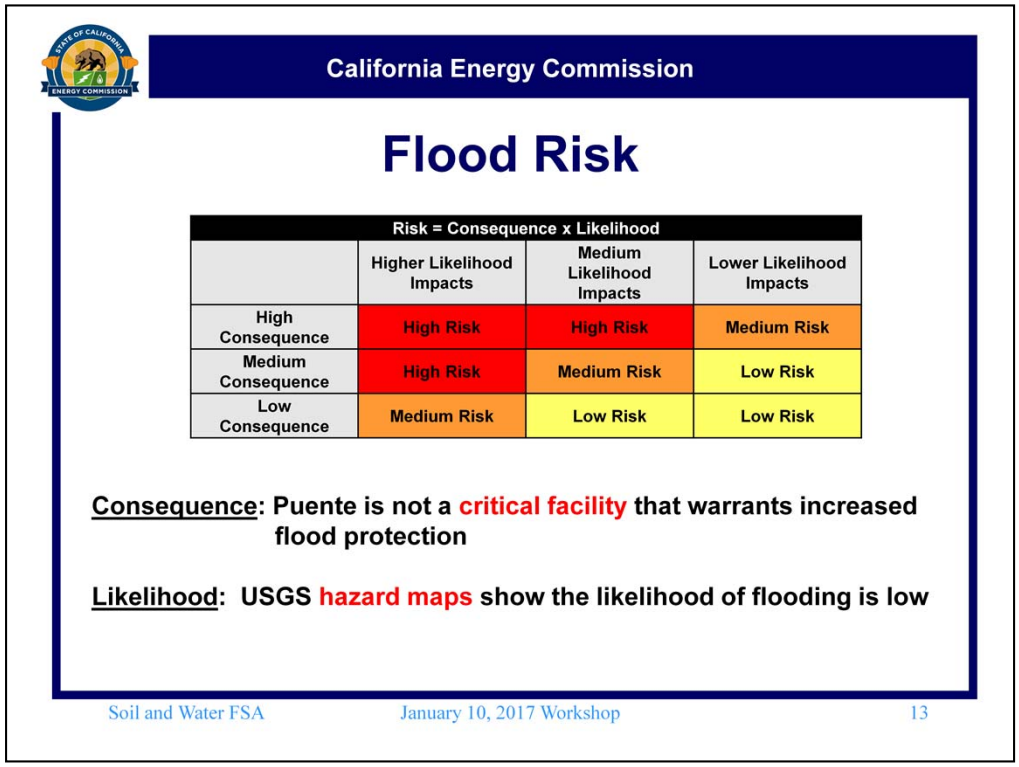


	Preliminary FIRM (FEMA)	Coastal Resilience (TNC)	CoSMoS 3.0 (USGS)
Extreme Events	Statistical 100-year flood event, with climate change not analyzed	Largest storm on record, applied with unlimited duration	Global climate model incorporated to produce statistical 100-year storm event
Shoreline Change	Winter beach profile, but no long-term change	Largest storm on record every ten years with maximum possible erosion	Global climate model incorporated to produce long-term beach erosion
Hazard Zone Mapping	The furthest inland extent of: wave runup, wave overtopping, or landward high-velocity flow	Layers several maps (erosion, flooding, wave impact, etc.) and shows areas of overlap	Area of flooding sustained for at least two minutes

This table summarizes the major differences between the three coastal hazard models.

Staff chose the USGS model because it:

- Incorporates climate change and the 100-year storm
- Includes long-term erosion
- Maps flooding more likely to cause shutdown

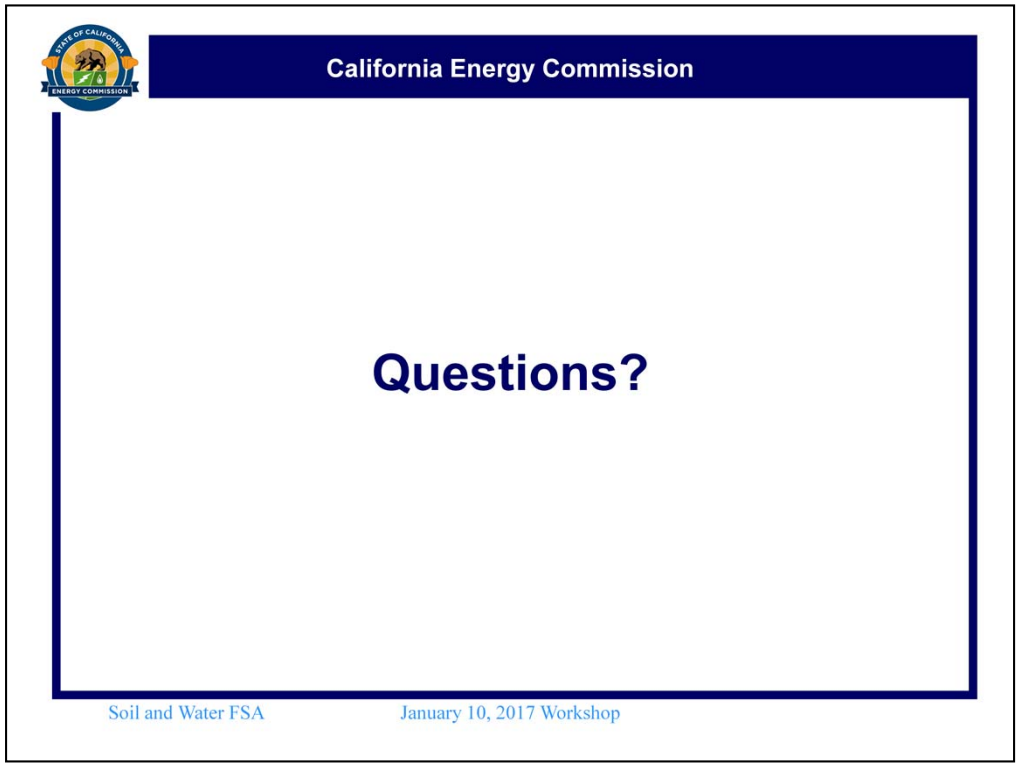


Going back to the flood risk table...

Puente is not a critical facility. If a flood event caused it to shut down, the electric grid has redundancies in place to provide power to the area.

USGS maps show 24 inches of sea level rise by 2050 is not expected to cause significant beach erosion (dunes are not eroded). And a 100-year storm will not flood the site enough to cause it to shut down.

Therefore, the project's flood risk is low (or perhaps medium), which does not require relocation of the project.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Questions?
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