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THE INDEPENDENT PEER REVIEW PANEL FOR SEISMIC HAZARD STUDIES AT DIABLO CANYON:

REVIEW OF PG&E'S DIABLO CANYON UPDATED SEISMIC ASSESSMENT,

DCISC MEETING AVILA BEACH, OCTOBER 9, 2024

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Hosgri Fault Seismic Source

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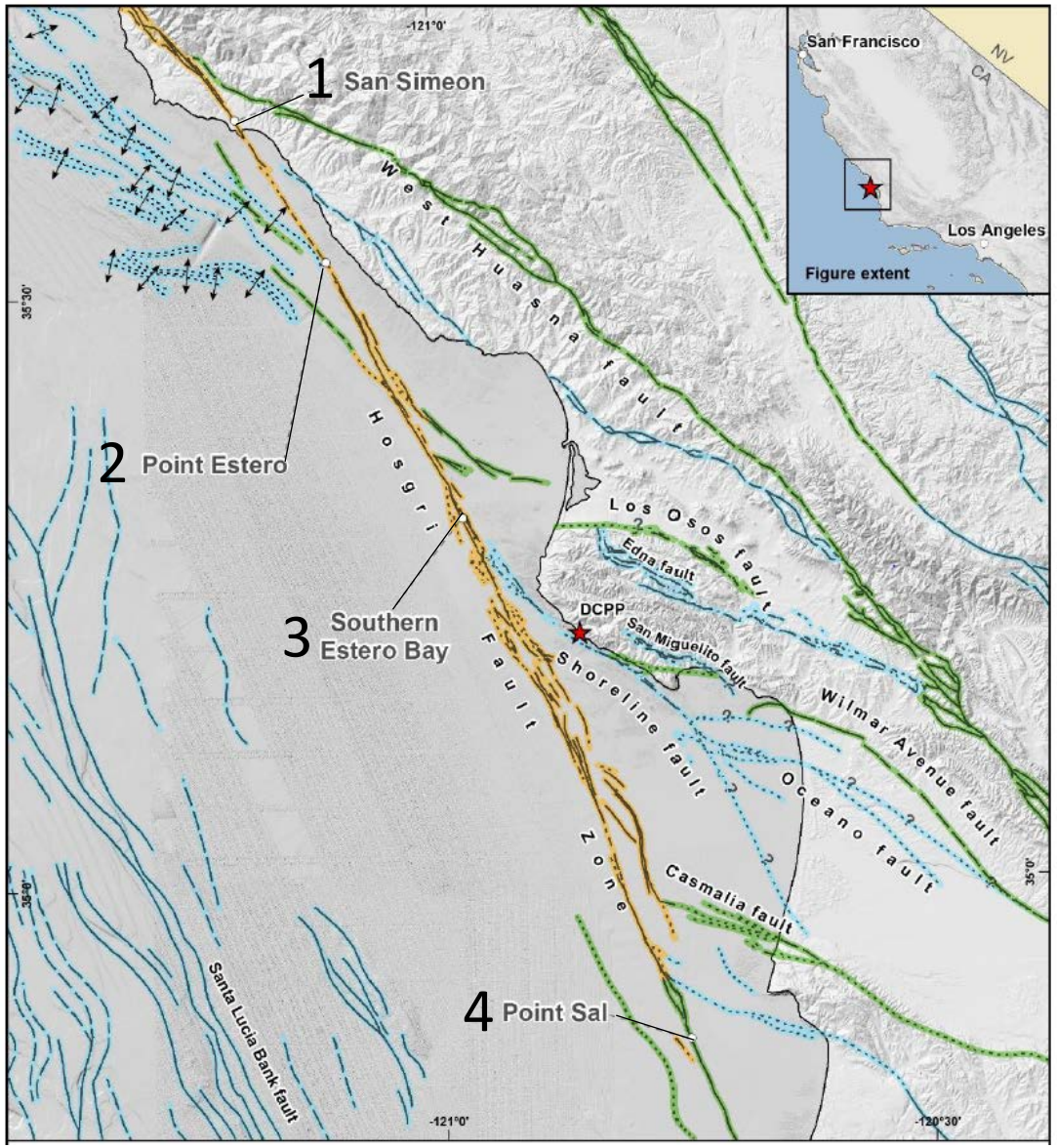
- The Hosgri fault is the primary seismic source for DCPP
  - Slip rate has been increased based on several peer-reviewed studies
  - High degree of confidence in a 2.6 mm/yr rate
  - Slip rate was calculated using 4 sites, 1-4.
  - However, we question PG&E using a lower slip rate in their hazard model based on weighting of each site.
- New data that was not addressed in the PG&E Update:
  - Hosgri fault slip rate study based on offshore seismic data reports slip rates have increased in the past million years, suggesting that rates older than Holocene may not be representative of the current seismic hazard.



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High-resolution geophysical and geochronological analysis of a relict shoreface deposit offshore central California: Implications for slip rate along the Hosgri fault

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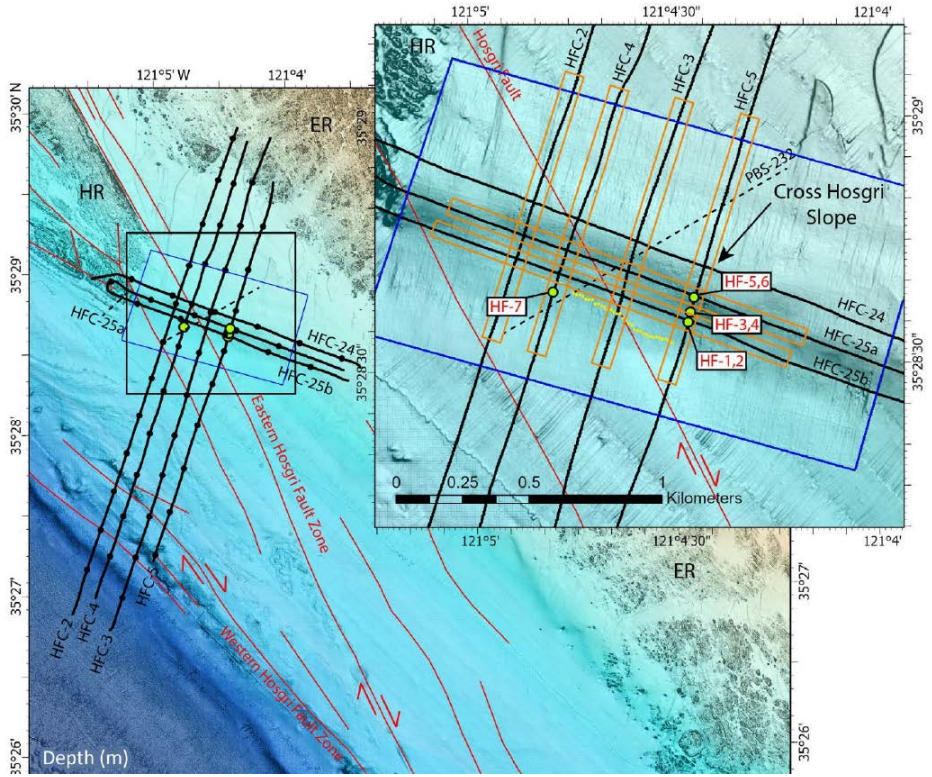
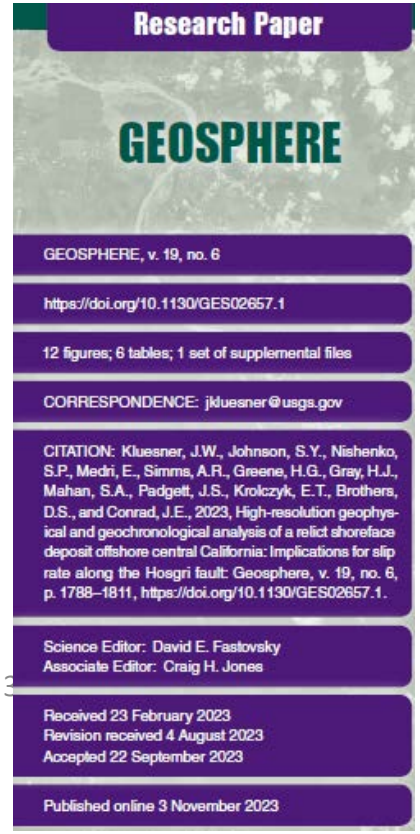
Slip rate determination improved from 2015

- Additional seismic profiles
- Sediment cores
- Chronology C-14 and OSL
- 2.6 ± 0.8 mm/yr





Cross-Hosgri Slope: Chirp profile and Sediment Cores

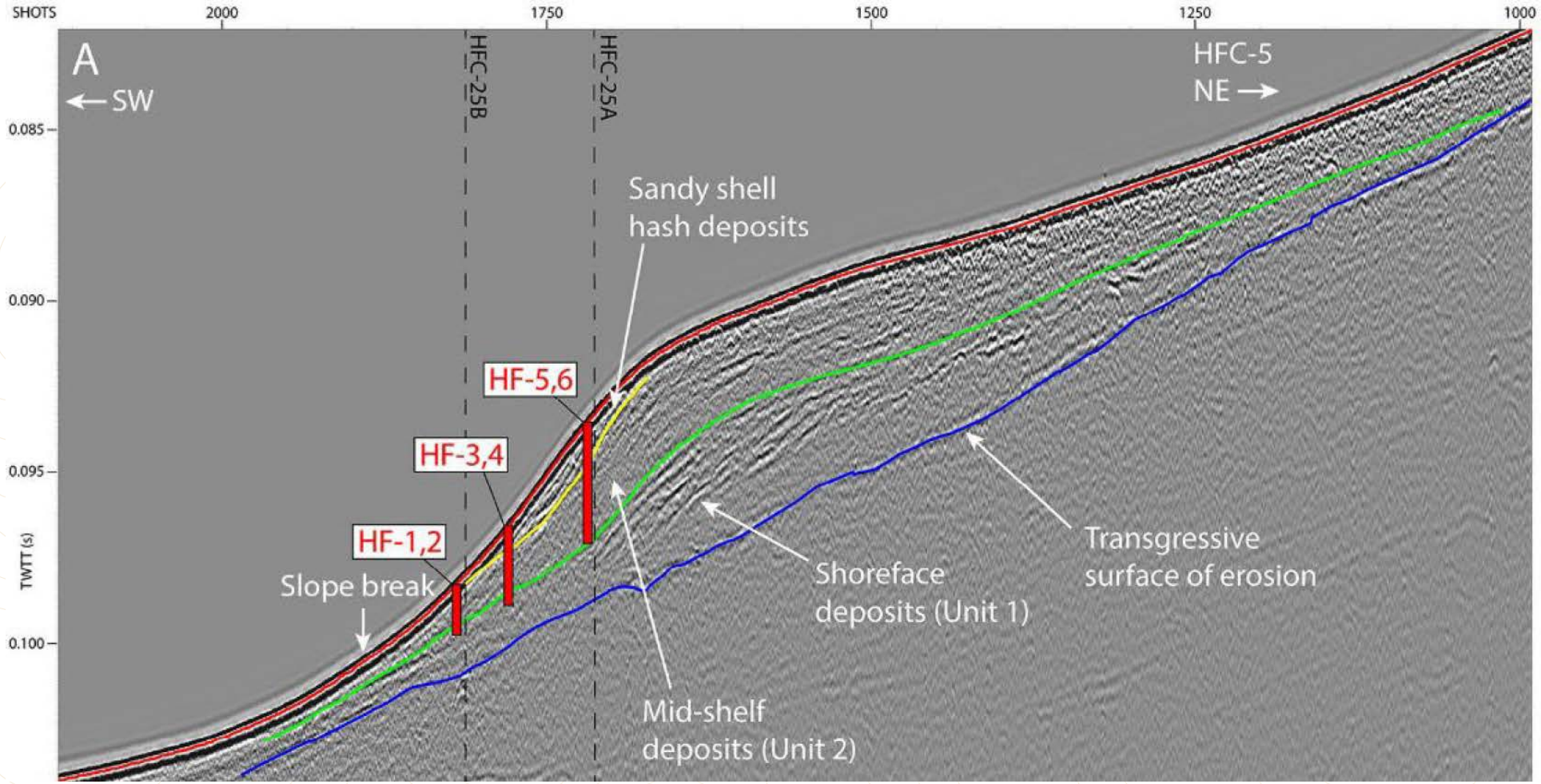


Figure 5-33. Stratigraphic Interpretation of New Chirp and Sediment Core Data Across the Cross-Hosgri Slope (from Kluesner et al., 2023, Figure 6)

Weighting of Slip Rate Sites

From PG&E (2024):

5.3.1.2. Weighting of the Four Slip Rate Sites

Due to the more thorough documentation of the CHS age and stratigraphy (Kluesner et al., 2023; Medri et al., 2023), there is greater confidence now than in 2015 that the geological interpretation of the site is correct and that the slip rate estimated from the site is a reliable estimate of the slip rate for the Hosgri fault source near the DCPP. The weighting of the four Hosgri fault slip rate sites in the 2015 SSC model (Table 5-12), therefore, needs to be revisited.

Our basis for reweighting the four slip rates sites is qualitative and considers three main criteria, as follows:

- The age of the offset feature
- The location of the slip rate site along the Hosgri fault and its proximity to the DCPP
- The confidence that the interpretation of the site provides a reliable result

Slip Rate Sites Weighting

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Study Site	Applicability of Offset Feature Age	Applicability of Slip Rate Site Location	Confidence in Site Location	PG&E 2015 Weight	PG&E 2024 Weight	Slip Rate mm/yr.
1. San Simeon	High (200 ka)	Moderate	Moderate	0.3	0.25	1.8
2. Point Estero – Cross-Hosgri Slope	High (12 ka)	Moderate	High	0.2	0.5	2.6
3. Southern Estero Bay	Low (700 ka)	High	Low	0.3	0.2	1.7
4. Point Sal	Low (700 ka)	Low	Moderate	0.2	0.05	0.8

Slip Rate Sites Weighting

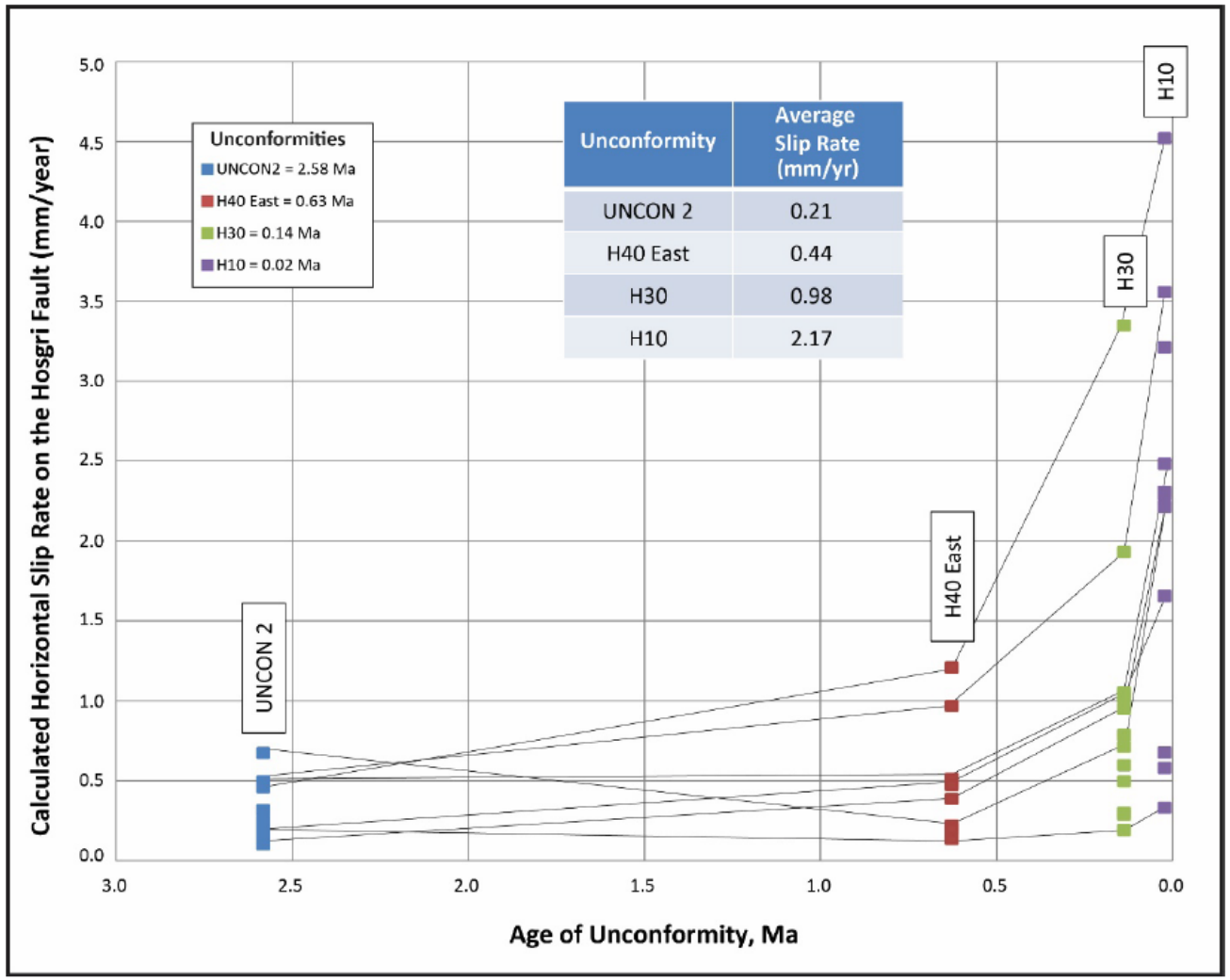

Figure 3-3. Calculated Horizontal Slip Rate for the Hosgri Fault Over Time. Black Line Connects Each Slip Rate for Seismic Lines That Contain All Four Unconformities. Inset Shows Average Slip Rate for Each Unconformity.

Slip Rate Increase in the Past 500 ka

From: Independent Evaluation of the Hosgri Fault Slip Rate Based on a Structural Analysis of the Pull-Apart Basin Linking the Hosgri and San Simeon Fault Systems, 2016, Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas, NRC Contract No. NRC-HQ-50-14-E-0001

Slip Rate Increase in the Past 500 ka

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Sequence Stratigraphic Models

The slip rates of the Hosgri and Shoreline faults in the 2015 SSC model relied to some degree on a sequence stratigraphic model of the continental shelf developed based on analysis of seismic reflection data (PG&E, 2014a, 2015a). Unconformity-bound sequences mapped in the shallow subsurface of the shelf were interpreted to be associated with major sea-level fluctuations associated with Quaternary glacial and interglacial periods.

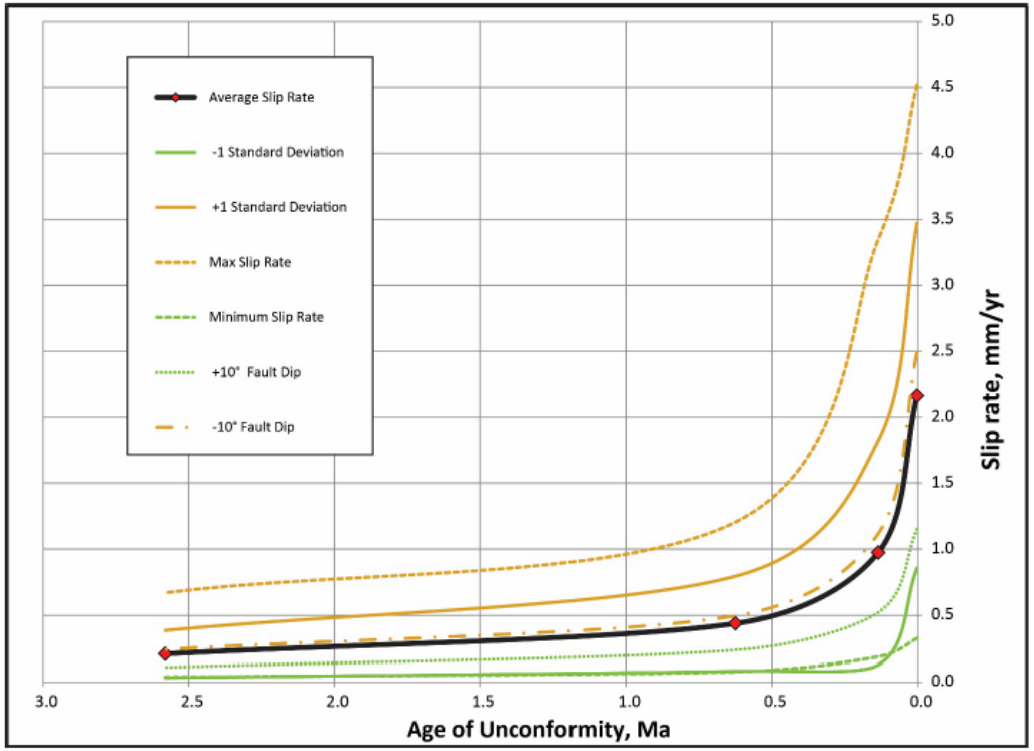
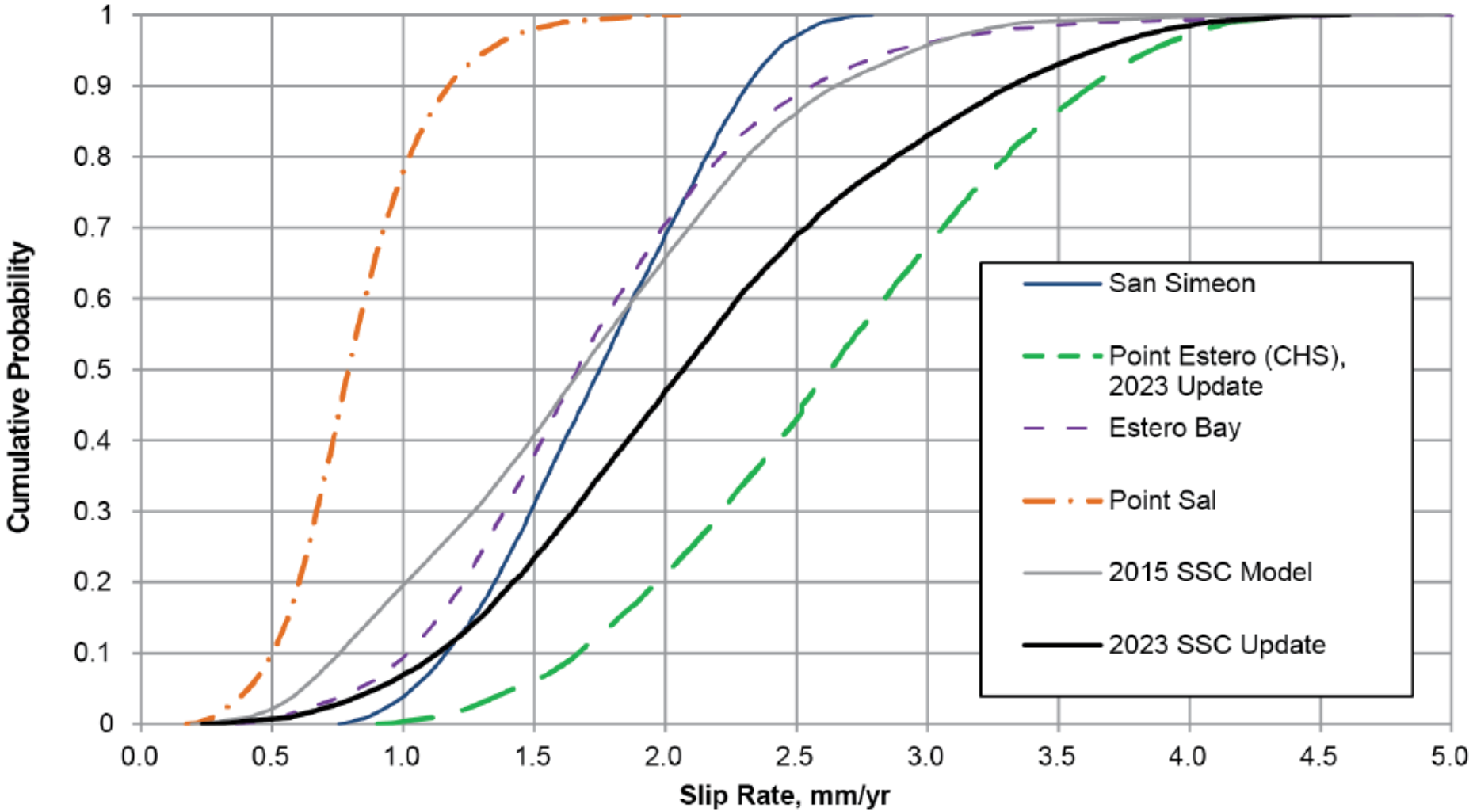


Figure 3-4. Plot of Slip Rates Versus Age. Ages are Those of the Four Unconformities Used in the Analysis. The Average Values are Averages of the Slip Estimates From All of the Cross Sections Analyzed for a Given Unconformity. The +/- 1 Standard Deviation Bounds, and the Maximum and Minimum Bounds are Based on Variations in Slip Rate Estimates From Cross Section to Cross Section. The +10 Degree and -10 Degree Bounds are the Upper and Lower Bounds of the Ranges Derived From Using the "Best Fit" Fault Dip Values Compared With Slip Estimates Derived Using A +/- 10 Degrees of Fault Dip Range. Note That the Range of Slip Rate Estimates That Results From Varying the Fault Dip Lies Well Within the Variation Bounds of the "Raw" Measurements.

From: Independent Evaluation of the Hosgri Fault Slip Rate Based on a Structural Analysis of the Pull-Apart Basin Linking the Hosgri and San Simeon Fault Systems, 2016, Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas, NRC Contract No. NRC-HQ-50-14-E-0001

Hosgri Fault Source Slip Rate CDFs



From PG&E (2024) Update Fig. 5-41

Evaluation Of Models And Methods

From PG&E (2024):

3.3 EVALUATION OF MODELS AND METHODS

In similar fashion to the SSHAC process, for this project it was essential to review the center,
body, and range (CBR) of the technically defensible interpretations (TDI) of both new and previously available data, models, and methods.

"The imperative to capture the full range of the integrated distribution should not lead the experts doing the model-building to include alternatives in their models only as a means to convey the impression of broad capture of epistemic uncertainty. The integration process need not be inclusive of all available interpretations and those interpretations deemed not credible by the TI Team must be culled from analysis."

Conclusions

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- We agree with PG&E that the Cross-Hosgri Slope slip rate best represents the hazard of the Hosgri fault.

- However, other slip rate sites used appear unrepresentative of current rates of tectonic deformation, and a bias towards the legacy 2015 model appears to be part of the reason.

- The Cross-Hosgri Slope slip rate should receive full weight in seismic hazard models.

THANK YOU

Gordon Seitz, California Geological Survey