# Proposed Implementation of Basin Effects into the 2018 NSHM (cont.)

# Implications

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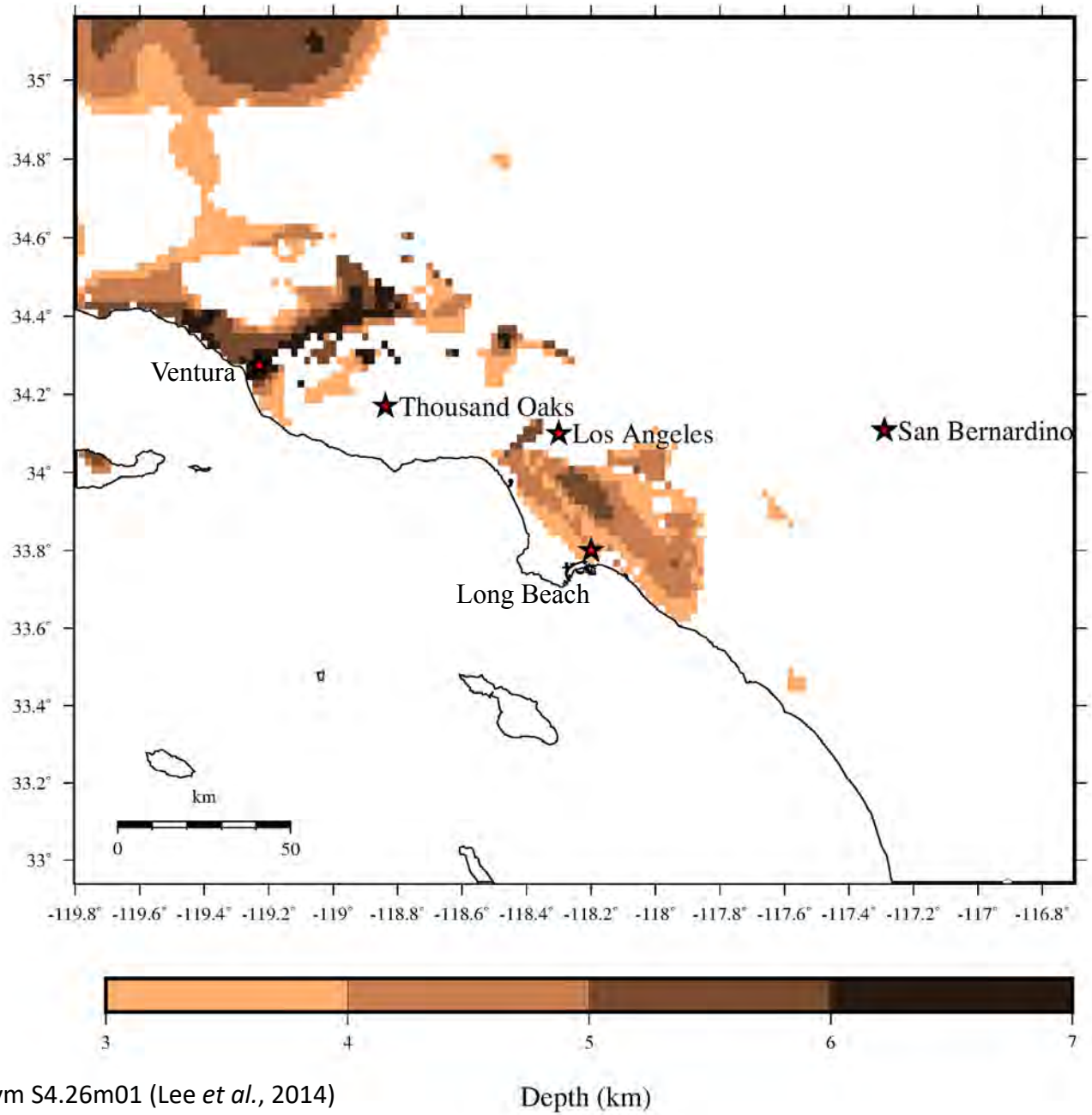
RMS Headquarters, Newark, CA

U.S. Department of the Interior
U.S. Geological Survey

# Region 1:

# Los Angeles Basin

# Los Angeles Basin: Areas Where $Z_{2.5}$ > 3 km




$Z_{2.5}$ values from local seismic velocity model: cvm S4.26m01 (Lee *et al.*, 2014)

# “Basin Depth Term” Comparisons: Los Angeles, CA

**Basin Depths**

Default

$V_{s30}$ =260 m/s

$Z_{1.0}$ (ASK14) = 0.475 km

$Z_{1.0}$ (BSSA14) = 0.486 km

$Z_{1.0}$ (CY14) = 0.485 km

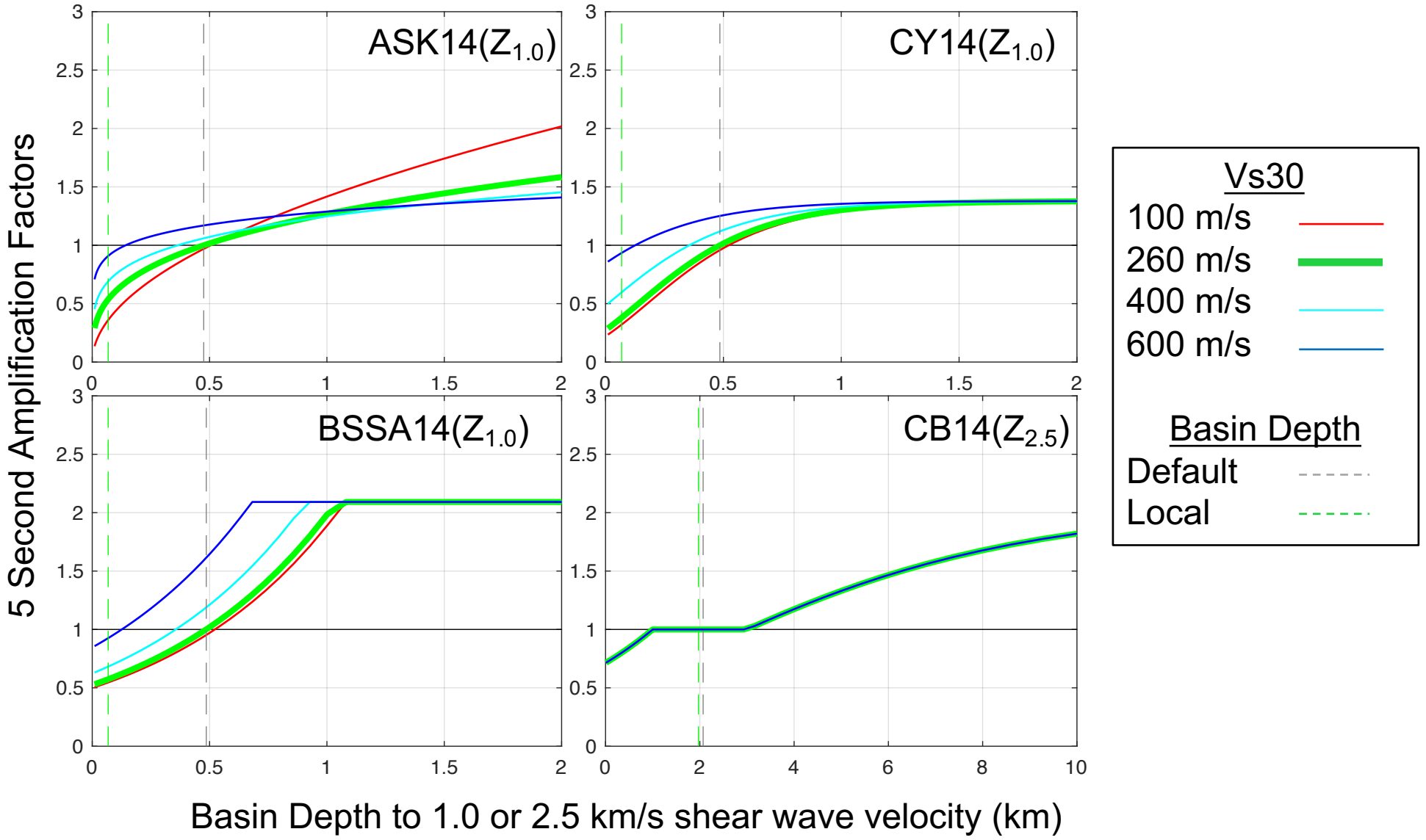
$Z_{2.5}$ (CB15) = 2.07 km

Local (cvm S4.26m01)

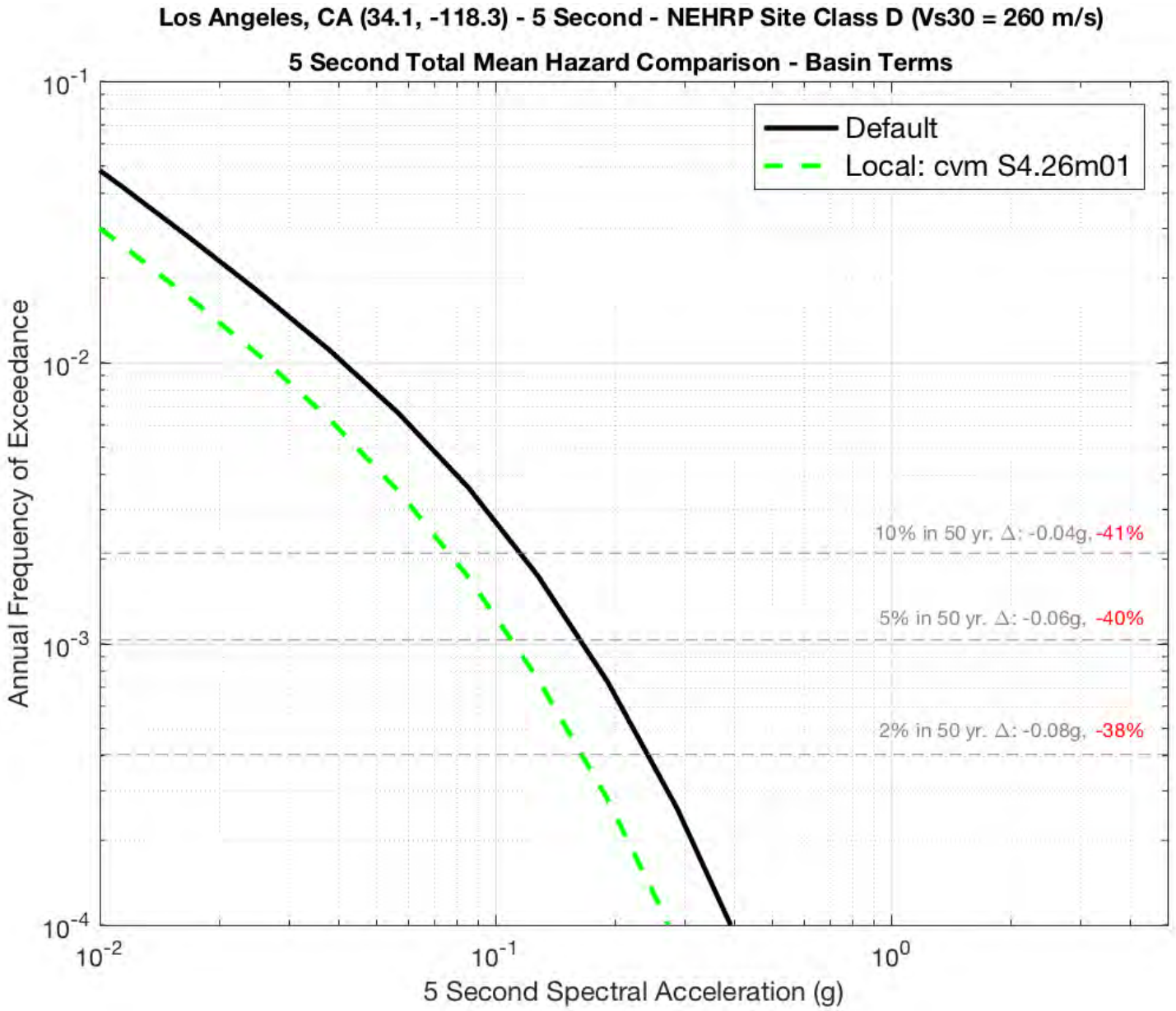
$V_{s30}$ = 353 m/s

$Z_{1.0}$ = 0.068 km

$Z_{2.5}$ = 1.97 km

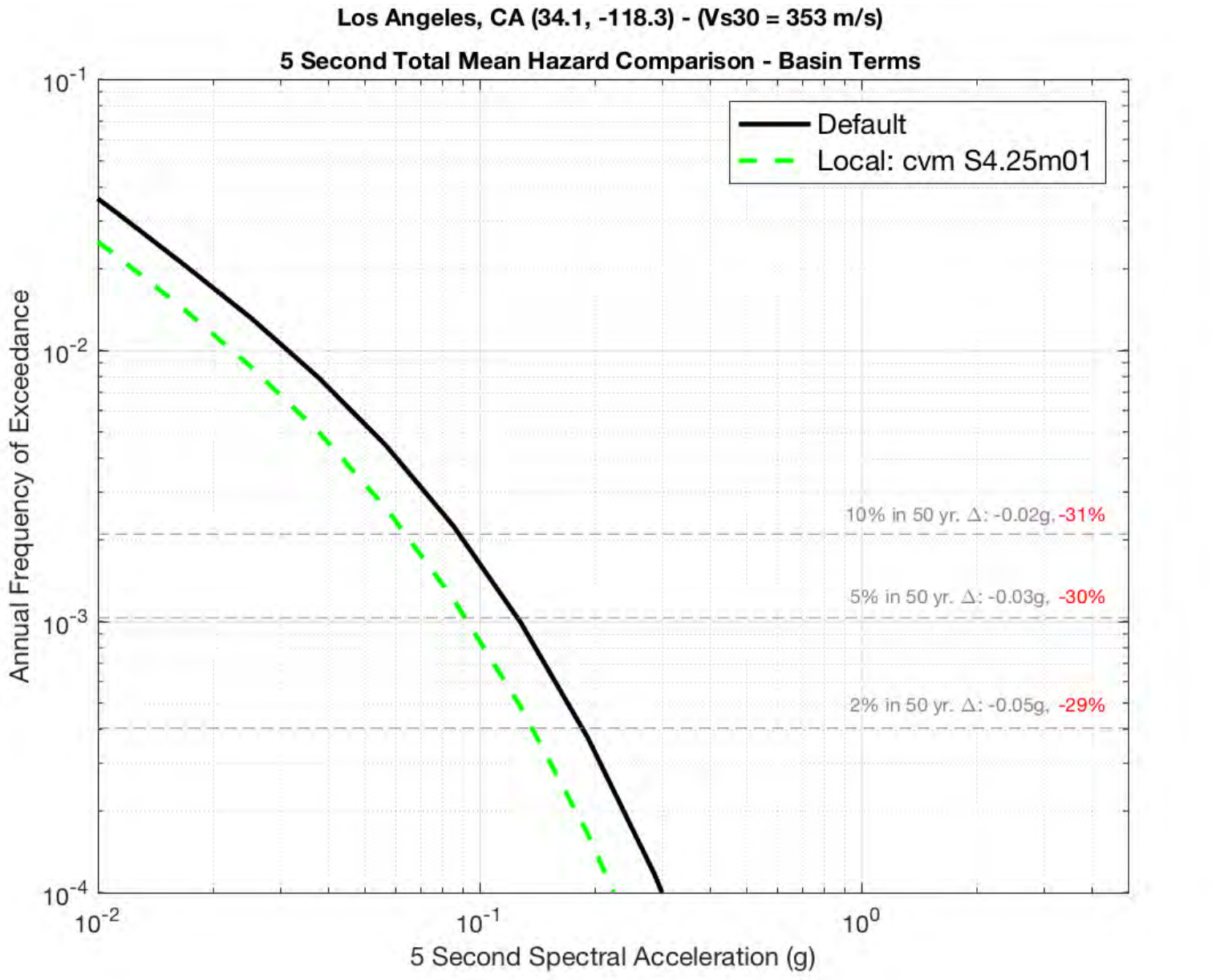


# Hazard Curve Comparisons: Los Angeles, CA

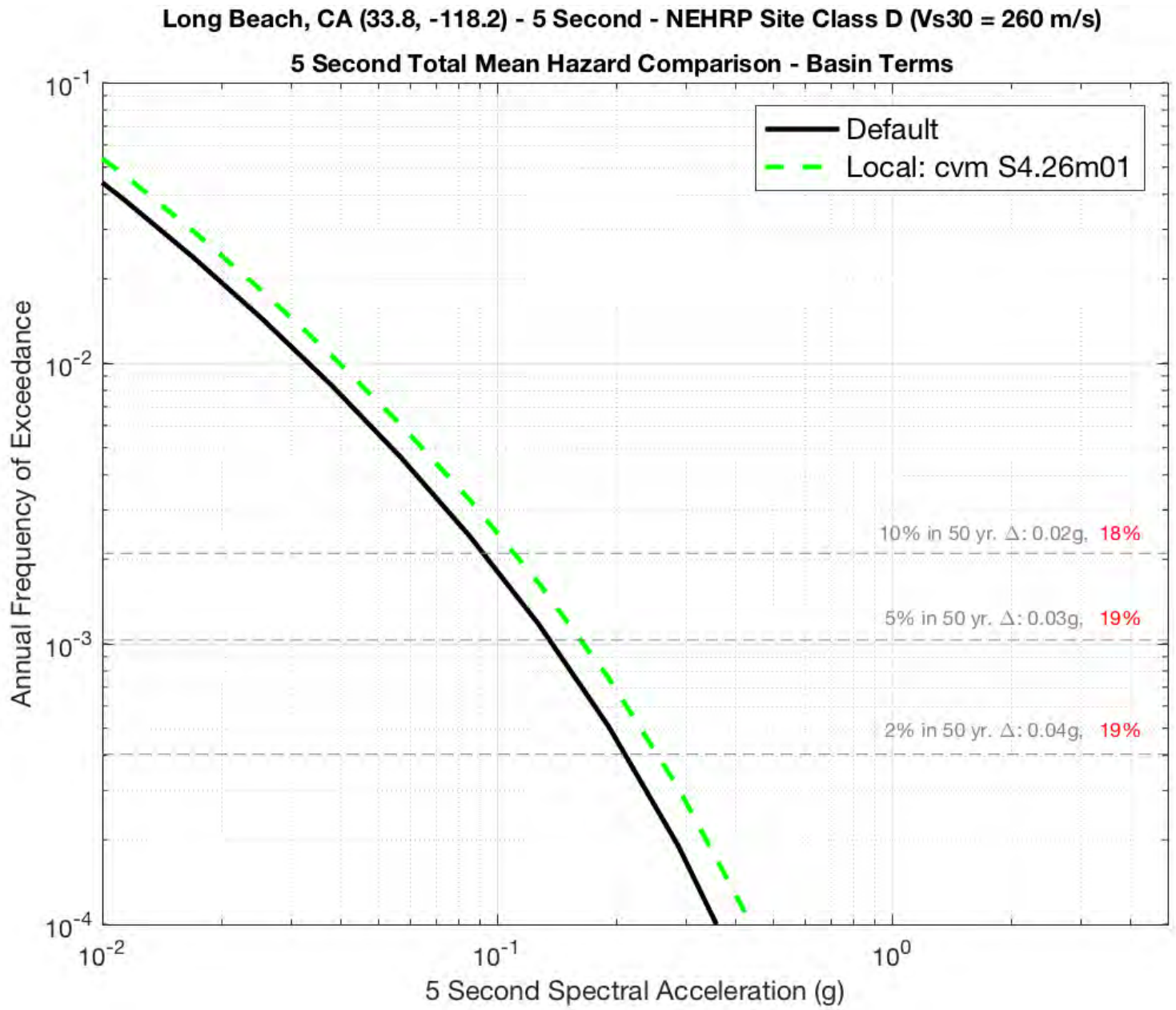



Note: Percent difference in hazard from the local model vs. the default model.

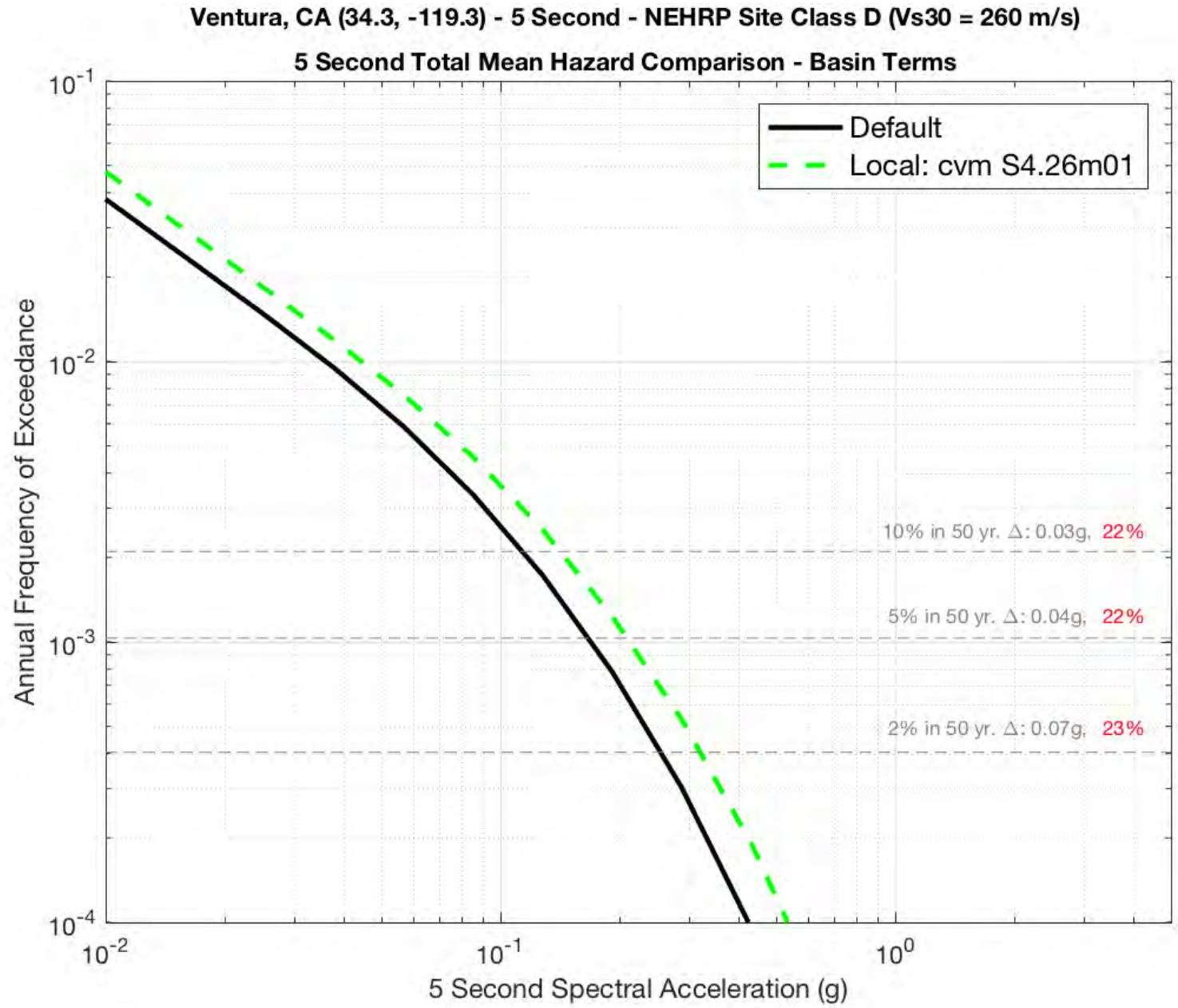
# Hazard Curve Comparisons: Los Angeles, CA



# Hazard Curve Comparisons: Long Beach, CA



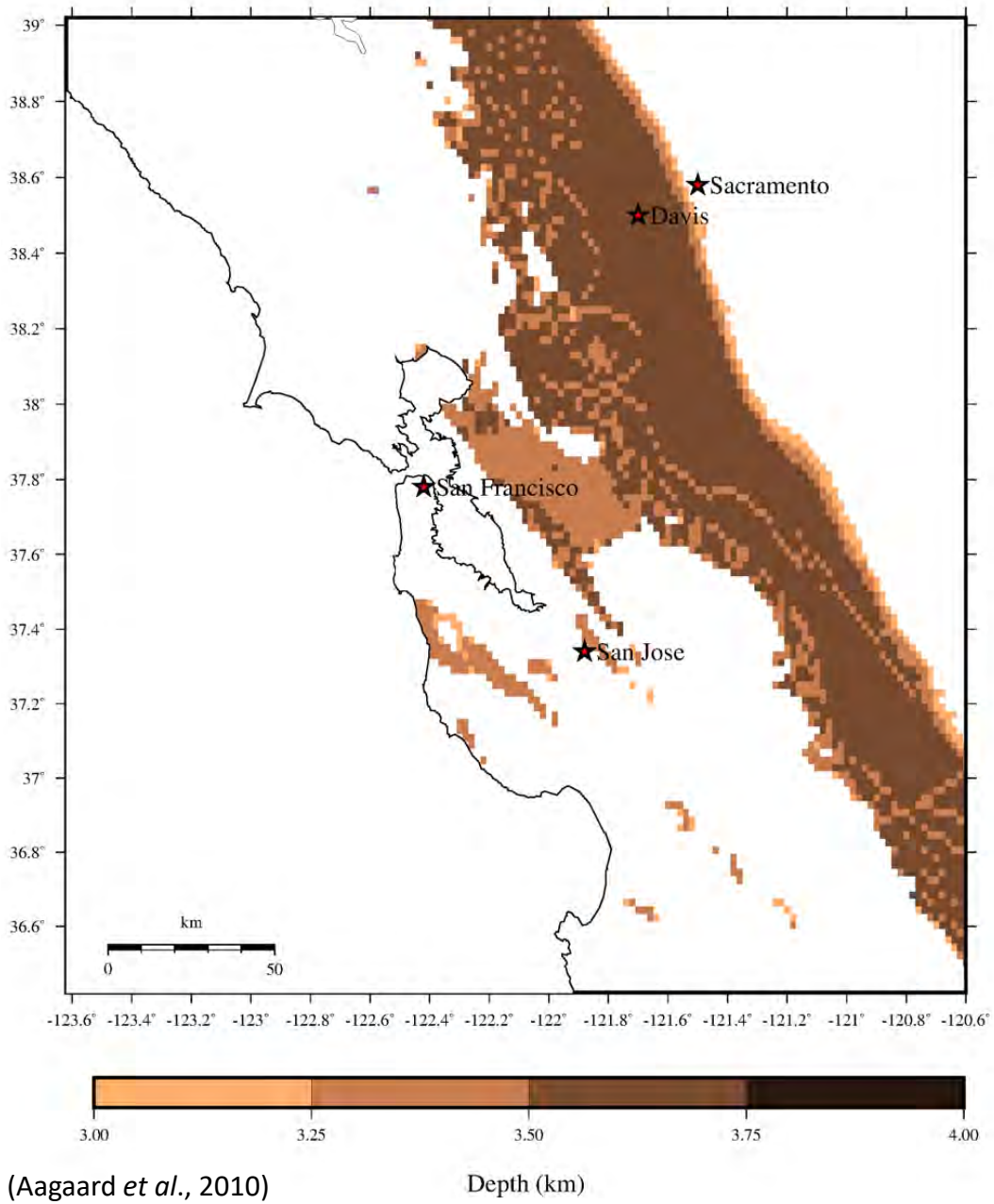
# Hazard Curve Comparisons: Ventura, CA



# Region 2:

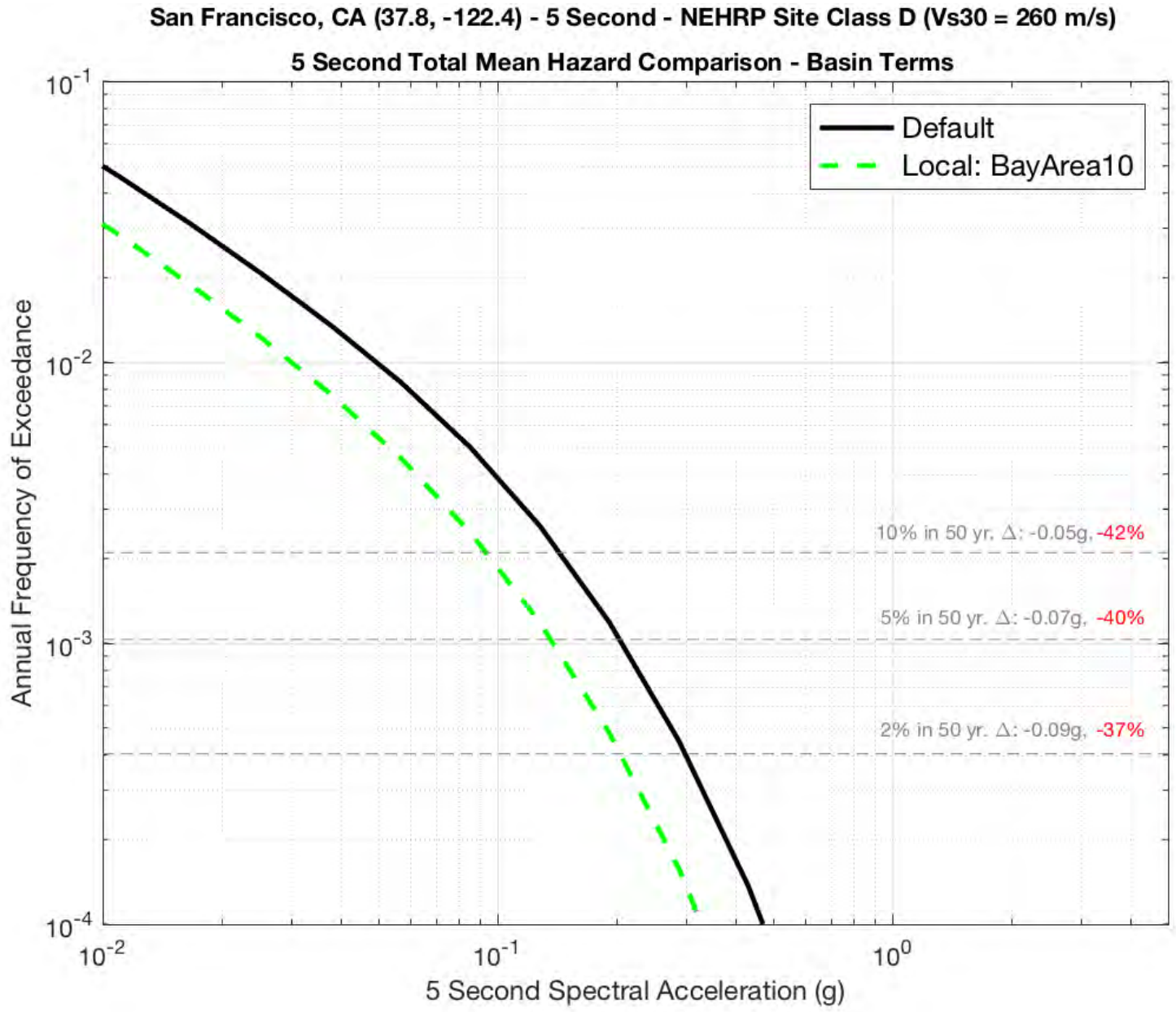
# Bay Area

# Bay Area Basins: Areas Where $Z_{2.5}$ > 3 km

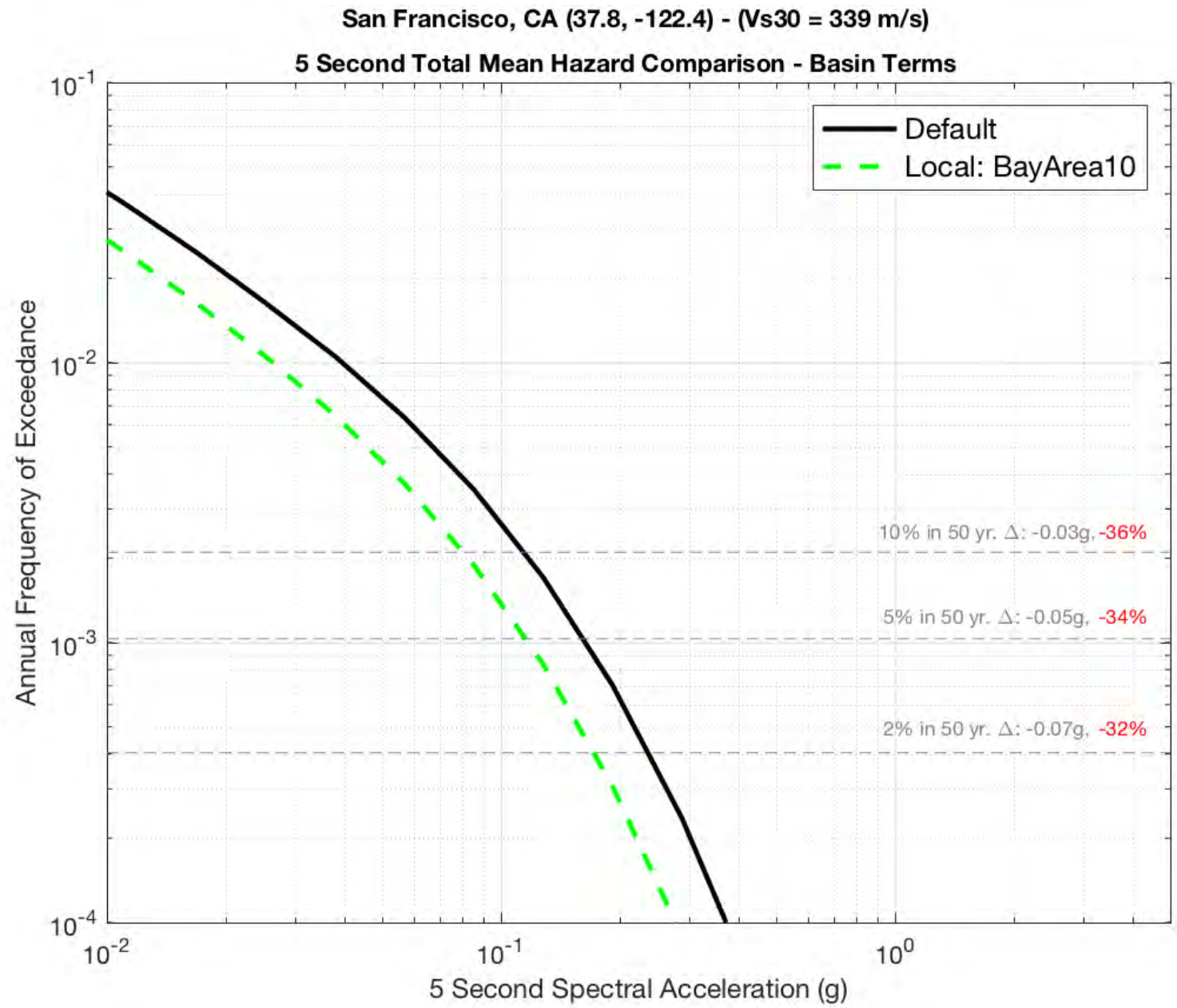



$Z_{2.5}$ values from local seismic velocity model: BayArea10 (Aagaard *et al.*, 2010)

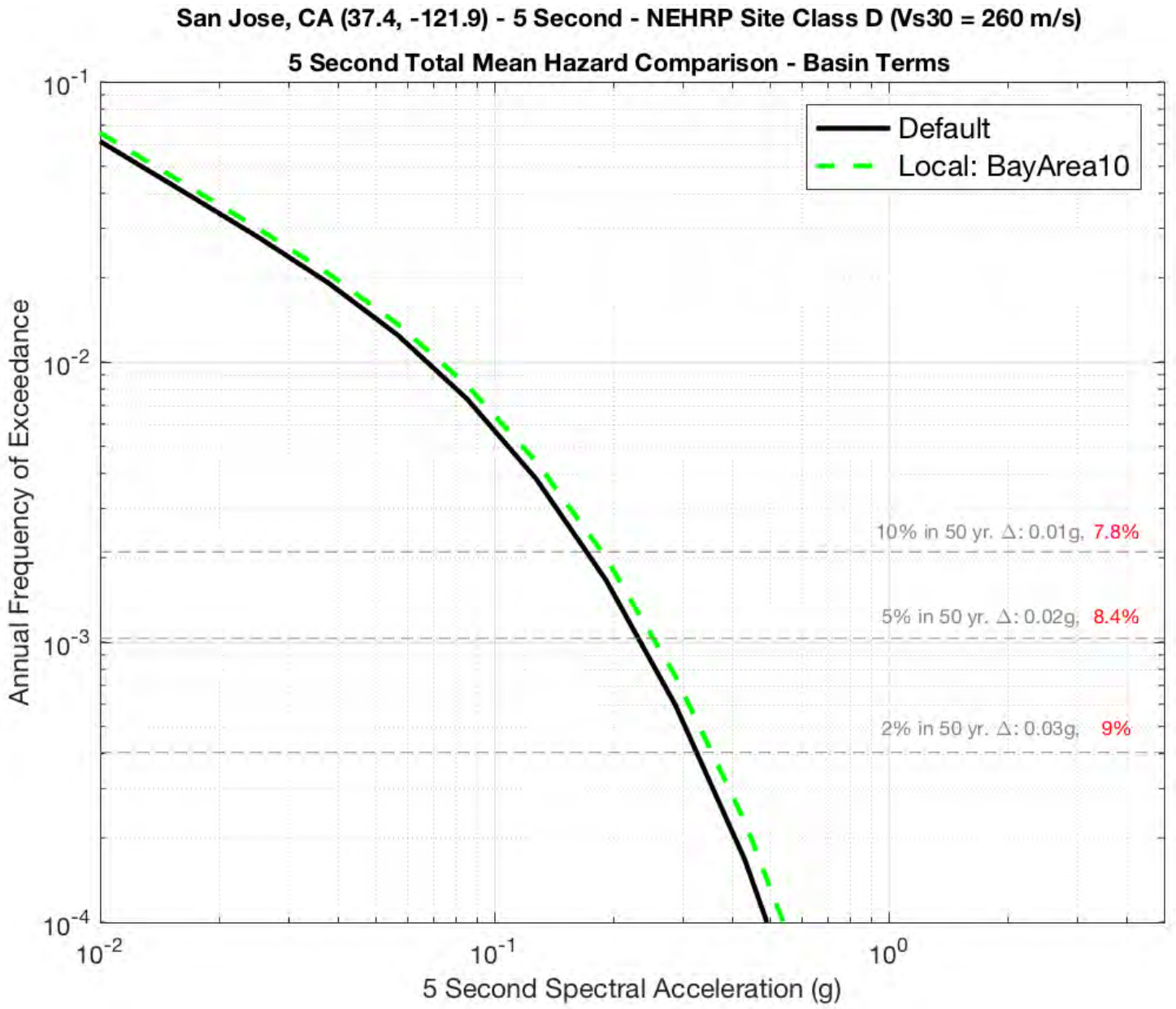
# Hazard Curve Comparisons: San Francisco, CA



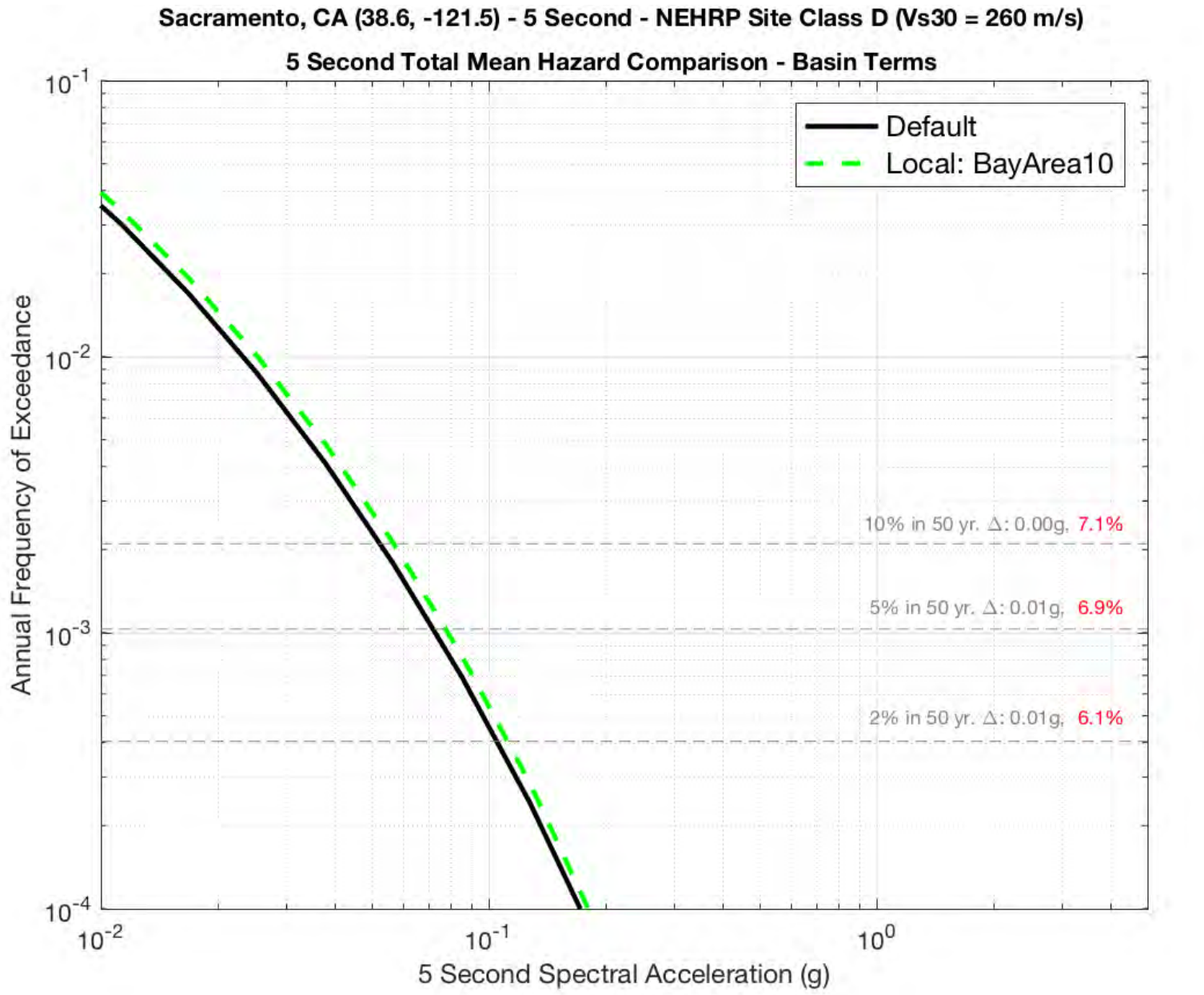
# Hazard Curve Comparisons: San Francisco, CA



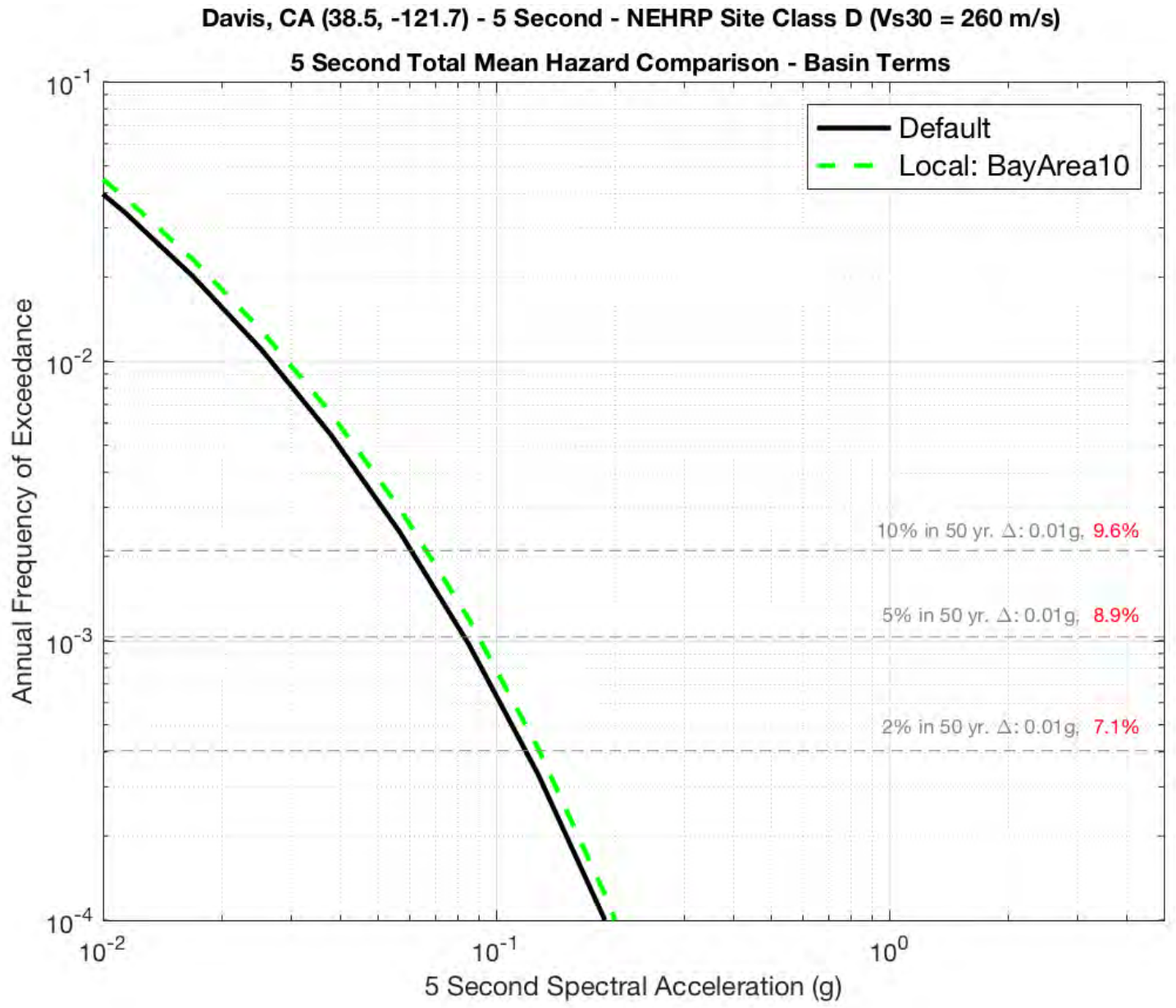
# Hazard Curve Comparisons: San Jose, CA



# Hazard Curve Comparisons: Sacramento, CA



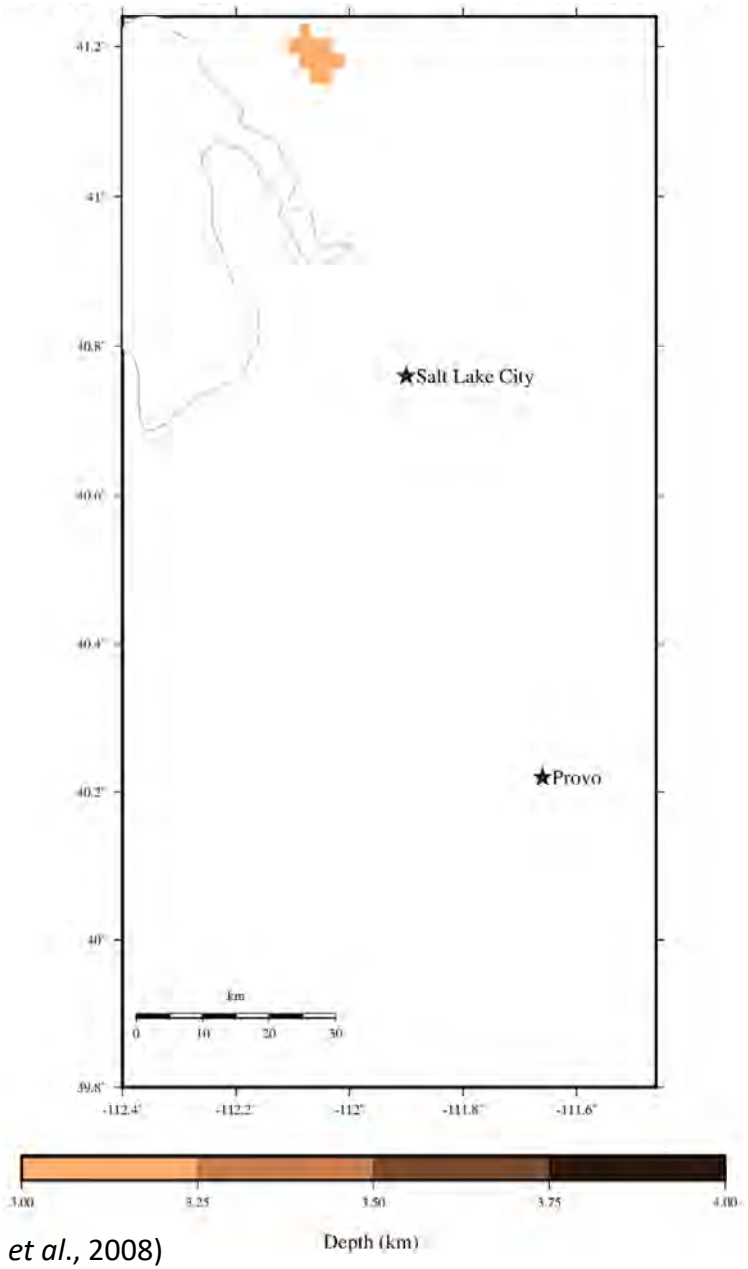
# Hazard Curve Comparisons: Davis, CA



# Region 3:

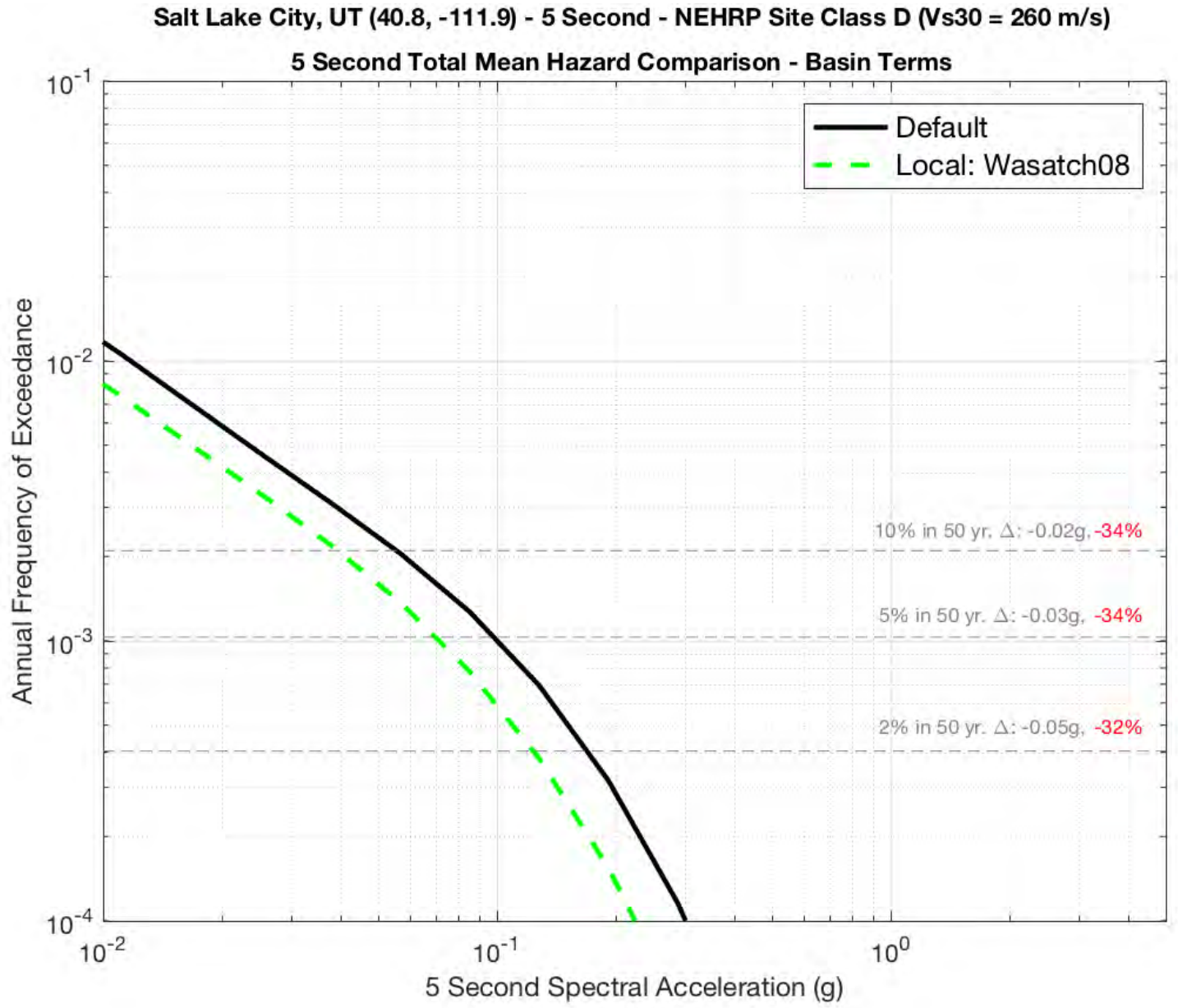
# Wasatch Front

# Wasatch Front Basins : Areas Where $Z_{2.5}$ > 3 km




$Z_{2.5}$ values from local seismic velocity model: Wasatch08 (Magistrale *et al.*, 2008)

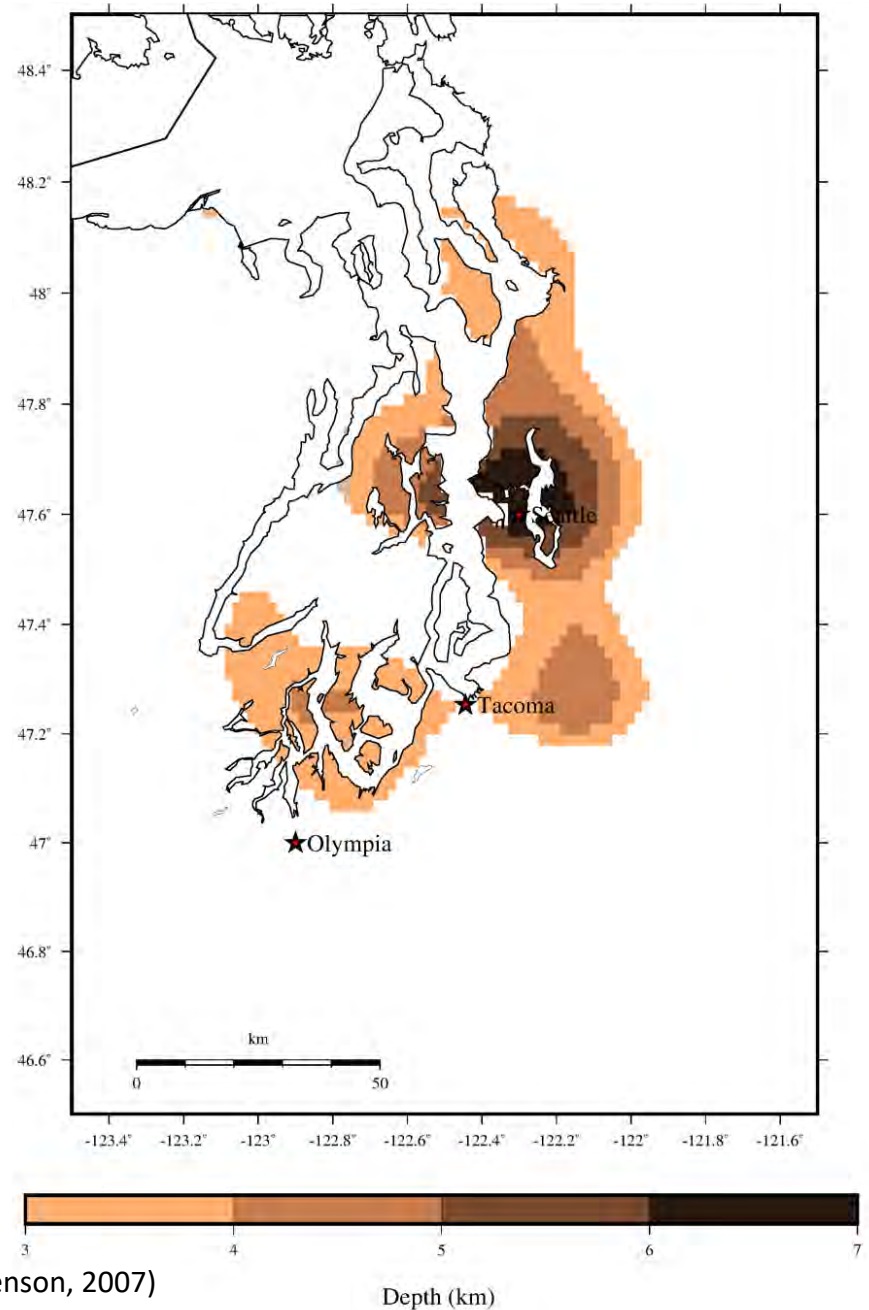
# Hazard Curve Comparisons: Salt Lake City, UT



# Region 4:

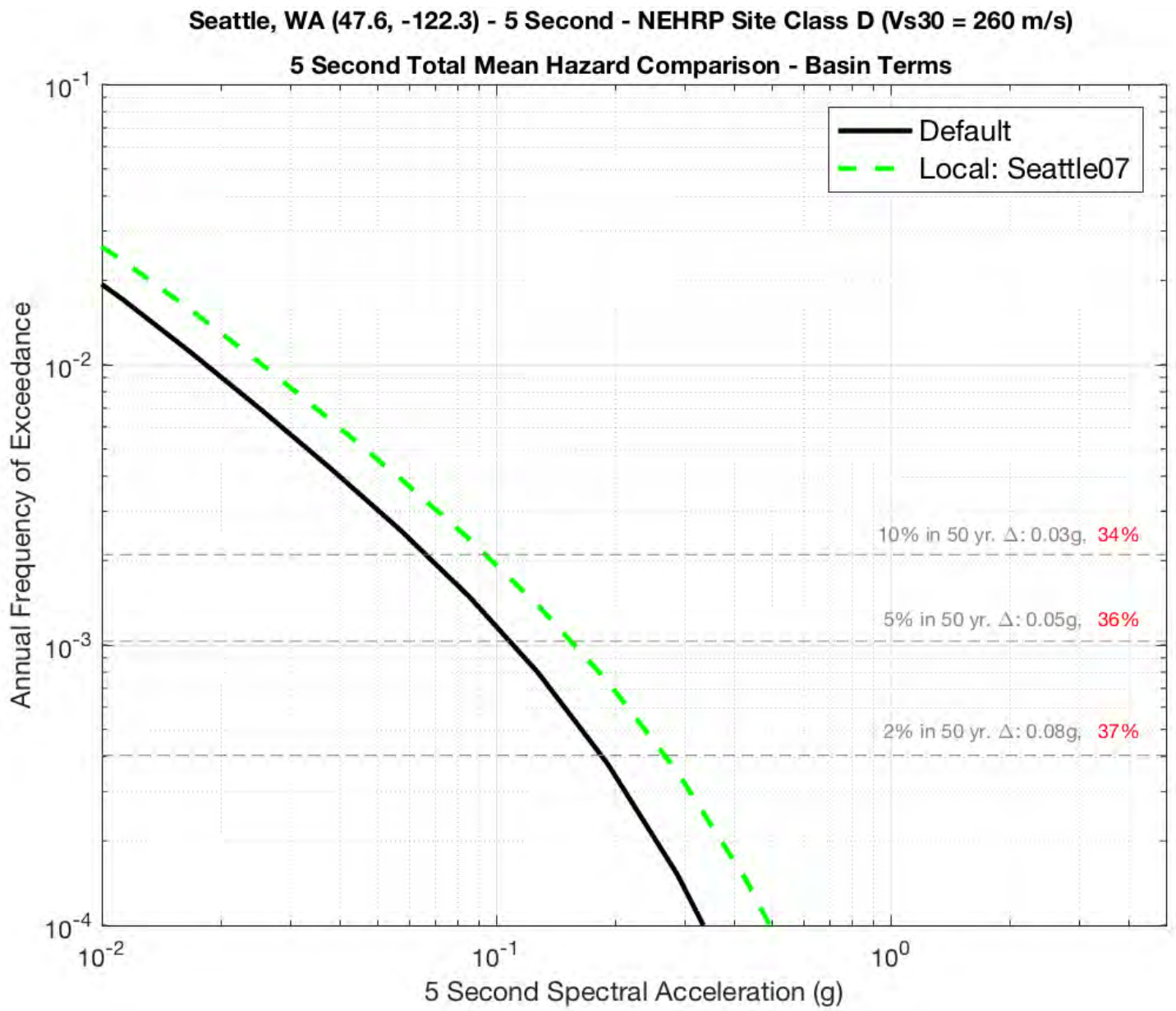
# Seattle Basin

# Seattle Basin: Areas Where $Z_{2.5}$ > 3 km

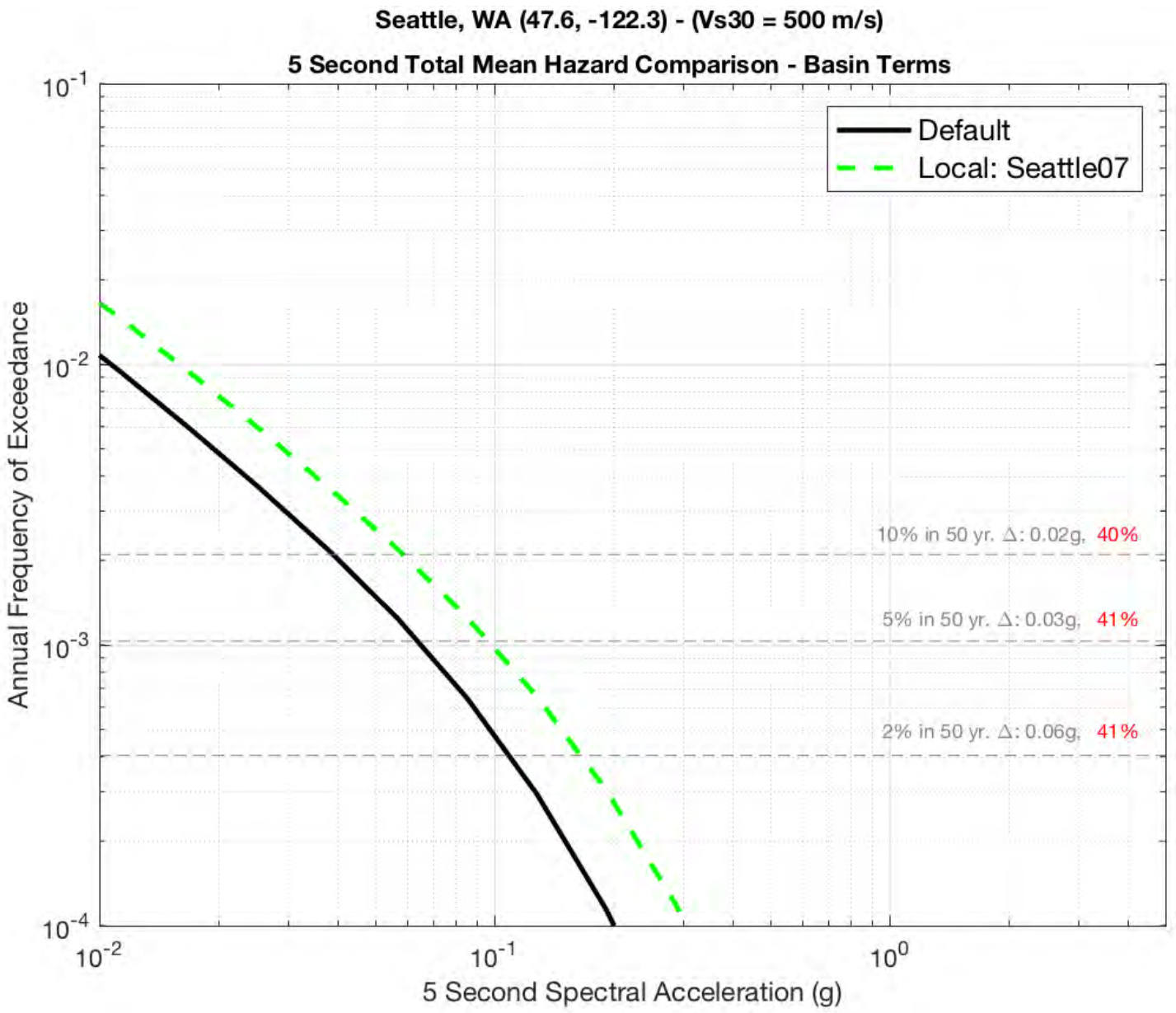



$Z_{2.5}$ values from local seismic velocity model: Seattle07 (Stephenson, 2007)

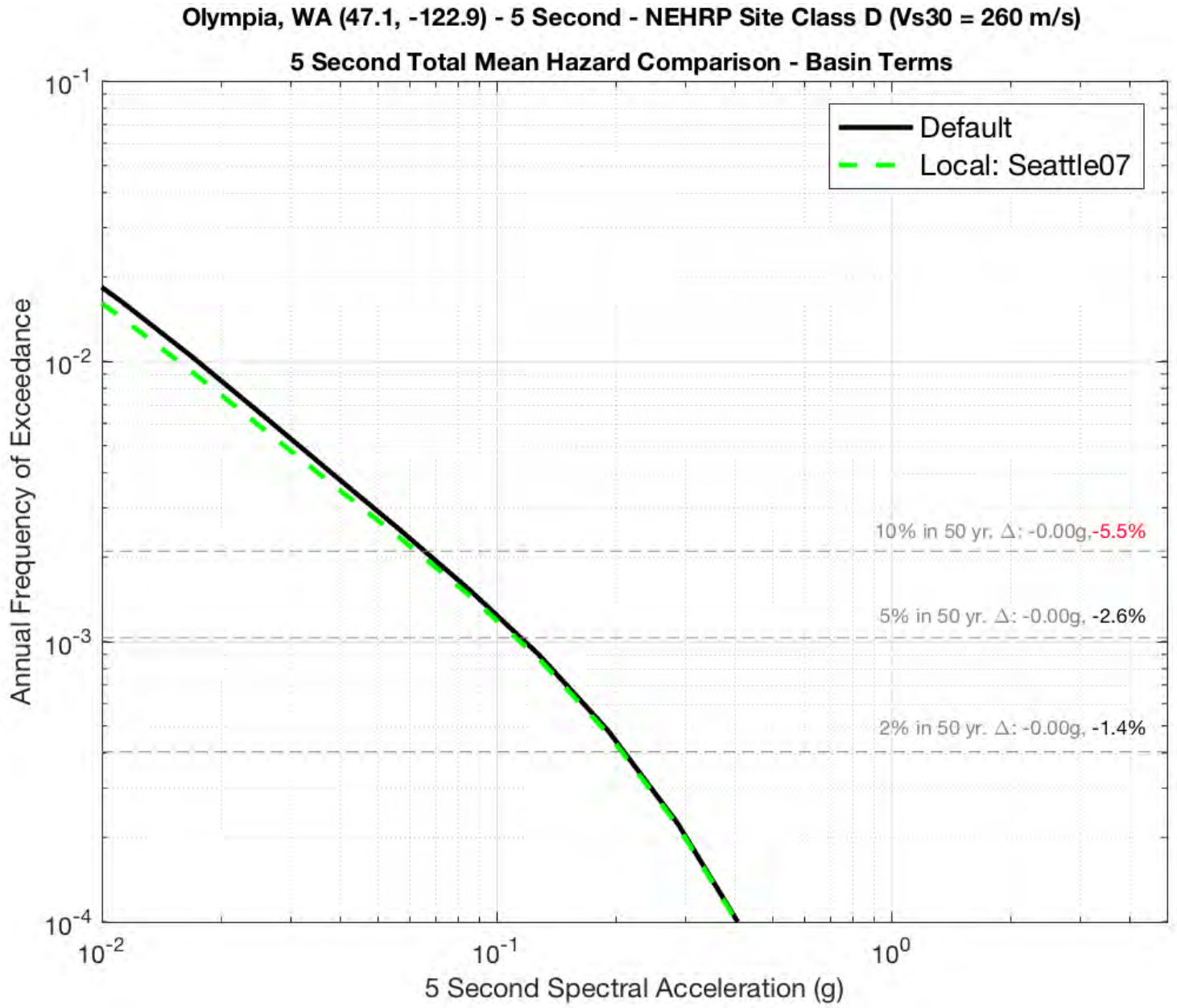
# Hazard Curve Comparisons: Seattle, WA



# Hazard Curve Comparisons: Seattle, WA



# Hazard Curve Comparisons: Olympia, WA



# Summary/Discussion

- For the Los Angeles, Bay Area, and Seattle regions, a large portion of the area is underlain by the deepest portion of the basin ($Z_{2.5}$ > 3 km). However, in Salt Lake City, most of the basin is shallow.

- For Long Beach, Ventura, and Seattle, which lie above the deepest part of the basin, the hazard from the local model is ~20-40% higher than the default model.

- For Los Angeles and San Francisco, which lie outside the deepest part of the basin, the hazard from the local model is ~35-40% lower than the default model.