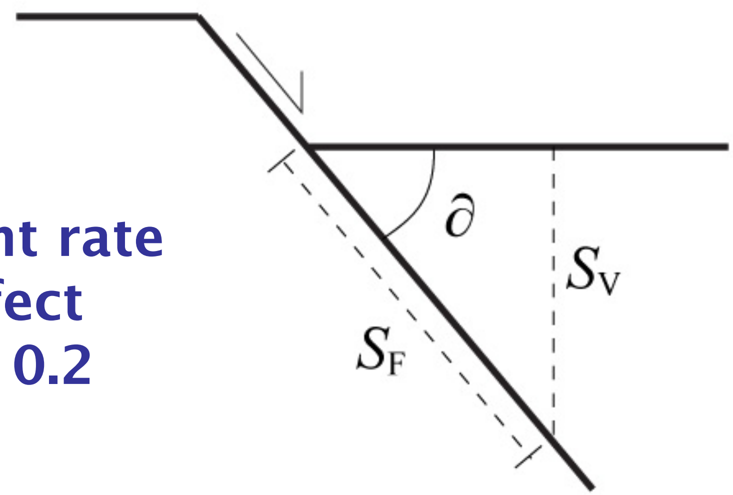
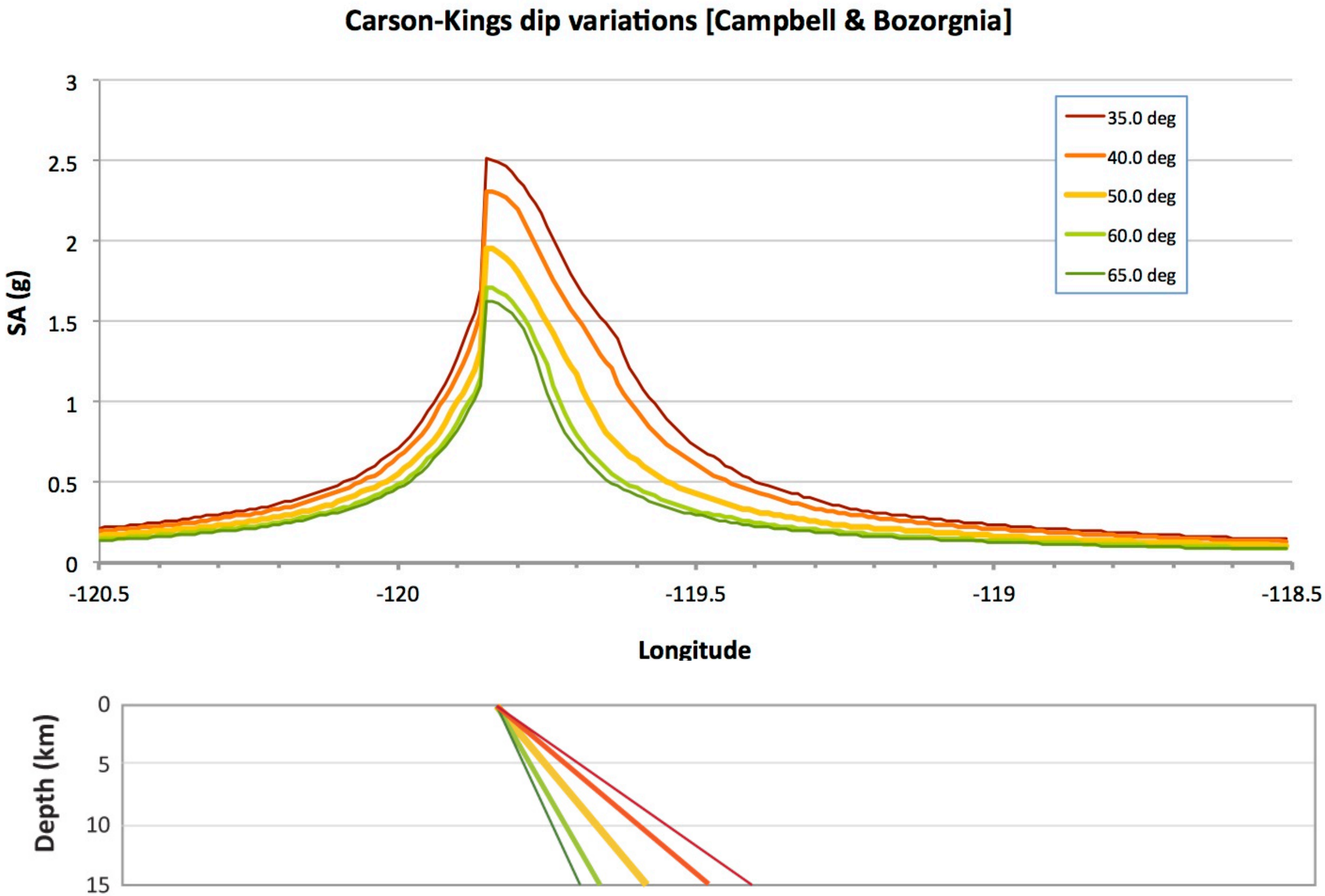
IMW normal fault event rate (2008)

Given vertical slip rate (S_V), length (L), and dip (∂):

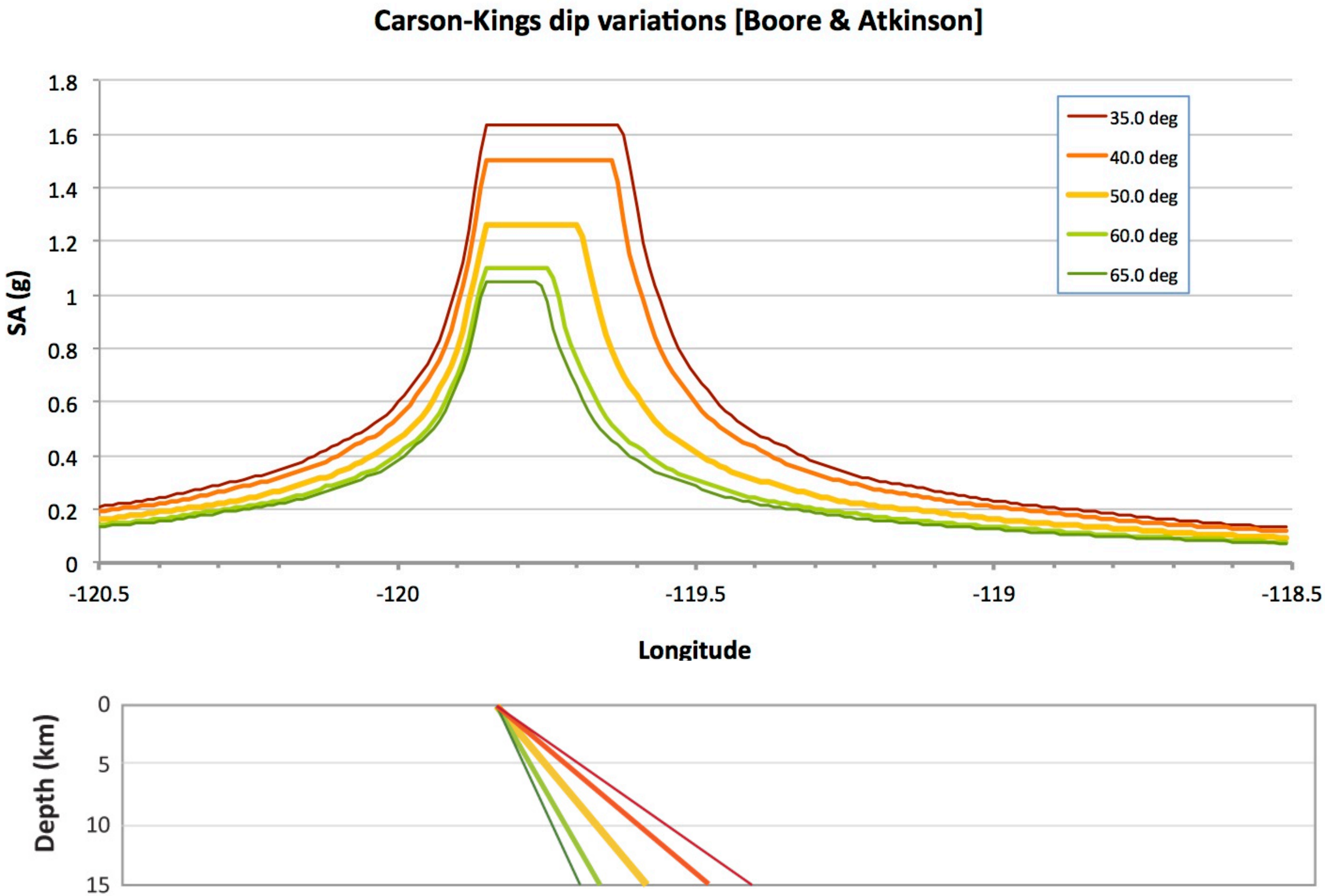
- Compute source magnitude and M_0 using generic WC94 Mag–Length relationship
- Slip rate $S_F = S_V/\sin(\partial)$
- Fault width $W = 15\text{km}/\sin(\partial)$
- Moment rate for geometry $\dot{m}_0 = \mu S_F W L$
- Event rate: $\dot{m}_0 / M_0$



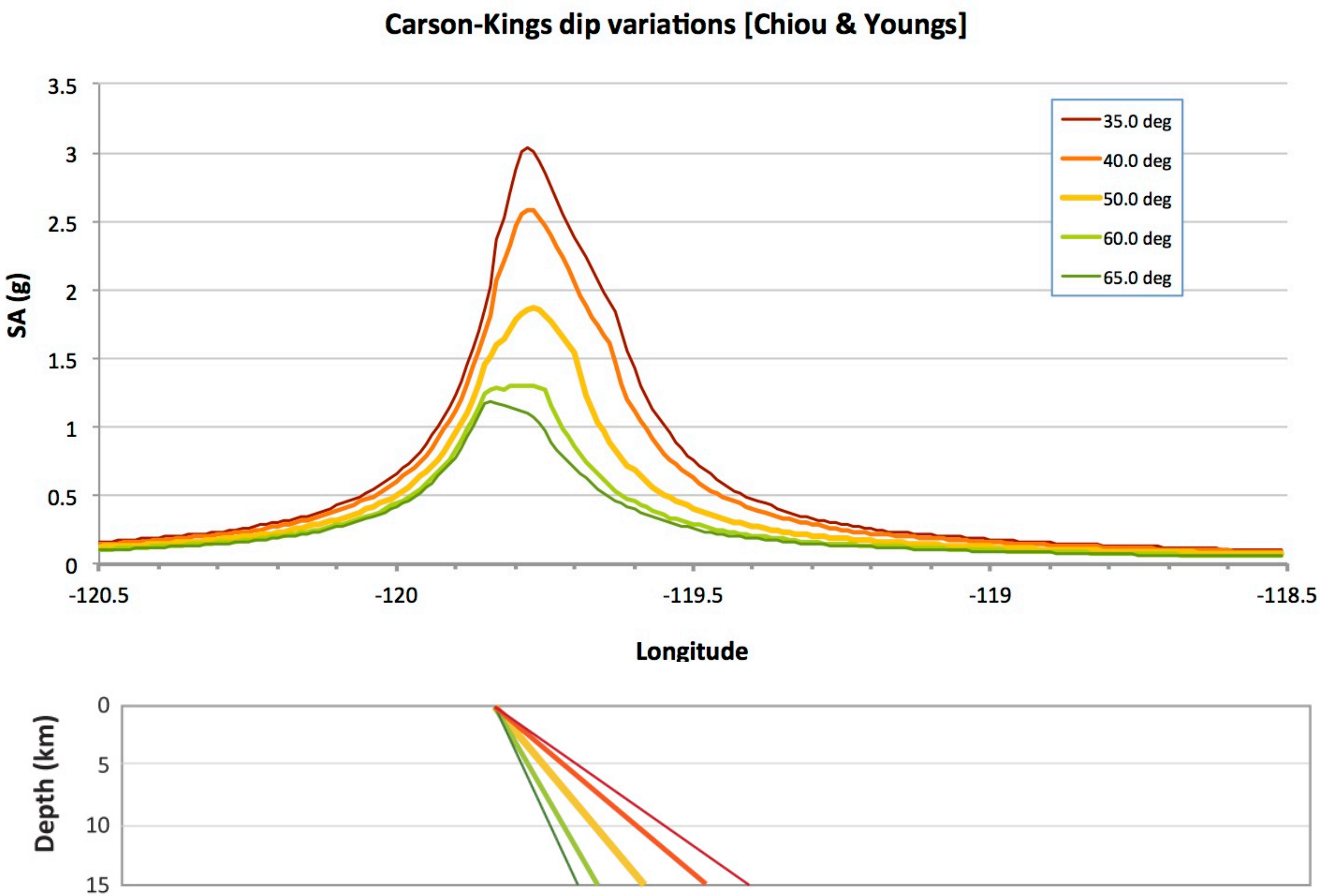
Shallow dip = increased event rate
Branch weights reduce effect
40˚= 0.2 50˚= 0.6 60˚= 0.2



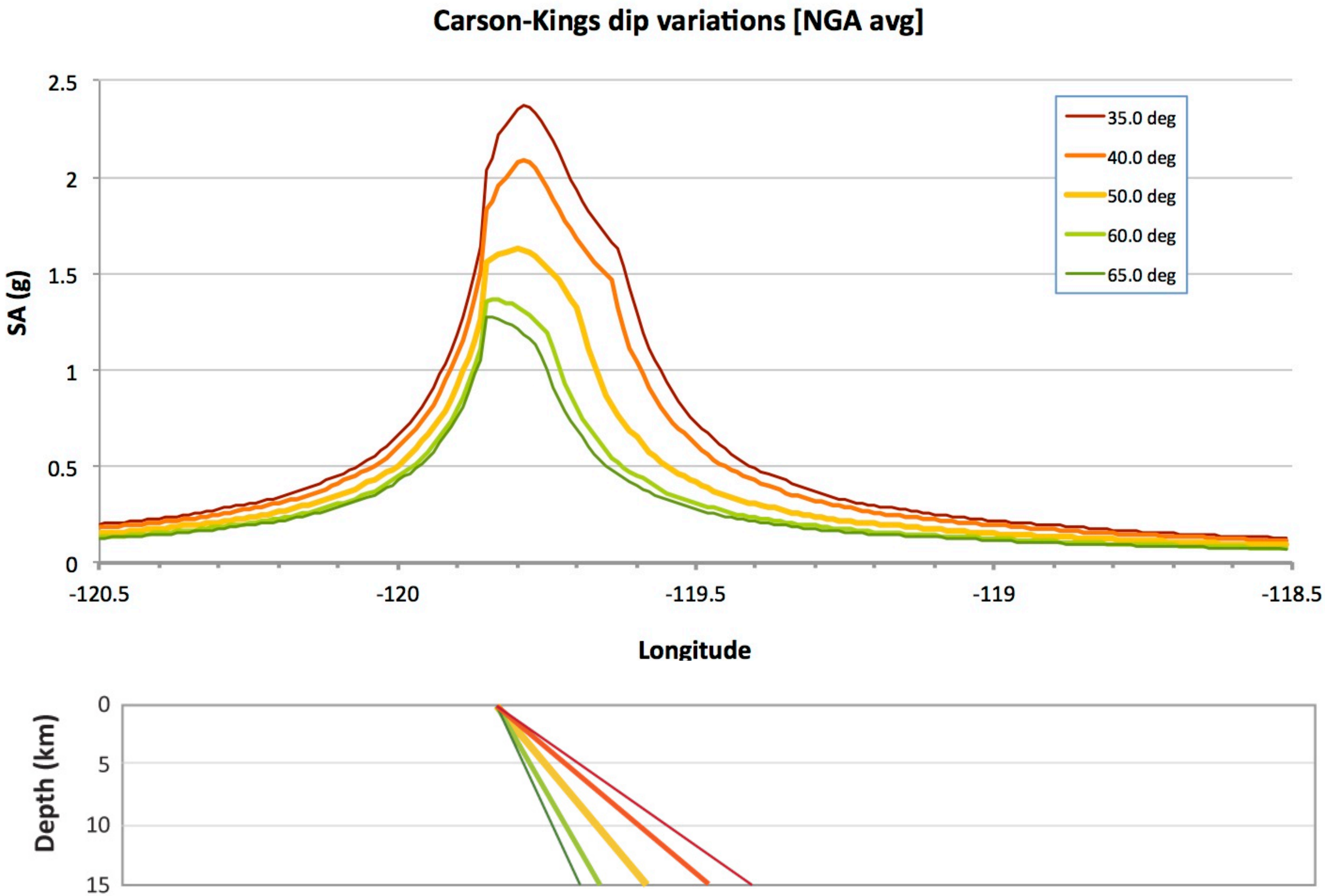
2% PE in 50 yrs. @ 0.3 sec SA



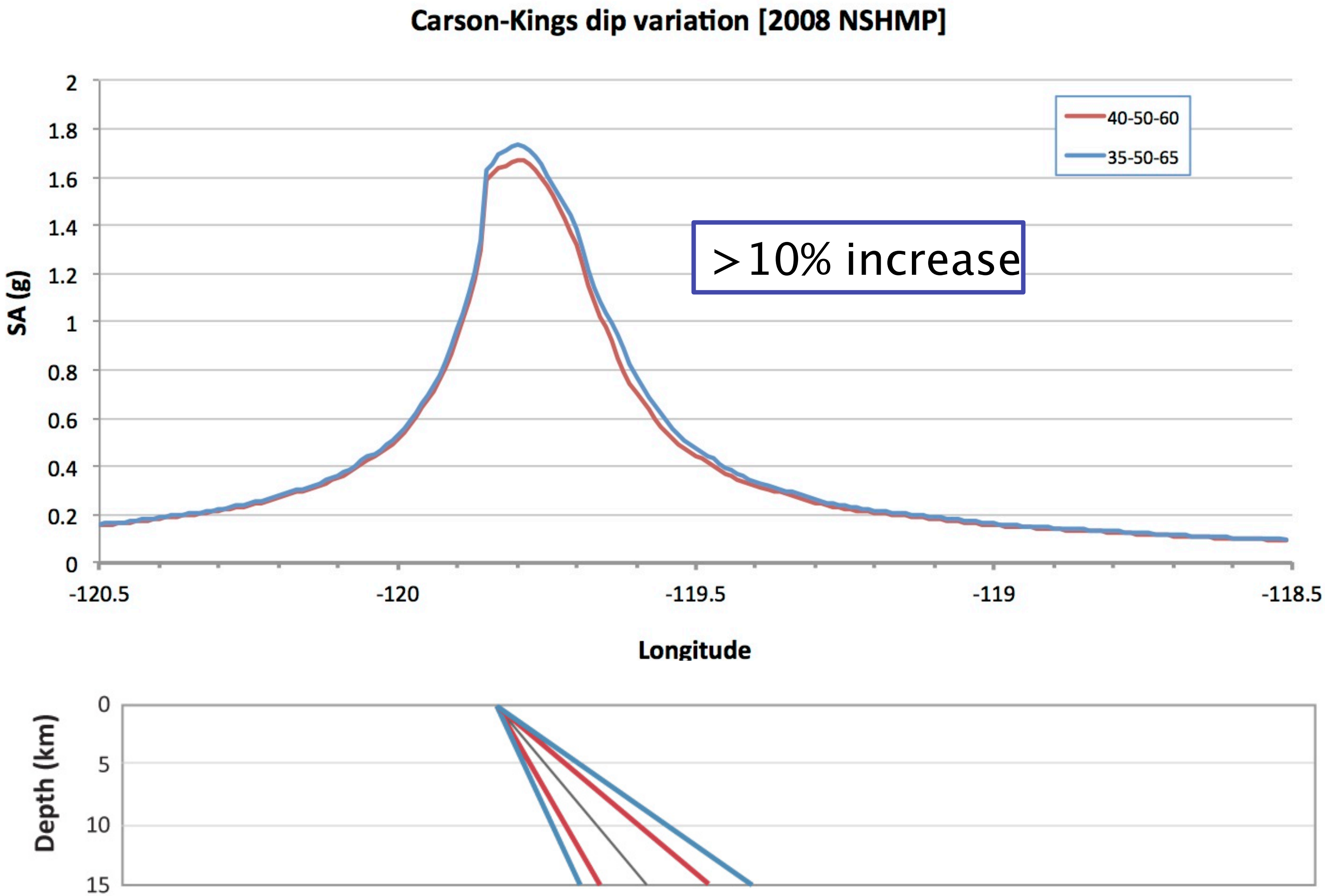
2% PE in 50 yrs. @ 0.3 sec SA



2% PE in 50 yrs. @ 0.3 sec SA



2% PE in 50 yrs. @ 0.3 sec SA



2% PE in 50 yrs. @ 0.3 sec SA

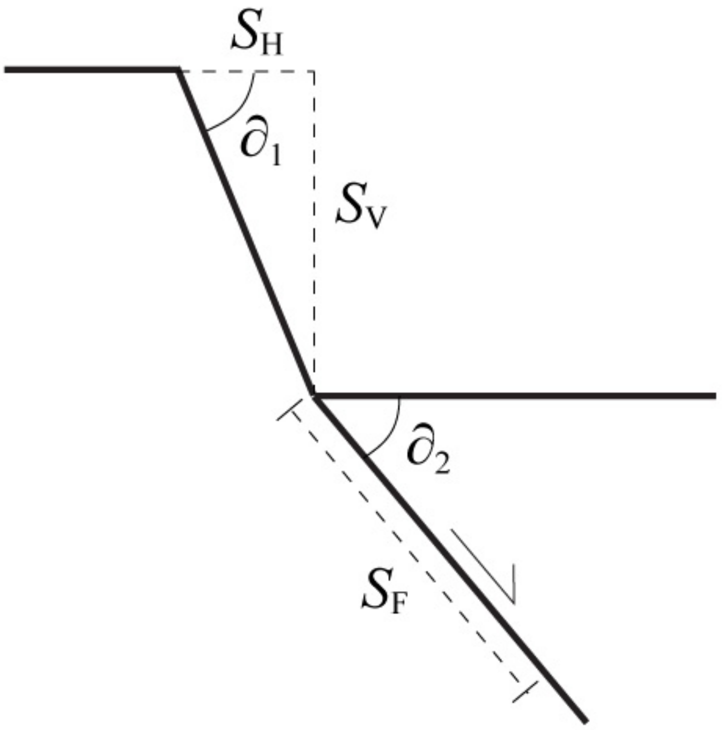
IMW normal fault event rate alternative

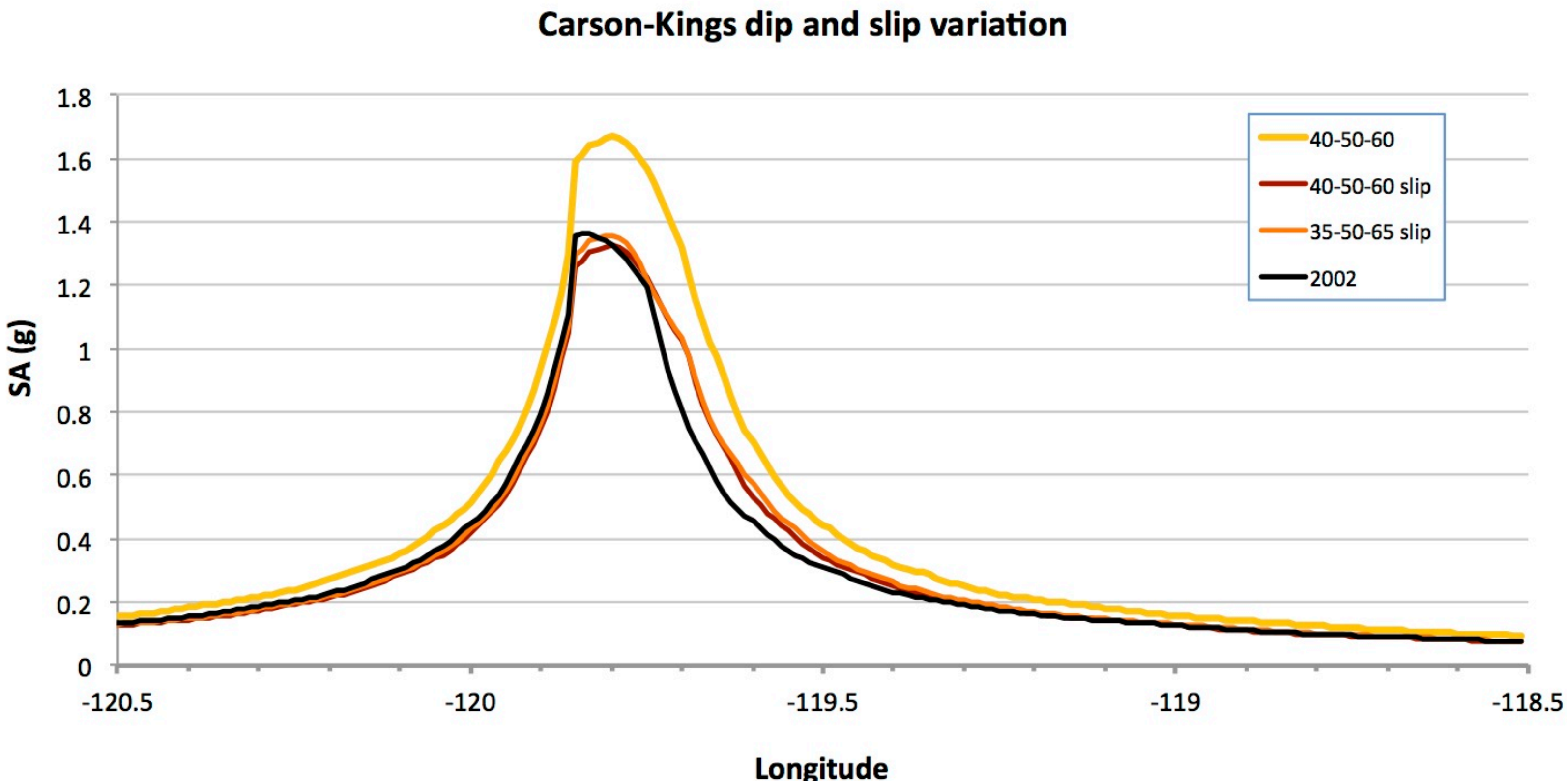
Given vertical slip rate (S_V), length (L), and dip (∂_1), and an average observed trace dip (∂_2):

- Constrain slip on fault to be consistent with horizontal slip (S_H) implied by steep surface dip

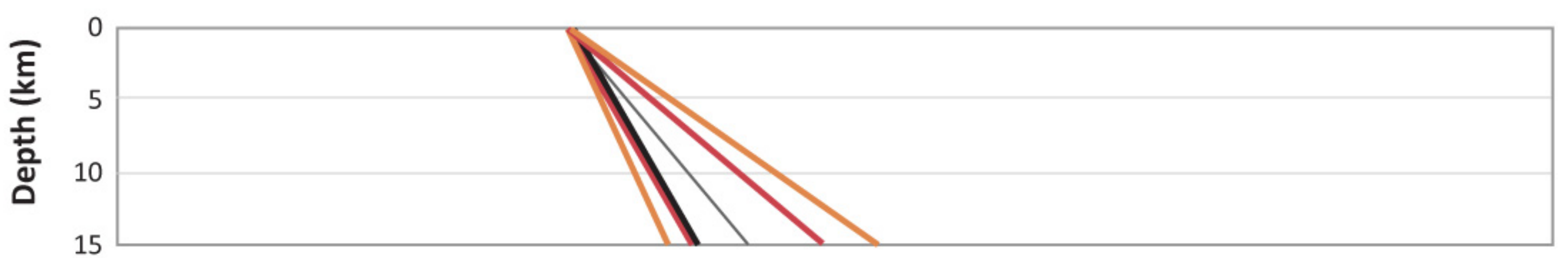
- Slip rate $S_F = S_V/\tan(\partial_1)/\cos(\partial_2)$

Rate and ground motion reduction relative to 2008





Carson-Kings dip and slip variation
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
SA (g)
-120.5
-120
-119.5
-119
-118.5
Longitude
40-50-60
40-50-60 slip
35-50-65 slip
2002



0
5
10
15
Depth (km)

0.3 sec SA

Dip variation & ground motion

- Broader range of dip uncertainty increases hazard

- Consider alternative geometric slip models