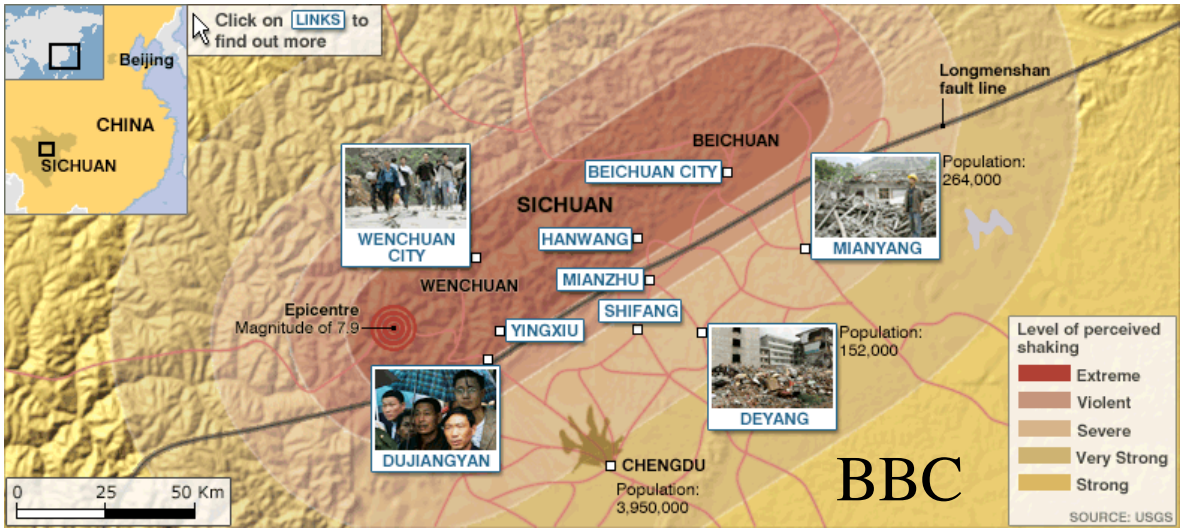
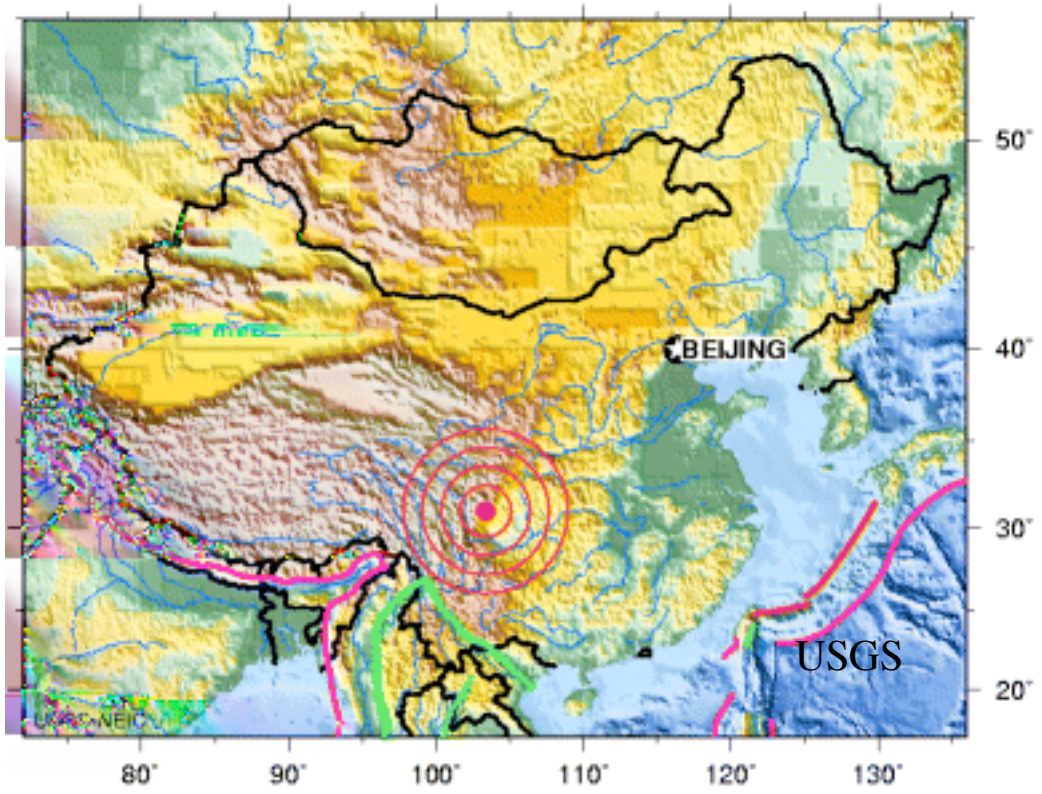
SICHUAN EARTHQUAKE May 12, 2008



David Gilkey, NPR

Two of the 48 pandas that live at China's Chengdu Research Base of Giant Panda Breeding frolic on an outdoor climbing structure.

1. Find the seismic moment



EASTERN SICHUAN, CHINA

2008 05 12 06:28:01 UTC 30.98N 103.36E Depth: 19 km, Magnitude: 7.9


MAY 14, 2008 - Collapsed buildings are seen in Beichuan county, China. (Yang Lei/Xinhua/AP)

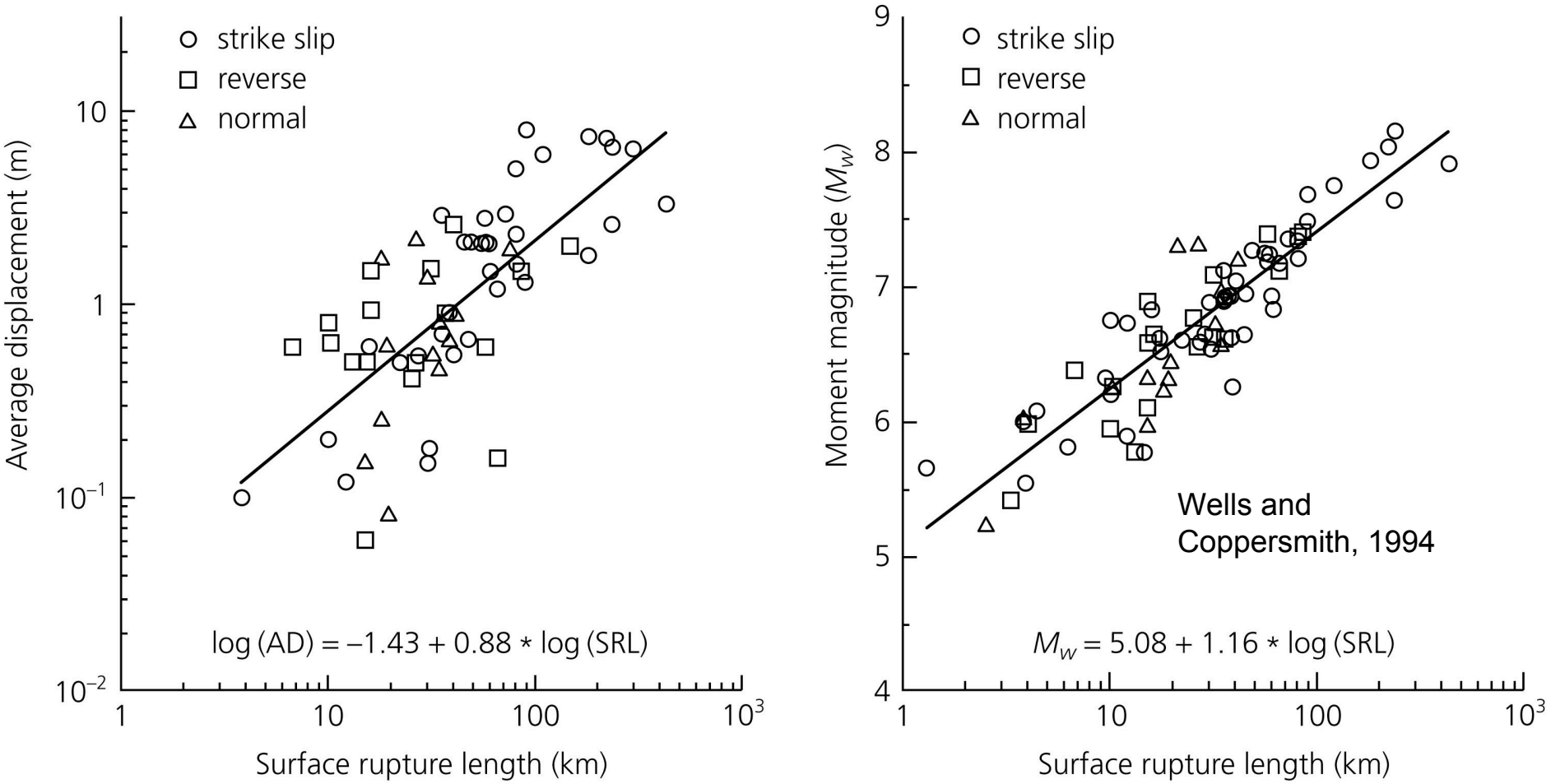
SEISMIC MOMENT M_0 =

fault area x slip x rigidity

MOMENT MAGNITUDE M_w =

2/3 x (log M_0 - 9.1)

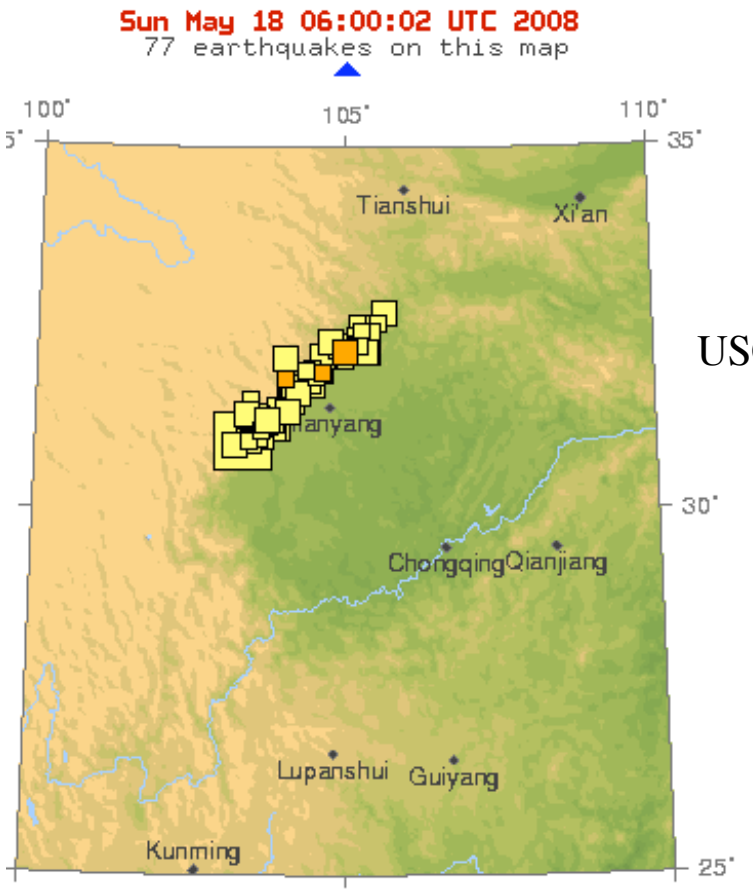
Figure 4.6-7: Empirical relations between slip, fault length, and moment.



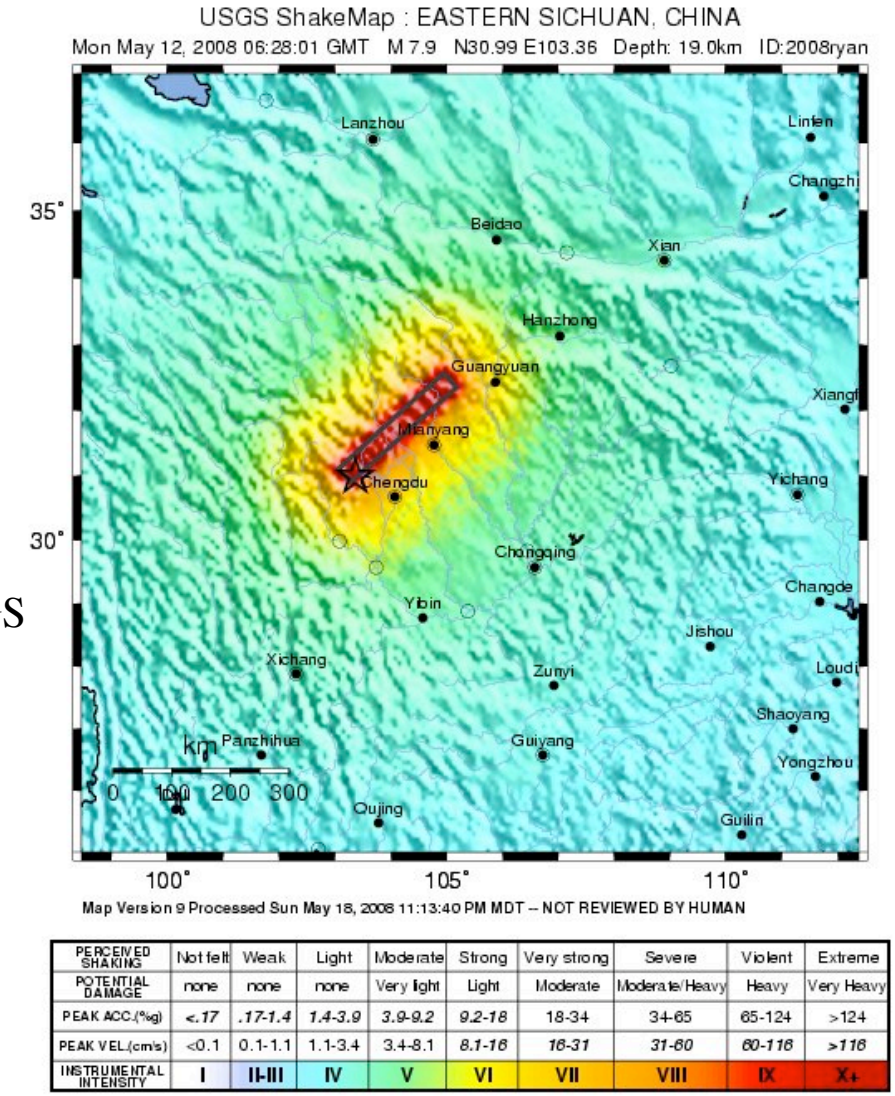
2. Predict the rupture length (km) and average displacement (m)

3. Use these and the moment to predict the downdip dimension (fault width). Use rigidity = $3*10^{10}$ Pa (1 Pascal=$N/m^{2)}$

4. How do the intensity & aftershock distributions compare to the fault parameters you estimated?



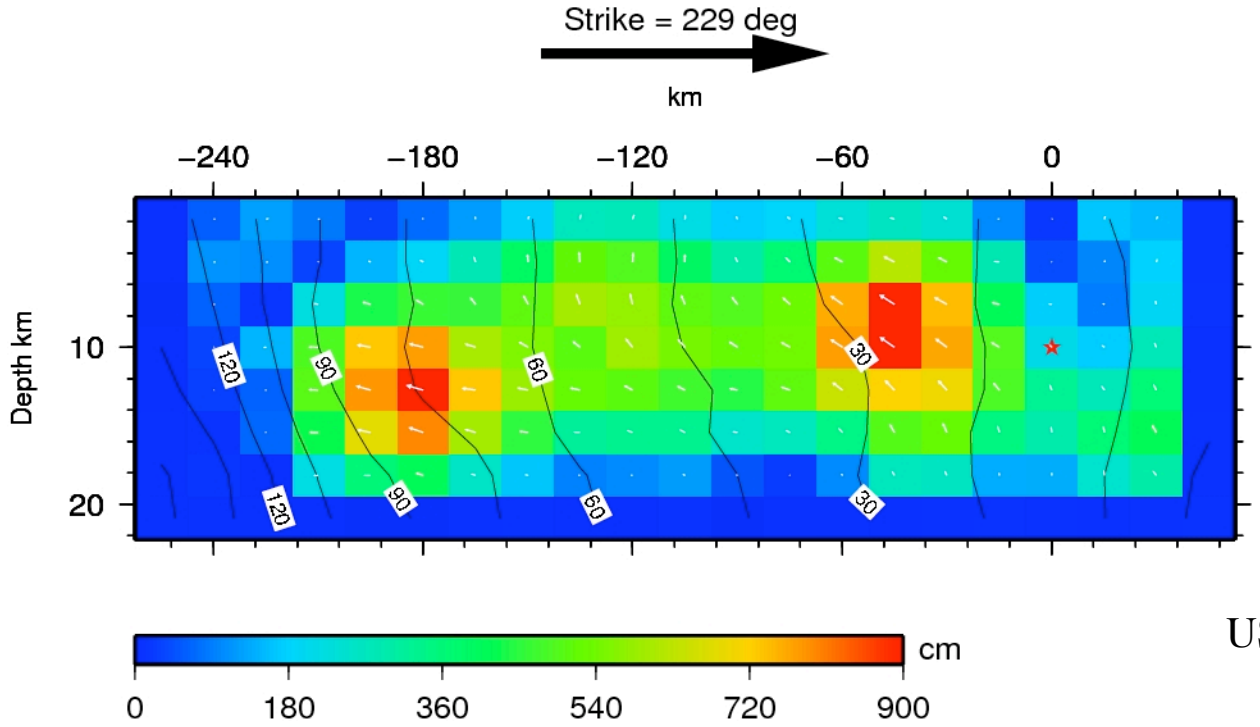
USGS



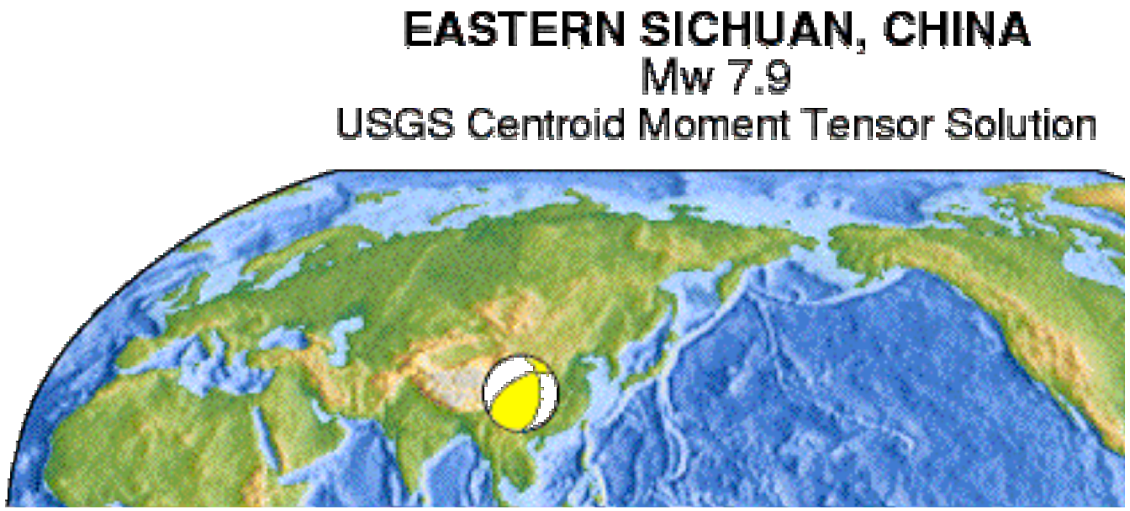
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	*8.1-16*	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

5. How does the slip distribution from body wave modeling compare to the fault parameters you estimated?


Rescuers inspect a crack at Fengshou reservoir dam caused by Monday's 7.9 magnitude earthquake. (Mei Zhen, Xinhua/AP)



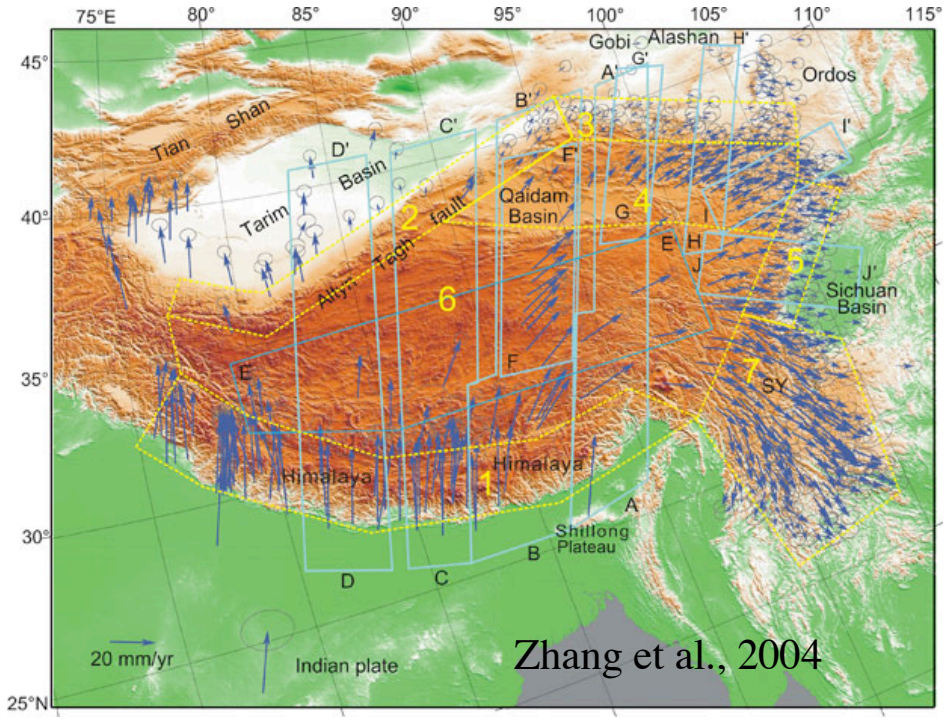
USGS



6. What type of faulting did it involve?

7. Which plane did it occur on?

8. What's the tectonic cause?



Zhang et al., 2004

GPS site velocities wrt Eurasia

USGS