

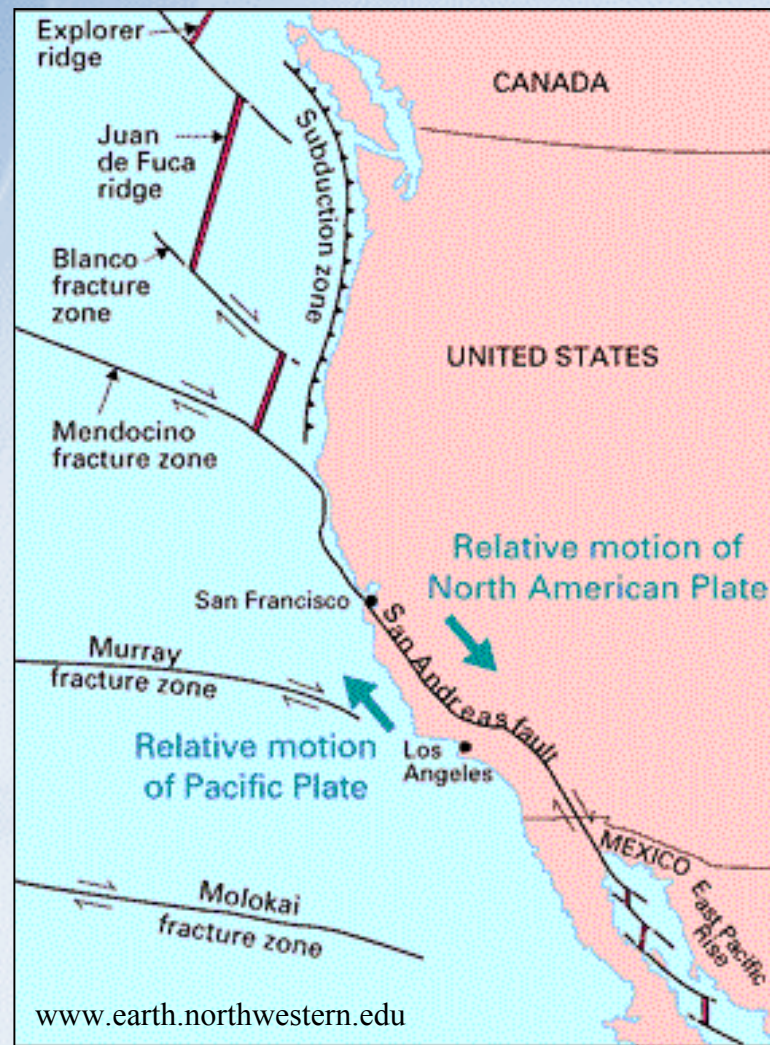
# The Mantle Flow Field beneath Western North America

Silver and Holt, *Science* 295, 1054, 2002

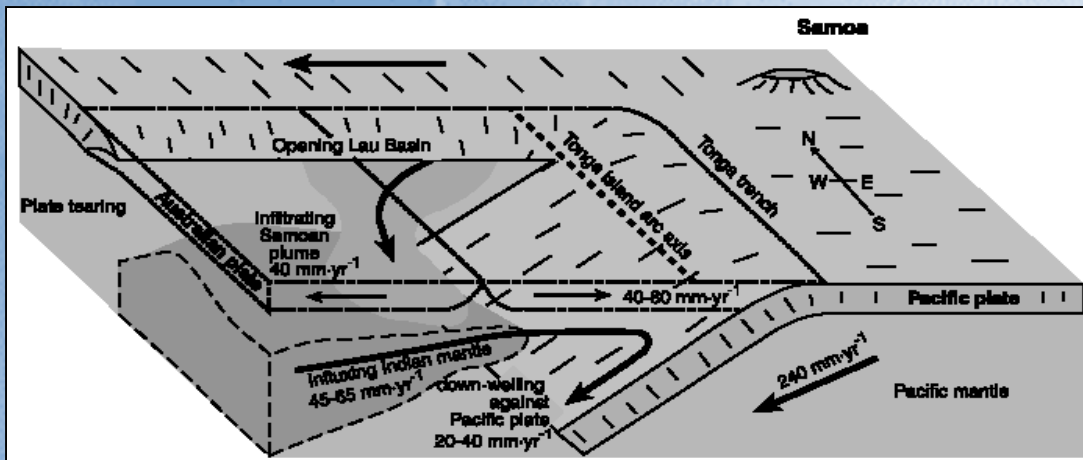
Abigail L. Bull

Earthscope Seminar, January 2007

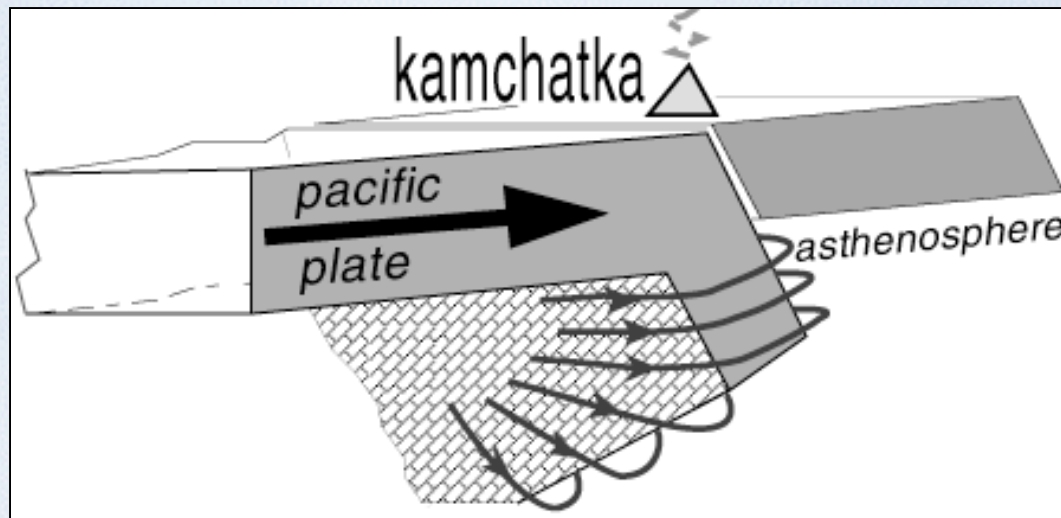
# Motivation: Western US Tectonics



# Motivation: Mantle Flow Pattern



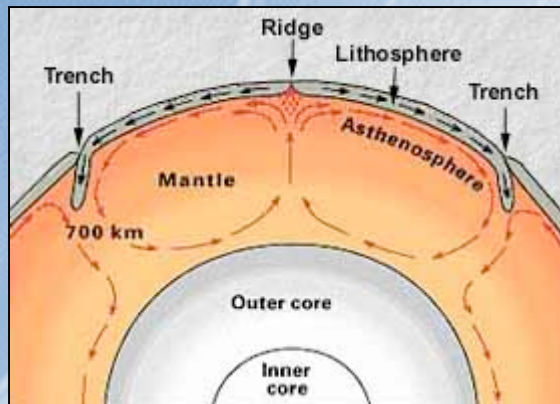
Smith *et al.*, *Science* **292**, 713 (2001).



Peyton *et al.*, *Geophys. Res. Lett.* **28**, 379 (2001).

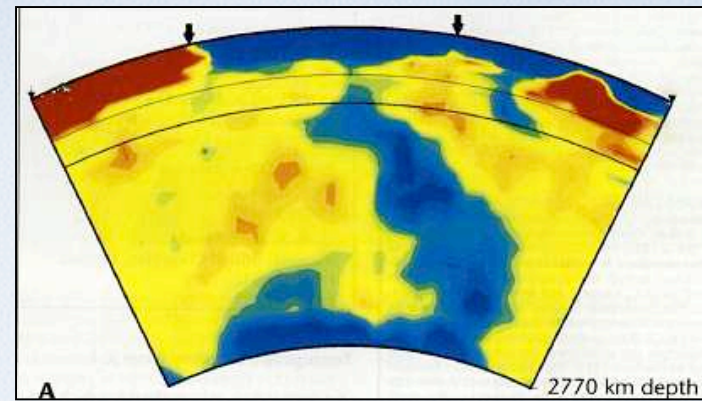
# Motivation: Modeling Mantle Flow

\* Flow: due to plate motion



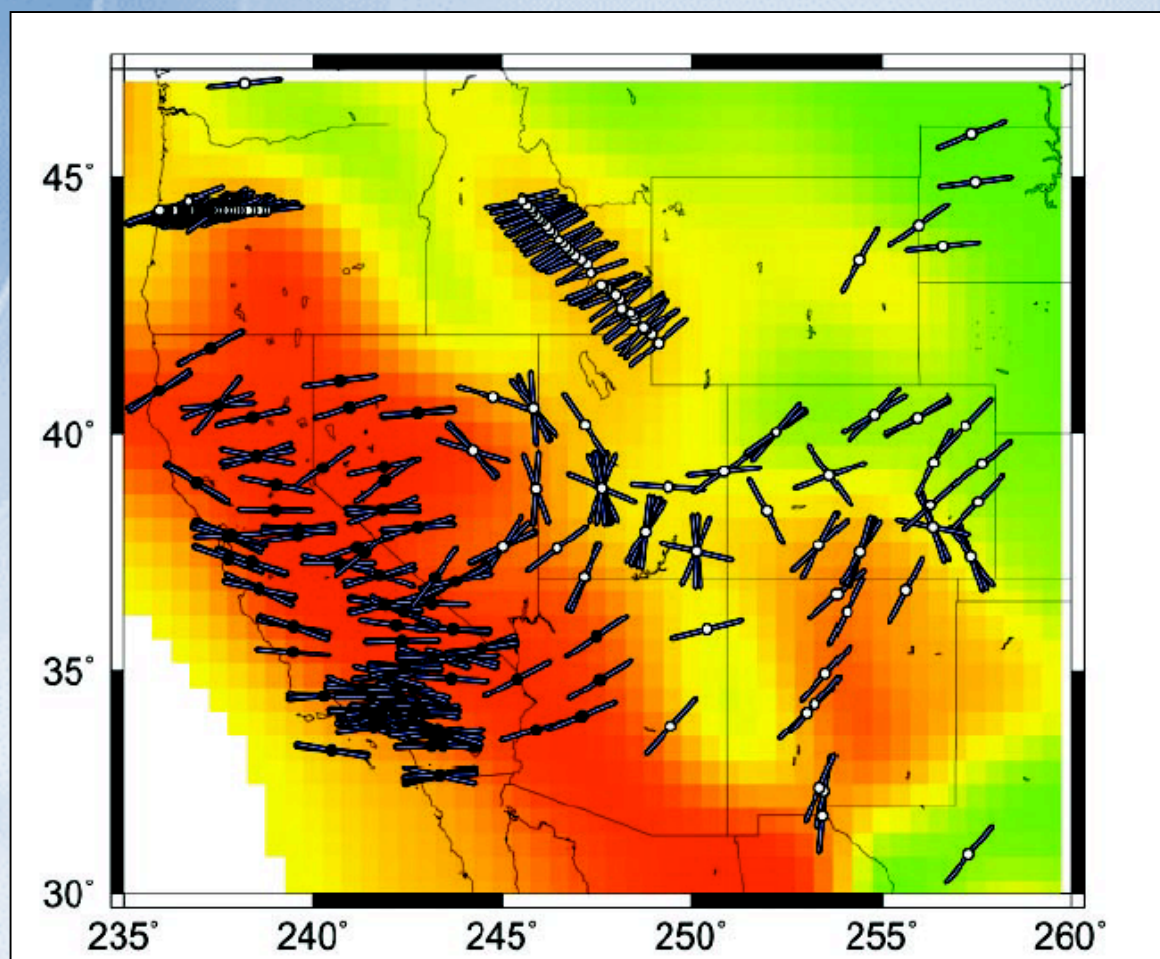
[www.cas.muchio.edu](http://www.cas.muchio.edu)

\* Flow: due to density anomalies



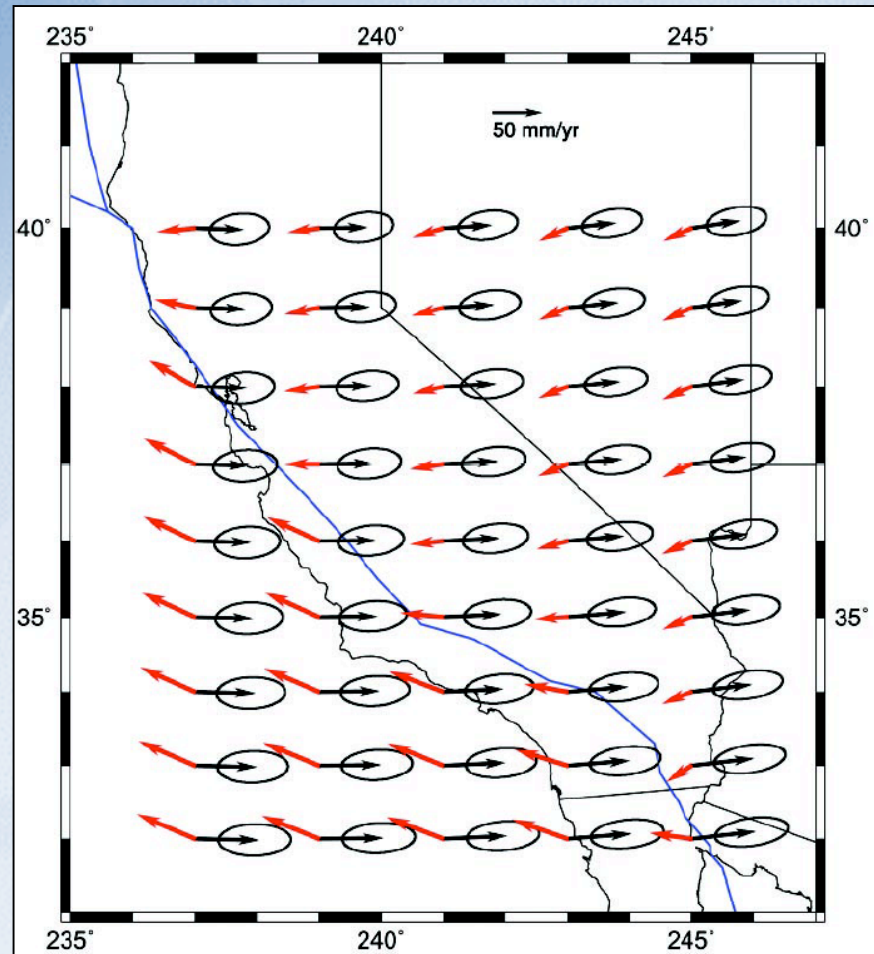
<http://www.geo.lsa.umich.edu/~crlb/>

# Data: Surface Deformation and Splitting data



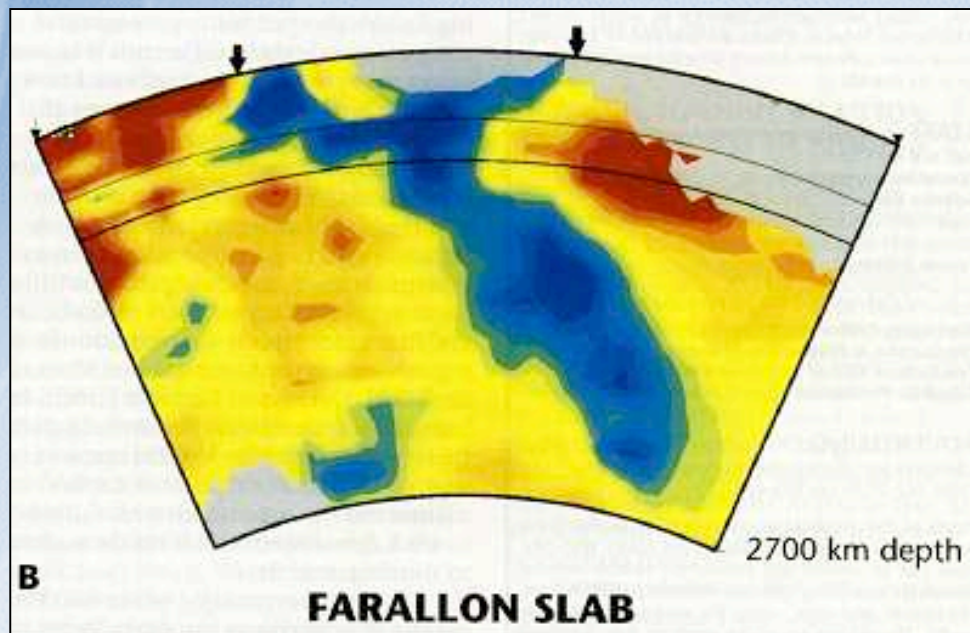
Silver *et al.*, *Science* **295**, 1054 (2002).

# Results



Silver *et al.*, *Science* **295**, 1054 (2002).

# Conclusions and Implications



[www.geo.lsa.umich.edu](http://www.geo.lsa.umich.edu)

- Mantle constitutes weak drag force

# Discussion Topics

- \* Is mantle flow related to velocities of overlying plates?
- \* Does mantle flow have any effect on a plate's motion?
- \* Are there other methods to determine mantle flow?
- \* What would flow field look like in various tectonic regions?