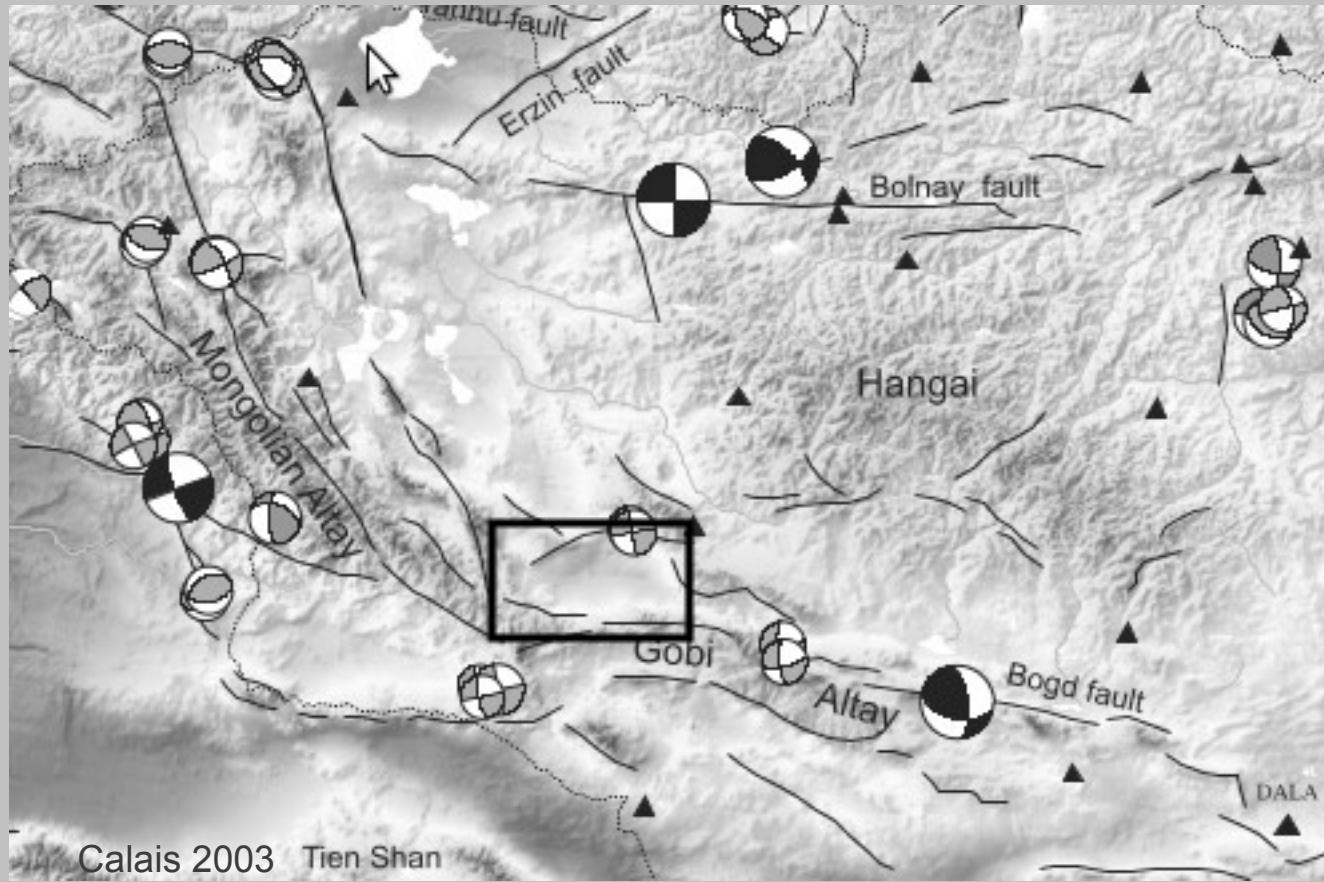


Crustal Kinematics of the Shargyn Basin, western Mongolia

Thomas Ben Thompson

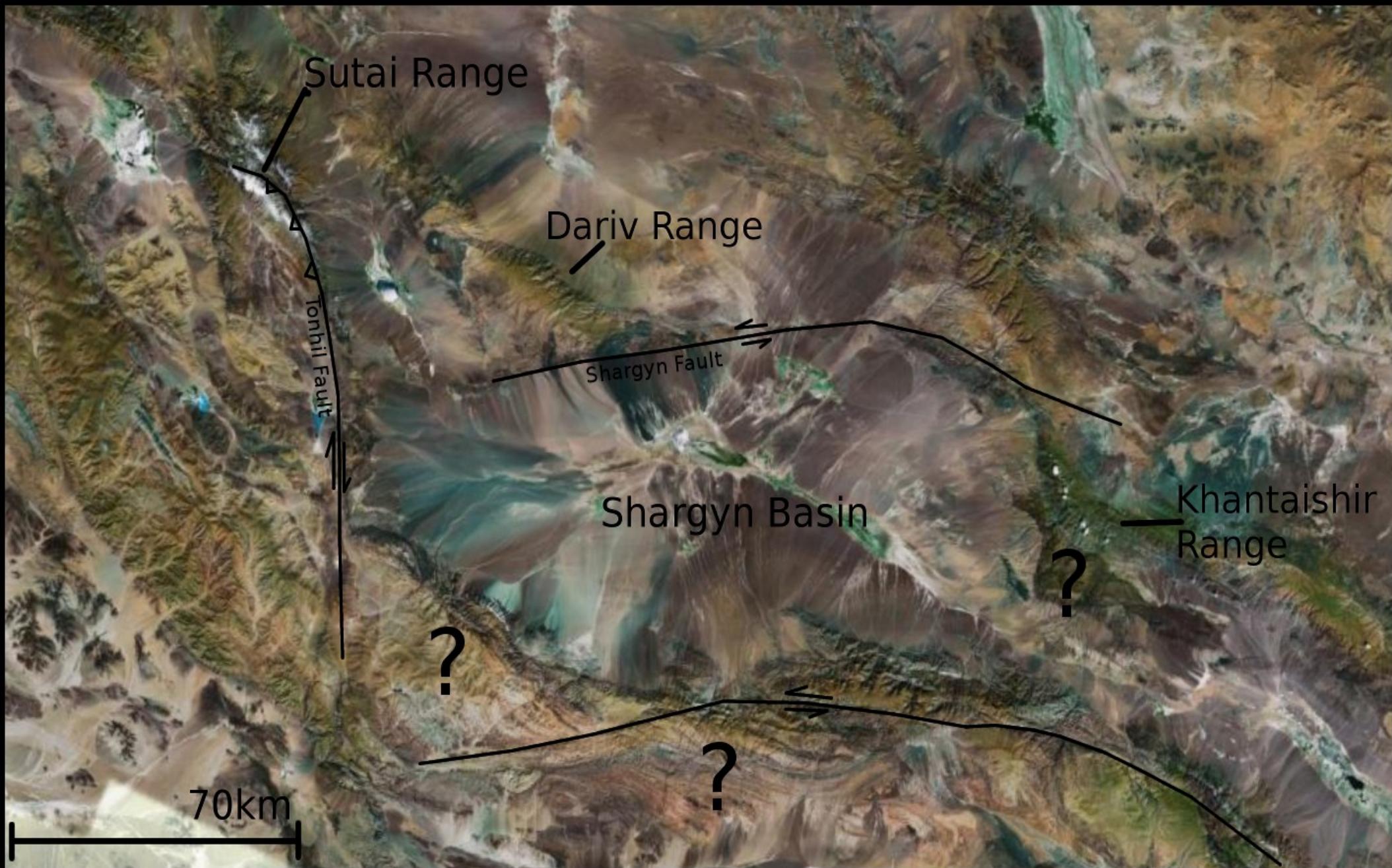


Intersection of two major strike-slip systems

+

Transpressional slip on both systems

=Complex kinematics (Shargyn Basin)



Why is there a big basin here (hole)?

Normally: Deformation at plate boundary zones



Mongolia: Lots of deformation. Plate boundary very distant!





GPS data show:

Northwards motion in the west

Eastwards motion in the east

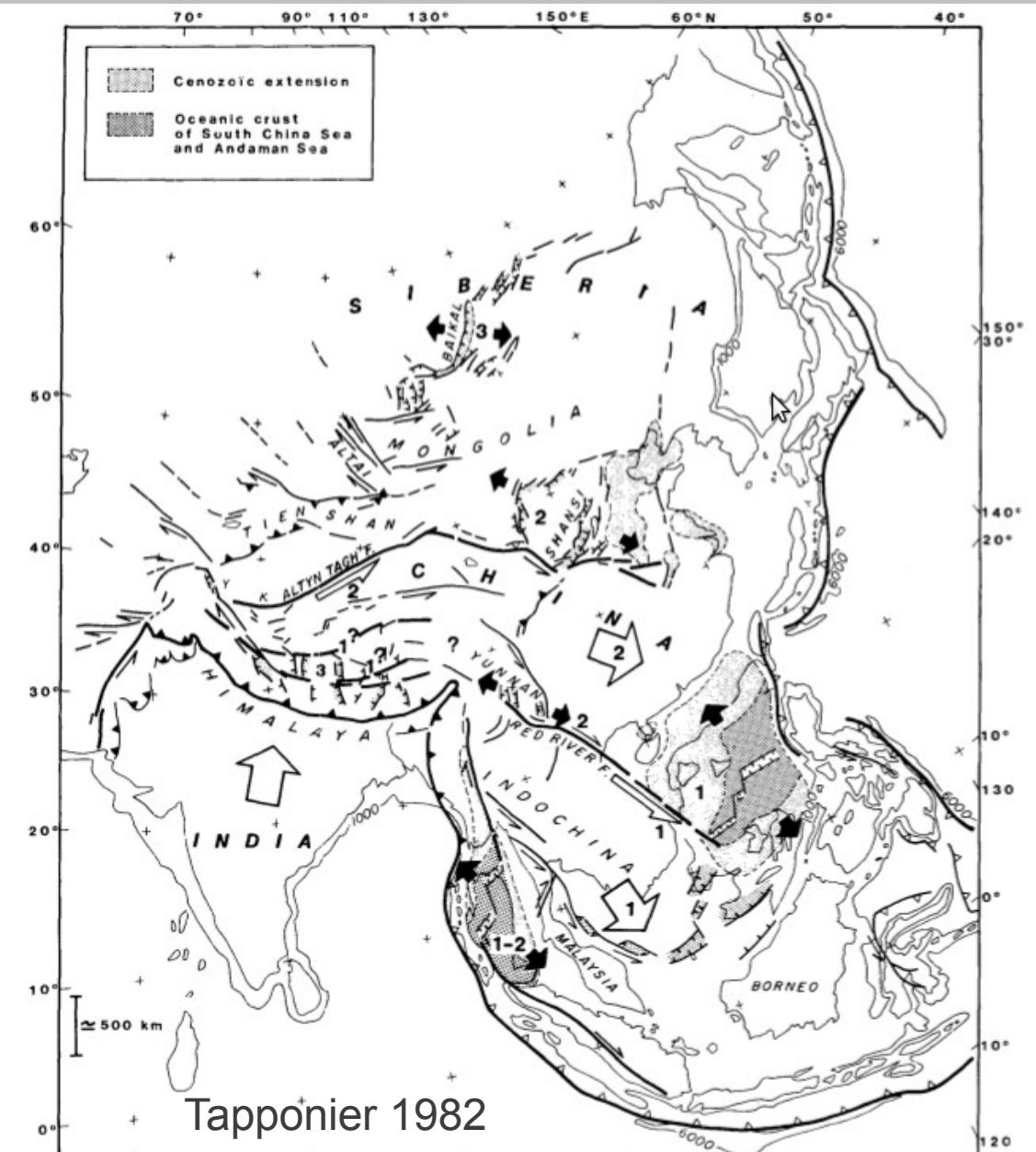
~5mm/yr average

Q: What drives Mongolian deformation?

A: India



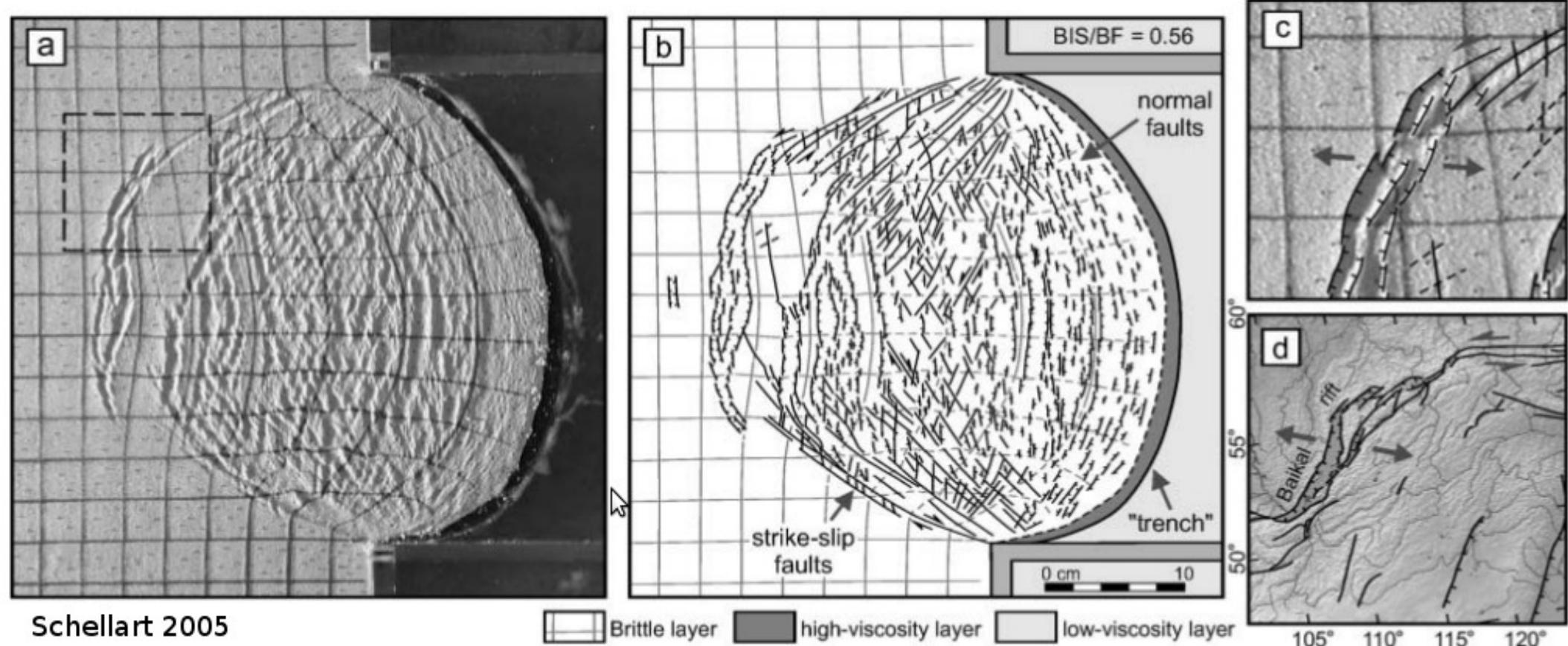
Tapponier 1982

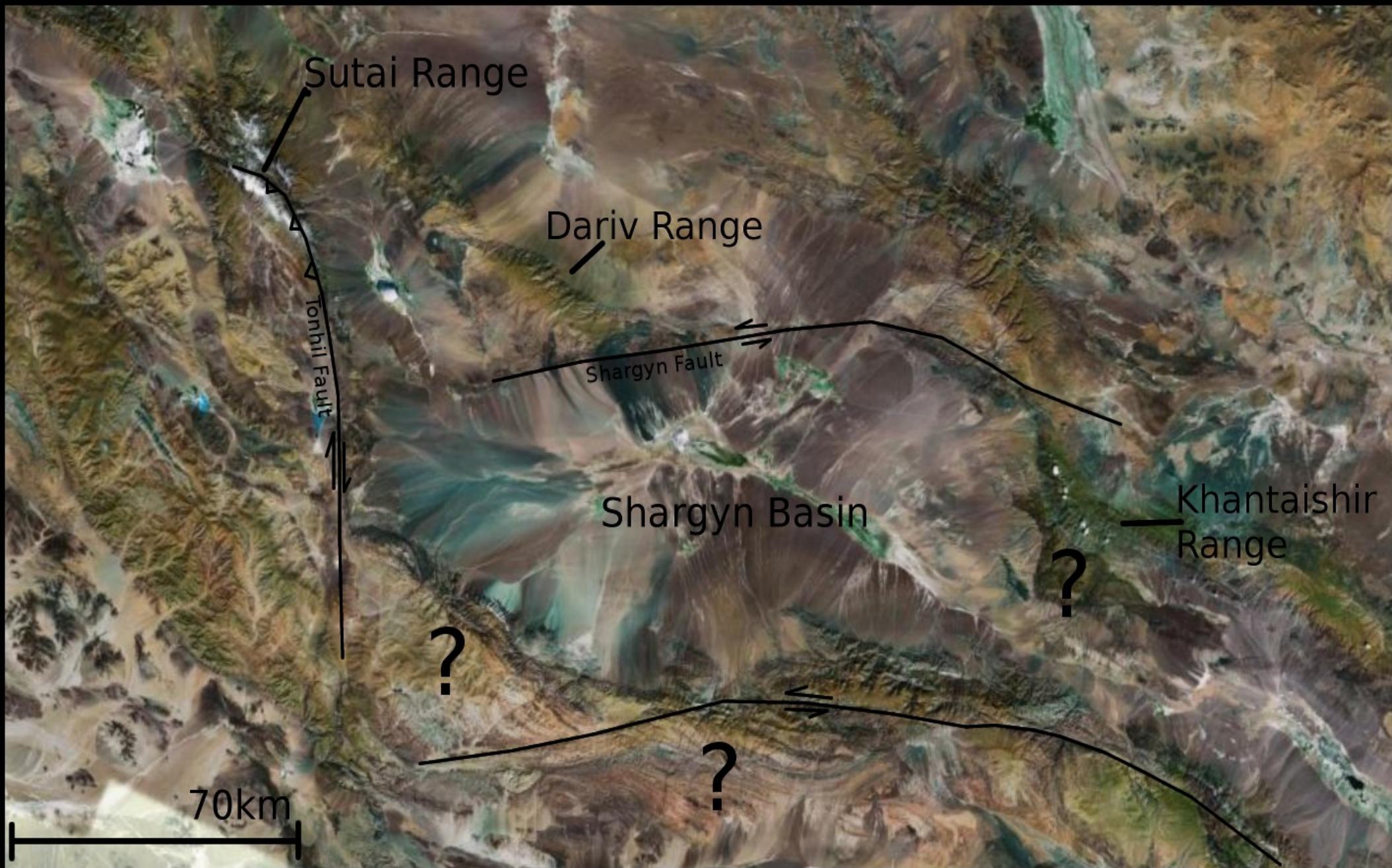


Q: What drives Mongolian deformation?

A: East Asian Subduction Zone rollback

- Eastward trench retreat pulls the continent along with it.

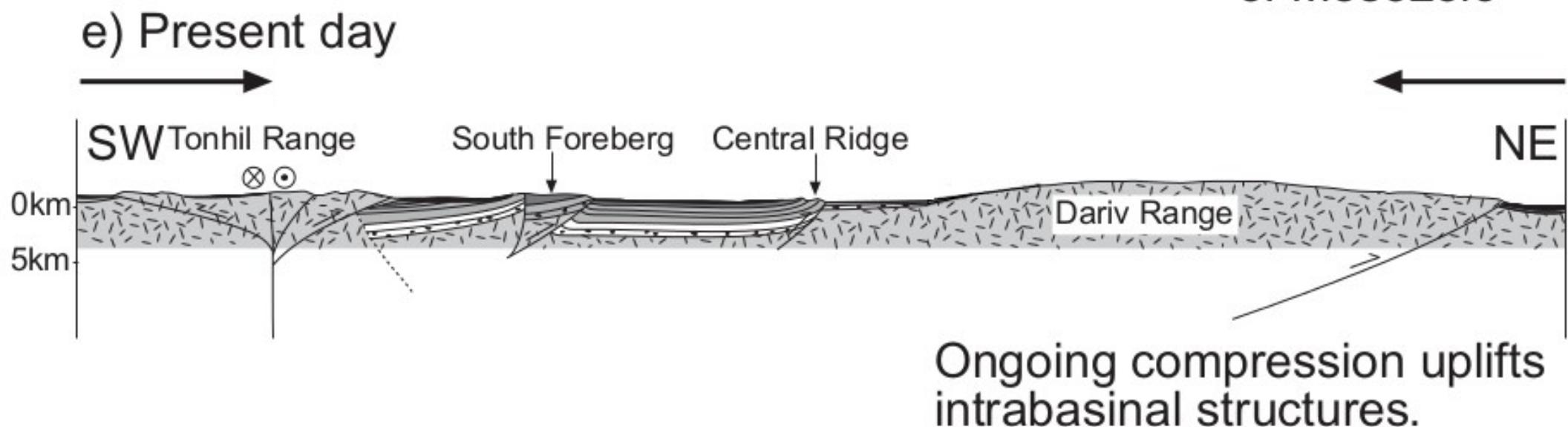




Why is there a big basin here (hole)?

Maybe the Dariiv Basin could be a useful model for Shargyn Basin Kinematics?

- piggyback basins
- transpressional basins



Key

Holocene fanglomerates
Cenozoic sediments

Cretaceous sediments
Jurassic sediments

Paleozoic basement
Howard 2006

What are the kinematics of the
Shargyn Basin?

Could the answer provide some
insight into the debate on Asian
stresses?

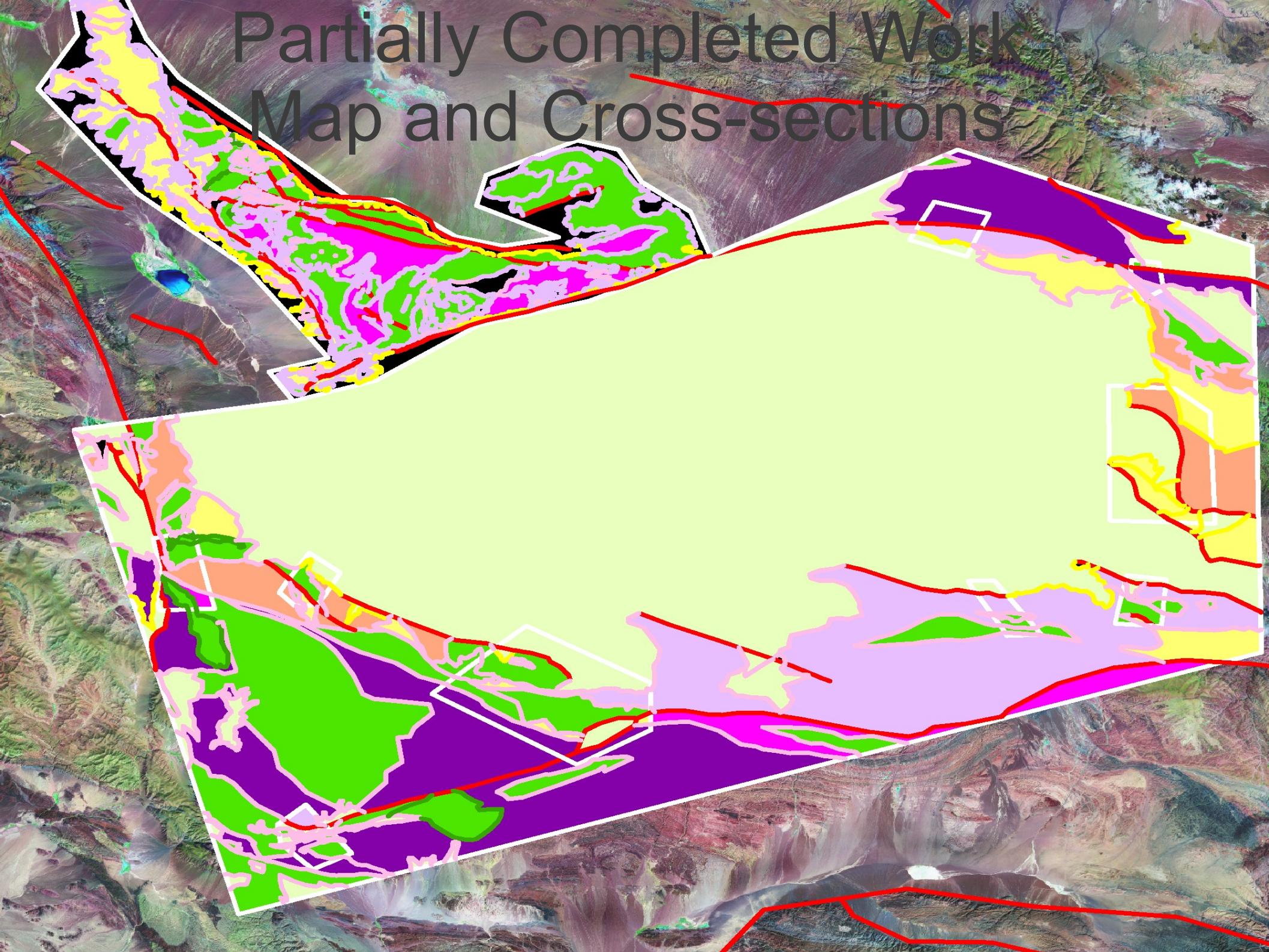
Completed Work – Field Season!



Completed Work – Direct Fault Observations



Partially Completed Work Map and Cross-sections



Todo: Kinematic Indicators

Ductile clast rotations – visible in thin section

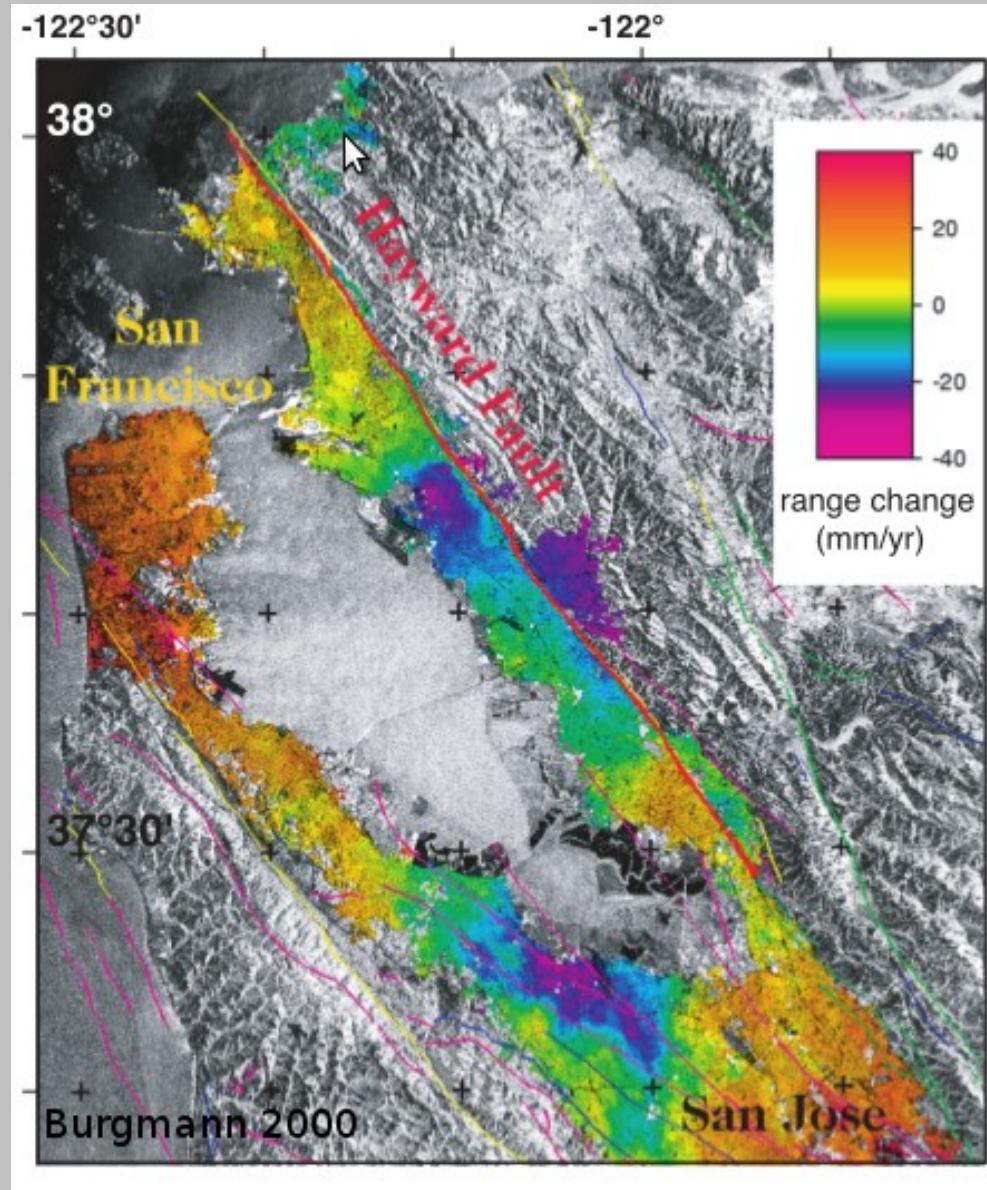
Collect brittle deformation fabric measurements



Source: Professor Bradley Hacker's website

Todo: inSAR of active deformation

Provides local measurement of active motion rates



Timeline

Now – March:

- Continue updating the map
- Create cross-sections through the important areas
- Kinematic indicators in samples and field data
- Further literature review on basin formation
- Active deformation rates using inSAR?
- Write while I go
- Develop coherent basin formation kinematics**
- Could any of this data help extrapolate backwards in time?**

April:

- Write remainder of thesis paper

May:

- Final touches and edits
- Presentation!

Complications

- Extrapolating into the past is difficult!
- But, the present-day kinematics of the Shargyn Basin are still worthwhile
 - Times up in April/May.
 - Regardless of what happens, the map is still valuable.

Why?

- A better understanding of active crustal deformations helps with:
 - disaster management (earthquakes)
 - resource development (oil, gas, coal)
 - helps understand past crustal deformation



Bayarsahan et al. 1996