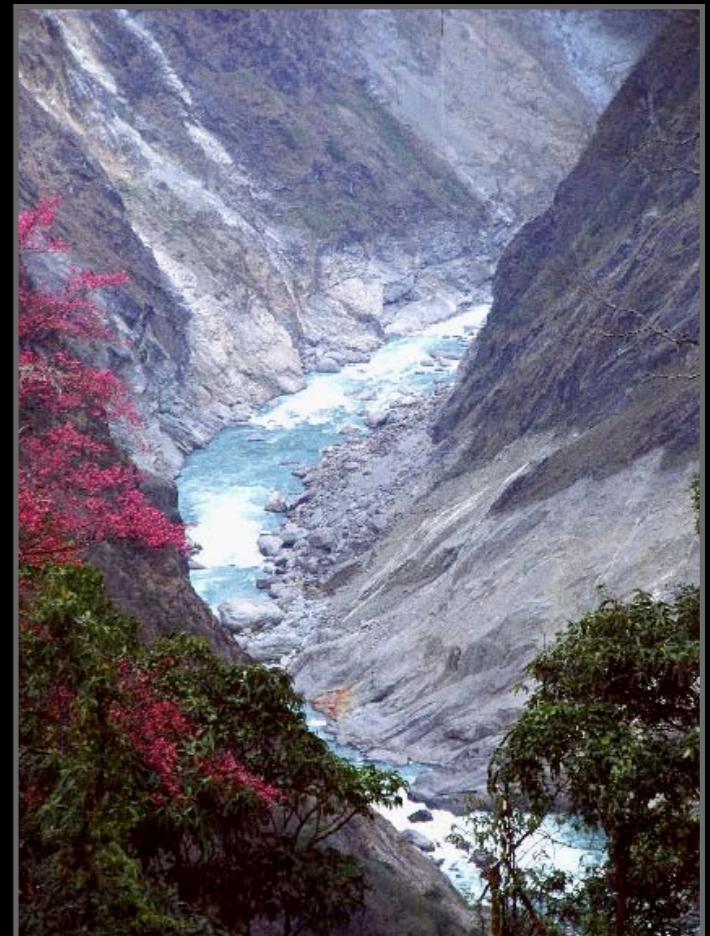
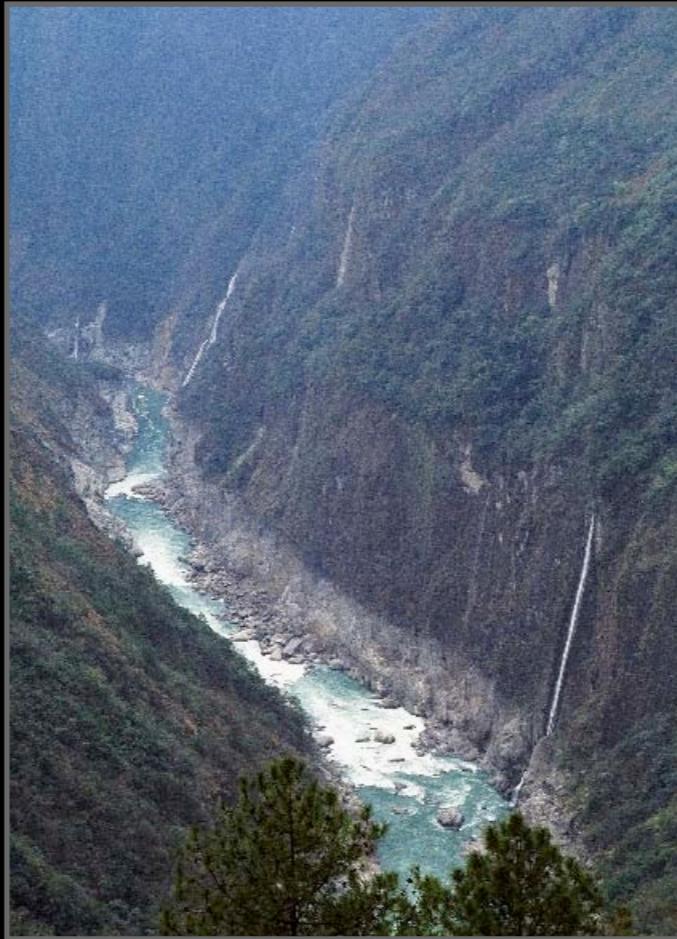


# Geochronological Evidence for the Tectonic and Topographic Evolution of SE Tibet

P. Zeitler<sup>1</sup>, M. Malloy<sup>1</sup>, M. Kutney<sup>1</sup>, B. Idleman<sup>1</sup>, Y. Liu<sup>2</sup>, W. Kidd<sup>3</sup>, A. Booth<sup>4</sup>

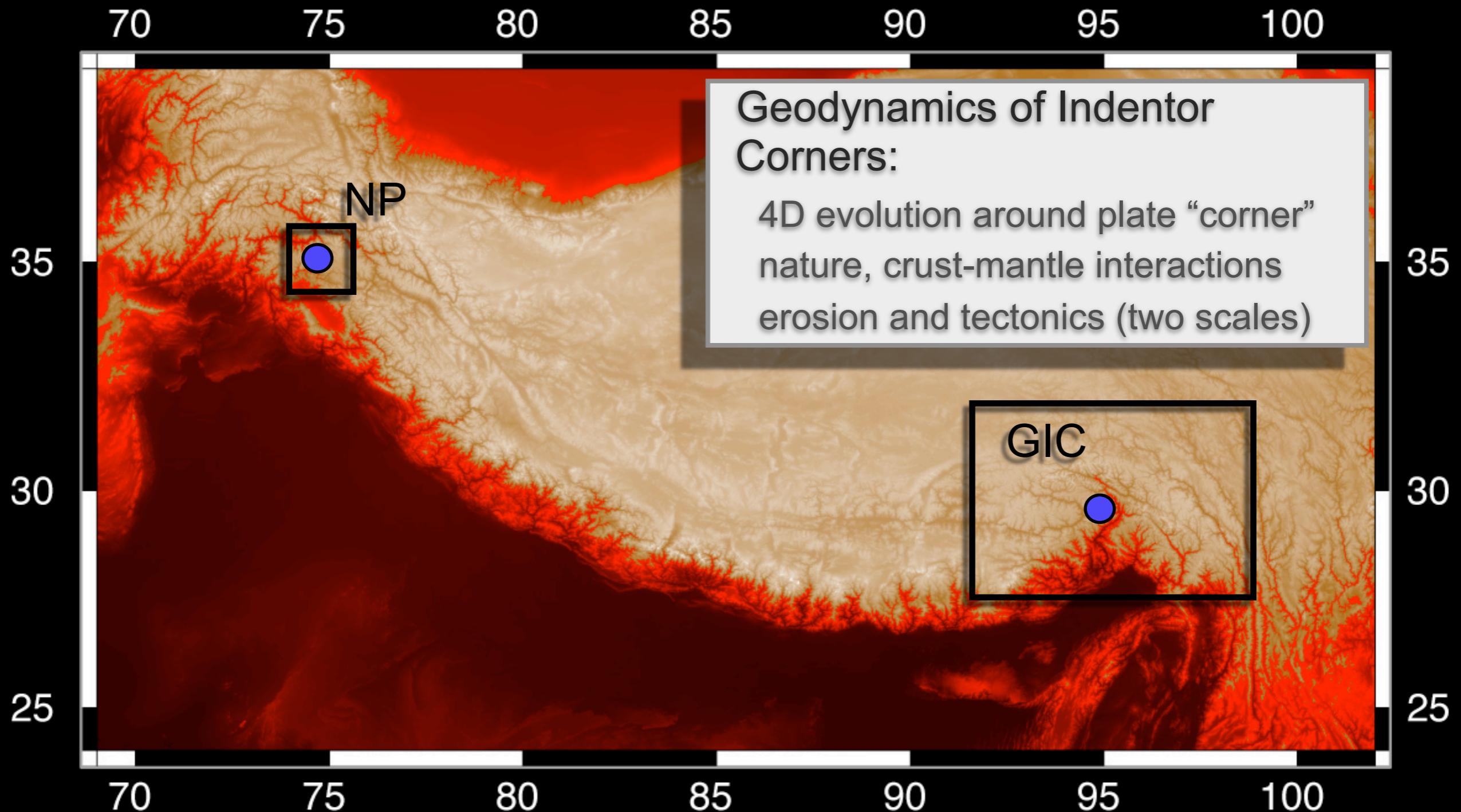
<sup>1</sup>Lehigh University <sup>2</sup>Chengdu Institute of Geology and Mineral Resources

<sup>3</sup>SUNY Albany <sup>4</sup>Stanford University

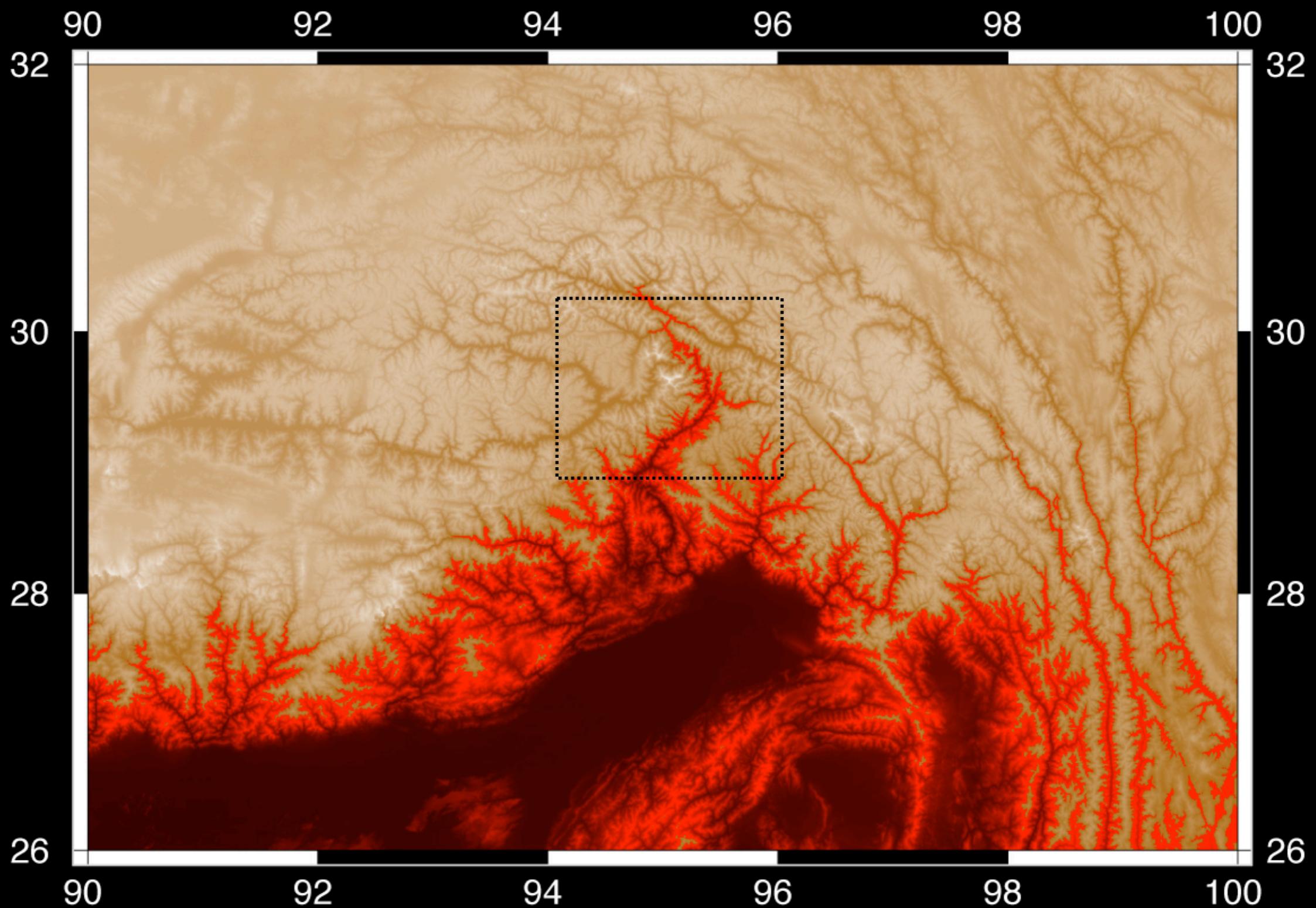


**geodynamics of indentor corners**  
supported by the  
continental dynamics program, NSF

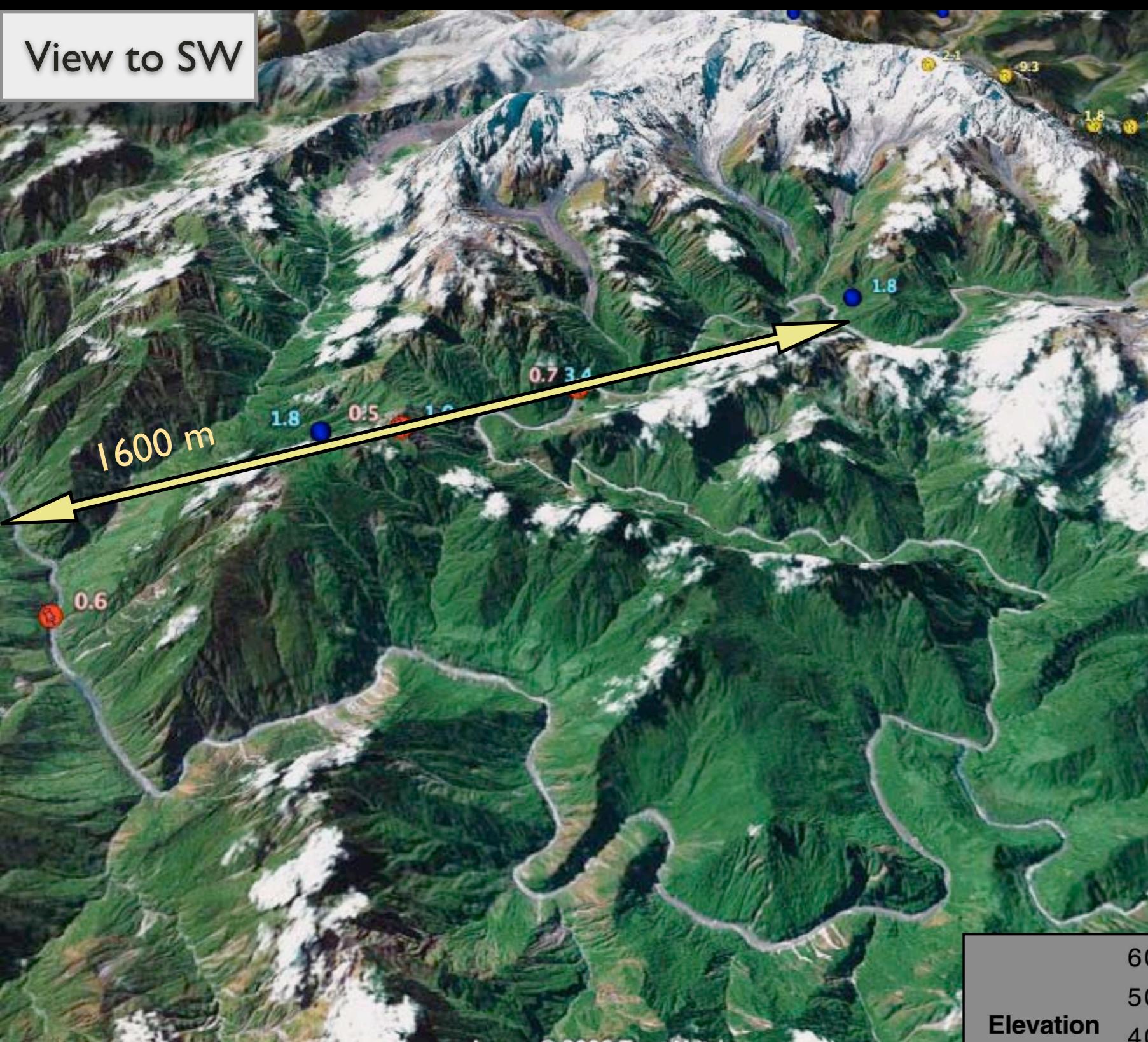
# Context and Location



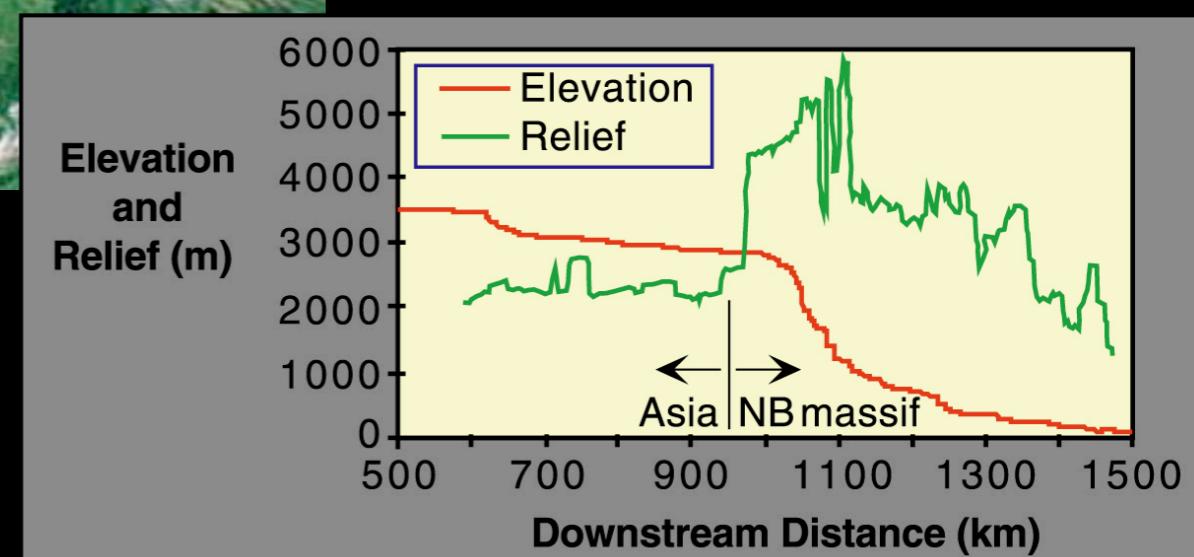
# Topography in Eastern Syntax



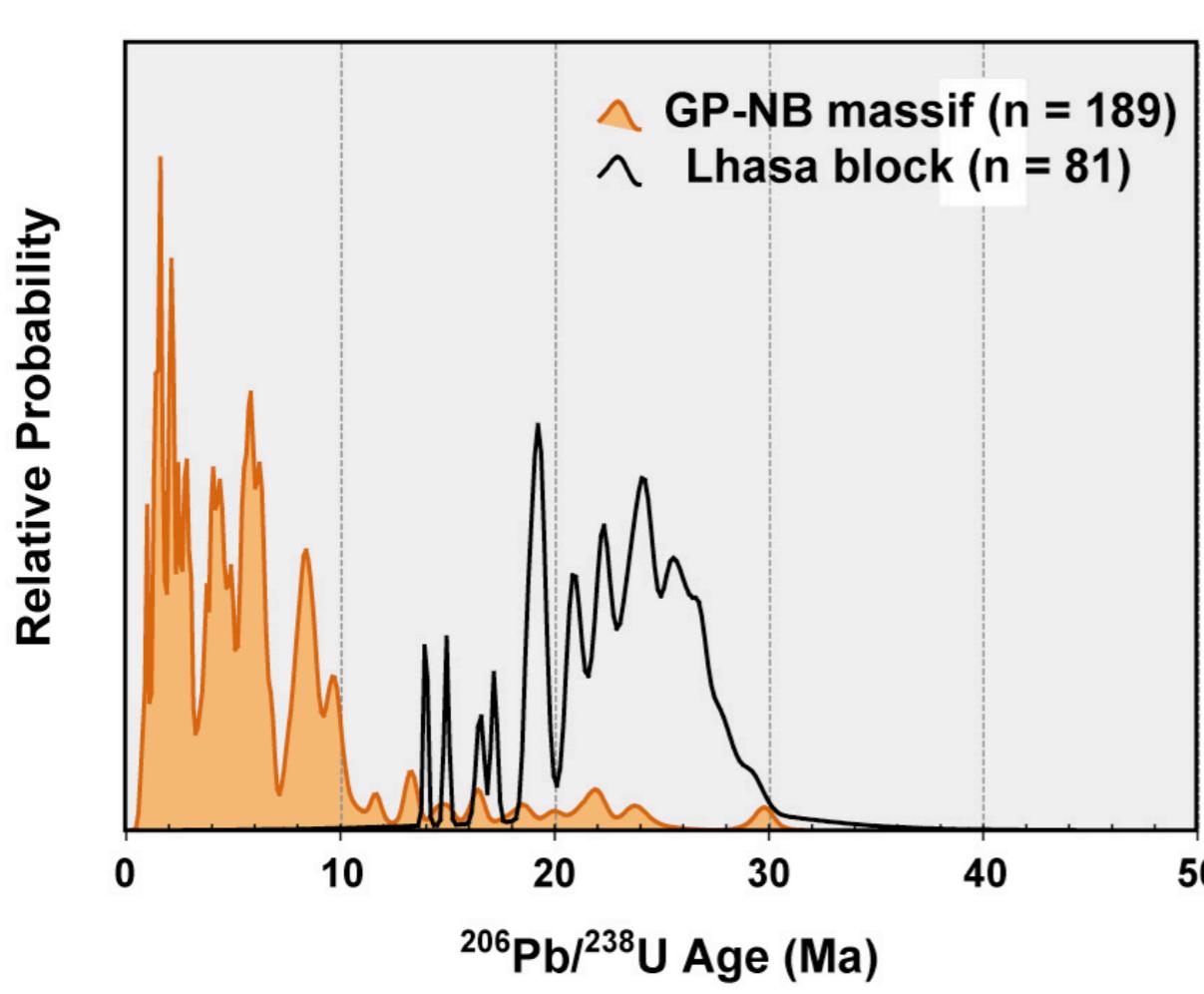
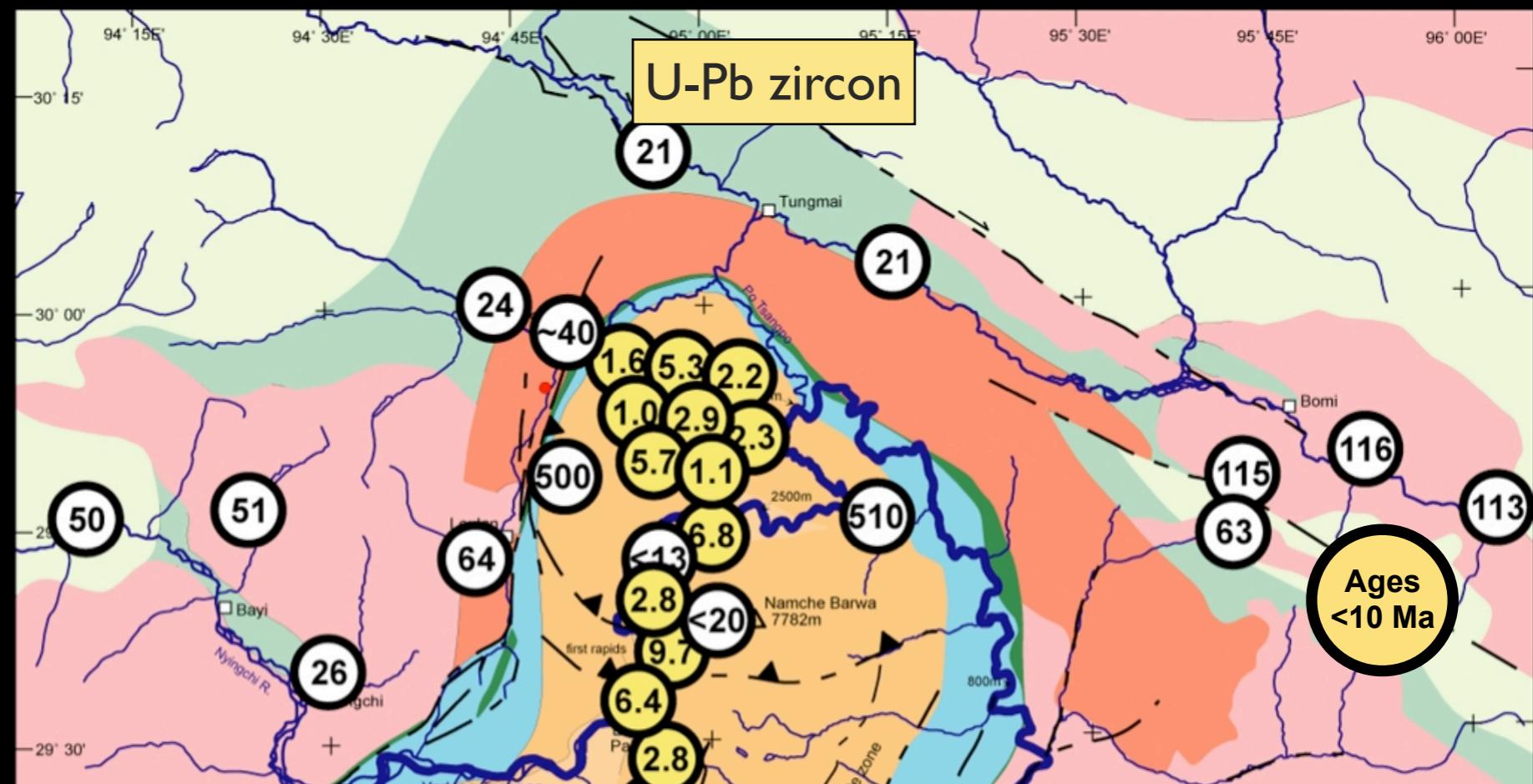
View to SW



## Tsangpo “Big Bend” Knickzone

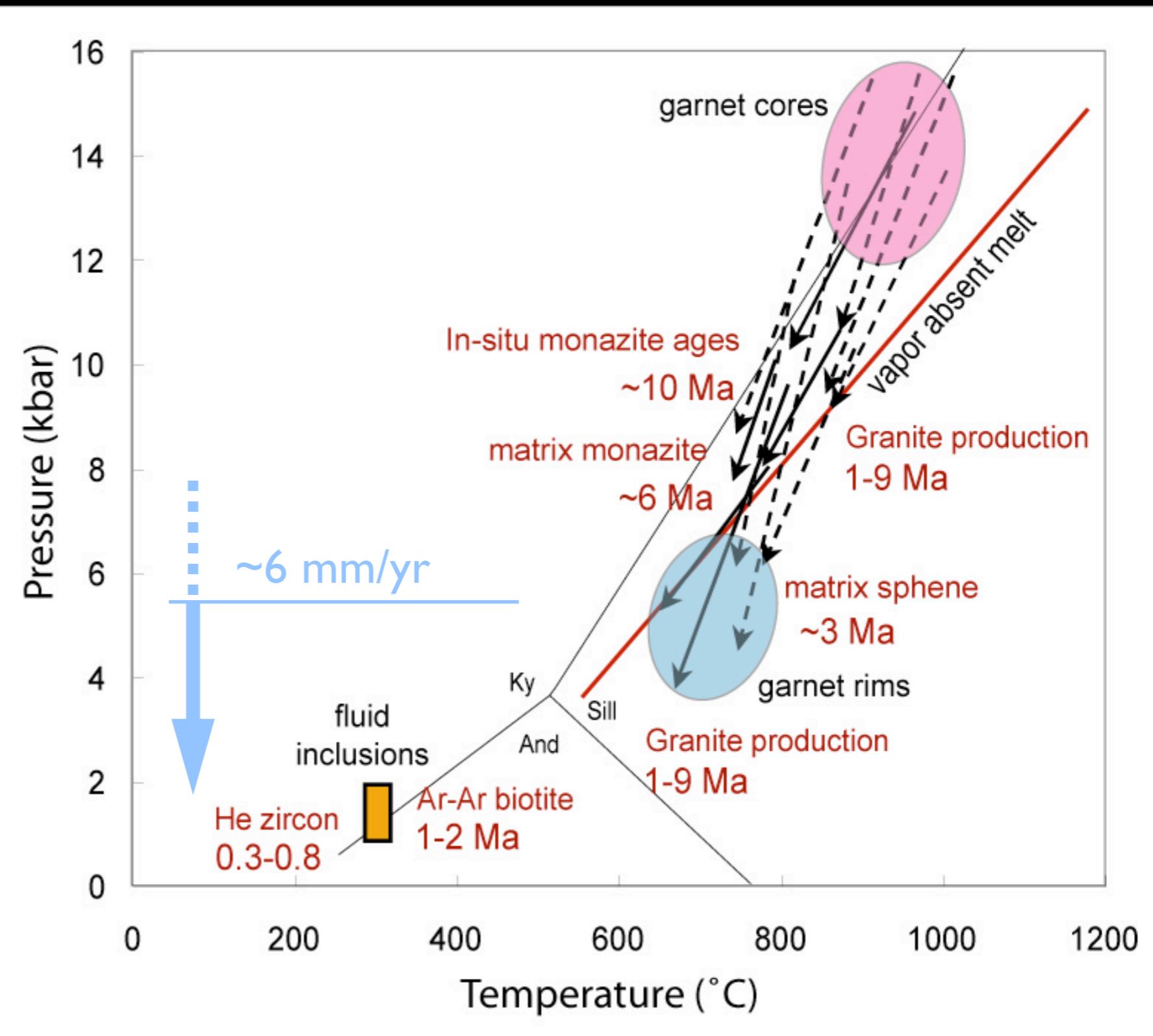
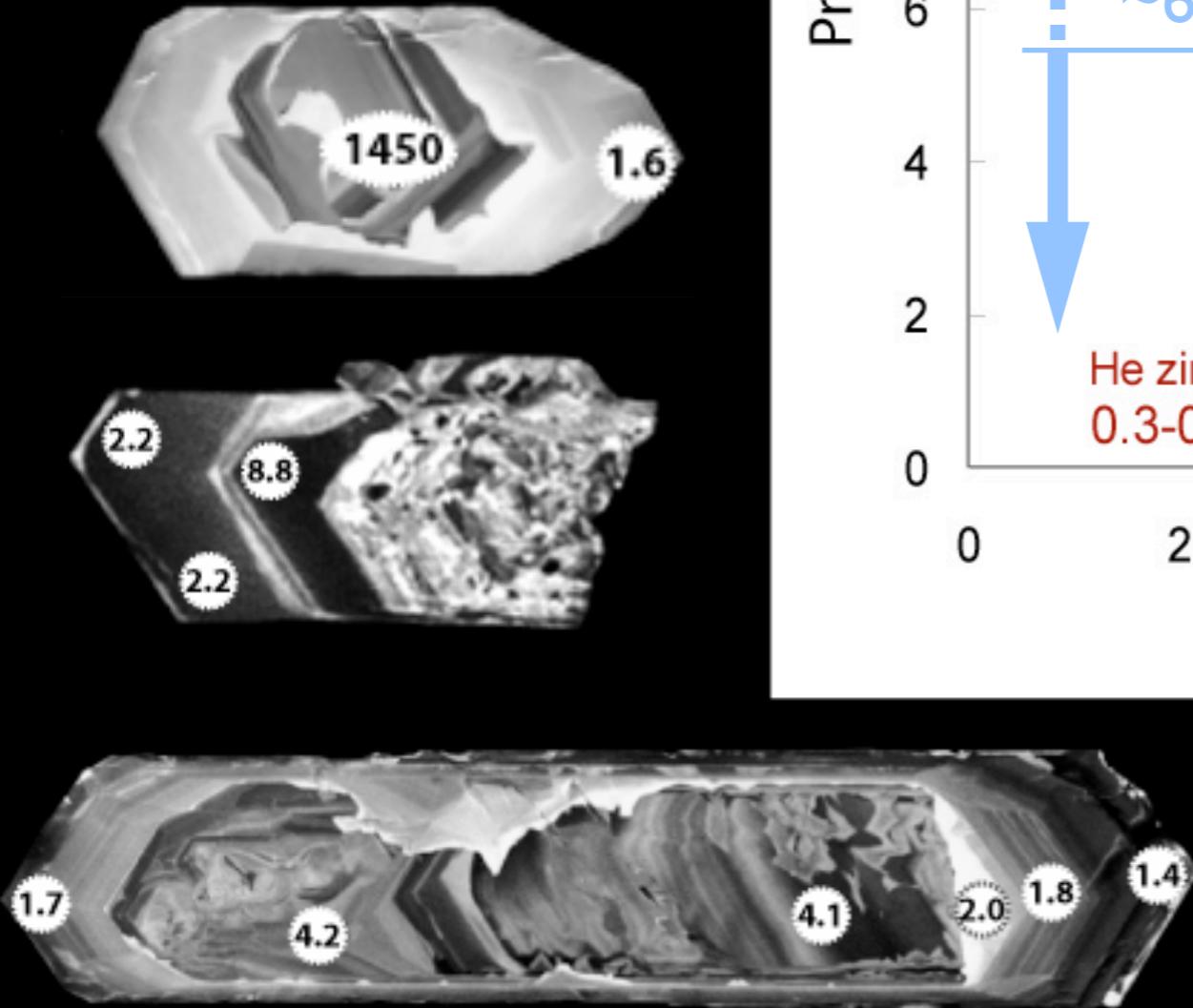


# Zircon U-Pb (granites and basement)

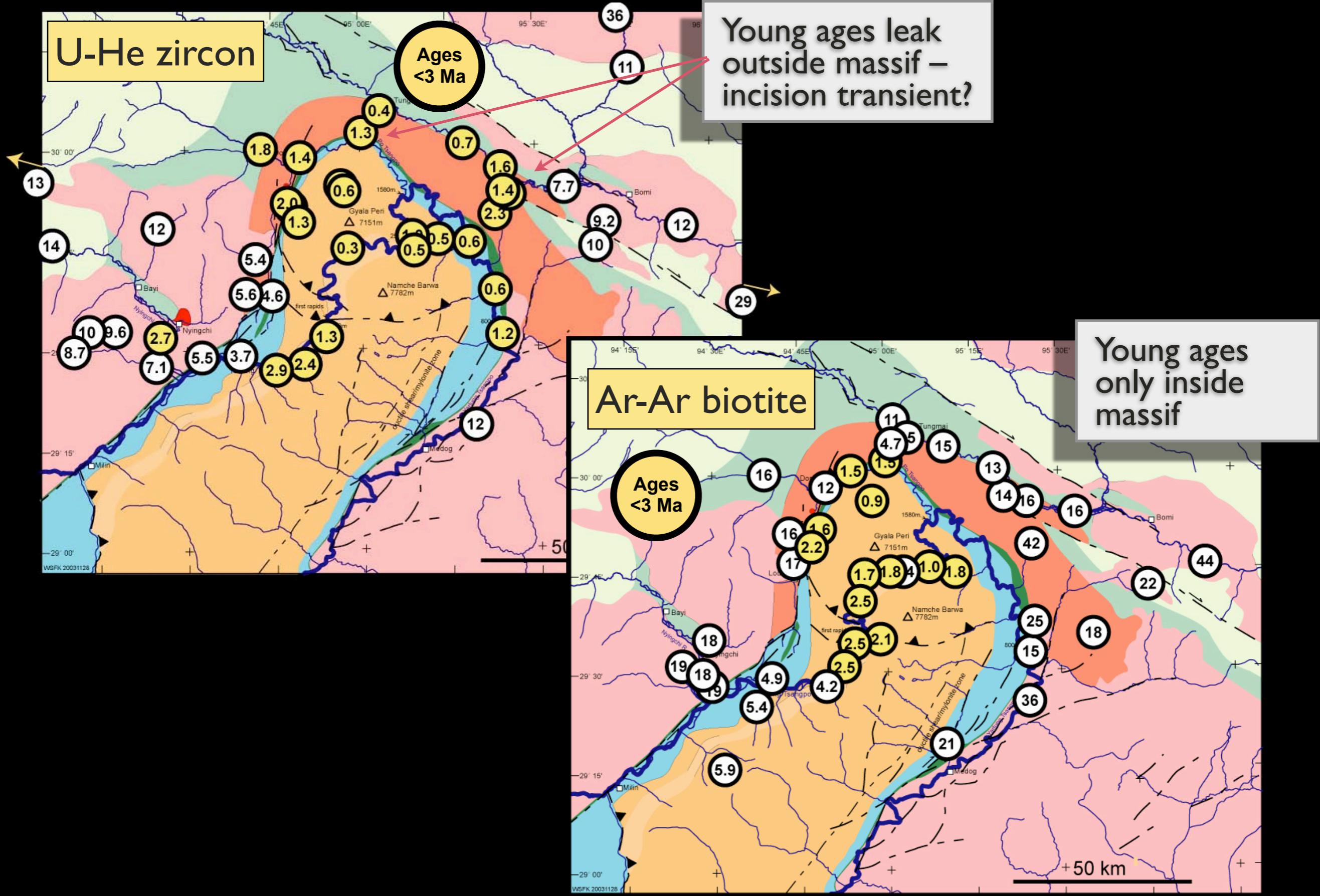


# *P-T-t*

## Namche Barwa – Gyala Peri

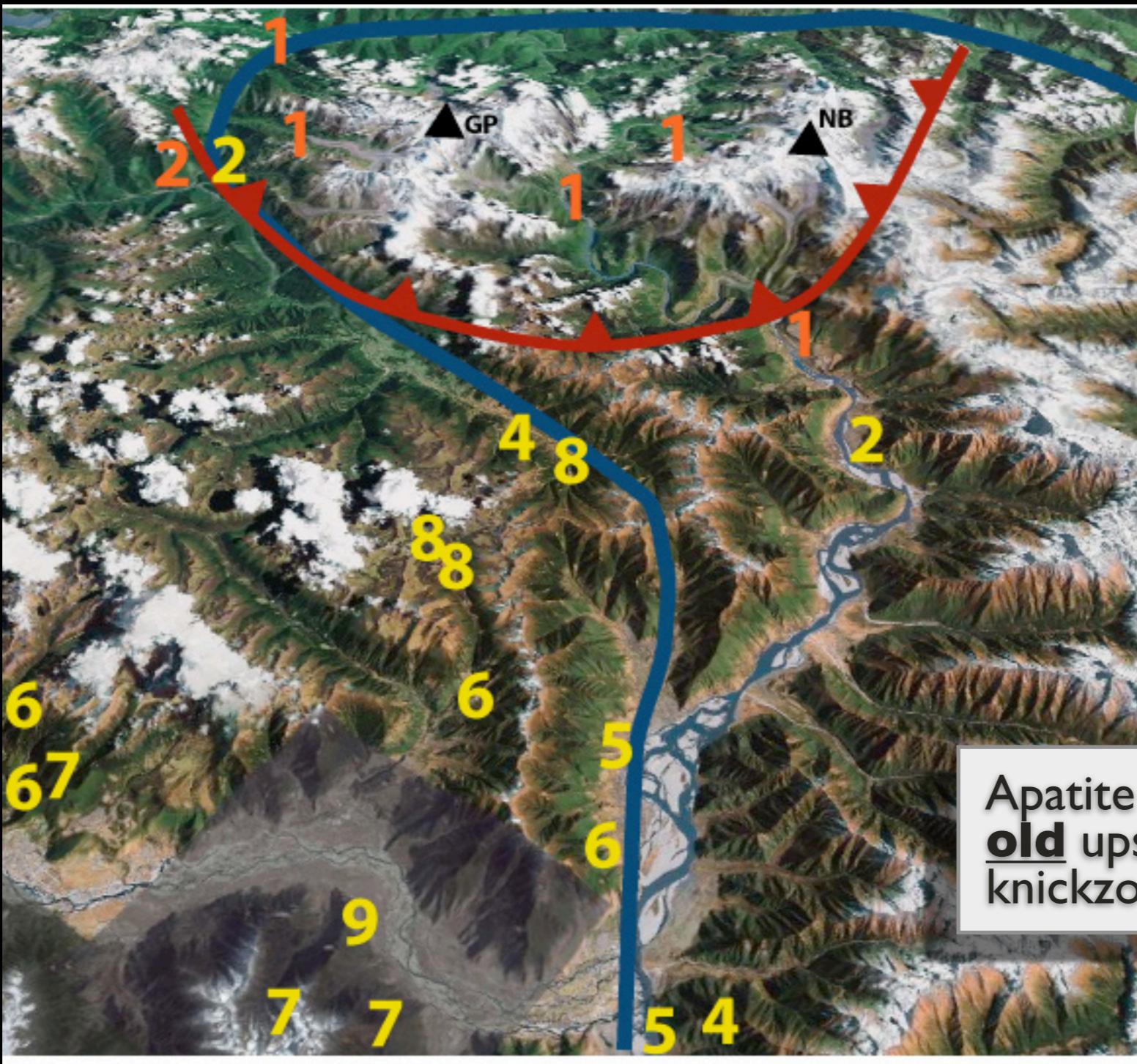


# Knickzone Thermochronology



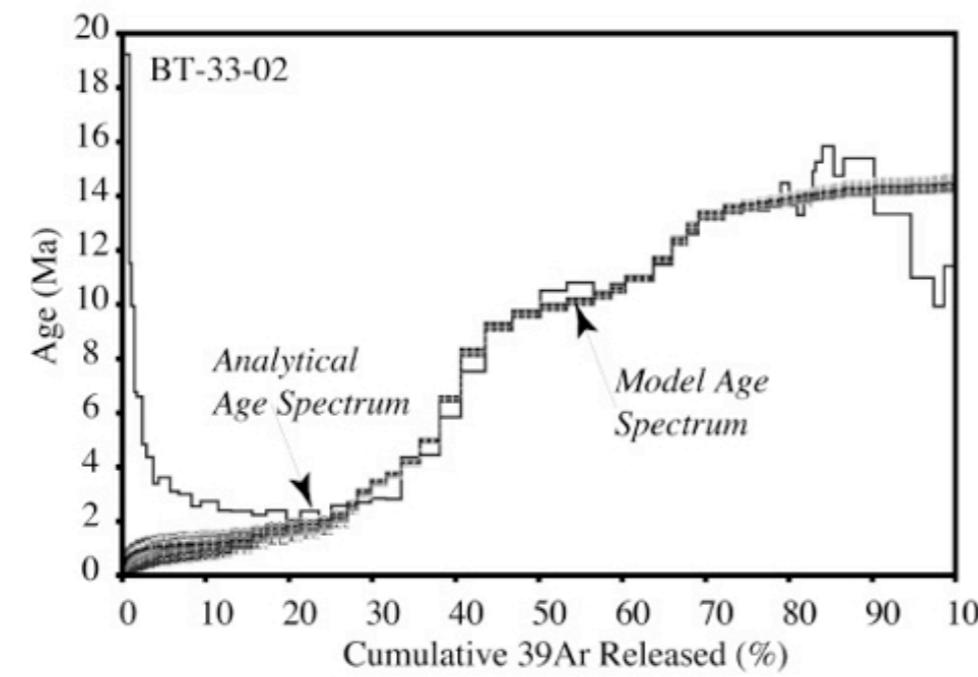
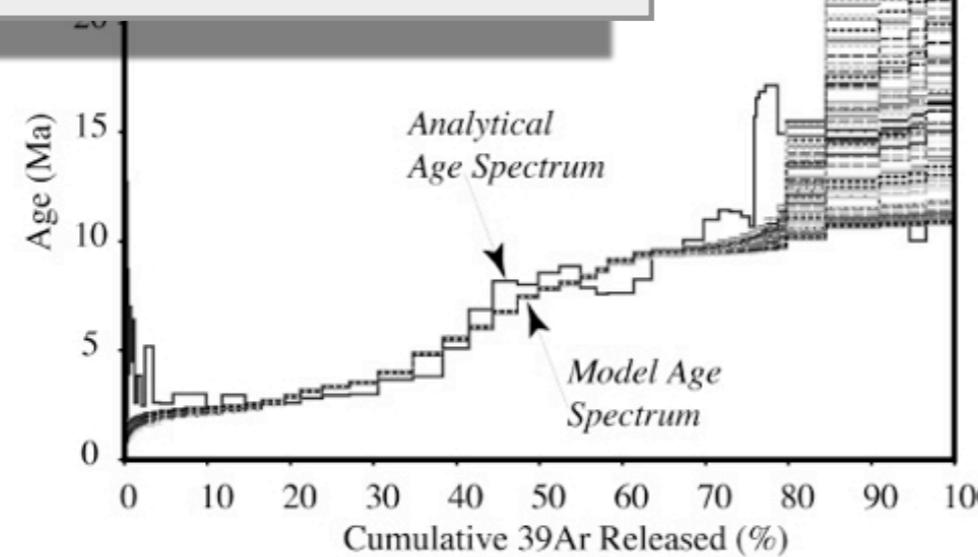
# Knickzone Thermochronology

U-He apatite (zircon in orange)

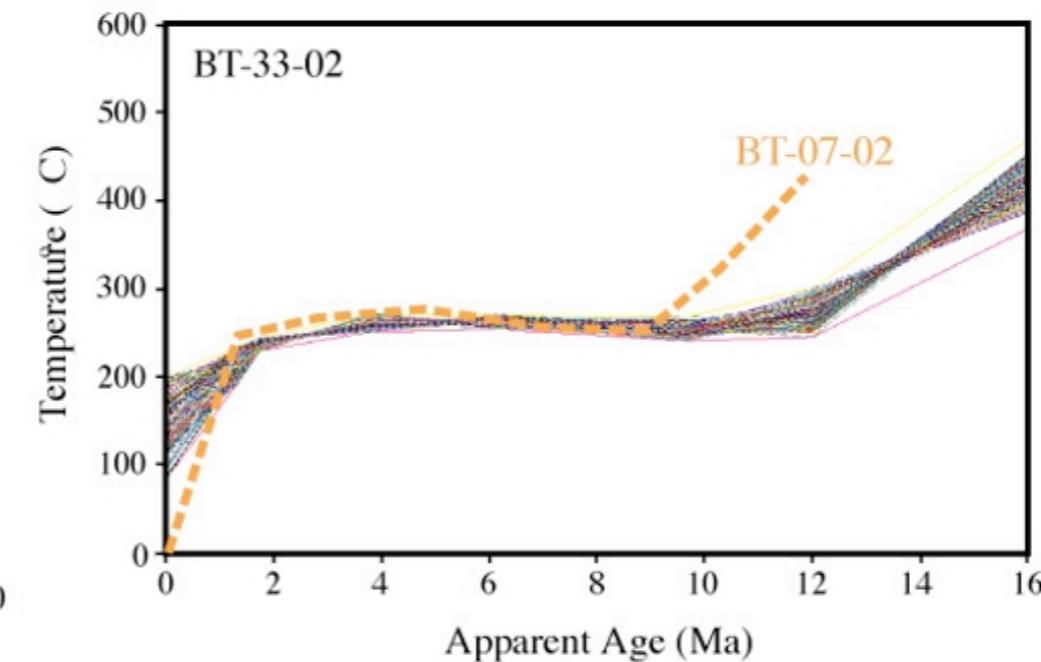
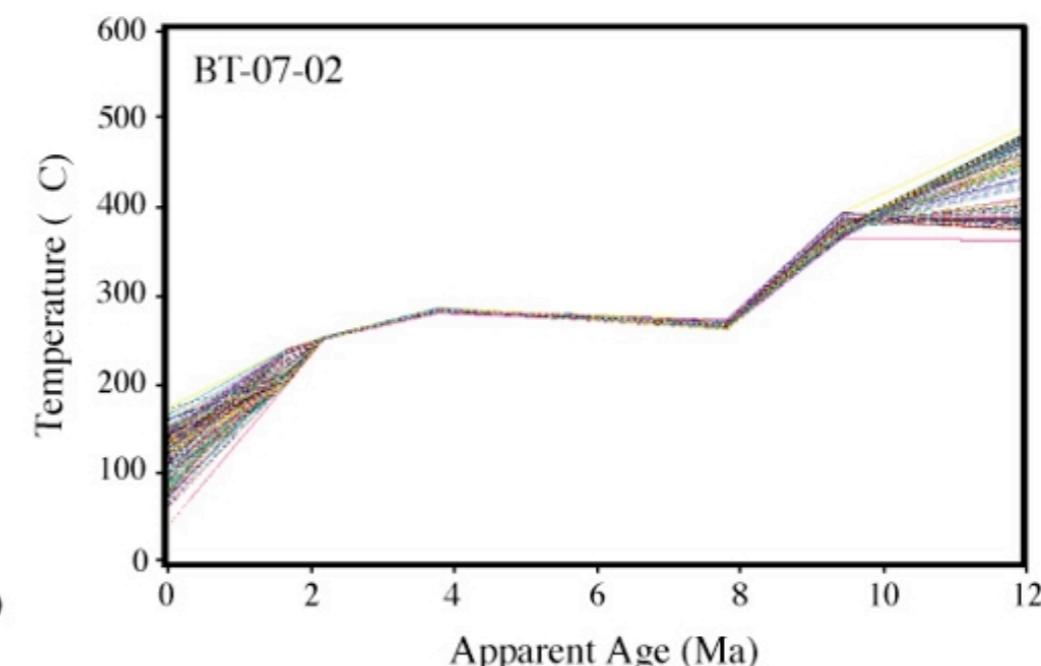


Regionally, K-spars tend to record slow to moderate cooling in interval 25 to 10 Ma.

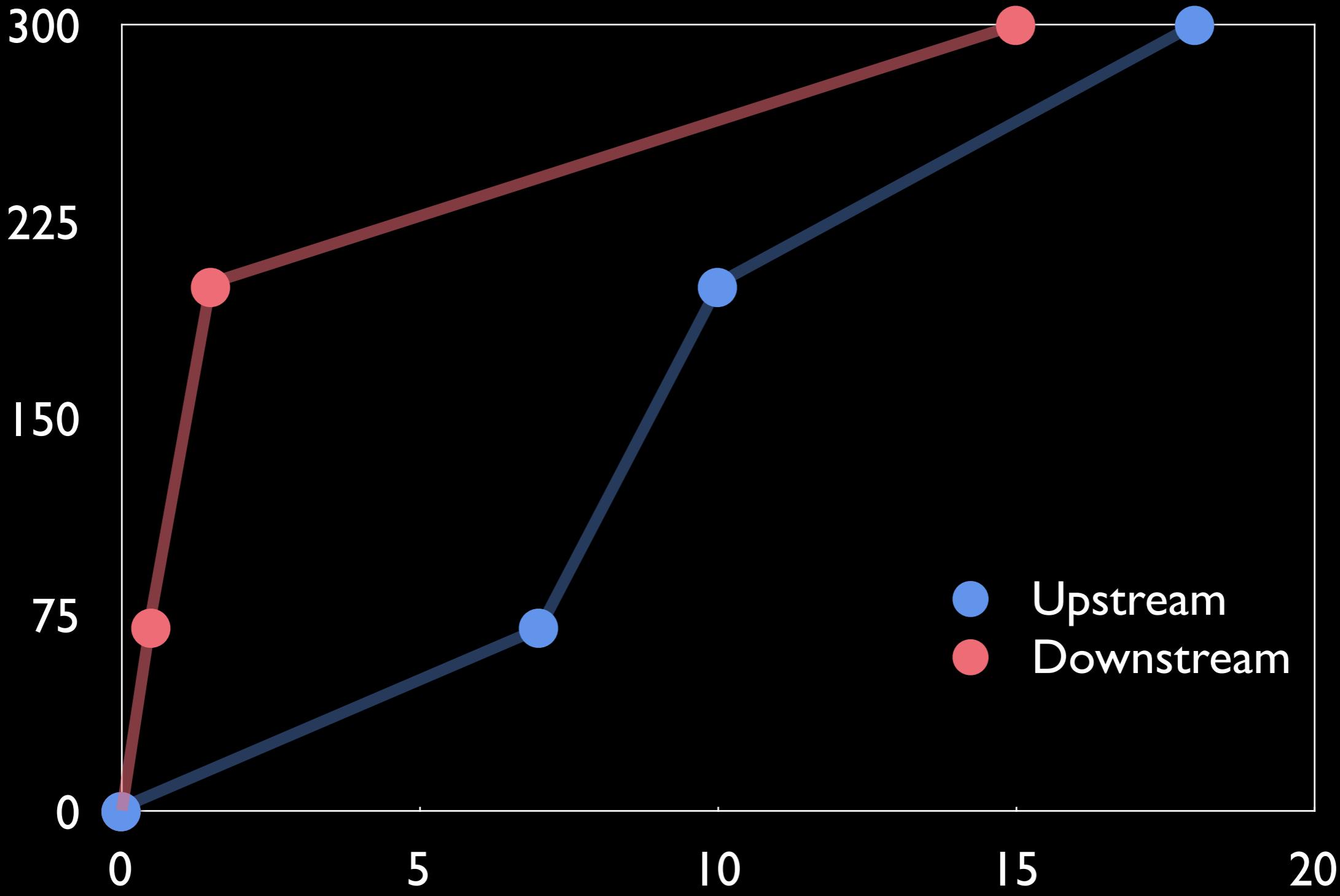
But outside massif, downstream of knickzone, samples like these record abrupt cooling pulse.



## $^{40}\text{Ar}/^{39}\text{Ar}$ K-feldspar data, margins of NB massif

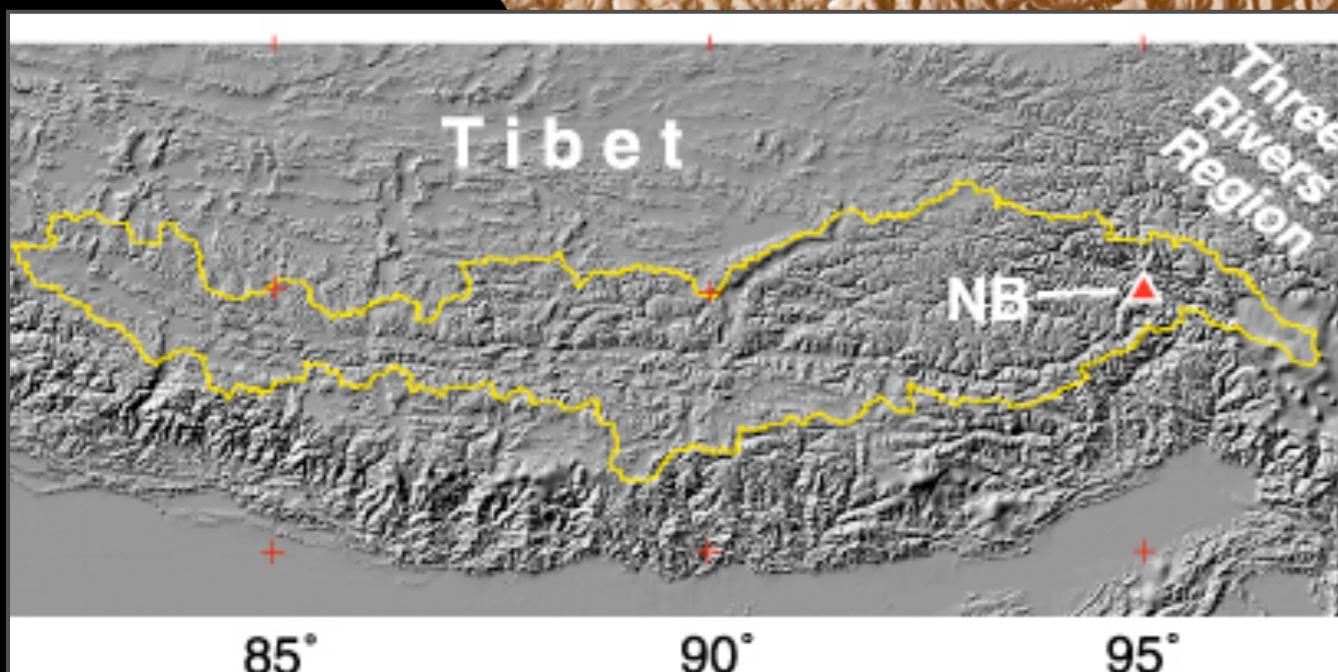
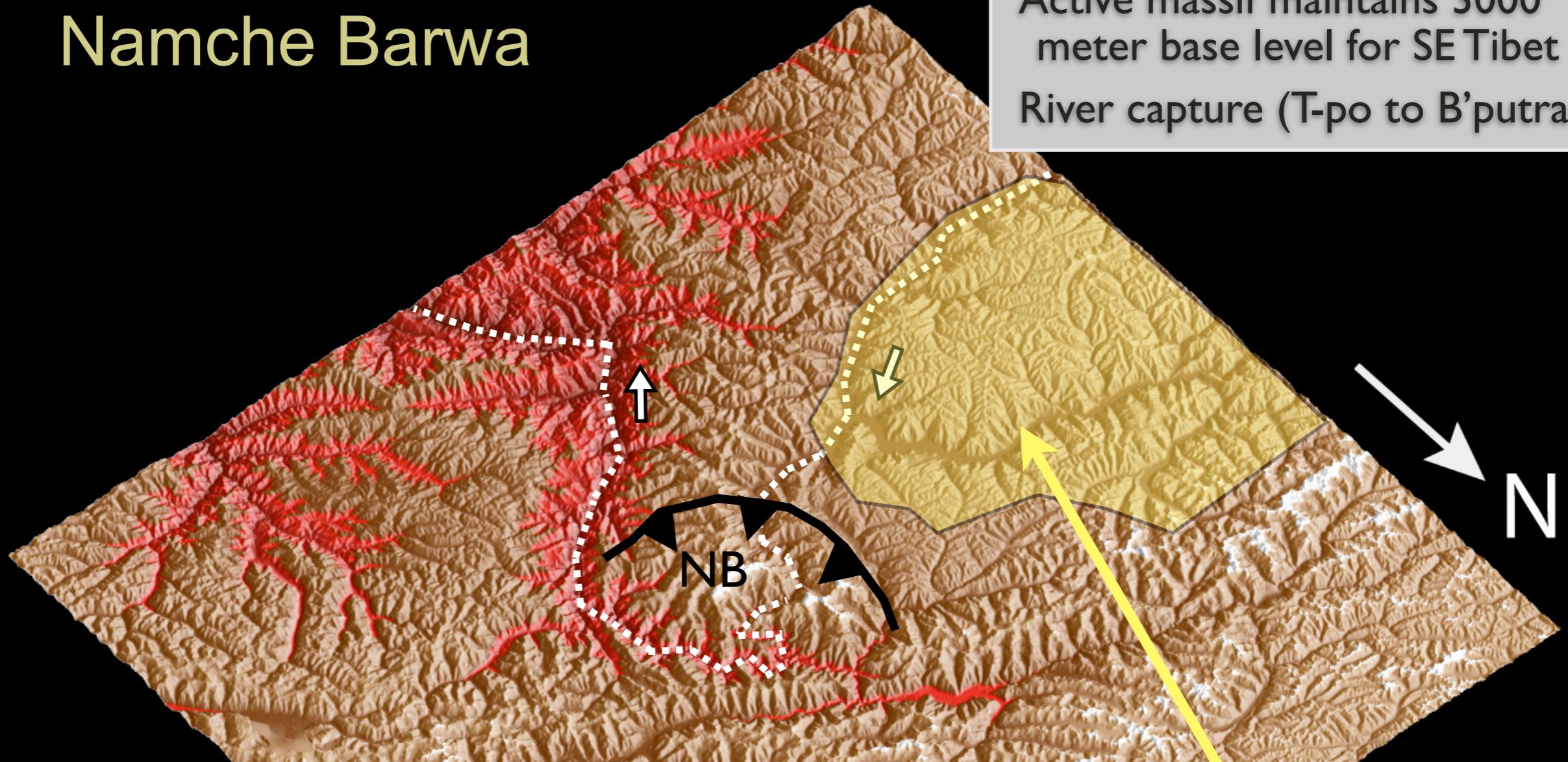


# Thermal histories above and below NB knickzone



# Barrier to incision at Namche Barwa

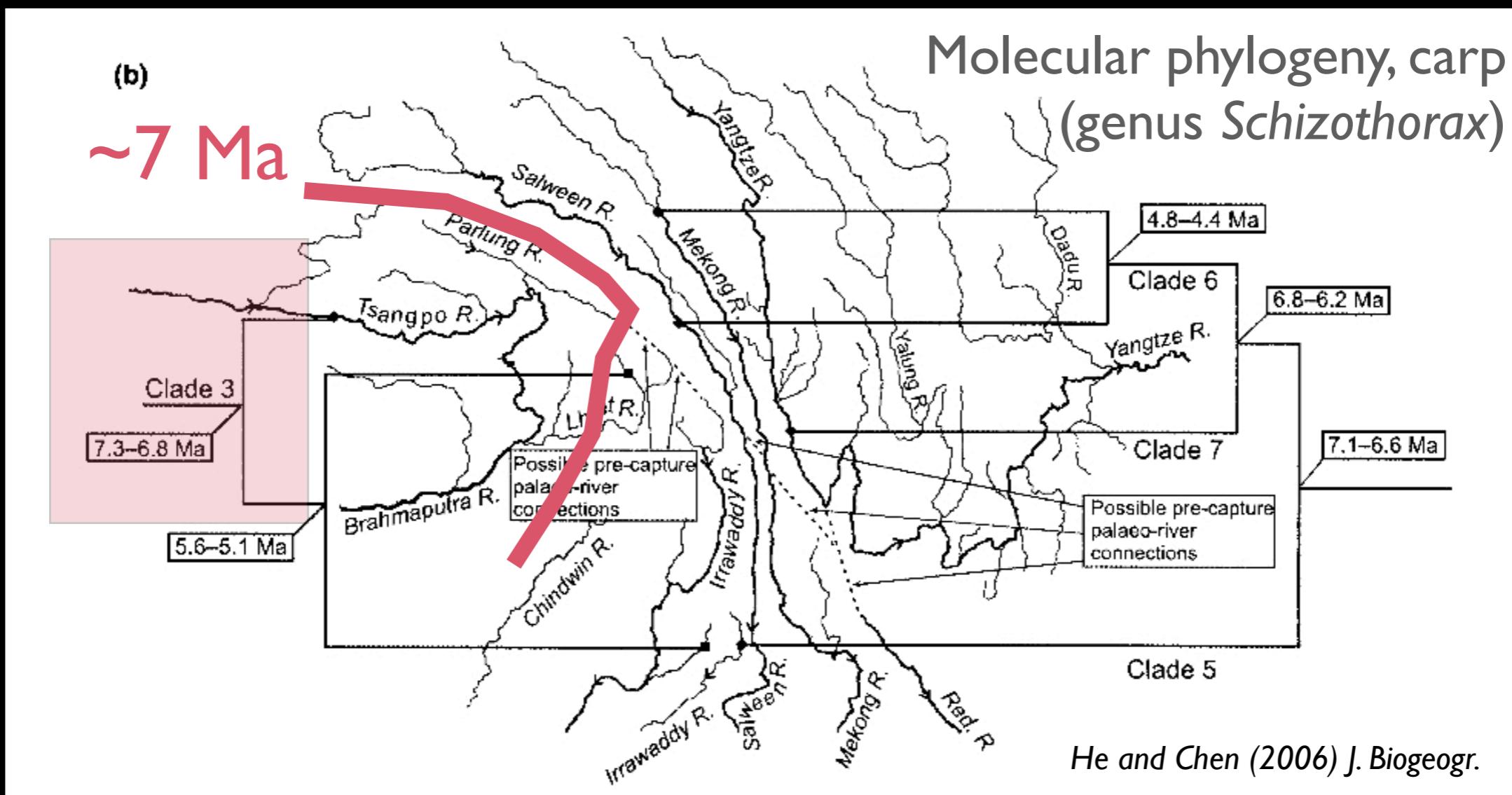
Incision wave bypasses NB massif  
Active massif maintains 3000 meter base level for SE Tibet  
River capture (T-po to B'putra?)



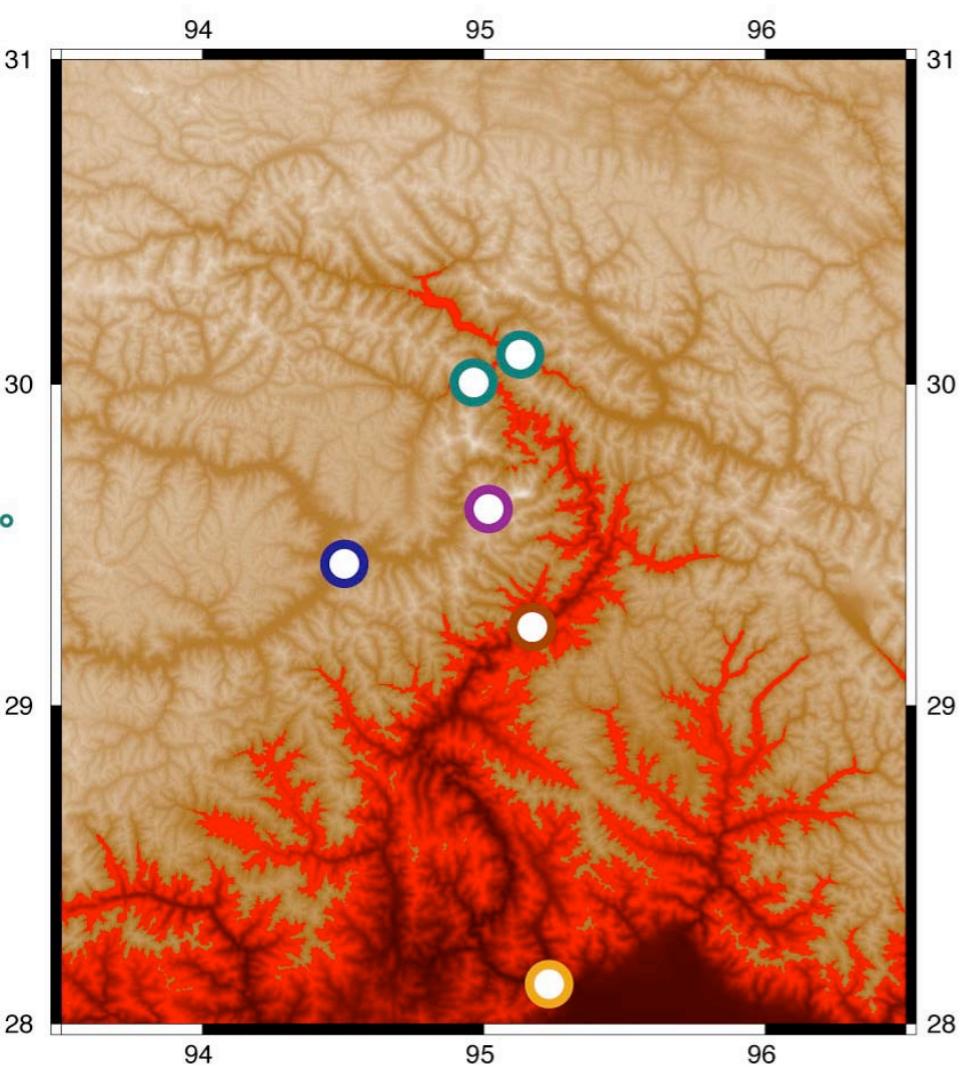
Youngest U-He  
apatite  
5 Ma in valleys

# Evidence from Biogeography

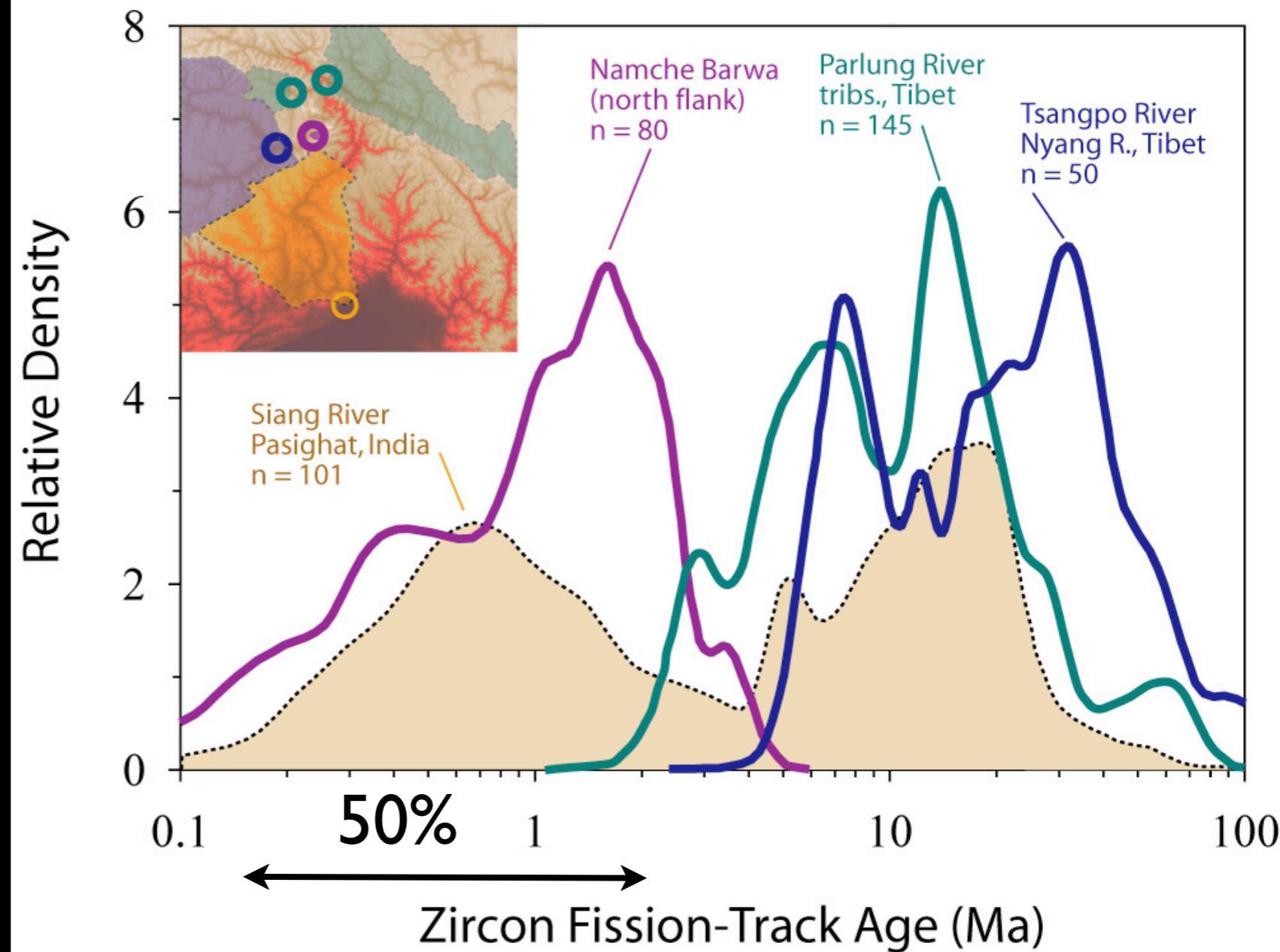
River capture (T-po to B'putra?)



# Modern Erosion Rates, Detrital Thermochronology



Sediment flux is 210 Mt/yr at Pasighat in Siang (= lower Tsangpo)



50% of sediment flux at Pasighat is young  
Must be from NB-GP massif (1800-5200 km<sup>2</sup>)  
Implies 10 mm/yr (7-20) modern erosion rate  
(50% of 210 Mt spread over 1800-5200 km<sup>2</sup>)  
Erosion, or incision? (massif appears 'stable', but incision wave elsewhere)

# Stream Power, Relief, and Geochronology Across Knickzone

