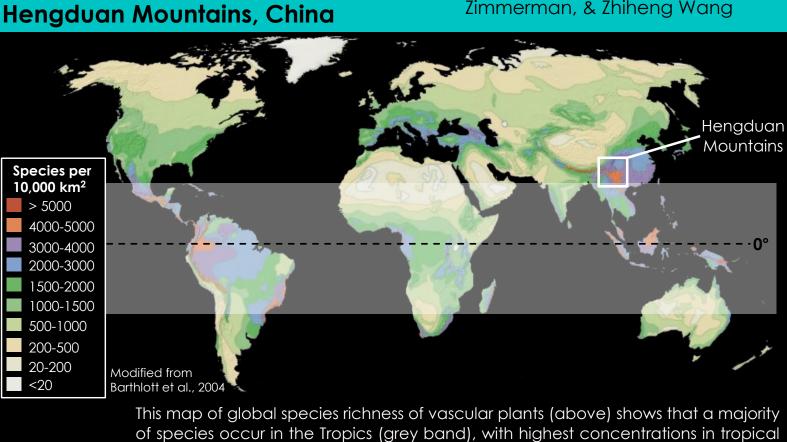
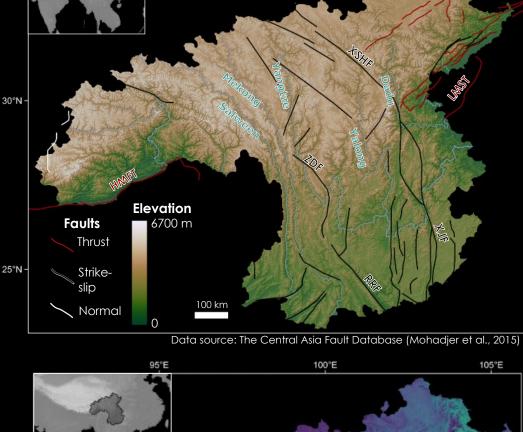


plant biodiversity patterns in the

Katrina D. Gelwick, Yaquan Chang, Sean D. Willett, Loïc Pellissier, Niklaus Zimmerman, & Zhiheng Wang



mountain ranges. The Hengduan Mountains (HDM) are an anomaly, with exceptionally high species richness despite a mostly temperate climate. Tectonic setting and species richness patterns in the HDM



ZDF = Zhongdian Fault The HDM are a series of tectonically active mountain ranges on the SE margin of the **Tibetan Plateau**. Due to a complex landscape

LMSF = Longmen Shan Thrust

RRF = Red River Fault XJF = Xiaojiang Fault XSHF = Xianshuihe Fault

出MFT = Himalayan Main Frontal Thrust

and ongoing faulting, rivers in the HDM do not exhibit a classic dendritic pattern. Species richness of seed plants shows high spatial variability in the HDM, with the highest concentration of species

located in the Three Parallel

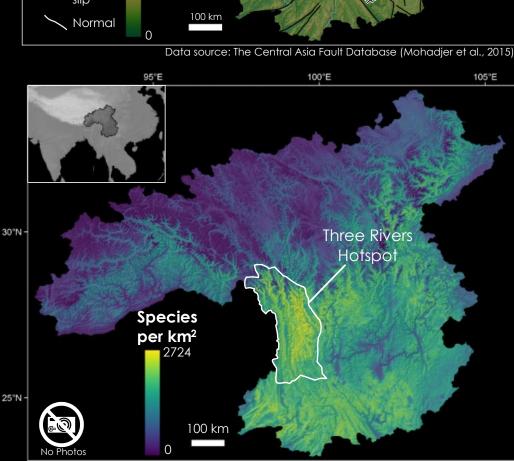
Rivers Area. Species in this "hotspot" occur predominantly at mid- to high-elevations, suggesting a similar adaptive

to

a

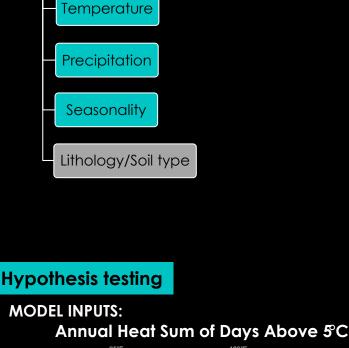
common

response



1) Ecological state variables explain all species richness

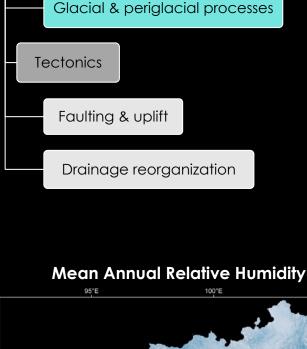
What drives species richness in the HDM?



Climate Cycles

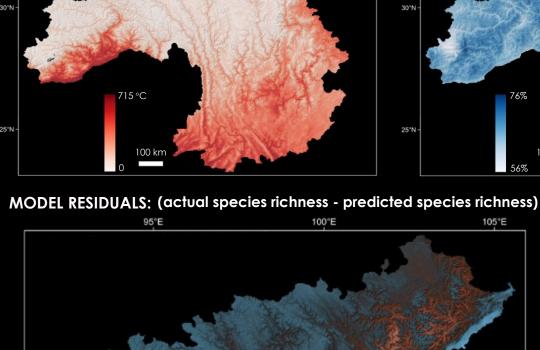
2) Transient climate and tectonic processes

drive evolution to explain species richness



30°N

25°N -



Species

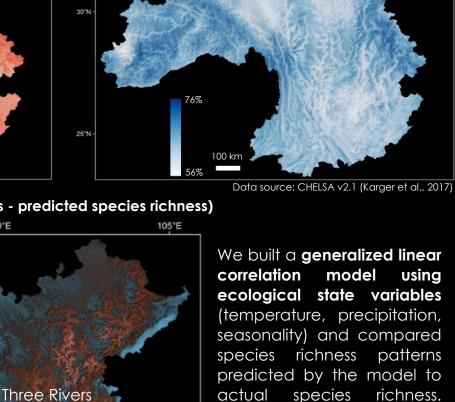
per km²

-2583

A landscape in transience

 χ (chi) Map

100 km



actual

Model

variables alone.

Hotspot

Stable divide

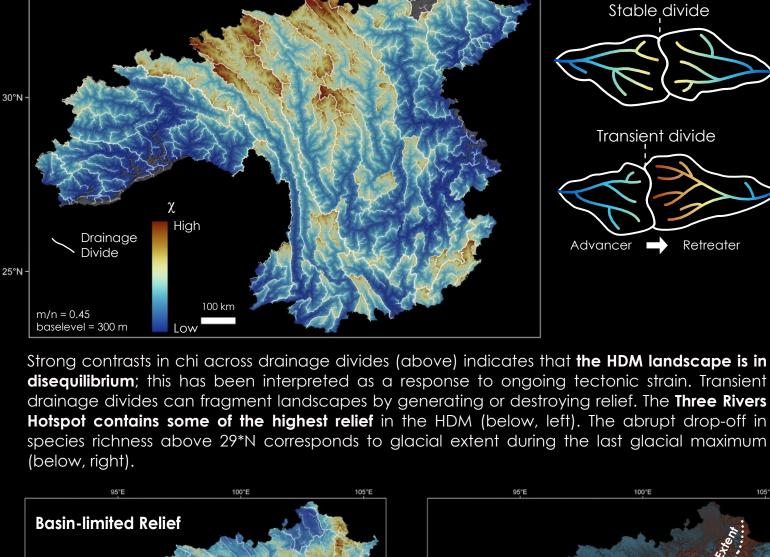
Transient divide

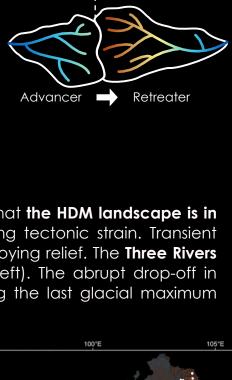
residuals that the Three Rivers Hotspot is not explained by state

Note: exceptionally low species richness indicated by model at the Himalayan front is likely due to

known under-sampling issues.

indicate





Drainage Divide

the north

Take-aways Ecological state variables do not fully explain species richness patterns of seed

100 km

Relief (5 km radius) 3000+ m

- plants in the HDM O Glaciation has reduced species richness in
- Tectonic processes have led to a complex, transient landscape

 - May drive evolution through habitat fragmentation and expansion

Give Feedback (OSPP)

