



RRF = Red River Fault
XJF = Xiaojiang Fault
XSHF = Xianshuihe Fault
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 history and ongoing faulting, rivers in the HDM do not exhibit a classic dendritic pattern.

Species Distribution

6000 m a.s.l.

5000

4000

3000

2000

1000

0

```
graph LR; Root --- Climate[Climate Cycles]; Root --- Glacial[Glacial & periglacial processes]; Root --- Tectonics[Tectonics]; Root --- Faulting[Faulting & uplift]; Root --- Drainage[Drainage reorganization];
```

- Climate Cycles
- Glacial & periglacial processes
- Tectonics
- Faulting & uplift
- Drainage reorganization

We built a **generalized linear correlation model using ecological state variables** (temperature, precipitation, seasonality) and compared species richness patterns predicted by the model to actual species richness. Model residuals indicate that the **Three Rivers Hotspot is not explained by state variables alone**.

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

Stable divide

Transient divide

Advancer → Retreater



Take-aways

- Ecological state variables do not fully explain inter- and intra-specific differences
- Tectonic processes have led to a complex, hierarchical pattern of species distribution

- Glaciation has reduced species richness in the north