

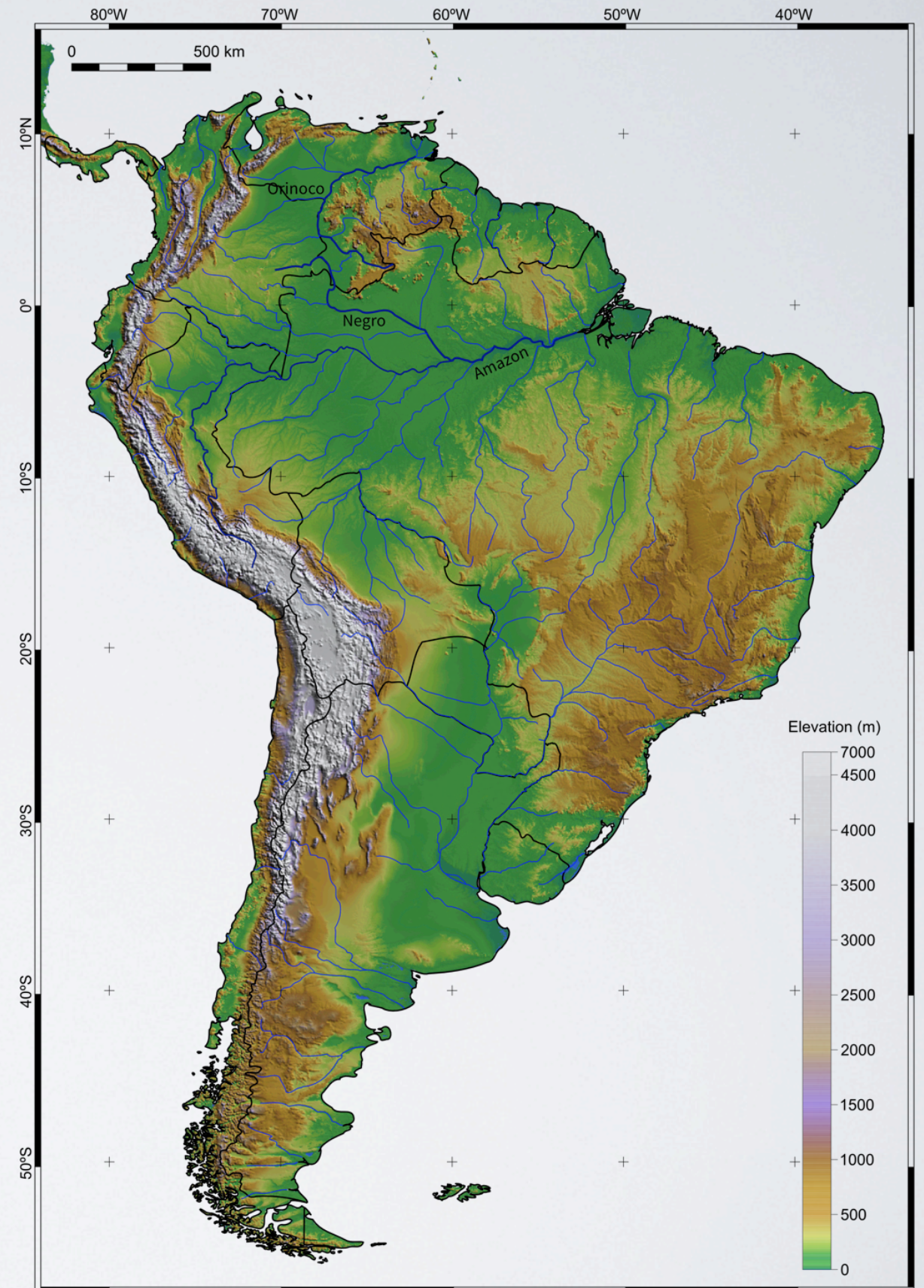
Tectonic controls on the capture of the Orinoco river and formation of the Casiquiare canal, Venezuela

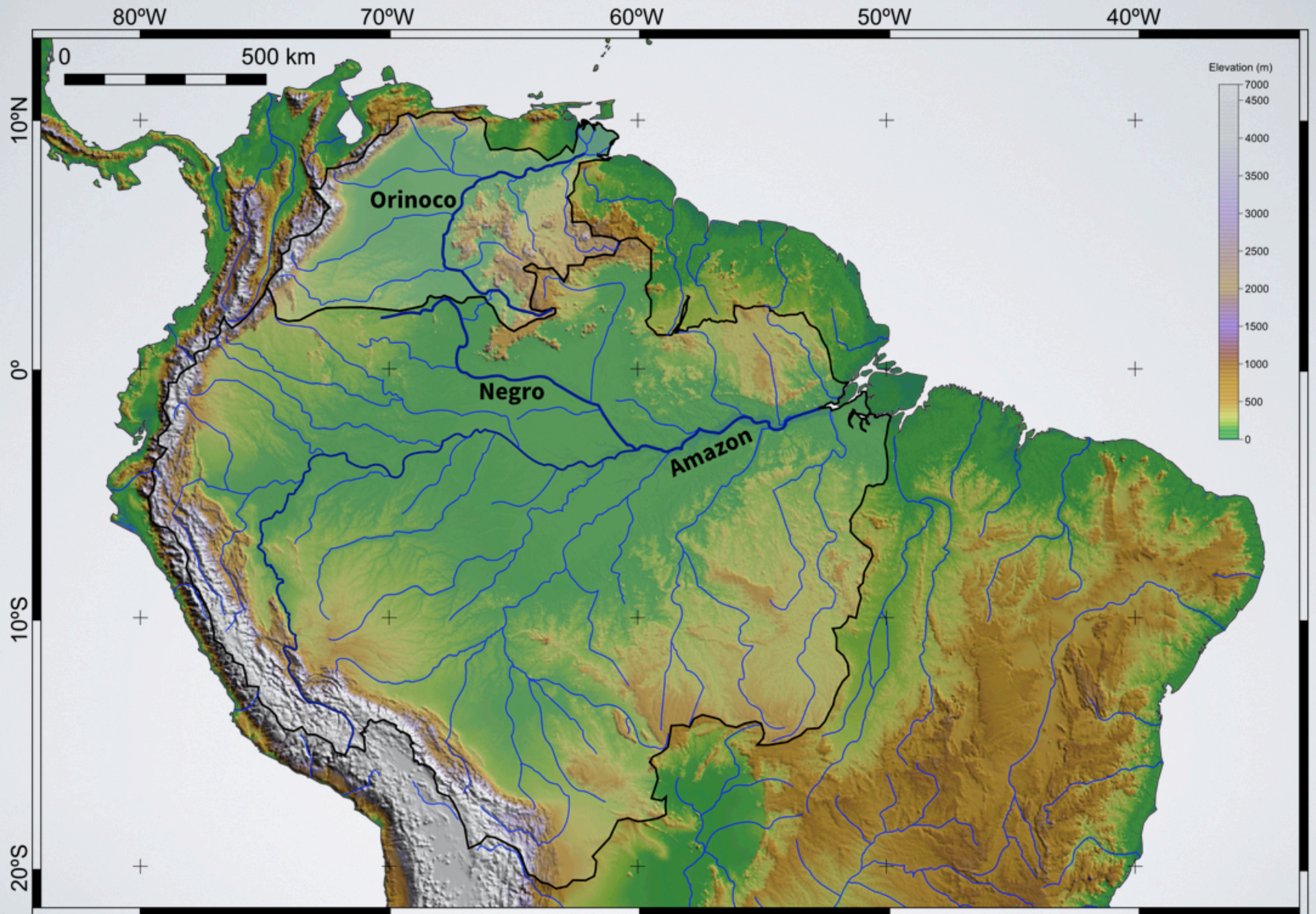
Carlos H. Grohmann, Claudio Riccomini,
André O. Sawakuchi

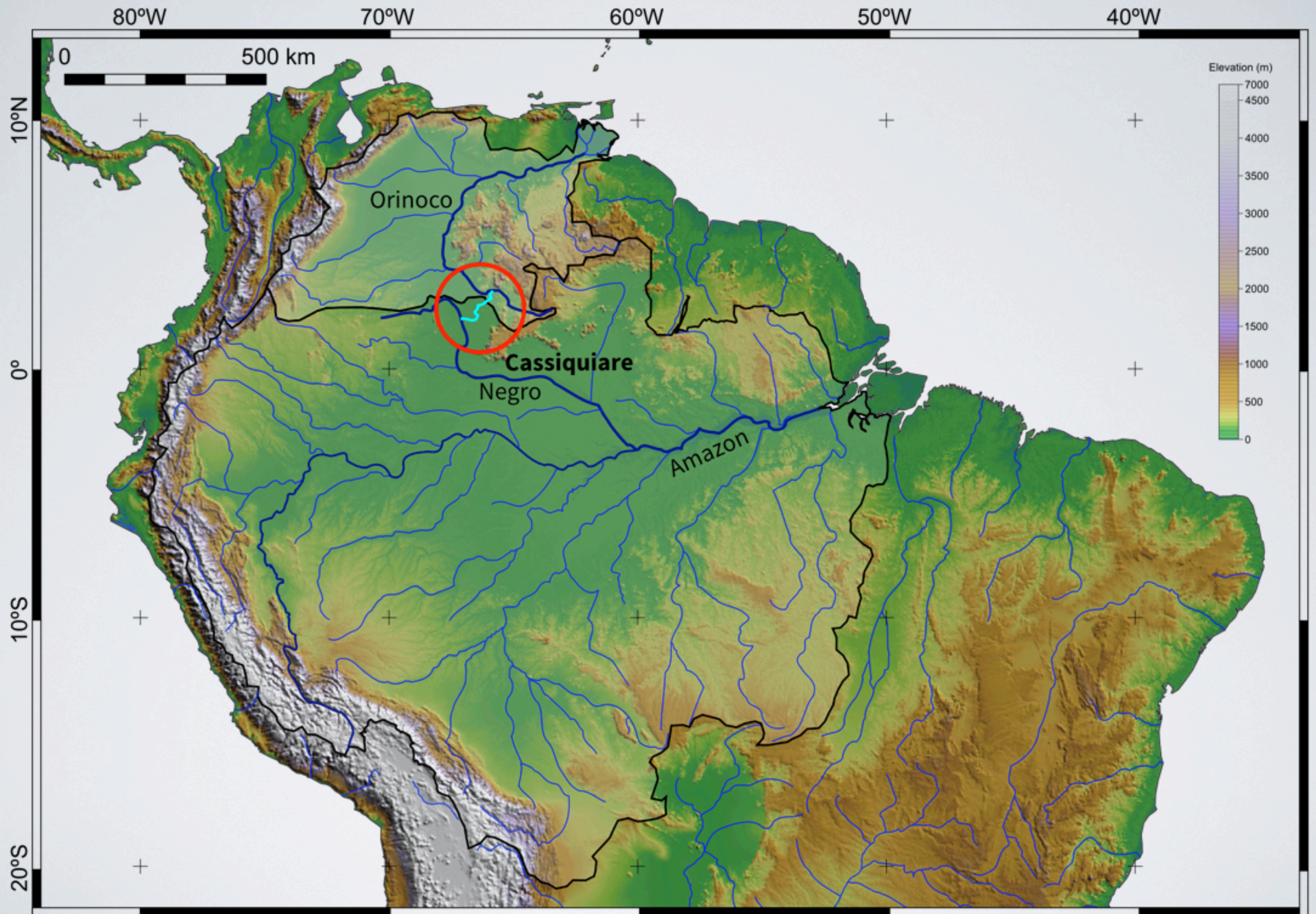
Institute of Geosciences
University of São Paulo - Brazil

- **Casiquiare Canal**

- Natural waterway in southern Venezuela connecting the Orinoco and Amazon basins
- Branches from the Orinoco and flows 320km (200 miles) SW to the Guainia River, after which it is called Negro River, one of the main tributaries of the Amazon River

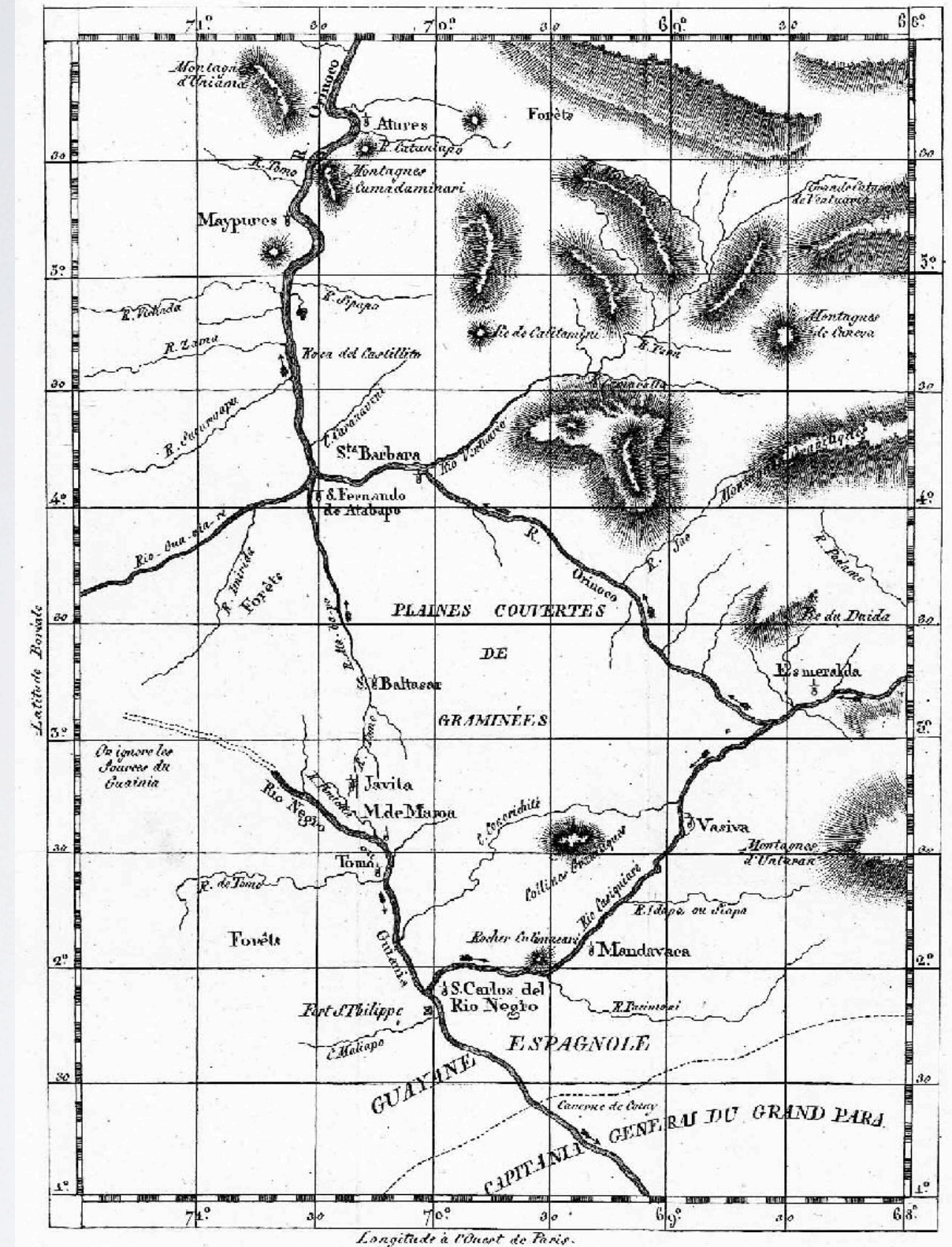






- **Casiquiare Canal**

- First reported by Spanish missionary Cristóbal Diatristán de Acuña in 1639
- Existence confirmed in 1744 by Jesuit Father Roman, and verified in 1755 by Iturriaga and Solano, chiefs of the Spanish boundary expedition
- Explored by Humboldt & Bonpland (1800s), Rice (1920)



CARTE

De l'Intérieur de la Guayane Espagnole dressée sur les lieux
d'après des observations astronomiques
par A. de Humboldt.

What is the mechanism of this capture?

Methods

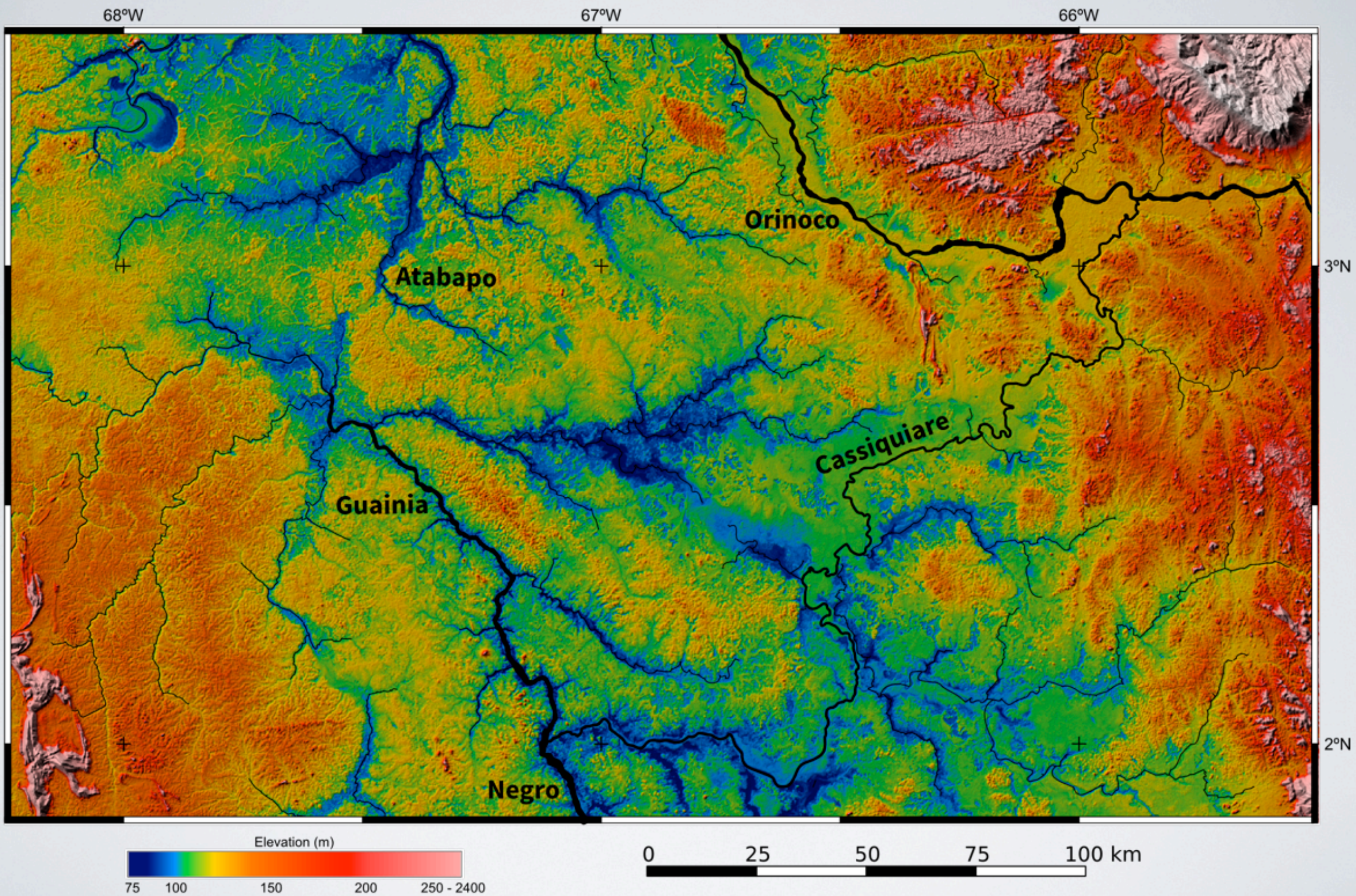
Geomorphometric analysis of the region

SRTM DEMs (3 arcsec)

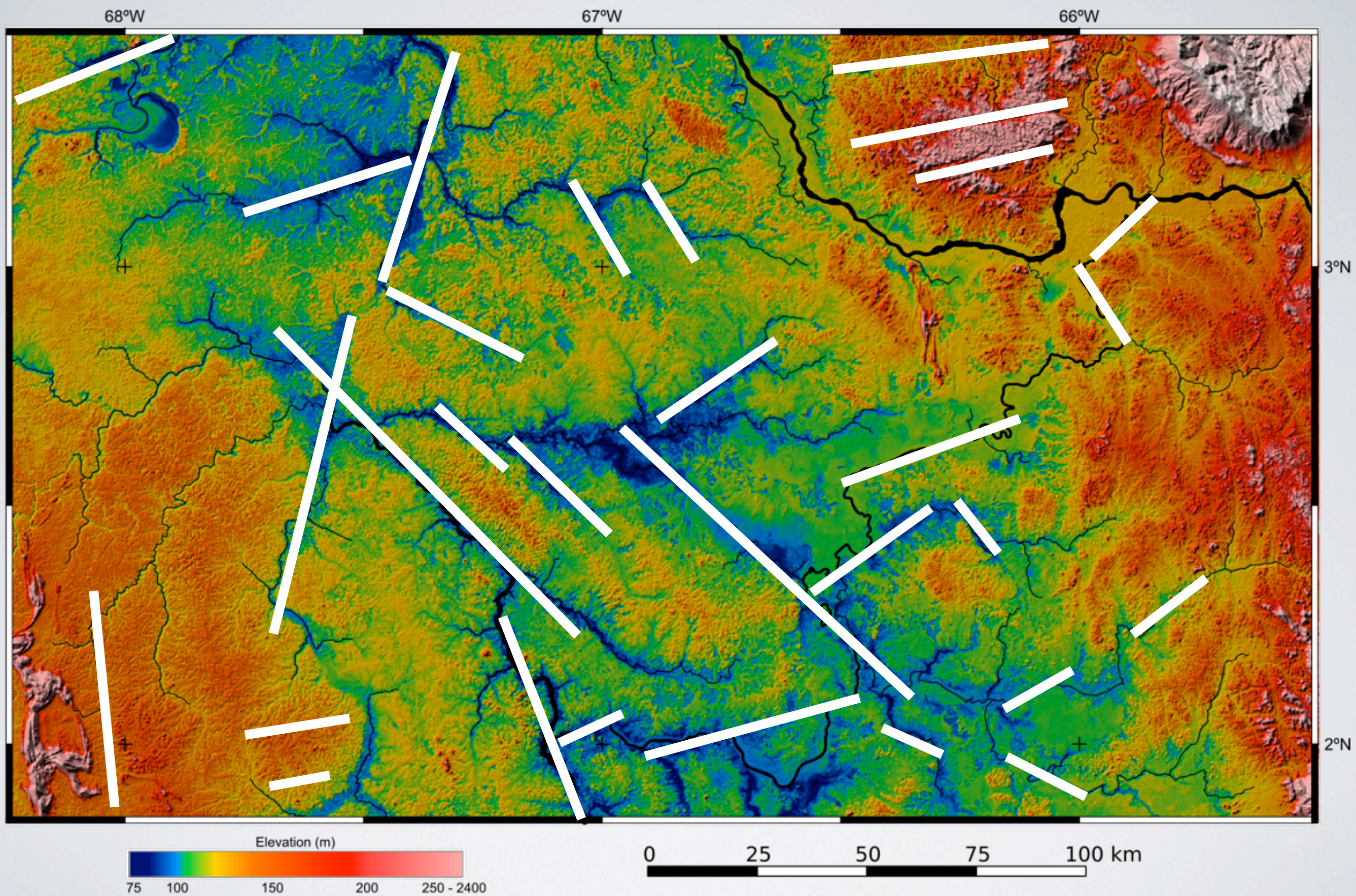
Hypsometry

Isobases

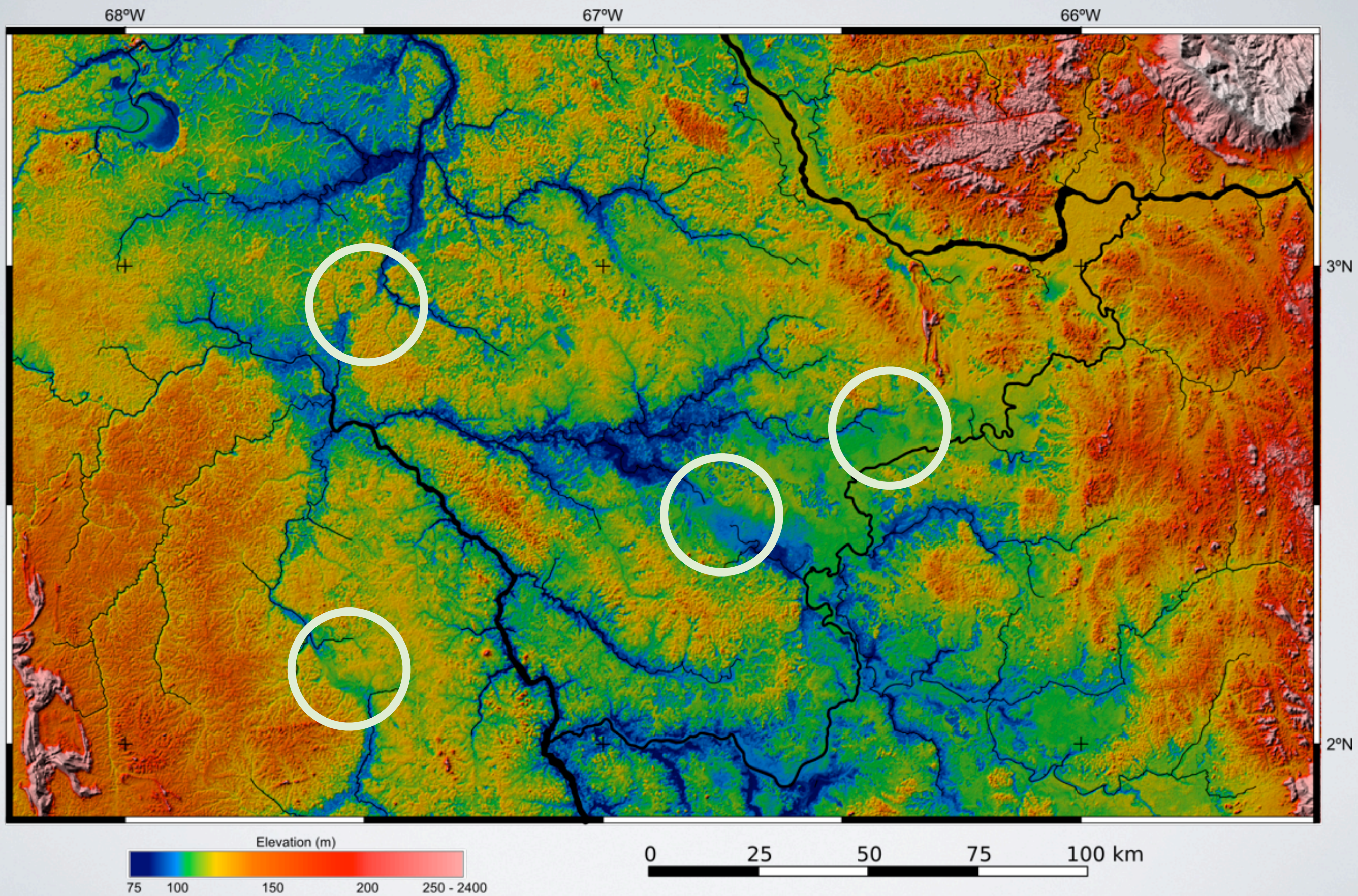
Swath Profiles



Hypsometry



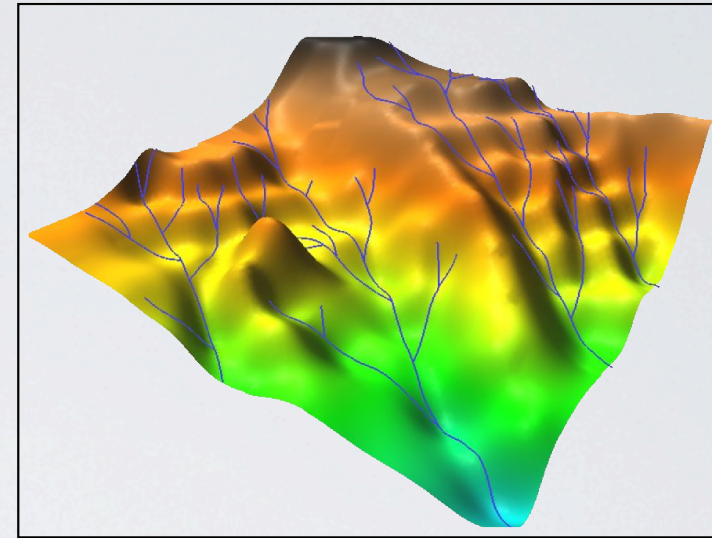
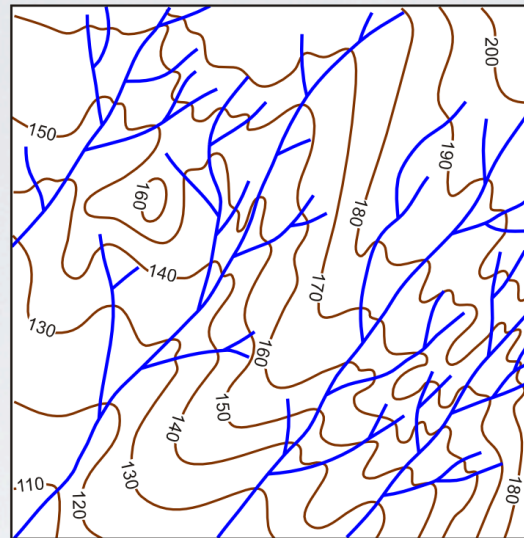
Hypsometry + Lineaments



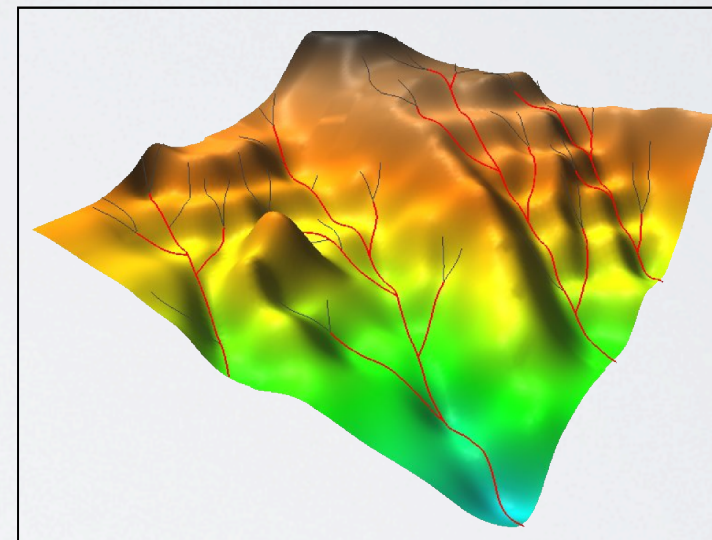
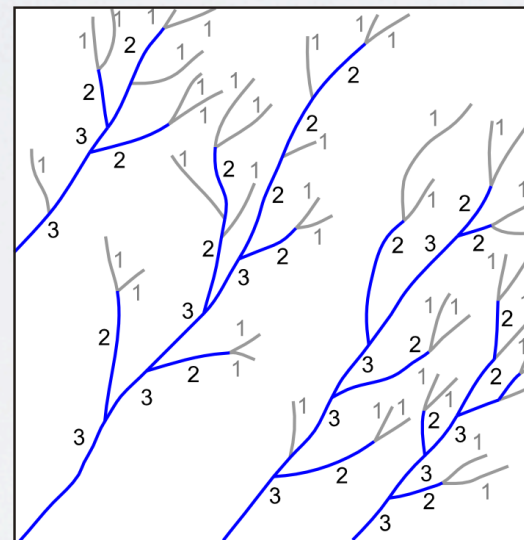
Previous Connections

Isobase Method - Filosofov 1960

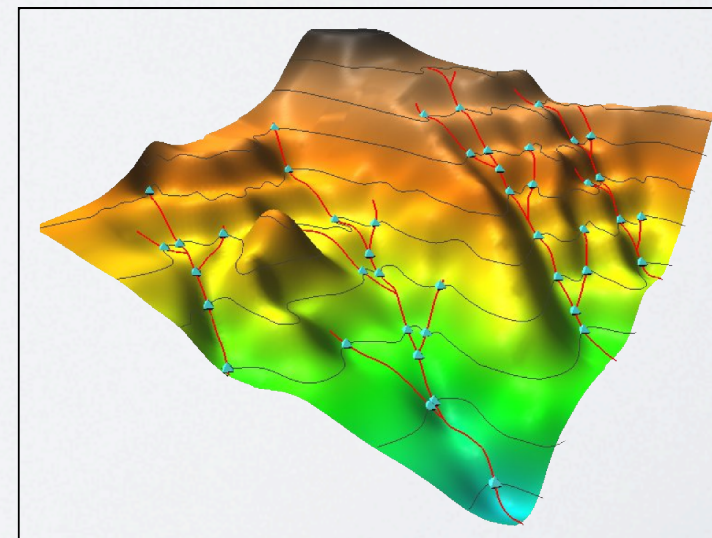
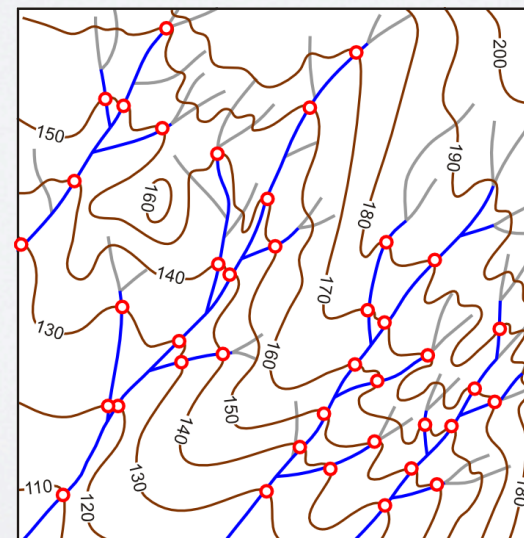
a) Original contours and drainage network



b) Classification of drainages and selection of 2nd and 3rd order channels

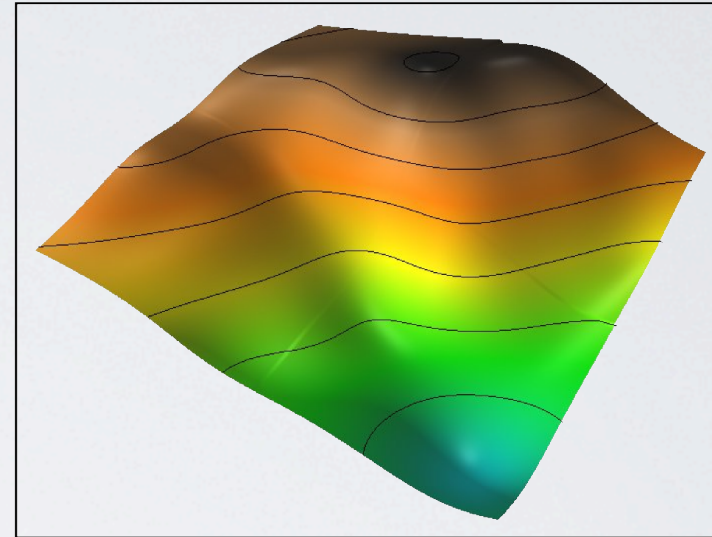
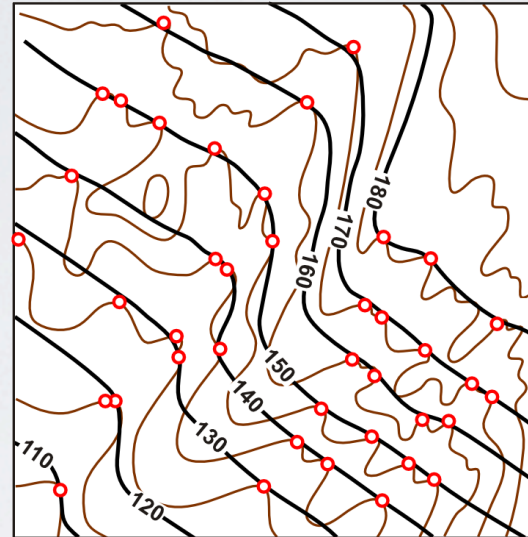


c) Intersections of contours with selected stream orders

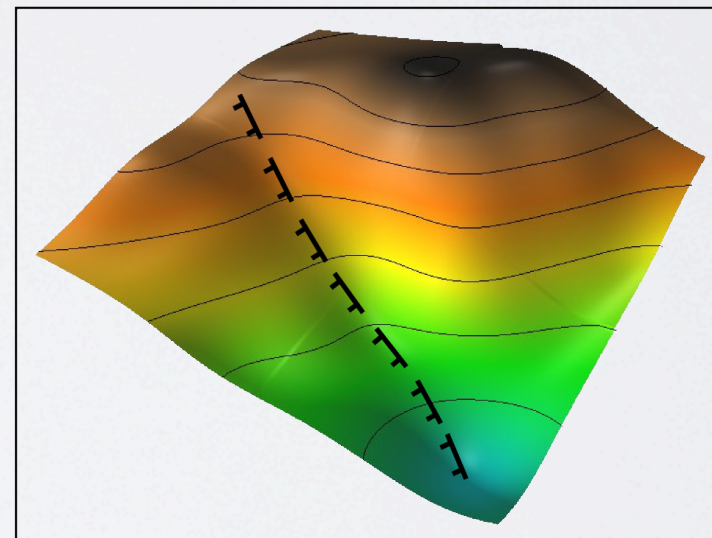
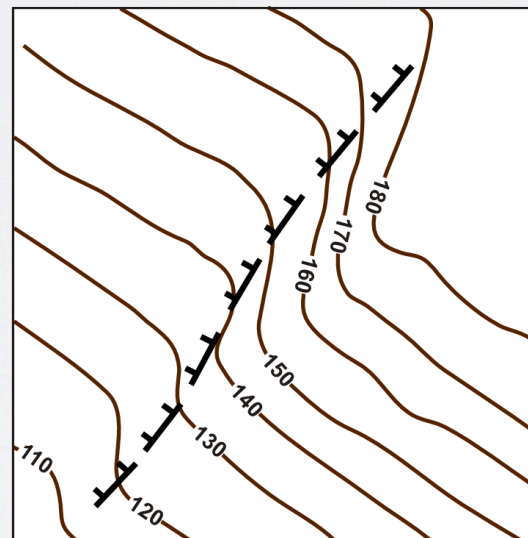


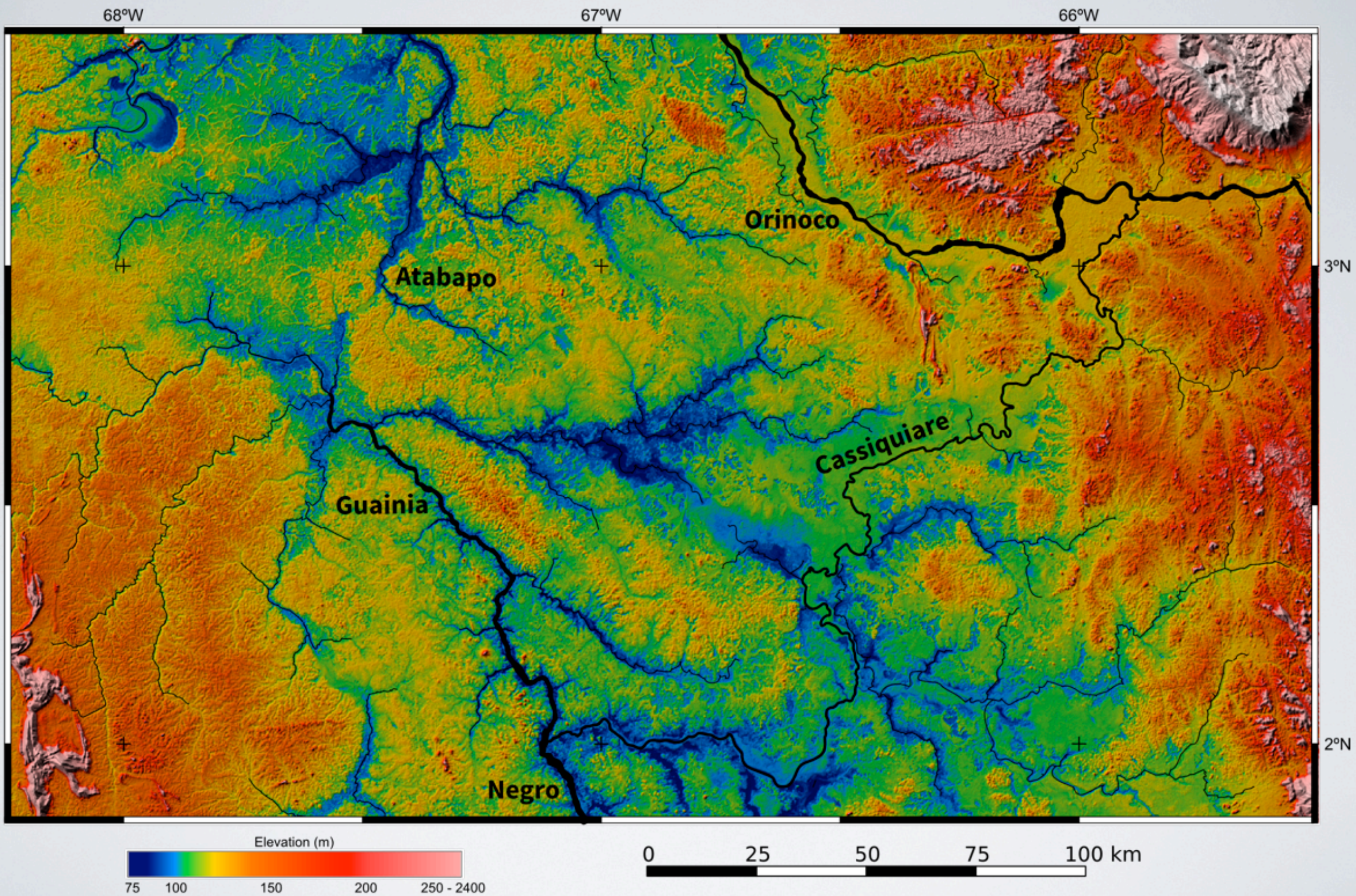
Isobase Method - Filosofov 1960

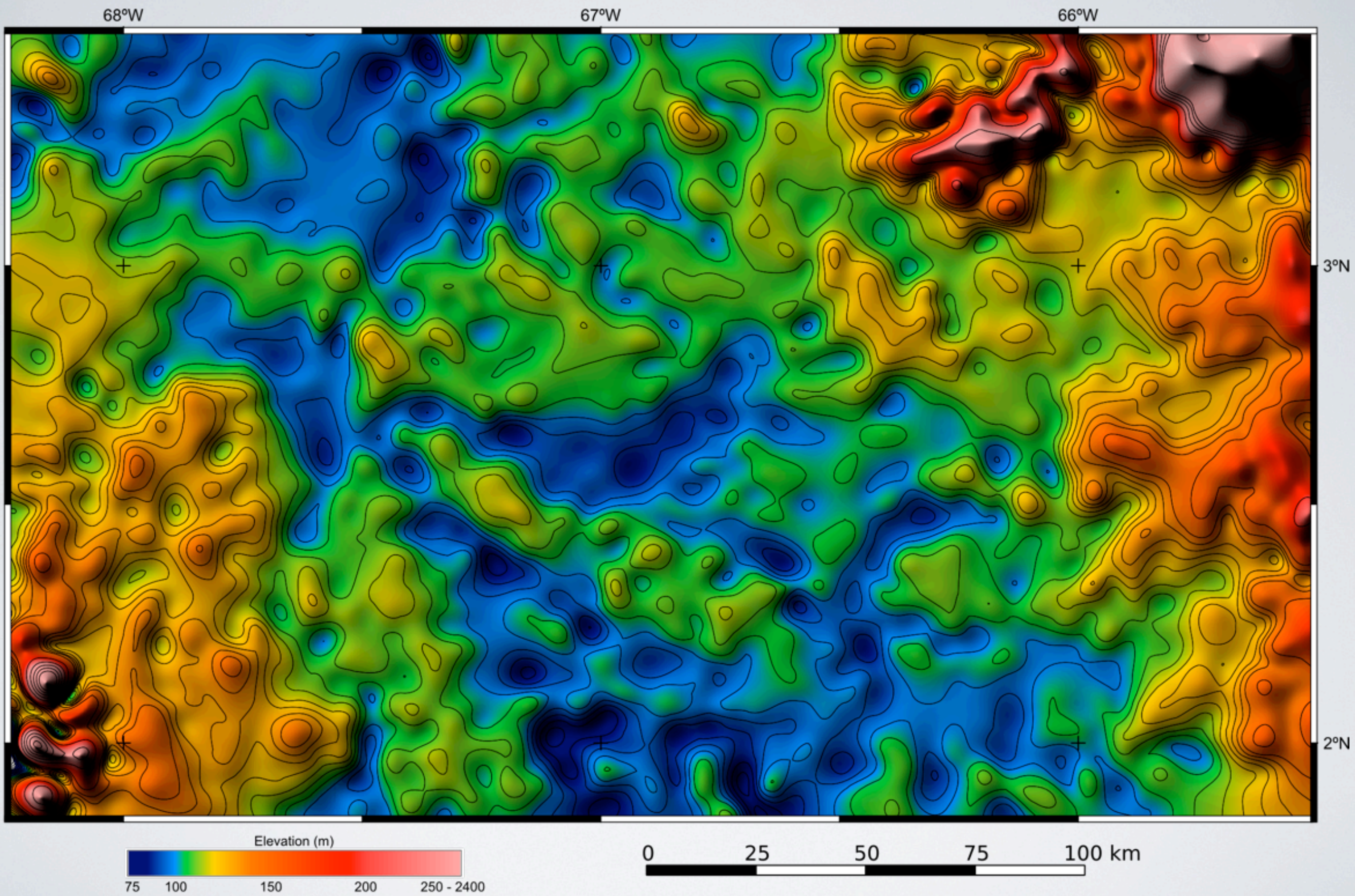
d) Interpolation of base-level surface from elevation of intersection points

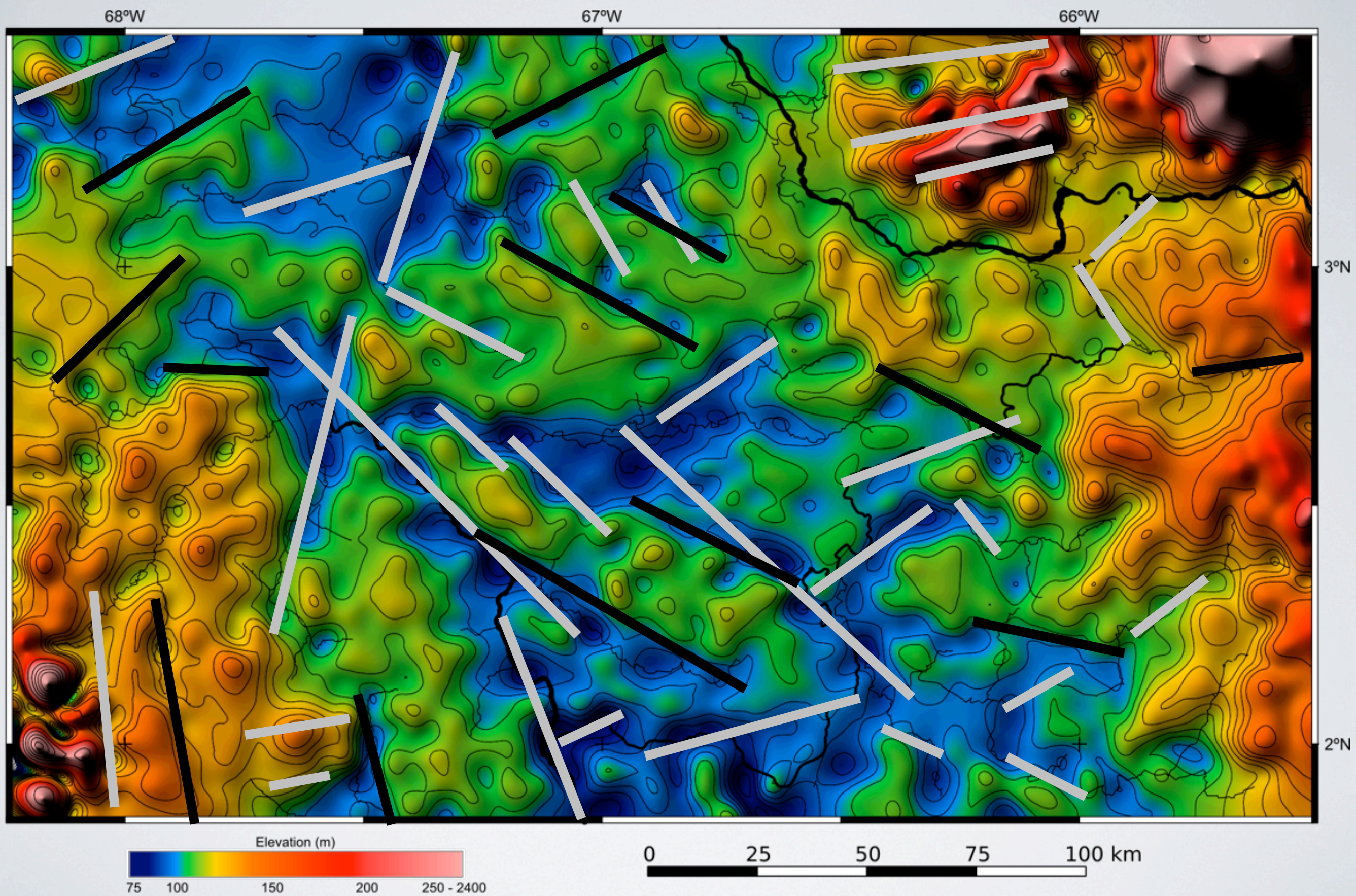


e) Interpretation of fault from abrupt change in base-level isoline orientation

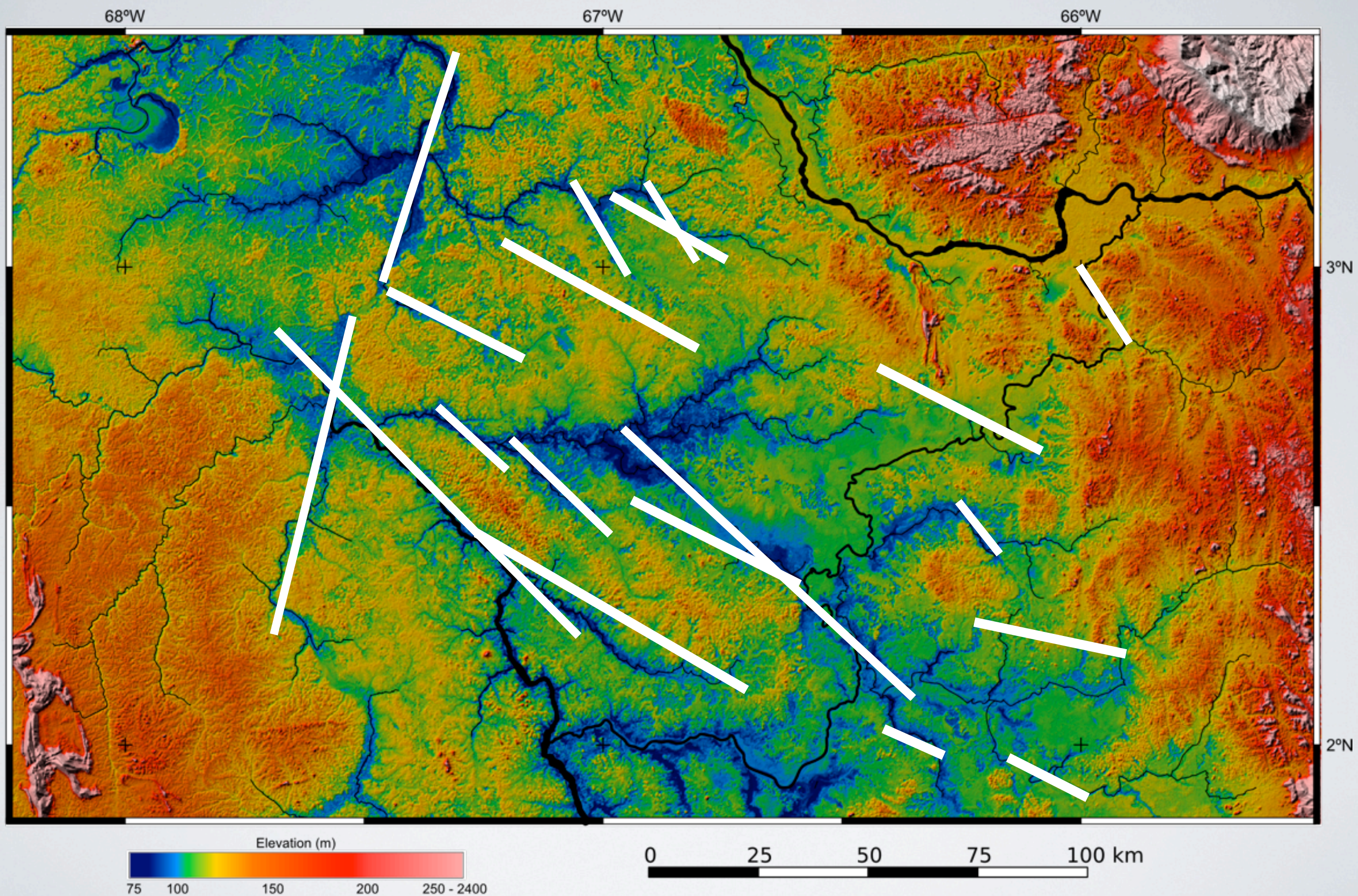




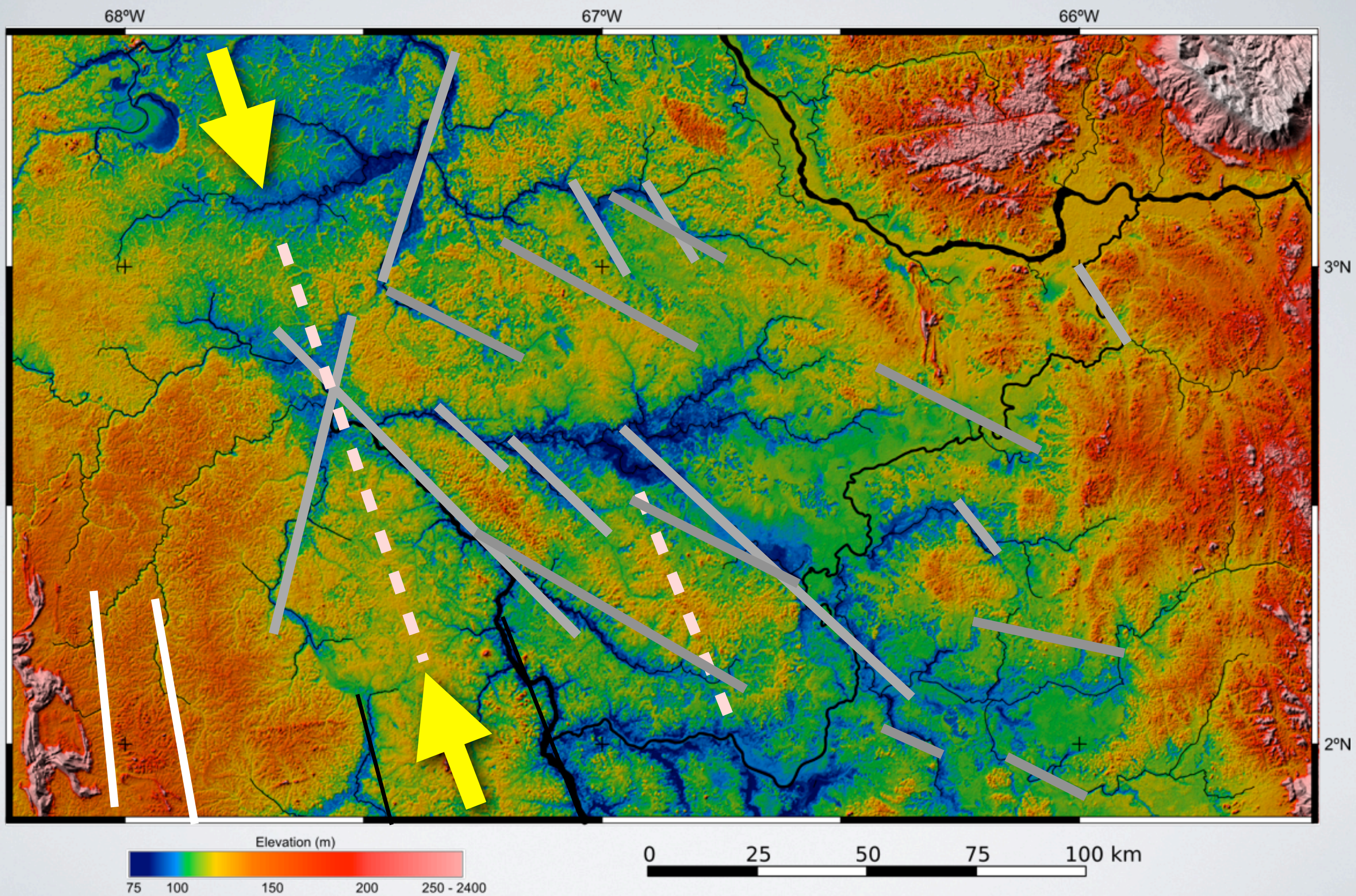




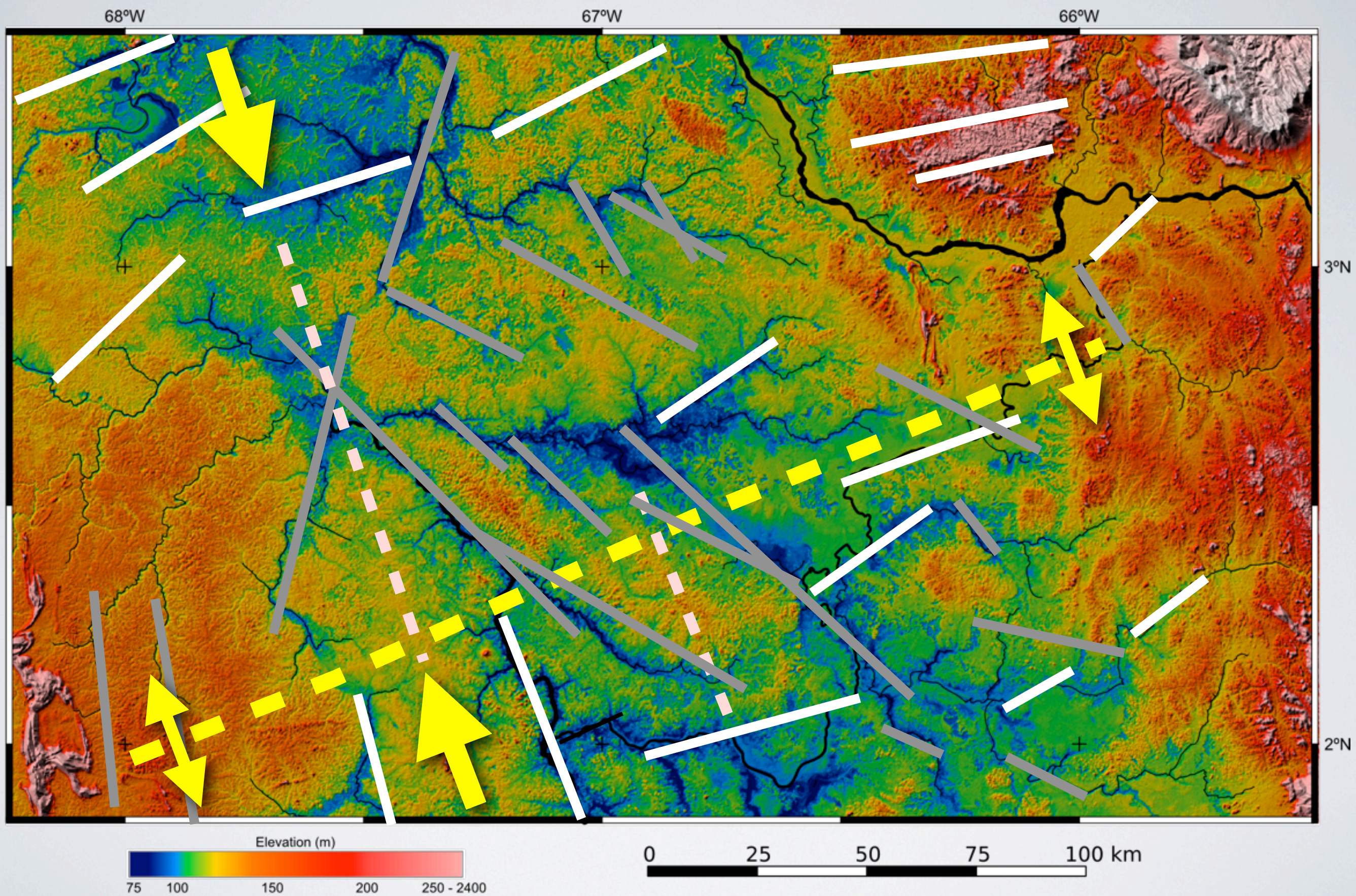
Isobase + Lineaments



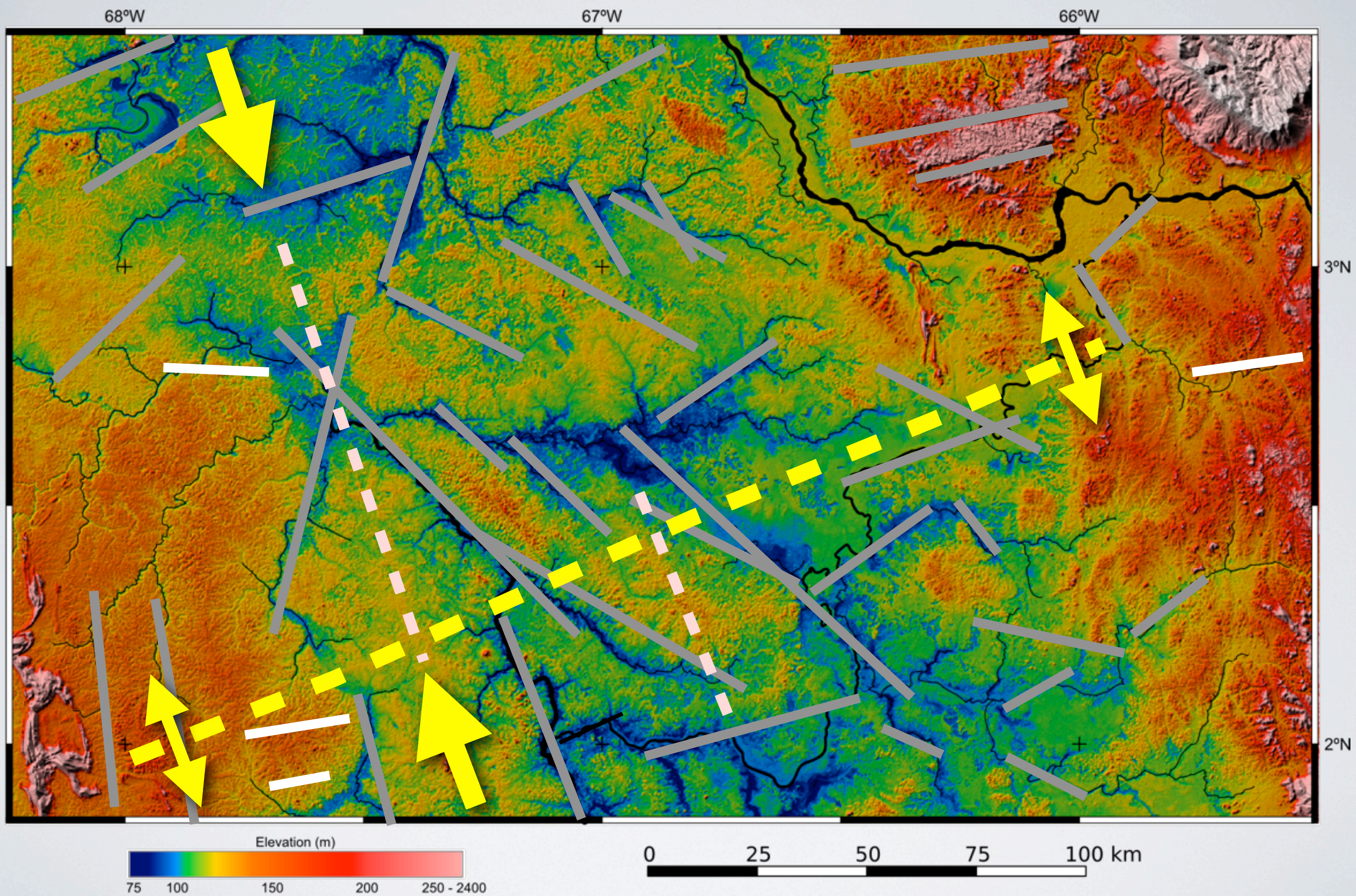
NNE-SSW + NW-SE Conjugated shear fractures



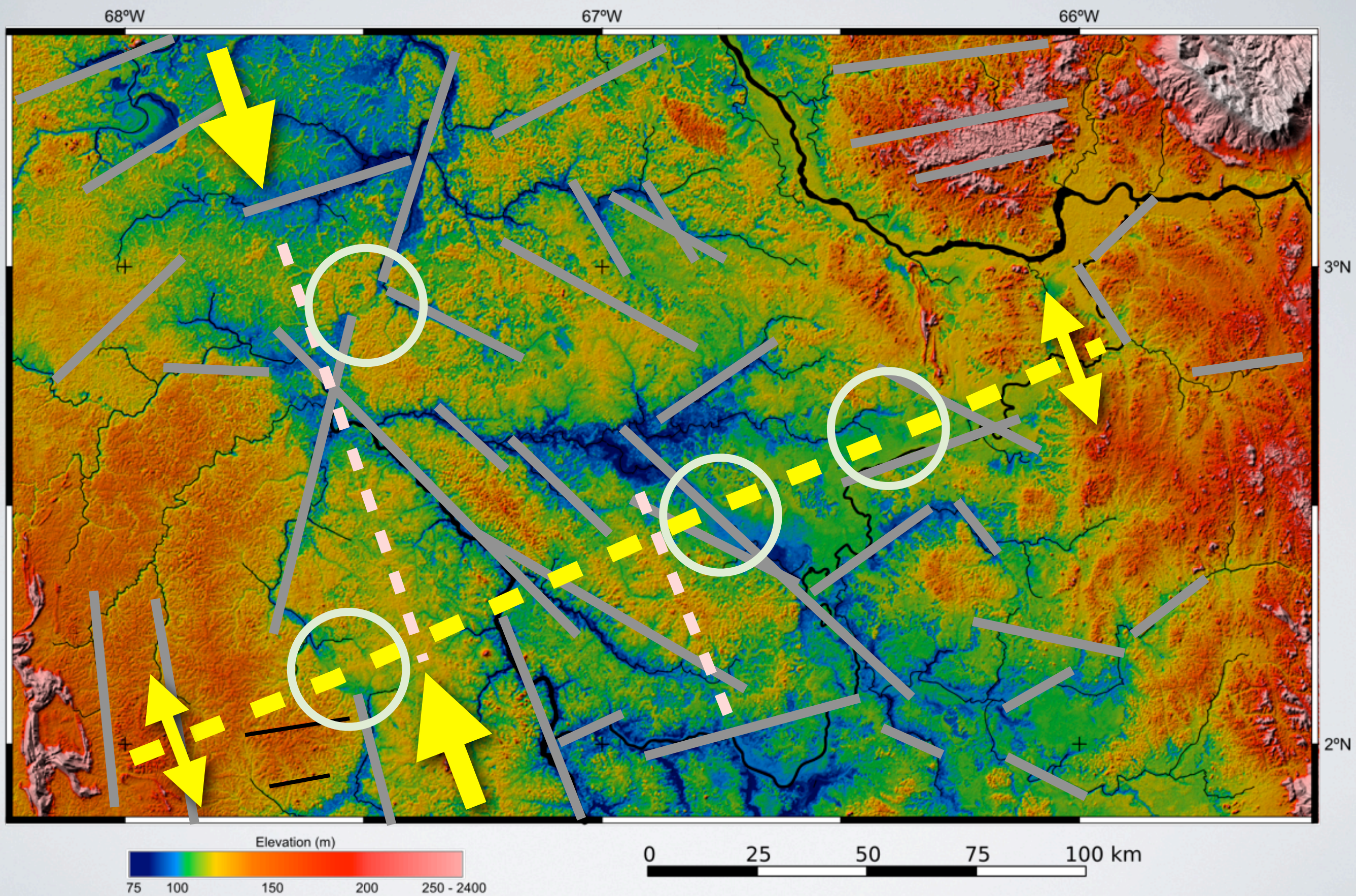
Maximum horizontal stress (S_{Hmax}) at NNW-SSE



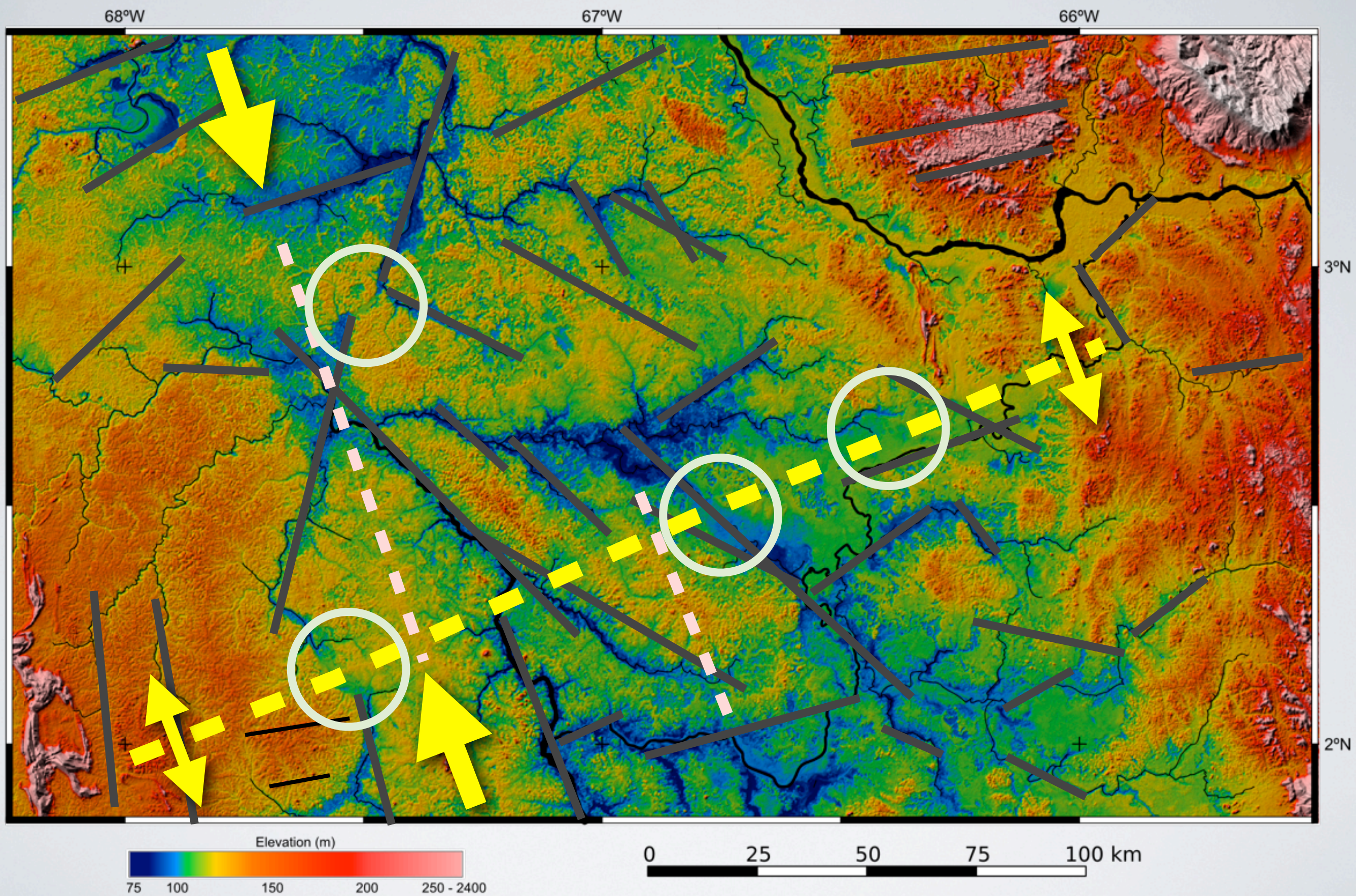
ENE-WSW - fold axes and cross-joints



Casiquiare: NW-SE + ENE-WSW control



Alignment of previous connections



Tectonic Model

THANKS