

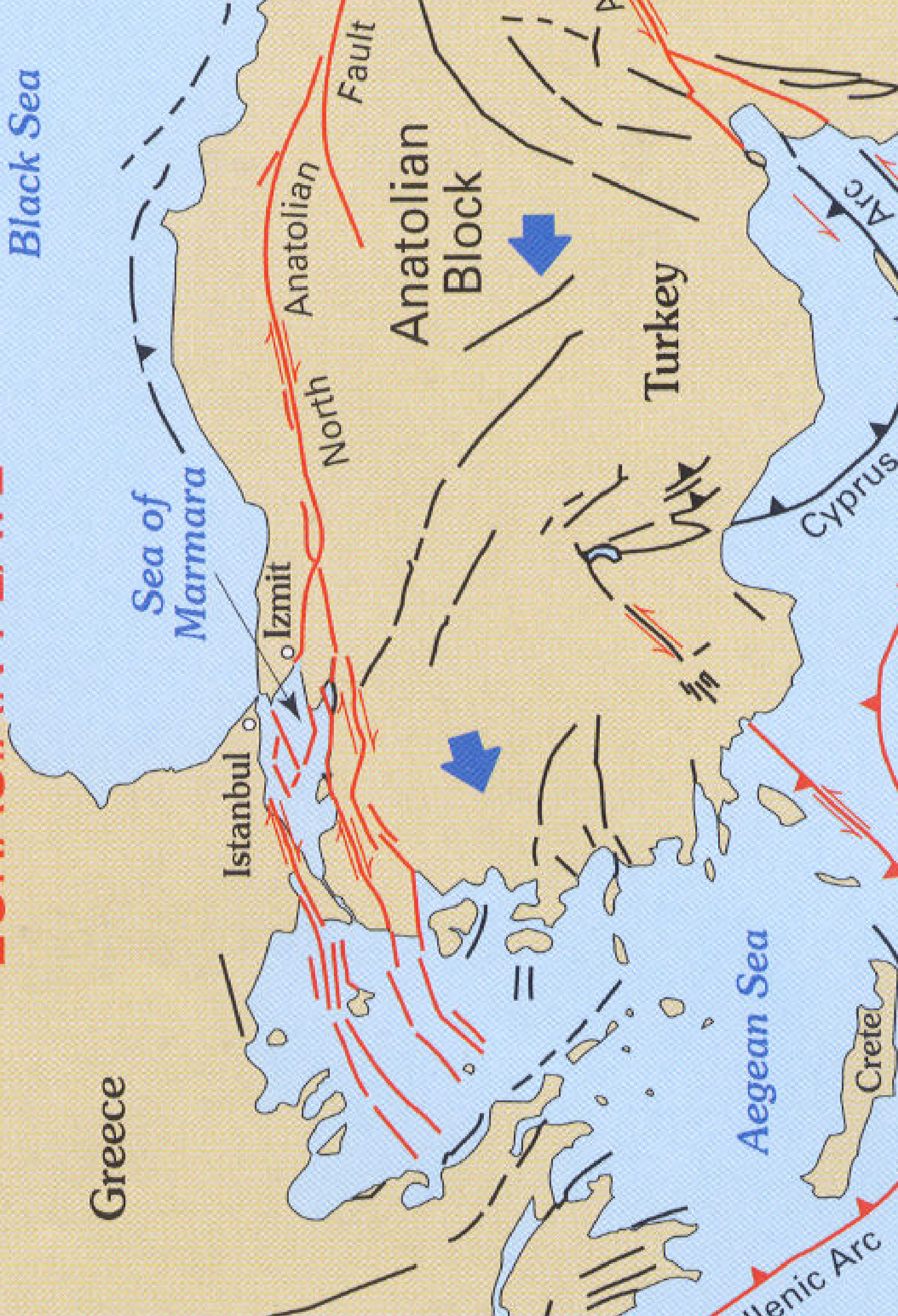
A satellite-style aerial photograph of Greece and the Aegean Sea. The land is shown in shades of green and brown, with the sea in deep blue. The text is overlaid in white, serif font.

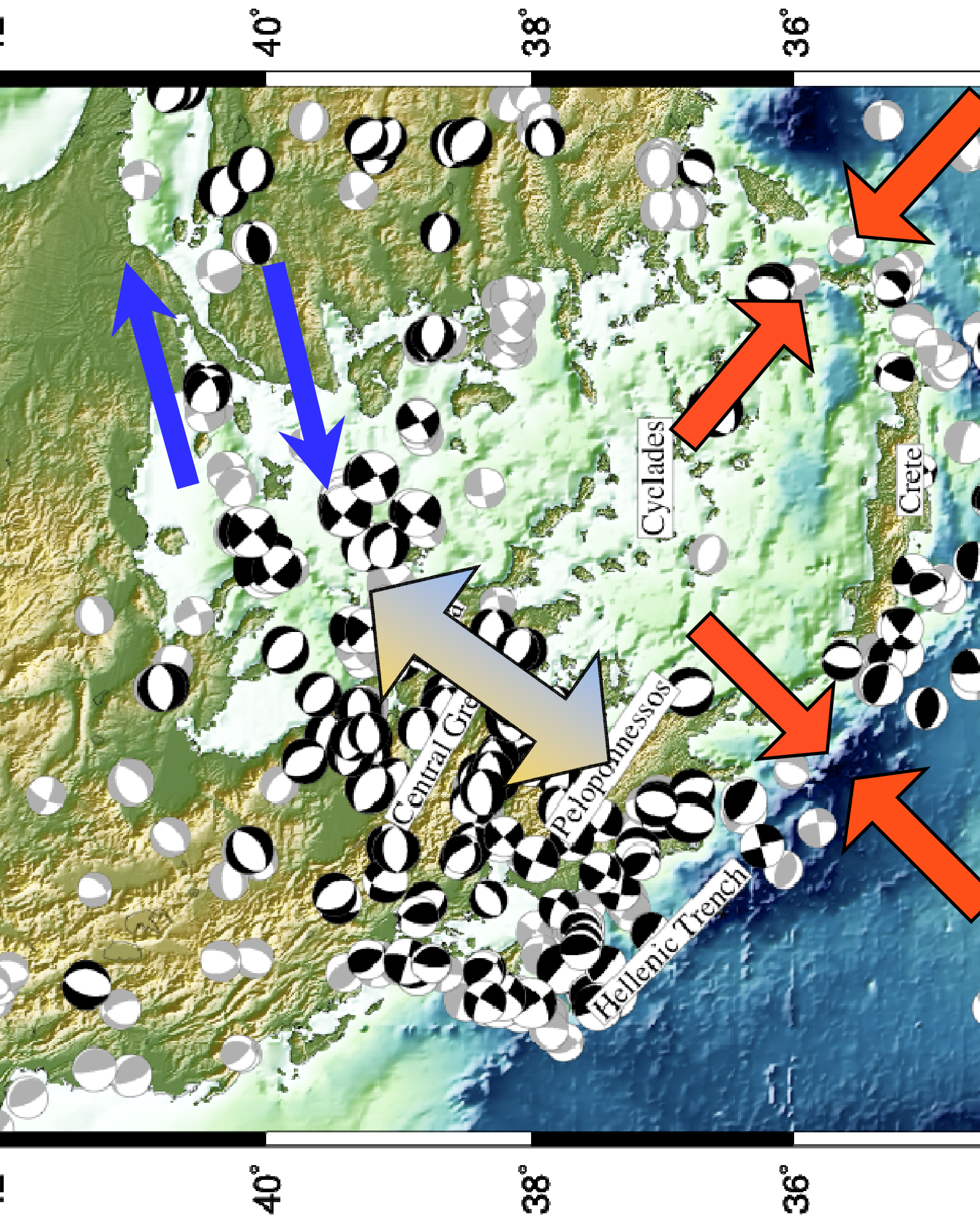
Geology and Geohazards in Greece

Philip England

- Greece is one of the most rapidly deforming areas on Earth (40 mm/yr over ~500 km).
- This deformation is complex and unpredictable.
- Quantification of hazard requires geodetic measurements of the highest precision.

EURASIAN PLATE





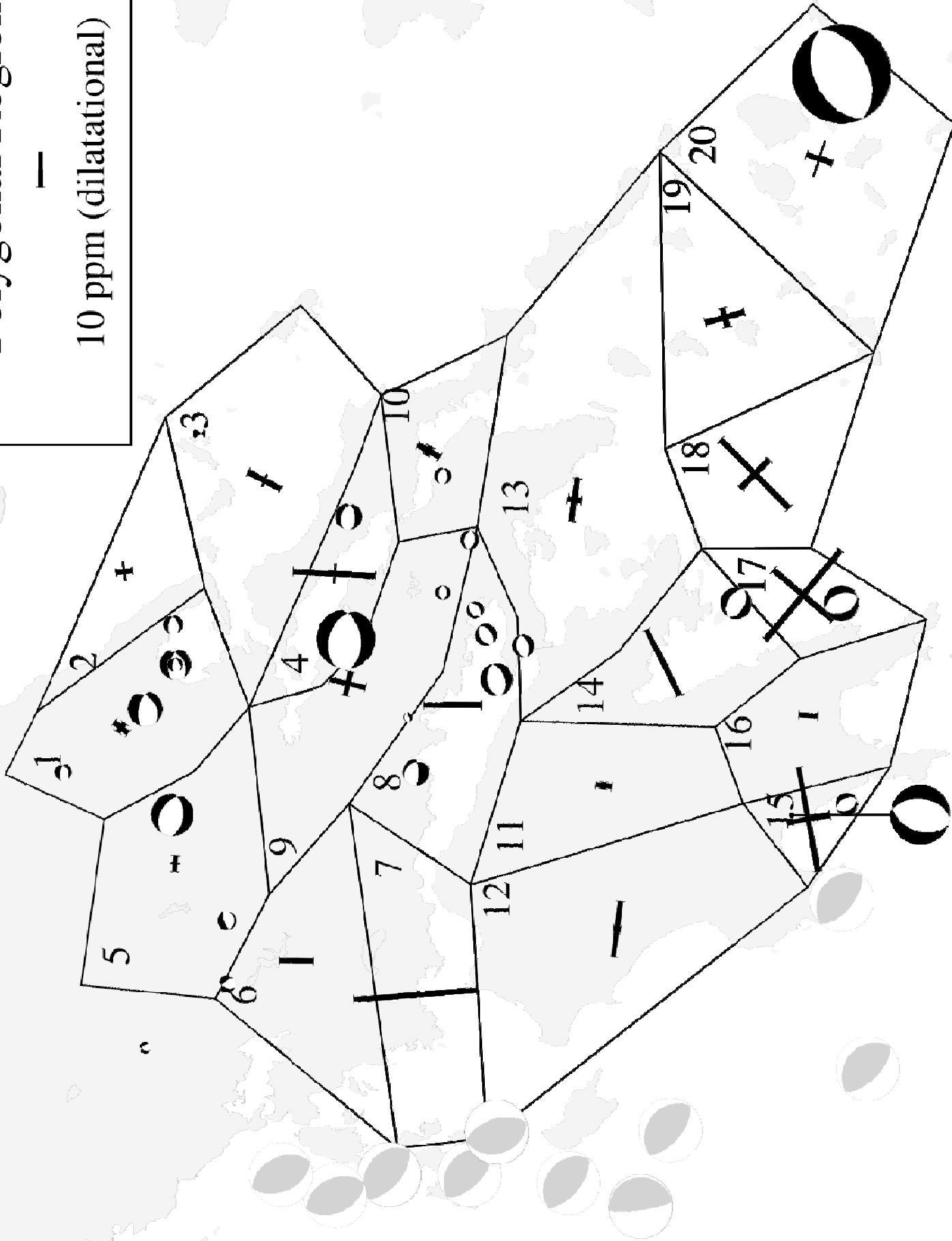
- How should we describe the deformation?
- Major Plates? (EU, AF, Aegean, Anatolia??)
- A few Microplates? (4, 6, 10??)
- Many Blocks (30, 100, 300??)



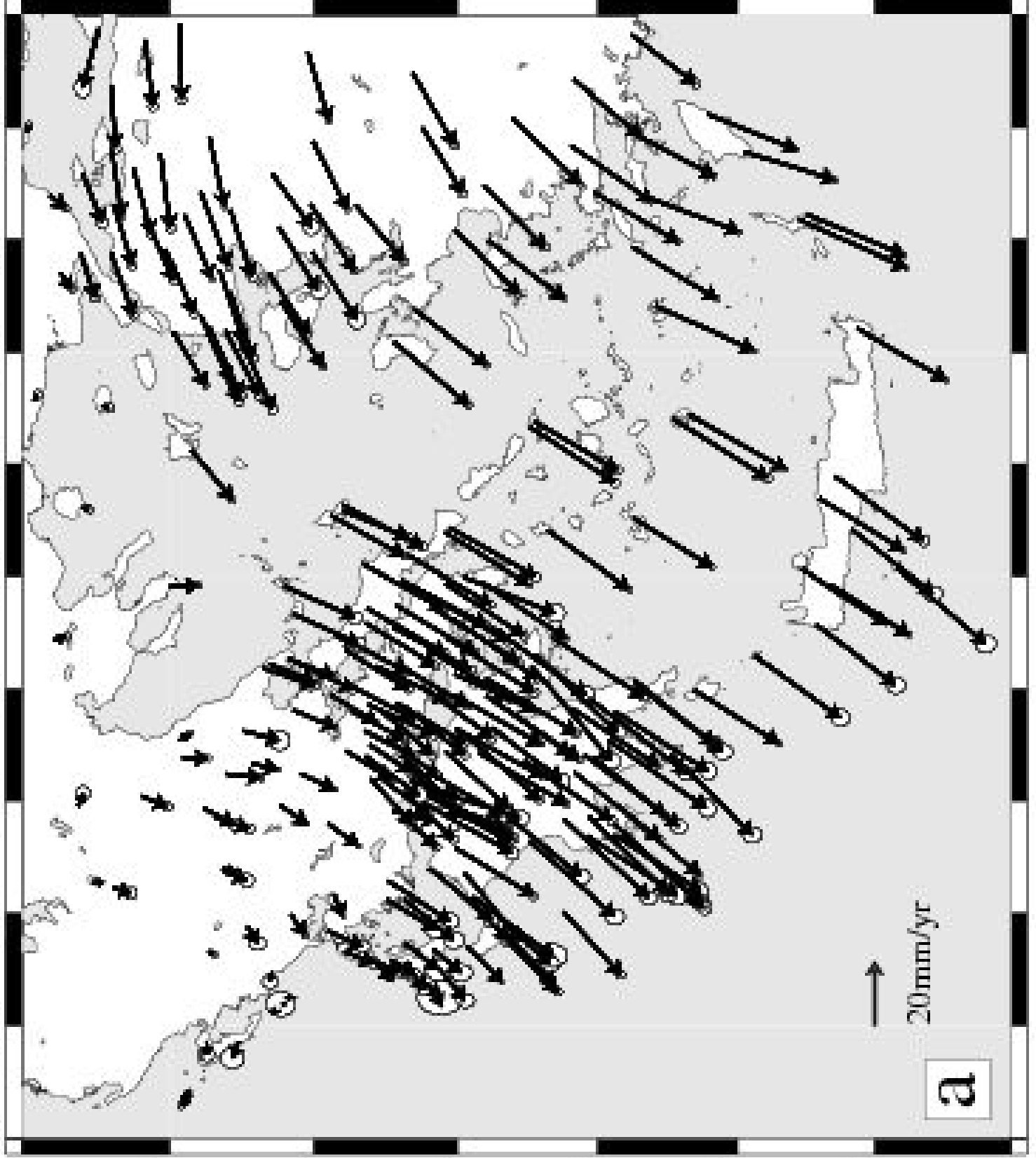


Geodetic Strains: Polygonal Regions

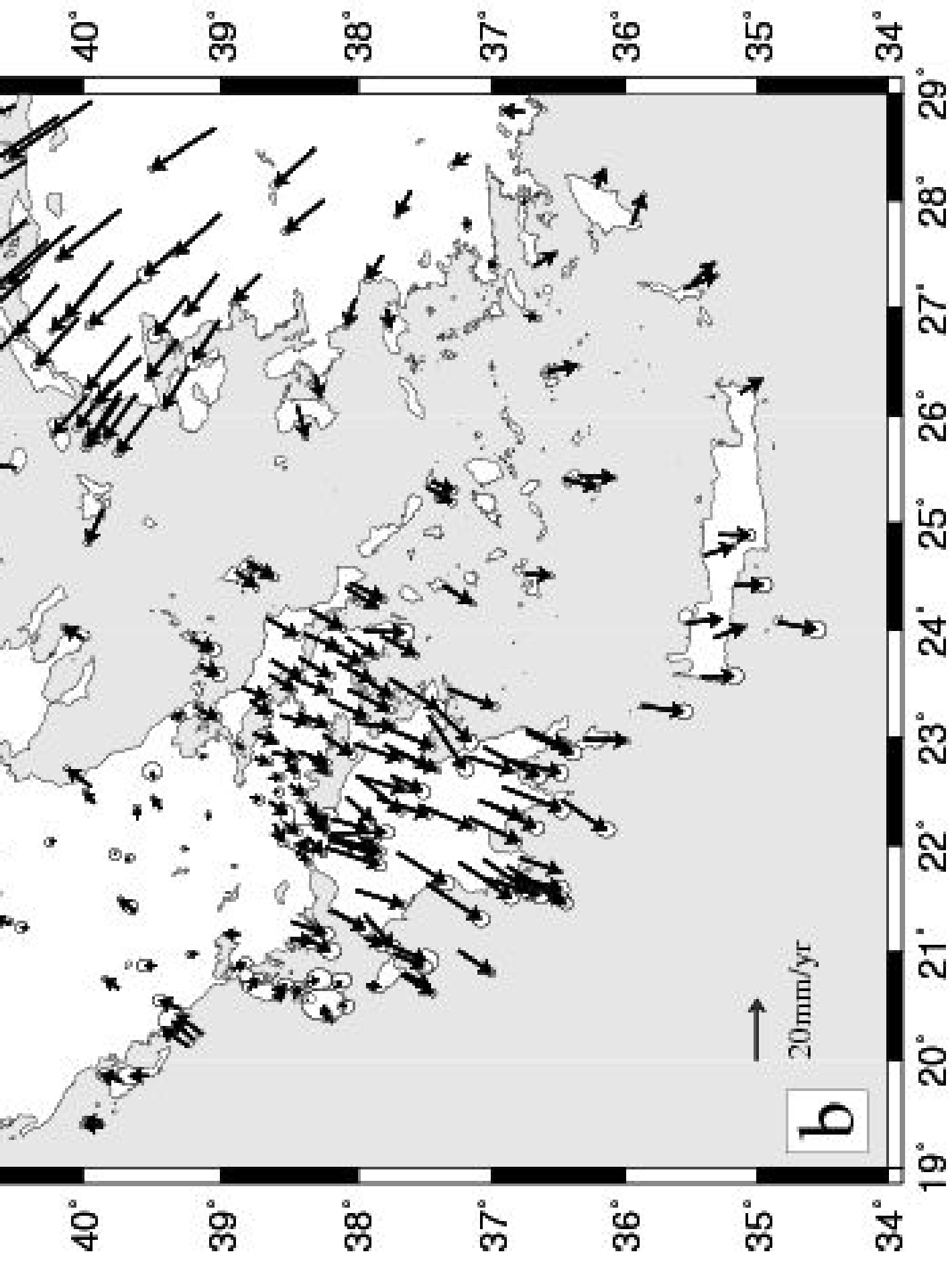
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10 ppm (dilatational)



41° 40° 39° 38° 37° 36° 35° 34°

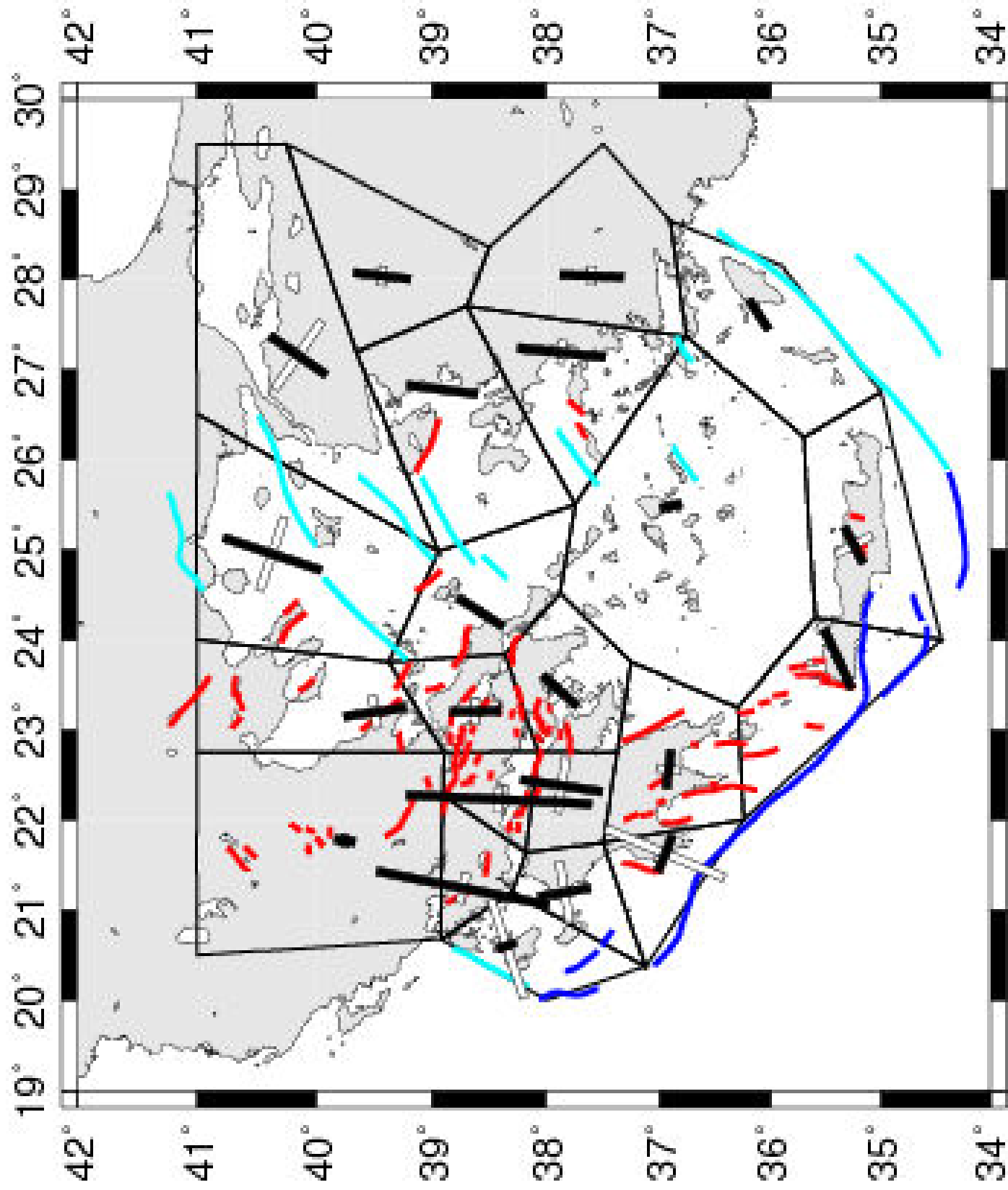


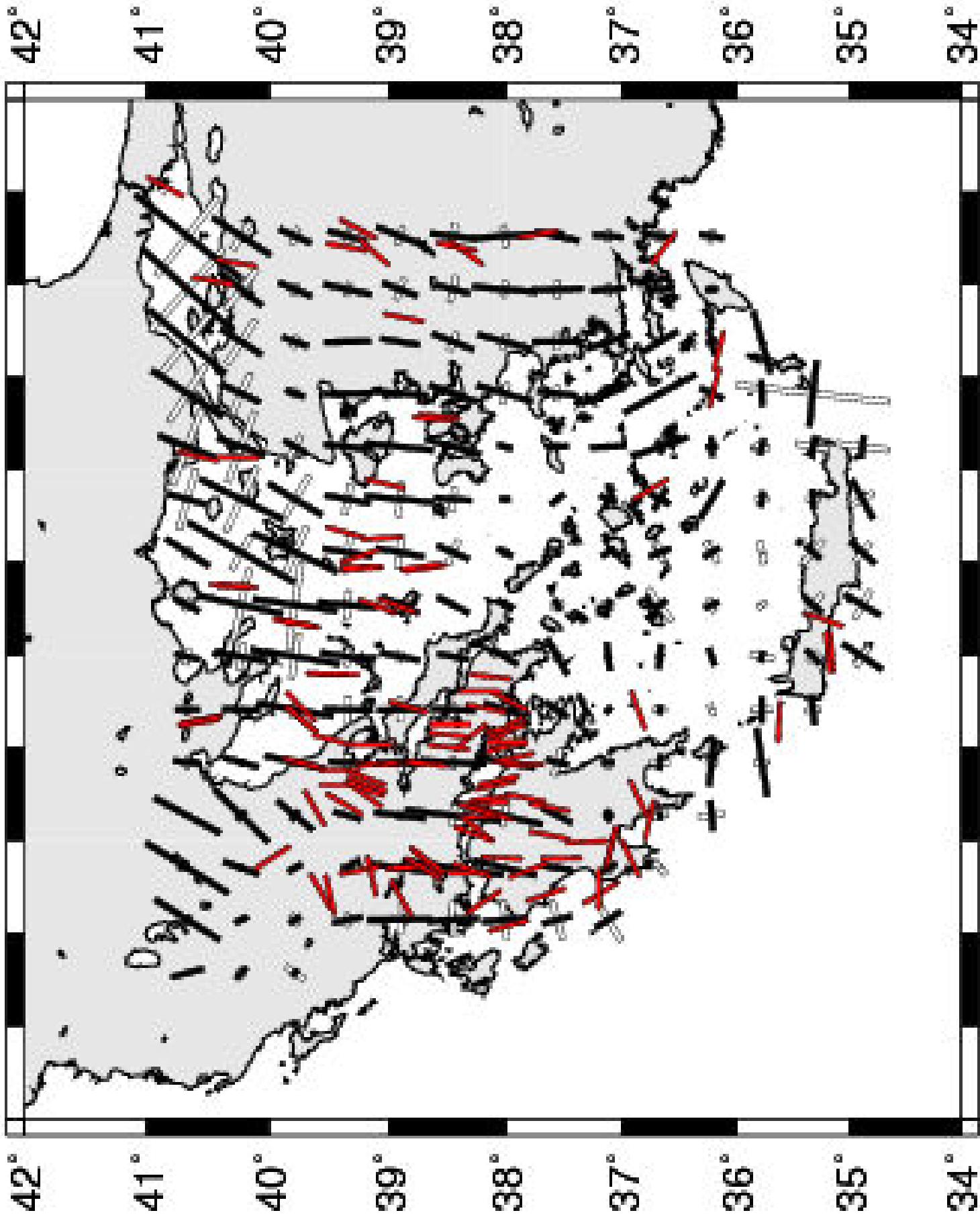
41° 40° 39° 38° 37° 36° 35° 34°



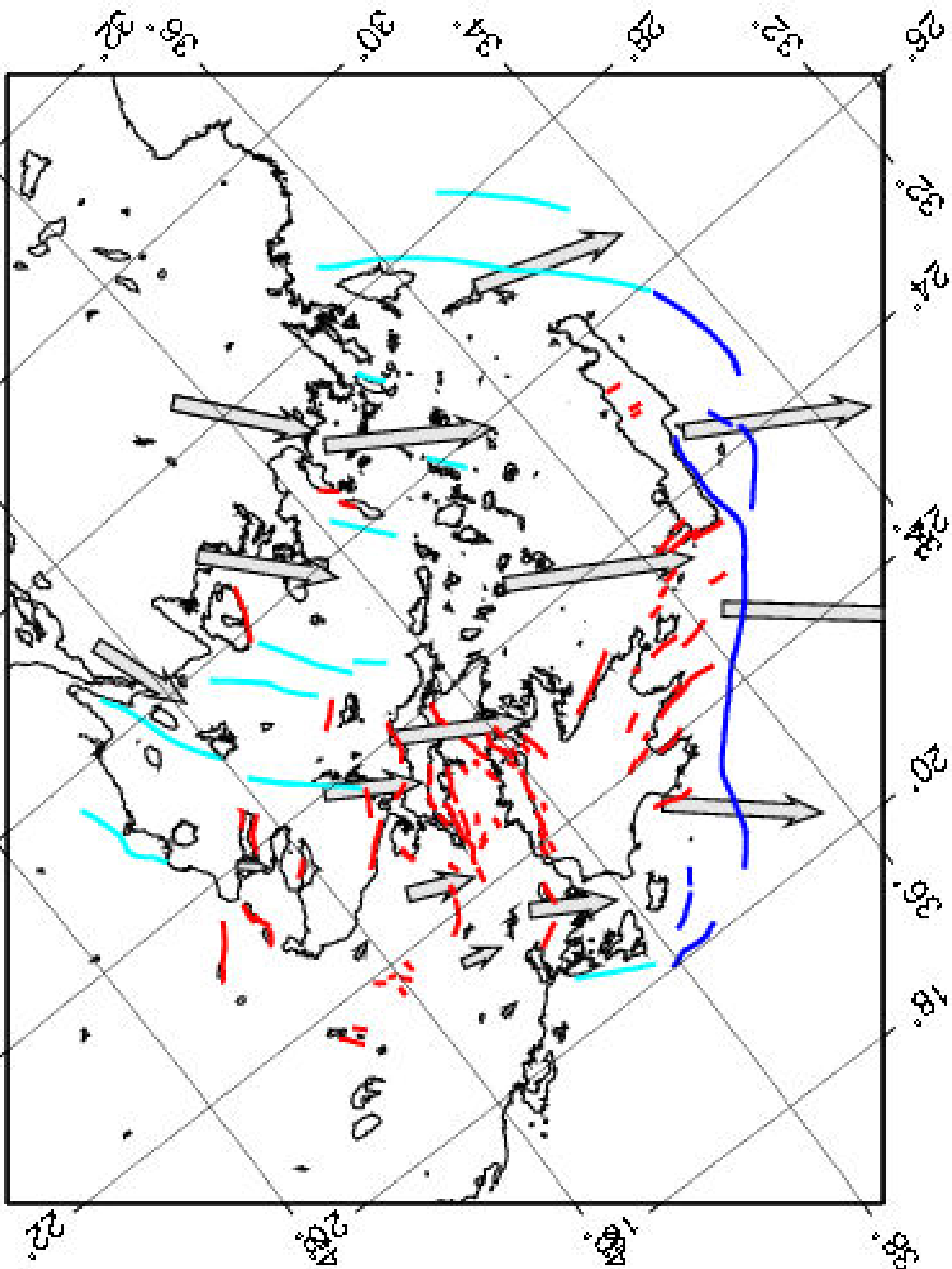
b

→ 20mm/yr





19° 20° 21° 22° 23° 24° 25° 26° 27° 28° 29° 30°





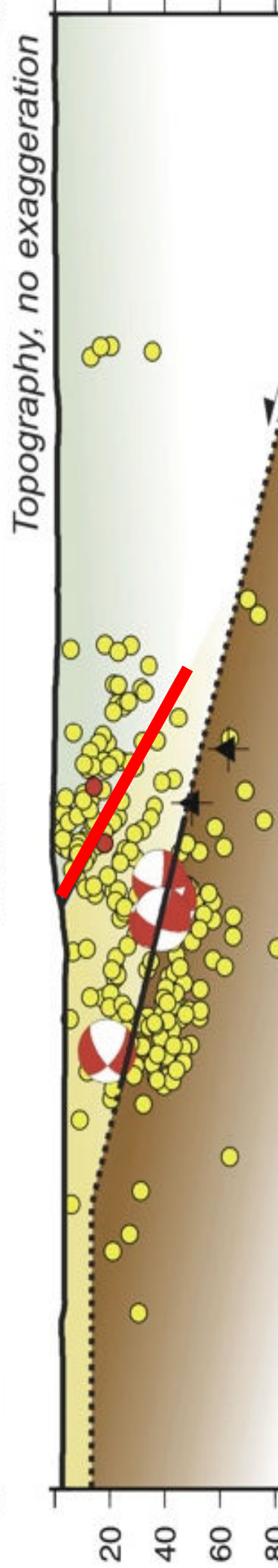
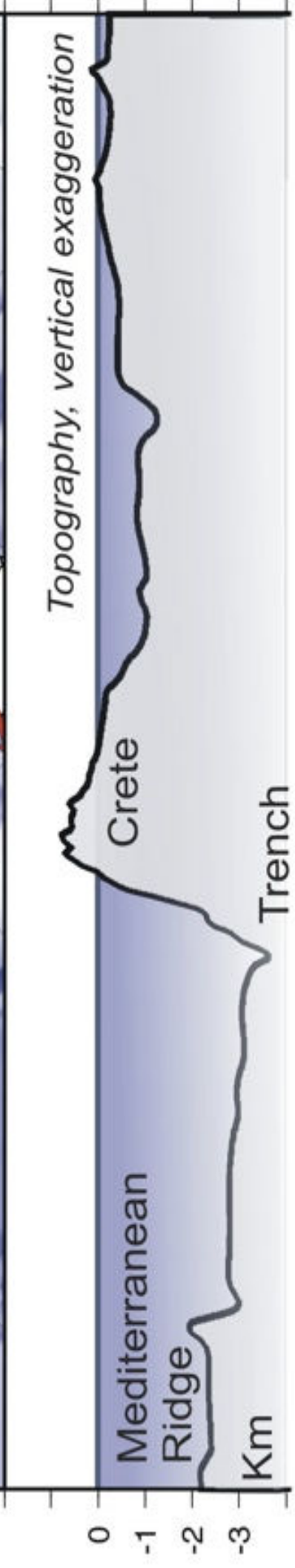
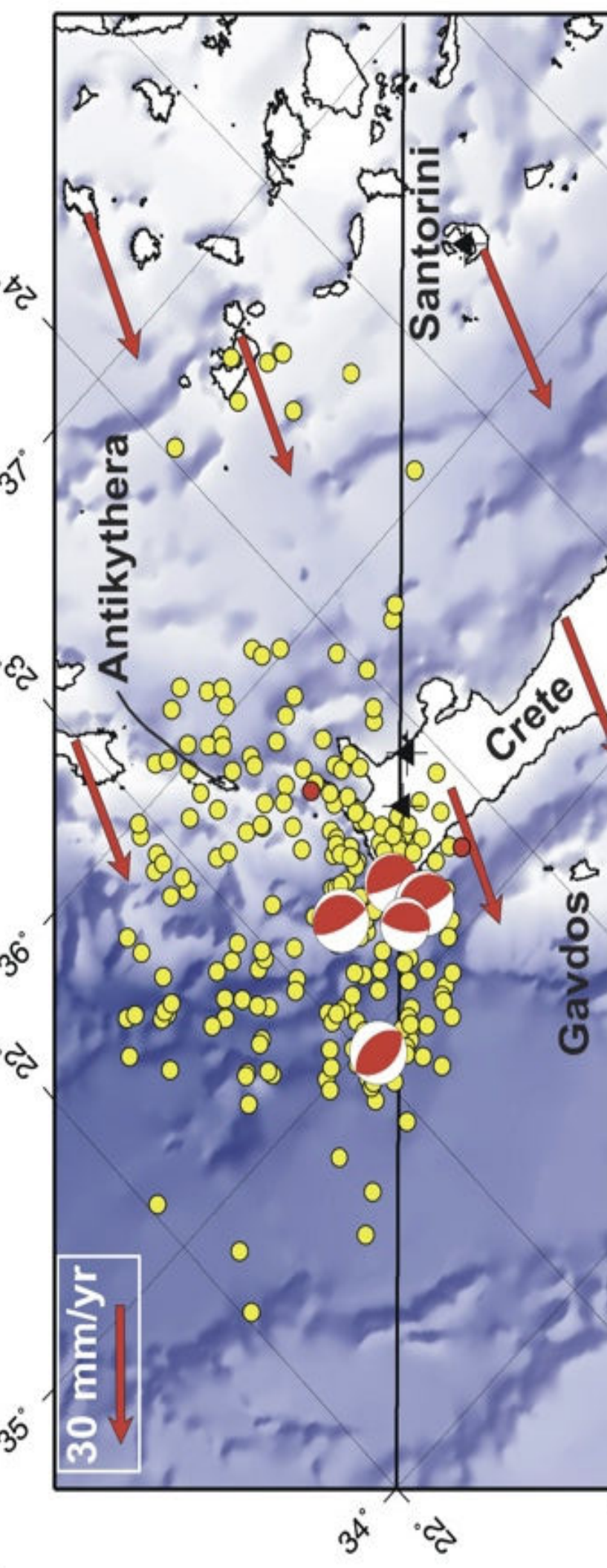
The AD 365 Earthquake and Tsunami

‘ . . . and solid earth was shaken and trembled. . . the roaring sea. . . rose in its turn; and over the boiling shoals it dashed mightily upon islands and broad stretches of the mainland, and levelled innumerable buildings in the cities and wherever else they are to be found’

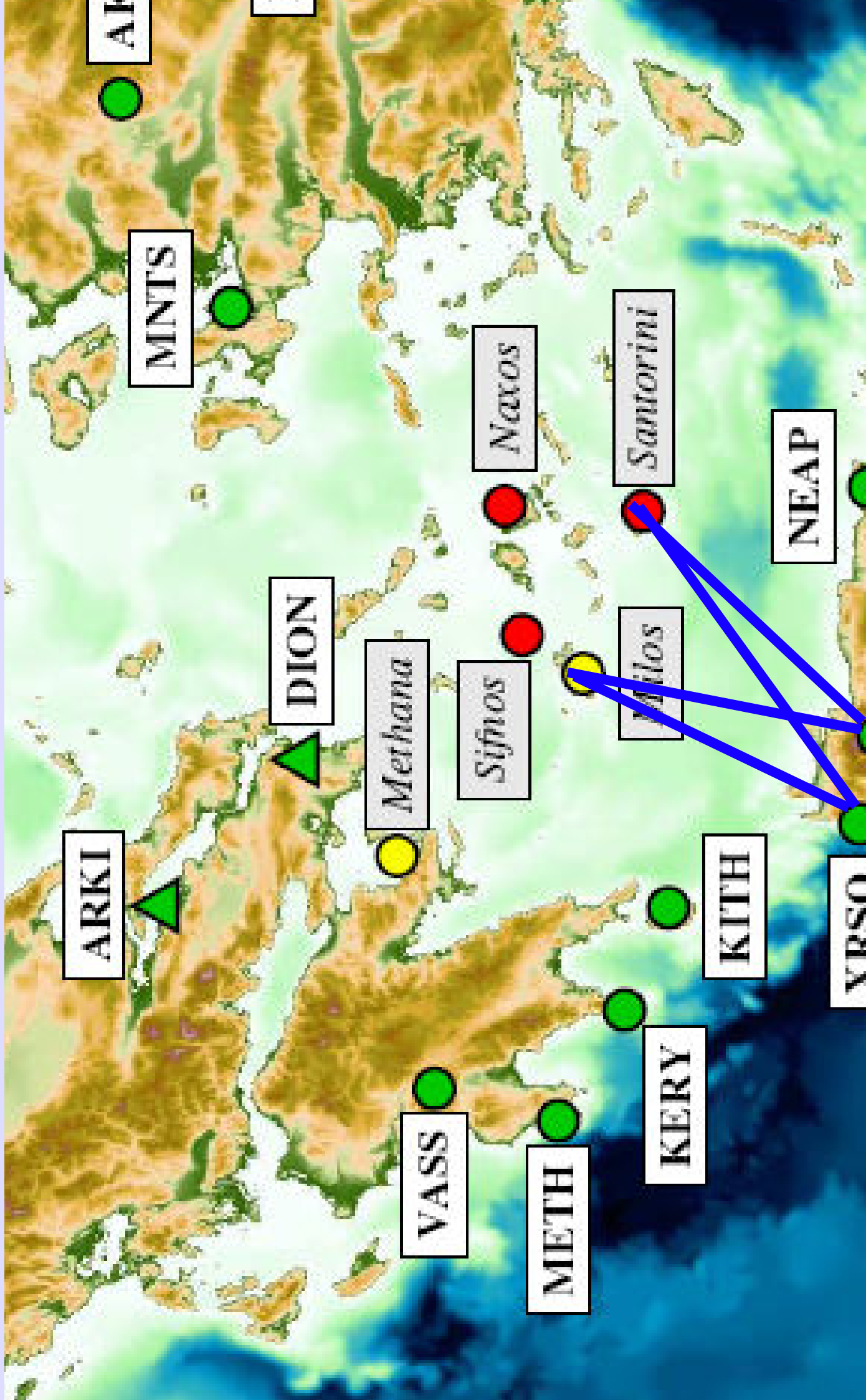
Account by Ammianus Marcellinus (AD325/30>391, writing post-AD378)

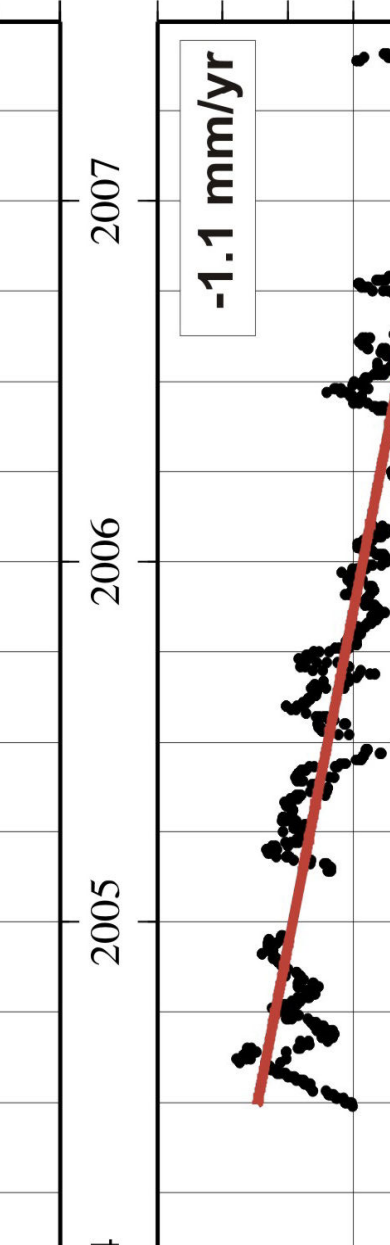
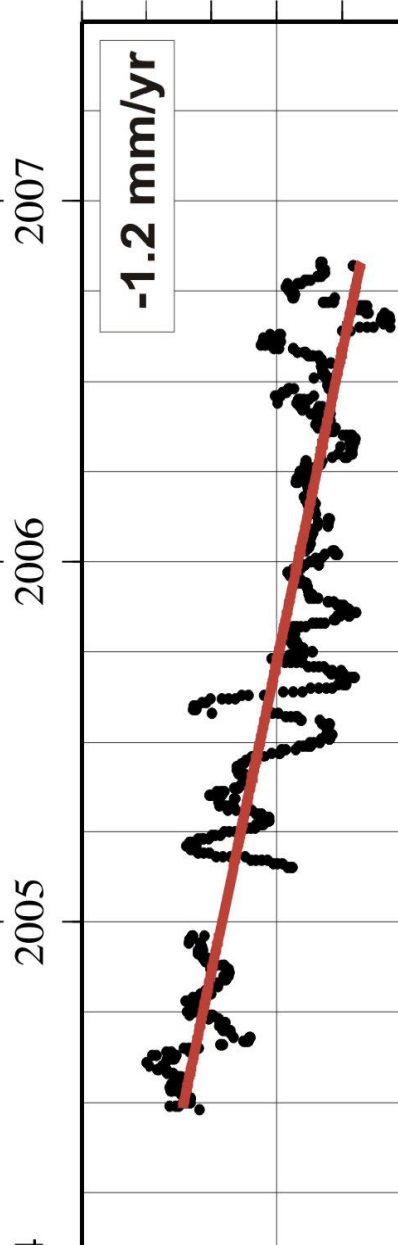
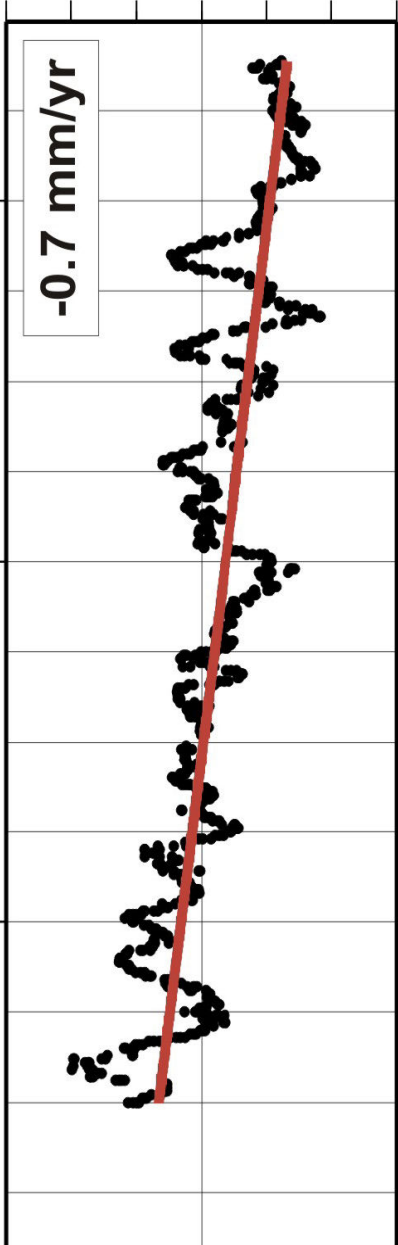
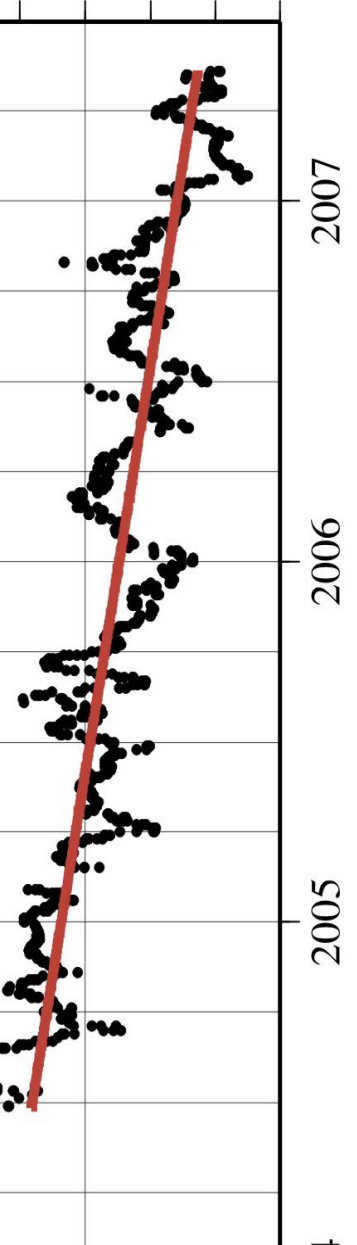






Sites in the Aegean





Shortening rates imp
 a repeat time of
 ~ 500 years for W C

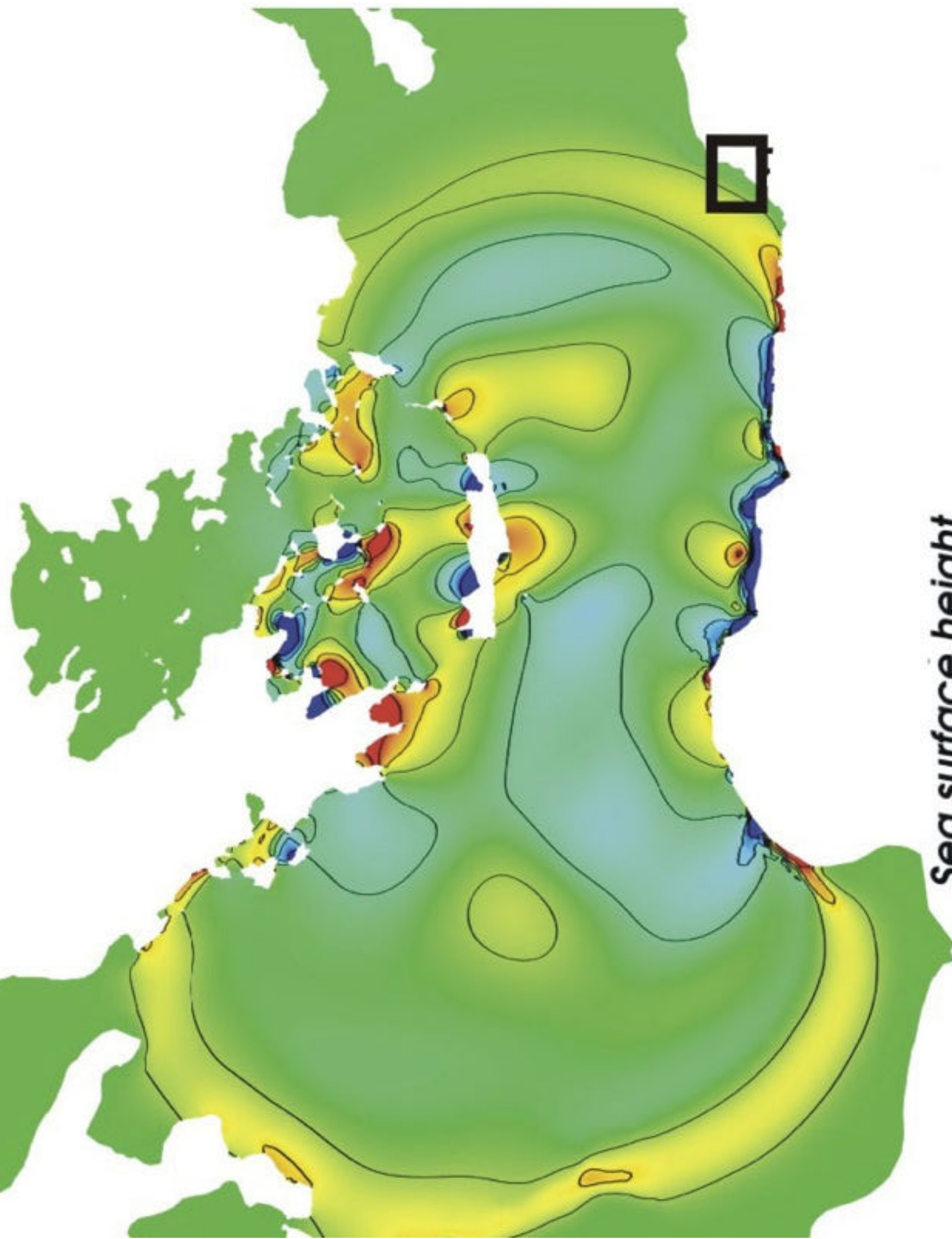
Therefore one tsunar
 earthquake every

~ 800 year for the ent
 Hellenic Trench

AD 365

AD 1303

AD ????



Sea surface height

- Transient deformation
 - Precursors to Earthquakes
 - Silent earthquakes
 - Strain waves
- Requires highest quality geodetic data coupled to seismology, geomorphology, and mathematical modelling of continental deformation