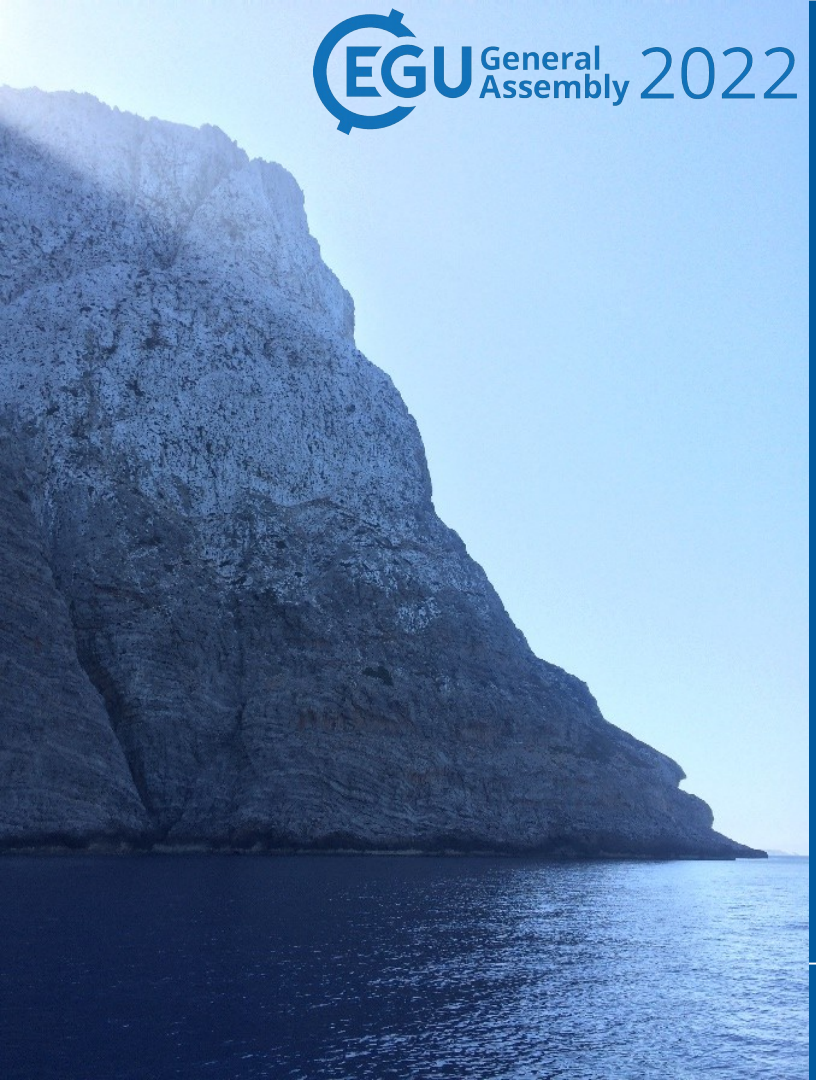


EGU General Assembly 2022

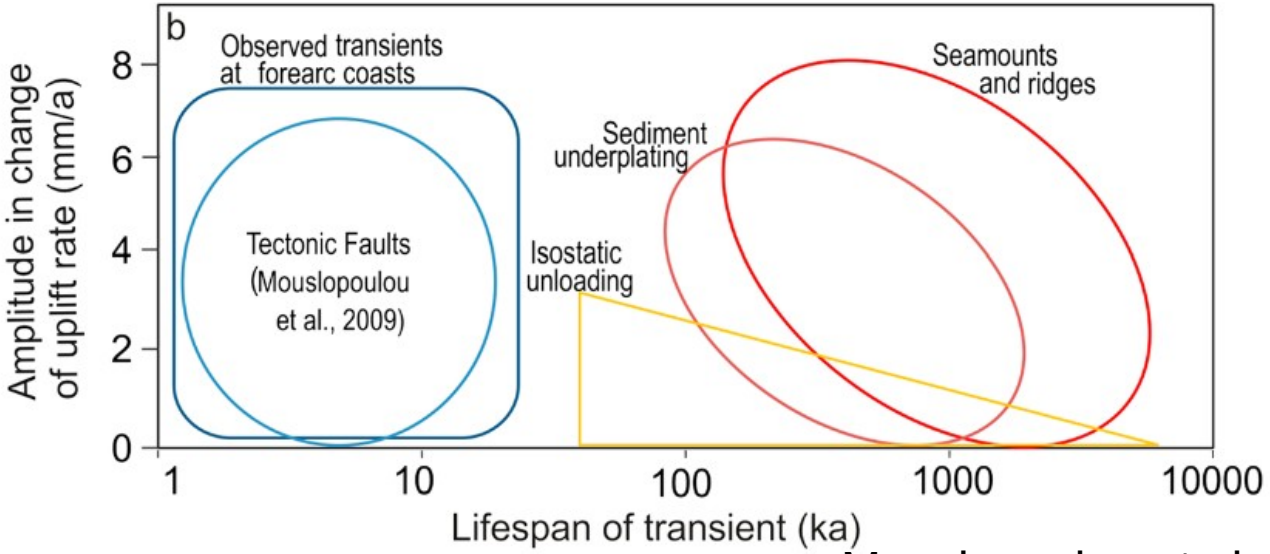
The vertical movement of *Karpathos*: Competing hypotheses

Violeta Veliz-Borel, Onno Oncken, Vasiliki Mouslopoulou, John Begg, Johannes Glodny, and Dimitris Sakellariou

HELMHOLTZ

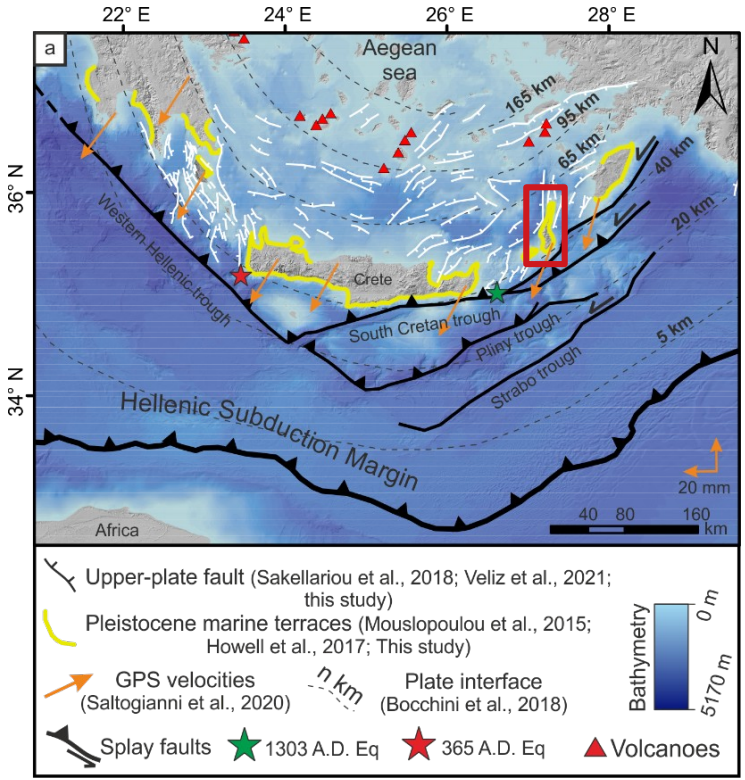
Uplift in forearc regions

Transient forearc uplift over a range of timescales

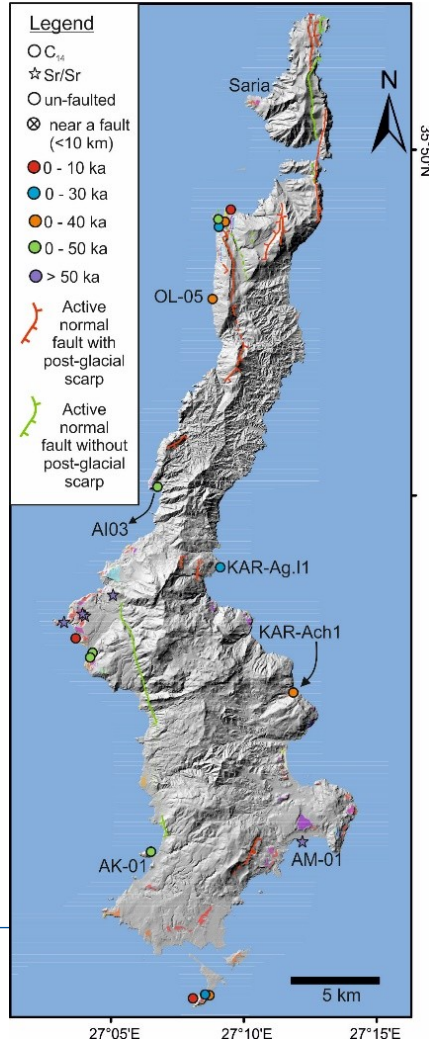


Mouslopoulou et al., 2016

Hellenic Subduction System

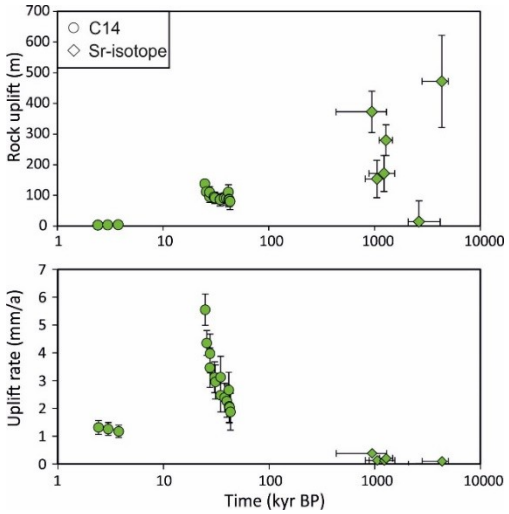


The subduction plate-interface lies ~40 km beneath the southern coastline of Karpathos, a forearc island that extends landward, and across the subduction margin, for ~50 km.



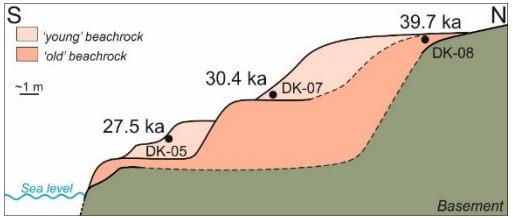
Dataset

- Paleoshoreline mapping
- Nineteen samples were radiocarbon dated.
- Six samples were dated with Sr-isotope

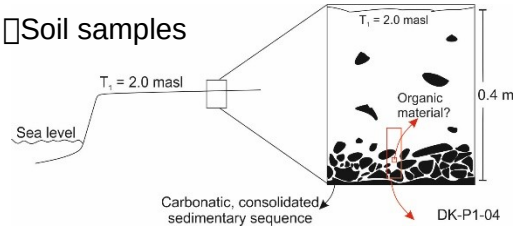


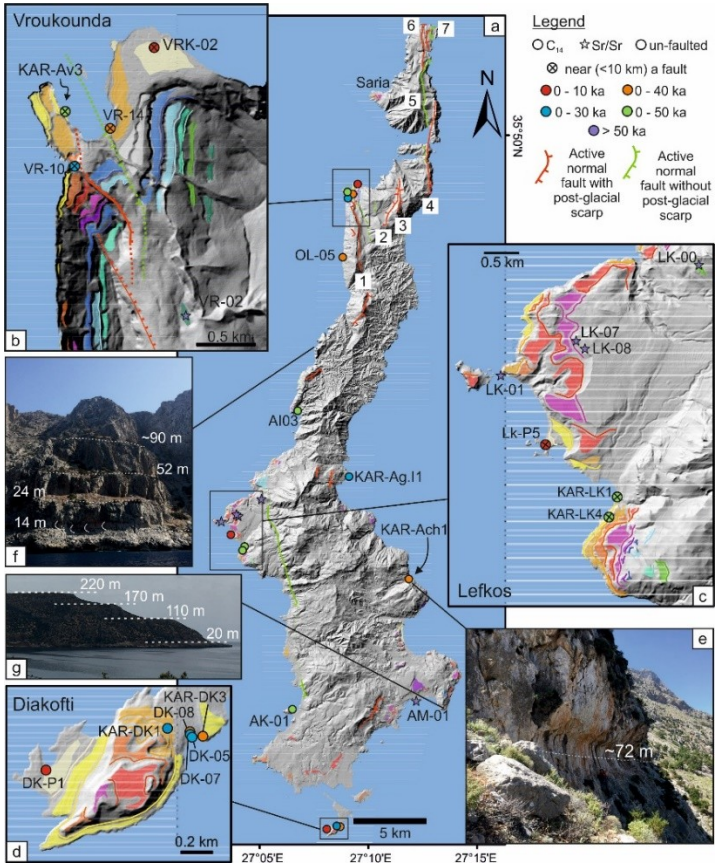
Veliz et al., in prep

Beachrock samples



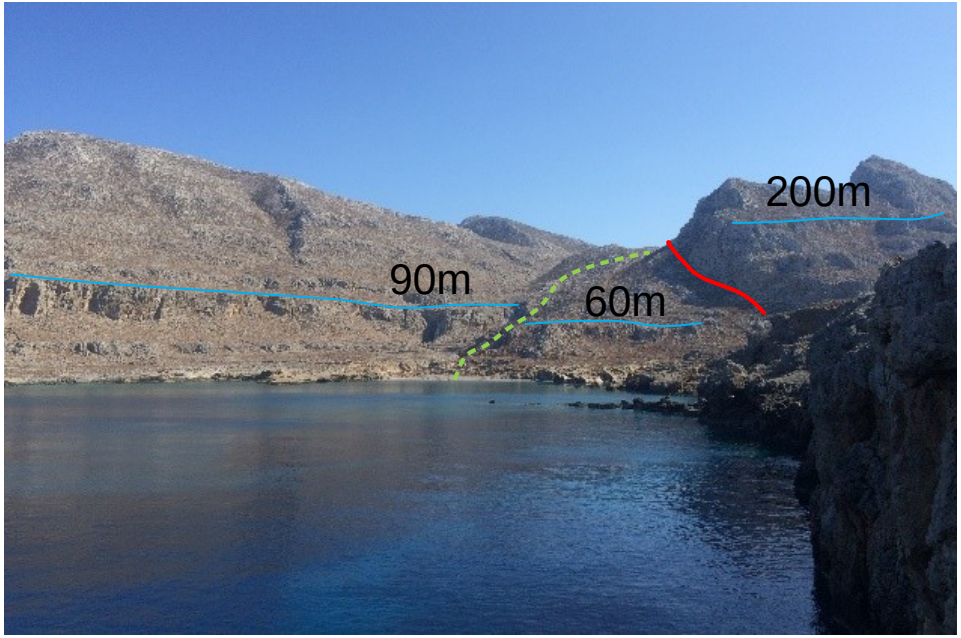
Soil samples

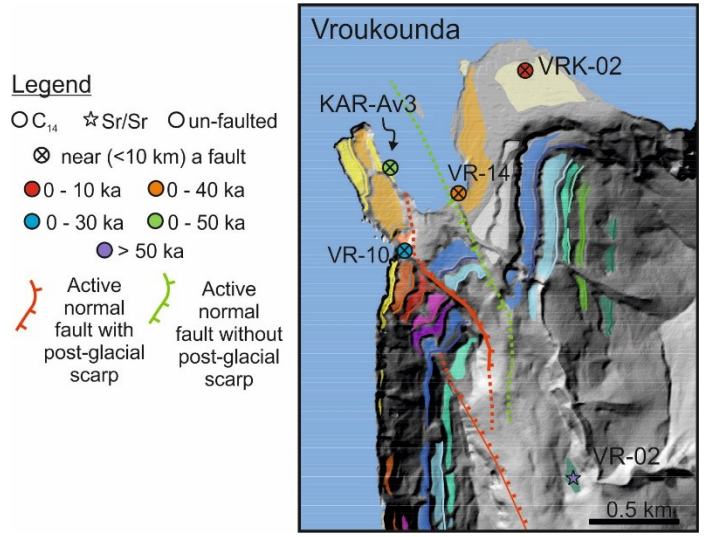




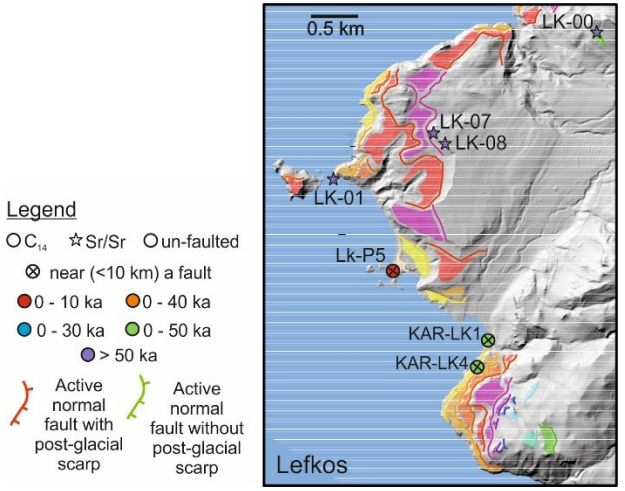
Veliz et al., in prep

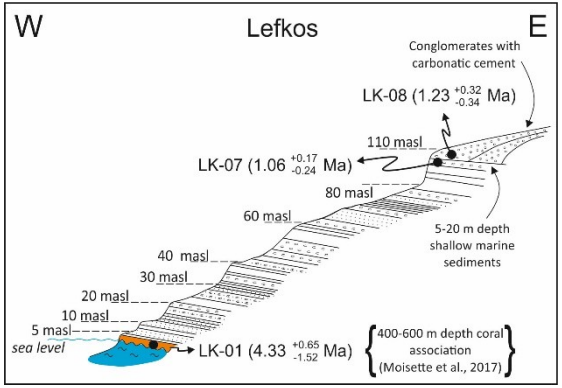
Short-term signature

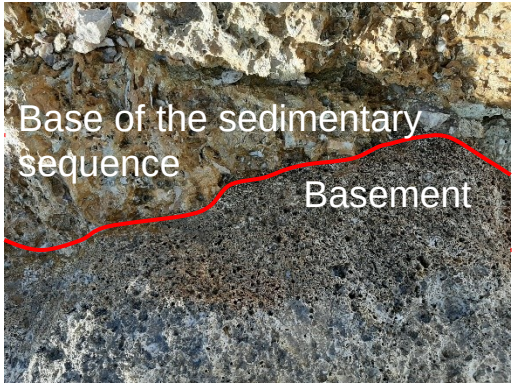




Long-term signature





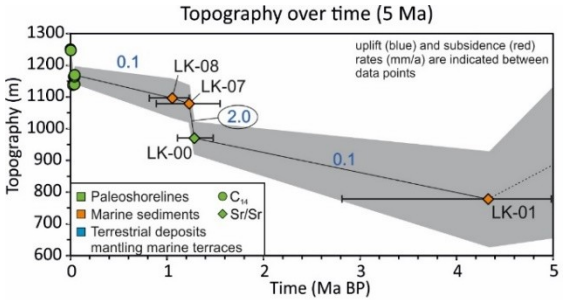


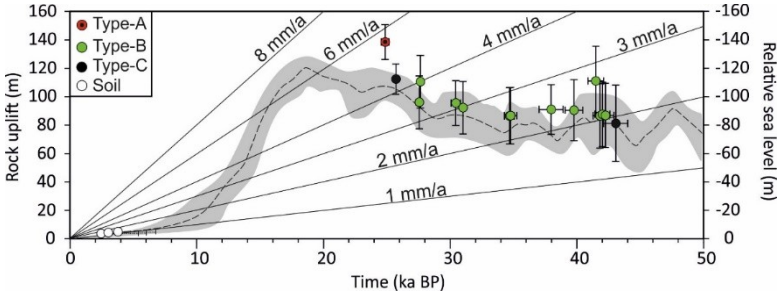
What drives vertical movement?

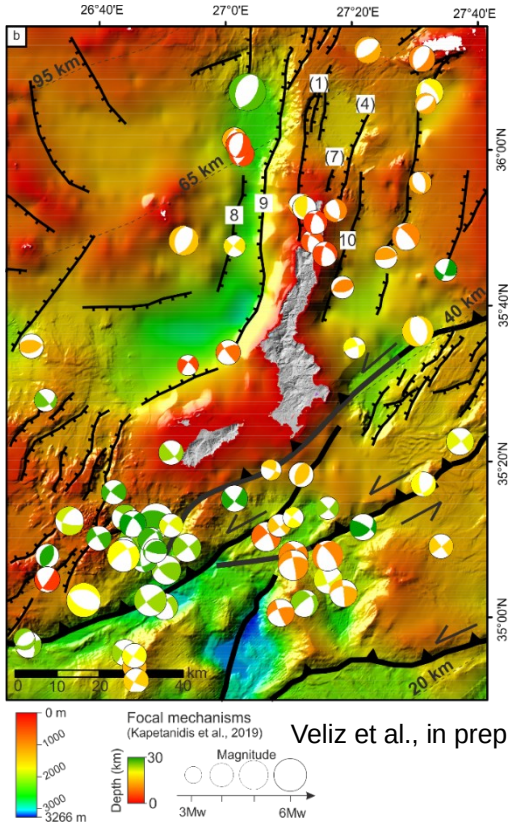
We observed a diversity of uplift and subsidence signals over a range of temporal and spatial scales on Karpathos

Which process could account for the observations?

Preliminary analysis indicates that no single mechanism is able to explain the full set of observations and data.







Veliz et al., in prep

Open questions

- Is it possible to discriminate between uplift produced by different mechanisms?
- Is uplift in the south mostly due to slip on the subduction thrust and/or splay-thrust faults?
- Is uplift in the north mostly due to slip on normal faulting?
- What is the contribution of sediment underplating in long-term uplift?