Rock record constraints on the seismic signature of subduction interface shear zones

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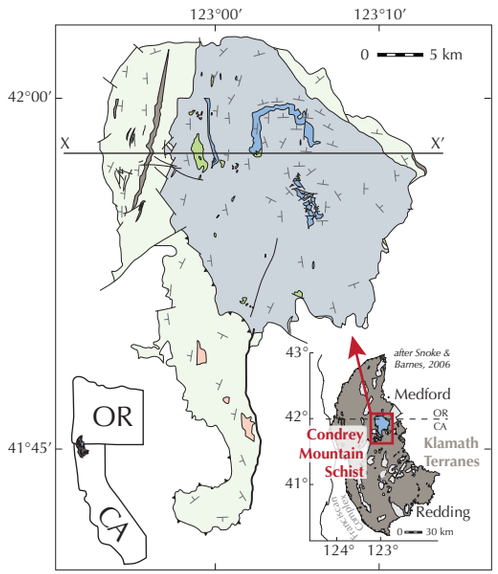
Condrey Mountain Schist (CMS)

records Late J - Early K subduction and punctuated underplating at 350-450°C and 0.8-1 GPa



CMSi (Epidote Blueschist Facies)
- Graphitic Mica Schist
- Epidote Blueschist
- Serpentinite

CMSo (Greenschist Facies)
- Graphite Phyllite
- Greenschist
- Dioritic to tonalitic orthogneiss

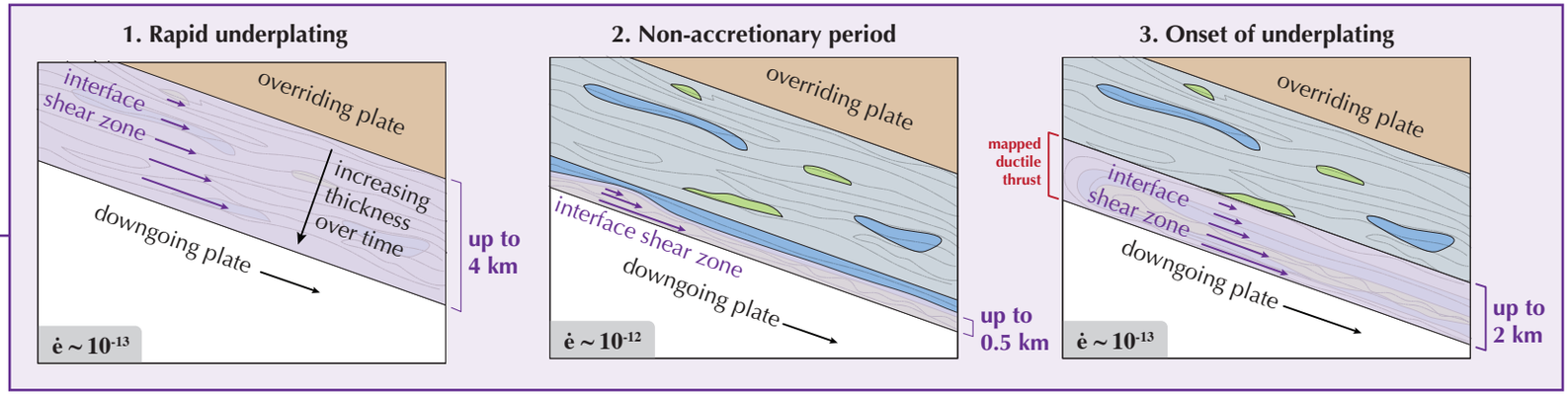
- thrust fault
- fault
- inferred fault
- contact

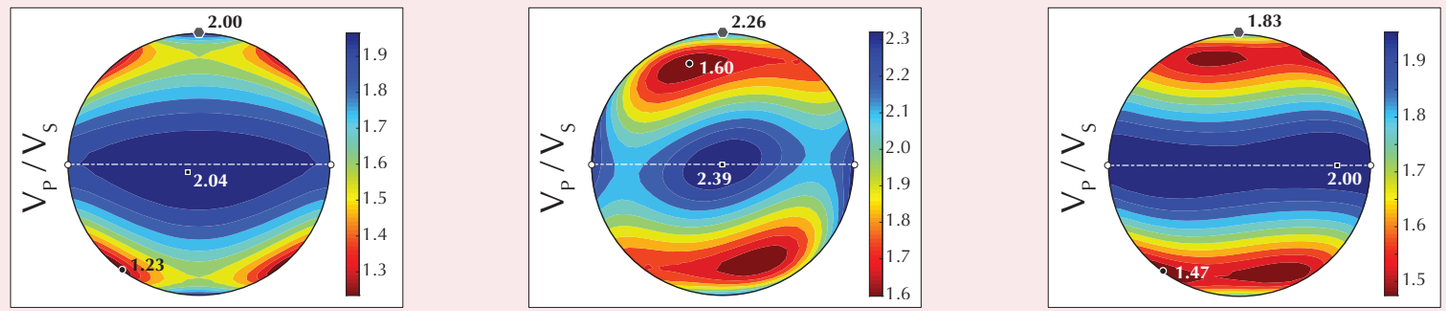
Used to characterize:

1) thickness & lithologies of the actively deforming interface
2) seismic signature for comparison to modern subduction zones

shear zone thickness & occupying lithologies vary temporally

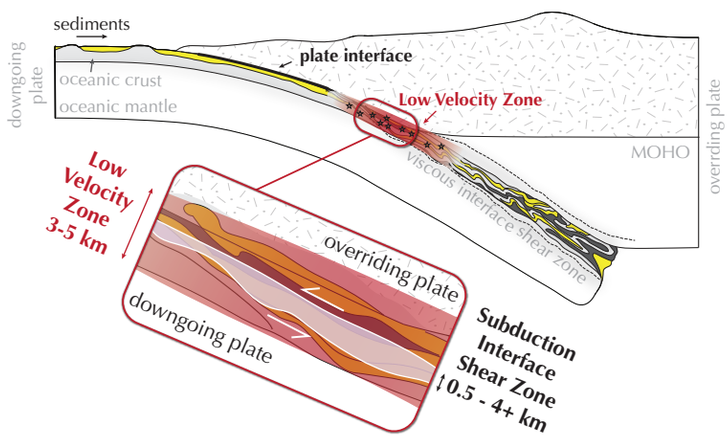
combined detailed geochronology & structural mapping to track strain localization evolution





seismic signature is highly anisotropic & V_P/V_S are elevated

accounted for mineral anisotropy & fracture porosity measured from the CMS rock record



The fossil subduction interface shear zone preserved in the CMS records:

1) distributed deformation comparable to or within modern LVZ thicknesses
2) comparable seismic signatures to modern LVZs