## Strain Rate Model of Contemporary Deformation in California and the Great Basin

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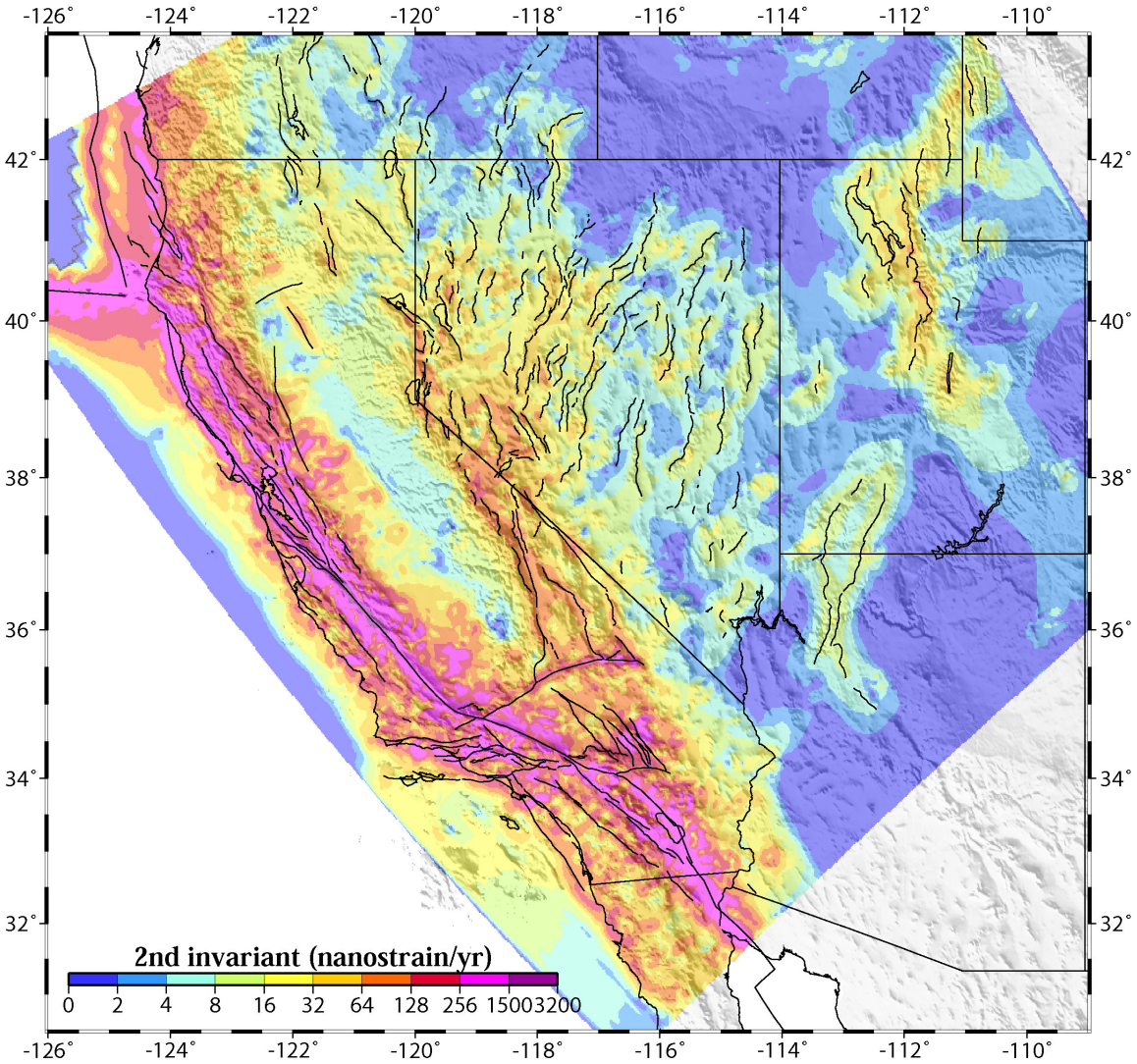
The proliferation of dense continuous, or semi-continuous, GPS networks has increased our ability to constrain contemporary crustal deformation tremendously. The most direct measure of deformation is given by the strain rate tensor field associated with the relative horizontal velocities at GPS sites. The inferred strain rates include the elastic strain that is released in future earthquakes, any aseismic strain or creep, and strain associated with the visco-elastic relaxation following past earthquakes. To aid the localization of strain where strain rate is low (or GPS sites sparse), Quaternary slip rates are inverted simultaneously with geodetic velocities (after being converted to strain rates) in the modeling. In the latest result (figure) the strain signature of individual faults can be recognized (including localized creep). The strain rate model is useful for 1) recognizing discrepancies between long- and short-term deformation, 2) constraining expected seismic moment release rate, 3) studying the underlying geodynamic forces, and 4) aiding the interpretation of InSAR measurements.




*Contours of the second invariant of the strain rate tensor model obtained from ~2000 GPS velocities (of which 854 from our own analysis of (semi-) continuous GPS sites, and the remainder from published studies) as well as the slip rates of Quaternary faults (black lines).*