The Joshua Tree Integrative GPS Network (JOIGN)

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Joshua Tree National Park lies within the eastern Transverse Ranges Province, southern California, which is bounded to the south and west by the northwest-striking right lateral San Andreas fault system, and to the north and east by the north-northwest striking right lateral eastern California shear zone. Mapped fault zones within the province include east-striking left lateral (or "transverse") faults, and north-northwest striking right lateral faults. These fault zones provide the kinematic links between the San Andreas fault and Eastern California shear zones. The relative rates of slip between these contrasting fault zones has implications for spatial versus temporal slip variation along the southern San Andreas fault zone. Offsets of distinctive crystalline basement outcrops indicate that the strike-slip component of total displacement on the transverse fault zones is several kilometers, an order of magnitude or more greater than that on the north-northwest fault system within the province. But the present-day rates of slip and partitioning of strike slip and normal components of motion on these fault systems remain poorly constrained by existing geological data for both sets of faults. To address this problem, we have initiated a long-term campaign-style GPS experiment to more precisely constrain the slip rates, sense of motion, and role of these fault zones in accommodating the total contemporary plate boundary deformation.

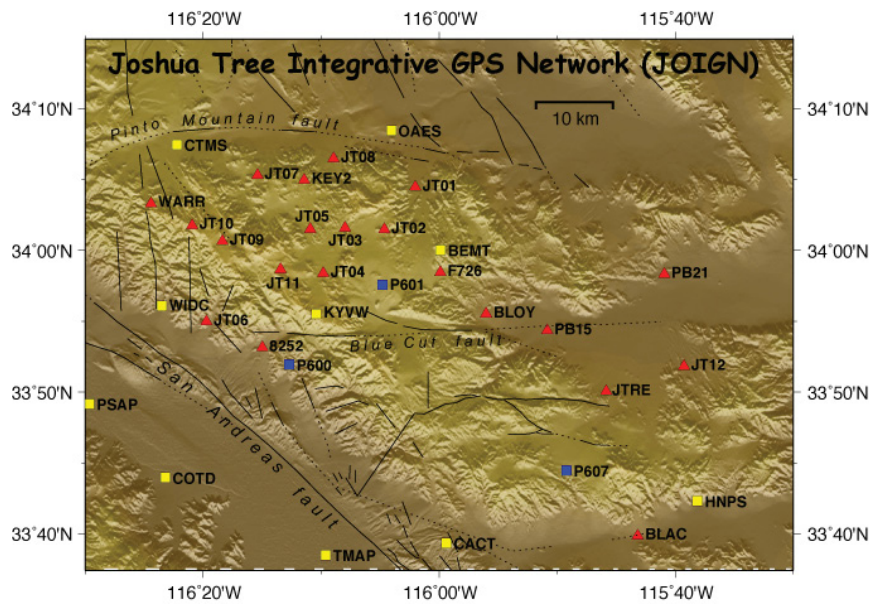

Figure 1. GPS network map for Joshua Tree National Park region. Squares locate CGPS stations from SCIGN (yellow) and PBO (blue). Triangles locate new and adopted campaign points comprising JOIGN. JOIGN will map strain in the eastern transverse Ranges Province between the San Andreas fault zone, and the eastern California shear zone (ECSZ). Strain transfer across this region is accommodated by N-NW striking right-lateral faults along the western side of the region, and east striking left lateral faults including the Pinto Mountain and Blue Cut faults. JOIGN will help us to assess the relative role of these contrasting structures in accommodating present-day strain transfer between the San Andreas and ECSZ.

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