

## **EVOLUTION OF STRESS IN THE PHILIPPINES FROM INVERSION OF FAULT, EARTHQUAKE AND GPS DATA**

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This paper integrates fault, earthquake and GPS data to comprehend the evolving stress states in and around the Philippine region. Fault sets in onshore areas provide for understanding the character of paleostresses while recent GPS and earthquake data allow the determination of present-day stress patterns in the Philippine region.

Inversion of data from earthquakes occurring in the past 100 years or so and from GPS measurements from 1991 to 1996 indicate that the Philippines is presently subjected to a generally east-west directed compressional stress. This stress direction is consistent with activity along major tectonic boundaries. Subduction is frontal along north-south trending subduction zones while significant left-lateral movements are detected along large strike-slip faults generally oriented NW-SE. Inversion of data gathered from inland outcrops that include faults and folds suggest that the stresses have evolved both in space and time. The present-day E-W directed stress corresponds to a far-field stress manifested over a broad area. However, stresses rotate perpendicularly while approaching major structures such as the Philippine Fault, and obliquely while tracing them back into the Pleistocene.

This understanding of the stresses in a tectonically active region like the Philippines is crucial in the assessment of earthquakes and volcanic eruptions and their catastrophic impacts on the environment.