

Variation of the mode of slip along the Blanco Transform Fault, NE Pacific

Oceanic transform faults (OTFs) connecting offset mid-ocean spreading ridges slip in a complex manner. They rupture seismically during earthquakes up to magnitude $6 < M < 7$, yet release majority of accumulated slip via aseismic creep. OTFs appear to have generally simpler structure comparing to their continental counterparts, however, detailed seismological studies suggested considerable along-strike variation of fault properties that likely results from fluid circulation within the fault zone and potential serpentinization of the fault material. We present results of the Blanco Transform Fault OBS Experiment, which included a 1-year deployment of 55 three-component seismometers co-located with differential pressure gauges on and around the Blanco Transform Fault Zone (BTFZ), a 350-km long OTF in the North East Pacific. We determined precise hypocentral parameters of about 8,000 events with an automatic detection (using BRTT Antelope) and a relative relocation algorithm (hypoDD). The seismicity distribution images the complex BTFZ structure comprising of multiple segments of transform and extensional tectonics and highlights considerable variations in the mode of slip along the fault likely linked to fluid circulation within the fault.

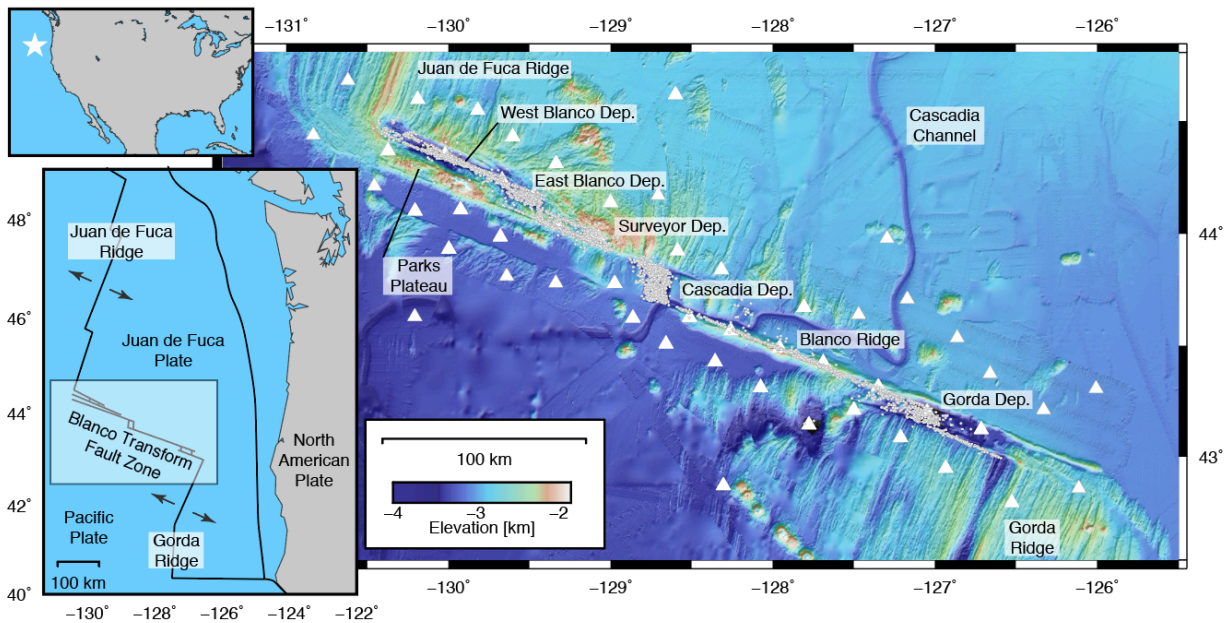


Figure: Bathymetric map of the BTFZ with locations of earthquake epicenters (white dots) and OBS stations (white triangles). Orientation maps on the left show location of the BTFZ.