

## **Non-Volcanic Tremor in Cascadia: Segmented along Strike, Anti-Correlated with Earthquakes, and Offset from the Locked Zone**

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Along the plate interface of subduction fault systems, the frictional response of the fault is characterized by stick-slip behavior in the shallow seismogenic zone which transitions to stable-sliding behavior with increasing depth. Geodetic observations of weeks of transient displacements with trenchward motions reminiscent to megathrust earthquake ruptures have been detected within this transition zone from 25-45 km depths. Accompanying many of these slow slip events is an emergent, low amplitude seismic signal referred to as non-volcanic tremor. Collectively, these two phenomena are known as episodic tremor and slip and owing to the wealth of geodetic and seismic observatories in Washington and Vancouver Island, episodic tremor and slip in northern Cascadia has been the subject of numerous studies over the last half-decade, while the rest of the margin has received considerably less attention. We will present a comprehensive review of tremor activity along the southern Cascadia margin by analyzing eight non-volcanic tremor episodes between 2005 and 2007 using both semi-automated and fully-automated source location routines. Individual episodes evolve in a very complex manner with periods of steady migration, halting, and frequent jumps of tremor clusters. We find the tremor zone is spatially offset by as much as 50 km down-dip from the thermally- and geodetically-defined transition zone, which may decrease the efficiency of stress transmission and slip propagation during either transient or seismogenic deformation episodes. Intriguingly, tremor activity is spatially anti-correlated with local seismicity, suggesting the two processes occur mutually exclusive of one another.