

Why did the very low frequency earthquakes occur locally and temporarily after the 2003 Tokachi-oki earthquake ?

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We investigated changes in slip rate behavior of small repeating earthquakes using 3-D numerical simulations of a subduction zone involving large and small asperities and based on a rate- and state-dependent friction law. Our results reveal that the post-seismic slip of a large earthquake can trigger slow events for the small asperity at a depth of 45 km [Ariyoshi et al. 2007a] and events with slip velocity higher than usual for the small asperity at a depth of 5 km in this study.

This difference would be explained by different effective normal stress because slip velocity and propagation speed of post-seismic slip is strongly depends on the effective normal stress [Ariyoshi et al., 2007b].

Applying these results to Tokachi-oki, the reason why low frequency events occur locally and temporarily on the subduction plate boundary near the trench [Obara et al., 2004] may be explained by the passage of postseismic slip and locally high effective normal stress due to sea mount. It is future study for us to perform additional simulations considering the effect of sea mount.

Reference:

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