

Post-seismic slow strain changes and groundwater level changes in the case of the TSS observation site of AIST

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In order to research short- and intermediate-term forecast of the Nankai megathrust earthquake, we observe crustal movement and groundwater at observation sites in Aichi Prefecture, Kii Peninsula and Shikoku, in particular focus on monitoring of short-term SSEs on the plate boundary. When the earthquake (M6.3) occurred on May 10, 2019 at the Hyuga-nada, slow strain changes were post-seismically observed at the Tosashimizu-Matsuo (TSS) observation site of AIST. The characteristic of these strain changes is similar to strain changes due to the short-term SSEs, and the principal strain field calculated from the strain changes indicated the possibility of SSE in the locked part of the plate boundary southeast of Cape Ashizuri. In addition to the possibility of SSE induced by the earthquake, there were also possibilities of local changes around the borehole strainmeter (such as changes in pore water pressure) and mechanical jumps inside the strain gauge. Therefore, we investigated the behavior of the strain and groundwater level at the TSS after the M5 or more earthquakes around Shikoku and the earthquakes with a seismic intensity of 3 or more in Tosashimizu city. 11 cases showed post-seismic strain changes, and the principal strain fields of these strain changes tended to be similar. In 10 out of 11 cases, the groundwater levels in the observation well (Hole 2) at the TSS were post-seismically low. It was found that the post-seismic strain changes at the TSS are likely to be caused by the local changes around the TSS due to the shaking of the earthquakes.

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