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Slow strain release along the eastern Marmara seismic gap offshore Istanbul in conjunction with enhanced local seismic moment release

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We analyze a large transient strainmeter signal recorded at 150 m depth along the southern shore of the eastern Sea of Marmara region in northwestern Turkey. The strainmeter is part of the downhole geophysical observatory ICDP-GONAF framing the eastern Marmara seismic gap where a magnitude M>7 earthquake is pending. The strain signal was recorded at the Esenkoy site on the Armutlu peninsula with an amplitude of up to 5 microstrain and lasting about 50 days. The strain signal coincides with the origin time of a MW 4.4 earthquake offshore Yalova, as part of a seismic sequence including eight MW $\geq$3.5 earthquakes. The MW 4.4 event occurred at a distance of about 30km from Esenkoy on June 25th 2016 representing the largest earthquake in this region since 2008. Before the event, the maximum horizontal strain was subparallel to the regional maximum horizontal stress derived from stress inversion of local seismicity. During the observed strain transient a clockwise rotation in the local horizontal strain field of about 20° occurred. The strain signal does not correlate with varying environmental parameters such as annual changes of sea level, rainfall or temperature. We suggest that the strain signal can indicate local slow-slip on the Armutlu fault as part of the eastern Marmara seismic gap.