Low-frequency earthquakes describe the slow slip that drives them

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Low-frequency earthquakes (LFEs) are repetitive seismic events that occur on plate boundaries where accompanying aseismic slip slowly releases built-up tectonic stress. Recent work has shown that LFE activity is an essential tool in monitoring slow slip, even when its geodetic signature is buried in the noise. Here, we attempt to go a step further and exploit LFE activity to estimate the aseismic moment of the colocated slow slip. We use an LFE catalog from the Guerrero subduction zone and calibrate their activity to the observed geodetic moment of the large Mw7.5 2006 slow slip event. We confirm that this calibration is robust by verifying that the LFE-estimated aseismic moments correspond well to the geodetically estimated moments of the Mw6.5 small slow slip events, which occur every 90 days. This demonstrates that LFE activity is more than just an indicator of when slow slip happens, and can be used to indirectly measure the slow slip that drives them. We analyze the magnitude distribution and moment balance of this aseismic event catalog and explore the scaling of moment rate and duration with magnitude.