From subduction processes to volcanic unrest: unravelling domino effects at Lake Taupo caldera, New Zealand

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What triggers volcanic unrest remains a fundamental - yet largely unanswered - scientific question. Amongst potential candidates as driving factors, tectonic processes such as large earthquakes have been repeatedly invoked. In the North Island of New Zealand, it is not the usual large subduction earthquakes but slow slip events (SSEs) that dominated "seismicity" for events above Mw6 over the past ten years. Here, we present some multidisciplinary results about the most recent unrest episode at Lake Taupo caldera in New Zealand. We show how processes along the subducted slab in 2008 changed the strain regime at Lake Taupo caldera, resulting in a domino effect that ultimately led to the last substantial episode of unrest at Taupo. We suggest that a deep slow slip event along the subduction zone triggered some readjustments at the caldera boundaries and latest vent area. We also propose that the subsidence of the central part of the caldera in turn caused stress changes in the underlying magmatic or hydrothermal system, resulting in a subsequent period of fluid-driven ground inflation and increased seismicity in the caldera.