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Global Earth: seismic and volcanic energy budget

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Earthquakes and eruptions are strongly correlated with plate tectonics and plate boundary dynamics, being volcanism associated with both accretionary plate margins and subduction zones, and large earthquakes correlated with displacements on pre-existing faults mainly in subduction zones. In this frame, scientists widely accept that a relationship exists between the occurrence of earthquakes and volcanic eruptions, noticing that large earthquakes are able to trigger not only other earthquakes but also volcanic eruptions through different static and dynamic triggering modes. In this work, we study the temporal evolution of eruption and earthquake occurrences worldwide at different time and spatial scales. From 1900 to date, we selected global catalogues describing seismic (1.692 earthquakes with magnitudes $\geq$ 7.0 MW) and volcanic (2.039 eruptions with VEI $\geq$ 2) global activity. We found an increase (days) on earthquake occurrence after large seismic events, as well as an increase on eruption occurrence after large eruptive events, as far as 90º of distance. Besides, we found an increase on the eruption occurrence after large seismic events, as far as 20º of distance. Studying case-by-case large eruptions and earthquakes events, we noticed a change in the rate and size of the activity after and before the time of occurrence. Furthermore, we found evidence of a global energy balance between earthquakes and eruptions and we quantified this balance for short timescales. We suggest a compatible mechanism of stress transmission, quantifying the energy available for the creation of large seismic and volcanic events.