

Moreover, recent earthquake activity is concentrated in an area between plutons. The spectra of both gravity and aeromagnetic anomalies and their first moments are used to delineate the depth, shape, and dimensions of these intrusives and their possible relationship to the seismicity pattern.

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EARTHQUAKE RISK IN GEOTHERMAL ENERGY EXTRACTION FROM SALTON SEA FIELD, CALIFORNIA

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Geothermal power production may induce a sequence of earthquakes owing to thermal strain release. The likely magnitudes and frequency of the induced earthquakes are constrained by the volumetric seismic moment M_0 as calculated from thermal contraction of reservoir rocks. If the tectonic and thermal stress drops are equivalent, the estimated magnitude agrees within 0.4 unit (Richter scale) of the observed magnitude for three events of different stress drops which occurred along a fault running through the Salton Sea geothermal field, Imperial Valley, California. An empirical earthquake frequency curve and the calculated M_0 are used to estimate the increased earthquake frequency and the cutoff magnitude. For 100 megawatt.year power production the cutoff magnitude is 3.8 and for 1000 megawatt.year it is 4.6, while the earthquake frequencies increase 1 and 4 times per year, respectively. Natural conduction cooling in the Salton Sea field at a rate of 58 megawatts may yield one event with magnitude 3.2 per year. Events with magnitude 3.2 ± 0.2 occur four times a year there in response to both tectonic and thermal stresses.