

## Understanding Earthquake After Effect “Gradient Pressure, Vibration & Rheology of Fluid”

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Effect of an earthquake to trigger another earthquake event is basically very common. The best example shows that Nias Earthquake of March 28<sup>th</sup> is triggered by The December Giant Thrust Earthquake event. Another effect of the earthquake in fluid reservoir is basically another phenomenon that is needed to be understood much better. The previous observation shows that effect of the earthquake could affect the rheology of fluid in term of permeability, changing the viscosity and the rate of production.

Take an analogue of the effect of the earthquake to the disaster of the mud flood around Sidoarjo East Java, we basically need to be carefully evaluate not only the effect of the main of the May 27<sup>th</sup> earthquake, but also need to take into account the effect of aftershock just before and after the mud flood.

To understand much better on how effective and how far the possibility of any effect to the mud flood, here we show several analogs of the experimental and mathematical model on the basis of Maxwellian fluid using vibroseismic sources. The result shows that several ten to hundred times of permeability could happen as the effect of vibration using that vibroseismic sources. Amplifying permeability in term of the rate flow is quite linear with magnitude of shaking and more viscous fluid, the amplifying of the permeability shows linier with high frequency of resonance. Another result shows that in the absence of the shaking, permeability relaxing as the function of time turn to the normal condition.

Referring all the above result to the mud flood phenomenon, we need to evaluate that loosing mass caused by flooding could effect the subsidence. The affect is basically will change the pressure gradient surrounding the fluid volume that is caused by gravitational forces. To understand better whether the earthquake could amplify the mud-flood, more careful evaluation and study is really needed. Also the possibility of changing of the gradient pressure is needed to put as the highly attention since it is function of state and time. The effect is probably unpredictable.