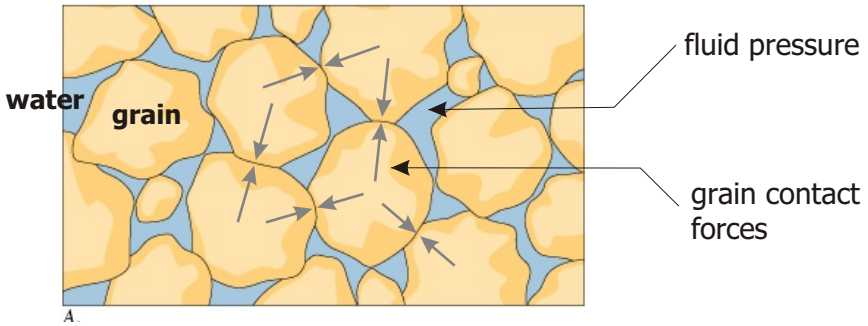
Name:_____
Geology 102, Winter 2003

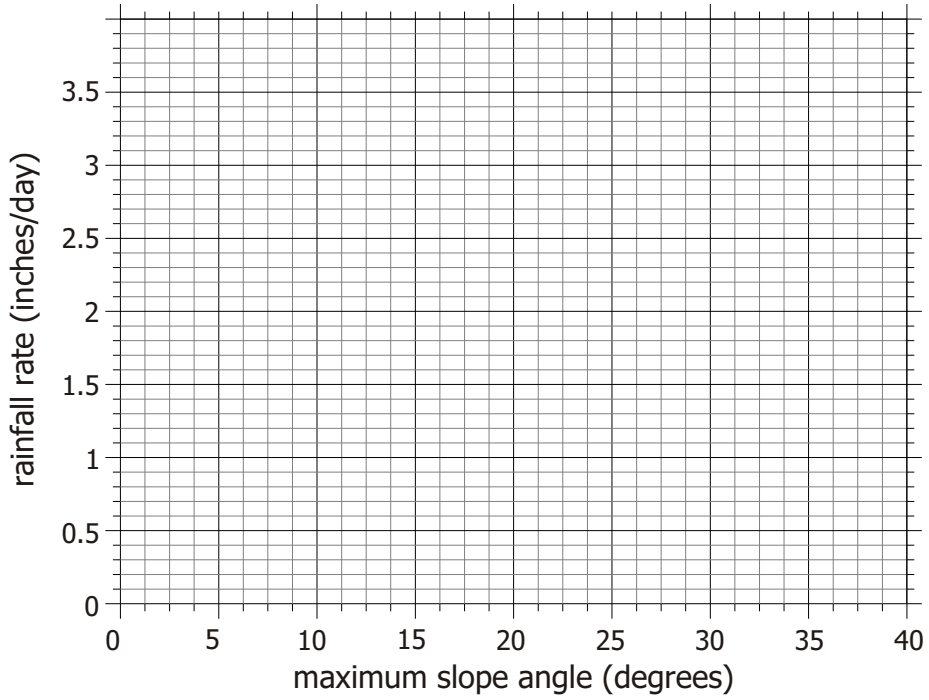
Pore pressure, earthquakes, and landsliding demonstration

In saturated soil or rock, water in voids imparts a buoyancy force that reduces the contact force between grains. As a result, saturation reduces the frictional strength of saturated soil or rock making it susceptible to slope failure



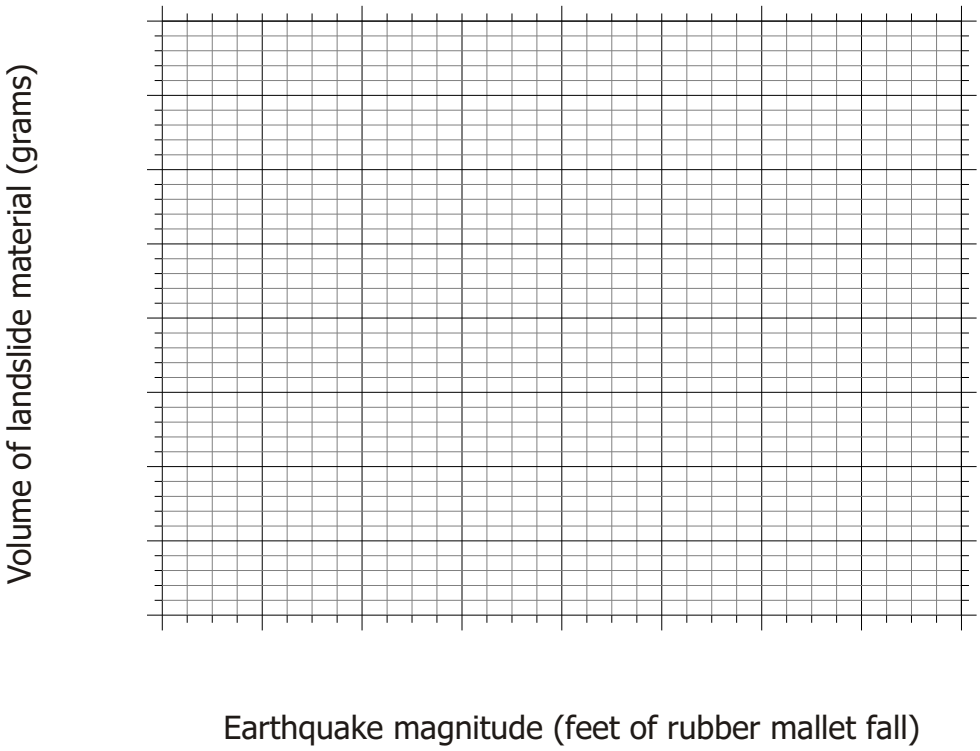
The magnitude of fluid (or pore) pressure between grains depends on the level of the water table. As the water table rises (and approaches the surface), fluid pressures rise and increase the likelihood of landsliding. High rainfall rates tend to cause rapid rise of the water table. We'll use our laboratory landslide model to explore how rainfall affects landsliding. Specifically, we'll determine how the rainfall rate affects the slope angle at which landslides occur.

What is the general relationship you'd expect between rainfall rate and the maximum stable slope angle? (In other words, is more or less rainfall required to make a gentle slope fail become unstable?)



Earthquakes cause the ground to accelerate and thus facilitate the initiation of landslides. Following large earthquakes, geologists have documented the volume of landslide material that was mobilized due to the seismic activity.

How might the volume of material sliding off our model mountain range vary depending on the size of the earthquake it experiences?



Final question: Thusfar, we've demonstrated how water and earthquakes can promote landsliding. What do you predict will happen if we spray water across the model mountain range before subjecting it to an earthquake?

Would we see more or less landsliding compared to our previous findings?

What happened and why?

Hint: