USGS holds briefing on induced seismicity in the United States

March 29, 2016

The U.S. Geological Survey (USGS), with sponsorship from the Seismological Society of America, held a briefing on induced seismicity in the United States. The speakers were Justin Rubinstein and Mark Petersen, both of the USGS.

The briefing came one day after the publication of the USGS 2016 One-Year Seismic Hazard Forecast for the Central and Eastern United States from Induced and Natural Earthquakes, which is the first USGS hazard forecast to include both natural and human-induced earthquakes. This forecast was a major focus of the briefing, which provided an introduction to induced seismicity and what is known about its causes, and outlined the work the USGS is doing to better understand and address the problem of induced earthquakes.

Rubinstein explained that the main cause of induced earthquakes is the deep underground injection of large volumes of wastewater from the oil and gas industry. He described how injecting water near existing faults can reactivate them, causing earthquakes. Rubinstein reported that, although most of the approximately 30,000 Class II wastewater injection wells in the US do not trigger earthquakes, some areas, such as central-northern Oklahoma and southern Kansas, are facing particularly high rates of injection-induced seismicity; so far, seven states (OK, KS, OH, TX, CA, AR, CO) have considered or enacted regulations in an attempt to reduce this. Looking to the future, Rubinstein gave examples from Kansas and Arkansas, where decreasing wastewater injection has led to a decrease in earthquake activity.

Petersen presented the 2016 forecast map, which shows the 1-year probability of earthquake damage across the central and eastern United States. He emphasized the likelihood of significant year-on-year changes in these forecasts, as injection activity and regulation respond to ongoing research and economic and technological changes. The 2016 forecast indicates that parts of Oklahoma have up to a 12% chance of experiencing some earthquake damage over the next year. Petersen stressed that large, destructive earthquakes are very unlikely, but called for continued research and discussion to better understand and deal with the many issues associated with induced seismicity, including psychological impacts and effects on house prices.

Source: U.S. Geological Survey