

SILENT EARTHQUAKES WITH DR REBECCA BELL

TALKING POINTS

1. What are the similarities and differences between a slow slip event and a typical earthquake? (See *What are slow slip events?*)
2. Why is it important to research slow slip events? (See *So are these slow slip events harmless?*)
3. What are the differences between deep and shallow slow slip events? (See *What's currently known about slow slip events?*)
4. Why does Becky's team focus on shallow slow slip events? (See *What's currently known about slow slip events?*)
5. What are the limits to drilling for investigating tectonic behaviour? (See *How is drilling used to investigate slow slip events?*)
6. How do sound waves and full-waveform inversion help advance understanding of slow slip events? (See *How can slow slip events be investigated in the field?*)
7. Why are drilling, lab experiments and sound wave experiments all needed in combination to fully understand slow slip events? (See *How can slow slip events be investigated in the field?*)

ACTIVITIES FOR HOME OR IN THE CLASSROOM

You can mimic lab experiments in slow slip events with a few common materials. You will need:

- Two bricks
- Water
- Washing up liquid

In this experiment, the bricks represent tectonic plates, the water represents liquid under low pressure, and the washing up liquid represents liquid under high pressure.

- Apply water to the surface of the bricks
- Stack one brick on top of the other on a flat surface (that will not be damaged by the bricks). This mimics subduction: one tectonic plate being pushed below another.
- If possible, use a vice or other clamping method to hold the bottom brick in place.
- Push diagonally downwards on the top brick until it moves against the bottom brick. (Watch your fingers!) How much force does it take to move the brick? Does the brick move slowly or suddenly?
- Apply a liberal amount of washing liquid between the two bricks and push diagonally downwards on the top brick once again. How does its movement differ to when just water is applied?

Think about how these two situations relate to plate tectonics, referring to Becky's article to help you. Which situation is closest to the conditions that cause a typical earthquake, and which is closest to a slow slip event? Why? What conditions lead to these two scenarios?

MORE RESOURCES

- You can see Dr Rebecca Bell give a public lecture on her work in slow slip events at the following link: <https://www.geolsoc.org.uk/GSL-Lecture-June>. The presentation style is similar to lectures you might encounter in a geosciences degree.
- Imperial College London offers outreach services to schools and colleges, such as inspiring talks from academics and presentations from student ambassadors. Find out more here: <https://www.imperial.ac.uk/be-inspired/student-recruitment-and-outreach/schools-and-colleges/students/in-school-activities/talks-fairs-and-demos/stem-activities/>
- The Geological Society offers a wide range of free resources for schools and students, including factsheets, posters and even card games. Find them here: <https://www.geolsoc.org.uk/SupportingMaterials>