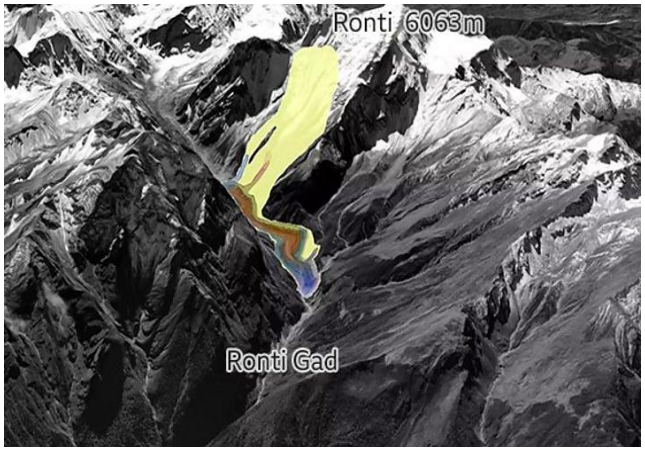
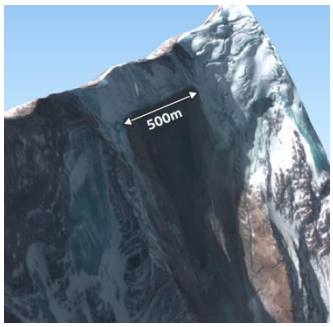
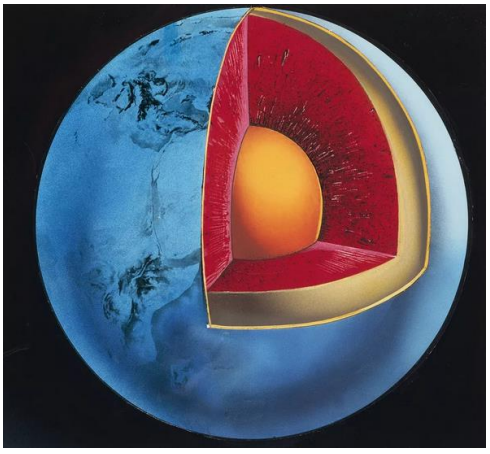
- **Chamoli disaster (February 2021):** A report has been issued on the Chamoli disaster, where the flank of a Himalayan mountain failed and fell into the valley below. It claimed over 200 lives and destroyed a hydro-electric infrastructure worth hundreds of millions of dollars. A wedge of glacier-covered rock, more than 500m wide and 180m thick, just suddenly dropped from the mountain side. It is calculated that almost 27 million cubic metres of material was put into a minute-long descent that at one point was in complete freefall. When the mass hit the Ronti Gad valley floor, it released the energy equivalent to 15 Hiroshima atomic bombs. When the debris flow ripped through the Rishiganga hydro-electric plant, 15km away, the frontal velocity was 25m/s (90km/h, 56 mph). Even 10km beyond that, at the Tapovan hydro plant, the flow was still moving at 16m/s. [Chamoli disaster]



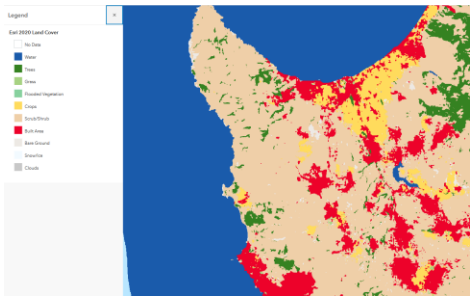


- **Hunks of oceanic crust are wedged inside Earth's mantle:** Seismic data has revealed that there may be hunks of oceanic crust stuck deep within the planet's liquid mantle, creating big lumps in what was previously thought to be a relatively smooth layer. The article, obviously written by a hunger American, describes as *deliciously* intriguing *peanut chunks* inside the *gooey* mantle beneath East Asia. How did those chunks of oceanic crust get into that layer? We know that the hot mantle churns and circulates, moving the crust at the surface, causing the oceanic crust to dive into its depths — a process called subduction. Scientists concluded that some of the oceanic slab had "bunched up" at the

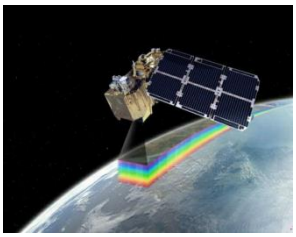


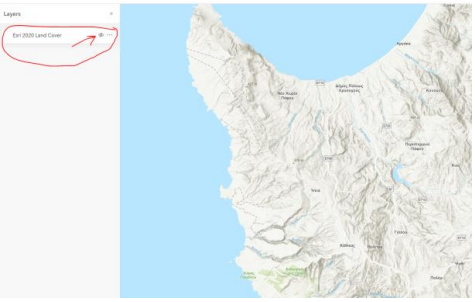
base of the transition zone between the upper and lower mantle and prevented the Pacific plate from diving further. The team hypothesized that as the oceanic slab meets denser rock at that depth; it ceases its descent into the mantle and instead spreads laterally within the transitional mantle. The stuck slab then separates chemically into differing mineral compositions. This chemical separation creates a "*chunky*" region of the mantle with a complex structure, which differs slightly from the rest of the mantle material, which is pyrolite (a rock that is about three parts peridotite and one part basalt). Hunks of oceanic crust are wedged inside Earth's mantle.

- **Globe Observer:** When researching for my future presentation on Meteorology, in particular 'Clouds', I came across a NASA 'Citizen Science' project to help monitor the conditions of 'clouds', 'water' (especially as a habitat for mosquitoes), 'plants' (trees and other land cover) and see how they change over time. The data collected enables scientists to track changes in the environment in support of Earth system science research. It helps NASA interpret environmental monitoring satellite data. The app can be downloaded to a smart phone or tablet and is very easy to use. 'Clouds' is an app based tool that will help you document what you see in the sky. Once you have downloaded the app and created an account, the Clouds tool (including the Clouds Wizard) will guide you through the observation process. Required data includes reporting on overall cloud cover and surface conditions that can impact satellite observations. Optional (but very useful) data include cloud types, cloud opacity, sky conditions and visibility. The app takes photographs of the sky automatically, once you point your device to the compass points shown on the mobile device screen. It's a great citizen science project if you want to help support Earth system science research. There are already over 30 observers around Cyprus contributing to the project. I will give a briefing on the 'Globe Observer Project' during the 'Meteorology – Clouds' presentation – whenever that will be?? Globe Observer Project

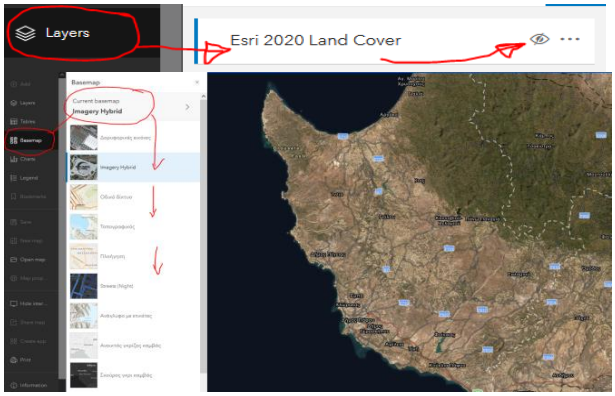


- **Esri 2020 Land Cover**. A global map of 'land use'/'land cover' (LULC) has been published for 2020. The map is derived from ESA Sentinel-2 imagery at 10m resolution. It is a composite of LULC predictions for 10 classes throughout the

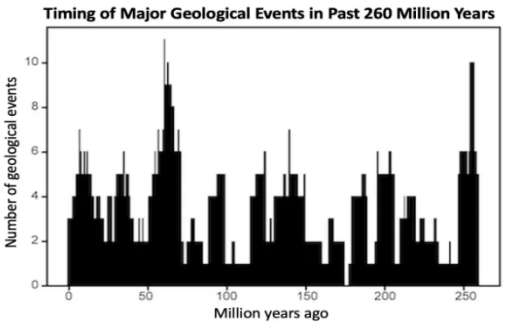




year (Water, Trees, Grass, Flooded Vegetation, Crops, Scrub/Shrub, Built Area, Bare Ground, Snow/Ice & Clouds). The 10 classes can be switched off and the map returned to the base map by clicking on ‘Layers’ in the left hand legend box and then selecting or de-selecting the eye symbol. There is an incredible amount of detail available in the maps, so you may have to give the map a little time to resolve on your computer/tablet. – enjoy. [Map viewer Esri 2020 Land Cover]



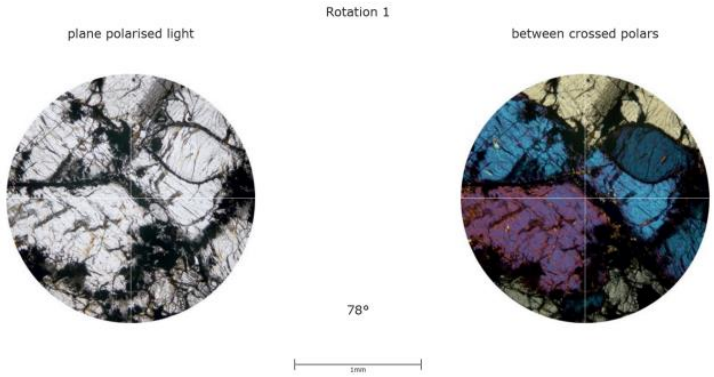
- **Earth has a 'pulse' of 27.5 million years.** Most major geological events in Earth's recent history have clustered in 27.5 million year intervals — a pattern that scientists are now calling the "pulse of the Earth, What the driving force behind these clusters of events is not clear . It could be internally driven by plate tectonics and movement inside the mantle. Alternatively, it could have something to do with the movement of Earth in the solar system and the galaxy. For example, the 27.5 million year pulse is close to the 32 million year vertical oscillation around the midplane of the galaxy, according to a study. [The Pulse of the Earth]



- **Earth's Crystallized Iron Inner Core Could Be Lopsided.** New models suggest this is because Earth's solid core is growing faster on one side, deep beneath Indonesia's Banda Sea and slower on the other side, underneath Brazil. There was a time when our planet didn't have a solid core. The deepest interior of our planet probably held a mass of molten material for billions of years before liquid iron in the center began to cool and solidify. The Earth’s core cools about 100 degrees Celsius per billion years. This means Earth's very center could be a giant, growing cluster of crystallized iron and when these crystals align in a certain way, it probably allows seismic waves to travel faster in some directions. The propagation of seismic waves and computer simulations are some of the only ways we can test possible explanations for why our planet is formed like it is. Running models on how this particular alignment might

have occurred, researchers have proposed that the Earth's inner core is growing in a lopsided way. [Earth's core maybe growing lobsided]

- **Virtual Microscope.** Many years ago, I gave presentation on 'Geological Thin Sections' – around the time that the rock-cutter donated by David May was revamped into a 'working' condition. The Open University has produced a Virtual Microscope project to allow access to a range of 'virtual thin sections' and in some cases virtual hand specimens as well. The Virtual Microscope allows users to examine and explore minerals and microscopic features of rocks, helping them to develop classification and identification skills without the need for high-cost microscopes and thin section preparation facilities. You can observe the properties, size, shape, proportion and colour of minerals in the sample, as well as textures and microstructures, piecing together clues to the rock's history. The rocks in the Virtual Microscope are presented as a series of collections to make them easy to browse. The largest collection is called the UKVM and consists of over 100 rocks from the United Kingdom. There is also an interactive location map allowing you to view the distribution of many of the rock samples on a map of the Earth. Unfortunately, there appears to be no samples from Cyprus. Samples can be rotated and viewed as if under polarized light. Virtual Microscope



Etna volcano update: Etna continues to give a spectacular display. Seeing a volcanic eruption at night is high on my 'to-do' list. So it is particularly annoying that Covid restrictions prevent the organization of a field trip. Etna, locally called 'Mongibello', is Europe's largest and most active volcano. Mount Etna volcanic activity is 'normally' in recognizable cycles, especially the "cycle of side eruptions". However, in February 2021, Etna began a series of violent, spectacular but basically contained ***'paroxysms'*** that are becoming more unpredictable the longer the volcanic activity is taking place. The frequency between events is reducing and causing some concern amongst volcanologists. However, violent and frequent *'paroxysms'* should not be too much of a worry as they are an outlet of energy from the summit craters that allows the volcano to expel gas and material. Otherwise, this would cause internal pressure and split the flank even at low altitudes. The columns of gas, ash and ***'Lapilli'*** from the paroxysms have reached 12 km in height and ash from the Etna has been identified as far away as the USA. Etna Volcano Live Web Cam. Etna Eruptions.

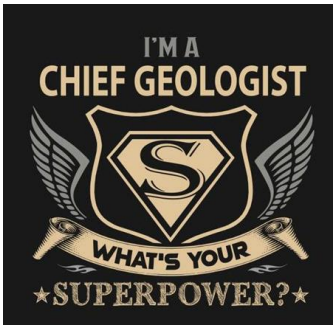
- ***paroxysms*** -"particularly violent eruption of a volcano.." Volcano Vocabulary.
- ***Lapilli:*** intermediate-sized fragments of material (2-64 mm, or 0.08-2.5 in) that are ejected in a pyroclastic explosion.
- Types of Lava Flows – A long read but great photographs.
- Don't you just hate it when people use unnecessarily complicated words just to sound perspicacious?

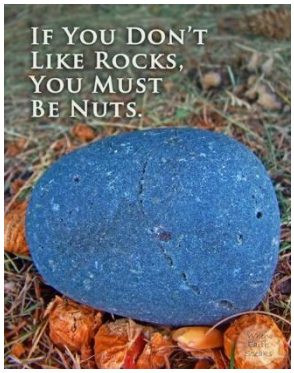
Quiz(zes – as they are only short)

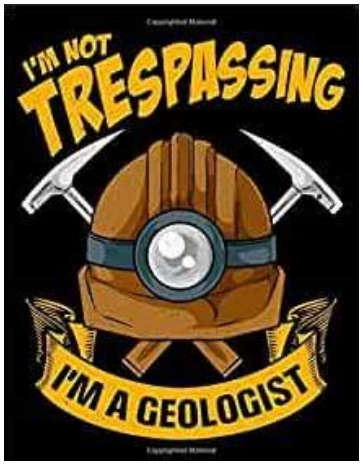
- ☹ **Excavation Earth - Fact or Fiction?**
- ☹ **Deserts Quiz**

- ☹ **Kids National Geographic Volcano Quiz** (I did quite well on this)

Don't groan - Do you know how difficult it is to find geology (ES) jokes that are 'funny'????







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