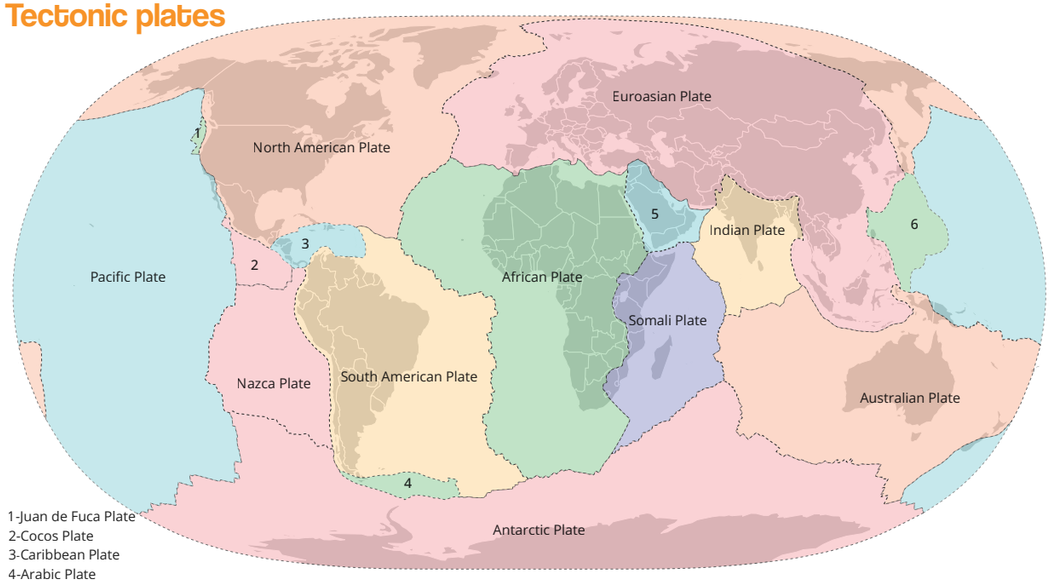
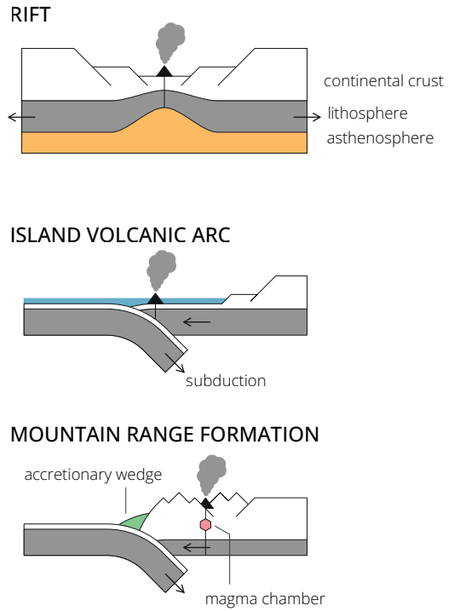
Tectonic plates



1-Juan de Fuca Plate
2-Cocos Plate
3-Caribbean Plate
4-Arabic Plate
5-Scotia Plate
6-Philippines Sea Plate

Source: Hugo Ahlenius, based on the work of Peter Bird, 2014.

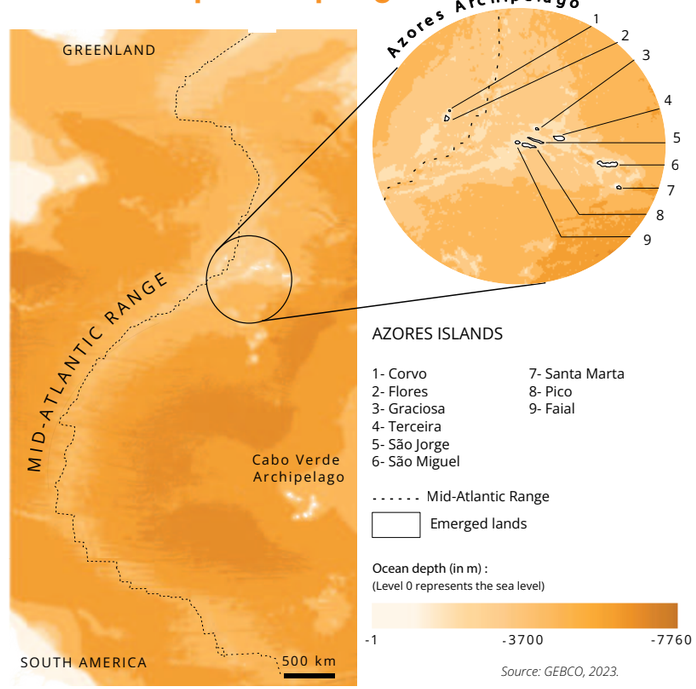
Orogenesis: mountains in the making



Source: based on the work of Anthony Saphon, 2007.

Mountain ranges can be found in every corner of the world, whether on land or in the oceans. They come in all shapes and sizes: the Himalayas are known to be the highest and the biggest concentration of mountains in the entire world. While the Andes cordillera is the longest (ignoring the undersea stretches). Other much older ranges lost their altitude due to erosion.
Mountains are so diverse that the problem of defining them needs to be addressed. Every country has its own laws regarding the definition of mountain. A rocky formation high enough to be considered mountains in France may not be called mountains elsewhere. In fact, the only similarities between these national definitions are elevation and slope. For decades, there was not even a global definition of mountains.Therefore national and European definitions established in the 60s-70s were the sole references.
The UNEP-WCMC is among the first organisms to establish criteria applicable to everywhere in the world. They identify two main categories: lower mountains and higher mountains. Lower mountains are topographic masses with steep slopes (over 2 % for mountains ranging between 300 and 1500 meters high and over 5 % for mountains ranging between 1500 and 2500 meters high) and high elevation ranges (exceeding 300 m for mountains ranging between 300 and 1500 meters) and higher mountains includes every rocky formation higher than 2500 meters.
However, geographers feel this definition is not broad enough because Mountains are also an ecosystem, an ambience, a place that is perceived and conceived differently by anyone.
No matter how diverse Mountains are, their life cycles are quite similar. They are the result of geological processes over long periods of time, driven mainly by tectonic forces and plate movements (mainly convergences). A mountain is the result of a well-known phenomenon called orogenesis.
At a junction between two diverging tectonic plates, opposite forces of the lithosphere lead to the tearing of the continental crust and a rift is formed. This rift is the starting point from which a new fragment of lithosphere will then expand. The speed of this lithosphere growth ranges from 0.5cm per year to 2 cm per year.
Such a dynamic is currently afoot in Eastern Africa. There, the African Plate and the Somali Plate are diverging, setting in motion the broadening of the rift and the emerging of a new sea. The same situation can be witnessed in the Azores Archipelago: the islands of Corvo and Flores being separated from the other Azores islands by the dorsal (undersea rift), they will most likely drift away from their companions since the lithosphere they're standing on expands in the opposite direction.
After its creation, the new plate drifts, carried by the expanding lithosphere until it subsides under a converging plate of lower density (subduction) or collides against another plate of a similar caliber (collision). In a oceanic-continental subduction scenario, the oceanic plate shifts beneath the continental plate due to the former being denser. In the first case scenario, the asthenosphere gets colder, allowing the less dense oceanic plate to subside. While it dives into earth's mantle, the plate partially melts under high pressures and temperatures. The magma from the fusion then ascends through cracks in the continental crust until reaching the surface where it solidifies and evolves into a volcano chain. The subduction also causes the sediments from the subsiding plate to gather in an accretionary wedge.
In the second case scenario, the two plates (continental both) collide and trigger the deformation of the continental crust and the rising of a mountain chain.

Azores: the split archipelago



Source: GEBCO, 2023.