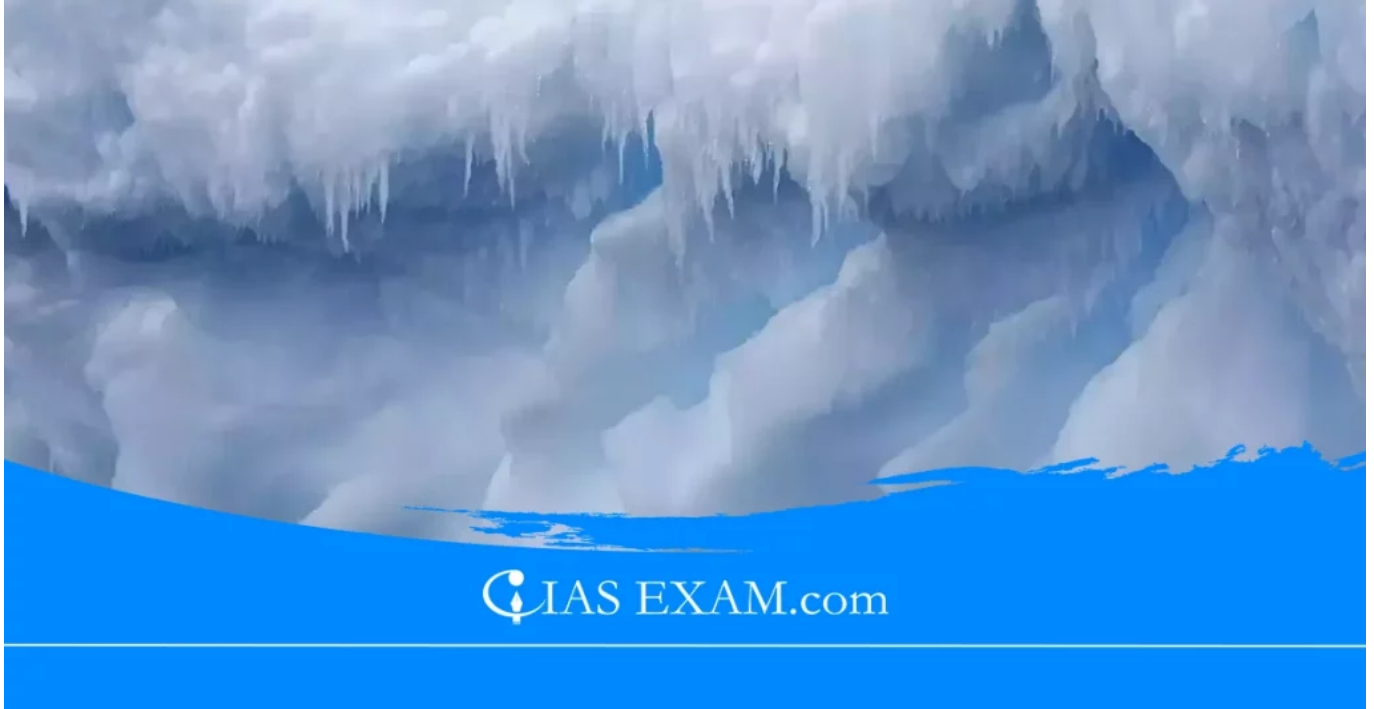


Subduction Zone beneath The Gibraltar Strait

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Context- Recently, a group of scientists has predicted the '**Ring of Fire**' Subduction Zone beneath the **Gibraltar Strait**.

About Subduction Zones

- They are the areas wherein tectonic plates collide and one plate is thrust under every other, descending into the Earth's mantle at rates of 2-8 centimetres per year.
- There are three approaches wherein convergence/collision can arise
 - Between an oceanic and continental plate;
 - Between oceanic plates;
 - Between two continental plates.
- The system of subduction is driven by the temperature difference between the subducting slab and the encircling asthenosphere, because the colder oceanic lithosphere has, on average, a greater density.
- The subducting plate, or 'slab' sinks into the mantle in large part under its weight.
- These are responsible for the planet's most powerful earthquakes, tsunamis, volcanic eruptions, and landslides.

Subduction Zones and the Plates

- The Earth's lithosphere is divided into sorts of plates: continental and oceanic, and is split into seven major and some minor plates.
- The oceanic plates are comparatively heavier, so while those collide with the

continental plates, they subduct downwards, forming a subduction zone.

- **Major Plates**

- Antarctica and the surrounding oceanic plate;
- North American (with western Atlantic floor separated from the South American plate along the Caribbean islands) plate;
- South American (with western Atlantic floor separated from the North American plate along the Caribbean islands) plate;
- Pacific plate;
- India-Australia-New Zealand plate;
- Africa with the eastern Atlantic floor plate;
- Eurasia and the adjoining oceanic plate;

- **Minor Plates:**

- Cocos Plate : Between Central America and Pacific plate;
- Nazca Plate : Between South America and Pacific plate;
- Arabian plate : Mostly the Saudi Arabian landmass;
- Philippine plate : Between the Asiatic and Pacific plate

Subduction Zones and Seismic Activity

- At shallow depths the interface between the plates may become 'locked' and stresses build alongside those giant 'megathrust' faults.
- Eventually, stresses exceed the fault's strength and it breaks free, releasing the stored energy as seismic (shaking) waves in an earthquake.
- The massive size of those faults produces the largest earthquakes on Earth.

Subduction Zones and Volcanic Activity

- As the subducting plate descends into the mantle, it undergoes changes in pressure and temperature that cause the release of water.
- This water can trigger the melting of the overlying mantle, leading to the formation of magma that may upward thrust to the floor, resulting in volcanic eruptions.

Future Implications

- Subduction zones are not static and can evolve over time.
 - For instance, the scientists, in a recent study, raised worries about the future of the Atlantic Ocean.
- They identified a subduction region, known as the 'Ring of Fire', that could doubtlessly swallow the Atlantic Ocean near to the Strait of Gibraltar.
- It is predicted to expand westwards over the next 20 million years.

Source: [The ToI](#)

Q. What is a 'subduction zone'? How does subduction lead to seismic activities? Also identify the major subduction zones of the world.