
1. Hidden Mantle Layers

Why in News?

- Recently, the mantle, a layer of solid rock sandwiched between the Earth's upper crust and lower core, has been hiding two new layers.

Highlights

- The first layer is a low viscosity zone in the upper mantle, approximately 100 kilometres thick, which was discovered by studying deep earthquakes (2018 Fiji earthquake of 8.2 magnitude) using GPS sensors.
- The second layer is a partially molten layer that extends from 90 km to 150 kilometres and sits below the tectonic plates.
- This layer was discovered by analysing seismic waves from earthquakes and suggests a higher temperature.
- The Earth's mantle is a layer of solid rock that extends from the bottom of the crust to the top of the core, with a thickness of approximately 2,900 kilometres (1,800 miles).
- The mantle is the largest layer of the Earth's interior, making up about 84% of the Earth's volume and about 68% of its mass.
- The mantle is composed of silicate rocks rich in iron and magnesium, and is divided into the upper mantle and the lower mantle.
- The mantle is an important part of the Earth's structure and plays a critical role in the geologic processes that shape the planet's surface, such as plate tectonics and volcanic activity.
- The mantle's viscous properties govern convection – the transfer of heat between areas of different temperatures.
- The heat generated by the core is transferred through the mantle, which drives the motion of the tectonic plates on the Earth's surface.