

Earthquake Swarms

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In News

Earthquake swarms are **sequences of many earthquakes that occur in a relatively short period without a specific main shock**. In the course of a swarm, thousands of small and intermediate magnitude earthquakes can occur within some months.

Features of Earthquake Swarms

- Seismic activities can be classified into either a major quake followed by aftershocks or an earthquake swarm. In general, **within major earthquakes a maximum-scale quake is followed by a number of minor aftershocks**.
- The swarm earthquake is a **series of the quakes of a similar scale to the mainshock**. The pace of subsidence in such earthquakes occurring is gradual relative to aftershocks in normal earthquakes, and the seismic activities are protracted.
- The AD 2000 **Izu islands earthquake** that struck the northern Izu islands showed one of the most energetic swarms ever recorded.
- Dominant hypotheses that explain the occurrence of the swarm include the **immediate influence of magma and groundwater (ex. intrusion to the fault), peculiar inhomogeneity of crustal structure** and so on.
- Although the mechanism of each earthquake is the same as that of a normal earthquake, an **extraordinarily high stress generated for a relatively short period rapidly elevates the rate of earthquake occurrence**, resulting in distinctive seismological behaviour.
- The **thousands of hypocentres of each swarm** do not build a diffuse cloud, but instead **form planar, fault-like structures**.
- Even if the source of the swarms is most likely

connected with ascending fluids, the **distribution of the hypocentres seems to be located at zones of pre-existing weakness**, which are most probably faults.

- They occur over an extended period **without a clear sequence of foreshocks, main quakes and aftershocks** and in **regions with complex contiguous fracture systems**.

