



## Mass Extinction

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### Why in News

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Recently, a paper published in the international journal Nature Geoscience **has come up with a new reason behind the first mass extinction, also known as the Late Ordovician mass extinction.**

It notes that the cooling climate likely changed the ocean circulation pattern. This caused a disruption in the flow of oxygen-rich water from the shallow seas to deeper oceans, leading to a mass extinction of marine creatures.

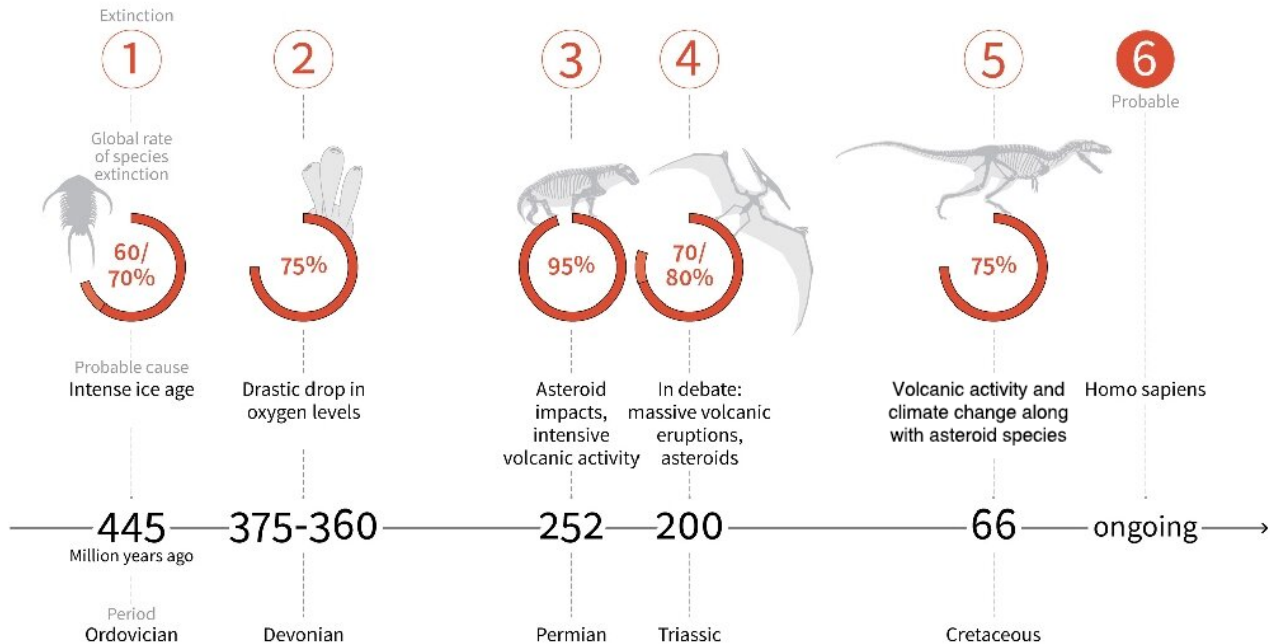
### Key Points

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- **Mass Extinction (Meaning):**
  - A mass extinction event is **when species vanish much faster than they are replaced.**
  - This is usually **defined as about 75% of the world's species being lost in a 'short' amount of geological time** - less than 2.8 million years.
- **Mass Extinctions So Far:**
  - **First Mass Extinction:** The **Ordovician mass extinction** that occurred about 445 million years ago killed about 85% of all species.
  - **Second Mass Extinction:** The **Devonian mass extinction** (about 375 million years ago) wiped out about 75% of the world's species.
  - **Third Mass Extinction:** The **Permian mass extinction** (about 250 million years ago) also known as the Great Dying caused the extinction of over 95% of all species.
  - **Fourth Mass Extinction:** The **Triassic mass extinction** (about 200 million years ago) eliminated about 80% of Earth's species, including some dinosaurs.
  - **Fifth Mass Extinction:** This **Cretaceous mass extinction** (about 65 million years ago) is known for wiping out non-avian dinosaurs.

# Earth's "mass extinctions"

During the last 500 million years, Earth has experienced five periods when at least half the living creatures were wiped out



## • About the Latest Findings:

- **New Explanations:** There have been several theories behind each mass extinction and with advances in new technologies, researchers have been uncovering more intricate details about these events.
- **Traditional Thought:** For decades, the prevailing school of thought was that **volcanism-induced global warming** causes the oceans to lose oxygen and thus impact marine habitability, potentially destabilising the entire ecosystem.
- **New School of Thought:** In recent years, mounting evidence points to several episodes in the Earth's history when **oxygen levels also dropped in cooling climates**.
  - Ordovician climate and marine biogeochemical cycles during that period showed "seafloor and upper-ocean oxygenation in response to ongoing global cooling."  
This led to **deep-sea anoxia affecting ocean circulation**.
  - Thus, the paper concludes that **climate cooling may have led to changes in nutrient cycling, primary producer communities** which ultimately drove the Late Ordovician mass extinction.

- **Ongoing Sixth Mass Extinction and Impact:**

- **Sixth Mass Extinction:**

- Some researchers have pointed out that we are currently experiencing a **sixth mass extinction** as the result of human-induced climate change (referred to as the **Anthropocene extinction**).

- Currently, only an **estimated 2% of all of the species** that ever lived are alive but the absolute number of species is greater than ever before.

- It is described as the most serious environmental problem since the **loss of species will be permanent**.

- The loss of species has been occurring since human ancestors developed agriculture over 11,000 years ago. Since then, the human population has increased from about 1 million to 7.7 billion.

- **Possible Impact:**

- The extinction of the species causes tangible impact such as in the form of a loss in crop pollination and water purification.
    - Further, if a species has a specific function in an ecosystem, the loss can lead to consequences for other species by impacting the food chain.
    - The effects of extinction are expected to worsen the genetic and cultural variability which would change entire ecosystems.

- When genetic variability and resilience is reduced, its contribution to human welfare may be lost.

**Source: IE**