

Introduction:

Every day, we hear about the growing threat of global warming. However, when compared to the last 500 million years of Earth's geological history, we are currently living in an Ice Age. It is also known that some periods in Earth's past have been even colder. For example, the Snowball Earth hypothesis proposes that during certain periods in Earth's deep past, the planet's surface was entirely, or nearly entirely, frozen. It is believed that around 720 to 635 million years ago, Earth may have been completely covered in ice.

The causes of this event remain unclear. A runaway chain of events may have radically altered the planet's climate, leading to a dramatic drop in temperatures. Ice sheets, potentially several miles thick, could have spread across the entire surface of the Earth.

These icy epochs, which occurred several times throughout the Proterozoic Eon, had profound effects on the evolution of life and Earth's geological history. Current research is focused on understanding the triggers of these global glaciations, their duration, and the eventual thawing that brought the planet back to a more temperate climate.

Question:

Using AI and available online resources, analyze the key evidence supporting the Snowball Earth hypothesis. Discuss the potential causes, duration, and consequences of these glaciation events. How do current models of Earth's climate system incorporate findings from Snowball Earth studies to predict future climate trends? Or are we instead heading toward global warming?