What Killed the Megafauna of the Ice Age?

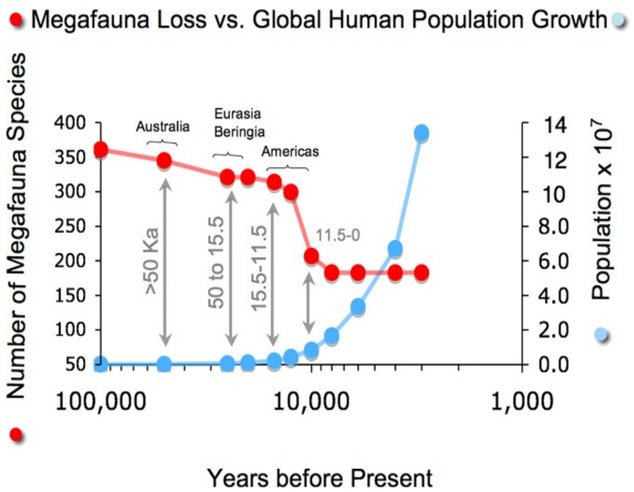
By

The Overkill Hypothesis

Humans killed off the megafauna as they migrated into new territories, overhunting and butchering the species to feed their growing populations.

Evidence:

- Megafaunal extinctions consistently occurred a few hundred to a few thousand years after the initial arrival of humans.
- Africa and Eurasia experienced lower extinction rates because species of *Homo* lived there for 100,000s of years, allowing megafauna to evolve with humans.
- Specialized large-game tools and megafauna bones with cut marks imply humans hunted and butchered megafauna.
- Megafauna that lived in areas absent of humans (i.e. islands) lived much longer than the megafauna that lived alongside them.



(Chart from Barnosky, 2008)

The Quaternary Megafaunal Extinction Event

was the mass extinction of most of the world's megafaunal population in a period spanning from approximately 50,000 years ago to the present.

- 178 Megafaunal Species and 101 Megafaunal Genera went Extinct

There are two leading hypotheses that explain what caused the Quaternary Megafaunal Extinction Event: the Overkill Hypothesis and the Climate Change Hypothesis

Continent	Extinction Dates (years BP)	Global Extinctions	Continental Extinctions	Continental Survivors	Continental Extinction Percentage
Australia	50,000 – 32,000	14	--	2	88%
Eurasia (two pulses)	48,000 – 23,000 14,000 – 11,000	4	5	17	35%
North America	14,000 – 10,000	28	6	13	72%
South America	12,000 – 8,000	48	2	10	83%
Africa*	--	7	3	38	21%

Global Extinctions represents the number of genera that went extinct on a global scale.
Continental Extinctions represents the number of genera that went extinct on that continent but may have survived elsewhere on the planet.
*Africa did not experience a definable extinction event; several of the extinctions represented here occurred throughout the entire Quaternary Megafaunal Extinction Event period.

(Data from Barnosky, 2008)

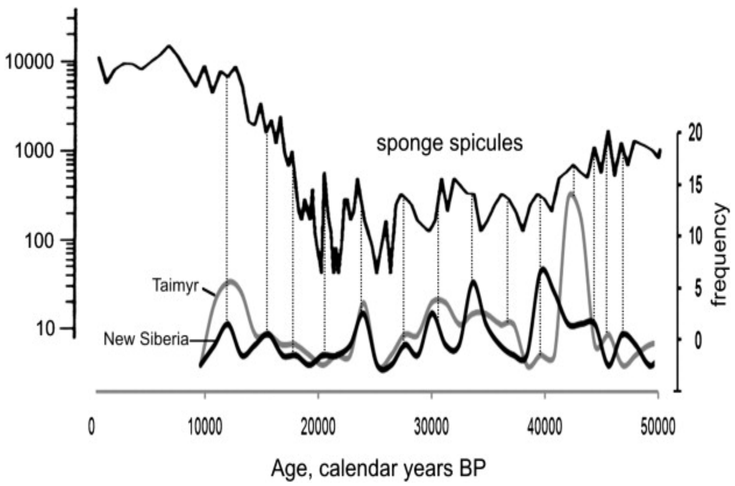
(Sources: Barnosky, 2008; Fillios, 2010; Haynes, 2008; Hubbe, 2013; Mann, 2013; Nikolskiy, 2011; Turney, 2008; Veltre, 2008; White, 2013; Woodman, 2009.)

The Climate Change Hypothesis

The changing climate of the Pleistocene-Holocene transition were too severe for the megafauna to survive, resulting in the ultimate demise and mass extinctions of the Pleistocene megafauna.

Evidence:

- Climatic changes throughout the Pleistocene were always accompanied by the increase or decrease in megafaunal population size.
- The climate changed the environments, ecosystems, and habitats of the megafauna, which affected megafaunal diets and migration patterns and made them more vulnerable to predators.
- Places that experienced severe climatic shifts during the Pleistocene-Holocene Transition experienced more severe extinction rates.



The top line represents the frequency of sponge spicules – a proxy for climatic events. The bottom line represents the frequency of two mammoth populations in Siberia.

(Chart from Nikolskiy, 2011)