

Did a meteor wipe out the dinosaurs?

Mass extinction at the Cretaceous-Paleogene (K/Pg) boundary 65 million years ago



Scientists are still not sure what exactly caused the extinction of the dinosaurs, and it's much more likely to have been caused by a combination of many factors. But one of these factors may have been the impact of a large asteroid crashing into what is now Mexico's Yucatan peninsula. We're able to see this extinction event in the fossil record, but is there a way to see if there was an asteroid impact?



K-Pg Specimen

This is a fragment of rock that shows the K-Pg boundary. Here you can clearly see the greenish layer that contains metal iridium, tektites, and asteroid debris. Samples like this one have been gathered from all around the world.

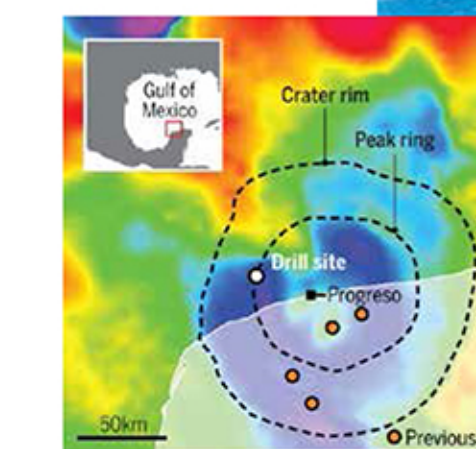
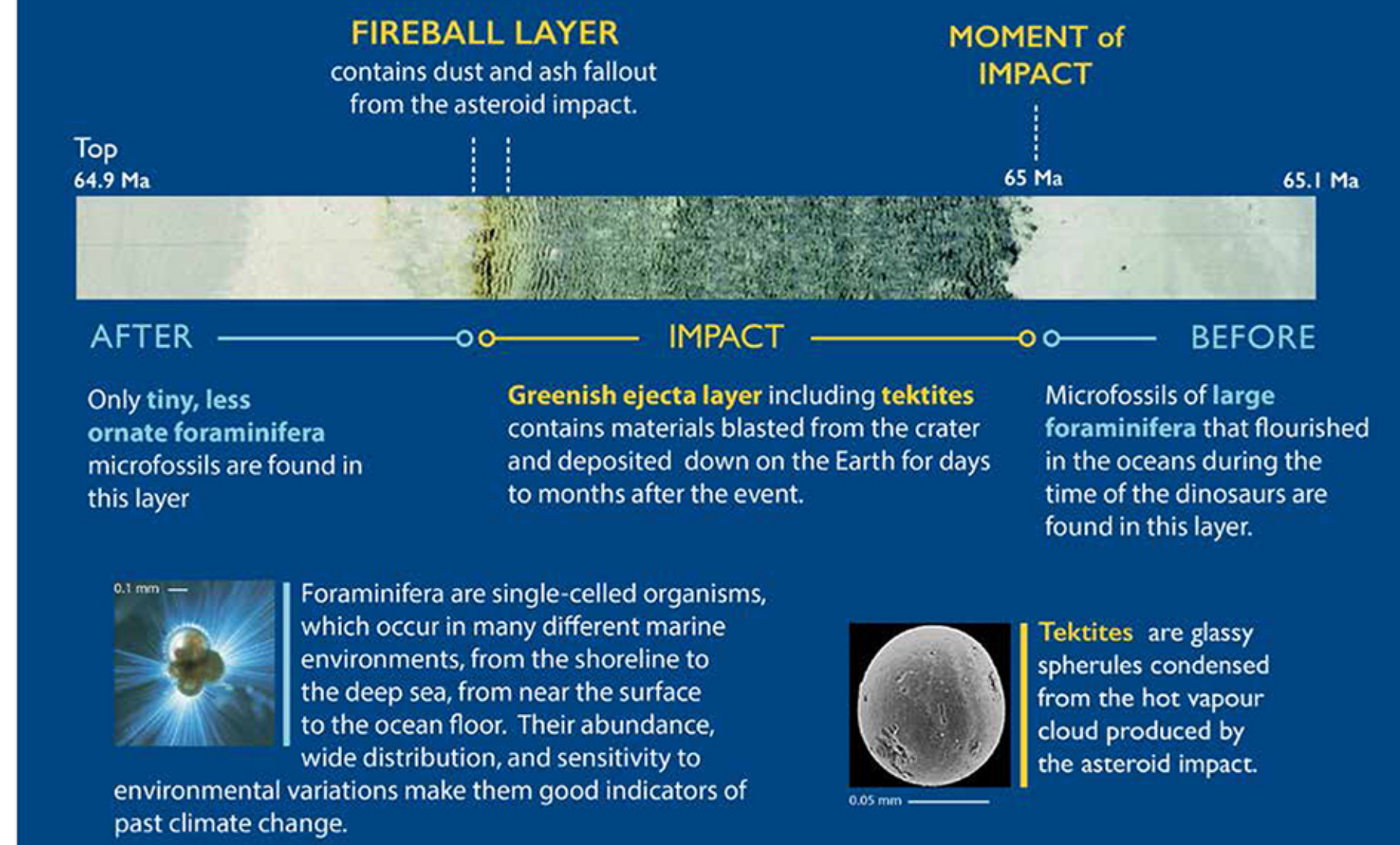
Location: Agost, Spain
Specimen Wt: 161.4 g
Provenance: C. Whitford

The Greenish Layer

The extinction event that wiped out three fourths of all plant and animal life (including the dinosaurs) that happened roughly 65 million years ago is called the Cretaceous-Paleogene boundary event (marking the end of the Cretaceous period) or, for less of a mouthful, the K-Pg. The K-Pg boundary is marked by a thin layer of sediment in the geologic record, commonly called the K-Pg boundary layer, which can be found all over the world in rocks collected both in water and on land. This layer contains a large amount of metal iridium, which is hard to find on Earth but is abundant in asteroids. **The discovery of all that metal iridium in the K-Pg boundary layer makes the asteroid impact theory very likely.**

The K-Pg boundary layer shows up in the geologic record as a layer of greenish rock. This layer is made up of sedimentary materials, as well as tektites and asteroid debris. Tektites are gravel sized bits of naturally occurring glass caused by the dirt of the Earth being heated up and ejected by the impact of meteorites, giving us further evidence of the impact.

January 1997: the drillship *JOIDES Resolution* retrieved sediments from beneath the Atlantic's seafloor 1920 km N from the Chicxulub Crater at a water depth of 2658 m.



Chicxulub Crater

An event the size of the K-Pg impact would surely leave a mark, and it did! The Chicxulub crater, the center of which is located off the shore of the Yucatán peninsula near the Chicxulub Puerto and Chicxulub Pueblo communities of Mexico, is approximately 150 kilometers (93 miles) across and 20 kilometers (12 miles) deep. It is estimated that the asteroid that made this huge dent was about 10 kilometers (6.2 miles) across. **Scientists have explored this crater and discovered that the date of the impact that caused it coincides closely with the K-Pg boundary in the geologic record, both of which would have been formed more than 66 million years ago.**

The crater was discovered by geophysicists Antonio Camargo and Glen Penfield in the late 1970's while they were searching the Yucatán area for petroleum reservoirs. During their search they discovered a nearly symmetrical underwater arc that appeared to be part of a ring measuring approximately 70 kilometers (40 miles) across. This primed Penfield to do further research using gravity anomaly maps and present his findings, but without physical evidence he was unable to prove what he discovered was an impact crater. The necessary evidence was not obtained until the 1990's, when Penfield was able to get samples from the site. Testing proved that the samples contained shock-metamorphic materials, and, given the size of the site, the only explanation would be a large celestial body making rapid contact with the Earth.

