

News

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SWOSU Assistant Professor Involved in Study Determining the Extinction Time for Dinosaurs



Jeremy Klingler (from left), Robert DePalma and Loren Gurche recently published a new study that highlights what time of year the dinosaur-killing asteroid hit the Earth nearly 66 million years ago.

An international team led by Robert DePalma (University of Manchester and Florida Atlantic University), including [Southwestern Oklahoma State University biologist Jeremy Klingler](#) in Weatherford, recently published an exciting new study that highlights what time of year the dinosaur-killing asteroid hit the Earth 66 million years ago, from evidence at a fossil site called Tanis.

The end-Cretaceous extinction event has long been one of the most iconic extinction events due to its dramatic nature, a massive asteroid that struck the Yucatan peninsula near what is now the town of Chicxulub. The asteroid impact set off a chain of cataclysms including wildfires, earthquakes, a mega-tsunami, acid rain, and left a lingering cloud of ash, soot and dust in the atmosphere, which had long-term devastating ecological effects that destroyed the base of the food-web.

Prior work at the Tanis fossil site (DePalma et al., 2019) documented an enormous surge of water, triggered by seismic activity from the asteroid impact, that rapidly entombed plants, animals and even asteroid ejecta during the very first few moments of the asteroid-induced devastation.

Tanis represents an unprecedented site of high-resolution geology in capturing those first few moments of the extinction event. Continuing research from this remarkable site, the team determined to figure out what time of the year the extinction event occurred. Using a combination of animal behavior, histology and isotopic data, the time of year that the catastrophe began became apparent. Growth bands in the bones of fish at the site captured details of their lives and death, with the growth bands terminating during a Spring-Summer growth phase. Isotopic analyses independently were used to support and confirm this. The behavior of insects at the site, such as the emergence of adult mayflies, further supports a Spring-Summer extinction.

How animals and plants respond to ecological disasters and disruptions can be influenced by the seasons. Many plants and animals only reproduce, do most of their growth and feeding, or go dormant during certain seasons, and so, understanding when the asteroid hit the Earth 66 million years ago can shed light in fully figuring out its ecological impacts.

"This study may inform us that life in the northern hemisphere was, perhaps, more effected by the asteroid than that of the southern hemisphere as the asteroid hit during the northern hemisphere's primary growth and feeding season (Spring-Summer)," Klingler said. "Such research is crucial for understanding the Cretaceous extinction event."

The new study, "[Seasonal calibration of the end-Cretaceous Chicxulub Impact Event](#)," is published in the journal *Scientific Reports*.

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