

# New study finds link between marine algae and whale diversity over time

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A new paper by researchers at George Mason University and the University of Otago in New Zealand shows a strong link between the diversity of organisms at the bottom of the food chain and the diversity of mammals at the top.

Mark D. Uhen, a geologist at Mason, says that throughout the last 30 million years, changes in the diversity of whale species living at any given time period correlates with the evolution and diversification of diatoms, tiny, abundant [algae](#) that live in the ocean. In the paper "Climate, Critters, and Cetaceans: Cenozoic Drivers of the Evolution of Modern Whales," which was published in the latest issue of *Science*, Uhen and co-author Felix G. Mark of Otago show that the more kinds of diatoms living in a time period, the more kinds of whales there are.

Looking at thousands of published accounts of whale [fossil](#) records, the researchers assembled the records in a database to analyze and pinpoint the various fossils. The fossil records show a direct link between the productivity of the ocean and the variety of whale fossils. Uhen says they also found a correlation between global changes and fossil variety.

"This study shows that if we look at the bottom of the food chain, it might tell you something about the top," says Uhen. "Diatoms are key primary producers in the modern ocean, and thus help to form the base of the marine [food chain](#). The fossil record clearly shows that diatoms and whales rose and fell in diversity together during the last 30 million years."

Uhen says this is the first time that such a correlation has been shown. Though scientists in the past have tried to answer the question of how the modern diversity of whale and dolphins arise, this question has been difficult to answer. The [fossil record](#) might not truly reflect [evolutionary history](#), says Uhen. "Is it possible that the diversity of fossils we find through geological time might really just reflect the amount of preserved [sedimentary rock](#) paleontologists can search - the more rock there is, the more fossils we find? This comprehensive study has shown that the diversity of these fossils is in fact not driven by the sedimentary rock record."

The researchers hope these findings will encourage other specialists to look at other animals with a similar narrow ecology to see if this link translates.

Uhen is a term assistant professor in Mason's Department of Atmospheric, Oceanic and Earth Sciences and is an expert in marine mammal fossils. In the future, he hopes to conduct research on how the body size of whales changes over time, and how [whales](#) became the largest living organisms in the world.

Provided by George Mason University

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