

How the plesiosaurs were able to swim with just flippers

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Thalassomedon in the American Museum of Natural History. Credit: Wikipedia

A team of researchers from the U.K. and Hungary has solved the mystery of how the dinosaur-era plesiosaurs were able to swim. In their paper published in *Proceedings of the Royal Society B*, the group

describes reconstructing parts of the creature to learn how it moved.

The plesiosaurs were very large [marine reptiles](#) that lived during the time of the dinosaurs but were not actually dinosaurs themselves. They swam the oceans and looked a lot like the descriptions of the mythical Loch Ness Monster.

Scientists studying the giant creatures have long wondered how they were able to swim. With their long necks, round bodies and just two pairs of nearly identical flippers, it would seem they would have trouble moving very well through the water. Making matters more mysterious is the fact that no other creature has ever been found to use four flippers simultaneously while swimming underwater.

To understand how the creature could swim, the researchers recreated [plesiosaur](#) flippers using a 3-D printer. They then studied plesiosaur fossil specimens and photographs of skeletal configurations before attaching the printed flippers to a body fabricated to mimic the plesiosaur's form. Next, they studied the way modern creatures such as turtles use flippers to get around and adjusted the fake flippers to allow them to move in similar ways. Then they placed their faux plesiosaurs into a tank of water, added dye to see water movement and began repeatedly adjusting the flippers until they came up with a configuration that resulted in optimal propulsion.

The team reports that the mechanical plesiosaurs swam best when all four flippers were used for swimming. Additionally, they noted that it had to be done in a specific way. As the front flippers flapped, they created a vortex of water under the body. The back flippers would then flap between the whirlpools which better used the energy expended. In essence, the team notes, the creature made use of its own wake—the only other creature besides the dragonfly found to do so. More testing showed that when the flippers worked well together, the back flippers

were able to increase thrust by up to 60 percent over flapping without assistance from the front [flippers](#).

More information: "The four-flipper swimming method of plesiosaurs enabled efficient and effective locomotion," *Proceedings of the Royal Society B* (2017). [DOI: 10.1098/rspb.2017.0951](https://doi.org/10.1098/rspb.2017.0951)

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