

# Study provides new look at ancient coastline, pathway for early Americans

August 27 2014

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The first humans who ventured into North America crossed a land bridge from Asia that is now submerged beneath the Bering Sea, and then may have traveled down the West Coast to occupy sites in Oregon and elsewhere as long as 14,000 to 15,000 years ago.

Now a new study has found that the West Coast of North America may have looked vastly different than scientists previously thought, which has implications for understanding how these early Americans made this trek.

The key to this new look at the West Coast landscape is a fresh approach to the region's sea level history over the last several thousand years. Following the peak of the last ice age about 21,000 years ago, the large [continental ice sheets](#) began to retreat, causing sea levels to rise by an average of about 430 feet. When the ice was prominent and sea levels were lower, large expanses of the continental shelf that today are submerged were then exposed.

As the melting progressed and sea levels rose, likely archaeological sites along the coast were submerged.

Most past models have assumed that as the massive North American ice sheets melted, [global sea levels](#) rose in concert – a phenomenon known as "the bathtub model." But the authors of this new study, which was just published in the *Journal of Archaeological Science*, say [sea level rise](#) does not happen uniformly.

"During the last deglaciation, sea level rise was significantly influenced by the weight of the large ice sheets, which depressed the land under and near the ice sheets," said Jorie Clark, a courtesy professor at Oregon State University and lead author on the study. "As the ice sheets melted, this land began to rise. At the same time, the weight of the water melting from the ice sheets and returning to the oceans also depressed the ocean basins.

"This exchange of mass between ice sheets and oceans led to significant differences in sea level at any given location from the assumption of a uniform change," she added.

The implications of this new approach are significant. The researchers ran models of what the sea level may have looked like over the last 20,000 years – based on knowledge of [ice sheet](#) dimensions and the topography of the ocean floor – and concluded that parts of the West Coast looked radically different than previous reconstructions based on a model of uniform sea level rise.

The central Oregon shelf, for example, was thought to be characterized by a series of small islands some 14,000 years ago. However, the models run by Clark and her colleagues suggest that much of the continental shelf was exposed as a solid land mass, creating an extensive coastline. In some areas, the change in estimated sea level may have been as much as 100 feet.

"There has been new evidence that the peopling of the Americas happened earlier than was long thought to be the case, which has put a lot of focus on coastal paleogeography," said Clark, who is in OSU's College of Earth, Ocean, and Atmospheric Sciences. "This new look at [sea level](#) changes helps explain how that earlier introduction into the Americas could be possible."

"It is also important for predicting where coastal villages that are now submerged on the [continental shelf](#) may be located."

Provided by Oregon State University

Citation: Study provides new look at ancient coastline, pathway for early Americans (2014, August 27) retrieved 20 April 2024 from <https://phys.org/news/2014-08-ancient-coastline-pathway-early-americans.html>

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