

# Humans inhabited New World's doorstep for 20,000 years

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The human journey from Asia to the New World was interrupted by a 20,000-year layover in Beringia, a once-habitable region that today lies submerged under the icy waters of the Bering Strait.

Furthermore, the New World was colonized by approximately 1,000 to 5,000 people — a substantially higher number than the 100 or fewer individuals of previous estimates.

The developments, to be reported by University of Florida Genetics Institute scientists in the open-access journal *PLoS ONE* on February 13, help shape understanding of how the Americas came to be populated — not through a single expansion event that is put forth in most theories, but in three distinct stages separated by thousands of generations.

“Our model makes for a more interesting, complex scenario than the idea that humans diverged from Asians and expanded into the New World in a single event,” said Connie Mulligan, Ph.D., an associate professor of anthropology at the College of Liberal Arts and Sciences and assistant director of the UF Genetics Institute. “If you think about it, these people didn’t know they were going to a new world. They were moving out of Asia and finally reached a landmass that was exposed because of lower sea levels during the last glacial maximum, but two major glaciers blocked their progress into the New World. So they basically stayed put for about 20,000 years. It wasn’t paradise, but they survived. When the North American ice sheets started to melt and a passage into the New World opened, we think they left Beringia to go to

a better place.”

UF scientists analyzed DNA sequences from Native American, New World and Asian populations with the understanding that modern DNA is forged by an accumulation of events in the distant past, and merged their findings with data from existing archaeological, geological and paleoecological studies.

The result is a unified, interdisciplinary theory of the “peopling” of the New World, which shows a gradual migration and expansion of people from Asia through Siberia and into Beringia starting about 40,000 years ago, a long waiting period in Beringia where the population size remained relatively stable, and finally a rapid expansion into North America through Alaska or Canada about 15,000 years ago.

“This was the raw material, the original genetic source for all of the Americas,” said Michael Miyamoto, Ph.D., a professor and associate chairman of zoology in UF’s College of Liberal Arts and Sciences. “You can think of the people as a distinct group blocked by glaciers to the east. They had already been west, and had no reason to go back. They had entered this waiting stage and for 20,000 years, generations were passing and genetic differences were accumulating. By looking at the kinds and frequencies of these mutations in modern populations, we can get an idea of when the mutations arose and how many people were around to carry them.”

Working with mitochondrial DNA — passed exclusively from mothers to their children — and nuclear DNA, which contains genes from both parents, UF scientists essentially added genetic information to what had been known about the archaeology, changes in climate and sea level, and geology of Beringia.

The result is a detailed scenario for the timing and scale of the initial

migration to the Americas, more comparable to an exhaustive video picture rather than a single snapshot in time.

“Their technique of reading population history by using coalescence rates to analyze genetic data is very impressive — innovative anthropology and edge-of-the-seat population study,” said Henry C. Harpending, Ph.D., a distinguished professor and endowed chairman of anthropology at the University of Utah and a member of the National Academy of Sciences who was not involved with the research. “The idea that people were stuck in Beringia for a long time is obvious in retrospect, but it has never been promulgated. But people were in that neighborhood before the last glacial maximum and didn’t get into North America until after it. It’s very plausible that a bunch of them were stuck there for thousands of years.”

As for Beringia, sea levels rose about 10,000 to 11,000 years ago, submerging the land and creating the Bering Strait that now separates North America from Siberia with about 100 kilometers of open, frigid water.

“Our theory predicts much of the archeological evidence is underwater,” said Andrew Kitchen, a Ph.D. candidate in the anthropology department at UF who participated in the research. “That may explain why scientists hadn’t really considered a long-term occupation of Beringia.”

UF researchers believe that their synthesis of a large number of different approaches into a unified theory will create a platform for scientists to further analyze genomic and non-genetic data as they become available.

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