

Fossils In North Dakota

FIND is a newsletter dedicated to helping young readers (in age or spirit) express their love of fossils and paleontology and to help them learn more about the world under their feet. Each issue will be broken up into sections including Feature Fossils, Travel Destinations, Reader Art, Ask Mr. Lizard, and more!

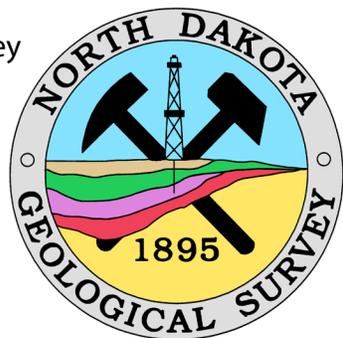
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Feature Fossil: *Mammuthus columbi*

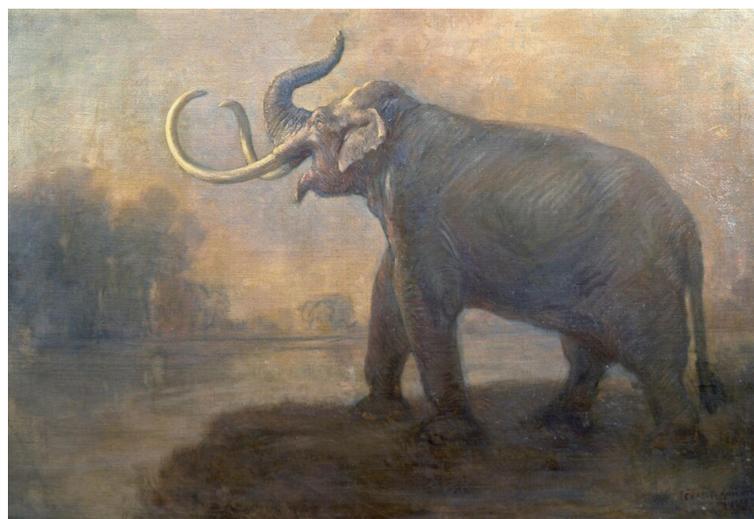
The Columbian mammoth, *Mammuthus columbi*, lived during the Pleistocene (the Ice Age). This large herbivore roamed most of North America, typically in herds, though they preferred to stick to the warmer southern half of the continent. Often confused for the woolly mammoth (*Mammuthus primigenius*), the Columbian mammoth was much larger than its hairy cousin. Woolly mammoths were similar in size to modern-day elephants, such as the African elephant (around 10 feet tall at the shoulders and weighing between 4 and 8 tons), whereas Columbian mammoths stood over 12 feet tall at the shoulders and could weigh between 9 and 12 tons!

2026 Public Fossil Digs

Signups for the Public Fossil Digs filled in a record 11 minutes this year! For anyone who didn't get to sign up, you can find our wait list via our website at:

www.dmr.nd.gov/dmr/paleontology

This year, the NDGS paleontology staff will be returning to the Bismarck, Pembina, and Dickinson sites. The Dickinson site, which has fossils around 32 million years old, was last visited in 2024. With a year off, we're hoping that there are many new fossils exposed waiting to be discovered!



Above: An artist's reconstruction of a Columbian mammoth. Illustration by Charles R. Knight, 1908.



North Dakota now boasts its own Columbian mammoth remains, found in the Beulah Freedom Mine in Beulah, ND. They found the mammoth remains during excavation within the mine. While other mammoth remains have been found sporadically within the state (an individual bone or fragment of bone here and there), determining whether the species is *M. columbi* or *M. primigenius* can be rather difficult. Paleontologists often have to rely on size to distinguish these two species.

Having worked at the Mammoth Site of Hot Springs, SD, which houses nearly 60 Columbian mammoths, I'm no stranger to mammoth bones. As Mindy Householder pieced together the innominate (one half of the pelvis, comprised of the ilium, ischium, and pubis), it became clear that this mammoth is large enough to be *M. columbi* – North Dakota's first confirmed Columbian mammoth! The innominate is so large, we had to improvise a new sandbox in which to piece it back together as our original sandbox is too small. Luckily, Jeff Person was kind enough to donate an old kiddie pool for the task. Based on measurements of the pelvis, we have determined the mammoth to be male!



Above: The kiddie pool filled with about 1,100lbs of sand to support the pelvis as it is pieced back together by Mindy. To aid in piecing the bones back together, we shrunk down and 3D printed an African elephant (*Loxodonta africana*) innominate for reference (the blue object in the sandbox).

Below: The mammoth tusk in its archival cradle.



In addition to the innominate, we also have part of a scapula (shoulder blade), a rib, a tusk, and a variety of unknown fragments. The tusk is over 6.5 feet long and has a circumference of about 20 inches near the base! The tusk required very special conservation as it was wet when it was found. When wet ivory dries, it tends to warp and peel, a process called delamination where the layers of ivory split from each other (when this happens to tusks, they look like a peeled banana). In order to prevent, or at least limit, delamination, the tusk was put through a series of baths to consolidate (stabilize) and then dewater it very slowly. This process included 12 baths and took a total of 16 months to complete!

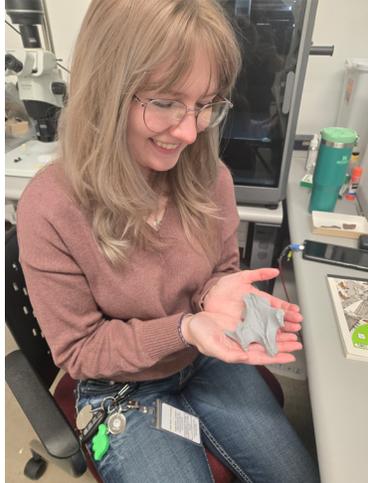


Left: The tusk submerged in a glue bath. The glue is a water-based adhesive called Acrysol WS-24.

Right: The tusk submerged in isopropyl alcohol. Isopropyl alcohol draws the water out of the tusk slowly. It was then allowed to slowly evaporate to limit delamination.

V. I. P. (Very Important Paleontologist) Anna Jordan

My name is Anna Jordan. I got my bachelor's degree from William & Mary in Virginia in 2024 and have been doing seasonal jobs and internships in paleontology for the last couple of years. I just finished my internship with NDGS Paleo that has lasted the past ~4 months.



I am originally from Atlanta, GA, so it was quite the experience to spend the winter up here in North Dakota! I've done a variety of work here in the field, the lab, and in collections. Over the last couple of months, I have been using the 3D scanner to create digital models of a *Champsosaurus* specimen.



Left: Anna editing a scan of a *Champsosaurus* maxilla and palate.

Right: A *Champsosaurus* skull printing in the 3D printer.

How did you get into paleontology? Did you always want to do this, or did it come to you later?

I didn't get into paleontology until college. I was a computer science major but signed up for a dinosaur class on a whim. I enjoyed it, so I kept taking geology and paleontology classes "for fun." Because I got into paleo late (compared to my classmates

who grew up as dinosaur kids) and had been pursuing computer science since early high school, I didn't think I could have a career in paleontology. I was lucky to have some really great mentors in college who supported me, and their confidence in me convinced me I could pursue a career in paleontology. Geology became my primary major, and now I have been working as a paleontologist for the last couple of years!

Do you have a favorite prehistoric creature?

My favorite prehistoric creature is the tapir! I know that's kind of a cop-out answer since there are still some living species of tapir, so some of my other favorites are early horses like *Miohippus*, and my favorite dinosaurs are hadrosaurs.

There are so many ways to be involved with paleontology - fieldwork, lab work, research, etc. Do you have a favorite aspect of paleo?

Fieldwork is where I truly fell in love with paleo, so I think it will always be my favorite. I like hiking, being out in the sun, and lifting buckets of dirt so it's a perfect environment for me. I also enjoy lab and collections work, though. Getting to open and work on the jackets I helped make was a lot of fun.



What have you enjoyed most about your time with NDGS?

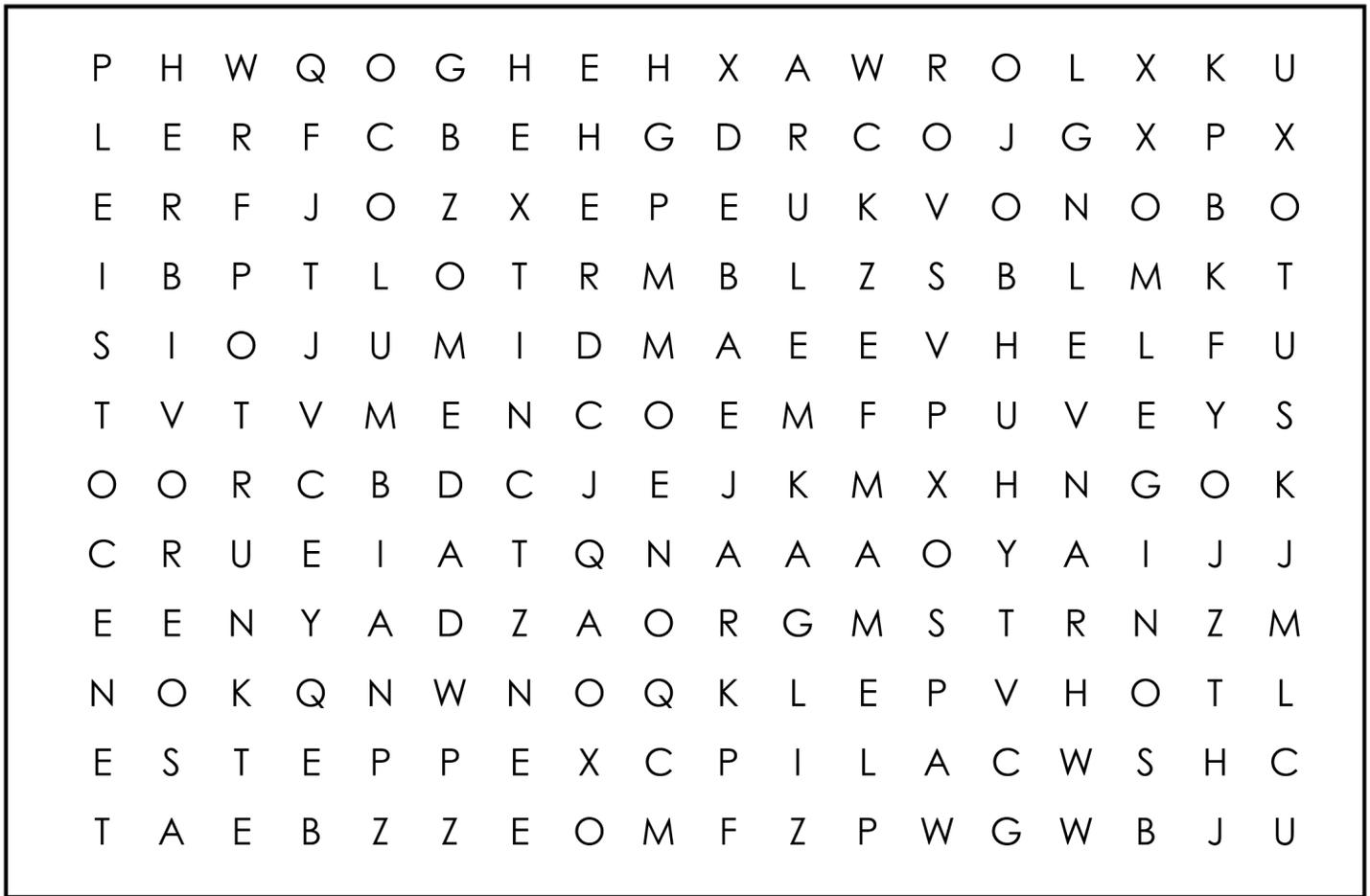
Besides the obvious answer of getting to dig up dinosaurs and mammoths, I think my favorite aspect was the people here. Y'all were always willing to give me advice on anything I was stuck on, and just a great team to work with in general. If I had to point to a specific highlight of my time here, though, it would be finding a teeny tiny mammal molar in a mammoth jacket I was prepping. Molars are the best way to identify mammals, so it was an exciting find because despite being very small it can provide a lot of information.

Have you learned any new skills during your time with NDGS?

Definitely! One of the big things I learned here was how to prep out a specimen from a plaster jacket in the lab. I had made jackets and worked on specimens that were already out of a jacket, but I had never experienced opening a jacket and getting the bone out of it. That taught me a lot about prep work and what I can do while building a jacket to make it easier on the person who will be opening it!

Do you have any advice for our aspiring young readers?

I don't know if I'm qualified to give advice yet, but I would say be adaptable. Until I found paleontology, I planned to be a software developer. Be open to finding something you like and then finding something you actually like more! I think being adaptable is a good general life skill, but it has been extra useful to me in paleontology. I have found that fossils don't seem to care about plans, and that you just have to adapt to what they want to do!



Find the following words in the puzzle.
Words are hidden →, ↓, and ↘.

COLUMBIAN
ELEPHANT
EXTINCT
HERBIVORE

HERD
ICE AGE
MAMMOTH
PLEISTOCENE

STEPPE
TRUNK
TUSK
WOOLLY