

# 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!

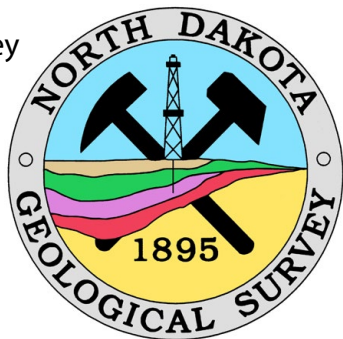
Summer 2024 No. 53

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Next Issue: September 2024

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<https://www.dmr.nd.gov/dmr/paleontology/fossils-north-dakota-find-newsletter>



## Public Fossil Digs: 25th Anniversary!

The ND Geological Survey's Public Fossil Digs began with Dr. John Hoganson in 2000 in the Pembina Gorge excavating mosasaurs, fish, and other animals that inhabited the Western Interior Seaway. That first year 50 people participated over the eight-day-long dig.

Contrast that with the 2023 field season, with 395 people over 36 days (we lost a few opportunities due to rain), and you can see how the fossil dig program has grown.

Staff, and participants from the public have worked all across the state of North Dakota. From those first digs in the far northeastern corner in the Pembina Gorge, to the far southwestern corner of dinosaur-rich Marmarth and Mud Buttes. The western Paleocene deposits of Medora and Whiskey Creek chock full of swamp creatures and crocodiles. Days spent prospecting the dry and rocky Little Badlands filled with the smallest teeth, some of the earliest dogs, cats, bears, and the last northern alligators.

Over 2,500 individuals have attended, many of whom have come back year after year. We have watched kids grow up, and new generations of enthusiastic citizen scientists are joining the experience.

Those first years were completed with just two staff members: Dr. John Hoganson, and first Johnathan Campbell, then Brett Woodward. In 2008, Jeff Person was hired as the Collections manager, and Becky Barnes was hired as the Lab manager, bringing the staff to three



Above: Dr. John Hoganson sits on a bench of Pierre shale cleared off during the first Pembina Gorge dig in 2000. Bands of yellow ash are behind him.



Above: Long-time friend and volunteer Jim D. working the 2000 Pembina Gorge dig.

Below: Jim D. helping paleontologists Jeff Person and Becky Barnes plaster a crocodile skull at Whiskey Creek, in 2013.



people (including Dr. Hoganson). Three people enabled us to rotate staff, and add in multiple dig locations instead of one site per summer.

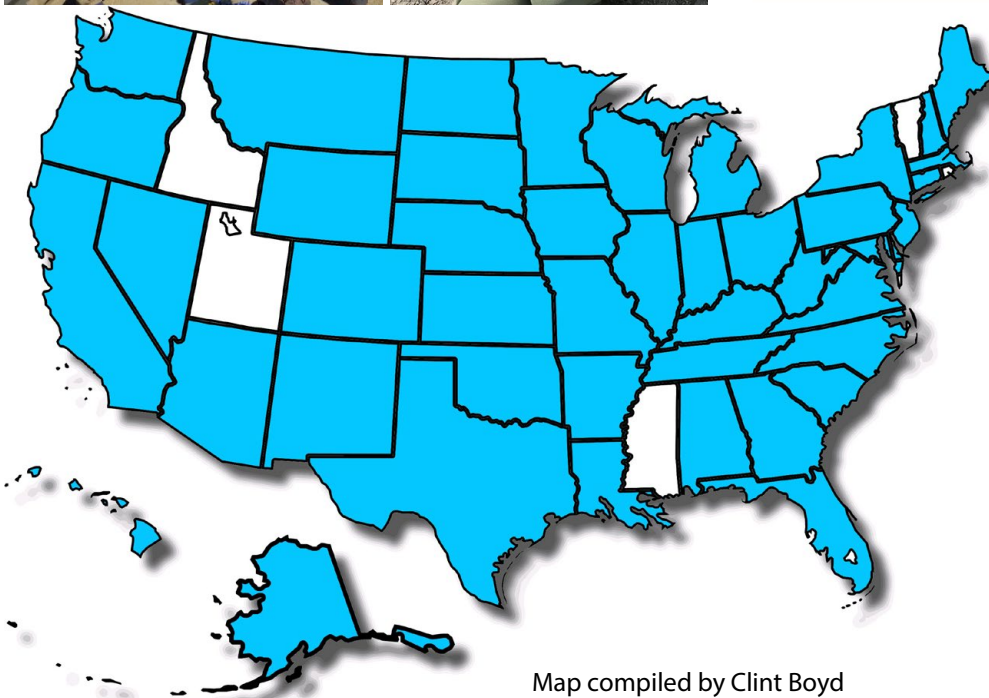
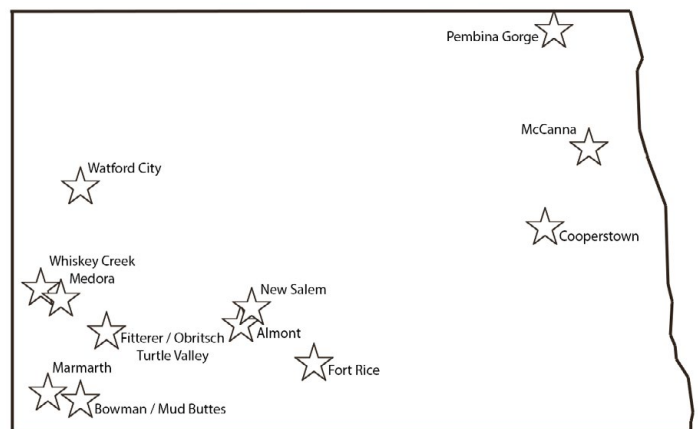


Above: Edythe N. and Becky N. at the Medora dig in 2008. Edythe has been joining us nearly every year since then!  
Below: Edythe joining us again in 2021 at the Medora and Pembina Gorge digs.



The locations moved around depending on the year, but we spread out to cover more of the state. This was great for tourism - people going to different places around North Dakota. It was also beneficial for some families who maybe couldn't travel as far, bringing digs closer to them.

The oldest sites belong to 85-70 million year old marine Cretaceous rocks. Places like the Pembina Gorge, Cooperstown, and McCanna in northeast ND, as well as an outcrop near Bowman in the southwest corner. Terrestrial 67 million-year-old Cretaceous sites holding dinosaurs and the creatures that lived along side them, such as the Fort Rice, Stumpf, Marmarth, and Mud Buttes areas. We have phenomenal 50-66 million year old Paleocene sites in the western half of the state, such as Medora, New Salem, Almont, and Whiskey Creek. Finally areas long-removed from both dinosaurs and modern times, the 32-4 million-year-old Oligocene sites of Turtle Valley, the Jepsen site, and Fitterer and Obritsch ranch.



The Public Fossil Digs have been attended by people from nearly every state! The only ones we're missing are Idaho, Utah, Mississippi, Vermont, and Rhode Island. Maybe you know someone who can help us fill out our map?

We've even had people attend from other countries, including Canada, Norway, Italy, The Netherlands, United Kingdom, and South Africa.

Map compiled by Clint Boyd

## When Dinosaurs Roamed North Dakota

The lonely landscape of the North Dakota Badlands has allowed nature to preserve one of the state's greatest intrigues: its prehistoric residents.

Above: screenshot of the NY Times article by By Hillary Richard, and photographed by Janie Osborne- read the whole story here: <https://tinyurl.com/NYTimesNDGS>

In 2017, things got a little crazy. Hillary Richard, a reporter from the New York Times came out to do a story on our little summer dig operation, as well as the crew from The Today Show. Those two things combined threw our little-known agency into the international spotlight. Leading up to that, when the summer digs were announced people would trickle in over the course of the winter for sign-ups, sometimes even down to the week before. There always seemed to be a few spots here and there.

We had to start a notification list for people interested, to let them know when the dig-dates were, and when registration was. We went from 50 people, to over 1500 within a few months. With so many people clamoring for a spot in 2018, we knew we had to try something new for registration to be as fair as possible. We attempted to hold registration for the dig via phone calls, with three of our phones chained together (kind of like pledge drives on Prairie Public TV). It was complete... utter... chaos. The phones went berserk, with some people on "hold" for a half-hour! Clearly we needed to try something else. Now we use online registration, with a set Open time, and set "ticket" numbers for each dig.



Above: The first attempt at a tent at the Medora site. We should have known better that the ND wind would make such short work of a pop-up shade.

Below: Tent upgrade! Metal poles, canvas tarp - now we even have a screen wall addition.



There were some definite growing pains – we know – we're sorry – it was new to us too! Vans instead of personal vehicles, age minimums instead of anything-goes, limited spots for first-time-participants, shade-tents, porta-potties, and of course ticket prices. Prior to 2017 digs were free – our staff is already paid, and we had had a generous donation to the paleontology department that we could pay for supplies with. The problem with that was people tended to forget they signed up, or cancelled last minute – some days we had 15



Above: Plastering then and now - looks like some participants REALLY get in to their work! At left, Cathy C. and another volunteer work in 2002 in the Pembina Gorge. At right, Madison M. helps with Jimmothy the Big Fish in 2023, also in the Pembina Gorge.

people registered with only 1-2 showing up. Next we attempted a \$10 deposit – you would get your money back if you showed up for your dig. That drastically improved turn-out. So why do we charge \$30-60 per ticket now? To break even on our supplies. The vans, shade-tents, chairs, plaster, and tools aren't free! Plus, with any extra we can help pay for a summer Intern. This is great for us (more hands to work), and great for them (REAL experience!). So we thank you from the bottoms of our hearts for helping our digs continue on.

The biggest downside to having so many people out with us over so many days is trying to keep up with preparation and cleaning of all the fossils collected in the lab. With three staff, to keep from burn-out we had to swap everyone in for dig-duty. Whenever Becky was in the field, the lab was shut down – which ground preparation to a halt. In 2023 we were able to hire a fourth full time permanent paleontologist to help with fossil preparation, swap in for field work, and keep the lab open during the summer! To read more about Cathy Lash, please check out FIND #52.

## FRIENDS OF NDGS PALEO

As more and more of our staff time was spent preparing for the summer digs, attempting to fundraise to keep things paid for and low cost, we had a couple of amazing people step forward to help. Trissa Ford and Katy Brooke, longtime paleo volunteers (in the field and lab), started up an official non-profit Friends Group to take some of the weight off of us. You can check out the awesome things they do here: <https://ndpaleofriends.org/>



To try and keep things as affordable as possible for our participants, they started a Dig Supporter option. A few dig tickets are set aside each year for people willing to donate a little extra to guarantee a spot at the site they wanted. Those people register earlier than the general

ticket sales, and their donation goes towards making the rest of the general ticket sales more affordable. As an added benefit - if they get enough donations, they can even add a housing bonus for our interns!

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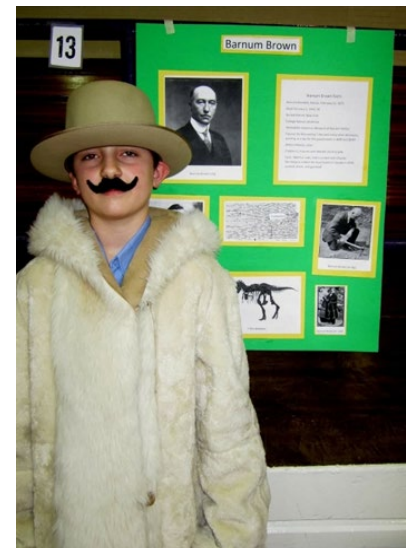
### Summer Field Intern: Kale Link



My name is Kale Link. I grew up on a farm in eastern Kansas, and from a young age, I knew I wanted to do paleontology. My passion began when I was around three or four, when my mom got me my first toy dinosaurs. From then on, my passion (and collection) only grew. My parents

supported me by supplying me with dinosaur toys, taking me to museums, and getting me a genuine hat and rock hammer. When I got the chance, I sorted through any available rocks looking for fossils, even if they meant picking shells out of the driveway gravel. It wasn't just paleo, either. I enjoyed learning about all natural sciences, from chemistry to astronomy (and still do).

Even though I'm in college now, my education began much earlier. I read every dinosaur book the library had to offer, and watched any documentary or show I came across. Prehistoric Park and Walking with Dinosaurs were some of my personal favorites. Nowadays, I listen to podcasts, but the idea is the same. On our yearly vacations, we visited fossil sites across the country, from Badlands National Park in South Dakota to Petrified Forests National Park in New Mexico, as well as the Sternberg Museum in Hays, Kansas, and everywhere in



between.

Our traveling also combined science with my love of the outdoors. Growing up on a farm, I was no stranger to exploring and being outside. My grandpa would teach us the names of all the birds, trees, and bugs, and everything there was to know about them. On our vacations, learning was a high priority, and National Parks were always an essential stop. Hiking, exploring, and observing the world around us was a must.

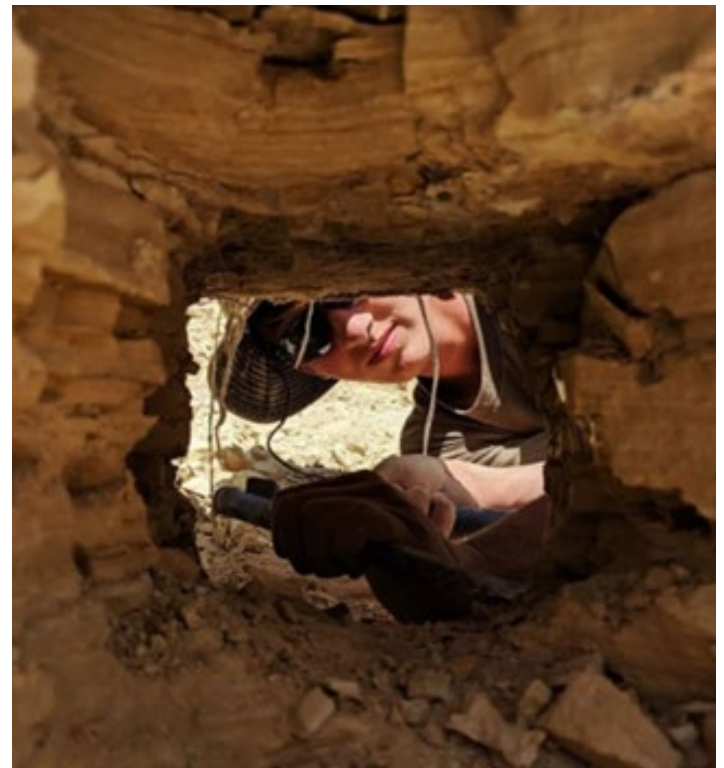
Growing up, my scientific side also collided with my artistic side. I made my own gigantic Periodic Table out of paper, illustrated my own Solar System picture book, and created dinosaur trading cards. This culminated at the end of my high school career when I was able to self-publish my first novel, *A Prehistoric Odyssey*,



which was heavily influenced by substantial scientific research, and focuses on one of my favorite geologic periods, the catastrophic extinction at the end of the Permian period.

My book also lent itself to one of my other passions: communicating science. When I was still in middle school, I would set up a table with my fossil collection in the local park as a mini-museum to answer questions for passersby. It was a hit. I also insisted on bringing my collection to share with my class at school. I've found that I can answer paleo questions endlessly, and I hope to make that part of my career going forward.

My first serious venture into paleo began with a summer field camp through the Sternberg Museum, where I was able to collect two plaster jackets containing a *Xiphactinus*, a giant prehistoric fish. Now, I'm getting a formal college education as I study both geology and biology at Fort Hays State University, and work at the very museum I visited as a kid. In the summers, I travel for paleontology internships (like this one with the North Dakota Geological Survey) to broaden my horizons and gain hands-on experience doing what I love. By working at the Sternberg Museum during the school year and interning in the summers, I've been able to combine my love of science, communication, and the outdoors. All the while, I'm still working on my second book. I plan to carry these things with me as I continue my career in paleontology.



## Summer Collections Intern: Hannah Maddox

My name is Hannah Maddox, and I am a current Masters' student at the University of Tennessee, Knoxville. I am originally from Jonesborough, TN, the "storytelling capital of the world", and so, naturally, I find that the history of life on our planet is one of the greatest stories there is to be told. My interest in paleontology began in high school, where I spent some of my free time after school volunteering at my local museum, the Gray Fossil Site, picking small



fossils using a microscope. My scientific interests lie in the study of taphonomy, which is the study of how things decay and fossilize. When animals die, whether they be a gigantic T. rex or a little minnow, they go through a series of distinct changes that can affect what parts of these animals end up in the fossil record. Some animals, like worms and jellyfish, decay really quickly, so we do not get many fossils of these animals. Other animals with lots of hard parts, like clams and crabs, still decay and disarticulate (come apart), but are much more likely to make it into the fossil record. Sometimes, in really exceptional cases, we may even find fossilized soft tissues! My current research is focused on the decay of reptiles, and we've found that reptilian skin can stick around much, much longer than the softer skin of mammals. Out of the 60 specimens of Argentine tegus (a large, tropical lizard invasive to the Florida Everglades), every single one of them has retained an entire or nearly complete 'skin envelope' over a year since placement!

I am currently working with the ND Geological Survey at the ND Heritage Center in Bismarck, ND for a three-month collections internship where I am helping to organize Paleocene vertebrate and invertebrate fossil collection from Medora, ND. This experience will give me the opportunity to see how museum curation and organization is done so as best to help future scientists find the fossils they want to study! Further in the future, I hope to finish my education, earn my doctorate degree in paleontology and continue to do studies on the taphonomic histories of both fossil remains and fossil sites.

