Have you ever found a fossil? Have you ever been on a real fossil dig? Not the kind where you uncover casts that have been permanently attached to the floor and covered up with sand, but an actual dig site where you never know what you might find? The North Dakota Geological Survey has a successful fossil dig program and we invite members of the public to come and join us on these real fossil digs. The first public dig was in 2000 near the town of Walhalla, ND in the Pembina Gorge. The success of that dig prompted the program to continue and it has shown success every year since. Although we do not return to all of the exact same sites every year, we do return to most of them on a yearly basis. For example, the Pembina Gorge public fossil dig went on a decade-long hiatus between 2002 and 2012, but has been visited every year since then. For a more in-depth look at the first 9 years of the NDGS public dig program please see Hoganson (2009).

Highlights from this year

2015 was a very good year for paleontology field collections at the NDGS. Between the months of March and November we spent 72 days in the field as opposed to 40 days in 2014 or 18 days in 2013 (fig. 1). This resulted in a tremendous amount of material being added to the State Fossil Collection. One way to measure our productivity per year is to count the number of field jackets that are brought back to the lab (fig. 1). Although this is only a small fraction of what we bring back during any given field season, it can still give some insight to its overall production. Some highlights of

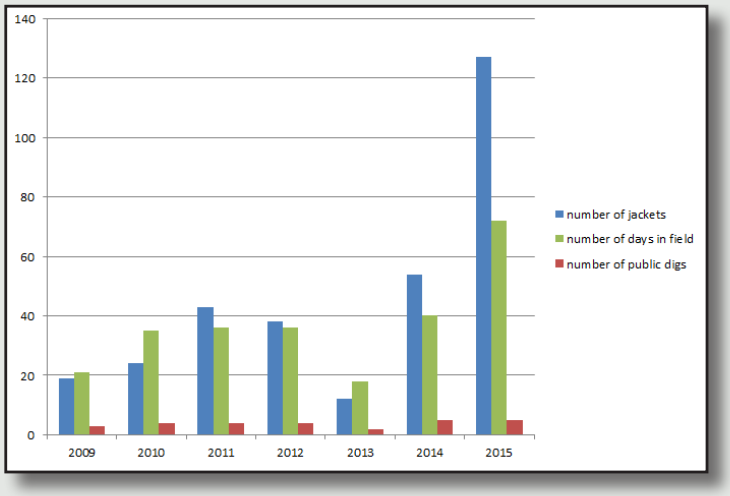

Figure 1. Graphic representation of jackets collected, number of field days, and number of public fossil digs since 2009.

Figure 2. *Subhyracodon* skull as discovered in field (left) and fully prepared (right).

Figure 3. *Glasbius* jaw with penny for scale.

Figure 4. Photo of mosasaur skull as discovered in field. Note the large jaw fragment (with teeth) in upper left portion of image.

the 2015 field season include a beautiful, nearly complete skull from the Oligocene rhinoceros *Subhyracodon* (fig. 2), a tiny jaw from an early mammal that lived at the same time as the dinosaurs (fig. 3), and a disarticulated, but nearly complete skull from a large swimming reptile (fig. 4). These and many other finds made 2015 a year to remember.

Miscellaneous numbers from previous years

Although our number of public digs per year remains relatively constant at five, the national participation is increasing over time. As of 2015, we have had participants from 28 states, Canada and Australia (fig. 5).

References

Hoganson, J. W., 2009, The history of the North Dakota Geological Survey Public Fossil Dig Program: DMR Newsletter, v. 36, no. 1, p. 26-29.

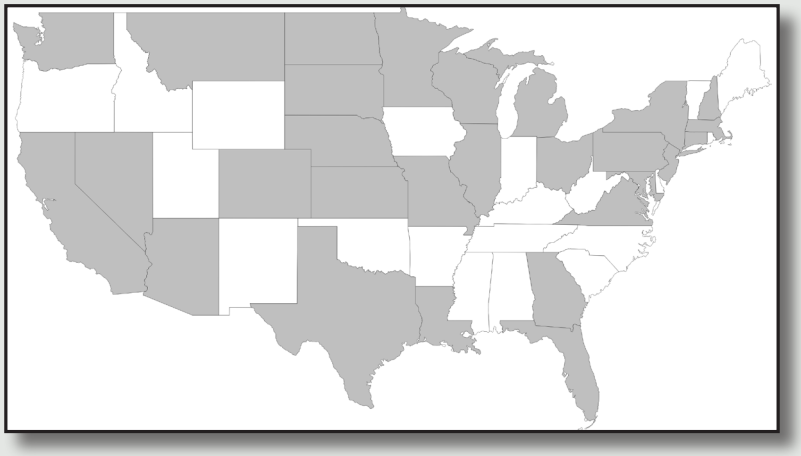

Figure 5. Map of USA showing which 28 states have participated in ND public digs. Updated from Hoganson, 2009.

2016 PUBLIC FOSSIL DIGS

Winter may be here now, but it is never too early to start thinking about the 2016 public fossil digs. If you are interested in joining us for one of our digs, please call Mindy at 701-328-8015 to sign up or for more information. A quick note, while dinosaurs may be the first thing that comes to mind when you think "fossil dig," only the Bismarck area 2016 dig is dinosaur-oriented.

Dickinson Area, June 27-July 1: Previously we called this the "Bismarck Area" dig, because we typically leave from and return to Bismarck each day. However, as most of our time is spent in the Dickinson area, we thought a name change would be appropriate. As with 2015, the areas we will be focusing on are 30-40 million-year-old mammal sites. If the weather does not cooperate, we will have spaces for people back in our paleontology lab in Bismarck to work on fossil preparation and cleaning. Maximum of 10 participants per day. Minimum age is 12 years; participants under 18 must have an accompanying adult. You must provide your own transportation, food, and lodging (if needed), but all tools for the day will be provided. We will caravan from Bismarck to the site, or you can meet us in Dickinson.

Whiskey Creek, July 12-14: If crocodiles came to eat in Medora, they died in Whiskey Creek. A little older than the Medora dig, this 60-65 million year old Bullion Creek Formation site was also very swamp-like. Each year we work to push the overburden back farther, and the fossils get better and better. Opposite to Medora, crocodiles are the most common creature found at this site, however other swamp creatures can be found as well. Maximum of 10 participants per day. Minimum age is 12 years; participants under 18 must have an accompanying adult. You must provide your own transportation, food, and lodging (if needed), but all tools for the day will be provided. Must be able to hike approximately half a mile to and from the site while carrying your supplies. We will caravan together to the site.

Medora, July 15-17:

After non-avian dinosaurs went extinct, crocodiles became the dominant predator in North Dakota, and the environment turned swampy. We imagine this site to have been a feeding ground for crocodiles. In Medora, we will be digging in Sentinel Butte Formation rocks, 55-60 million years old. This North Dakota everglades environment includes a variety of swamp denizens, including crocodiles, champsosaurs, giant salamanders, fish, clams, snails, birds, mammals, and more. The rugged badlands in the nearby Theodore Roosevelt National Park may also be a draw for those not interested in digging in the dirt. Maximum of 14 participants per day. Minimum age is 12 years; participants under 18 must have an accompanying adult. Transportation from and to Medora will be provided. You must provide your own water and lunches. A shade tent, port-a-potty, and all tools needed for the day will be provided.

Bismarck, July 25-29: This is a new site we began exploring in 2015, which houses a plethora of Hell Creek creatures. Teeth from *Tyrannosaurus*, bones from *Triceratops* and *Edmontosaurus*, plus crocodiles and other creatures abound. This location will be reserved for adult participants only, who have had dig experiences with us in the past. More of a research site, we will be conducting numerous measurements and recording data on every element found. This area is not for the faint of heart, or the impatient. Prior approval is needed to register for this dig.

Pembina Gorge, August 10-13: We will be returning once again to the beautifully scenic Pembina Gorge in our ongoing search for sea monsters. This Pierre Formation location, 80 million years old, holds some of the oldest surface rocks in North Dakota. This was a time when the state was covered with the Western Interior Seaway, and was home to great swimming reptiles called mosasaurs, giant squid, sea turtles, aquatic birds, large (and small) fish, snails, clams, and more. These past few years we have been slowly uncovering the partial skeleton of a mosasaur, and hope to find more. Last year during our search, we uncovered the skull of a second mosasaur. Maximum of 15 participants per day. Minimum age on day-long digs is 12, minimum age on family half-days is 10. Participants under 18 must have an accompanying adult. A shade tent, food, port-a-potty, and all tools needed for the day will be provided.