



Fall Calendar

September

21 **NCFC Meeting-** NCMNS, 11 West Jones Street, Raleigh. 1:30 pm, Level A conference room and via zoom. The speaker is Soon Flynn. Check email for details.

November

15 **NCFC Fossil Fair-** Mount Airy. Check email for details.

President's Message

Greetings NCFC Members! I have been looking back over these last 4 years that I have served as NCFC President. During this time, I have enjoyed getting to know many of you better as I have had opportunities to talk to members and guests at meetings and other events. We really have some amazing people in our club. A lot of things have happened, as well. We came out of Covid and got back to in-person meetings, although we gained the ability to include a virtual aspect to our meetings. This has allowed us to connect with members at a distance who might not be able to attend otherwise, and to enjoy speakers from as far away as Germany! This opens up lots of great topics for us. We finally gained access to the quarries again, and started semi annual picnics and auctions to raise funding for our research grants. This has allowed us to award several grants rather than just one per year. We have seen some recovery in our membership numbers which had been impacted by Covid as well. Quite a few of our members have been involved with research publications, and there has been a lot of outreach happening with more to come! Our outreaches impact lots of communities across the state, and bring in new members.

We are approaching our Fall Collecting Season and I am excited. With all the summer rains, the gravel has to have weathered out quite a bit, and there should be some great finds awaiting us! I look forward to hearing what treasures are discovered. We should have dates and sign up information soon. These cooler days we have had recently make me hope for great collecting weather ahead.

Our Fossil Fair is coming up in November. This year we have found a new area of the state to visit and we will be at The Mount Airy Museum of Regional History on November 15th. While it might be a distance away for many of you, it is great to be able to bring our knowledge and enthusiasm for fossils to a new audience! Manoa Daniel has agreed to again be the coordinator for us and she will appreciate your involvement. I hope you will consider exhibiting or volunteering for this event. Our hosts are excited to have us, so let's make this a great turn-out and a successful fair. All in all, I am proud of the NCFC and all our accomplishments, and am thankful to have been able to take a leadership role in this great organization.

Terry Denny
President, NC Fossil Club

FOSSILS IN THE NEWS

Teeth marks suggest 'terror bird' was killed by reptile 13 million years ago

By Victoria Gill
Science correspondent, BBC News
<https://www.bbc.com/news/articles/cvg8d2j195yo>



The researchers say the terror bird did not survive the encounter.

Teeth marks made on the leg bone of a large avian reptile known as a terror bird 13 million years ago suggest an even bigger predator may have killed it, scientists say.

Terror birds were top predators - they could be taller than a human and had powerful legs and hooked, flesh-ripping beaks.

Palaeontologists in Colombia matched teeth marks on the fossilised leg bone of one of these fearsome birds to a caiman, or a crocodile-like reptile.

3D digital scans of the bites allowed the scientists to reconstruct what they believe was a "battle to the death" that the terror bird did not survive.



The researchers scanned the teeth marks in the leg bone and compared it with skulls and teeth of crocodile-like predators.

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The new study, published in the journal **Biology Letters**, compared the size and shape of the teeth marks to the skulls and teeth of crocodile-like predators in museum collections.

It provides rare evidence, the researchers say, of an interaction between two extinct top predators at the time.

The leg bone the scientists studied was first unearthed more than 15 years ago in Colombia's Tatacoa Desert.

When the bird lived in the swamps of that area 13 million years ago, it would have been about 2.5m tall and would have used its legs and beak to hold down and rip at its prey.

What the scientists are not able to prove conclusively is whether this particular, unfortunate terror bird was killed in the attack, or if the caiman scavenged its remains.

"There is no sign of healing in the bite marks on the bone," explained lead researcher Andres Link from the Universidad de Los Andes in Bogotá, Colombia.

"So if it wasn't already dead, it died in the attack. That was the last day that bird was on this planet - then a piece of its leg bone was found 13 million years later."



The teeth marks are clearly visible on the piece of leg bone.



César Augusto Perdomo has been collecting fossils since he was a child.

This new analysis of the marks revealed that they most closely match an extinct caiman species called *Purussaurus neivensis*, a crocodylian that would have been up to five metres long.

The researchers say it would have ambushed its prey from the water's edge, much like crocodiles and caimans do today.

"I would imagine it was waiting for prey to be nearby," said Dr Link.

If this was indeed a battle between two apex predators, Dr Link says that provides insight into an ancient ecosystem. It reveals that ferocious terror birds were much more vulnerable to predators than previously thought.

"Every piece of a body helps us to understand so much about life on the planet in the past," Dr Link told BBC News.

"That's something that amazes me - how one tiny bone can complete the story."

Giant Prehistoric Whale Graveyard Revealed By Disappearing Glacier In The Russian Arctic

By Tom Hale, edited by Holly Large

<https://www.iflscience.com/giant-prehistoric-whale-graveyard-revealed-by-disappearing-glacier-in-the-russian-arctic-80157>



A researcher at Russia's Arctic and Antarctic Research Institute standing next to a whale skeleton. Image credit: Nikita Demidov, AARI, Alexander Ermolov

A melting glacier has pulled back the veil on a prehistoric whale graveyard in Russia.

Scientists at Russia's Arctic and Antarctic Research Institute (AARI) recently found the gathering of whale skeletons on Wilczek Island in the Franz Josef Land archipelago, northern Russia, during the study of the region's permafrost.

"Having compared the current position of the glacier with satellite imagery, we came to the conclusion that in less than 20 years, the island's ice cap split into two parts, exposing a surface area of several square kilometers. A large number of whale bones were found on the marine terrace that emerged from under the glacier," Nikita Demidov, a researcher at the AARI, said in a statement.



More researchers study the remains on Wilczek Island in the Franz Josef Land archipelago. Image credit: Nikita Demidov, AARI, Alexander Ermolov

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"Some skeletons thawing out of the permafrost on the periphery of the glacier are well preserved. The paleontological find indicates an episode of extremely rapid sea level change in the area of the northernmost archipelago of Eurasia, which occurred in the last few thousand years," said Demidov.

The researchers haven't yet disclosed the number or species of whale remains, but images suggest multiple large individuals are present.

It's estimated that the world's glaciers collectively lost 6,542 billion tonnes of ice between 2000 and 2023 as a result of climate change. This loss has serious consequences, from the destruction of wildlife habitats to rising sea levels, but it also offers a rare opportunity to study landscapes that have been hidden beneath ice for tens of thousands of years.



It's currently unclear which species the whales belonged to. Image credit: Nikita Demidov, AARI, Alexander Ermolov

Prehistoric whale graveyards have been discovered around the world, sometimes in the most unexpected places. One of the most outstanding can be found in the Atacama Desert of Chile, one of the driest places on Earth. While expanding part of the Pan-American highway in 2010, workers unearthed 40 near-perfect whale skeletons. Analysis of the remains suggested the group died in a one-off event, perhaps a harmful algae bloom.

Another site, known as Whale Bone Alley, was discovered by Soviet scientists in the 1970s on Yttygran Island along Russia's far northeastern coast. The now-uninhabited island features a long strip of bowhead skulls and jawbones that were planted vertically in the icy ground, like a decorative monument that guides you down a path. It's believed the site once served as a butchering and storage area for whale meat, used by the local Yupik people before they migrated to the mainland.

Our North Carolina Fossil Club has long supported Appalachian State University's Fred Webb, Jr, Outdoor Geology Laboratory - Interactive Rock Garden

Submitted by David Sanderson and James Bain

Many thanks to the North Carolina Fossil Club members who have supported development of Appalachian State's Webb Rock Garden, one of the Old North State's premiere public geology displays. After a long and distinguished career of teaching and leadership in geology, the Webb Garden's namesake, Fred Webb, Jr, PhD, is now Professor Emeritus at App State. His decades of service were key to the formation of what is now ASU's superb Department of Geological and Environmental Sciences or GES.

Vertebrate paleontologist and GES Professor, Andrew B Heckert, PhD, or ABH, together with his ASU colleagues, students, and university support staff, have been diligent in building up the Webb Garden and restoring it after it was ravaged by Hurricane Helene in September of 2024. In addition to scientific and aesthetic attributes, one of ABH's criteria for new additions to the Garden is that, "Rocks need to be heavy enough that six college pranksters cannot pick them up and move them."

Many of you know ABH and the App State geology bunch from events where both of our groups performed science outreach at public events across the state, to which the ASU gang often brings its popular Geobago, a mobile geology classroom built from a Winnebago motorhome. When one of us (JB) was shorthanded and overwhelmed at a Pungo wet-screening fossil exercise at the Greensboro Science Center, a group of college-age people appeared and helped out—it turned out that they were App State geo students sent by ABH.

NCFC support of the Webb Garden has included contributions toward funding construction of a bronze statue of "Archie," the Triassic aetosaur from the Pekin Formation of Chatham County, NC, described by Heckert and colleagues in 2015. From the archosaur's Facebook page: "I'm a Triassic reptile from the Tar Heel State. I love head scratches and long walks on the edges of rift basins. Looking to make new friends 'cause all my old ones are extinct :(" So won't you please log on to Facebook and show lonesome Archie some love? <https://www.facebook.com/p/Archie-the-Aetosaur-100063839445801/>

Corporate support of the Webb Garden by mining firms has included the generosity of such collaborators as Vulcan Materials Company and Martin Marietta Materials or MMM. Many of our NCFC field trips are to MMM quarries—please think of ways to express our appreciation to them for allowing us to fossick at their sites. MMM kindly arranged for one of us (DS) and our helpers to harvest three large slabs (the Cretaceous Peedee Formation and the Eocene Castle Hayne Limestone) from their Castle Hayne Quarry, which we then moved ~308 miles to the Webb Garden at App State (Janus 2025, number 2). ABH makes a humorous prediction that these three new, fossiliferous additions will eventually be disassembled by members of the public seeking "paleo-treasures" and might need to be replaced someday.

Literature cited:

Heckert AB, Schneider VP, Fraser NC, & Webb RA (2015). A new aetosaur (Archosauria, Suchia) from the Upper Triassic Pekin Formation, Deep River Basin, North Carolina, U.S.A., and its implications for early aetosaur evolution. *Journal of Vertebrate Paleontology*, 35(1).

<https://doi.org/10.1080/02724634.2014.881831>.

Further reading:

<https://earth.appstate.edu/archie>

<https://earth.appstate.edu/news/archie-aetosaur-now-home-rock-garden>

<https://today.appstate.edu/2025/07/01/rock-garden>



Figure 1: Archie the Aetosaur, a bronze model of *Gorgetosuchus pekinensis*. Adjacent petrified wood includes a reddish specimen of a Triassic conifer, nominally *Araucarioxylon arizonicum*, from Arizona. Note the "living fossil," Equisetum, Horsetails or Scouring Rushes, a group whose morphology has changed little since the Mesozoic—a nice paleobotanical touch here. This photo was taken on July 30th, 2024, before the historic and tragic flood of September 2024.

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Figure 2: Archie is often decorated with App State swag. July 30th, 2024. Archie is a star attraction in Boone, and the reptile appears in many people's selfies on social media. Children are delighted with this armored and spiky Mesozoic herbivore. Scratching Archie's head brings good luck!

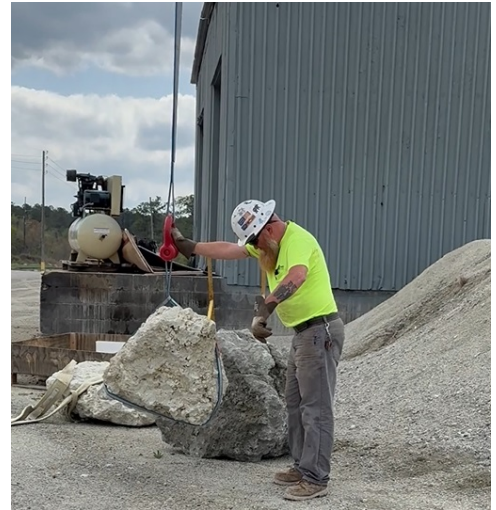


Figure 3: Preparing to load at Martin Marietta Materials, Castle Hayne, NC, April 23rd, 2025. Three cheers for MMM and its people!



Figure 4: Unlimbering and planning the loadout at App State in Boone, NC, April 24th, 2025.

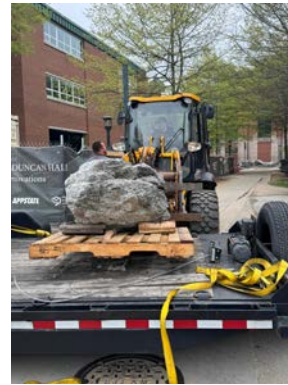


Figure 5: Unloading begins at App State. Pallets and a forklift were helpful.



Figure 6: A fossil-rich rock for a macrofossil-poor region of North Carolina's Appalachia.



Figure 7: Surveying the haul: David Sanderson (left) & Dr. AB Heckert (right) at App State.



Figure 8: Now, where to put the 3 new arrivals in the Webb Garden?

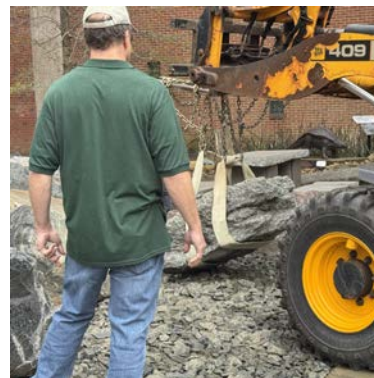


Figure 9: Supervisors Archie the Aetosaur & Professor ABH assured proper placement of the new acquisitions in the Webb Garden.

Martin Marietta Collecting Rules

Dear NCFC Members,

Great News!

After much negotiation, Martin Marietta (MM) has granted the North Carolina Fossil Club limited access twice-yearly to five quarries (Fountain, Clark's, Onslow, Belgrade and Castle Hayne) for field trips. Our newly negotiated access is contingent on strict adherence to a revised, comprehensive set of rules designed to enhance safety. Therefore, the following new rules will immediately apply to ALL MM Quarry trips. (All field trip procedures to other sites will remain unchanged.)

1. **There will be a maximum of 20 people allowed on each trip** regardless of the quarry.
 - a. Anyone not on the approved list will be denied access.
2. **A maximum of 5 vehicles will be allowed into the quarry per trip**, all others will be left in the designated parking area. Two of these will be trip leader vehicles and the trip leader(s) will select the remaining 3 (or 4 if only one trip leader is present).
 - a. All vehicles entering the collecting areas must be high clearance and capable of carrying 3 additional passengers and their gear.
 - b. There will be 4 participants per vehicle entering the quarry.
 - c. The 5 vehicles accessing the quarry must have their wheels chocked the entire time with their parking brake engaged.
3. **No participants under 18 years of age will be allowed.**
4. You **MUST** provide your own **safety gear**, including all the following **REQUIRED GEAR**.
 - a. Hard Hat
 - b. High visibility (Hi-viz) shirt and / or vest. (Orange or safety yellow)
 - c. Safety Glasses. Even if you wear prescription glasses, have safety glasses with you. Each quarry will decide if you must wear them or not.
 - d. Sturdy, closed toe shoes. Boots preferable. No tennis shoes, etc.
 - e. Gloves recommended but not required.
5. **If you show up without all the respective safety gear you will not be allowed in** and will be banned from future MM trips for 6 months. You just cost someone their slot.
 - a. If you need to cancel a MM trip you are signed up for - do it as soon as possible. There will be a waiting list.
 - b. If you habitually cancel within 24 hours of a MM trip, you will face consequences, including being banned from future MM trips for up to 6 months.
 - c. **If you NO SHOW** for a MM trip, you will be banned from attending future MM trips for 6 months.
6. **YOU MUST STAY IN THE QUARRY COLLECTING AREA THE ENTIRE TIME OF THE TRIP.** This is a hard and fast Martin Marietta Rule. If you cannot stay the entire time, do not ask for a spot. (Remember, you are either riding with someone else, or you are transporting 3 other people.) You can't leave to go to the bathroom or go up to the office to go to the bathroom or leave early for any reason other than an emergency.
7. Report all injuries to a trip leader, no matter how minor.
8. **All Martin Marietta rules, and quarry specific rules must be followed explicitly.** Any violations will be immediately dealt with. Consequences can include anything from a verbal reprimand all the way up to a 6-month ban from future MM trips. A lifetime ban from MM trips can occur for serious, dangerous behavior that jeopardizes NCFC future access.
9. **NO pictures** are allowed to be taken inside of the quarry without prior permission from the quarry manager and the NCFC board. This includes pictures of your fossils on the ground. Picture time after the trip at the parking area will be done if we are granted permission at the quarry. All pictures must have the location metadata removed.
10. **No Social Media** posting before, during or after a trip that gives ANY details that could identify a Martin Marietta Quarry. You may say, "I found these fossils in the Castle Hayne Formation of NC." You may not say I found these in a quarry that contains Castle Hayne Formation. Please ensure that Martin Marietta cannot be tied to any post. Again, all location metadata must be scrubbed.
11. You will be required to **sign waiver documents** for Martin Marietta and the NCFC before any quarry entry.

2025 Membership Application - North Carolina Fossil Club



Name (1) _____ email _____

(Primary adult member -18 or older for Single/HH Membership)

Name (2) _____ email _____

(Secondary adult member - 18 or older for HH Memberships)

Address _____

City, State, ZIP _____

Phone (____) _____ - _____

First names of minor (<18) children: _____

Current members need to only complete name, any changes and sign the Liability Statement.

Select **One** Type of Membership

(Enclose check or money order

for the indicated amount.)

- | | | |
|--------------------------|----------------------|---------|
| <input type="checkbox"/> | Individual (new) | \$20.00 |
| <input type="checkbox"/> | Individual (renewal) | \$15.00 |
| <input type="checkbox"/> | Household (new) | \$25.00 |
| <input type="checkbox"/> | Household (renewal) | \$20.00 |

Children of NCFC members who are dependent minors (<18) and living at home may accompany parents on any trip *except those with specific age restrictions*.

Memberships are effective from January through December of the year (or portion of the year) of the date of application. For example, persons joining in August will need to renew their membership 5 months later in January.

The Fossil Club's newsletter, JANUS, is published four times a year and is available only online for members. You may read it online or download it from the website

NCFC Liability Statement

The Undersigned hereby acknowledges his/her understanding that fossil collecting is an inherently dangerous activity which can result in serious bodily injury or death, and/or property damage and hereby confirms his/her voluntary assumption of the risk of such injury, death or damage.

The Undersigned, in return for the privilege of attending field trips related to the collection of and/or study of fossils, or any other event or activity conducted or hosted by the North Carolina Fossil Club (NCFC), hereinafter collectively and individually referred to as "NCFC Events", hereby releases the NCFC, NCFC Members of the Board, NCFC Event leaders or organizers and hosts, landowners and mine or quarry operators from any and all liability claims resulting from injury to or death of the undersigned or his/her minor children or damage to his/her property resulting from any cause whatsoever related to participation in NCFC Events.

The Undersigned agrees to comply with any and all rules and restrictions which may be communicated to the undersigned by the NCFC Event leader and/or landowner and mine or quarry operator and acknowledges that failure to comply will result in immediate expulsion from the premises.

The Undersigned acknowledges that this release covers all NCFC Events and will remain in effect at all times unless or until it is revoked by written notice to the current President of the NCFC and receipt of such revocation is acknowledged.

The Undersigned further attests to his/her intent to be legally bound by affixing his/her signature to this release.

Name _____ Signature _____ Date _____

Name _____ Signature _____ Date _____

Privacy Policy: The NCFC collects contact information for purposes of contacting you regarding your membership, collecting trips you may have signed up for and for other members who may wish to contact you. Your contact information is also included on a membership list published on a secure location on the NCFC website and is available to other current NCFC members. If you do not wish for your contact information to be included on the published membership list, please send an email to membership@ncfossilclub.org with "membership list opt out" in the subject line. Please note while you will continue to receive information (electronic and paper) from the club; other members, including trip leaders may not have access to your contact information.

Mail To: North Carolina Fossil Club, P.O. Box 25276, Raleigh, NC 27611

NORTH CAROLINA FOSSIL CLUB, INC.

(Founded 1977)

Members of the Board

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GENERAL CONTACT	paleoNC@ncfossilclub.org		

NORTH CAROLINA FOSSIL CLUB

CODE OF ETHICS AND CONDUCT

1. Please conduct yourselves in a manner that best represents the NCFC.
2. Please make a sincere effort to keep informed of all laws, regulations and rules regarding collecting on private and public lands.
3. Never use the name of the Club to gain access to lands, or scientific sites actively under study by paleontological professionals for personal gain or profit.
4. Please act responsibly and safely on all club outings so as not to bring other members or yourself into harm or danger. Parents are responsible for their children and making sure their children follow all quarry, etc. rules. Firearms are prohibited from all Club functions.
5. Always respect and cooperate with the field trip leader or designated authorities in collecting areas. Do not bring along anyone not signed up for the trip, or any non-member to a trip without clearing it with the field-trip leader first.
6. Never collect a site immediately prior to a scheduled field trip thereby preventing fair collecting opportunities for the rest of the members of the Club. "Scouting" ahead of time by the field trip leader is fine.
7. You are encouraged to contact the appropriate professionals upon discovery of what you consider to be scientifically significant fossils. This includes excavation, preparation, and documentation of the fossils in question. You are encouraged to consider donating such fossils to appropriate facilities.