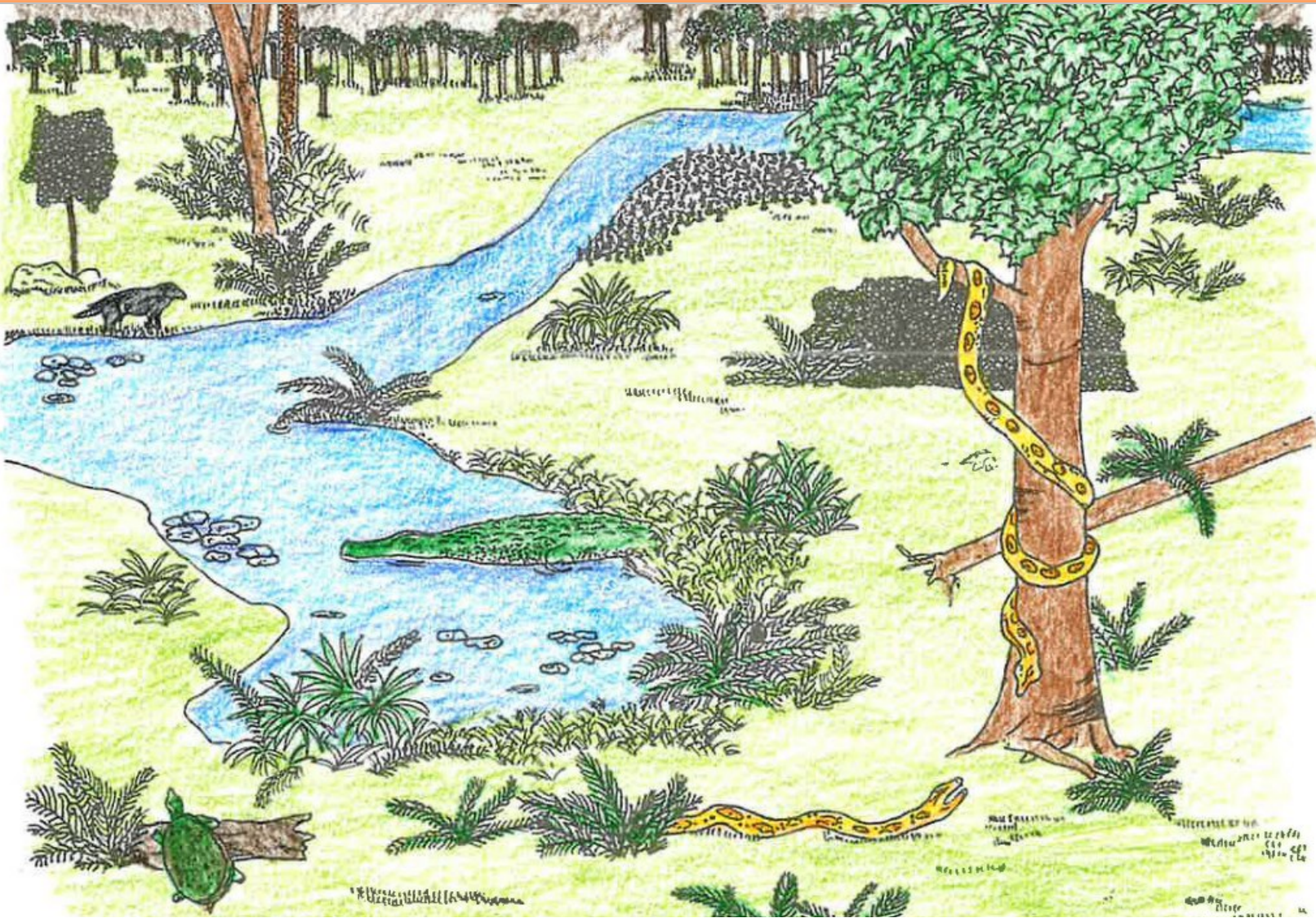


MISSISSIPPI GEOLOGICAL SOCIETY
eBULLETIN

Volume 74

No. 8

April 2026



ADVANCES IN CARBONATE STIMULATION
Murtaza Ziauddin

2026 MISSISSIPPI ACADEMY OF SCIENCES AWARD WINNERS

MDEQ OFFICE OF GEOLOGY, SCIENCE TEACHER RESOURCES
Dr. David Dockery III, RPG



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2025-2026 MGS MEETING SCHEDULE

When	What/Who	Where
September 10	Howard Duhom - Viking Engineering	River Hills - 11:30am
October 8	Ashley Little - IperionX	River Hills - 11:30am
November 12	SPE Sporting Clay Shoot	Providence Hill Farm
December 10	Randy Seright - Polymer Flooding - SPE	River Hills - 11:30am
January 14	Reza Fard - NOV Tuboscope	River Hills - 11:30am
February 11	Natalia Usachenko - Fossil Whales in Mississippi	River Hills – 11:30am
March 11	Alan Cockrell - Drilling Ahead	River Hills – 11:30am
April 8	Murtaza Ziauddin - Advances in Carbonate Stimulation	River Hills - 11:30am
May 13		River Hills - 11:30am
TBD	Spring Fling	TBD

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TBD

TBD

TBD

TBD

TBD

TBD

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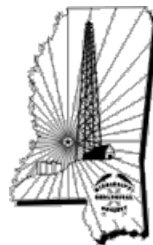
OIL AND GAS EXPLORATION

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PRESIDENT'S LETTER



Dear MGS Members,

I would like to thank Alan Cockrell for his time and generous donation to the Mississippi Geological Society. Alan has graciously provided his archival materials for **Drilling Ahead**, an important contribution to preserving our region's exploration history and can-do attitude.

Our Webmaster, Jonathan Leard, is continuing development and testing of a new MGS website designed to improve membership management and streamline Society communications.

I am pleased to announce that the Mississippi Geological Society sponsored the student awards at the 2026 Mississippi Academy of Sciences Geology and Geography Division. This year's conference was held from March 18-20, 2026 in Biloxi, MS.

- The 1st Place Graduate award was presented to Ethan Kogg, Mississippi State.
- The 1st Place undergraduate award was presented to Keishawn Smith, Southern Mississippi.
- The 2nd Place undergraduate award was presented to Grace Lane and Hannah Baxter, Mississippi State.

It was great seeing many of you at GeoGulf, 2026! GCAGS leadership expressed appreciation for our participation and has encouraged us to consider hosting a future meeting - an opportunity that would further elevate our Society's role in the Gulf Coast geoscience community.

As we move through the spring, we also enter one of the most meaningful traditions of our Society: the **Boland Scholarship Awards**. This annual program represents our long-standing commitment to supporting the next generation of geoscientists in Mississippi. I appreciate everyone who participates in the nomination, interview, and review process each year. Your engagement ensures that the Boland Awards remain a cornerstone of our mission and a source of pride for the Society. If any of you would like to serve, please do not hesitate to reach out.

Lastly, I would like to welcome SPE Distinguished Lecturer Murtaza Ziauddin to our April 8th, 2026 meeting, where he will speak on carbonate reservoir rock stimulation. Prior to the lecture, we will recognize this year's Boland and Dustin Johnson Award recipients.

Respectfully,

Tim Palmer, President, Mississippi Geological Society.



FEBRUARY SPEAKER



Mississippi Section

Advances in Carbonate Stimulation: Unveiling the Potential of Single-Phase Retarded Acids (SPRA)

Murtaza Ziauddin

11:30 AM

Wednesday, April 08, 2026

Mississippi Section



Clovelly Oil Co. LLC

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Vice-President Exploration

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Market Watch

Crude Oil WTI (NYM \$/bbl) Front Month

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☀ OPEN

Last Updated: Apr 7, 2026 at 2:10 p.m. EDT - Delayed quote

\$ **113.90**

▲ 1.49 1.33%

SETTLEMENT PRICE 04/06/2026

\$112.41



Natural Gas Continuous Contract

[+ Watchlist](#)

☀ OPEN

Last Updated: Apr 7, 2026 at 2:11 p.m. EDT - Delayed quote

\$ **2.865**

▲ 0.054 1.92%

SETTLEMENT PRICE 04/06/2026

\$2.811





GEOLOGY POST

**2026 Mississippi Academy of Sciences
Geology and Geography Division
Chairs: Dr. Alyson Brink and Dr. Claire Babineaux
Mississippi Geological Society Award Winners**

Each year, the Mississippi Geological Society sponsors awards for student presentations in the Geology and Geography Division at the Mississippi Academy of Sciences. Awards are available for 1st, 2nd, and 3rd best undergraduate and graduate presentations. This year, the conference was held in Biloxi, Mississippi from March 18-20, 2026. The program featured contributions from the Mississippi Department of Environmental Quality's Office of Geology, the University of Southern Mississippi, Mississippi State University, the USDA Agricultural Research Service's National Sedimentation Laboratory, and the Mississippi Museum of Natural Science. Topics included modeling the volume of Mississippi's Pre-loess Terrace Deposits (MDEQ); vein growth and lithospheric hydration at the Atlantis Massif from Mid-Atlantic Ridge Expedition 399 (University of Southern Mississippi); the timing of evaporite deposition and brine formation in the northern Gulf of Mexico (MDEQ); surface-subsurface water fluxes in the Goodwin Creek Experimental Watershed (USDA ARS); the Ripley-Prairie Bluff formational contact near Macon (Mississippi Museum of Natural Science); geologic mapping of the Bluff Lake Quadrangle and the Mississippi Gulf Coast (MDEQ); geology influencing the habitat of the Big Black River Rock Snail (MDEQ); the Neogastropoda family Pyramimitridae (MDEQ); new taphonomic and pathologic insights from archaeocete fossils in Yazoo County (MDEQ); and the use of opalescent Catahoula orthoquartzite as a lithic material in Mississippi (MDEQ). Additional presentations include the description of non-dinosaurian fossils from the Coffee Formation (University of Southern Mississippi); the discovery, spatial analysis, and geomorphic interpretation of methane seeps on the U.S. Atlantic Margin (Mississippi State University); diversity and abundance of bivalve assemblages in the Demopolis Formation (Mississippi State University); the first report of Columbian mammoth fossils from the Mississippi Gulf Coast (MDEQ); a paleoenvironmental study of the Eutaw Formation through NSF-funded REU projects (University of Southern Mississippi); a new Columbian mammoth discovery in the Jackson Prairie region (MDEQ); community-centered geoheritage development at the Dr. Jack Kaye Cretaceous Fossil Park (Mississippi State University); and efforts to engage local communities in the co-production of scientific knowledge (University of Southern Mississippi). Three awards were presented to students. Images from the conference and their abstracts are included on the following pages. To read all of the abstracts in the Geology and Geography Division, or others, the link to the journal download is: https://msacad.org/wp-content/uploads/2026/03/Vol-71_January_No.-1-Journal-of-MAS_abstract_Issue-3-17-2026-.pdf



GEOLOGY POST

1st Place Graduate Presentation – Ethan Kogg



Tim Palmer (Left), Ethan Kogg (Center Left), Dr. Alyson Brink (Center Right), and Dr. Athena Nagel (Right)

Diversity and Abundance of Bivalve Assemblages within the Cretaceous Demopolis Formation, West Point, MS

Ethan Hogg¹, Renee Clary¹, Athena Nagel¹, Christy Visaggi²

¹Mississippi State University, Mississippi State, MS,

²Georgia State University, Atlanta, GA

Bulk samples were collected in September 2025 from the Cretaceous Demopolis Formation at an agricultural lime quarry in Mississippi to study the distribution of bivalve faunas and related paleoenvironmental interpretations. The samples were collected along a 30-meter transect in ten sections; each section measured 1 m², with sections centered every 3 meters. Within each square meter, all surface fossils were collected ($N \approx 2,060$). Additional samples were collected along the transect post-collection between sections, and/or from nearby fossils that had naturally eroded out. Samples were separated according to genus, and then species if identifiable. The ability to identify each sample was based on specimen completeness and what parts of each sample were preserved. The genera collected include *Acutostrea*, *Arctostrea*, *Anomia*, *Exogyra*, *Paranomia*, *Pododesmus*, and *Pycnodonte*, as well as a few vertebrate teeth, encrusting bryozoans (cheilostome), serpulid tubes, echinoderm spines, and steinkerns. The samples were also counted as left, right, or both valves (when both mollusk valves were found together). In terms of abundance within the samples, the cementing oysters (*Acutostrea*, *Arctostrea*, *Exogyra*, and *Pycnodonte*) were by far the most abundant, with *Arctostrea* being the most abundant of all the collected samples (>50% of all samples). *Pododesmus*, *Anomia*, and *Paranomia*, which are all anomiid clams, were significantly less abundant and *Paranomia* was the most abundant of the anomiiids. This abundance of both cementing oysters and byssal bivalves indicates that the area was a shallow reef environment that was very diverse in invertebrate fauna, but mostly dominated by encrusting/cementing invertebrates, particularly cementing oysters.



GEOLOGY POST

1st Place Undergraduate Presentation – Keishawn Smith



Dr. Alyson Brink (Left), Keishawn Smith (Center), and Tim Plamer (Right)

Description of non-dinosaurian material from the site of the most complete dinosaur thus far discovered in Mississippi - Coffee Formation (Late Cretaceous, Campanian)

Keishawn Smith¹, Alyson A. Brink¹

¹The University of Southern Mississippi, Hattiesburg, MS

The Selma Group consists of Late Cretaceous marine units that extend northeastward, outcropping in Tennessee, Mississippi, and Alabama. The Coffee Sand Formation, a shallow marine to transitional sand and clay unit within the Selma Group, is divided into a sandy upper section, the Tupelo Tongue, and a clay-rich lower section. The formation is exposed in the northeastern region of Mississippi and is noted for its diverse assemblage of mollusks. This project is primarily concerned with the invertebrate fauna from the Booneville locality, where the most complete dinosaur specimen in Mississippi was recently described. The site, which is composed of the clay-rich lower section of the Coffee Sand, represents a nearshore, high-energy transitional depositional environment based on the abundance of infaunal, shallow-burrowing suspension feeders (*Pterotrigonidae* indet., *Eufistulana* sp.), along with an apparent lack of deeper-burrowing bivalves. Vertebrate material includes freshwater turtles (*Chedighaii* sp., *Leiochelys* sp.), coastal sharks (*Scapanorhynchus* sp., *Squalicorax yangensis*, *Squatina* sp., *Ischyodus* sp.), and mosasaur vertebrate material, which suggests an interaction between marine and freshwater conditions. Furthermore, palynological and stratigraphic data suggest a freshwater influence with estuarine implications. Another interesting aspect of the Booneville locality is the ammonite assemblage (*Placenticerias*, *Menabites*), which enables more precise dating. Evidence from palynology (*Holkopollenites*, *Tschudypollis*) and ammonite biostratigraphy supports a late-early Campanian age. In summary, the data indicate that the Booneville site is early Campanian in age, representing possible intertidal deposition within a nearshore environment. This interpretation designates the hadrosaurid found at the site as the youngest and the only southeastern hadrosaur discovered in a nearshore, intertidal depositional environment.



GEOLOGY POST

2nd Place Undergraduate Presentation – Grace Lane and Hannah Baxter



Grace Lane (Left), Hannah Baxter (Center Left), Dr. Alyson Brink (Center Right), and Tim Palmer (Right)

Discovery, Spatial Analysis, and Geomorphic Interpretation of Methane Seeps on the U.S. Atlantic Margin

Hannah Baxter¹, Grace Lane¹, Adam Skarke¹

¹Mississippi State University, Mississippi State, MS

Widespread methane discharge from seafloor gas seeps on the U.S. Atlantic Margin (USAM) has been recognized since 2012. Over the past decade, research has refined seep inventories, examined spatial distributions, and explored the geologic processes that control gas transport along this passive margin, primarily using shipboard multibeam echosounder (MBES) water column backscatter data (12–30 kHz). Recently, we acquired 386 km of very high-resolution (200 kHz) MBES water column and bathymetry data with the autonomous underwater vehicle (AUV) Sentry at seep locations on the central USAM, covering 45.1 km² of the continental shelf and slope (150–1200 m depth). Analysis of these AUV data revealed over 2800 gas seeps, comparable to the 171 seeps previously detected within the same area using shipboard MBES, highlighting the significant improvement in detection capability afforded by higher-frequency AUV-based surveys.

Spatial analysis indicates that these newly identified seeps occur both in clusters and isolation, with distributions broadly consistent with previously mapped seeps but with much greater definition of seep clustering along ridge crests and around upper-slope canyon heads. Over 200 of these seeps are associated with pockmark features concentrated on the upper continental slope (150–480 m depth). Pockmarks were identified through visual and quantitative geomorphologic analyses of MBES bathymetry using the Bathymetry Position Index and morphological classification, while seep bubble plumes were extracted and visualized in three dimensions. Subbottom profiler data collected concurrently enabled interpretation of subsurface conditions beneath pockmark-associated seeps, revealing three distinct classes of pockmark-associated seepage.

Together, these results demonstrate that shipboard MBES seep inventories likely underestimate total seep abundance and associated methane flux on the USAM. The new high-resolution AUV MBES dataset provides an unprecedented view of the fine-scale morphology and spatial organization of methane seepage sites, advancing understanding of the geologic controls on fluid transport and discharge along the U.S. Atlantic Margin.

SOUTHEAST

OIL & GAS ASSOCIATION



AL/MS Oil and Gas Industry: We'll See You in 4 Weeks at the 3rd Annual SOGA Annual Meeting and Golf Tournament

LAST 24 HOURS to book your room. You don't want to miss the fun and networking, so [click here to make your reservation](#) with The Grand if you haven't yet.

US Oil and Gas Association President Tim Stewart will be joining us to share about his growing popularity on X and in the media pointing out where global oil market disruptions are exposing the consequences of anti-fossil fuel energy policies in California and adjacent states.

Afternoon Golf Tournament Thursday, April 30, with great prizes and fun on course games. Gifts for ALL golfers. A few spots are left. If you want to play or sponsor but haven't secured your spot, [email Christopher](#).

The SOGA Annual Networking Meeting and Golf Tournament is the premier annual gathering of the oil and gas industry in MS and AL. The 1st and 2nd Annual Meetings were both well attended and, more importantly, a good time with great company at a beautiful location. The 2026 SOGA event will be Wednesday and Thursday, April 29-30, and is expected to attract more attendees and sponsors at the historic Grand Hotel in Point Clear, AL.

Schedule of events:

- April 29 - Welcome Reception (5:00)
- April 30 - Golf Tournament (11:30 lunch at course, 1:00 shotgun start)
- April 30 - Evening Reception (6:00) and Dinner at The Grand
- May 1 - Check out or hang around for the weekend



MISSISSIPPI OFFICE OF GEOLOGY

New Publications

The Mississippi Office of Geology is pleased to announce the publication of the following maps for the month of December

[OF-356 Geologic Map of the Bovina Quadrangle Hinds and Warren Counties, Mississippi](#)

[Native Lithic Materials of Mississippi](#)

[OF-349 Geologic Map of the Sharon Southeast Quadrangle Rankin, Madison, and Scott Counties, Mississippi](#)

[OF-348 Geologic Map of the Shoccoe Quadrangle Madison and Rankin Counties, Mississippi](#)

[OF-347 Geologic Map of the Canton Quadrangle Madison County, Mississippi](#)





MONTHLY POST

Dr. David Dockery III RPG

MDEQ OFFICE OF GEOLOGY, SCIENCE TEACHER RESOURCES

David T. Dockery III, RPG

MDEQ Office of Geology has participated in a series of Science Teacher Workshops, some that we hosted and some others have hosted. The cover of this November 1995 issue of MDEQ's newsletter *Environmental News* (volume 15, number 3) features an MDEQ Science Teacher Workshop held at St. Andrew's North Campus for grades 1-5 in October of 1995 (Figure 1).

Figure 1 **ENVIRONMENTAL NEWS**

DEPARTMENT OF ENVIRONMENTAL QUALITY

GEOLOGY. LAND AND WATER. POLLUTION CONTROL

Volume 15, Number 3, November 1995

FOSSIL WORKSHOP FOR TEACHERS

Fifty-eight teachers from across the state gathered at St. Andrew's North Campus in Ridgeland in late October for a rock and fossil workshop. The workshop, designed for Mississippi teachers of grades 1 - 5, was sponsored by DEQ, the Mississippi Department of Education, and St. Andrew's School. The teachers discovered ways to get students excited about science, how to have a fun field trip without ever leaving the school campus, and how to use fossil collecting as a class project or as an individual assignment.

The teachers attending the workshop also learned that fossil collecting can be used to study biology, taxonomy, geology, climate, earth history, geography, and/or social studies. Instructors for the workshop included Dr. David Dockery, John Davis, and Ann Ranck.

Dr. Dockery, chief of the surface geology division of the Office of Geology, served as principal instructor. Dr. Dockery shared a brief history of Mississippi geology and showed slides of his actual experiences in fossil collecting. He then provided information for determining fossil names and assisted the teachers as they searched, with magnifying glass in hand, through the bag of rocks they each collected earlier in the day.

Mr. Davis is a teacher of genetics, biology, and general science at St. Andrew's Middle School. He shared fossils from his classroom experiences while giving the history of various fossils and fossil names.

Ann Ranck, a first grade teacher at St. Andrew's Lower School who has been doing some serious fossil collecting with her students for the past four years, shared several creative classroom activities and assisted the teachers as they actively participated. Each teacher made a fossil and also scraped carefully through a sand box for hidden fossils.

FOSSIL COLLECTION COMPETITION

Teachers are encouraged to bring fossil collections to the Office of Geology or to the Office of Geology booth at the Mississippi Gem and Mineral Show. The deadline for entries is 3:00 p.m. on February 24, at the Office of Geology booth at the Mississippi Gem and Mineral Show. Before the 24th entries should be taken to the Office of Geology. There is a small charge for the Gem and Mineral Show. For further details about the competition contact the Office of Geology at 601-354-6328.

Betty Kamman, a teacher at Grove Street Elementary School in Vicksburg, and Michael Bograd, Assistant State Geologist, search for fossils and interesting rocks at the workshop.



John Davis, teacher at St. Andrew's Middle School in Ridgeland and an instructor and organizer of the teacher workshop, shares his knowledge of fossils with a group of workshop attendees.

Gwendolyn Whittington of Holy Child Jesus School in Canton takes a close look at a rock. The teachers attending the workshop spent a portion of the first session looking for fossils in a gravel parking lot on the campus of St. Andrew's Middle School.





MONTHLY POST

Dr. David Dockery III RPG

Fifty-eight teachers from across the state participated in the workshop. The article features both St. Andrew's teacher John Davis and me. The two of us gave a paper entitled "Fossil fair: an exhibit of competitive rock and fossil collections made from chert gravel for grades K-5" at the Geological Society of America Annual Meeting in New Orleans in the Geology Education Session on November 7, 1995.

In the March 1997 issue of *Mississippi Geology*, the history of MDEQ Science Teacher Workshops was given in an article entitled, "DEQ Geology Workshops for Science Teachers." The article stated, "The idea of geology workshops for science teachers, as a joint venture of the Mississippi Department of Environmental Quality (DEQ) and the Mississippi Department of Education, was the conception of Eleana Turner, then in charge of DEQ Public Relations. According to Turner, the idea developed when she observed several publications on fossils by the Mississippi Office of Geology featured in the December 1994 issue of *American Conchologist* (Scheu editor, 1994), a well-illustrated popular journal for shell collectors. Turner's surprise at the broad interest in the state's fossils aroused the thought of utilizing DEQ expertise in sponsoring science-teacher workshops."

The first MDEQ Science-Teacher Workshop on April 6, 1995, extended invitations only to those teachers in Mississippi classified as geology teachers, all eleven of them. Exceptions were made to include my wife Mary Dockery and Sam Mabry's (of MDEQ) wife Marsha Mabry. The workshop was held at LeFleur's Bluff State Park clubhouse with only three teachers, Mary Dockery, Marsha Mabry, and John Davis of St. Andrew's. By 1996, there were three well-attended Science-Teacher Workshops in the spring semester, the first in Hattiesburg on March 1, 1996, the second at St. Andrew's Middle School on March 5, 1996, and the third at the University of Mississippi in Oxford on March 7, 1996. Eleana Turner retired from MDEQ's Public Relations Division on April 1, 1996, and the workshops continued under the leadership of Jennifer Reed in coordination with Brian Knippers of the Mississippi Department of Education. Two workshops were held in the spring of 1997, with twenty-two teachers attending the University of Mississippi workshop on March 7, 1997, and seventy-two attending the Southside Assembly of God in Jackson workshop on March 21, 1997. The Science Teacher Workshops were discontinued after the departure of Jennifer Reed as interim Director of MDEQ's Public Relations Division.

It was during this time that we developed publications suitable as Science Teacher Resources for elementary and middle school. The first publication was an article entitled *Rocks and fossils collected from Mississippi gravel* published in the June 1995 issue of *Mississippi Geology*. The article contained six plates, illustrating different rock types, fossils, and even mimetoliths, which are rocks that mimic other objects in their shape. The paper also introduced the egg-carton rock collection, a concept of John Davis of St. Andrews Middle School. The second science teacher resource item was a publication in the December 1996 issue of *Mississippi Geology* entitled *More rocks and fossils from Mississippi gravel*, which had four plates illustrating rocks and fossils. After this, we worked with Kaie Lightsey, a fifth-grade student recommended by John Davis for her art skills, to develop our Circular 6, an illustrated book entitled *Windows into Mississippi's Geologic Past*. Katie created line drawings of fourteen scenes depicting different geologic periods and epochs, which could be colored by students. The book was published in 1997 and today is available online in a PDF format.



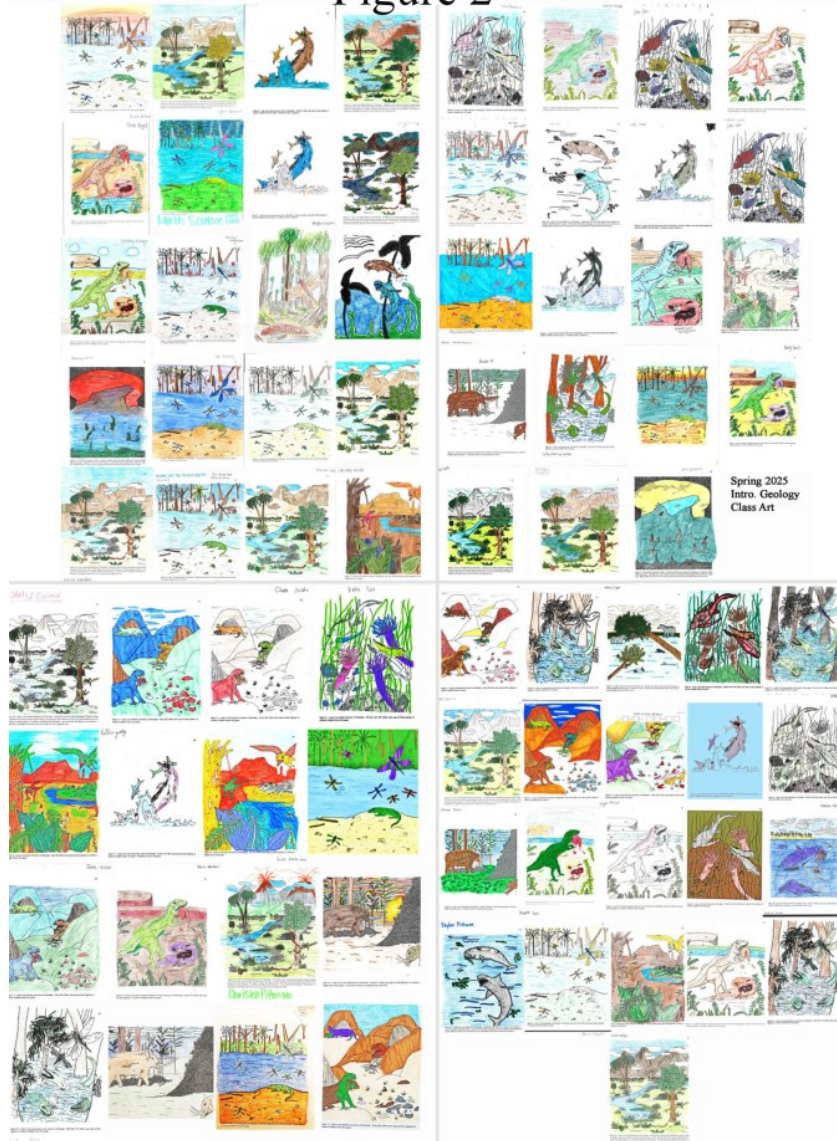
MONTHLY POST

Dr. David Dockery III RPG

In preparation for the Children's Educational Fair, hosted by the Junior League of Jackson at the State Agriculture Museum on April 2-4, 2008, we published Circular 7, an in-color guidebook entitled *Rocks and Fossils Found in Mississippi Gravel Deposits*. The three-day fair included some 1,500 students per day from schools around the state, who would be exposed to different careers and a strong stay-in-school message. Teachers and students used Circular 7 to look through a dump-truck load of gravel hauled in for that purpose.

Now I am using these resources as an adjunct professor to teach an Introduction to Earth Science course required for all Elementary Education majors at Mississippi College. One assignment they have is to color one of Katie Lightsey's illustrations of Mississippi's geologic past and write their own story of what it would be like to live at that time. Figure 2 is a collage of MC student art over a period of four semesters. At top in the figure are the Fall 2024 and Spring 2025 semesters' student art, at left and right, and at bottom, the Fall 2025 and Spring 2026 semesters at left and right

Figure 2





MONTHLY POST

Dr. David Dockery III RPG

For the student stories to accompany their art, they are encouraged to look beyond Circular 6 in finding plants and animals that could be include in their chosen geologic period or epoch. In reviewing student stories, I came across Hannah Weeks' work (see a portion of Weeks' art in Figure 3) entitled *An Unexpected Adventure*, a story in the Paleocene of Mississippi, and read this:

Figure 3

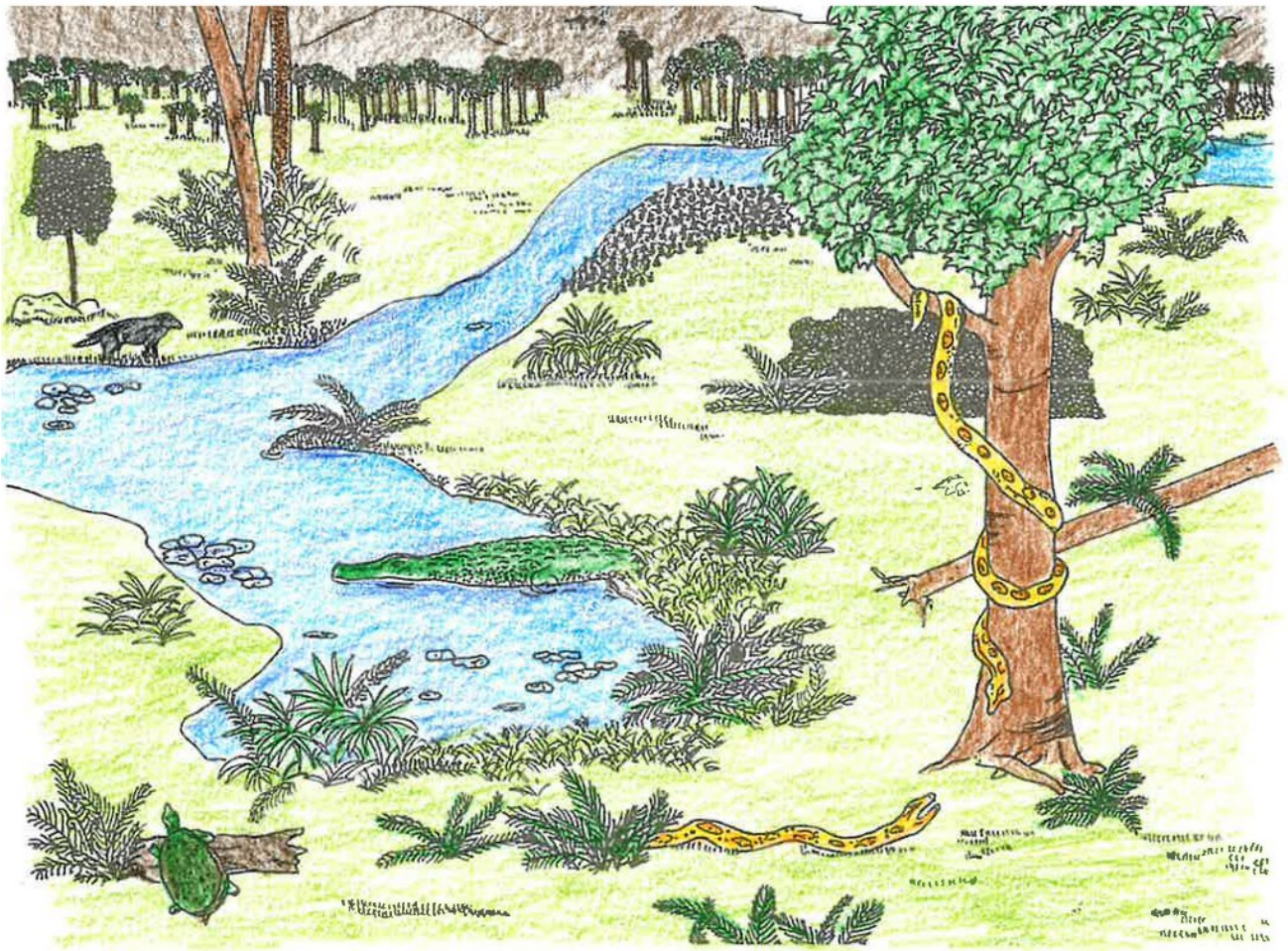


Figure 18. A day in the Middle Paleocene of Mississippi. Composite scene including Mississippi's tropical setting as viewed to the west of Smoky Top 60 million years ago, but with volcanoes of the rising Rocky Mountains in the distance, by Katie Lightsey, St. Andrew's Middle School 6th grade. Can you find all the reptiles in this picture? A pantodont, the largest mammal of the time, walks the river's opposite shore.



MONTHLY POST

Dr. David Dockery III RPG

“I was in Mississippi, from what I gathered, but it was different. Something was off. I took in the rest of my surroundings and breathed in the warm, damp air, trying to make sense of what I was experiencing. There were streams running all around me, and I was actually standing in mud. I gasp as a snake slithers over my muddy shoes. ‘*Tuscahomaophis* (*T. leggetti*),’ I say aloud to myself. ‘*How did I know that?*’ Suddenly, memories of my geology class I took my sophomore year of college come flooding back. I remember learning about this period... could it be that I am back in the Middle Paleocene Epoch?”

Now I’m taking a pause--What? I didn’t recall this fossil snake, but I can tell she didn’t make it up. Tuscahoma is the name of the formation. *Ophis* is Latin for snake or serpent. Together these words create a name “the Tuscahoma snake” for a new fossil snake genus. The species *leggetti* has a masculine ending and is named in honor of someone I remember from the Carnegie Museum of Natural History. I went online and found the paper naming the new genus and species, two pages of which are shown in Figure 4. I later checked my reprint files and found the paper sent to me by Alan Holman in 1992, some 34 years ago and forgotten. It is amazing what is available today to college students through an online search.

ANNALS OF CARNEGIE MUSEUM
VOL. 61, NUMBER 3, PP. 197-205
31 AUGUST 1992

Figure 4

A PUZZLING NEW SNAKE (REPTILIA: SERPENTES)
FROM THE LATE PALEOCENE OF MISSISSIPPI

J. ALAN HOLMAN¹
GERARD R. CASE²

ABSTRACT

A puzzling new genus and species of primitive alethinophidian snake, *Tuscahomaophis leggetti*, is described on the basis of vertebrae from the late Paleocene Tuscahoma Formation of Meridian, Mississippi. *Tuscahomaophis* has characters on the centrum, condyle, hypapophysis, neural arch, and prezygapophyses that indicate relationships to the Palaeophiidae and, to a lesser extent, the Nigero-phiidae and distinguish it from other primitive alethinophidians. But *Tuscahomaophis* differs from the above two families in the location of the paradiapophyses, characters on the ventral centrum and neural arch, and in having parazygantral foramina that occur in small fossae. Curiously, the parazygantral character is unique to the Madtsoiidae (and one other undescribed snake) and is considered to be apomorphic in each of these taxa.

At present it seems best to suggest that *Tuscahomaophis* is a sister group of the Palaeophiidae, that the Nigerophiidae is a sister group to both of the former; and that *Tuscahomaophis* has independently developed the parazygantral character of the Madtsoiidae. The new snake is assigned to the suborder Alethinophidia, family incertae sedis. *Tuscahomaophis* may have been an aquatic snake that occupied a riverine or an estuarine habitat.

INTRODUCTION

In April 1990 a field party from the Carnegie Museum of Natural History led by K. C. Beard collected the vertebral remains of a new genus and species of primitive alethinophidian snake from the upper part of the Tuscahoma Formation in Meridian, Mississippi. The new form is puzzling, as it has a suite of characters that indicate it is most similar to the Palaeophiidae and somewhat less similar to the Nigerophiidae; one character that is unique to the Madtsoiidae (and one other undescribed snake); and other characters that distinguish it from all three families. Here we describe this new taxon and discuss its relationships.

The Tuscahoma Formation.—The upper part of the Tuscahoma Formation at Meridian, Mississippi, has previously been referred to the early Eocene (Case, 1986; Dockery et al., 1991; Parmley and Case, 1988:334), but new evidence (Ingram, 1991) suggests that the sediments that yielded the new snake described below are of latest Paleocene age.

The Tuscahoma Formation at the Meridian, Mississippi, site (CM loc. 517; see Beard and Tabrum, 1991) is overlain by the fossiliferous Bashi Formation. CM loc. 517 is the first known vertebrate site in the Tuscahoma Formation, and likely represents an estuarine or riverine deposit, as it contains the teeth, scales, vertebrae, spines, etc., of a large variety of fishes including numerous species of selachians (Case, 1986). The fauna also includes a variety of tetrapods including mammals, birds, lizards, crocodilians, turtles, the presently described new primitive alethinophidian snake, and three species of palaeophiid snakes: *Palaeophis*

¹ Michigan State University Museum, East Lansing, MI 48824-1045.
² P.O. Box 689, Ridgefield Park, NJ 07660.
Submitted 13 June 1991.

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1992 HOLMAN AND CASE—PALEOCENE SNAKE FROM MISSISSIPPI 199

Fig. 1.—Holotype trunk vertebra of *Tuscahomaophis leggetti* nov. gen. et sp., CM 47872. A, posterior view; B, anterior view; C, dorsal view; D, ventral view; E, lateral view. The line equals 8 mm and applies to all views.



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Thanks & Regards,

Matt Caton
Editor

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