

MISSISSIPPI GEOLOGICAL SOCIETY

*e***BULLETIN**

Volume 73

No. 8

April 2025



VALUABLE ELEMENTS FROM BRINES

Kyle Murray

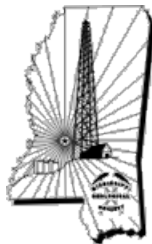
MGS SCHOLARSHIP AWARDS

GEOARCHAEOLOGY AND FORENSICS OF PROJECTILE POINTS

Dr. David Dockery III, RPG



www.missgeo.com



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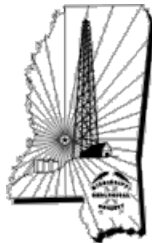
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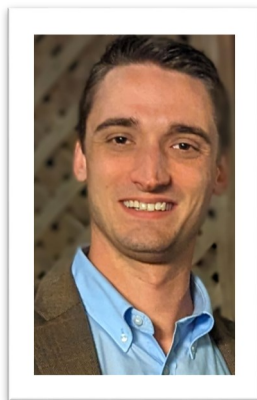
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PRESIDENT'S LETTER



Dear MGS Members,

There is a lot to write about this month! To begin, we would like to thank Dean Foss of Harvest Oil & Gas for his talk on Brooklyn and Little Cedar Creek Fields. This month we will have SPE Distinguished Lecturer Kyle Murray discussing “Pathway for Recovering Valuable Elements of Interest from Subsurface Brines and Oilfield Produced Waters”. His talk will be on Wednesday, April 9, 2025, with lunch at 11:30 AM and the discussion starting at noon at the River Hills Club in Jackson. The cost to attend is \$25, and check or exact change is appreciated. If you’re planning to attend and don’t normally, please let us know so we can adjust table settings. We have enjoyed a consistent packed house this semester! This talk will follow the brief presentation of our Boland and Dustin Johnson scholarships and an update from the Universities. The winners will be listed in the May Bulletin.

The Mississippi Academy of Sciences was held March 20-21. Society Members Dr. David Dockery and Mr. James Starnes were inducted as Fellows. George Phillips, paleontologist for the Mississippi Museum, gave the Keynote Dogen Lecture. The Mississippi Geological Society sponsors awards for the best presentations in the Geology Division. The winners this year were:

Graduate Oral Presentations:

First Place: Derek Hoffman (The University of Southern Mississippi)

Second Place: Haitham Saleh (University of Mississippi)

Third Place: Natalya Usachenko (Mississippi State University)

Undergraduate Oral Presentations:

First Place: Makayla Capasso and Samantha Chapman (The University of Southern Mississippi)

Second Place: Kris Arrington and Sarah Strickland (Millsaps University)

Poster Recognition:

Alyssa Wurtz (Mississippi State University)



PRESIDENT'S LETTER

A note from the Chair, Dr. Alyson Brink:

“No third place was given because the other presenters were not present. You might want to put a note in there about everyone doing REALLY well, but the students have to be there in order to award the prizes. I don't want people to think the other three presentations were not worthy, because they absolutely were.”

To view the MAS abstracts and the program, here is a link: https://msacad.org/wp-content/uploads/2025/03/Vol-70_January_-No-1-2025final-7-3-10-2025-updated-1.pdf

The time has come to renew your membership with MGS! We will drive for new and renewed memberships through April and May. The membership year runs from June 2025 through May 2026. Membership is delinquent on October 1st and members dropped from emailing lists on January 1st. When filling out a membership form, please consider a donation to the Boland Scholarship fund. The membership form is included in the Bulletins.

Vice President Tim Palmer and I are attending GCAGS GeoGulf 2025 in Nacogdoches, April 6–8. If you're attending, let us know.

Jonathan R. Leard, RPG

MDEQ-Office of Geology

Surface Geology Division

Phone: (601)-961-5352

Website: <https://www.mdeq.ms.gov/geology/work-areas/surface-geology/>





PRESIDENT'S LETTER

Mississippi Academy of Sciences

Geology and Geography Division Winners

Chairs: Dr. Alyson Brink (Left) and Dr. Claire Babineaux (Right)



Derek Hoffman



Haitham Saleh



Natalya Usachenko



Makayla Capasso and Samantha Chapman



Kris Arrington and Sarah Strickland



Alyssa Wurtz

2024-2025 MGS MEETING SCHEDULE

When	What/Who	Where
September 11	The Ice Ages in Mississippi - James Starnes	River Hills - 11:30am
October 9	Toddy Guidry - Core Lab	River Hills - 11:30am
November 13	Dwayne Purvis P.E	River Hills - 11:30am
December 12	Christmas Party	JYC - 5:30pm
January 8	Seafloor Gas Seeps Dr. Adam Skarke, Mississippi State University	River Hills - 11:30am
February 12	OneNexus - Matt Lee	River Hills – 11:30am
March 12	Deane Foss - Harvest Oil & Gas	River Hills – 11:30am
April 9	Kyle Murray - Valuable Elements from Brines	River Hills - 11:30am
May 14	Mark Worthy - MS Tertiary Recovery	River Hills - 11:30am

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601.936.6939
mnbirdwell@comcast.net

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Mandeville, LA 70471

504.756.2000
jmcduff@att.net

[illegible]



APRIL SPEAKER

Kyle Murray



“Pathway for Recovering Valuable Elements of Interest from Subsurface Brines and Oilfield Produced Waters”

Kyle Murray

Wednesday, April 9, 2025

Abstract:

Water that is co-produced with oil and gas is referred to as produced water. This water originated as seawater that occupied the pore space of marine sediments at the time of deposition. Over geological time, the sediment is buried, consolidated, and lithified, while minerals dissolve into the formation water. This “geologically-aged” seawater becomes a subsurface brine that can have total dissolved solids concentrations 10 times higher than the original seawater. After separating produced water from oil, the wastewater is normally disposed into saltwater disposal wells. However, because wastewaters and residual solids contain critical minerals (CM), rare earth elements (REE), and other elements of interest (EOI) that are in demand for medical, computer, and energy technologies, they are a potential resource in a twenty-first century circular economy.

A pathway for recovering EOI includes assessment of commodity markets, characterization of waters and wastes for EOI concentrations, and computation of gross values of EOI in \$/bbl or \$/tonne. Then evaluation of technologies that are economically favorable for extraction of the EOI. Indications are that 10 or more EOI can be economically extracted from subsurface brines and oilfield produced waters. Case studies and results from ongoing projects are presented including characterization of more than 60 EOI in produced water samples. The approach could be applied in any region of the world to assess potential for resource recovery of EOI from seawater, brackish water, subsurface brines, produced water, or solid wastes. The characterization and recovery of EOI from produced water will feed a circular economy.

Biography:

Dr. Kyle E. Murray is the Principal Scientist of Murray GeoConsulting, LLC. He earned a Ph.D. in Geological Engineering from Colorado School of Mines and has worked on geoscience projects since 1995. Dr. Murray’s experience as a consultant or researcher is in hydrogeology, natural resources and GIS databases, water resources, induced seismicity, produced water management, and resource recovery.



CURRENT PRICES

Market Watch

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

[+ Watchlist](#)

☀ OPEN

Last Updated: Apr 8, 2025 at 3:02 p.m. EDT - Delayed quote

\$ **59.05**

▼ -1.65 -2.72%

SETTLEMENT PRICE 04/07/2025

\$60.70



Natural Gas Continuous Contract

[+ Watchlist](#)

☀ OPEN

Last Updated: Apr 8, 2025 at 3:03 p.m. EDT - Delayed quote

\$ **3.523**

▼ -0.132 -3.61%

SETTLEMENT PRICE 04/07/2025

\$3.655





MGS SCHOLARSHIP AWARDS

Faculty & Students,

This month the Mississippi Geological Society along with the Boland Scholarship Fund is proud to honor the most outstanding students for the 2024-2025 year.

Each year, the Boland and Dustin Johnson scholarships award Mississippi students for their hard work and dedication to the Geosciences and their community.

We look forward to seeing you this month to help us celebrate these deserving winners

Best Regards,

Matt Caton
Editor





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](#)





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Joseph R. Johnson Jr.
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Three Lakeway
Suite 3360
3838 N. Causeway Blvd.
Metairie, LA 70002

Office: (504)-522-7496
jjohnson@clovellyoil.com

Joe R. White, Jr.
Petroleum Geologist

8505 Dogwood Trail
Haughton, LA 71037
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MONTHLY POST

Dr. David Dockery III RPG

GEOARCHAEOLOGY AND FORENSICS OF PROJECTILE POINTS

David T. Dockery III, RPG

MDEQ Office of Geology has a Lithic Materials website created by James Starnes that has greatly expanded our knowledge of the bedrock sources for projectile points (arrowheads), tools, ceremonial stones, and effigy pipes. The use of the term “forensics” in the title doesn’t mean that we are solving a crime, though that could be true of a death investigation by prehistoric Native Americans. Imagine a tribe pulling a spear or dart out of a victim of a night-time hit and run attack. The searing question is, “Who did this?” Blood is washed off the projectile point, and it is found to be a white chert. The chief proclaims, “It’s the Burlington Tribe!” Maybe even the style of knapping gives the tribe away.

The term “forensic,” as used here, is for the identification of artifact lithic types to determine their bedrock source. How far away and which direction is the bedrock source from where the artifact was found? Projectile points of Fort Payne chert turn up statewide, but the primary source of the chert is in the vicinity of Fort Payne in northern Alabama (Figure 1).



Figure 1. Fort Payne chert point from Desoto county, Mississippi.



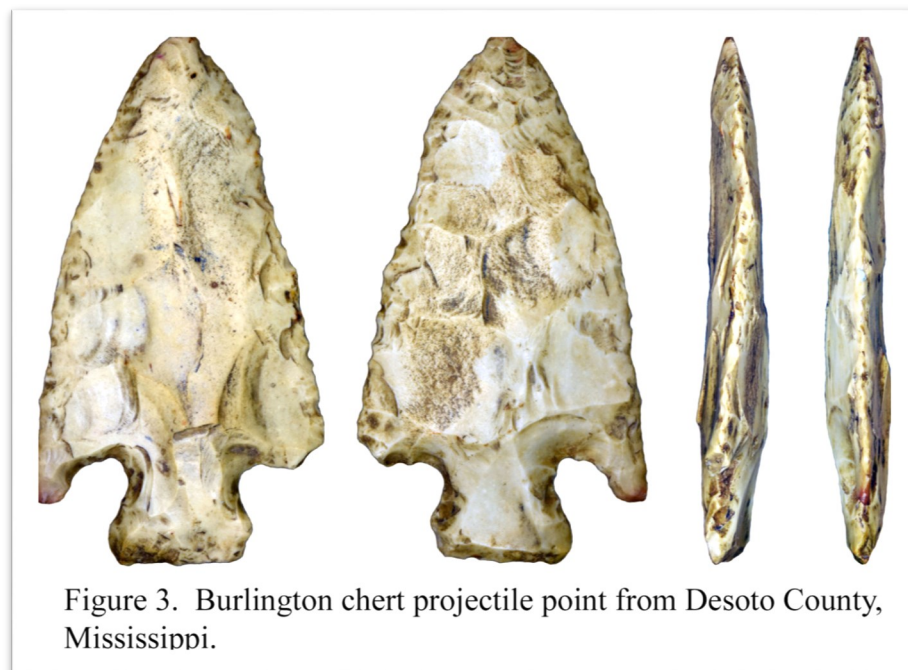
MONTHLY POST

Dr. David Dockery III RPG

Burlington, as cited above, comes from white chert in the Burlington Formation centered at the confluence of the Arkansas and Mississippi rivers. Figure 2 shows the distribution of Burlington points in Illinois, Kentucky, Missouri, Arkansas, Tennessee and Mississippi. This distribution chart only includes Desoto County in Mississippi.



Figure 3 is a Burlington chert point found on the Dockery farm south of Hernando, probably by my father or his brother. Based on our forensic identification, the raw material for this point came down the Mississippi River from a quarry near the confluence with the Arkansas River—or could there be another source?





MONTHLY POST

Dr. David Dockery III RPG

The pre-loess Mississippi River terrace gravels underlie Desoto County and continue southward in a band of perched gravels to Natchez, Mississippi. These gravels contain ice-rafted cobbles and boulders of various rock materials, including occasional cobbles of white chert. The question is, “Is this white chert Burlington chert?” In a weekly internal Geology Report for the week of September 6, 2019, we featured Donald Hearn of Hammett Gravel Company who brought us a white chert cobble with fossil blastoids (Figure 4).



Figure 4. Blastoid internal mold loose within the external mold from Hammett Gravel Company’s Redwood, Mississippi, pit.



MONTHLY POST

Dr. David Dockery III RPG

The internal mold of one blastoid was loose within the external mold, and we managed to get it out without damaging the molds. The blastoid species was identified as *Schizoblastus sayi*, a guide fossil for the Burlington Formation (Figure 5). Now we know that Burlington chert cobbles in pre-loess terrace gravel deposit may be a second source for Burlington chert projectile points.

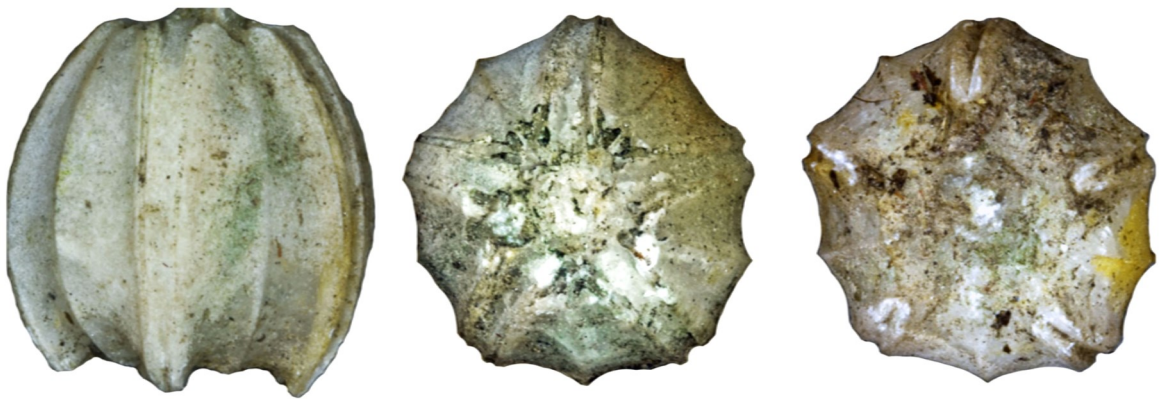


Figure 5. Internal mold of the blastoid *Schizoblastus sayi* from the Lower Mississippian Burlington Formation (Osage Group).



GEOLOGY POST

ARTICLES, PAPERS or NEWS?

ATTENTION!!!!!! Industry, Professors and Students:

I am looking for more content from the industry and our schools.

Submissions can include anything from professional papers, thesis abstracts, job opportunities to pictures. Anything!!!!

If you have any information or news you would like to share with the Society **PLEASE** email them to the MGS Editor at:

mcaton13@yahoo.com

Thanks & Regards,

Matt Caton
Editor

GEO LINK POST

USGS TAPESTRY OF TIME AND TERRAIN <http://tapestry.usgs.gov> The CCGS is donating to all of the 5th and 6th grade schools in the Coastal Bend. Check it out—it is a spectacular map. You might want a framed one for your own office. The one in my office has glass and a metal frame, and it cost \$400 and it does not look as good as the ones we are giving to the schools. Call Owen 510-6224 if you want one for your office for \$150. Duncan, Mike, Chris, Dave, Bob Randy, Seb., Kevin, Ken, Craig, Patrick, Robert.

FREE TEXAS TOPO'S <http://www.tnris.state.tx.us/digital.htm> these are TIFF files from your state government that can be downloaded and printed. You can add them to SMT by converting them first in Globalmapper. Other digital data as well.

FREE NATIONAL TOPO'S [http://store.usgs.gov/b2c_usgs/b2c/start/\(xcm=r3standardpitrex_prd\)/.do](http://store.usgs.gov/b2c_usgs/b2c/start/(xcm=r3standardpitrex_prd)/.do) go to this webpage and look on the extreme right side to the box titled TOPO MAPS DOWNLOAD TOPO MAPS FREE.

<http://www.geographynetwork.com/> Go here and try their top 5 map services. My favorite is 'USGS Elevation Date.' Zoom in on your favorite places and see great shaded relief images. One of my favorites is the Great Sand Dunes National Park in south central Colorado. Nice Dunes.

<http://antwrp.gsfc.nasa.gov/apod/astropix.html> Astronomy picture of the day — awesome. I click this page everyday.

<http://www.spacimaging.com/gallery/ioweek/iow.htm> Amazing satellite images. Check out the gallery.

<http://www.ngdc.noaa.gov/seg/topo/globegal.shtml> More great maps to share with kids and students.

www.geo.org Don't forget we have our own web page.

<http://micro.magneet.fsu.edu/primer/java/scienceoptiscu/owersofl0/>

<http://asterweb.jpl.nasa.gov/galery/default.htm> Great satellite images of volcanoes

<http://terra.nasa.gov/gallery/> More here

www.ermapper.com They have a great free downloadable viewer for TIFF and other graphic files called ER Viewer.

www.drillinginfo.com This is an incredible (subscription) well and completion data service for independents. Can be demo'ed for free.

<http://terraserver.com/> Go here to download free aerial photo images that can be plotted under your digital land and well data. Images down to 1 meter resolution, searchable by Lat Long coordinate. Useful for resolving well location questions.

<http://www.fs.fed.us/gpnmf/volcanocams/msh/> This is a live cam of Mt. St. Helens refreshed every 5 minutes. At the bottom are old videos of past eruptions in this cycle. It is worth a watch especially now.



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(Note: Please contact Steve Walkinshaw at (601) 607-3227 or mail@visionexploration.com for details concerning placing your ad on the MGS web site.)

Total Remitted \$ _____

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