

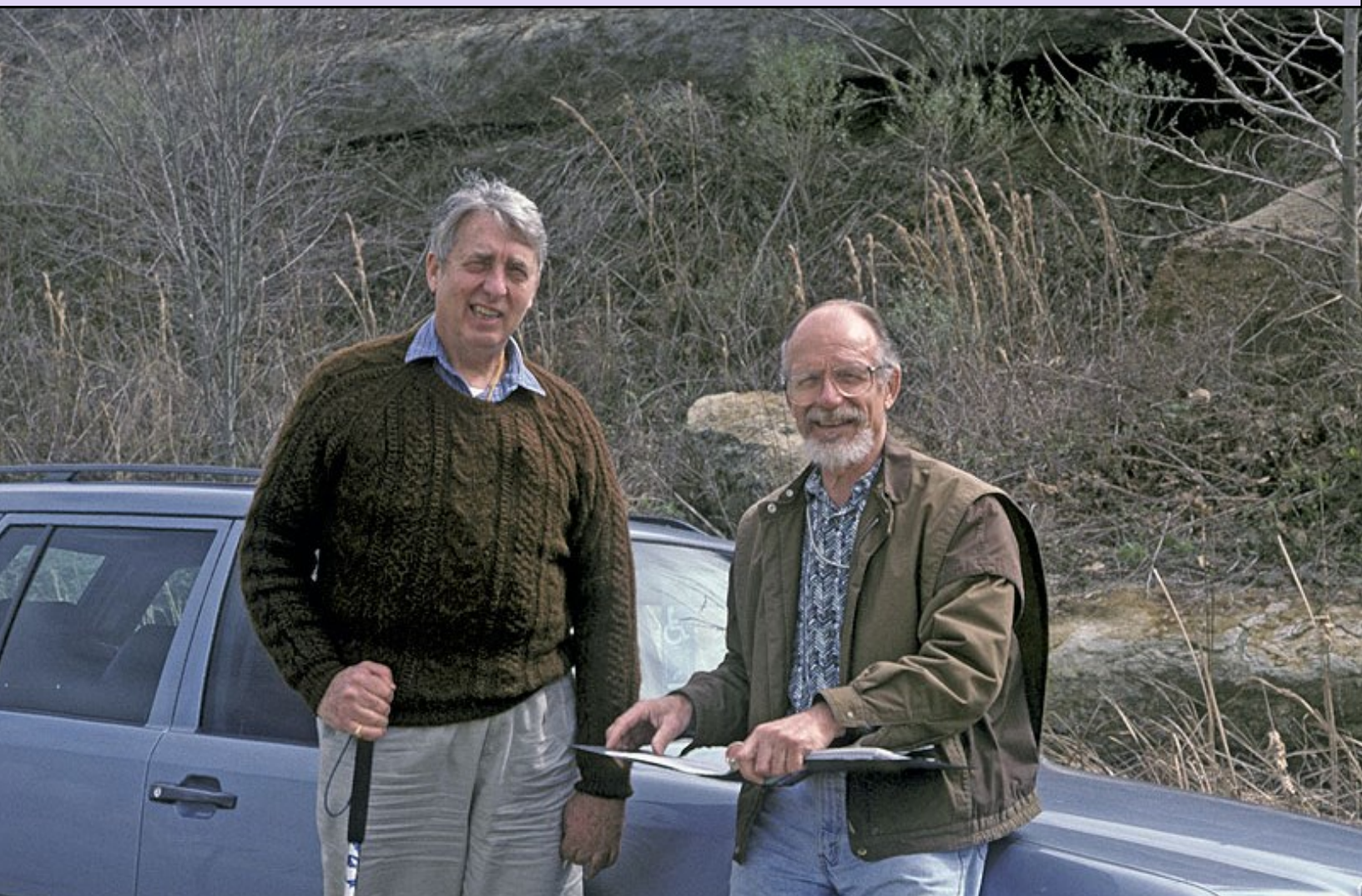
MISSISSIPPI GEOLOGICAL SOCIETY

*e***BULLETIN**

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**SEAFLOOR GAS SEEPS: DISCOVERY, GEOLOGIC INVESTIGATION, AND
ENERGY RESOURCE IMPLICATIONS**

Dr. Adam Skarke, Associate Professor, Mississippi State University

MISSISSIPPI OFFICE OF GEOLOGY NEW PUBLICATIONS

**PETER VAIL, FATHER OF THE “VAIL CURVE” IN SEQUENCE STRATIGRAPHY,
PASSES AT THE AGE OF 94**

Dr. David Dockery III, RPG



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PRESIDENT'S LETTER



Dear MGS Members,

Happy New Year!

We express our sincere gratitude to all members who participated in the Oil and Gas Industry Christmas Party. The event was an immense success, and we anticipate replicating this achievement in the forthcoming year.

We are privileged to announce that our upcoming meeting on January 8th at River Hills Club in Jackson will feature a presentation by Dr. Adam Skarke from Mississippi State University. Dr. Skarke's will discuss "Seafloor Gas Seeps: Discovery, Geologic Investigation, and Energy Resource Implications," will delve into the methodologies employed in identifying and analyzing seafloor gas seeps, their geological significance, and the potential implications for energy resources.

If you have a topic or are interested in presenting at our meetings, please let me know. We are always looking for speakers and subjects for our 2025 schedule.

We extend our heartfelt appreciation for your continued involvement and active participation in the Mississippi Geological Society. The accomplishments of our society serve as a testament to the dedication and expertise of our members. I look forward to 2025!

Jonathan R. Leard, RPG

MDEQ-Office of Geology

Surface Geology Division

Phone: (601)-961-5352

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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		River Hills – 11:30am
March 12		River Hills – 11:30am
April 9		River Hills - 11:30am
May	Spring Fling	TBD

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JANUARY SPEAKER

Dr. Adam Skarke



Seafloor Gas Seeps: Discovery, Geologic Investigation, and Energy Resource Implications

Abstract:

Seafloor seeps are locations where gas (primarily methane) is discharged from marine sediments into the ocean. They are widely recognized as an important component of the global carbon cycle because they directly link methane reserves in subseafloor sediments — the largest carbon reservoir on Earth — to the marine environment. Methane released at seeps drives a wide range of interconnected biogeochemical processes in the shallow subsurface, at the seafloor, and in the overlying water column. These processes contribute to ocean acidification and deoxygenation but also result in extraordinary hotspots of deep-sea benthic biodiversity with unique authigenic rock outcrops that harbor complex chemosynthetic ecosystems. Additionally, gas seeps indicate the potential for significant marine geohazards and are a demonstrated energy exploration and production resource. Gas seeps are globally distributed on continental margins with their extent as well as abundance only beginning to be recognized in the last two decades. This talk will present the discovery of widespread seafloor methane discharge on the US Atlantic margin and subsequent exploration of seep environments with human-occupied as well as uncrewed and submersible vehicles. Additionally, it will review novel machine learning-based geophysical data processing methods used for seep discovery. Finally, it will discuss some of the more geologically enigmatic aspects of seep occurrence and behavior as well as the implications and applications of seeps for energy exploration and production.

Bio:

Adam Skarke is an Associate Professor of Geology in the Department of Geosciences at Mississippi State University. His research is broadly focused on marine geology and geophysics. Specifically, Adam's research investigates fundamental physical relationships between sediment transport, morphological expression, stratigraphy, and subsurface fluid flow in seafloor environments that span the continental margin from coastal waters to the deep sea. His technical approach is field-based and focused on the analysis of geological, geophysical, and oceanographic data collected with innovative environmental observing sensors and platforms. Adam has participated in 24 oceanographic research cruises and utilized human-occupied submersibles, remotely operated submersibles, and autonomous underwater vehicles to conduct subsurface, seafloor, and water column exploration.



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▼ -0.92 -1.24%

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\$74.25



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\$ **3.681**

▲ 0.232 6.73%

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\$3.449





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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MONTHLY POST

Dr. David Dockery III RPG

PETER VAIL, FATHER OF THE “VAIL CURVE” IN SEQUENCE STRATIGRAPHY,
PASSES AT THE AGE OF 94.

Peter Vail (1930-2024) passed on December 28, 2024 (Figure 1 from legacy.com). He worked for the U.S. Geological Survey in the summer months while in graduate school at Northwestern University. According to legacy.com (Bradshaw-Carter Memorial & Funeral Services—Houston), “While working for the U.S. Geological Survey during a college summer, Peter made an overnight stop in Talyorville, Illinois, where he met his beloved wife, Carolyn Flesher. The two were married in 1956, the same year Peter earned his doctorate. Their partnership spanned decades, marked by love, travel, and an unwavering commitment to family.”



“Peter and Carolyn began their life together in Tulsa, Oklahoma, where he worked for the Carter Oil Company. During their years in Tulsa, they welcomed three children. In the early 1960’s, when Carter Oil merged with Humble Oil and Esso to become Exxon, Peter moved his family to Houston, Texas, where he worked at the Exxon Production Research Company until his retirement as Senior Research Scientist in 1986. Post-retirement, Peter launched a second career as the W. Maruice Ewing Professor of Oceanography at Rice University. Peter was a pioneering geologist whose groundbreaking work integrating geology and geophysics revolutionized the interpretation of subsurface data, hydrocarbon exploration, and our understanding of Earth’s geologic history. He was the first to demonstrate that seismic reflections follow geologic timelines rather than lithofacies boundaries, leading to the development of seismic and sequence stratigraphy interpretation methodologies. His research revealed how seismic reflection patterns corresponded to globally correlative sea-level changes, resulting in the creation of the renowned “Vail Curve,” depicting how the sea level changed over geologic time.”



MONTHLY POST

Dr. David Dockery III RPG

While Peter Vail correlated seismic reflections of specific geologic ages on continental shelves worldwide, much of his data came for the North American Gulf Coastal Plain. After I published *Mississippi Geological Survey Bulletin 120* on the molluscan fossils of the Late Eocene Moodys Branch Formation in 1977, I was invited by a colleague, Luc Dolin, to collect Bartonian (Auversian) fossils for a month in the Paris Basin of France, which I did in 1979. In 1980, Luc and his brother Cyrille came to collect fossils from the Jackson Group in Mississippi; they stayed with my family's next door neighbor, who had a daughter studying French. Then I and my newly wed wife Mary went to collect Eocene and Oligocene fossils in France. What made this great connection between Mississippi and France?—Sequence Stratigraphy, the global rise and fall of sea levels, and marine deposits of the same age on the opposite sides of the Atlantic. So, we were onboard with the concept of Sequence Stratigraphy when Peter Vail's Chapter *Seismic Stratigraphy and Global Changes of Sea Level, Part 3: Relative Changes of Sea Level from Coastal Onlap* was published in an AAPG Memoir (January 1, 1977). Figure 2 is a picture of our French-American fossil collecting expedition to the Early Oligocene of the Aquitaine Basin of Southwestern France.



Figure 2. From left to right, Luc and Therese Dolin, Pierre Lozouet, Cyrille Dolin, and Mary and David Dockery collecting fossil in the Lower Oligocene at Gaas in the Aquitaine Basin of Southwestern France, July 26, 1983.



MONTHLY POST

Dr. David Dockery III RPG

While in agreement with the general Vail, Mitchum, and Thompson (1977) sea-level curve, some of us disagreed as to where elements of the curve fit in the Gulf Coast Eocene-Oligocene section. Some called the Eocene-Oligocene boundary at the Shubuta Clay-Red Bluff Clay contact a highstand condensed section (a time a maximum marine flooding) based on the section in St. Stephen's Quarry in Alabama, and others (me) called it lowstand erosional surface (a time of maximum marine regression) based on sections in Mississippi. This controversy continued in the SEPM Foundation's Eleventh Annual Research Conference, Gulf Coast Section in Houston, Texas, on December 2-5, 1990. I gave a paper on *The Eocene-Oligocene Boundary in the Northern Gulf—A Sequence Boundary* (pages 141-150, as published in the meeting's *Program and Extended and Illustrated Abstracts*, 409 pages). The meeting was full, and many that wanted to attend were turned away. So, a second meeting with the same presenters was held in Houston on June 2-5, 1991, with a republication of the *Program and Extended and Illustrated Abstracts*. Later, a comprise suggested that the Shubuta-Red Bluff boundary was sequence boundary resting on (or merged with) a highstand condensed section. The boundary more recently has been described as a lowstand hiatus in: Miller, K. G., P. R. Thompson, and D. V. Kent, 1993, *Integrated Late Eocene—Oligocene stratigraphy of the Alabama coastal plain: correlation of hiatuses and stratal surfaces to glacioeustatic lowering: Paleceanography*, v. 8, no. 2, p. 313-331, and Miller, K. G., J. V. Browning, M.-P. Aubry, B. S. Wade, M. E. Katz, A. A. Kulpecz, and J. D. Wright, 2008, *Eocene-Oligocene global climate and sea-level changes: St. Stephen Quarry, Alabama: Geological Society of America Bulletin*, v. 120, no. 1-2, p. 34-53.

Sequence Stratigraphy has moved beyond a concept to a scientific revolution in geology. It has given us a new way to look at the geological record, a new vocabulary of technical geologic terms, a new way to conduct our practice of geology, and something new to argue about. Figure 3 is a picture of Peter Vail and Jon Hardenbol at an outcrop of the Vicksburg Group north of Vicksburg, Mississippi. The limestone of this outcrop was deposited in the same global sea-level rise as was the Early Oligocene deposits in Figure 2 at Gaas, France.



Figure 3. Peter Vail (left) and Jan Hardenbol at the cut in the Vicksburg Group at the International Paper Company off Highway 3 in Warren County (MGS locality 113). The Byram Formation is present above the upper layer of the Glendon Limestone in the overgrown exposure. Picture (Kodachrome slide 308-2; Image 87) taken on March 3, 1997.



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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