

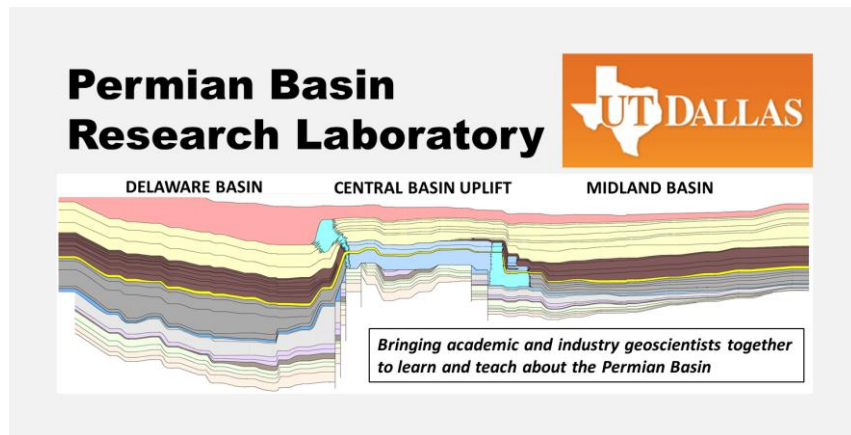
# Newsletter

## Spring 2024

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# UT Dallas Permian Basin Research Lab



Co-Directors: Dr. Robert Stern, Professor  
Mr. Lowell Waite, Lecturer  
Established 2019

Website: <https://labs.utdallas.edu/permianbasinresearch/>  
Join Facebook Group "Permian Basin Research Laboratory"

## Permian Basin Research Lab:

## Welcome

# The UTD PBRL Newsletter, Spring, 2024

Welcome back to our official newsletter, this one for Spring, 2024!

The Permian Basin Research Lab was officially established in January 2019, within the Department of Geosciences at the University of Texas at Dallas. We are very proud of what we've accomplished in 5 short years!

In this newsletter you'll learn about what we've been up to since last year's newsletter. In the following pages, you can find out who we are (p. 3), read about a recent personnel addition to our lab, Mr. Mark Varhaug (pg. 4), our continuing research efforts (p. 5), learn about our teaching and training activities beyond the formal courses we teach at UTD (p. 6), read brief descriptions of our Masters students currently working in our lab or who have graduated since our last newsletter (p. 7), enjoy some exciting news (p. 8), and learn about UTD Comets Giving Day on April 3-4, 2024 (p. 9), when our many friends and supporters can help us fulfill our mission and goals:

- Advance understanding of all geologic aspects of the Permian Basin through open applied research, linking academia and industry
- Educate students interested in industry careers by providing experience with subsurface data sets in the analysis of sedimentary basins and petroleum systems

In 2024 we continue our effort to expand our network of students and industry partners. We rely heavily on our industry supporters to provide ideas and data for student projects, hire and provide internships for our students, and who support us financially. All financial support goes to support our students!

Sincerely,  
Bob and Lowell



## Permian Basin Research Lab:

## People

### Directors

**Dr. Robert J. Stern** Professor of Geosciences, UT Dallas  
**Mr. Lowell Waite** Lecturer, UT Dallas

### Researchers

**Dr. Mortaza Pirouz** Senior Lecturer, UT Dallas  
**Dr. Hejun Zhu** Assistant Professor, UT Dallas  
**Mr. Mark Varhaug** Adjunct Assistant Professor, UT Dallas

### Affiliated Faculty

**Dr. Majie Fan** Associate Professor, UT Arlington

### Industry Associates

**Dr. Yuxiang (Shawn) Zhang** Geoscientist  
**Mr. David Williamson** Founder, Wheelhouse Geoscience  
**Mr. Tim Reed** Pioneer Natural Resources (Retired)

Note: Full bios are available on the Permian Basin Lab website:  
<https://labs.utdallas.edu/permianbasinresearch/>



Permian Basin  
Research Lab:

People (continued)

## NEW PERSONNEL ADDITION TO THE LAB: MR. MARK VARHAUG



We are proud to announce that **Mark N. Varhaug**, P.G., C.P.G., of Dallas, has joined PBRL as of February 2024. He retired in 2020 after 46 years as a geologist applying his geological and analytical skills to oil and gas field mapping. During that time, he worked in Houston and Dallas for companies that explored and developed oil and gas fields in Texas and Louisiana onshore and offshore areas. Since 2020, he has been an independent geologist in Dallas. Mark also serves the State of Texas as a member of the Texas Board of Professional Geoscientists where he is Secretary/Treasurer of the Board. In this role, he chairs Board Committees and makes presentations on professional ethics to professional societies and conferences

The last 21 years before retiring, Mark was a Senior Geologist and Vice President for DeGolyer & Macnaughton. In that role, he evaluated and mapped petroleum fields world-wide. In addition to geological mapping, Mark learned about geophysics, petrophysics, reservoir engineering, and petroleum economics.

Mark earned his BS degree in Geology from Southern Methodist University in 1974. He is a Licensed Professional Geoscientist in Texas and Louisiana and an AAPG C.P.G. He is a member of the Dallas, Fort Worth, Houston, and West Texas Geological Societies, The Geological Society of America, and The Texas Energy Council.

In 2024, Mark was appointed Adjunct Assistant Professor in the School of Natural Sciences and Mathematics at The University of Texas at Dallas. He wanted to join the University so he could share his skills and knowledge with undergrad and graduate students.

Mark has an office in the Permian Basin Research Lab and can be contacted there or by email ([Mark.Varhaug@utdallas.edu](mailto:Mark.Varhaug@utdallas.edu)).

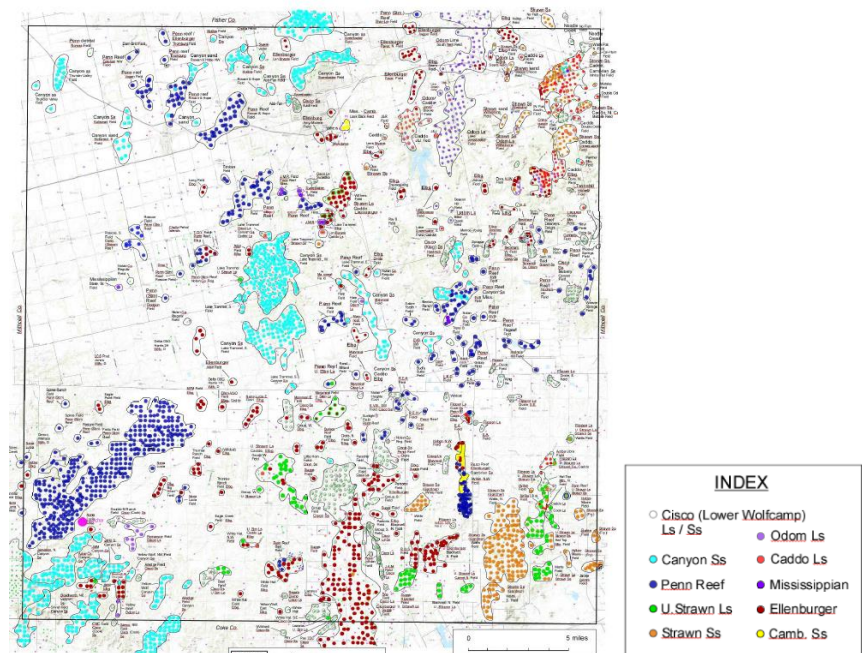
## Permian Basin Research Lab: Research

**Eastern Shelf of the Midland Basin:** In 2023 and into 2024, we continue to focus our research within the Lab to better understand the depositional systems and hydrocarbon reservoirs of the Eastern Shelf of the Midland Basin, west Texas.

We continue to work on this stratigraphically complex region, having completed assessments of producing trends in Nolan and Fisher, and Kent Counties, with plans to expand into eastern Scurry County. In addition to providing potential M.S. projects for UTD students, we hope ultimately to better understand the future hydrocarbon potential of this mature geologic province. Our work in Scurry County will augment a machine learning study at the SMU Department of Mathematics directed by Mr. Todd Garner.

As mentioned, with the addition of Mark Varhaug to our lab, there will be a new focus moving forward on preparing students for professional careers in energy and other geoscientific fields. The job market today for all geoscience graduates is challenging and Mark wants to offer his experiences and perspectives to students as they begin their professional lives. Many geology students finish school with strong educational backgrounds but could benefit from additional training in practical skills they will need to start working in companies. We hope to impress our students with the importance of developing professional contacts, help identify mentoring and employment opportunities, and strengthen interpersonal, communication, and presentation skills.

### NOLAN COUNTY PRODUCING ZONES



(large, downloadable version of this map available on PBRL website)

**Permian Basin  
Research Lab:  
Teaching and Training**

## TEACHING AND TRAINING

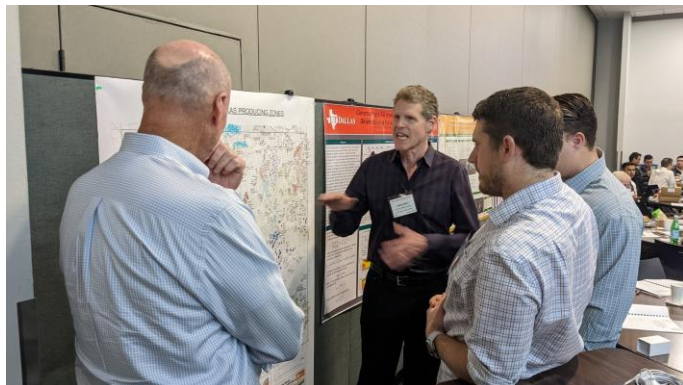
Teaching and training continue to be a focus of the Lab. We are always happy to engage with local energy companies to share knowledge and data. In 2022 we interfaced primarily with Foundation Energy Management in Dallas. We value all our industry partners.

In 2023, we taught energy-related Undergraduate and Graduate courses on Geology Resources and Environment of Latin America (Stern), Sustainable Energy (Stern) and Carbonate Sedimentology (Waite).

Classes in the current semester (Spring, 2024) include Geology of the Permian Basin (Waite)

We continued to accept invited speaking opportunities in 2023 whenever possible. Presentations include:

- Dallas SIPES (Stern, Marianas Trench; March 21, 2023)
- North Texas Women's Energy Network (Waite, Permian Basin petroleum system; April 5, 2023)
- Fort Worth Geologic Society (Waite, Eastern Shelf; April 11, 2023)
- Permian Basin Section-SEPM (Waite, Eastern Shelf; May 16, 2023)



**Permian Basin  
Research Lab:  
Student Projects**

## STUDENT PROJECTS

In 2023, Emily Strain completed her project on a geologic characterization of a portion of Lea County, New Mexico. With an initial geologic data base generously provided by Foundation Energy Partners, Dallas, Texas, she was able to build a stratigraphic framework and access the main producing units of a local region of subsidence known as the Tatum Basin of the Northwest Shelf. Her final database included over 60,000 wells and 7000 digital and raster logs, which she analyzed using both Petra and Enverus software tools. Emily graduated with her MS in Geoscience from UTD in December 2023.



Our newest graduate, Emily Strain

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M.S candidate Jordan Groff joined the PBRL Team last year. He is in the process of completing a study of the stratigraphy and structural elements of pre-Pennsylvanian units of Gaines County, Texas. This area was the NW part of the Tobosa Basin and occurs at the nexus of several key sub-regions of the Permian Basin, including the Northwest Shelf, San Simon Channel, Central Basin Uplift, and Horseshoe Atoll. Jordan's work is focusing on fields producing from Devonian carbonates of the Frame Formation of the Wristen Group, which were likely sourced by the overlying Woodford Shale. Jordan's expected graduation date is December 2024. He recently accepted an internship position with Kinder-Morgan in Houston for the summer of 2024.



Jordan Groff

## Permian Basin

### Research Lab:

## Recent News

### RECENT NEWS

- We wish to extend our gracious thanks to Mr. Beau Tinnin of EOG Resources for his continued support and generous monetary donations to the Lab. These funds will be applied directly to support student projects.
- We continue our fruitful partnership with Enverus and their University Liaison Program. Last year they provided software training for three of our M.S students in the Lab, and this year, several students obtained their certification in the Enverus Prism application. <https://www.enverus.com/>
- We continue to partner with M.J. Logs to provide the Lab with high quality raster log images for minimal cost. Obtaining these well logs are critical to our research on the Eastern Shelf and Permian Basin <https://mjlogs.com/>





Comets Giving Day is an annual fund-raising event at UT Dallas. This is a chance for individuals to contribute to the future of UTD by directly supporting our students. We wish thank all those individuals who graciously donated funds to the UTD Geoscience Department, and to the Permian Basin Research Lab, during past Comet Giving Days.

Comet's Giving Day this year will be held on April 3 - 4, 2024. Donations may be targeted to several funds within the UTD Department of Geosciences, including a Permian Basin Research Lab Fund. Even a small donation makes a difference for our students!

In addition to The PBRL, there are many Geoscience funds to choose from. Featured this year will be:

1. **Sustainable Earth, Environment, and Natural Resources** - these funds will be used to help our geoscience faculty, both new and experienced, to develop new courses, research opportunities, and field methods for undergrad and grad students.
2. **Geoscience Studios** - these funds will pay undergraduate students supervised by Dr. Stern's project to make more student educational outreach videos explaining geologic concepts.
3. **Earth Science Field Camp** – Dr. Zach Sickmann has recently revamped our summer field camps, and the Department sets aside funds to reimburse students their \$1,000 field camp fees via scholarships.
4. **Earth Science student research** - Most of our endowments and grants are focused on graduate student scholarship support. We have a great need for BS (and some MS) level student research project support.

Other important labs that need funding for student research include the **Micro-Imaging Lab**, run by Dr. Stern, Ignacio Pujana, and Kristina Butler, including a scanning electron microscope, an X-ray diffractometer, a Laser Raman instrument, handheld X-ray fluorescence unit; and the **Meteorite Education and Research Lab**, run by Dr. Stern and Dr. Randy Griffin, which houses a growing collection of meteorites uses for teaching.

Information on Comets Giving Day, including how to donate, may be found here <https://givingday.utdallas.edu/giving-day/83844>