

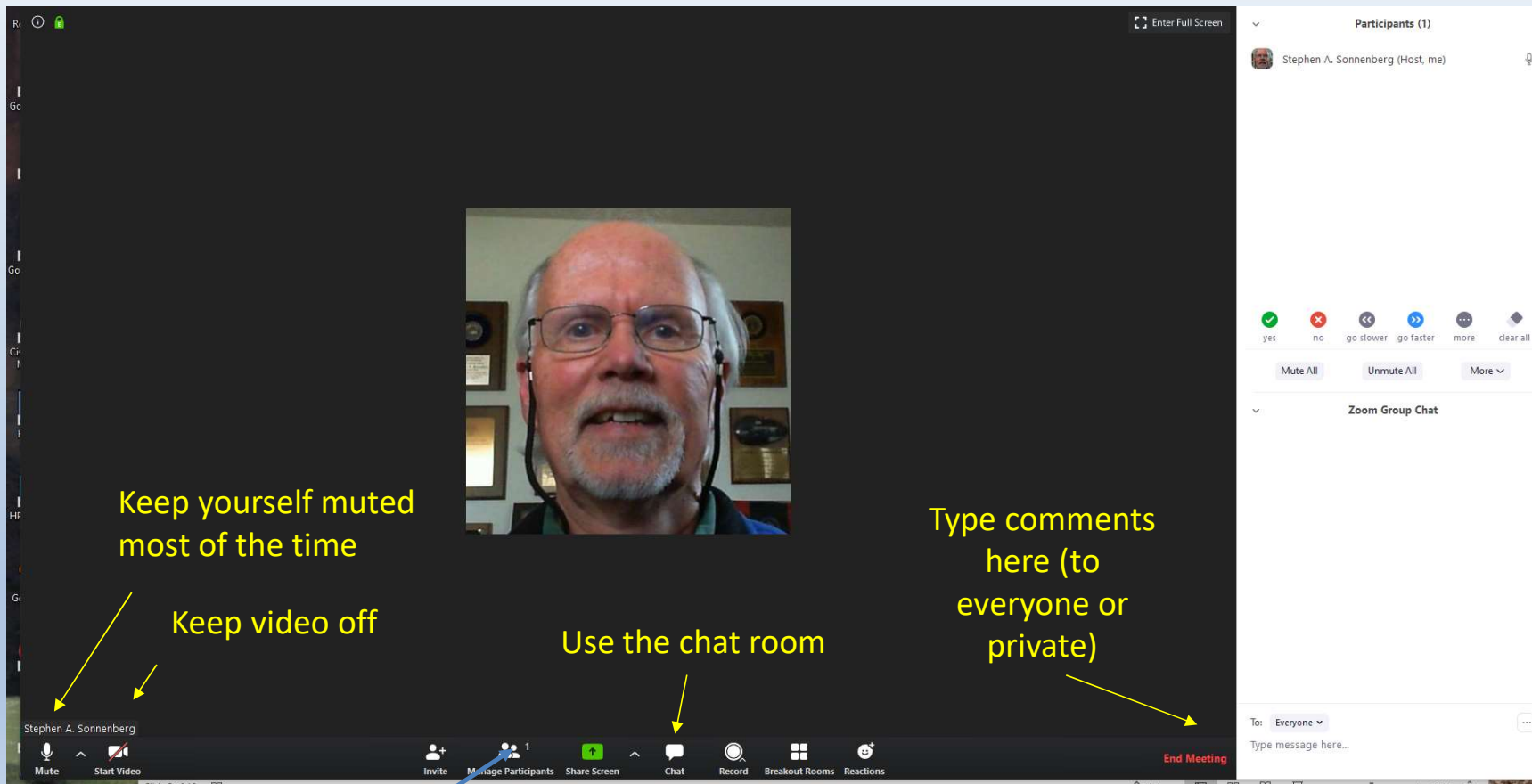


COLORADO SCHOOL OF  
**MINES**<sup>®</sup>  
**MUDTOC**

Steve Sonnenberg  
MUDTOC PI/Director

**SPRING 2022 MEETING**

# Zoom Suggestions



Participant's list

## MUDTOC Advisors, Faculty & Committee Members

- Steve Sonnenberg, PI
- Chris Matson, RC

### Advisors:

- John Curtis
- Jim Emme
- Matt Bauer
- Mike Hendricks
- Bill Zogg

### Recent Committee Members

- Marsha French
- Donna Anderson
- Mary Carr
- Zane Jobe
- James Hagadorn
- Hossein Kazemi
- Jennifer Miskimins
- John Kaszuba, UW
- Mark Longman
- Keith Shanley
- Jeff May
- Ali Tura
- Terri Olsen

# MUDTOC Research



Mudrock and Tight Oil Characterization Consortium (includes Carrier Bed / Halo Plays)

- Denver Basin:
  - Skull Creek, Niobrara, Codell
- Powder River Basin:
  - Mowry, Niobrara, Frontier/Turner, Shannon
- Permian Basin (Midland & Delaware):
  - Wolfcamp
  - Avalon, Bone Springs
- Appalachian Basin:
  - Marcellus
  - Utica
- Williston Basin:
  - Bakken Petroleum System (Bakken & Three Forks)
- GGRB
  - Lewis Shale
- San Juan Basin:
  - Niobrara & Semilla SS
- Neuquen Basin
  - Vaca Muerta
- CCUS: Niobrara, Bakken
- Geothermal: Rockies and Gulf Coast

# MUDTOC Characterization

- Outcrop & Core descriptions
- Basin Modeling
- 3D seismic
- Petrographic thin sections
- FE SEM, EDS, EDS mineral maps
- QEMSCAN
- XRD
- XRF + mineral models
- SRA
- Bambino
- MICP, Nitrogen adsorption, water (kerosene) immersion, etc.
- TinyPerm3 & other permeability measurements
- Petrophysics + NMR + ECS
- Core Scanning
- Carbon & oxygen isotope analysis
- CCUS
- Geothermal

# MUDTOC Project Ideas

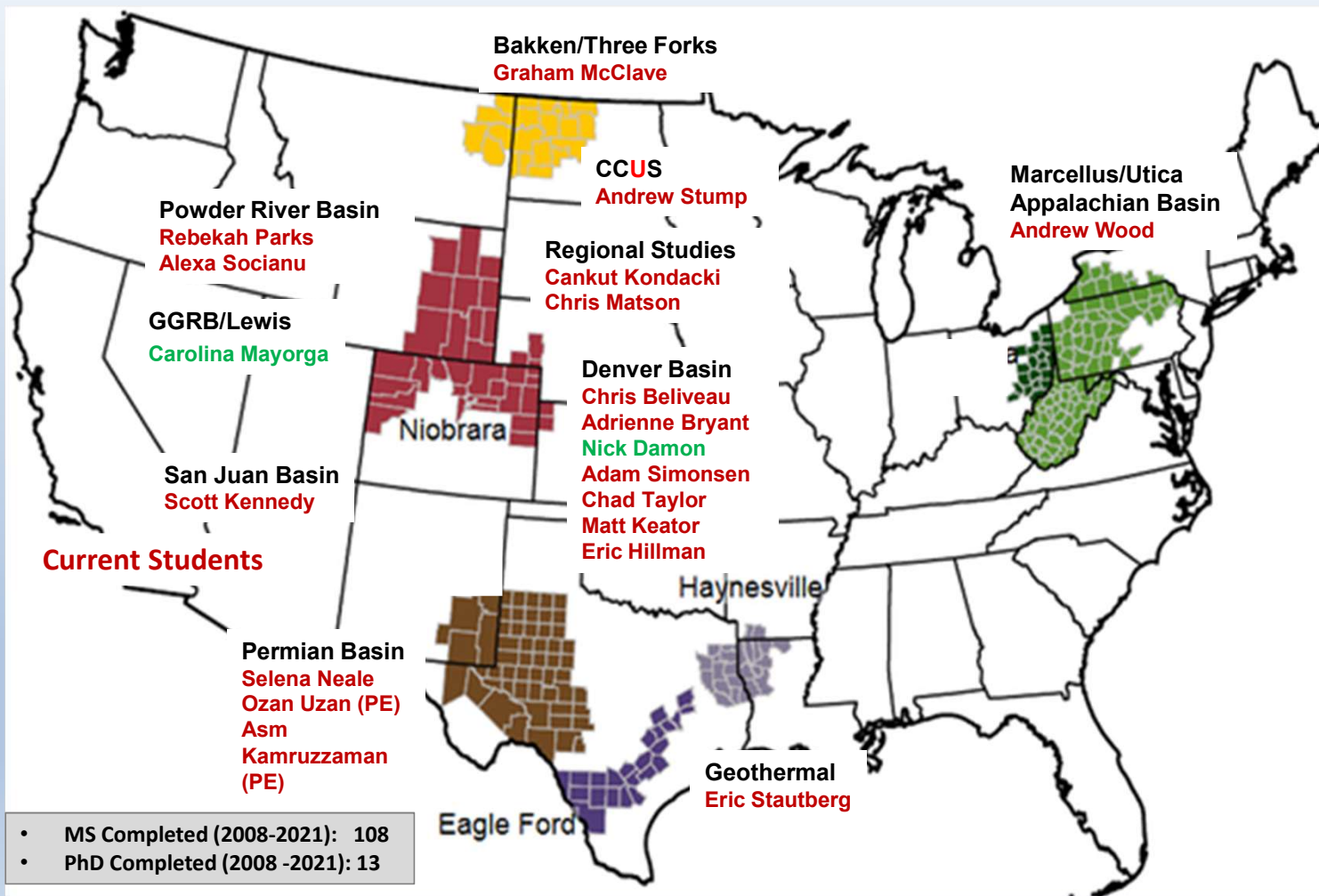


- NMR & ECS - Permian, Bakken, Niobrara, Mowry, etc.
- Niobrara & Greenhorn Regional
  - Ash beds, biostratigraphy, OAEs, etc.
- Niobrara Redtail area
- Niobrara Newatt area
- Niobrara/Codell Postle Wattenberg area
- Codell Redtail area
- Codell Silo area
- Pyrobitumen in Niobrara (Wattenberg)
- Denver basin-Skull Creek
- Biogenic/authigenic silica-Bakken, Mowry
- Three Forks Deposition model, Petrophysics, Dolomite, etc.
- Basin Modeling: Permian
  - Pressure & Temperature Anomalies
- Permian continued
  - Comparison of Wolfcamp from gas, gas-condensate, oil windows
  - Water occurrences in Wolfcamp
  - Machine Learning
- Faults & fractures
- Carrier-Bed Plays
- CCUS Wolfcamp, Niobrara
- CCUS Niobrara
- CCUS Bell Creek Muddy Sandstone
- Lewis Shale, GGRB
- Geothermal

# Advisory Board Suggestions

- Silo area Codell study ✓
- Wettability studies ✓
- Fluid & rock interactions ✓
- OAE II & III ✓
- PRB & DJB – burial history & maturity studies northern part of basin
- Regional stratigraphic study Frontier to Turner ✓
- Austin Chalk study
- Geothermal studies ✓
- CCUS (HC gas & CO<sub>2</sub>) ✓

# MUDTOC Project Areas





# MUDTOC Consortium Sponsors

## Spring 2022



### Sponsoring Member Companies



### In-Kind Supporting Companies

GEO MARK



Mike Johnson & Associates

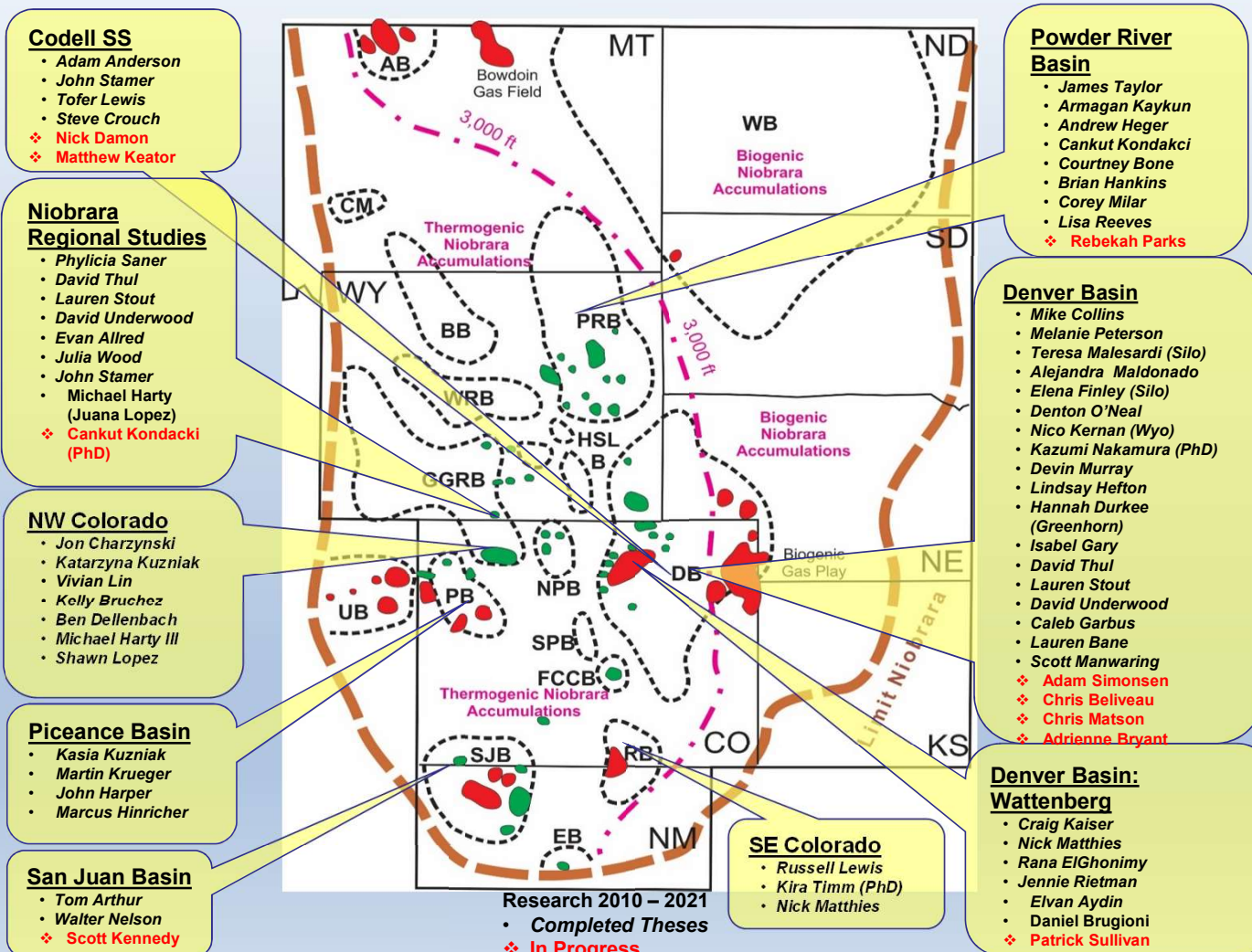


**PRA**  
Platte River Associates, Inc.

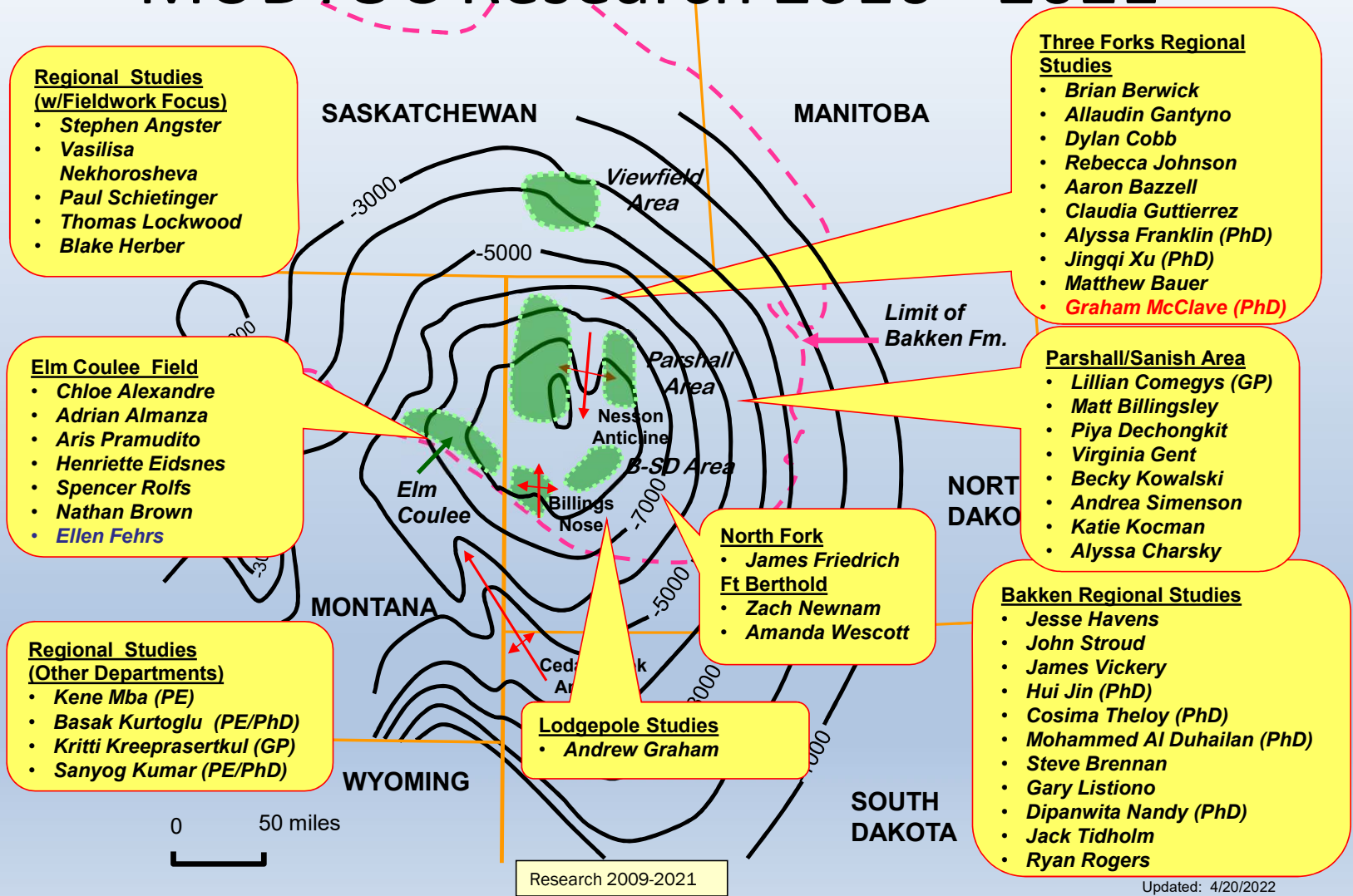
Schlumberger



# MUDTOC Research 2010 - 2021



# MUDTOC Research 2010 - 2021



- Regional Studies (w/Fieldwork Focus)**
- Stephen Angster
  - Vasilisa Nekhorosheva
  - Paul Schietinger
  - Thomas Lockwood
  - Blake Herber

- Elm Coulee Field**
- Chloe Alexandre
  - Adrian Almanza
  - Aris Pramudito
  - Henriette Eidsnes
  - Spencer Rolfs
  - Nathan Brown
  - Ellen Fehrs

- Regional Studies (Other Departments)**
- Kene Mba (PE)
  - Basak Kurtoglu (PE/PhD)
  - Kritti Kreeprasertkul (GP)
  - Sanyog Kumar (PE/PhD)

- Lodgepole Studies**
- Andrew Graham

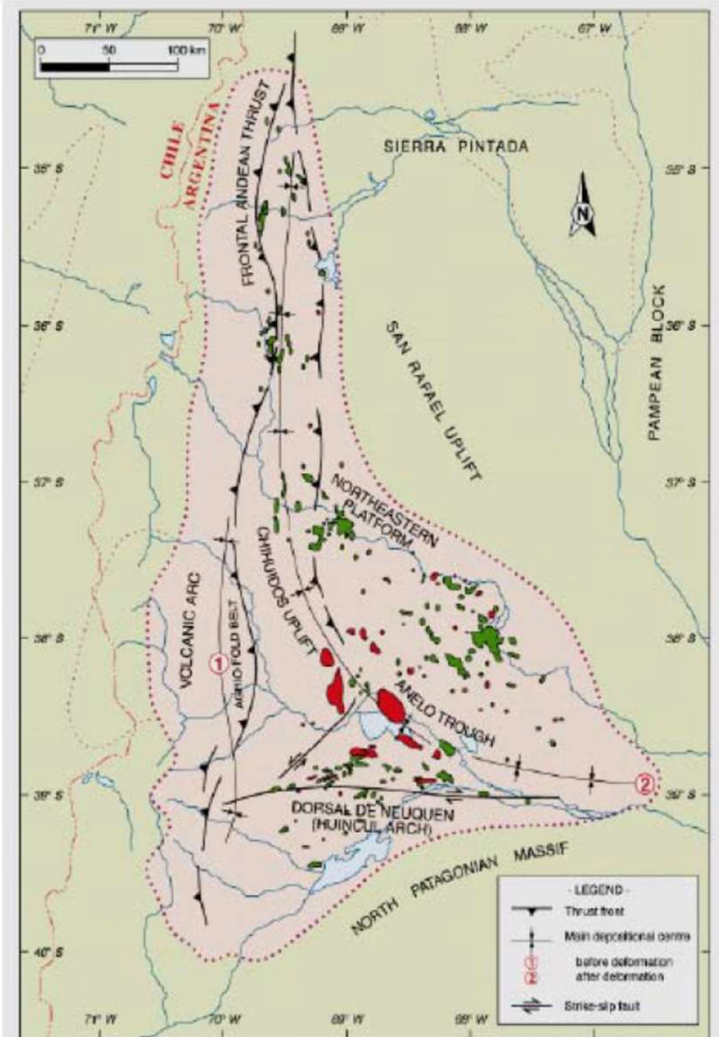
- North Fork Ft Berthold**
- James Friedrich
  - Zach Newnam
  - Amanda Wescott

- Three Forks Regional Studies**
- Brian Berwick
  - Allaudin Gantyno
  - Dylan Cobb
  - Rebecca Johnson
  - Aaron Bazzell
  - Claudia Guttierrez
  - Alyssa Franklin (PhD)
  - Jingqi Xu (PhD)
  - Matthew Bauer
  - **Graham McClave (PhD)**

- Parshall/Sanish Area**
- Lillian Comegys (GP)
  - Matt Billingsley
  - Piya Dechongkit
  - Virginia Gent
  - Becky Kowalski
  - Andrea Simenson
  - Katie Kocman
  - Alyssa Charsky

- Bakken Regional Studies**
- Jesse Havens
  - John Stroud
  - James Vickery
  - Hui Jin (PhD)
  - Cosima Theloy (PhD)
  - Mohammed Al Duhailan (PhD)
  - Steve Brennan
  - Gary Listiono
  - Dipanwita Nandy (PhD)
  - Jack Tidholm
  - Ryan Rogers

Updated: 4/20/2022



Source: Americas Petrogas

**VACA MUERTA RESEARCH TITLES/(OR DRAFT PROPOSAL TITLE)**

**Max Willis: MS, PE**

**Talgat Kosset: MS, PE**

**Anton Padin: PhD, PE**

**Matt Herzog: MS, PE**

**Eider Hernandez-Bilbao: PhD, Geology/GE**

**Ted Kernan: MS Student in Geology**

**Josefina D'Hiriart: PRMS Geology/GE**

**Jessica Franklin: MS Geology/GE**

**Sebastian Ramiro: MS, Geology/GE**

**Dina Hegazy: MS PE**

**Darkhan Maulimgazy: MS, PE**

**Pablo Benitez: PRMS, Geology**

**Kyla Bishop: MS GP**

**Pedro Biscayart: PRMS Geology**

# Research Topics

## EAGLE FORD, HAYNESVILLE, MARCELLUS RESEARCH

