Jason Gumble, Ph.D.
Senior Associate Researcher
Kansas Geological Survey
Email: jason.gumble@ku.edu
Tel: +1.303.810.9038
Address: 1930 Constant Ave., Lawrence, KS 66047, USA

Professional Profile

High performing, results-oriented, energetic analytical geophysicist proficient at integrating diverse data with over twenty years of experience working with multi-disciplinary teams in both CCS/CCUS and Oil and Gas industries. Extensive unconventional experience generating exploration targets and high grading landing zones as well as identifying and avoiding geohazards. Expert at applying geophysical skillsets to achieve cost-effective solutions, and help organizations meet development goals.

Strategic and Critical Thinker - Problem Solver	Innovative – "Outside the box"
Analytical Geoscientist	Proficient at Integrating Diverse Data
Bridge between Technical and Non-technical	Applied, Timely Research Objectives
Multi-disciplinary Team Leader	Achieve Profitable Timely Results

High-Impact Results

Developed mechanical earth model (MEM) for phase 1 of Class IV injection well feasibility study in central Kansas. Integrated well log, core and pressure data to construct fully developed MEM for verifying seal integrity and the potential for fault slip during CO_2 injection.

Influenced selection of target formation for CCUS project in Los Angeles County, CA via in depth seismic reservoir characterization. Interpreted 2D seismic and integrated well logs to characterize depth and extent of target injection formation. Eliminated original target formation based on key risk criteria, provided new target and backup target formations for Class VI CO_2 injection well application.

Prevented production of toxic H2S and uneconomic water, resulting in the most economic well in Southern Reeves County Wolfcamp play; conducted 3D seismic interpretation and attribute analysis to provide asset team with tools to avoid zones of low pressure, prevent well flooding, and improve well treatment design in future wells.

Implemented wellbore stability program in deep-water Gulf of Mexico on $135 million well, preventing well loss and blow outs common in the region. Conducted "look-ahead" VSP (Vertical Seismic Profile) data to image the target formation ahead of the bit. Predicted pore pressure to within 2% accuracy preventing costly mitigation operations.

Executed program to determine root cause of casing collapse and recommendations for improved well design enabling future completion of 65 million-dollar wells. Partnered with operator to develop a new unconventional resource, utilizing geomechanical and petrophysical techniques to determine cause of casing collapse during well treatment in the Persian Gulf. Identified multiple causes for failure and steps for mitigation.

Created earliest industry operated induced seismicity network in North America to detect and mitigate magnitude 3.0 earthquakes induced by water injection. Installed induced seismicity network in Canadian County, OK in active unconventional play. Results led to modification of injection program to limit pressures, prevent earthquakes, and maintain productive operations.

Green lighted exploration targets for years long development program in Lea County, NM through post-processing of PSDM seismic data (using AASPI software) for seismic attributes, including spectral decomposition and reconstruction for best interpretation volume as input into geometric attribute workflows.

Professional Experience

Kansas Geological Survey

Research and service division of the University of Kansas.

Senior Research Associate, 2024 – present

• Developed fully characterized mechanical earth model(s) (MEM's) for use in evaluating seal integrity, fault slip potential, and injectability of CCS/CCUS (CO_2 injection) programs.

• Conducted rare earth element exploration and feasibility analysis of mineral extraction utilizing nuclear spectroscopy well logging tools adapted from oil and gas exploration application. Integrated results with core XRF, ICPMS and other chemical analysis, as well as additional well logging data. Utilized calibrated elemental data set to build mineralogical models in offset wells throughout Kansas.

Antora Geophysical

Environmental and Petroleum geoscience consulting.

Geophysical Advisor – SCS Engineers, 2024

• Validated CCS targets through interpretation of 2D/3D seismic data in California and multiple locations in Texas.

• Integrated geologic, well log and engineering data with seismic interpretations to provide the best achievable static model for evaluation of multiple CCS targets.

Geophysical Advisor – Summit Resources, 2023

• Performed evaluation of seismic and well derived petrophysical properties for determination of best landing zone in fringe acreage in Midland Basin, TX.

• Developed a tiered classification system to high-grade landing zones for best reservoir properties and fewest drilling hazards.

Geophysical Advisor – Matador Resources, 2023

• Prospect interpretation using Petrel in Lea County, NM utilizing state of the art PSDM (Pre-stack Depth Migration) volume. Advised on future prospect locations.

• Conducted post-processing of PSDM seismic data (using AASPI software) for seismic attributes, including spectral decomposition and reconstruction for best interpretation volume as input into geometric attribute workflows.

Geophysical Advisor – Henry Resources, 2022

• Developed a workflow to predict and mitigate the presence of H2S and saturated water by identifying at-risk zones and defining standoff distance to skip stages during treatment.

• Integrated well log, treatment and other engineering data with 3D seismic interpretation and post-stack attribute analysis to predict fault zones and connectivity to H2S and highly saturated water zones. Incorporated structural analysis to validate paleo and current stress orientations and relationship to faulting.

Geophysical Advisor – APEX Petroleum Engineering, 2019 – 2021

• Performed petrophysical analysis and core data integration for O&G operators, including ELAN and Cluster analysis utilizing Techlog. Integrating well log and core data, aided client in determining reservoir quality and well landing zone in support of unconventional development.

Geophysical Advisor – Tap Rock Resources, 2019

• Performed 3D seismic interpretation and attribute analysis in support of well planning in Delaware Basin, TX to successfully mitigate geo hazards. Provided asset team with tools to high-grade well placement and well treatment design.

Fracture ID Incorporated

A petrotech company innovating new downhole MWD.

VP, Subsurface Characterization, 2017-2019

Led multidisciplinary team consisting of geologists, geophysicists, engineers, geomechanics, and petrophysicists in subsurface data integration efforts in unconventional (and conventional) plays throughout North America including Permian, Bakken, Eagleford, Anadarko, Marcellus, Green River.

- Introduced innovative MWD tool designed to measure in-situ rock properties and downhole stress for improved geologic understanding and completion design.
- Managed data integration projects encapsulating completions, geologic, petrophysical and geomechanical data, with the objective to present solutions in geologic context, immediately applicable to the business objectives of lowering costs and maximizing stimulation results.
- Maintained active role with Research and Development developing physical modeling, testing, numerical modeling, and data validation in context of core, lab and wireline measurements.

Cimarex Energy Co.

A $6B Independent Energy Co.

Geophysical Analyst – Geophysical Analysis Team, 2008 - 2016

- Oversaw acquisition and processing of microseismic data companywide (Permian, Anadarko, Arkoma basins). Oversaw operation of induced seismicity array. Interpreted results in the context of stress field and impact on stimulated reservoir and production. Integrated with core and log data.
- Served as industry committee member for two master's theses conducted at the Colorado School of Mines, Department of Geophysics, focused on the advancement of microseismic imaging.
- Created synthetic well ties, and time depth models for guiding horizontal boreholes. Conducted inversion, AVO analysis, and attribute analysis in unconventional reservoirs to delimit zones of higher productivity.
- Conducted pore pressure analysis for both conventional and unconventional plays. Implemented seismic velocity transforms to estimate pore pressure, integrated with well pressure data to provide maps for use in de-risking land acquisition and well location.

BP America

Multinational energy company.

Geophysicist – Land Seismic Technology Group, 2007 - 2008

- Oversaw processing, QC & analysis of prototype PS-wave data field acquisition executed by contractor. Conducted poststack processing, interpretation and event registration with variety of tools including 3D interpretation software (Transform, Landmark), to make full use of PS-wave data to optimize large-scale drilling program in the Wamsutter field.

Geophysicist – TIGER Team, Gulf of Mexico Exploration, 2006 - 2007

- Predicted pore pressure in deep water, Gulf of Mexico, in over-pressured, subsalt, prospects. Utilized seismic velocity to predict pore pressure, density, overburden and fracture gradient from seismic velocity cubes. Integrated and calibrated seismic to log data using USP, GoCad and Presgraph.
- Communicated results to prospect geoscientists, engineers and on-site drillers during drilling, including daily updates at rig call.
- Processed and interpreted "look-ahead" VSP (Vertical Seismic Profile) data to constrain base of salt location and pore pressure at salt exit.

Education

- **Ph.D. Geological Sciences,** University of Texas at Austin, Complete anisotropic rotation analysis of three-component seismic data, under a student authored grant from the Petroleum Research Fund. 2006
- **BS in Geophysical Engineering,** Minor in Geology, recipient of the Cecil H. Greene Award in Geophysics, Colorado School of Mines - 2000

Professional Association Memberships

Society of Exploration Geophysicists (SEG) – 1998-Present; Active Member Since 2009
American Association of Petroleum Geologists (AAPG) – 1999-Present
European Association of Geoscientists and Engineers (EAGE) –2002-Present
Society of Petroleum Engineers (SPE) – 2011-Present
Society of Petrophysicists and Well Log Analysts (SPWLA) – 2024 – present

Publications

Gumble, J.E., Morehouse, T., 2023, Fault Identification Utilizing Seismic Attributes and Well Data for Mitigating H2S and Water Production in the Delaware Basin Wolfcamp Formation, DGS, Denver, 3D Seismic Symposium

Gumble, J.E., Morehouse, T., 2022, Mitigating H2S and water production from horizontal wells in the Delaware Basin Wolfcamp formation, SPE, Scottsdale, SPE Workshop: Completion Optimization Focused on the Near Wellbore Region – Methods, Techniques, and Technologies that are Critical for Continued Process Improvement

Cole, S., Karrenbach, M., Roche, S., Gumble, J., LaFlame, L., Emuh, M., Yartsev, V. and Bartling, B., 2015, Interferometric Imaging of Microseismic Data, SEG, New Orleans, Expanded Abstracts

Gumble, J. E., M. L. Albertin, J. P. Blangy, D. A. Ebrom, R. A. Clarke and S. Sugianto, 2008, Subsalt pore pressure prediction from spiral 3D VSP, SEG, Las Vegas, Expanded Abstracts

Gumble, J. E., and J. E. Gaiser, 2006, Characterization of layered anisotropic media from prestack PS-wave-reflection data: Geophysics, 71, no.5, D171-D182.

Gumble, J. E., J. E. Gaiser, and R. H. Tatham, 2006, Imaging Anisotropic Symmetry Using Prestack Converted-wave Seismic Data for Fracture Analysis, International Conference and Exhibition: AAPG, Perth

Lyons, E. S., J. E. Gumble, and R. H. Tatham, 2006, Polarization rotation upon reflection of direct shear waves in purely isotropic media, 76th Annual Meeting: SEG, New Orleans, Expanded Abstracts, 1213

Gumble, J. E., and R. H. Tatham, 2005, P-SV 4C rotation analysis compared to direct shear wave 4C rotation analysis and sensitivity to acquisition geometry, 75th Annual International Meeting: SEG, Houston, Expanded Abstracts, MC2.3

Gumble, J. E., J. E. Gaiser, and R. H. Tatham, 2005, Anisotropic analysis of 3C data and comparison to 9C data, EAGE/SEG Joint Research Workshop on Multicomponent Seismic, Pau, A29

Gumble, J. E., P. E. Murray, E. S. Lyons, and R. H. Tatham, 2005, Comparing full azimuth 9C and 3C data polarization analysis using prestack data in HTI media, Presented at the 67th Mtg.: EAGE, Madrid, P064

Gumble, J. E. and J.E. Gaiser, 2004, Converted wave modeling of azimuthally anisotropic media: Pre-stack evaluation of constant rotation and shift operators for layer stripping, 74th Annual International Meeting: SEG, Denver, Expanded Abstract, MC1.5

Gumble, J. E. and J. E. Gaiser, 2004, Prestack layerstripping evaluation: constant rotation and shift operators in HTI/TTI media Presented at the 66th Meeting: EAGE, Paris, E009

Gumble, J. E. and R. H. Tatham, 2002, Enhancing analysis of 4C data in the Gulf of Mexico from results of 9C data onshore, Transactions – Gulf Coast Associations of Geological Societies, Vol. 72, p. 363