Sharon Cornelius, PhD
Certified PMP **Geoscientist Researcher/Advisor/Consultant**

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SUMMARY OF QUALIFICATIONS

- Over thirty years' experience as a Geophysicist and Geologist in a mix of E&P projects directing the combined interpretation of seismic and well data simultaneously for basin analysis down to drilling location sites. Successfully manage projects, budgets, and people. Enjoy training or mentoring geoscientists, managing technical teams, handling negotiations, doing risk analysis and economic evaluations, and giving presentations. Expert at creating 3D velocity models and 3D earth models.
- Guided E&P projects extensively in the Gulf of Mexico including the deepwater areas of Keathley Canyon and Walker Ridge using sequence stratigraphy as a geologist and seismic interpretation as a geophysicist. Other areas worked are offshore Brazil, offshore Nova Scotia, the Gulf of Suez (discovered the Zaafarana Oil Field for BG Group), offshore Argentina, Venezuela, China, coastal Peru, Salina del Istmo Basin in Mexico, the Getic Basin in Romania, onshore Texas and onshore Louisiana.
- Experienced with Petrel, IHS Kingdom (2019), Neuralog, Vel Pro 3D velocity modeling software (CGG), Microsoft Office, and adjusting to new software quickly. Created efficient workflows for 2D/3D modeling, structural delineation, fracture detection/analysis, using seismic attributes to match rock properties for reservoir evaluation, all depending on the quality and quantity of data available. Perform AVO analysis, spectral decomposition, well log analysis, pore pressure prediction; geothermal calculations, and geostatistics.
- Twelve years of experience in management, including six years managing my own business and managing projects on a global basis.

AREAS OF EXPERTISE

- Geophysics/Geology
- Project Management
- Consulting in E&P (International and USA)
- Well log data analysis
- 1D and 3D Basin modeling, salt tectonics
- Reservoir characterization
- Seismic interpretation and data processing
- Applied Sequence Stratigraphy

WORK HISTORY

ExxonMobil

Consultant on Gulf of Mexico shallow water CO_2 sequestration project, part-time, with permission from CBTH Aug-Dec, 2022

University of Houston, Dept. of Earth and Atmospheric Sciences, CBTH, Houston, Texas

Research Scientist 2 Sep 2022-Present

- 3-year study of the Santos-Campos-Espirito Santos basins, offshore Brazil, to look for undrilled areas of potential prospectivity that involved:
- 2 years working at the Houston offices of TGS accessing their vast seismic database encompassing these Brazilian basins
- 9 months to analyze 100 wells and create 1D basin models while collecting heat flow and thermal conductivity measurements in all three basins
- 3 months creating 3D basin mode from 1D basin models and other required data inputs
- Presented the 3D basin model at IMAGE 24 in Houston, TX on Aug 27 and received an invitation from Petrobras to come to Rio de Janeiro and present the model there
- Presented the 3D model at Petrobras's national research center CENPES on Oct 28 and virtually to ANP on Dec 4. The model confirmed the viability of ANP's 4 prospects for their next lease sale.

Post-doctoral research associate Sep 2018-Sep 2022

- Continued research in the deepwater Gulf of Mexico and published results
- Began regional study of Santos, Campos, and Espirito Santo Basins, offshore Brazil in 2020
- Acted as a mentor to graduate students who wished to work in the Gulf of Mexico
- Numerous oral presentations at various technical conferences/conventions

University of Houston 2014- 2017

Doctoral research was experimenting with 3D velocity modeling and the effects of salt composition in the deepwater Gulf of Mexico. Discovered that the allochthonous Louann Salt in the deepwater area is compositionally complex due to presence of other evaporites (gypsum, anhydrite, or sylvite) and/or sediment inclusions acquired through salt movement basinward. Created a geological 3D velocity model from 300+ well logs and stacking velocities from high-resolution seismic data that covers all of Keathley Canyon and Walker Ridge areas in the Gulf of Mexico. Four publications in 2018 derived from this research are: (1) the variation of salt interval velocities with latitude in the deepwater GOM; (2) a regional 3D velocity model; and (3-4) volume fractions of lithologic units deposited per geologic epoch in the Cenozoic deepwater GoM, Part 1 Clastics and Part 2 Carbonates. Dissertation title: Velocity Studies in the Deepwater Gulf of Mexico: Keathley Canyon and Walker Ridge areas. Research advisor was Dr. John Castagna with Dr. Fred Hilterman, Dr. Pete Emmet, Dr. Paul Mann and Dr. Hua-wei Zhou on the advisory committee.

University of Houston, Houston, Texas Spring 2017
Teaching Assistant in Geophysics

University of Houston, Houston, Texas Spring/Fall 2016
Teaching Assistant in Physical Geology

YPF, Argentina, Houston, Texas Nov. 2013
Senior Consulting Advisor in Geophysics and Geology (Contract)

- Contracted to be a primary seismic interpreter on a new 3D seismic survey being acquired in deepwater offshore Argentina during November and December 2013

Tiandi Energy, Houston, Texas, and Beijing, China April – September 2013
(the company offers strategic consulting for upstream oil & gas projects, employing Geologists, Geophysicists, Petrophysicists, and Reservoir Engineers)
Senior Consulting Advisor in Geophysics and Geology (Contract)

- Taught the importance of utilizing all geophysical and geological data available for analyzing both actual and potential reservoirs in an integrated approach, something not done generally in China. Emphasized importance of determining the resolution of the data before analyses. Emphasized the quality of your analysis is only as good as the quality of your data.
- Supervised geoscientists in Beijing, China while they worked on various field development/re-development projects in other countries; built 3D earth models combining seismic data and well logs using Kingdom and Petrel. These old fields were created before sequence stratigraphy so that the producing zones were mislabeled and miscorrelated, meaning the production histories were meaningless.
- These new 3D earth models created infill drilling sites, evaluated fringe areas of lease blocks, studied deeper formations for potential hydrocarbons, and determined feasibility of secondary recovery by water flood, thus giving new economic life to old-depleting fields.
- Revised subsurface geological models on field re-development projects in Mexico (for Pemex) and in Romania (for OMV Petrom)

Lumina Geophysical, Houston, Texas Feb 2011 - April 2013
(company specializing in seismic attributes, spectral decomposition, and specialty seismic processing using in-house proprietary software developed by Founder Dr. John Castagna
Exploration & Production Technical Advisor (contract)

- Evaluated various clients' drilling prospects and/or development plans in unconventional, deep-water plays (including offshore Angola, Santos, and Campos Basins offshore Brazil and offshore Vietnam), and conventional drilling in coastal Peru, Venezuela, and Mexico. Made recommendations on how to proceed.
- Lectured visiting scientists from SINOPEC on all the seismic and borehole techniques used to explore/produce shale gas/oil resource plays
- Presented to clients on which proprietary software could help them accomplish in terms of seismic reservoir evaluation, especially in restoring frequency content to seismic data for extracting seismic attributes and doing FWI.

Korea National Oil Company (KNOC), Calgary, Alberta, Canada **(**Contract**)** May –July 2012
Exploration Consultant and supervising the International Ventures Team for the offshore northern Brazil project

- Contracted to teach deepwater exploration techniques and workflows for 5 northern offshore Brazilian basins with only one deepwater well
- Developed regional geology, determined source & reservoir rocks, and maturation history with minimal well control from shallow water wells using sequence stratigraphy and 2D seismic data of different vintages.
- Demonstrated what these types of potential reservoirs look like on seismic (turbidite mounds, channel fills, and contourites) by interpreting the seismic data within geological constraints of sequence boundaries and flooding surfaces, consequently developing 15 potential prospects for bidding purposes in Brazil Round 11 in only 3 months. There was no time to acquire 3D seismic or to reprocess the existing 2D seismic.
- Demonstrated how to use seismic sequence stratigraphy for relative age indicators and explained direct hydrocarbon indicators (DHIs). Seismic inversion and seismic attributes were not possible due to a lack of velocity info/well data in the deepwater basins.
- Compared prospects with analogs offshore West Africa

Crescent Geo, Houston, Texas (geophysical processing company) 2009 - March 2011
Business Development Manager, part-time

- Developed analyses of all onshore E&P companies involved in shale gas plays in the Marcellus, Haynesville, Eagle Ford, Fayetteville, and those involved in the Bakken oil shale to determine client potential.
- Encouraged technical diversifications to process RTM, VSP, WAZ, and multicomponent seismic in addition to the usual Kirchhoff time and depth migrations for 2D and 3D. Software used: Paradigm's *Echos* processing package.

Paradigm Geophysical, Corporate Headquarters in Houston, Texas Aug. 2007- June 2008
Operations Manager-USA, Strategic Consulting

- Supervised US team of geophysicists, geologists, petrophysicists, and IT technicians on consulting services projects, responsible for generating revenue to meet annual budget requirements, roughly $500,000 per team member at that time
- Devised business development strategy and case studies for marketing
- Acted as project manager on client projects, determining best practice techniques and maintaining schedules
- Originated client proposals/legal contracts for the requested services, which first required proper workflow determination, then Gantt charting to determine cost.
- Planned career path opportunities and provided training classes for employees
- Networked with R&D to implement existing software to meet client's specific needs
- Communicated with Customer Support to ensure client received onsite training in software application

Integranet, Inc, Houston, Texas June 2004 – July 2007
Senior Project Manager

- Corporate project manager for a company with five subsidiary corporations
- Interfaced with shareholders, investors, accountants, company lawyers, and employees
- Acted as Director of Accounts Payable for five corporations with 23 different bank accounts

Halliburton Energy Services, Houston, Texas Jan. 1999- June 2002
Principal Technical Administrator in Global Well Construction

EDUCATION

Ph.D. in Geophysics (**GPA: 3.87)** (May, 2017)
University of Houston
Dissertation topic: "Velocity Studies in the Deepwater Gulf of Mexico: Keathley Canyon and Walker Ridge areas", development of a regional geological 3D velocity from high resolution 2D seismic data and extensive well control, which led to discovery of the variability of salt interval velocities due to unexpected variations in salt mineralogy.

Master of Science in Physics/Geophysics (1971)
Rice University (National Science Foundation fellowship recipient)

Bachelor of Science in Chemistry (1967)
University of Houston (Honor s College)

LANGUAGES: Native language English, read/write French and German; able to read technical Spanish and Portuguese.

CERTIFICATION: Certified as Project Management Professional by ESI International in Paris, France on October 7, 2007.

PROFESSIONAL ORGANIZATIONS: AAPG, SEG, GSA, AGU, EAGE, GSH (Geophysical Society of Houston), HGS (Houston Geological Society), GCSSEPM, GCAGS (Gulf Coast Association of Geological Societies), and Research Gate.

PUBLICATIONS:

Cornelius, S. and J. P. Castagna, 2018, Variation in salt-body interval velocities in the deep-water Gulf of Mexico: Keathley Canyon and Walker Ridge areas, SEG Interpretation, v.6, no.1, p. T15-T27, doi:10.1190/INT-2017-0069.1

Cornelius, S. and P. A. Emmet, 2018, Geological 3D velocity model in Keathley Canyon and Walker Ridge, Gulf of Mexico, SEG The Leading Edge, v. 37, no.4, p. -299a7, 299a1, doi:10.1190/tle37040299a1.1

Cornelius, S. and P. A. Emmet, 2018a, Volume fractions of lithologic units deposited per geologic epoch in the Cenozoic, Keathley Canyon, and Walker Ridge, deepwater Gulf of Mexico: Part 1—Sand, Shale, and Siltstone: Gulf Coast Association of Geological Societies Journal, v. 7, p. 121-150.

Cornelius, S. and P. A. Emmet, 2018b, Volume fractions of lithologic units deposited per geologic epoch in the Cenozoic, Keathley Canyon, and Walker Ridge, deepwater Gulf of Mexico: Part 2—Limestone and Marl: Gulf Coast Association of Geological Societies Journal, v. 7, p. 151-166.

Cornelius, S. and P. A. Emmet, 2019, Depth to the top of overpressure in the deepwater Gulf of Mexico: Garden Banks, Green Canyon, Keathley Canyon, and Walker Ridge, 2019 SEG Annual Meeting Expanded Abstracts.

Cornelius, S. and P. A. Emmet, 2019, Linear Relationships between Geothermal and Geopressure Gradients in the Northern Central Deepwater Gulf of Mexico, GCAGS Transactions, expanded abstract.

Cornelius, S. and P. A. Emmet, 2022, Difference in overpressure environments for the western and central deep-water Gulf of Mexico, AAPG Bulletin, v. 106, no. 12 (Dec, 2022) pp.2417-244, doi: 10.1306/08 182221123