

Fatemeh Belyadi, PhD

Assistant Research Professor | Texas Christian University, Dallas-Fort Worth, TX | f.belyadi@tcu.edu |

Professional Summary

Reservoir Engineer with 10+ years of experience delivering reservoir engineering solutions for unconventional oil and gas resource development. Three years of experience as a process engineer in the midstream sector. Proven track record leading reservoir simulation, history matching, reservoir surveillance, pressure transient analysis (PTA), rate transient analysis (RTA), production forecasting, well performance evaluation, and reservoir optimization for unconventional reservoirs. Extensive experience integrating geologic characterization, production and completion data, field surveillance, and reservoir modeling to maximize recovery and support field development planning. Skilled collaborator with multidisciplinary teams across the Appalachian Basin and other unconventional plays.

Education

PhD, Petroleum and Natural Gas Engineering — West Virginia University — GPA: 3.95

MS, Petroleum and Natural Gas Engineering — West Virginia University — GPA: 4.00

BS, Petroleum and Natural Gas Engineering — West Virginia University — GPA: 3.47

Core Competencies

- Enhanced Oil and Gas Recovery
 - Reservoir, completion and production Engineering
 - Unconventional Shale oil and gas Reservoir Expertise
 - CO₂ Storage Capacity Assessment & Reserves Review
 - Injection & Production Forecasting (CMG GEM/IMEX, Eclipse)
 - Engineering Well Design (EWD) Standardization
 - Geothermal Field Test Interpretation & Reporting
 - Injectivity Evaluation & Workover Planning
 - Integrated Reservoir & Geoscience Collaboration
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Professional Experience

Senior Reservoir Engineer (Consultant)

Pangea Geoscience | Houston, TX | 2024 – 2026

- **Conduct injectivity evaluations and uncertainty assessments** to inform well design decisions, workover requirements, and operational planning.
- **Collaborate with multidisciplinary geoscience and engineering teams** to integrate reservoir insights with operational execution.
- **Lead reservoir engineering for geothermal development projects**, developing injection and production forecasts to evaluate well performance and reservoir sustainability across subsurface systems.
- **Independently authored *Subsurface CO₂ Sequestration: A Thorough Analysis of Sustainable Emission Solutions and Regulatory Frameworks* (Springer, 2026)** — a comprehensive technical reference covering CO₂ storage engineering, Class VI regulatory frameworks, plume monitoring, and long-term storage risk assessment, directly applicable to CCUS project development and EWD standardization.

References: Subsurface CO₂ Sequestration, Springer (2026) ([link](#)); MIP-1S study ([doi:10.3390/su16188053](#))

Lead Subsurface Engineer (Consultant)

Obsertelligence LLC | 2021 – 2024

- **Supported injection well design and workover planning** through injectivity analysis, wellbore modeling, and operational scenario evaluation for active storage wells.
- **Integrated microseismic, fiber optic, and field surveillance data** to analyze CO₂ plume evolution, identify anomalies, and support monitoring, verification, and risk assessment activities.
- **Prepared technical documentation and project reporting** for field tests, interpreting results using reservoir engineering principles and communicating findings to project stakeholders.
- **Conducted water leak detection in 32 miles water disposal network in Texas** by incorporating field project data and numerical analyses, in alignment with established regulatory and engineering frameworks.

References: IBDP ([doi:10.3390/en17174421](#)); Citronelle ([doi:10.3390/en16073191](#)); Leak Detection ([doi:10.2118/217455-PA](#))

Founder & CEO

Integrated Smart Data Solutions LLC | 2018 – 2020

- **Developed reservoir and production analytics workflows**
Conducting performance benchmarking and establishing frameworks to inform development planning.
- **Performed production forecasting and completion optimization** using decline curve analysis and data-driven diagnostics, directly supporting well design decisions and resource assessments in Appalachian Basin.
- **Built integrated reservoir diagnostic workflows** combining production data, completion parameters, and geologic inputs directly applicable to Class II EGR project evaluation in depleted Marcellus and Utica wells.

References: Marcellus study ([doi:10.1144/petgeo2023-077](#)); Unconventional Reservoir Analysis ([doi:10.3390/fuels5010003](#)); AI/ML for Production Forecasting ([doi:10.3390/fuels2030017](#))

Teaching Assistant Professor – Petroleum Engineering

West Virginia University | 2014 – 2018

- **Taught undergraduate courses** including reservoir engineering, Core lab, Mud lab, Capstone design and hydraulic fracturing.
- **Mentored graduate students** on reservoir modeling and field development planning.
- **Academic advisor and undergraduate student curriculum advisor.**

Process / Production Systems Engineer

Exterran Energy Solutions | 2007 – 2010

- Supported production operations and facility design for gas processing systems, performing Aspen HYSYS simulations and developing P&IDs for field operations.
- Contributed to startup, commissioning, and operational readiness activities, building field-level operational context that informs current injection and production system planning.

Technical Skills

Domain	Tools & Methods
Reservoir Simulation & Modeling	CMG (GEM, IMEX, STARS, CMOST), Eclipse

Domain	Tools & Methods
CCUS & Storage Evaluation	CO ₂ plume analysis, injectivity evaluation, storage risk assessment
Reservoir Engineering	Injection/production forecasting, DCA, storage capacity assessment (S&P Global)
Well & Production Analysis	IHS Harmony, nodal analysis, wellbore hydraulics
Stimulation & Completion	FracPro, GOHFER
Programming & Analytics	Python, MATLAB
Process Engineering	Aspen HYSYS

HONORS AND AWARDS

1. Associate Editor of Frontiers in Earth Science
 2. Guest Editor for a special issue on "Recent Advances in Subsurface Sequestration of Anthropogenic Carbon Dioxide" in the Journal of Energies.
 3. Society of Petroleum Engineering (SPE) chapter vice president (March 2012- January 2013)
 4. Society of Petroleum Engineering (SPE) member (2004 – Present)
 5. Outstanding graduate student (Ph.D.) awards (April 2012)
 6. Academic Dean's List in WVU (2004 to 2009)
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Selected Publications & Presentations

Books

- Subsurface CO₂ Sequestration: A Thorough Analysis of Sustainable Emission Solutions and Regulatory Frameworks, Springer (2026)
- Hydraulic Fracturing in Unconventional Reservoirs, Elsevier (2016, 2019)

Journal Publication

1. Belyadi et al., (2024) Optimizing Deep Geothermal Drilling for Energy Sustainability in the Appalachian, Sustainability Journal, Sustainability 16 (18), 8053 <https://doi.org/10.3390/su16188053>
2. Belyadi et al., (2024), Machine Learning-Driven Quantification of CO₂ Plume Dynamics at IBDP Sites using Microseismic Data, , Energies 2024, 17(17), 4421; <https://doi.org/10.3390/en17174421>
3. Belyadi et al., (2024). Application of Fiber Optics for Completion Design Optimization: A Methodological Approach and Key Findings; Fuels 5 (1), 33-52; <https://doi.org/10.3390/fuels5010003>
4. Belyadi et al., (2024). Simultaneous well spacing and completion optimization using an automated machine learning approach. A case study of the Marcellus Shale reservoir, northeastern United States, Petroleum Geoscience 30 (1), petgeo2023-077 <https://doi.org/10.1144/petgeo2023-077>
5. Belyadi et al., (2024). High-Precision Single-Leak Detection and Localization in Single-Phase Liquid Pipelines Using the Negative Pressure Wave Technique: An Application in a Real-Field Case Study. SPEJ (SPE-217455-PA) <https://doi.org/10.2118/217455-PA>
6. Belyadi et al., (2023), Impacts of Different Operation Conditions and Geological Formation Characteristics on CO₂ Sequestration in Citronelle Dome, Alabama. Energies 16 (7), <https://doi.org/10.3390/en16073191>
7. Belyadi et al., (2021), New hybrid approach for developing automated machine learning workflows: a real case application in evaluation of marcellus shale gas production Fuels 2 (3), 286-303
8. Belyadi et al., (2021), Shale Poroelastic Effects on Well Performance Analysis of Shale Gas Reservoirs, Fuels 2, 130-143
9. Belyadi et al., (2018). An Integrated Multiscale Model for Gas Storage and Transport in Shale Reservoirs. Journal of Fuel, Volume 237, 1 February 2019, Pages 1228-1243

10. Belyadi et al., (2018). Effects of nano-pore wall confinements on rarefied gas dynamics in organic rich shale reservoirs. Fuel, Volume 220, 15 May 2018, Pages 120-129
11. Belyadi et al., (2017). Stress Field Behavior Induced by Hydraulic Fracture in Shale Reservoirs: A Practical View on Cluster Spacing. Journal of Natural Gas Science and Engineering, Volume 48, December 2017, Pages 186-196
12. Belyadi et al., (2017). Drawdown Key To Well Performance. The American Oil & Gas Reporter 60 (5), 69-73

Selected conference papers

13. Belyadi et al., (2023) "Hydraulic Fracturing Fluid Optimization Using Machine Learning Approach: A Case Study of Marcellus Shale. SPE Eastern regional meeting conference
14. Belyadi et al., (2018) "Data-based smart model for real time liquid loading diagnostics in Marcellus Shale via machine learning". SPE Canada Unconventional Resources Conference
15. Belyadi et al., (2016). "Managed Pressure Drawdown in Utica/Point Pleasant with Case Studies" SPE Eastern Regional Meeting, 13-15 September, Canton, Ohio, USA
16. Belyadi et al., (2012): "Analysis of Production Performance of Hydraulic fracture Horizontal Well." SPE161348, SPE Western Regional Conference, October 2012.
17. Belyadi et al., (2014). Predicting Production Behavior of Marcellus Shale. SPE 171002-MS, SPE Eastern Regional meeting, in Charleston, WV, USA
18. Belyadi et al., (2014). Predicting long Term Production Behavior of Marcellus Shale. SPE 169489MS, SPE Western North America USA.