Eugene C. Morgan

CONTACT INFORMATION	John and Willie Leone Family Department of Energy and Mineral Engineering

CONTACT
INFORMATION

John and Willie Leone Family Department of Energy and Mineral Engineering
Penn State University   *Office:* (814) 863-1642
156 Hosler Building   *Fax:* (814) 865-3248
University Park, PA 16802-5000 USA   eugene.morgan@psu.edu

RESEARCH
INTERESTS

CO_2 sequestration, data analytics and assimilation, spatial and temporal statistics, seismic reservoir characterization, rock physics, Bayesian inversion

EDUCATION

Ph.D., **Tufts University**, Civil & Environmental Engineering, August 2011
    Dissertation: *Stochastic modeling techniques for offshore geohazards*
    Adviser: Professor Laurie G. Baise
    Area of Study: Geotechnical Engineering
    Passed the NCEES Fundamentals of Engineering (EIT) Exam, April 2009
M.S., **Tufts University**, Civil & Environmental Engineering, August 2008
    Thesis: *Quantifying geomorphology associated with large subduction zone earthquakes*
    Adviser: Professor Laurie G. Baise
    Area of Study: Geotechnical Engineering
B.S. (*Honors*), **University of California, Santa Cruz**, Earth Sciences, June 2005
    Senior Thesis: *Constraining the timing and height of tsunami through 14C dating and hydrodynamic transport equations of coralline debris deposits*

ACADEMIC
APPOINTMENTS

Penn State University, Associate Head for Undergraduate Education January 2020 to Present
    John and Willie Leone Family Department of Energy and Mineral Engineering
Penn State University, Assistant Teaching Professor   January 2020 to Present
    John and Willie Leone Family Department of Energy and Mineral Engineering
Penn State University, Assistant Professor of Petroleum and Natural Gas Engineering   August 2014 to December 2019
    John and Willie Leone Family Department of Energy and Mineral Engineering
Duke University, Adjunct Faculty   August 2012 to August 2014
    Pratt School of Engineering & Department of Statistical Science
Duke University, Visiting Assistant Professor   August 2011 to August 2012
    Department of Civil & Environmental Engineering
SAMSI, Research Fellow   August 2011 to August 2012
    Statistical and Applied Mathematical Sciences Institute
    Program on Uncertainty Quantification: Extremes and Geosciences working groups
Tufts University, Research Assistant   June 2006 to August 2011
    Department of Civil & Environmental Engineering
- Funded by National Science Foundation Office of International Science and Engineering grant: "PIRE: Developing International Protocols for Offshore Sediments and their Role in Geohazards: Characterization, Assessment, and Mitigation" ([#0530151](#))

PUBLICATIONS

Joon, S, Dawuda, I, Morgan, E, and Srinivasan, S (2022). Rock Physics-Based Data Assimilation of Integrated Continuous Active-Source Seismic and Pressure Monitoring Data during GCS. *SPE Journal* SPE-209585-PA (in press; posted 28 February 2022). doi:[10.2118/209585-PA](https://doi.org/10.2118/209585-PA)

Udegbe, E, Morgan, EC, and Srinivasan, S (2019). Big Data Analytics for Seismic Fracture Identification, Using Amplitude-Based Statistics.*Computational Geosciences*: 1-

15. doi:10.1007/s10596-019-09890-z

Xi, Z, and Morgan, EC (2019). Combining Decline Curve Analysis and Geostatistics to Forecast Gas Production in the Marcellus Shale. *SPE Reservoir Evaluation & Engineering - Formation Evaluation*. doi:10.2118/197055-PA

Udegbe, E, Morgan, EC, and Srinivasan, S (2019). Big Data Analytics for Production Data Classification using Feature Detection: Application to Restimulation Candidate Selection. *SPE Reservoir Evaluation & Engineering - Formation Evaluation*. doi:10.2118/187328-PA

Morgan, EC, Vanneste, M, Lecomte, I, Baise, LG, Longva, O, and McAdoo, BG (2012). Estimation of free gas saturation from seismic reflection surveys by the genetic algorithm inversion of a P-wave attenuation model. *Geophysics*, 77(4): R175-R187. doi:10.1190/geo2011-0291.1

Thompson, EM, Baise, LG, Kayen, RE, Morgan, EC, and Kaklamanos, J (2011). Integrated multiscale site response mapping. *Bulletin of the Seismological Society of America*, 101(3): 1081-1100. doi:10.1785/0120100211

Morgan, EC, Lackner, M, Vogel, RM, and Baise, LG (2011). Probability distributions for offshore wind speeds. *Energy Conversion and Management*, 52(1): 15-26. doi:10.1016/j.enconman.2010.06.015

Morgan, EC, McAdoo, BG, and Baise, LG (2008). Quantifying geomorphology associated with large subduction zone earthquakes. *Basin Research*, 20(4): 531-542. doi:10.1111/j.1365-2117.2008.00368.x

Hoffmann, G, Silver, E, Day, S, Morgan, EC, Driscoll, NW, and Orange, D (2008). Sediment waves in the Bismarck volcanic arc, Papua New Guinea. *Special Paper - Geological Society of America*, 436: 91-126. doi:10.1130/2008.2436(05)

Book Chapters

Ayala, L, and Morgan, EC (2016). Natural Gas Production Engineering. In: *ASTM Publication MNL73: Exploration and Production of Petroleum and Natural Gas Handbook*. ASTM. doi:10.1520/MNL7320140018

Vanneste, M, Forsberg, C, Knudsen, S, Kvalstad, T, L?Heureux, J, Lunne, T, Vardy, M, Chand, S, Longva, O, Morgan, EC, et al. (2015). Integration of very-high resolution seismic and CPTU data from a coastal area affected by shallow landsliding–the Finneidfjord natural laboratory. *Frontiers in Offshore Geotechnics III* (Chapter 137). Peer-reviewed/refereed. ISBN: 978-1-138-02848-7

Vanneste, M, L'Heureux, J, Brendryen, J, Baeten, N, Larberg, J, Vardy, ME, Steiner, A, Morgan, EC, Forsberg, C, Kvalstad, T, et al. (2012). Assessing offshore geohazards: A multi-disciplinary research initiative to understand shallow landslides and their dynamics in coastal and deepwater environments, Norway. *Submarine Mass Movements and Their Consequences*, Vol. 31, Springer. pp. 29-41. doi:10.1007/978-94-007-2162-3

Morgan, EC, Vanneste, M, Longva, O, Lecomte, I, McAdoo, B, and Baise, LG (2010). Evaluating gas-generated pore pressure with seismic reflection data in a landslide-prone area: an example from Finneidfjord, Norway. *Submarine Mass Movements and Their Consequences*, Vol. 28, Springer. pp. 399-410. doi:10.1007/978-90-481-3071-9

Conference Papers (with talks)

Morgan, EC (2018). Accounting for serial autocorrelation in decline curve analysis of Marcellus shale gas wells. *Society of Petroleum Engineers - Eastern Regional Meeting*, 2018, Pittsburgh, PA. SPE-191788-MS

Xi, Z, and Morgan, EC (2018). Combining decline curve analysis and geostatistics to forecast gas production in the Marcellus shale. *Society of Petroleum Engineers - Eastern Regional Meeting*, 2018, Pittsburgh, PA. SPE-191793-MS

Udegbe, E, Morgan, EC, and Srinivasan, S (2018). Big data analytics for seismic fracture identification, using amplitude-based statistics. *Society of Petroleum Engineers 2018 Annual Technical Conference and Exhibition*, Dallas, TX. SPE-191668-MS

Udegbe, E, Morgan, EC, and Srinivasan, S (2017). From face detection to fracture reservoir characterization: Big Data analytics for restimulation candidate selection. *Society of Petroleum Engineers 2017 Annual Technical Conference and Exhibition*, San Antonio, TX. SPE-187328-MS

Lei, X, and Morgan, EC (2017). Characterization of gas-charged sediments from joint inversion of Qp and Qs with sonic logs. *Society of Exploration Geophysics Annual Meeting*, 2017. pp. 3319-3324. doi:10.1190/segam2017-17799758.1

Lei, X, and Morgan, EC (2016). A comparison of methods for estimating Q. *Society of Exploration Geophysics Annual Meeting*, 2016. pp. 3021-3025. doi:10.1190/segam2016-13971809.1

Venugopal, K, Kelly, P, Jamaluddin, A, McConnell, C, Alger, M, Morgan, EC, Ni, R, Dunn, R, and Grasselli, G (2016). The PetroChallenge - An Innovative E&P Learning Experience Using an Interactive Learning Simulation, *SPE Annual Technical Conference and Exhibition*, Society of Petroleum Engineers, Dubai, UAE, Sept. 2016. doi:10.2118/181404-MS

Lei, X, and Morgan, EC (2015). Characterization of gas-charged sediments from joint inversion of Qp and Qs. *Society of Exploration Geophysics Annual Meeting*, 2015. pp. 2765-2770. doi:10.1190/segam2015-5904497.1

Vardy, ME, Vanneste, M, Henstock, TJ, Morgan, EC, and Pinson, LJW (2015). Can high-resolution marine geophysical data be inverted for soil properties? *Proceedings of the Institute of Acoustics*. Vol. 37, Pt. 1. University of Bath, UK, Sept. 7-9, 2015.

Morgan, EC, Vanneste, M, and Vardy, M (2014). Characterization of the slope-destabilizing effects of gas-charged sediment via seismic Surveys. *Proceedings of the Offshore Technology Conference*, Paper No. 25196.

Haflidason, H, Morgan, EC, L'Heureux, J-S, Forsberg, CF, Kreiter, S, Kopf, A, Lecomte, I, Kvalstad, TJ, Vardy, ME, Longva, O, et al. (2013). Finneidfjord: A field laboratory for integrated submarine slope stability assessments and characterization of landslide-prone sediments: A Review. *Offshore Technology Conference*.

Thompson, E, Baise, LG, Kayen, RE, Morgan, E, and Kaklamanos, J (2011). A Case Study of Alternative Site Response Explanatory Variables in Parkfield, California. *GeoRisk, 2011*. (pp. 310–317).

Morgan, EC, and Baise, LG (2011). Assessing the probability of occurrence of earthquake-induced landslides offshore the U.S. East Coast: a first-order, second moment approach. *GeoRisk, 2011*. Paper # 136.

Morgan, EC, McAdoo, B, Baise, LG, and DeGroot, DJ (2007). Quantitative seafloor geomorphology and offshore geohazards. *Proceedings of the Offshore Technology Conference*, Paper No. 18736.

CONFERENCE TALKS	Joon, S, and Morgan, E (2021). Crosswell Seismic and Pressure Sensor Placement Optimization during GCS: An Ensemble-Based Sensitivity Analysis Approach using Data Assimilation. *AGU Fall Meeting*, American Geophysical Union (Abstract ID: 964082), New Orleans, LA, 13-17 Dec., 2021.
	Morgan, EC, and Lei, X. (2019). Bayesian Regression of the Laplace-Space Solution to the Double-Porosity Model. *IAMG 2019 Annual Meeting*, IAMG, State College, PA.
	Morgan, EC (2019). A Review of Seismic Attenuation Mechanisms, Measurements, and Inversion Strategies, *2019 EAGE Annual Conference*, European Association of Geoscientists and Engineers, London, England.
	Morgan, EC, and Lu, C (2015). Characterizing Outburst with Microseismic Amplitude Versus Angle Analysis. *8th International Symposium on Green Mining*, China University of Mining Technology, Xuzhou, China, **Invited**.
	Morgan, EC (2012). Adding spatial dependence constraints to a geophysical inverse problem. *SIAM Conference on Uncertainty Quantification*, Spatial UQ session: UQ12-MS44-2.
	Morgan, EC (2012). Mapping landslide hazard over a nonstationary space. *SAMSI Workshop on Models with Complex and Uncertain Domains*.
	Morgan, EC (2011). Mapping the probability of earthquake-induced submarine slope failure along the U.S. Atlantic margin: a first-order, second-moment approach. *NRC/ USGS Workshop on Landslide Tsunami Probability*.
	Morgan, EC, McAdoo, B, and Baise, LG (2008). Quantitative geomorphology associated with large subduction zone earthquakes. *EGU General Assembly*, Session GM6.2. **Solicited**.
CONFERENCE POSTERS	Joon, S, Morgan, EC, Srinivasan, S, and Dawuda, I (2020). Rock Physics-Based Joint Assimilation of Seismic and Pressure Data for Monitoring and Predicting CO2 Plume Migration: a Cranfield Case Study. *AGU Fall Meeting*, American Geophysical Union, online.
	Joon, S, Morgan, EC, and Sun, AY (2019). Real-Time Monitoring of CO2 Plume During GCS with Integrated Continuous Active-Source Seismic and Pressure Monitoring Data. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA. #S31E-0568
	Bonotto, G, Morgan, EC, and Karpyn, Z (2016). A Comparison of Patchy Saturation Velocity Models to Ultrasonic Tests. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA.
	Morgan, EC, Lackner, M, Vogel, RM, and Baise, LG (2010). Application-based probability distributions for offshore wind speeds. *AGU Fall Meeting, 2010*, Session A08: Wind Power Meteorology. A41F-0186.
	Baise, LG, Morgan, EC, Vanneste, M, Longva, O, Lecomte, I, and McAdoo, B (2009). Using seismic reflection surveying to map gas-generated excess pore pressures at Finneidfjord, Norway. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA.
	Morgan, EC, Vanneste, M, Longva, O, Lecomte, I, McAdoo, B, and Baise, LG (2008). Using Seismic Reflection Data to Investigate Gas-generated Pore Pressure in a Landslide-prone Area: an Example From Finneidfjord, Norway. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA.
	Morgan, EC, McAdoo, B, and Baise, LG (2007). Quantifying Geomorphology Associated With Large Subduction Zone Ruptures. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA.

Morgan, EC, Day, S, Elemunop, J, Silver, E, Ward, S, and Hoffmann, G (2005). Tsunami deposits related to volcanic Island collapses in the Southern Bismarck Sea. *AGU Fall Meeting*, American Geophysical Union, San Francisco, CA.

FUNDED PROJECTS	Morgan, EC (PI), Contract, "Tools and Methodologies Demonstration," DOE-NETL via Leidos, Inc., Corporations. Total: $323,029. (January 15, 2019 - December 30, 2021).

Morgan, EC (co-PI), Zhu, T (PI), Grant, "Integration of seismic-pressure-petrophysics inversion of continuous active source seismic monitoring data for monitoring and quantifying CO2 plume," DOE. Total: $1,800,069. (January 24, 2018 - June 30, 2022).

Morgan, EC (PI), Contract, "Tools and Methodologies Demonstration," DOE-NETL via AECOM. Total: $79,588. (November 20, 2017 - December 30, 2018).

EDITORIAL DUTIES
- **Mathematical Geosciences**, Guest Editor, IAMG 2019 Special Issue   2020
- **Int'l Journal of Oil, Gas and Coal Technology**, Associate Editor   2019-present

SELECTED TECHNICAL PAPER REVIEWS
- *SPE Journal*
- *Upstream Oil and Gas Technology*
- *Journal of Petroleum Science and Engineering*
- *Journal of Petroleum Exploration and Production Technology*
- *Journal of Natural Gas Science & Engineering*
- *Journal of Sustainable Energy Engineering*
- *Geophysical Journal International*
- *Near Surface Geophysics*
- *Mathematical Geosciences*
- *IEEE Access*

AWARDS
Faculty Advising Award, College of Earth and Mineral Sciences, Penn State, 2021
G. Montgomery and Marion Mitchell Award for Innovative Teaching, College of Earth and Mineral Sciences, Penn State, 2019
Regional Young Member Outstanding Service Award, Society of Petroleum Engineers, 2018
George H. Deike, Jr. Research Grant, College of Earth and Mineral Sciences, Penn State, July 2017-June 2019
Earle F. Littleton Award, Tufts University, 2011
Dean's Fellowship Program, Tufts University, 2006

TEACHING
Penn State University
- **PNG 397/EME 210: Data Analytics for Energy Systems**   2021 - present
- **PNG 490: Intro to Petroleum Engineering Design**   2015 - present
- **PNG 440W: Formation Evaluation**   2014 - 2020
- **PNG 566: Reservoir Characterization**   2015 - 2019
- **PNG 492: Petroleum Engineering Capstone Design**   2017

Duke University
- **EGR 201L: Mechanics of Solids**   Fall, 2011; Summer, 2012; Fall, 2013
- **EGR 103L: Computational Methods in Engineering**   Fall, 2012; Fall, 2013
- **STA 130L: Probability & Statistics in Engineering**   Fall, 2012; Spring, 2013

OTHER ACTIVITIES
Faculty Adviser, Penn State SPE Student Chapter   2014 - 2018
Scholarship Chairperson, SPE Pittsburgh Section   2014 - 2019

PROFESSIONAL MEMBERSHIP
International Association of Mathematical Geosciences   2017 - present

Society of Petroleum Engineers   2014 - present
Society of Exploration Geophysicists   2008 - present