

James P. Cassanelli, Ph.D.

Data Geoscientist – Planetary Geophysics Doctorate

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EDUCATION & RESEARCH

Brown University: Ph.D. in Geology and Geophysics 2013 – 2019

Brown University: M.Sc. in Geology and Geophysics 2013 – 2015

Emphasis on: planetary science, geophysics, numerical modeling

Thesis topic: Geophysical and numerical analysis of planetary geologic processes, primarily martian hydrology.

University of Connecticut: M.Sc. in Geology and Geophysics 2009 – 2011

University of Connecticut: B.S. in Geology and Geophysics 2005 – 2009

Emphasis on: hydrogeology, geology, geophysics

Thesis topic: Regional scale geostatistical analysis of spatial and temporal trends in groundwater salinity.

PROFESSIONAL EXPERIENCE

Geologist – Occidental Petroleum Corporation (formerly Anadarko) March 2019 – Present

- Generated maps to rank TX Delaware Basin asset acreage and refine development strategies through geostatistical analysis utilizing unsupervised machine learning clustering. Results adopted by company to guide >\$1 billion development program.
- Developed multivariate analysis models to forecast/optimize well production as part of the Analytics & Data Science team.
- Enhanced drilling efficiency through statistical predictions derived from a series of tools developed using Python and SQL.
- Greatly reduced manual workload by developing a stochastic optimization algorithm to automate completions design.
- Improved operational workflow efficiency by producing a suite of Python-based geologic software tools.
- Interpreted real-time geologic/drilling data to optimize (>90% in-zone) placement of ~20 Delaware Basin horizontal wells.
- Regional and local scale geologic structure and hazard mapping to generate pre-drill geologic prognoses.
- Process post-drill geologic and drilling data to document challenges and extract lessons-learned.
- Collaborate with development geologists, drilling engineers, and field staff to facilitate drilling activities.

Hydrogeologist – Leggette, Brashears, and Graham Inc. June 2010 – April 2013

- Collected and documented critical data for water supply exploration and environmental remediation projects.
- Conducted data and sample analyses and prepared technical reports for clientele and regulatory agencies.
- Supervised drilling, installation, and testing of water supply, monitoring, and remediation wells.
- Completed projects on time and under budget by consistently maintaining a billable time percentage >90%.
- Supervised and documented hazardous waste site remediation projects.
- Worked in a team-based environment maintaining close communications with colleagues and managers.

COMPUTATIONAL COMPETENCIES

Languages – Python | MATLAB | JavaScript/HTML/CSS | SQL | Git | some experience: C++, Fortran, VB, R

Programs – ArcGIS | DecisionSpace Geo. | StarSteer | Petra | Petrel | SAS JMP | ADOBE suite |

Mathematica | ERDAS Imagine | ENVI | AQTESOLV | Surfer/Grapher | MS Office (incl. Access)

Modeling and Geoscience

- Extensive experience in scientific computing, numerical modeling (finite difference & volume), and quantitative analyses.
- Proficient in construction and application of geologic models (1-D, 2-D, 3-D) to simulate physical processes/properties (e.g. heat flow, fluid flow, compaction, phase changes, convection, gravitational anomalies) and solve scientific problems.
- Skilled in utilization/visualization/interpretation of geospatial, geologic, geophysical, remote sensing, and other datasets.
- Application of geostatistical and geophysical analyses to answer business and scientific questions.

Data Science and Analytics

- Experienced in manipulation, transformation, processing, and storage of large data sets (Python, SQL, Access, Excel).
- Application of data science and statistical practices, including supervised and unsupervised machine learning models, to inform business decision-making.
- Proficient in application of coding and modeling skills to derive actionable insights through data analytics and visualizations.
- Created and maintain a coding/data science personal blog: jpcassanelli.com/Blog

TECHNICAL COMPETENCIES

Geology and Geophysics

- Supervision and analysis of aquifer characterization tests including: low flow sampling, slug & pump testing.
- Professional experience in geologic field operations and oversight including well drilling and remediation activities.
- Aqueous geochemistry, well profiling, bore logging, laboratory chemical analyses, water quality monitoring, tracer studies.
- Characterization of surficial hydrology: drainage basin assessment, fluvial system properties, discharge and erosion estimates.
- Regional and local scale geologic mapping (structure, isopach/isochore, geologic properties, heat flow).
- Basin and petroleum system analysis including: seismic interpretation and mapping, geochemical source rock evaluation, subsurface lithology and poroperm characterization, reservoir provenance characterization.
- Adept at analytical and numerical modeling of physical processes including heat and fluid (surficial and porous media) flow.
- Application of quantitative analyses to evaluate geophysical properties (e.g. density, porosity, temperature, conductivity).
- Experience working with potential field data to evaluate basin structure.

General

- Experience in the integration of disparate data (in type and scale) and models to address scientific and business problems.
- Significant experience in technical writing and communication including publication of >10 papers and delivery of presentations at numerous national and international science and industry conferences.

SELECTED AWARDS & HONORS

Occidental Petroleum Thanx Award – For work on machine learning project	February 2020
Anadarko Employee Excellence Award – For producing an automated completions design tool	August 2019
Lunar Planetary Institute Career Development Award – For outstanding conference abstract	March 2018
Rocky Mountain Rendezvous (AAPG/SEG/UWYO) – 2 nd Place Poster Award (out of ~75 presentation)	September 2017
Brown University Dissertation Fellowship recipient – For research excellence	July 2017

SELECTED CONTINUING EDUCATION

Introduction to Energy Machine Learning (Daytum online course)	March 2020
Introduction to Geomodeling (Occidental In-house training)	February 2020
Petroleum Economics and Risk Analysis (Nautilus)	November 2019
JMP Software: ANOVA and Regression	August 2019
Anadarko Data Scientist Curriculum (Anadarko In-house training)	May 2019 – Present

SELECTED PUBLICATIONS & PRESENTATIONS

- Cassanelli, J.P., and Head, J.W., (2018). Assessing the formation of valley networks on a cold early Mars: Predictions for erosion rates and channel morphology. *Icarus*, 321, 216-231.
- Weiss, D.K., Head, J.W., Palumbo, A.M., and Cassanelli, J.P., (2017). Extensive Amazonian-aged fluvial channels on Mars: Evaluating the role of Lyot crater in their formation. *Geophysical Research Letters*, 44(11), 5336-5344.
- Cassanelli, J.P., and Head, J.W., (2016). Did the Orientale impact melt sheet undergo large-scale igneous differentiation by crystal settling? *Geophysical Research Letters*, 43(21), 11156-11165.
- Cassanelli, J.P., Head, J.W., and Fastook, J.L., (2015). Sources of water for the outflow channels on Mars: Implications of the Late Noachian “Icy Highlands” model for melting and groundwater recharge on the Tharsis Rise. *Planetary and Space Science*, 108, 54-65.
- Cassanelli, J.P., and Robbins, G.A., (2013). Effects of road salt on Connecticut’s groundwater: A statewide centennial perspective. *Journal of Environmental Quality*, 42(3), 737-748.