

Preston D. Jordan

1 Cyclotron Road, Mail Stop 74R316C
Berkeley, CA 94720
(510) 486-6774
PDJordan@lbl.gov

- Education:** B.A., Geology, University of California, Berkeley, 1988
M.S. in Eng. Sci., Geotechnical Engineering, University of California, Berkeley, 1997
- Licenses:** California Professional Geologist No. 6942 (since 1999)
California Certified Hydrogeologist No. 880 (since 2007)
California Certified Engineering Geologist No. 2581 (since 2012)
- Career:** Principal Scientific Engineering Associate, 2017-Present, Energy Geosciences Division, Lawrence Berkeley National Laboratory. Analyze risk of geologic carbon storage and hydrocarbon production and storage, characterize reservoir uncertainty for geologic carbon storage, develop risk management protocols, interact with clients and external partners, contribute to proposal development, manage research projects, author journal papers.
- Staff Research Associate, 2010-2017, Energy Geosciences Division, Lawrence Berkeley National Laboratory. Analyze risk of geologic carbon storage and hydrocarbon production and storage, characterize reservoir uncertainty for geologic carbon storage, develop conceptual models of subsurface gas and fluid flow, manage research projects, author journal papers.
- Principal Research Associate, 1998-2010, Earth Science Division, Lawrence Berkeley National Laboratory. Analyze risk of geologic carbon storage, characterize reservoir uncertainty for geologic carbon storage, characterize hydrogeology and subsurface contaminant distributions, develop conceptual models of subsurface gas and fluid flow, consult on the environmental and engineering geology of proposed building and infrastructure projects and conduct investigations.
- Senior Research Associate, 1995-1998, Earth Science Division, Lawrence Berkeley National Laboratory. Characterize environmental geology, manage geologic data gathering activities, manage excavation activities, collect geologic data, implement and manage geographic information systems for subsurface environmental data, supervise temporary personnel performing geologic data tasks, advise geologic database design teams.
- Research Associate, 1994-1995, Earth Science Division, Lawrence Berkeley National Laboratory. Manage soil sampling, monitoring well installation, and field mapping activities, perform borehole logging and geologic field mapping, interpret geologic structure, participate in design of geologic visualization systems.
- Research Technician, 1990-1994, Earth Science Division, Lawrence Berkeley National Laboratory. Assist in paleoseismic studies, perform geologic field mapping and collect subsurface geologic data, interpret geologic structure, manage soil sampling and monitoring well installation activities.
- Field Geologist, 1989-1990, Consultant to the United States Department of Justice. Assist in detailed mapping and quantification of streambed morphology and sediment distribution. Reduce and analyze data.

Staff Geologist, 1988-1989, Harlan Tait Associates, San Francisco. Perform geologic field mapping, produce geotechnical hazard maps, inspect grading activities including fill control and landslide excavation, perform geotechnical insurance inspections of residential properties, conduct paleoseismic studies.

Field Geologist, 1988, Department of Geology and Geophysics, University of California, Berkeley. Determine suitable location of a long-term hydrologic study of a zero-order basin.

Assistant Field Geologist, 1987, Department of Geology and Geophysics, University of California, Berkeley. Assist in mapping and quantification of various parameters associated with channel heads.

Awards:

Societal Impact, Lawrence Berkeley National Laboratory, 2016, for the Aliso Canyon natural gas storage well blowout response
Spot, Lawrence Berkeley National Laboratory, 2015, for the SB 4 well stimulation study
Spot, Lawrence Berkeley National Laboratory, 2014, for the BLM CA hydraulic fracturing study
Outstanding Mentor, Lawrence Berkeley National Laboratory, 2012
Outstanding Performance, Lawrence Berkeley National Laboratory, 2010, for community relations
Nominated for the National Association of Geoscience Teachers-United States Geologic Survey Summer Field-Training Program by the University of California, Berkeley, 1987

Journal Publications, Technical and Conference Reports, and Book Contributions:

Jordan, P.D., and J.L. Wagoner (2017). Characterizing construction of existing wells to a CO₂ storage target: the Kimberlina site, California. NRAP-TRS-III-001-2017; NRAP Technical Report Series; U.S. Department of Energy, National Energy Technology Laboratory: Morgantown, WV.

Stringfellow, W.T., M.K. Camarillo, J.K. Domen, W.L. Sandelin, C. Varadharajan, **P.D. Jordan**, M.T. Reagan, H. Cooley, M.G. Heberger, J.T. Birkholzer (2017). Identifying chemicals of concern in hydraulic fracturing fluids used for oil production. *Environmental Pollution*, 220: 413-420.

Freifeld, B.M., C.M. Oldenburg, **P. Jordan**, L. Pan, S. Perfect, J. Morris, J. White, S. Bauer, D. Blankenship, B. Roberts, G. Bromhal, D. Glosser, D. Wyatt, and K. Rose (2016). Well integrity for natural gas storage in depleted reservoirs and aquifers: DOE National Laboratories Well Integrity Work Group. LBNL-1006165.

Jordan, P.D., and J. Gillespie (2016). Produced water disposal injections in the southern San Joaquin Valley: no evidence of groundwater quality impacts due to leakage. *Environmental Geosciences*, 23: 141-177.

Jordan, P.D., and J.W. Carey (2016). Steam blowouts in California Oil and Gas District 4: Comparison of the roles of initial defects versus well aging and implications for well blowouts in geologic carbon storage projects. *International Journal of Greenhouse Gas Control*, 51:36-47.

Esser, B.K., H.R. Beller, S.A. Carroll, J.A. Cherry, J. Gillespie, R.B. Jackson, **P.D. Jordan**, V. Madrid, J. P. Morris, B.L. Parker, W.T. Stringfellow, C. Varadharajan, and A. Vengosh (2015). Recommendations on model criteria for groundwater sampling, testing, and monitoring of oil and gas development in California. Prepared for the California State Water Resources Control Board. LLNL-TR-669645. 295 p.

- Jordan, P.**, A. Brandt, K. Ferrar, L. Feinstein, and S. Phillips (2015). A case study of the potential risks associated with hydraulic fracturing in existing oil fields in the San Joaquin basin, *In: An independent assessment of well stimulation technology in California, Volume III: case studies of hydraulic fracturing and acid stimulation in select regions: offshore Monterey Formation, Los Angeles Basin and San Joaquin basin*. California Council on Science and Technology, Sacramento, CA, pp.28-111.
- Long, J.C.S., L.C. Feinstein, J. Birkholzer, **P. Jordan**, J. Houseworth, P. Dobson, M. Heberger, D. Gautier (2015). An independent assessment of well stimulation technology in California, Volume I: well stimulation technologies and their past, present, and potential future use in California. California Council on Science and Technology, Sacramento, CA. 406 p.
- Stringfellow, W.T., H. Cooley, C. Varadharajan, M. Heberger, M.T. Reagan, J.K. Domen, W. Sandelin, M.K. Camarillo, **P.D. Jordan**, K. Donnelly, S.C.T. Nicklisch, A. Hamdoun, J.E. Houseworth (2015). Impacts of well stimulation on water resources, *In: An independent assessment of well stimulation technology in California, Volume II: potential environmental impacts of hydraulic fracturing and acid stimulations*. California Council on Science and Technology, Sacramento, CA, pp.49-181.
- Long, J., J. Birkholzer, **P. Jordan**, and J. Houseworth (2014). Introduction, *In: Advanced well stimulation technologies in California: an independent review of scientific and technical information*, California Council on Science and Technology, Sacramento, CA, pp. 17-46.
- Jordan, P.D.**, and M. Heberger (2014). Historic and current application of well stimulation technology in California, *In: Advanced well stimulation technologies in California: an independent review of scientific and technical information*, California Council on Science and Technology, Sacramento, CA, pp. 87-118.
- Jordan, P.**, and J. Gillespie (2013). Potential impacts of future geological storage of CO₂ on the groundwater resources in California's central valley: southern San Joaquin basin oil and gas production analog for geologic carbon storage. California Energy Commission. CEC-500-2014-029. 122 p.
- Last, G., C. Brown, C. Murray, D. Bacon, **P.D. Jordan**, and M. Sharma (2013). Determining threshold values for identification of contamination predicted by reduced order models. Pacific Northwest National Laboratory, PNNL-22077. 68 p.
- Quinn, N, H. Wainwright, **P. Jordan**, Q. Zhou, and J. Birkholzer. (2013). Potential impacts of future geological storage of CO₂ on the groundwater resources in California's central valley: simulations of deep basin pressure changes and effect on shallow water resources. California Energy Commission. Publication number: CEC-500-2014-028.
- Jordan, P.D.**, C.M. Oldenburg and J.-P. Nicot (2012). Measuring and modeling fault density for CO₂ storage plume-fault encounter probability estimation. *AAPG Bulletin*, 97:597-618.
- Jordan, P.D.**, C.M. Oldenburg and J.-P. Nicot (2011). Estimating the probability of CO₂ plumes encountering faults. *Greenhouse Gases: Science and Technology*, 1:160-174.
- Jordan, P.D.** (2010). Basin-Wide Pressure Changes Due to CO₂ Storage: California Production as a Reverse Analog. SPE 132656. *2010 SPE Western Regional Meeting, 25-26 May 2010, Anaheim, California*.

- Oldenburg, C.M., **P.D. Jordan**, J.-P. Nicot, A. Mazzoldi, A.K. Gupta, and S.L. Bryant (2010). Leakage risk assessment of the In Salah CO₂ storage project: Applying the Certification Framework in a dynamic context. In: Gale, J., C. Hendriks, W. Turkenberg (eds), *Greenhouse Gas Control Technologies 10, Proceedings of the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 19-23 September 2010, Amsterdam, The Netherlands*, Energy Procedia, April 2011, 4: 4154-4161. LBNL-4278E.
- Jordan, P.D.**, and S.M. Benson (2009). Well Blowout Rates in California Oil and Gas District 4: Update and Trends. *Exploration and Production, Oil and Gas Review*, 7: 59-65.
- Jordan, P.D.**, and C. Doughty (2009). Sensitivity of CO₂ migration estimation on reservoir temperature and pressure uncertainty. In: Gale, J., H. Herzog, and J. Braitsch (eds), *Greenhouse Gas Control Technologies 9, Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 16-20 November 2008, Washington DC, US*, Energy Procedia, February 2009, 1: 2587-2594.
- Jordan, P.D.**, C.M. Oldenburg, and J.-P. Nicot (2009). Characterizing fault-plume intersection probability for geologic carbon sequestration leakage risk assessment. In: Gale, J., H. Herzog, and J. Braitsch (eds), *Greenhouse Gas Control Technologies 9, Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 16-20 November 2008, Washington DC, US*, Energy Procedia, February 2009, 1: 2825-2832.
- Leetaru, H.E., S.M. Frailey, J. Damico, E. Mehnert, J. Birkholzer, Q. Zhou, **P.D. Jordan** (2009). Understanding CO₂ Plume Behavior and Basin-Scale Pressure Changes during Sequestration Projects through the use of Reservoir Fluid Modeling. In: Gale, J., H. Herzog, and J. Braitsch (eds), *Greenhouse Gas Control Technologies 9, Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 16-20 November 2008, Washington DC, US*, Energy Procedia, February 2009, 1: 1799-1806.
- Oldenburg, C.M., S.L. Bryant, J.-P. Nicot, N. Kumar, Y. Zhang, **P. Jordan**, L. Pan, P. Granvold, F. K. Chow (2009). Chapter 21: model components of the certification framework for geologic carbon sequestration risk assessment. In: Eide, L.I. (ed.) *Carbon Dioxide Capture for Storage in Deep Geologic Formations - Results from the CO₂ Capture Project, Volume Three Advances in CO₂ Capture and Storage Technology (2004-2009)*, CPL Press, Newberry, UK, pp. 289-316.
- Zhang, Y., C.M. Oldenburg, P.D. Jordan, S. Finsterle, and K. Zhang (2009). Fuzzy rule-based probability estimation of fault leakage at geologic carbon sequestration. In: Gale, J., H. Herzog, and J. Braitsch (eds), *Greenhouse Gas Control Technologies 9, Proceedings of the 9th International Conference on Greenhouse Gas Control Technologies (GHGT-9), 16-20 November 2008, Washington DC, US*, Energy Procedia, February 2009, 1: 41-46.
- Jordan, P.D.**, and S. M. Benson (2008). Well blowout rates and consequences in California Oil and Gas District 4 from 1991 to 2005: implications for geological storage of carbon dioxide. *Environmental Geology*, 57: 1103-1123.
- Birkholzer, J.T., Q. Zhou, J. Rutqvist, **P. Jordan**, K. Zhang, and C.-F. Tsang (2007). Research project on CO₂ geological storage and groundwater resources: large-scale hydrogeological evaluation and impact on groundwater systems, Annual Report October 1, 2006 to September 30, 2007, LBNL-63544.

- Jordan, P.D.**, and I. Javandel (2007). Hydrogeology and tritium transport in Chicken Creek Canyon, Lawrence Berkeley National Laboratory, Berkeley, California. LBNL-63557.
- Jordan, P.**, C. Oldenburg, and G. Su (2005). Analysis of aquifer response, groundwater flow, and plume evolution at Site OU 1, Former Fort Ord, California. LBNL-57251.
- Su, G.W., B.M. Freifeld, C.M. Oldenburg, **P.D. Jordan**, and P.F. Daley (2005). Simulation of In-Situ Permeable Flow Sensors for Measuring Groundwater Velocity. *Ground Water*, 44: 386-393
- Zhou, Q., J.T. Birkholzer, I. Javandel, and **P.D. Jordan** (2005). Numerical simulation of groundwater flow at the LBNL Old Town Site in support of remediation strategies. LBNL-57372.
- Zhou, Q., J.T. Birkholzer, I. Javandel, and **P.D. Jordan** (2004). Modeling Three-Dimensional Groundwater Flow and Advective Contaminant Transport at a Heterogeneous Mountainous Site in Support of Remediation Strategy. *Vadose Zone Journal*, 3: 884-900.
- Oldenburg, C.M., Y. Zhang, J.L. Lewicki, and **P.D. Jordan** (2003). Preliminary application of a coupled modeling framework for CO₂ leakage and seepage at the Rio Vista gas field. LBNL-54051.
- Oldenburg, C.M., P.F. Daley, B.M. Freifeld, J. Hinds, and **P.D. Jordan** (2002). Three-dimensional groundwater flow, aquifer response and treatment system monitoring at Site OU 1, former Fort Ord, California, LBNL-49586.
- Oldenburg, C.M., A.J.A. Unger, R.P. Hepple, and **P.D. Jordan** (2002). On leakage and seepage from geological carbon sequestration sites. LBNL-51130.
- Parsons Engineering Science (2000). Draft final RCRA facility investigation report, Environmental Restoration Program, Lawrence Berkeley National Laboratory, Berkeley, California, September 2000.
- Faybishenko, B., M. Bandurraga, S.M. Conrad, P. Cook, C. Eddy-Dilek, L. Everett, T. Hazen, S. Hubbard, A.R. Hutter, **P. Jordan**, C. Keller, F.J. Leij, N. Loaiciga, E.L. Majer, L. Murdoch, S. Renehan, B. Riha, J. Rossabi, Y. Rubin, A. Simmons, S. Weeks, and C.V. Williams (2000). Vadose zone characterization and monitoring: current technologies, applications and future developments. *In: Looney, B.B., and Falta, R.W.(eds.), Vadose Zone: Science and Technology Solutions*, Battelle Press, Columbus, OH, pp. 133-395.
- Faybishenko, B., **P. Holland**, M. Mesa, D. Burgess, C. Knutson, and B. Sisson (1998). Lithological conditions at the box canyon site: results of drilling, coring and open borehole measurements 1995-1997 data report. LBNL-40182.
- Shoshani, A., **P. Holland**, J. Jacobsen, D. Mitra (1996). Characterization of temporal sequences in geophysical databases. *Eighth International Conference Scientific and Statistical Database Management, Stockholm, Sweden, 18-20 June 1996*.
- Jacobsen, J., W. Bethel., A. Datta-Gupta, and **P. Holland** (1995a). Petroleum reservoir simulation in a virtual environment. *Symposium on Reservoir Simulation, San Antonio, Texas, 12-15 February 1995*, SPE Paper 29118.

- Jacobsen, J., W. Bethel., A. Datta-Gupta, and **P. Holland** (1995b). Virtual reservoir development a reality on prototype system. *American Oil & Gas Reporter*, 38: 78-86.
- Bethel, E.W., J. Jacobsen, **P. Holland** (1994). Site remediation in a virtual environment. *In: Moorhead, R.J., D.E. Silver, and S.P. Uselton, (Eds.), Visual Data Exploration and Analysis, Proceedings of the 6th Annual Symposium on Electronic Imaging, San Jose, CA, 6-10 February 1994, SPIE Proceedings, 2178:78-87*
- Bethel, W., and **P. Holland** (1993). Site characterization at Lawrence Berkeley Laboratory (LBL). *AVS Network News*, 2: 3-12.
- Holland, P.J.** (1992). Initial appraisal of the geologic controls of groundwater occurrence and movement in the "Old Town" area of Lawrence Berkeley Laboratory. LBID-1851.
- Holland, P.J.** (1992). Initial Appraisal of the Geologic Controls of Groundwater Occurrence and Movement in the "Grizzly" area of Lawrence Berkeley Laboratory. LBID-1852.
- Dietrich, W.E., D.R. Montgomery, S.L. Reneau, and **P. Jordan** (1988). The use of hillslope convexity to calculate diffusion coefficients for a slope dependent transport law. *EOS, Trans. AGU* 69:1123-4.