Thomas M. Daley

Experience:

2018-Present	Staff Scientist (Retiree Rehire) Energy Geosciences Division, LBNL
2018	Retired, Lawrence Berkeley National Laboratory
2015-2018	Staff Scientist, Energy Geosciences Division, LBNL
2015-2017	Geophysics Department Head, Earth & Environmental Sciences Area, Lawrence Berkeley National Laboratory (LBNL)
2014-2015	Geophysics Department Head, Earth Sciences Division, LBNL
2011-2014	Staff Scientist, Earth Sciences Division, LBNL
2007-2011	Research Scientist, Earth Sciences Division, LBNL
1995-2007	Staff Research Associate, Earth Sciences Division, LBNL
1987-1995	Research Associate, Earth Sciences Division, LBNL
1982-1985	District Manager, Seismograph Service Corp.
1980-1982	Field Engineer, Birdwell Division, Seismograph Service Corp.

Education:

1987 M.S. Engineering, Engineering Geoscience, Univ. of California, Berkeley
1980 B.A. Geophysics, Geology and Geophysics, Univ. of California, Berkeley

Research Abstract:

My research is focused on the acquisition and analysis of borehole seismic data from field scale experiments. Problems addressed include continuous monitoring to detect stress changes, monitoring of geologic sequestration of CO_2, monitoring for risk assessment, characterization of fracture content and dominant fracture orientation in geothermal and oil fields, high resolution imaging of shallow surface materials, imaging fracture flow zones in contaminated aquifers, and integrated geophysical characterization of volcanic tuff flows for nuclear waste isolation at Yucca Mountain.

Professional Affiliations:

Member: Society of Exploration Geophysicists (SEG), American Geophysical Union (AGU), Bay Area Geophysical Society (BAGS)
Member: SEG Research Committee
Member and Previous Chair: SEG CO_2 Research Subcommittee

Honors/Awards/Patents

2016	System and Method of Detecting Well Integrity Failure, US Patent 20,160,116,621
2015	R&D 100 Award (R&D Magazine): CASSM (Continuous Active-Source Seismic Monitoring)
2015	Outstanding Performance Award, Lawrence Berkeley National Lab.
2012	Best Paper at 2011 Annual Meeting, Society of Exploration Geophysicists
2011	US Patent 8,717,850 Piezotube Borehole Seismic Source
2008	Schlumberger Gold Award
2007	Outstanding Performance Award, Lawrence Berkeley National Lab.
2006	Outstanding Performance Award, Lawrence Berkeley National Lab.

Invited Presentations:

1. **Daley, Thomas M.,** 2017, Monitoring CO_2 Storage, Workshop on Geologic Capture and Sequestration of Carbon, National Academy of Sciences, Stanford Univ., Nov. 28, 2017.

2. **Daley Thomas M.,** et al., 2017, Monitoring Technology at Aquistore, IEA Greenhouse Gas Monitoring Network, Traverse City, Michigan, June 12-15, 2017.

3. **Daley, Thomas M.,** Freifeld, B. M., 2016, Advanced Monitoring Technology: DAS (Distributed Acoustic Sensing) at Otway and Aquistore, IEA Greenhouse Gas Monitoring Network Edinburgh, Scotland, July 6, 2016.

4. **Daley, Thomas M,** and Freifeld, Barry M, 2015, Integrated Technology for Deep Boreholes: Modular Borehole Monitoring (invited), American Geophysical Union Annual Meeting, paper H13M-02.

5. **Daley, T.M.,** 2015, Comparison of Fiber Optic Monitoring with Conventional Geophone Detection Systems at Aquistore, 10th Monitoring Network Meeting, International Energy Agency Greenhouse Gas Program, Berkeley, CA, June 10-12, 2015.

6. **Daley, T.M.,** 2015, Induced seismicity from CO_2 storage: monitoring and risk assessment, Stanford Center for Carbon Storage Annual Meeting, Workshop on "Induced Seismicity due to CO_2 injection", Palo Alto, Ca, May 27-28.

7. **Daley, T. M.,** 2014, Pathways to integrate monitoring in risk assessment based modeling, IEAGHG Monitoring Network and Modeling Network – Combined Meeting, Morgantown WV, 4-8 August, 2014.

8. **Daley, T.M,** 2014, Continuous Active Source Seismic Monitoring (CASSM): Applications to Crosswell Reservoir Monitoring, Society of Exploration Geophysics, Development and Production Forum: Reservoir Characterization and Monitoring with Advanced Geophysical Technology, Santa Rosa, California, July 3, 2014.

9. **Daley, T.M.,** Miller, D., Freifeld, B.M., Dodds, K., 2014, Results of field testing of simultaneous DAS and Geophone VSP, Workshop: Fibre Optics Sensing for Vertical Seismic Profile (VSP) Surveys: Challenges Faced & The Way Forward for Fiber Optics Sensing Use in VSP Surveys, 76th EAGE Conference & Exhibition 2014, Amsterdam, Netherlands.

10. **Daley, Thomas M,** and Barry Freifeld, 2014, Borehole Based Monitoring of CO_2 Storage: Recent Developments in Fiber-Optic Sensing, CCS Technical Workshop, Research Institute of Innovative Technology for the Earth, Tokyo, Japan, January 23, 2014.

11. **Daley, Thomas M**, 2013, Detection, monitoring and modeling of a probable fracture zone at the In Salah CO_2 storage project, Society of Exploration Geophysics, Post-convention Workshop, Houston, Tx, September 27, 2013.

12. **Daley, Thomas M.,** B.M. Freifeld, P. Cook, R. Trautz, K. Dodds, 2013, Modular Borehole Monitoring (MBM) at SECARB's Citronelle Site: Project Update, IEA GHG CCS Combined Monitoring and Environmental Network Meeting: Canberra, ACT, August 26-30, 2013.

13. **Daley, Thomas M.,** Barry Freifeld, multiple co-authors, 2013, VSP Acquisition Using Fiber Optic Distributed Acoustic Sensing (DAS):A Comparison of Sites and with Conventional Geophones, Society of Petroleum Engineers Workshop on Distributed Fiber-Optic Monitoring for Well and Reservoir Management, Palos Verdes, CA, July 16-18, 2013.

14. **Daley, Thomas M**., Monitoring the Subsurface with Borehole Seismic: CASSM and Beyond, Stanford Geophysics Department Seminar, May 2, 2013.

15. **Daley, Thomas M.,** Subsurface Monitoring of CO_2 Sequestration – A Review and Look Forward (Invited), 2012, Fall Meeting, American Geophysical Union, Dec. 2012,GC53D-07.

16. Korneev, V., and **Daley, T.M**., 2012, Uncertainty of micro-seismic events location during fluid injection, 2012, 1st Joint International Workshop for the Earth's Surface and Subsurface 4D Monitoring, Riyadh, Saudi Arabia, January 8 -11.

17. **Daley, T.M**., Jonathan B. Ajo-Franklin, Fenglin Niu, 2011, Recent Results from Crosswell CASSM (Continuous Active-Source Seismic Monitoring), American Geophysical Union Annual Meeting, Special session T05, 5-9 December, San Francisco.

18. **Daley, T.M.**, 2011, Monitoring Strategies for Geologic Storage of CO_2, MIT Carbon Sequestration Forum XII, Cambridge MA, October 26.

19. Ajo-Franklin, J. B., **Thomas Daley**, Belinda Butler-Veytia, John Peterson, Yuxin Wu, Bob Kelly, and Susan Hubbard, 2011, Multi-level continuous active source seismic monitoring (ML-CASSM): Mapping shallow hydrofracture evolution at a TCE contaminated site, SEG Expanded Abstracts 30, 3727 (2011), DOI:10.1190/1.3627980

20. **Daley, T.M.,** 2011, Seismic Monitoring of Geologic Sequestration, Research and Development Symposium, Society of Petroleum Engineers, Austin, Tx, June 7.

21. **Daley, T.M.,** 2010, Geophysical Characterization/MMV Experiences, Joint SECARB Meeting, Electric Power Research Institute, Palo Alto, CA, July 14.

22. **Daley, T.M.,** E. Majer, M, Hoversten, R. Gritto, J. Ajo-Franklin, 2010, Borehole Seismic Monitoring of Sequestration Pilots, Geologic Carbon Sequestration Site Integrity: Characterization and Monitoring Workshop, Columbus, Ohio, June 7-8, 2010.

23. Majer, E. and **Daley, T.M**., 2010, Induced Seismicity Associated with Fluid Injections for Energy Resource Applications: Lessons learned from Geothermal, Geologic Carbon Sequestration Site Integrity: Characterization and Monitoring Workshop, Columbus, Ohio, June 7-8, 2010.

24. **Daley, T.M.,** 2010, MMV Planning in WESTCARB and DOE's National Risk Assessment Partnership (NRAP), 6th Annual International Energy Agency Greenhouse Gas Monitoring Network, Natchez, MS, May 2010.

Journal Publications (Peer and Editorial Reviewed), Book Chapters:

1. White, D., Daley, T.M., Paulsson, B., Harbert, W., 2021, Borehole seismic methods for geologic CO_2 storage monitoring, The Leading Edge, 30, p434-441,

2. Prasad, M., Glubokovskikh, S., Daley, T., Oduwole, S. Harbert, W., CO_2 messes with rock physics, The Leading Edge, 40, 424-432.

3. Trautz, R., **Daley, T.,** Miller, D., Robertson, M., Koperna, G., Riestenberg, D., 2020, Geophysical monitoring using active seismic techniques at the Citronelle Alabama CO_2 storage demonstration site, International Journal of Greenhouse Gas Control, v99, https://doi.org/10.1016/j.ijggc.2020.103084.

4. Zhou, Q., Yang, X., Zhang, R., Hosseini, S.A., Ajo-Franklin, J.B., Freifeld, B.M., **Daley, T.M.,** and Hovorka, S.D., 2020, Dynamic Processes of CO_2 Storage in the Field: 1. Multiscale and Multipath Channeling of CO_2 Flow in the Hierarchical Fluvial Reservoir at Cranfield, Mississippi, Water Resources Research, 56, e2019EF001360, http://dx.doi.org/10.1029/2019WR025688

5. **Correa**, J., Pevzner, R., Bona, A., Tertyshnikov, K., Freifeld, B., Robertson, M. & **Daley, T.** 2019. *3D VSP Acquired with DAS on Tubing Installation: A Case Study from the CO2CRC Otway Project*. Interpretation 7 (1), SA11-SA19. doi.org/10.1190/INT-2018-0086.1

6. Yavuz, S., Freifeld, B., Pevzner, R., Dzunic, A., Ziramov, S., Bóna, A., Correa, J., Tertyshnikov, K., Urosevic, M., Robertson, M., and **Daley T**., 2019. "The initial appraisal of buried DAS system in CO2CRC Otway Project: the comparison of buried standard fibre-optic and helically wound cables using 2D imaging." Exploration Geophysics 50(1): 12-21. DOI: 10.1080/08123985.2018.1561147

7. **Daley, T. M.,** and Harbert, W., 2019, Goals of CO_2 monitoring: Why and how to access the subsurface changes associated with CCS, in Geophysics and Geosequestration, Cambridge University Press. **ISBN:** 9781107137493

8. **Daley, T.M.,** 2019, Rock Physics of CO_2 Storage Monitoring in Porous Media, in Geophysics and Geosequestration, Cambridge University Press. **ISBN:** 9781107137493

9. Vasco, D. W., Masoud Alfi, Seyyed A. Hosseini, Rui Zhang, **Thomas Daley**, Jonathan B. Ajo-Franklin, and Susan D. Hovorka, 2019, The seismic response to injected carbon dioxide: Comparing observations to estimates based upon fluid flow modeling, Journal of Geophysical Research. **DOI:**10.1029/2018JB016429

10. Yang, Chenhao; Niu, Fenglin; **Daley, Thomas M**; Taira, Taka-aki, 2018, Continuous Measurement of Stress-Induced Travel Time Variations at SAFOD, Seismological Research Letters, Seismological Society of America, October 31, 2018, Vol.90, 212-218. doi:10.1785/0220180080

11. Vasco, Donald W; Bissell, Robert C; Bohloli, Bahman; **Daley, Thomas M**; Ferretti, Alessandro; Foxall, William; GoertzÉ_êAllmann, Bettina P; Korneev, Valeri; Morris, Joseph P; Oye, Volker; 2018, Monitoring and Modeling Caprock Integrity at the In Salah Carbon Dioxide Storage Site, Algeria, in Geological Carbon Storage: Subsurface Seals and Caprock Integrity, 238-243, American Geophysical Union

12. Jung, Y., C Doughty, A Borgia, KJ Lee, CM Oldenburg, L Pan, **TM Daley**, 2018, Pressure transient analysis during CO_2 push-pull tests into faults for EGS characterization, Geothermics 75, 180-191. DOI: 10.1016/j.geothermics.2018.05.004

13. Lee, K.J., Curtis M Oldenburg, Christine Doughty, Yoojin Jung, Andrea Borgia, Lehua Pan, Rui Zhang, **Thomas M Daley**, Bilgin Altundas, Nikita Chugunov, 2018, Simulations of carbon dioxide push-pull into a conjugate fault system modeled after Dixie Valley—Sensitivity analysis of significant parameters and uncertainty prediction by data-worth analysis, Geothermics 74, 121-134. DOI: 10.1015/j.geothermics.2018.02.011

14. Ajo-Franklin, J., Shan Dou, Nathaniel Lindsey, Inder Monga, Chris Tracy, Michelle Robertson, Craig Ulrich, Barry Freifeld, **Tom Daley**, Xiaoye S Li, 2018, Using Dark Fiber and Distributed Acoustic Sensing for Near-Surface Characterization and Broadband Seismic Event Detection, *Scientific Reports,* **9,** 1328 (2019). https://doi.org/10.1038/s41598-018-36675-8

15. Dou, S., Lindsey, N., Wagner, A.M., **Daley, T.M**., Freifeld, B., Robertson, M., Peterson, J., Ulrich, C., Martin, E.R., and J.B. Ajo-Franklin, 2017, Distributed Acoustic Sensing for Seismic Monitoring of the Near Surface: A Traffic-Noise Interferometry Case Study, Scientific Reports, 7:11620, DOI:10.1038/s41598-017-11986-4

16. Zhu, T., Ajo-Franklin, J., and **T. Daley**, 2017, Spatio-temporal changes in seismic attenuation caused by injected CO_2 at the Frio-II pilot site, Dayton TX, USA, *Journal of Geophysical Research – Solid Earth*, 122(9), 7156-7171, DOI: 10.1002/2017JB014164

17. Marchesini, P., J.B. Ajo-Franklin, **T.M. Daley**, 2017, In-Situ Measurement Of Velocity-Stress Sensitivity Using Crosswell Continuous Active-Source Seismic Monitoring (CASSM), Geophysics 82 (5), 1-27.

18. Borgia, A, Curtis M. Oldenburg, Rui Zhang, Lehua Pan, **Thomas M. Daley**, Stefan Finsterle, T.S. Ramakrishnan, 2017, Simulations of CO_2 injection into fractures and faults for improving their geophysical characterization at EGS sites, Geothermics, Volume 69, September 2017, Pages 189-201, ISSN 0375-6505, https://doi.org/10.1016/j.geothermics.2017.05.002.

19. Pevzner, R., Milovan Urosevic, Dmitry Popik, Valeriya Shulakova, Konstantin Tertyshnikov, Eva Caspari, Julia Correa, Tess Dance, Anton Kepic, Stanislav Glubokovskikh, Sasha Ziramov, Boris Gurevich, Rajindar Singh, Matthias Raab, Max Watson, **Tom Daley**, Michelle Robertson, Barry Freifeld, 2017, 4D surface seismic tracks small supercritical CO_2 injection into the subsurface: CO2CRC Otway Project, International Journal of Greenhouse Gas Control, 63, 150-157, ISSN 1750-5836, https://doi.org/10.1016/j.ijggc.2017.05.008.

20. Pevzner, R., M Urosevic, K Tertyshnikov, B Gurevich, V Shulakova, S Glubokovskikh, D Popik, J Correa, A Kepic, B Freifeld, M Robertson, T Wood, T Daley, R Singh, 2017, Stage 2C of the CO2CRC Otway Project: Seismic monitoring operations and preliminary results, Energy Procedia, 114, 3997-4007. https://doi.org/10.1016/j.egypro.2017.03.1540

21. White, D, Kyle Harris, Lisa Roach, Brian Roberts, Kyle Worth, Anna Stork, Christopher Nixon, Douglas Schmitt, Tom Daley, Claire Samson, 2017, Monitoring Results after 36 Ktonnes of Deep CO_2Injection at the Aquistore CO_2 Storage Site, Saskatchewan, Canada, Energy Procedia, 114, 4056-4061. https://doi.org/10.1016/j.egypro.2017.03.1546

22. Al Hosni, M Vialle, S., Gurevich, B., **Daley, T. M**., 2016, Estimation Of Rock Frame Weakening Using Time-Lapse Crosswell: The Frio Brine Pilot Project, Geophysics, 81, B235–B245, DOI: 10.1190/GEO2015-0684.1

23. Al Hosni, M, E Caspari, R Pevzner, **T. M. Daley**, B Gurevich, 2016, Case History: Using time−lapse vertical seismic profiling data to constrain velocity–saturation, Geophysical Prospecting 64 (4), 987-1000, **DOI:** 10.1111/1365-2478.12386

24. Miller, D. E., **T.M. Daley**, D. White, B.M. Freifeld, M. Robertson, J. Cocker, M. Craven, 2016, Simultaneous Acquisition of Distributed Acoustic Sensing VSP with Multi-mode and Single-mode Fiber-optic Cables and 3C-Geophones at the Aquistore CO_2 Storage Site, Recorder, Canadian Society of Exploration Geophysics, v41, n06, p28-33.

25. Harbert, W., **T M. Daley**, G Bromhal, C Sullivan, L Huang, 2016, Progress in monitoring strategies for risk reduction in geologic CO_2 storage, International Journal of Greenhouse Gas Control, pp. 260-275. DOI: 10.1016/j.ijggc.2016.05.007

26. **Daley, T.M**., Miller, D. E., Dodds, K., Cook, P., Freifeld, B.M., 2016, Field Testing of Modular Borehole Monitoring with Simultaneous Distributed Acoustic Sensing and Geophone Vertical Seismic Profile at Citronelle, Alabama, Geophysical Prospecting, 64 (5), 1318-1334, DOI: 10.1111/1365-2478.12324.

27. Harris, K**.,** White, D., Melanson, D., Samson, C., and **Daley, T. M.,** 2016, Feasibility of Time-lapse VSP Monitoring at the Aquistore CO_2 Storage Site Using a Distributed Acoustic Sensing System, International Journal of Greenhouse Gas Control, 50, p248-260. doi:10.1016/j.ijggc.2016.04.016

28. Commer, M., J Doetsch, B Dafflon, Y Wu, **TM Daley**, SS Hubbard, 2016, Time-lapse 3-D electrical resistance tomography inversion for crosswell monitoring of dissolved and supercritical CO_2 flow at two field sites: Escatawpa and Cranfield, Mississippi, USA, International Journal of Greenhouse Gas Control, 49, p297-311. doi:10.1016/j.ijggc.2016.03.020

29. **Daley, Thomas M**., J. Torquil Smith, John Henry Beyer and Douglas LaBrecque, 2015, Borehole EM Monitoring at Aquistore with a Downhole Source, Chapter 39 in Carbon Dioxide Capture for Storage in Deep Geologic Formations – Results from the CO_2 Capture Project, Volume Four: CCS Technology Development and Demonstration Results (2009-2014), Karl F. Gerdes, editor, CPL Press, ISBN 978-1-872691-68-8.

30. Freifeld, Barry M., **Thomas M. Daley** and Paul Cook, 2015, Modular Borehole Monitoring an Integrated Deployment Package Development, Chapter 29 in Carbon Dioxide Capture for Storage in Deep Geologic Formations – Results from the CO_2 Capture Project, Volume Four: CCS Technology Development and Demonstration Results (2009-2014), Karl F. Gerdes, editor, CPL Press. ISBN 978-1-872691-68-8.

31. Freifeld, Barry M., **Thomas M. Daley**, Paul Cook and Douglas E. Miller, 2015, Modular Borehole Monitoring: Deployment and Testing, Chapter 37 in Carbon Dioxide Capture for Storage in Deep Geologic Formations – Results from the CO_2 Capture Project, Volume Four: CCS Technology Development and Demonstration Results (2009-2014), Karl F. Gerdes, editor, CPL Press. ISBN 978-1-872691-68-8.

32. Zhang, R., **Daley, T.M.,** Vasco, D., 2015, Improving thin-bed resolution: Application of a sparse-layer inversion on 3D seismic observations from the In Salah carbon dioxide storage project, Interpretation, v 3, n3, p SS65-SS71. doi: 10.1190/INT-2014-0204.1

33. Zhang, R., Vasco, D. and **Daley, T. M.,** Study of seismic diffractions caused by a fracture zone at In Salah carbon dioxide storage project, 2015 International Journal of Greenhouse Gas Control, v 42, p 75-86. DOI:10.1016/ j.ijggc.2015.07.033

34. Zhang, R., Vasco, D., **Daley, T.M**., 2015, Characterization of a fracture zone using seismic attributes at the InSalah CO_2 storage project, Interpretation, SM37-46. DOI:10.1190/INT-2014-0141.1.

35. **Daley, T.M.,** J. Hendrickson, JH Queen, 2015, Monitoring CO_2 Storage at Cranfield, Mississippi with Time-Lapse Offset VSP–Using Integration and Modeling to Reduce Uncertainty, Energy Procedia 63, 4240-4248.

36. Freifeld, B, **T Daley**, P Cook, R Trautz, K Dodds, 2015, The Modular Borehole Monitoring Program: a research program to optimize well-based monitoring for geologic carbon sequestration, Energy Procedia 63, 3500-3515.

37. White, D.J., L.A.N Roach, B. Roberts, **T.M. Daley**, 2015, Initial Results from Seismic Monitoring at the Aquistore CO_2 Storage Site, Saskatchewan, Canada, Energy Procedia 63, 4418-4423.

38. **Daley, T.M**., Freifeld, B., Siggins, T., 2014, Seismic Monitoring at Naylor-1 using High Resolution Travel Time (HRTT) and Offset VSP, In: *Geologically Storing Carbon: Learning from the Otway Project Experience*. (Ed. P J Cook) 408pp. CSIRO Publishing, Melbourne, ISBN: 9781486302307.

39. Vasco, D.W., **Thomas M. Daley** and Andrey Bakulin, 2014, Utilizing the onset of time-lapse changes: a robust basis for reservoir
monitoring and characterization, Geophysical Journal International, doi: 10.1093/gji/ggt526.

40. Oye, Volker, Eyvind Aker, **Thomas M. Daley,** Daniela Kühn, Bahman Bohloli, Valeri Korneev, Microseismic Monitoring and Interpretation of Injection Data from the in Salah CO_2 Storage Site (Krechba), Algeria, 2013, Energy Procedia, Volume 37, 2013, Pages 4191-4198, ISSN 1876-6102, http://dx.doi.org/10.1016/j.egypro.2013.06.321.

41. **Daley, Thomas. M.,** Barry M. Freifeld, Jonathan Ajo-Franklin, Shan Dou, Roman Pevzner, Valeriya Shulakova, Sudhendu Kashikar,Douglas E. Miller, Julia Goetz, Jan Henninges, Stefan Lueth, 2013, Field testing of fiber-optic distributed acoustic sensing (DAS) for subsurface seismic monitoring, The Leading Edge 32, 6 (2013); pp. 699-706, http://dx.doi.org/10.1190/tle32060699.1

42. Doetsch, J., Kowalsky, M.B., Doughty, C., Finsterle, S., Ajo-Franklin, J.B., Carrigan, C., Yang, X., Hovorka, S.D., **Daley, T.M**., 2013. Constraining CO_2 simulations by coupled modeling and inversion of electrical resistance and gas composition data. International Journal of Greenhouse Gas Control 18, 510-522. http://dx.doi.org/10.1016/ j.ijggc.2013.04.011

43. Ajo-Franklin, J., B., Peterson, J., Doetsch, J., **Daley, T.M.**, 2013, High-Resolution Characterization of a CO_2 Plume Using Crosswell Seismic Tomography: Cranfield, MS, International Journal of Greenhouse Gas Control, 18, 497-509, http://dx.doi.org/10.1016/j.ijggc.2012.12.018; Data DOI: 10.18141/1499028

44. Nakagawa, Seiji, Timothy J. Kneafsey, **Thomas M. Daley**, Barry M. Freifeld, and Emily V. Rees, 2013, Laboratory seismic monitoring of supercritical CO_2 flooding in sandstone cores using the Split Hopkinson Resonant Bar technique with concurrent x-ray CT imaging, Geophysical Prospecting, 61, 254–269.

45. Dafflon B., Wu Y., Hubbard S.S., Birkholzer J., **Daley T.**, Pugh J., Peterson J.E., and Trautz R. 2012. Monitoring CO_2 intrusion and associated geochemical transformations in a shallow groundwater system using complex electrical method, Environ. Sci. Techn.; 47(1), 314-321, 2013.

46. **Daley, Thomas M**., Jonathan B. Ajo-Franklin, Christine Doughty, 2011, Constraining the reservoir model of an injected CO_2 plume with crosswell CASSM at the Frio-II brine pilot, International Journal of Greenhouse Gas Control, 5, pp. 1022-1030, DOI information: 10.1016/j.ijggc.2011.03.002.

47. Myer, L. R., and **Daley, T. M**., 2011, Elements of a best practices approach to induced seismicity in geologic storage, Energy Procedia, V. 4, p 3707-3713.

48. Hovorka, S.D., Timothy A. Meckel, Ramon H. Trevino, Jiemin Lu, Jean-Philippe Nicot, Jong-Won Choi, David Freeman, Paul Cook, **Thomas M. Daley**, Jonathan B. Ajo-Franklin, Barry M. Freifeild, Christine Doughty, Charles R. Carrigan, Doug La Brecque, Yousif K. Kharaka, James J. Thordsen, Tommy J. Phelps, Changbing Yang, Katherine D. Romanak, Tongwei Zhang, Robert M. Holt, Jeffery S. Lindler, Robert J. Butsch, 2011, Monitoring a large volume CO_2 injection: Year two results from SECARB project at Denbury's Cranfield, Mississippi, USA, *Energy Procedia*, *Volume 4*, *2011*, *Pages 3478-3485*.

49. Zhou, Rongmao, Lianjie Huang, James T. Rutledge, Michael Fehler, **Thomas M. Daley**, Ernest L. Majer, 2010, Coda-wave interferometry analysis of time-lapse VSP data for monitoring geological carbon sequestration, International Journal of Greenhouse Gas Control, 4, 679–686, doi:10.1016/j.ijggc.2010.01.010. LBNL-3076E.

50. **Daley, Thomas M**., Fenglin Niu, Paul G. Silver, Ernest L. Majer, 2010, Acquisition of Crosswell Seismic Monitoring Data. In: Junzo Kasahara, Valeri Korneev and Michael Zhdanov, editors: Active Geophysical Monitoring, Vol 40, Handbook of Geophysical Exploration: Seismic Exploration, Klaus Helbig and Sven Treitel. The Netherlands, Elsevier, 2010, pp. 165-176.

51. Lumley, D., Sherlock, D., **Daley, T**., Huang, L., Lawton, D., Masters, R., Verliac, M., and White, D., 2010. Highlights of the 2009 SEG summer research workshop on "CO_2 Sequestration Geophysics," The Leading Edge, v29, p138-145, LBNL-3074E.

52. Xu, T., Y.K. Kharaka, C. Doughty, B.M. Freifeld, **T.M. Daley**, 2010, Reactive transport modeling to study changes in water chemistry induced by CO_2 injection at the Frio brine pilot, Chemical Geology, v. 271, p. 153-164, 2010. (LBNL-3056E)

53. Dodds, K., **Daley, T.**, Freifeld, B., Urosevic, M., Kepic, A. and Sharma, S., 2009, Developing a monitoring and verification plan with reference to the Australian Otway CO_2 pilot project, The Leading Edge, v28, n7, 812-818, LBNL-2310E.

54. Freifeld, B.M., **Daley, T.M.,** Hovorka, S.D., Henninges, J., Underschultz, J., and Sharma S, 2009, Recent advances in well-based monitoring of CO_2 sequestration, Energy Procedia, Elsevier, Vol. 1, Issue 1, 2277- 2284.

55. Niu, F., Silver, P.G., **Daley, T.M.**, Cheng, X., Majer, E.L., 2008, Preseismic velocity changes observed from active source monitoring at the Parkfield SAFOD drill site, Nature, 454, 204-208, DOI:10.1038/nature07111, LBNL-717E.

56. **Daley, T.M.**, Myer, L.R., Peterson, J.E., Majer, E.L., Hoversten, G.M., 2008, Time-lapse crosswell seismic and VSP monitoring of injected CO_2 in a brine aquifer, Environmental Geology, 54, 1657-1665, DOI:10.1007/s00254-007-0943-z.

57. **Daley, T.M.,** R.D. Solbau, J.B. Ajo-Franklin, S.M. Benson, 2007, Continuous active-source monitoring of CO_2 injection in a brine aquifer, Geophysics, v72, n5, pA57–A61, DOI:10.1190/1.2754716.

58. Silver, P.G., **Daley, T.M**., Niu, F., Majer, E.L., 2007, Active source monitoring of crosswell seismic travel time for stress induced changes, Bulletin of Seismological Society of America, v97, n1B, p281-293.

59. Ajo-Franklin, J.B., Minsley, B.J., **Daley, T.M**., 2007, Applying Compactness Constraints to Seismic Traveltime Tomography, Geophysics, v72, n4, pR67-R75, DOI:10.1190/1.2742496.

60. Majer, E. L., **T. M. Daley**, V. Korneev, D. Cox, J. E. Peterson, and J. H. Queen, 2006, Cost-effective imaging of CO_2 injection with borehole seismic methods, The Leading Edge, V25, n10, pp. 1290-1302.

61. Hovorka, S.D., Benson. S.M., Doughty, C., Freifeld, B.M., Sakurai, S., **Daley, T.M.**, Kharaka, Y.K, Holtz, M.H., Tarutz, R.C., Nance, S.H., Myer, L.R. and Knauss K.G., 2006, Measuring permanence of CO_2 storage in saline formations: the Frio experiment, Environmental Geosciences, V. 13, no 2, pp 1-17, DOI:10.1306/eg.11210505011.

62. **Daley, T.M**., Schoenberg, M.A., Rutqvist, J., Nihei, K.T., 2006, Fractured reservoirs: An analysis of coupled elasto-dynamic and permeability changes due to pore pressure variation, Geophysics, v71, n5, O33-O41.

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2. Correa, Julia; Freifeld, Barry; Robertson, Michelle; Pevzner, Roman; Bona, Andrej; Popik, Dmitry; Tertyshnikov, Konstantin; **Daley, Thomas;** "2018, 3D Vertical Seismic Profiling Acquired Using Fibre-Optic Sensing Das" Results From The CO2CRC Otway Project, Australian Society of Exploration Geophysicists, Extended Abstract.

3. Niu, F., Hongrui Qiu, Taka'aki Taira, **Thomas M Daley,** Michelle Robertson, Pierpaolo Marchesini, Todd Wood, 2020, Inverting temporal velocity changes at SAFOD from cross-well active source seismic data using a Markov Chain Monte Carlo approach, American Geophysical Union, Fall Meeting Abstracts, S062-0017.

4. Um, Evan; Marchesini, Pierpaolo; Wilt, Michael; Nichols, Edward; Alumbaugh, David; Vasco, Donald; **Daley, Thomas**; Key, Kerry; 2020, Joint use of crosswell EM and seismics for monitoring CO_2 storage at the Containment and Monitoring Institute Field Site (CaMI): Baseline surveys and preliminary results,SEG International Exposition and Annual Meeting, OnePetro

5. Correa, J; Freifeld, B; Ajo-Franklin, J; Dou, S; Commer, M; **Daley, T;** Robertson, M; Wood, T; McDonald, S; 2020, Fibre-optics Sensing and Permanent Sources for Seismic Monitoring of a Large-scale CCS site in Decatur, Illinois: Preliminary Results and Lessons Learnt, EAGE Workshop on Fiber Optic Sensing for Energy Applications in Asia Pacific,1,1-5, European Association of Geoscientists & Engineers.

6. Rampton, David; **Daley, Thomas M;** Dilmore, Robert M; 2019, Analysis of a Repeat Crosswell Tomography Dataset with Microseismic for Fracture and Fluid Placement by Hydraulic Fracturing, American Geophysical Union, Fall Meeting Abstract.

7. Correa, Julia; Pevzner, Roman; Freifeld, Barry M; **Daley, Thomas M;** Wood, Todd; Tertyshnikov, Konstantin; Yavuz, Sinem; Glubokovskikh, Stanislav; Continuous intelligent seismic monitoring of a CO 2 injection during Stage 3 of the CO2CRC Otway Project,AGU Fall Meeting Abstracts,2019,,S34B-05,2019

8. Gasperikova, Erika; Commer, Michael; Jeanne, Pierre; Zhou, Quanlin; Gao, Kai; Alumbaugh, David; Huang, Lianjie; **Daley, Thomas M;** 2019, Feasibility of active seismic and electromagnetic methods for detecting secondary CO 2 plumes, AGU Fall Meeting Abstracts,2019,,S34B-04.

9. **Daley, Thomas M;** Taira, Taka'aki; Niu, Fenglin; Marchesini, Pierpaolo; Wood, Todd; Robertson, Michelle; 2019, Monitoring Stress-Induced Seismic Velocity Changes At SAFOD Using Crosswell Continuous Active-Source Seismic Monitoring (CASSM), AGU Fall Meeting.

10. Gordon, A., D. Lawton, K Hall, B Freifeld, T Daley, P Cook, 2018, Depth registration of VSP DAS fiber, Society of Exploration Geophysicists, Annual Meeting Technical Program Expanded Abstracts 2018, 5427-543.

11. Nakatsukasa, Masashi; Ban, Hideaki; Kato, Ayato; Shimoda, Naoyuki; White, Donald; Nickel, Erik; **Daley, Thomas**; 2018, Combined use of Optical-fiber DAS and a Permanent Seismic Source for Vertical Seismic Profiling Demonstrated at the Aquistore CO_2 Storage Site, Abu Dhabi International Petroleum Exhibition & Conference, 2018, Society of Petroleum Engineers.

12. KW Hall, DC Lawton, **TM Daley**, BM Freifeld, P Cook, 2018, Effect of source effort and source distance on optical-fibre data at CaMI. FRS, Newell County, Alberta, SEG Technical Program Expanded Abstracts 2018, 206-210.

13. **T.M. Daley**, P. Marchesini, M. Wilt, P. Cook, B.M. Freifeld and D. Lawton,2017, Containment and Monitoring Institute - Baseline Geophysics for CO_2 Monitoring with Crosswell Seismic and Electromagnetics EAGE/SEG Research Workshop 2017, DOI: 10.3997/2214-4609.201701934

14. Julia Correa, Barry Freifeld, Michelle Robertson, Roman Pevzner, Andrej Bona, Dmitry Popik, Konstantin Tertyshnikov, **Thomas Daley**, 2018, 3D Vertical Seismic Profiling Acquired Using Fibre-Optic Sensing Das–Results From The CO2CRC Otway Project, ASEG Extended Abstracts 2018 (1), 1-5.

15. R. Pevzner, M. Urosevic, K. Tertyshnikov, B. Gurevich, V. Shulakova, S. Glubokovskikh, D. Popik, J. Correa, A. Kepic, B. Freifeld, M. Robertson, T. Wood, **T. Daley** and R. Singh, 2017, Seismic Monitoring of a Small-scale Supercritical CO_2/CH_4 Injection - CO2CRC Otway Stage 2C Case Study, EAGE/SEG Research Workshop 2017 DOI: 10.3997/2214-4609.201701938

16. **Daley, Tom;** Ringrose, Philip. (2017) EAGE, SEG to host CO_2 storage research workshop in Trondheim, Norway. *The Leading Edge.* vol. 36 (1).

17. Dou, Shan; Wood, Todd; Ajo-Franklin, Jonathan; Robertson, Michelle; **Daley, Thomas**; Freifeld, Barry; Pevzner, Roman; Gurevich, Boris; 2017, Surface orbital vibrator for permanent seismic monitoring: A signal contents and repeatability appraisal, SEG Technical Program Expanded Abstracts 2017, 5906-5910, 2017, Society of Exploration Geophysicists

18. Ajo-Franklin, Jonathan; Dou, Shan; **Daley, Thomas**; Freifeld, Barry; Robertson, Michelle; Ulrich, Craig; Wood, Todd; Eckblaw, Ian; Lindsey, Nathan; Martin, Eileen; 2017, Time-lapse surface wave monitoring of permafrost thaw using distributed acoustic sensing and a permanent automated seismic source, SEG Technical Program Expanded Abstracts 2017,5223-5227,Society of Exploration Geophysicists.

19. Marchesini, Pierpaolo; **Daley, Thomas**; Ajo-Franklin, Jonathan; 2017, Measuring the effects of pore-pressure changes on seismic amplitude using crosswell continuous active-source seismic monitoring (CASSM),SEG Technical Program Expanded Abstracts 2017,5917-5922, Society of Exploration Geophysicists

20. Oldenburg, CM; Dobson, PF; Wu, Y; Cook, PJ; Kneafsey, TJ; Nakagawa, S; Ulrich, C; Siler, DL; Guglielmi, Y; Ajo-Franklin, J; **TM Daley**, JT Birkholzer, HF Wang, NE Lord, BC Haimson, H Sone, P Vigilante, WM Roggenthen, TW Doe, MY Lee, M Ingraham, H Huang, ED Mattson, J Zhou, TJ Johnson, MD Zoback, JP Morris, JA White, PA Johnson, DD Coblentz, J Heise, 2017, Overview of the kISMET Project on Intermediate-Scale Hydraulic Fracturing in a Deep Mine, 51st US Rock Mechanics/Geomechanics Symposium, 2017, American Rock Mechanics Association.

21. Correa, JC; Freifeld, BM; Robertson, M; Pevzner, R; Bona, A; Popik, D; Yavuz, S; Tertyshnikov, KV; Ziramov, S; Shulakova, V; **T.M. Daley**, 2017, Distributed Acoustic Sensing Applied to 4D Seismic-Preliminary Results from the CO2CRC Otway Site Field Trials 79th EAGE Conference and Exhibition 2017.

22. Borgia, Andrea; Oldenburg, Curtis M; Zhang, Rui; Pan, Lehua; Daley, Thomas M; Finsterle, Stefan; Ramakrishnan, TS; 2017, Simulations of CO_2 injection into fractures and faults for improving their geophysical characterization at EGS sites, Geothermics.

23. Ajo-Franklin, J.B., Wagner, A.M., Lindsey, N.J., Dou, S., Bjella, K.L., **Daley, T.M**., Freifeld, B.M., Ulrich, C., Gelvin, A., Morales, A., James, S., Saari, S., Ekblaw, I., Wood, T., Robertson, M., and E. Martin, 2017, "Applying distributed fiber optic sensing to permafrost evolution: A controlled thaw experiment", SAGEEP 2017, Cryosphere.

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53. **Daley, Thomas M.,** Subsurface Monitoring of CO_2 Sequestration – A Review and Look Forward (Invited), 2012, Fall Meeting, American Geophysical Union, Dec. 2012,GC53D-07.

54. Wang, J.; Christina Morency; **Thomas M. Daley;** Phil R. Cummins, 2012, Crosswell seismic imaging of CO_2 sequestration at the Frio Pilot based on spectral-element and adjoint methods, Fall Meeting, American Geophysical Union, Dec. 2012 S41A-2355.

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