Curriculum Vitae

Contact Information

David O. S. Oakley
University of Nebraska Omaha
Omaha, Nebraska
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Academic Employment

August 2025 – present: Assistant Professor, University of Nebraska Omaha
Subjects Taught: Physical Geology, Data Analysis

November 2023 – July 2025: Postdoctoral research associate, University of Glasgow
Project: Quantifying the Effects of Mantle Processes and Climate Variability on Hinterland Denudation in the Central and Eastern Alps since the Oligocene
Supervisor: Paul Eizenhöfer

November 2022 – October, 2023: Postdoctoral researcher, BRGM and University of Pau
Project: Automatic recognition of geological structures using AI methods
Supervisors: Christelle Loiselet and Jean-Paul Callot

September 2020 – September 2022: Postdoctoral fellow, University of Stavanger
Project: Stochastic structural modelling for estimating uncertainty in geological models
Supervisor: Nestor Cardozo

May 2019 – August 2020: Postdoctoral researcher, Pennsylvania State University
Project: EAGER SitS: Emergent Properties during Soil Formation
Supervisors: Susan Brantley, Andrew Nyblade

August 2018 – May 2019: Instructor, Slippery Rock University of Pennsylvania
Subjects Taught: Geophysics, Physical Geology

May 2017 – July 2018: Research and Teaching Assistant, Pennsylvania State University
Projects: Work on multiple small projects and a field course.
Supervisors: Donald Fisher, Susan Brantley, Andrew Nyblade

Education

2011-2017: Ph.D., Pennsylvania State University, Department of Geosciences.
Dissertation: "Fault-Propagation Fold Kinematics and Deformation Rates in the North Canterbury Fold and Thrust Belt, South Island, New Zealand"
Advisor: Donald Fisher

2007-2011: BA, Williams College. Geosciences and Astrophysics Major.
Senior Thesis: “Basement Faults of the Edelman Lineament, Bighorn Mountains, Wyoming.”
Advisor: Paul Karabinos
Graduated Magna Cum Laude, with Highest Honors in Geosciences

Teaching Experience

Assistant Professor, University of Nebraska Omaha, Geography/Geology Department
GEOL 1170 Physical Geology (1 semester)
GEOL 23009 Geodata Analysis & Modeling (1 semester)
GEOL-2500 Special Topics: Professional Development (1 semester)

Instructor, Slippery Rock University, Department of Geography, Geology, and the Environment
EGEO 101 Physical Geology (2 semesters)
EGEO 111 Physical Geology Lab (2 semesters)
EGEO 358 Introduction to Geophysics (1 semester)
EGEO 458 Geophysical Field Methods (1 semester)

Teaching Assistant, Pennsylvania State University, Geosciences Department
GEOSC 472 Field Camp (4 summers)
GEOSC 465 Structural Geology (2 semesters)
GEOSC 452 Hydrogeology (1 semester)
GEOSC 310 Earth History (2 semesters)
GEOSC 010 Geology of the National Parks (2 semesters, online class)
GEOSC 001 Physical Geology (1 semester)

Grants Received

NSF EAPSI Fellowship	2015
Scholten-Williams-Wright Scholarship in Field Geology	2014
Shell Geosciences Energy Research Facilitation Award	2014
GSA Graduate Student Research Grants	2012, 2014
Sigma Xi Grants-in-Aid of Research	2012, 2013
AAPG Grants-in-Aid	2012, 2013

Awards and Honors

Chelius Graduate Fellowship in Earth Sciences	2011
Mineralogical Society of America Undergraduate Prize	2011
Sigma Xi	2011
Phi Beta Kappa	2010

Professional Affiliations

American Geophysical Union
Geological Society of America
European Geosciences Union
International Association for Mathematical Geosciences

Reviewer For

Geology
Earth Surface Processes and Landforms
Journal of Petroleum Science and Engineering
Terra Nova
Geophysical Journal International
The Cryosphere
Geoscientific Model Development
Basin Research
Geophysical Research Letters

Citizenship: United States, Ireland
Languages: English (native speaker), French (limited working proficiency), Norwegian (elementary proficiency)
Programming Languages: Matlab, Fortran, Python, R

Publications

Oakley, D., Loiselet, C., Coowar, T., Labbe, V., and Callot, J.-P., 2025. GEOMAPLEARN 1.2: detecting structures from geological maps with machine learning – the case of geological folds. Geoscientific Model Development 18, 939-960. https://doi.org/10.5194/gmd-18-939-2025

Hammond, P.A., Wen, T., Woda, J., and **Oakley, D.**, 2024. Pathways and environmental impacts of methane migration: case studies in the Marcellus Shale, USA. Geofluids, 9290873. https://doi.org/10.1155/2024/9290873

Yoxtheimer, D.A., **Oakley, D.O.S.**, Nyblade, A.A., Mount, G., 2023. Geo-electrical anisotropy corrections derived from square array data to improve Earth resistivity models of the Shale Hills' critical zone. Journal of Applied Geophysics 215, 105113. https://doi.org/10.1016/j.jappgeo.2023.105113

Oakley D.O.S., Cardozo, N., Almendral Vazquez, A., and Røe, P., 2023. Structural geologic modeling and restoration using ensemble Kalman inversion. Journal of Structural Geology 171, 104868. https://doi.org/10.1016/j.jsg.2023.104868

Hodges, C., Regan, J.M., Forsythe, B., **Oakley, D.**, Kaye, J., and Brantley, S.L., 2023. Using fixed-potential electrodes to quantify iron and manganese redox cycling in upland soils. Biogeochemistry 162, 25-42. https://doi.org/10.1007/s10533-022-01012-9

Ma, L., **Oakley, D.**, Nyblade, A., Moon, S., Accardo, N., Wang, W., Gu, X., Brubaker, K., Mount, G.J., Forsythe, B., Carr, B.J., and Brantley, S.L., 2021. Seismic image of a shale landscape under compression shows limited influence of topography-induced fracturing. Geophysical Research Letters 48, e2021GL093372. doi: 10.1029/2021GL093372

Oakley, D.O.S., Forsythe, B., Gu, X., Nyblade, A.A., and Brantley, S.L., 2021. Seismic ambient noise analyses reveal changing temperature and water signals to 10s of meters depth in the critical zone. Journal of Geophysical Research: Earth Surface. doi: 10.1029/2020JF005823

Bright, J., Kaufman, D.S., Whitacre, K., Ebert, C., Southon, J.R., Albano, P., Flores, C., Frazer, T.K., Kosnik, M.A., Kowalewski, M., Martinelli, J., **Oakley, D.,** Retelle, M., Do Nascimento Ritter, M., Rivadeneira, M., and Scarponi, D., 2021. Comparing rapid and standard ^{14}C ages from an assortment of biologic carbonates. Radiocarbon. doi: 10.1017/RDC.2020.131

Gu, X., Mavko, G., Ma, L., **Oakley, D.**, Accardo, N., Carr, B.J., Nyblade, A.A., and Brantley, S.L., 2020. Seismic refraction tracks porosity generation and possible CO_2 production at depth under a headwater catchment. Proceedings of the National Academy of Sciences, 117:32, 18991-18997. doi: 10.1073/pnas.2003451117

Fisher, D.M., Tonai, S., Hashimoto, Y., Tomioka, N., and **Oakley D.**, 2019. K-Ar dating of fossil seismogenic thrusts in the Shimanto accretionary complex, southwest Japan. Tectonics 38:11, 3866-3880. doi: 10.1029/2019TC005571

Fisher, D.M., Hooker, J.N., and **Oakley, D.O.S.,** 2019. Numerical models for slip on the subduction interface motivated by field observations. Lithosphere 11(3), 322-332. https://doi.org/10.1130/L1008.1

Cardozo, N.F. and **Oakley, D.**, 2019. Inverse modeling for possible rather than unique solutions. Journal of Structural Geology 125, 285-295. doi: 10.1016/j.jsg.2018.05.026

Woda, J., Wen, T., **Oakley, D.**, Yoxtheimer, D., Engelder, T., Castro, M.C., and Brantley, S.L., 2018. Detecting and explaining why aquifers occasionally become degraded near hydraulically fractured shale gas wells. Proceedings of the National Academy of Sciences, 115:49, 12349-12358. doi: 10.1073/pnas.1809013115

Oakley, D.O.S., Fisher D.M., Gardner, T.W., and Stewart, M.K., 2018. Uplift rates of marine terraces as a constraint on fault-propagation fold kinematics: Examples from the Hawkswood and Kate anticlines, North Canterbury, New Zealand. Tectonophysics 724-725, 195-219. doi: 10.1016/j.tecto.2017.12.021

Regalla, C., Fisher, D., Kirby, E., **Oakley, D.**, and Taylor, S., 2017. Slip inversion along forearc faults, eastern Tohoku, Japan. Tectonics 36, 2647-2668. doi: 10.1002/2017TC004766

VanderLeest, R.A., Fisher, D.M., **Oakley, D.O.S.**, and Gardner, T.W., 2017. Growth and Seismic Hazard of the Montserrat Anticline in the North Canterbury Fold and Thrust Belt, South Island, New Zealand. Journal of Structural Geology 101, 1-14. doi: 10.1016/j.jsg.2017.06.003

Oakley D.O.S., Kaufman, D.S., Gardner, T.W., Fisher, D.M., and VanderLeest, R.A., 2017. Quaternary marine terrace chronology, North Canterbury, New Zealand using amino acid racemization and infrared stimulated luminescence. Quaternary Research 87, 151-167. doi: 10.1017/qua.2016.9

Oakley D.O.S. and Fisher, D.M., 2015. Inverse trishear modeling of bedding dip data using Markov chain Monte Carlo methods. Journal of Structural Geology 80, 157-172. doi: 10.1016/j.jsg.2015.09.005

Conference Abstracts

Oakley, D. and Eizenhöfer, P., 2025. Inversion of Landscape Features for Deformation Patterns using Landscape Evolution Models: An Example from the Eastern Alps. Abstract EGU25-9953, presented at EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May. https://doi.org/10.5194/egusphere-egu25-9953

Oakley, D. and Eizenhöfer, P., 2024. A method for recovering fault kinematics and long-wavelength surface uplift from the inversion of landscape features and its application in the Eastern European Alps. Abstract alpshop2024-24, presented at 16th Emile Argand Conference on Alpine Geological Studies, Siena, Italy, 16-18 Sep. https://doi.org/10.5194/egusphere-alpshop2024-24

Oakley, D., Coowar, T., Loiselet, C., and Callot, J.-P., 2023. Automatic Detection of Geological Structures from Map Data. Abstract S0802, presented at IAMG 22nd Annual Conference, Trondheim, Norway, 5-12 Aug.

Oakley, D., Cardozo, N., Røe, P., and Almendral Vazquez, A., 2022. Structural Geologic Modelling and Restoration by Ensemble Kalman Inversion. Abstract S0904, presented at IAMG 21st Annual Conference, Nancy, France, 29 Aug. - 3. Sep.

Oakley, D., Cardozo, N., Røe, P., and Almendral Vazquez, A., 2022. Structural Geologic Modelling and Restoration Using the Ensemble Kalman Filter. Abstract EGU22-5823 presented at EGU General Assembly 2022, Vienna Austria, 23-27 May. https://doi.org/10.5194/egusphere-egu22-5823

Oakley, D.O.S., Cardozo, C., and Loveless, J.P., 2021. Comparison of kinematic and elastic dislocation models of fault-propagation folds through inverse modeling. GeoMod 2021, 19-23 Sept.

Oakley, D., Nyblade, A., Brantley, S., Accardo, N., Forsythe, B., Hodges, C., Regan, J., and Kaye, J., 2019. Seismic Ambient Noise and Electrical Resistivity Imaging of Subsurface Water Changes in the Susquehanna Shale Hills CZO, Pennsylvania. Abstract NS23A-07 presented at 2019 Fall Meeting, AGU, San Francisco, 9-13 Dec.

Oakley, D.O., Fisher, D.M., Gardner, T., VanderLeest, R.A., Barnes, P., and Ghisetti, F.C., 2018. Joint Modeling of Fault Related Fold Kinematics and Marine Terrace Uplift to Estimate Active Fault Slip Rates in North Canterbury, New Zealand. Abstract EP54A-05 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Fisher, D.M., Smye, A., Hooker, J.N., **Oakley, D.O.**, and Yamaguchi, A., 2018. Silica Kinetics and Subduction Zone Slip Behavior. Abstract T11C-08 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Hooker, J.N., Fisher, D.M., and **Oakley, D.O.**, 2018. Modeling Diagenesis on Subduction Interfaces. Abstract T21E-0255 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Tonai, S., Fisher, D.M., **Oakley, D.O.**, Hashimoto, Y., and Tomioka, N., 2018. K-Ar dating of fossil seismogenic thrusts in the Shimanto accretionary complex, southwest Japan. Abstract T21F-0272 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Oakley, D.O.S. and Cardozo, N., 2018. Comparison of trishear and elastic dislocation fault-propagation fold models and characterization of uncertainty in model parameters. Geological Society of America Abstracts with Programs, Vol. 50, No. 6.

Woda, J., Wen, T., **Oakley, D.O.,** and Brantley, S.L., 2017. A Geochemical and Structural Geologic Look at Methane Rich Waters Near a Problematic Shale Gas Well. Abstract EP23C-1941 presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.

Oakley, D.O.S., Fisher, D.M., Gardner, T.W., Barnes, P.M., Ghisetti, F.C., and VanderLeest, R.A., 2017. Rates and mechanisms of active faulting and folding in the transition from Hikurangi subduction to North Canterbury transpression, South Island, New Zealand. Geological Society of America Abstracts with Programs, Vol. 49, No. 6, doi: 10.1130/abs/2017AM-307236.

Fisher, D.M., Smye, A.J., Marone, C., van Keken, P., Yamaguchi, A., **Oakley, D.**, and Ramirez, G., 2017. Spectrum of megathrust slip behavior recorded within ancient accretionary complexes: The role of silica redistribution. Geological Society of America Abstracts with Programs, Vol. 49, No. 6, doi: 10.1130/abs/2017AM-304279.

Regalla, C., Fisher, D.M., Kirby, E., and **Oakley, D.O.S.**, 2017. Slip inversion in the forearc of Tohoku Japan, over multiple time scales. Geological Society of America Abstracts with Programs, Vol. 49, No. 6, doi: 10.1130/abs/2017AM-307361.

Oakley, D.O.S. and Fisher, D.M., 2016. A New Method for Analysis of Trishear Fault-Propagation Folds, with Application to Structures in North Canterbury, New Zealand. Geological Society of America Abstracts with Programs, Vol. 48, No. 7.

Oakley, D.O.S., Gardner, T.W., and Fisher, D.M., 2015. Uplift Rates of Marine Terraces as Constraints on Fault-Propagation Fold Kinematics: Examples from Two Anticlines in North Canterbury New Zealand, Geological Society of America Abstracts with Programs, Vol. 47, No. 7, p. 719.

VanderLeest, R., **Oakley, D.O.S.**, Fisher, D.M., and Gardner, T.W., 2015, Investigation of Fold Growth in North Canterbury, South Island, New Zealand, Geological Society of America Abstracts with Programs, Vol. 47, No. 7, p. 718.

Oakley, D., Fisher, D., and Gardner, T., 2014, Inverse Trishear Modeling of Bedding Dip Data, Geological Society of America Abstracts with Programs, Vol. 46, No. 6, p. 227.

VanderLeest, R., **Oakley, D.**, Fisher, D.M., and Gardner, T.W., 2014, Modeling the Evolution of the Montserrat Anticline and Happy Valley Fault in the North Canterbury Region on the South Island of New Zealand, Geological Society of America Abstracts with Programs, Vol. 46, No. 6, p. 778.

Oakley, D., Gardner, T., Fisher, D., Kaufman, D., 2013, Uplift Rates and Structure of the North Canterbury Fold and Thrust Belt, South Island, New Zealand, Geological Society of America Abstracts with Programs, Vol. 45, No. 7, p. 710.

Oakley, D.O., Kuhn, M.E., Stephenson, A.L., Wang, K., Spence, G., Hole, J.A., Miller, K.C., Harder, S.H., Kaip, G.M., Clowes, R.M., Hammer, P.T., 2009. Seismic Refraction - Wide-angle Reflection Survey of the Coast Mountains Batholith, British Columbia, Canada, *Eos Trans. AGU, 90*(52), Fall Meet. Suppl., Abstract T23A-1888.

French, R.G., Rappaport, N.J., Marouf, E.A., McGhee, C.A., Curtis, A., Garber, J., Judd, K., **Oakley, D.O.,** 2008. Saturn's Titan and Maxwell Ringlets from Cassini RSS Observations, *Eos Trans. AGU, 89*(53), Fall Meet. Suppl., Abstract P13A-1296.