

Donald M. Fisher

Education

- 1983-1988 Ph. D., Brown University. Dissertation Topic: Structural Evolution of a Thickly Sedimented Convergent Margin: Evidence from Macroscopic Structures, Microstructures, and Incremental Strain Histories. Thesis Advisor: Tim Byrne. Graduation date: 5/88.
- 1979-1983 A.B. in Geology, Franklin and Marshall College, Thesis Advisor: Edward C. Beutner. Graduation date: 5/83.

Experience

- 1999- Professor, Penn State University, Department of Geosciences
- July, 1996-June, 1997 Visiting Fellow, Princeton University, Department of Geosciences
- 1992-1999 Associate Professor, Penn State University, Department of Geosciences
- 1988-1992 Assistant Professor, Penn State University, Department of Geosciences

Publications

- Allmendinger, R., N. Cardozo, and **D. M. Fisher**, 2012, Structural Geology Algorithms: Vectors and Tensors in Structural Geology, Cambridge Press, 286 pp.
- Anastasio, D., **Fisher, D.**, Messina, T. and J. Hull, 1997, Kinematics of decollement folding, Lost River Range, Idaho, *Journal of Structural Geology*, v. 19, no. 3/4, p. 355-368.
- Beam, E. and **D. Fisher**, 1999, Rotation of elongate porphyroblasts in a shear zone, south-central Alaska, *Journal of Structural Geology*, v. 21, no. 11, p. 1553-1559.
- Beutner, E.C., **Fisher, D.**, and J. Kirkpatrick, 1988, Kinematics of deformation at a thrust fault ramp (?) from syntectonic fibers in pressure shadows, in Geometries and Mechanisms of Thrusting, with special reference to the Appalachians, Mitra, G. and Wojtal, S., eds., *Geological Society of America Special Paper 222*, p. 77-88.
- Brantley, S., **Fisher, D.**, Clark, M. B., Myers, G., and P. Deines, 1998, Segregation veins: evidence for the deformation and dewatering of a low-grade metapelite, in Deformation-enhanced Fluid Transport in the Earth's Crust and Mantle, M. B. Holness (ed.), 1997, Chapman and Hall, London, 266-287.
- Byrne, T. and **D. Fisher**, 1987, Episodic growth of the Kodiak convergent margin, *Nature*, v. 325, p. 338-341.
- Byrne, T. and **D. Fisher**, 1990, Evidence for a weak and overpressured decollement beneath sediment-dominated accretionary prisms, *Journal of Geophysical Research*, v. 95, 9081-9098.
- Clark, M. B., Brantley, S., and **D. Fisher**, 1995, Power law vein thickness distributions and runaway vein growth, *Geology*, v. 23, p. 975-978.
- Clark, M. B., **Fisher, D.**, Lu, C.-Y. and C.-S. Chen, 1993, The Hsueshan Range of Taiwan: A crustal scale pop-up structure, *Tectonics*, v. 12, no. 1, p. 205-217.
- Clark, M. B. and **D. Fisher**, 1995, Strain partitioning and crack-seal growth of chlorite-muscovite aggregates during progressive noncoaxial strain: an example from the slate belt of Taiwan, *Journal of Structural Geology*, v. 17, p. 461-474.
- Clendenen, W., **Fisher, D. M.**, and T. Byrne, 2003, Cooling and exhumation history of the Kodiak accretionary prism, southwest Alaska, in *Geology of a Transpressional Orogen Developed during Ridge-Trench Interaction along the North Pacific Margin*, Sisson, V. B., Roeske, S. M., and Pavlis, T. L., eds., *Geological Society of America Special Paper 371*, p. 71-88.
- Davis, K., Burbank, D. W., **Fisher, D.**, Wallace, S., and D. Nobes, 2005, Thrust-fault growth and segment linkage in the active Ostler fault zone, New Zealand, *Journal of Structural Geology*, v. 27, 1528-1546.
- Fisher, D.** and T. Byrne, 1987, Structural evolution of underthrust sediments, Kodiak Islands, Alaska, *Tectonics*, v. 6, p. 775-793.
- Fisher, D.**, 1990, Orientation history and rheology in slates: Kodiak and Afognak Islands, Alaska, *Journal of Structural Geology*, v. 12, p. 483-498.
- Fisher, D.** and T. Byrne, 1992, Strain variations in an ancient accretionary wedge: implications for forearc evolution, *Tectonics*, v. 11, no. 2, p. 330-347.
- Fisher, D.**, and T. Byrne, 1990, The character and distribution of mineralized fractures in the Kodiak

- Formation, Alaska: implications for fluid flow in an underthrust sequence, *Journal of Geophysical Research*, v. 95, p. 9069-9080.
- Fisher, D.** and S. Brantley, 1992, Models of quartz vein and overgrowth formation: Fluid flow in an ancient accretionary wedge, *Journal of Geophysical Research*, v. 97, p. 20,043-20,063.
- Fisher, D.** and D. Anastasio, 1994, Kinematic analysis of a large scale leading edge fold, Lost River Range, Idaho, *Journal of Structural Geology*, v. 16, p. 337-354.
- Fisher, D.**, Gardner, T., Marshall, J., and W. Montero, 1994, Kinematics associated with Quaternary deformation in central Costa Rica, The western boundary of the Panama microplate, *Geology*, v. 22, p. 263-266.
- Fisher, D.**, Brantley, S., Everett, M. and B. Wambold, 1995, Cyclic fluid flow through a regionally extensive fracture network within the Kodiak accretionary prism, *Journal of Geophysical Research*, v. 100, p. 12,881-12,894.
- Fisher, D.**, 1996, Fabrics and veins in the forearc: a record of cyclic fluid flow at depths of <15km, in Subduction-top to bottom, edited by Bebout, G., Scholl, D. and Kirby, S., *American Geophysical Union Monograph 96*, p. 75-90.
- Fisher, D.**, Gardner, T., Marshall, J. S., Sak, P. B., and M. Protti, 1998, The effect of subducting seafloor roughness on fore-arc kinematics, Pacific coast, Costa Rica, *Geology*, v. 26, p. 467-470.
- Fisher, D.**, 1999, Orogen-parallel extension in the eastern Central Range of Taiwan, *Journal of the Geological Society of China*, v. 42, p. 43-60.
- Fisher, D.**, Lu, C.-Y., and H. T. Chu, 2002, Taiwan Slate Belt: Insights into the ductile interior of an arc-continent collision, 2002, in., Geology and Geophysics of an Arc-continent collision, Taiwan, Byrne T. B., and Liu, C.-S., eds, Boulder, Colorado, *Geological Society of America Special Paper 358*, p. 93-106.
- Fisher, D. M.**, Gardner, T. W., Sak, P. S., Sanchez, J., Murphy, K., and P. Vannucchi, 2004, Active thrusting in the inner fore arc of an erosive convergent margin, Pacific Coast, Costa Rica, *Tectonics*, v. 23, no. 2, 13 pp.
- Fisher, D. M.**, Willett, S., Yeh, E.-C., and M. B. Clark, 2007, Cleavage fronts and fans as reflections of orogenic stress and kinematics in Taiwan, *Geology*, v. 35, no. 1, p. 65-68.
- Fisher, D. M.**, Mosher, D., Austin, J. A., Gulick, S. P. S., Masterlark, T., and K. Moran, 2007, Active deformation across the Sumatran forearc over the December 2004 Mw rupture, *Geology*, v. 35, no. 2, p. 99-102.
- Fisher, D. M.**, and S. Brantley, 2014, The role of silica redistribution in the evolution of slip instabilities along subduction interfaces: Constraints from the Kodiak Accretionary Complex, Alaska, *Journal of Structural Geology*, v. 69, p. 395-414.
- Fisher, D. M.**, Hooker, J. N., and D. Oakley, 2019a, Numerical models for slip along the subduction interface based on field observations, *Lithosphere*, v. 11, no. 3, p. 322-332.
- Fisher, D. M.**, Smye, A. J., Marone, C., van Keken, P. E., and A. Yamaguchi, 2019b, Kinetic models for healing of the subduction interface based on observations of ancient accretionary complexes. *Geochemistry, Geophysics, Geosystems*, v. 20. <https://doi.org/10.1029/2019GC008256> ^[L] _[SEP]
- Fisher, D. M.**, Tonai, S., Hashimoto, Y., Tomioka, N. and D. Oakley, 2019c, K-Ar dating of fossil seismogenic thrusts in the Shimanto accretionary complex, southwest Japan, *Tectonics*, DOI:10.1029/2019TC005571
- Fisher, D. M.**, Hooker, J. N., Smye, A. J., and T.-W. Chen, 2021, Insights from the geological record of deformation along the subduction interface at depths of seismogenesis, *Geosphere*,
- Fuller, C. W., Willett, S. D., **Fisher, D. M.**, and C.-Y. Lu, 2006, A thermomechanical wedge model of Taiwan constrained by fission-track thermochronometry, *Tectonophysics*, v. 425, no. 1-4, p. 1-24.
- Gardner, T. W., **Fisher, D. M.**, and K. Morell, 2013, Upper plate deformation in response to flat slab subduction inboard of the aseismic Cocos Ridge, Osa Peninsula, Costa Rica, *Lithosphere*, v. 5, p. 247-264.
- Gardner, T. W., and 10 others, 2001, Holocene fore arc block rotation in response to seamount subduction, southeastern Peninsula de Nicoya, Costa Rica, *Geology*, v. 29, p. 151-154.
- Gilman, T., Feineman, M., and **D. M. Fisher**, 2009, The Chulitna Terrane of south-central Alaska: A rifted volcanic arc caught between the Wrangellia Composite Terrane and the Mesozoic margin of North America, *Geological Society of America Bulletin*, v. 121, no. 7-8, p. 979-991.
- Heaney, P. and **D. Fisher**, 2003, A new interpretation of the origin of tiger's-eye, *Geology*, v. 31, p. 323-326.

- Hedlund, C., Anastasio, D. and **D. Fisher**, 1994, Kinematics of fault-related folding within a duplex, Lost River Range, Idaho, U.S.A., *Journal of Structural Geology*, v. 16, p. 571-584.
- Hooker, J. N., and **D. M. Fisher**, 2021, How cementation and fluid flow influence slip behavior at the subduction interface, *Geology*, v. 49, <https://doi.org/10.1130/G48741.1>
- Laubach, S. E., Lander, R. H., Criscenti, L. J., Anovitz, L. M., Urai, J. L., Pollyea, R. M., Hooker, J. N., Narr, W., Evans, M. A., Kerisit, S. N., Olsen, J. E., Dewers, T., **Fisher, D.**, Bodnar, R., Evans, B., Dove, P., Bonnell, L. M., Marder, M. P., and L. Pyrak-Nolte, 2019, The role of chemistry in fracture pattern development and opportunities to advance interpretations of geological materials. *Reviews of Geophysics*, v. 57. <https://doi.org/10.1029/2019RG000671>
- Marshall, J. S., **Fisher, D.**, and T. Gardner, 2000, Central Costa Rica deformed belt: kinematics of diffuse deformation across the western Panama block, *Tectonics*, v. 19, p. 468-492.
- Marshall, J. S., Idleman, B. D., Gardner, T. W., and **D. M. Fisher**, 2003, Landscape evolution within a retreating volcanic arc: Valle Central and Orotina debris fan, Costa Rica, Central America, *Geology*, v. 31, no. 5, p. 419-422.
- Mondro, C. A., **Fisher, D. M.**, and E.-C., Yeh, 2017, Strain histories from the eastern Central Range of Taiwan: A record of advection through a collisional orogen, *Tectonophysics*, v. 705, p. 1-11.
- Morell, K., **D. M. Fisher**, D. M., Gardner, T. W., and M. Protti, 2008, Inner Forearc Response to subduction of the Panama Fracture Zone, southern Central America, *Earth and Planetary Science Letters*, v. 265, p. 82-95.
- Morell, K. D., **Fisher, D. M.**, Gardner, T. W., La Femina, P., Davidson, D., and A. Teletzke, 2011, Quaternary outer fore-arc deformation and uplift inboard of the Panama Triple Junction, Burica Peninsula, *Journal of Geophysical Research*, v. 116, B05402, doi:10.1029/2010JB007979.
- Morell, K. D., Kirby, E., **Fisher, D. M.**, and M. Soest, 2012, Geomorphic and exhumational evolution of the Central American volcanic arc and the timing of Cocos Ridge subduction, *Journal of Geophysical Research*, v. 117, B04409, doi:10.1029/2011JB008969.
- Morell, K., Gardner, T., **Fisher, D.**, Idleman, B. D., and H. M. Zellner, 2013, Active thrusting, landscape evolution, and late Pleistocene sector collapse of Barú Volcano above the Cocos-Nazca slab tear, southern Central America, *Geological Society of America Bulletin*, v. 125, p. 1301-1318, doi:10.1130/B30771.1
- Morell, K. D., **Fisher, D. M.**, and N. Bangs, 2019, Plio-Quaternary outer forearc deformation and mass balance of the southern Costa Rica convergent margin. *Journal of Geophysical Research: Solid Earth*, v. 124, p. 9795–9815. <https://doi.org/10.1029/2019JB017986>
- Mosher, D. C., Austin, J., **Fisher, D.**, and S. P. S. Gulick, 2008, Deformation of the northern Sumatra accretionary prism from high resolution seismic reflection profiles and ROV observations, *Marine Geology*, v. 252, no. 3-4, p. 89-99.
- Oakley, D. O. and **D. M. Fisher**, 2015, Inverse trishear modeling of bedding dip data using Markov chain Monte Carlo methods, *Journal of Structural Geology*, v. 80, p. 157-172.
- Oakley, D. O., Kaufman, D. S., Gardner, T. W., and **D. M. Fisher**, 2017, Quaternary marine terrace chronology, North Canterbury, New Zealand, using amino acid racemization and infrared-stimulated luminescence, *Quaternary Research*, v. 87, p. 151-167.
- Oakley, D., **Fisher, D. M.**, Gardner, T. W., and M. K. Stewart, 2017, 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*, v. 724-725, 195-219.
- Raimbourg, H., Rajic, K., Morris-Muttoni, B., Famin, V., Pallazini, G., **Fisher, D.**, Morell, K., Erdman, S., DiCarlo, I., & Montmartin, C., (2021). Quartz vein geochemistry records deformation processes in convergent zones, *Geochemistry, Geophysics, Geosystems*,
- Ramirez, G., Smye, A. J., **Fisher, D. M.**, Hashimoto, Y., and Yamaguchi, A., 2021, Constraints on Element Mobility during Deformation within the Seismogenic Zone, Shimanto Belt, Japan, *Geochemistry, Geophysics, Geosystems*,
- Regalla, C., **D. Fisher**, and E. Kirby, 2010, Timing and magnitude of shortening within the inner fore arc of the Japan Trench, *Journal of Geophysical Research*, v. 115, B03411, doi:10.1029/2009JB006603.
- Regalla, C., Kirby, E., **Fisher, D.**, and P. Bierman, 2013, Active forearc shortening in Tohoku, Japan: Constraints on fault geometry from erosion rates and fluvial longitudinal profiles, *Geomorphology*, <http://dx.doi.org/10.1016/j.geomorph.2013.04.029>.

- Regalla, C., **Fisher, D.**, Kirby, E., and K. Furlong, 2013, Relationship between outer forearc subsidence and plate boundary kinematics at the Northeast Japan convergent margin, in press, *Geochemistry, Geophysics, Geosystems*, v. 14, no. 2, 5227–5243, doi:10.1002/2013GC005008.
- Regalla, C., **Fisher, D.**, Kirby, E., Oakley, D., and S. Taylor, 2018, Slip inversion along inner forearc faults, eastern Tohoku, Japan, *Tectonics*, v. 36, 2647-2668.
- Sacks, A., Saffer, D. M., and **D. Fisher**, 2013, Analysis of normal fault populations in the Kumano forearc basin, Nankai Trough, Japan: 2. Principal axes of stress and strain from inversion of fault orientations. *Geochemistry, Geophysics, Geosystems*, v. 14, no. 6, p. 1973–1988.
- Sak, P. B., **Fisher, D. M.**, Gardner, T. W., and S. L. Brantley, 2004, Rates of transport-limited weathering: Basaltic weathering rinds in Costa Rica, *Geochimica et Cosmochimica Acta*, v. 68, no. 7, p. 1453-1472.
- Sak, P. B., **Fisher, D. M.**, and T. W. Gardner, 2004, Effects of subducting seafloor roughness on upper plate vertical tectonism: Osa Peninsula, Costa Rica, *Tectonics*, v. 23, TC1017.
- Sak, P.B., **Fisher, D. M.**, Gardner, T.W., Marshall, J.S., and LaFemina, P.C., 2009, Rough crust subduction, fore arc kinematics, and Quaternary uplift rates, Costa Rican segment of the Middle American Trench, *Geological Society of America Bulletin*, v. 121, p. 992-1012.
- Sample, J. and **Fisher, D.**, 1986, Duplex accretion and underplating in an ancient accretionary complex, Kodiak Islands, Alaska, *Geology*, v. 14, p. 160-163.
- Sitchler, J. C., **D. M. Fisher**, T. W. Gardner, and M. Protti, 2007, Constraints on inner forearc deformation from balanced cross sections, Fila Costeña thrust belt, Costa Rica, *Tectonics*, v. 26, TC6012, doi:10.1029/2006TC001949.
- Vanderleest, R. A., **Fisher, D. M.**, Oakley, D. O. S., and T. W. Gardner, 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*, v. 101, p. 1-14.
- Vannucchi, P., **Fisher, D. M.**, Gardner, T. W., and Bier, S., 2006, From seamount accretion to tectonic erosion: the formation of Osa Melange and the effects of Cocos Ridge subduction in southern Costa Rica, *Tectonics*, v. 25, no. 2, 19 pp.
- Vannucchi P., **D. M. Fisher**, T. W. Gardner, 2007, Reply to comment by David M. Buchs and Peter O. Baumgartner on “From seamount accretion to tectonic erosion: Formation of Osa Mélangé and the effects of the Cocos Ridge subduction in southern Costa Rica”, *Tectonics*, v. 26, TC3010, doi:10.1029/2007TC002129.
- Willett, S. D., **Fisher, D.**, Fuller, C., Yeh, E. C., and C.Y. Lu, 2003. Erosion rates and orogenic-wedge kinematics in Taiwan inferred from fission-track thermochronometry, *Geology*, v. 31, no. 11, p. 945-948.

Professional Activities

- 1995 Co-convener, GSA Penrose conference on *Fault-related Folding*, Banff, Alberta, Canada
- 1996 Special Editor, J. Struct. Geol. Special Volume on *Fault-related folding*.
- 1997 Co-organizer and session chair, Conference on the Tectonics of East Asia, Taipei, Taiwan.
- 1997-2000 Tectonics Panel, National Science Foundation
- 1998- 2002 Associate Editor, *Journal of Structural Geology*
Associate Editor, *Journal of Geological Society of China*
Associate Editor, *Western Pacific Earth Sciences*
- 1999-2002 JOIDES Scientific and Steering Evaluation Panel (SSEP) for Earth's Interior
- 2003 Co-convener, GSA Penrose conference on *Tectonics, Climate, and Landscape Evolution*
- 2003 Field Trip Leader and Editor of Field Trip Guidebook, Pre-Penrose Field Trip, Taiwan
- 2003 Alternate, Science Committee, International Ocean Drilling Program, Sapporo
- 2004 Alternate, Scientific and Steering Panel for IODP, Okinawa
- 2005 Margins Panel, National Science Foundation
- 2005 Tectonics Team Leader, SEATOS (Sumatran Earthquake and Tsunami Offshore Survey)
- 2005 Proponent, CRISP Ocean Drilling Proposal
- 2006 Co-editor, *Tectonics, Climate, and Landscape Evolution*, *Geol. Soc. Am. Spec. Paper 398*
- 2007 Field Trip Leader, Editor of field trip guidebook, and keynote speaker, Margins Workshop, Costa Rica

- 2009 Tectonics Panel, National Science Foundation
2011 Keynote speaker, Geoprisms Workshop on the Alaskan margin, Portland, OR.
2012 Co-convener, GSA Penrose conference on *Deformation, fluid flow and mass transfer along Convergent margins*, Il Cioccho, Italy
2017 Keynote Speaker, Conference on the Subduction Interface, Barcelona, Spain
2018 Co-editor, Geology and Tectonics of Subduction Zones: A Tribute to Gaku Kimura, *Geol. Soc. Am. Spec. Paper 534*.

Honors and Awards

- Sigma Xi Award, 1983
Harold T. Stearns Fellowship Award, 1984
Fellow, Geological Society of America, 1998
College of Earth and Mineral Sciences Deike Research Award, 2012
College of Earth and Mineral Sciences Robertson Scientific Breakthrough Award, 2014
College of Earth and Mineral Sciences Wilson Teaching Award, 2017