

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>
- 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
- 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.
- 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.
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- 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.
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- 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.
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- 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