

Oliver Duffy

Professional Summary

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Professional Preparation

Academic Background

PhD, Basin Analysis: School of Earth, Atmospheric and Environmental Geosciences, University of Manchester, June 2012

BSc (Hons), Geology: School of Earth, Atmospheric and Environmental Sciences, University of Manchester, June 2007

Professional Appointments

Research Associate, Bureau of Economic Geology, The University of Texas at Austin (March 2015-Present)

Post-doctoral Research Associate (Structural Evolution of Multiphase Rift Basins), Imperial College London (September 2012-February 2015)

Research Associate (Tectono-stratigraphic Evolution of the Gulf of Mexico), University of Manchester (March-August 2013)

Theses

Tectonic, Stratigraphic, and Geomorphic Interactions and Salt Influence in Rift Basins, University of Manchester, 2012, 182 p.

Areas of Expertise

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Fault Geometry and Network Evolution

Rift Sediment Routing Systems

Salt Tectonics

Seismic Interpretation

Structural Geology

Tectono-stratigraphic Evolution of Rift Basins

Awards

Awards and Honorary Societies

Midland Valley Structural Prize: Award for Best Worldwide Postgraduate Publication in the Field of Structural Geology, 2013

AAPG Annual Conference Student Poster Prize (4th place), Denver, Colorado, 2009

Accenture Prize for Best Final Year Student in School of Earth and Environmental Sciences,

University of Manchester, 2007

Mackenzie and Guilford Prize for Best 1st Class Performance in BSc (Hons) Geology, University of Manchester, 2007

Midland Valley Prize for Best Undergraduate Structural Geology Paper, 2007

Centenary Alice and Edith Hamer Scholarship to the University of Manchester, 2004-2007

FM Broadhurst Prize for Highest Averaging Student, School of Earth, Atmospheric and Environmental Sciences, University of Manchester, 2005-2006

Publications

Peer Reviewed Journal Articles

Coleman, A. J., Jackson, C. A.-L., Duffy, O. B., and Nikolinakou, M. A., 2018, How, where, and when do radial faults grow near salt diapirs?: *Geology*, v. 46, no. 7, p. 655-658, <http://doi.org/10.1130/G40338.1>.

Duffy, O. B., Dooley, T. P., Hudec, M. R., Jackson, M. P. A., Fernandez, N., Jackson C. A.-L., and Soto J. I., 2018, Structural evolution of salt-influenced fold-and-thrust belts: a synthesis and new insights from basins containing isolated salt diapirs: *Journal of Structural Geology*, v. 114, p. 206-221, <http://doi.org/10.1016/j.jsg.2018.06.024>.

Phillips, T. B., Jackson, C. A.-L., Bell, R. E., and Duffy, O. B., 2018, Oblique reactivation of lithosphere-scale lineaments controls rift physiography - the upper-crustal expression of the Sorgenfrei-Tornquist Zone, offshore southern Norway: *Solid Earth*, v. 9, p. 403-429, <http://doi.org/10.5194/se-9-403-2018>.

Coleman, A. J., Jackson, C. A.-L., and Duffy, O. B., 2017, Balancing sub- and supra-salt strain in salt-influenced rifts: implications for extension estimates: *Journal of Structural Geology*, v. 102, p. 208-225, <http://doi.org/10.1016/j.jsg.2017.08.006>.

Duffy, O. B., Fernandez, N., Hudec, M. R., Jackson, M. P. A., Burg, G., Dooley, T. P., and Jackson, C. A.-L., 2017, Lateral mobility of minibasins during shortening: Insights from the SE Precaspian Basin, Kazakhstan: *Journal of Structural Geology*, v. 97, p. 257-276, <http://doi.org/10.1016/j.jsg.2017.02.002>.

Duffy, O. B., Nixon, C. W., Bell, R. E., Jackson, C. A.-L., Gawthorpe, R. L., Sanderson, D. J., and Whipp, P. S., 2017, The topology of evolving rift fault networks: single-phase vs multi-phase rifts: *Journal of Structural Geology*, v. 96, p. 192-202, <http://doi.org/10.1016/j.jsg.2017.02.001>.

Fernandez, N., Duffy, O. B., Hudec, M. R., Jackson, M. P. A., Burg, G., Jackson, C. A.-L., and Dooley, T. P., 2017, The origin of salt-encased sediment packages: observations from the SE Precaspian Basin (Kazakhstan): *Journal of Structural Geology*, v. 97, p. 237-256, <http://doi.org/10.1016/j.jsg.2017.01.008>.

Phillips, T. B., Jackson, C. A.-L., Bell, R. E., Duffy, O. B., and Fossen, H., 2016, Reactivation of intrabasement structures during rifting: A case study from offshore southern Norway: *Journal of Structural Geology*, v. 91, p. 54-73, <http://doi.org/10.1016/j.jsg.2016.08.008>.

Duffy, O. B., Bell, R. E., Jackson, C. A.-L., Gawthorpe, R. L., and Whipp, P. S., 2015, Fault growth and interactions in a multiphase rift fault network: Horda Platform, Norwegian North Sea: *Journal of Structural Geology*, v. 80, p. 99-119, <http://doi.org/10.1016/j.jsg.2015.08.015>.

Duffy, O. B., Brocklehurst, S. H., Gawthorpe, R. L., Leeder, M. R., and Finch, E., 2015, Controls on landscape and drainage evolution in regions of distributed normal faulting: Perachora Peninsula, Corinth Rift, Central Greece: *Basin Research*, v. 27, p. 473-494, <http://doi.org/10.1111/br.12084>.

Magee, C., Duffy, O. B., Purnell, K., Bell, R. E., Jackson, C. A.-L., and Reeve, M. T., 2015, Fault-controlled fluid flow inferred from hydrothermal vents imaged in 3D seismic reflection data,

offshore NW Australia: Basin Research, v. 28, no. 3, p. 299-318, <http://doi.org/10.1111/bre.12111>.

Reeve, M. T., Bell, R. E., Duffy, O. B., Jackson, C. A-L., and Sansom, E., 2015, The growth of non-colinear normal fault systems; What can we learn from 3D seismic reflection data?: Journal of Structural Geology, v. 70, p. 141-155, <http://doi.org/10.1016/j.jsg.2014.11.007>.

Osagiede, E. E., Duffy, O. B., Jackson, C. A-L., and Wrona, T., 2014, Quantifying the growth history of seismically imaged normal faults: Journal of Structural Geology, v. 66, p. 382-399, <http://doi.org/10.1016/j.jsg.2014.05.021>.

Duffy, O. B., Gawthorpe, R. L., Docherty, M., and Brocklehurst, S. H., 2013, Mobile evaporite controls on the structural style and evolution of rift basins: Danish Central Graben, North Sea: Basin Research, v. 25, no. 3, p. 310-330, <http://doi.org/10.1111/bre.12000>.

Published Abstracts

Duffy, O. B., Bell, R. E., Jackson, C.A-L., Gawthorpe, R.L., and Whipp, P. S., 2015, Dynamic Topology: A New Approach to Help Distinguish Modes of Rift Fault Network Formation? (abs.): AAPG Annual Convention and Exhibition.

Duffy, O. B., Bell, R. E., Jackson, C.A-L., Whipp, P. S., and Gawthorpe, R. L., 2015, The Growth and Interaction of Faults in Multiphase Rifts: Horda Platform, Norwegian North Sea (abs.): AAPG Annual Convention and Exhibition.

Lenhart, A., Jackson, C.A-L., Bell, R. E., Duffy, O. B., and Fossen, H., 2015, Identifying Basement Heterogeneities and Evaluating Their Influence on Normal Fault Characteristics (abs.): AAPG Annual Convention and Exhibition.

Phillips, T. B., Jackson, C.A-L., Bell, R. E., Duffy, O. B., and Fossen, H., 2015, The Influence of the Selective Reactivation of Ancient Intrabasement Thrusts on the Geometry and Evolution of Rift Systems (abs.): AAPG Annual Convention and Exhibition.

Duffy, O. B., Brocklehurst, S. H., Gawthorpe, R. L., and Finch, E., 2010, Landscape Response to Active Extensional Faulting and Multiple Local Base Levels: The Perachora Peninsula, Eastern Gulf of Corinth, Greece (abs.): AGU Fall Meeting Abstracts, v. 1.

Teaching and Advising

Student Committee Supervision

Co-Supervisor, M.S., Group Supervision Committee, James Hamilton-Wright, Strain Migration During Multiphase Rifting in the Stord Basin, Northern North Sea, Imperial College, London, 2014

Co-Supervisor, M.S., Group Supervision Committee, Mikhail Skaryatin, Salt Tectonics and Related Prospectivity in UK CNS Quads 28 and 29, Imperial College, London (hosted by E. On), 2014

Co-Supervisor, M.S., Supervising Committee, Robin Thomas, Three-Dimensional Numerical Modeling of Normal Fault Growth in Multiphase Rifts, Imperial College, London, 2014

Co-Supervisor, MSci Project Supervision Committee, Benjamin Ganesh, Deciphering pre-Permian Tectonics in the North Sea Using 3D Seismic Data, Imperial College, London, 2014

Co-Supervisor, Ph.D. Project Supervising Committee, Alex Coleman, Fault-Related Folds in Salt-Influenced Extensional Basins, Imperial College, London, 2014

Co-Supervisor, M.S., Group Supervising Committee, David Reader, Three-Dimensional Numerical Modeling of Normal Fault Growth in Multiphase Rifts, Imperial College, London, 2013

Co-Supervisor, MSc Petroleum Geoscience, MSc Project Supervision Committee, Tanaporn Charoenpun, Evolution of a Major Basin Boundary Fault System in the Stord Basin, northern North Sea, Imperial College, London, 2013

Co-Supervisor, MSci Project Supervision Committee, Thomas Barling, Linkage of a Major Normal Fault Array in the Horda Platform, Northern North Sea, Imperial College, London, 2013

Co-Supervisor, Ph.D. Project Supervising Committee, Thomas Phillips, The Influence of Salt Tectonics, Basement Fabrics, and Multiple Rift Phases on the Tectono-Stratigraphic Evolution of Rift Basins, Imperial College, London, 2013

Lead Supervisor, M.S., Group Committee, Stephen Watkins, The Geometry and Evolution of Fault-Related Folds Adjacent to a Major Reactivated Rift Border Fault, Oygarden Fault Complex, Norwegian North Sea, Imperial College, London, 2013

Lead Supervisor, M.S., Group Supervising Committee, Edoseghe Osagiede, Quantifying the Growth History of Seismically-Imaged Normal Faults: The Effect of Variable Seismic Velocities and Source Wavelet Frequencies, Imperial College, London, Project awarded a distinction and prize for best in year, 2013

Ph.D. Co-Supervisor, Ph.D. Student Supervising Committee, Antje Lenhart, The Influence of Pre-Existing Structures on the Tectono-Stratigraphic Evolution of Rift Basins, Imperial College, London, 2013

Co-Supervisor, MSci Project Supervision Committee, James Scaife, Subsurface Investigation of the Pre-Oxfordian Tectonic Evolution of the Exmouth Sub-basin Offshore NW Australia, Imperial College, London, 2012

Co-Supervisor, MSci Project Supervision Committee, Toby Gann, Evolution of Cretaceous Conjugate Faults in the Exmouth Sub-basin, Offshore NW Australia, Imperial College, London, 2012

Co-Supervisor, MSc Petroleum Geoscience Project Supervision Committee, Vasileios Korakas, Velocity Modelling in the Mexican Gulf, University of Manchester, 2011

Presentations

Invited Presentations

The topology of evolving single phase and multiphase rift fault networks: presented to Topology Workshop: Statoil and University of Bergen, presented at University of Bergen, Bergen, Norway, October 14, 2015.

Presentations

Shortening of salt basins containing isolated diapirs: a synthesis and new insights: presented to Advances in Salt Tectonics: Observations, Applications and Perspectives, presented at Penrose Conference, Ein Boqueq, Dead Sea, Israel, February 11-16, 2018.

Why do squeezed diapir provinces have such variable structural styles?: presented to Advances in Salt Tectonics: Observations, Applications and Perspectives (in honor of Martin P.A. Jackson), presented at Penrose Conference, Ein Boqueq, Dead Sea, Israel, February 11-16, 2018.

Lateral mobility of minibasins during shortening: insights from the SE Precaspian Basin, Kazakhstan: presented to AAPG, presented at Annual Conference, Houston, April 2-5, 2017.

The topology of evolving single phase and multiphase rift fault networks: presented to Tectonic Studies Group, presented at Tectonic Studies Group Annual Meeting 2016, University College London, UK, January 6-8, 2016.

The growth and interaction of faults in multiphase rifts: Horda Platform, Norwegian North Sea: presented to AGU, presented at AGU Fall Meeting, San Francisco, December 14-18, 2015.

Criteria for detecting shortening in minibasin provinces: presented to Applied Geodynamics Research Laboratory, presented at Applied Geodynamics Research Laboratory Annual Meeting, Pickle Campus, University of Texas at Austin, USA, November 12-13, 2015.

The role of encased minibasins during shortening: observations from the SE Precaspian Basin (Kazakhstan): presented to Applied Geodynamics Laboratory Consortium, presented at Applied Geodynamics Laboratory Consortium Annual Meeting, Pickle Campus, University of Texas at Austin, USA, November 12-13, 2015.

Dynamic Topology: A New Approach to Help Distinguish Modes of Rift Fault Network Formation?: presented to American Association of Petroleum Geologists, presented at AAPG Annual Convention, Denver, CO, May 31-June 3, 2015.

The Growth and Interaction of Faults in Multiphase Rifts: Horda Platform, Norwegian North Sea: presented to American Association of Petroleum Geologists, presented at AAPG Annual Convention, Denver, CO, May 31-June 3, 2015.

Dynamic Topology: A New Approach to Help Distinguish Modes of Rift Fault Network Formation: presented to Norwegian Geological Society, presented at Norwegian Geological Society Winter Conference, Stavanger, Norway, January 11-13, 2015.

Styles and Evolution of Fault Intersections in a Multiphase Rift: Horda Platform, Northern North Sea: presented to Geological Society of London, presented at "The Geometry and Growth of Normal Faults" Geological Society Conference, Burlington House, London, UK, June 20-22, 2014.

Mobile Salt Thickness as a Control on the Structural Style and Evolution of Rift Basins: Danish Central Graben, North Sea: presented to American Association of Petroleum Geologists, presented at AAPG Annual Conference, Pittsburgh, PA, June 13-15, 2013.

Mobile Evaporite Controls on the Structural Style and Evolution of Rift Basins: presented to Tectonic Studies Group, presented at Tectonic Studies Group Annual Conference, Leeds, UK, January 2-4, 2013.

Landscape Response to Active Extensional Faulting Along a Step-Faulted Rift Margin: The Perachora Peninsula, Eastern Gulf of Corinth, Greece: presented to American Geophysical Union, presented at AGU Annual Conference, San Francisco, CA, December 16-20, 2010.

The Influence of Mobile Evaporites upon Fault Structural Style and Depocentre Development: The Coffee-Soil Fault Zone, Danish North Sea.: presented to Geological Society of London, presented at Salt, Sediments and Prospectivity Conference, Burlington House, London, UK, January 14-16, 2010.

Fault Growth and Linkage as Controls on Depocentre Development: The Coffee-Soil Fault Zone, Danish North Sea: presented to American Association of Petroleum Geologists, presented at AAPG Annual Conference, Denver, CO, June 12-14, 2009.

Stratigraphic Response to Normal Fault Growth and Linkage: presented to British Sedimentology Research Group, presented at Annual Conference, Liverpool, UK, December 18-20, 2008.

Activities of a Professional Nature

Professional Societies

American Association of Petroleum Geologists (AAPG) member

American Geophysical Union (AGU)

Funding

Research Support

Principal Investigator: Numerical Modelling of Fault Growth in Multiphase Rifts, Imperial College Post-Doc Collaboration Grant (June 1, 2013-January 31, 2015; \$5500).

Principal Investigator: Evolution of Depositional Systems in Salt-Influenced Rifts, Statoil Academia Mobility Grant (October 1-November 15, 2011; \$4590).