Dr Emma A. Morris

University of Utah
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January 2023

Education:

University of Liverpool (England, UK) **[2009-2014]**

Ph.D. in Geology

Advisers: Prof. David M. Hodgson (University of Leeds), Prof. Stephen S. Flint (University of Manchester) and Dr Rufus L. Brunt (University of Manchester)

Examiners: Professor Jim Marshall (University of Liverpool) and Dr Ian Kane (University of Manchester)

Thesis title: 'Stratigraphic record of sedimentary processes in submarine channel-levee systems'

My Ph.D. research was part of a major consortium funded project sponsored by 17 oil majors; it involved extensive field work and detailed core logging of the Permian Fort Brown Formation, Karoo Basin, South Africa. Research focused on the geometry, architecture, interconnectivity and detailed characterization of slope channel-levee systems through logging and mapping the facies distribution using outcrop and behind outcrop research borehole datasets.

University of St Andrews (Scotland, UK) **[2005-2009]**

BSc. (Hons) Geoscience: Upper second class (2:1)

Honors dissertation adviser: Prof. Tony Prave

Honors dissertation title: A paleoenvironmental reconstruction of the Burning Buttes area, across the K-Pg boundary, Upper Hell Creek Formation, Garfield County, Montana

Professional Experience:

Current job role:

University of Utah **[August 2020-Present]**

Postdoctoral Research Associate *PI: Dr Cari Johnson*

I am a Postdoctoral Research Associate at the Department of Geology and Geophysics, where my research focuses on characterizing and understanding shallow marine settings, including shoreface deposits of the Cretaceous-aged deposits of the Book Cliffs, Utah (Blackhawk Formation), growth faulting within deltaic deposits of the Cretaceous-aged Ferron Sandstone Member, Utah (in both the Last Chance and Notom deltas), and deformation associated with ancient shelf-edge delta deposits of the Permian-aged Waterford and Kookfontein Formations, of the Karoo Basin South Africa. My research includes the collection and creation of virtual outcrop models, as well as traditional field data collection methods supplemented with borehole data where available.

Other research areas:

- Machine learning project in collaboration with Royal Dutch Shell to create a training dataset of shallow marine and deepwater core images, mentoring final year undergraduate geology students as part of this project.
- Collaborating with colleagues at the University of Utah examining the J5 unconformity that marks the boundary between the Morrison and Sundance formations of south-central Wyoming.

- Virtual outcrop project examining the first evidence of marine habitat use by mammals within the Paleocene-aged Hanna Basin, Wyoming, with colleagues at the University of Utah and Texas A&M.
- Collaborating with colleagues at the University of Utah to examine the sedimentary record of Lake Powell
- Collaborating with colleagues at the University of Utah in Jan-July 2023 on a Department of Energy project examining the presence of Rare Earth Minerals in coals.

My role at the University of Utah also includes teaching both undergraduate and postgraduate students as co-instructor for Tectonics and Sedimentary basins, Field Geology, Sedimentology and Stratigraphy and Evolving Earth (an intro to Earth Science class). I also designed an in-person fieldwork focused Basin Analysis field camp in sedimentology, stratigraphy and structural geology in May 2022. In my role, I have also co-supervised, trained and mentored MS and PhD students to complete and defend their theses.

I am a passionate advocate of public engagement in science, science communication, and using art to communicate science. I have continued my outreach activities at the University of Utah, virtually, as a co-lead for a Forensic Geology workshop with iCRAG (Irish Centre for Research in Applied Geoscience) for Girls into Geoscience that took place in June 2021.

Previous job roles:

University College Dublin, Ireland **[May 2017-August 2020]**

Postdoctoral Research Fellow *PI: Prof. Peter Haughton*

I was a Geological Survey of Ireland Griffith funded Postdoctoral Research Fellow within iCRAG (Irish Centre for Research in Applied Geosciences) at the School of Earth Sciences, University College Dublin (UCD). My research focused on thin-bedded, deepwater deposits within the Pennsylvanian-aged Ross and Gull Island Formations, County Clare, western Ireland, using a combination of outcrop data and behind-outcrop research boreholes.

Whilst working at UCD, I co-led fieldtrips and core logging training for the Petroleum Geoscience MSc students, co-led core workshops for petroleum industry fieldtrips and the UK NERC (National Environmental Research Council) Centre for Doctoral Training PhD students. In addition, I mentored PhD students, petroleum geoscience MSc students and a research MS student.

During my time at University College Dublin, I participated in a range of outreach events, from leading geology walks for the general public, to planning and giving workshops in elementary/primary schools throughout Ireland and within the UCD School of Earth Sciences. In addition, I co-led the Girls into Geoscience Ireland 2019 program in Dublin, which is a program designed to introduce female school and university students to Earth Sciences and to demonstrate the world of careers open to geoscience graduates today.

Geolumina, Haute-Vienne, France **[February-May 2017]**

Volunteer Sedimentologist and technical assistant *Supervisor: Dr Greg Samways*

Technical assistant with working on data management, seismic interpretation and GIS on a voluntary basis at Geolumina (a Geoscience training initiative), in return for technical training and mentorship.

Badley Ashton America Inc., Houston, Texas **[April 2014-December 2016]**

Deepwater clastic Sedimentologist *Manager: Jennie Folger*

Secondment to Houston, TX with Badley Ashton where I continued my role as a reservoir geologist and clastic sedimentologist. Through this role I learnt how to apply my knowledge of the process sedimentology of deepwater clastic systems to the detailed reservoir characterization of single well and multi-well studies of deepwater plays from West Africa, the North Sea and the Gulf of Mexico for major oil companies. Data collection involved the detailed description of core, borehole image, conventional wireline logs, CT scan and reservoir quality datasets for sedimentological evaluation. I also liaised closely with clients in oil majors and their partners through technical core workshops, technical meetings and conferences; reporting results in a variety of styles from formal presentations to conventional written and fully poster-based reports.

Badley Ashton and Associates Ltd., England **[November 2013-April 2014]**

Deepwater clastic Sedimentologist *Manager: Jennie Folger*

Deepwater clastic sedimentologist based at Badley Ashton and Associates Ltd at Winceby House, Lincolnshire, a geoscience consultancy company within the hydrocarbon industry. During my time there, duties included the detailed sedimentological collection and evaluation of borehole image and conventional wireline logs in single-well studies from the North Sea and offshore Tanzania.

University of Leeds, England **[March 2013]**

Teaching assistant *Supervisors: Prof. Jeff Peakall, Prof. Paul Wignall and Prof. David Hodgson*

Postgraduate demonstrator, teaching assistant and first aider for the University of Leeds undergraduate field trip to the Pennsylvanian Clare Basin, County Clare, western Ireland.

BP America, Houston, Texas **[October-December 2012]**

Sedimentologist *Advisors: Dr Gillian Apps and Laura Rumelhart*

Sedimentology and stratigraphy contractor for BP America as part of the Paleogene Appraisal Team, where I directly applied knowledge gained as part of my PhD to several fields within the Paleogene-aged Wilcox Formation, Gulf of Mexico. Data evaluation included the collection and interpretation of core and wireline datasets, findings were reported to team members within the Appraisal and Exploration teams via presentations and a written report, alongside digitized and integrated core logs with consideration of suitable outcrop analogues.

University of Liverpool, England **[September 2009-August 2012]**

Teaching assistant *Supervisors: Dr Rufus Brunt, Prof. Jim Marshall, Dr Charlotte Jeffrey, Dr Graham Potts, Dr Elisabetta Mariani and Prof. Dan Faulkner*

Postgraduate demonstrator and teaching assistant in practical lab classes for sedimentology, stratigraphy, petroleum geology, basin analysis and paleontology, at the University of Liverpool, assisting in the teaching of 1st-3rd year undergraduate students. In addition, assisted with field teaching on residential fieldtrips at the University of Liverpool, including the 2nd year undergraduate field mapping field course to Almeria, Spain and the 2nd year undergraduate field course to Donegal, Ireland.

University of St Andrews, Scotland **[June-September 2009]**

Graduate Research Assistant *Supervisors: Dr Angus Calder*

Assisted as a lab technician in the Department of Geography and Geosciences, University of St Andrews. Work involved using a microwave digestion unit for tobacco sample preparation to obtain only the inorganic fraction for solution ICPMS. This work was carried out as part of a larger research project investigating the effect inorganic material may have on the health of smokers as well as constraining the source of counterfeit tobacco. Work also included basic sample preparation techniques for XRF, XRD and ICPMS.

Peer-reviewed Journal Publications:

Hussain, A., **Morris, E.A.**, Al-Ramadan, K., Shannon, P.M., Haughton, P.D.W., 2023, Hybrid event beds (HEBs) and the 'greywacke problem' revisited, *Earth Science Reviews,* vol. 237, no. 104297, DOI: 10.1016/j.earscirev.2022.104297

Wroblewski, A.F.-J and **Morris, E.A.,** Unconformity Generation and the Shift from Storm- to Tide-Dominated Processes in a Jurassic Retroarc Foreland Basin: Insights from Ichnology, *The Depositional Record,* DOI: 10.1002/dep2.215

Hussain, A., Haughton, P.D.W., Shannon, P.M., **Morris, E.A.,** Pierce, C.S. and Omma., J.E., 2021, Mud-forced turbulence dampening facilitates rapid burial and enhanced preservation of terrestrial organic matter in deep-sea environments, *Marine and Petroleum Geology*, vol. 130, 105101

Morris, E.A., Hodgson, D.M., Flint, S.S., Brunt, R.L., Luthi, S.M. and Kolenberg, Y., 2016, Integrating outcrop and subsurface data to assess the temporal evolution of a submarine channel-levee system*, AAPG Bulletin*, vol. 100, no. 11, p. 1663-1691.

Morris, E.A., Hodgson, D.M., Flint, S.S., Brunt, R.L., Butterworth, P.J. and Verhaeghe, J., 2014, Sedimentology and architecture of submarine frontal lobe complexes from outcrop and subsurface datasets, *Journal of Sedimentary Research*, vol. 84, no. 9, p.763-780.

Morris, E.A., Hodgson, D.M., Brunt, R.L and Flint, S.S., 2014, Origin, evolution and anatomy of silt-prone submarine external levees, *Sedimentology,* vol. 61, p. 1734-1763.

Gallagher, W.B., Hatcher, J. and **Morris, E.**, 2014, Stratigraphy, Depositional Environment, Taphonomy, and Geochemistry of the Baby-back Triceratops Quarry, Hell Creek Formation (Late Cretaceous), Garfield County, Montana, *The Mosasaur - The Journal of the Delaware Valley Paleontological Society,* vol. 8, p. 1-13.

In review:

Reat-Wersan, E.J., Johnson, C., **Morris., E.A.,** Wickens, H.D.-V., Slumping and sediment storage at the shelf-edge: A case study from the Kookfontein and Waterford Formations, Tanqua Karoo Depocenter, South Africa [*Sedimentology – accepted pending revision*].

Atlas, C.E., **Morris, E.A., *** Johnson, C.L. and Wroblewski, A.F.-J., New approaches to the architectural analysis of deltaic outcrops: Implications for subsurface reservoir characterization and paleoenvironmental reconstruction [*Sedimentologika*] **corresponding author*

In prep:

Hussain, A., **Morris, E.A.**, Haughton, P.D.W. and Shannon, P.M., Compositional scanning of deep-water mudstones: implications for mud deposition in distal fan environments [*will be submitted to the Sedimentary Record*].

Morris, E.A., Haughton, P.D.W., Shannon, P.M., Pierce, C., Pulham, A., Martinsen, O.J., and Barker, S.P., Origin and significance of thin-bedded packets interleaved in sandy deep-sea fan successions [*will be submitted to the Journal of Sedimentary Research*].

Morris, E.A., Hodgson, D.M., Brunt, R.L and Flint, S.S., Spilling into confinement: facies and architecture of thin-beds within deepwater channel-levee systems [*will be submitted to Sedimentology*].

Wroblewski A.F.-J., **Morris E.A.,** Schueth J., A Tale of Two Tidal Systems: Exploring the Roles of Climate, Subsidence, Sediment Flux, and Sea Level in Generation of Tidal Deposits [*will be submitted to The Depositional Record, Tidalites Special Issue titled "Modern and ancient tidal sedimentary systems in the era of energy transition*"]

Other:

Co-author of Stratigraphy, Sedimentology and Paleontology blog for EGU:

https://blogs.egu.eu/divisions/ssp/2020/01/31/county-clare-ireland-a-world-class-geological-locality/

Conference Contributions:

Morris, E.A., Hodgson, D.M., Flint, S.S., 2009, Integrating Research Borehole and Outcrop Data to Understand Sedimentary Processes Operating on Submarine Channel-levee Systems, An Example from The Karoo Basin, South Africa. [Poster Presentation], *British Sedimentological Research Group (BSRG) Annual General Meeting 2009*, School of Ocean Sciences, Bangor University, 20-Dec-09 - 22-Dec-09.

Morris, E.A., 2010, Understanding a Channel-levee system, Laingsburg Formation, Karoo Basin, South Africa. [Oral Presentation], *The Value of PhD Research: National Postgraduate Conference*, Cumberland Lodge, Windsor Great Park, 02-Aug-10 - 05-Aug-10.

Emma Morris, David Hodgson, Stephen Flint and Rufus Brunt, 2011, Spilling into confinement: processes in internal levees to submarine channels. [Oral Presentation], *BSRG Annual General Meeting 2011*, Department of Earth Science and Engineering, Imperial College London, 18-Dec-11 - 21-Dec-11.

Hodgson, D.M., Brunt, R.L., van der Merwe, W.C., **Morris, E.** and Flint, S.S., 2011, Degradational and aggradational processes recorded in outcrop and core from submarine channel-levee systems in the Laingsburg Karoo, South Africa. [Oral

Presentation], *Internal architecture, bedforms and geometry of turbidite channels conference*, The Geological Society, Burlington House, Piccadilly, London, 20-Jun-11 - 21-Jun-11.

Morris, E.A., Hodgson, D.M., Flint, S.S and Brunt, R.L., 2011, Sand-rich external levees at outcrop and in core: origin, geometry and subsurface implications. [Poster Presentation], *Internal architecture, bedforms and geometry of turbidite channels conference*, The Geological Society, Burlington House, Piccadilly, London, 20-Jun-11 - 21-Jun-11.

Morris, E.A., Hodgson, D.M., Flint, S.S and Brunt, R.L., 2012, Anatomy of submarine external levees: combining examples from the Karoo Basin, South Africa. [Oral Presentation], *AAPG ACE 2012: American Association of Petroleum Geology Annual Conference and Exhibition*, Long Beach, California, 22-Apr-12 - 25-Apr-12.

Emma A. Morris, David M. Hodgson, Stephen S. Flint and Rufus L. Brunt., 2013, Integrating Core and Outcrop Data to Constrain the 4D Evolution of Submarine Channel Complexes: an example from the Karoo Basin, South Africa. [Poster Presentation], *AAPG ICE 2013: American Association of Petroleum Geology International Conference and Exhibition*, Cartagena, Colombia, 08-Sep-13 - 11-Sep-14.

Hodgson, D.M., **Morris, E.A.,** Flint, S.S. and Brunt, R.L., 2014, The Good, the Bad, and the Levee: Thin-Bedded Turbidite Outcrops as Critical Analogues in Reducing Deep-Water Field Development Uncertainties. [Invited Oral Presentation], *Reducing uncertainty and risk through field-based studies: The Value of Outcrops and Analogues in Hydrocarbon Exploration, Development and Production Implications for Global Exploration and Production*, The Geological Society, Burlington House, Piccadilly, London, 04-Mar-14 - 06-Mar-14.

Emma A. Morris, David M. Hodgson, Stephen S. Flint and Rufus L. Brunt, 2014, Spilling into confinement: processes in internal levees to submarine channels. [Oral Presentation], *AAPG ACE 2014*, Houston, Texas, 06-Apr-14 - 09-Apr-14.

Morris, E.A., Haughton, P.D.W., Pierce, C., Shannon, P.M., Martinsen, O.J. and Barker, S.P., 2017, Detailed characterization of thin beds in Pennsylvanian slope and fan deposits, Co Clare, western Ireland. [Poster Presentation], *BSRG Annual General Meeting 2017*, University of Newcastle, 17-Dec-17 - 19-Dec-17.

Morris, E.A., Haughton, P.D.W., Shannon, P.M., Lacchia, A.R., Hussain, A., Martinsen, O.J., and Barker, S.P., 2017, Detailed characterisation of thin beds in deepwater settings. [Poster Presentation], *Atlantic Ireland 2017*, Clayton Hotel Dublin, 31-Oct-17 - 01-Nov-17

Morris, E.A., Haughton, P.D.W., Pierce, C., Shannon, P.M., Martinsen, O.J. and Barker, S.P., 2018, Detailed characterization of thin-beds in Pennsylvanian-aged submarine slope and basin-floor fan deposits, Co Clare, western Ireland. [Poster Presentation], *Irish Geological Research Meeting 2018*, University College Cork, 23-Feb-18 - 25-Feb-18.

Morris, E.A., Haughton, P.D.W., and Shannon, P.M., 2018, Detailed characterisation of thin beds associated with submarine channels in Pennsylvanian Ross Sandstone Formation, Co Clare, western Ireland. [Poster Presentation], Atlantic Ireland 2017, Clayton Hotel Dublin, 30-Oct-18 - 31-Oct-18

Morris, E.A., Haughton, P.D.W., Pierce, C., Shannon, P.M., Lacchia, A., Hussain, A., Pulham, A., Martinsen, O.J. and Barker, S. 2018, Sedimentological character of thin-beds in behind-outcrop cores from the Pennsylvanian Ross Sandstone and Gull Island formations, Co Clare, western Ireland. [Poster and Core Exhibition], Atlantic Ireland 2017, Clayton Hotel Dublin, 30-Oct-18 - 31-Oct-18

Morris, E.A., Haughton, P.D.W., Pierce, C., Lopez-Cabrera, J. and Shannon, P.M., 2018, Characterisation of thin-beds associated with submarine channels in Pennsylvanian Ross Sandstone Formation, Co Clare, western Ireland. [Oral Presentation], *BSRG Annual General Meeting 2017*, Heriot Watt University, Edinburgh, 17-Dec-18 - 19-Dec-18.

Morris, E.A., Haughton, P.D.W., Lopez-Cabrera, J., Shannon, P.M. and Pierce, C.S., 2019, The character of thin-bedded deposits associated with submarine channels: examples from the Ross Sandstone Formation, Co Clare. [Oral Presentation], *Irish Geological Research Meeting 2019*, University College Dublin, 01-Mar-19-03-Mar-19.

Morris, E.A., Haughton, P.D.W., Shannon, P.M., Pierce, C., Pulham, A., Martinsen, O.J., and Barker, S.P., 2019, Origin and significance of thin-bedded packets interleaved in sandy deep-sea fan successions. [Poster Presentation], *AAPG ACE 2019*, San Antonio, Texas, 19-May-19 - 22-May-19.

Morris, E.A., Haughton, P.D.W., Shannon, P.M., Pierce, C., Pulham, A., Martinsen, O.J., and Barker, S.P., 2019, Character and significance of thin beds associated with channels in sandy deep-sea fan successions. [Oral Presentation], *IAS ROMA 2019: 34th IAS meeting of sedimentology*, Rome, Italy, 10-Sept-19 - 14-Sept-19.

Wallace, E.C., **Morris, E.A.,** Blowick, A., McNamara, M., 2019, Girls into Geoscience Ireland [Poster Presentation], *AGU*, San Francisco, USA, 9-Dec-19 – 13-Dec-19.

Wallace, E.C., Lacchia, A., Harrington, E., McAuliffe, F., **Morris, E.A.,** Haughton, P.D.W.H., 2019, A Feat of Clay: Palaeontology Engagement through Art [Poster Presentation], *The Palaeontological Association Annual Meeting*, Valencia, Spain, 15-Dec-19 – 21-Dec-19.

Wallace, E.C., **Morris, E.A.,** Blowick, A., McNamara, M., 2019, Girls into Geoscience Ireland [Poster Presentation], *EGU*, Vienna, Austria, 3-May-20 – 8-May-20.

Johnson, K., Schueth, J., Wroblewski, A.F.-J. and **Morris, E.,** 2022, Depositional environments and the evolution of the Jurassic Western Interior Seaway around the contested Jurassic J5 unconformity of the Sundance Formation, WY. [Poster Presentation], *GSA Connects*, Denver, United States of America, 9-Oct-22 – 12-Oct-22, Geological Society of America *Abstracts with Programs*, vol. 54, no. 5, doi: 10.1130/abs/2022AM-378566

Schueth, J., Wroblewski, A., **Morris, E.** and Johnson, K., 2022, The role of climate and paleoceanography in dead zone development of the Jurassic Sundance Sea, [Oral Presentation], *GSA Connects*, Denver, United States of America, 9-Oct-22 – 12-Oct-22, Geological Society of America *Abstracts with Programs*, vol 54, no. 5, doi: 10.1130/abs/2022AM-377154

Wroblewski, A., Schueth, J., Basso, M., Connely, M., Johnson, K., Krejci, M. and **Morris, E.,** 2022, Regional variability of a mixed clastic-carbonate, forced regressive, tidal system: The Windy Hill Sandstone and Upper Sundance Formation, Wyoming, USA [Oral Presentation], *GSA Connects*, Denver, United States of America, 9-Oct-22 – 12-Oct-22, Geological Society of America *Abstracts with Programs*, vol. 54, no. 5, doi: 10.1130/abs/2022AM-377151

Funding and Awards:

Reservoir significance of thin-bedded successions in deep-water settings **[2017]**

PI: Professor Peter Haughton (Co-Author: E. A. Morris)

Amount: €120 000

Funded by iCRAG (Irish Centre for Research in Applied Geosciences) a Science Foundation Ireland research center. My participation in the project included writing the grant proposal to supplement existing funding in place from the Geological Survey of Ireland for a three-year postdoctoral research position that I was employed to complete, upon successful award of the funding. The objective of the project was to develop criteria to interpret the disparate origin of thin-bedded turbidites and other sorts of muddy sediment gravity flow deposits that commonly are a key heterogeneity in otherwise sandy deep-water systems. The project combined insights from a behind-outcrop drilling project in County Clare, Ireland with outcrop examples to focus on the distinction between channel margins, internal levees, external levees, frontal lobes, crevasse lobes/splays, lobe fringe and distal lobe fringes in an ancient basin floor to slope succession (the Ross and Gull Island Formations, respectively). The work dovetailed with parallel iCRAG work on deep-water systems including the development of training resources in Clare and targeted projects focusing on turbidite reservoir characterisation and modelling.

AAPG International Conference and Exhibition, Cartagena, Colombia **[2013]**

Top 10 poster presentation award

Walker Trust Travel Bursary **[2008]**

Recipient of the Walker Trust Travel grant

Amount: £500

Irvine Prize for fieldwork **[2006, 2008, 2009]**

Award for top 3 fieldwork projects within the School of Geography and Geoscience at the University of St Andrews.

Professional Activity:

- Co-organized the Student and Early Career virtual ISGC meeting for SEPM (June 2021)
- SEPM Pettijohn Medal committee member (February 2021-present)
- Coordinate the Americas coffee breaks for SedsOnline (December 2020-present)
- Secretary for the Irish Association for Women in Geosciences (January 2019-September 2021)
- SEPM Deepwater Research Group meeting coordinator (February 2019-present) – we are coordinating with SEPM to create a themed issue of the Sedimentary Record journal based on the 2021 theme of the SEPM Deepwater Research Group meeting that will be held virtually in November 2021
- Girls into Geoscience co-lead Dublin (December 2018-August 2020)
- British Sedimentological Research Group postgraduate representative (2009-2010)

Journals Refereed:

- Sedimentology
- Marine and Petroleum Geology
- Interpretation
- Marine Geology
- Basin Analysis
- The Sedimentary Record
- New Zealand Journal of Geology and Geophysics
- SEPM Special Publications

Professional Memberships:

- SEPM (the Society for Sedimentary Geology),
- IAS (the International Association for Sedimentologists)
- IAWG (Irish Association for Women in Geosciences)

Relevant Skills:

Drivers License: Full, clean driving license.

IT Skills: I am experienced user of MS Office, Canvas, CorelDraw, Adobe Illustrator, Adobe Photoshop, Agisoft Metashape, Lime, WellCAD and Terrastation.
I also have experience using GIS software (ArcGIS and QGIS) and industry seismic programs (Petrel, IHS Kingdom Suite and OpendTect).

Teaching Experience:

University of Utah **[2020-present]**

- Co-instructor of the graduate-level Tectonics and Sedimentary Basins class to final year undergraduates and 2nd year MS students in Spring 2021 – writing and developing lab and assessment content
- Co-instructor of Sedimentology and Stratigraphy for junior and senior year geology majors in Fall 2021 and Fall 2022 – designing, developing and writing full lecture, lab, assessment and exam content
- Co-instructor of Evolving Earth, an intro to Earth Science class in Spring 2022 and Spring 2023
- Field Camp co-instructor for geology, environmental geology and engineering geology majors in Summer 2022 – designing, developing and writing content for a Basin Analysis field camp with a focus on sedimentology, stratigraphy and structural geology.

- Co-instructor on Sed-Strat and Environments of Deposition fieldtrips to the Book Cliffs and surrounding areas (Spring and Fall 2022)
- Co-supervising, training and mentoring undergraduate, MS and PhD students
- Mentoring final year undergraduate geology students on a machine learning project July 2021-March 2022

University College Dublin **[2017-2020]**

- Deepwater Sedimentology lectures and lab classes for third year undergraduate students
- Applied Paleontology lab classes for third year undergraduate students
- Applied Sedimentology lab classes for Petroleum Geology MSc students
- Co-lead of the Girls into Geoscience program in 2019, designing and presenting a series of workshops, activities and a fieldtrip to Loughshinny, County Dublin.
- Co-lead of the south of England sedimentology, structural geology and essential field skills fieldtrip for third year undergraduate BSc Geology students.
- Co-lead of the County Wexford, Hook Head sedimentology fieldtrip for third year undergraduate BSc Geology students
- Co-lead of multiple fieldtrips to the Clare Basin, Ireland, for fourth year undergraduates, Petroleum Geology MSc students and second year undergraduates at the University of Leeds
- Co-supervising, training and mentoring MSc and PhD students

University of Leeds **[2013]**

- Teaching assistant and first aider on the fieldtrip to the Pennsylvanian Clare Bain, western Ireland, for second year undergraduate students

University of Liverpool **[2009-2012]**

- Teaching assistant on the fieldtrip to the Donegal Basin, Ireland for third year undergraduate students, and the field mapping skills fieldtrip to Almeria, Spain for second year undergraduate students
- Teaching assistant in Sedimentology and Stratigraphy for first year undergraduate students
- Teaching assistant in Invertebrate Paleontology for first year undergraduate students
- Teaching assistant in Basin Analysis for third year undergraduate students
- Teaching assistant in Petroleum Geology for third year undergraduate students
- Applied Sedimentology and core workshops for industry clients

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Other Technical and Field Experience:

University of Utah **[Aug 2020-present]**

- Field data collection within the Cretaceous-aged Panther Tongue and Ferron delta systems, includes traditional field mapping and data collection techniques along with UAV data collection for virtual outcrop models [Oct 2020-present]
- Field data collection across the J5 unconformity, the contact between the basal Morrison and Upper Sundance Formations in south-central Wyoming and the Bighorn Basin of northern Wyoming, using a drone/unmanned aerial vehicle (UAV) to collect data for virtual outcrop models, and traditional photography to create detailed 3D outcrop models in collaboration with colleagues at the University of Utah and the University of Nebraska Omaha [June 2022]
- Machine learning data collection utilizing a custom-built app in MATLAB in collaboration with researchers at Royal Dutch Shell (Houston) to create a training dataset of shallow marine and deepwater images [July 2021-present]
- Field data collection within the Paleocene-Eocene aged Hanna Basin, using a drone/unmanned aerial vehicle (UAV) to collect data for virtual outcrop models, and traditional photography to create detailed 3D models of mammal footprints throughout a Paleocene-aged mammal trackway site [June 2021]

- Field data collection within the Jurassic-aged Morrison Formation, using a drone/unmanned aerial vehicle (UAV) to collect data for virtual outcrop models, and traditional photography to create detailed 3D outcrop models for collaboration with colleagues at the University of Glasgow, UK [August 2021]

University College Dublin **[May 2017-August 2020]**

- Extensive field work and detailed core logging of the Pennsylvanian-aged Ross and Gull Island Formations, Clare Basin, western Ireland. Studies focused on the geometry, architecture, and detailed characterisation of the thin-bedded component of the sand-prone Ross Sandstone Formation through logging and mapping the facies distribution using outcrop and behind outcrop research borehole datasets [May 2017-Aug 2019]
- Art-science training workshop coordinated by Science Foundation Ireland (SFI) focusing on promoting effective collaboration, communication of science and research in the art-science context for a range of public audiences, developing a set of practical tools for planning meaningful public engagement [Sept 2019]
- Co-led the Clare Basin fieldtrip for the iGEO Early Career Researcher Symposium [Jan 2018]
- Field assisted researchers in the Pïera Cava outlier, French (Maritime) Alps [Nov 2017]
- Co-leader of the Petroleum Infrastructure Project (PIP) workshop on the Porcupine Basin [Aug 2017]

University of Liverpool **[Sept 2017-Dec 2014]**

- My PhD research was part of SLOPE 3, a major consortium funded project sponsored by 17 oil majors (BHP Billiton, BP, Chevron, ConocoPhillips, Engie, Equinor, ExxonMobil, Maersk, Murphy, Neptune, Petrobras, Schlumberger, Shell, Oxy, Total, Tullow, and Woodside). Data collection involved extensive field work (totaling 8 months) and detailed core logging (1.2km) of behind outcrop boreholes drilled through the deepwater, Permian-aged Fort Brown Formation, Karoo Basin, South Africa. Throughout this time, I also co-led annual sponsors fieldtrips and core workshops for the duration of the project, where we communicated the aims and progress of the research to industry sponsors [Sept 2009-Dec 2014]
- Field assisted researchers examining a range of depositional settings within the Karoo Basin, South Africa, from shelf-edge deltas to the basin floor. In addition, I field assisted a research examining the ichnofaunal changes across the PETM in the Basque Country [July-Sept 2009]

University of St Andrews **[Sept 2009-June 2009]**

- I volunteered as an Assistant Paleontologist on several dinosaur digs in the Cretaceous-aged Hell Creek Formation, Garfield County, Montana, USA [July 2007; June-Aug 2008].
- Extensive field training completed throughout the duration of my undergraduate degree, including numerous field excursions throughout Scotland, England and a 2-week field trip to the Alps. In addition, several field-mapping projects were completed along the Fife Coastline (Scotland), around Ullapool in the NW Highlands (Scotland), on Mull and Iona (Scotland), and in the Sierra Norte hills, near Madrid, Spain.

Other Interests and Activities:

Industry engagement panel at iCRAG summit (June 2019): I was part of a discussion panel focusing on the interaction of researchers and industry and the annual iCRAG summit, a 2-day conference for the entire iCRAG research center academic staff, postdoctoral researchers and postgraduate researchers (typically 150 staff and students).

Organizer of the UCD School of Earth Sciences Seminar Series (May 2019-Sept 2020): I coordinated the weekly school seminar series, inviting and coordinating with researchers from all over Europe to present their current research to the school, in person. This transitioned to an online seminar series during the Covid-19 pandemic, it also provided an opportunity for the entire school to meet together online on a weekly basis.

iGEO2020 symposium organizing committee (April 2019-Jan 2020): I was a member of the organizing committee for the biannual Irish Geosciences Early Career Symposium (iGEO) Symposium held at the National University of Ireland at Galway (NUIG), Ireland. This 2-day event provided early career geoscientists with an opportunity to collaborate and benefit from the multidisciplinary nature of research across Ireland. iGEO2020 enabled early-career geoscientists to

discuss their research with fellow early-career geoscientists, industry members and policy makers.

iCRAG Education and Public Engagement committee (April 2019-present): This was a platform for researchers within the research center to discuss effective education and public engagement (EPE) techniques, strategically plan the direction and approaches to EPE, and also advised on effective EPE to the wider research community within the center.

SEPM Deepwater Research Group meeting coordinator (February 2019-present): I co-organize the annual Deepwater Research Group meeting of the SEPM typically during the American Association for Petroleum Geologists (AAPG) Annual Conference and Exhibition. In 2020, we transitioned the meeting online as a highly successful event that allowed more than 200 deepwater sedimentologists across the world to interact and engage together. In 2022, we are collaborating with the editors of The Sedimentary Record to produce and guest edit a special volume of papers on '*Future directions of deep-water sedimentology'.*

Girls into Geoscience Ireland committee lead Dublin (December 2018-August 2020): Girls into Geoscience (GiG) is a one-day, national event held at one of the national universities, designed to introduce female school students to Earth Sciences for study and as a possible future career pathway. In 2019 we organized an additional event day fieldtrip to North Dublin. Girls into Geoscience is also held annually in England, Scotland and Wales. In July 2020, I was part of a panel on women in the field at the online combined Girls into Geoscience UK and Ireland event day.

Member of the iCRAG committee (2018-2019): This was a platform for researchers within the research center to give collective feedback from each of the eight institutions across Ireland, which form the research center, at each researcher level (PhD student, postdoc, research scientist), to the various levels of management within iCRAG.

SED Sessions at the University of Liverpool and the University of Leeds (2009-2013): I helped coordinate weekly departmental Stratigraphy, Environments and Diagenesis (SED) Sessions, where we met to discuss ongoing research within the research group and provided an opportunity for the discussion of recently published journal articles.

President of St Andrews University GeolSoc (2008-2009): As president, I chaired committee meetings, helped arrange residential fieldtrips for the society to various locations throughout the UK and coordinated the organization of the annual society ball.

Volunteer Work:

- I am currently a volunteer at the Utah Humane Society animal shelter (July 2022-present)
- I was a volunteer demonstrator at the BT young scientist exhibition, RDS Dublin in January 2020.
- I was an outreach and education volunteer at the National Museum of Ireland (2017-2020).
- I volunteered at the Liverpool World Museum Clore Natural history center explaining the museum specimens and exhibits to a wide and varied public audience (2011-2012).
- Participated in geology outreach events whilst attending the University of St Andrews (2005-2009), this included outreach fieldtrips for the general public, visiting local primary schools with rocks and fossils, assisting at the University of St Andrews Science Discovery days and science outreach mornings for the Royal Society of Edinburgh.

Additional Employment History:

University of St Andrews **[Jan-June 2009]**

Cataloguer

I helped to document and record the full collection of the Bell Pettigrew Museum at the University of St Andrews. The Bell Pettigrew Museum sits within the School of Biology and displays natural history specimens alongside other collections of fossils and skeletons, taxidermy, and spirit collections. It is organized taxonomically.

University of St Andrews **[Sept 2006-Sept 2009]**

Catering Assistant

I worked as a catering assistant at David Russell Apartments Bistro, University of St Andrews, where my duties included interacting with customers, general kitchen cleaning duties, baking, salad prep and working as part of a team. I acted as

catering supervisor during the tourist season when my duties expanded to include staff supervision, cashier balancing and securing the facility at closing time.

University of St Andrews **[June-Sept 2006]**

Housekeeping Assistant

I worked as a general assistant at the David Russell Apartments student accommodation, at the University of St Andrews, where my duties included deep cleaning apartments following the departure of the undergraduate students for the summer, general housekeeping and maid service during the tourist season.

Doran's Newsagents **[Feb 2001-Sept 2005]**

Shop assistant

Part-time shop assistant at a local grocery store whilst I attended grammar school full time. My duties included interacting with customers, general cleaning, and cashier balancing and securing the facility at closing time.