
Dr. Matt Rowberry PhD FGS

Professional Details

Research Scientist (commenced: 4th January 2010)

Department of Engineering Geology

Institute of Rock Structure & Mechanics CAS

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Employment History

Postdoctoral Research Fellow (01.01.2008–31.12.2009)

School of Geosciences, University of the Witwatersrand, 2050 Wits, Johannesburg, South Africa

Topic: the tectonic and geomorphological evolution of southern Africa since the breakup of Gondwana

Host: Professor Terence McCarthy.

Education and Qualifications

Doctoral Research (01.10.2003–31.10.2007)

Institute of Geography & Earth Sciences, University of Wales Aberystwyth, United Kingdom

Topic: The tectonic and geomorphological evolution of Wales since the opening of the North Atlantic

Supervisors: Professor Mark Macklin & Dr. Paul Brewer.

Major grant awards (since 2015)

- 2019** 3D fracture behaviour monitoring presented online in real time using Spinterference. BCRA Cave Science and Technology Research Fund. Role: Principal Investigator.
- 2016–2018** El Hierro megalandslide dynamics analysed using big data to predict the future behaviour of megalandslides on other volcanic islands. GAČR Project No. 16-12227Y. Role: Coinvestigator.
- 2015–2017** The development and optimisation of a prototype for the automated monitoring of three dimensional fracture movements. TAČR Project No. TA04021791. Role: Principal Investigator.
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Research Publications

- Rowberry, M., Frontera, C., Baroň, I., Kučera, J., Křivánek, L., Martí, X., 2020. A novel positioning system for three dimensional fracture displacement monitoring in the British Cave Science Centre, Poole's Cavern, Buxton, Derbyshire. *Cave & Karst Science*, v. 47, p. 146–152.
- Blahůt, J., Mitrovic-Woodell, I., Baroň, I., René, M., Rowberry, M., Blard, P., Hartvich, F., Meletlidis, S., 2019. Volcanic edifice slip events recorded on the fault plane of the San Andrés Landslide, El Hierro, Canary Islands. *Tectonophysics*, v. 776, art. no. 228317. <https://doi.org/10.1016/j.tecto.2019.228317>
- Blahůt, J., Balek, J., Klimeš, J., Rowberry, M., Kusák, M., Kalina, J., 2019. A comprehensive global database of giant landslides on volcanic islands. *Landslides*, v. 16, p. 2045–2052. <https://doi.org/10.1007/s10346-019-01275-8>
- Rowberry, M., Dubois, C., Kaufmann, O., Baele, J., Blahůt, J., 2018. Weathering by dolomite dissolution responsible for the formation of an important palaeontological locality in the Prague Synform. *Acta Geodynamica et Geomaterialia*, v. 15, p. 297–309. <https://doi.org/10.13168/AGG.2018.0022>
- Blahůt, J., Baroň, I., Sokol, L., Meletlidis, S., Klimeš, J., Rowberry, M., Melichar, R., García-Cañada, L., Martí, X., 2018. Large landslide stress states calculated following extreme climatic and tectonic events on El Hierro, Canary Islands. *Landslides*, v. 15, p. 1801–1814. <https://doi.org/10.1007/s10346-018-0993-1>
- Blahůt, J., Klimeš, J., Rowberry, M., Kusák, M., 2018. Database of giant landslides on volcanic islands – first results from the Atlantic Ocean. *Landslides*, v. 15, p. 823–827. <https://doi.org/10.1007/s10346-018-0967-3>
- Rinaldi-Montes, N., Rowberry, M., Frontera, C., Garcés, J., Baroň, I., Blahůt, J., Pérez-López, R., Pennos, C., Martí, X., 2017. A contactless positioning system for monitoring discontinuities in three dimensions with geological and geotechnical applications. *Review of Scientific Instruments*, v. 88, art. no. 074501. <https://doi.org/10.1063/1.4993925>

- Blahůt, J., Rowberry, M., Balek, J., Klimeš, J., Baroň, I., Meletlidis, S., Martí, X., 2017. Monitoring giant landslide detachment planes in the era of big data analytics. In: Mikoš, M., Arbanas, Ž., Yin, Y., & Sassa, K. (eds.), *Advancing Culture of Living with Landslides*. Springer, Cham, 333–340. https://doi.org/10.1007/978-3-319-53487-9_38
- Rowberry, M., Kriegner, D., Holý, V., Frontera, C., Llull, M., Olejník, K., Martí, X., 2016. The instrumental resolution of a moiré extensometer in light of its recent automatisisation. *Measurement*, v. 91, p. 258–265. <https://doi.org/10.1016/j.measurement.2016.05.048>
- Rowberry, M., Martí, X., Frontera, C., Van De Wiel, M., Briestenský, M., 2016. Calculating flux to predict future cave radon concentrations. *Journal of Environmental Radioactivity*, 157, p. 16–26. <https://doi.org/10.1016/j.jenvrad.2016.02.023>
- Dubois, C., Deceuster, J., Kaufmann, O., Rowberry, M., 2015. A new method to quantify carbonate rock weathering. *Mathematical Geosciences*, v. 47, p. 889–935. <https://doi.org/10.1007/s11004-014-9581-7>
- Briestenský, M., Rowberry, M., Stemberk, J., Stefanov, P., Vozár, J., Šebela, S., Petro, L., Bella, P., Gaal, L., Ormukov, C., 2015. Evidence of a plate wide tectonic pressure pulse provided by extensometric monitoring in the Balkan Mountains (Bulgaria). *Geologica Carpathica*, v. 66, p. 427–438. <https://doi.org/10.1515/geoca-2015-0035>
- Briestenský, M., Thinová, L., Praksová, R., Stemberk, J., Rowberry, M., Knejřlová, Z., 2014. Radon, carbon dioxide, and fault displacements in central Europe related to the Tōhoku Earthquake. *Radiation Protection Dosimetry*, v. 160, p. 78–82. <https://doi.org/10.1093/rpd/ncu090>
- Dubois, C., Quinif, Y., Baele, J., Barriquand, L., Bini, A., Bruxelles, L., Dandurand, G., Havron, C., Kaufmann, O., Lans, B., Maire, R., Martin, J., Rodet, J., Rowberry, M., Tognini, P., Vergari, A., 2014. The process of ghost rock karstification and its role in the formation of caves. *Earth-Science Reviews*, v. 131, p. 116–148. <https://doi.org/10.1016/j.earscirev.2014.01.006>
- Tooth, S., McCarthy, T., Rodnight, H., Keen-Zebert, A., Rowberry, M., Brandt, D., 2014. Late Holocene development of a major fluvial discontinuity in floodplain wetlands of the Blood River, eastern South Africa. *Geomorphology*, v. 205, p. 128–141. <https://doi.org/10.1016/j.geomorph.2011.12.045>
- Briestenský, M., Stemberk, J., Rowberry, M., 2014. The use of damaged speleothems and *in situ* fault displacement monitoring to characterise active tectonic structures: an example from Západní Cave, Czech Republic. *Acta Carsologica*, v. 43, p. 129–138. <https://doi.org/10.3986/ac.v43i1.626>
- Rowberry, M., Battiau-Queney, Y., Walsh, P., Błażejowski, B., Bout-Roumazeilles, V., Trentesaux, A., Křížová, L., Griffiths, H., 2014. The weathered Carboniferous Limestone at Bullslaughter Bay, South Wales: the first example of ghost-rock recorded in the British Isles. *Geologica Belgica*, v. 17, p. 33–42.
- Martí, X., Rowberry, M., Blahůt, J., 2013. A MATLAB code for counting the moiré interference fringes recorded by the optical mechanical crack gauge TM-71. *Computers & Geosciences*, v. 52, p. 164–167. <https://doi.org/10.1016/j.cageo.2012.09.029>
- Klimeš, J., Rowberry, M., Blahůt, J., Briestenský, M., Hartvich, F., Košťák, B., Rybář, J., Stemberk, J., Štěpančíková, P., 2012. The monitoring of slow moving landslides and assessment of stabilisation measures using an optical mechanical crack gauge. *Landslides*, v. 9, p. 407–415. <https://doi.org/10.1007/s10346-011-0306-4>
- Rowberry, M., 2012. A comparison of three terrain parameters that may be used to identify denudation surfaces within a GIS: a case study from Wales, United Kingdom. *Computers & Geosciences*, v. 43, p. 147–158. <https://doi.org/10.1016/j.cageo.2011.09.016>
- Rowberry, M., McCarthy, T., Thompson, M., Nomnganga, A., Moyo, L., 2011. The spatial and temporal characterisation of flooding within the floodplain wetland of the Nyl River, Limpopo Province, South Africa. *Water SA*, v. 37, p. 445–452. <https://doi.org/10.10520/EJC116815>
- Briestenský, M., Stemberk, J., Michalík, J., Bella, P., Rowberry, M., 2011. The use of a karstic cave system in a study of active tectonics: fault displacements recorded at Driny Cave, Malé Karpaty Mts (Slovakia). *Journal of Cave and Karst Studies*, v. 73, p. 114–123. <https://doi.org/10.4311/jcks2010es0166>
- McCarthy, T., Tooth, S., Jacobs, Z., Rowberry, M., Thompson, M., Brandt, D., Hancox, P., Marren, P., Woodborne, S., Ellery, W., 2011. The origin and development of the Nyl River floodplain wetland: trunk-tributary river interactions in a dryland setting. *South African Geographical Journal*, v. 93, p. 172–190. <https://doi.org/10.1080/03736245.2011.619324>
- Briestenský, M., Thinová, L., Stemberk, J., Rowberry, M., 2011. The use of caves as observatories for recent geodynamic activity and radon gas concentrations in the Western Carpathians and Bohemian Massif. *Radiation Protection Dosimetry*, v. 145, p. 166–172. <https://doi.org/10.1093/rpd/ncr080>

- Štěpančíková, P., Rowberry, M., 2008. Rock landforms that reflect differential relief development in the northeastern sector of the Rychlebské hory and the adjacent area of Žulovská pahorkatina (SE Sudeten Mts, Czech Republic). *Acta Geodynamica et Geomaterialia*, v. 5, p. 297–321.
- Walsh, P., Battiau-Queney, Y., Howells, S., Ollier, C., Rowberry, M., 2008. The Gash Breccias of the Pembrokeshire Peninsula, SW Wales. *Geology Today*, v. 24, p. 137–145. <https://doi.org/10.1111/j.1365-2451.2008.00676.x>
- Rowberry, M., 2008. Constraining the altitudinal range of elevated sub-horizontal denudation surfaces in Wales, U.K., using the elevation–relief ratio. *Revista Geográfica Acadêmica*, v. 2, p. 26–40.
- Rowberry, M., Brewer, P., Macklin, M., 2007. The number, form, and origin of sub-horizontal surfaces in north Ceredigion, Wales, United Kingdom. *Norwegian Journal of Geology*, v. 87, p. 207–222.
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Research Monographs

- Rowberry, M., 2007. The evolutionary geomorphology of Wales, U.K. (PhD Thesis). Institute of Geography and Earth Sciences, University of Wales: 300 pp.
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Conference Presentations

- Rowberry, M., Martí, X., Frontera, C., Baroň, I., 2019. Cave stability monitoring and its significance for environmental protection. BCRA Cave Science Symposium, 19–20 October 2019, British Geological Survey, United Kingdom.
- Mitrovič-Woodell, I., Blahůt, J., René, M., Baroň, I., Rowberry, M., Hartvich, F., 2019. Frictional silica gel and cataclastic microstructures from shallow earthquakes on El Hierro, Canary Islands. European Geosciences Union Meeting, 7–12 April 2019, Vienna, Austria.
- Rowberry, M., 2018. Interdisciplinarity: a vision to move from nanomagnets to rocks. From Nano to Geo: Bridging Science and Industry, 15 November 2018, Prague, Czech Republic.
- Rowberry, M., Baroň, I., Pérez-López, R., Garcés, J., Rinaldi-Montes, N., Frontera, C., Martí, X., 2018. Monitoring subterranean fault behaviour using a contactless positioning system. BCRA Cave Science Symposium, 13–14 October 2018, Bristol, United Kingdom.
- Baroň, I., Sokoř, L., Melichar, R., Blahůt, J., Rowberry, M., 2017. Deciphering large deep seated gravitational slope deformation stress states in active tectonic settings using contemporary three dimensional fault slip data. 4th Slope Tectonics Conference, 14–18 October 2017, Kyoto, Japan.
- Blahůt, J., Rowberry, M., Rinaldi-Montes, N., Frontera, C., Klimeš, J., Balek, J., Kalinová, R., Kusák, M., Martí, X., 2017. Understanding the behaviour of megalandslide detachment planes in the era of big data processing. World Landslide Forum, 29 May–2 June 2017, Ljubljana, Slovenia.
- Hokr, M., Havlová, V., Rukavičková, L., Rowberry, M., Žanda, L., Dědeček, P., Bárta, J., Petružálek, M., 2016. Monitoring in the Bedřichov Water Supply Tunnel. Radioactive Waste Repository Authority Annual Seminar, 09–10 November 2016, Liblice, Czech Republic.
- Rowberry, M., Rinaldi-Montes, N., Baroň, I., Pennos, C., Pérez-López, R., Martí, X., 2016. 3D magnetoresistive sensors as a new tool for measuring deformation across geological discontinuities. DGGV Annual Meeting, 25–28 September 2016, Innsbruck, Austria.
- Rowberry, M., Martí, X., Frontera, C., Van De Wiel, M., Briestenský, M., 2016. Calculating flux to predict future cave radon concentrations and the significance of fault displacement monitoring. 8th International Conference on Protection against Radon at Home and Work, 12–16 September 2016, Prague, Czech Republic.
- Baroň, I., Koktavý, P., Stemberk, J., Macků, R., Trčka, T., Škarvada, P., Lenhardt, L., Meuers, B., Rowberry, M., Martí, X., Plan, L., Grasemann, G., Mitrovič, I., 2016. Underground electromagnetic activity in two regions with contrasting seismicity. European Geosciences Union Meeting, 17–22 April 2016, Vienna, Austria.
- Rowberry, M., Martí, X., Stemberk, J., 2015. Installation of an automated fault displacement monitoring system at a geological test site in northern Bohemia. *Advances in Active Tectonics & Speleotectonics*, 21–24 September 2015, Vienna, Austria.
- Stemberk, J., Rowberry, M., 2015. Slow aseismic fault slip recorded across Europe. *Advances in Active Tectonics & Speleotectonics*, 21–24 September 2015, Vienna, Austria.
- Briestenský, M., Stefanov, P., Rowberry, M., 2014. The first results from new underground extensometric laboratories established in caves in Bulgaria. 3rd International Conference on Geographical Sciences and Education, 12–13 September 2014, Shumen, Bulgaria.

- Rowberry, M., Briestenský, M., Marti, X., Frontera, C., 2014. The quantitative prediction of radon emanation based on data recorded at Driny Cave, Malé Karpaty Mountains, Slovakia. 43rd Tectonic Studies Group Annual Meeting, 6-9 January 2014, Cardiff, United Kingdom.
- Rowberry, M., Hartvich, F., Blahůt, J., Marti, X., Briestenský, M., Valenta, J., Stemberk, J., Thinová, L., 2013. The study of microdisplacements in the shallow crust: results from a temporary subterranean geodynamic observatory in the Czech Republic. 18th International Conference of Deformation Mechanics, Rheology, and Tectonics, 16-18 September 2013, Leuven, Belgium.
- Rowberry, M., Battiau-Queney, Y., Błażejowski, B., Walsh, P., 2012. The nature and origin of the ghost-rocks at Bullslaughter Bay, South Wales. Ghost-Rock Karst Symposium, 7-11 October 2012, Hans-sur-Lesse, Belgium.
- Rowberry, M., 2012. Project Esblygiad Cymru: a reinterpretation of the erosion and uplift history of Wales, United Kingdom. Czech Association of Geomorphologists Annual Meeting, 18-20 April 2012, Sokolov, Czech Republic.
- Tooth, S., McCarthy, T., Rodnight, H., Keen-Zebert, A., Rowberry, M., Brandt, D., 2010. Geomorphological dynamics of southern African floodplain wetlands: implications for land degradation assessment and management planning. Southern African Association of Geomorphologists Biennial Conference, 3-5 September 2010, Grahamstown, South Africa.
- Rowberry, M., McCarthy, T., Tooth, S., 2010. The late Mesozoic and Cenozoic development of southern Africa: geological and geomorphological evidence for widespread denudation and epeirogenic uplift. European Geosciences Union Meeting, 3-7 May 2010, Vienna, Austria.
- Tooth, S., McCarthy, T., Rodnight, H., Keen-Zebert, A., Rowberry, M., Brandt, D., 2010. Geomorphological dynamics of South African floodplain wetlands and the implications for management planning. Association of American Geographers Annual Meeting, 14-18 April 2010, Washington DC, United States of America.
- Rowberry, M., McCarthy, T., Tooth, S., 2009. Widespread denudation and uplift within a passive continental margin: geological and geomorphological insights into the late Mesozoic and Cenozoic evolution of southern Africa. Out of Africa Meeting, 15-17 November 2009, Johannesburg, South Africa.
- Rowberry, M., McCarthy, T., Tooth, S., 2009. Geomorphological insights into the post break-up morphogenic evolution of southern Africa. 7th International Conference on Geomorphology, 6-11 July 2009, Melbourne, Australia.
- Tooth, S., McCarthy, T., Rodnight, H., Keen-Zebert, A., Rowberry, M., Brandt, D., 2009. Morphological and sedimentary dynamics of a South African floodplain wetland: from channelled to unchannelled and back to channelled? 9th International Conference on Fluvial Sedimentology, 24-28 August 2009, San Miguel de Tucumán, Argentina.
- Rowberry, M., Macklin, M., Brewer, P., 2006. Cainozoic inheritance and the significance of ancient landforms as indicators of the long-term geomorphic evolution of the Welsh Massif, United Kingdom. British Geomorphological Research Group Annual Conference, 28-30 June 2006, Loughborough, United Kingdom.
- Rowberry, M., Macklin, M., Brewer, P., 2006. Combining geomorphology, geophysics and computational evidence to elucidate the evolution of Cenozoic Wales, U.K. 27th Nordic Geological Winter Meeting, 9-12 January 2006, Oulu, Finland.
- Rowberry, M., Macklin, M., Brewer, P., 2005. Crustal heterogeneity and long-term landscape evolution: the Accumulative Geomorphic Evolution Model applied to Wales. "Recent Developments in the Geological History of the British Isles - A Tribute to W. Stuart McKerrow", 14-16 January 2005, Oxford, United Kingdom.
- Rowberry, M., Macklin, M., Brewer, P., 2004. Structural compartmentalisation and long-term geomorphological landscape evolution: results from a DEM analysis of Wales. "Earth's Dynamic Surface: Catastrophe and Continuity in Landscape Evolution", William Smith Meeting, 4-5 October 2004, London, United Kingdom.
- Rowberry, M., Macklin, M., Brewer, P., 2004. Long-term landscape evolution and drainage network development in Wales. "Tectonics, Climate and Landscape Evolution in south-central England", British Geological Survey Workshop, 5 April 2004, Keyworth, United Kingdom.

Other results in R&D

- Rowberry, M., Blahůt, J., Hartvich, F., Stemberk, J., Fučík, Z., Briestenský, M., Martí, X., Garcés, J., 2018. Prototype for the automatic monitoring of mutual displacements and angular rotations.
Type of Result: Utility Model - No. 31 362 (RIV Identification Code: RIV/67985891:____/18:00499818)
- Rowberry, M., Martí, X., 2016. Software for the automatic processing of moiré interference patterns generated by the TM-71.
Type of Result: Software (RIV Identification Code: RIV/67985891:____/16:00470424)

Rowberry, M., Martí, X., 2015. Communication protocol between the ADAS and the GEMS.

Type of Result Software (RIV Identification Code: RIV/67985891:____/15:00457347)

Rowberry, M., Martí, X., 2015. Design of robust packaging for the ADAS and the GEMS.

Type of Result: Functional Specimen (RIV Identification Code: RIV/67985891:____/15:00457336)

Rowberry, M., Martí, X., 2015. Design and fabrication of a prototype Automatic Data Acquisition System.

Type of Result: Prototype (RIV Identification Code: RIV/67985891:____/15:00457297)

Rowberry, M., Martí, X., 2015. Design and fabrication of a prototype Geophysical & Environmental Monitoring Station.

Type of Result: Prototype (RIV Identification Code: RIV/67985891:____/15:00457344)

Membership of Scientific Bodies

- Fellow of the Geological Society of London
 - Member of the British Cave Research Association
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Outreach activities

Martí, X., Jungwirth, Y., Pérez-López, R., Rowberry, M., 2018. From Nano to Geo: Scaffolds for Innovation. Meeting organised by the Spanish Embassy in Prague. <https://www.avcr.cz/en/news-archive/from-nano-to-geo-scaffolds-for-innovation/>

Martí, X., Catalan, G., Rowberry, M., Jungwirth, T., Veà, A., 2015. Internet of kings, internet of sinks - rethinking the massively sensorised society. Published by the Internet Society. <https://www.isoc-es.org/internet-of-kings-internet-of-sinks/>

Biography

Matt Rowberry has been a research scientist in the Department of Engineering Geology since 2010. He graduated with first class honours from the University of Liverpool in 2003. His doctoral research at the University of Wales, Aberystwyth, focused on reconstructing the tectonic and geomorphological evolution of Wales since the early Cenozoic opening of the North Atlantic while his postdoctoral research at the University of the Witwatersrand, Johannesburg, developed this theme by focusing on reconstructing the tectonic and geomorphological evolution of southern Africa since the Mesozoic breakup of Gondwana. Since joining the Department of Engineering Geology much of his research has centred on studying the process of limestone dissolution in order to better understand its role in the formation of cave systems. At present his research focuses on, first, radon concentration monitoring on active volcanic islands and the application of time series models - particularly from econometrics - to forecast degassing anomalies and, second, developing and fabricating triaxial positioning systems for fracture displacement monitoring that use machine learning algorithms to forecast undesirable events including anthropogenic and natural disasters. Matt is an active member of the British Cave Research Association and a Fellow of the Geological Society of London. He has also submitted peer review assignments for a number of prestigious international journals including Applied Radiation & Isotopes, Earth Science Reviews, Environmental Science & Pollution Research, Geological Magazine, Global & Planetary Change, Geomorphology, Journal of Cave & Karst Studies, and Tectonophysics.
