

Dr Marie Rosanna Gabrielle Attard

Spatial Scientist and Ecologist

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PROFILE

PhD-qualified multidisciplinary researcher with over 14 years' experience in ecology, environmental monitoring, and remote sensing. Specialist in integrating drone and satellite imagery, spatial analysis and environmental datasets to address biodiversity and environmental challenges across large spatial and temporal scales, including wetland monitoring and fauna population estimates. Experience spanning diverse taxa, including birds, mammals and vegetation. Proven leader of international, cross-institutional projects with a strong track record in scientific publication, technical proficiency (Python, R, SQL, ENVI, QGIS, ArcGIS) and science communication.

EDUCATION

2013 **Ph.D. in Biological Sciences.** University of New South Wales
2008 **B. Sci. (Honours, First Class) in Biological Sciences.** Macquarie University
2007 **B. Sci. (Advanced Science) in Biological Sciences.** Western Sydney University. Environmental Science (major); Microbiology (major); Biochemistry and Molecular Biology (sub-major)

PROFESSIONAL APPOINTMENTS (selected)

2025-26 **Remote Sensing Analyst**, Water and Wetlands Research Centre, DCCEEW
2024-25 **Seabird Remote Image Data Analyst**, British Antarctic Survey
2022-23 **Postdoctoral Albatross Remote Image Analyst**, British Antarctic Survey
2019-22 **Postdoctoral Associate**, Stephen Portugal Lab, Royal Holloway University of London
2016-18 **Postdoctoral Associate**, Tim R Birkhead Lab, University of Sheffield
2014-16 **Research Assistant**, Function, Evolution and Anatomy Lab, University of New England
2014/15 **Postdoctoral Associate**, Function, Evolution and Anatomy Lab, University of New England
2014 **Unit coordinator**, Principles of Zoology (ZOOL100), University of New England
2013 **Field Assistant**, GreenCollar Consulting Solutions
2009/10 **Demonstrator**, Animal Behaviour (BIOS3011), University of New South Wales
2009 **Research Assistant**, Tracey Rogers research group, University of New South Wales

AWARDS AND HONORS

2013 **Postgraduate Writing and Skills Transfer Award** (AU\$6,000), University of New South Wales
2012 **Postgraduate Research Competition Winner** (AU\$5,000), University of New South Wales
2012 **Wiley-Blackwell Student prize** (AU\$300) for presentation, Ecological Society of Australia conference
2010 **Postgraduate Forum Award** for outstanding spoken presentation, University of New South Wales
2009-12 **Academic Postgraduate Award** (AU\$20,427 per annum), University of New South Wales
2005-07 **Academic Excellence Scholarship** (AU\$5,000), Western Sydney University
2005-07 **University Dean's Medal**, Western Sydney University

GRANTS

2024 **£489,579** Darwin Plus Round 11 Grant, [South Georgia Seabirds from Space](https://figshare.com/s/fd498d97c473b86b2bdd), 2024–2026
2013 **£300** INTECOL Student Travel Grant
2012 **AU\$1,000** E&ERC Postgraduate Research Start-Up Grant, University of New South Wales
2012 **AU\$200** Ecological Society of Australia
2011 **AU\$3,300** Postgraduate Research Student Support Scheme, University of New South Wales.
2011 **AU\$1,000** Society for Marine Mammalogy Travel Grant.
2008 **AU\$500** Golden Key International Honours Society Scholarship.

PUBLISHED MANUSCRIPTS AND MANUSCRIPTS UNDER REVIEW

Manuscripts include links to associated data and reproducible Python/R scripts hosted on Figshare, Dryad and GitHub. Private, confidential links to data and reproducible scripts are provided for manuscripts currently under review and are not for distribution.

1. **Attard MRG**, Phillips RA, Poncet S, Bowler E, Fretwell PT (In review) Crowdsourcing for conservation: A citizen science approach to monitoring wandering albatrosses using satellite imagery. *Remote Sensing in Ecology and Conservation*. Data repository (private link): <https://figshare.com/s/fd498d97c473b86b2bdd>

2. **Attard MRG**, Poncet S, Daunt F, Prince F, Whitelaw M, Fisher A, Bamford C, Trathan P (In review) The South Georgia Ecological Atlas: A historical dataset of biological surveys and human activity from 1960 to 1990. *Scientific Data*. Data repository (private link): <https://figshare.com/s/31e1750cc3004485d328> and <https://figshare.com/s/d914f911e0f7bf764f60>
3. Bowler E, **Attard MRG**, Phillips RA, Poncet S, Fretwell PT (In review) Citizen science annotations of wandering albatrosses in satellite imagery, a dataset for training machine learning models. *Scientific Data*. Data available upon request.
4. Clarke PJ, Cubaynes HC, Stockin KA, Bowler E, Carlyon K, Attard MRG, Fretwell PT, Skachkova A, de Vos A, McConnell KM, Medina-Lopez E, Dubon SL, Jackson JA (2026) Odontocete strandings from space: Accurately counting individuals with very-high resolution optical and SAR satellite imagery. *Ecological Informatics*. 99: 103924. doi: [10.1016/j.ecoinf.2026.103924](https://doi.org/10.1016/j.ecoinf.2026.103924). Data repository: [10.5285/b26c3a3d-73c8-4500-9a23-696011c20a45](https://doi.org/10.5285/b26c3a3d-73c8-4500-9a23-696011c20a45)
5. Clarke PJ, Cubaynes HC, Stockin KA, Bowler E, Carlyon K, **Attard MRG**, Fretwell PT, Skachkova A, de Vos A, McConnell KM, Medina-Lopez E, Dubon SL, Jackson JA (2026) Open-source satellite image pre-processing and annotation workflows: Stranded whale and dolphin case study. *MethodsX*. 103949. doi: [10.1016/j.mex.2026.103949](https://doi.org/10.1016/j.mex.2026.103949).
6. **Attard MRG**, Bowen J, Portugal SJ (2025) Scratching beyond the surface: Examining macroecological patterns in bird eggshell texture. *Proceedings of Royal Society Interface*. 22(232): 20240527. doi: [10.1098/rsif.2024.0527](https://doi.org/10.1098/rsif.2024.0527). Data repository: <https://figshare.com/s/1dbaa5ae26554677473d>.
7. **Attard MRG**, Phillips RA, Oppel S, Bowler E, Fretwell PT (2025) Feasibility of using very high-resolution satellite imagery to monitor Tristan albatrosses *Diomedea dabbenena* on Gough Island. *Endangered Species Research*. 56: 187-199. doi: [10.3354/esr01396](https://doi.org/10.3354/esr01396). Data repository doi: [10.5281/zenodo.14711473](https://doi.org/10.5281/zenodo.14711473)
8. **Attard MRG**, Phillips RA, Bowler E, Clarke PJ, Cubaynes H, Johnston DW, Fretwell PT (2024) Review of Satellite Remote Sensing and Unoccupied Aircraft Systems for Counting Wildlife on Land. *Remote Sensing*. 16(4): 627. doi: [10.3390/rs16040627](https://doi.org/10.3390/rs16040627).
9. **Attard MRG**, Portugal SJ (2024) Global diversity and adaptations of avian eggshell thickness. *Ibis*. 166:2, 534-550. Data repository doi: [10.6084/m9.figshare.14763147](https://doi.org/10.6084/m9.figshare.14763147)
10. Sansalone G, Wroe S, Coates G, **Attard MRG**, Fruciano C (2024) Unexpectedly uneven distribution of functional trade-offs explains cranial morphological diversity in carnivores. *Nature Communications* 15 (1): 3275. doi: [10.1038/s41467-024-47620-x](https://doi.org/10.1038/s41467-024-47620-x)
11. van Heteren AH, Tsang LR, Sansalone G, Ross P, Ledogar JA, **Attard MRG**, Sustaita D, Clausen P, Scofield P, Wroe S (2021) New Zealand's extinct giant raptor (*Harpagornis moorei*) killed like an eagle, ate like a condor. *Proceedings of Royal Society B: Biological Sciences*. doi: [10.1098/rspb.2021.1913](https://doi.org/10.1098/rspb.2021.1913)
12. **Attard MRG**, Lewis A, Wroe S, Hughs C, Rogers R (2021). Whisker growth in Tasmanian devils (*Sarcophilus harrisii*) and applications for stable isotope studies. *Ecosphere*. doi: [10.1002/ecs2.3846](https://doi.org/10.1002/ecs2.3846). Data repository doi: [10.6084/m9.figshare.12477563](https://doi.org/10.6084/m9.figshare.12477563)
13. **Attard MRG**, Bowen J, Corado R, Hall L, Dorey R, Portugal SJ (2021) Ecological drivers of eggshell wettability in birds. *Journal of the Royal Society Interface*. 18: 20210488. doi: [10.1098/rsif.2021.0488](https://doi.org/10.1098/rsif.2021.0488). Data repository doi: [10.6084/m9.figshare.14685744](https://doi.org/10.6084/m9.figshare.14685744)
14. **Attard MRG** and Portugal SJ (2021) Climate variability and parent nesting strategies influence gas exchange across avian eggshells. *Proceedings of Royal Society B: Biological Sciences* 288: 20210823. doi: [10.1098/rspb.2021.0823](https://doi.org/10.1098/rspb.2021.0823). Data repository doi: [10.6084/m9.figshare.12490559](https://doi.org/10.6084/m9.figshare.12490559)
15. Birkhead T, Russell D, Garbout A, **Attard MRG**, Thompson J and Jackson D (2020) New insights from old eggs – the shape and thickness of Great Auk *Pinguinus impennis* eggs. *Ibis* 162(4):1345-1354. doi: [10.1111/ibi.12820](https://doi.org/10.1111/ibi.12820)
16. Tsang LR, Sansalone G, Wilson LAB, **Attard MRG**, Ledogar J and Wroe S (2019). Raptor talon shape and biomechanical performance are controlled by relative prey size but not by allometry. *Scientific Reports*. 9: 7076. doi: [10.1038/s41598-019-43654-0](https://doi.org/10.1038/s41598-019-43654-0). Data repository url: <https://hdl.handle.net/1959.11/23363>
17. Birkhead TRB, **Attard MRG**, Pilastro A (2019) Subtle egg-membrane structures in birds' eggs. *Molecular Reproduction and Development*.
18. **Attard MRG**, Sherratt E, McDonald P, Gracia M and Wroe S (2018) A new, three-dimensional geometric morphometric approach to assess egg shape variation. *PeerJ*. 6: e5052. doi: [10.7717/peerj.5052](https://doi.org/10.7717/peerj.5052). Data repository doi: [10.6084/m9.figshare.3382477.v1](https://doi.org/10.6084/m9.figshare.3382477.v1) and [10.6084/m9.figshare.3382501.v1](https://doi.org/10.6084/m9.figshare.3382501.v1)

19. **Attard MRG**, Medina I, Langmore N, Sherratt E (2017) Egg shape mimicry in parasitic cuckoos, *Journal of Evolutionary Biology*. 7(2): e31704. doi: [10.1111/jeb.13176](https://doi.org/10.1111/jeb.13176). Data repository doi: [10.5061/dryad.v5375](https://doi.org/10.5061/dryad.v5375)
20. **Attard, MRG**, Wilson LAB, Worthy TH, Scofield P, Johnston P, Parr WCH and Wroe S (2016) Moa diet fits the bill: virtual reconstruction incorporating mummified remains and prediction of biomechanical performance in avian giants. *Proceedings of Royal Society B*. 283(1822). doi: [10.1098/rspb.2015.2043](https://doi.org/10.1098/rspb.2015.2043). Data repository doi: [10.5061/dryad.hf0rm](https://doi.org/10.5061/dryad.hf0rm)
21. **Attard MRG**, Parr W, Archer M, Hand S, Rogers TL and Wroe S (2014) Virtual reconstruction and prediction of diet of the Australian mid Cenozoic thylacinid, *Nimbacinus dicksoni* (Thylacinidae, Marsupialia). *PLOS ONE*. 9 (4), e93088. doi: [10.1371/journal.pone.0093088](https://doi.org/10.1371/journal.pone.0093088)
22. D'Anastasio R, Wroe S, Tuniz C, Arensburge B, Mancini L, Cesana DT, Dreossi D, Ravichandiran M, **Attard MRG**, Parr W, Agur A. (2013) Micro-Biomechanics of the Kebara 2 Hyoid and Its Implications for Speech in Neanderthals. *PLOS ONE*. doi: [10.1371/journal.pone.0082261](https://doi.org/10.1371/journal.pone.0082261)
23. **Attard MRG**, Chamoli U, Ferrara T, Rogers TL, Wroe S (2011) Skull mechanics and implications for feeding behaviour in a large marsupial carnivore guild: the thylacine, Tasmanian devil and spotted-tailed quoll. *Journal of Zoology*, 285 (4); 292-300. doi: [10.1111/j.1469-7998.2011.00844.x](https://doi.org/10.1111/j.1469-7998.2011.00844.x)
24. **Attard MRG**, Pitcher BJ, Charrier I, Ahonen H, Harcourt RG (2010) Vocal discrimination in mate guarding male Australian sea lions: Familiarity Breeds Contempt, *Ethology*, 116; 1-9. doi: [10.1111/j.1439-0310.2010.01786.x](https://doi.org/10.1111/j.1439-0310.2010.01786.x)

PUBLISHED BOOK CHAPTERS AND FEATURE ARTICLES

1. Attard MRG and Wroe S (2022) Thylacine Prey Size in "History and Mystery of the Thylacine". Editor: Branden Holmes. *CSIRO Publishing*.
2. **Attard MRG** and Wroe S (2012) "The thylacine myth". *Australasian Science Magazine*. (6): 19- 22.
3. **Attard MRG** (2012) "Unveiling the mysteries of the Tasmanian Tiger". *The conversation*.

PUBLIC OUTREACH

My research has been featured in:

- **Media interviews** (ABC Science Show, BBC Nature, Australian Geographic)
- **Feature articles** (Science Illustrated, Science News, Sydney Morning Herald)
- **Public talks and domestic and international conferences**

Full media list available at marieattard.com.

RESEARCH EXPERIENCE

Remote Sensing Analyst

2025-26 **Environmental Scientist Spatial**, Water and Wetlands Research Centre, DCCEE

- Project team member developing automated mapping of wetland inundation across NSW using drone and Sentinel-2 imagery.
- Developed Python, R, and SQL based workflows to process and analyse wetland inundation using remote sensing imagery, hydrological, elevation, vegetation and land use data.
- Developed automated Python time-series analysis of inundation extent and trends across six major Murray-Darling Basin wetlands using 70+ years of daily hydrological logger data.
- Conducted drone-based fieldwork and image annotation to validate water, vegetation and mixed water/vegetation pixel detection from Sentinel-2 imagery.
- Prepared technical reports and data products for stakeholders to meet programme requirements.

2023-25 **Seabird Remote Sensing Data Analyst**, Wildlife from space centre, British Antarctic Survey.

- Lead scientist on **Darwin Plus project (DPLUS187)** mapping seabird breeding distributions and abundance across South Georgia using very high-resolution satellite imagery.
- Developed advanced workflows for automated detection of seabird colonies
- Applied high-performance computing (HPC) to process large-scale satellite datasets.
- Collaborated with stakeholders (e.g., South Georgia Surveys, South Georgia Heritage Trust, RSPB) and government bodies to deliver actionable spatial data for seabird conservation.
- Prepared manuscripts and presented results at scientific conferences.
- Mentored two PhD students, providing training in remote sensing and python scripting.

Postdoctoral Researcher

2021-22 **Postdoctoral Albatross Project Image Analyst**, Wildlife from space centre, British Antarctic Survey.

- Lead researcher on **Darwin Plus project (DPLUS132)**, using satellite imagery and citizen science to monitor 24 wandering albatross colonies in South Georgia.
 - Conducted a feasibility study on Tristan albatross detection on Gough Island using satellite imagery.
 - Published findings in peer-reviewed journals; presented at international conferences.
 - Designed image annotation protocols and developed R script to estimate breeding pair numbers from crowdsourced remote sensing data.
 - Produced biannual project reports for Darwin Plus and authored outreach articles; supported successful grant applications for further remote sensing research.
- 2019-22 **Stephen Portugal Lab**, Department of Biological Sciences, Royal Holloway University of London
- Led studies on avian eggshell adaptation in collaboration with universities and museums.
 - Used imaging and materials analysis techniques (e.g., nanoindentation, interferometry).
- 2016-18 **Tim R Birkhead lab**, Department of Animal and Plant Sciences, University of Sheffield.
- Lead researcher to explore adaptive function of avian eggs. Duties including conducting and publishing studies, mentoring students, travelling to museums to measure and scan eggshells from auk species.
 - Co-organised an international conference on eggshell biology (<https://eggconference.wixsite.com/home>)
- 2014-15 **Function, Evolution and Anatomy Research lab**, Department of Zoology, University of New England.
- Published studies on avian egg shape and co-supervised PhD and honours students.
 - Administration duties including writing grants, processing invoices, training students on software, managing large data sets, organising Function, Evolution and Anatomy conference.

Research Assistant

- 2014-16 **Function, Evolution and Anatomy Research lab**, University of New England.
- Led research using Finite Element Analysis and Geometric Morphometrics to study feeding ecology.
 - Managed lab operations, including equipment procurement, museum loans, CT scanning, software training, and conference and website coordination.
- 2009 **Mammal Lab**, University of New South Wales.
- Data preparation and statistical analysis of home range using satellite tracking data for Leopard Seal Ecology Project. Travelled to museums to collect historical tissues for stable isotope analysis.
- 2006/07 **School of Computing and Mathematics**, Western Sydney University.
- Co-author of Almanac, a statistical reference guide for Self-Storage Industries. Duties involved statistical analysis, interpretation and write-up of annual survey data.

Education

- 2009-13 **PhD**, Evolution and Ecology Research Centre, University of New South Wales.
- Lead investigator to develop methods to monitor endangered Tasmanian devils and explore long-term change in marsupial carnivore diet and habitat use (published)
- 2008 **Honours**, Department of Environment and Geography, Macquarie University.
- Conducted vocal recognition experiments on Australian sea lions (published)

PROFESSIONAL PRESENTATIONS

- 2025 **BIOSPACE25: Biodiversity Insight From Space**, Oral presentation, "Albatrosses from Space: A citizen science approach to monitor remote colonies using satellite imagery", The European Space Agency, ESRI, Frascati, Italy.
- 2024 **Ecological Society of America**, Oral presentation, "Monitoring albatrosses in remote breeding locations using citizen science and high-resolution satellite imagery", California, USA.
- 2024 **International Polar Year 2032-33 Planning Workshop**, "Observe and Preserve Nature: Using citizen science to monitor wildlife in remote sensing imagery", France.
- 2024 **British Antarctic Survey Science Symposium**, Poster, "Why is the grass greener on the other side: Using spectral signature of guano-fertilised vegetation to detect burrowing-nesting species", Cambridge.
- 2022 **British Ornithology Union: Avian Reproduction**, Oral presentation "Albatrosses from Space: Using crowdsourcing and satellites to monitor breeding Wandering Albatrosses", Online.
- 2019 **Advances in Avian Reproduction: Nests, Eggs and Incubation Conference**, Oral presentation, "Life on the edge: Are pyriform eggs more resistant to breakage among cliff-breeding seabirds?" and poster, "Scratching beyond the surface: the evolution and functional role of avian eggshell structure and tomography", Lincoln, UK.
- 2018 **Resolving the Mysteries of the Avian Egg Conference**, Oral presentation "Egg shape mimicry in brood parasites", Sheffield, UK.

- 2015 **Function, Evolution and Anatomy Conference**, Oral presentation. "Extinct Australian predator was fierce but no Tasmanian devil", Armidale, Australia.
- 2014 **Society of Vertebrate Palaeontology**, Oral presentation. "Virtual reconstruction and prey preference of Tasmanian tiger's ancient relative", Berlin, Germany.
- 2014 **4th International Palaeontological Congress**, Poster, "Moa diet fits the bill: clip and pluck feeding strategies of New Zealand's Extinct giant flightless birds", Mendoza, Argentina.
- 2013 **International Association for Ecology conference**, Poster, "New insight from the old: Using stable isotopes to assess marsupial carnivore vulnerability to anthropogenic impacts", London, UK.
- 2013 **Ecological Society of America conference**, Oral presentation, "The risks of being big - The ecological and evolutionary significance of the thylacine's body size and diet", Minneapolis, USA.
- 2013 **Australian Mammal Society conference**, Oral presentation, "Tracking long-term diet and habitat shifts in the world's largest marsupial carnivores", Sydney, Australia.
- 2012 **Ecological Society of Australia conference**, Oral presentation, "The thylacine myth: stable isotopes and skull biomechanics reveal their 'actual' diet and extinction risk", Melbourne, Australia.
- 2012 **Using virtual reconstruction and computational biomechanics to study form and function in biology workshop**, guest speaker, Sydney, Australia.
- 2011 **19th Biennial Conference on the Biology of Marine Mammals**, Oral presentation, "Are you really what you eat: Influences of fasting on stable isotope ratios in male southern elephant seals", Tampa, USA.

TEACHING EXPERIENCE

- 2018 **Brilliant Club tutor**, Year 6 students. Castle Hall Academy
- Developed teaching material, delivered tutorials and provided feedback on assignment
- 2017/18 **Teaching Coordinator for Level 1 Sign Language**, Sheffield University Sign Language Society.
- Developed teaching material, deliver weekly classes, prepared students for exams.
- 2015 **Unit Coordinator for Principles of Zoology (ZOOL100)**, University of New England
- Developed teaching material, delivered lectures, set and marked assessments. Provided advice to students on unit related matters including withdrawal, extensions and assignments.
- 2012 **Demonstrator for Vertebrate Zoology (BIOS2061)**, University of New South Wales.
- Used interactive computer-based case studies to teach vertebrate evolution.
- 2009/10 **Demonstrator for Animal Behaviour (BIOS3011)**, University of New South Wales.
- Laboratory demonstrator and supervised student group projects.

FIELD AND LABORATORY EXPERIENCE (selected)

- 2013 **Field assistant** for Greencollar consulting solutions, Sydney.
- Estimated biomass and CO₂ abatement through vegetation field surveys.
- 2013 **Field assistant** for Cetacean Ecology Research, Maldives. Directed by CEBEL lab, Flinders University.
- Three-week expedition recording behaviour, collecting biopsy samples and photo-identification.
- 2010/12 **Field assistant** for Southwest Whale Ecology Study, Western Australia.
- Two-month fieldwork theodolite tracking cetaceans, collecting biopsy samples and photo-identification.
- 2010 **Field assistant**, Murray Darling Basin. Directed by Australian Wetlands, Rivers and Landscapes Centre.
- One week frog abundance and distribution survey to assess response to river regulation.
- 2009 **Field and laboratory assistant** for Leopard seal Research Program, Primavera Station. Directed by University of New South Wales, Instituto Antártico Argentino and Taronga Conservation Society.
- Two-month fieldwork involving satellite tag deployment, scat and biopsy sampling.
- 2008 **Field assistant** for Oyster Research, Sydney. Directed by Benthic Ecology Group, Macquarie University.
- Assisting in field experiments to assess recruitment in Sydney rock oysters and Pacific oysters.

COURSES (selected)

- 2025 **Introduction to ENVI Analytics** (Online training by ENVI)
- Topics included satellite imagery pre-processing, subsetting and masking, creating spectral libraries.
- 2025 **ENVI Advanced Spectral Analytics** (2-day training by ENVI)
- Spectral profile extraction, spatial and spectral subsetting, endmember classification, and python scripting for remote sensing workflows.
- 2025 **High Performance Computing (HPC) training** (2-day course by the British Antarctic Survey)
- HPC fundamentals, Linux shell, data transfer, Jupyter notebooks and SLURM job scheduling.

- 2024 **QGIS training course** (1-day training by the British Antarctic Survey)
- Spatial data visualisation, layer manipulation, and basic geospatial analysis techniques.

JOURNAL REVIEWER

I have been a reviewer for several journals, including *Ecology and Evolution* and *Animal Behaviour*.