

Dr Sarah Hamylton *Curriculum Vitae*
School of Earth and Environmental Sciences
University of Wollongong, Wollongong NSW 2522
Australia

CURRENT POSITION

January 2014 - Present Senior Lecturer, School of Earth and Environmental Sciences, University of Wollongong (UOW)

QUALIFICATIONS

PhD, University of Cambridge, UK
MPhil GIS and Remote Sensing, University of Cambridge, UK (Distinction)
M.Env.Sci, University of Southampton, UK (Distinction)

POSITIONS PREVIOUSLY HELD

January 2011 – January 2014 Lecturer, School of Earth and Environmental Sciences, UOW
July 2010 – January 2011 UOW Australian Bicentennial Fellow, UOW
July 2007- July 2010 PhD, University of Cambridge
July 2007 – March 2010 Spatial Data Coordinator (part time), United Nations Environment Programme- World Conservation Monitoring Centre
August 2005 – September 2009 Geospatial Analyst (part time), Infoterra Consulting, UK
July 2004 – August 2005 Chief Project Scientist, Coral Cay Conservation, Fiji Coral Reef Conservation Project

VISITING ACADEMIC POSITIONS

2012 – 2013 Visiting Fellow, Department of Geography, University of Cambridge, UK
2011 – Present Research Associate, GeoCoastal Research Group, School of Geosciences, University of Sydney

MEMBERSHIPS

Royal Geographical Society Fellow, 2005 – present
Elected Fellow of the Linnean Society of London, 2011 – present
International Society of Coral Reef Studies
Australian Coral Reef Society, 2011 – present
Royal Zoological Society of New South Wales, 2010 - present

RESEARCH SUMMARY STATEMENT

My research interests lie in spatial analysis of coastal environments, through the application of Geographical Information Systems (GIS), Remote Sensing (RS) and spatial statistics to tropical coastal systems (e.g. reef islands, coral reefs, mangroves). I develop models to further understand coastal processes at the landscape scale, including shoreline movements, wave energy conditions, the influence of sea-level rise on reef systems, the implications of ocean acidification for reef island evolution, benthic faunal patterns, carbonate sediment production and ecological and habitat dynamics of atoll environments. I have worked in the Chagos Islands, Australia, Fiji, Thailand, the Philippines, the Seychelles, Saudi Arabia, Egypt and Belize. I have carried out remote sensing projects in tropical marine environments for several organisations, including: the Australian Museum, the Lizard Island Reef Research Foundation, the Fijian Ministry of Tourism, the Department of Environment and Natural Resources, Republic of the Philippines, the United Nations Environment Programme, the British Foreign and Commonwealth Office, the Seychelles Islands Foundation and the Living Oceans Foundation. Having completed a PhD at the University of Cambridge, UK entitled “Modelling the Structure and Function of Tropical Marine Communities at the Landscape Scale”, I am now applying my modelling techniques to Australian reef islands.

ACADEMIC GOVERNANCE

June 2013 – Present

Head of Postgraduate Studies, School of Earth and Environmental Sciences, University of Wollongong (70 postgraduate students). Duties include scholarship ranking, organization of first year progress reviews and presentations and provision of pastoral support for 70 postgraduate students

January 2013 – Present

Deputy Director, GeoQuest Research Centre. Duties include report grant expenditure across membership of 56 researchers, reporting research performance to the Deputy Vice-Chancellor of Research and collating research performance figures for the Excellence in Research for Australia (ERA) National Higher Education research assessment exercise.

January 2013 – Present

Faculty Research Committee, Faculty of Science, Medicine and Health. Duties include grant scheme design, grant application assessment.

TEACHING EXPERIENCE

January 2011 – Present

Course Coordinator, Fundamentals of Spatial Analysis, School of Earth and Environmental Sciences, University of Wollongong (180 students). Responsibilities include preparation and delivery of teaching material, student assessment, course administration and development of an online teaching platform

January 2011 – Present

Course Coordinator, Advanced Coastal GIS, School of Earth and Environmental Sciences, University of Wollongong (90 students). Responsibilities as per position listed immediately above.

Jan 2010 – Mar 2010

Supervisor for Coastal Processes, Department of Geography, University of Cambridge: supervision of small groups of undergraduate students on coastal processes for eight different Colleges (St John's, Trinity, Robinson, St Catherine's, Homerton, Kings', Emmanuel and Corpus Christi). I guided students through reading materials, set and marked assignments.

Jan 2007- June 2009

Lecturing responsibilities & GIS training to Graduate Students

Geography Department, Cambridge University, including:

MPhil in GIS & Remote Sensing: Modelling coastal landscapes;

Geographical tripos 1a: Spatial data;

Geographical tripos 1b: Geography and public policy.

July 2008- Dec 2008

Open University Tutor, Coastal Remote Sensing course: Revised the course handbook (employed nationally and internationally) and provided tuition for students enrolled in this distance learning course.

November 2003 – November 2004

Multivariate Environmental Data Analysis course, University of the South Pacific Co- authored and conducted a course in multivariate statistical exploration, using Plymouth Routines in Multivariate Environmental Research software for Environmental Studies Masters students, Institute of Applied Sciences.

Sept. 2003 – June 2004

Training Officer (Project Scientist), Fiji Coral Reef Conservation Project: Carried out two-week Science training programme for marine conservation volunteers (groups of 10 – 25 volunteers) on a monthly basis. Trained volunteers in underwater survey methods and marine species identification.

RECENT PUBLICATIONS : BOOKS / BOOK CHAPTERS

Hamylton, S.M. *Spatial Analysis of Coastal Environments*, Cambridge University Press (in preparation).

Hamylton, S. & Andréfouët, S. (2012) An appraisal of the extent and geomorphological diversity of the coral reefs of the United Kingdom Dependent Territories. In: Sheppard, C. (2012) *The Coral Reefs of the British Overseas Territories*, Springer-Verlag, Amsterdam. Accepted January 2012.

Hamylton, S., Spencer, T & Hagan, A (2009) Coral reefs and reef islands of the Amirantes Archipelago, western Indian Ocean, pp. 99 – 106. In: Harris, P & Baker, E (Eds.) (2009) *Atlas of Seafloor Geomorphology as Habitat*, Elsevier, Chatswood, Australia. 600pp.

Hamylton, S. (2009) The Al Wajh Bank reef system, Saudi Arabia, Red Sea, pp. 28 – 37. In: Harris, P & Baker, E (Eds.) (2009) *Atlas of Seafloor Geomorphology as Habitat*, Elsevier, Chatswood, Australia. 600pp.

Hamylton, S. (2009) *A comparison of the coastal habitat maps derived from remote sensing campaigns at the Al Wajh Bank, Saudi Arabia, Red Sea*, pp. 45 – 66, in: *Atlas of the coastal habitats of the Saudi Arabian Red Sea*, Living Oceans Foundation Publication, ISBN: 978-1-901480-09-04.

Spencer, T., Hagan, A.B., **Hamylton, S.M.** & Renaud, P. (2008) *Atlas of the Amirantes*, Cambridge Coastal Research Unit, University of Cambridge, ISBN: 978-1-901480-09-2. 64pp.

Hamylton, S. (2008) *Airborne Remote Sensing of the Al Wajh Barrier Reef, Saudi Arabia, Red Sea*. In: N. McWilliam, R. Teeuw, M. Whiteside & P. Zukowskyj (2008) *Expedition Field Techniques: GIS, GPS and Remote Sensing Manual*. Pages 318-328, Royal Geographical Society-IBG Publication.

Hamylton, S. (2007) *Use of high resolution optical Remote Sensing data to investigate the effects of wave exposure on seagrass communities of Etoile Cay, Seychelles*, 90-103, In: *Marine Benthic Habitats of the Pacific and other Oceans: Status, Use and Management*, Institute for Research and Development, Noumea, New Caledonia.

JOURNAL ARTICLES

Saunders MI, Leon JX, Callaghan DP, Roelfsema CM, **Hamylton S**, Brown CJ, Baldock T, Golshani A, Phinn SR, Lovelock CE, Hoegh-Guldberg O, Woodroffe CD, Mumby PJ (2014) Interdependency of tropical marine ecosystems in response to climate change. *Nature Climate Change* 4:724-729

Hamylton S (2014) Will Coral Islands Maintain Their Growth over the Next Century? A Deterministic Model of Sediment Availability at Lady Elliot Island, Great Barrier Reef. *PLoS ONE* 9(4): e94067.
doi:10.1371/journal.pone.0094067

Silverman, J., Schneider, K., Kline, D. I., Rivlin, T., Rivlin, A., **Hamylton, S.**, & Caldeira, K. (2014). Community calcification in Lizard Island, Great Barrier Reef: A 33year perspective. *Geochimica et Cosmochimica Acta*, 144, 72-81.

Hamylton S & Puotinen, M (2014) A meta-analysis of reef island response to environmental change on the Great Barrier Reef. *Earth Surface Processes and Landforms*. DOI: 10.1002/esp.3694

Hamylton, S., Leon, J.X., Saunders, M.I., Woodroffe, C.D (2014) Simulating reef response to sea-level rise at Lizard Island: A geospatial approach. *Geomorphology*, <http://dx.doi.org/10.1016/j.geomorph.2014.03.006>

Hamylton, S & East, H. (2014) Response to Sheppard, C. Atoll Rim Expansion or Erosion in Diego Garcia Atoll, Indian Ocean? Comment on Hamylton, S.; East, H. A Geospatial Appraisal of Ecological and Geomorphic Change on Diego Garcia Atoll, Chagos Islands (British Indian Ocean Territory). *Remote Sens.* 2014, 6, 2468–2472.

Barnes, R.S.K., & **Hamylton, S.** (2013) Abrupt transitions between macrobenthic faunal assemblages across seagrass bed margins, *Estuarine, Coastal and Shelf Science*, 131: 213-223.

Leon, J. X., Phinn, S. R., **Hamylton, S.**, & Saunders, M. I. (2013). Filling the ‘white ribbon’ - A seamless multisource Digital Elevation Model for Lizard Island, northern Great Barrier Reef *International Journal of Remote Sensing* DOI:10.1080/01431161.2013.800659.

Hamylton, S. Pescud, A., Leon, J.X., Callaghan, D.P. (2013) A Geospatial assessment of the relationship between reef flat community calcium carbonate production and wave energy, *Coral Reefs*, 32(4), 1025-1039.

Hamylton, S., (2013) Critical cartography and the use of new technologies for conserving the Australian coastline: A case study from Lord Howe Island, *Geographical Research*, 52: 65-73

Doo, S., **Hamylton, S.** & Byrne, M. (2012) Reef scale assessment of intertidal Large Benthic Foraminifera populations on One Tree Reef and future carbonate production in a warming ocean, *Zoological Studies*, 51 (8) 1-18

Hamylton, S., Silverman, J & Shaw, E. (2013) The use of remote sensing to scale up measures of carbonate production on reef systems: A comparison of census-based and hydrochemical estimation methods, *International Journal of Remote Sensing, Special Issue on Emerging Methods for the Study of Coastal Ecosystem Landscape Structure and Change*, 34(18), 6451-6465

Hamylton, S., (2013) Five practical uses of spatial autocorrelation for studies of coral reef ecology, *Marine Ecology Progress Series*, 478: 15-25.

Hamylton, S., Spencer, T & Andréfouët, S. (2012) Comparing coral reef geomorphic and habitat diversity at the landscape scale, Amirantes Archipelago, western Indian Ocean, *Estuarine, Coastal and Shelf Science*, doi.org/10.1016/j.ecss.2012.06.001.

Hamylton, S. & Prosper, J (2012) Development of a Spatial Data Infrastructure for coastal management in the Amirante Islands, Seychelles, *International Journal of Applied Earth Observation and Geoscience*, 19: 24-30.

Hamylton, S., Spencer, T & Hagan, A (2012) Spatial modelling of benthic cover using remote sensing data in the Aldabra lagoon, western Indian Ocean, *Marine Ecology Progress Series*, doi: 10.3354/meps09779.

Hamylton, S. & East, H.(S) (2012) A geospatial appraisal of ecological and geomorphic change on Diego Garcia Atoll, Chagos Islands (British Indian Ocean Territory), *Remote Sensing Special Issue Remote Sensing for Understanding Coral Reef Dynamics and Processes: Photo-Systems to Coral Reef Systems*, 4: 3444-3461

Hamylton, S. (2012) A comparison of spatially explicit and classic regression modelling of live coral cover using hyperspectral remote sensing data in the Al Wajh lagoon, Red Sea, *International Journal of Geographic Information Science*, 10.1080/13658816.2012.683195

Hamylton, S., Hagan, A & Doak, N (2012) Observations of Dugongs at Aldabra Atoll, Western Indian Ocean: Lagoon Habitat Mapping and Spatial Analysis of Sighting Records, *International Journal of Geographic Information Science*, 26: 839-853.

Walker, RJ, Whitmore, N., Rafeliarisoa, T.H., **Hamylton, S.** (2012) The effect of habitat degradation on the long term survival of the Critically Endangered Madagascar spider tortoise (*Pyxis arachnoides*). *Biological Conservation*, 152: 152–158.

Hamylton, S. (2011) The use of remote sensing and linear wave theory to model local wave energy around Alphonse Atoll, Seychelles, *Estuarine, Coastal and Shelf Science*, 95: 349-358.

Hamylton, S. and Spencer, T. (2011) Geomorphological modeling of tropical marine landscapes: Remote sensing, patches and spatial statistics, *Continental Shelf Research, Special Issue on Coastal Remote Sensing*, 31: 151-161.

Hamylton, S. (2011) An evaluation of waveband pairs for water column correction using band ratio methods for seabed mapping in the Seychelles, *International Journal of Remote Sensing*, 32: 9185 - 9195.

Hamylton, S. (2011) *Estimating the coverage of coral reef benthic communities from airborne hyperspectral remote sensing data: Derivatives, multiple discriminant function analysis and linear spectral unmixing*, *International Journal of Remote Sensing*, 32: 9673 - 9690.

Hamylton, S., Hagan, A., & Spencer, T. (2009) *Development of an island habitat classification scheme for the Amirante Islands, Seychelles*, *WIO Journal of Marine Science*, 6 (3) 15-34.

Hamylton, S. (2009) *Determination of the separability of coastal community assemblages of the Al Wajh Barrier Reef, Red Sea, from hyperspectral data*, *European Journal of Geosciences*, 01: 1-11.

Hamylton, S. & Spencer, T. (2007) *Classification of Seagrass habitat structure as a response to wave exposure at Etoile Cay, Seychelles*, *European Association of Remote Sensing Laboratories, EARSeL Proceedings*, 6(2): 82-94.

Hagan, A, **Hamylton, S.** & Spencer, T. (2007) *Status of Carbonate Reefs of the Amirantes and Alphonse Groups, Southern Seychelles*. In: Coastal Oceans Research and Development in the Indian Ocean, Status Report, International Coral Reef Initiative.

RESEARCH GRANTS

- 2014 **Hamylton, S.** “Quantifying calcification on the Great Barrier Reef” Global Challenges Research Fund, £13k.
- 2014 **Hamylton, S.**, Rogers, K., Woodroffe, C “Are coral islands disappearing? Reef scale reductions in calcium carbonate production at Cocos Keeling Atoll, Australia” UOW Research Committee Small Grant, £11.5k.
- 2014 Woodroffe, C., Kenchington, R., **Hamylton, S.**, Rogers, K. “Engaging local councils in coastal research in southern New South Wales” Global Challenges Research Fund, £5k.
- 2014 **Hamylton, S.** “Modelling carbonate dynamics of the Capricorn-Bunker Group, Great Barrier Reef” Great Barrier Reef Marine Park Authority Science for Management Award, £3k.
- 2013 Byrne, M., **Hamylton, S.**, Eggins, S., Vila-Concejo A “Calcification of Foraminifera in a changing ocean – contribution to a GBR resilience index” Great Barrier Reef Foundation, £54k
- 2013 David, A., Rogers, K., **Hamylton, S.**, Minchington, T., Woodroffe, C., Jones, B. “Purchase of a new survey boat for offshore fieldwork” Research Infrastructure Block Grant, £39k.
- 2012 **Hamylton, S** CI and Puotinen, M “Geospatial modeling of reef island response to sea level rise in the Chagos Islands, Central Indian Ocean” UOW University Research Committee Small Grant, £14k.
- 2011 **Hamylton, S.** CI “Modelling coral reef response to environmental change: a geospatial approach” UOW University Research Committee Near-Miss Grant, £12k.
- 2011 **Hamylton, S.** CI “Modelling coral reef response to environmental change: a geospatial approach” Lizard Island Research Fellowship, £11k.
- 2010 **Hamylton, S.** CI “Modelling coral reef response to environmental change: a geospatial approach” Australian Bicentennial Fellowship, £6k.
- 2010 **Hamylton, S.** CI, “Detecting ecological and geomorphic change on Diego Garcia Atoll, Chagos Islands (British Indian Ocean Territory)” GeoEye Foundation Remote Sensing Award, £9k.
- 2009 **Hamylton, S.** CI “Modelling coral reef response to environmental change: a geospatial approach” Living Oceans Foundation Post Doctoral Fellowship, £30k.
- 2009 Spencer, T., **Hamylton, S.** CI, “Using field spectrometry to discriminate the benthic habitats of Aldabra Lagoon” UK National Environment Research Council Fieldwork grant, £15k.
- 2008 Bunbury, N., **Hamylton, S.** CI, Hagan, A., Spencer, T., Fleischer-Dogley, F. “Mapping the habitats of the lagoon of Aldabra Atoll, West Indian Ocean” Seychelles Environment Trust Fund Award, £120k.
- 2008 **Hamylton, S.** CI, “Hyperspectral remote sensing surveys of the Al Wajh Lagoon, Saudi Arabia” Khaled bin Sultan Living Oceans Fieldwork grant, £20k.
- 2007 **Hamylton, S.** CI, “Modelling the structure and function of tropical marine communities at the landscape scale” Living Oceans Foundation PhD Fellowship, £65k.
- 2007 **Hamylton, S.** CI, “Modelling the structure and function of tropical marine communities at the landscape scale” Isaac Newton Research Studentship, Cambridge University, £152k.
- 2004 **Hamylton, S.** CI, “The Fiji Mamanuca Coral Reef Conservation Project” Roy Queree Fieldwork Award, Southampton University, £15k.
- 2003 Rupenee, E. CI, Aalbersberg, B., **Hamylton, S.** “Integrated Coastal Management along the Coral Coast, Viti Levu, Fiji” Equator Initiative Award, World Summit on Sustainable Development, £30k.
- 2002 **Hamylton, S.** CI, “Socrates Environmental Studies Grant, York University, Toronto, £9k.