DR AMY SING WONG

MARINE ECOLOGIST

SOCIAL LINKS

WEBSITE
GITHUB
LINKEDIN
ORCID-ID

Research Interests

Marine ecologist in tropical marine ecosystems and extending to deep-sea environments. Research has used ecological and socio-ecological approaches complemented with field work, open access databases, spatial analyses, and modelling to produce outputs that facilitate policy. Particularly interested in developing reproducible and accessible methods that result in tools and outputs to further inform policy, drive human welfare, livelihoods, and ecosystem conservation efforts. Additionally, exploring the relationships between people and nature, and the concepts of ecosystem services, value of nature, and the nascent tools of insurance policy for nature.

Education

2018 – 2023 **PhD Biological Science, University of Essex**
Thesis: *Temporal global trends of human population and dependency on coral reefs*
Supervisors: Dr Michelle L. Taylor, Dr Spyridon Vrontos
Faculty Research Studentship - School of Life Sciences and School of Mathematics, Statistics and Actuarial Science.

2017 – 2018 **M.Res Tropical Marine Biology, University of Essex**
Thesis: *Functional structure of herbivorous fish communities in the Wakatobi National Park, Southeast Sulawesi*
Supervisors: Prof. David Smith, Dr Thomas Cameron

2012 – 2013 **M.Sc Marine Biology, Bangor University:** Merit
Thesis: *The effect of tidal setting on carbon delivery in mangrove forests on Unguja Island, Zanzibar.*
Supervisors: Prof. Hilary Kennedy, Dr Martin W. Skov

2007 – 2010 **B.Sc (Hons) Wildlife Biology, Manchester Metropolitan University:** 2:1
Thesis: *Investigating the fecundity of the European speckled wood butterfly (Pararge aegeria), without the presence of male harassment.*
Supervisor: Dr Lesley Lace

Relevant Employment

Oct – Dec 2022
Marine Environmental Consultancy, Freelance, Remote
Research and development of Project Development Document (PDD) for mangrove restoration project based in the Philippines.

Oct 2017 – Dec 2022
Graduate Laboratory Assistant, University of Essex, Colchester
Assisting lecturers with fieldwork and lab practicals for undergraduate and master's students.
Demonstrating and Divemaster for Tropical field course for undergraduate and master students in addition to supporting students with independent research projects.

Jun – Aug 2017 & 2018
Dissertation Project Leader & General Marine Scientist, Operation Wallacea, Indonesia
Dissertation project leader for undergraduate and master level dissertation students, mentoring them to drive research projects in planning, conducting, analysing and presenting aspects. Organised research diving logistics and project milestones for students as well as ensuring underwater research techniques were conducted properly. In addition, implemented my own field research and experiments and assisted with PhD students' research.

- **Jun – Aug 2016**
  Assistant Schools Coordinator & Coral Reef Ecology Lecturer, Operation Wallacea, Indonesia
  Planned and organised coral reef ecology lectures and in-water practical lessons (snorkelling and/or scuba diving) for expedition students. Lessons included basic reef ecology, fish, invertebrate & benthic identification skills and introduction to reef surveying techniques. As a member of the "Schools Team" ensured the welfare of the students and teachers were maintained during their stay on the remote island.

- **Jun 2015 – Jun 2016**
  Resident Marine Biologist & EarthCheck Coordinator (Sustainability Officer), Park Hyatt Mal- dives
  Coral reef manager monitored the house reef with a focus on bleaching and the crown of thorns starfish (*Acanthaster planci*); in addition, monitored the shoreline of the island to observe the sediment movement and potential erosion. As the EarthCheck Coordinator led and managed the resort to follow and maintain EarthCheck sustainable practices and coordinated onsite audits, with cooperation across all departments and wrote the Environmental Management Systems report for the resort. Undertaking all the corresponding administrative work which included regular reviews of risk assessments and environmental management system. Communicated the environmental & social sustainability policy to all stakeholders, business partners, local communities, staff members and guests. Produced and conducted internal staff training in sustainability.

Skills

Research & Laboratory Skills

Planned and designed research projects, including experimental components in terrestrial and marine environments. Species identification skills, from birds, trees, fish, marine invertebrates, and benthos in temperate and tropical environments. Applied mangrove forest and underwater coral reef research techniques. Use of laser particle analyser, C/N Elemental analysers and Loss of Ignition for organic matter calculations. Animal behavioural research methods in and ex-situ, including animal husbandry.

Technical Skills

- Data extraction, wrangling and manipulation, analysis, and visualisation with R coding language.
  - Web scraping and extraction with APIs – open access databases and big data.
  - Spatial analysis and GIS with R including creating maps.
  - Animated maps and graphs in R.
  - Packages: tidyverse, sf, sp, raster, terra, ggplot2, tmap, patchwork, pcaMethods, factoextra, NbClust, flipMutivariates, vegan, MASS.
- R shiny app development - created a standardised format for data entry of in-field fisheries data by citizen scientists. https://github.com/amysw13/citSciClean
- Basic experience with Python: numpy, pandas, scipy.
- GitHub for version control, course/paper/ data repository.
- Basic HTML & CSS knowledge.

Specialist data handling skills

- 3D photogrammetry for coral reef rugosity modelling using PhotoScan & Rhino.
- Hydrographic data acquisition with EM124 (12khz sonar) and Seafloor Information Systems (SIS) v.5, acoustic and backscatter data, real-time acquisition watchstander. Deployed XBTs and imported to SIS with Sound Speed Manager. Data processing with QPS Qimera and exporting mapping products at from levels 0 - 2, with Fledermaus and ArcGIS/QGIS.

Statistical Skills

Applied ecological statistics, ecological community analyses, diversity indices, general linear regressions, ANOVAs, non-metric multidimensional scaling, unsupervised learning techniques, PCA, k-means and hierarchical clustering, linear discriminant analysis, time-series analysis, ecological niche modelling, Bayesian modelling.

Computing skills

HPC (High Performance Computing), KVM (Keyboard, Video, Mouse) systems.

Extra qualifications/ certifications

- PADI Divemaster (dry-suit and EFR, 550+ dives)
- RYA Powerboat Level 2
- STCW PST Certification
- JNCC MMO Certification
- Full clean UK driving license

Teaching & Student Supervision

- Assisted with student data analysis and R coding issues.
- In-field teaching and underwater teaching (marine expeditions with Operation Wallacea).
- Assisted with an overseas field trip for "Tropical Marine Field Research Skills" module.
- Demonstrating field and lab practicals (population demography, biological and physical processes of estuaries, and biology of reef-building corals).
- Demonstrating online practical modules (marine ecology, GIS, remote sensing data manipulation, Bioinformatics and, Introduction to R).
- Course creation for self-directed learning module - online teaching.
- Designed, developed, and supervised undergraduate and master's research projects for Marine Biology students.
- Guided student project proposals.
- In multiple roles on marine expeditions with Operation Wallacea based in Indonesia, I taught coral reef ecology to school groups and supervised students on summer research projects at both masters and undergraduate levels.
    - Research projects supervised:
        - Functional ecology of coral reefs.
        - Are mutualistic relationships the norm?
        - The feeding behaviour of herbivorous fish and their role in maintaining reefs.
        - Fisheries research in local communities.

Scientific Expeditions & Fieldwork

2023 **Deep Sea Coral Reefs**, Galapagos: 5 weeks.
Galapagos Deep 2023 research cruise – Biology, Data Management and Mapping teams.
https://galapagosdeep2023.com

2019 **Coral reefs**, Seychelles: 2 weeks.
coral reef monitoring, coral nursery building, 3D coral modelling Earthwatch and University of Essex partnership.

2016, 2017 & 2018 **Coral Reefs**, Wakatobi, Indonesia with Operation Wallacea: 8 weeks each year

2013 **Mangrove Forests**, Zanzibar: 8 weeks.
mangrove forest biodiversity, carbon, and tidal sampling in collaboration with the Institute of Marine Science, Zanzibar; University of Dar Es Salaam.

2013 **Mudflats**, Shell Island, North Cardigan Bay, Wales: 2 days Mudflat habitat and biodiversity monitoring

2012 **Coral reefs**, Fiji: 6 weeks.
Research assistant internship, marine conservation project with Frontier.

2009 **National Parks**, Tanzania: 2 weeks
Conservation and Management methods – large mammal surveys, management of national parks in collaboration with Mweka Wildlife College.

2009 **Laurel forests**, Madeira, Portugal: 2 weeks Self-directed laurel forest monitoring project.

2008 **Laurel forests**, Madeira, Portugal: 2 weeks

Publications

Sing Wong, A., Vrontos, S., & Taylor, M. L. (2022). An assessment of people living by coral reefs over space and time. *Global Change Biology*, *00*, 1–15. https://doi.org/10.1111/gcb.16391

Sing Wong, A., Vrontos, S., & Taylor, M. L. Rethinking assessment methods of human dependency on coral reef ecosystems. (in prep).

Conferences & Presentations

2021 University of Essex, Ecology and Environmental Microbiology Group – 24th February
SING WONG, A., VRONTOS, S. & TAYLOR, M. L. Close to 1 billion people live by coral reefs: an assessment over time and space. *Talk*

2020 UN Environment World Conservation Monitoring Centre, Cambridge, UK – 5th March
SING WONG, A., VRONTOS, S. & TAYLOR, M. L. Human Populations and Coral Reefs. *Invited talk*.

2019 Earthwatch Global Coral Reef Conservation Project, Seychelles – 16th April
SING WONG, A., SMITH, D., VRONTOS, S. & TAYLOR, M. Risk to human health and welfare due to coral reef decline caused by climate change impacts. *Invited talk*.

University of Essex, School of Life Sciences Graduate Forum – 25th September
SING WONG, A., VRONTOS, S. & TAYLOR, M. L. (2019). Human Dependence on Coral Reef Ecosystems. *Poster Presentation.*

2018 British Ecological Society Annual Meeting, ICC Birmingham – 16th - 19th December
SING WONG, A., CAMERON, T.C. & SMITH, D. J. (2018). Functional role and partitioning of herbivorous fish communities in driving benthic structure in coral reef systems. *Lightning talk and poster presentation*

20th Reef Conservation UK Conference - ZSL, London – 1st December
SING WONG, A., CAMERON, T.C. & SMITH, D. J. (2018). Functional role of herbivorous fish communities in driving benthic structure in coral reef systems. *Poster presentation.*

BES Special Interest Group Conference – London 7th November
(UK Marine Climate Change Impacts Partnership (MCCIP) and the Climate Change Ecology SIG - joint conference) - Marine and coastal climate change: science for policy through effective engagement.

2017 European Coral Reef Symposium 2017, Oxford University - 12th - 15th December - *Volunteer.*

2014 17th Reef Conservation UK Conference - ZSL, London - 6th December
MORTIMER, C., **SING WONG, A.**, KENNEDY, H. & SKOV, M. W. (2014). Quantifying carbon storage in mangrove sediments in Zanzibar, East Africa. *Contributed to poster presentation.*

Relevant Courses & Workshops

2022
WORKSHOP: **Establishing a Rights of Nature Approach for Deep-Sea Mining**, University of Essex, 12th & 13th September (Notetaker).

2021
WORKSHOP**: Nature-based solutions for climate change in the UK**, British Ecological Society, 12th May.
COURSE: **R Forwards Package development module: Packages in a nutshell, Setting up your system and your first package!** R Forwards, 15th - 17th February.

2020

COURSE: **An introduction to Bayesian approaches in Macroecology**, British Ecological Society Macroecology Special Interest Group, 12th March.

COURSE: **Policy School**, HM Government's Open Innovation Team, 23rd & 27th November, and 4th December.

2019

COURSE: **Bayesian Analysis: An Introduction**, University College London, 29th October.

WORKSHOP: **The Quantitative Ecology Hackathon**, British Ecological Society Quantitative Ecology Special Interest Group, 8th October, https://github.com/amysw13/citSciClean

COURSE: **Introduction to spatial analysis of ecological data using R**, PR Statistics, Glasgow, 29th July - 2nd August.

COURSE: **SENSS: Introduction to GIS and ArcGIS**, University of Essex, 23rd July.

WORKSHOP: **Marine Social Science Research and Practice Workshop**, Marine Social Science Network, 5th February.

2018

WORKSHOP: **Climate Change Adaptation in the Natural Environment: Measuring Progress**, British Ecological Society Climate Change Ecology Special Interest Group, 30th - 31st October.

COURSE: **Ecological Niche Modelling in R**, PR Statistics, Glasgow, 12th - 16th March.

2015

WORKSHOP: **Coral Bleaching Protocols and Crown of thorns starfish**, The Marine Research Centre, Maldives (MRC) in collaboration with the International Union for Conservation (IUCN), 5th December.

COURSE: **Edx MOOC - Climate Change and the Pacific Islands**, The University of South Pacific supported by UNESCO, 28th August - 16th October.

Funding & Awards

2021 BES Training and Travel Grant: £500 (Note: research cruise cancelled)

2018 University of Essex Faculty Research Studentship

2013 Thomas Dunkley Memorial award: £500

Professional Memberships

- International Coral Reef Society
- British Ecological Society