### Bruno Welter Giraldes, PhD.

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##### Research Assistant Professor

# PERSONAL PROFILE

A dynamic Lecturer and Researcher with over 10 years of experience post PhD, leading local, national and international research, education and outreach activities, as well as advising undergraduate and postgraduate levels. Published over a dozen peer-reviewed scientific articles, co/authored books, in addition to several patents and technical protocols. Proven expertise in attracting government grants and private funding for a range of research projects. Managed directly or indirectly to secure and further administer nearly $10 million dollars in funds during my career span for high quality scientific research of local, regional, and global relevance. Proven success leveraging truly international experiences to navigate complex cross-cultural environments and build highly collaborative teams. With outcomes and deliverables constantly presented at international scientific events and in lectures for the scientific community and industry.

Areas of expertise include, but are not limited to:

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| * Ecosystem Restoration * Environmental Management * R&D * Applied science * TRL Improvement * Technology Development * Biomimicry * Scientific Communication * Environmental Policy | * Taxonomy & Systematic * Ecology * Oceanography * Marine Biology * Ocean Instrumentation * Population & Community Dynamics * Coral reefs, Mangroves * Quantitative Research | * Animal Behavior * Underwater Monitoring * Benthic Invertebrates * Biogeography/ * Project Management * Fisheries * Ecosystem Processes * Scientific Diving * Underwater video and photo |

# Education

**2012, Ph.D. in Biological Oceanography**

Oceanographic Museum, Universidade Federal de Pernambuco – UFPE

**Thesis Title:** *Subtidal decapods at coastal reefs, northeastern Brazil - an approach using nocturnal Underwater Visual Census* supervised by Prof. Petronio Alves Coelho.

**2007, M.Sc. in Biological Oceanography**

Oceanographic Museum, Universidade Federal de Pernambuco – UFPE

**Thesis Title:** *Subtidal crustaceans decapod assemblage from reefs of Porto de Galinhas’ beach* supervised by Prof. Petrônio Alves Coelho.

**2003, B.A. and Teaching in Biological Sciences**

Entomology Laboratory, Universidade Estadual de Londrina - UEL

**Thesis Title:** *Biology and susceptibility of Ascia monuste orseis to NIM at different concentrations in laboratory conditions*.

# PROFESSIONAL APPOINTMENTS

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| **2017 - Present** | **Qatar University (QU) - Environmental Science Center -** Doha, Qatar  **Research Assistant Professor**  After three years with outstanding evaluations in my previous role, I was invited to update my academic position as Research Assistant Professor. Leading several high-profile projects within the Environmental Science Department and building important local and international partnerships with other researchers and professors across the globe. Although most projects were grounded in oceanography, marine biology, ecology, and taxonomy of benthic invertebrates, I started driving initiatives to monetize projects by exploring new fields in marine drugs, phylogeography, marine ecosystem’s restorations, subsea constructions and advisory on environmental policies.   * I had managed 5 projects as Lead Principal Investigator (LPI), 1 as Co-Lead-PI, and collaborated on another seven by leading specific work packages as a Principal Investigator (PI). * Authored 12 peer-reviewed scientific articles with another 5 currently being reviewed for publication. * Described 2 new sponge species, one of them with an antibiotic potential. * Built important local and international collaboration partnerships with professors and researchers across highly reputable institutions. * Supported the governmental policy in the usage of artificial reef in Qatar. * Conducted very successful collaborative research on restoration of coral reefs and oyster beds, which led to 2 patents and several articles published and in preparation. * Attracted 3 private companies to signed contracts with external grants for the trading of new technologies, generating ongoing royalties for the university and funding my research. | |
| **2014 – 2017** | **Qatar University (QU) - Environmental Science Center -** Doha, Qatar  **Post-Doctor Research Fellow (Marine Biology)**  Resulting from a very strict and thorough selection process, QU offered me an opportunity as a Fellow Researcher, where I provided direct expertise in support of major research projects related to marine biology, biogeography, ecology, and taxonomy. I also delved into the impact of fishing activity over the historical oyster beds in the offshore zone of the country; and the ecological study of the hyperarid mangrove ecosystem of Qatar. Participated in several other projects covering the taxonomy and ecological patterns of benthic invertebrates.   * Co-authored 10 peer-reviewed scientific article publications, being first author for most. * Directly supported three high profile projects related to fishing impact and mangroves ecosystem off the coast and offshore of Qatar. * Discovered through high-quality research a new species of crab, which led to a patent of an environmentally friend fishery apparatus. * Established the very first nationwide Marine Collection for the State of Qatar. * Supervised and mentored theses for undergraduate students and contributed to instructional and outreach activities. | |
| **2012 – 2014** | | **Universidade Federal de Santa Catarina (UFSC) -** Santa Catarina, Brazil  **Post-Doctor Associate Researcher**  Upon completing my PhD studies, I was immediately asked to lead a work package under a multidisciplinary project for underwater monitoring and classification of decapods (maare.ufsc.br). Additionally, provided research expertise as a SME to an ongoing study on Demersal Plankton.   * Led a multidisciplinary sub-project responsible for biogeography, taxonomy and ecology of decapods. * Authored two peer-reviewed scientific articles as a first author and published two technical protocols. * Co-authored entire chapters for three books. * Steered end-to-end preparation of an application for a patent on bongo-net frame fixed in DPV (Dive Propulsion Vehicles) for demersal plankton survey. * Conducted scientific research that led to the discovery of a new species of shrimp. |

# PUBLICATIONS

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| **Books**  **Scientific Articles** | **Giraldes, B.W**. & Freire, A.S. (2017). Crustáceos *(Crustacean).* – *A Biodiversidade marinha das ilhas da Rebio Arvoredo e entorno*. *In.* Segal,B *et al* MAArE : Monitoramento ambiental da Reserva Biológica Marinha do Arvoredo e entorno.222-229p. ISBN: 978-85-64093-48-5. <https://www.researchgate.net/publication/327689542_Crustaceos_in_Capitulo_5_-_A_biodiversidade_Marinha_das_Ilhas_da_Rebio_Arvoredo_e_Entorno_222-227>  **Giraldes, B.W**. & Freire, A.S. (2016). Crustáceos *(Crustacean).* (52-61pp). *In.* Lindner, A. *Vida marinha de Santa Catarina (Vol.2).* *(Marine Life at Santa Catarina).* Editora UFSC. ISBN: 978-85.328.0600-0. <https://livraria.ufsc.br/produto/804/vida-marinha-de-santa-catarina->  **Giraldes, B.W**. (2014) Sessão Invertebrados *(Invertebrate Section)* (36pp). In Pereira, H.C.P, Feitosa J.L.L & Chaves, L.C.T. *Guia de Biodiversidade Marinha da APA costa dos Corais.* *(Marine Biodiversity guide from MPA “Coral coast”.* Technical books 204pp. ISBN: 978-85-61368-44-9. <https://www.amazon.com/Guia-Biodiversidade-Marinha-Costa-Corais/dp/8561368446>  **Giraldes, B.W**. & Freire, A.S. (2014). Crustáceos *(Crustacean).* (52-61pp). *In.* Lindner, A. *Vida marinha de Santa Catarina.* *(Marine Life at Santa Catarina).* (Vol.1). Editora UFSC, 128p. ISBN: 978-85.328.0600-0. <https://livraria.ufsc.br/produto/804/vida-marinha-de-santa-catarina->  **Giraldes, B.W.** Wuppukondur, A. Al-Mohannadi, H.S. .....& Tom Baldock, (2023) Enhancing subsea asset performance: Investigating the biomimetic functionality of the Mushroom Reef design in hydrodynamics, stability, and sedimentation. *Ocean Engineering*, 287 (2) 115850.  **Giraldes, B.W**., Smyth, D., Chatting, M., Al-Ashwel, A.A., Al-Omary, N.H., Mello, L., Engman, A. and Leitão, A., 2023. Increasing knowledge to restore oyster beds and related services in the Arabian-Persian Gulf. *Regional Studies in Marine Science*, p.103172.  Mello, E., Smyth, D., Chatting, M., Alatalo, J. M., & **Giraldes, B**.**W** (2023). The Blue Management: Adding Economic Value to Restoration Actions in Collapsed Ecosystems. *Sustainability*, *15*(8), 6758. <https://doi.org/10.3390/su15086758>  Yahia, M. N. D., Range, P., **Giraldes, B. W**., & Morandini, A. C. (2023). First jellyfish records for Qatar and further notes on Scyphomedusae species from the Arabian Gulf (Cnidaria, Scyphozoa). *Journal of the Marine Biological Association of the United Kingdom*, *103*, e17. <https://doi.org/10.1017/S002531542300005X>  Fawzi, N. A. M., Fieseler, C. M., Helmuth, B., Leitão, A., Al-Ainsi, M., Al Mukaimi, M., **Giraldes, B. W** ... & Pyenson, N. D. (2022). Diplomacy for the world's hottest sea. *Science* (New York, NY), 376(6600), 1389-1390. <http://dx.doi.org/10.1126/science.add1555>  **Giraldes, B. W.,** Al-Thani, J. A. K., Dib, S., Engmann, A., Alsaadi, H. A., Vethamony, P., ... & Yigiterhan, O. (2022). Target gastropods for standardizing the monitoring of tar mat contamination in the Arabian Gulf. *Regional Studies in Marine Science*, 102328.<https://doi.org/10.1016/j.rsma.2022.102328>  **Giraldes B. W,.**  Coelho, P.A., Coelho Filho, P.A., Macedo, T., & Freire, A.S. (2021) The ghost of the past anthropogenic impact: Reef-decapods as bioindicators of threatened marine ecosystems. *Ecological Indicators,* 133:108465. <https://www.sciencedirect.com/science/article/pii/S1470160X21011304>  Boughattas, S., Albatesh, D., Al‐Khater, A., **Giraldes, B. W**., Althani, A. A., & Benslimane, F. M. (2021). Whole genome sequencing of marine organisms by Oxford Nanopore Technologies: Assessment and optimization of HMW‐DNA extraction protocols. *Ecology and Evolution* 00:1-9. <https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.8447>  Liu, L., Aljathelah, N. M., Hassan, H., **Giraldes, B. W.,** Leitão, A., & Bayen, S. (2021). Targeted and suspect screening of contaminants in coastal water and sediment samples in Qatar. *Science of The Total Environment*, 145043. <https://www.sciencedirect.com/science/article/pii/S0048969721001091>  Al-Khayat, J.A. & **Giraldes B.W.** (2020). Burrowing crabs in arid mangrove forests on the southwestern Arabian Gulf: Ecological and biogeographical considerations. *Regional Studies in Marine Science*, (39) 101416. <https://www.sciencedirect.com/science/article/pii/S2352485520305442>  **Giraldes B.W,** Goodwin C, Al-Fardi N.AA, Engmann A, Leitão A, Ahmed AA, et al. (2020). Two new sponge species (Demospongiae: Chalinidae and Suberitidae) isolated from hyperarid mangroves of Qatar with notes on their potential antibacterial bioactivity. *PLoS ONE* 15(5): e0232205. [https://doi.org/10.1371/journal. pone.0232205](https://doi.org/10.1371/journal.%20pone.0232205)  Bean, T.P., Khatir, Z., Lyons, B.P., van Aerle, R., Minardi, D., Bignell, J.P., Smyth, D., **Giraldes, B.W**. & Leitão, A., (2020). De novo transcriptome assembly of the Qatari pearl oyster *Pinctada imbricata radiata*. *Marine Genomics*, p.100734. <https://www.sciencedirect.com/science/article/pii/S1874778719301850>  **Giraldes, B.W.**, Leitão, A. & Smyth D. (2019) The benthic sea-silk-thread displacement of a sessile bivalve – the curious behavior of the pearl oyster *Pinctada imbricata radiata* (Leach, 1814) in the Arabian-Persian Gulf. *PLoS ONE* 14 (5): e0215865. [https://doi.org/10.1371/journal. pone.0215865](https://doi.org/10.1371/journal.%20pone.0215865)  **Giraldes, B. W.** (2019). The first record of the Indo-Pacific benthic ctenophore *Coeloplana (Benthoplana) meteoris* (Ctenophora: Coeloplanidae) in the Arabian-Persian Gulf. *Journal of Asia-Pacific Biodiversity*, <https://doi.org/10.1016/j.japb.2019.03.012>  **Giraldes, B.W.,** Chatting, M. & Smyth D. (2019). The fishing behavior by *Metopograpsus messor* (Decapoda: Grapsidae) and the use of pneumatophore-borne vibrations for prey-localizing in an arid mangrove setting. *Journal of the Marine Biological Association of the United Kingdom*, 1-9. <https://doi.org/10.1017/S0025315419000146>  **Giraldes, B.W.,** Macedo, T., Brandão, M.C., Baeza, J.A. & Freire, A.S. (2018). *Lysmata arvoredensis* **nov. sp**. a new species of shrimp from the south coast of Brazil with a key to species of *Lysmata* (Caridea: Lysmatidae) recorded in the southwestern Atlantic. *PEERJ* 6:e5561. <https://peerj.com/articles/5561/>  Al-Maslamani, I., Smyth, D., **Giraldes, B.**, Chatting M., Al-Mohannadi M. & Le Vay L. (2018). Decline in oyster populations in traditional fishing grounds; is habitat damage by static fishing gear a contributory factor in ecosystem degradation? *Journal of Sea Research* 140: 40–51. <https://www.sciencedirect.com/science/article/pii/S1385110118300790>  **Giraldes, B.W**., Coelho Filho, P.A., Smyth, D.M. & Coelho, P.A. (2017). The nocturnal zonation of decapods in the subtidal zone within the reef seascape—abiotic factors defining habitats. *ICES Journal of Marine Science*. 74, (8) : 2180–2190. <https://academic.oup.com/icesjms/article/74/8/2180/3749599?login=true>  **Giraldes, B.W**., Al-Maslamani & Smyth, D. (2017). A new species of leucosiid crab (Decapoda: Brachyura: Leucosiidae) from the Arabian Gulf. *Zootaxa*, 250(4): 389–395. <http://dx.doi.org/10.11646/zootaxa.4250.4.9>  Smyth, D.M., Al-Maslamani, I., Chatting,M & **Giraldes, B.W.** (2016). Benthic surveys of the historic pearl oyster beds of Qatar reveal a dramatic ecological change. *Marine Pollution Bulletin*, <http://dx.doi.org/10.1016/j.marpolbul.2016.08.085>  **Giraldes, B. W**., Chatting, M&Smyth, D. (2016). Modern problems in marine biodiversity records – illustrated by the case of the Caribbean *Pelia mutica* (Gibbes, 1850) confirmed in Brazil. *Marine Biodiversity records*, 9(1)1. <https://mbr.biomedcentral.com/articles/10.1186/s41200-016-0044-3>  **Giraldes, B.W.** & Smyth, D.M. (2016). Recognizing *Panulirus meripurpuratus* **sp. nov**. (Decapoda: Palinuridae) in Brazil – Systematic and biogeographic overview of *Panulirus* species in the Atlantic Ocean. *Zootaxa* 4107 (3): 353-366. <https://www.mapress.com/zt/article/view/zootaxa.4107.3.4/5670>  **Giraldes, B.W.,** Al-Maslamani, I., Chatting, M. and Smyth, D. (2016) Basic assessment of *Portunus segnis* (Forskål, 1775) - The baseline for stock management of important decapod resource in Western Arabian Gulf. *Egyptian Journal of Aquatic Research* 42: 111-119. <https://www.sciencedirect.com/science/article/pii/S1687428516000121>  Smyth, D.M., Al-Maslamani, I., **Giraldes, B.W**., Chatting, M., Al-Ansari, E., Le Vay, L. (2016) Anthropogenic related variations in the epibiotic biodiversity and age structure of the "Pearl Oyster" *Pinctada radiata* within the eulittoral zone of Qatar. *Regional Studies in Marine Sciences*, 5: 87-96. <https://www.sciencedirect.com/science/article/pii/S2352485516300184>  **Giraldes, B.W**., Silva, A. Z., Corrêa, F. M., & Smyth, D.M. (2015). Artisanal fishing of spiny lobsters with gillnets—A significant anthropic impact on tropical reef ecosystem. *Global Ecology and Conservation,* 4, 572-580. <https://www.sciencedirect.com/science/article/pii/S2351989415001031>  **Giraldes, B.W**. & Freire, A.S. (2015). Extending the southern range of four shrimps (Crustacea: Decapoda: Stenopodidae, Hippolytidae and Alpheidae) in southwestern Atlantic (27o S) and confirming the presence of Mediterranean *Stenopus spinosus* Risso, 1827 in Brazil. *Zootaxa*, 3972(3), 419. <https://www.mapress.com/zootaxa/2015/f/z03972p431f.pdf>  **Giraldes, B.W**., Coelho Filho, P.A. & Smyth, D.M. (2015). Decapod assemblages in subtidal and intertidal zones - Importance of scuba diving as a survey technique in tropical reefs, Brazil. *Global Ecology and Conservation,* 3, 163-175. <https://www.sciencedirect.com/science/article/pii/S235198941400081X>  **Giraldes B.W**., Coelho-Filho, P.A. & Coelho, P.A. (2012). Composition and spatial distribution of subtidal Decapoda on the “Reef Coast”, northeastern Brazil, evaluated through a low-impact visual census technique. *Nauplius*, 20(1): 187-201. <https://www.scielo.br/j/nau/a/btgTBSN5RSngVRQfR7ddxWg/abstract/?lang=en>  **Giraldes B.W**., Coelho-Filho, P.A., Coelho, P.A. & Anker, A. (2012). Confirmation of the presence of *Janicea antiguensis* (Chace, 1972) (Decapoda: Barbouriidae) in northeastern and eastern Brazil. *Nauplius*, 20(2): 171-178. <https://www.scielo.br/j/nau/a/mbRZ5wjwtJNXPY5bYHhKRHP/abstract/?lang=en>  Coelho, P.A., Almeida, A.O., Souza-filho, J.F., Bezerra, L.E.A. & **Giraldes, B.W**. (2006). Diversity and distribution of the marine and estuarine shrimps (Dendrobranchiata, Stenopodidea and Caridea) from North and Northeast Brazil. *Zootaxa* (Online), 1221: 41 - 62. <https://www.mapress.com/zt/article/view/zootaxa.1221.1.5> |
| **Awarded Patents**  **Technical Protocols** | **Giraldes B.W.** (2022) Raft Sampling Bench. Publication No. US 2021/0387701 A1. <https://patents.google.com/patent/US20210387701A1/en>  **Giraldes, B.W.** (2020) The Mushroom Forest Artificial Reef – A new designed artificial reef for ecosystem restoration and fishing resource augmentation. No. US 2020/0236911 A1. <https://patents.google.com/patent/US20200236911A1/en?oq=US+2020%2f0236911+A1>  Al-Maslamani, I, Smyth, D., Mehmet, D. & **Giraldes, B.W,** Chatting, M. (2020). *Marine Clutch Apparatus - A new material more environmentally friendly to retrieve fishing traps (gargour)*. No US10973213B2. <https://patents.google.com/patent/US10973213B2/en?q=Marine+Clutch+Apparatus&oq=Marine+Clutch+Apparatus>  **Giraldes, B.W**. & Freire, A.S. (2014) *Protocolo de Monitoramento de Crustáceos (Crustacean Monitoring Protocol)*. *In* Monitoramento Ambiental da Reserva Biológica Marinha do Arvoredo e Entorno, Projeto MAARE – UFSC *(Environmental Monitoring Program at Arvoredo’s Marine No-Take Zone and surroundings, Project MAARE, – UFSC).*  **Giraldes, B.W.,** Gorri, C & Freire, A.S. (2014) *Protocolo de Monitoramento de Plâncton Demersal (Demersal Plankton monitoring Protocol)*. *In* Monitoramento Ambiental da Reserva Biológica Marinha do Arvoredo e Entorno, Projeto MAARE – UFSC *(Environmental Monitoring Program at Arvoredo’s Marine No-Take Zone and surroundings, Project MAARE, – UFSC).* |
| **New species** | *Suberites luna* **Giraldes** & Goodwin, 2020 **–** A new sponge species described in the mangroves of Qatar. Active taxonomic status.  *Chalinula qatari***Giraldes** & Goodwin, 2020 **–** A new sponge species described in the mangroves of Qatar. Active taxonomic status.  *Lysmata* *arvoredensis***Giraldes,**Macedo, Brandão, Baeza & Freire, 2018**–** A new shrimp species described in the Arvoredo marine Park in South of Brazil. Active taxonomic status. Junior synonym.  *Coleusia janani***Giraldes,** Al-Maslamni & Smyth, 2017**–** A new crab described associated to offshore oyster beds in Qatar. Active taxonomic status.  *Panulirus meripurpuratus***Giraldes** & Smyth, 2016 **–** A new lobster described in Brazil. We demonstrated that the most important lobster resource in Brazil is indeed an isolated species from *P.argus* from Caribbean and North America. Active taxonomic status. |

# Research Projects

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| ***Under Negotiations*** | |
| **2023 – On-going** | Blue Carbone commercialization on mangroves in Southeast Brazil  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** Blue Reef Brazil ~ USD 500,000.  **Partnerships:** Tourism Authority (MTur) Brazil. Ecosystem Restoration Proof. |
| **2023 – On-going** | Coral reef Farm - Coral Reef restoration projects in Brazil  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~USD 1,900,0000 / under commercialization. <https://investimento.turismo.gov.br/portuguese/fazenda-de-corais/>  **Partnerships:** Tourism Authority (MTur) Brazil. Environmental Science Centre, Qatar University.  **Funding Company:** Blue Reef Brazil. |
| **2023 – On-going** | Marine Gardening – Restoration of marine biodiversity in coastal resources in Brazil  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~USD 1,900,0000 / under commercialization. <https://investimento.turismo.gov.br/portuguese/parque-subaquatico/>  **Partnerships:** Tourism Authority (MTur) Brazil. Environmental Science Centre, Qatar University.  **Funding Company:** Blue Reef Brazil. |
| **2023 – On-going** | Tourism in Reservoirs - Restoring freshwater biodiversity in hydroelectric reservoirs in Brazil  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~USD 1,900,0000 / under commercialization. <https://investimento.turismo.gov.br/portuguese/turismos-em-represas/>  **Partnerships:** Tourism Authority (MTur) Brazil. Environmental Science Centre, Qatar University.  **Funding Company:** Blue Reef Brazil. |
| ***AWARDed GRANTS*** | |
| **2023 – 2026** | Subsea Assets for controlling coastal erosion – biomimetic concepts for Wave force dissipation.  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** Blue Reef Brazil ~ USD 200,000  **Partnerships:** Environmental Science Centre, Qatar University  **Awarded Institution:** Coastal Engineering Laboratory, The University of Queensland, Australia. |
| **2021 – 2024** | Increasing the TRL of the Mushroom Forest Artificial Reef (MFAR)  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~ USD 80,000 Qatar University High-Potential Projects Program (H3P) QPH3P-ESC-2021-456.  **Partnerships:** Smeet Precast  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article; 1 Patent disclosure. |
| **2021 – 2023** | Circulation, flushing and associated biogeochemical changes in Doha Bay under varying climate conditions  **My Position:** Principal Investigator (PI).  **Funding:** ~ USD 70,000 Qatar University Colaborative Grants QUCG-ESC-22/23-591.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar. |
| **2021– 2023**  **2020 – 2025**  **2020 – 2021**  **2018 – 2022** | Closing the cycle for coral restoration in Qatar: innovative technologies for ex-situ sexual propagation of corals  **My Position:** Principal Investigator (PI).  **Lead-PI:** Dr. Pedro Range.  **Funding:** ~ USD 600,000 – Qatar Foundation - NPRP12S-0311-190304.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  Coral Transplantation and coral nursery farm – Developing coral reef restoration facilities in Qatar.  **My Position:** Co-Lead Principal Investigator (**Co-Lead-PI).**  **Funding:** ~ USD 1,000,000 - Qatargas.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 4 articles in submission; 1 master student.  Identifying Qatar’s marine fauna speciation using nanopore sequencing.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Dr. Fatiha Benslimane.  **Funding:** ~USD 10,000 – Qatar Foundation - UREP26-102-1-011.  **Awarded Institution:** Biomedical Research Center, Qatar University, Qatar.  **Outcome:** 3 articles.  The Biomimicry of the “Mushroom Forest Artificial Reef” – Experimental strategies for coral reef restoration and fish stock augmentation in Qatar.  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~USD 300,000 - Smeet Precast (building company); SIKA (cement and supplements brand); Qatar Petroleum (QP) Funding Program.  **Partnerships:** Coastal Engineering Laboratory, The University of Queensland, Australia.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 Patent**,** 2 licensing Contract. |
| **2019 – 2022** | Innovative In situ Biotechnology for Continuous Water Quality Monitoring on the Qatari Marine Environment.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Dr. Alexandra Leitão-Ben Hamadou  **Funding:** ~USD 1,000,000 - Qatar Foundation – NPRP11S-0115-180308.  **Co-Funding:** TOTAL Petroleum.  **Partnerships**: CNRS and ADERA, France**.**  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article; logistic support in the Valvometry validation. |
| **2019 – 2021** | Tar mats of Qatar Coast: Resilience to Weathering Processes and Quantification of Environmental Hazards.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Prof.Ponnumony Vethamony  **Funding:** ~USD 1,000,000 - Qatar Petroleum (QP) Funding Program QUEX-ESC-QP-TM-18/19.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article. |
| **2019 – 2022** | Qatari National Genetic Habitat and Environmental Biomonitoring  **My Position:** Principal Investigator (PI).  **Lead-PI:** Prof. Asma Al-Thani  **Funding:** ~USD 1,500,000 - Qatar Petroleum (QP) Funding Program.  **Awarded Institution:** Biomedical Research Centre, Qatar University, Qatar.  **Outcome:** 3 articles. |
| **2018 – 2021** | Does a seasonal biogeographic barrier dividing the Arabian Gulf exist? A study based in the Taxonomy, Phylogeny and Phylogeography of decapod’s biodiversity in Qatar.  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~USD 30,000 - ESC-QU Funds.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 2 articles, Biodiversity list and deposited material in Marine collection |
| **2018 – 2020** | Integrated monitoring of chemicals and their biological effects on four sentinel species *Pinctada imbricata radiata*, *Brachidontes variabilis*, *Pirinella conica* and *Petrolisthes tuerkayi* within Qatari coastal waters: A step forward in marine environmental monitoring in Qatar.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Dr. Alexandra Leitão-Ben Hamadou  **Funding:** ~USD 20,000 - ESC-QU Funds.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 Report, Biodiversity list and deposited material in Marine collection. |
| **2018 – 2019** | The potential antibacterial effect of the Marine Sponges of the Qatar Marine Zone.  **My Position:** Lead Principal Investigator (**Lead-PI**).  **Funding:** ~ USD20,000 - Qatar Foundation - UREP21-141-3-032.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article, 1 Report, Biodiversity list and deposited material in Marine collection. |
| **2018 – 2020** | A study of Qatar Island.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Prof. Ekhlas M.M. Abdel Bari  **Funding:** ~USD 170,000 - ESC-QU Funds. “nd”.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article, 1 report, georeferenced map, Biodiversity collected and deposited in Marine collection |
| **2016 – 2020** | The pearl oysters: From national icon to guardian of Qatar marine environment.  **My Position:** Principal Investigator (PI).  **Lead-PI:** Dr. Alexandra Leitão-Ben Hamadou  **Funding:** ~USD 800,000 - Qatar Foundation – NPRP 9-141-3-032.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 4 articles, 1 patent. |
| **2015 – 2018** | Ecological processes underlying ecosystem function in arid mangroves.  **My Position:** Associate Researcher.  **Lead-PI:** Dr. Ibrahim Al-Maslamani  **Funding:** ~USD 900,000 - Qatar Foundation - NPRP 7 - 1302 - 1 - 242.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article. |
| **2014 – 2017** | The impact of static fishing gear over the offshore oyster beds in Qatar.  **My Position:** Associate Researcher.  **Lead-PI:** Dr. Lewis Le Vay  **Funding:** ~USD 900,000 - Qatar Foundation - NPRP 6 - 1680 - 4 - 027.  **Awarded Institution:** Environmental Science Centre, Qatar University, Qatar.  **Outcome:** 1 article. |
| **2012 – 2014** | MAArE - Monitoramento Ambiental da Reserva Biológica Marinha do Arvoredo e Entorno – (<http://www.maare.ufsc.br/o-projeto/>).  **My Position:** Post-Doctor Associate Researcher.  **Lead-PI:** Dr. Andrea Santarosa Freire  **Funding:** ~USD350,000 – Petrobras, National Oil Company in Brazil.  **Awarded Institution:** Laboratório de crustáceos e Plânctons, Universidade Federal de Santa Catarina (UFSC) Brazil.  **Outcome:** 2 Field Protocol; 1 Patent; 2 book chapters; and 3 articles. |
| **2005 – 2012** | Decapods from Coastal Reefs at Pernambuco, Brazil.  **My Position:** MSc and PhD Student (Graduation Projects).  **Advisor:** Prof.Petrônio Alves Coelho  **Funding:** ~USD30,000 - Capes and Facepe.  **Co-Funding:** Mormaii, Zoea Diving Centre and Ecotourism; Acqua Viva (In Kind contribution)  **Awarded Institution:** Laboratório de Carcinologia, Museu Oceanográfico, Universidade Federal de Pernambuco (UFPE) Brazil.  **Outcomes:** MSc and PhD Thesis; 8 articles. |

# INNOVATIONS

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| **2023** | The reef mattress for controlling coastal erosion  **Description:** I collaborated with a production engineer to design this innovative concept, which serves as a substitute for traditional breakwaters in subsea construction. The main objective was to prevent coastal erosion while preserving the aesthetic appeal of coastal areas, thereby maintaining property values. The reef mattress is specifically designed to dissipate wave energy, reducing wave pressure on beaches and retaining sediment in coastal regions.  **Readiness Level:** Currently at TRL 3, experiments are being conducted at the Coastal Engineering Laboratory at the University of Queensland using prototypes in a wave pool. The aim is to reach TRL 6 by 2024 and conduct practical experiments with full-scale prototypes on an eroded beach in Brazil by 2025, with the goal of achieving TRL 9 by 2026.  **Commercialization:** R&D for this innovation was funded by Blue Reef Brazil, and the technology and intellectual property have been assigned to the funding company. |
| **2023** | The Deployment Frame  **Description:** In collaboration with subsea engineering experts, I developed the Deployment Frame to significantly reduce the costs associated with subsea construction for artificial reefs. This technology enables the simultaneous deployment of multiple artificial reefs, increasing habitat heterogeneity and reducing deployment expenses, which are typically the most costly aspect of restoring marine ecosystems using artificial reefs.  **Readiness Level:** Currently at TRL 5, the technology incorporates adaptations from existing subsea construction methods. Practical experiments are underway using full-scale prototypes at the Environmental Science Center at Qatar University, aiming to reach TRL 9 by 2024 with the commercial prototype used in the practical experiments.  **Commercialization:** The Deployment Frame will be utilized in subsea construction services for my patented artificial reefs and further subsea assets, primarily in ecosystem restoration efforts undertaken by the partner startups and companies (Seascaping and Blue Reef). |
| **2022** | The Raft Sampling bench  **Description:** I created the Raft Sampling Bench, a lightweight and powerful buoyant raft specifically designed for use in shallow waters in the Arabian Gulf. With its exceptional stability and ability to support up to 400 kg in just 20cm of water, it serves as an ideal platform for divers, tourists, and scientists to access and handle materials from the water. This technology offers convenience and ease of use for scientific and tourism purposes.  **Readiness Level:** Currently at TRL 7, the prototype has been validated through practical experiments. Further improvements are being developed, aiming to create a final marketable product by 2024 that includes propulsion options and an optimized production line for commercialization.  **Commercialization:** Leveraging the potential for ecotourism in mangroves, coastal areas, and lakes, the final product will be tailored for touristic usage. |
| **2022** | The Mushroom Forest Artificial Reef  **Description:** I developed the Mushroom Forest Artificial Reef as a biomimetic technology for subsea constructions. This innovative reef design emulates the hydrodynamics of corals. It has been validated for stability and resistance against water currents while serving as an effective substrate for coral farming and attracting marine biodiversity in offshore sites. Additionally, it is validated to prevent sedimentation over outplanted corals and avoid being buried by sediment carried by water currents, a major problem for most artificial reefs that get buried when placed in soft sediments in offshore sites.  **Readiness Level:** Currently at TRL 9, the technology has undergone complete validation and has a defined production line in the precast industry.  **Commercialization:** he Mushroom Forest Artificial Reef is licensed for commercialization by startups and partner companies and will be used in marine ecosystem restoration projects. Commercialization projects are currently in development. |
| **2022** | Coral gardening in the Arabian Gulf  **Description:** In collaboration with my research team at the university, I have optimized the coral gardening technology specifically for resilient coral species from the Arabian Gulf. This includes improvements in fragmentation techniques, husbandry practices, and outplanting methods. Fragmentation enhancements involve determining ideal fragment sizes per species and refining cutting methods. Husbandry advancements focus on feeding, lighting (intensity and color), and promoting accelerated growth of fragments in aquarium settings. Outplanting improvements encompass fixation methods and site selection in marine habitats.  **Readiness Level:** Currently at TRL 9, this coral gardening technology has successfully outplanted over 8,000 fragments, exhibiting higher growth rates compared to previous reports, both in controlled husbandry environments and in field settings.  **Commercialization:** The commercialization strategy involves implementing these technologies in marine ecosystem restoration projects through partner companies and startups (Blue Reef and Seascaping). |
| **2022** | The valvometry devices in the pearl oysters *Pinctada radiata*  **Description:** I provided support in validating the Valvometry technology, which is a non-invasive, high-frequency monitoring systems of the opening and closing behaviour of. This real-time monitoring system, connected to remote communication, enables early detection of pollutants and stress. Oysters, as filtering feeders, can identify these issues before traditional electronic sensors. The technology is designed for applications such as oil platforms to detect even minor leaks before conventional sensors, and it has also been validated for monitoring sound pollution.  **Readiness Level:** Currently at TRL 9, the technology is ready for commercialization.  **Commercialization:** The commercialization is performed by a private French company, and the technology has been validated by Total Petroleum. |
| **2019** | Marine Clutch Apparatus  **Description:** In collaboration with colleagues from the research center I am assigned to, and in response to a government request, we developed the Marine Clutch Apparatus. This technology addresses the issue of destructive retrieval methods, such as anchors, used for retrieving fishing traps in the Arabian Gulf. The Marine Clutch Apparatus enables the underwater retrieval of fishing devices with minimal environmental impact.  **Readiness Level:** Currently at TRL 9, the final product has been validated for retrieving ropes and the fishing traps.  **Commercialization:** Negotiations are underway with the government of Qatar to implement this technology and reduce the environmental impact of fishing activities in the marine zones of the country. |
| **2016** | Rapid Assessment Survey (RAS) for identifying the anthropogenic impact in coastal ecosystem  **Description:** I have proposed a method utilizing decapods as bioindicators to assess anthropogenic impact on coastal ecosystems. This method aims to identify the "Ghost of the Past" anthropogenic impact by examining decapod populations in relation to prey-predator ecological patterns and trophic cascades.  **Readiness Level:** The method has been validated and is ready for implementation in environmental assessment programs.  **Commercialization:** The method will be used by consultancy companies to assess the level of preservation or collapse in marine sites. It is intended for use in evaluating ecosystems prior to marine ecosystem restoration services. |
| **2014** | Bongo-frame for Dive Propulsion Vehicles  **Description:** I designed the Bongo-Frame to collect demersal plankton in reef ecosystems using Dive Propulsion Vehicles (DPVs) during technical scuba dives. Considering the importance of larval stages as several marine species and the demersal planktonic biomass that are not addressed by the current oceanographic methods.  **Readiness Level:** Currently at TRL 6, the prototypes have been validated. Further TRL improvements involve finalizing the commercial product connected to a specific DPV brand and model.  **Commercialization:** Due to the limited market size, DPV companies declined to create a final product for the general public. However, there remains a possibility of using it for scientific purposes within the research community. |
| **2009** | Method for monitoring populations of Decapods  **Description:** I have adapted the Underwater Visual Census (UVC) method for monitoring decapod populations in shallow ecosystems. This method enables the monitoring of important fishing resources such as lobsters and ornamental species.  **Readiness Level:** Currently at TRL 9, the method has been validated and is ready for use.  **Commercialization:** While this method was not specifically designed for commercialization, it is free available for use in underwater population monitoring of decapods. |
| **2006** | Diving certification for underwater ecological monitoring  **Description:** I have developed a specialized technical course for PADI (Professional Association of Diving Instructors) to train and certify advanced scuba divers in performing Underwater Visual Census methods for ecological monitoring.  **Readiness Level:** Currently at TRL 9, the course has been validated and is actively being commercialized.  **Commercialization:** The course is currently active in my Dive Instructor Teaching Status as a Distinctive Specialty, and several certifications have been performed. |

# START-UP

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| **2023 – on-going** | **Name:** Seascaping  **Aims:** A company for subsea construction, aiming to provide underwater architecture and seascaping.  **My Position:** Founder  **Stage:** Active.  **Location:** Qatar. |  |
| **2023 – on-going** | **Name:** Ecosystem Restoration Proof  **Aims:** To validate and audit preservation and restoration projects (especially blue resources).  **My Position:** Shareholder  **Stage:** Active.  **Location:** United Kingdom. |  |
| **2022 – on-going** | **Name:** Blue Reef  **Aims:** To commercialize the restoration of marine ecosystem for tourism industry.  **My Position:** Scientific Lead.  **Stage:** Active.  **Location:** Brazil. |  |
| **2019 – 2022** | **Name:** Marine Mushroom  **Aims:** To sell the Mushroom Forest Artificial Reef, a technology patented in my name and under the IP of Qatar University.  **My Position:** Creator  **Stage:** Discontinued  **Location:** Qatar University, Qatar. |  |
| **2009 – 2012** | **Name:** Connus Dive Center  **Aims:** Pitching the touristic concept of Scuba Dive Center in the rivers and lakes in Brazil.  **My Position:** Business Owner.  **Stage:** Discontinued.  **Location:** Londrina, Parana, Brazil |  |
| **2005 – 2009** | **Name:** Zoea Ecotourism  **Aims:** To create a touristic field class (Marine Biology) to take students and tourist to visit the Blue Resources (Mangrove, Coral reefs, Beach).  **My Position:** Business Owner.  **Stage:** Sold  **Location:** Porto de Galinhas, Pernambuco, Brazil. |  |

# Scuba Diving Certification

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| * Scuba Diving Instructor, CMAS/PADI * Peak Performance Buoyancy Instructor * Project Aware Instructor * AWARE Coral Reef Conservation Sp Instructor * Divemaster * Care for Children w/AED Instructor * Scientific Diver and Distinctive Instructor - Underwater Visual Census Techniques, PADI * Emergency First Responder (EFR) Instructor, ILCOR/PADI |

# LANGUAGES

English – Fully proficient

Spanish – Intermediary

Portuguese – Native

# REFERENCES

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