

Curriculum vitae

Fernando P. Lima

Researcher and Leader of the group 'Marine Ecology, Diversity and Change'
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Synopsis of the scientific and curricular path

I earned my PhD in 2007 from the University of Porto and the Marine Biological Association of the UK, focusing on the biogeographic changes of rocky intertidal species along the Atlantic coast of Europe. From 2007 to 2013, I was a postdoc at Dr. DS Wetthey's lab at the University of South Carolina, USA, where I expanded my skills in programming, modeling, and climatology and ventured into electronics. I also conducted field studies on both coasts of the USA. Since 2013, I have been an independent assistant researcher at CIBIO, UP, and leader of my research group since 2017. My *h-index* is 33. I published 2 book chapters, 1 book, 3 conference proceedings, 4 datasets, and 57 papers with more than 4400 citations, indicating a considerable impact in my field. I was either the lead or senior author in 22. A total of 8 papers were published in major multidisciplinary journals (*Nature*, *Nature Climate Change*, *Nature Communications*, *PNAS*, *Scientific Reports*). 37/57 were published in Q1 journals, including five in *Global Change Biology*, ranked 1st in the area of Biodiversity Conservation.

I have been working on climatic reconstruction and analysis, showing that temperature plays a significant role in shaping modern and historic coastal communities. My research group is the only one studying coastal biodiversity and biogeography change along the entire Atlantic coast of Europe. We have been leading the design of rugged autonomous loggers capable of measuring temperature at the scale of organisms. This represents a genuine breakthrough and transformed our research along with that of hundreds of scientists across the globe. It also enabled us to establish the world's most extensive rocky shore temperature and biodiversity monitoring network, CCTBON (coastalwarming.com/cctbon). The largest of its kind in the world, it spans both Atlantic coasts, from the Arctic to the Antarctic, including most mid-Atlantic archipelagos. We have also been innovating how large volumes of data are analyzed and synthesized.

I have already secured €829k in salary grants, €805k as PI in project grants, €1,347k as co-PI, and €1,373k as a team member (totalling €4.35 Million). I supervised 5 MSc and 2 PhD students, and currently have 2 MSc and 4 PhD students. I established collaborations leading to publications with more than 170 researchers from 25 countries, and I have been invited to several international consortiums (e.g., COST actions, IABO, ARCBON). I am a co-founder of ElectricBlue CRL, a technology transfer start-up developing environmental monitoring and biologging instruments (electricblue.eu). I reviewed for 6 grant agencies, including NASA, and for a large variety of journals – I am currently ranked in the 96th percentile at Publons. I am an Associate Editor at *Frontiers*. I delivered numerous talks at international congresses and workshops (22 under invitation, 2 keynote) and various

seminars in Europe and the US. Since 2022, I have been an Invited Assistant Professor at ICBAS, UP, Portugal, where I co-chair an MSc-level and a BSc-level class, each worth 5 credits.

Education

PhD in Biology, University of Porto, Portugal, 2007. Biogeography of Benthic Invertebrate Assemblages on the Portuguese Rocky Coast: Relation with Climatic and Oceanographic Patterns. Advisors: António M. Santos (University of Porto) and Stephen J. Hawkins (The Marine Biological Association of the UK).

Licentiate degree in Biology, University of Porto, Portugal, 2001. Final Thesis in Marine Biogeography, University of Porto, Portugal, 2002.

Appointments

Invited Assistant Professor, Abel Salazar Biomedical Sciences Institute, University of Porto, Portugal, 2022-present.

Permanent Associate Editor, Frontiers in Marine Science, Switzerland, 2022-present.

Assistant Researcher (CEEC) at CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, 2020-present.

Research Fellow at CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, 2018-2019.

Group Leader of the research group MarChange – Marine Ecology, Diversity and Change at CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, 2017-present.

Assistant Researcher (iFCT) at CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, 2013-2018.

Postdoctoral Fellow, University of South Carolina, USA, and CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, May 2008-2013.

Postdoctoral Fellow, University of South Carolina, USA, 2007-2008. PI: Dr. David Wethey.

Grants awarded as Principal Investigator or Co-Principal Investigator

OceanLog – Atlantic-wide long-term collaborative temperature and biodiversity observation network, FCT - Foundation for Science and Technology, ref. PTDC/BIA-BMA/4848/2021, from 2022 to 2025, Total value of €249,988. Principal Investigator: Fernando P. Lima (CIBIO, UP).

ThermalBuffer – The buffering effects of upwelling and geomorphology on coastal warming, FEDER funds through the Operational Programme for Competitiveness Factors - COMPETE and by National Funds through FCT - Foundation for Science and Technology, ref. POCI-01-0145-FEDER-31088, from 2018 to 2021, Total value of €239,500. Principal Investigator: Fernando P. Lima (CIBIO, UP).

NORTE_ROCKS – Fine scale mapping, modelling and quantification of thermal habitat in rocky shore ecosystems in Northern Portugal, FEDER funds through the Operational Programme for Competitiveness Factors - COMPETE and by National Funds through FCT - Foundation for

Science and Technology, ref. POCI-01-0145-FEDER-31053, from 2018 to 2021, Total value of €220,000. Principal Investigator: Rui Martinho (CIBIO, UP). Co-Principal Investigator: Fernando P. Lima (CIBIO, UP).

SharkTag – Developing a 'daily-diary' tag to infer predator-prey interactions under environmental gradients, FEDER funds through the Operational Programme for Competitiveness Factors - COMPETE and by National Funds through FCT - Foundation for Science and Technology, ref. POCI-01-0145-FEDER-028855, from 2018 to 2021, Total value of €238,745. Principal Investigator: Nuno Queiroz (CIBIO, UP). Co-Principal Investigator: Fernando P. Lima (CIBIO, UP).

MarInfo – Integrated Platform for Marine Data Acquisition and Analysis, Norte Portugal Regional Operational Programme (NORTE2020), under the PORTUGAL 2020 Partnership Agreement through the European Regional Development Fund (ERDF), ref. NORTE010145FEDER000031, from 2016 to 2018, Value allocated to CIBIO, €888,502. Principal Investigator of the research line 1 “Towards an integrated ocean observing system”: Fernando P. Lima (CIBIO, UP).

Coastal4cast – Linking habitat heterogeneity with physiology and metapopulation structure to forecast effects of climate change on continental scales, FCT - Foundation for Science and Technology, ref. PTDC/MAR/117568/2010, from 2012 to 2015, Total value of €151,364. Principal Investigator: Fernando P. Lima (CIBIO, UP).

HINT – Impacts of climate change on European rocky intertidal ecosystems: coupling ecological, physiological and genetic approaches, FCT - Foundation for Science and Technology, ref. PTDC/MAR/099391/2008, from 2010 to 2013, Total value of €164,404. Principal Investigator: Fernando P. Lima (CIBIO, UP).

Grants awarded as Co-Investigator

ANERIS – Operational Sensing Life Technologies for Marine Ecosystems, Horizon 2020, ref. 101094924, from 2023 to 2027. Total value: €9,999,665. Value allocated to CIBIO €391,520. Consortium of 23 institutions across Europe. Principal Investigator: Jaume Piera, CSIC (Spain).

BiolInteract – Biotic interactions in a changing world: how marine foundation species determine biodiversity across environmental gradients, FCT - Foundation for Science and Technology, ref. 2022.02887.PTDC, from 2023 to 2026, Total value of €249,603. Principal Investigator: Cátia Monteiro (CIBIO, Portugal).

BLUEFORESTING – Climate Resilient Marine Forests for a Sustainable Future, Iceland, Liechtenstein and Norway EEA grants, ref. EEA.BG.CALL4.026.2020, from 2021 to 2024. Total value: €942,407. Value allocated to CIBIO €18,626. Principal Investigator: Francisco A. Parra, CIIMAR (Portugal).

FutureMARES – Climate Change and Future Marine Ecosystem Services and Biodiversity, Horizon 2020, ref. 869300, from 2020 to 2024. Total value: €8,555,905. Value allocated to CIBIO €94,989. Consortium of 32 institutions across Europe. Principal Investigator: Myron Peck, University Hamburg (Germany).

SeeingShore – Understanding and predicting the impact of climate change on coastal habitats, FEDER funds through the Operational Programme for Competitiveness Factors - COMPETE and by National Funds through FCT - Foundation for Science and Technology, ref. POCI-01-0145-

FEDER-031893, from 2018 to 2021. Value allocated to CIBIO €12,500. Principal Investigator: Francisco Arenas (CIIMAR, UP).

MicrobeModel – Modelling the water and fish microbiomes to monitor and predict pathogen outbreaks, FEDER funds through the Operational Programme for Competitiveness Factors - COMPETE and by National Funds through FCT - Foundation for Science and Technology, ref. POCI-01-0145-FEDER-027995, from 2018 to 2021, Total value of €240,000. Principal Investigator: Raquel Xavier (CIBIO, UP).

REEHAB – Assessment of the distribution and ecological status of *Sabellaria alveolata* reefs in Europe, TOTAL Foundation, ref. 1512215588/F, from 2015 to 2019. Total value of €764,010. Value allocated to CIBIO, €27,800. Principal Investigator: Stanislas Dubois, (IFREMER, Institut Français de Recherche pour l'Exploitation de la Mer, France).

The paths of parallel evolution and their genetic crossroads, FCT - Foundation for Science and Technology, ref. PTDC/BIA-EVF/113805/2009, from 2011 to 2013, Total value of €185,335. Principal Investigator: Rui Faria (CIBIO, Portugal).

Scales of adaptation along environmental gradients in keystone intertidal organisms under different gene flow scenarios, FCT - Foundation for Science and Technology, ref. PTDC/MAR/121016/2010, from 2012 to 2015, Total value of €152,360. Principal Investigator: Pedro A. Ribeiro (IMAR, Portugal).

Research Grant, CIBIO, Research Center in Biodiversity and Genetic Resources, University of Porto, Portugal, from 2003 to 2004. Supporting grant: *Environmental impact of the construction of an industrial facility in the Setubal Harbour, Portugal – Invertebrate benthic community*. Funded by AGRIPRO. Principal Investigator: António M. Santos (CIBIO, UP).

Research Grant, Centro de Estudos de Ciência Animal do ICETA, University of Porto, Portugal, from 2002 to 2003. Supporting grant: Environmental impact assessment at the Coral Bulker oil-spill (Viana do Castelo): changes and recovery of intertidal rocky shore organisms. Funded by DRAOT-Norte. Principal Investigator: António M. Santos (CIBIO, UP).

Competitive salary awards

Research Fellow, Stimulus of Scientific Employment – Individual Support 2018, Foundation for Science and Technology, ref. CEECIND/03185/2018, from 06/2020 to 05/2026, Total value of €336,982.

Research Fellow, FCT Investigator Programme, Foundation for Science and Technology, ref. IF/00043/2012, from 06/2013 to 05/2018, Total value of €280,818.

Postdoctoral Fellowship, FCT - Foundation for Science and Technology, ref. SFRH/BPD/34932/2007, from 03/2008 to 02/2014, Total value of €156,360.

Postdoctoral Fellowship, University of South Carolina, USA, from 2007 to 2008. Support:

ECOFOR 2004: Climate Change and intertidal biogeography: Forecasting the effects of climate change on the biogeography of foundation species in estuarine and rocky intertidal ecosystems. PI: David Wetthey. Funded by NOAA (NA04NOS4780264).

Ecological forecasting and hindcasting of biodiversity responses to climate change: from MODIS to Mussels Pls: David Wethey and Brian Helmuth. Funded by NASA (NNX07AF20G).

Doctoral Fellowship, FCT - Foundation for Science and Technology, ref. SFRH/BD/8730/2002, from 10/2002 to 09/2006, Total value of €109,030.

Supervision

Graduate Students

Laura Prigge (2024-2028). Diversity and phylogeography of Macroalgae in the Gulf of Guinea. **PhD** in Biology, University of Porto. Co-supervision by Fernando P. Lima.

João Nunes (2023-2024). Systematic and automated aerial surveys of rocky intertidal communities using unmanned aircraft systems. **MSc** in Marine Sciences - Marine Resources, ICBAS, University of Porto. Supervision by Fernando P. Lima.

Joana Pereira (2022-2026). *Understanding the impacts of climate change on coastal biodiversity through the lens of a cold-adapted marine foundation species*. **PhD** in Biology, University of Porto. Primary supervision by Fernando P. Lima.

Sofía Hernández Chan (2022-2026). *ExtremeMarForest: Assessing the vulnerability and potential adaptive capacity of marine forest habitats to extreme thermal events*. **PhD** in Biology, University of Porto. Co-supervision by Fernando P. Lima.

Gabriela Borer Rodrigues (2022-2023). *What is in the turf? A multi-approach biodiversity assessment of turf-forming algae on rocky shores*. **MSc** in Biodiversity and Genetic Resources, University of Porto. Co-supervision by Fernando P. Lima.

Carolina Miranda (2022-2023). *Understanding the thermal amelioration provided by algae cover in rocky shore habitats*. **MSc** in Marine Biology and Conservation, Instituto Universitário de Ciências Psicológicas, Sociais e da Vida, Lisbon. Co-supervision by Fernando P. Lima.

Luís Filipe Ferreira Pereira (2019-2023). *Macroecological consequences of local adaptation to climate change*. **PhD** in Biology, University of Porto. Primary supervision by Fernando P. Lima.

Joana Pereira (2020-2021). *Fine-scale assessment of southern distribution limit of cold-water species in northwestern Iberia*. **MSc** in Biodiversity and Genetic Resources, University of Porto. Supervision by Fernando P. Lima.

Claudia Meneghesso (2016-2020). *Upwelling and Biodiversity in a Climate Change Context*. **PhD** in Biology, University of Porto. Primary supervision by Fernando P. Lima.

Rui Seabra Martinho (2010-2015). *Analysis of the mechanistic link between micro-climate and macro-biogeographic patterns of intertidal rocky shore organisms*. **PhD** in Biology, University of Porto. Primary supervision by Fernando P. Lima.

Catarina Cunha Moreira (2013-2015). *Does thermal microhabitat variability modulate thermal stress responses? A study focusing on the physiology and behavior of Patella vulgata*. **MSc** in Biodiversity and Genetic Resources, University of Porto. Primary supervision by Fernando P. Lima and co-supervision by Raquel Xavier.

Ana Filipa Oliveira Gomes (2011-2012). Thermal stress in the intertidal: its influence on the geographic distribution of *Patella vulgata*. **MSc** in Recursos Biológicos Aquáticos, University of Porto. Supervision by Fernando P. Lima.

Raquel Susana Brazão Xavier (2005-2008). *Modelling the geographical distribution of Patella rustica L. 1758, as a tool for predicting responses to environmental changes*. **MSc** in Biodiversity and Genetic Resources, University of Porto. Co-supervision by Fernando P. Lima.

Sílvia Cristina Gomes Pereira (2004-2005). *Diversity and Biogeography of Rocky Intertidal Isopods along the Portuguese Coast*. **MSc** in Biodiversity and Genetic Resources, University of Porto. Co-supervision by Fernando P. Lima

Undergraduate Students

Mar Humet Caballero (2022). Building up a baseline of thermal stress in a natural population non-invasively. Universitat de Barcelona, Spain.

Dimitri Vlahopoulos (2022). Micro-scale modelling of intertidal species skin temperature. ENSTA Bretagne, Brest, France.

João Silva (2020-2021). Thermal stress in rocky shore organisms. University of Aveiro, Portugal.

Maike Kaffenberger (2018-2019). Understanding changes in the distribution of the warm-water false limpet *Siphonaria pectinata*. University of Bremen, Germany.

Maria Cristina Ruiz Pena (2014-2015). Climate warming and coastal biodiversity. ICBAS, University of Porto, Portugal.

Luís Alberto Santos Nunes (2014-2015). Climate warming and coastal biodiversity. FCUP, University of Porto, Portugal.

Miguel Mena Matos Gandra (2012-2013). A low-cost versatile data logging system for ecological applications. CIBIO, University of Porto, Portugal.

Nicholas P. Burnett (2010-2011). Biomimetic desiccation data loggers and heart frequency monitoring in intertidal mollusks. CIBIO, University of Porto, Portugal and University of South Carolina, USA.

Publications

Citation metrics

Google Scholar: <http://scholar.google.com/citations?user=Q4BkMRAAAAAAJ>

Publons/Researcher ID: <https://publons.com/researcher/447799/fernando-p-lima>

ORCID ID: <http://orcid.org/0000-0001-9575-983>

Papers

indicates a paper on the top 1% most cited papers (ISI WOK) for the field and publication year

Lorenzo Cozzolino, Katy R. Nicastro, Camille Detree, Laura Gribouval, Laurent Seuront, **Fernando P. Lima**, Christopher D. McQuaid and Gerardo I. Zardi (2024). Intraspecific variations in oyster (*Magallana gigas*) ploidy does not affect physiological responses to microplastic pollution. *Chemosphere*, 364:143206. <https://doi.org/10.1016/j.chemosphere.2024.143206>

- Gabriela Borer*, Cátia Monteiro, **Fernando P. Lima** and Filipa Martins (2024), Performance of DNA metabarcoding vs morphological methods for assessing intertidal turf diversity. *Authorea Preprints*.
- Patrícia Beltrão, Ana Cristina R. Gomes, Beatriz C. Saldanha, **Fernando P. Lima** and Gonçalo C Cardoso (2024). Multiple effects of weather on common waxbill group foraging and social behavior. *Behavioral Ecology*, 35:5. <https://doi.org/10.1093/beheco/arae052>
- Gonzalo Bravo, Gregorio Bigatti, María Bagur, Erasmo Macaya, Nelson Valdivia, Ariel Rodriguez, Mariela Gauna, Ian Walker, Juan Pablo Livore, María Mendez, Rocío Nieto-Vilela, **Fernando P. Lima**, Rui Seabra, Enrique Montes (2024) Implementing biodiversity monitoring of rocky shores using photo-quadrats and Artificial Intelligence in support of data-driven decision-making of marine living resources. *Research Ideas and Outcomes*: 10. <https://doi.org/10.3897/rio.10.e126660>
- Amelia Curd, Mathieu Chevalier, Mickaël Vasquez, Aurélien Boyé, Louise B. Firth, Martin P. Marzloff, Lucy M. Bricheno, Michael T. Burrows, Michael T. Burrows, Céline Cordier, Andrew J. Davies, J. A. Mattias Green, Stephen J. Hawkins, **Fernando P. Lima**, Claudia Meneghesso, Nova Mieszkowska, Rui Seabra and Stanislas F. Dubois (2023). Applying landscape metrics to species distribution model predictions to characterize internal range structure and associated changes. *Global Change Biology*, 00:1-17. <https://doi.org/10.1111/gcb.16496>
- Sarah L. Salois, Tarik G. Gouhier, Brian Helmuth, Rui Seabra and **Fernando P. Lima** (2022). Coastal upwelling generates cryptic temperature refugia. *Scientific Reports*, 12:19313. <https://doi.org/10.1038/s41598-022-23717-5>
- Cátia Monteiro, Joana Pereira¹, Rui Seabra and **Fernando P. Lima** (2022). Fine-scale survey of intertidal macroalgae reveals recent changes in a cold-water biogeographic stronghold. *Frontiers in Marine Science*, 9:880074. <https://doi.org/10.3389/fmars.2022.880074>
- Joana Pereira¹, Cátia Monteiro, Rui Seabra and **Fernando P. Lima** (2022). Fine-scale abundance of rocky shore macroalgae species with distribution limits in NW Iberia in 2020/2021. *Biodiversity Data Journal*, 10: e80798. <https://doi.org/10.3897/BDJ.10.e80798>
- Amelia Curd, Aurélien Boyé, Céline Cordier, Fabrice Pernet, Louise B. Firth, Laura Bush, Andrew J. Davies, **Fernando P. Lima**, Claudia Meneghesso, Claudie Quéré, Rui Seabra, Mickaël Vasquez and Stanislas F. Dubois (2021). Environmental optima for a foundation species: a multidisciplinary trait-based approach. *Scientific Reports*. 11:1-12. <https://doi.org/10.1038/s41598-021-02351-7>
- Joana Pereira*, Pedro A. Ribeiro, António M. Santos, Cátia Monteiro, Rui Seabra and **Fernando P. Lima** (2021). A comprehensive assessment of the intertidal biodiversity along the Portuguese coast in the early 2000s. *Biodiversity Data Journal*, 9:e72961. <https://doi.org/10.3897/BDJ.9.e72961>
- Catarina Moreira*, Jonathon H. Stillman, **Fernando P. Lima**, Raquel Xavier, Rui Seabra, Filipa Gomes, Ana Veríssimo and Sofia M. Silva (2021). Transcriptomic response of the intertidal limpet *Patella vulgata* to temperature extremes. *Journal of Thermal Biology*, 101:103096. <https://doi.org/10.1016/j.jtherbio.2021.103096>

¹ Supervised student

- Stanislas F Dubois , Alexandre Muller, Camille Poitrimol, Flávia L D Nunes, Aurélien Boyé, Amelia Curd, Nicolas Desroy, Louise Firth, Laura Bush, Andrew J. Davies, **Fernando P. Lima**, Martin Pierre Marzloff, Claudia Meneghesso and Rui Seabra (2021). Musical chairs on temperate reefs: Species turnover and replacement within functional groups explain regional diversity variation in assemblages associated with honeycomb worms. *Frontiers in Marine Science*, 8:654141. <https://doi.org/10.3389/fmars.2021.654141>
- Samuel Gurr, Ian Dwyer, Jennifer Goleski, **Fernando P. Lima**, Rui Seabra, Christopher Gobler and Nils Volkenborn (2021). Acclimatization in the bay scallop *Argopecten irradians* along a eutrophication gradient: Insights from heartbeat rate measurements during a simulated hypoxic event. *Marine and Freshwater Behaviour and Physiology*, 54:23-49. <https://doi.org/10.1080/10236244.2020.1867477>
- Louise Firth, Daniel Harris, Julie Blaze, Martin Marzloff, Aurelien Boyé; Peter Miller; Amelia Curd, Julia Nunn; Nessa O'Connor, Anne Marie Power, Nova Mieszkowska, Ruth O'Riordan, Michael Burrows, Lucy Bricheno, Antony Knights, Flavia Nunes, François Bordeyne, Laura Bush, James Byers, Carmen David, Andrew Davies, Stanislas Dubois, Hugh Edwards, Andrew Foggo, Lisa Grant, Mattias Green, Paul Gribben, **Fernando P. Lima**, David McGrath, Laure Noël, Rui Seabra, Christina Simkanin, Michael Vasquez, and Stephen J. Hawkins (2021). Specific niche requirements underpin multidecadal range edge stability, but may introduce barriers for climate change adaptation. *Diversity and Distributions*, 27:668-683. <https://doi.org/10.1111/ddi.13224>
- Anna P. Muir, Stanislas F. Dubois, Rebecca E. Ross, Louise B. Firth, Antony M. Knights, **Fernando P. Lima**, Rui Seabra, Erwan Corre, Gildas Le Corguille and Flavia L. D. Nunes (2020). Seascape genomics reveals population isolation in the reef-building honeycomb worm, *Sabellaria alveolata* (L.). *BMC Evolutionary Biology*, 20:100. <https://doi.org/10.1186/s12862-020-01658-9>
- Hui-Yu Wang, Ling-Ming Tsang, **Fernando P. Lima**, Rui Seabra, Monthon Ganmanee, Gray A. Williams and Benny K.K. Chan (2020). Spatial variation in thermal stress experienced by barnacles on rocky shores: the interplay between geographic variation, tidal cycles and microhabitat temperatures. *Frontiers in Marine Science*, 7:553. <https://doi.org/10.3389/fmars.2020.00553>
- Claudia Meneghesso*, Rui Seabra, David S. Wethey, Bernardo R. Broitman, Benny K. K. Chan, Gil Rilov, Pedro A. Ribeiro, Lara L. Sousa, Michael T. Burrows and **Fernando P. Lima** (2020). Remotely-sensed L4 SST underestimates the thermal fingerprint of coastal upwelling. *Remote Sensing of Environment*, 237:111588. <https://doi.org/10.1016/j.rse.2019.111588>
- Hung M. Nguyen, Ioannis Savva, Periklis Kleitou, Demetris Kletou, **Fernando P. Lima**, Yuval Sapir, and Gidon Winters (2020). Seasonal dynamics of native and invasive *Halophila stipulacea* populations – a case study from the northern Gulf of Aqaba and the eastern Mediterranean Sea. *Aquatic Botany*, 162:103205. <https://doi.org/10.1016/j.aquabot.2020.103205>
- # Hung M. Nguyen, Narendra S. Yadav, Simon Barack, **Fernando P. Lima**, Yuval Sapir and Gidon Winters (2020). Responses of invasive and native populations of the seagrass *Halophila stipulacea* to simulated climate change. *Frontiers in Marine Science*, 6:812. <https://doi.org/10.3389/fmars.2019.00812>

- Jeffrey S. Levinton, Nils Volkenborn, Samuel Gurr, Kelly Correal, Sebastian Villacres, Rui Seabra and **Fernando P. Lima** (2020). Temperature-related heart rate in water and air and a comparison to other temperature-related measures of performance in the fiddler crab *Leptuca pugilator* (Bosc 1802). *Journal of Thermal Biology*, 102502. <https://doi.org/10.1016/j.jtherbio.2019.102502>
- Francis Choi, Tarik Gouhier, **Fernando P. Lima**, Gil Rilov, Rui Seabra and Brian Helmuth (2019). Mapping Physiology: Biophysical mechanisms define scales of climate change impacts. *Conservation Physiology*, 7:coz028. <https://doi.org/10.1093/conphys/coz028>
- Rui Seabra, António M. Santos, Rubén Varela, Moncho Gomez-Gesteira, Cláudia Meneghesso*, David S. Wetthey and **Fernando P. Lima** (2019). Reduced nearshore warming associated with Eastern Boundary Upwelling Systems. *Frontiers in Marine Science*, 6:104. <https://doi.org/10.3389/fmars.2019.00104>
- Amanda E. Bates, Brian Helmuth, Michael T. Burrows, Murray I. Duncan, Joaquim Garrabou, Tamar Guy-Haim, **Fernando P. Lima**, Ana M. Queiros, Rui Seabra, Robert Marsh, Jonathan Belmaker, Nathaniel Bensoussan, Yunwei Dong, Antonios D. Mazaris, Dan Smale, Martin Wahl and Gil Rilov (2018). Biologists ignore ocean weather at their peril. *Nature*, 560:299-301. <https://doi.org/10.1038/d41586-018-05869-5>
- Rubén Varela, **Fernando P. Lima**, Rui Seabra, Claudia Meneghesso* and Moncho Gomez-Gesteira (2018). Coastal warming and wind-driven upwelling: a global analysis. *Science of the Total Environment*, 639:1501-1511. <https://doi.org/10.1016/j.scitotenv.2018.05.273>
- Samuel J. Gurr, Jennifer Goleski, **Fernando P. Lima**, Rui Seabra, Christopher J. Gobler, Nils Volkenborn (2018). Cardiac responses of the bay scallop *Argopecten irradians* to diel-cycling hypoxia. *Journal of Experimental Marine Biology and Ecology*, 500:18-29. doi:10.1016/j.jembe.2017.12.011
- Regina Cunha, Jorge Assis, Celine Madeira, Rui Seabra, **Fernando P. Lima**, Evandro Lopes, Suzanne Williams and Rita Castilho (2017). Drivers of archipelagic endemism in keyhole limpets. *Scientific Reports*, 7:41817. doi:10.1038/srep41817
- Ana Tavares, Maria P. Cabezas, Raquel Xavier, Madalena Branco, **Fernando P. Lima**, Rui Seabra*, Pedro Ribeiro, Evandro Lopes, António M. Santos (2017). Phylogeography and phylogeny of the genus *Acanthonyx* (Decapoda, Epialtidae) in the north-east Atlantic and Mediterranean. *Zoologica Scripta*, 46:571-583. <https://doi.org/10.1111/zsc.12232>
- Fernando P. Lima**, Filipa Gomes*, Rui Seabra*, David S. Wetthey, Inês Seabra, Teresa Cruz, António M. Santos and Thomas J. Hilbish (2016). Loss of thermal refugia near equatorial range limits. *Global Change Biology*, 22:254-263. <https://doi.org/10.1111/gcb.13115>
- Rui Seabra*, David S. Wetthey, António M. Santos, Filipa Gomes* and **Fernando P. Lima** (2016). Equatorial range limits of an intertidal ectotherm are more linked to water than air temperature. *Global Change Biology*, 22:3320-3331. <https://doi.org/10.1111/gcb.13321>
- # Nuno Queiroz, Nicolas E. Humphries, Gonzalo Mucientes, Neil Hammerschlag, **Fernando P. Lima**, Kylie Scales, Peter Miller, Lara L. Sousa, Rui Seabra and David W. Sims (2016). Ocean-wide tracking of pelagic shark interactions with longline fishing vessels reveals persistent exploitation hotspots. *PNAS*, 113:1582-1587. <https://doi.org/10.1073/pnas.1510090113>

- Celia Olabarria, Ignacio Gestoso, **Fernando P. Lima**, Elsa Vázquez, Luc Comeau, Filipa Gomes*, Rui Seabra* and José M.F. Babarro (2016). Response of two mytilids to a heat wave: the complex interplay of physiology, behaviour and ecological interactions. *PLoS ONE*, 11:e0164330. doi:10.1371/journal.pone.0164330
- Justin H Baumann, Joseph E Townsend, Travis A Courtney, Hannah E Aichelman, Sarah W Davies, **Fernando P. Lima** and Karl D Castillo (2016). Temperature regimes impact coral assemblages along environmental gradients on lagoonal reefs in Belize. *PLoS ONE*, 11:e0162098. <https://doi.org/10.1371/journal.pone.0162098>
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Book Chapters

- Stephen J. Hawkins, Kathryn E. Pack, Louise B. Firth, Nova Mieszkowska, Ally Evans, Gustavo M. Martins, Per Åberg, Leonie C Adams, Franciso Arenas, Diano M. Boaventura, Katrin Bohn, Debora G. Borges, Joao J. Castro, Tasman P. Crowe, Ross A. Coleman, Teresa Cruz, Mark S. Davies, Graham Epstein, Joao Faria, Joao G. Ferreira, Natalie J. Frost, Gillian M. Notman, John N. Griffin, Roger J. H. Herbert, Kieran Hyder, Mark P. Johnson, **Fernando P. Lima**, Patricia E. Masterson-

Algar, Pippa J. Moore, Paula S. Moschella, Federica G. Pannacciulli, Pedro A. Ribeiro, Antonio M. Santos, Ana C. F. Silva, Martin W. Skov, Heather Sugden, Maria Vale, Kringpaka Wangkulangkul, Edward J. G. Wort, Richard C. Thompson, Richard G. Hartnoll, Michael T. Burrows and Stuart R. Jenkins (2019). The Intertidal Zone of the Northeast Atlantic Region: Pattern and Process. Stephen J. Hawkins, Katrin Bohn, Louise B. Firth and Gray A. Williams (Eds.), *Interactions in the Marine Benthos: Global Patterns and Processes*. Cambridge University Press. <https://doi.org/10.1017/9781108235792.003>

Fernando P. Lima, Nicholas P. Burnett, Brian Helmuth, Kyle Aveni-Deforge, Nicole Kish and David S. Wethey (2011). Monitoring the intertidal environment with bio-mimetic devices. Anne George (Ed.), *Biomimetic Based Applications*, 500:522. InTech. ISBN:978-953-307-195-4. <https://doi.org/10.5772/14153>

Books

Fernando P. Lima (2010). *Biogeography of Intertidal Species Along the Portuguese Rocky Coast*. Lambert Academic Publishing. ISBN:978-3-8433-7903-8.

Conference Proceedings

João P. Ventura, Nuno A. Cruz and **Fernando P. Lima** (2016). A remote monitoring and control system for ecosystem replication experiments," *OCEANS 2016 MTS/IEEE Monterey*, Monterey, CA, USA. <https://doi.org/10.1109/OCEANS.2016.7761279>

Manuel Sousa e Silva, Nuno A. Cruz and **Fernando P. Lima** (2016). Remote Supervision System for Aquaculture Platforms. *OCEANS 2016 MTS/IEEE Monterey*, Monterey, CA, USA. <https://doi.org/10.1109/OCEANS.2016.7761278>

Cátia Monteiro, Joana Pereira, Rui Seabra and **Fernando P. Lima** (2021). Fine-scale assessment of southern distribution limits of cold-water species in Northwestern Iberia. *Phycologia*, 60:102-102.

Theses

Fernando P. Lima (2007). *Biogeography of Benthic Invertebrate Assemblages on the Portuguese Rocky Coast: Relation with Climatic and Oceanographic Patterns*. PhD Thesis, Faculdade Ciências Universidade Porto, Porto, Portugal. ISBN:978-989-96941-0-1. <https://hdl.handle.net/10216/64280>

Curated biodiversity datasets

*Joana Pereira, Cátia Monteiro and **Fernando P. Lima** (2021). *Herbarium collection of intertidal macroalgae biodiversity along the Northwestern Iberian coast in 2020/2021*. GBIF.org. <https://doi.org/10.15468/9t2gxy>

*Joana Pereira, Cátia Monteiro, Rui Seabra, António M. Santos and **Fernando P. Lima** (2021). *Intertidal macroalgae species distribution along the Northwestern Iberian coast in 2020/2021*. GBIF.org. <https://doi.org/10.15468/247z4g>

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Amelia Curd, Celine Cordier, Louise B. Firth, Laura Bush, Yves Gruet, Patrick Le Mao, Julie A. Blaze, Callum Board, François Bordeyne, Michael T. Burrows, Paul N. Cunningham, Andrew J. Davies, Nicolas Desroy, Hugh Edwards, Daniel R. Harris, Stephen J. Hawkins, Francis Kerckhof, **Fernando P. Lima**, David McGrath, Claudia Meneghesso, Nova Mieszkowska, Julia D. Nunn, Flavia Nunes, Nessa E. O' Connor, Ruth M. O' Riordan, Anne Marie Power, Rui Seabra, Christina Simkanin, and Stanislas Dubois (2020). *A broad-scale long-term dataset of Sabellaria alveolata distribution and abundance curated through the REEHAB (REEf HABitat) Project*. SEANOE. <https://doi.org/10.17882/72164>

Software

Rui Seabra (lead developer) and **Fernando P. Lima** (contributor). An R package for processing and automatically assessing cardiac frequency on data collected with PULSE systems. <https://github.com/coastalwarming/HeartBeatR>. Released in December 2023.

Data servers

Fernando P. Lima. ERDDAP server at BIOPOLIS. <https://erddap.at.biopolis.pt>. Released in January 2024.

Presentations

(*indicates student co-authors)

Invited oral communications

Fernando P. Lima (2024). Innovative temperature monitoring across multiple scales for ecological research, *Artificial Intelligence and Ecological Research, Società Italiana di Ecologia*. Rome, Italy.

Fernando P. Lima (2024) Robolimpets: origin, evolution, and applications. Limpets 2020 (+4) Biology of Limpets: evolution, adaptation, ecology & environmental impacts. Meeting of the Malacological Society of London. NHM, London, UK

Fernando P. Lima, Cátia Monteiro, Rita da Silva, Rocio Nieto-Vilela and Rui Seabra (2023). CCTBON: Cutting-edge temperature and biodiversity monitoring in rocky shores across the entire Atlantic Ocean. *Ciência 2023*. Universidade de Aveiro, Portugal.

Cátia Monteiro, Rita da Silva, Rui Seabra and **Fernando P. Lima** (2023). eDNA and autonomous temperature logging as tools to understand biotic interactions in a changing world. *Ciência 2023*. Universidade de Aveiro, Portugal.

Fernando P. Lima, Cátia Monteiro, Rita da Silva and Rui Seabra (2023). CCTBON – Temperature and biodiversity observation and citizen science. Ocean Data Week, The Ocean race, Genova, Italy.

Fernando P. Lima, Cátia Monteiro, Rita da Silva and Rui Seabra (2023). CCTBON – Temperature and biodiversity observation and citizen science. Democratizing Ocean Observations Through Low-Cost Technologies and Citizen Science. AtlantOS Ocean Hour, online.

Fernando P. Lima, Cátia Monteiro, Rita da Silva and Rui Seabra (2023). CCTBON – Temperature and biodiversity observation and citizen science. Ocean Hour: Ocean Data and Citizen Science, The Ocean Race 2022/23, online.

Fernando P. Lima, Cátia Monteiro, Joana Pereira, Rita da Silva, Rocío A. Nieto-Vilela and Rui Seabra (2022). Monitoring temperature and biodiversity in rocky shores across the whole Atlantic Ocean. International Symposium on Advances in Marine Mussel Research, Exeter, UK.

Luís F. Pereira*, Rocío A. Nieto-Vilela, Mar Humet, Rui Seabra, Bruno Loureiro, Francisco Arenas and **Fernando P. Lima** (2022). Quantification of cardiac performance in mollusks subjected to realistic simulations of intertidal thermal conditions. International Symposium on Advances in Marine Mussel Research, Exeter, UK.

Fernando P. Lima and Rui Seabra (2021). Cutting-edge temperature monitoring across multiple scales, *GLEX, Global Exploration Summit 2021*. Lisbon and Azores, Portugal.

Fernando P. Lima and Rui Seabra (2021). Cutting-edge temperature monitoring across multiple scales, *The 4th Annual Meeting of the International Joint Research Center of Marine Biology*. Shanghai Ocean University and University of Algarve, online.

Fernando P. Lima, Rui Seabra, Nuno P. Alexandrino, David S. Wethey, Pedro Tarroso, António M. Santos (2016). High-resolution 3D reconstruction of rocky shore topography as a tool for studying thermal stress, keynote presentation at *11th International Temperate Reefs Symposium*. Pisa, Italy.

Fernando P. Lima (2015). Understanding the mechanistic link between environmental heterogeneity, physiology and metapopulation structure to forecast the effects of climate change at continental scales, *4th Iberian Ecological Congress*. Coimbra, Portugal.

Fernando P. Lima (2014). Thermal stress, climate change and biogeography: a multidisciplinary approach, *Environmental Monitoring and Surveillance Challenges, Solutions and Opportunities*. Porto, Portugal.

Fernando P. Lima, Rui Seabra* and David S. Wethey (2013). Biomimetic sensors for autonomous temperature logging in the coastal environment, *Ocean's Challenges and Opportunities, University of Porto*, Portugal.

Fernando P. Lima (2010). Coastal oceanic warming and its effects on biogeography and biodiversity, *2010 International Year of Biodiversity – and what after 2010? International conference organised by the Portuguese Parliament*. Lisbon, Portugal.

Invited workshops

Fernando P. Lima, Rui Seabra (2023). CCTBON – Coupled Temperature and Biodiversity Observation Network, *MBON Pole to Pole Workshop*, Camarones, Argentina.

Rui Seabra, **Fernando P. Lima** (2023). Biodiversity monitoring using new photo-quadrat tools, *MBON Pole to Pole Workshop*, Camarones, Argentina.

Fernando P. Lima (2019). Sustainable management under global change, *9th edition of Business2Sea/ Fórum do Mar workshop*, Porto, Portugal.

Fernando P. Lima (2018). Microhabitats, climate change, thermal stress and biogeography, Assessing Marine Biodiversity: from the Field to the Cloud, MBON Pole to Pole Workshop, São Sebastião, Brazil.

Fernando P. Lima (2017). Climate change and biogeographic patterns along the European coast: a multi-scale and multidisciplinary approach. *ACES 2017, Workshop on Advanced Computing for Earth Sciences*. Porto, Portugal.

Fernando P. Lima (2016). Ultra-High resolution SST products, Workshop at University of North Carolina at Chapel Hill, NC, USA.

Fernando P. Lima, Rui Seabra* and David S. Wethey (2014). Biomimetic sensors for autonomous temperature logging in the coastal environment, *Workshop at The Swire Institute of Marine Science, University of Hong Kong*, Hong Kong.

Fernando P. Lima, Rui Seabra* and David S. Wethey (2013). Biomimetic sensors for autonomous temperature logging in the coastal environment, *Workshop at The Swire Institute of Marine Science, University of Hong Kong*, Hong Kong.

Fernando P. Lima, Rui Seabra* and David S. Wethey (2011). Using robolimpets et al. to measure organismal temperatures in the intertidal zone, Sensor Development for the study of Global Climate Change in Intertidal Ecosystems. Workshop at University of South Carolina, SC, USA.

Invited exhibits

Luís F. Pereira*, Cátia Monteiro, Rocío A. Nieto-Vilela, Rui Seabra, Nuno Queiroz, and **Fernando P. Lima** (2023). Science and technology exhibit at Ciência 2023, Aveiro, Portugal.

Fernando P. Lima, Rui Seabra and Nuno Queiroz (2022). Science and technology exhibit at “One Sustainable Ocean” event, a side event at the United Nations Ocean Conference 2022, Lisbon, Portugal.

Invited seminars

Fernando P. Lima (2022). Climate change, thermal stress and biogeography along the Atlantic coast of Europe. University of Plymouth, UK.

Fernando P. Lima (2019). WE-LOG: A collaborative global network of coastal temperature sensors, *CCMAR*, Faro, Portugal.

Fernando P. Lima (2018). Stress térmico, alterações climáticas e biogeografia: uma abordagem multidisciplinar, *Congresso Nacional sobre Alterações Climáticas*. Vila Real, Portugal

Fernando P. Lima (2016). Understanding the mechanistic link between environmental heterogeneity and physiology to forecast the effects of climate change at continental scales, *University of North Carolina at Chapel Hill*, NC, USA.

Fernando P. Lima Rui Seabra* and David S. Wethey (2013). Autonomous loggers for environmental sensing in intertidal ecosystems, *University of Açores*, Ponta Delgada, Portugal.

Fernando P. Lima (2013). Understanding the mechanistic link between environmental heterogeneity, physiology and metapopulation structure to forecast the effects of climate change at continental scales. *Stony Brook University, NY, USA*.

Fernando P. Lima (2012). Understanding the mechanistic link between environmental heterogeneity, physiology and metapopulation structure to forecast the effects of climate change at continental scales. *CIIMAR, Porto, Portugal*.

Other oral communications

Carolina Miranda*, Pedro Duarte-Coelho, Cátia Monteiro, Frederico Almada and **Fernando P. Lima** (2024). Algae as a thermal buffer of temperate intertidal rocky shore communities. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

Ana Luísa Sinde-Mano, Rocio Nieto-Vilela, Cátia Monteiro and **Fernando P. Lima** (2024) Seven decades later, following in the footsteps of Édouard Fischer-Piette, documenting changes in macroalgae communities on the Atlantic coast of Europe. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

Gabriela Borer*, Filipa Martins, **Fernando P. Lima**, and Cátia Monteiro(2024) Exploring turf algae biodiversity: Comparing metabarcoding and morphology as monitoring tools. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

Mar Humet, Rocio Nieto-Vilela, Fernando P. Lima, Rui Seabra (2024) Assessing basal thermal stress in a natural population in a non-invasive way. *Limpets 2020 (+4)*, Biology of Limpets: evolution, adaptation, ecology & environmental impacts. Meeting of the Malacological Society of London, UK.

Rocio Nieto-Vilela, Rita da Silva, Mike Kaffenberger*, Mar Humet, Cátia Monteiro, João Nunes*, Rui Seabra, Francisco Arenas and **Fernando P. Lima** (2024) Unveiling climate-driven shifts: exploring range expansion and thermal limits of *Siphonaria pectinata* in NW Iberian rocky shores. *Limpets 2020 (+4)*, Biology of Limpets: evolution, adaptation, ecology & environmental impacts. Meeting of the Malacological Society of London, UK.

Cátia Monteiro, Rita da Silva, Luís Pereira, João Nunes, Duarte Martins, Rocío Nieto-Vilela, Mar Humet, Carolina Miranda*, Gabriela Borer, Filipa MS Martins, Joana Pereira, Rui Seabra and **Fernando P. Lima** (2024). How to study intertidal ecology in the 21st century? *Jornadas do Mar*. Porto, Portugal.

Cátia Monteiro, Rocio Nieto-Vilela, Mar Humet, Rita da Silva, Rui Seabra, Joana Pereira*, Duarte Martins, João Nunes, **Fernando P. Lima**, Xavier Salvador, Berta Companys and Jaume Piera (2023) O contributo da ciência cidadã para o levantamento de biodiversidade marinha - o projeto ANERIS e a plataforma MINKA. Encontro Nacional Ciência Cidadã. Coimbra, Portugal.

Joana Pereira*, Cátia Monteiro, Rocio Nieto-Vilela and **Fernando P. Lima** (2023) Major contraction at warmer edges of the distribution of the cold-water algae *Himanthalia elongata* (Linnaeus) S.F. Gray 1821. *8th European Phycological Congress (EPC8)*, Brest, France.

Luís F. Pereira*, Cátia Monteiro, Rui Seabra, Francisco Arenas, **Fernando P. Lima** (2023) Geographical variability of physiological responses of *Ascophyllum nodosum* to realistic simulations of

- intertidal conditions in a self-contained autonomous system. *8th European Phycological Congress (EPC8)*, Brest, France.
- Gabriela Borer*, Cátia Monteiro, Filipa MS Martins, **Fernando P. Lima** (2023) What is in the turf? A multi-approach biodiversity assessment of turf-forming algae on rocky shores. *8th European Phycological Congress (EPC8)*, Brest, France.
- Cátia Monteiro, Claudia Meneghesso, Francisco Arenas, Joana Pereira*, Rui Seabra, **Fernando P. Lima** (2023) Recent changes in rocky shore biodiversity across the NE Atlantic coast. *8th European Phycological Congress (EPC8)*, Brest, France.
- Luís F. Pereira*, Cátia Monteiro, Rocio Nieto-Vilela, Mar Humet, Rui Seabra, Bruno Loureiro, Francisco Arenas and **Fernando P. Lima** (2023) Quantification of cardiac performance in mollusks subjected to realistic simulations of intertidal thermal conditions. *XIII International Symposium on Littorinid Biology and Evolution (ISOLBE)*, Vila do Conde, Portugal.
- Cátia Monteiro, Joana Pereira*, Rui Seabra and **Fernando P. Lima** (2021). Fine-scale assessment of southern distribution limits of cold-water species in Northwestern Iberia. *12th International Phycological Congress*. Online.
- Fernando P. Lima**, Brian Helmuth, Enrique Montes, Ben Best, Gil Rilov, Eduardo Klein, Frank Muller-Karger, Tylar Murray, Gray Williams and Rui Seabra (2019). WE-LOG: A collaborative global network of coastal temperature sensors. *12th International Temperate Reefs Symposium*. Hong Kong.
- Rui Seabra, Rubén Varela, António M. Santos, Moncho Gomez-Gesteira, Claudia Meneghesso, David S. Wethey and **Fernando P. Lima** (2019). Upwelling buffers coastal oceans from global warming – but not indefinitely. *12th International Temperate Reefs Symposium*. Hong Kong.
- Brian Helmuth, Thomas J. Barrett, Francis Choi, Ashley Cryan, Sagi Filin, Tarik Gouhier, **Fernando P. Lima**, Sinan Müftü, Gil Rilov and Rui Seabra (2019). Topographic complexity and rescue effects in rocky intertidal ecosystems: what drives vulnerability of intertidal organisms to climate change? *12th International Temperate Reefs Symposium*. Hong Kong.
- Louise B. Firth, D. Harris, J. Blaze, F. Bordeyne, L. Bush, Amelia Curd, Andrew J. Davies, Stanislas Dubois, H. Edwards, A. Foggo, P. Gribben, **Fernando P. Lima**, D. McGrath, Nova Mieszkowska, L. Noel, Flávia L. Nunes, J. Nunn, N. E. O'Connor, R. M. O'Riordan, A. Patterson, A. Power, Rui Seabra, C. Simkanin and Stephen J. Hawkins (2019). The way that we went: biogeography and historical ecology of the ecosystem engineer *Sabellaria alveolata* in Ireland. *12th International Temperate Reefs Symposium*. Hong Kong.
- Amelia Curd, Céline Cordier, Louise B. Firth, Laura Bush, Andrew J. Davies, **Fernando P. Lima**, Claudia Meneghesso, Rui Seabra and Stanislas D. Dubois (2019). Large-scale Patterns in the Reproductive Features of the Honeycomb Worm *Sabellaria alveolata*. *12th International Temperate Reefs Symposium*. Hong Kong.
- Stanislas F. Dubois, Laura Bush, Celine Cordier, Amelia Curd, Andy Davies, Louise Firth, **Fernando P. Lima**, Claudia Meneghesso, Camille Poitrimol and Rui Seabra (2019). On the structural and

- functional diversity of honeycomb worm reef associated macrofauna across a European latitudinal gradient, *12th International Temperate Reefs Symposium*. Hong Kong.
- Claudia Meneghesso*, Francisco Arenas, António M Santos, Rui Seabra and **Fernando P. Lima** (2018). Have 15 years of climatic changes altered the Iberian Peninsula's intertidal biodiversity? *International Biogeographical Society Meeting*. Évora, Portugal.
- Claudia Meneghesso*, Francisco Arenas, Rui Seabra, Leonel Pereira and **Fernando P. Lima** (2018). Mudanças na distribuição de *Asparagopsis armata* na costa Portuguesa: uma resposta às alterações climáticas, a alterações no upwelling, ou ambas? *Primeiro Congresso de Biologia Marinha dos Países de Língua Portuguesa*. Faro, Portugal.
- Amelia Curd, Louise Firth, Stanislas F. Dubois, Andrew J. Davies and **Fernando P. Lima**. (2016). Assessment of the shifts in perception and changing distribution of *Sabellaria alveolata* reefs in Europe: the REEHAB project, *Oceans Past VI*. Sesimbra, Portugal.
- Rui Seabra*, David S. Wethey, António M. Santos and **Fernando P. Lima** (2016). Topographical shading shapes coastal habitat complexity, *11th International Temperate Reefs Symposium*. Pisa, Italy.
- Coraline Chapperon, Nils Volkenborn, Jacques Clavier, Sarah Séité, Rui Seabra* and **Fernando P. Lima** (2015). Seasonal and microclimatic acclimatisation effects on heat stress responses in the intertidal gastropod *Patella vulgata*. *Aquatic Biodiversity and Ecosystems Conference*. Liverpool, UK.
- Fernando P. Lima**, Filipa Gomes*, Rui Seabra*, David S. Wethey and Thomas J. Hilbish (2015). Microclimate, thermal stress and biogeographic patterns in the European Atlantic Intertidal. *ASLO Aquatic Sciences Meeting 2015: Global And Regional Perspectives – North Meets South*. Granada, Spain.
- Rui Seabra*, Filipa Gomes, David S. Wethey and **Fernando P. Lima** (2015). Water wins over air: Medium-term stress levels in the limpet *Patella vulgata* are more linked to water than air temperature. *ASLO Aquatic Sciences Meeting 2015: Global and Regional Perspectives – North Meets South*. Granada, Spain.
- Hui-Yu Wang, Gray A. Williams, **Fernando P. Lima**, Monthon Ganmanee, Ling-Ming Tsang and Benny K.K. Chan (2015). The interplay of latitude, tidal level and microhabitat on heat stress and thermal profiles of intertidal barnacles, *Tetraclita* species, in the West Pacific. *Aquatic Biodiversity & Ecosystems Conference*, Liverpool, UK
- Fernando P. Lima**, Rui Seabra*, Bernardo Broitman, Lara Sousa and David S. Wethey (2014). Running too hot: satellite-derived high-resolution sea surface temperatures (HRSST) largely miss near-shore upwelling. *10th International Temperate Reefs Symposium*. Perth, Australia.
- Rui Seabra*, David S. Wethey, António M. Santos and **Fernando P. Lima** (2014). Latitudinal patterns in temperature, aren't. *10th International Temperate Reefs Symposium*. Perth, Australia.
- Fernando P. Lima** and David S. Wethey (2011). Worldwide analysis of three decades of high-resolution coastal sea temperatures reveals more than warming. *9th International Temperate Reefs Symposium*. Plymouth, United Kingdom.

- Rui Seabra* and **Fernando P. Lima** (2011). How hot is hot? Characterization of induced thermal stress levels in *Patella* spp. *9th International Temperate Reefs Symposium*. Plymouth, United Kingdom.
- David S. Wethey, Sarah A. Woodin, Thomas J. Hilbish, **Fernando P. Lima** and Sierra J. Jones (2011). Ecological forecasts, climate change and extreme events: the winters of 2008-2009 and 2009-2010 in Europe. *Benthic Ecology Meeting 2011*. Mobile, Alabama.
- Fernando P. Lima** and David S. Wethey (2011). Analysis of three decades of high-resolution coastal sea temperatures. *ASLO Aquatic Sciences Meeting 2011: Limnology and Oceanography in a Changing World*. San Juan, Puerto Rico.
- David S. Wethey, Sarah A. Woodin, Thomas J. Hilbish, **Fernando P. Lima** and Sierra J. Jones (2011). Extreme events as tests of ecological forecasts: the winter of 2009-2010 in Europe. *ASLO Aquatic Sciences Meeting 2011: Limnology and Oceanography in a Changing World*. San Juan, Puerto Rico.
- Rui Seabra*, David S. Wethey, António M. Santos and **Fernando P. Lima** (2010). Side matters: microhabitat influence on intertidal heat stress over a large geographical scale. *45th European Marine Biology Symposium*. Edinburgh, United Kingdom.
- Sarah K. Berke, Andrew R. Mahon, **Fernando P. Lima**, Kenneth M. Halanych, David S. Wethey and Sarah A. Woodin. (2009). Range shifts and species diversity in marine ecosystem engineers: Patterns and predictions for European sedimentary habitats. *94th ESA Annual Meeting*. Albuquerque, New Mexico, USA.
- Elizabeth K. Fly, Thomas J. Hilbish and **Fernando P. Lima** (2009). Climate change and shifts in the distribution of mussel hybrid zones on the coast of Britain, *Benthic Ecology Meeting 2009*. Corpus Christi, Texas, USA.
- Fernando P. Lima**, Thomas J. Hilbish and David S. Wethey (2008). Centennial Sea Surface warming patterns on the Northern Atlantic and North-Eastern Pacific coasts, *Benthic Ecology Meeting 2008*. Providence, Rhode Island, USA.
- Karl D. Castillo and **Fernando P. Lima**. (2008) Comparison of sea surface temperature derived from MODIS TERRA/AQUA and subtidal measurements from the Inner Lagoon and Outer Barrier reefs of Southern Belize, *2008 Ocean Sciences Meeting*. Orlando, Florida, USA.
- Thomas J. Hilbish, David S. Wethey and **Fernando P. Lima**. (2008) Characteristic length in marine populations: the interplay of larval dispersal and adult population success in determining distribution, *2008 Ocean Sciences Meeting*. Orlando, Florida, USA.
- David S. Wethey, Lindsay D. Brin, Sierra J. Jones, **Fernando P. Lima**, Brian Helmuth, Sarah A. Woodin and Thomas J. Hilbish. (2008) Ecological forecasting and hindcasting in the intertidal zone: from weather and oceanography to body temperatures, mortality risks, and biogeography, *2008 Ocean Sciences Meeting*. Orlando, Florida, USA.
- Fernando P. Lima**, Nuno Queiroz, Pedro A. Ribeiro, Raquel Xavier, Stephen J. Hawkins and António M. Santos. (2006) Effects of climate change on rocky shore intertidal species: insights from the Portuguese coast, *41st European Marine Biological Symposium*. Cork, Ireland.
- Nuno Queiroz, Anabela Maia, **Fernando P. Lima**, Pedro A. Ribeiro, João P. Correia and António M. Santos. (2005) Biological data on sharks landed in Portugal. Growth and reproduction of

Centrosymnus coelolepis, Centrophorus squamosus and Prionace glauca off the Portuguese coast. *AES Annual Meeting*, Tampa Bay, USA.

Nuno Queiroz, **Fernando P. Lima**, Sílvia G. Pereira, Pedro A. Ribeiro, António M. Santos and João P. Correia. (2004) Biological data on sharks landed in Portugal. *ASIH Annual Meeting*, Norman Oklahoma, USA.

Posters in conferences

João Nunes*, Cátia Monteiro, Joana Pereira, Mar Humet, Rita da Silva, Rocío Nieto and **Fernando P. Lima** (2024). Flying over the Tide: Systematic and Automated aerial surveys of rocky intertidal communities. IJUP, Porto, Portugal.

Rita da Silva, Rui Seabra, **Fernando P. Lima**, Cátia Monteiro, Catarina Queiroga, Rocio Vilela, Bruno Loureiro (2024). Unlocking Coastal Dynamics: The Coupled Temperature and Biodiversity Observation Network. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

João Nunes*, Cátia Monteiro and **Fernando P. Lima** (2024) Systematic and automated aerial surveys of rocky intertidal algal communities using Unmanned Aircraft Systems. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

Rita da Silva, **Fernando P. Lima**, Cátia Monteiro and Rui Seabra (2024) Unlocking Coastal Dynamics: The Coupled Temperature and Biodiversity Observation Network. 8th Congress of the International Society for Applied Phycology, Porto, Portugal.

Joana Pereira*, Cátia Monteiro, Mar Humet and **Fernando P. Lima** (2024) Has the distribution of *Himantalia elongata* retracted due to increased temperature? Insights from the field and from the lab. 8th congress of the International Society for Applied Phycology, Porto, Portugal.

Claudia Meneghesso*, Francisco Arenas, Rui Seabra, Pedro Ribeiro, António M. Santos, Stephen J. Hawkins, Michael T. Burrows, and **Fernando P. Lima** (2019). Have 15 years of climatic changes altered the identity of the NE Atlantic intertidal communities?. *12th International Temperate Reefs Symposium*. Hong Kong.

Amelia Curd, Céline Cordier, Louise B. Firth, Laura Bush, Andrew J. Davies, N. Desroy, D. Faget, Y. Gruet, F. Kerckhof, Stephen J. Hawkins, **Fernando P. Lima**, P. Le Mao, Nova Mieszowska, Rui Seabra and Stanislas D. Dubois (2019). Range far and wide: building a broad-scale long-term dataset of *Sabellaria alveolata* distribution and abundance. *12th International Temperate Reefs Symposium*. Hong Kong.

Francis Choi, Tarik Gouhier, **Fernando P. Lima**, Gil Rilov, Rui Seabra and Brian Helmuth (2019). Estimating body temperature and thermal performance at fine spatial and temporal scales. *12th International Temperate Reefs Symposium*. Hong Kong.

Claudia Meneghesso*, Rui Seabra, **Fernando P. Lima**(2016). Assessing the usefulness of remotely sensed data for studying upwelling dynamics on nearshore environments, *11th International Temperate Reefs Symposium*. Pisa, Italy.

- Catarina Moreira*, Raquel Xavier and **Fernando P. Lima** (2015). Temporal Dynamics of the heat shock protein response in an intertidal gastropod (*Patella vulgata*). *ASLO Aquatic Sciences Meeting 2015: Global and Regional Perspectives – North Meets South*. Granada, Spain.
- Miguel Gandra*, Rui Seabra* and **Fernando P. Lima** (2014). A low-cost, versatile data logging system for ecological applications. *10th International Temperate Reefs Symposium*. Perth, Australia.
- Nicholas P. Burnett*, **Fernando P. Lima** and David S. Wethey (2011). Biomimetic desiccation loggers for intertidal mollusks. *Society for Integrative and Comparative Biology*. Salt Lake City, Utah
- Nicholas P. Burnett*, **Fernando P. Lima** and David S. Wethey (2011). Biomimetic desiccation loggers for intertidal mollusks. *9th International Temperate Reefs Symposium*. Plymouth, United Kingdom.
- Fernando P. Lima**, Rui Seabra and David S. Wethey (2010). Where to get SST data from? The performance of different remote-sensed SST datasets in the coastal zone. *45th European Marine Biology Symposium*. Edinburgh, United Kingdom.
- Fernando P. Lima** and David S. Wethey (2009). Robolimpets: measuring intertidal body temperatures using biomimetic loggers, *Benthic Ecology Meeting 2009*. Corpus Christi, Texas, USA.
- Fernando P. Lima**, Stephen J. Hawkins and António M. Santos. (2007) Detection of boundaries in one-dimensional unevenly distributed community data: a new tool for investigating responses to environmental change, *Change in Aquatic Ecosystems: Natural and Human Influences*. Plymouth, UK.
- Fernando P. Lima**, Raquel Xavier, Pedro A. Ribeiro, Nuno Queiroz, Stephen J. Hawkins and António M. Santos. (2007) Using modelling to explain recent changes in the distribution of the marine gastropod *Patella rustica*. *3rd International Conference of the International Biogeography Society*, Tenerife, Canarias.
- Pedro A. Ribeiro, **Fernando P. Lima**, Stephen J. Hawkins and António M. Santos. Development of a computer simulation model to investigate larval dispersal and levels of population connectivity in a marine gastropod, *Patella depressa*. (2007) *3rd International Conference of the International Biogeography Society*, Tenerife, Canarias.
- Pedro A. Ribeiro, **Fernando P. Lima**, Raquel Xavier, Nuno Queiroz, António M. Santos and Stephen J. Hawkins. (2006) Effect of temperature on larval development of NE Atlantic *Patella* spp. *41st European Marine Biology Symposium*, Cork, Ireland.
- Raquel Xavier*, **Fernando P. Lima**, Pedro A. Ribeiro, Nuno Queiroz, Pedro Tarroso, Stephen J. Hawkins and António M. Santos. (2006) Modelling the geographical distribution of *Patella rustica* Linnaeus, 1758 as a tool for predicting responses to environmental changes. *41st European Marine Biology Symposium*, Cork, Ireland.
- Raquel Xavier*, **Fernando P. Lima**, Nuno Queiroz and António M. Santos. (2006) Biogeography of isopoda in Portuguese and north Spanish rocky shores. *XIV Simposio Ibérico d'Estudios de Biología Marina*. Barcelona, Spain.
- Sílvia G. Pereira*, **Fernando P. Lima**, Nuno Queiroz, Pedro A. Ribeiro and António M. Santos. (2003) Biogeographic patterns of intertidal macroinvertebrates and their association with macroalgae

distribution along the Portuguese rocky coast. *38th European Marine Biology Symposium*, Aveiro, Portugal.

Nuno Queiroz, **Fernando P. Lima**, Pedro A. Ribeiro, Sílvia G. Pereira and António M. Santos. (2003) Coping with contingency in environmental impact assessment of unplanned disturbances: a case study. *38th European Marine Biology Symposium*, Aveiro, Portugal.

Pedro A. Ribeiro, **Fernando P. Lima**, Nuno Queiroz and António M. Santos. (2003) New records of *Patella rustica* Linnaeus, 1758 in northern Portugal: misobservation or evidence of recent expansion? *Limpets 2003 – Evolution and Biology of Marine Limpets*. Millport, Isle of Cumbrae, Scotland.

Outreach talks

Fernando P. Lima (2024). Monitorização a longo prazo de temperatura e biodiversidade costeiras em Viana do Castelo e a sua importância num contexto de alterações globais. 10 anos de Ciência no Mar de Viana. CMIA Viana do Castelo, Portugal.

Fernando P. Lima (2023). *Impactos das alterações climáticas na biodiversidade costeira*, Colóquio O Mar: Tradições e Desafios. Dia da Marinha 2023. Reitoria da Universidade do Porto, Portugal.

Fernando P. Lima (2021). *Novas Tecnologias para o estudo das alterações climáticas sobre a biodiversidade a escalas continentais*. Investigação em zonas Costeiras, Conversas de fim de tarde. CMIA Viana do Castelo, Portugal.

Fernando P. Lima (2021). *Novas tecnologias para o estudo das alterações climáticas a escalas continentais*. Noite Europeia dos Investigadores, Galeria da Biodiversidade – Centro Ciência Viva. Porto, Portugal.

Fernando P. Lima (2020). *Ó mar salgado, quanto do teu valor são algas de Portugal?*, Galeria da Biodiversidade – Centro Ciência Viva. Porto, Portugal.

Fernando P. Lima (2013). *Alterações climáticas e biodiversidade costeira*, Área Protegida das Lagoas de Bertandos e S. Pedro de Arcos. Ponte de Lima, Portugal.

Fernando P. Lima (2013). *Os efeitos das alterações globais na biogeografia e biodiversidade marinhas*, Universidade dos Açores. Ponta Delgada, Portugal.

Outreach activities in the field

In 2024, my research group is organizing a bio-marathon (bioMARatona Norte), with multiple visits to rocky shores between Gaia and Viana do Castelo, aiming at involving citizens in the collection and identification of biodiversity data.

In 2023, I lead a citizen-focused BioBlitz survey at Praia de Vila Chã, in collaboration with the “Centro Ciência Viva de Vila do Conde”.

In 2022, my research group organized a field visit to Praia de São Lourenço, where we were accompanied by the presence of distinguished guests such as the Minister of the Sea (Ricardo Serrão Santos), representatives of FLAD, Escola Azul, and various delegates from local municipalities.

In 2022, I lead a citizen-focused BioBlitz survey at Praia de Angeiras, in collaboration with the “Centro Ciência Viva de Vila do Conde”.

In 2001 and 2002, I participated as an instructor in two summer-long “Ciência Viva” expositions at the “Estação de Zoologia Marítima António Nobre”. My duties were to collect live animals and algae from the intertidal, maintaining them alive on display, and guiding visiting schools and families, introducing them to the diversity and natural history of those species.

Technology transfer

I am a **founding member** of *ElectricBlue, CRL*, a technology transfer start-up created in 2018 at CIBIO/InBIO, developing electronic instruments to help the scientific community address large-scale issues related to climate change, ecology, and biodiversity loss through the application of innovative tools for environmental monitoring and bio-logging.

Between 2010 and 2014, I collaborated with a Portuguese company (*Newshift Lda.*, Leiria, Portugal), at first improving their temperature logging instruments and later creating a commercial “out-of-the-box” version of a heart-beat sensor/amplifier to study the response of marine invertebrates to thermal or pollution stress. This device is an effective example of knowledge and technology transfer between academia and the market and has since been internationally marketed by *Newshift Lda.*

Teaching experience, graduate and undergraduate levels

Invited lecturer (2022 -) and regent of the discipline “Aquatic Biology”, BSc in Aquatic Sciences, Abel Salazar Biomedical Sciences Institute, University of Porto, Portugal.

Invited lecturer (2022 -) and regent of the discipline “Marine Biology and Ecology”, MSc in Marine Science, Abel Salazar Biomedical Sciences Institute, University of Porto, Portugal.

Invited lecturer (2019) at the advanced course “Global Change, Marine Resources and Biodiversity”, part of the Do*Mar Doctoral Programme at University of Aveiro, Portugal.

Other teaching experience

In 2017, I was responsible for the organization of *TiBE, Trends in Biodiversity and Evolution*, a three-day long international meeting annually held at CIBIO, University of Porto, Portugal. 2017 theme was Bio-logging.

In 2016, I was responsible for the advanced course held at CIBIO, University of Porto, Portugal, on *Bio-logging: Developing sensors and loggers for behavioral and ecological applications*, which encompassed all steps necessary to design, build, and use bio-logging tools.

In 2009 and 2010, I was responsible for the advanced course held at CIBIO, University of Porto, Portugal, on *Introduction to data processing and analysis in R*, introducing graduates and postgraduates to the R programming language on a practical course focused on data manipulation and analysis.

In 2001 and 2002, I was instructor in a practical course at the University of Porto, Portugal, introducing undergraduates to the diversity and natural history of marine invertebrates.

Committee member

Institutional Animal Care and Use Committee (IACUC) at CIBIO/BIOPOLIS (2016 - Present).
Committee member.

Marco Sannolo (2019), Reptiles under the sun: using lacertid lizards to study thermal and water ecology in ectotherms. *Committee member on PhD defense*, University of Porto.

Ricardo Piazza Meireles (2013), Marine Paleo-ecological and depositional processes on the shallow-waters of the Azores Archipelago: The mobile Ostracoda (Crustacea) and the sessile Bryozoa as case studies. *Committee member on PhD defense*, Universidade dos Açores.

Collaboration network

Invited member of the International Association for Biological Oceanography (IABO, <http://www.iabo.org/>) (2019).

Invited member of the Arctic Biodiversity Observation Network (ARCBON) (2024).

Funder of WE-LOG: A collaborative global network of coastal temperature sensors. Officially founded at ITRS (2019), Hong Kong.

Invited member of the **Marine Biodiversity Observation Network Pole to Pole of the Americas (MBON Pole to Pole)** (2018), São Sebastião, Brazil.

Local host of the **EU COST** action CA15121, Workshop on Mapping ocean variability and ocean refugia (2019). CIBIO, Porto, Portugal.

Invited member of the **EU COST** action CA15121, Workshop on Climate change implications on marine conservation (2018). Israel Oceanographic and Limnological Research, Haifa, Israel.

Invited member of the **EU COST** action CA15121, Workshop on climate change impacts (2017). COST Offices, Brussels, Belgium.

Funding member of **INSHORE**, International Network for the Study of Rocky Intertidal Ecosystems (2014), Hong Kong.

Graduate and postdoctoral advisors

David S. Wethey (Postdoctoral research advisor, University of South Carolina, USA)

António M. Santos (PhD co-supervisor, University of Porto, Portugal)

Stephen J. Hawkins (PhD co-supervisor, The Marine Biological Association of the UK, UK)

Peer-reviewing experience

Reviewer profile at Publons: <https://publons.com/a/447799>. Reviewed 61 manuscripts for journals including *Nature Communications*, *PNAS* and *American Naturalist*, ranking in the **96st percentile** for verified review contributions on Publons up until February 2022.

Reviewer for the Natural Sciences and Engineering Research Council Canada (NSERC), Research Grants Council (RGC) of Hong Kong, for the National Aeronautics and Space Administration (NASA) Postdoctoral Program (where I acted both as reviewer and as panel member), Scientific

Committee for Oceanic Research (SCOR, <http://www.scor-int.org/>), Israel Science Foundation (ISF), and for Fundação Belmiro de Azevedo/ Fundação para a Ciência e a Tecnologia.

Other Duties, Activities, and Skills

Funder and curator of the website on coastal climate change, www.coastalwarming.com.

Media appearances

"Shore Patrol", November 2, 2023, news piece by April Reese in Science Magazine, <https://doi.org/10.1126/science.adl6586>

Falar Global, July 15th, 2023, CMTV, interviewed by Suely Costa, available at www.youtube.com/watch?v=NFMIM4_7Y-g

"The importance of technological innovation on scientific research", April 2020, *Biosfera*, RTP2, produced by Sílvia Camarinha, Farol de Ideias, available at <https://www.rtp.pt/play/p6689/e465045/biosfera> at minute 12:00

"Termómetros low cost - Rede de Observação da Temperatura Costeira e da Biodiversidade do Atlântico", June 30th, 2022, National magazine *Visão*, pp 37.

"Rubrica Vida Animal", July 24th, 2010, *Bom dia Portugal*, RTP1.

Technical courses attended

Applied Remote Sensing Training Program. J Torres-Pérez, A McCullum. NASA online training course, 2020.

5th ESA Advanced Training on Ocean Remote Sensing and Synergy. Y-L Desnos, C Donlon, J. Silva, University of Porto, Portugal, 2017.

Spatial Analysis in Macroecology (SAM) Workshop, J. F. Diniz-Filho and T. B. Rangel, International Biogeography Society, 2007.

Specialization Course in Principles of Modelling Geostatistical Data, K. Krivoruchko (ESRI), University of Girona, Spain, 2005.

Advanced Course in Geographic Information Systems, University of Porto, 2004.

Scuba Diving Course, Amigos do Mar, Viana do Castelo, 2002.

Research Cruises

LUSO2009: Participation in the research cruise to the Great Meteor, Small Meteor, Hyeres and Tyros seamounts, in the Mid-Atlantic Ridge. Coordination by EMEPC - Task Group for the Extension of the Portuguese Continental Shelf, Ship: NRP Almirante Gago Coutinho, Sep-Oct 2009.

Languages

English (Fluent), Spanish (Good), French (Fair) and Portuguese (Native).