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BIOGRAPHY AND RESEARCH INTERESTS

Motivated **research scientist** trained in **autonomous oceanography** and statistical analyses of ocean data. Highly effective at using **Matlab** to integrate and map **large datasets** with data from different sources (**autonomous vehicles, ocean observatories, remote sensing, ships**) to evaluate temporal/spatial patterns and variability in **environmental controls** driving climatic changes, focusing on **biophysical interactions** and the **biological carbon pump**. Interested in understanding how **water column dynamics** affect **phytoplankton** and the consequent **carbon export**. Currently I use high resolution data from gliders to look at **mixed layer depth dynamics** and the role it plays in controlling the phytoplankton population, with a large focus in **polar ecosystems**. Exceptional interpersonal, communication and multitasking abilities, field experience, with multiple peer-reviewed publications in specialty journals, presentations at conferences as well as lectures and training to college and graduate level students.

EDUCATION

- 2017 **PhD**, Oceanography, Rutgers University, United States.
Coupled physical and phytoplankton dynamics in coastal Antarctica
- 2009 **MS** (no thesis, Specialized Studies), Integrated Ocean Studies, University of the Azores, Portugal
- 2009 **MS**, Fisheries and Aquaculture, University of Lisbon, Portugal.
Morphology of Fish Eggs: a comparative method for different salinities and preservatives
- 2007 **LIC** (Pre-Bologna), Environmental Marine Biology, University of Lisbon, Portugal

PROFESSIONAL APPOINTMENTS

- 2020 - Research Scientist, National Oceanography Centre (UK)
- 2017- 2020 Postdoc in Biogeochemistry and Autonomous Vehicles, National Oceanography Centre (UK)
- 2017 Postdoctoral Research Associate, Rutgers University (USA)
- 2011-2017 Teaching/Research Assistant, Rutgers University (USA)
- 2009-2011 Research Assistant, University Azores (Department of Oceanography and Fisheries, PT)

FUNDING/ PROJECTS

- 2021-2024 H2020 TechOceanS (Res Co-I). €9M
- 2018-2020 NERC GPSF, BIARRITZ (Res Co-I). £83k
- 2015-2017 Teledyne Graduate Research Fellowship, 2 years
- 2011-2015 Foundation for Science and Technology (FCT, PT), Doctoral Fellowship, 4 years
- 2009 Luso-American Foundation (FLAD) Saldanha/Tenore Fellowship, 3 months

AWARDS, HONORS

- 2019 National Oceanography Centre Directorate for Science and Technology Early Career Award for Science
- 2018, 2019 National Oceanography Centre 'Over and Beyond' contribution Bonus (Feb'18, Mar'18, Mar'19)
- 2019 Ocean Obs'19 Travel Grant Award
- 2017 Graduate School of New Brunswick Travel Grant Award
- 2016 NSF Scientific Committee on Antarctic Research OSC Travel Grant Award
- 2011 Antarctic Service Medal
- 2010 European Meteorological Society Young Scientist Award

SELECTED PUBLICATIONS ([Google Scholar Profile](#); *student)

- Carvalho**, Gorbunov, Oliver, Haskins, Aragon, Kohut, Schofield (2020). FIRE glider: Mapping *in situ* chlorophyll variable fluorescence with autonomous underwater gliders. *Limnol Oceanogr Methods*. doi: [10.1002/lom3.10380](https://doi.org/10.1002/lom3.10380).
- Carvalho**, Fitzsimmons, Couto, Waite, Gorbunov, Kohut, Oliver, Sherrell, Schofield (2020). Testing the Canyon Hypothesis: Evaluating light and nutrient controls of phytoplankton growth in penguin foraging hotspots along the West Antarctic Peninsula. *Limnol Oceanogr*. doi: [10.1002/lno.11313](https://doi.org/10.1002/lno.11313).
- *Cryer, **Carvalho**, Wood, Strong, Brown, Loucaides, Young, Sanders, Evans (2020). Evaluating the sensor-equipped autonomous surface vehicle C-Worker 4 as a tool for identifying coastal ocean acidification and changes in carbonate chemistry. *J. Mar. Sci. Eng*. doi: [10.3390/jmse8110939](https://doi.org/10.3390/jmse8110939).
- Laber, Hunter, **Carvalho**, Collins, Schieler, et al. (2018). Coccolithovirus stimulation of carbon export in the North

Atlantic. *Nature Microbiology*. doi:[10.1038/s41564-018-0128-4](https://doi.org/10.1038/s41564-018-0128-4).

- Carvalho**, Kohut, Oliver, Schofield (2017). Defining the ecologically relevant mixed-layer depth for Antarctica's coastal seas, *Geophys. Res. Lett.* doi:[10.1002/2016GL071205](https://doi.org/10.1002/2016GL071205).
- Schofield, Saba, Coleman, **Carvalho**, Couto, Ducklow, Finkel, Irwin, Kahl, Miles, Montes-Hugo, Stammerjohn, Waite (2017). Decadal variability in coastal phytoplankton community composition in a changing West Antarctic Peninsula, *Deep Sea Res Part 1 Oceanogr Res Pap.* doi: [10.1016/j.dsr.2017.04.014](https://doi.org/10.1016/j.dsr.2017.04.014).
- Kohut, Kustka, Hiscock, Lam, Measures, Milligan, White, **Carvalho**, Hatta, Jones, Ohnemus, Swartz (2017). Mesoscale variability of the summer bloom over the northern Ross Sea shelf: A tale of two banks, *Journal of Marine Systems*, 166, 50-60. doi: [10.1016/j.jmarsys.2016.06.009](https://doi.org/10.1016/j.jmarsys.2016.06.009).
- Carvalho**, Kohut, Oliver, Sherrell, Schofield (2016). Mixing and phytoplankton dynamics in a submarine canyon in the West Antarctic Peninsula, *J. Geophys. Res. Oceans*, doi:[10.1002/2016JC011650](https://doi.org/10.1002/2016JC011650).
- Carvalho**, Kohut, Gorbunov, Schofield, Oliver (2016). Mapping Antarctic phytoplankton physiology using autonomous gliders. OCEANS 2016 MTS/IEEE Monterey. doi: [10.1109/OCEANS.2016.7761193](https://doi.org/10.1109/OCEANS.2016.7761193).
- Yi, Glenn, **Carvalho**, Jones, Kohut, McDonnell, Miles, Seroka, Schofield (2019). Chapter 8 - Glider Technology Enabling a Diversity of Opportunities with Autonomous Ocean Sampling. In Delory & Pearlman (Eds.), *Challenges and Innovations in Ocean in Situ Sensors*. Elsevier. doi: [10.1016/B978-0-12-809886-8.00008-9](https://doi.org/10.1016/B978-0-12-809886-8.00008-9).

SELECTED INVITED SEMINARS/LECTURES

- Upper ocean dynamics and the biological carbon pump seen from the eyes of underwater gliders. Virginia Institute of Marine Sciences, USA (2020)
- Observing ocean biogeochemistry from afar: a remote sensing approach. Uni. of Southampton, UK (2019)
- Variability in the biological carbon pump. CSIR, South Africa (2018)
- Mixing and phytoplankton dynamics in Antarctica's coastal seas. British Antarctic Survey, UK (2016)
- *RUCOOL glider applications*. PLOCAN Glider School. Gran Canaria, Spain (2015, 2016)
- Mixing and phytoplankton dynamics in Antarctica's coastal seas. University of East Anglia, UK (2016)
- Using gliders to map phytoplankton dynamics in submarine canyons. Teledyne Webb Research, USA (2015)

SELECTED ORAL PRESENTATIONS and POSTERS (P=poster)

- Biological Carbon Pump through the “eyes” of multiple high-resolution gliders. Ocean Sciences Meeting, 2020
- Insights on the Biological Carbon Pump from high-resolution glider measurements. 8th EGO Meeting and International Glider Workshop. USA, 2019
- Mapping Antarctic phytoplankton physiology using autonomous gliders. Ocean Optics XXIV. Croatia, 2018
- Coupled physical and phytoplankton dynamics in Antarctic coastal seas. Polar Marine Science GRC, 2017 (P)
- Mixing and phytoplankton dynamics in Antarctica's coastal seas. XXXIV SCAR OSC. Malaysia, 2016.
- Impact of canyon dynamics on the spring phytoplankton bloom. Ocean Optics XXII. USA, 2014

RELEVANT TEACHING EXPERIENCE

- 2018 Instructor, Biogeochemistry Summer School, National Oceanography Centre, UK
- 2017, 2019 Invited Lecturer, Biological Oceanography, University of Southampton, UK
- Spring 2017 Instructor, Scientific Diving - AAUS (11:628:306), Rutgers University, USA
- 2015, 2016 Lecturer, PLOCAN Glider School, PLOCAN, Gran Canaria, Spain
- Spring 2016 Assistant Instructor, Scientific Diving - AAUS (11:628:306), Rutgers University, USA
- Spring 2015 Teaching Assistant, Oceanographic Methods and Data Analysis (11:628:364), Rutgers Uni., USA
- 2014 – 2017 Scuba Instructor. Rutgers Scuba program, USA
- Spring 2011 Teaching Assistant, Sea and Laboratory Methods II, University of the Azores

RELEVANT RESEARCH EXPERIENCE/WORKSHOPS

- 2019 Introduction to Python for oceanographers, Ocean Obs'19, Honolulu, HI, USA
- 2019 IOCCP/Bonus-Integral International training course on a suite of biogeochemical sensors, Sweden
- 2015-2016 PLOCAN Glider School
- 2014 COSEE Gears Professional Development Workshop for Early Career Scientists, Ocean Sciences, Hawaii
- 2010 5th ESA/ENVISAT Earth Observation Summer School Earth System Monitoring & Modelling, ESA, Italy

STUDENTS

- Current students: **Benoit Espinola**, *Observing the biological carbon pump with autonomous underwater vehicles* (PhD 2019-Present, U. Southampton); **Sarah Cryer**, *The role of river flow is regulating ocean acidification in Belizean Coastal waters* (PhD 2018-Present, U. Southampton)

- Graduated students: **Evelyn Byer** (*Temporal evolution of the interior carbon stocks in South Georgia*, MSc 2018, U. Southampton).

FIELD EXPERIENCE

7 cruises (3+ weeks) conducting glider operations, CTD and water sampling from biogeochemistry, primary productivity, optical profiling (AC9, PRR, Hyperpro, LISST Holo, ECO triplet), experimental incubations; Scientific diver/lead diver on multiple projects; Glider operations from small and large vessels for multiple projects (Azores, Mid Atlantic Bight, Southern Ocean, West Antarctic Peninsula, Ross Sea, Benguela)

- 2018 **RRS Discovery**, Southern Ocean. *CUSTARD 1* cruise, 3 weeks (Optics leader)
- 2018 **RRS Discovery**, Benguela. *COMICS 2* cruise, 6 weeks
- 2018 **RV Mirabilis**, Benguela, *Hake MOM1802* cruise, 3 weeks (Glider leader)
- 2017 **RRS Discovery**, South Georgia. *COMICS 1* cruise, 6 weeks
- 2017 **Espegrend Marine Research Field Station**, Norway. *MesoHux*. Dive operations involving sediment traps recovery, water column optics and water sampling. 3+ weeks (Dive leader/Dive Safety Officer)
- 2015 **ARSV Laurence M. Gould**, West Antarctic Peninsula. *PAL-LTER* cruise, 4+ weeks
- 2014 **R/V Joanne Daiber**, Delaware River. Dye Experiment (Philadelphia Water Department). 1 week
- 2014 **ARSV Laurence M. Gould**, West Antarctic Peninsula. *PAL-LTER* cruise, 4+ weeks
- 2013 **Palmer Station, Antarctica**. *PAL-LTER* cruise, 3+ months (Phytoplankton leader)
- 2012 **R/V Knorr**, North Atlantic. *NA-VICE* cruise, 5 weeks (Glider leader)
- 2011 **R/V Nathaniel B. Palmer**, Ross Sea, Antarctica. *SEAFARERS* cruise, 7 weeks
- 2010 **DOP**, Faial, Portugal. *INVASORAS*. Exploration/scientific dives to detect invasive algae. 3 months

COMMUNITY SERVICE INVOLVEMENT

- National Oceanography Centre Science & Technology Strategy Committee (2020 – Present);
- National Oceanography Centre Arctic Cross-Cutting Theme leader (2020 – Present);
- Outreach at Bluedot Festival, UK (2018, 2019) and Science Uncovered, UK (2017);
- Association of Polar Early Career Scientists (APECS) Portugal Executive Committee (2015-2019);
- APECS Portugal outreach coordinator (2015-2017);
- 4-H Climate & Environmental Change Teen Summit, USA (2014-2017);
- Manuscript reviewer for *Journal of Geophysical Research: Oceans*, *Geophysical Research Letters*, *Scientific Reports*, *Limnology and Oceanography*, *Journal of Marine Systems*, *Antarctic Science* and *Acta Oceanologica Sinica*.