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Bia Villas Bôas

Education

2014–2020 | **Ph.D. in physical oceanography**, Scripps Institution of Oceanography.

2012–2014 | **MSc. in physical oceanography**, University of São Paulo.

2007–2011 | **BSc. in physics**, Federal University of Rio Grande do Norte.

Research Experience

2020 | **Postdoctoral Researcher - SIO**
My postdoc at Scripps focuses on understanding the role of surface waves in modulating signals detected by the upcoming SWOT mission and evaluating how surface waves can be used to improve understanding of upper ocean currents.

2014–2020 | **Graduate Student Researcher - SIO**
Dissertation title: ***Wind, wave, and current interactions***. Advisors: Sarah Gille, Matthew Mazloff, and Bruce Cornuelle.

2012–2014 | **Graduate Student Researcher - IOUSP**
Thesis title: ***The contribution of mesoscale eddies to the surface heat budget in the South Atlantic***. Masters student at the Oceanographic Institute of the University of São Paulo (IOUSP) working on air–sea interactions at mesoscales.

2013 | **Visiting Research Student - LEGOS**
Visiting masters student at the *Laboratoire d'Etudes en Géophysique et Océanographie Spatiales (LEGOS)*, Toulouse, France, under the supervision of Dr. Alexis Chaigneau. This project focused on the identification of mesoscale eddies and eddy dynamics.

2011 | **Undergraduate Student Researcher - UFRN**
Undergraduate student researcher at the Federal University of Rio Grande do Norte (UFRN) working on the dynamics of well-mixed estuaries.

Fellowships and Awards

2018 | **Fellow of the Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons Program** – The Kavli Institute for Theoretical Physics, University of California, Santa Barbara.

2017 | **NASA Earth and Space Science Graduate Fellowship** – Awarded by the National Aeronautics and Space Administration.

2017 | **Outstanding Mentor Award** – Awarded by Scripps Institution of Oceanography for guidance, leadership, and unwavering commitment to helping fellow students.

2017 | **French-American Doctoral Exchange Program** (FADEX-O) Laureate– Awarded by the Embassy of France in the US.

2014 | **T.R. and Edith Folsom Endowed Graduate Fellowship Fund** – Awarded by Scripps Institution of Oceanography.

2013 | **Research Internships Abroad Fellowship** (BEPE) – Awarded by the São Paulo Research Foundation (FAPESP).

2012 | **Master's Research Fellowship** – Awarded by the São Paulo Research Foundation (FAPESP).

2012 | **Best Honors Thesis** – Awarded by the Federal University of Rio Grande do Norte (UFRN).

Teaching and Mentoring

Fall 2020 | **Assistant** – SIOC 221A: *Analysis of Physical Oceanographic Data* (`https://github.com/biavillasboas/SIO221A`), UC San Diego (remote).

Summer 2020 | **Instructor** – Software Carpentry workshop for the Scripps SURF program, UC San Diego (remote).

2019 | **Programming with Python** – School of Global Policy and Strategy, UC San Diego.

2019 | **"An impractical guide to surfing surface waves"** – Guest lecturer for SIO 90, UC San Diego.

2017 - Present | **Software and Data Carpentry Instructor** – Certified Software and Data Carpentry Instructor. I have taught several Carpentries workshops for a broad range of audiences, including the Scripps Undergraduate Research Fellowship (SURF) and the UC San Diego Library.

2018-present | **Luke Colosi** – Co-advisor (with Sarah Gille), UC San Diego.

2017–2020 | **Roger Wu** – Co-advisor (with Sarah Gille), UC San Diego.

2010 | **Linear Algebra** – Teaching assistant for linear algebra, Federal University of Rio Grande do Norte, Natal, Brazil.

2009 | **Calculus II** – Teaching assistant for calculus II, Federal University of Rio Grande do Norte, Natal, Brazil.

Service

2020 | **Ad hoc panelist for funding agency** – Panel reviewer for the National Aeronautics and Space Administration (NASA), Washington, DC.

2020 | **Student committee member** – Served as a member of the student committee for the air-sea interaction modeling faculty search at Scripps Institution of Oceanography and the Mechanical and Aerospace Engineering department at UC San Diego.

2020 | **Session convener** – Convener of "*Wave Breaking in Ocean-Atmosphere Exchanges*" at the Ocean Sciences Meeting, La Jolla, CA.

2018 **Session convener** – Convener of "*Integrated Observations and Modeling of Surface Currents, Waves, and Winds*" at the AGU Fall Meeting, Washington, DC.

2016–present **Ad hoc referee for scientific journals** – Reviewer for the Journal of Physical Oceanography, the Journal of Geophysical Research, Geophysical Research Letters, and Remote sensing of Environment.

2016–present **Outreach** – Help lead various outreach activities at Scripps' Hydraulics Laboratory running demos in the wave tank.

2016–present **Peer-mentor** – Mentor for first-year PhD. students as part of the peer-mentor program at Scripps Institution of Oceanography, UC San Diego.

2016 **Student committee member** – Served as a member of the student committee for the observational physical oceanography faculty search at Scripps Institution of Oceanography.

Publications

Peer-Reviewed Articles

Ana B. Villas Bôas, Sarah T. Gille, Matthew R. Mazloff, Bruce D. Cornuelle, and Fabrice Ardhuin. Wave-current interactions at meso and submesoscales: Insights from idealized numerical simulations. *Journal of Physical Oceanography*, 2020b. doi: 10.1175/JPO-D-20-0151.1

Ana B. Villas Bôas and W. R. Young. Directional diffusion of surface gravity wave action by ocean macroturbulence. *Journal of Fluid Mechanics*, 890:R3, 2020. doi: 10.1017/jfm.2020.116

Sophia Merrifield, Eric Terrill, Travis Schramek, Sean Celona, **Ana B. Villas Bôas**, and Patrick Colin. Typhoon-forced waves around a western pacific island nation. *Oceanography*, 33, 2019. doi: 10.5670/oceanog.2019.411

Ana B. Villas Bôas, Fabrice Ardhuin, Ernesto Rodriguez, Christine Gommenginger, et al. Integrated observations of global surface winds, currents, and waves: requirements and challenges for the next decade. *Frontiers in Marine Science*, 2019a. doi: 10.3389/fmars.2019.00425

Ana B. Villas Bôas, Sarah T. Gille, Matthew R. Mazloff, and Bruce D. Cornuelle. Characterization of the deep water surface wave variability in the California Current Region. *Journal of Geophysical Research: Oceans*, 122(11):8753–8769, 2017. ISSN 2169-9291. doi: 10.1002/2017JC013280

Ana B. Villas Bôas, Olga T Sato, Alexis Chaigneau, and Guilherme P Castelão. The signature of mesoscale eddies on the air-sea turbulent heat fluxes in the South Atlantic Ocean. *Geophysical Research Letters*, 42(6):1856–1862, 2015. doi: 10.1002/2015GL063105

Guilherme P Castelão, Luiz C Irber, and **Ana B. Villas Bôas**. An objective reference system for studying rings in the ocean. *Computers & Geosciences*, 61:43–49, 2013. doi: 10.1016/j.cageo.2013.07.004

Yao Yu, David Sandwell, Sarah Gille, and **Ana B. Villas Bôas**. Assessment of ICESat-2 for the recovery of ocean topography. *Accepted, Geophysical Journal International.*, 2021

Luke V. Colosi, **Ana B. Villas Bôas**, and Sarah T. Gille. The seasonal cycle of significant wave height: Local vs. remote forcing. *Submitted to Journal of Geophysical Research - Oceans.* doi: doi.org/10.1002/essoar.10506029.1

White Papers

Christopher Erdmann, Natasha Simons, Reid Otsuji, Stephanie Labou, Ryan Johnson, Guilherme Castelão, **Ana B Villas Bôas**, et al. Top 10 fair data software things. `http://doi.org/10.5281/zenodo.2555498`, 2019

S. T. Gille, R. Abernathey, T. Chereskin, B. Cornuelle, P. Heimbach, M. Mazloff, C. Rocha, S Soares, M. Sonnewald, **Ana B Villas Bôas**, et al. Open code policy for NASA Space Science: A perspective from NASA-supported ocean modeling and ocean data analysis. White paper submitted in support of National Academies study on *Open Source Software Policy Options for NASA Earth and Space Sciences,* `https://www.nap.edu/resource/25217/whitepapers/pdf/41_GilleSarahT.pdf`, 2018

Data and Software

Luke V. Colosi. Source code for: "The seasonal cycle of significant waveheight in the ocean: Local vs remote forcing". `https://github.com/lcolosi/WaveClimatology`, 2021

Ana B. Villas Bôas and Guilherme P. Castelão. Data from: "Wave-current interactions at meso and submesoscales: Insights from idealized numerical simulations". `https://doi.org/10.6075/J0X928V6`, 2020

Ana B. Villas Bôas. Source code for: "Wave-current interactions at meso and submesoscales: Insights from idealized numerical simulations". `https://github.com/biavillasboas/IdealizedWaveCurrent`, 2020

Ana B. Villas Bôas. Source code for: "Characterization of the deep water surface wave variability in the California Current region". `https://github.com/biavillasboas/CaliforniaWaveVariability`, 2020

Selected Conference Presentations

Work led by students that I advise are marked with a star.

Ana B. Villas Bôas, Sarah T. Gille, Matthew R. Mazloff, Bruce D. Cornuelle, and Fabrice Ardhuin. Wave-current interactions at meso and submesoscales: Insights from idealized numerical simulations (talk). Ocean Sciences Meeting, San Diego, 2020a

William Young and **Ana B. Villas Bôas**. Diffusion of surface gravity waves by submesoscale turbulence at the sea surface (talk). Ocean Sciences Meeting, San Diego, 2020

Luke Colosi*, **Ana B. Villas Bôas**, and Sarah T. Gille. The seasonal cycle of significant wave height: Local vs. remote forcing (poster). Ocean Sciences Meeting, San Diego, 2020

Ana B. Villas Bôas. Wind, wave, and current interactions (**invited talk**). US CLIVAR - Surface Currents in the Coupled Ocean-Atmosphere System, La Jolla, 2020

Ana B. Villas Bôas, Weiguang Wu*, and Sarah T. Gille. Upper-ocean response to alongshore winds off the California coast (talk). International Ocean Vector Winds Science Team Meeting, Portland, ME, 2019d

Ana B. Villas Bôas, Fabrice Ardhuin, et al. Upper-ocean response to alongshore winds off the California coast (talk). SWOT Science Team Meeting, Bordeaux, France, 2019b

Ana B. Villas Bôas, Sarah T. Gille, Matthew R. Mazloff, Bruce D. Cornuelle, Donata Giglio, Shang-Ping Xie, et al. Wind, wave, and current interactions from CFOSAT: Processes in the california current region (**invited talk**). CFOSAT Science Team Meeting, Brest, France, 2019c

Ana B. Villas Bôas, Sarah T. Gille, Matthew R. Mazloff, and Bruce D Cornuelle. The surface wave variability in the California Current region: Potential implications for SWOT (talk). SWOT Science Team Meeting, Toulouse, France, 2017

Computational Skills

Operating Systems	Unix-based operating systems and high-performance computing (HPC) environments (Pleiades - NASA and Datarmor - IFREMER).
Programming Languages	Python, Bash, Shell-Script, R, Fortran, and MatLab.
Tools and Software	Jupyter notebooks, workflow management with Ansible and Makefile, version control systems (Git, Mercurial).
Numerical Modeling	WaveWatch III framework.

Languages

Portuguese:	Native language
English:	Full proficiency
Spanish:	Professional working proficiency
French:	Limited working proficiency