Gustavo M. Marques

CONTACT

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EMPLOYMENT

*** Project Scientist I** **Jun 2017 - present**
Oceanographic Section of the Climate & Global Dynamics division, National Center for Atmospheric Research

*** Postdoctoral Research Associate** **Jul 2015 - Jun 2017**
Program in Atmospheric and Oceanic Sciences, Princeton University / Geophysical Fluid Dynamics Laboratory

EDUCATION

*** PhD in Meteorology & Physical Oceanography** **Sep 2010 - May 2015**

Rosenstiel School of Marine & Atmospheric Science, University of Miami

Dissertation title: *On the processes controlling Antarctic dense shelf water outflows*

Advisor: Dr. Tamay M. Özgökmen

*** M.Sc. in Physical Oceanography** **Sep 2007 - May 2010**

School for Marine Science and Technology, University of Massachusetts Dartmouth

Thesis title: *Secondary Flow Associated with Transient Tidal Eddy Motion in the Western Gulf of Maine*

Advisor: Dr. Wendell S. Brown

*** B.Sc., Oceanography** **Jan 2002- Dec 2006**

Oceanographic Institute of the University of Sao Paulo (IOUSP), Sao Paulo, SP, Brazil

Thesis title: *Assessment of the Toxicity Field of Santos/Sao Vicente Sewage Outfall between Hydrodynamic Dispersion Models Coupled with an Empirical Ecotoxicological Model*

Advisor: Dr. Joseph Harari

PEER-REVIEWED PUBLICATIONS

- Stern, A., A. Adcroft, O. Sergienko, and **G. Marques¡**, (2017). Modeling tabular icebergs submerged in the ocean. *Journal of Advances in Modeling Earth Systems* (accepted).
- **Marques, G.**, M. G. Wells, L. Padman, and T.M. Özgökmen, (2017). Flow splitting in numerical simulations of oceanic dense-water outflows. *Ocean Modelling*, 113, 66-84, doi:10.1016/j.ocemod.2017.03.011.
- **Marques, G.** and T.M. Özgökmen, (2014). On Modeling Turbulent Exchange in Buoyancy-Driven Fronts. *Ocean Modelling*, 83, pp. 43-62, doi:10.1016/j.ocemod.2014.08.006.
- **Marques, G. M.**, L. Padman, S. R. Springer, S. L. Howard, and T. M. Özgökmen (2014). Topographic vorticity waves forced by Antarctic dense shelf water outflows, *Geophys. Res. Lett.*,

41, doi:10.1002/2013GL059153.

- Brown, W.S. and **Marques, G.**, (2012). Tidal eddy motions in the western Gulf of Maine, Part 1: Primary Structure. *Continental Shelf Research*, doi:10.1016/j.csr.2012.08.018.
- **Marques, G.** and Brown, W.S., (2012). Tidal eddy motions in the western Gulf of Maine, Part 2: Secondary Flow. *Continental Shelf Research*, doi:10.1016/j.csr.2012.02.008.

Teaching

- Lectured, Ocean Physics for Climate, GEO-425, Princeton University, Fall 2015.
- Workshop, Introduction to the Regional Ocean Modeling System (ROMS). University of Miami, Fall 2013.
- Lectured, Atmospheric and Oceanic Turbulence, RSMAS/MPO-664. University of Miami, Fall 2013.
- Lectured, Geophysical Fluid Dynamics I, RSMAS/MPO-511. University of Miami, Fall 2011, 2012 and 2013.
- Teaching Assistant, Survey of Oceanography, MSC-101. University of Miami, Fall 2012.
- Teaching Assistant, Numerical Methods in Fluid Dynamics, RSMAS/MPO-662. University of Miami, Fall 2011.

Honors and Awards

- Earned a scientific initiation scholarship from the Foundation for Research Support of the State of São Paulo (FAPESP), 2006.

Experience at sea (summary)

- Cruises around São Paulo and Rio de Janeiro, Brazil. Observation of physical, biological, geological and chemical properties.
- Coastal cruises around Massachusetts, USA. Observation of physical properties.
- Cruise around Florida, USA. Observation of physical properties.
- Instruments deployed: glider, CTD, ADCP, rosette, Niskin and Nansen bottles, fluorometer, plankton net, Van Veen grab, box-corer, fish net, moorings and side-scan sonar. Total of approximately 21 days at sea.

Oral Presentations

- **Marques, G.**, M., Sergienko, A., Harrison, O., Adcroft A., and Hallberg R., 2018. An idealized framework to study interactions between ocean, sea ice and ice shelves. COMMODORE Workshop, Paris, France.
- **Marques, G.**, 2018. New developments in ocean models since CMIP5. ISMIP6 Workshop, Sassenheim, Netherlands.
- **Marques, G.**, and others, 2018. Improving vertical mixing parameterizations in MOM6. 23rd Annual CESM Workshop, Boulder - CO, USA.
- **Marques, G.**, Stern, A., Harrison, M., Sergienko, O., Adcroft A., and Hallberg, R., 2018. The impact of wind forcing on sub-ice-shelf melting and circulation. Rising Coastal Seas on a Warming Earth III, Abu Dhabi, United Arab Emirates.
- **Marques, G.**, Stern, A., Harrison, M., Sergienko, O., Adcroft A., and Hallberg, R., 2018. The impact of sub-ice-shelf melting on sea-ice formation under different atmospheric forcing. Ocean Science Meeting, Portland - OR, USA.
- **Marques, G.**, and others, 2018. Coupling MOM6 into CESM: Progress, challenges, and next steps. CESM Ocean Model Working Group Meeting, Boulder - CO, USA.
- **Marques, G.**, Stern, A., Harrison, M., Sergienko, O., Adcroft A., and Hallberg, R., 2017. Sensitivity of sub-ice-shelf melting to changes atmospheric forcing. Regional Sea Level Changes

and Coastal Impacts, 2017, New York - NY, USA.

- **Marques, G.**, Stern, A., Harrison, M., Sergienko, O. and Hallberg, R., 2017. The effects of sub-ice-shelf melting on dense shelf water formation and export in idealized simulations of Antarctic margins. EGU, 2017, Vienna, Austria.
- **Marques, G.**, 2017. Processes controlling bottom water formation and sub-ice-shelf melting in idealized simulations of Antarctic margins. Center for Coastal Physical Oceanography, Old Dominion University, Norfolk - VA, USA.
- **Marques, G.**, Harrison, M., Sergienko, O. and Hallberg, R., 2016. Changes in bottom water formation in the western Ross Sea due to the melting of ice shelves in West Antarctica. Rising Coastal Seas on a Warming Earth II, Abu Dhabi, United Arab Emirates.
- **Marques, G.**, L. Padman and Özgökmen, T.M., 2016. Flow Splitting in Numerical Simulations of Oceanic Dense-Water Outflows. Ocean Science Meeting, New Orleans - LA, USA.
- **Marques, G. M.**, L. Padman, S. R. Springer, S. L. Howard, and T. M. Özgökmen, 2014. Topographic vorticity waves forced by Antarctic dense shelf water outflows. Ocean Science Meeting, Honolulu - HI, USA.
- **Marques, G.** and Özgökmen, T.M., 2012. On modeling the turbulent exchange in buoyancy-driven fronts. ROMS/TOMS User Workshop, Rio de Janeiro, Brazil.
- **Marques, G.** and Özgökmen, T.M., 2012. Lagrangian Coherent Structures Introduced by Overflows. LAPCOD V, Miami Beach - FL, USA.
- **Marques, G.** and Brown, W.S., 2010. Transient Tidal Eddy Motion and Associated Secondary Flow in the Western Gulf of Maine. Graduate School of Oceanography, University of Rhode Island, USA.

Poster Presentations

- **Marques, G.**, L. Padman and Özgökmen, T.M., 2013. Idealized Numerical Model Simulations of AABW Production in the NW Ross Sea: Sensitivity to Grid Resolution, Mixing Models and Background Stratification. In: Gordon Research Conference on Coastal Ocean Circulation, Biddeford, ME, USA.
- **Marques, G.**, and Özgökmen, T.M. (2011). Comparing mixing and coherent turbulent features using an OGCM and a non-hydrostatic spectral element model. In: Coastal Modeling Summer School, University of Toulon in La Londe des Maures, France.
- **Marques, G.**, and Brown, W. S. (2010). Secondary Circulation Associated with Strong Tidal Flow in the Western Gulf of Maine. In: 2010 Ocean Sciences Meeting, Portland, Oregon, USA.
- **Marques, G.**, and Brown, W. S. (2009). Transient tidal eddy motion in the Western Gulf of Maine: preliminary dynamical results. In: Gordon Research Conference on Coastal Ocean Circulation, New London, NH, USA.
- **Marques, G.**, and Brown, W. S. (2008). Preliminary measurements of the water properties in the western Great South Channel. In: Mid-Atlantic Bight Physical Oceanography and Meteorology Meeting 2008, Woods Hole, Massachusetts, USA.
- **Marques, G.** and Harari, J. (2006). Assessment of the near field associated with the Santos sewage outfall using a non-hydrostatic model and fecal coliform analysis. In: III Brazilian Symposium of Oceanography, Brazil.

Courses and Workshops

- *Using Satellite Observations to Advance Climate Models*, Keck Institute for Space Studies, California Institute of Technology, Pasadena - CA , Aug 31-Sep 4, 2015.
- *Summer School in Fluid Dynamics of Sustainability and the Environment*, Department of Applied Mathematics and Theoretical Physics at the University of Cambridge, UK, Sep 1-12, 2014.
- *All Hands Meeting/Tutorials*, Consortium for Advanced Research on Transport of Hydrocarbon in the Environment, Miami - FL, May 29-31, 2013
- *ROMS/TOMS User Workshop*, Rio de Janeiro, Brazil, Oct 22-25, 2012.

- *Coastal Modeling Summer School* organized by the CNRS and University of Toulon in La Londe des Maures, France, Sep 18-23, 2011.
- *Glider training*, Coastal Ocean Observation Laboratory, Rutgers University - NJ, January 9-11, 2008.
- *Course on physical and biological ocean modeling: Biogeochemical (ROMS-NPZ-PISES) and individual based (IBM) modeling*, Universidad de Concepcion, Dichato, Chile, Jul 03-14, 2007, (SACC - CRN Scholarship).
- *Modeling the ocean in the climate system*, Dr. William George Large. III Brazilian Symposium of Oceanography, Brazil. Dec 04-08, 2006.

Professional Activities

Reviewer for Ocean Modeling, Journal of Physical Oceanography, Deep Sea Research, Ocean Science, Journal of Advances in Modeling Earth Systems, Earth and Planetary Science Letters and National Science Foundation.

Member of the American Geophysical Union, 2009-present.

Languages

Portuguese: native; English: fluent; Spanish: conversational level.

Last update: May 2, 2019