

# Cesar B. Rocha

## Curriculum Vitae

MS 29, 266 Woods Hole Road  
Woods Hole, MA 02543  
✉ crocha@whoi.edu  
🌐 www.cbrocha.com  
📞 crocha700

*Last Updated: April 5, 2019*

### Profile

I'm a physical oceanographer concerned with upper-ocean dynamics and the impact of fine-scale processes—such as eddies and fronts and internal waves—on climate. I have 8+ years of experience in data analysis, development of mathematical theories, implementation of computer models, and science writing. I'm also interested in education and open source/data/science.

### Profesional preparation

- 2018 **Ph.D.**, *Physical Oceanography*.  
Scripps Institution of Oceanography, University of California San Diego.
- 2013 **M.S. (w/ honors)**, *Physical Oceanography*.  
University of São Paulo, Brazil.
- 2011 **B.S. (w/ honors)**, *Oceanography*.  
University of São Paulo, Brazil.

### Employment History

- Current **Postdoctoral Scholar**.  
Woods Hole Oceanographic Institution.
- 2016–2018 **Graduate Writing Consultant**.  
Writing + Critical Expression Hub, University of California San Diego.  
Supervisor: Matthew Nelson.
- 2013–2018 **Graduate Student Researcher**.  
Scripps Institution of Oceanography, University of California San Diego.  
Advisor: William R. Young.

### Achievements

#### Fellowships

- 2018 WHOI Postdoctoral Fellowship, Woods Hole Oceanographic Institution.
- 2016 NASA Earth and Planetary Sciences Graduate Fellowship.
- 2015 Geophysical Fluid Dynamics Fellowship, Woods Hole Oceanographic Institution.
- 2011 Master's Research Fellowship, Fundação de Amparo à Pesquisa do Estado de São Paulo.
- 2010 Undergrad Research Fellowship, Fundação de Amparo à Pesquisa do Estado de São Paulo.

## Honors

2011 Best Honors Thesis, Oceanographic Institute, University of Sao Paulo

## Other Awards

2017 French-American Doctoral Exchange Program Laureate, Embassy of France in the USA

---

## Publications

### Submitted

- [1] T. Bossy, **C. B. Rocha**, S. G. Llewellyn Smith, and W. R. Young. Improved bounds on horizontal convection. Submitted, Mar. 2019.
- [2] D. C. Napolitano, I. C. A. da Silveira, **C. B. Rocha**, G. R. Flierl, P. H. R. Calil, and R. P. Martins. On the steadiness and instability of the Intermediate Western Boundary Current between 24°S and 18°S. Submitted, Jan. 2019.
- [3] A. Paradise, **C. B. Rocha**, P. Barpanda, and N. Nakamura. Atmospheric blocking statistics in a varying climate: lessons from a ‘traffic jam’ model with pseudostochastic forcing. Submitted, Feb. 2019.

### Published

- [1] T. K. Chereskin, **C. B. Rocha**, S. T. Gille, D. Menemenlis, and M. Passaro. Characterizing the transition from balanced to unbalanced motions in the southern California Current. *Journal of Geophysical Research: Oceans*, Accepted, 2019.
- [2] **C. B. Rocha**, G. L. Wagner, and W. R. Young. Stimulated generation: Extraction of energy from balanced flow by near-inertial waves. *Journal of Fluid Mechanics*, 847:417–451, 2018.
- [3] F. Ardhuin, S. T. Gille, D. Menemenlis, **C. B. Rocha**, N. Rascle, b. Chapron, J. Gula, and J. Molemaker. Small-scale open-ocean currents have large effects on wind-wave heights. *Journal of Geophysical Research: Oceans*, 2017.
- [4] **C. B. Rocha**, W. R. Young, and I. Grooms. On Galerkin approximations of the surface active quasigeostrophic equations. *Journal of Physical Oceanography*, 46(1):125–139, 2016.
- [5] **C. B. Rocha**, S. T. Gille, T. K. Chereskin, and D. Menemenlis. Seasonality of sub-mesoscale dynamics in the Kuroshio Extension. *Geophysical Research Letters*, 43(21), 2016.
- [6] **C. B. Rocha**, T. K. Chereskin, S. T. Gille, and D. Menemenlis. Mesoscale to sub-mesoscale wavenumber spectra in Drake Passage. *Journal of Physical Oceanography*, 46(2):601–620, 2016.
- [7] **C. B. Rocha**, I. C. A. da Silveira, B. M. Castro, and J. A. M. Lima. Vertical structure, energetics, and dynamics of the Brazil Current System at 22 S–28 S. *Journal of Geophysical Research: Oceans*, 119(1):52–69, 2014.
- [8] **C. B. Rocha**, A. Tandon, I. C. A. da Silveira, and J. A. M. Lima. Traditional quasi-geostrophic modes and surface quasi-geostrophic solutions in the Southwestern Atlantic. *Journal of Geophysical Research: Oceans*, 118(5):2734–2745, 2013.

---

## Select Invited Seminars

- 2017 **Laboratoire Météorologie Dynamique Seminar Series**, *École Normale Supérieure*, Paris, France, “Stimulated generation of near-inertial waves”.
- 2017 **Physical Oceanography Seminar Series**, *CICESE*, Ensenada, Mexico, “Stimulated generation of near-inertial waves”.
- 2015 **Oceans and Cryosphere Seminar Series**, *JPL/CalTech*, Pasadena, CA, “Drake Passage wavenumber spectra”.

---

## Select Conference Talks

- 2018 **Ocean Sciences Meeting**, Portland, OR, “Stimulated generation: extraction of energy from balanced flow by near-inertial waves”.
- 2017 **French-American Doctoral Exchange Program, European Institute for Marine Studies**, Brest and Villefranche-sur-Mer, France, “Macroturbulence and internal waves in the upper ocean”.
- 2014 **AGU Fall Meeting**, San Francisco, CA, “Drake Passage upper-ocean spectra”.

---

## Select Poster Presentations

- 2017 **French–American Doctoral Exchange Program, Mediterranean Institute of Oceanography**, Marseille, France, “Stimulated generation of near-inertial waves”.
- 2017 **Munk Symposium on Turbulence, Internal Waves, and the Overturning Circulation of the Ocean**, La Jolla, CA, “Near-inertial waves extract energy from barotropic quasi-geostrophic flow”.

---

## Teaching, Mentorship, and Outreach

- 2019–2019 **Falmouth Public Schools, Science & Engineering Fair**.  
Served as a judge of K-6 and high-school projects.
- 2018–2018 **Thomas Bossy, University of California San Diego**.  
Intern from ENS Lyon (faculty advisor at SIO: William R. Young).  
Mentorship: Co-advised the student on his research project, helping him to set up and run computational simulations of horizontal convection.
- 2015–2016 **Momme Hell, University of California San Diego**, Peer-mentoring program.  
SIO Ph.D student.  
Mentorship: Assisted the student in navigating through the first year of graduate school, helping him tailor his coursework and choose an advisor.
- 2012–2012 **Teaching Assistant for *Oceanografia Dinâmica II*, University of São Paulo**.  
Instructor: Professor Ilson Silveira.  
Tasks: Assisted the instructor in preparing and grading problem sets, quizzes, and exams; taught review sessions and recitations; and held weekly office hours.
- 2010–2011 **Volunteer Physics Instructor, Rede Emancipa de Cursinhos Populares**.  
Tasks: Taught standard lectures of classical mechanics to underprivileged high schoolers, preparing them for college entrance exams; and mentored students interested in STEM careers.

---

## Field work

- 2008-2010 **Célula de Recirculação da Corrente do Brasil na Bacia de Santos (CERES).**  
I participated in four Project CERES cruises in the Brazil Current region, in which I undertook CTD/LADCP watches, and worked on data processing and visualization, and assisted adaptive sampling decisions. During the CERES IV cruise, I oversaw the night shift.
- 2010 **South Atlantic Meridional Overturning Circulation (SAMOC).**  
I participated in the SAM03 SAMOC cruise at 34.5°S in the western Atlantic (Chief scientist: Alberto Piola), and undertook CTD/LADCP watches and assisted with telemetry of C-PIES.

---

## Service

- 2019 **Ad hoc referee for funding agency.**  
*National Science Foundation.*
- 2019 **Ad hoc referee for scientific journals.**  
*Geophysical Research Letters; Journal of Physical Oceanography; Deep-Sea Research I; Journal of Marine Systems.*
- 2018 **Ad hoc referee for scientific journals.**  
*Journal of Geophysical Research–Oceans; Journal of Physical Oceanography; Journal of Atmospheric and Oceanic Technology; Geophysical Research Letters.*
- 2017 **Ad hoc referee for scientific journals.**  
*Journal of Geophysical Research–Oceans; Journal of Physical Oceanography; Journal of Fluid Mechanics.*
- 2017 **Member of student committee.**  
SIO teaching award.
- 2016 **Ad hoc referee for scientific journals.**  
*Deep-Sea Research–I; Journal of Fluid Mechanics; Nature Communications; Journal of Geophysical Research–Oceans; Ocean Modelling; Geophysical Research Letters.*
- 2016 **Member of student committee.**  
SIO faculty search in large-scale observational physical oceanography; SIO teaching award.

---

## Software

The codes are open source, written in Python, and distributed under the MIT license.

- niwqg QG-NIW coupled model in Python, <https://github.com/crocha700/niwqg>
- pyqg Python Quasigeostrophic Model, <http://pyqg.readthedocs.io>
- pyspec Spectral Analysis in Python, <https://github.com/pyspec/pyspec>

---

## Languages

- Portuguese** Native fluency (written and spoken).
- English** Full fluency (written and spoken).
- Spanish** Working proficiency (written and spoken).