

Diego R. Barneche

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RESEARCH INTERESTS

I am a theoretical ecologist who is passionate about making better use of mathematical, statistical and computational tools to develop predictive ecological models and tests. I am currently interested in explaining mechanistically how individual-level determinants of metabolism and stoichiometry affect the fluxes of energy and materials across the world's oceans.

EDUCATION

2011 – 2015. Ph.D. Biological Sciences. Macquarie University, Australia.

2009 – 2011. M.Sc. Ecology. UFSC - Universidade Federal de Santa Catarina, Brazil.

2004 – 2008. B.Sc. Biology. UFSC - Universidade Federal de Santa Catarina, Brazil.

SKILLS

Advanced programming in R; Basic programming in Python and the Shell (bash); Version control in git; Database management in R; Mathematical modeling; Generalized linear models; Linear mixed-effects models; Bayesian statistics; GIS (basics); Multivariate statistics; Rescue and Scientific SCUBA diver (> 200 h).

PROFESSIONAL EXPERIENCE

2014 - Present - Adaptation and aftereffects in perception of tactile motion. Employer: Dr. Tatjana Seizova-Cajic, University of Sydney. **Activity:** Software development.

2012 - 2015 - A Biomass and Allometry Database for Woody Plants. Staff – Employer: Dr. Daniel Falster, Macquarie University. **Activity:** Database management.

2010 - 2011 - SISBIOTA-Mar: Brazilian National Research Network on Marine Biodiversity. Employer: Dr. Sergio R. Floeter, UFSC. **Activity:** Field work and web design.

2007 - Data collection for Eastern Tropical Pacific Fishes Red List Assessment – IUCN. Smithsonian Tropical Research Institute, Panamá. Employer: Conservation International. **Activity:** Database Management.

GRANTS

2014 - Macquarie University Postgraduate Funds: Visit Dr. Boris Worm and Dr. Derek Tittensor at Dalhousie University (Halifax, Canada); attend the GRC/GRS Unifying Ecology Across Scales at University of New England (Biddeford, USA). AUD\$3,851

2013 - IBS Student Award for the International Biogeography Society Early Career Conference 2014 (Canberra, Australia). AUD\$250

- 2012 ISRS Student Award to attend the International Coral Reef Symposium (Cairns, Australia). AUD\$1,000
- 2008 Project: Feeding ecology of Brazilian damselfish *Stegastes fuscus* and its benthic disturbance at Recife de Fora Marine Park (Porto Seguro, Brazil). USD\$ 3,000

AWARDS

- 2014 Best student talk. International Biogeography Society Early Career Conference, ANU, Australia.
- 2013 Highly commended talk. Annual Higher Degree Research Conference, Macquarie University, Australia.
- 2008.2 Best Oral Presentation at the 18th Scientific Initiation Program Meeting. UFSC, Brazil.
- 2008.2 Academic Achievement: Undergraduate GPA > 9 (from 0 to 10). UFSC, Brazil.

SCHOLARSHIPS

- 2011 - 2015 PhD scholarship (Macquarie University, iMQRES) – *Scaling energetics from individuals to ecosystems*. 3.5 years, ~AUD\$80,000
- 2011 Technician Scholarship – SISBIOTA-Mar: Brazilian National Research Network on Marine Biodiversity (CNPq). 2 years, USD\$ 42,300
- 2009 – 2011 Master of Science Scholarship – *How are species packed in space? The role of regional richness and stochasticity on local community assembly* (CAPES). 2 years, USD\$ 14,400.
- 2007 – 2008 Scientific Initiation Program Scholarship – *Reef fish community structure at Santa Catarina coast, south Brazil* (CNPq). 1 year, USD\$ 1,800.
- 2006 – 2007 Scientific Initiation Program Scholarship – *Feeding activity of herbivorous reef fish at south Brazil with comparisons along the Brazilian coast* (CNPq). 1 semester, USD\$ 900.
- 2005 – 2006 Scientific Initiation Program Scholarship – *Characterization of the hemocytes from the native prawns (*Macrobrachium spp.*) and the molecular approach for the search of penaeidin in these cells* (CNPq). 1 year, USD\$ 1,800.
- 2004 – 2005 Scientific Initiation Program Scholarship – *Detection of antimicrobial peptides (AMP) in the hemocytes of crustaceans and bivalves through indirect immunofluorescence* (CNPq). 1 semester, USD\$ 900.

PUBLICATIONS

Published

- Hachich NF, Bonsall MB, Arraut EM, Barneche DR, Lewinsohn TM, Floeter SR. Island biogeography: patterns of marine shallow-water organisms in the Atlantic Ocean. *Journal of Biogeography*, online early. doi: [10.1111/jbi.12560](https://doi.org/10.1111/jbi.12560).
- Barneche DR, Allen AP (2015) Embracing general theory and taxon-level idiosyncrasies to explain nutrient recycling. *PNAS*, 112: 6248–6249. doi: [10.1073/pnas.1506305112](https://doi.org/10.1073/pnas.1506305112).
- Falster DS, Duursma RA, Ishihara MI, Barneche DR, *et al.* (2015) BAAD: a Biomass and allometry database for woody plants. *Ecology*, 96: 1445. doi: [10.1890/14-1889.1](https://doi.org/10.1890/14-1889.1). [[GitHub repository](#)]

- Luiz OJ, Mendes TC, Barneche DR, Ferreira CGW, Noguchi R, Villaça RC, Rangel CA, Gasparini JL, Ferreira CEL (2015) Community structure of reef fishes on a remote oceanic island: the relative influence of abiotic and biotic variables. *Marine and Freshwater Research*, 66: 739–749. doi: [10.1071/MF14150](https://doi.org/10.1071/MF14150).
- Anderson AB, Bonaldo RM, Barneche DR, Hackradt CW, Félix-Hackradt FC, García-Chartón JA, Floeter SR (2014) Recovery of grouper assemblages indicates effectiveness in a Marine Protected Area in Southern Brazil. *Marine Ecology Progress Series*, 514: 207–215. doi: [10.3354/meps11032](https://doi.org/10.3354/meps11032).
- Barneche DR, Kulbicki M, Floeter SR, Friedlander AM, Maina J, Allen AP (2014) Scaling metabolism from individuals to reef-fish communities at broad spatial scales. *Ecology Letters*, 17: 1067–1076. doi: [10.1111/ele.12309](https://doi.org/10.1111/ele.12309). [[GitHub repository](#)]
- Lobato FL, Barneche DR, Siqueira AC, Liedke AR, Lindner A, Pie MR, Bellwood DR, Floeter SR (2014) Diet and diversification in the evolution of coral reef fishes. *PLoS One*, 9(7): e102094. doi: [10.1371/journal.pone.0102094](https://doi.org/10.1371/journal.pone.0102094).
- Barneche DR, Floeter SR, Ceccarelli DM, Frensel DMB, Dinslaken DF, Mário HFS, Ferreira CEL (2009) Feeding macroecology of territorial damselfishes: (Perciformes: Pomacentridae). *Marine Biology*, 156: 289–299. doi: [10.1007/s00227-008-1083-z](https://doi.org/10.1007/s00227-008-1083-z).
- Barneche DR, Anderson AB, Floeter SR, Silveira M, Dinslaken DF, Carvalho-Filho A (2009) Ten new records of reef fish on the coast of Santa Catarina State, Brazil. *Marine Biodiversity Records*, 2: e143. doi: [10.1017/S1755267209990613](https://doi.org/10.1017/S1755267209990613).

In review

- Barneche DR, Kulbicki M, Floeter SR, Friedlander AM, Allen AP. Energetic and ecological constraints on population abundance.
- Liedke AMR, Barneche DR, Ferreira CEL, Segal B, Nunes LT, Burigo AP, JA Carvalho, Buck S, Floeter SR. Diet, nutrition and foraging activity of the banded butterflyfish *Chaetodon striatus* along the Western Atlantic Ocean.

In preparation

- Barneche DR, Allen AP. Quantifying the energetics of fish growth and its implications for energy transfer between trophic levels.
- Barneche DR, Rezende EL, Luiz OJ, Ferreira CEL, Rodríguez-Zaragoza FA, Arias-González JE, Friedlander AM, Vigliola L, Kulbicki M, Floeter SR. Reef fish biogeography reveals link between diversity loss and biotic homogenization.

CONSULTANT REFEREE FOR

PNAS, Journal of Biogeography, Oikos, Marine Biodiversity Records

SCIENTIFIC MEETINGS/ WORKSHOPS

- 2014 [Complex Systems Summer School](#). St. John's College / Santa Fe Institute, Santa Fe, NM, USA. (Duration: 1 month)
- 2014 Unifying Ecology Across Scales (Gordon Research Seminar and Conference). University of New England, Biddeford, ME, USA.
- 2014 International Biogeography Society Early Career Conference. Canberra, Australia.

- 2013 GASPAR – General Approach to Species-Abundance Relationships in a context of global change, reef fish species as a model. Aix en Provence, France.
- 2012 The 12th International Coral Reef Symposium. Cairns, Australia.
- 2012 Workshop: Multivariate Analysis for Biologists, Ecologists and Environmental Scientists. Massey University, Auckland, New Zealand.
- 2011 III Brazilian Congress of Marine Biology. Natal, RN, Brazil.
- 2009 XIII Latin-American Congress of Marine Sciences – COLACMAR. Havana, Cuba.
- 2009 61^a SBPC Annual Meeting. Manaus, AM, Brazil.
- 2009 II Brazilian Congress of Marine Biology. Armação de Búzios, RJ, Brazil.
- 2008 XVII Annual Seminar for the Scientific Initiation Program, UFSC. Florianópolis, SC, Brazil.
- 2007 Workshop: Global Marine Species Assessment. IUCN Red List Assessment Workshop: Eastern Tropical Pacific Fishes (Facilitator). Panama city, Panama.
- 2007 Workshop: Biochemical and Molecular Approach in Ecotoxicology: Emphasis in Algae and Mollusks. Florianópolis, SC, Brazil.
- 2007 XVII EBI – Brazilian Ichthyology Meeting. Itajaí, SC, Brazil.
- 2006 XXVI Brazilian Congress of Zoology. Londrina, PR, Brazil.
- 2006 XVI Annual Seminar for the Scientific Initiation Program, UFSC. Florianópolis, SC, Brazil.
- 2005 XX Encontro Anual da FeSBE. Águas de Lindóia, SP, Brazil.
- 2005 XV Annual Seminar for the Scientific Initiation Program, UFSC. Florianópolis, SC, Brazil.

Oral presentations

- Duursma RA, Falster DS, Barneche DR, Fitzjohn RG. Global patterns in biomass allocation in woody plants: the biomass and allometry database (BAAD). In: ComBio 2014, Canberra, Australia (*presented by Duursma RA*).
- Barneche DR, Kulbicki M, Floeter SR, Friedlander AM, Maina J, Allen AP. Scaling metabolism from individuals to reef-fish communities at broad spatial scales. In: International Biogeography Society Early Career Conference, Canberra, Australia.
- Barneche DR, Floeter SR, Ferreria CEL, Luiz Jr. OJ, Rodriguez-Zaragoza F, Arias-González, JE, Friedlander AM, Kulbicki M. Global species' packing of coral-reef fishes. In: The 12th International Coral Reef Symposium, Cairns, Australia.
- Barneche DR, Floeter SR (2008) Estrutura da comunidade de peixes recifais de Ilhas catarinenses costeiras, com ênfase em conservação. In: 18^o Seminário de Iniciação Científica da UFSC, Florianópolis, Brazil.

Poster presentations

- Barneche DR, Kulbicki M, Floeter SR, Friedlander AM, Allen AP. Energetic constraints on maximum population abundance. In: Unifying Ecology Across Scales (Gordon Research Seminar and Conference), Biddeford, USA.

- Aued AW, Longo GO, Barneche DR, Dinslaken DF, Silveira M, Floeter SR (2010) Territoriality of the Brazilian damselfish (*Stegastes fuscus*): territory size and interactions with reef fish community. In: Euro ISRS symposium 2010: Reefs in a changing environment, Hof van Wageningen, The Netherlands (*presented by Aued AW*).
- Barneche DR, Floeter SR, Ferreria CEL, Luiz Jr. OJ, Krajewski JP, Kulbicki M (2009) Global patterns on the relationship between diversity components using reef fish community data. In: XIII Congresso Latino-Americano de Ciências do Mar – XIII COLACMAR, Havana, Cuba.
- Barneche DR, Floeter SR (2009) Estrutura da comunidade de peixes recifais de Ilhas catarinenses costeiras, com ênfase em conservação. In: 61ª Reunião Anual da SBPC, Manaus, Brazil.
- Barneche DR, Silveira M, Dinslaken DF, Floeter SR (2009) Peixes macrocarnívoros alvos da pesca em ilhas costeiras de Santa Catarina. In: II Congresso Brasileiro de Biologia Marinha, Armação de Búzios, Brazil.
- Silveira M, Barneche DR, Dinslaken DF, Floeter SR (2009) Relação entre variáveis de complexidade de habitat e parâmetros de comunidade de peixes de recifes rochosos. In: II Congresso Brasileiro de Biologia Marinha, Armação de Búzios, Brazil (*presented by Silveira M*).
- Dinslaken DF, Silveira M, Barneche DR, Floeter SR (2009) Estruturas das comunidades de peixes de costão rochoso na ilha de Santa Catarina. In: II Congresso Brasileiro de Biologia Marinha, Armação de Búzios, Brazil (*presented by Dinslaken DF*).
- Floeter SR, Barneche DR, Ferreira CEL, Ceccarelli DM, Frensel DMB, Dinslaken DF (2008) Feeding macroecology of territorial damselfishes (Perciformes: Pomacentridae). In: 11th International Coral Reef Symposium, Fort Lauderdale, USA (*presented by Floeter SR*).
- Barneche DR, Frensel DMB, Dinslaken DF, Cecarelli DM, Ferreira CEL, Floeter SR (2007) Macroecologia alimentar de peixes herbívoros territoriais: Família Pomacentridae (Perciformes: Teleostei). In: XII Congresso Latino-Americano de Ciências do Mar – XII COLACMAR, Florianópolis, Brazil.
- Frensel DMB, Barneche DR, Dinslaken DF, Cecarelli DM, Ferreira CEL, Floeter SR (2007) Macroecologia do comportamento territorial dos gêneros *Stegastes* e *Pomacentrus*. In: XII Congresso Latino-Americano de Ciências do Mar – XII COLACMAR, Florianópolis, Brazil (*presented by Frensel DMB*).
- Barneche DR, Frensel DMB, Dinslaken DF, Leopoldo BF, Ceccarelli DM, Ferreira CEL, Floeter SR (2007) Macroecologia alimentar de peixes territoriais: gênero *Stegastes*. In: XVII EBI - Encontro Brasileiro de Ictiologia, Itajaí, Brazil.
- Frensel DMB, Dinslaken DF, Barneche DR (2006) A study of agonistic behavior of Brazilian damselfish *Stegastes fuscus* (Teleostei: Pomacentridae) in Santa Catarina Island, Brazil. In: XXIV Encontro Anual de Etologia, Brasília, Brazil (*presented by Frensel DMB*).
- Barneche DR, Rosa RD, Barracco MA (2006) Caracterização dos hemócitos de camarões do gênero *Macrobrachium* e avaliação, por abordagem genômica, da ocorrência de peneidinas nestas células. In: XVI Seminário de Iniciação Científica da UFSC, Florianópolis, Brazil.
- Rosa RD, Barneche DR, Barracco MA (2006) Caracterização básica das células da hemolinfa dos caranguejos *Chasmagnathus granulata* e *Goniposis cruentata* (Decapoda: Grapsidae). In: I Congresso Brasileiro de Biologia Marinha, Niterói, Brazil (*presented by Rosa RD*).
- Rosa RD, Barneche DR, Schleder DD, Bachère E, Barracco MA (2006) Detecção de peptídeos antimicrobianos nas células da hemolinfa de três espécies nativas de bivalves marinhos por

imunofluorescência indireta. In: I Congresso Brasileiro de Biologia Marinha, Niterói, Brazil (*presented by Rosa RD*).

Barneche DR, Gargioni R, Barracco MA (2005) Detecção de peptídeos antimicrobianos (PAM) nas células da hemolinfa de crustáceos e moluscos bivalves por imunofluorescência indireta. In: XV Seminário de Iniciação Científica da UFSC, Florianópolis, Brazil.

Rosa RD, Barneche DR, Bandeira PT, Kayser M, Gargioni R, Barracco MA (2005) Estudo preliminar das células da hemolinfa do camarão *Macrobrachium olfersi*. In: XX FeSBE - Federação de Sociedades de Biologia Experimental, Águas de Lindóia, Brazil (*presented by Rosa RD*).

PROFESSIONAL DEVELOPMENT

- 2014 Provide First Aid (HLTAID003); Apply advanced resuscitation techniques (HLTFA404C). Australian Lifesaving Academy New South Wales, Sydney Australia.
- 2013 Nice R Code. Macquarie University, Sydney, Australia. Lecturers: Dr. Daniel Falster and Dr. Rich FitzJohn, Macquarie University.
- 2013 - Present Instructor for the Software Carpentry. Topics: R, Python (basics), Bash and version control (git). Coordinator: Dr. Greg Wilson.
- 2013 Software Carpentry – Teaching scientists how to develop better computer code. Macquarie University, Sydney, Australia. Lecturer: Greg Wilson, Software Carpentry.
- 2012 Intensive writing course for academics (20 hours). Macquarie University, Sydney, Australia. Lecturer: Dr. Wendy Noble, ANU College of Asia & the Pacific.
- 2012 Writing for journals (5 hours). Macquarie University, Sydney, Australia. Lecturer: Professor Michael Gillings, Macquarie University.
- 2012 PADI Scientific Diver (RTD3508A: Perform Diving for Scientific Purposes, AQF credited). Abyss Scuba Diving, Sydney, Australia.
- 2012 PADI Rescue Diver (SROSCB007A: Perform Diver Rescues, AQF credited). Plunge Diving, Sydney, Australia.
- 2011 Modeling population dynamics (8 hours). Macquarie University, Sydney, Australia. Lecturer: Dr. Daniel Falster, Macquarie University.
- 2011 Evolutionary divergence analysis (8 hours). Macquarie University, Sydney, Australia. Lecturers: Professor Mark Westoby and Dr. Ian Wright, Macquarie University.
- 2008 St. Peter and Paul's Archipelago (Arquipélago de São Pedro e São Paulo): scientific expeditions training. Brazilian Navy, Natal, Brazil.
- 2008 Bioestatics. Universidade Federal de Santa Catarina, Florianópolis, Brazil.
- 2008 Ecology, Evolution and Conservation of Reef Fishes (Universidade Federal Fluminense). IEAPM, Arraial do Cabo, Brazil.
- 2008 PADI Advanced Open Water Diver; PADI Enriched Air Diver. Bertuol Diving Center, Bombinhas, Brazil.
- 2007 A lecture on lectures. Universidade Federal de Santa Catarina, Florianópolis, Brazil.
- 2007 Phylogeography, Molecular Systematics and Conservation Genetics of Fishes. (6 hours). XVII EBI - Encontro Brasileiro de Ictiologia, Itajaí, Brazil.
- 2006 Marine Mammals of Santa Catarina State: rescuing and conservation. (12 hours).

Universidade Federal de Santa Catarina, Florianópolis, Brazil.

- 2006 Brazilian environment politics as an instrument for Environmental Management. (30 hours). Universidade Federal de Santa Catarina, Florianópolis, Brazil.
- 2005 Biotechnological applications for the detection of aquatic microorganisms. (15 hours). Universidade Federal de Santa Catarina, Florianópolis, Brazil.

RESEARCH COLLABORATIONS

- 2013 - dataMashR: an easy-to-use package for database management in R (in development):
2014 <https://github.com/dfalster/dataMashR>. **Activity:** Package development.
- 2010 - Project: The influence of habitat and temperature in feeding ecology, nutritional status and
2012 connectivity patterns in populations of Butterflyfish (Gen. *Chaetodon*) – CNPq, Brazilian Council of Science and Technology. Staff – Coordinator: Prof. PhD. Sergio R. Floeter. CNPq Edital MCT/CNPq 14/2010 – Edital Universal - R\$ 48,487.14. **Activity:** Field work.
- 2009 - Project: Using underwater cameras to evaluate fish impact on benthic communities:
2011 latitudinal gradient and comparisons with freshwater systems – CNPq, Brazilian Council of Science and Technology. Staff – Coordinator: Prof. PhD. Sergio R. Floeter. CNPq Edital MCT/CNPq 06/2008 - Jovens Pesquisadores – R\$ 120,000. **Activity:** Field work.
- 2007 - Project: Connectivity among reef fish populations on southern Brazilian islands: an
2009 ecological and population genetic approach – CNPq, Brazilian Council of Science and Technology. Staff - Coordinator: Prof. PhD. Sergio R. Floeter. CNPq Edital MCT/CNPq 02/2006 - Universal (2007-8) – R\$ 40,000. FAPESC – R\$ 12,000. **Activity:** Field work and Database Management.
- 2007 - Research staff: Reef fish community structure on the coast of Santa Catarina, south Brazil.
2008 Universidade Federal de Santa Catarina, Florianópolis, Brazil. **Activity:** Field work and Database Management.
- 2006 - Web Design: Marine Biogeography and Macroecology Laboratory:
2011 <http://www.lbmm.ufsc.br/>. **Activity:** Web designer.
- 2006 - Research staff: Feeding activity of herbivorous reef fish at south Brazil with comparisons
2007 along the Brazilian coast. Universidade Federal de Santa Catarina, Florianópolis, Brazil. **Activity:** Database Management.
- 2005 - Research staff: Characterization of the hemocytes of the native prawns (*Macrobrachium* spp.)
2006 and the molecular detection of penaeidin in these cells. Universidade Federal de Santa Catarina, Florianópolis, Brazil. **Activity:** Experimental work.
- 2005 - Research staff: Detecting of antimicrobial peptides (AMP) in the hemocytes of crustaceans
2005 and bivalves through indirect immunofluorescence. Universidade Federal de Santa Catarina, Florianópolis, Brazil. **Activity:** Experimental work.
- 2004 - Research staff: Mussel (*Perna perna*) farming. Universidade Federal de Santa Catarina,
2005 Brazil. **Activity:** Field work.

TEACHING

- 2015 BIO114 – Biodiversity and Evolution (9h/week). Activity: *Tutor*. Macquarie University, Sydney, Australia.
- 2014 Software Carpentry – Advanced R, software testing, version control in git, intro to the shell (bash) and scientific reproducibility (16h). Activity: *Instructor*. Four institutions: UNSW (Australia), UTS (Australia), Dalhousie University (Canada) and UFSC (Brazil).
- 2013 – 2014 Software Carpentry – R for beginners, version control in git, intro to the shell (bash) and scientific reproducibility (16h). Activity: *Instructor*. Two institutions: Pasteur Institute (France) and University of Sydney (Australia).
- 2014 BIOL379 – Reef Evolution and Dynamics (54h). Activity: *Field Tutor*. Heron Island Research Station, Heron Island, Great Barrier Reef. Macquarie University, Sydney, Australia.
- 2014 BIOL369 – Vertebrate Evolution (1h). Activity: *Guest lecturer (The Osteichthyes)*. Macquarie University, Sydney, Australia.
- 2013 Software Carpentry – Advanced Python, software testing, version control in git, software documentation and scientific reproducibility (24h). Activity: *Instructor*. University of Adelaide (Australia).
- 2012 BIO115 – Thread of Life (12h/week). Activity: *Tutor*. Macquarie University, Sydney, Australia.

SPOKEN LANGUAGES

Portuguese – mother tongue;

English – fluent speaking, reading, and writing;

Spanish – fluent speaking and reading; basic writing.

COMPUTER LANGUAGES

R – fluent speaking, reading, and writing;

git – fluent speaking, reading, and writing;

Python – basic speaking, reading, and writing;

Shell (bash) – basic speaking, reading, and writing;

FIELDWORK EXPERIENCE

Since 2006 I have participated on field trips along the Brazilian coast (Santa Catarina, Arraial do Cabo, Abrolhos Archipelago, Porto Seguro, Fernando de Noronha Archipelago), Central America (Panama and Cuba) and Australia (One Three Island Research Station and the coast of New South Wales). These trips included SCUBA diving, where I did mostly fish transects, tallying individuals, species and sizes. I have also collected specimens for myriad measurements including otolith ring counts, gut content analyses and genetic material. Some of this work was done in remote locations (Fernando de Noronha in Brazil and Jardines de la Reina in Cuba), and I have been trained by the Brazilian Navy to resist stressful and starvation situations at sea, including spending one entire day adrift under the sun without food or water supply.