

Rafael M. Almeida, Ph.D.

Curriculum Vitae

School of Earth, Environmental, and Marine Sciences
The University of Texas Rio Grande Valley, Edinburg, TX, USA

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Website: <https://ecslab.org>

EDUCATION

Ph.D., Ecology, Federal University of Juiz de Fora, Brazil	2017
M.S., Ecology, Federal University of Juiz de Fora, Brazil	2013
B.S., Biology, Federal University of Juiz de Fora, Brazil	2010

APPOINTMENTS

Assistant Professor. The University of Texas Rio Grande Valley, USA	2022-present
Atkinson Postdoctoral Research Fellow. Cornell University, USA	2018-2021
Postdoctoral Associate. Uppsala University (Sweden) / UFJF (Brazil)	2017-2018

PUBLICATIONS

27. Opperman JJ, Carvalho JP, Kelman R, Schmitt RJP, [Almeida RM](#), Chapin E, Flecker A, Goichot M, Grill G, Harou JJ, Hartmann J, Higgins J, Kammen D, Marin E, Martins T, Newsock A, Rogeliz C, Raeppele J, Sada R, Thieme ML, Harrison D. Balancing renewable energy and river resources by moving from individual assessments of hydropower projects to energy system planning. **Frontiers in Environmental Science** 10:1036653
26. [Almeida RM](#), Schmitt RJP, Grodsky S, Flecker AS, Gomes CP, Zhao L, Liu H, Barros N, Kelman R, McIntyre PM. Ensuring sustainable expansion of floating solar power. **Nature** 606:246-249
25. [Almeida RM](#), Schmitt RJP, Castelletti A, Flecker AS, Harou, JJ, Heilpern SA, Kittner N, Kondolf GM, Opperman JJ, Shi Q, Gomes CP, McIntyre PB. (2022). Strategic planning of hydropower development: balancing benefits and socioenvironmental costs. **Current Opinion in Environmental Sustainability** 56:101175
24. Flecker AS, Shi Q, [Almeida RM](#), Angarita H, Gomes-Selman J, García-Villacorta R, Sethi SA, Thomas SA, Poff NL, Forsberg BR, Heilpern SA, Hamilton SK, Abad JD, Anderson EP, Barros N, Bernal IC, Bernstein R, Cañas CM, Dangles O, Encalada AC, Fleischmann AS, Goulding M, Higgins J, Jezequel C, Larson EI, McIntyre PB, Melack JM, Montoya M, Oberdorff T, Paiva R, Perez G, Rappazzo BH, Steinschneider S, Torres S, Varese M, Walter MT, Wu X, Xue Y, Zapata-Ríos XE, Gomes. CP. (2022). Reducing adverse impacts of Amazon hydropower expansion. **Science**, 375(6582):753-760
23. [Almeida RM](#), Fleischmann AS, Angarita A, Brêda JPF, Cardoso DS, Collischonn W, Forsberg B, García-Villacorta R, Hamilton SK, Paiva R, Poff NL, Sethi SA, Shi Q, Gomes CP, Flecker AS. (2021). Climate change may impair electricity generation and economic viability of future Amazon hydropower. **Global Environmental Change**, 71:102383.
22. Santos JA, Quadra GR, [Almeida RM](#), Soranço L, Lobo H, Rocha VN, Bialezki A, Roland F, Reis Jr JL, Barros N. Sublethal effects of environmental concentrations of caffeine on a Neotropical freshwater fish. **Ecotoxicology**, s10646-021-02498-z
21. Paranaíba JR, Barros N, [Almeida RM](#), Linkhorst A, Mendonça R, Vale R, Roland F, Sobek S. (2021). Hotspots of diffusive CO₂ and CH₄ emission from reservoirs shift through time. **Journal of Geophysical Research: Biogeosciences** 126, e2020JG006014
20. [Almeida RM](#), Hamilton SK, Rosi EJ, Barros N, Doria C, Fleischmann AS, Flecker AS, Reisinger AJ, Roland F. (2020). Hydropeaking operations of two run-of-river mega-dams alter downstream hydrology of the largest Amazon tributary. **Frontiers in Environmental Science** 8:120

19. Kosten S, [Almeida RM](#), Barbosa I, Mendonça R, Muzitano IS, Oliveira-Junior ES, Vroom RJE, Wang H, Barros N. (2020). Better assessments of greenhouse gas emissions from global fish ponds needed to adequately evaluate aquaculture footprint. **Science of the Total Environment** 141247
18. Paschoalini M, [Almeida RM](#), Trujillo J, Melo-Santos G, Marmontel M, Pavanato HJ, Guerra FM, Ristau N, Zerbini AN. (2020). On the brink of isolation: Population estimates of the Araguaian river dolphin in a human-impacted region in Brazil. **PLoS ONE** 15(4): e0231224
17. Paranaíba JR, Quadra G, Josué P, [Almeida RM](#), Mendonça R, Cardoso SJ, Silva J, Kosten S, Campos JM, Almeida J, Araujo RL, Roland F, Barros N. (2020). Sediment drying-rewetting cycles enhance greenhouse gas emissions, nutrient and trace element release, and promote water cytogenotoxicity. **PLoS ONE** 15(4): e023108
16. Amado, AM, [Almeida RM](#), Cardoso SJ, Santos JA, Camargo AFM. (2020). Freshwater sustainability and aquatic ecology in a fast-changing world. **Acta Limnologica Brasiliensia** 32:e100
15. Junger, PC, [Almeida RM](#), Mendonça R, Farjalla VF, Melo RCN, Roland F, Barros N. (2020). Not all viruses in nature are human enemies: a perspective on aquatic virus ecology in Brazil. **Acta Limnologica Brasiliensia** 32:e105
14. [Almeida RM](#), Shi Q, Gomes-Selman JM, Angarita H, Barros N, Forsberg BR, García-Villacorta R, Hamilton SK, Melack JM, Montoya M, Perez G, Sethi SA, Gomes CP, Flecker AS. (2019). Reducing greenhouse gas emissions of Amazon hydropower with strategic dam planning. **Nature Communications** 10:4281
13. [Almeida RM](#), Arantes Jr JD, Barros N, Boemer G, Gripp A, Hamilton SK, Huszar VLM, Junger PC, Lima M, Pacheco F, Pires D, Reisinger AJ, Rosi E, Roland F. (2019). Limnological effects of a large Amazonian run-of-river dam on the main river and drowned tributary valleys. **Scientific Reports** 9:16846
12. [Almeida RM](#), Paranaíba JR, Barbosa I, Sobek S, Kosten S, Linkhorst A, Mendonça R, Quadra G, Roland F, Barros N. (2019). Carbon dioxide emission from drawdown areas of a Brazilian reservoir is linked to surrounding land cover. **Aquatic Sciences** 81:68
11. Feitosa IB, Huszar VLM, Domingues CD, Appel E, Paranhos R, [Almeida RM](#), Branco CWC, Bastos WR, Sarmento H. (2019). Plankton community interactions in an Amazonian floodplain lake, from bacteria to zooplankton. **Hydrobiologia** 831:55
10. Quadra G, Roland F, Barros N, Malm O, Lino AS, Azevedo GM, Thomaz JR, Andrade-Vieira LF, Praça-Fontes MM, [Almeida RM](#), Mendonça RF, Cardoso SJ, Guida YS, Campos JMS. (2019). Far-reaching cytogenotoxic effects of mine waste from the Fundão dam disaster in Brazil. **Chemosphere** 215:753-757
9. [Almeida RM](#), Han BA, Reisinger AJ, Kagemann C, Rosi E. (2018). High mortality in aquatic predators of mosquito larvae caused by exposure to insect repellent. **Biology Letters** 14(10):20180526
8. Paranaíba JR, Barros N, Mendonça R, Linkhorst A, Isidorova A, Roland F, [Almeida RM](#), Sobek S. (2018). Spatially resolved measurements of CO₂ and CH₄ concentration and gas-exchange velocity highly influence carbon-emission estimates of reservoirs. **Environmental Science & Technology** 52(2):607-615
7. [Almeida RM](#), Pacheco FS, Barros N, Rosi E, Roland F. (2017). Extreme floods increase CO₂ outgassing from a large Amazonian river. **Limnology & Oceanography** 62(3):989-999
6. [Almeida RM](#), Lovejoy T, Roland F. (2016). Brazil's Amazon conservation in peril. **Science** 353(6296):228-229
5. [Almeida RM](#), Nobrega GN, Junger PC, Figueiredo AV, Andrade AS, Moura CGB, Tonetta D, Oliveira Jr ES, Araujo F, Rust F, Piñeiro-Guerra JM, Mendonça Jr JR, Medeiros LR, Pinheiro L, Miranda M, Costa MRA, Melo ML, Nobre RLG, Benevides T, Roland R, de Klein J, Barros NO, Mendonça R, Becker V, Huszar VLM, Kosten S. (2016). High primary production contrasts with intense carbon emission in a eutrophic tropical reservoir. **Frontiers in Microbiology** 7:717
4. [Almeida RM](#), Roland F, Cardoso SJ, Farjalla VF, Bozelli RL, Barros NO. (2015). Viruses and bacteria in floodplain lakes along a major Amazon tributary respond to distance to the Amazon River. **Frontiers in Microbiology** 6:158
3. [Almeida RM](#), Tranvik L, Huszar VLM, Sobek S, Mendonça R, Barros N, Boemer G, Arantes Jr JD, Roland F. (2015). Phosphorus transport by the largest Amazon tributary (Madeira River, Brazil) and its sensitivity to precipitation and damming. **Inland Waters** 5(3):275-282
2. [Almeida RM](#), Barros N, Cole JJ, Tranvik L, Roland F. (2013). Emissions from Amazonian dams. **Nature Climate Change** 3(12):1005

1. Almeida RM, Pinto VG, Castro MM, Divino AC, Alves ACA, Vasconcelos D, Silva MRM, Nameda N, Lima RNS, Mello RM, Siviero TS, Martins T, Campos V, Conde BE, Brito PS, Favoreto FC, Vidal LO, Roland F. (2013). Addressing key ecological questions to support policy making in Brazil. **Brazilian Journal of Biology** 73(2):455-456

Book chapters

- Paiva R, Mello M, Cardoso S, Lobão L, Freitas A, Dias G, Mucci M, Almeida RM, Roland F, Soares MC. 2010. Avaliação dos parâmetros ambientais para detecção de florações de cianobactérias no Lago dos Manacás (Campus UFJF). In: Soares JHP, Gomes MHR, Paiva LED, Ribeiro CBM. Simpósio de Engenharia Sanitária e Meio Ambiente da Zona da Mata Mineira. 1st ed. Juiz de Fora: UFJF, 2010, v. 1, p. 83-93

Publications in news and popular science outlets

- Almeida RM. 2016. Hidrelétricas: novos estudos aprimoram estimativa de emissões dos reservatórios (“Hydropower: new studies improve estimates of reservoir emissions”). ((o)eco, available at <https://bit.ly/2R6BZda>
- Almeida RM. 2016. Aedes aegypti: Liberar a pulverização de pesticidas por aeronaves é uma solução? (“Aedes aegypti: is aerial spraying of pesticides a solution?”) Nexo Jornal, available at <https://bit.ly/2A6AaTV>
- Almeida RM, Lovejoy T, Roland F. 2016. Recessão não pode justificar fim do licenciamento ambiental. (“Economic recession cannot justify abolishment of environmental licensing”) ((o)eco, available at <https://bit.ly/2T0WPZ1>
- Roland F and Almeida RM. 2016. Proposta de emenda à Constituição Federal coloca o Brasil em perigo. (“Proposed constitutional amendment puts Brazil in peril). SRZD.com, available at <https://bit.ly/2R6DWGw>
- Almeida RM, Tófoli R, El Bizri H. 2016. Crise e retrocessos na legislação ambiental (“Crisis and setbacks in environmental regulation”). Ciência Hoje 342:48-49

GRANTS AND SCHOLARSHIP

- 2023-2026 (PI) Validating agrivoltaic technology with underserved farmers. USDA Partnerships for Climate-Smart Commodities. \$2,229,177
- 2023-2024 (PI) Co-locating irrigation and solar power infrastructure to bolster freshwater sustainability in a semi-arid agricultural region. USDA NIFA-AFRI, BNRE Water Quantity and Quality. \$299,296
- 2023-2024 (co-PI) Leveraging eDNA for a national pollinator-solar energy monitoring and research network. DOE EERE-SolWEB. PI: Steve Grodsky (Cornell University). \$2,000,000 (\$100,834 to Almeida)
- 2023 (co-PI) Greenhouse gas flux response in biochar- and compost-amended urban soils under simulated soil hydrologic dynamics. DOE RDPP. PI: James Kang (UTRGV). \$149,999
- 2022-2024 Rising STARS. The University of Texas System. \$300,000
- 2021-2023 Balancing environmental and nutritional tradeoffs of expanding Amazonian aquaculture (co-PI). Cornell Atkinson Venture Fund. Amount: \$175,000
- 2018-2020. A computational sustainability approach to evaluate greenhouse gases and environmental effects of dams proposed for the Amazon basin. Cornell Atkinson Postdoctoral Fellowship in Sustainability. \$150,000
- 2017 Bentley Holden Scholarship. Cary Institute Award for Graduate Student Research. \$2,300
- 2016 12-month visiting graduate student scholarship, Cary Institute of Ecosystem Studies, NY. National Council for Scientific and Technological Development (CNPq, Brazil). \$20,400
- 2013-2017 Ph.D. fellowship. Coordination for the Improvement of Higher Education Personnel (CAPES, Brazil). R\$105,600 (BRL)

- 2012 3-month M.S. exchange scholarship, Uppsala University, Sweden. Swedish Foundation for International Cooperation in Research and Higher Education (STINT, Sweden). \$7,000
- 2011-2013 M.S. fellowship. Coordination for the Improvement of Higher Education Personnel (CAPES, Brazil). R\$28,000 (BRL)
- 2010 B.S. exchange scholarship, Colorado College, CO. Coordination for the Improvement of Higher Education Personnel (CAPES, Brazil) and Fund for the Improvement of Postsecondary Education (FIPSE, USA). \$6,000 plus tuition

AWARDS

- 2021 Hynes Award for New Investigators. Awarded by the Society for Freshwater Science
- 2015 José Carlos Loures Academic Excellence Award. Awarded by the Federal University of Juiz de Fora
- PhD Thesis Distinction. Awarded by the Postgraduate Program in Ecology, Federal University of Juiz de Fora

TEACHING AND MENTORING

Graduate-level teaching

- Current Topics in Ecology & Evolutionary Biology BIOEE 7670. Cornell University. 2019 and 2020 (guest lecturer)
- Limnology and Biodiversity. Postgraduate Program in Environmental Sciences. State University of Mato Grosso, Brazil. 2018 (guest lecturer)
- Ecology of Aquatic Microbes. Postgraduate Program in Ecology. Federal University of Juiz de Fora, Brazil. 2018 (lecturer)
- Scientific Writing and Publishing. Postgraduate Program in Ecology. Federal University of Juiz de Fora, Brazil. 2018 (lecturer)
- Ecosystem Ecology. Postgraduate Program in Ecology. Federal University of Juiz de Fora, Brazil. 2016 (teaching assistant)

Undergraduate-level teaching

- Introduction to Environmental Sciences I ENVR1401. The University of Texas Rio Grande Valley. 2022.
- Excursions in Computational Sustainability AEM 2770. Cornell University. 2020 (guest lecturer)
- Stream Ecology NTRES/BIOEE 4560. Cornell University. 2019 (guest lecturer)
- Summer Course in Ecology. Federal University of Juiz de Fora. 2015
- Environmental and Sanitary Engineering. Federal University of Juiz de Fora. 2014 (guest lecturer)

Mentoring

- José R. Paranaíba, Ph.D. candidate at the Postgraduate Program in Ecology, Federal University of Juiz de Fora, Brazil. 2017 – 2021 (co-mentorship)
- Maria Clara Santos, Laboratory of Aquatic Ecology undergraduate researcher, Federal University of Juiz de Fora, Brazil. 2015 – 2017 (co-mentorship)

INVITED TALKS

- Geological Society of America – South-Central Section Meeting (2022). Keynote speaker
- The University of Texas Rio Grande Valley, Edinburg, TX. Biology Seminar Series (2022). Invited speaker
- Society for Freshwater Science Annual Meeting (2021). Keynote speaker
- Carnegie Institution for Science, Department of Global Ecology, Stanford, CA (2021). Invited speaker
- Amazon Dams Network webinar (2020). Invited speaker

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- Cary Institute of Ecosystem Studies, Millbrook, NY (2020). Invited seminar speaker
- Cornell University, Ithaca, NY. Biogeochemistry, Environmental Science, and Sustainability (BESS) Seminar Series (2018). Invited speaker
- State University of Mato Grosso, Brazil. Special Topical Seminar (2018). Invited speaker
- Federal University of Juiz de Fora, Juiz de Fora, Brazil. Environmental Consulting Symposium (2017). Invited speaker
- CUNY Advanced Science Research Center, New York, NY (2017). Invited speaker
- Brooklyn College, New York, NY (2017). Invited speaker
- Radboud University, Nijmegen, Netherlands. Aquatic Sciences and Environmental Biology Department Seminar (2015). Invited speaker

NON-ACADEMIC PROFESSIONAL EXPERIENCE

Environmental consultant

Ecology and Environment Inc., Brazil

2011-2018

Consultant at the Brazilian subsidiary of Ecology and Environment Inc.

Activities: Environmental planning and licensing of large infrastructure projects, including hydropower dams, wind farms, transmission lines, oil drilling, and slurry pipelines

Responsibilities: coordination of field work and field staff; data analysis; impact assessments; writing and review of environmental reports; meetings with clients and environmental agencies

SERVICE AND OUTREACH

Member of advisory committees

- M.S. committee of Ligia Araújo, Postgraduate Program in Biodiversity and Nature Conservation, Federal University of Juiz de Fora, Brazil (“Biological degradation of dissolved organic matter in six tropical reservoirs”). 2020
- Ph.D. committee of Juliana Gamalier de Paiva, Postgraduate Program in Ecology, Federal University of Juiz de Fora, Brazil (“Production of outer membrane vesicles by aquatic bacteria in response to UV radiation and interaction with viruses”). 2019
- M.S. committee of Alyne Maciel, Postgraduate Program in Ecology, Federal University of Juiz de Fora, Brazil (“Lifecycle assessment of milk production”). 2019
- Ph.D. committee of Federico Perez. Postgraduate Program in Ecology, Federal University of Juiz de Fora (“Distribution and abundance of La Plata dolphin via aerial survey”). 2018
- Ph.D. committee of Mariana Frias, Postgraduate Program in Ecology, Federal University of Juiz de Fora (“Estimating populational parameters of river dolphins in South America”). 2018
- Ph.D. committee of Juliana Costa, Postgraduate Program in Ecology, Federal University of Juiz de Fora (“Palynology and reproductive biology of Plagiochilaceae”). 2018
- Ph.D. committee of Bárbara Vieira, Postgraduate Program in Biological Sciences, Federal University of Juiz de Fora (“Genotoxicity of personal care products”). 2018
- M.S. committee of Ícaro Barbosa, Postgraduate Program in Ecology, Federal University of Juiz de Fora (“Carbon dynamics in an oligotrophic tropical reservoir”). 2018

Conference sessions convened

- Balancing benefits and socioenvironmental costs of water infrastructure projects. 2022. Joint Aquatic Sciences Meeting, Grand Rapids, MI. Co-conveners: Rafael Schmitt, Caroline Arantes, Alexander S. Flecker
- River damming: applying ecological knowledge for better planning and decisions. 2019. XVI Congresso Brasileiro de Limnologia e 2° Congresso Ibero-americano de Limnologia, Florianópolis (Brazil). Co-conveners: Alexander S. Flecker, Nathan Barros, Fábio Roland

Editorial experience

Rafael M. Almeida, Ph.D.

- Associate Editor. *Acta Limnologica Brasiliensia*. 2019 – present
- Guest Editor. *Agriculture, Ecosystems & Environment*. 2021 – present

Journal ad-hoc reviewer

Science Advances, Environmental Science & Technology, Environmental Science & Policy, Journal of Geophysical Research, Climatic Change, Environmental Research Letters, Aquatic Sciences, Inland Waters, Lakes and Reservoirs, Perspectives in Ecology and Conservation, Brazilian Journal of Biology, *Acta Limnologica Brasiliensia*

Membership in professional societies

AAAS/Science, Association for the Sciences of Limnology and Oceanography (ASLO), International Society of Limnology (SIL), Associação Brasileira de Limnologia (ABLimno), Society for Freshwater Science (SFS)

SELECTED CONFERENCE PRESENTATIONS

First author only

Future Amazon hydropower under climate change. 2020. AGU Fall Meeting 2020. Virtually held

GHG emissions of Amazon hydropower in a planning context. 2019. XVI Congresso Brasileiro de Limnologia e 2º Congresso Ibero-americano de Limnologia, Florianópolis, Brazil.

Greenhouse-gas emissions of Amazon hydropower. Society for Freshwater Science Meeting 2018, Detroit, MI

Dams and greenhouse gases: is hydropower a green alternative in the Amazon? Congreso Aquatrop – Ecosistemas Acuáticos Tropicales en el Antropoceno, Quito, Ecuador

Effects of a run-of-river dam on the water chemistry of the Madeira River and back-flooded tributaries within the reservoir. XVI Congresso Brasileiro de Limnologia, Rio de Janeiro, Brazil

Extreme floods boost CO₂ outgassing from a large Amazonian river. ASLO Aquatic Sciences Meeting 2015, Granada, Spain

Seasonality of phosphorus in the Madeira River (Brazil): implications for the Amazonian flux of phosphorus. 2012. XVI Congress of the Iberian Association of Limnology, Guimarães, Portugal

Phosphorus in the Madeira River prior to filling the Santo Antônio reservoir. 2011. XIII Congresso Brasileiro de Limnologia, Natal, Brazil