

Curriculum Vitae

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Bruce R. Forsberg

Aquatic ecologist and conservation biologist with extensive experience in the investigation, conservation and management of aquatic ecosystems in both North and South America, and a strong desire to contribute to the conservation of diminishing aquatic resources in the face of increasingly complex regional and global challenges.

CURRENT PROFESSIONAL ADDRESS

National Institute of Amazon Research (INPA – Instituto Nacional de Pesquisas da Amazonia)
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(INPA, a federal research institution linked to the Brazilian Ministry of Science and Technology, has been at the center of international research efforts in Amazon Basin since its foundation in 1952. As a researcher at INPA, Bruce Forsberg has played a central role in the investigation, conservation and management of aquatic ecosystems in the Amazon)

EDUCATION

Ph.D. in Ecology (Limnology), 1981, University of Minnesota, Minneapolis, MN

Thesis title: A general theory of phytoplankton growth for field applications

Bachelor of Science in Biology, 1974, Michigan State University, East Lansing, MI

PROFESSIONAL EMPLOYMENT

1988 – Present Senior Research Scientist, National Institute of Amazon Research,
Department of Environmental Dynamics, Aquatic Ecosystems
Laboratory (Head), Manaus, Brazil

2010 - Present Project Scientist, Earth Research Institute, University of California at
Santa Barbara, CA

2004 – 2010 Project Scientist, Institute for Computational Earth System Science,
University of California at Santa Barbara, CA

- 1983 – 1993 Research Associate, School of Oceanography, University of Washington, Seattle, WA
- 1980 - 1982 Postdoctoral Fellow, Institute of Environmental Studies, University of Washington, Seattle, WA

PUBLICATIONS

Peer-reviewed articles and book chapters

- Melo, M.L., Bertilsson, S., Amaral, J.H.F (student), Barbosa, P.M. (student), **Forsberg, B.R** and Sarmiento, H. 2019. Flood pulse regulation of bacterioplankton community composition in an Amazonian floodplain lake. *Freshwater Biology* 64: 108-210.
- Kasper, D (student), Amaral, J.H.F.(student) and **Forsberg, B.R.** 2018. The effect of filter type and porosity on total suspended sediment determinations. *Analytical Methods* 10: 5532–5539.
- Kasper, D. (student), Forsberg, B.R., Kehrig, H.S., Amaral, J.H.F. (student), Bastos, W.R. and Malm, O. 2018. Mercury in Black-Waters of the Amazon, pp 39-56. In Myster, R.W. [ed.] Igapó (Black-water flooded forests) of the Amazon Basin. Springer Nature-Cham, Switzerland.
- Goulding, M. M., Venticinque, E., Ribeiro, M.L.B., Barthem, R.B., Leite, R.L., **Forsberg, B.R.** Petry, P., Lopes Jr., U. S., Ferraz, P.S. and Cañas, C. 2018. Ecosystem-based management of Amazon fisheries and wetlands. *Fish and Fisheries*, DOI: 10.1111/faf.12328.
- Freitas , C.E.C, Laureson, L., Yamamoto, K.C., **Forsberg, B.R.**, Petrere Jr. M., Arantes, C. and Siqueira-Souza, F.K. 2018. Fish species richness is associated with the availability of landscape components across seasons in the Amazonian floodplain. *PeerJ* 6:e5080; DOI 10.7717/peerj.5080
- Amaral, J.H.F.(student), Borges, A.V., Melack, J.M., Sarmiento, H., Barbosa, P.M., Kasper, D., de Melo, M.L. deFex-Wolf, D., Silva, J.S. and **Forsberg, B.R.** 2018. Influence of plankton metabolism and mixing depth on CO2 dynamics in an Amazon floodplain lake. *Science of the Total Environment* 630: 1381-1393.
- Barbosa, P.M.(student), Farjalla, V.F., Melack, J.M., Amaral, J.R.F (student)., Silva, J.S. and **Forsberg, B.R.** 2018. High rates of methane oxidation in an Amazon floodplain lake. *Biogeochemistry* 137: 351-365.
- Kasper, D. (student), **Forsberg, B. R.**, Amaral, J.H.F. (student), Py-Daniel, S.S.S. (student), Bastos, W.R. and Malm, O. 2017. Methylmercury modulation in Amazon rivers linked to basin characteristics and seasonal flood-pulse *Environ. Sci. Technol.*, DOI: 10.1021/acs.est.7b04374.
- Forsberg, B.R.**, Melack, J.M., Dunne, T., Barthem, R., Goulding, M. Paiva, R.C.D., Sorribas, M.V., Silva, U.L. and Weisser, S. 2017. The potential impact of new Andean dams on Amazon fluvial ecosystems. *PLoS ONE* 12(8): e0182254. <https://doi.org/10.1371/journal.pone.0182254>
- Forsberg, B.R.**, Melack, J.M., Richey, J.E. and Pimentel, T.P. 2017. Regional and seasonal variability in planktonic photosynthesis and plankton community respiration in Amazon floodplain lakes. *Hydrobiologia* 800: 187-206.

- Barthem, R., Goulding, M., Leite, R., Cañas, C., **Forsberg, B.R.**, Venticinques, E., Petry, P., Ribeiro, M., Chuctara, J. and Mercado, M. 2017. Goliath catfish spawning in the far western Amazon confirmed by the distribution of mature adults, drifting larvae and migrating juveni. *Sci. Rep.* 7, 41784; doi: 10.1038/srep41784
- Carvalho, F.M., Freitas, C., **Forsberg, B.R.**, Power, M. and Martins, E. 2017. Trophic Ecology of Arapaima sp. in a ria lake - river-floodplain transition zone of the Amazon. In *Ecology of Freshwater Fish*. DOI: 10.1111/eff.12341.
- Nagy, L., Artaxo, P. and **Forsberg, B.R.** 2016. Interaction between biosphere, atmosphere and human land use in the Amazon Basin: An introduction, pp. 3-15. In Nagy, L., **Forsberg, B.R.** and Artaxo, P. [eds.], *Interactions Between Biosphere, Atmosphere and Human Land Use in the Amazon Basin*. Ecological Studies, Vol. 227, Springer Verlag, Berlin.
- Artaxo, P., **Forsberg, B.R.** and Nagy, L. 2016. Amazonia in perspective as a changing environment, pp. 465-469. In Nagy, L., **Forsberg, B.R.** and Artaxo, P. [eds.], *Interactions Between Biosphere, Atmosphere and Human Land Use in the Amazon Basin*. Ecological Studies, Vol. 227, Springer Verlag, Berlin.
- Venticinque, E., **Forsberg, B.R.**, Barthem, R. Petry, P., Hess. L., Mercado, A., Cañas, C., Montoya, M., Durigan, C., Goulding, M. 2016. An Explicit GIS-Based River Basin Framework for Aquatic Ecosystem Conservation in the Amazon. *Earth System Science Data* 8: 651-661
- Scofield, V., Melack, J.M., Barbosa, P.M (student)., Amaral, J.H.F.(student), **Forsberg, B.R.** and Farjalla, V. 2016. Carbon dioxide outgassing from Amazonian aquatic ecosystems in the Negro River basin. In *Biogeochemistry* (Dordrecht), doi: 10.1007/s10533-016-0220-x.
- Barbosa, P. M.(student), Melack, J.M., Amaral, J.H.F.(student), Farjalla, V. Scofield, V. and **Forsberg, B.R.** 2016. Diffusive methane fluxes from Negro, Solimões and Madeira rivers and fringing lakes of the Amazon Basin. In *Limnology and Oceanography*, doi: 10.1002/lno.10358
- Marshall, B.G. 2016. **Forsberg, B.R.**, Thomé-Souza, M.(student) , Peleja, R.(student), Moreira, M.Z. and Freitas, C.E.C. (in press). Evidence of mercury biomagnification in the food chain of the cardinal tetra *Paracheirodon axelrodi* (Osteichthyes: Characidae) in the Rio Negro, central Amazon, Brazil. In *J. Fish Biology*. doi:10.1111/jfb.12952.
- Brito, B.C.(student), **Forsberg, B.R.**, Kasper, D.(student), Amaral, J.H.F.(student), Vasconcelos, M.R.R.(student), Souza, O.P.(student), Cunha, F.A.G.(student) and Bastos, W. 2016. The influence of inundation and lake morphometry on the dynamics of mercury in the water and plankton in an Amazon floodplain lake. *Hydrobiologia* DOI 10.1007/s10750-016-3017-y.
- Kemenes, A.(student), **Forsberg, B.R.** and Melack J.M. 2016. Downstream emissions of CH₄ and CO₂ from hydroelectric reservoirs (Tucuruí, Samuel, and Curuá-Una) in the Amazon basin. *Inland Waters*. *Inland Waters* 6: 295-302.
- Soares, J.L.F., Goch, Y.G.F.(student), Peleja, J.R.P. **Forsberg, B.R.**, Lemos, E.J.S., and Souza, O.P.(student). 2016. Bioacumulação de mercúrio total (Hg_T) e hábitos alimentares de peixes da bacia do Rio Negro, Amazônia, Brasil. *Biota Amazônia* 6(1):102-106. DOI: 10.18561/2179-5746.
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- Kasper, D. (student), **Forsberg, B.R.**, Almeida, R., Bastos, W.R. and Malm, O. 2015. Metodologias de coleta, preservação e armazenamento de amostras de água para análise de mercúrio – Uma revisão. *Quimica Nova* 38: 410-418.
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- Kemenes, A. (student), **Forsberg, B. R.** and J. M. Melack. 2007. Methane release below a tropical hydroelectric dam. *Geophys. Res. Let.* 34: L12809,

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- Forsberg, B. R.**, and J. Shapiro. 1980. The effects of artificial destratification on algal populations, p. 851-864. In H. G. Stephan [ed.], *Proceedings of a Symposium on Surface Water Impoundments*, Univ. of Minnesota, ASCE, AWRA, AGU.

Books

- Barthem, R., Calle, I., Cañas, C., Castillo, O., **Forsberg, B.R.**, Goulding, M., Heck, C., Montoya, M., Mora, C. and Venticinque, E. 2016. *Inambari*. Lima, Peru. Wildlife Conservation Society. 62 p.
- Nagy, L., **Forsberg, B.R.** and Artaxo, P. [eds.] (2016). *Interactions Between Biosphere, Atmosphere and Human Land Use in the Amazon Basin*. Ecological Studies, Vol. 227, Springer Verlag, Berlin. 490 p.
- Leite, R.G., Cañas, C. **Forsberg, B.R.**, Barthem, R. and M. Goulding. 2007. *Larvas dos Grandes Bagres Migradores*. Lima, Peru: INPA/Amazon Conservation Association, 127 p.
- Barthem, R., Goulding, M., **Forsberg, B.R.**, Canas, C. and Ortega, H. 2003. *Aquatic Ecology of the Madre de Dios: Scientific Bases for Andes-Amazon Headwaters Conservation*. Lima, Peru. Amazon Conservation Association, In English and Spanish. 117 p.
- Goulding, M.; Canas, C., Barthem, R., **Forsberg, B. R.**, Ortega, H. 2003. *Amazon Headwaters*. Lima, Peru, Amazon conservation Association, In English and Spanish. 198 p
- Ferreira, E., Zuanon, J., **Forsberg, B.R.**, Goulding, M and S.R.B. Ferreira. 2007. *Rio Branco: Peixes, Ecologia e Conservação de Roraima*. Lima, Peru. INPA/Amazon Conservation

Association. 201p.

Technical Reports

- Forsberg, B.R. 2014. (in Spanish) Mercury in the Madre de Dios Basin: A critical examination of existing levels of contamination and their possible causes and consequences. Working Paper 13. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2014. (in Spanish) Mercury in the Madre de Dios: Executive Summary. Working Paper 12, Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013.(in Spanish) Sediments and the planned reservoir complex of the Inambari basin. Working Paper 10. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R., 2013. (in Spanish) The Inambari Dam – Greenhouse gases. Working Paper 17. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013. (in Spanish) The Inambari Dam – Sediment transport. Working Paper 14. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013. (in Spanish) The Inambari Dam – Aquatic production scenario. Working Paper 15. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013. (in Spanish) Limnology of the Inambari basin. Working Paper 18. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013 (in Spanish) The Inambari Dam – Mercury. Working Paper 16. Wildlife Conservation Society, Lima, Peru.
- Forsberg, B.R. 2013. (in Spanish) Proposal for a hydrological monitoring network in the Madre de Dios basin. Working Paper 13. Wildlife Conservation Society, Lima, Peru.

Graduate courses taught

1. Theoretical Ecology, National Institute of Amazon Research (INPA), Manaus, Brazil, annually from 1986 – 1990
2. Limnology, INPA, Manaus, Brazil, annually from 1990 – present,
3. Aquatic Ecosystems, INPA, Manaus, Brazil, annually from 1990 – present
4. Field Ecology (aquatic component), INPA, Manaus, Brazil, annually from 1990 - 2006
5. Biogeochemistry, INPA, Manaus, Brazil, 1995
6. Biogeochemical Cycles, Manaus, Brazil, annually from 2008 – 2015
7. Wetland Dynamics (field course), Manaus, Brazil, annually from 1990 – 2013

SUPERVISION OF GRADUATE STUDENTS (CHAIR OR CO-CHAIR)

Masters Students (english translation of titles)

1. Andressa de Jesus França. 2017. Spatial and temporal dynamics and ecotoxicology of methyl Mercury in fish in Lake Janauaça, Amazonas, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.

2. Felipe de Moraes Carvalho. 2015. Trophic ecology of the pirarucu (*Arapaima spp.*) in floodplain lake ecosystems in the central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
3. Otavio Peleja de Souza. 2015. The role of organic matter and hydromorphism in the dynamics of mercury in different soils of the Central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
4. Brensdson Carlos Brito. 2015. Spatial and temporal dynamics of mercury in water and plankton in and Amazon floodplain lake, Amazonas, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
5. Fabio Andrew Gomes Cunha. 2015. Biomagnification of mercury in the foodchain of a freshwater turtle (*Chelus Fimbiata*) and it's genotoxic consequences in the fluvial environments of the middle Rio Negro, Amazonas, Brazil.
6. Moema Rachel Ribeiro de Vasconcelos. 2014. The role of hydromorphic podzols in the export and bioaccumulation of methyl mercury in small upland streams in the central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
7. Pedro Maia Barbosa. 2013. Estimation of diffusive emissions of methane in aquatic environments in the central Amazon. M.S. Thesis Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.
8. Adry Thiago de Lima Trindade. 2013. Investigation of the impacts of net-tank fish culture on water quality and the Mercury contamination and structure of residente fish communities in Balbina Reservoir, Amazonas, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
9. Diana Sarmiento Franco. 2013. Investigation of the impacts of net-tank fish culture on greenhouse gas emission in Balbina Reservoir, Amazonas, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
10. Sewbert Rodrigues Jati. 2013. Emission of CO₂ and CH₄ in the wet savanas of Roraima.. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
11. Rodrigo Nunes de Souza. 2013. The influence of inundation dynamics on seasonal leaf fall in central Amazon floodplain forests and the viability as detected by remote sensing and field measurements. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
12. Anderson Lima. 2012. Organogeochemical characterization of sedimentary organic matter in Lago Calado, Central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
13. Eric Leandro Silva Pereira. 2012. The influence of drainage basin characteristics on physical and quematical properties of the Amazon river and its principal brazilian tributaries. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.

14. Veber Moura. 2012. Investigation of the spatial and temporal variation in methane emissions from forest soils in central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
15. Graziela Custodia Balassa. 2011. The influence of environmental factors on the bioaccumulation of Mercury in riverine populations of the Negro river basin, Amazonas, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
16. Ronaldo Monteiro. 2011. The relationship between inundated área and fish production in the Tefe fishing region, central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
17. Juliana Scheidman Almeida. 2005. Photodegradation and the concentration of Mercury in small tributaries in the mid Negro river. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
18. Sheyla Regina Marques Couceiro. 2005. Effects of deforestation and pollution on the species richness, density and composition of aquatic macroinvertebrates in urban streams in Manaus, Amazonas, Brazil. M.S. Thesis National Insitute of Amazon Research.
19. Bruce Marshall. 2004. Autotrophic energy sources for *Paracheirodon axelrodi* (osteichthyes, characidae) in the middle Negro River region. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
20. Maria Cecilia da Fatima Vega Corredor. 2004. The influence of seasonal variations in the availability of wetland habitats on the fish community of a central Amazon floodplain lake. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
21. Fernando Frickmann. 2003. Influence of interannual variations in inundation on the anual growth incremente of em *Macrolobium* (caesalpinaceae). M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
22. José Reinaldo Pacheco Peleja. 2002. Factors influencing the Mercury level in plankton in floodplain lakes of the Negro and Tapajos rivers. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
23. Lauren Belger. 2001. The influence of environmental factors on Mercury levels in *Cichla spp.* And *Hoplias malabaricus* in the Negro river basin. 2001. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
24. Gisele Trevisan. 2001. The influence of total nutrient concentrations and zooplankton community size structure on phytoplankton biomass in central Amazon floodplain lakes. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
25. Sabine Coreta Weisser. 2001. Investigation of the history of mercury contamination in Balbina Reservoir, Amazon, Brazil. 2001. M.S. Thesis, Universitat Konstanz, Germany

26. Casemiro Martins. 2000. Fish community structure in streams of Urubu river basin, Central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
27. Fabio Garcia. 2000. Factors controlling chlorophyll concentrations in floodplain lakes in the upper Paraguai river basin, Caceres, MT, Brazil. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
28. Alexandre Kemenes. 1999. Factors influencing the trophic structure and spatial distribution of fish communities in headwater streams in the Jau river basin, Amazonas. 1999. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
29. Vivian Karina Zeidemann. 1998. The geochemistry of mercury in soils of the Negro river basin and its influence on the regional Mercury cycle. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
30. Urbano Lopes da Silva Júnior. 1998. Analysis of fish production in a lower Amazon floodplain lake using a mass balance model. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
31. Carlos Eduardo Gianini. 1998. Diatoms as indicators of acidification in central Amazon floodplain lakes. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
32. Eduardo Cargnin-Ferreira. 1998. Factors influencing the distribution of functional groups of aquatic macroinvertebrates in small tributaries of the Jau River. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
33. Andrea Vivian Waichman. 1995. Autotrophic carbon sources for bacterioplankton in a central Amazon floodplain lake. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.
34. Justa Marcano Fernandez. 1993. Autotrophic energy sources for fry of jaraqui *Semaprochilodus insignis* ((Schomburgki, 1841) e curimatã *Prochilodus nigricans* (Agassiz, 1829) (Pisces: Prochilodontidae) in the Central Amazon. M.S. Thesis. National Institute of Amazon Reserach, Manaus, Brazil.
35. Carlos Roberto Padovani. 1992. Autotrophic carbon sources for shrimp in a Central Amazon floodplain lake. M.S. Thesis. National Institute of Amazon Research, Manaus, Brazil.
36. Antonio Donato Nobre. 1989. Relation between organic matter and minerals along toposequence of latossols and podzols in the Curiau river basin, Central Amazon. M.S. Thesis, National Institute of Amazon Research, Manaus, Brazil.

Doctoral Students (English translation of titles)

1. Pedro Maia Barbosa. 2018. Seasonal dynamics of methane in a central Amazon floodplain lake. PhD Thesis, University Federal do Rio de Janeiro, Rio de Janeiro, Brazil.
2. João Henrique Fernandez Amaral. 2017. Factors controlling the seasonal variation of CO₂ in a central Amazon floodplain lake. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
3. Daniele Kasper. 2013. Seasonal dynamics of methyl mercury in Amazonian fluvial ecosystems. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
4. Pedro Ramón Caraballo Gracia. 2010. The role of the microbial loop in the trophic dynamics of a central Amazon floodplain lake. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
5. Bruce Gavin Marshall. 2010. Seasonal variations in autotrophic carbon sources and trophic level of *Paracheridon axelrodi* (Osteichthyes, Characidae) in an interfluvial wetland of the middle Negro River. Ph.D. Thesis National Institute of Amazon Research.
6. José Reinaldo Pacheco Peleja. 2007. Mass balance of total Mercury in two stream basins with different soil compositions in the central Amazon. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
7. Ynglea Georgina de Freitas Goch. 2007. Effects of siltation on fish communities in the Urucu river basin, Coari, Amazonas, Brazil. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
8. Lauren Belger. 2007. Factors influencing CO₂ e CH₄ emissions in interfluvial wetlands of the middle Negro river basin. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
9. Alexandre Kemenes. 2006. Emissions of CO₂ e CH₄ from the Balbina hydroelectric system. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
10. Mario Thomé de Souza. 2005. Autotrophic energy sources for channel fish communities and turtles along in the middle Negro river basin, Amazonas, Brazil. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
11. Carlos Eduardo Gianini. 2003. Paleolimnological study of the anthropogenic acidification of Amazon lakes using fossil diatom assemblages as bioindicators. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
12. José Gerley Diaz Castro. 1999. Biomass and biodiversity of periphytic algae along the Jau river main channel and abiotic factors controlling its annual bloom, Jau National Park, Central Amazon. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.

13. Domitila Pascoaloto. 1999. Seasonality and distribution of macroalgae in terra firme streams in forest reserves near Manaus, Amazonas, Brazil. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.
14. Patricia Rodrigues Carvalho Pinheiro. 1996. Fractionation, characterization and dynamics of phosphorus in some aquatic environments in the Central Amazon. PhD Thesis, National Institute of Amazon Research, Manaus, Brazil.

PARTICIPATION IN PROJECTS (PI OR CO-PI INDICATED)

2016 – present, Collaborator, Cornell University Andean Dams Working Group, Atkinson Center for a Sustainable Future.

2015 – present, Team member, Amazon Waters Initiative: Balancing infrastructure development with the conservation of waters, wetlands and fisheries”, Science for Nature and People Partnership (SNAPP), National Center for Ecological Analysis and Synthesis, Wildlife Conservation Society, and others.

2014 – present, Co-PI, “ Mapping habitat distribution, vegetation structure and flooding dynamics in the Amazon basin wetlands”, Kyoto Carbon Initiative, Phase 4, JAXA (free preliminary access to ALOS-2 SAR imagery).

2014 – 2015, Team member, “ Science for Nature and People (SNAP), Western Amazon Working Group”, National Center for Ecological Analysis and Synthesis, Wildlife Conservation Society, The Nature Conservancy, Moore Foundation.

2013 – present, Principal Investigator, “Biogeochemistry of carbon in the Amazon basin: Interactions between lakes and rivers”, Brazil Research Council (CNPq), \$50,000.

2013 - present, Principal Investigator, “The potential impacts of climate and land-use change on the biogeochemistry of carbon and nutrients in central Amazon lakes and rivers”. CNPq, \$300,000.

2011 – present, Co-PI, “The influence of environmental change on the fish communities of Amazon lakes: complex interactions on different scales”, CNPq, \$200,000.

2011 – 2014, Principal Investigator, “The use of ALOS imagery to investigate the carbon dynamics of the Amazon river system”, Kyoto Carbon Initiative, Phase 3, JAXA (free preliminary access to ALOS SAR imagery).

2010 – 2016, Co-PI, “ RHIA - Amazon Hydrological Network”, Financer of Studies and Projects (FINEP), \$500,000.

2010 – 2015, Principal Investigator, “Socio-environmental diagnostic of a complex ecosystem: basis for the sustainable use of Balbina Reservoir”, CNPq, \$250,000.

2010 – 2013, Principal Investigator, “The biogeochemistry of carbon and mercury in the Amazon Basin”, CNPq/FAPEAM, \$250,000.

2010 – 2013, Principal Investigator, “The biogeochemistry of mercury in the Amazon basin”, CNPq, \$75,000.

2003 – 2007, Principal Investigator, “Peacock Bass Project: fundamental knowledge for the sustainable development of the sport fishing industry in the Negro river basin”, FAPEAM (Research Development Foundation for the State of Amazonas), \$250,000.

2002 – 2008, Co-PI, “LBA-ECO (Large Scale Biosphere-Atmosphere Program) – LC-07: Multi-scale analyses of inundation with microwave and optical remote sensing in the Amazon Basin: Applications to biogeochemical measurements and modeling”, CNPq/NASA.

2002 – 2008, Co-PI, “Cognitive tools for the investigation of the complexity of Amazon ecosystems”, Petrobras.

2000 – present, Co-PI, “Conservation of the Amazon River Ecosystem”, funding from multiple sources through the years (Moore Foundation, MacArthur Foundation, WWF, Amazon Conservation Association, Wildlife Conservation Society).

2000 – 2015, Co-PI, “PIATAM Project – Development of models to predict inundation and oil spill flow flood patterns along the central Amazon floodplain”, PETROBRAS S.A./FINEP, about \$300,000.

2000 – 2008, Co-PI, “CTPETRO AMAZONIA Subproject PI3: Analysis and modeling of the environmental impacts of terrestrial oil exploration in the Central Amazon”, PETROBRAS S.A./FINEP, about \$200,000.

1999 – 2005, Co-PI, Mariuá Project: Ecological, technological and socio-economic basis for the sustainable management of ornamental fish and turtles in the Negro River basin”, CNPq.

1995 – 1999, Principal Investigator, “Global Rain Forest Mapping Program – Using multi-temporal JERS-1 SAR imagery to investigate the pattern of inundation and greenhouse gas emissions in the Jau River basin”, NASDA/Japan (free preliminary access to JERS-1 L-band SAR imagery).

1993 – 1995, Co-PI, “Rio Negro Program, Jaú Project – Characterization of the of the Jaú River ecosystem”, Victoria Amazonica Foundation.

1988 – 1995, Principal Investigator, “Causes and consequences of mercurial contamination in the Negro River basin, with emphasis on the natural mercury cycle”. CNPq/NSF/Victoria Amazonica Foundation.

1982 – 1998, Co-PI, Brazilian Coordinator since 1988, “Carbon in the Amazon River Experiment”, NSF/NASA, multiple renewals, about \$3,000,000 total.

CONSULTING EXPERIENCE

2015 – present, Collaborating member of the science team of Amazon Waters Initiative, WCS

2015, Contributed to the evaluation of the Environmental Impact Study for the proposed São Luiz Hydroelectric Dam on the Tapajos River, Green Peace.

2014 – 2015, Created a detailed spatial data base for aquatic habitats in the Amazon basin and used it to develop impact scenarios for infrastructural development and climate change as part of the SNAP/Western Amazon Working Group, NCIS/WCS/TNC, 2014-2015.

2011 – 2013, Collected limnological data for tributaries of the Inambari and Ucayali rivers and used it to develop impact scenarios for infrastructural development and land use change in the Peruvian Amazon for WCS.

2010, Contributed to the evaluation of the Environmental Impact Study for the Santo Antonio Hydroelectric Dam on the Tapajos River, Rondonia State Public Prosecutor.

2006-2007, Contributed to a general analysis of the ecology and conservation of the Branco river system: general description of basin geology, geomorphology, wetland habitats, hydrological and limnological characteristics, existing environmental impacts, Amazon Conservation Association (ACA).

2003, Contributed to the Environmental Impact Study for the Licensing of the Coari-Manaus Gas Pipeline: Adjustment of pipeline trajectory to minimize impacts to fluvial wetlands, Petrobras. S.A.

2002, Produced a general synthesis of information on aquatic habitats and fisheries for the Amazon River system for the Pro-Varzea Project, ESTUDO MATRIZ, PPG7 – DFID, EU.

2001-2003, Collected and analyzed hydrological and limnological data for tributaries of the Madre de Dios river for Amazon Conservation Association (ACA).

2000, Generated the first wetland classification for the entire Amazon basin, derived from JERS-1 L-band SAR imagery for WWF

1998-2001, Coordinated impact assessment of Lake Cururu oil spill, Reman/Petrobras S.A., Manaus.

ADDITIONAL SKILLS

- Fluent in English, Portuguese and Spanish

- Proficient in hydrological modeling and spatial analysis
- Proficient in the use of autonomous environmental sensors and the interpretation and analysis of data derived from these sensors
- Advanced proficiency in ArcGis, Spatial Analyst, ArcHydro, Envy and Geomatic softwares
- Advanced proficiency in Microsoft Office and Statistica
- Proven ability to work effectively and efficiently with multidisciplinary teams in both collaborator and coordinator roles, under deadline situations.
- Ample experience working with governmental and non-governmental organizations, with public and private stakeholders, and with a diversity of funding organizations in a variety of contexts relevant to the investigation and conservation of lakes and wetlands.