NORTON SIANO RIBEIRO DE FREITAS
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(a) PROFESSIONAL PREPARATION

Babson College	Management Science	B.Sc.	1980
University of São Paulo	Sciences - Economics	Ph.D.	1993
University of Vermont	Ecological Economics	Graduate Degree	2011
	Isotope Geochemistry	Graduate Degree	2012

(b) APPOINTMENTS

2008-present	Environmental Scientist, Environment Authority of São Paulo
May 2018-present	Visiting Scholar, Physics &Astronomy, Texas A&M University
Jan.2015-Dec.2015	Fulbright Professor, Texas A&M University AgriLife Research
Jan.2011-Dec.2012	Faculty Member, University of Vermont

(c) PRODUCTS

Book chapter

1. de Freitas, N., & Farley, J. (2012). **Restoring Ecosystem Services in Riparian Zones by Promoting Working Forests in São Paulo, Brazil.** In Deborah Rigling Gallagher (Ed.), Environmental leadership: A reference handbook. (pp. 519-527). Thousand Oaks, CA: SAGE Publications,Inc.doi:10.4135/9781452218601.n55. http://knowledge.sagepub.com/view/hdbk_enviroleadership/n55.xml

Journal article accepted for publication

2. Ribeiro de Freitas, N. Jr., Lini, A & Domingos.M. **Documenting and Understanding Biochemical Changes Affecting the Sustainability of Tropical Forest Ecosystem Services in Southeastern Brazil.** ISOSCAPES. Purdue University, Discovery Park, West Lafayette, Indiana. http://wateriso.utah.edu/isoscapes2011/images/Abstracts_Program.pdf

Journal article

3. Farley, J. Schmitt F., A. Alvez, J. Ribeiro de Freitas Jr., N. 2012. **How Valuing Nature Can Transform Agriculture. Solutions.**Vol.2, No.6. pp.64-73. http://www.thesolutionsjournal.com/node/1014

Technical Work

4. De Freitas, N., & McCarl, B. A. **Working Forests for Energy Generation and the Restoration of Riparian Ecosystems in São Paulo, Brazil, Using a Regional Model with a Structure Similar to the Forestry and Agricultural Sector Optimization Model – Greenhouse Gas Version (FASOM GHG).** http://www.cies.org/grantee/norton-ribeiro-de-freitas-junior

Technical Work

5. Ribeiro de Freitas, N. Jr., Markewitz. D., R.H. Howard and A. Howard. **Indicators of Forest Ecosystem Functions for Valuing Land Based Mitigation of the Impact of Agriculture in the Environment.** http://www.bv.fapesp.br/en/bolsas/76908/ecological-indicators-of-the-ecosystem-services-provided-by-the-forests-of-the-state-of-sao-paulo/

(d) OTHER PRODUCTS:

Book

Ribeiro de Freitas, N. Jr. (1994). O capital norte-americano e investimento no Brasil: características e perspectivas de um relacionamento econômico, 1950-1990.
Editora Record. **https://lccn.loc.gov/95832096d)**

(e) SYNERGISTIC ACTIVITIES

1. **Dynamic modeling of ecosystem response to land use**. The central focus of my research is in the area of Forest Management for Ecosystem Services and the intersection of Environmental Analysis and Climate Change Adaptation. It requires understanding ecosystem responses stemming from land use conversion as having important influences on land use, environmental quality, biodiversity, biogeochemical and hydrological cycles, including measures to quantify such responses.

2. **Fulbright Professor.** In 2015, I developed a model for multiple-period analyses of environmental policy to assess the benefits for creating working forests for energy generation and the restoration of riparian ecosystems, with the support of Texas A&M University (TAMU), where I was a Fulbright Professor at the Dept. of Agricultural Economics. Through this research, I set up the "Brazil nut-cultivation for sustainable development in the Amazon Initiative" with the Borlaug Institute for International Agriculture. The concept of this project is based on sustainable reforestation of degraded lands along the Amazon, with Brazil nut trees in combination with other crops on small farms, and training farmers in their cultivation and marketing as well as conserving forest areas and biodiversity.

3. **Bridging ecological and economic sciences**. I taught Forest Ecosystem Services Analysis at the University of Vermont (UVM) from January 2011 through December 2012. My field and lab oriented research included the following activities in the Geology Department: a) sampling leaf canopy from major plant species collected from native forest stands, b) performing analysis of $\delta^{13}C$, %C, $\delta^{15}N$, %N and C/N on leaf samples, c) tracking changes in the isotopic composition of $\delta^{13}C$, d) analyzing the isotopic ratio of N leaf samples expressed as $\delta^{15}N$, e) comparing the seasonal variability of $\delta^{13}C$ and $\delta^{15}N$ to extract general trends and increase precision of reported isotopic effects, f) performing statistical analysis to examine the differences between study sites, seasons and species, observing if species are acting as clear markers for different ecosystem functions, g) depicting results graphically to describe the temporal variability of C and N isotope ratios, indicating where there is a relationship between sampling locations, N content and C/N ratios of the species.

4. **Working with Multilateral Organizations.** I collaborated with the "World Bank Ecosystem Restoration of Riparian Forests Project" (http://projects.worldbank.org/P088009?lang=en), enhancing my ability to access the ecological benefits and economic value from the Atlantic Rainforest and Cerrado region. I examined forests subjected to different kinds of anthropogenic stress and demonstrated the use of isotope tracers to predict spatial and temporal signals of disturbance imposed by decreasing air quality. These approaches were utilized to document and understand biochemical changes affecting the sustainability of forest ecosystem services in Southeastern Brazil.

5. **Designing policies that encourage diverse landscapes, communities and products.** I taught scientific workshops manageable at the community level and a system of training focused on the sustainability of agro-forestry systems in Brazil's Atlantic Rainforest and Payments for Ecosystem Services (PES) for small family farmers. In each workshop I worked closely with local communities, businesses, governments and non-government organizations planning, developing and implementing water resources projects and programs. Outcomes ranged from a publication in a major reference handbook in environmental leadership to immediate on the ground results, such as a proposal to establish an environmental protected area in a critical watershed, passed into law by the municipal government.