

Trina Leigh Merrick

tmerrick@fsu.edu

1-270-625-0456

www.trinamerrick.weebly.com

Education

Provost's Postdoctoral Research Fellow, Florida State University Department of Geography	Present
Research Associate, University of Florida Spatial Ecology and Conservation Lab, GatorEye Flying Laboratory School of Forest Resources and Conservation	Present
Doctor of Philosophy, Vanderbilt University Environmental Engineering and Earth & Environmental Sciences	Aug 2018
Master of Science, Murray State University, Murray, Kentucky Geosciences: Remote Sensing & GIS	May 2012
Master of Education, Murray State University, Murray, Kentucky Secondary Education, Physics and Physical Science	Aug 2003
Bachelor of Science, Murray State University, Murray, Kentucky Physics, Mathematics minor	Dec 1998

Publications

Published and in revision:

Merrick, T., Pau, S., Jorge, M.L.S.P., Silva, T.S.F., and Bennartz, R. (2019). Spatiotemporal Patterns and Phenology of Tropical Vegetation Solar-Induced Chlorophyll Fluorescence across Brazilian Biomes Using Satellite Observations. *Remote Sensing*, 11(15), 1746.

Merrick, T., Jorge M.L.S.P., Silva, T.S.F., Pau, S., Rausch, J., Broadbent, E.N., and Bennartz, R. *accepted*. Characterization of chlorophyll fluorescence, absorbed photosynthetically active radiation, and reflectance-based vegetation index spectroradiometer measurements. *International Journal of Remote Sensing*.

Merrick, T., Pau, S., Jorge, M.L.S.P., Rausch, J., and Bennartz, R. *in revision*. Detecting plant stress by monitoring chlorophyll fluorescence using a portable spectrometer and red-blue grow light. *Applications in Plant Sciences*.

In preparation (in order of expected submission date):

Merrick, T., Pau, S., Jorge, M.L.S.P., Silva, T.S.F., Broadbent, E.N., and Bennartz, R. *in prep*. Solar induced fluorescence and reflectance indices to detect seasonality in a temperate deciduous forest. To be submitted to *Remote Sensing of Environment*.

Merrick, T., Bennartz, R., Pau, S., Jorge, M.L.S.P., Broadbent, E.N., and Silva, T.S.F. *in prep*. Parallel spatial patterns of UAV-based solar-induced fluorescence and reflectance indices in tropical forest fragments along an ecological gradient in the Pantanal, Brazil. To be submitted to *Environmental Research Letters*.

Merrick, T., Bennartz, R., Pau, S., Detto, M., Broadbent, E.N., Bohlman, S., and Bennartz, R. *in prep*. Multiscale analysis of diurnal photosynthetic function and structure of a tropical forest canopy on Barro Colorado Island, Panama. To be submitted to *Journal of Geophysical Research: Biogeosciences*.

Presentations

Invited talks

Conservation biology and remote sensing data fusion using R and Python geospatial, time series, and spectral satellite data tools. February 2020. Vanderbilt University, Conservation Biology Interdisciplinary Group Meeting.

Characterizing remote sensing observations of vegetation chlorophyll fluorescence at multiple scales. March 2018. University of Florida, Hyperspectral Remote Sensing Seminar, School of Forest Resources and Conservation.

Intersections of agriculture, eco-tourism, and scientific research in the Atlantic Forest, Cerrado, and Pantanal, Brazil. October, 2017. Vanderbilt University, Warren Center Seminars: Brazilian Studies.

Estimating fluorescence metrics using passive spectroscopy in two extreme lighting conditions. July 2017. Universidade Estadual Paulista Rio Claro, Department of Geography, The Ecosystem Dynamics Laboratory

Characterizing solar induced fluorescence of fragmented Brazilian landscapes: Bridging the gap from ground to satellite. February 2017. Murray State University, Department of Geosciences.

How we see the unseen: Using spectroscopy to study Earth from air and space. June 2015 and June 2016. Vanderbilt Summer Academy.

Evaluation of biome-specific solar-induced chlorophyll fluorescence from field spectroradiometer observations in fragmented landscapes. June 2015. Universidade Estadual Paulista Rio Claro, Department of Ecology.

Conference Presentations

Merrick, T., Pau, S., Broadbent, E.N., Detto, M., Bohlman, S., Almeyda-Zambrano, A. and Bennartz, R. 2019. Multi-scale analysis of tropical forest canopy productivity and function using heterogeneous remote sensing data on Barro Colorado Island, Panama. Oral Presentation. American Geophysical Union Annual Meeting: San Francisco, California.

Merrick, T., Pau, S., Broadbent, E.N., Detto, M., Bohlman, S., and Bennartz, R. 2019. Tropical forest solar-induced fluorescence, reflectance indices, GPP, and canopy temperature relationships on Barro Colorado Island, Panama, from UAV and tower remote sensing. Poster. Florida State University Postdoctoral Symposium. 1st Place.

Merrick, T., Pau, S., Jorge, M.L.S.P., Silva, T.S.F., and Bennartz, R. 2019. Spatiotemporal patterns of tropical vegetation solar-induced fluorescence across Brazilian biomes. Oral Presentation. Ecological Society of America 104th Annual Meeting: Louisville, Kentucky.

Larrinaga, R., D. Morgan, G. Balco, **T. Merrick,** M. Salvatore, M. Guglielmin, and A. Longhi, 2018. Comparing spectral reflectance patterns to the concentration of cosmogenic NE-21 to link weathering and erosion rates for bedrock in Terra Nova Bay, Antarctica. Geological Society of America, Indianapolis, IN., U.S.A.

Merrick, T., Pau, S., Broadbent, E.N., Detto, M., Bohlman, S., and Bennartz, R. 2018. Tropical forest solar-induced fluorescence, reflectance indices, GPP, and canopy temperature relationships on Barro Colorado Island, Panama, from UAV and tower remote sensing. Poster. Florida State University Postdoctoral Symposium. 1st Place.

Merrick, T., R. Bennartz, J. Burnett, M.L.S.P. Jorge, J. Rausch, 2017. Remote Sensing of plant fluorescence at ground, UAS, and satellite scale. European Space Agency FLEX: Solar Induced Fluorescence. Frascati, Italy.

Gorczyński, D., Bradham, J., **Merrick, T.,** Andrade Santos, D., Keuroghlian, A., and Jorge, M. 2016. Effect of white-lipped peccary presence on plant community structure of Buritizal forest fragments in central Brazil. Vanderbilt University Undergraduate Research Fair: Nashville, Tennessee.

- Merrick, T.**, Jorge, M.L.S.P., Silva, T.S.F., and Bennartz, R. 2016. Evaluation of biome-specific solar-induced chlorophyll fluorescence from Orbiting Carbon Observatory-2 observations in Brazil. Oral Presentation. Ecological Society of America 101st Annual Meeting: Fort Lauderdale, Florida.
- Merrick, T.**, Bennartz, R., Jorge, M.L.S.P., and Rausch, J. 2014. Passive field spectroradiometer characterization of solar-induced fluorescence to monitor plant health, estimate carbon flux, & use as ground-truth. Poster. American Geophysical Union Annual Meeting: San Francisco, California.
- Merrick, T.**, Cetin, H. Bennartz, R. 2014. Classification of sand types on Perdido Key, Florida, using multi & hyper-spectral remote sensing. Poster. American Society of Photogrammetry & Remote Sensing Annual Meeting: Louisville, Kentucky.

Grants and Fellowships

University of Florida Jumpstart Grant Partner (\$4000)	2019
Postdoctoral Symposium Poster Competition Award (\$250)	2018
Provost's Postdoctoral Fellowship Award, Salary and Research Funding (3yr~\$171,000)	2018
Summer Research Award, College of Arts & Science, Vanderbilt University (\$3000)	2017
AirCTEMPS/NSF Award, Unmanned Aerial Systems Fellowship (UAV/Pilot, est. value \$96,000)	2016
Goetz Instrument Program Award, ASDInc/Panalytical (FieldSpec 4, est. value \$25,000)	2015
Vanderbilt University Graduate Student Travel Grant (\$500)	2014
Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) & Vanderbilt University Research and Travel Grant and Student Exchange Award (\$40,000)	2014
American Society of Photogrammetry and Remote Sensing (ASPRS) National Conference Graduate Student Grant and Volunteer Program Award (\$1000)	2014
Gordon Research Conference: Radiation and Climate Award (\$1000)	2013

University Teaching Experience

Vanderbilt University (Fall 2013-Summer 2018)

Department of Earth & Environmental Sciences/Department of Environmental Engineering

Head Graduate Teaching Assistant

- Earth & Atmosphere (Fall 2014, Fall 2015, Fall 2016)
- Satellite-Based Remote Sensing (Spring 2018, Summer 2018, Co-head Graduate Assistant)

Graduate Teaching Assistant

- Oceanography: (Spring 2017, Fall 2017)
- Physics of the Climate System: (Spring 2015, Spring 2016) Assisted with course materials, activities, and teaching duties for upper level undergraduate/graduate cross-listed course.

Guest Lecturer

- Physics of the Climate System: (Spring 2015, Spring 2016)
 - "From the Sun to Earth: Basics of Radiation through the Atmosphere"
 - "Experiments with Beer Lambert"

University of Florida

Guest Lecturer

- Forest Ecology: (November 2018) "Insects and Pathogens"

Murray State University

Instructor of Record

- Introduction to Engineering & Physics (Summer 2007, Summer 2008) Commonwealth Honors Academy

Instructional Assistant

- General Physics I & II Laboratory, Department of Physics & Engineering, Fall 1996, Fall 1997, Spring 2004
- Introduction to Remote Sensing (Summer 2010, Fall 2011)
- Introduction to GIS (Spring 2010, Summer 2011)

Guest Lecturer

- Transitions, Department of Physics & Engineering, “Careers in STEM and STEM Education” 2005-2009

Language and Technical Skills

Programming: IDL, R, Python, Matlab, Jupyter Notebook, Github, SVN, C++, FORTRAN, Databases (DBaseIV), Maple

Software: ENVI, ArcMap, TIMESAT, Imagine, AutoCAD

Instrumentation: Multispectral and hyperspectral spectroradiometers, UAV Systems, thermal cameras, RGB and NDVI converted digital cameras, Campbell datalogger systems, camera traps, GPS collars, VHF systems for tracking animals, sound monitoring systems, eddy-covariance flux system, LiCor System photosynthesis measurements, tower-based mounting systems

Languages: English (Native), Portuguese (intermediate), Spanish (beginner)

Leadership and Professional Experience

Florida State University Leadership and Service:

- Developed and led workshops for graduate teaching assistants: “Instructional Planning for the Semester: A Survival Guide
- Undergraduate Research Opportunity Program Mentor: students from computer science, scientific computing, and International Policy/Environmental Studies
- Member, Florida State University Postdoctoral Association & National Postdoctoral Association
- Graduate Student Mentor, Programming in R, IDL, Python, GIS, Google Earth Engine, Algorithm development, deep learning

University of Florida Leadership and Service:

- Technical Expert: Instrumentation Characterization for Tower-Mounted Cameras
- Technical Team Member: IDL Workflow Development for Hyperspectral and LiDAR Fusion
- Graduate Student Mentor, Satellite and UAV Remote Sensing, GIS, and Programming

Vanderbilt University Leadership:

- Coordinator, ENVE/EES Graduate Student Seminar Series
- Team Member-UAV’s for flood protection systems integrity analysis and evaluation, Vanderbilt University Intelligent and Resilient Infrastructure Systems Initiative
- Seminar Speaker Series Planning Committee
- Undergraduate and Graduate Mentor-programming, GIScience and fieldwork
- Vanderbilt University Satellite Trans-Institutional Program Pilot, Graduate Assistant (Fall 2017-Summer 2018) Assisted with developing material for interdisciplinary research and immersion.
- Coding and Mapping Partner-Introduction to Remote Sensing Vanderbilt-Fisk Bridge Program

Kentucky Science & Technology Corporation (2011-2014):

- AP Physics Consultant Instructor Developed and led teacher training on STEM instruction and student preparation courses in AP Physics

High School Educator, Marshall Co. High School, KY (2000-2013)

- Courses Taught: Physics, Engineering, Geoscience
- Kentucky Science Teacher of the Year, 2010

- Project Lead the Way Principles of Engineering Coordinator
- GIS for High School Pilot Teacher (via Principles of Engineering Course)
- Mentor: New STEM Teacher Program, Intern Teacher Program, Student Teaching Mentor
- Mentor: National Board Teacher Portfolio and Exam Mentor
- JETS-TEAMS Engineering Team Coach, Regional Championship, National Representative Team
- STEM Fair for Community Coordinator, STEM Field Day Co-coordinator
- Roller Coaster Physics Coordinator (Bush Gardens, St. Louis)
- Academic Team Coach, Physics Bowl Coach, Engineering Team Coach, Science Club Sponsor

Certifications

- FAA Commercial Remote Pilot Certification (2019)
- Project Lead the Way Instructor, Principles of Engineering (2011)
- Advanced Placement Physics, The College Board (2005, 2011)
- Gifted Education, Murray State University, Murray, Kentucky (2009)
- National Board Certification in Adolescent/Young Adult Education Physics (2005)
- KY Teaching Certification, Physical science (physics, chemistry, Earth science) & Mathematics (1999)

Professional Development Activities

- Applications and User Development SIF & ECOSTRESS Data Products from Spaceborne Platforms (Dec 2018,2019)
- Entrepreneurship training, Vanderbilt WOND'RY and Nashville Entrepreneur Center (Fall 2017)
- ASD/Panalytical Spectral Devices Training (April 2017)
EcoSpec: Linking Hyperspectral Remote Sensing and Plant Activity
- Ecological Society of America (Oct 2016)
Eyes in the Sky: Drone Use for Ecological and Environmental Research
- Harris Geospatial Solutions Workshop (Nov 2015)
Using ENVI with IDL and Scientific Programming with IDL

Professional References

Dr. Stephanie Pau

Associate Professor of Geography
Florida State University
spau@fsu.edu
1-850-644-1706

Dr. Ralf Bennartz

Professor of Earth and Environmental
Sciences/Environmental Engineering
Vanderbilt University
Affiliate Professor of Atmospheric and Oceanic
Sciences
UW-Madison Space Science and Engineering Ctr
University of Wisconsin-Madison
ralf.bennartz@vanderbilt.edu
1-615-322-2976

Dr. Stephanie Bohlman

Associate Professor
Forest Resources and Conservation
University of Florida
sbohlman@ufl.edu
1-352-846-3503

Dr. Thiago S.F. Silva

Lecturer of Environmental Informatics
Biological and Environmental Sciences
University of Stirling
Assistant Researcher
Earth Research Institute
University of California Santa Barbara
thiago.sf.silva@stir.ac.uk
+44-1786-467853