Eben North Broadbent

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University of Florida
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A. PROFESSIONAL PREPARATION

College/University	Major	Degree & Year
University of Vermont	Botany	B.S. 2000
University of Florida	Forestry	M.S. 2005
Stanford University	Biology	Ph.D. 2012

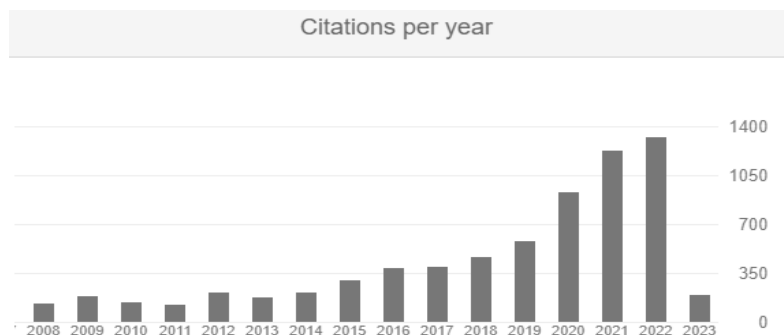| College/University	Position	Year
Harvard University	Postdoctoral Fellow	2012
Smithsonian Institution	Postdoctoral Fellow	2013-14
Stanford University	Postdoctoral Fellow	2013-14

B. ACADEMIC/PROFESSIONAL APPOINTMENTS

Associate Professor, School of Forest, Fisheries, and Geomatics Sciences, UFL   2012-Present
       Appointment: 60% Research, 40% Teaching
Assistant Professor, School of Forest Resources & Conservation, Univ. of Florida 2016-2022
Assistant Professor, Dept. of Geography, University of Alabama   2014-2016

Affiliated Faculty, Tropical Conservation & Development, Univ. of Florida   2016-Present
Affiliated Faculty, Center for Latin American Studies, University of Florida   2016-Present
Affiliated Faculty, Water Institute, University of Florida   2016-Present
Co-Director, GatorEye Unmanned Flying Laboratory (GE-UFL)   2016-Present
Co-Director Spatial Ecology & Conservation (SPEC) Lab   2014-Present
Affiliate Researcher, Woods Institute for the Environment, Stanford University   2014-Present
Adjunct Faculty, Dept. of Biology, University of Alabama   2014-2021
Faculty Affiliate, Center for Freshwater Science, University of Alabama   2014-2016

C. PUBLICATIONS – Peer-reviewed journals

1) Impact

Metric	All (02/16/23)	Since 2018
Citations	7327	4781
h-index	30	28
i10-index	63	61

Citations per year (201 in 2023)

Citations per year

2) Total (since 2016 UF appointment year) = 86 (67)

Number	Publication
86	[p]Klauberg C., Vogel, J., Dalagnol, R., Pinheiro Ferreira M., Hamamura, C., **Broadbent, E.,** Silva, C. 2023. Post-Hurricane Damage Severity Classification at the Individual Tree Level Using Terrestrial Laser Scanning and Deep Learning. Remote Sensing.
85	Cosenza, D.N., Vogel, J., **Broadbent, E.N**. and Silva, C.A., 2022. Silvicultural experiment assessment using lidar data collected from an unmanned aerial vehicle. Forest Ecology and Management, 522, p.120489.
84	Liang, J., Gamarra, J.G., Picard, N., Zhou, M., Pijanowski, B., Jacobs, D.F., Reich, P.B., Crowther, T.W., Nabuurs, G.J., De-Miguel, S., Fang, J., … **Broadbent, E.N.,** … 2022. Co-limitation towards lower latitudes shapes global forest diversity gradients. Nature Ecology & Evolution, 6(10), pp.1423-1437.
83	Kaddoura, Y.O., Wilkinson, B., Merrick, T., Barnes, G., Duffy, K., **Broadbent, E**.N, Abd-Elrahman, A., Binford, M. and Richardson, A.D., 2022. Georeferencing oblique PhenoCam imagery. ISPRS Journal of Photogrammetry and Remote Sensing, 190, pp.301-321.
82	Jakovac, C.C., Meave, J.A., Bongers, F., Letcher, S.G., Dupuy, J.M., Piotto, D., Rozendaal, D.M., Peña-Claros, M., Craven, D., Santos, B.A., Siminski, A., … **Broadbent, E.N**., … 2022. Strong floristic distinctiveness across Neotropical successional forests. Science Advances, 8(26), p.eabn1767.
81	Vargas Soto, J.S., Beirne, C., Whitworth, A., Cruz Diaz, J.C., Flatt, E., Pillco-Huarcaya, R., Olson, E.R., Azofeifa, A., Saborío-R, G., Salom-Pérez, R, Espinoza-Muñoz, D., Hay, L., Whittaker, L., Roldan, C., Bedoya-Arrieta, R., **Broadbent, E.N.,** Molnar, P.K. 2022. Human disturbance and shifts in vertebrate community composition in a biodiversity hotspot. Conservation Biology, 36(2), p.e13813.
80	Dalla Corte, A.P., de Vasconcellos, B.N., Rex, F.E., Sanquetta, C.R., Mohan, M., Silva, C.A., Klauberg, C., de Almeida, D.R.A., Zambrano, A.M.A., Trautenmüller, J.W. and Leite, R.V., 2022. Applying High-Resolution UAV-LiDAR and Quantitative Structure Modelling for Estimating Tree Attributes in a Crop-Livestock-Forest System. Land, 11(4), p.507.
79	Corte, A.P.D., da Cunha Neto, E.M., Rex, F.E., Souza, D., Behling, A., Mohan, M., Sanquetta, M.N.I., Silva, C.A., Klauberg, C., Sanquetta, C.R. and Veras, H.F.P., 2022. High-Density UAV-LiDAR in an Integrated Crop-Livestock-Forest System: Sampling Forest Inventory or Forest Inventory Based on Individual Tree Detection (ITD). Drones, 6(2), p.48.
78	Gatti, R.C., Reich, P.B., Gammara, J.G.P., Crowther, T., Hui, C., Morera, A., Bastin, JF., de-Miguel, S., Nabuurs, GJ., Svenning, JC., Jacobs, D.F., Pijanowski, B., Banerjee, A., Giaquinto, R.A., Alberti, G., Almeyda Zambrano, A.M., Alvarez-Davila, E, Araujo-Murakama, A., Avitabile, V., Aymard, G.A., Balazy, R., Baraloto, C., Barroso, J.G., Bastian, M.L., Birnbaum, P., Bitariho, R., Bogaert, J., Bongers, F., Bouriaud, O., Brancalion, P.H.S., Brearley, F.Q., **Broadbent, E.N.,** Bussotti, F., Castro da Silva, W., Cesar, R.G., Cesljar, G., Moscoso, V.C., Chen, H.Y.H., Cienciala, E., Clark, C.J., Coomes, D.A., Dayanandan, S., Decuyper, M., Dee, L.E., Pasquel, J.D.A., Derroire, G., Djuikouo, M.N.K., Do, T.V., Dolezal, J., Dordevic, L.D., Engel, J., Fayle, T.M., Feldpausch, T.R., Fridman, J.K., Harris, D.J., Hemp, A., Hengeveld, G., Herault, B., Herold, M., Ibanez, T., Jagodzinski, A.M., Jaroszewicz, B., Jeffery, K.J., Johannsen, V.K., Jucker, T., Kangur, A., Karminov, V.N. Kartawinata, K., Kenard, D.K., Kepfer-Rojas, S., Keppel, G., Khan, J.L., Khara, P.K., Kileen, T.J., Kim, H.S., Korjus, H, Kumar, A., Kumar A., Laarann D., Labriere, N., Land, M., Lewis, S.L., Lukina, N., Maitner, B.S., Malhi, Y., Marshall, A.R., Martynenko, O.V., Mendoza, A.L.M., Ontikov, P.V., Ortiz-Malavasi, E., Camacho, N.C.Pallqui., Paquette, A., Park, M., Parthasarathy, N., Peri, P.L., Petroelli, P., Pfautsch, S., Phillips, O.L., Picard, N., Piotto, D., Poorter, L., Poulsen, J.R., Pretzsch, H., Ranirez-Angulo, H., Correa, Z.R., Rodeghiero, M., Gonzales, R.D.P.R., Roli, S.G., Rovero, F.,

	Rutishauser, E., Saikia, P., Salas-Eljatib, C., Schepaschenko, D., Scherer-Lorenzen, M., Seben, V., Silveira, M., Slik, F., Sonke, B., Souza, A.F., Sterenczak, K.J., Svoboda, M., Taedoumg, H., Tchebakova, N., Terbourgh, J., Tikhonava, E., Torres-Lezama, A., Plas, F.V.D., Vasquez, R., Viana, H., Vibrans, A.C., Vilanova, E., Vos, V.A., Wang, H.F., Westerlund, B., White, L.J.T., Wiswer, S.K., Zawia-Niedzwiecki, T., Zemagho, L., Zhu, Z.X., Zo-Bi, I.C., Liana, J. 2022. The number of tree species on Earth. *Proceedings of the National Academy of Sciences (PNAS).*
77	Gerson, J., Szponar, N., Almeyda Zambrano, A.M., Bergquist, B., **Broadbent, E.N.,** Driscoll, C., Erkenswick, G., Evers, D., Fernandez, L., Hsu-Kim, H., Inga, G., Lansdale, K., Marchese, M., Martinez, A., Moore, C., Pan, W., Pérez Purizaca, R.O., Sánchez, V., Silman, M., Ury, E., Vega, C., Watsa, M., Bernhardt E.S., 2022. Amazon forests capture high levels of atmospheric mercury pollution from artisanal gold mining. *Nature Communications.*
76	Magee, L., Pandit, K., Flory, S.L., Crandall, R.M., Broadbent, E.N., Prata, G.A., Dillon, W., Bohlman, S. and Johnson, D.J., 2022. Life Stage and Neighborhood-Dependent Survival of Longleaf Pine after Prescribed Fire. Forests, 13(1), p.117.
75	Silva, C.A., Hudak, A., Vierling, L., Valbuena, R., Cardil, A., Mohan, M., Almeida, D., **Broadbent, E.N.,** Almeyda Zambrano, A.M.. Wilkinson, B., Sharma, A., Drake, J.B., Medley, P.B., Vogel, J., Prata, G.A., Atkins, J., Hamamura, C., Johnson, D., Klauberg, C. 2022. Treetop: A Shiny-based Application and R package for Extracting Forest Information from LiDAR data for Ecologists and Conservationists. *Methods in Ecology and Evolution.*
74	Leite, R.V., Silva, C.A., **Broadbent, E.N**., Do Amaral, C.H., Liesenberg, V., De Almeida, D.R.A., Mohan, M., Godinho, S., Cardil, A., Hamamura, C. and De Faria, B.L., 2022. Large scale multi-layer fuel load characterization in tropical savanna using GEDI spaceborne lidar data. *Remote Sensing of Environment*, 268, p.112764.
73	Meunier, F., Visser, M.D., Shiklomanov, A., Dietze, M.C., Guzmán Q, J.A., Sanchez-Azofeifa, G.A., De Deurwaerder, H.P., Krishna Moorthy, S.M., Schnitzer, S.A., Marvin, D.C. and Longo, M., 2022. Liana optical traits increase tropical forest albedo and reduce ecosystem productivity. Global change biology, 28(1), pp.227-244.
72	Schroder, W., Murtha, T., Golden, C., Scherer, A.K., **Broadbent, E.N**., Almeyda Zambrano, A.M., Herndon, K., Griffin, R. 2021. UAV LiDAR Survey for Archaeological Documentation in Chiapas, Mexico. Remote Sensing. 13(23): 4731
71	Mere-Roncal, M., Carrero, G.C., Chavez, A.B., Almeyda Zambrano, A.M., Loiselle, B., Gutierrez, F.V., Luna-Celino, V., Arteaga, M., Bongiolo, E.S., Tomasi, A.S., Damme, P.V.D., Zapata, D.E.L., **Broadbent, E.N.** 2021. Participatory Mapping for Strengthening Environmental Governance on Socio-Ecological Impacts of Infrastructure in the Amazon: Lessons to Improve Tools and Strategies. *Sustainability*. 13 (24): 14048
70	Magee, L., Pandit, K., Flory, S.L., Crandall, R.M., **Broadbent, E.N**., Prata, G.P., Dillon, W., Bohlman, S., Johnson, D.J., 2021. Life stage and neighborhood-dependent survival of longleaf pine after prescribed fire. *Forests.*
69	Meunier, F., Visser, M.D., Shiklomanov, A., Deitze, M., Guzman, A.Q., Sanchez-Azofeifa, G.A., De Deurwaerder, H.P.T., Moorthy S.M, Schnitzer, S.A., Marvin, D.C., Longo, M., **Broadbent, E.N.,** Almeyda Zambrano, A.M., Muller-Landau, H.C., Detto, M., Verbeeck, H. 2022. Liana optical traits increase tropical forest albedo and reduce ecosystem productivity. *Global Change Biology*. 28(1): 227-244.
68	Poorter, L., Craven, D., Jakovac, J.C., van der Sande, M.T., Amissah, L., Bongers, F., Chazdon, R.L., Farrior, C.L., Kambach, S., Meave, J.A., Muñoz, R., Norden, N., Rüger, N., Breugel, M., Almeyda Zambrano, A.M., Amani, B., Andrade, J.L., Brancalion, P.H.S., Broadbent, E.N., de Foresta, H., Dent, D.H., Derroire, G., DeWalt, S.J., Dupuy, J.M., Durán, S.M., Fantini, A.C., Finegan, B., Hernández-Jaramillo, A., Hernández-Stefanoni, J.L., Hietz, P., Junqueira, A.B., N'dja., J.K., Letcher S.G., Lohbeck, M., López-Camacho, R., Martínez-Ramos, M., Melo, F.P.L., Mora, F., Müller, S.C., N'Guessan, A.E., Oberleitner, F., Ortiz-

	Malavassi, E., Pérez-García, E.A., Pinho, B.X., Piotto, D., Powers, J.S., Rodríguez-Buriticá, S., Rozendaal, D.M.A., Ruíz, J., Tabarelli, M., Teixeira, H.M., Valadares, E., van der Wal, H., Villa, P.M., Fernandes, G.W., Santos, B.A., Aguilar-Cano, J., Almeida-Cortez, J.S., Alvarez-Davila, E., Arreola-Villa, F., Balvanera, P., Becknell, J.M., Cabral, G.A.L., Castellanos-Castro, C., de Jong, B.H.J., Nieto, J.E., Espírito-Santo, M.M., Fandino, M.C., Garcia, H., García-Villalobos, D., Hall, J.S., Idárraga, A., Jiménez-Montoya, J., Kennard, D., Marín-Spiotta, E., Mesquita, R., Nunes, Y.R.F., Ochoa-Gaona, S., Peña-Claros, M., Pérez-Cárdenas, N., Rodríguez-Velázquez, J., Villanueva, L.S., Schwartz, N.B., Steininger, M.K., Veloso, M.D.M., Vester, H.F.M., Vieira, I.C.G., Williamson, G.B., Zanini, K., Hérault, B., 2021. Multidimensional tropical forest recovery. *Science*, 374 (6573): p 1370-1376.
67	Soto, J.S.V., Beirne, C., Whitworth, A., Diaz, J.C.C., Flatt, E., Pillco-Huarcaya, R., Olson, E.R., Azofeifa, A., Saborío-R, G., Salom-Pérez, R., Espinoza-Muñoz, D., Hay, L., Whittaker, L., Roldan, C., Bedoya-Arrieta, R., **Broadbent, E.N**., and Molnar, P.K. 2021. Human disturbance and shifts in vertebrate community composition in a biodiversity hotspot. *Conservation Biology*.
66	Laidlaw, K., **Broadbent, E**. and Eby, S., 2021. Effectiveness of aerial wildlife crossings: Do wildlife use rope bridges more than hazardous structures to cross roads?. *Revista de Biología Tropical*, 69(3).
65	Schnitzer, S.A., DeFilippis, D.M., Visser, M., Estrada-Villegas, S., Rivera-Camaña, R., Bernal, B., Peréz, S., Valdéz, A., Valdéz, S., Aguilar, A., Dalling, J.W., **Broadbent, E.N**., Almeyda Zambrano, A.M., Hubbell, S.P., and Garcia-Leon, M. 2021. Local canopy disturbance as an explanation for long-term increases in liana abundance. *Ecology Letters*.
64	Mohan, M., Leite, R.V., **Broadbent, E.N**., Jaafar, W.S.W.M., Srinivasan, S., Bajaj, S., Dalla Corte, A.P., do Amaral, C.H., Gopan, G., Saad, S.N.M. and Kamarulzaman, A.M.M., 2021. Individual tree detection using UAV-lidar and UAV-SfM data: A tutorial for beginners. *Open Geosciences*, 13(1), pp.1028-1039.
63	Chen S, Du Y, Das P, Lamore AF, Dimova NT, Elliott M, **Broadbent EN**, Roebuck Jr JA, Jaffé R, Lu Y. 2021. Agricultural land use changes stream dissolved organic matter via altering soil inputs to streams. *Science of The Total Environment*. 796:148968.
62	de Almeida DR, **Broadbent EN**, Ferreira MP, Meli P, Zambrano AM, Gorgens EB, Resende AF, de Almeida CT, do Amaral CH, Dalla Corte AP, Silva CA. 2021. Monitoring restored tropical forest diversity and structure through UAV-borne hyperspectral and lidar fusion. *Remote Sensing of Environment*. 264:112582.
61	Schroder W, Murtha T, **Broadbent EN**, Almeyda Zambrano AM. 2021. A confluence of communities: households and land use at the junction of the Upper Usumacinta and Lacantún Rivers, Chiapas, Mexico. *World Archaeology*. 3:1-28.
60	da Cunha Neto EM, Rex FE, Veras HF, Moura MM, Sanquetta CR, Käfer PS, Sanquetta MN, Zambrano AM, **Broadbent EN**, Dalla Corte AP. 2021. Using high-density UAV-Lidar for deriving tree height of Araucaria Angustifolia in an Urban Atlantic Rain Forest. *Urban Forestry & Urban Greening*. 25:127197.
59	Mohan M, Richardson G, Gopan G, Aghai MM, Bajaj S, Galgamuwa GA, Vastaranta M, Arachchige PS, Amorós L, Corte AP, de-Miguel S, Leite RV, Kganyago M, **Broadbent EN**, Doaemo W, Abdullah Bin Shorab M, Cardil A. 2021. UAV-Supported Forest Regeneration: Current Trends, Challenges and Implications. *Remote Sensing*. 13:2596.
58	[g]da Costa MBT, Silva CA, **Broadbent EN**, Leite RV, Mohan M, Liesenberg V, Stoddart J, do Amaral CH, de Almeida DRA, da Silva AL, Goya LRRY, Cordeiro VM, Rex F, Hirsch A, Marcatti GE, Cardil A, de Mendonca BAF, Hamamura C, Dalla Corte AP, Matricardi EAT, Hudak AT, Almeyda Zambrano AM, Valbuena R, de Faria BL, Silva Jr. CHL, Aragao L, Ferreira ME, Liang J, Carvalho SPC, Klauberg C. 2021. Beyond trees: Mapping total

	aboveground biomass density in the Brazilian savanna using high-density UAV-lidar data. *Forest Ecology and Management*, 491, p.119155.
57	Johnson DJ, Magee L, Pandit K, Bourdon J, **Broadbent EN**, Glenn K, Kaddoura Y, Machado S, Nieves J, Wilkinson BE and Almeyda Zambrano AM. 2021. Canopy tree density and species influence tree regeneration patterns and woody species diversity in a longleaf pine forest. *Forest Ecology and Management,* 490, p.119082.
56	*P*Merrick T, Pau S, Detto M, **Broadbent EN**, Bohlman S, Still CJ and Almeyda Zambrano AM. 2021. Unveiling spatial and temporal heterogeneity of a tropical forest canopy using high-resolution NIRv, FCVI, and NIRvrad from UAS observations. *Biogeosciences Discussions*, pp.1-20.
55	*g*Mohan M., Rue HA, Bajaj S, Galgamuwa GP, Adrah E, Aghai MM, **Broadbent EN**, Khadamkar O, Sasmito SD, Roise J and Doaemo W. 2021. Afforestation, reforestation and new challenges from COVID-19: Thirty-three recommendations to support Civil Society Organizations (CSOs). *Journal of Environmental Management*, p.112277.
54	*A*Brumberg H, Beirne C, **Broadbent EN**, Almeyda Zambrano AM, Almeyda Zambrano S, Quispe Gil C, Lopez Gutierrez B, Eplee R, Whitworth A. 2021. Riparian buffer length is more influential than width on river water quality: A case study in southern Costa Rica. *Journal of Environmental Management.* 286: 112132.
53	*g*Shrestha M, **Broadbent EN**, and Vogel JG. 2021. Using GatorEye UAV-Borne LiDAR to Quantify the Spatial and Temporal Effects of a Prescribed Fire on Understory Height and Biomass in a Pine Savanna. *Forests* 12(1):38. https://doi.org/10.3390/f12010038.
52	Cardil A, de-Miguel S, Silva CA, Reich PB, Calkin D, Brancalion PH, Vibrans AC, Gamarra JG, Zhou M, Pijanowski BC, Hui C, Crowther TW, Hérault B, Piotto D, Salas-Eljatib C, **Broadbent E**, Almeyda Zambrano AM, Picard N, Aragao LEO, Bastin J-F, Routh D, van den Hoogen J, Peri PL and Liang J. 2020. Recent deforestation drove the spike in Amazonian fires. *Environmental Research Letters* 15(12):121003.
51	Wan Mohd Jaafar WS, Said NFS, Abdul Maulud KN, Uning R, Latif MT, Muhmad Kamarulzaman AM, Mohan M, Pradhan B, Saad SNM, **Broadbent EN** and Cardil A. 2020. Carbon Emissions from Oil Palm Induced Forest and Peatland Conversion in Sabah and Sarawak, Malaysia. *Forests* 11(12):1285.
50	*P*Dalla Corte AP, Souza DV, Rex FE, Sanquetta CR, Mohan M, Silva CA, Zambrano AMA, Prata G, de Almeida DRA, Trautenmüller JW, Klauberg C, de Moraes A, Sanquetta MN, Wilkinson B, and **Broadbent EN**. 2020. Forest inventory with high-density UAV-Lidar: Machine learning approaches for predicting individual tree attributes. *Computers and Electronics in Agriculture* 179:105815.
49	*P*de Almeida DRA, Almeyda Zambrano AM, **Broadbent EN**, Wendt AL, Foster P, Wilkinson BE, Salk C, Papa DDA, Stark SC, Valbuena R and Gorgens EB. 2020. Detecting successional changes in tropical forest structure using GatorEye drone-borne lidar. *Biotropica* 52(6):1155-1167.
48	*P*Schroder W, Murtha T, Golden C, Hernández AA, Scherer A, Morell-Hart S, Zambrano AA, **Broadbent E** and Brown M. 2020. The lowland Maya settlement landscape: Environmental LiDAR and ecology. *Journal of Archaeological Science: Reports* 33:102543.
47	Brancalion PH, **Broadbent EN**, de-Miguel S, Cardil A, Rosa MR, Almeida CT, Almeida DR, Chakravarty S, Zhou M, Gamarra JG and Liang J. 2020. Emerging threats linking tropical deforestation and the COVID-19 pandemic. *Perspectives in Ecology and Conservation* 18(4):243-246.
46	*P*Merrick T, Jorge MLS, Silva TS, Pau S, Rausch J, **Broadbent EN** and Bennartz R. 2020. Characterization of chlorophyll fluorescence, absorbed photosynthetically active radiation, and reflectance-based vegetation index spectroradiometer measurements. International Journal of *Remote Sensing* 41(17):6755-6782.

45	[g]Dobbins M, Sollmann R, Menke S, Almeyda Zambrano A and **Broadbent E**. 2020. An integrated approach to measure hunting intensity and assess its impacts on mammal populations. *Journal of Applied Ecology* 57(11):2100-2111.
44	[g]Lacouture DL, **Broadbent EN** and Crandall RM. 2020. Detecting Vegetation Recovery after Fire in A Fire-Frequented Habitat Using Normalized Difference Vegetation Index (NDVI). Forests, 11(7), p.749.
43	[g]Leite RV, Amaral CHD, Pires RDP, Silva CA, Soares CPB, Macedo RP, Silva AALD, **Broadbent EN**, Mohan M and Leite HG. 2020. Estimating Stem Volume in Eucalyptus Plantations Using Airborne LiDAR: A Comparison of Area-and Individual Tree-Based Approaches. *Remote Sensing* 12(9):1513.
42	[p]Prata GA, **Broadbent EN**, de Almeida DRA, St Peter J, Drake J, Medley P, Corte APD, Vogel J, Sharma A, Silva CA and Zambrano AMA. 2020. Single-Pass UAV-Borne GatorEye LiDAR Sampling as a Rapid Assessment Method for Surveying Forest Structure. *Remote Sensing* 12(24):4111.
41	[g]Leite RV, Silva CA, Mohan M, Cardil A, Almeida DRAD, Carvalho SDPC, Jaafar WSWM, Guerra-Hernández J, Weiskittel A, Hudak AT and **Broadbent EN**. 2020. Individual Tree Attribute Estimation and Uniformity Assessment in Fast-Growing Eucalyptus spp. Forest Plantations Using Lidar and Linear Mixed-Effects Models. *Remote Sensing* 12(21):3599.
40	d'Oliveira MV, **Broadbent EN**, Oliveira LC, Almeida DR, Papa DA, Ferreira ME, Zambrano AMA, Silva CA, Avino FS, Prata GA and Mello RA. 2020. Aboveground Biomass Estimation in Amazonian Tropical Forests: a Comparison of Aircraft-and GatorEye UAV-borne LiDAR Data in the Chico Mendes Extractive Reserve in Acre, Brazil. *Remote Sensing* 12(11):1754.
39	[g]Leite RV, Amaral CHD, Pires RDP, Silva CA, Soares CPB, Macedo RP, Silva AALD, **Broadbent EN**, Mohan M and Leite HG. 2020. Estimating Stem Volume in Eucalyptus Plantations Using Airborne LiDAR: A Comparison of Area-and Individual Tree-Based Approaches. *Remote Sensing* 12(9):1513.
38	[g]Rex FE, Silva C, Dalla Corte AP, Klauberg C, Mohan M, Cardil A, Silva VSD, Almeida DRAD, Garcia M, **Broadbent EN** and Valbuena R. 2020. Comparison of Statistical Modelling Approaches for Estimating Tropical Forest Aboveground Biomass Stock and Reporting their Changes in Low-intensity Logging Areas using Multi-temporal LiDAR Data. *Remote Sensing* 12(9):1498.
37	Silva VSD, Silva CA, Mohan M, Cardil A, Rex FE, Loureiro GH, Almeida DRAD, **Broadbent EN**, Gorgens EB, Dalla Corte AP and Silva EA. 2020. Combined Impact of Sample Size and Modeling Approaches for Predicting Stem Volume in Eucalyptus spp. Forest Plantations Using Field and LiDAR Data. *Remote Sensing* 12(9):1438.
36	[p]Dalla Corte AP, Rex FE, Almeida DRAD, Sanquetta CR, Silva CA, Moura MM, Wilkinson B, Zambrano AMA, Cunha Neto EMD, Veras HF and Moraes AD, Klauberg C, Mohan M, Cardil A, **Broadbent EN**. 2020. Measuring individual tree diameter and height using GatorEye High-Density UAV-Lidar in an integrated crop-livestock-forest system. *Remote Sensing* 12(5):863.
35	[p]**de Almeida DRA**, Stark SC, Valbuena R, **Broadbent EN**, Silva TSF, de Resende AF, Ferreira MP, Cardil A, Silva CA, Amazonas N, Almeyda Zambrano AM, Brancalion PHS. 2020. A new era in forest restoration monitoring. *Restoration Ecology* 28(1) 8-11. - Cover – see section 33.
34	[G]Gutierrez BL, AM Almeyda Zambrano, G Mulder, C Ols, R Dirzo, SL Almeyda Zambrano, CA Quispe Gil, JC Cruz Díaz, D Alvarez, V Valdelomar Leon, E Villareal, A Sanchez Espinosa, A Quiros, TV Stein, K Lewis, **EN Broadbent**. 2020. Ecotourism: the

	'human shield' for wildlife conservation in the Osa Peninsula, Costa Rica. *Journal of Ecotourism* 15:1-20.
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D. GRANTS

Since starting at UF in 2016, I have collaborated on the submission of (as of 01/20/23) 120 proposals totaling $57,585,093 to internal and external sources, including private foundations, non-profit organizations, and national agencies, including NASA, USFS, USDA, NEH, and NSF, and through collaborations with external institutions. Below I provide a summary of my funded external grants.

External funded grants.

Summary of External Grant Funding, 2016 (UF hire) – Present (01/20/23) – Total represents grant total, and direct and indirect are for the UF portion only.				
Role	Total ($ USD)	Allocation UF ($ USD)	UF IDC ($ USD)	Allocation Candidate ($ USD)
Principal Investigator	$595,862	$510,862	$57,478	$471,584
Co-Principal Investigator	$8,944,117	$3,831,217	$1,153,764	$1,585,104
Senior Personnel	$2,757,026	$2,393,026	$354,663	$206,000
Totals	**$12,297,005**	**$6,735,105**	**$1,565,905**	**$2,262,688**

Awarded: External Funding							
Title:							
Date	Agency	Role	Total ($ USD)	Allocation UF ($ USD)	UF IDC ($ USD)	Allocation Candidate ($ USD)	Int/Ext
Storm Cloud Addendum focused on salvage logging and mangrove disturbance monitoring							
2022	USFS	PI	$100,000	$100,000	$10,000	$100,000	Ext
EMS4D: multi-scale fuel mapping and decision support system for next generation of fire management							
2022	JFSP	Sr. Personnel	$486,423	$486,423	$100,000	$0	Ext
Jungle Movement Ecology in the Peruvian Amazon							
2022	Moore Foundation	CoPI	$1,098,454	$101,725	$3,525	$101,725	Ext
Assessing Plant-Pollinator Networks in Fire-Maintained Pinelands							

2022	FWS	CoPI	$82,355	$82,355	$28,352	$30,000	Ext
GatorEye Lite data collection of restoration areas in 5 countries							
2021	RESTOR	PI	$6,085	$6,085	$2,095	$6,085	Ext
PRISM: Partnership for Remote Inventory, Status, and Management - high-spatial and temporal monitoring of large-area forest lands through sensor fusion and advanced machine learning							
2021	USFS	CoPI	$2,900,000	$1,398,985	$279,797	$1,011,415	Ext
Using fused lidar and hyperspectral to assess biodiversity in long term plots at the Cedar Creek Ecosystem Science Preserve							
2021	NSF RCN	CoPI	$4,000	$1,000	$0	$1,000	Ext
Rapid assessment of forest damage and economic impacts using radar and optical remote sensing combined with Forest Inventory and Analysis (FIA) plot data: The Hurricane Michael case study – development of the "Storm Cloud" rapid remote damage assessment system.							
2021	USFS	PI	$124,278	100%	$11,298	$110,000	Ext
MRA: Resolving the multi-scale drivers of tree mortality from field and remote sensing data on co-located ForestGEO-NEON sites							
2020	NSF	CoPI	$1,005,822	$804,706	$316,427	$180,000	Ext
Assessing Plant-Pollinator Networks in Fire-Maintained Pinelands: Northwest Florida Sandhill and Upland Coniferous Habitats							
2020	FWS	CoPI	$135,000	$27,000	$13,500	$27,000	Ext
Linking wood decomposition dynamics to forest management decisions after a major hurricane							
2020	NIFA	CoPI	$199,991	$199,991	$59,997	$60,000	Ext
Structural drivers of biodiversity across spatial scales							
2020	FWS	PI	$100,000	$15,000	$9,081	$15,000	Ext
Data collection of key California sites using the GatorEye system							
2020	BetterPlace, Ltd.	PI	$7,999	$7,999	$2,754	$7,999	Ext
Understanding restored forests for benefiting people and nature – "NewFor							
2020	NOW & FAPESP	Sr. Personnel	$320,000	$8,000	$4,000	$8,000	Ext
GatorEye data collection at the University of Alabama Moundsville Archeological Site							
2020	University of Alabama	PI	$2,500	$2,500	$1,250	$2,500	Ext
The Ancient Maya Landscape: Households, Settlement, and Ecology of the Lowlands							
2019	NASA	CoPI	$741,346	$741,346	$360,000	$50,000	Ext
Scaling leaf phenology to ecosystem-scale productivity and understanding trade-offs between leaf, woody, and reproductive phenology							
2020	NSF GSS	CoPI	$350,000	$50,000	$11,864	$34,464	Ext
High resolution spatial mapping of terrestrial-marine landscape resilience to climate change in the Caribbean.							
2020	IICA	CoPI	$1,916,089	$191,609	$54,842	$25,000	Ext
Linking wood decomposition dynamics to forest management decisions after a major hurricane							
2020	USDA-NIFA	CoPI	$200,000	$200,000	$20,000	$40,000	Ext
Assessing the spatial components of pollinator and arthropod habitat using the GatorEye Unmanned Flying Laboratory							
2019	FWS	CoPI	$26,000	$26,000	$5,460	$18,000	Ext
PREVFOGO: Controls over fire dynamics in the Brazilian Cerrado							
2019	FAPESP	Sr. Personnel	$65,000	$13,000	$0	$13,000	Ext
Monitoring forest structure post-disturbance for restoration ecology and hydrology in the Panhandle of Florida							

2019	USFS	PI	$205,000	$205,000	$21,000	$180,000	Ext
Infrastructure governance in the Colombian, Peruvian, and Brazilian Amazon							
2018	Moore Foundation	Sr. Personnel	$1,520,250	$1,520,250	$150,000	$120,000	Ext
Low altitude imaging spectroscopy in biodiversity detection: spectral and spatial resolution considerations							
2018	NSF RCN	CoPI	$5,000	$1,000	$0	$1,000	Ext
Resilient Landscapes: Terraces and Settlement Ecology across the Maya Lowlands							
2019	NSF	Sr. Personnel	$265,353	$265,353	$90,663	$60,000	Ext
Numba Wachokkeri: Empowering indigenous peoples to protect their forests with cutting-edge technology (in Peru)							
2018	NSF PEER	CoPI	$250,000	$2,500	$0	$2,500	Ext
GatorEye sensor fusion for monitoring ecosystems							
2017	McIntire Stennis	PI	$50,000	$50,000	$0	$50,000	Ext
Hotspots for restoration using global geospatial analysis							
2017	PAFSP	CoI	$30,000	$3,000	$0	$3,000	Ext
New Amazon Workshop							
2017	Moore Foundation	Sr. Personnel	$100,000	$100,000	$10,000	$5,000	Ext

D. MENTORING

I presently chair/co-chair one Ph.D. student, eleven MS students and serve on the graduate committee for an additional 7 Ph.D. students, totaling 19 active graduate committees. Since 2016, I have graduated as chair four Ph.D. students and seven MS students while serving on committees for an additional three Ph.D. student and three MS students.

Role	Student	Major	Completion Date
5. Chair PhD	Jesse Scott	FRC-SFRC	Expected 2023
4. Chair PhD (Co)	Youssef Omar Kaddoura	FRC-SFRC	2022
3. Chair PhD	Carla Mere Roncal	FRC-SFRC	2022
2. Chair PhD	Beatriz Lopez Gutierrez	FRC-SFRC	2020
1. Chair PhD	Michael Dobbins	IE-SNRE	2019
18. Chair Master's	Sean MacWilliam	FRC-SNRE	Expected 2025
17. Chair Master's	Brendon Lalman	FRC-SNRE	Expected 2025
16. Chair Master's	Ali Alruzuq	Geo-SFRC	Expected 2023
15. Chair Master's	Linton Drake	FRC-SFRC	Expected 2024
14. Chair Master's	Joseph Bondi	FRC-SFRC	Expected 2023
13. Chair Master's	Rhett Quigly	FRC-SFRC	2022
12. Chair Master's *	Tyler Fox	FRC-SFRC	Expected 2024
11. Chair Master's *	Jackson Woods	FRC-SFRC	Expected 2023
10. Chair Master's	Savanna Walters	FRC-SFRC	Expected 2022
9. Chair Master's *	Sarah Cartmill	FRC-SFRC	Expected 2023
8. Chair Master's *	Danielle Kaminski-Slater Clooney	FRC-SFRC	Expected 2023
7. Chair Master's *	Tammy Lynn Hunter	FRC-SFRC	Expected 2023
6. Chair Master's *	Ryan Lam	FRC-SFRC	2021
5. Chair Master's (Co)	Oscar Ivan Raigosa Garcia	FRC-SFRC	2019

4. Chair Master's	Shady Susana Ruiz Diaz	FRC-SFRC	2020
3. Chair Master's *	Jesse Aron Scott	FRC-SFRC	2020
2. Chair Master's *	David Huggins	FRC-SFRC	2020
1. Chair Master's *	Gary C. Baine II	FRC-SFRC	2020
10. Member PhD	Orlando Acevedo-Charry	IE-SNRE	Expected 2027
9. Member PhD	Pamela Alvarez Montero	IE-SNRE	2021
8. Member PhD	Susana Ruiz Diaz	FRC-SFRC	Expected 2024
7. Member PhD	Nicholas Gengler	IE-SNRE	Expected 2023
6. Member PhD	Sairandhri Arun Lapalikar	FRC-SFRC	Expected 2024
5. Member PhD	Owen P Schneider	WEC	Expected 2023
4. Member PhD	Alvin Clarke	FRC-SFRC	Expected 2023
3. Member PhD	Maryada Shrestha	FRC-SFRC	2020
2. Member PhD	Diego Alonso Garcia Olaechea	WEC	Expected 2025
1. Member PhD	Luyu Wang	TRSM	2021
4. Member MS	Catherine Frock	WEC	2022
3. Member Master's	Frank Anthony Prince	FRC-SFRC	2020
2. Member Master's	Yun Liang	TRSM	2020
1. Member Master's	Elan Simon Parsons	WEC	2018

* Indicates non-thesis graduate student.

International graduate committee contributions. These are not included in the table or description above.

Role	Student	Major	Completion Date
1. Member PhD	*José Augusto Spiazzi Favarin*	USP-Brazil	Expected 2026

D. COURSES

My 40% teaching appointment includes teaching three courses per academic year. My position is in both Forest Resources and Conservation (FRC), and Geomatics (GEO), one of only several cross-program positions in the school, and I teach foundational undergraduate courses in both. In FRC, I teach <u>Forest Ecology</u>, and in GEO I teach <u>Remote Sensing</u>, and the <u>Practicum in Unmanned Aerial Systems (UAS)</u>. In addition, I teach graduate-level courses that vary depending on student interests. Forest Ecology incorporates a weekly 5-hour field lab with a 2-hour lecture, and Remote Sensing incorporates both lecture and interactive computer lab assignments. The UAS Practicum is field and computer lab based, providing real-world experience in defining objectives, collecting data, processing and analyzing data, and presenting it in various formats verbally, visually, and written.

E. INTERNATIONAL ACTIVITIES (selected)

Presently, I have an active international research program, including ongoing projects in Brazil, Costa Rica, and Peru, and collaborations in development in Colombia, Bolivia, Panama, Mexico, Bhutan, and Malaysia. My lab has extensive graduate involvement from around the world, including graduate students representing Iran, China, Paraguay, Peru, Spain, the Dominican Republic, and Brazil.

My specific goals for international activities are:
- Apply cutting-edge geospatial solutions to better quantify and monitor ecological changes related to sustainability in high-biodiversity tropical areas.
- Develop capacity for local researchers and partners to engage in the use of such technology for these purposes.
- Better understand ecological impacts of human-induced ecosystem degradation and loss across spatial and temporal scales in high-biodiversity areas in the global tropics.

Some examples of my activities/outcomes on this theme are provided below:
- 2022. Drone demonstrations, data collection, and discussions in 4 Caribbean countries, Ecuador, Costa Rica, Philippines, and Brazil.
- 2021. Drone demonstrations, data collection, and discussions in 4 Caribbean countries and France.
- 2020. Drone data fusion post-processing overview. Santa Rosa National Park, Guanacaste, Costa Rica.
- 2019. Drone-borne lidar data collection and processing workshop. SilvaLidar, Brazil.
- 2019. Workshop on using drones for environmental monitoring to local non-profits, government organizations, and indigenous groups. Peru.
- 2019. Workshop on using drones for environmental monitoring to local non-profits, government organizations, and indigenous groups. Brazil.
- 2019. Workshop on using drones for environmental monitoring to local non-profits, government organizations, and indigenous groups. Bolivia.
- 2019. Drone-borne sensor fusion workshop. Brazil.
- 2018. Training workshop for drone-based sensor fusion for Peruvian NGOs and government officials, Andes-Amazon, Peru.
- 2017. Training workshop for using drones for monitoring protected areas with the Environmental Ministry of Costa Rica. San Jose, Costa Rica.
- 2017. Training workshop for using advanced sensors in drones for Brazilian faculty and advanced geomatics students, Goiana, Brazil.

F. AWARDS (selected)
- 2021. IFAS annual membership to AAAS for publication record and top-tier citation frequency within IFAS.
- 2020 Forest Resources and Conservation Faculty of the Year, SFFGS, UFL
- 2019. Sigma Xi, University of Florida Chapter
- 2019. Award for top downloaded paper in Restoration Ecology.
- 2015. Award for being a top 10% reviewer for 2012-14 in Biological Conservation.
- 2010. Award for highly cited article, by Biological Conservation, 2008-09
    o Forest Fragmentation in the Amazon from Deforestation and Selective Logging.
- 2010. NSF Doctoral Dissertation Improvement Grant.
- 2009. Outstanding teaching assistant award, Stanford University.
- 2009. NASA Land Use and Change Doctoral Fellowship.
- 2008. NSF Graduate Research Fellowship Program (GRFP) Honorable Mention.
- 2008 to 2012. DOE Global Climate Change Energy Program Fellowship (GCEP).

G. SYNERGISTIC ACTIVITIES

Editor (1 active; 1 total)

- 2021 to Present. Editor-In-Chief of the section 'Drones for Ecology' in the journal Drones [peer-reviewed journal].

Editorial advisory boards (5 active; 5 total)

- 2020 to Present. Drones [peer-reviewed journal].
- 2020 to Present. Geomatics [peer-reviewed journal].
- 2019 to Present. Sustainability [peer-reviewed journal], Sustainability, Biodiversity, and Conservation Section.
- 2019 to Present. Remote Sensing [peer-reviewed journal]
- 2019 to Present. Challenges [peer-reviewed journal].
- 2021 to 2023. International Journal of Applied Earth Observation and Geoinformation [peer-reviewed journal].

Special Issues in peer-reviewed journals (6 active; 12 total)

Journal	Special Issue Title	Start	End
Drones	Using Drones for Individual Tree Detection (ITD) and Its Applications	2022	Ongoing
Drones	Feature Papers for Drones in Ecology Section II	2022	Ongoing
Forests	Deep Learning Techniques for Forest Parameter Retrieval and Accurate Tree Modeling from Remote Sensing Data	2022	Ongoing
Land	Modeling Biodiversity and Landscape Conservation Planning	2022	Ongoing
MEE/JoE/JoAE/JoAniE	Active Remote Sensing for Ecology, Biodiversity, and Ecosystem Conservation	2021	Ongoing
Remote Sensing	Drones for Ecology and Conservation II	2022	Ongoing
Drones	Feature Papers for Drones in Ecology Section I	2021	2022
Remote Sensing	Multi-Sensor Forest Monitoring: Lidar, Multi-and Hyperspectral, Polarimetric Interferometric SAR	2021	2022
Remote Sensing	Drones for Ecology and Conservation I	2019	2022
Forests	Remote Sensing of Forest Disturbance and Recovery	2019	2021
Remote Sensing	Remote Sensing Data Fusion for Mapping Ecosystem Dynamics	2020	2021
Remote Sensing	Remote Sensing of Tropical Phenology	2018	2019

Reviewer for scholarly journals

Total reviewed = 280 reviews in 43 journals as of Jan 20th, 2023. In 2022, I reviewed 115 manuscripts in peer-reviewed journals.

Peer-Reviewed Journal Title	Number of Articles Reviewed							
	(calendar year)							
	2022	2021	2020	2019	2018	2017	Before 2017	Total
TOTAL	115	35	34	15	2	1	78	280

Journal							Total
African Journal of Agricultural Research							1	1
Agroforestry Systems		1						1
Applied Earth Observation and Geoinformation							1	1
Biological Conservation							12	12
CAB Reviews							1	1
Diversity							1	1
Drones	45	7						52
Ecography							1	1
Ecosphere							1	1
EDIS (Electronic Data Information Source IFAS Extension			2					2
Egyptian Journal of Remote Sensing and Space Sciences							1	1
Environment, Development and Sustainability							1	1
Environmental Management							1	1
Estuarine, Coastal and Shelf Science							1	1
Forest Ecology and Management							18	18
Forests	3						2	5
Functional Ecology							1	1
Geomatics	3	1						4
Global Ecology and Biogeography							1	1
International Journal of Tourism Research							3	3
International Journal of Tropical Biology and Conservation							1	1
Journal of Applied Ecology							2	2
Journal of Arid Lands							2	2
Journal of Ecotourism			1					1
Journal of Geophysical Research - Atmospheres							2	2
Journal of Geophysical Research – Biogeosciences							1	1
Journal of Human Sciences and Extension				2				2
Journal of Tropical Forest Science							1	1
Journal of Rural Studies					1			1
Land Degradation & Development							1	1
Landscape Ecology							1	1
Methods in Ecology and Conservation (MEE)	3							3
PeerJ						1		1
PLOS one					1		2	3
Proceedings of the National Academy of Sciences (PNAS)		1					1	2
Remote Sensing	36	17	22	7			4	86
Remote Sensing of the Environment		1					11	12
Revista de Biología Tropical							1	1
Science Advances				1				1

Scientific Reports	1							1
Silva Fennica			2					2
Sustainability	24	7	7	5				43
Tourism Management							1	1

H. VISUALS

Outreach activity at Ordway-Swisher for UF faculty and staff (top); Data collection and TV filming in Atlantic Forest, Brazil (lower-left); Data collection and training / capacity building in Cerrado, Brazil (lower-right).