ATTICUS E. L. STOVALL

Atticus@UMD.edu | Atticus.Stovall@NASA.gov

Publications: 49 | H-index: 26 | Citations: 3049 | Awards: $2,273,139

Atticus Stovall earned his Ph.D. in Environmental Sciences from the University of Virginia in 2017. A unifying theme of his work is using new technology to understand how environmental factors influence plant structure and function. During his Ph.D., he developed new approaches to carbon monitoring in forests using high-resolution laser scanning through 3D modeling, algorithm development, extensive field work, building allometric equations, and airborne LiDAR and radar biomass calibration. In his first postdoc position he focused on plant stress monitoring - [i] capturing the structural components of the solar induced fluorescence signal with high temporal resolution leaf angle and area measurements and [ii] using LiDAR for monitoring 2 million California trees over 8 years of drought. Now, he is working directly with the GEDI science team to improve forest structure calibration with a global database of laser scanning acquisitions, developing high-resolution global canopy height products, and mapping 3D structural biodiversity traits of trees across the globe.

EDUCATION

University of Virginia *2017*
Ph.D. in Environmental Sciences

University of Virginia *2012*
B.A. in Environmental Sciences

Piedmond Virginia Community College *2010*
A.A in Liberal Arts

RESEARCH POSITIONS

University of Maryland / NASA Goddard Space Flight Center 2021 - Present
Assistant Research Professor *Greenbelt, MD*

Quantifying global structural biodiversity traits with terrestrial laser scanning. Development of a pantropical high-resolution forest canopy height and mangrove biomass product by fusing the NASA Global Ecosystem Dynamics Investigation (GEDI) mission with TanDEM-X.

NASA Goddard Space Flight Center 2019 - 2020
NASA Postdoctoral Fellowship Research under direction of Dr. Lola Fatoyinbo *Greenbelt, MD*

Improving global calibration and calibration of the NASA Global Ecosystem Dynamics Investigation (GEDI) mission with terrestrial laser scanning using precise vertical vegetation distributions, plot-level biomass estimates, and updated allometric equations.

University of Virginia 2018 - 2019
Postdoctoral Research under direction of Dr. Xi Yang *Charlottesville, VA*

[i] Disentangled contribution of structural complexity to forest productivity by fusing solar induced fluorescence and terrestrial laser scanning (TLS) measurements. [ii] Determining size-dependent mortality risk for trees under extreme drought by mapping dimensions of 2 million tree crowns in the southern Sierra Nevada.

University of Virginia 2012 - 2017
Ph.D. Research under direction of Dr. H. H. Shugart *Charlottesville, VA*

Quantifying forest structure and carbon storage in forest ecosystems using TLS at multiple spatial scales. Results improved biomass allometry and understanding of three—dimensional structure in forests.

Smithsonian Conservation Biology Institute 2015 - 2016
Smithsonian Fellow *Front Royal, VA*

Investigating biomass mapping uncertainty from using national-scale allometric equations at the fine-scale by developing non-destructive local allometric equations with terrestrial LiDAR.

RECENT AWARDS

NASA ECIP - *3D Signature of Biodiversity in Mediterranean Forests* ($300,000) *2024-2027*

NASA GEDI - *Forest Recovery in Mediterranean Ecosystems with GEDI* ($530,224) *2024-2027*

NASA BioSCape - *BioREaCH* ($599,676) *2021-2025*

NASA Commercial Smallsat Data Acquisition ($100,000) *2021-2022*

NASA Biodiversity - *Understanding the global 3D signature of tree biodiversity* ($687,291) *2021-2025*

NASA Postdoctoral Program Fellowship ($155,948) *2019-2022*

BROADER IMPACTS

NASA SARP EAST Research Coordinator *Summer 2023*

NASA ARSET Program Tutorial on Remote Sensing of Wetlands and Biodiversity *Spring 2023*

Creation of the Global TLS Metadata Database for international collaboration *2019-Present*

Coordination / participation in SilvaCarbon workshops *2014-Present*

WEB ARTICLES AND MEDIA SPOTS

Research Highlighted in CBC Nature of Things: *Apocalypse Plan B* (2023).
https://gem.cbc.ca/the-nature-of-things/s62

Research Highlighted in PBS NOVA: Can We Cool the Planet (2020). Season 47, Episode 15.
https://www.pbs.org/wgbh/nova/video/can-we-cool-the-planet/

Stovall, A.E.L. (2020), Science Spotlight: Atticus Stovall. SketchFab Blog. In Press.

1st Place Winner of #GEDIVis Twitter GEDI Data visualization competition.

Sima, R. J. (2019), The bigger they are, the harder they fall, Eos, 100, https://doi.org/10.1029/2019EO135705. Published on 18 October 2019.

Pennisi, E. (2019), Sturdy as they are, giant trees are particularly susceptible to these three killers, Science 365, 962–963, doi:10.1126/science.aaz3891.

ACCEPTED, IN-REVIEW, SUBMITTED, AND IN-PREP PUBLICATIONS

Stovall, A.E.L. ... Fatoyinbo, T. Improved structural estimates and allometry of tallest known mangrove forest using terrestrial laser scanning. To be submitted to *Methods in Ecology and Evolution.*

Stovall, A.E.L., ... Yang, X.. High-frequency seasonal shifts in leaf angle distribution from terrestrial laser scanning. To be submitted to *Global Change Biology*.

PEER-REVIEWED PUBLICATIONS

Wenlu Qi, John Armston, Changhyun Choi, **Stovall, Atticus**, Svetlana Saarela, Matteo Pardini, Lola Fatoyinbo, Konstantinos Papathanassiou, Adrian Pascual, and Ralph Dubayah. Mapping large-scale pantropical forest canopy height by integrating GEDI lidar and TanDEM-X InSAR data. *Remote Sensing of Environment*, 318:114534, March 2025.

Marc Simard, Lola Fatoyinbo, Nathan M. Thomas, **Stovall, Atticus E.**, Adriana Parra, Abigail Barenblitt, Pete Bunting, and Irena Hajnsek. A New Global Mangrove Height Map with a 12 meter spatial resolution. *Scientific Data*, 12(1):15, January 2025.

Zoe Amie Pierrat, Troy S. Magney, Will P. Richardson, Benjamin R. K. Runkle, Jen L. Diehl, Xi Yang, William Woodgate, William K. Smith, Miriam R. Johnston, Yohanes R. S. Ginting, Gerbrand Koren, Loren P. Albert, Christopher L. Kibler, Bryn E. Morgan, Mallory Barnes, Adriana Uscanga, Charles Devine, Mostafa Javadian, Karem Meza, Tommaso Julitta, Giulia Tagliabue, Matthew P. Dannenberg, Michal Antala, Christopher Y. S. Wong, Andre L. D. Santos, Koen Hufkens, Julia K. Marrs, Yujie **Stovall, Atticus E. L.** and Liu, Joshua B. Fisher, John A. Gamon, and Kerry Cawse-Nicholson. Proximal remote sensing: an essential tool for bridging the gap between high-resolution ecosystem monitoring and global ecology. *New Phytologist*, n/a(n/a), 2025.

Michael J. Campbell, Jessie F. Eastburn, Philip E. Dennison, Jody C. Vogeler, and **Stovall, Atticus E. L.** Evaluating the performance of airborne and spaceborne lidar for mapping biomass in the United States' largest dry woodland ecosystem. *Remote Sensing of Environment*, 308:114196, July 2024.

Juan Guerra-Hernández, José M. C. Pereira, **Stovall, Atticus**, and Adrian Pascual. Impact of fire severity on forest structure and biomass stocks using NASA GEDI data. Insights from the 2020 and 2021 wildfire season in Spain and Portugal. *Science of Remote Sensing*, 9:100134, June 2024.

Elisabeth Powell, Ralph Dubayah, and **Stovall, Atticus E. L.** Characterizing low-lying coastal upland forests to predict future landward marsh expansion. *Ecosphere*, 15(6):e4867, 2024.

Seamus Lombardo, Javier Kinney, Dawn Blake, Shaonna Chase, Afreen **Stovall, Atticus** and Siddiqi, Katya Arquilla, Steven Israel, Danielle Wood, and Olivier de Weck. Accessible satellite data decision support systems for Yurok Tribe forest management. *Acta Astronautica*, 213:777–791, December 2023.

Jeff W. Atkins, Parth Bhatt, Luis Carrasco, Emily Francis, James E. Garabedian, Christopher R. Hakkenberg, Brady S. Hardiman, Jinha Jung, Anil Koirala, Elizabeth A. LaRue, Sungchan Oh, Gang Shao, Guofan Shao, H. H. Shugart, Anna Spiers, **Stovall, Atticus E. L.**, Thilina D. Surasinghe, Xiaonan Tai, Lu Zhai, Tao Zhang, and Keith Krause. Integrating forest structural diversity measurement into ecological research. *Ecosphere*, 14(9):e4633, September 2023.

Abigail Barenblitt, Lola Fatoyinbo, Nathan Thomas, **Stovall, Atticus**, Celio de Sousa, Chukwuebuka Nwobi, and Laura Duncanson. Invasion in the Niger Delta: remote sensing of mangrove conversion to invasive *Nypa fruticans* from 2015 to 2020. *Remote Sensing in Ecology and Conservation*, page rse2.353, July 2023.

Celio de Sousa, Lola Fatoyinbo, Miroslav Honzák, Timothy Max Wright, Paulo Jose Murillo Sandoval, Zargou Elijah Whapoe, Jerry Yonmah, Emmanuel Temitope Olatunji, Jerry Garteh, **Stovall, Atticus**, Christopher S. R. Neigh, Rosimeiry Portela, Keith D. Gaddis, Trond Larsen, and Daniel Juhn. Two decades of land cover change and forest fragmentation in Liberia: Consequences

for the contribution of nature to people. *Conservation Science and Practice*, 5(6):e12933, June 2023.

Xi Yang, Rong Li, Andrew Jablonski, **Stovall, Atticus**, Jongmin Kim, Koong Yi, Yixin Ma, Daniel Beverly, Richard Phillips, Kim Novick, Xiangtao Xu, and Manuel Lerdau. Leaf angle as a leaf and canopy trait: Rejuvenating its role in ecology with new technology. *Ecology Letters*, 26(6):1005–1020, June 2023.

Michael J. Campbell, Jessie F. Eastburn, Katherine A. Mistick, Allison M. Smith, and **Stovall, Atticus E.L.** Mapping individual tree and plot-level biomass using airborne and mobile lidar in piñon-juniper woodlands. *International Journal of Applied Earth Observation and Geoinformation*, 118:103232, April 2023.

Stovall, Atticus E L, David W MacFarlane, Debbie Crawford, Tom Jovanovic, Jereme Frank, and Cris Brack. Comparing mobile and terrestrial laser scanning for measuring and modelling tree stem taper. *Forestry: An International Journal of Forest Research*, page cpad012, March 2023.

Jeff W. Atkins, Jennifer Costanza, Kyla M. Dahlin, Matthew P. Dannenberg, Andrew J. Elmore, Matthew C. Fitzpatrick, Christopher R. Hakkenberg, Brady S. Hardiman, Aaron Kamoske, Elizabeth A. LaRue, Carlos Alberto Silva, **Stovall, Atticus E. L.**, and Elske K. Tielens. Scale dependency of lidar-derived forest structural diversity. *Methods in Ecology and Evolution*, pages 2041–210X.14040, January 2023.

Nathan Thomas, Mikhail Urbazaev, **Stovall, Atticus E L**, Laura Hess, John Armston, Amy Neuenschwander, Lola Fatoyinbo, and Laura Duncanson. Seasonal flooding provides limitations and opportunities for ecosystem carbon accounting from space. *Environ. Res. Lett.*, 2023.

Stovall, Atticus E. L., Anthony Vorster, Ryan Anderson, and Paul Evangelista. Developing nondestructive species-specific tree allometry with terrestrial laser scanning. *Methods in Ecology and Evolution*, pages 2041–210X.14027, November 2022.

Miro Demol, Hans Verbeeck, Bert Gielen, John Armston, Andrew Burt, Mathias Disney, Laura Duncanson, Jan Hackenberg, Daniel Kükenbrink, Alvaro Lau, Pierre Ploton, Artie Sewdien, **Stovall, Atticus**, Stéphane Momo Takoudjou, Liubov Volkova, Chris Weston, Verginia Wortel, and Kim Calders. Estimating forest aboveground biomass with terrestrial laser scanning: current status and future directions. *Methods in Ecology and Evolution*, pages 2041–210X.13906, May 2022.

Jeff W. Atkins, Jonathan A. Walter, **Stovall, Atticus E. L.**, Robert T. Fahey, and Christopher M. Gough. Power law scaling relationships link canopy structural complexity and height across forest types. *Functional Ecology*, 36(3):713–726, March 2022.

Jeff W. Atkins, **Stovall, Atticus E.L.**, and Carlos Alberto Silva. Open-Source tools in R for forestry and forest ecology. *Forest Ecology and Management*, 503:119813, January 2022.

Jonathan A Walter, Clare A Rodenberg, **Stovall, Atticus E L**, Gabriela C Nunez-Mir, Ksenia S Onufrieva, and Derek M Johnson. Evaluating the success of treatments that slow spread of an invasive insect pest. *Pest Management Science*, 77(10):4607–4613, October 2021.

Carl C. Trettin, Zhaohua Dai, Wenwu Tang, David Lagomasino, Nathan Thomas, Seung Kuk Lee, Marc Simard, Médard Obiang Ebanega, and Temilola E. **Stoval, Atticus** and Fatoyinbo. Mangrove carbon stocks in Pongara National Park, Gabon. *Estuarine, Coastal and Shelf Science*, page 107432, May 2021.

Nathan Thomas, Priscilla Baltezar, David Lagomasino, **Stovall, Atticus**, Zaheer Iqbal, and Lola Fatoyinbo. Trees outside forests are an underestimated resource in a country with low forest cover. *Scientific Reports*, 11(1):1–13, April 2021.

Xi Yang, Xiangtao Xu, **Stovall, Atticus**, Min Chen, and Jung-Eun Lee. Recovery: Fast and Slow—Vegetation Response During the 2012–2016 California Drought. *Journal of Geophysical Research: Biogeosciences*, 126(4), April 2021.

Jonathan A. Walter, **Stovall, Atticus E. L.**, and Jeff W. Atkins. Vegetation structural complexity and biodiversity in the Great Smoky Mountains. *Ecosphere*, 12(3), March 2021.

Andre S. Rovai, Robert R. Twilley, Edward Castañeda-Moya, Stephen R. Midway, Daniel A. Friess, Carl C. Trettin, Jacob J. Bukoski, **Stovall, Atticus E.L.**, Paulo R. Pagliosa, Alessandra L. Fonseca, Richard A. Mackenzie, Aslan Aslan, Sigit D. Sasmito, Mériadec Sillanpää, Thomas G. Cole, Joko Purbopuspito, Matthew W. Warren, Daniel Murdiyarso, Wolfram Mofu, Sahadev Sharma, Pham Hong Tinh, and Pablo Riul. Macroecological patterns of forest structure and allometric scaling in mangrove forests. *Global Ecology and Biogeography*, February 2021.

Committee on Earth Observation Satellites) Land Product Validation Subgroup (Working Group on Calibration and Validation. Aboveground Woody Biomass Product Validation Good Practices Protocol. 2021.

Kim Calders, Jennifer Adams, John Armston, Harm Bartholomeus, Sebastien Bauwens, Lisa Patrick Bentley, Jerome Chave, F. Mark Danson, Miro Demol, Mathias Disney, Rachel Gaulton, Sruthi M. Krishna Moorthy, Shaun R. Levick, Ninni Saarinen, Crystal Schaaf, **Stovall, Atticus**, Louise Terryn, Phil Wilkes, and Hans Verbeeck. Terrestrial laser scanning in forest ecology: Expanding the horizon. *Remote Sensing of Environment*, 251:112102, December 2020.

Anthony G. Vorster, Paul H. Evangelista, **Stovall, Atticus E. L.**, and Seth Ex. Variability and uncertainty in forest biomass estimates from the tree to landscape scale: the role of allometric equations. *Carbon Balance and Management*, 15(1), December 2020.

Jeff W. Atkins, **Stovall, Atticus E. L.**, and Xi Yang. Mapping Temperate Forest Phenology Using Tower, UAV, and Ground-Based Sensors. *Drones*, 4(3):56, September 2020.

Stovall, Atticus E. L., Herman H. Shugart, and Xi Yang. Reply to "Height-related changes in forest composition explain increasing tree mortality with height during an extreme drought". *Nature Communications*, 11(1):3401, July 2020.

Jacob S. Diamond, Daniel L. McLaughlin, Robert A. Slesak, and **Stovall, Atticus E. L.** Microtopography is a fundamental organizing structure of vegetation and soil chemistry in black ash wetlands. *Biogeosciences*, 17(4):901–915, February 2020.

Jeff W. Atkins, Ben Bond-Lamberty, Robert T. Fahey, Lisa T. Haber, Ellen Stuart-Haëntjens, Brady S. Hardiman, Elizabeth LaRue, Brenden E. McNeil, David A. Orwig, **Stovall, Atticus E. L.**, Jason M. Tallant, Jonathan A. Walter, and Christopher M. Gough. Application of multidimensional structural characterization to detect and describe moderate forest disturbance. *Ecosphere*, 11(6):e03156, 2020.

Ian R. McGregor, Ryan Helcoski, Norbert Kunert, Alan J. Tepley, Erika B. Gonzalez-Akre, Valentine Herrmann, Joseph Zailaa, **Stovall, Atticus E. L.**, Norman A. Bourg, William J. McShea, Neil Pederson, Lawren Sack, and Kristina J. Anderson-Teixeira. Tree height and leaf drought tolerance traits shape growth responses across droughts in a temperate broadleaf forest. *New Phytologist*, n/a(n/a), 2020.

Martin Mokroš, Markus Hollaus, Yunsheng Wang, Peter Surový, Livia Piermattei, Xinlian Liang, Milan Koreň, Julián Tomaštík, Lin Cao, Gábor Brolly, Carlos Cabo, Bartłomiej Kraszewski, Grzegorz Krok, Martin Krůček, Nizar Polat, **Stovall, Atticus**, Di Wang, and Jinhu Wang. International Benchmarking of Terrestrial Image-based Point Clouds for Forestry. *ISPRS Scientific initiative 2019*, page 12, 2020.

Jacob S. Diamond, Daniel L. McLaughlin, Robert A. Slesak, and **Stovall, Atticus E. L.** Pattern and structure of microtopography implies autogenic origins in forested wetlands. *Hydrology and Earth System Sciences*, 23(12):5069–5088, December 2019.

Stovall, Atticus E. L., Herman Shugart, and Xi Yang. Tree height explains mortality risk during an intense drought. *Nature Communications*, 10(1):4385, September 2019.

M. Disney, A. Burt, K. Calders, C. Schaaf, and **Stovall, A.** Innovations in Ground and Airborne Technologies as Reference and for Training and Validation: Terrestrial Laser Scanning (TLS). *Surveys in Geophysics*, March 2019.

Stovall, Atticus E. L., Jacob S. Diamond, Robert A. Slesak, Daniel L. McLaughlin, and Hank Shugart. Quantifying wetland microtopography with terrestrial laser scanning. *Remote Sensing of Environment*, 232:111271, 2019.

Stovall, Atticus E.L., Kristina J. Anderson-Teixeira, and Herman H. Shugart. Assessing terrestrial laser scanning for developing non-destructive biomass allometry. *Forest Ecology and Management*, 427:217–229, November 2018.

Stovall, A. E. L. and H. H. Shugart. Improved Biomass Calibration and Validation With Terrestrial LiDAR: Implications for Future LiDAR and SAR Missions. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 11(10):3527–3537, October 2018.

J. W. Atkins, Gil Bohrer, Robert T. Fahey, Brady S. Hardiman, Timothy H. Morin, **Stovall, Atticus E. L.**, Naupaka Zimmerman, and Christopher M. Gough. Quantifying vegetation and canopy structural complexity from terrestrial LiDAR data using the forestr package. *Methods in Ecology and Evolution*, August 2018.

Stovall, Atticus E.L., Kristina J. Anderson-Teixeira, and Herman H. Shugart. Terrestrial LiDAR-derived non-destructive woody biomass estimates for 10 hardwood species in Virginia. *Data in Brief*, June 2018.

Xi Yang, Hanyu Shi, **Stovall, Atticus**, Kaiyu Guan, Guofang Miao, Yongguang Zhang, Yao Zhang, Xiangming Xiao, Youngryel Ryu, and Jung-Eun Lee. FluoSpec 2—An Automated Field Spectroscopy System to Monitor Canopy Solar-Induced Fluorescence. *Sensors*, 18(7):2063, June 2018.

Stovall, Atticus E.L., Anthony G. Vorster, Ryan S. Anderson, Paul H. Evangelista, and Herman H. Shugart. Non-destructive aboveground biomass estimation of coniferous trees using terrestrial LiDAR. *Remote Sensing of Environment*, 200:31–42, October 2017.

FELLOWSHIPS, GRANTS AND AWARDS

NASA NPP Fellowship ($78,724)	*2020*
Huron Mountain Wildlife Foundation ($5,000)	*2019*
NASA NPP Fellowship ($77,224)	*2019*
GRSM/Appalachian Highlands Science LC Grant ($1,575)	*2018*
Fred Holmsley Moore Teaching Award ($500)	*2017*
NASA VSGC Graduate Research STEM Fellowship Program ($6,000)	*2015-2016*
NASA VSGC Graduate Research STEM Fellowship Program ($5,000)	*2014-2015*
University of Virginia Graduate Travel Grant ($1,000)	*2014*
National Fish and Wildlife Foundation Fellowship	*2012-2017*
Federal SEOG ($600), UVA SMART Grant ($4000), Dupont Grant ($5,149)	*2010-2012*
Deans List	*2008-2010*

SELECTED CONFERENCES AND PRESENTATIONS

Stovall, A.E.L.., Calders, K., Armston, J.A., Fatoyinbo, L., Understanding global trends in 3D tree architecture. 2019 Fall Meeting, AGU, San Francisco, CA, Dec. 2019

Stovall, A.E.L.., Calders, K., Armston, J.A.. Capturing global trends in tree and forest structure with a unified terrestrial laser scanning database. 2019 Fall Meeting, AGU, San Francisco, CA, Dec. 2019

Stovall, A.E.L.. Capturing global trends in tree and forest structure with a unified terrestrial laser scanning database. Silvilaser 2019. Igazu Falls, Brazil, Oct. 8, 2019.

Stovall, A.E.L.. Terrestrial Laser Scanning improves LiDAR and radar biomass calibration in tallest mangrove forest on Earth. NASA Terrestrial Ecology Meeting 2019. College Park, MD, Sep. 23, 2019.

Stovall, A.E.L.. Monitoring two million trees through extreme drought shows size determines survival. ESA Meeting 2019. Louisville, KY, Aug.13, 2019. **(Invited)**

Stovall, A.E.L.. Advancing TLS Technology Enables Sensor-Specific Applications. Terrestrial Laser Scanning in Forest Ecology: Expanding the Horizon. Ghent, Belgium, 6-7 May 2019. **(Invited Keynote)**

Stovall, A.E.L., Yang, X., Khuu, A., Smith, J., Widespread tree mortality mapping suggests size-dependent risk for extreme drought stress. 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018

Stovall, A.E.L., Maini, R., Nardacci, R., Shi, H., Yang, X. Seasonal structure-function interactions: fusing solar induced fluorescence and terrestrial Lidar for holistic ecosystem measurement. ForestSat 2018, College Park, MD. 1-5 Oct. 2018.

Stovall, A.E.L. and X. Yang. Widespread tree mortality mapping suggests size-dependent risk for extreme drought stress. ForestSat 2018, College Park, MD. 1-5 Oct. 2018.

Stovall, A.E.L. and H. H. Shugart. Improving LiDAR Biomass Model Uncertainty through Non-Destructive Allometry and Plot-level 3D Reconstruction with Terrestrial Laser Scanning. Abstract B11H-02, 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec. 2017

Stovall, A.E.L.. Reduced Uncertainty Biomass Mapping with Plot-level TLS Validation. Silvilaser 2017, Virginia Tech, Blacksburg, VA, 12 Oct. 2017

Stovall, A.E.L.. Revolutionizing 3D Forest Measurement from the Ground Up: Integrating Terrestrial LiDAR into Biomass Mapping. Biospheric Sciences Seminar, NASA Goddard Space Flight Center, Greenbelt, MD, 19 Jul. 2017

Stovall, A.E.L.. Outer Hull Model (OHM): Retrieving Component Biomass with Noisy Phase-shift TLS. TLS RCN Meeting, UCL, London, United Kingdom, 1 Mar. 2017

Stovall, A.E.L.. Validated Non-Destructive Biomass Estimation with Terrestrial LiDAR for Reducing Uncertainty in Carbon Mapping. The terrestrial laser scanning revolution in forest ecology, Chicheley Hall, Newport Pagnell, United Kingdom, 28 Feb. 2017

Stovall, A.E.L.. Estimating Biomass and Reducing Uncertainty for MRV with Terrestrial LiDAR. Silvacarbon Central/South America Meeting 2017, San José, Costa Rica, 30 Jan - 3 Feb. 2017

Stovall, A.E.L..; Vorster, Anthony G.; Anderson, Ryan; Evangelista, Paul; H. H. Shugart. Validated Non-Destructive Biomass Estimation with Terrestrial LiDAR for Reducing Uncertainty in Carbon Mapping. Abstract B51F-0471, 2016 Fall Meeting, AGU, San Francisco, CA, 12-16 Dec. 2016

Stovall, A.E.L. and H. H. Shugart. Mapping Forest Carbon by Fusing Terrestrial and Airborne LiDAR Datasets. Abstract B53C-0195, 2015 Fall Meeting, AGU, San Francisco, CA, 14-18 Dec. 2015

Stovall, A.E.L.. Quantifying Structure and Carbon Storage in Forest Ecosystems unsing Terrestrial LiAR on the Plot Level. Silvacarbon SE Asia Meeting 2015, Bogor, Indonesia, 5-9 Oct. 2015

Stovall, A.E.L. and H. H. Shugart. Quantifying Forest Carbon and Structure with Terrestrial LiDAR. Abstract B53C-0195, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec. 2014

Stovall, A.E.L. and H. H. Shugart. Estimating Carbon Storage of a Temperate North American Forest with TLS. Abstract B51I-0416, 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec. 2013

WEB ARTICLES AND MEDIA SPOTS

Research Highlighted in PBS NOVA: Can We Cool the Planet (2020). Season 47, Episode 15. https://www.pbs.org/wgbh/nova/video/can-we-cool-the-planet/

Stovall, A.E.L. (2020), Science Spotlight: Atticus Stovall. SketchFab Blog. In Press.

1st Place Winner of #GEDIVis Twitter GEDI Data visualization competition.

Sima, R. J. (2019), The bigger they are, the harder they fall, Eos, 100, https://doi.org/10.1029/2019EO135705. Published on 18 October 2019.

Pennisi, E. (2019), Sturdy as they are, giant trees are particularly susceptible to these three killers, Science 365, 962–963, doi:10.1126/science.aaz3891.

Lemon M.G. (2019), Where the mangrove grows, Envirobites. Jan. 23, 2019. https://envirobites.org/2019/01/23/where-the-mangrove-grows/

Stovall, A.E.L., 2018. Measuring Forests In 3D To Improve Global Carbon Estimates. *Science-Trends.*

Hansen, K., 2017. Below the Mangrove Canopy: *NASA Image of the Day.*

Feigenoff, C., 2016. Terrestrial LiDAR Measurements. *Environmental Sciences 2015-16 Annual Report.*

TECHNICAL SKILLS

Programming and Statistics

- R: *Algorithm development and modeling for terrestrial LiDAR biomass estimation, geospatial analysis with LiDAR and optical data, model evaluation and statistics, figures*
- MATLAB: *Algorithm development, 3D analysis, and figures*
- Python: *Geospatial analysis in the ArcMap environment and batch processing*
- IDL: *LiDAR product analysis in the ENVI environment*
- PC-ORD: *Multidimensional analysis of species distributions*

Geospatial Software

- ArcMap/QGis: *Geospatial analysis, biomass mapping, model building and evaluation*
- Quick Terrain Modeler: *Airborne and terrestrial LiDAR processing, geospatial analysis, visualization*
- FUSION: *Airborne and terrestrial LiDAR processing (point cloud statistics and CHM creation)*
- LASTools *Airborne and terrestrial LiDAR processing (point cloud statistics and CHM creation)*
- CloudCompare: *Terrestrial LiDAR processing (point cloud mensuration and segmentation)*

- CompuTree: *Terrestrial LiDAR processing (3D forestry mensuration, biomass estimation)*
- ENVI: *Passive optical imagery analysis (Landsat and NAIP)*
- Faro SCENE: *Terrestrial LiDAR processing (registration and filtering)*

Field Experience

- TLS and Forest inventory: tropical (*Indonesia, Costa Rica*), temperate (*Virginia, Massachusetts, Minnesota, Michigan, Tennessee*), Tundra/Boreal (*Toolik Lake, Alaska*), and mangrove (*Gabon*).
- Licensed UAV/UAS Certified Drone Pilot

EARLY EXPERIENCE

The National Fish and Wildlife Foundation 2012
Internship and Research supervised by Dr. Daniel Petit *Charlottesville, VA*

Developed a GIS based model that prioritized funding for longleaf pine restoration in North Carolina and identified high priority locations for restoration, maximizing cost benefit.

University of Virginia 2011 - 2012
Undergraduate Research under direction of Dr. Aaron Mills *Charlottesville, VA*

Studied impact of management techniques for soil restoration in a Central VA farming community, with analysis of soil structure, chemistry, and a time series of in-situ moisture over an elevation gradient.

PROFESSIONAL ACTIVITIES AND AFFILIATIONS

Institutions of Past Collaboration

- University of Maryland: GEDI Science team Calibration and Validation with TLS *2018*
- University of Alaska Fairbanks: Tundra solar-induced chlorophyll fluorescence monitoring *2018*
- University of New Mexico: Dryland solar-induced chlorophyll fluorescence monitoring *2018*
- NASA: AfriSAR Field Campaign, Gabon *2017*
- Colorado State University: Non-destructive biomass estimation with TLS *2016-2017*
- Virginia Polytechnic Institute and State University: Microtopography mapping with TLS *2017-2019*

Academic

- Ecological Society of America *2019-2020*
- AAAS/Science Program for Excellence in Science Member *2018-2020*
- Terrestrial Laser Scanning Research Coordination Network *2016-Present*
- American Geophysical Union Member *2013-Present*

Broader Impacts

- Creation of the *Global TLS Metadata Database* for international collaboration *2019-Present*
- Coordination and participation in Silvacarbon workshops (Indonesia, D.C., Costa Rica) *2014-2017*

TEACHING AND MENTORING

PhD Advising and Mentoring 2019 - Present

- Romina Gonzolez Musso - TLS Allometry and GEDI Calibration *2021-2025*
- Brandon Alveshere - Understanding Forest Complexity with TLS *2019-2022*
- Brian Lee - Forest Biomass mapping with LiDAR *2021-2022*
- Seamus Lombardo - GEDI Biomass mapping on Yurok Land in California *2021-2022*

· Isamar Cortes - Mangrove Island Height Sensitivity to Salinity *2021-2022*

Teaching Assistant 2012 - 2017

· GIS Methods *Fall 2017*
· Forest Sampling *Spring 2013, Spring 2015 - Spring 2017*
· Forest Ecosystems Management *Fall 2012 - Fall 2016*
· Applied Statistics for Environmental Scientists *Spring 2014*

Undergraduate Mentor 2012 - 2017

· Jacob Smith - Tree mortality mapping and UAV SFM reconstruction *2018*
· Rebecca Nardacci - Precision TLS registration *2017-2018*
· Kendra Counts - Tree modeling for allometry development using TLS *2017*
· Annie Khuu - Tree mortality mapping at a NEON site using airborne LiDAR *2017*
· Yvonne Dinh - Created local non-destructive allometry with TLS *2016-2017*
· Gabriella Reyes - Developed field methods and data collection using TLS *2015-2016*
· Gloria Desanker - Validated manual forestry measurements with TLS *2014-2015*

SELECTED COAUTHORED CONFERENCES AND PRESENTATIONS

D Crawford*, T Jovanovic, C Brack, **A Stovall**, D MacFarlane, J Frank, T Condon, A Strahler, C Schaaf, A Barker-Plotkin, D Orwig. Using Zeb1, a highly-mobile terrestrial laser scanner, to assess and measure trees in an eastern hemlock-dominated forest

P Radtke, A Barker-Plotkin, P Boucher, A Burt, K Calders, D Walker, J Frank, Z Li, D MacFarlane, D Orwig, I Paynter, F Peri, P Raumonen, C Schaaf, **A Stovall**, A Strahler. Comparing Lidar-Derived Quantitative Structure Models (QSM) with Direct Measurements of Tree Structure, Volume, and Biomass. ForestSat 2018, College Park, MD. 1-5 Oct. 2018.

J Atkins*, R Fahey, B Hardiman, E Stuart-Haëntjens, B McNeil, D Orwig, L Turner, **A Stovall,** C Gough. Structural Signatures of Forest Disturbance. ForestSat 2018, College Park, MD. 1-5 Oct. 2018.

Atkins, J., **Stovall, A.E.L.**, Clark, G., Hardiman, B., Gough., Quantifying forest structure, complexity, and biomass using the Leica BLK360 terrestrial laser scanner. ForestSat 2018, College Park, MD. 1-5 Oct. 2018.

Diamond, Jacob; **Stovall, A.E.L.**; Mclaughlin, Daniel; Slesak, Rob. Wetland Microtopographic Structure is Revealed with Terrestrial Laser Scanning. Abstract H11D-1199, 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec. 2017

David Lagomasino, Lola Fatoyinbo, SeungKuk Lee, Emanuelle Feliciano,**Atticus Stovall**, Ian Paynter. Getting to the root of the problem. NASA Hyperwall. 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec. 2017.

Vorster, Anthony; **Stovall, A.E.L.**. Biomass Estimate Variability between Allometric Equations from Tree to Landscape Scale. Abstract 427, SAF 2017, Portland, OR, Oct. 2017

Alan Strahler, Jeff Atkins, Martin Beland, Debbie Crawford, Mark Danson, Mathias Disney, Ahmed Elsharif, Rachel Gaulton, Christopher Gough, Tom Jovanovic, Crystal Schaaf, **Atticus Stovall**. Early scanner data and structure retrievals from TLS calibrated by destructive sampling at Harvard Forest. Silvilaser 2017, Virginia Tech, Blacksburg, VA, 10-12 Oct. 2017