

## **Michael W. Palace**

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### **Summary**

I am an environmental scientist focusing on carbon dynamics, ecosystems, and geospatial science. My research ranges from field studies of forest structure to the use of satellite imagery in an effort to predict disease, understand forest dynamics and biogeochemistry, and find and interpret past human settlement patterns. I am a former TEDx speaker and a Research Associate Professor in the Earth System Research Center at the Institute of Earth, Oceans, and Space at the University of New Hampshire, a faculty fellow at the Sustainability Institute and coordinator for the environmental science interdisciplinary undergraduate major, both at UNH. I have been a Principal Investigator on eight major remote sensing projects, three completed and five active. My research projects have received external funding from NASA, NSF, USAID, USDA and USGS. Production of electronic music and audio field recording, as a semi-professional, is a focus of my creative outlet. I have numerous albums under the pseudonym “horchata” and have made many field recordings during my trips to Amazonia and other locations.

### **Education**

2006 Ph.D., Natural Resources and Earth System Science, University of New Hampshire  
1995 M.S., Environmental Science, University of Virginia  
1992 B.A., Archaeology and Environmental Science, University of Virginia

**Ph.D Dissertation Committee:** George Hurtt, Michael Keller, John Aber, Steve Frolking, Herman Hank Shugart

**Ph.D. Dissertation Title** – Tropical Forest Structure: Ground Measurements of Coarse Necromass and Satellite Observations of Crown Geometry

**M.S. Thesis Committee:** Tom Smith, John Porter, Herman Hank Shugart

**Ms Thesis Title** – A Multivariate Analysis of Habitat Selection by the Mantled Howler Monkey (*Alouatta palliata*)

### **Professional Experience**

2014-present **Research Associate Professor**, Earth System Research Center, Institute for the Study of Earth Oceans and Space, UNH  
2012-present **Coordinator** for the Environmental Science Interdisciplinary Undergraduate Major, UNH  
2012-present **Faculty Coordinator** for the Graduate Certificate in Geospatial Sciences, UNH  
2012-2104 **Faculty Fellow and Co-chair** for the Ecosystem and Biodiversity Task Force, Sustainability Academy, University of New Hampshire, Durham, NH  
2009-2014 **Research Assistant Professor**, Earth System Research Center, Institute for the Study of Earth Oceans and Space, UNH

- 2008-2009 **Research Scientist III**, Institute for the Study of Earth Oceans and Space, Durham, University of New Hampshire, New Hampshire
- 2008 **Research Scientist**, Environmental Change Institute, School of Geography and the Environment, Oxford University, UK
- 2003-2008 **Research Scientist II**, Institute for the Study of Earth Oceans and Space, University of New Hampshire, Durham, NH
- 2005-present **Independent Consulting**, Portsmouth, NH
- 2004 **Teaching Assistant**, Global Biological Change, Department of Natural Resources, University of New Hampshire
- 1999-2003 **Research Associate II**, Institute for the Study of Earth Oceans and Space, University of New Hampshire, Durham, NH
- 1997-1999 **Environmental Scientist**, Science Applications International Corporation (SAIC), McClean, VA
- 1997-present **Multi-Media Designer and Co-Founder of Electronic Media Group**, Zero1Media, Inc.
- 1995-1997 **Chesapeake Research Consortium Fellow**, US EPA's Chesapeake Bay Program Office, Annapolis, MD
- 1992-1995 **Research Assistant**, Department of Environmental Sciences, University of Virginia
- 1995 **Teaching Assistant**, Department of Environmental Sciences, UVa
- 1994 **Lab and Teaching Assistant**, Electronic Music Lab, University of Virginia
- 1992 **Research and Teaching Assistant**, School for Field Studies, Primate Ecology and Conservation, Costa Rica
- 1987-1988 **Research Volunteer**, Marine Systems Laboratory, Smithsonian Institute, Washington, D.C.

#### **Peer Reviewed Scientific Publications (\*student or postdoc)**

\*Pellissier, P., S. Ollinger, L. Lepine, **M. Palace**, W. McDowell (2015). Remote sensing of foliar nitrogen in cultivated grasslands of human dominated landscapes. *Remote Sensing of Environment*, 167, 88-97. doi:10.1016/j.rse.2015.06.009

**Palace M**, FB Sullivan, MJ Ducey, C Czarnecki, J Zanin Shimbo, Jonas Mota e Silva (2015). Estimating forest structure in a tropical forest using field measurements, a synthetic model and discrete return lidar data. *Remote Sensing of Environment*, 161, 1-11. doi:10.1016/j.rse.2015.01.020.

Treuhaft, R., Gonçalves, F., Roberto dos Santos, J., Keller, M., **Palace, M.**, Madsen, S., Sullivan, F., Graça, P. (2015). Tropical-Forest Biomass Estimation at X-Band from the Spaceborne TanDEM-X Interferometer. *IEEE Geoscience and Remote Sensing Letters*, 12, 239-243.

Hartter, J., Sadie Ryan, **Michael Palace**, Abe Goldman, Nicholas Dowhaniuk, Jeremy Diem, Colin A. Chapman (2015). Now there is no land: a story of ethnic migration in a protected area landscape in western Uganda. *Population and Environment*. doi: 10.1007/s11111-014-022.

- Morton, D.C. J. R. Nagol, J. Rosette, C. C. Carabajal, D. J. Harding, **M.W. Palace**, B. D. Cook, P. R. North, (2014). Apparent Seasonal Green up of Amazon Forests, *Nature*, doi:10.1038/nature13006.
- \*McMichael, C., **M. Palace**, M.B. Bush, B. Braswell, S.C. Hagen, M. Silman, C. Czarnecki, E. Neves, (2014). Terra preta distribution in Amazonia, *Proceedings of the Royal Society B*. doi: 10.1098/rspb.2013.2475.
- Howey, M., **Palace, M.**, McMichael, C.H., Braswell, B. (2014). Moderate-resolution remote sensing and geospatial analyses of microclimates, mounds, and maize in the northern Great Lakes. *Advances in Archaeological Practice*, doi 10.7183/2326-3768.2.3.195.
- Sullivan, FB, **Palace M**, MJ Ducey. (2014). Multivariate statistical analysis of asynchronous lidar data and vegetation models in a neotropical forest. *Remote Sensing of Environment*. doi: 10.1016/j.rse.2014.04.027
- \*Espírito-Santo, F. D. B., M. Gloor, M. Keller, Y. Malhi, S. Saatchi, B. Nelson, R. C. Oliveira Junior, C. Pereira, Y. E. Shimabukuro, V. Duarte, S. Frolking, **M. Palace**, J. Lloyd, A. Monteagudo, G. López-González, T. R. Baker, T. R. Feldpausch, R. Brienen, and O. L. Phillips (2014). Size and Frequency of Natural Forest Disturbances in Amazonia. *Nature: Communications*, doi:10.1038/ncomms4434.
- \*Couto de Miranda, Sabrina Joice Ferreira, Mercedes Bustamante, **Michael Palace**, Michael Keller, Steve Hagen, Laerte Guimarães Ferreira (2014). Regional Variations in Biomass Distribution in Brazilian Savanna Woodland, *Biotropica*. 46, 125-138. doi:10.1111/btp.12095
- Diem, J.E., S.J. Ryan, J. Hartter, and **M.W. Palace** (2014). Satellite-based rainfall data reveal a recent drying trend in central equatorial Africa. *Climatic Change*, 26, 263-272
- Howey, M., **Palace, M.**, McMichael, C.H., Braswell, B. (2014). Moderate-resolution remote sensing and geospatial analyses of microclimates, mounds, and maize in the northern Great Lakes. *Advances in Archaeological Practice*, 3, 195-207(13).
- Diem, J.E., J. Hartter, S.J. Ryan, and **M.W. Palace** (2014). Validation of satellite rainfall products for western Uganda. *Journal of Hydrometeorology*, 15, 2030-2038.
- \*McMichael, C.H., **Palace, M.**, Golightly, M., (2014). Associations between geoglyph formation and bamboo-dominated forests in western Amazonian forests, *Journal of Biogeography*. doi:10.1111/jbi.12325
- Urrego, D.H., Bush, M.B., Silman, M.R., Niccum, B.A., De la Rosa, P., McMichael, C., Hagen, S., **Palace, M.** (2013). Western Amazonia: Holocene histories of extreme events, fire and ecotonal stability. *Journal of Biogeography*. doi: 10.1111/jbi.12016

- Palace, M.**, M. Keller, S. Frohking, H. Hurtt (2012). A review of above ground necromass in tropical forests. In *Tropical Forests*. Editors Dr. Padmini Sudarshana, Dr. Madhugiri Nageswara-Rao, and Dr. Jaya R. Soneji, ISBN 978-953-307-954-7.
- \*McMichael C.H., M.B. Bush, M.R. Silman, D.R. Piperno, M. Raczka, L.C. Lobato, M. Zimmerman, S. Hagen and **M. Palace** (2012). Historical fire and bamboo dynamics in western Amazonia. *Journal of Biogeography*. doi: 10.1111/jbi.12002
- Frohking, S., S. Hagen, T. Milliman, **M. Palace**, J.Z. Shimbo, M. Fahnestock.(2012). Estimating deforestation rates of pan-tropical humid forests 2000-2009 with the SeaWinds Ku-bands scatterometer. *IEEE Transactions on Geoscience and Remote Sensing* 50: 2603-2617, doi: 10.1109/TGRS.2011.2182516.
- Frohking, S., T. Milliman, **M. Palace**, D. Wisser, R. Lammers, Mark Fahnestock (2011). SeaWinds microwave scatterometer detects 2005 Amazonian forest drought. *Remote Sensing and Environment* 115: 897-907.
- Feldpausch, T, Lloyd J, Phillips, OL, Baker, TR, **Palace, M**, et al. (51 co-authors) (2010). Height-diameter allometry of tropical trees. *Biogeosciences* 7: 7727-7793.
- Gonzalez, P., G.P. Asner, J.J. Battles, M.A. Lefsky, K.M. Waring, **M. Palace** (2010). Forest carbon densities and uncertainties from Lidar, QuickBird, and field inventories in California. *Remote Sensing of Environment* 114: 1561-1575.
- Frohking, S., **M. Palace**, D.B. Clark, J.Q. Chambers, H.H. Shugart, G.C. Hurtt, (2009). Forest disturbance and recovery - a general review in the context of space-borne remote sensing of impacts on aboveground biomass and canopy structure. *J. Geophys. Res.*, 114, G00E02, doi:10.1029/2008JG000911.
- Palace, M.**, M. Keller, G.P. Asner, S. Hagen, B. Braswell, (2008a). Amazon forest structure from IKONOS satellite data and the automated characterization of forest canopy properties. *Biotropica*, 40(20): 141-150.
- Palace, M.**, M. Keller, H. Silva, (2008b). Necromass production: studies in undisturbed and logged Amazon forests. *Ecological Applications*: 18, 873–884.
- Broadbent, E.N., G.P. Asner, M. Peña-Claros, **M. Palace**, M. Soriano, (2008). Spatial partitioning of biomass and diversity in a lowland Bolivian forest: linking field and remote sensing measurements. *Forest Ecology and Management*, 255, 2602-2616.
- Chambers, J.Q., G.P. Asner, D.C. Morton, L.O. Anderson, S.S. Saatchi, F.D.B. Espírito-Santo, **M. Palace**, C. Souza, (2007). Regional ecosystem structure and function: ecological insights from remote sensing of tropical forests. *Trends in Ecology and Evolution* doi:10.1016/j.tree.2007.05.001.
- Palace, M.**, M. Keller, G.P. Asner, J.N.M. Silva, C. Passos, (2007). Necromass in undisturbed and logged forests in the Brazilian Amazon. *Forest Ecology and Management*, 238, 309-318.

- Rice, A. H., E. H. Pyle, S. R. Saleska, L. Hutyyra, P. B. Camargo, K. Portilho, D. F. Marques, **M. Palace**, M. Keller, and S. C. Wofsy, (2004). Carbon balance and vegetation dynamics in an old-growth Amazonian forest, *Ecological Applications*, 14(4):s55-s71.
- Keller, M., **M. Palace**, G.P. Asner, R. Pereira Jr., and J.N.M. da Silva, (2004a). Coarse woody debris in undisturbed and logged forests in the eastern Brazilian Amazon, *Global Change Biology* 10:5.
- Keller, M., G. P. Asner, J.M.N. Silva, and **M. Palace**, (2004b). Sustainability of Selective Logging of Upland Forests in the Brazilian Amazon: Carbon Budgets and Remote Sensing as Tools for Evaluation of Logging Effects. in Eds: D.J. Zarin, J. Alavalapati, F.E. Putz, M. Schmink Working Forests in the American Tropics: *Conservation Through Sustainable Management?* Publisher, Colombia University Press. New York.
- Hurttt, G., X. Xiao, M. Keller, **M. Palace**, G. P. Asner, R. Braswell, E.S. Brondizio, Manoel Cardoso, C. J.R. Carvalho, M.G. Fearon, L. Guild, S. Hagen, T. Sá, A. Schloss, G. Vourlitis, A. J. Wickel, B. Moore III, and C. Nobre, (2003). IKONOS Imagery for the large scale biosphere atmosphere experiment in Amazonia (LBA). *Remote Sensing of the Environment*, 88: 111-127.
- Asner, G., **M. Palace**, M. Keller, M., Pereira, J. Silva, J. Zweede, (2002). Estimating canopy structure in an Amazon forest from laser rangefinder and IKONOS satellite observations. *Biotropica* 34(4): 483-492.
- Keller, M., **M. Palace** and G. Hurtt, (2001). Biomass in the Tapajos National Forest, Brazil: examination of sampling and allometric uncertainties, *Forest Ecology and Management*, 154, 371-382.

**Peer Reviewed Scientific Publications (in review) (\*student)**

- Bush, Mark, Crystal McMichael, Dolores Piperno, Miles Silman, Jos Barlow, Carlos Peres, Mitchell Power, **Michael Palace** (*in review at Journal of Biogeography*). Humans and Amazonia in Prehistory: A Review and Summary of the Evidence.
- Bustamante, Mercedes MC, Roitman, Iris, Aide, T, Alencar, A., Anderson, Liana, Aragão, Luiz Eduardo, Asner, Greg, Barlow, Jos, Berenguer, Erika, Chambers, Jeffrey Q, Costa, Marcos Heil, Fanin, Thierry, Ferreira, Laerte, Ferreira, Joice, Keller, Michael, Magnusson, William, Morales, Lucia, Morton, Douglas, Ometto, Jean Pierre, **Palace, Michael**, Peres, C., Silvério, Divino, Trumbore, Susann, Vieira, Ima Célia (*in review at Global Biological Change*). Towards an integrated monitoring framework to assess effects of tropical forest degradation and recovery effects on carbon stocks and biodiversity.
- \*Papanastassiou, Katrina, **Michael Palace**, Kathleen M. O'Brien, Lindsey E. Fenderson, Adrienne I. Kovach. (*in review at Landscape Ecology*). Functional connectivity of an early successional specialist in a heterogeneous landscape.
- \*Algeo, T.P. **Michael Palace**, Dennis Slate, Rosemary M. Caron, Todd Atwood, Sergio Recuenco, Richard B. Chipman, Mark Ducey (*in review at Journal of Mammalogy*). Raccoon (*Procyon Lotor*) abundance indices in eastern U.S. Pine-dominated forests: Information for raccoon rabies control strategies.

\*Algeo, T.P. **Michael Palace**, Dennis Slate, Rosemary M. Caron, Todd Atwood, Sergio Recuenco, Richard B. Chipman, Mark Ducey (*in review at PLoS Neglected Tropical Diseases*). Remote sensing: the potential of an increasingly important vector-borne disease research tool to rabies and other zoonotic diseases.

Rosette, Jacqueline, Bruce Cook, Douglas Morton, **Michael Palace**, Juan Suárez, Jérémy Rubio-Gil, Peter North, Fred Huemrich, Claudia Carabajal, K. Jon Ranson (*in revision for Remote Sensing of Environment*). Seasonality of vegetation and environmental conditions influence forest biophysical parameter estimation from large footprint Lidar.

Ryan, S. J., **Palace, M.**, Diem, J.E., Chapman, C.A., Hartter, J. (*in revision for Ecosphere*). Population pressure and global markets drive deforestation in Africa's Albertine Rift.

\*Shimbo, J. M., Bustamante, **M. Palace**. F. S. C. Takahashi (*in revision for the Journal of Tropical Ecology*). Spatial and environmental influences on palm communities in mature and disturbed Amazonian forests.

Varner, R. K., M. Keller, S. Phillips, R.C. de Oliveira Jr., P.M. Crill, **M. Palace**, H.C.P. Silva Jr., J.D. Dias, and E. Souza Neto, (*in revision for Journal of Geophysical Research - Biogeosciences*). High Frequency Measurements of Soil-Atmosphere Carbon Dioxide in an Undisturbed Forest in the Brazilian Amazon.

### **Reports**

Boag, Angela E., Joel Hartter, Lawrence C. Hamilton, Forrest R. Stevens, Mark J. Ducey, **Michael W. Palace**, Nils Chistoffersen, and Paul T. Oester. Forest Views Shifting Attitudes Toward the Environment in Northeast Oregon. Carsey Research, National Issue Brief #81, Spring 2015

### **Government Documents**

**Palace, M.** Principal Author, Chesapeake Bay Watershed Model Application and Calculations of Nutrient and Sediment Loadings, Appendix H: Tracking Best Management Practice Nutrient Reductions in the Chesapeake Bay Program, August 1998.

**Palace, M.** Principal Author, Chesapeake Bay Watershed Model, Appendix I: Phase IV Chesapeake Bay Watershed Model - Operations Manual, Fall 1998.

### **Funding History (Awarded)**

Drought-induced vegetation change and fire in Amazonian forests: past, present, and future. NASA- Interdisciplinary Research in Earth Science (NASA-IDS). **MW Palace** (PI), Co-Is- H. Asbjornsen (UNH), M. Bush (FIT), B. Braswell (AGS), M. Ducey (UNH), S. Frolking (UNH), M. Keller (USDA), C. McMichaels (FIT), D. Morton (NASA-Goddard), D. Roberts(UCSB). (\$1,944,730), 11/1/13-10/31/16.

Climate Change Adaptation in Working Landscapes of the Intermountain Northwest. USDA-AFRI. J. Hartter (PI), **MW Palace** (Co-I), Mark Ducey (Co-I), Larry Hamilton (Co-I), \$900,000, 1/1/14 - 12/31/16.

Operational multi-sensor design for national scale forest carbon monitoring to support REDD+ MRV systems. NASA - Carbon Monitoring System: Continuing Prototype Product Development, Research, and Scoping. S Hagen (PI), **MW Palace** (Co-I). Co-Is, W. Salas, B. Braswell, S. Brown, N. Harris, S. Saatchi, D. Lawrence, J. Blair. (\$1,788,547), 8/1/2013 – 7/31/2016.

Using Spatial and Genetic Tools to Understand Functional Connectivity in a Patchy Landscape - NSF – Geography and Geospatial Science (A. Kovack – PI, **MW Palace** (Co-I), (\$75,000) 6/1/13 - 5/31/15.

Collaborative Research: Investigating northern peatland methane dynamics by synthesizing measurements, remote sensing and modeling from local to regional to continental scales. NSF MacroSystems Biology. (w/ R. Varner – UNH - PI) **MW Palace** (co-I) (\$1,640,045) 2/1/13 - 1/31/16.

Estimating forest structure and change using high resolution lidar. USAID (**MW Palace – PI**, M. Keller – Co-I) (\$30,000 - Augmentation) 12/1/12-11/30/13.

Estimating forest structure and change using high resolution lidar. USAID (**MW Palace – PI**, M. Keller – Co-I) (\$147,591) 12/1/12-11/30/13.

Mounds, Microclimates, and Maize: Understanding the Influence of Inland Lakes on Agriculture in Pre-contact Indigenous Societies using Remote Sensing Image Data – NASA Space Archaeology. **MW Palace** (PI), M Howey, M Bush, C McMichaels, S Hagen, B Braswell. Estimated Budget (\$378,364). (05/01/12 - 4/30/15).

Collaborative Research: Long-term Anthropogenic Influences on the Crater Lake Environmental Landscape of Western Uganda. M. Jointly funded by NSF BCS – Archaeology and Geography and Geospatial Sciences. Howey (PI), **MW Palace**, J. Hartter, P. Schmidt, L. Kiage. (\$23,660) 8/1/12 - 7/31/13.

Iola Hubbard Climate Change Endowment (\$20,000) - Development of paleoecological research (5/01-12 – 10/1/12).

Tropical Moist Forest Structure and Biomass Estimation from Simultaneous InSAR at X-band (TanDEM-X), Small- and Large-Spot Lidar, and Field Measurements. – NASA Terrestrial Ecology Program . Robert Treuhaft (PI), Joao Santos, Luciano Dutra, Fabio Goncalves, Michael Keller, **Michael Palace**, Scott Hensley, Paulo Maurício de Alencastro Graca. Estimated Budget (\$750,000) (05/01/12 - 4/30/15).

UNH Class of 1941 Professorship Award (\$21,000). Award honors a UNH faculty member for outstanding teaching and research or public service.

Promoting Wonder and Innovation in Learning: Design and Implementation of a Graduate Certificate in Geospatial Science. PI- Michael Routhier (EOS), Lead Graduate Faculty- **Michael Palace** (EOS), Co-Is- Shane Bradt (Coop Ex), Russell Congalton (NR/COLSA), Mark Ducey (NR/COLSA), Mark Fahnestock (EOE/CEPS), Stephen Hale (Leitzel Center), Larry Hamilton (Sociology/COLA), Jennifer Jacobs (CIE/CEPS),

- Ernst Linder (Math/CEPS), Mary Martin (EOS), Barry Rock (EOS/COLSA), Fay Rubin (EOS), Joseph Salisbury (EOS/CEPS), Harlan Spence (EOS), Steve Wineberg (MATH/CEPS), Douglas Vandemark (EOS/CEPS), and Cameron Wake (EOS/CEPS). \$54,000.
- CI-TEAM Demo: Cyber-Infrastructure Digital Education and Research (CIDER) (w/ A. Schloss – PI, **M. Palace** and J. Beaudry - Co-Is) – NSF CI-TEAM. (10/1/11 - 9/30/13) \$249,973.
- Hotter Hotspots: Land use intensification and protected area vulnerability in Africa's Albertine Rift – NSF Dynamics of Coupled Natural and Human Systems (CNH). (\$249,956). PI Joel Hartter, Co-Is – **Michael Palace**, Colin Chapman, Sadie J. Ryan, Jeremy Diem. (06/01/11 - 5/31/13).
- Ebullition of Methane from Flooded Environments: Measurements and Scaling. PI- Ruth Varner, EOS, Co-I – **Michael Palace**, EOS. New Hampshire Space Grant Consortium at UNH, NASA Space Grant Research Development Award. – (\$10,000).
- Experiential Student Learning and Collaborative Research: Understanding Tropical Ecosystem Responses to Climate Change from Leaves to Landscapes. Heidi Asbjornsen, COLSA. **Michael Palace**, EOS. UNH-NSF-ADVANCE Program's "Collaborative Scholarship Advancement Award" – (\$40,000).
- Landscapes, Networks, & Social Resource Decisions: Using Geospatial Technologies to Create Long-Term Models of Firewood Use - New Ventures Research Leverage Proposal, **Michael Palace**, Meghan Howey, Joel Hartter, Joe Lugalla -(\$48,289).
- Engaged Scholars Academy Grant, University of New Hampshire. **Michael Palace**. Audio Field Recording and Digital Sound Processing for Junior High Students (\$400) (2010-2011).
- Characterizing the frequency and chemistry of ebullitive events in flooded ecosystems – USGS (\$60,000) – PI Ruth Varner, Co-I **Michael Palace** (8/23/10-8/22/11).
- Modeling the Impacts of Major Forest Disturbances on the Earth's Coupled Carbon-Climate System, and the Capacity of Forests to Meet Future Demands for Wood, Fuel, and Fiber. NASA - NNH09ZDA001N-IDS: Interdisciplinary Research in Earth Science. G Hurtt (PI), **Michael Palace**, Douglas Morton, Ralph Dubayah, Steve Frolking, Anthony Janetos, James Edmonds, Peter Thornton, Jeffrey Chambers, Elena Shevliakova, George Collatz. Estimated Budget (\$1,754,788) (09/01/10 - 08/31/14).
- Development of a global database of height and biomass allometric equations that can aid in estimating biomass using spaceborne lidar - Scaling Forest Biometric Properties in Amazonia – NASA Terrestrial Ecology – Augmentation (\$62,990) – PI **Michael Palace** and Michael Lefsky (CSU), Co-I Mark Ducey.



Estimation of tropical forest structure using multiple remote sensing platforms and field based data, **Michael Palace** (PI). NASA – NNH09ZDA001N-NIP. New Investigator Program in Earth Science. (\$360,000) (9/1/2010 – 8/31/2014).

Analysis and Detection of Amazonian Black Earth Sites using Hyperspectral Satellite Imagery, **Michael Palace** (PI), Co-I Stephen Hagen (AGS), Mark Bush (Florida Institute of Technology), Eduardo Goes Neves (University of Sao Paulo) NASA- Space Archaeology (\$365,697) (9/1/2010 - 8/31/2013).

Enhancing Research and Education Capacity for Integration of Earth Observations, Infectious Diseases Ecology and Public Health in New Hampshire. D Bartlett (PI), **MW Palace** (Science PI). NASA - Experimental Program to Stimulate Competitive Research (EPSCoR). (\$749,221). (2007-2010).

A Historical Reconstruction of Vegetation Change and a Carbon Budget for the Brazilian Cerrado Using Multiple Satellite Sensors and Historical Aerial Photography, **MW Palace** (PI). NASA Carbon Science NNH07ZDA001N-CARBON. (\$864,518) (2/1/07 - 4/30/11).

Scaling Forest Biometric Properties Derived from High Resolution Imagery to the Amazon Basin using Moderate Resolution Spectral Reflectance Data, **MW Palace** (PI). NASA – Terrestrial Ecology NNH07ZDA001N-TE. (\$442,439) (2/1/07 - 2/30/11).

### **Funding History (Pending)**

Arctic and boreal lakes and ponds: quantifying and upscaling spatial and temporal variability in methane and carbon dioxide emissions. Ruth Varner (PI-ESCI), Michael Palace (Co-I, ESRC), Sally MacIntyre (Co-I-UCSB), Philip March (Collaborator-Wilfrid Laurier University), Patrick Crill (Collaborator-University of Sweden), Oliver Sonnentag (Collaborator-University of Montreal). NASA-ABOVE-Terrestrial Ecology (\$719,028), (8/1/2015-7/31/18).

Nitrogen feedbacks on carbon assimilation and surface energy exchange in response to climate warming and disturbance across the ABOVE study region. Scott Ollinger (PI-NREN/ESRC), Michael Palace (Co-I-ESRC), Steve Frolking (Co-I-ESRC/ESCI). NASA-ABOVE-Terrestrial Ecology. (\$630,038), (8/1/2015-7/31/18).

### **Popular Press**

2014 – Interviewed for Science article titled “Ecosystems Say 'Pass the Salt!'” - Science 31 January 2014: 472-473. [DOI:10.1126/science.343.6170.472]

2013-2014 – Working with Ive Van Krunkelsven, filmmaker, on section of documentary “Infiltrating Science.” Featuring use of Unmanned Aerial Systemsto characterize mire vegetation in Sweden. Part of Ruth Varner’s, NERU and NSF Macroscale Biology project. Documentary will also feature musical compositions by **Michael Palace**.

2014 – Interviewed for Science article titled “Searching for the Amazon's Hidden Civilizations” – Science January 7, 2014.

2012 – Article on Lyme disease and Remote Sensing in the Tin Mountain Newspaper, Conway, NH.

2012 – Article in EOS Spheres about postdoc’s work and about Space Archaeology and Remote Sensing.

2011 – Interviewed on NH NPR program “The Exchange” with Laura Knoy about Lyme Disease and Ecology.

2011 – Article in UNH Magazine about Lyme Disease.

2010 – Article on UNH Website about Space Archaeology and Remote Sensing.

2010 – Article in EOS Spheres, UNH on Space Archaeology

2010 – Article in “The Wire, Portsmouth, NH” about Space Archaeology, Remote Sensing and Amazonia.

2001 – Geospatial Solutions Magazine – Wrote article titled “Geospatial in the Jungle – Logging in the Amazon.”

### **Awards**

USDA Two Chiefs Award – for collaborative work among the USDA Forest Service, the USDA Natural Resources Conservation Service, and UNH – 2015.

UNH Class of 1941 Professorship Award – award honors a UNH faculty member for outstanding teaching and research or public service - 2012.

Member of the Engaged Scholars Academy at the University of New Hampshire 2010-2011.

Graduate Student Travel Grant Award 2004, Used to attend the Gordon Conference on Theoretical Biology and Biomathematics, Tilton, NH. Presented poster titled “Examination of Networks, Synchronization, and Critical Population Sizes based a Model Simulating Ficus trees and their obligate Wasp Pollinator.”

The Computerworld Smithsonian Awards, For Heroic Achievement in Information Technology, U.S. Environmental Protection Agency, Chesapeake Bay Program Office, In Recognition of your Visionary use of Information Technology in the Field of Environment, Energy and Agriculture, June 4, 1996.

Chesapeake Research Consortium Fellowship, Annapolis, MD 1995-1997.

Outstanding Graduate Student in Ecology, Department of Environmental Sciences, University of Virginia, 1993-1994.

Member of Sigma Gamma, the Earth Science Honor Society, 1992.

### **Public Outreach and Education**

Talk Brixham Montessori Friends School May 2015, on Drones and Vegetation. - Discussed work with Kindergarten Class and 3-4 Grade Class.

Chairing a biogeoscience session of the American Geophysical Union Conference 2014, San Francisco, CA. Session Title: Forests and Drought: Vulnerability and Resilience, Past, Present and Future.

Talk at Portsmouth High School, June 18, 2014, on Tropical Ecology in conjunction with a student's project on parasitic fungi and ants.

Talk at Child Study and Development Center, Durham, NH, May 2014, on Light, Cameras, and Drones - Discussed work with Kindergarten Class.

Talk at Brixham Montessori Friends School, April 2014, on Plant growth and water.

TEDx speaker at TEDxPiscataquaRiver, May 3, 2013. "Science is a mash-up. Why idea sharing makes science so productive."

Talk at Seacoast Science Café, February 13, 2013. "Don't go outside, don't stay inside: Lyme disease and lead poisoning.

Chaired a remote sensing section of the US Regional Association of the International Association for Landscape Ecology Conference 2013, Austin, TX.

Talk given about remote sensing and archaeological research to Forest Watch participants 2013 UNH.

Talk given about remote sensing and tropical ecology to visting Rotary Group from Niger, at UNH 2013.

Faculty Fellow and Ecosystem TaskForce Co-Chair for the Sustainability Institute, UNH.

Iola Hubbard Climate Change Endowment Review Panel, ESRC, UNH.

Talk given about remote sensing and archaeological research to Forest Watch participants 2012 UNH.

Talk given about remote sensing and archaeological research to Women's Country Group participants 2012 UNH.

2011 Workshop Participant in NASA-LBA-ECO Data Review Panel.

2010-2011, Member of the NASA Terrestrial Ecology Field Campaign Workgroup.

Executive Council Member of the Natural Resource and Earth System Science PhD. Program at UNH (2011-2014).

Gave talk to school children about ecology and animals depicted in paintings by Dahlov Ipcar, "Lions, Tigers, and Animals Galore! Family Program at Museum of Art, UNH.

Discussion leader and participator in the Department of Energy's GOAmazon 2014 Workshop, 2011.

Participant in "Center for Excellence in Geosciences Education," New Ventures Research Leverage Grant, 2011.

Participant in "Incubating Interdisciplinary Sustainability Science Research at UNH," New Ventures Research Leverage Grant, 2011.

Project Proposal to Hydrophonia 5 – A conference on hydrophone (underwater microphone) use in science and art. FERMENTS - Fen Experimental Research in Methane: Ebullitive NeTwork Sensors, 2011.

Worked and hosted, Julia Shimbo, a graduate student from the Federal University of Brasilia, visiting in February 2011 to April 2011 examining Chagas disease and prediction of outbreaks using remote sensing techniques. (2nd visit).

Worked and hosted, Sabrina do Couto de Miranda, a graduate student from the Federal University of Brasilia, visiting in Fall 2011 examining Cerrado (savanna) vegetation integrating remote sensing techniques and field data.

Talk give at Complex System Research Center Lunch Seminar. Title: How Dungeons and Dragons made me a better researcher? I am not wearing my +3 headband of intellect. (November 2010).

Chaired a Special Session of the American Geophysical Union's Meeting of the Americas, 2010 Foz do Iguacu, Brazil, Titled "Remote Sensing Applications in Seasonally Dry Tropical Ecosystems."

Member of the Planning Committee for for Interdisciplinary Science and Engineering Symposium, Undergraduate Research Conference, University of New Hampshire 2011.

Talk at Oyster River High School for a series called the Power of One. Title: Space Forestry, Audio Recording and Electronic Music (June 2010).

Talk for Seacoast Academy, Hampton Falls, NH in May on Ecology and Sustainability for 6th and 7th grade classes (May 2010).

Worked and hosted Julie Melling, a graduate student from the University of Utrecht, the Netherlands, examining Secondary Tropical Forest through the Integration of Remote Sensing and Modeling. (MS Thesis completed).

Worked and hosted a graduate student from the Federal University of Brasilia, visiting in February 2010 examining Chagas disease and prediction of outbreaks using remote sensing techniques.

Worked on a project as part of the Member of the Engaged Scholars Academy at the University of New Hampshire on teaching audio field recording and digital signal processing to middle school students (Spring and Fall 2010).

Organized and lead an Eco-Epidemiological Workshop here at the University of New Hampshire. Workshop will focus on Chagas disease, Lyme disease, and Rabies in an ecological context using field data and remote sensing techniques (February 2010).

Member of the Planning Committee for Interdisciplinary Science and Engineering Symposium, Undergraduate Research Conference, University of New Hampshire 2010.

Judge for Interdisciplinary Science and Engineering Symposium, Undergraduate Research Conference, University of New Hampshire 2009.

Judge for Interdisciplinary Science and Engineering Symposium, Undergraduate Research Conference, University of New Hampshire 2008.

Talks given to various Elementary Schools (Rye, NH and Barrington, NH) on Tropical Ecology and Remote Sensing.

Wrote general science article titled "Geospatial in the Jungle: Logging in the Amazon," *Geospatial Solutions*, 11(3) 2001.

Wrote general science article on necromass sampling using power drills for Milwaukee Power Tool Company Newsletter, 2001.

Oral Presentation Given to Stuart's Draft High School, VA about Tropical Studies, Statistics, and Ecological Methods (1995).

Talk given a Canterbury Wood Elementary School, VA 1994 on Hydrology and Evaporation.

Talks given a Canterbury Wood Elementary School, VA in 1992 and 1994 on Tropical Ecology and Conservation.

Oral Presentation Given to Area School Teachers at Eco-Connections about General Ecology and Tropical Ecology and How Best to Implement Teaching these in a Classroom Setting, Charlottesville, VA 1992.

### **Reviewer**

Nature: Climate Change, Animal Conservation, PLOS ONE, Plant Ecology and Diversity, Journal of Anthropological Archaeology, Ecosphere, Journal of Biogeography, Journal of Anthropological Archaeology, Photogrammetric Engineering and Remote Sensing, Ecology Letters, Ecological Applications, Forest Ecology and Management, Canadian Journal of Forest Research, Global Change Biology, Remote Sensing of Environment, JGR-Biogeosciences, Biogeosciences, Journal of Applied Ecology, Biotropica.

Member of Proposal Review Panel for Department of Energy - Terrestrial Carbon Cycle Research Program.

Member of Proposal Review Panel for NASA – The Science of Aqua and Terra 2013

Member of Proposal Review Panel for NASA – The Science of Aqua and Terra 2009

Member of Proposal Review Panel for NASA – Carbon Science Program.

Member of Proposal Review Panel for NASA – Earth Science Fellowship Program 2012.

**STUDENT ADVISING (\*Chair) (16)**

Florencia Prado (PhD) – UNH – Natural Resource and Earth System Science Program

Laura Storch (PhD) – UNH – Integrated Applied Mathematics Program

Jose Gutierrez-Lopez – UNH – Natural Resource and Earth System Science Program

Olivia Bartlett (PhD) – UNH – Natural Resource and Earth System Science Program

Robert Colter (PhD) – UNH – Natural Resource and Earth System Science Program

James Perkins (MS) – UNH – Natural Resource Program

Nick Dowhaniuk (MS) – UNH – Natural Resource Program

\*Tim Algeo (PhD) – UNH – Natural Resource and Earth System Science Program (graduated)

Stephanie Coster (PhD) – UNH – Natural Resource and Earth System Science Program (graduated)

Fernando Santo (PhD) – UNH – Natural Resource and Earth System Science Program (graduated)

Jillian Lennartz (MS) – UNH – Earth Science (graduated)

Julia Shimbo (PhD) – University of Brasilia, Brazil – Ecology (graduated)

Sabrina do Couto de Miranda (PhD). University of Brasilia, Brazil – Ecology (graduated)

Katrina E Papanastassiou (MS) – UNH – Biology Program (graduated)

Paul Pellisser (MS) – UNH – Natural Resource Program (graduated)

Samantha Roddy (MS) – UNH – Earth Science (graduated)

**Student Independent Studies**

Dylan Schiff, Independent study and Capstone Project. Winner of the Stem Award for the ISE-URC conference 2015.

Jessica DelGreco, 2013 and 2014, 2015, Independent Research - Estimating Anthropogenic Influence in Tropical Forests Using Charcoal, Undergraduate Research Conference

Victoria Goulet, 2014, Capstone Environmental Science – Tree disease and maximum entropy modeling

KJ Schelling, 2014, Capstone Environmental Science – Lyme disease and maximum entropy modeling

Samantha Anderson, 2014, Capstone Environmental Science – Mire vegetation characterization

Anthony Guidice, 2014, Capstone Environmental Science – Vegetation classification in an agricultural system

Students Mentored on four students on two NSF-REU program campaigns – Northern Ecosystems Research for Undergraduates – Samatha Anderson (UNH), Michael Lyne (UCSB), Anthony Garnello (Arizona), Dan Finnell (VCU).

### **Teaching Experience**

Environmental Science NR791 Capstone Environmental Science Course, Spring 2013, 2014, 2015

Introduction to Environmental Science NR403 – Environmental Science Course, Fall 2012, 2013, 2014

Tropical Ecology NR784/884 – Natural Resource and Environment Course in Fall 2013, Co-taught with Heidi Asbjornsen

Advanced Topics in Remote Sensing Studies – Lidar, NRESS Investigation, Spring 2013

Professional Perspectives in Natural Resources NR400 – Environmental Science Course, Fall 2012, 2013, 2014

Tropical Ecology NR784/884 – Natural Resource and Environment Course in Spring term 2012, Funding acquired from NSF-ADVANCE grant. Co-taught with Heidi Asbjornsen

Guest Lecturer for Landscape Archaeology (Dept. of Anthropology, COLA, UNH).

Guest Lecturer for Data Analysis Methods in Earth System Science (Dept. of Earth, Ocean and Space, UNH).

Guest Lecturer for Advanced Remote Sensing Methods in Earth System Research (Dept. of Earth, Ocean and Space, UNH).

Guest Lecturer for Advanced Remote Sensing II (Dept. of Earth, Ocean and Space, UNH).

Teaching Assistant for Global Biological Change (Dept. of Natural Resources, UNH).

Teaching Assistant for Ecology Lab (Dept. of Environmental Sciences, UVA).

Ecological Modeling Lab (single lab session) (Dept. of Environmental Sciences, UVA).

Lab and Teaching Assistant, Electronic Music Lab, University of Virginia.

Teaching Assistant for Independent Study for two undergraduates (Dept. of Environmental Sciences, UVA).

Teaching Assistant for Primate Ecology and Conservation (2 month long courses) (School for Field Studies, Costa Rica).

Mentored various graduate and undergraduate students while at the University of Virginia and the University of New Hampshire.

### **Membership**

American Geophysical Union (AGU)

Ecological Society of America (ESA)

Association of American Geographers (AAG)

US Regional Association of the International Association for Landscape Ecology (US-IALE)

American Association for the Advancement of Science (AAAS)

Institute of Acoustic Ecology

### **Presentations (Oral and Poster Presentations at Professional Conferences)**

Poster at NASA Carbon Cycle and Ecosystems Joint Science Workshop 2015. Characterization and scaling of vegetation structure in Amazonia and Cerrado regions using remotely sensed imagery. **Michael Palace**, Bobby Braswell, Stephen Hagen, Laerte Ferreria, Mercedes Bustamante, Michael Keller, Sabrina Miranda, Julia Shimbo, Christina Herrick, Franklin Sullivan.

Poster at NASA Carbon Cycle and Ecosystems Joint Science Workshop 2015. Drought-induced vegetation change and fire in Amazonian forests: past, present, and future. **Michael Palace**, Steve Frohking, Crystal McMichael, Bobby Braswell, Dar Alexander Roberts, Mark Bush, Douglas Morton, Michael Keller, Heidi Asbjornsen, Luiz Aragao, Laerte Ferreria, Matt Vadenboncoeur, Mark Ducey, Stephen Hagen, Tom Milliman, Christina Herrick.

Poster at NASA Carbon Cycle and Ecosystems Joint Science Workshop 2015. Forest Monitoring in Indonesia: Using an extensive LiDAR data set to map forest carbon stock and logging impacts. Stephen Hagen, Franklin B. Sullivan, Sassan Saatchi, Timothy Pearson, **Michael Palace**, Bobby H. Braswell, Sandra Brown, William A. Salas, Matthew Hanson.

Poster at NASA Carbon Cycle and Ecosystems Joint Science Workshop 2015. Estimating forest structure in tropical forested sites using lidar point cloud data. Franklin B. Sullivan, **Michael Palace**, Michael Keller, Ekena Rangel Pinage, Maiza Nara dos Santo.

Poster at NASA Carbon Cycle and Ecosystems Joint Science Workshop 2015. Tropical-Forest Profiles and Biomass from TanDEM-X, Single-Baseline Interferometric SAR: InSAR Performance at Higher Frequencies and Bandwidths. Robert Neil Treuhaft, Fabio G. Goncalves, Michael Keller, João Roberto Santos, Maxim Neumann, **Michael Palace**.



- Talk at UMass-Lowell 2015. From the tropics to the tundra, from forests to fens: Understanding structure and process in ecosystems. **Michael Palace**.
- Talk at Peatland Workshop 2015. A high resolution image classification analysis of Stordalen and scaling issues. **Michael Palace**, Christina Herrick, Daniel Finnell , AJ Garnello, Carmondy McCalley, Franklin Sullivan, Samantha Anderson, Ruth Varner.
- Talk at Macroscale Biology Project Workshop. UAV Classification: Three centimeter classification, How cool is that? **Michael Palace**, Christina Herrick, Daniel Finnell , AJ Garnello, Carmondy McCalley, Franklin Sullivan, Samantha Anderson, Ruth Varner.
- Talk at AGU Fall 2014 Meeting. Estimating forest structure at five tropical forested sites using lidar point cloud data. **Michael Palace**, Franklin Sullivan, Michael Keller, and Robert Truehaft.
- Poster at AGU Fall 2014 Meeting. Multi-sensor remote sensing of the extent and persistence of the 2005 Amazon drought. Steve Frolking, Bobby Braswell, Michael, Seth Peterson, Dar Roberts, **Michael Palace**.
- Poster at AGU Fall 2014 Meeting. Can Plant Community Turnover Mitigate Permafrost Thaw Feedbacks to the Climate System? Moira Hough, AJ Garnello, Daniel Finnell, **Michael Palace**, Virginia Rich, Scott Saleska.
- Poster at AGU Fall 2014 Meeting. Characterization of Permafrost Degradation and Plant Communities Using Hyperspectral Reflectance. AJ Garnello, Daniel Finnell, **Michael Palace**, Jin Wu, Lucie Lepine, Patrick Crill, Ruth Varner.
- Poster at AGU Fall 2014 Meeting. Use of High Resolution UAS Imagery to Classify Sub-Arctic Vegetation Types. Christina Herrick, **Michael Palace**, Daniel Finnell , AJ Garnello, Franklin Sullivan, Samantha Anderson, Ruth Varner.
- Poster at AGU Fall 2014 Meeting. Characterization of subarctic vegetation using ground based remote sensing methods. Daniel Finnell, AJ Garnello, **Michael Palace**, Franklin Sullivan, Christina Herrick, Samantha Anderson, Patrick Crill, Ruth Varner.
- Poster at AGU Fall 2014 Meeting. The spectrum of natural forest disturbances and the Amazon forest carbon balance. Fernando D.B. Espirito-Santo, Michael Keller, Yadvinder Malhi, Bruce Nelson, Raimundo Oliveira Junior, Cleuton Pereira, Jon Lloyd, **Michael Palace**, Yosio Shimabukuro, Valdete Duarte, Abel Mendoza, Tim R. Baker, Ted Feldpausch, Gregory Asner, Doreen Boyd.
- Poster at AGU Fall 2014 Meeting. The Influence of Vegetation on Methane Ebullition in a Temperate Wetland. Samantha Roddy, Ruth Varner, **Michael Palace**.
- Poster at AGU Fall 2014 Meeting. Comparison of Stem Map Developed from Crown Geometry Allometry Linked Census Data to Airborne and Terrestrial Lidar at Harvard Forest, MA. Franklin Sullivan, **Michael Palace**, Orwig David.

- Poster at AGU Fall 2014 Meeting. Using LiDAR, RADAR, and Optical data to improve a NFMS in Kalimantan, Indonesia. Steven Hagen, Sassan Saatchi, Bobby Braswell, **Michael Palace**, Dirk Hoekman, Catherine Ipsan, Sandra Brown, Franklin Sullivan.
- Invited talk at the EMBRAPA, Campinas, Brazil (2014). Crown delineation and synthetic canopy profiles as tools for understanding lidar point cloud data. **M.Palace** and F. Sullivan.
- Invited talk at the University New Hampshire, Earth Science Department, UNH (2014). Tropics to the Tundra: Repurposing Technology for the Environmental Sciences. **M.Palace**.
- Invited talk at the University of Brasilia, Biology Department, Remote Sensing of Tropical Vegetation (2014). **M.Palace**.
- Invited talk at International Geoscience and Remote Sensing Symposium (IGRASS) Conference 2013. Physical Interpretations of Lidar and X-band INSAR Structure of Tropical Forests in Costa Rica and Brazil. R. N. Treuhaft, F. G. Goncalves, S. N. Madsen, M. Neumann, B. D. Chapman, S. Hensley, J. R. dos Santos, C. V. J. Silva, L. V. Dutra, **M. Palace**, P. M. L. A. Graca. Melbourne, Australia.
- Invited talk at NASA Carbon Science Conference 2013. Plenary presentation Satellite remote sensing of vegetation structure: Functional Synthesis of InSAR and Lidar.. R. N. Treuhaft, M. Neumann, F. G. Goncalves, **M. Palace**, La Jolla, CA.
- Oral Presentation at the US Regional Association of the International Association for Landscape Ecology Conference 2013. Detection of Amazonian Black Earth Sites using Satellite Image Data. **Michael Palace**, Crystal McMichael, Mark Bush, Bobby Braswell, Stephen Hagen, Eduardo Góes Neves, Christina Czarnecki. Austin, TX.
- Poster Presentation at the US Regional Association of the International Association for Landscape Ecology Conference 2013. Mounds, Microclimates, and Maize: Understanding the Influence of Inland Lakes on Agriculture in Pre-contact Indigenous Societies using Remote Sensing Image Data. **Michael Palace**, Meghan Howey, Crystal McMichael, Mark Bush, Bobby Braswell, Stephen Hagen, Austin, TX.
- Poster at the Association of American Geographers 2013. Assessment of Gridded Rainfall Products in Western Uganda. J Diem, J Hartter, S Ryan, **M Palace**, C Chapman.. Los Angeles, CA.
- Poster at the Association of American Geographers 2013. Parks, People, and Fragments: Remediating De-coupled Research into Natural-Human Systems. S Ryan, J Hartter, **M Palace**, J Diem Los Angeles, CA.
- Poster at the Association of American Geographers 2013. Forest Loss, Agricultural Intensification, and the Islandization of Protected Areas in the African Albertine Rift. J Hartter, **M Palace**, S. Ryan, J Diem. Los Angeles, CA.
- Poster at the Northeast Fish and Wildlife Conference 2013. Low raccoon (*Procyon lotor*) density indexes in pitch pine (*Pinus rigida*)-dominated landscapes in Massachusetts and New Jersey: Implications for rabies management. Algeo, T. P., B. M. Bjorklund, J. Borgeson,

- M. J. Swallow, R. J. Bevilacqua, A. R. Randall, M. D. Chandler, W. S. Anderson, **M. Palace**, R. B. Chipman, and D. Slate.
- Poster at International Biogeography Society Conference 2013. Historical fire and bamboo dynamics in western Amazonia. Crystal H. McMichael, Mark B. Bush, Miles R. Silman, Dolores R. Piperno, Marco F. Raczka, Luiz C. Lobato, Monica Zimmerman, Stephen Hagen, **Michael W. Palace**. Miami, FL
- Poster at 2012 AGU Fall Meeting. Estimating tropical forest structure using discrete-return LiDAR data and a locally-trained synthetic forest algorithm. **Michael W. Palace**; Franklin B. Sullivan; Christina Czarnecki; Mark J. Ducey; Julia Zanin e Shimbo; Jonas Mota e Silva. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Population, environment, and climate in the Albertine Rift: understanding local impacts of regional change. Joel Hartter; J. Diem; S.J. Ryan; **Michael W. Palace**. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Relative vegetation profiles in a neotropical forest: comparison of LiDAR instrumentation and field-based measurements. Franklin B. Sullivan; **Michael W. Palace**; Christina Czarnecki; Mark J. Ducey; Julia Zanin e Shimbo; Jonas Mota e Silva. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Predicting anthropogenic soils across the Amazonia. Crystal McMichael; **Michael W. Palace**; Christina Czarnecki; Mark B. Bush; Bobby H. Braswell; Stephen C. Hagen; Miles Silman; Eduardo Neves. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Detection of Amazonian black earth sites using hyperspectral satellite imagery. Bobby H. Braswell; **Michael W. Palace**; Crystal McMichael; Christina Czarnecki; Mark B. Bush; Marco Raczka; Eduardo Neves; Bruno Moraes. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Acoustic monitoring of ebullitive flux from a mire ecosystem in subarctic Sweden. S.A. Burke; Ruth K. Varner; J. Amante; M. Wik; Patrick M. Crill; C.K. McCalley, **Michael Palace**.. San Francisco, CA.
- Poster at 2012 AGU Fall Meeting. Using an Acoustic System to Estimate the Timing and Magnitude of Ebullition Release from Wetland Ecosystems. Ruth K. Varner; Michael W. Palace; Jillian M. Lennartz; Patrick M. Crill; Martin Wik; Jacqueline Amante; Christopher Dorich; Jennifer W. Harden; Stephanie A. Ewing; Merritt R. Turetsky. San Francisco, CA.
- Poster at Cambridge Student Conference on Conservation Science, Cambridge, UK. Palms as an ecological indicator of forest disturbance and human impact in the Amazon. Julia Shimbo, Mercedes Bustamante, **Michael Palace**, Cambridge, UK.
- Poster at Planet under Pressure 2012. Carbon Stock Assessment and Potential for Application of REDD Projects in the Brazilian Savanna, Sabrina do Couto de Miranda, Mercedes Bustamante, Alexandre de Siqueira Pinto, **Michael Palace**. London, UK.

Oral Presentation at 2011 AGU Fall Meeting. Predicting distributions of charcoal in Amazonian soils: approaches from earth and space. Crystal McMichael; **Michael W. Palace**; Mark B. Bush; Rob Braswell; Stephen C. Hagen; Christina Czarnecki; Eduardo Neves; Marco Raczka. San Francisco, CA.

Oral Presentation at 2011 AGU Fall Meeting. What drives the Amazon green up phenomenon? Douglas C. Morton; Jyoteshwar R. Nagol; Jacqueline Rosette; Claudia C. Carabajal; David J. Harding; **Michael W. Palace**; Bruce D. Cook; Peter R. North. San Francisco, CA.

Poster at 2011 Carbon Cycle and Ecosystems Joint Science Workshop, NASA. Fake it till you make it: What can we learn about simulating forest structure? **Michael Palace**, Bobby H. Braswell, Stephen Hagen. Alexandria, VA.

Poster at 2011 Carbon Cycle and Ecosystems Joint Science Workshop, NASA. Remote sensing of terra preta in Amazonia. **Michael Palace**, Mark Bush, Eduardo Góes Neves, Crystal N. McMichaels, Christina Czarnecki, Stephen Hagen, Bobby H. Braswell, Bruno Moraes, Marco Raczka. Alexandria, VA.

Poster at 2011 Carbon Cycle and Ecosystems Joint Science Workshop, NASA. Detection of forest canopy change in pan-tropical humid forests 2000-2009 with the SeaWinds Ku-band scatterometer. Steve Frolking, Stephen Hagen, Thomas Milliman, **Michael Palace**, Julia Shimbo, Mark Fahnestock. Alexandria, VA.

Poster at 2011 Carbon Cycle and Ecosystems Joint Science Workshop, NASA. A historical land cover map of the Cerrado region of Brazil based on Landsat MSS imagery. Stephen Hagen, Laerte Ferreira, **Michael Palace**, Mercedes Bustamante. Alexandria, VA.

Invited Talk at Clark University 2012. From a Forest to a Fig. **Michael Palace**. Department of Geography, Worcester, MA.

Oral Presentation at 2011 Translational Ecological Knowledge Conference. What is natural? A long-term view of the ecosystems of the Americas. **Michael Palace**, Browne Center, Durham, NH.

Oral Presentation at 2011 Ecological Society of American Meeting. Invited speaker. Symposium title: What is natural? **Michael Palace**, A long-term view of the ecosystems of the Americas. Talk title: Anthropogenic disturbances in Amazonia: Detection of disturbed soils through remote sensing methods. Austin, TX.

Oral Presentation at UNH. Invited speaker. **Michael Palace**, 2011. Bugs in the Landscape: Looking at ticks and fig wasps in a Landscape ecology context.

Poster at 2011 US Regional Association of the International Association for Landscape Ecology. A Landscape Model Simulating *Ficus* trees and their obligate Wasp Pollinator. **Michael Palace**. Portland, OR.

- Poster at 2011 Association of American Geographers Meeting of 2011. Examining the spatial and temporal ecology of vector-borne lyme disease. Christina Czarnecki, **Michael Palace**, Ernst Linder, William Salas, Peter Ingram, Michael Routhier, Nate Torbick, Chengwei Yuan, David Bartlett, Rosemary Caron, Xiangming Xiao, Seattle, WA.
- Poster at 2011 US Regional Association of the International Association for Landscape Ecology. Detection of Amazonian Black Earth Sites using Hyperspectral Satellite Imagery. **Michael Palace**, Mark Bush, Eduardo Góes Neves, Rob Braswell, Stephen Hagen, Crystal McMichael, Christina Czarnecki, Bruno Moraes, Marco Raczka. Portland, OR.
- Poster at 2011 US Regional Association of the International Association for Landscape Ecology. Examining the spatial and temporal ecology of vector-borne lyme disease. Christina Czarnecki, **Michael Palace**, Ernst Linder, William Salas, Peter Ingram, Michael Routhier, Nate Torbick, Chengwei Yuan, David Bartlett, Rosemary Caron, Xiangming Xiao. Portland, OR.
- Poster at AGU Fall 2010 Meeting. Temporal and spatial variability of greenhouse gas fluxes from soil in an undisturbed forest in the Brazilian Amazon. Varner, R K, Keller, M M, Cosme de Oliveira, R, Crill, P M, **Palace, M W**, Hunter, M O, Silva, H P, Dias, J, Neto, E.
- Poster at AGU Fall 2010 Meeting. Tropical Forest Backscatter Anomaly Evident in SeaWinds Scatterometer Morning Overpass Data During 2005 Drought in Amazonia. Frolking, S E, Milliman, T, **Palace, M W**, Wisser, D, Lammers, R B, Fahnestock, M A.
- Poster at the Rabies in the Americas Conference 2010, Satellite-Based Land Cover Classification Accuracy for Raccon Rabies Risk Modeling. Timothy Algeo, Michael Palace, Rosemary Caron, Todd Atwood, Sergio Recuenco, Richard Chipman, Mark Ducey, Frank Boyd, Monte Chandler, Charles Rupprecht, Dennis Slate.
- Presentation at AGU Meeting of the Americas 2010. A historical land cover map of the Cerrado region of Brazil based on Landsat MSS imagery. S. Hagen; L. G. Ferreira; **M. Palace**; M. Bustamante – American Geophysical Union, Meeting of the Americas – Brazil.
- Poster at AGU Meeting of the Americas 2010. Amazonian Drought – Does the SeaWinds Scatterometer Active Microwave Data Contain a Signal? S. E. Frolking; T. Milliman; M. A. Fahnestock; **M. Palace**; R. B. Lammers – American Geophysical Union, Meeting of the Americas – Brazil.
- Poster at AGU Meeting of the Americas 2010. Fusing Radar, Lidar and High Resolution Optical Remotely Sensed Data to Estimate Vegetation Structure in the Brazilian Cerrado. **M. W. Palace**; S. C. Hagen; M. Bustamante; L. G. Ferreira; S. Miranda – American Geophysical Union, Meeting of the Americas – Brazil.
- Poster at ESA 2010. Examining the spatial and temporal ecology of vector-borne lyme disease. Christina Czarnecki, **Michael Palace**, Ernst Linder, William Salas, Peter Ingram,

- Michael Routhier, Nate Torbick, Chengwei Yuan, David Bartlett, Rosemary Caron, Xiangming Xiao. Ecological Society of America Meeting, Pittsburg, PA.
- Poster at GEOBIA (GEOgraphic Object-Based Image Analysis) 2010 Conference, Understanding Secondary Tropical Forest structure through the Integration of Remote Sensing and Modelling. Julie Melling, Elisabeth Addink, Ted Feldpausch, **Michael Palace**, Karin Rebel, Ghent, Belgium.
- Oral Presentation at UNH. Invited speaker. **Michael Palace**, 2010. Determining Vegetation Structure and Pattern Using Remote Sensing and Field-Based Methods.
- Poster at AGU Fall 2009 Meeting - Biometric Properties Estimated from High Resolution Imagery in the Amazon and the Cerrado Regions.
- Poster at AGU Fall 2009 Meeting - Estimation of Tropical Forest Structure Using the Full Waveform Lidar from ICESat.
- Oral Presentation at Forest Carbon Science and Management Workshop 2009, Portsmouth, NH – Remote Sensings of Tropical Vegetation using High Resolution Imagery and Lidar.
- Oral Presentation at NRESS Graduate Student Seminar 2009 - Estimating Tropical Forest Structure and Crown Geometry using Remotely Sensed Image Data.
- Poster at AGU Fall 2008 Meeting – Scaling Forest Biometric Properties Estimated from High Resolution Imagery to the Amazon and Cerrado Regions using Moderate Resolution Spectral Reflectance Data.
- Oral Presentation at Tropical Disturbance Workshop – 2008, Oxford University, Oxford, UK - Scaling Biometric Properties Derived from High Resolution Imagery to the Cerrado and the Amazon Basin using Moderate Resolution Spectral Reflectance Data.
- Poster at 2008 NASA Carbon Cycle and Ecosystems Joint Science Workshop - Forest Biometric Properties Derived from High Resolution Imagery to the Amazon Basin using Moderate Resolution Spectral Reflectance Data.
- Poster at 2008 NASA Carbon Cycle and Ecosystems Joint Science Workshop - A Historical Reconstruction of Vegetation Change and a Carbon Budget for the Brazilian Cerrado Using Multiple Satellite Platforms and Historical Aerial Photography.
- Talk at 2008 VEG3D & BIOMASS: Science and Measurement Requirements for Future Spaceborne Missions – University of Virginia, Charlottesville, VA - Global measurements of vegetation structure: A climate and carbon cycle science perspective Wofsy, S.C., Moorcroft, P.R., Palace, M., & Saleska, S.
- Poster at 2008 VEG3D & BIOMASS: Science and Measurement Requirements for Future Spaceborne Missions – University of Virginia, Charlottesville, VA - Development of

- Three Dimensional Vegetation Structure Using High Resolution Imagery and Crown Detection Algorithms.
- Poster at 2008 VEG3D & BIOMASS: Science and Measurement Requirements for Future Spaceborne Missions – University of Virginia, Charlottesville, VA - Regional Extrapolation of Tropical Ecosystem Structural Properties.
- Poster at AGU 2007 - Examination of Tropical Forest Structure Using Field Data and High Spatial Resolution Image Data.
- Poster at AGU 2007 - Automated measurements of soil-atmosphere methane, carbon dioxide, and nitrous oxide fluxes in an undisturbed forest in the Brazilian Amazon.
- Poster at 2007 NRC Decadal Study DESDynI Science Workshop – Orland, FL - Amazon Forest Structure: An Analysis of 16 Sites.
- Oral Presentation at AGU 2006 - Necromass Production in an Amazon Forest: Examination of Undisturbed and Logged Forest Sites.
- Poster at AGU 2006 – Detection of Canopy Opening in Undisturbed and Selectively Logging Tropical Forests by Gap Fraction Data.
- Poster at AGU 2006 – Forest Structure at Five Sites in the Brazilian Amazon.
- Poster at AGU 2006 – Canopy Estimation in Logged Forests in the Brazilian Amazon using IKONOS Imagery.
- Oral Presentation at LBA Brasilia 2006 - Necromass Creation in an Amazon Forest: Examination of Undisturbed and Logged Forest Sites.
- Poster at LBA Brasilia 2006 - Gap Fraction for Detection and Mapping of Canopy Opening in Undisturbed and Selectively Logging Forests.
- Poster at LBA Brasilia 2006 - Forest Structure at Five LBA Study Sites.
- Poster at Joint Workshop on NASA Biodiversity, Terrestrial Ecology, and Related Applied Sciences, Adelphi, MD 2006 - Examination of Canopy Disturbance in Logged Forests in the Brazilian Amazon using IKONOS Imagery.
- Oral Presentation at the Tropical Disturbance Workshop 2006, Tulane University, New Orleans, LA - Automated Crown Detection and Canopy Disturbance in the Brazilian Amazon using IKONOS Imagery.
- Poster at LBA Sao Paulo 2005 - Examination of Tropical Forest Canopy Profiles Using Field Data and High Resolution Remotely Sensed Satellite Imagery.
- Poster at LBA Sao Paulo 2005 -Examination of Canopy Disturbance in Logged Forests in the Brazilian Amazon using IKONOS Imagery.

Poster at Working Forests in the Tropics Gainesville, FL 2005 – Examination of Canopy Disturbance in Logged Forests in the Brazilian Amazon using IKONOS Imagery.

Oral Presentation at LBA Brasilia Conference 2004 - Biomass and Necromass in Three Undisturbed Forests in the Brazilian Amazon.

Oral Presentation at LBA Brasilia Conference 2004 (co-author) - Selective Logging Effects on Carbon Budgets at Three Sites in the Brazilian Amazon.

Poster at LBA Brasilia Conference 2004 - Necromass Density Estimates from Two Forests in the Brazilian Amazon.

Poster at 2004 Gordon Conference on Theoretical Biology and Biomathematics - Fig Wasp Pollination Networks.

Poster at AGU 2003 - Automated Crown Detection Algorithm: An Analysis of Two Tropical Amazonian Forests.

Oral Presentation at Graduate Student Seminar 2003 - Coarse Woody Debris in Logged and Undisturbed Forests from two Amazonian Forests and Crown Detection Analysis

Oral Presentation at LBA Fortaleza Conference 2003 - Coarse Woody Debris in Logged and Undisturbed Forests from two Amazonian Forests.

Poster at LBA Fortaleza Conference 2003 -Estimating site level differences in ecosystem process parameters using eddy flux data and a toy model.

Poster at AGU 2002 - Automated Crown Detection Algorithm: An Analysis of Two Tropical Amazonian Forests.

Poster at AGU 2002 - Scaling Forest Properties Derived from High-Resolution Imagery to the Amazon Basin.

Poster at LBA Manaus Conference 2002 - Coarse Woody Debris in Logged and Undisturbed Forests: Determination of Stocks Using a New Methodology for Wood Density and Void Estimation.

Poster at LBA Manaus Conference 2002 - Soil-Atmosphere Flux of Carbon Dioxide in Undisturbed Forest at the FLONA Tapajos, Brazil.

Poster at LBA Manaus Conference 2002 - IKONOS Imagery for Large-scale Biosphere Atmosphere Experiment in Amazonia.

Poster at LBA Belem Conference 2000 - Biomass in the Tapajos National Forest, Brazil: Examination of Sampling and Allometric Uncertainties.

Poster at LBA Belem Conference 2000 - IKONOS at LBA Sites.



Poster at American Geophysical Union Conference (AGU) 2000 - Biomass in the Tapajos National Forest, Brazil: Examination of Sampling and Allometric Uncertainties.

Poster at AGU 2000 - Spatial heterogeneity (subpixel composition) and scaling issues in Amazon Basin: land cover observation from MODIS, Landsat 7 ETM+ and IKONOS images.

Abstract and Poster Session at the 16th International Conference of the Coastal Society (Williamsburg, VA July 1998) with the title "Tracking Progress of the Chesapeake Bay Program's Nutrient Reduction Goals," Michael L. Clipper, Michael W. Palace, Thomas W. Simpson, Lewis C. Linker, and James Hannawald.

Poster at Coastal Zone '97 (Boston, MA July 1997) titled "A Manure Mass Balance for the Chesapeake Bay Watershed," Michael W. Palace.

Thesis Defense, "A Multivariate Analysis of Habitat Selection by the Mantled Howler Monkey (*Alouatta palliata*)" (1995).

Oral Presentation of Study Conducted in Costa Rica at the Enviro-days Symposium at the University of Virginia, 1993. "Howler Monkey Habitat Use."

Involved with the multinational Functional Plant Types-Global Climate Modeling Workshop at the University of Virginia (1992).

### **Hobbies**

Electronic Music Composition and Synthesis (over 25 titles released), Hiking, Running, Cooking, Mushroom Field Identification, Beer Brewing