

Eli Kellen Melaas, Ph.D.

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EDUCATION

Boston University, Boston, MA Sep. 2008 – June 2014

Ph.D., Geography

Advisor: Dr. Mark Friedl

Dissertation title: Using Eddy Covariance, Remote Sensing and In situ Observations to Improve Models of Springtime Phenology in Temperate Deciduous Forests

Readers: Dr. Mark Fried (chair), Dr. Andrew Richardson, Dr. Curtis Woodcock

Kalamazoo College, Kalamazoo, MI Sep. 2004 – June 2008

B.A., Mathematics, *Cum Laude* (Minor: Physics)

TEACHING EXPERIENCE

Adjunct Professor, Environmental Science Jan. 2016 – May 2016

Environmental Studies Program, Lasell College, Newton, MA

Guest Lecturer, Digital Image Processing April 2015

Department of Earth and Environment, Boston University

Guest Lecturer, Charlestown High School, Charlestown, MA Feb. 2015

Guest Lecturer, Biology of Global Change Oct. 2014

Department of Biology, Boston University

National Science Foundation GK-12 Fellow June 2013 – June 2014

Sixth Grade Science, Baker Elementary School, Brookline, MA

Teaching Assistant, Natural Environments: The Atmosphere Sep. 2011 – Dec. 2011

Department of Earth and Environment, Boston University

RESEARCH EXPERIENCE

Postdoctoral Research Associate July 2014 – Present

Land Cover and Surface Climate Group

Department of Earth and Environment, Boston University

Graduate Research Assistant Sep. 2009 – June 2013

Land Cover and Surface Climate Group

Department of Earth and Environment, Boston University

MENTORING EXPERIENCE

Student Mentor

Harvard Forest Research Experience for Undergraduates
Petersham, MA

May 2012 – Aug. 2013

HONORS AND AWARDS

Student Travel Scholarship, Phenology 2012 Conference
Milwaukee, WI

Sep. 2012

Presidential Fellowship, Boston University

Sep. 2008 – May 2009

PEER-REVIEWED ARTICLES

- A16. Jönsson, P., Z. Cai, **E.K. Melaas**, M.A. Friedl, and L. Eklundh (2018). A Method for Robust Estimation of Vegetation Seasonality from Landsat and Sentinel-2 Time Series Data. *Remote Sensing*, 10(4), 635.
- A15. **Melaas, E.K.**, D. Sulla-Menashe, M.A. Friedl (2018) Multi-decadal Changes and Interannual Variation in Springtime Phenology of North American Temperate and Boreal Deciduous Forests. *Geophysical Research Letters*
- A14. Gallinat, A.S., L. Russo, **E.K. Melaas**, C.G. Willis, R.B. Primack (2018) Herbarium specimens show patterns of fruiting phenology in native and invasive plant species across New England. *American Journal of Botany*, 105(1), 31-41
- A13. Hufkens, K., D. Basler, T. Milliman, **E.K. Melaas**, A.D. Richardson (2018) An integrated phenology modelling framework in R. *Methods in Ecology and Evolution*, 00, 1-10
- A12. Klosterman, S.T., **E.K. Melaas**, J.A. Wang, A. Martinez, S. Frederick, J. O'Keefe, D.A. Orwig, Z. Wang, Q. Sun, C. Schaaf, M. Friedl, A.D. Richardson (2018) Fine-scale perspectives on landscape phenology from unmanned aerial vehicle (UAV) photography. *Agricultural and Forest Meteorology*, 248, 397-407
- A11. **Melaas, E.K.**, D. Sulla-Menashe, J.M. Gray, T.A. Black, T.H. Morin, A.D. Richardson, and M.A. Friedl (2016) Multisite analysis of land surface phenology in North American temperate and boreal deciduous forests from Landsat. *Remote Sensing of Environment*, 186, 452-464
- A10. Mann, M.L., **E.K. Melaas**, and A. Malik (2016) Using VIIRS Day/Night Band to Measure Electricity Supply Reliability: Preliminary Results from Maharashtra, India. *Remote Sensing*, 8(9), 711
- A9. **Melaas, E.K.**, J.A. Wang, D.L. Miller, and M.A. Friedl (2016) Interactions Between Urban Vegetation and Surface Urban Heat Islands: A Case Study in the Boston Metropolitan Region. *Environmental Research Letters*, 11(5), 054020

- A8. Chen, M., **E.K. Melaas**, J.M. Gray, M.A. Friedl, and A.D. Richardson (2016) A New Seasonal-Deciduous Spring Phenology Submodel in the Community Land Model 4.5: Impacts on Carbon and Water Cycling Under Future Climate Scenarios. *Global Change Biology*, doi:10.1111/gcb.13326
- A7. **Melaas, E.K.**, M.A. Friedl, and A.D. Richardson. (2016) Multi-scale Modeling of Spring Phenology Across Deciduous Forests in the Eastern United States. *Global Change Biology*, 22(2): 792-805
- A6. Klosterman, S.T., K. Hufkens, J.M. Gray, **E.K. Melaas**, O. Sonnentag, I. Lavine, L. Mitchell, R. Norman, M.A. Friedl, and A.D. Richardson. (2014) Evaluating Remote Sensing of Deciduous Forest Phenology at Multiple Spatial Scales Using PhenoCam Imagery. *Biogeosciences*, 11: 1-16
- A5. Everill, P., R.B. Primack, E.R. Ellwood, and **E.K. Melaas**. (2014) Determining Past Leaf-out Times of New England's Deciduous Forests From Herbarium Specimens. *American Journal of Botany*, 101: 1293-1300
- A4. Magee, N.B., **E.K. Melaas**, P.M. Finocchio, M. Jardel, A. Noonan, and M.J. Iacono (2014). Blue Hill Observatory Sunshine – Assessment of Climate Signals in the Longest Continuous Meteorological Record in North America. *Bulletin of the American Meteorological Society*, 95: 1741-1751
- A3. Friedl, M.A., J.M. Gray, **E.K. Melaas**, A.D. Richardson, K. Hufkens, T.K. Keenan, A. Bailey, and J. O'Keefe (2014) A Tale of Two Springs: Using Climate Anomalies to Characterize the Sensitivity of Temperate Forest Phenology to Climate Change. *Environmental Research Letters*, 9(5), 054006
- A2. **Melaas, E.K.**, A.D. Richardson, M.A. Friedl, D. Dragoni, C.M. Gough, M. Herbst, L. Montagnani, and E. Moors (2013). Using FLUXNET Data to Improve Models of Springtime Vegetation Activity Onset in Forest Ecosystems. *Agricultural and Forest Meteorology*, 171-172: 46-56
- A1. **Melaas, E.K.**, M.A. Friedl, and Z. Zhu (2013). Detecting Interannual Variation in Deciduous Broadleaf Forest Phenology Using Landsat TM/ETM+ Data. *Remote Sensing of Environment*, 132: 176-185

MANUSCRIPTS SUBMITTED AND IN PREPARATION

- M2. Hufkens, K., **E.K. Melaas**, M.L. Mann, T. Foster, F. Ceballos, M. Robles, and B. Kramer (in prep) Monitoring Crop Phenology Using a Smartphone Based near-surface remote sensing approach. *Agricultural and Forest Meteorology*
- M1. Primack, R.B., **E.K. Melaas**, and L. Zipf (submitted) How Well Does Landsat Satellite Data Estimate Leafing Out of Trees on the Ground in an Urban Landscape? *Remote Sensing of Environment*

ORAL AND POSTER PRESENTATIONS

- P15. **Melaas, E.K.**, J. Graesser, and M.A. Friedl (2017). Multisource Imaging of Seasonal Dynamics in Land Surface Phenology Using Harmonized Landsat and Sentinel-2 Data. *Talk*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P14. **Melaas, E.K.**, D. Sulla-Menashe, and M.A. Friedl (2017). Using Three Decades of Landsat Data to Characterize Trends and Interannual Variation in Boreal and Temperate Forest Spring Phenology. *Talk*. Landsat Science Team Meeting. Boston, MA, USA
- P13. **Melaas, E.K.**, J.A. Wang, D.L. Miller, and M.A. Friedl (2016) Interactions Between Urban Vegetation and Surface Urban Heat Islands: A Case Study in the Boston Metropolitan Region. *Invited Talk*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P12. **Melaas, E.K.**, D. Sulla-Menashe, J.M. Gray, and M.A. Friedl. (2015). Using Three Decades of Landsat Data to Characterize Changes and Vulnerability of Temperate and Boreal Forest Phenology to Climate Change. *Poster and Invited Ignite Talk*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P11. **Melaas, E.K.**, D. Sulla-Menashe, J.M. Gray, and M.A. Friedl. (2015). Using Three Decades of Landsat Data to Characterize Changes and Vulnerability of Temperate and Boreal Forest Phenology to Climate Change. *Poster*. NASA Carbon Cycle and Ecosystems Joint Science Workshop. College Park, MD, USA
- P10. **Melaas, E.K.**, M.A. Friedl, and A.D. Richardson (2014). Tree Species Composition Influences Dependence of Climate Forcing on Spring Phenology Across Temperate Deciduous Broadleaf Forests in Eastern United States. *Poster*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P9. **Melaas, E.K.**, M.A. Friedl, and Z. Zhu (2013). Detecting Interannual Variation in Deciduous Broadleaf Forest Phenology Using Landsat TM/ETM+ Data. *Oral Presentation*. Multitemp 2013. Banff, AB, Canada
- P8. **Melaas, E.K.**, M.A. Friedl, J.M. Gray, and C. Holden (2013) Linking Interannual Phenology from MODIS and Landsat. *Poster*. NASA Terrestrial Ecology Meeting. La Jolla, CA, USA
- P7. Petroy, S., J. Dwyer, S. Elmendorf, **E.K. Melaas**, and S. Berukoff (2013). Enabling Continental-scale Ecology through Multi-decadal Landsat Time Series Data. *Poster*. Ecology Society of America Annual Meeting. Minneapolis, MN, USA
- P6. Frick, E., M.A. Friedl, **E.K. Melaas**, and J.M. Gray (2012). A Comparison of Phenophase Transition Dates Calculated From MODIS EVI and NBAR EVI. *Poster*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P5. **Melaas, E.K.**, M.A. Friedl, and Z. Zhu (2012). Filling the Scale Gap: Monitoring Interannual Variation in Deciduous Broadleaf Forest Phenology Using Landsat. *Oral Presentation*. Phenology 2012 Conference. Milwaukee, WI, USA

- P4. **Melaas, E.K.**, A.D. Richardson, and M.A. Friedl (2011). Using FLUXNET Data to Improve Models of Spring Onset. *Poster*. FLUXNET/SPECNET Workshop. Berkeley, CA, USA
- P3. Friedl, M.A., K. Hufkens, A.D. Richardson, **E.K. Melaas**, O. Sonnentag, A. Bailey and J. O’Keefe (2011) Anomalous Spring Warmth in 2010: A Precursor of Future Changes to Ecosystem Phenology and Function in the Northeastern United States. *Oral Presentation*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P2. Hufkens, K., O. Sonnentag, T.K. Keenan, A.D. Richardson, **E.K., Melaas**, A. Bailey, J. O’Keefe, and M.A. Friedl (2011). Community Impacts of Mid-May Frost Event During an Anomalously Warm Spring. *Oral Presentation*. American Geophysical Union Fall Meeting. San Francisco, CA, USA
- P1. **Melaas, E.K.**, A.D. Richardson, and M.A. Friedl (2011). Using FLUXNET Data to Improve Models of Spring Onset. *Poster*. American Geophysical Union Fall Meeting. San Francisco, CA, USA

DATASETS

- D2. **Melaas, E.K.**, D. Sulla-Menashe, and M.A. Friedl (2018). Landsat-derived Spring and Autumn Phenology, Eastern US-Canadian Forests, 1984-2013. ORNL DAAC, Oak Ridge, Tennessee, USA.
<https://doi.org/10.3334/ORNLDAAC/1570>
- D1. Richardson, A.D., K. Hufkens, T. Milliman, D.M. Aubrecht, M. Chen, J.M. Gray, M.R. Johnston, T.F. Keenan, S.T. Klosterman, M. Kosmala, **E.K. Melaas**, et al. (2017). PhenoCam Dataset v1.0: Vegetation Phenology from Digital Camera Imagery, 2000-2015. ORNL DAAC, Oak Ridge, Tennessee, USA.
<https://doi.org/10.3334/ORNLDAAC/1511>

GRANTS AND RESEARCH AWARDS: FUNDED

- G1. Using Three Decades of Landsat Data to Characterize Changes and Vulnerability of Temperate and Boreal Forest Phenology to Climate Change (PI: Mark Friedl, BU), National Aeronautics and Space Administration, 2014-2017, \$680,444

EXTRACURRICULAR ACTIVITIES

Biogeoscience Journal Club, Department of Earth and Environment Student-Faculty Liaison

TRAINING AND SKILLS

Programming/scripting/mathematics: MATLAB, R, Microsoft Office

Geospatial/remote sensing software: ENVI, ArcGIS, QGIS

Techniques/instrumentation: Mathematical modeling (Euler, Monte Carlo, simulated annealing), eddy covariance data analysis, installation and maintenance of micrometeorological instrumentation and data loggers

Languages: English (native), Spanish (intermediate)

JOURNAL REFEREEING

Agricultural and Forest Meteorology, Biogeosciences, Environmental Pollution,
International Journal of Photogrammetry and Remote Sensing, Nature Geoscience,
Remote Sensing of Environment, Science of the Total Environment

INTERNATIONAL WORKSHOP ATTENDANCE

National Science Foundation MacroSystems Biology PI Meeting Arlington, VA, USA	Jan. 2018
USA-National Phenology Network Model Workshop Tuscon, AZ, USA	Mar. 2016
National Science Foundation MacroSystems Biology PI Meeting Arlington, VA, USA	Aug. 2014
Department of Energy Workshop: Strategies to Promote Integrated Experiment-Model Approaches to Terrestrial Ecosystem Study Bethesda, MD, USA	Mar. 2014
FLUXNET/SPECNET Workshop, Berkeley, CA, USA	June 2011
Summer Course in Flux Measurements and Advanced Modeling University of Colorado, Boulder, Mountain Research Station Niwot Ridge, CO, USA	July 2009

ASSOCIATIONS

American Geophysical Union July 2010 - Present

REFERENCES

Dr. Mark Friedl, Professor of Earth and Environment, Boston University – friedl@bu.edu

Dr. Andrew Richardson, Professor, School of Informatics, Computing and Cyber
Systems, Northern Arizona University – andrew.richardson@nau.edu

Dr. Richard Primack, Professor of Biology, Boston University – primack@bu.edu

