Kathryn I. Wheeler

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EDUCATION

Boston University Boston, MA
Doctor of Philosophy in Earth and Environment *Jan. 2023*
Certificate in Biogeosciences
GPA: 3.95
Dissertation: "Cold-deciduous broadleaf phenology: monitoring using a geostationary satellite and predicting using trigger-less dynamic models"
Academic Awards: National Science Foundation Graduate Research Fellowship and Dean's Fellowship
Relevant Courses: Remote sensing, multivariate analysis, Bayesian statistics, and ecological forecasting

University of Delaware Newark, DE
Bachelor of Science in Environmental Science *May 2017*
Honors with Distinction, summa cum laude
GPA: 3.95
Concentration: Water Science
Academic Awards: Full four-year merit scholarship, NOAA Hollings Scholarship, UD American Association of University Professors Outstanding Senior, and Outstanding Senior in Environmental Science
Relevant Courses: GIS, microeconomics, meteorology, geology, ocean sciences, chemistry, biology, environmental modeling, hydrogeology, climatology, forensic environmental chemistry, soil science, plant physiology, ecosystem ecology, computer science, and data structures

RELEVANT EXPERIENCE

Massachusetts Institute of Technology Cambridge, MA
NOAA Climate and Global Change Postdoctoral Fellow Sep. 2022 – Current
- Funded through a highly competitive 2-year fellowship ($200k) selected through a written research proposal.
- Led a multidisciplinary team of 43 scientists and technicians to conduct ecological forecasts of tree leaf growth.
- Coded Bayesian and random forest models to analyze impacts of soil properties and biota on leaf seasonality.
- Utilized Google Earth Engine and MODIS data to assess drought impacts on tropical forests.
- Mentored four undergraduate students and earned a mentorship certificate through a course.

Boston University Boston, MA
Research Assistant Sep. 2017 – Aug. 2022
- Created novel Bayesian statistical models in R to predict tree leaf seasonality.
- Processed (Downloaded, cleaned, organized, and condensed) 30 TB of satellite data from MODIS and GOES using high-performance computing.
- Maintained lab safety compliance of Professor Michael Dietze's research lab.

Teaching Fellow and Lab Instructor Jan. 2022 – May 2022
- Led weekly lab based in R for 30 students in an environmental modeling course.

University of Delaware Newark, DE
Delaware Environmental Institute Environmental Scholar Aug. 2014 – May 2017
- Analyzed water quality data using MATLAB to fit advanced statistical and machine learning models to available data.
- Collected 1,700 measurements of hyperspectral observations on leaves using a portable spectrophotometer
- Conducted lab work using a Vario EL cube to analyze nitrogen concentrations in collected leaves.
- Presented research at the American Geophysical Union conference and won two student presentation awards in hydrology and biogeoscience (top 5%)

General Computer Science for Engineers Course Teacher Assistant Aug. 2014 – Dec. 2016

- Provided teaching assistance for a weekly lab based in Python and MATLAB.

NOAA Air Resources Lab, Atmospheric Turbulence and Diffusion Division Oak Ridge, TN
Ernest F. Hollings Scholar Research Intern Summer 2016
- Ran a Fortran canopy chemistry model to improve estimations of ozone production in forests

The Pennsylvania State University State College, PA
Research Experience for Undergraduates in Climate Science Research Assistant Summer 2014
- Collected atmospheric methane concentration measurements throughout NE PA
- Using MATLAB, modeled methane plumes to estimate livestock and natural gas emissions

Duke University: Durham, NC
Research Technician Aug 2011 – Feb 2012
- Ran a Picarro to investigate groundwater methane contamination near hydraulic fracturing sites

PUBLICATIONS

1. **Wheeler** et al. (2024). "Predicting spring phenology in deciduous broadleaf forests: NEON Phenology Forecasting Community Challenge." *Agr Forest Meteorol* 345: 109810.
2. Thomas et al.[+] (2023). "The NEON Ecological Forecasting Challenge." *Front Ecol Evol* 21(3): 112–113.
3. Halpern et al.[+] (2023) "Priorities for synthesis in ecology and environmental science." *Ecosphere* 14(1):e4342.
4. **Wheeler** & Dietze (2021). "Improving the monitoring of deciduous broadleaf phenology using the Geostationary Operational Environmental Satellite (GOES) 16 and 17." *Biogeosciences* 18: 1971-1985.
5. Iida[*] & **Wheeler**[*] et al. (2021). "Canopy structure metrics governing stemflow funneling differs between leafed and leafless states: Insights from a large-scale rainfall simulator". *Hydrol Processes* 35:e14294.
   [*]**These authors contributed equally to this paper**
6. Woelmer et al.[+] (2021). "10 Simple Rules for training yourself in an emerging field" *PLoS Comput Biol* 17(10): e1009440. https://doi.org/10.1371/journal.pcbi.1009440
7. Rollinson et al.[+] (2021) "Working across space and time: nonstationarity in ecological research and application." *Front Ecol Evol* 19(1): 66-72.
8. **Wheeler** et al. (2020). "Visible and near-infrared hyperspectral indices explain more variation in lower-crown leaf nitrogen concentrations in autumn than in summer." *Oecologia*. 192:13-27.
   Award: Highlighted Student Paper
9. **Wheeler** & Dietze (2019). "A statistical model for estimating midday NDVI from the Geostationary Operational Environmental Satellite (GOES) 16 and 17." *Remote Sensing* 11(21):2507.
10. Dietze et al.[+] (2018). "Ecological Forecasting." *Oxford Bibliographies.*
11. Hudson et al.[+] (2018). "American beech leaf-litter leachate chemistry: effects of geography and phenophase." *J Plant Nutr Soil Sci* 181(2):287-295.
12. **Wheeler** et al. (2017). "Tracking senescence-induced patterns in leaf litter leachate using parallel factor analysis modeling (PARAFAC) and self-organizing maps." *J. Geophys Res Biogeosci* 122(9):2233-2250.

[+]Includes K.I. Wheeler

SKILLS AND INTERESTS

Computer: R (Expert), ArcGIS (Intermediate), Python (Intermediate), Excel (Intermediate), High-Performance Computing (Expert), Bash (Expert), Unix (Expert), Git (Intermediate), MATLAB (Intermediate), Java (Familiar), and C++ (Familiar).
Science: Bayesian and multivariate statistics, machine learning, ecological forecasting, and environmental modeling
Communication: Proposal writing, technical presentations, project management, leadership, and mentorship
Interests: Running, hiking, cycling, backpacking, and reading.