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EDUCATION

2012	Ph.D.	Ecosystem Ecology, Cornell University, Ithaca, NY
2007	M.S.	Natural Resources, University of New Hampshire, Durham, NH
2005	A.B.	Environmental Biology (High Honors), Dartmouth College, Hanover, NH

PROFESSIONAL APPOINTMENTS

2022 - present	Data Science Faculty Fellow, College of Science, Virginia Tech, Blacksburg, VA
2021- present	Associate Professor, Department of Biological Sciences, Virginia Tech, Blacksburg, VA
2019 - present	Associate Professor, Department of Forest Resources and Environmental Conservation, Virginia Tech, Blacksburg, VA
2022 - 2022	Visiting Scientist, Terrestrial Ecosystem Research Network, University of Queensland, Brisbane, Australia
2021 - 2022	Visiting Scholar, Department of Biological Sciences, Dartmouth College, Hanover, NH
2013 - 2019	Assistant Professor, Department of Forest Resources and Environmental Conservation, Virginia Tech, Blacksburg, VA
2012 - 2013	Postdoctoral Scientist, National Center for Atmospheric Research, Boulder, CO

RESEARCH AND TEACHING INTERESTS

Ecosystem ecology, ecological and Earth system modeling, environmental data science and informatics, forecasting, forest dynamics, land-atmosphere interactions, data assimilation, eddy-covariance flux measurements

PEER-REVIEWED PUBLICATIONS

[G]denotes mentored graduate student; [P]denotes mentored post-doc; [U]denotes mentored undergraduate student

52. **Thomas, R.Q**, R.P. McClure[P], T.N. Moore[P], W.M. Woelmer[G], C. Boettiger, R.J. Figueiredo, R.T. Hensley, C.C. Carey. Near-term forecasts of NEON lakes reveal gradients of environmental predictability across the U.S. Accepted at *Frontiers in Ecology and Environmen*t.

51. Moore, T.N. [P], **R.Q. Thomas**, W.M. Woelmer[G], C.C Carey. 2022. Integrating ecological forecasting into undergraduate ecology curricula with an R Shiny application-based teaching module. *Forecasting* 4:604-633. https://doi.org/10.3390/forecast4030033

50. Carey, C.C., P.C. Hanson, **R.Q. Thomas**, A.B. Gerling, A.G. Hounshell, A.S.L Lewis [G], M.E. Lofton [P], R.P. McClure [P], H.L. Wander[G], W.M. Woelmer[G], B.R. Niederlehner, M.E. Schreiber. Anoxia decreases the magnitude of the carbon, nitrogen, and phosphorus sink in freshwater ecosystems. *Global Change Biology* 28:4861-4881 https://doi.org/10.1111/gcb.16228

49. Ahlswede, B.J.[G], T.L. O'Halloran, and **R.Q. Thomas**. 2022. Combined carbon and albedo climate forcing from pine and switchgrass grown for bioenergy. *Frontiers in Forests and Global Change* 5:774067. https://doi.org/10.3389/ffgc.2022.774067

48. Woelmer, W. [G], **R.Q. Thomas**, M. Lofton, R. McClure [P], and C.C Carey. 2022. Near-term phytoplankton forecasts reveal the effects of model time step and forecast horizon on predictability. *Ecological Applications* XX*:* e2642. https://doi.org/10.1002/eap.2642

47. Lewis, A. [G], W. Woelmer [G], H. Wander [G], D. Howard, J. Smith [G], R. McClure [P], M. Lofton, N. Hammond, R. Corrigan [G], **R.Q. Thomas**, C.C. Carey. 2022. Increased adoption of best practices in ecological forecasting enables comparisons of forecastability across systems. at *Ecological Applications* 32: e02500. https://doi.org/10.1002/eap.2500

46. Kyker-Snowman, E., D.L. Lombardozzi, G.B. Bonan, S.J. Cheng, J.S. Dukes, S.D. Frey, E.M. Jacobs, R. McNellis [G], J.M. Rady [G], N.G. Smith, **R.Q. Thomas**, W.R. Wider, and A.S. Grandy. 2022. Increasing the spatial and temporal impact of ecological research: A roadmap for integrating a novel terrestrial process into an Earth system model. *Global Change Biology* 28: 665-684. https://doi.org/10.1111/gcb.15894
    - Accompanying peer-reviewed commentary: https://doi.org/10.1111/gcb.15915

45. Ahlswede, B.J.[G], T.L. O'Halloran, J. Forsythe[G], and **R.Q. Thomas.** 2022. A minimally managed switchgrass ecosystem in a humid subtropical climate is a source of carbon to the atmosphere. *Global Change Biology - Bioenergy.* 14: 665-684. https://doi.org/10.1111/GCBB.12897

44. Carey C.C, W.M. Woelmer[G], M.E. Lofton, R.J. Figueiredo, B.J. Bookout, R.S. Corrigan[G], V. Daneshmand[G], A.G. Hounshell, D.W. Howard, A.S. Lewis, R.P. McClure[G], H.L. Wander[G], N.K. Ward, and **R.Q. Thomas**. 2022. Advancing lake and reservoir water quality management with near-term, iterative ecological forecasting. *Inland Waters* 12: 107-120 https://doi.org/10.1080/20442041.2020.1816421

43. McClure, R.P [P], **R.Q. Thomas**, M.E. Lofton [P], W.M. Woelmer [G] and C.C. Carey. 2021. Iterative forecasting improves near-term predictions of methane ebullition rates. *Frontiers in Environmental Science* 9:756603. https://doi.org/10.3389/fenvs.2021.756603

42. Peters, J. and **R.Q. Thomas**. 2021. Going Virtual: What We Learned from the Ecological Forecasting Initiative Research Coordination Network Virtual Workshop. *Bulletin of the Ecological Society of America* 102: e01828 https://doi.org/10.1002/bes2.1828

41. Meyer, M. F., R. Ladwig, H.A. Dugan, A. Anderson, A.R. Bah, B. Boehrer, L. Borre, R.J. Chapina, C. Doyle, E.J. Favot, G. Flaim, P. Forsberg, P.C. Hanson, B.W. Ibelings, P. Isles, F-P Lin, D. Lofton, T.N. Moore, S. Peel, J.A. Peters, D. Peirson, L.N. de Senerpont Domis, J.A. Schloss, M. Shikhani, A.P. Smagula, J.D. Stockwell, P. Thomas, **R.Q. Thomas**, T. Tietjen, and K.C. Weathers. 2021. Virtual Growing Pains: Initial Lessons Learned from Organizing Virtual Workshops, Summits, Conferences, and Networking Events during a Global Pandemic. *Limnology and Oceanography Bulletin* 30: 1- 11. https://doi.org/10.1002/lob.10431

40. Daneshmand, V., A. Breef-Pilz, C.C. Carey, Y. Jin, Y.-J. Kun, K.C., **R.Q. Thomas**, R.J. Figueiredo. 2021 "Edge-to-cloud Virtualized Cyberinfrastructure for Near Real-time Water Quality Forecasting in Lakes and Reservoirs" in *2021 IEEE 17th International Conference on eScience (eScience)*, Innsbruck, Austria, 2021 pp. 138-148. https://doi.org/10.1109/eScience51609.2021.00024

39. Graham, M.W.[G], **R.Q. Thomas**, D.L. Lombardozzi, and M.E. O'Rourke. 2021. Modest capacity of no-till farming to offset emissions over 21st century. *Environmental Research Letters* 16: 054055. https://doi.org/10.1088/1748-9326/abe6c6

38. Koplitz, S.N., C.G. Nolte, R.D. Sabo, C.M. Clark, K.J. Horn[P], **R.Q. Thomas**, and T.A. Newcomer-Johnson. 2021. The contribution of wildland fire emissions to nitrogen and sulfur deposition in the contiguous U.S.: Implications for tree growth and survival in the Northwest. *Environmental Research Letters* 16: 024028. https://doi.org/10.1088/1748-9326/abd26e

37. Thomas, V.A., R.H. Wynne, J. Kauffman, W. McCurdy[G], E.B. Brooks, **R.Q. Thomas**, and J. Rakestraw. 2021. Mapping thins to identify active forest management in southern pine plantations using Landsat time series stacks. *Remote Sensing of Environment* 252: 112127. https://doi.org/10.1016/j.rse.2020.112127

36. **Thomas R.Q**, R.J. Figueiredo, V. Daneshmand[G], B.J. Bookout, L.K. Puckett[U], and C.C. Carey. 2020. A near-term iterative forecasting system successfully predicts reservoir hydrodynamics and partitions uncertainty in real time. *Water Resources Research* 56: e2019WR026138. https://doi.org/10.1029/2019WR026138

35. Daw, A., **R.Q. Thomas,** C.C. Carey, J.S. Read, A.P. Appling, and A. Karpatne. 2020. "Physics-guided architecture (PGA) of neural networks for quantifying uncertainty in lake temperature modeling" in *Proceedings of the 2020 SIAM International Conference on Data Mining*: 532-540. https://doi.org/10.1137/1.9781611976236.60

34. Weaver, E.A. [G], K. Kolivras, V.A. Thomas, **R.Q. Thomas**, and K. Abbas. 2020. Environmental factors affecting ecological niche of *Coccidioides* (spp.) and spatial dynamics of valley fever in the United States. *Spatial and Spatio-temporal Epidemiology* 32: 100317. https://doi.org/10.1016/j.sste.2019.100317

33. Lawrence, D.M., et al. [52 authors including **R.Q. Thomas**]. 2019. The Community Land Model version 5: Description of new features, benchmarking, and impact of forcing uncertainty. *Journal of Advances in Modeling Earth Systems* 11: 4245-4287. https://doi.org/10.1029/2018MS001583
    - Web of Science Highly Cited Paper: top 1% in Geoscience

32. **Thomas, R.Q.**, M. Williams, M.A. Cavaleri, J.-F. Exbrayat, T.L. Smallman, and L.E. Street. 2019. Alternate trait-based leaf respiration schemes evaluated at ecosystem-scale through carbon optimization modeling and canopy property data. *Journal of Advances in Modeling Earth Systems* 11: 4629-4644. https://doi.org/10.1029/2019MS001679

31. Wieder, W.R., D.M. Lawrence, R.A. Fisher, G.B. Bonan, S.J. Cheng, C.L. Goodale, C.D. Koven, D.L. Lombardozzi, K.W. Oleson, and **R.Q. Thomas**. 2019. Beyond static benchmarking: Evaluating model assumptions with experimental manipulations. *Global Biogeochemical Cycles* 33: 1289 – 1309. https://doi.org/10.1029/2018GB006141

30. Song, J.J., S. Wan, S. Piao, A.K. Knapp, A.T. Classen, S. Vicca, P. Ciais, M. Hovenden, S. Leuzinger, C. Beier, P. Kardo, J, Xia, Q. Liu, J. Ru, Z. Zhou, Y. Luo, D. Guo, J. A. Langley, J. Zscheischler, J.S. Dukes, J. Tang, J. Chen, K.S. Hofmocke, L.M. Kueppers, L. Rustad, L. Liu, M.D. Smith, P.H. Templer, **R.Q. Thomas**, R.J. Norby, R.P. Phillips, S. Niu, S. Fatichi, Y. Wang, D. Wang, L. Lei, J. Wang, X. Li, Q. Zhang, H. Han, P. Shao, X. Li, F. Su, B. Liu, F. Yang, G. Ma, G. Li, Y. Liu, Y. Liu, Z. Yang, K. Zhang, Y. Miao, M. Hu, C. Yan, A. Zhang, M. Zhong, Y. Hui, Y. Li, M. Zheng. 2019. A meta-analysis of 1,119 manipulative experiments on terrestrial carbon-cycling responses to global change. *Nature Ecology and Evolution* 3, 1309 – 1320. https://doi.org/10.1038/s41559-019-0958-3

29. Cheng, S.J., P. Hess, W.R. Wieder, **R.Q. Thomas**, K.J. Nadelhoffer, and C.L. Goodale. 2019. Decadal fates and impacts of nitrogen additions on temperate forest carbon storage: a data–model comparison. *Biogeosciences* 16: 2771-2793. https://doi.org/10.5194/bg-16-2771-2019

28. Van Houtven, G., J.N. Phelan, C.M. Clark, R. Sabo, J. Buckley, **R.Q. Thomas**, K.J. Horn[P], and S.D. LeDuc. 2019. Nitrogen deposition and climate change effects on tree species composition and ecosystem services: A cohort analysis. *Ecological Monographs* 89: e01345. https://doi.org/10.1002/ecm.1345

27. Jinshi, J.[G], M.K. Steele, S. Day, and **R.Q. Thomas**. 2018. Future global soil respiration rates will swell despite regional decreases in temperature sensitivity caused by rising temperatures. *Earth's Future* 6: 1539 – 1554. https://doi.org/10.1029/2018EF000937

26. Horn, K.J.[P], **R.Q. Thomas**, C.M. Clark, L.H. Pardo, M.E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. 2018. Growth and survival relationships of 94 tree species with nitrogen and sulfur deposition across the conterminous U.S. *PLoS ONE* 13: e0205296. https://doi.org/10.1371/journal.pone.0205296
    - Top 10% most cited PLOS ONE papers published in 2018

25. Chu, H., D.D. Baldocchi, C. Poindexter, M. Abraha, A. Desai, G. Bohrer, A. Arain, T. Griffis, P. Blanken, T. O'Halloran, **R.Q. Thomas**, Q. Zhang, S. Burns, D. Christian, S. Brown, A. Black, C. Gough, B. E. Law, X. Lee, Ji. Chen, D. Reed, K. Clark, J. Hatfield, J. Prueger, R. Bracho, and T.A. Martin. 2018. Temporal dynamics of aerodynamic canopy height derived from eddy covariance momentum data collected across North American Flux Networks. *Geophysical Research Letters* 45: 9275-9287. https://doi.org/10.1029/2018GL079306

24. **Thomas. R.Q.,** A.L. Jersild[G], E.B. Brooks, V.A. Thomas, and R.H. Wynne. 2018. A mid-century ecological forecast with partitioned uncertainty predicts increases in loblolly pine forest productivity. *Ecological Applications.* 28: 1503-1519. https://doi.org/10.1002/eap.1761

23. Jian, J.[G], M.K. Steele, S.D. Day, **R.Q. Thomas,** and S.C. Hodges. 2018. Measurement strategies to account for soil respiration temporal heterogeneity across diverse regions. *Soil Biology and Biochemistry* 125: 167-177. https://doi.org/10.1016/j.soilbio.2018.07.003

22. Jian, J.[G], M.K. Steele, **R.Q. Thomas**, S. Day, and S. Hodges. 2018. Constraining global soil respiration by quantifying sources of uncertainty. *Global Change Biology* 24: 4143 – 4159. https://doi.org/10.1111/gcb.14301

21. Ahlswede, B.J.,[G] and **R.Q. Thomas**. 2017. Community Earth system model simulations reveal the relative importance of afforestation and forest management to surface temperature in eastern North America. *Forests* 8: 499. https://doi.org/10.3390/f8120499

20. **Thomas, R.Q**., E.B. Brooks, A.L. Jersild[G], E.J. Ward, R.H. Wynne, T.J. Albaugh, H.D. Aldridge, H.E. Burkhart, J.-C. Domec, T.R. Fox, C.A. Gonzalez-Benecke, T.M. Martin, A. Noormets, D.A. Sampson, and R.O. Teskey. 2017. Leveraging 35 years of *Pinus taeda* research in the southeastern US to constrain forest carbon cycle predictions: regional data assimilation using ecosystem experiments. *Biogeosciences* 14: 3525-3547. https://doi.org/10.5194/bg-14-3525-2017
    - Awarded the Ecological Forecasting Prize by the Ecological Society of America.

19. Niu, S., A.T. Classen, J. Dukes, P. Kardol, L. Liu, Y. Luo, L. Rustad, J. Tang, P.H. Templer, **R.Q. Thomas**, D. Tian, S. Vicca, Y.-P. Wang, J. Xia, and S. Zaehle. 2016. Global Patterns and Fundamental Mechanisms of the Terrestrial Nitrogen Cycle. *Ecology Letters* 19: 697-709. https://doi.org/10.1111/ele.12591

18. Hurtt, G.C., **R.Q. Thomas**, J. Fisk, R. Dubayah, and S. Sheldon. 2016. The impact of fine-scale disturbances on the predictability of vegetation dynamics and carbon flux. *PLOS One* 11: e0152883. https://doi.org/10.1371/journal.pone.0152883

17. Burd, A.B., S. Frey, A. Cabre, T. Ito, N.M. Levine, C. Lønborg, M. Long, M. Mauritz, **R.Q. Thomas**, B. Stevens, T. Vanwallenghem, and N. Zeng. 2016. Terrestrial and marine perspectives on modeling organic matter degradation pathways and controls. *Global Change Biology* 22: 121-136. https://doi.org/10.1111/gcb.12987

16. Bracco, A.B., M.C. Long, N.M. Levine, **R.Q. Thomas**, C. Deutsch, and G.A. McKinley. 2016. The NCAR advanced study program summer colloquium on carbon-climate connections in the Earth system: capacity building in cross-disciplinary research. *Bulletin of the American Meteorological Society* 96, 1381–1384. https://doi.org/10.1175/BAMS-D-13-00246.1

15. **Thomas, R.Q.,** E.N.J. Brookshire, S. Gerber. 2015. Nitrogen limitation on land: how can it occur in Earth system models? *Global Change Biology* 21: 1777–179. https://doi.org/10.1111/gcb.12813

14. **Thomas, R.Q.,** and M. Williams. 2014. A model using marginal efficiency of investment to analyze carbon and nitrogen interactions in terrestrial ecosystems (ACONITE Version 1). *Geoscientific Model Development* 7: 2015–2037. https://doi.org/10.5194/gmd-7-2015-2014

13. **Thomas, R.Q.,** S. Zaehle, P. H. Templer, and C.L. Goodale. 2013. Global patterns of nitrogen limitation: Confronting two global biogeochemical models with observations. *Global Change Biology 19*, 2986–2998. https://doi.org/10.1111/gcb.12281

12. Bell, R.C., A. Belmaker, C.S. Couch, K.M. Marchetto, J.L. Simonis, **R.Q. Thomas**, J.P. Sparks, J.M. Brown, K.S. Franscisco, and M.E. Manuel. 2013. Effectiveness of *Erythrina* gall wasp biocontrol and implications for the recovery of threatened Wiliwili trees (Fabaceae: *Erythrina sandwicensis*). *Journal of the Torrey Botanical Society* 140:215–224. https://doi.org/10.3159/TORREY-D-12-00069.1

11. **Thomas, R.Q**., J.R. Kellner, D.B. Clark, and D.R. Peart. 2013. Low mortality in tall tropical trees. *Ecology* 94:920–929. https://doi.org/10.1890/12-0939.1

10. **Thomas, R.Q**., G.B. Bonan, and C.L. Goodale. 2013. Insights into mechanisms governing forest carbon response to nitrogen deposition: a model-data comparison using observed responses to nitrogen addition. *Biogeosciences* 10: 3869–3887. https://doi.org/10.5194/bg-10-3869-2013

9. Rastetter, E.B., R.D. Yanai, **R.Q. Thomas**, M.A. Vadeboncoeur, T.J. Fahey, M.C. Fisk, B.L. Kwiatkowski, and S.P. Hamburg. 2013. Recovery from disturbance requires resynchronization of ecosystem nutrient cycles. *Ecological Applications* 23:621-642. https://doi.org/10.1890/12-0751.1

8. Carey, C.C.**,** H.A. Ewing, K.L. Cottingham, K.C. Weathers, **R.Q. Thomas**, and J.F. Haney. 2012. Occurrence, toxicity, and potential ecological consequences of the cyanobacterium *Gloeotrichia echinulata* for low-nutrient lakes in the northeastern United States. *Aquatic Ecology* 46:395–409. https://doi.org/10.1007/s10452-012-9409-9

7. Raciti, S.M., T.J. Fahey, **R.Q. Thomas**, P.B. Woodbury, C.T. Driscoll, F.J. Carranti, D.R. Foster, P.S. Gwyther, B.R. Hall, S.P. Hamburg, J.C. Jenkins, C. Neill, B.W. Peery, E.E. Quigley, R. Sherman, M.A. Vadeboncoeur, D.A. Weinstein, and G. Wilson. 2012. Local scale carbon budgets and mitigation opportunities for the northeastern United States. *BioScience* 62:23-38. https://doi.org/10.1525/bio.2012.62.1.7

6. Leuzinger, S., and **R.Q Thomas.** 2011. How do we improve Earth system models? Integrating Earth system models, ecosystem models, experiments and long-term data. *New Phytologist* 191:15–18. https://doi.org/10.1111/j.1469-8137.2011.03778.x

5. **Thomas, R.Q.,** C.D. Canham, K.C. Weathers, and C.L. Goodale. 2010. Increased tree carbon storage in response to nitrogen deposition in the U.S. *Nature Geosciences* 3:13-17. https://doi.org/10.1038/ngeo721
   - Web of Science Highly Cited Paper: top 1% in Geoscience

4. Hurtt, G.C., J. Fisk, **R.Q. Thomas**, R. Dubayah, P. Moorcroft, and H. Shugart. 2010. Linking models and data on vegetation structure: data requirements and a modeling framework for future space-borne missions. *Journal of Geophysical Research* 115: G00E10. https://doi.org/10.1029/2009JG000937

3. Canham, C.D. and **R.Q. Thomas**. 2010. Local frequency but not relative abundance of temperate tree species varies along climate gradients in eastern North America. *Ecology*. 91:3433–3440. https://doi.org/10.1890/10-0312.1

2. **Thomas, R.Q.,** G.C. Hurtt, R. Dubayah, and M. Schilz. 2008. Using lidar data and a height structured ecosystem model to improve estimates forest carbon stocks and fluxes over mountainous terrain. *Canadian Journal of Remote Sensing* 34: S351-S363. https://doi.org/10.5589/m08-036

1. Fisher, J., G.C. Hurtt, **R.Q. Thomas**, and J.Q. Chambers. 2008. Clustered disturbances lead to bias in large-scale estimates based on forest sample plots. *Ecology Letters* 11: 554-563. https://doi.org/10.1111/j.1461-0248.2008.01169.x

<u>In review or revision</u>

1. McNellis, R.[G], N. van Gestel, **R.Q. Thomas**, and N.G. Smith. Winter cover cropping increases albedo and latent heat flux in a Texas High Plains agro-ecosystem. *Journal of Geophysical Research – Biogeosciences* (manuscript ID: 2022JG006880).

2. Smith, J.W.[G], L.R. Johnson, and **R.Q. Thomas**. Assessing Ecosystem State Space Models: Identifiability and Estimation. *Journal of Agricultural, Biological and Environmental*

Statistics. (manuscript ID: JABE-D-21-00060).

3. Clark, C.M., **R.Q. Thomas**, and K.J. Horn[P]. Forest tree C responsiveness to N deposition in the U.S. has strong regional variation and may be weakening with implications for climate policy. *Global Change Biology.* (manuscript ID: Pending).

4. Phelan, J., G. Van Houtven, C. Clark, J. Buckley, J. Cajka, A. Hargrave, K. Horn[P], **R. Q. Thomas**, and R. Sabo. Impacts of Climate Change and Atmospheric Deposition on Ecosystem Services Provided by U.S. Forests. *Communications Earth & Environment.* (manuscript ID: COMMSENV-22-0064-T).

5. Hounshell, A.G., B. M. D'Acunha, A. Breef-Pilz, M.S. Johnson, **R.Q. Thomas**, C.C. Carey. Eddy covariance data reveal that a small freshwater reservoir emits a substantial amount of carbon dioxide and methane. *Journal of Geophysical Research – Biogeosciences*. (manuscript ID: 2022JG006859)

6. Willson A.M., H. Gallo, J.A. Peters, A. Abeyta, N.B. Watts, C.C. Carey, T.N. Moore, G Smies, **R.Q. Thomas**, W.M. Woelmer, J.S. McLachlan. Assessing opportunities and inequities in undergraduate ecological forecasting education. *Ecology and Evoluation* (manuscript ID ECE-2022-08-01157

SOFTWARE

Boettiger, C., **R.Q. Thomas**, C. Laney, C. Lunch. 2020. neonstore: NEON Data Store. R package version 0.3.1. https://cran.r-project.org/web/packages/neonstore/index.html

Boettiger, C., R.Q. Thomas, M. Dietze, A. Shiklomanov. 2020. EFIstandards: EFI ecological forecasting output and metadata standards. https://github.com/eco4cast/EFIstandards

Thomas, R.Q. 2020. noaaGEFSpoint: Downloads And Temporally Downscales NOAA GEFS 6-hr Forecasts for a Point Location. https://github.com/rqthomas/noaaGEFSpoint

Thomas, R.Q., R.J. Figueiredo, V. Daneshmand, L.K. Puckett, C. C. Carey. 2020. Forecasting Lakes and Reservoir Ecosystems (FLARE). Zenodo. https://doi.org/10.5281/zenodo.3862905

Daneshmand, V., **R.Q. Thomas**, B.J. Bookout, C.C. Carey and R.J. Figueiredo. 2020. Sensor Gateway code for Forecasting Lake and Reservoir Ecosystems (FLARE). Zenodo. https://doi.org/10.5281/zenodo.3862907

Thomas, R.Q., M. Williams, M.A. Cavaleri, J.-F. Exbrayat, T.L. Smallman, and L.E. Street. 2019. ACONITE_canopy: ACONITE Canopy Model and analysis code. Zenodo. https://doi.org/10.5281/zenodo.3530843

Lawrence, D.M., et al. [52 authors including **R.Q. Thomas**]. 2019. Community Land Model Version 5. https://github.com/ESCOMP/ctsm

Thomas, R.Q. 2018. DAPPER (Data Assimilation for Predicting Productivity in Ecosystem and Regions). https://github.com/EcoDynForecast/DAPPER

Thomas, R.Q. and M. Williams. 2014. ACONITE: Analysis of Carbon and Nitrogen Interactions in Terrestrial Ecosystems. https://github.com/rqthomas/ACONITE

BOOK CHAPTERS

Pace, M.L., G.M. Lovett, C.C. Carey, and **R.Q. Thomas**. 2021. Primary production: the foundation of ecosystems. In K.C. Weathers, D.L. Strayer, and G.E. Likens (editors). *Fundamentals of Ecosystems Science*, 2e. Academic Press.

Daw, A., **R.Q. Thomas,** C.C. Carey, J.S. Read, A.P. Appling, and A. Karpatne. 2022. Physics-Guided Architecture (PGA) of LSTM Models for Uncertainty Quantification in Lake Temperature Modeling. In A. Karpatne, R. Kannan, V. Kumar (editors). *Knowledge Guided Machine Learning,* 1e, Chapman and Hall/CRC

OTHER PUBLICATIONS

Dietze, M., E.P. White, and **R.Q. Thomas**. 2019. Can we predict nature? NASA Biological Diversity and Ecological Forecasting Programs: White Papers on Important Questions.

Thomas, R.Q., G.A. McKinley, M. C. Long. 2013. Examining Uncertainties in Representations of the Carbon Cycle in Earth System Models. *EOS, Transactions American Geophysical Union* 94: 460. https://doi.org/10.1002/2013EO480006

Peters, J. and R.Q. Thomas. 2020. Going Virtual! What we learned from the EFI-RCN Virtual Workshop. Ecological Forecasting Initiative Blog. https://ecoforecast.org/going-virtual-what-we-learned-from-the-efi-rcn-virtual-workshop/

Zwart, J., A. Shiklomanov, K. McHenry, D.S. Katz3, R. Kooper, C. Boettiger, B. Mecum, M. Dietze, and **R.Q. Thomas**. 2020. Reproducible Forecasting Workflows. Ecological Forecasting Initiative Task Views. https://ecoforecast.org/reproducible-forecasting-workflows/

DATASETS

Seyednasrollah, B. et al. [115 authors including **R.Q. Thomas**]. 2019. PhenoCam Dataset v2.0: Vegetation Phenology from Digital Camera Imagery, 2000-2018. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1674

COMPETITIVE GRANTS

Funding for my research group comes from seven unique federal sources (EPA, NASA, National Science Foundation, National Parks Service, USDA, U.S. Forest Service, USGS).

Lead PI: **Thomas, R.Q.** (Co-PIs: G. Bonan, J. Dukes, C. Goodale, S. Grady, S. Frey, J. Sparks) 2015-2021. Decadal prediction of sustainable agricultural and forest management - Earth system prediction differs from climate prediction. USDA-NIFA Earth System Modeling	$2,569,544
Lead PI: **Thomas, R.Q.** (co-PIs: M. Dietze, M.A. Kenny, C. Laney, J.S. McLachlan) 2020-2024. NEON RCN: The Ecological Forecasting Initiative RCN: Using NEON-enabled near-term forecasting to synthesize our understanding of predictability across ecological systems and scales. National Science Foundation Macrosystems Biology	$500,000
Co-PI: **Thomas, R.Q.** (PI: C.C. Carey; Co-PIs: M. Sorice, M. Schreiber, R.J. Figueiredo) 2018-2021. S&CC-IRG Track 2: Resilient water systems: Integrating environmental sensor networks and real-time water quality forecasts securely to adaptively manage drinking water and build social trust. National Science Foundation Smart & Connected Communities	$1,000,000
Co-PI: **Thomas, R.Q.** (co-PIs: R.J. Figueiredo, C.C. Carey, K.C. Weathers) Collaborative Research: CIBR: Cyberinfrastructure enabling end-to-end workflows for aquatic ecosystem forecasting, National Science Foundation Division of Biological Infrastructure	$658,391
Co-PI: **Thomas, R.Q. Thomas** (PI: V.A. Thomas, Co-PIs: R.H. Wynne, D. Wear, L. Chini, B. Mei) 2017-2021. Regionally specific drivers of land-use transitions and future scenarios: A synthesis considering the land management Influence in the southeastern US. NASA Land-use Land-cover Change	$613,508
Co-PI **Thomas, R.Q.** (PI: C.C. Carey) 2020-2022. MSA: Macrosystems EDDIE: An undergraduate training program in macrosystems science and ecological forecasting. National Science Foundation Macrosystems Biology	$300,000
Lead PI: **Thomas, R.Q.** 2014-2016. Forecasting forest response to N deposition: integrating data from individual plant responses to soil chemistry with a continental scale gradient analysis. US Geological Survey.	$100,000
Lead PI: **Thomas, R.Q.** (co-PI K.J. Horn) 2016. Applying species-specific information on tree responses to nitrogen deposition to develop critical loads for national parks in the U.S. National Parks Service Air Resources Division	$78,189

Lead PI. **Thomas, R.Q. (**Co-PI J. Coulston, P. Ratke). 2016-2018. Past, current, and future CO_2 and N fertilization impacts on forest carbon sequestration. U.S. Forest Service. $60,000

PI: **Thomas, R.Q.** (co-PI K.J. Horn) 2016. Advancing critical load estimates nationally. Environmental Protection Agency (Via Research Triangle Institute) $18,000

HONORS AND AWARDS

2021 Data Science Faculty Fellowship, College of Science, Virginia Tech
2020 Fralin Life Sciences Institute affiliated faculty
2020 Web of Science Highly Cited Paper (top 1% in Geosciences) for Thomas et al. 2010
2018 Ecological Forecasting Prize, Ecological Society of America
2011 LaMont C. Cole Award in recognition of the most outstanding paper published by a graduate student in the Department of Ecology and Evolutionary Biology at Cornell University
2005 Rufus Choate Scholar (top 5% of class), Dartmouth College, 2005
2005 Willard W. Eggleston Memorial Botany Prize, Dartmouth College, 2005

ADVISING/MENTORING

Post-doctoral Research Associates

Mary Lofton (2022 – present)
Maike Holthuijzen (2022 – present)
Freya Olsson (2022 – present)
Tadhg Moore (2020 - 2022)
Kevin Horn (2014 - 2017)
Ryan McClure (2021)

Ph.D. Students

Joshua Rady (2016-present)
John Smith (degree conferred 2022; co-advised with Leah Johnson in Department of Statistics)
Benjamin Ahlswede (degree conferred 2021)
Michael Graham (degree conferred 2019; co-advised with Megan O'Rourke in School of Plant and Environmental Sciences)

Master of Science

Benjamin Ahlswede (degree conferred 2015)
Annika Jerslid (degree conferred 2016)
Wyatt McCurdy (degree conferred 2019)

Undergraduate Research

Laura Puckett (degree conferred in 2019)

Graduate Committees

Edward Russell (Ph.D.)
Dexter Howard (Ph.D.)
Cameron Houser (Ph.D.)
Elizabeth Weaver (Ph.D.)
Whitney Woelmer (Ph.D.)
Nicholas Hammond (M.S/)
Abby Lewis (Ph.D.)
Heather Wander (Ph.D.)
John Smith (Ph.D.)
Jinshi Jian (Ph.D.)
Risa NcNellis (M.S., Texas Tech)
Jeremy Forsythe (Ph.D., Clemson)

COURSES TAUGHT AT VIRGINIA TECH AS INSTRUCTOR OF RECORD

- FREC 3044: Environmental Data Science (3 offerings to date: Spring 2019, Spring 2020, Spring 2021)
- FREC 5884: Ecological Forecasting (3 offerings to date: Fall 2018, Spring 2020, Spring 2021)
- FREC 3604: Climate Science (4 offerings to date: Spring 2015, Spring 2016, Spring 2017)
- FREC 5034: Ecosystem Dynamics (co-taught; 3 offerings to date: Fall 2015, Fall 2017, Fall 2019)
- FREC 5204: Ecosystem and Climate (4 offerings to date: Spring 2014, Fall 2014, Fall 2016, Fall 2018)
- FREC 5004: Graduate Seminar (Spring 2016, Spring 2017, Spring 2018);
- Co-instructor for FREC 3344: Field Exp. Forest Resources (Spring 2014, Spring 2015, Spring 2016, Spring 2017) and GRAD 5134: Interdisciplinary Research in Remote Sensing (Spring 2017)

SUMMER GRADUATE TRAINING COURSES AS INSTRUCTOR

- Near-term Iterative Forecasting Summer Training Course, Boston University (virtual format), 2020
- Invited Instructor, Mechanisms and Interactions of Climate Change in Mountain Regions (MICMoR), 'Examining Mountain Ecosystems in Regional to Global Environments of Carbon-cycling and Climate (EMERGE-CC)' at the Institute of Meteorology and Climate Research KIT/IMK-IFU, Garmisch-Partenkirchen, Germany, 2014
- National Center for Atmospheric Research Advanced Studies Program Colloquium on Carbon – Climate Interactions, Boulder, Colorado, 2013

PROFESSIONAL SERVICE AND DEVELOPMENT

<u>External Service and Editorships</u>

2019 – present	Lead, Ecological Forecasting Initiative Research Coordination Network (EFI-RCN)

2018 – present	Steering Committee, Ecological Forecasting Initiative
2019 – present	Member, National Ecological Observatory Network (NEON) Technical Working Group on Ecological Forecasting
2019 – present	Member, American Meteorological Society Committee on Ecological Forecasting
2018	Committee Member, Ecological Society of America Ecological Forecasting Award committee
2018 – present	Founding Board, Ecological Forecasting Initiative
2019 – present	Associate Editor, *Journal of Geophysical Research - Biogeosciences*
2018 – present	Associate Editor*, Frontiers in Forests and Global Change*
2012 – 2013	Co-organizer, National Center for Atmospheric Research Advanced Studies Program Colloquium on Carbon – Climate Interactions

Service at Virginia Tech

2020	Proposal reviewer, COVID-19 Rapid Response Seed Fund
2015 – present	Founding organizer, Cross-Boundaries Biogeosciences Group
2013 – present	Member of Interfaces of Global Change and Remote Sensing Interdisciplinary Graduate Education Program
2019	Environmental Informatics Collegiate Faculty search committee
2018- 2019	Member, University Faculty Senate Research Assessment Committee
2016 – 2019	Chair, College of Natural Resources elections committee
2016 – 2018	Faculty adviser, Graduate student-lead department seminar series
2016 – 2017	Forest Ecology faculty search committee
2016 – 2017	Chair of department Graduate Affairs Committee
2014	Ecohydrologic Modeling and Informatics Search Committee
2013	Department Seminar Series coordinator

Manuscript Reviews

Agricultural and Forest Meteorology, Biogeosciences, Canadian Journal of Remote Sensing, Ecology Letters, Ecological Applications, Ecological Modeling, Environmental Pollution, Environmental Research Letters, Ecosystems, Frontiers in Ecology and Environment, Forest Ecology and Management, Forest Ecosystems, Geoscientific Model Development, Global Biogeochemical Cycles, Global Change Biology, Journal of Advances in Modeling the Earth System, Journal of Geophysical Research: Biogeosciences, Journal of Forestry, New Phytologist, PLoS One, Proceedings of the National Academy of Sciences, Remote Sensing of Environment, Scientific Reports

Grant Reviews

- National Science Foundation (NSF), Division of Biological Sciences, Ecosystem Science, Ad-Hoc Reviewer, 2016
- Virginia Agricultural Experiment Station, Hatch project review, 2016
- National Science Foundation (NSF), Division of Behavioral and Cognitive Sciences, Geography and Spatial Sciences, 2014
- Virginia Agricultural Experiment Station, McIntire-Stennis Project Review, 2014

- National Science Foundation (NSF), Division of Environmental Biology (DEB), Ecosystem Science Program, Ad-Hoc Reviewer, 2013

Professional meetings, panels, workshops, led and/or organized

- Lead organizer, Ecological Forecasting Initiative Research Coordination Network workshop *Coordinating the NEON-enabled forecasting challenge,* 2020
  *See: Peters and Thomas 2021 (https://doi.org/10.1002/bes2.1828)
- Symposium lead convener, Ecological Society of America, *The Ecological Forecasting Initiative: Lessons Learned from a Grassroots Network to Advance Ecology,* 2020
- Session Co-convener, American Geophysical Union Fall Meeting, *Ecological Forecasting in the Earth System, 2019*
- Session lead convener, American Geophysical Union Fall Meeting, *Land Management in the Earth system: Measurements and Models, 2018*
- Session Co-convener, American Geophysical Union Fall Meeting, *Ecological Forecasting in the Earth System, 2018*
- Session Co-convener, American Geophysical Union Fall Meeting, *Land-use and Biogeochemical Processes, 2016*
- Co-organizer, Integrated Network for Terrestrial Ecosystem Research on Feedbacks to the Atmosphere and ClimatE (INTERFACE) Research Coordination Network Meeting, St Petersburg Beach, FL, 2016
- Co-organizer, USGS Powell Center workshop on "Forecasting forest response to N deposition: Integrating data from individual plant responses to soil chemistry with a continental-scale gradient analysis". 2nd meeting, 2015
- Co-organizer, USGS Powell Center workshop on "Forecasting forest response to N deposition: Integrating data from individual plant responses to soil chemistry with a continental-scale gradient analysis". 1st meeting, 2014
- Co-Organizer, International Workshop titled "Key Uncertainties in the Global Carbon-Cycle: Perspectives Across Terrestrial and Ocean Ecosystems", National Center for Atmospheric Research, Boulder, CO, 2013
- Co-organizer, National Center for Atmospheric Research Advanced Studies Program Colloquium on Carbon – Climate Interactions

INVITED SEMINARS AND PRESENTATIONS

2022

Thomas, R.Q. The NEON Ecological Forecasting Challenge. Terrestrial Ecosystem Research Network. University of Queensland. Brisbane, Australia. May 2022.

Thomas, R.Q. Ecological forecasting to anticipate the future of forests and freshwaters. School of Agriculture and Environment Seminar Series. University of Western Australia. Perth, Australia. May 2022.

2021

Thomas, R.Q. Ecological forecasting: data-model fusion to anticipate the future of forests and freshwaters. Ecology, Evolution, Environment & Society Seminar Series. Dartmouth College. Hanover, NH. October 2021.

Thomas, R.Q. The NEON Ecological Forecasting Challenge. NCAR-NEON Workshop. November 2021. [virtual]

Thomas, R.Q. Using forecasting challenges to advance the field of ecological forecasting. American Fisheries Society Annual Meeting. Baltimore, MD. November 2021. [virtual]

Thomas, R.Q. Ecological forecasting: data-model fusion to anticipate the future of forests and freshwaters. U.S. Environmental Protection Agency Office of Research and Development. October 2021 [virtual]

Thomas, R.Q. Galvanizing the field of ecological forecasting using the NEON Ecological Forecasting Challenge. Ecological Society of America Annual Meeting. August 2021 [virtual]

Thomas, R.Q. Ecological forecasting to anticipate ecological responses to environmental stressors. National Academy of Science Committee on Anticipatory Research for EPA. National Academy of Sciences. Washington, D.C. July 2021 [virtual]

Thomas, R.Q. The NEON Ecological Forecasting Challenge: Using forecasting challenges to leverage observational networks and advance prediction in ecology. Terrestrial Ecosystem Research Network Science Symposium. Australia. July 2021. [virtual]

Thomas, R.Q. Ecological forecasting: data-model fusion to anticipate the future of forests and freshwaters. University of Virginia, Charlottesville, Virginia, May 2021 [virtual due to COVID]

2020

Thomas, R.Q, C.C. Carey, R.S. Corrigan, M.E. Lofton, R. McClure, W.M. Woelmer**.** Near-term, iterative forecasts of freshwater ecosystem dynamics enable a novel strategy for managing reservoir drinking water quality. Ecological Society of America Annual Meeting, Salt Lake City, Utah, August 2020. [virtual due to COVID]

Thomas, R.Q. Integrating public environmental datasets into a seminar long undergraduate course in Environmental Informatics. Ecological Society of America Annual Meeting, Salt Lake City, Utah, August 2020. [virtual due to COVID]

Thomas, R.Q. Ecological Forecasting: A case study using the Forecasting Lakes and Reservoir Ecosystems (FLARE) system. New Advances in Land Carbon Cycle Modeling Summer 2020 Course, July 2020. [virtual due to COVID]

Thomas, R.Q. Lessons learned from integrating EDDIE modules into a semester-long undergraduate Environmental Data Science course, Project EDDIE Webinar Series as part of the National Association for Geoscience Teachers (NAGT), virtual, April 2020.

Thomas, R.Q. Ecological Forecasting: anticipating the future of forests and freshwaters, Department of Statistics, Virginia Tech, Blacksburg, Virginia, March 2020.

Thomas, R.Q. Ecological Forecasting: anticipating the future of forests and freshwaters, Department of Geosciences, Virginia Tech, Blacksburg, Virginia, February 2020.

2019

Thomas, R.Q. Ecological Forecasting: anticipating the future of forests and freshwaters, Auburn University, Auburn, Alabama, November 2019.

Thomas, R.Q. From sensors to society: A road-map for ecological forecasting based on SmartReservoir.org. NCAR-NEON Workshop on Ecological Forecasting, Boulder, Colorado, April 2019.

2018

Thomas, R.Q. Forecasting the Future of Southeastern U.S. Pine Forests in Response to Climate Change. Virginia Tech Math-Biology Seminar Series, Blacksburg, Virginia, April 2018

2017

Thomas, R.Q. Forecasting the future of southeastern U.S. pine forests, Clemson University Department of Forestry and Environmental Conservation Seminar Series. Clemson, South Carolina, October 2017.

Thomas, R.Q. Climate change and southern pines: using the rich history of research in the Southern U.S. to inform predictions, Belle W. Baruch Institute of Coastal Ecology and Forest Science, Clemson University, Georgetown, South Carolina, October 2017.

Thomas, R.Q. Disturbance and N limitation in Earth system models. NOVUS IV Workshop (an NSF sponsored research coordination network focused on ecosystem disturbance), Hubbard Brook, New Hampshire. September 2017.

Thomas, R.Q., S.J. Cheng, N.G. Smith, and W.R. Wieder. Evaluating the present and future of ecology in Earth system models. Ecological Society of America Annual Meeting, Portland, Oregon, August 2017.

Thomas, R.Q. Forecasting the future of southeastern U.S. pine forests. Visiting Scholar Seminar Series, University of Maryland, Center for Environmental Science, Appalachian Lab, Frostburg, Maryland, March 2017.

2016

Thomas, R.Q. Forecasting the future of southeastern U.S. pine forests. Forest Modeling Research Cooperative Annual Meeting. Brookeland, Texas, December 2016.

2015

Thomas, R.Q. Forecasting the Forests of the Future. Landsat Science Team Meeting. Blacksburg, Virginia, January 2015.

Thomas, R.Q. Forecasting the Forests of the Future. Virginia Tech College of Natural Resources and Environment Briefing Day, Blacksburg, Virginia, January 2015.

Thomas, R.Q. Observed canopy structures constrain carbon-nitrogen interactions through photosynthesis-respiration trade-offs. Department of Biology, Virginia Commonwealth University, Richmond, Virginia, September 2015.

Thomas, R.Q. Using conceptual theory and observations to evaluate mechanisms of N limitation in Earth system models. Ecological Society of America Annual Meeting. Baltimore, Maryland, August 2015.

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. Department of Environmental Science Seminar Series. University of Virginia, Charlottesville, Virginia, April 2015.

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. Department of Geography and Program in Ecology Seminar Series. The Pennsylvania State University, State College, Pennsylvania, February 2015.

2014

Thomas, R.Q. Nitrogen Limitation on Land: How Can It Exist in Earth System Models and What Are the Implications for Climate? University of Michigan Biological Station Summer Lecture Series, Pellston, Michigan, July 2014.

Thomas, R.Q. Nitrogen limitation on land: How can it occur in Earth system models? University of Edinburgh, School of Geosciences Seminar Series. Edinburgh, Scotland, June 2014.

Thomas, R.Q. Using ecosystem responses to N deposition and N fertilization inputs to evaluate models. INTERFACE Workshop: Using results from global change experiments to inform land model development and calibration. Beijing, China, May 2014.

Thomas, R.Q. Nitrogen limitation on land: How can it occur in Earth System Models? Community Land Model Tutorial, Boulder, Colorado, February 2014.

2013

Thomas, R.Q., G.B. Bonan, and C. Koven. Using experimental data of ecosystem response to N addition to improve predictions of coupled C and N cycling in Earth System models. American Geophysical Union Fall Meeting, San Francisco, California, December 2013.

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) Atmospheric and Marine Research Division. Aspendale, Australia, April 2013.

Thomas, R.Q. Nitrogen cycling in the Community Land Model. Greencycles II Training Workshop IV: Nitrogen in the Earth System. Jena, Germany, February 2013 [Virtual].

2012

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. Environmental Science Seminar Series, University of New Hampshire, Durham, New Hampshire, November 2012.

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. Departments of Biological Sciences and Forest Resources and Environmental Conservation, Virginia Tech, Blacksburg, Virginia, February 2012.

Thomas, R.Q. Nitrogen constraints on terrestrial carbon sequestration, from trees to the globe. Department of Geography, Boston University, Boston, Massachusetts, February 2012.

CONTRIBUTED AND OTHER PRESENATIONS

Presenter is underlined, [G] denotes mentored graduate students, [U] denotes mentored undergraduate students, [P] denotes mentored postdocs.

2021

Ahlswede, B.J.[G], T.L. O'Halloran, and **R.Q. Thomas**. Comparing the Biogeophysical and Biogeochemical Trade-Offs of a Pine Plantation vs a Bioenergy Cropland. American Geophysical Union. New Orleans, Louisiana, December 2021. [virtual due to COVID]

D'Acunha, B., A.G. Hounshell[P], A. Breef-Pilz, **R.Q. Thomas**, M.S. Johnson, and C.C. Carey. Eddy covariance data reveal that small freshwater reservoirs emit a substantial amount of carbon dioxide and methane. Poster presentation. American Geophysical Union. New Orleans, Louisiana, December 2021. [virtual due to COVID]

Figueiredo, R.J., V. Daneshmand, Y.-J. Ku, K. Subratie, A. Breef-Pilz, C.C. Carey, and **R.Q. Thomas**. Cyberinfrastructure for near real-time water quality forecasting in lakes and reservoirs. Oral presentation. American Fisheries Society. Baltimore, Maryland, November 2021. [virtual due to COVID]

Lofton, M.E.[P], **R.Q. Thomas**, W.M. Woelmer[G], T.N. Moore[P], R.P. McClure[P], A.S. Lewis[G], and C.C. Carey. Assessing model parameter sensitivity of phytoplankton functional groups in a one-dimensional lake ecosystem model. Poster presentation. Global Lakes Ecological Observatory Network (GLEON) conference, October 2021. [virtual due to COVID]

Wander, H.L.[G], **R.Q. Thomas**, T.N. Moore[P], R.P. McClure[G], W.M. Woelmer[G], V. Daneshmand, R.J. Figueiredo, and C.C. Carey. Predicting 16-day water temperature and dissolved oxygen in a eutrophic drinking water reservoir using an open-source forecasting system. Poster presentation. Global Lakes Ecological Observatory Network (GLEON) conference, October 2021. [virtual due to COVID]

Moore, T.N.[P], **R.Q. Thomas**, W.M. Woelmer[G], and C.C. Carey. Macrosystems EDDIE: Benefits of integrating ecological forecasting into undergraduate ecology curricula. Poster presentation. Global Lakes Ecological Observatory Network (GLEON) conference, October 2021. [virtual due to COVID]

Moore, T.N.[P], C.C. Carey, W.M. Woelmer[G], and **R.Q. Thomas**. Macrosystems EDDIE: Teaching Ecological Forecasting to Undergraduates. Oral Presentation and Workshop. Ecological Society of America. Long Beach, California, August 2021. [virtual due to COVID]

McClure, R.P.[P], C.C. Carey, V. Daneshmand[G], R.J. Figueiredo, T. Moore[P], and **R.Q. Thomas**. Application of a novel near-term, iterative water quality forecasting workflow to NEON lakes. Poster presentation. Ecological Society of America. Long Beach, California, August 2021. [virtual due to COVID]

McClure, R.P.[P], C.C. Carey, V. Daneshmand, R.J. Figueiredo, T.N. Moore[P], **R.Q. Thomas**. Application of an iterative, near-term water temperature forecasting workflow in NEON

lakes. Oral presentation. Incorporating Data Science and Open Science in Aquatic Research Summit, July 2021. [virtual due to COVID]

Wander, H.L.[G], **R.Q. Thomas**, A.G. Hounshell[P], V. Daneshmand[G], R.J. Figueiredo, R.P. McClure[P], and C.C. Carey. Application of an open-source forecasting system for predicting future water temperature and dissolved oxygen in a eutrophic drinking water reservoir. Poster presentation. Association for the Society of Limnology and Oceanography, Mallorca, Spain, June 2021. [virtual due to COVID]

Carey, C.C., P.C. Hanson, **R.Q. Thomas**, A.B. Gerling[G], A.G. Hounshell[P], M.E. Lofton[G], R.P. McClure[G], B.R. Niederlehner, H.L. Wander[G], and W.M. Woelmer[G]. Anoxia alters freshwater ecosystem stoichiometry and decreases carbon and nutrient retention in reservoirs. Oral presentation. Association for the Society of Limnology and Oceanography, Mallorca, Spain, June 2021. [virtual due to COVID]

Hammond, N.W.[G], M.E. Schreiber, B.J. Bookout, R.S. Corrigan, F. Birgand, **R. Q. Thomas**, and C.C. Carey. Assessing short-term variability of iron and manganese cycling in a drinking-water reservoir using a high-frequency water quality sensor. Geological Society of America Southeastern Section Meeting, Auburn, Alabama, April 2021. [virtual due to COVID]

2020

D'Acunha, B., A. Hounshell, H.L. Wander[G], **R.Q. Thomas**, C.C. Carey, and M.S. Johnson. Fluxes of CO_2 and CH_4 from a small, eutrophic, managed reservoir as determined by eddy covariance. Oral presentation. American Geophysical Union Fall Meeting, Virtual, December 2020.

Lewis, A.[G], M.E. Lofton, R. McClure[G], W.M. Woelmer[G], P.C. Hanson, **R.Q. Thomas.** and C.C. Carey. Near-term, iterative forecasts highlight the relative importance of two drivers for dynamic oxygen concentrations in a drinking water reservoir. Oral presentation. American Geophysical Union Fall Meeting, Virtual, December 2020.

Carey, C.C., **R.Q. Thomas**, R.J. Figueiredo, M. Dietze. The power and potential for iterative, near-term ecological forecasting to advance freshwater science, Poster presentation. American Geophysical Union Fall Meeting, Virtual, December 2020.

McClure, R.[G], R.Q. Thomas, M.E. Lofton, W.M. Woelmer and C.C Carey. Near-term, iterative forecasting suggests high predictability of reservoir methane ebullition at weekly time scales. Poster presentation. American Geophysical Union Fall Meeting, Virtual, December 2020.

Thomas, R.Q., C. Boettiger, C.C. Carey, M. Dietze, A. Fox, M.A. Kenney, C.M. Laney, J.S. McLachlan, J. Peters, J.F. Weltzin, W.M. Woelmer, J.R. Foster, J.P. Guinnip, A. Spiers, S. Ryan, K.I. Wheeler, A.R. Young, and L.R. Johnson. Introducing the NEON Ecological Forecasting Challenge hosted by the Ecological Forecasting Initiative Research Coordination Network. Poster presentation. American Geophysical Union Fall Meeting, Virtual, December 2020.

McNellis, R.[G], N. van Gestel, **R.Q. Thomas**, and N.G. Smith. Winter cover cropping increases albedo and latent heat flux in the Texas High Plains. Poster presentation . American Geophysical Union Fall Meeting, Virtual, December 2020.

Carey, C.C., W.M. Woelmer[G], M.E. Lofton, R.J. Figueiredo, B.J. Bookout, R.S. Corrigan[G],

V. Daneshmand[G], A.G. Hounshell, D.W. Howard, A.S.L. Lewis, R.P. McClure[G], H.L. Wander[G], N.K. Ward, and **R.Q. Thomas**. Advancing lake and reservoir water quality management with near-term, iterative ecological forecasting. Poster presentation. Ecological Society of America, Salt Lake City, Utah, August 2020. [virtual due to COVID]

Lewis, A.S.L., M.E. Lofton, R.P. McClure[G], W.M. Woelmer[G], P.C. Hanson, **R.Q. Thomas**, and C.C. Carey. Near-term, iterative ecological forecasts provide insight into the drivers of changing oxygen concentrations in a drinking water reservoir. Poster presentation. Ecological Society of America, Salt Lake City, Utah, August 2020. [virtual due to COVID]

McClure, R.P.[G], **R.Q. Thomas**, M.E. Lofton, W.M. Woelmer[G], and C.C. Carey. Near-term iterative forecasting and data assimilation improve methane ebullition rate estimates in a small reservoir. Poster presentation. Ecological Society of America, Salt Lake City, Utah, August 2020. [virtual due to COVID]

Dietze, M.C., and 27 co-authors, including **R.Q. Thomas.** Improving ecological prediction: the role of cross-network data fusion in iterative ecological forecasting. Oral presentation. Ecological Society of America, Salt Lake City, Utah, August 2020. [virtual due to COVID]

Carey, C.C., **R.Q. Thomas**, R.J. Figueiredo, and M.C. Dietze. The power and potential for iterative, real-time ecological forecasting to advance the aquatic sciences. Oral presentation. Association for the Society of Limnology and Oceanography, Madison, Wisconsin, June 2020. [cancelled due to COVID]

Woelmer, W.M.[G], B.J. Bookout, M.E. Lofton, R.P. McClure[G], **R.Q. Thomas**, and C.C. Carey. Near-term iterative hindcasts at multiple time scales improves understanding of phytoplankton dynamics. Oral presentation. Association for the Society of Limnology and Oceanography, Madison, Wisconsin, June 2020. [cancelled due to COVID]

McClure, R.P.[G], **R.Q. Thomas**, M.E. Lofton , W.M. Woelmer [G], and C.C. Carey. Iterative near-term forecasts improve estimates of methane ebullition efflux from a small temperate reservoir. Oral presentation. Association for the Society of Limnology and Oceanography, Madison, Wisconsin, June 2020. [cancelled due to COVID]

Figueiredo, R.J., V. Daneshmand[G], C.C. Carey, and **R.Q. Thomas**. End-to-end ecological forecasting: cyber-infrastructure challenges and frontiers from sensors to clouds. Oral presentation. Association for the Society of Limnology and Oceanography, Madison, Wisconsin, June 2020. [cancelled due to COVID]

Woelmer, W.M.[G], M.E. Lofton, R.P. McClure[G], B.J. Bookout, **R.Q. Thomas**, and C.C. Carey. Translating forecasts of algal blooms into decision support tools for drinking water management. Oral presentation. Virginia Water Conference, Richmond, Virginia, March 2020.

2019

Ahlswede, B.J. [G], **R.Q. Thomas**, and T.L. O'Halloran. Controls on Land Surface Temperature along a Gradient of Managed Land-Cover Types in Central Virginia. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.

Rady, J.M.[G], J.K. Shuman, and **R.Q. Thomas**. Leveraging Data from Forest Manipulation Experiments to Understand and Improve a Global Dynamic Vegetation Model. Poster

presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.

Thomas, R.Q., C.C. Carey, M.E. Lofton, and W.M. Woelmer[G]. Near-term iterative forecasting of water quality in a reservoir reveals relative forecastability of physical, chemical, and biological dynamics. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.

McClure, R. [G], **R. Q. Thomas**, M.E. Lofton, W.M. Woelmer[G], A. M. Mickens, and C. C. Carey. Successful real-time prediction of methane ebullition rates in a eutrophic reservoir using temperature via iterative near-term forecasts. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2019.

Thomas, R.Q., R.J. Figueiredo, M.E. Lofton, R.P. McClure[G], W.W. Woelme[G]r, and C.C. Carey. Near-term iterative forecasting with GLM-AED and daily data assimilation reveals the forecastability of water quality dynamics. Poster presentation. 21st GLEON meeting, Huntsville, Ontario, Canada, November 2019.

McClure, R.P. [G], **R.Q. Thomas**, M.E. Lofton, W.M. Woelmer[G], A.M. Mickens, and C.C. Carey. Successful real-time prediction of methane ebullition rates in a eutrophic reservoir using temperature via iterative near-term forecasts. Poster presentation. 21st GLEON meeting, Huntsville, Ontario, Canada, November 2019.

Woelmer, W.M. [G], M.E. Lofton, R.P. McClure[G], B.J. Bookout, **R.Q. Thomas**, and C.C. Carey. Looking backward to look forward: forecasting phytoplankton in a drinking water reservoir using multiple modeling approaches. Poster presentation. 21st GLEON meeting, Huntsville, Ontario, Canada, November 2019.

Dietze, M.C., P.B. Alder, C.C. Carey, M. Kenney, A. Fox, A. Janetos, L.R. Johnson, C. Laney, H.J. Lynch, J.S. McLachlan, J.A. Peters, **R.Q. Thomas**, J.F. Weltzin, and E.P. White. Building an ecological forecasting community. Oral presentation. Ecological Society of America Annual Meeting, Louisville, Kentucky, August 2019.

Woelmer, W.M. [G], B.J. Bookout, M.E. Lofton, R.P. McClure[G], **R.Q. Thomas**, and C.C. Carey. Forecasting water quality in a drinking water reservoir: An ensemble model approach. Oral presentation. Ecological Society of America Annual Meeting, Louisville, Kentucky, August 2019.

Figueiredo, R. J., C. C. Carey, **R. Q. Thomas**, V. Daneshmand[G], and B. Bookout. End-to-end ecological forecasting: Cyber-infrastructure challenges and frontiers from sensors to clouds. Oral presentation. Ecological Society of America Annual Meeting, Louisville, Kentucky, August 2019.

Carey, C. C., R.J. Figueiredo, **R.Q. Thomas**, B.J. Bookout, V. Daneshmand[G], M.E. Lofton, R.P. McClure[G], and W.M. Weolmer. All-hands-on-deck data management: Building the team, tools, and workflows to forecast future water quality. Oral presentation. Ecological Society of America Annual Meeting, Louisville, Kentucky, August 2019.

Woelmer, W.M. [G], **R.Q. Thomas**, R. Figueiredo, V. Daneshmand [G], and C.C. Carey. Integrating sensor networks and real-time ecological forecasting to adaptively manage water quality. Oral presentation. Oral presentation. Virginia Forests and Drinking Water Forum. Charlottesville, Virginia. June 2019.

Carey, C.C., **R.Q. Thomas,** R.J. Figueiredo, V. Daneshmand[G], and B.J. Bookout. Integrating high-frequency environmental sensors, overlay virtual private networks, and simulation models in an end-to-end workflow to generate real-time iterative water quality forecasts. Oral presentation. Ecological Forecasting Initiative Conference, Washington, D.C., May 2019.

Smith, J.W.[G], L.R. Johnson, and **R.Q. Thomas**. Bayesian parameter estimation for ecosystem state space models with linear autoregressive process models. Poster presentation. Ecological Forecasting Initiative Conference, Washington, D.C., May 2019.

Woelmer, W.M. [G], B.J. Bookout, M.E. Lofton, R.P. McClure, **R.Q. Thomas**, and C.C. Carey. Forecasting harmful algal blooms in a drinking water reservoir: an ensemble model approach. Poster presentation. Ecological Forecasting Initiative Conference, Washington, D.C., May 2019.

Woelmer, W.M.[G], M.E. Lofton, R.P. McClure[G], B.J. Bookout, **R.Q. Thomas**, and C.C. Carey. Analysis of historical monitoring data to forecast future phytoplankton blooms in a small drinking water reservoir. Oral presentation. Virginia Water Conference, Richmond, Virginia, March 2019.

Carey, C.C., **R.Q. Thomas**, R.J. Figueiredo, M.E. Lofton, B.J. Bookout, V. Daneshmand[G], D. Howard, R.P. McClure[G], and W.W. Woelmer[G]. Real-time ecological forecasting enables adaptive water quality management in a drinking water reservoir. Oral presentation. Virginia Water Conference, Richmond, Virginia, March 2019.

Rady, J.M. [G], B.J. Ahlswede[G], and **R.Q. Thomas**. Forest Management in Space and Time: When it Matters and When it Doesn't. Oral presentation. CESM Land Model Working Group Spring meeting, Boulder, Colorado, February 2019.

Carey, C.C., **R. Q. Thomas**, R.J. Figueiredo, V. Daneshmand[G]. Real-time ecological forecasting enables adaptive water quality management in a drinking water reservoir. Association for the Sciences of Limnology and Oceanography 2019 Aquatic Sciences Meeting, San Juan, PR, February 2019.

2018

Graham, M.W.[G], **R.Q. Thomas**, B.D. Strahm, and M.E. O'Rourke. Examining historical impacts and mitigation potential of soil tillage practices in the Community Land Model. Oral presentation. American Geophysical Union Fall Meeting, Washington, D.C., December 2018.

Rady, J.M.[G], B.J. Ahlswede[G], and **R.Q. Thomas**. The Influence of a More Explicit Representation of Forest Management on Carbon Sequestration in the Community Land Model. Poster presentation. American Geophysical Union Fall Meeting, Washington, D.C., December 2018.

Thomas. R.Q., A. Jersild[G], E.B. Brooks, V.A. Thomas, and R.H. Wynne. Forecasting mid-century forest productivity by assimilating regional observations from plot networks and ecosystem experiments into a process-based model. Poster presentation. American Geophysical Union Fall Meeting, Washington, D.C., December 2018.

Carey, C.C., **R.Q. Thomas**, R.J. Figueiredo, V. Daneshmand[G], B.J. Bookout, and F. Birgand. Integrating environmental sensor networks and real-time ecological forecasting to

adaptively manage water quality. Poster presentation. 20th GLEON meeting, Rottnest Island, Australia, December 2018.

Carey, C.C., R.J. Figueiredo, **R.Q. Thomas**, F. Birgand, J.C. Little, M.E. Schreiber, and M.G. Sorice. Resilient water systems: Integrating environmental sensor networks and real-time forecasting to adaptively manage water quality and build social trust. Poster presentation. National Science Foundation Smart and Connected Communities Principal Investigator Meeting. Kansas City, Missouri, March 2018.

2017

Ahlswede, B.J. [G], **R.Q. Thomas**, T.L. O'Halloran, J.M. Rady[G], and J. LeMoine. Seasonality and Management Affect Land Surface Temperature Differences Between Loblolly Pine and Switchgrass Ecosystems in Central Virginia. Poster presentation. American Geophysical Union Fall Meeting, Washington, D.C., December 2017.

Horn, K. J.[P], **R.Q. Thomas**, L.H. Pardo, C.M. Clark, M. E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Species- to continental-scale influences of nitrogen and sulfur deposition on tree growth and mortality across the conterminous United States. Oral presentation. American Geophysical Union Fall Meeting, Washington, D.C., December 2017.

Carey, C.C., R.J. Figueiredo, **R.Q. Thomas**, F. Birgand, J.C. Little, M.E. Schreiber, and M.G. Sorice. Integrating environmental sensor networks and real-time forecasting to adaptively manage drinking water quality and build social trust. Poster presentation. 19th GLEON meeting, Mohonk, New York, November 2017.

Horn, K.J.[P], **R.Q. Thomas**, L.H. Pardo, C.M. Clark, M.E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Individual tree species responses to concurrent nitrogen and sulfur deposition across the contiguous United States. Oral presentation. National Atmospheric Deposition Program Annual Meeting, San Diego, California, October 2017.

Horn, K.J.[P], **R.Q. Thomas**, L.H. Pardo, C.M. Clark, M.E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Continental-scale impact of concurrent atmospheric nitrogen and sulfur deposition on individual tree species. Oral presentation. Ecological Society of America Annual Meeting, Portland, Oregon, August 2017.

Thomas, R.Q. and J.M. Rady[G]. Harvesting more wood from less area: Simulating the intensification of forest management in the CLM. Oral presentation. Community Land Model Spring Meeting, Boulder, Colorado, February 2017.

2016

Thomas, R.Q, T.L. O' Halloran, and B.J. Ahlswede[G]. Climate regulation ecosystem services of biofuels: a new paired flux tower study using comparing loblolly pines and switchgrass ecosystems. Poster presentation. American Geophysical Union Fall Meeting. San Francisco, California, December 2016.

O'Halloran, T.L**, R.Q. Thomas**, and B.J. Ahlswede[G]. Environmental Controls on Loblolly Pine Productivity in Central Virginia. Poster presentation. American Geophysical Union Fall Meeting. San Francisco, California, December 2016.

Horn, K.J.[P]**, R.Q. Thomas**, L.H. Pardo, C.M. Clark, M.E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Enhanced Carbon Uptake from Nitrogen Deposition in North American Forests is a Species Dependent Phenomenon. Poster presentation. American Geophysical Union Fall Meeting. San Francisco, California, December 2016.

Horn, K.J.[P]**, R.Q. Thomas**, L.H. Pardo, C.M. Clark, M. E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Assessing regional impacts of N deposition on forests through species specific responses. Oral Presentation. National Atmospheric Deposition Program meeting, Santa Fe, New Mexico, October 2016.

Horn, K.J.[P]**, R.Q. Thomas**, L.H. Pardo, C.M. Clark, M. E. Fenn, G.B. Lawrence, S. Perakis, E.A.H. Smithwick, D. Baldwin, S. Braun, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S.B. St.Clair, R. Warby, and S. Watmough. Changes in Tree Growth and Survival in Response to Atmospheric Nitrogen Deposition for the Contiguous United States. Oral presenation. National Atmospheric Deposition Program CLAD Focus meeting, Madison, Wisconsin, April 2016.

Ahlswede, B.J.[G], **R.Q. Thomas**, and T.L. O'Halloran. The Two Towers: An ecosystem story as told by the atmosphere. Oral presentation. Virginia Tech Department of Forest Resource and Environmental Conservation Seminar Series, Blacksburg, Virginia, April 2016.

Ahlswede, B.J.[G], **R.Q. Thomas**, and T.L. O'Halloran. The Two Towers: An ecosystem story as told by the atmosphere. Poster presentation. Interfaces of Global Change Symposium, Blacksburg, Virginia, April 2016.

Jersild, A.L.[G], **R.Q. Thomas**, E.B. Brooks, R. Teskey, R. Wynne, D.A. Sampson, C. Gonzalez, T. Fox, V.A. Thomas, and L. Smallman. Relative role of parameter vs. climate uncertainty for predictions of future Southeastern U.S. pine carbon cycling. Oral presentation. Virginia Space Grant Consortium Conference Hampton, Virginia, April 2016.

Jersild, A.L.[G], **R.Q. Thomas**, E.B. Brooks, R. Teskey, R. Wynne, D.A. Sampson, C. Gonzalez, T. Fox, V.A. Thomas, and L. Smallman. Relative role of parameter vs. climate uncertainty for predictions of future Southeastern U.S. pine carbon cycling. Oral presentation. Virginia Tech Graduate Student Research Conference, Blacksburg, Virginia, March 2016.

Dallas, E., T.L. O'Halloran, and **R.Q. Thomas**. Investigating effect of forest management on light use efficiency in loblolly pine. Poster presentation. American Geophysical Union Virtual Poster Showcase. Virtual. February 2016.

2015

Jersild, A.L.[G]**, R.Q. Thomas**, E.B Brooks, R. Teskey, R. Wynne, D.A. Sampson, C. Gonzalez, T. Fox, V. Thomas, and L. Smallman. Relative role of parameter vs. climate

uncertainty for predictions of future Southeastern U.S. pine carbon cycling. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Clark, C.M.**,** K.J. Horn[P], **R.Q. Thomas**, S. Simkin, L.H. Pardo, T. Blett, G.B. Lawrence, S. Belyazid, and J.N. Phelan. Synthesis of recent advances in critical loads research on impacts from atmospheric nitrogen deposition on terrestrial plant communities. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Thomas, R.Q., A.L. Jersild[G], E.B. Brooks, R.H. Wynne, D.A. Sampson, C.A. Gonzalez-Benecke, R.O. Teskey, and E.J. Ward. Predicting future productivity of Southeastern U.S. pine ecosystems in a changing climate using data assimilation with diverse data sources. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Ward, E. J., **R.Q. Thomas**, G. Sun, S.G. McNulty, J.-C. Domec, A. Noormets, and J.S. King. Incorporating Ecosystem Experiments and Observations into Process Models of Forest Carbon and Water Cycles: Challenges and Solutions. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Bonan, G.B**.**, D. Lombardozzi, W.R. Wieder, K.T. Lindsay, and **R.Q. Thomas**. Chasing Perfection: Should We Reduce Model Uncertainty in Carbon Cycle-Climate Feedbacks. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Ensor, B. L.**,** D. Scott, B.D. Strahm, **R.Q. Thomas**, and E.T. Hester. Spatial and Temporal Trends in Greenhouse Gas Fluxes from a Temperate Floodplain Along a Stream-Riparian-Upland Gradient. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Cheng, S.J., **R.Q. Thomas**, J.V. Wilkening, P. Curtis, T.D. Sharkey, and K.J. Nadelhoffer. Testing Earth System Model Assumptions of Photosynthetic Parameters with *in situ* Leaf Measurements from a Temperate Zone Forest. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2015.

Perry, C.H., K.J. Horn[P], **R.Q. Thomas**, L.H. Pardo, E.A.H. Smithwick, D. Baldwin, G.B. Lawrence, S.W. Bailey, S. Braun, C.M. Clark, M. Fenn, A. Nordin, J.N. Phelan, P.G. Schaberg, S. St. Clair, R. Warby, S. Watmough, and S.S. Perakis. Repeated measures from FIA data facilitates analysis across spatial scales of tree growth responses to nitrogen deposition from individual trees to whole ecoregions. Oral presentation. 12th biennial Forest Inventory and Analysis symposium, Portland, Oregon, December 2015.

Horn, K.J.[P]**, R.Q. Thomas**, E.A.H. Smithwick, L.H. Pardo, D. Baldwin, G.B. Lawrence, S.W. Bailey, S. Braun, C.M. Clark, M. Fenn, A. Nordin, C.H. Perry, J.N. Phelan, P.G. Schaberg, S. St. Clair, R. Warby, S. Watmough, and S. Perakis. Continental Scale Analysis of Tree Growth, Mortality, and Recruitment Responses to Nitrogen Deposition Reveal Regional and Species-specific variability that May Enhance and Concentrate Mitigation Efforts. Oral presentation. 9[Th] International Conference on Acid Deposition. Rochester, New York, October 2015.

Horn, K.J.[P]**, R.Q. Thomas**, E.A.H. Smithwick, L.H. Pardo, D. Baldwin, G.B. Lawrence, S.W. Bailey, S. Braun, C.M. Clark, M. Fenn, A. Nordin, C.H. Perry, J.N. Phelan, P.G.

Schaberg, S. St. Clair, R. Warby, S. Watmough, and S. Perakis. Species Specific Asynchronies in the Response of Tree Growth and Mortality to Nitrogen Deposition at the Continental Scale. Oral presentation. 100th Ecological Society of America Annual Meeting. Baltimore, Maryland, August 2015.

Ahlswede, B.J.,[G] and **R.Q. Thomas**. What to plant and where to plant it; modeling the biophysical effects of temperate forests on climate using the Community Earth System Model. Poster presentation. 100th Ecological Society of America Annual Meeting. Baltimore, Maryland, August 2015.

Smithwick, E.A.H., D. Baldwin, L. H. Pardo, **R.Q. Thomas**, K.J. Horn[P], G.B. Lawrence, S.W. Bailey, S. Braun, C.M. Clark, M. Fenn, A. Nordin, S.S. Perakis, C.H. Perry, J.N. Phelan, P.G. Schaberg, S. St.Clair, R. Warby, and S. Watmough. Linking plants and soils to understand ecosystem thresholds in response to N deposition at a continental level. Oral presentation. 100th Ecological Society of America Annual Meeting. Baltimore, Maryland, August 2015.

Thomas, R.Q., and B.J. Ahlswede[G]. Towards forestry in the Community Land Model. Oral presentation. Spring Land-Biogeochemistry Community Earth System Model Working Group Meeting. Boulder, Colorado, February 2015.

2014

Thomas, R.Q. and M. Williams. A model using marginal efficiency of investment to analyze carbon and nitrogen interactions in forested ecosystems. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2014.

Ahlswede, B. J.,[G] and **R.Q. Thomas**. Sub-biome variability in the biophysical influence of forests on climate using the Community Earth System Model. Poster presentation. American Geophysical Union Fall Meeting, San Francisco, California, December 2014.

Ahlswede, B. J.,[G] and **R.Q. Thomas**. Biophysical Effects of Sub-Biome Deforestation and Implications for Future Forest Management in the Southeast. Poster presentation. PINEMAP Annual Meeting, Athens, Georgia, May 2014.

Ahlswede, B. J.,[G] and **R.Q. Thomas**. The Community Earth System Model at Virginia Tech. Poster presentation. Virginia Tech High Performance Computing Day Poster Session, Blacksburg, VA, April 2014.

2013

Pardo, L.H., M. J. Robin-Abbott, C.M. Clark, L.H. Geiser, J.A. Lynch, C.B. O'Dea, S. Simkin, D.C. Baldwin, K.J. Horn[P], E.A.H. Smithwick, and **R.Q. Thomas**. Towards a new uncertainty framework for empirical loads. Oral presentation. U.S. National Acid Deposition Program Annual Meeting. Indianapolis, Indiana, October 2013.

Smithwick E.A. H**.,** D.C. Baldwin, K.J. Horn[P], L.H. Pardo, and **R.Q. Thomas**. Integrating Plant Response with Soil Chemistry at a Continental Scale. Oral presentation. U.S. National Acid Deposition Program Annual Meeting. Indianapolis, Indiana, October 2013.

Thomas, R.Q. Challenges modeling C:N interactions in terrestrial models. Oral presentation. PnET Modeling Workshop at the University of New Hampshire, Durham, New Hampshire, May 2013.

2012

Thomas, R.Q., G.B. Bonan, and C.L. Goodale. Evaluating alternative approaches to modeling terrestrial C and N interactions using observations of ecosystem response to nitrogen deposition and experimental fertilization. Oral presentation. American Geophysical Union Fall meeting. San Francisco, California, December 2012.

Thomas, R.Q., G.B. Bonan, and C.L. Goodale. Using observation and experimental data to improve carbon and nitrogen cycling in Earth System models. Poster presentation. NSF RCN FORECAST conference "New Perspectives on Data Assimilation in Global Change Science", Woods Hole, Massachusetts, October 2012.

Thomas, R.Q., S. Zaehle, P.H. Templer, and C.L. Goodale. Global pattern of nitrogen limitation: Confronting two global biogeochemical models with observations. Oral presentation. Community Earth System Model - Spring Working Group Meeting. Boulder, Colorado, March 2012.

Thomas, R.Q., G.B. Bonan, and C.L. Goodale. Insights into mechanisms governing forest carbon response to nitrogen deposition: a model-data comparison using observed responses to nitrogen addition. Oral presentation. Community Earth System Model - Spring Working Group Meeting. Boulder, Colorado, February 2012.

2011

Thomas, R.Q., S. Zaehle, P.H. Templer, and C.L. Goodale. An inter-comparison of nitrogen limitation in global land surface models with carbon and nitrogen cycles (CLM-CN and O-CN). Oral presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2011.

Thomas, R.Q., S. Zaehle, P.H. Templer, and C.L. Goodale. An inter-comparison of nitrogen limitation in global land surface models with carbon and nitrogen cycles (CLM-CN and O-CN). Poster presentation. 27th New Phytologist symposium: Stoichiometric Flexibility in Terrestrial Ecosystems, Oracle, Arizona, September 2011.

Goodale, C.L., **R.Q. Thomas**, M.S. Weiss, C. Tonitto. Nitrogen deposition effects on forest carbon storage, Nitrogen and the Human Endeavor. Oral presentation. American Chemical Society annual meeting, Denver, Colorado, August 2011

Yanai, R.D., E.B. Rastetter, M.C. Fisk, T.J. Fahey, **R.Q. Thomas**, and M.A. Vadeboncoeur. Multi-Element Limitation: Simulation and Measurements Suggest that P is More Limiting than N in Young Northern Hardwood Ecosystems. Oral presentation. Ecological Society of America Annual Meeting, Austin, Texas, August 2011.

Thomas, R.Q., C.L. Goodale, G.B. Bonan, N.M. Mahowald, D.M. Ricciuto, and P.E. Thornton. An evaluation of carbon-nitrogen coupling in a global land surface model (CLM-CN) using plot-level nitrogen fertilization experiments. Poster presentation. INTERFACE Meeting: How do we improve Earth system models? Integrating Earth system models, ecosystem models, experiments and long-term data, Captiva Island, Florida, March 2011.

2010

Thomas, R.Q., C.L. Goodale, G.B. Bonan, N.M. Mahowald, D.M. Ricciuto, and P.E. Thornton. The role of nitrogen availability in land-atmosphere interactions: a systematic

evaluation of carbon-nitrogen coupling in a global land surface model using plot-level nitrogen fertilization experiments. Poster presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2011.

Hurtt, G.C., R. Dubayah, J. Fisk, **R.Q. Thomas**, K.A. Dolan, and H.H. Shugart. Terrestrial Ecosystem Dynamics Over Complex Terrain: Challenges for the Future. Oral presentation. America Geophysical Union Fall meeting, San Francisco, California, December 2010

Thomas, R.Q. Nitrogen and the global carbon cycle: Insights from experimental N additions and N deposition gradients. Oral presentation. Community Climate Model Biogeochemistry Working Group Meeting, National Center for Atmospheric Research, Boulder, Colorado, February 2010.

2009

Goodale, C.L., **R.Q. Thomas**, F. Dentener, M.B. Adams, J. Baron, B. Emmett, C.D. Evans, I. Fernandez, P. Gundersen, F. Hagedorn, G. Lovett, A. Kulmatiski, S. McNulty, F. Moldan, A. Melvin, S. Ollinger, P. Schleppi, and M. Weiss. Nitrogen Deposition and Forest Carbon Sequestration: A Quantitative Review from Plot to Global Scales. Oral presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2009.

Thomas, R.Q., C.D. Canham, K.C. Weathers, and C.L. Goodale. Nitrogen deposition increases tree carbon storage and shifts species' competitive balance. Oral presentation. National Atmospheric Deposition Program Meeting, Saratoga Springs, New York, October 2009.

Thomas, R.Q., C. D. Canham, K. C. Weathers, and C. L. Goodale. Seeing the trees for the forest: Nitrogen deposition alters tree growth and survival across the northeastern U.S., responses vary by species. Poster presentation. North American Carbon Program meeting, San Diego, California, February 2009

2008

Thomas, R.Q., C.D. Canham, K.C. Weathers, and C.L. Goodale. Seeing the trees for the forest: Nitrogen deposition alters tree growth and survival across the northeastern U.S., responses vary by species. Poster presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2008.

Hurtt, G.C., J. Fisk, **R.Q. Thomas**, R. Dubayah, P. Moorcroft, and H. Shugart. Linking Models and Data on Vegetation Structure. Oral presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2008.

Thomas, R.Q., G.C. Hurtt, and R.O. Dubayah. Lidar and height structured ecosystem models: the importance of spatial scale and height accuracy. Poster presentation. Veg 3D Workshop for DESDynI Planning. University of Virginia, Charlottesville, Virginia, March 2008.

2007

Hurtt, G.C., **R.Q. Thomas**, and R.O. Dubayah. Beyond Potential Vegetation II: Using Repeat Lidar Data on Changes in Vegetation Height to Test Model Predictions of Ecosystem Dynamics. Oral presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2007.

Thomas, R. Q., G. H. Hurtt, R. O. Dubayah, K. J. Ranson, S. V. Ollinger, and J. D. Aber. Consequences of fine-scale heterogeneity for predictions of the carbon cycle using lidar data and a height-structured ecosystem model at Hubbard Brook. Oral presentation. Hubbard Brook Experimental Forest Annual Meeting, Woodstock, New Hampshire, July 2007.

Thomas, R.Q., G.C. Hurtt, R.O. Dubayah, K.J. Ranson, S.V. Ollinger, and J. D. Aber. The importance of heterogeneity: integrating lidar remote sensing and a height-structured ecosystem model to improve estimates of forest structure and dynamics at Hubbard Brook Experimental Station. Poster presentation. North American Carbon Program meeting, Colorado Springs, Colorado, January 2007.

2006

Thomas, R. Q., G.C. Hurtt, R.O. Dubayah, K.J. Ranson, S.V. Ollinger, J.D. Aber. and M. Schliz. Fusing an ecosystem model and lidar remote sensing to study forests with biotic and abiotic heterogeneity. Oral presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2006.

Thomas, R.Q., G.C. Hurtt, R.O. Dubayah, K.J. Ranson, S.V. Ollinger, J.D. Aber. The importance of heterogeneity: integrating lidar remote sensing and height-structured ecosystem models to improve estimation forest carbon stocks and fluxes. Poster presentation. International Union of Forest Research Organizations Regional Forest Response to Environmental Change Northeast US Workshop, Cornwall, New York, October 2006.

2005

Thomas, R.Q., J.R. Kellner, and D.R. Peart. Potential and limitations of satellite imagery to identify deaths of individual trees in a Central American tropical rain forest. Poster presentation. American Geophysical Union Fall meeting, San Francisco, California, December 2005.

Kellner, J.R., R.Q. Thomas, D.R. Peart, M.L. Clark, and D.B. Clark. Small-Footprint LiDAR for Individual-Based Tree Demography in a Lowland Neotropical Rain Forest. Oral presentation. Silviscan: Lidar Applications in Forest Assessment and Inventory, Blacksburg, Virginia, September 2005.

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
Ecological Society of America
Ecological Forecasting Initiative