ALEXANDRA M. THORN
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EDUCATION

Ph.D., Department of Biology, Tufts University 2012
Dissertation: *Theoretical and Empirical Approaches to Examining the Interplay between Vascular Constraints and Plant Responses to Environmental Heterogeneity*

M.S., Horticulture and Agronomy, University of California, Davis 2003
Thesis: *Considerations in Spatially Explicit, Individual Based Modeling of Waterfowl Foraging Behaviors*

B.A., Biological Sciences, Wellesley College, graduated with Honors 2001

SUMMARY

Post-secondary educator in GIS, Environmental Science, and Food Systems and researcher with a PhD in Biology PhD, specialized in modeling, spatial analysis, and the environmental impact of food production.

TEACHING POSITIONS

Lecturer, Tufts University 2019 - present
Courses: Food Systems Modeling and Analysis (2 semesters)
Introduction to Geographic Information Systems (6 semesters)
Fundamentals of Geographic Information Systems (8 semesters)
Directed studies:
Agricultural and Environmental Modeling – Fall 2022 (3 students)

Adjunct Professor, Bunker Hill Community College 2018 - 2020
Course: Introduction to Geographic Information Systems (6 semesters)
Environmental Science I with Lab (1 semester)

Co-instructor, Tufts University Fall 2017
Course: Agricultural Science and Policy II (1 semester)

Instructor, Boston University Spring 2012
Courses: Biogeography (1 semester),
Atmosphere science (1 semester)

Teaching Assistant, Tufts University 2005 - 2011
Courses: Cells and Organisms (Lab instructor: 4 semesters),
Organisms and Evolution (Lab instructor: 4 semesters),
Biostatistics (1 semester),
Environmental Biology (1 semester)

Instructor, Bay State College 2004 - 2005
Courses: Introductory Biology (2 semesters),
Ecology (1 semester)

Teaching Assistant, UC Davis Spring 2003
Courses: Evolution of Crop Plants (1 quarter),
Plant Breeding (1 quarter)

Teaching Assistant, Wellesley College Spring 1999
Course: Computer Programming and Problem Solving (1 semester)

PROFESSIONAL DEVELOPMENT

Tufts Famine Forecasting Hackathon 2023
Center for the Enhancement of Learning and Teaching (CELT) trainings & events 2020
-Modeling Student-Centered Learning in an Online Course
-Roundtable Discussing Race and Racism
-Building connection and forstering deeper learning through online group work
-The role of the instructor in online group work
-Online group work in larger classes
-Using VoiceThread for Collaboration, Projects, and Feedback
3rd Annual Center for Equity and Cultural Wealth Institute, Bunker Hill 2020
2nd Annual Center for Equity and Cultural Wealth Institute, Bunker Hill 2019
31st Annual Teaching Conference, Tufts University 2018
Graduate Institute for Teaching Fellowship, Tufts University 2017
Watershed Optimization Support Tool (WMOST) V2 Training, EPA Region 1 2016
Integrating Community Engagement in STEM, NHTI 2013
NSF Science: Becoming the Messenger, UNH 2013
Affiliate: Program on Science, Technology and Society, Harvard University 2011
Workshop on Communicating Science to the Public, Annual ESA Meeting 2008
Seminar in College Teaching Certification Program, UC Davis 2003
Teaching in a Time of Change Certification Program, UC Davis 2003

RESEARCH EXPERIENCE

Postdoctoral Scholar, Tufts University 2016 – 2018
Assessing current and potential biophysical capacity to produce forages for ruminant meat production in New England and New York. Responsible for modeling forage productivity and land use change in participatory scenarios for increased beef productivity in the region.

Part-time Researcher, University of New Hampshire 2015 – 2016
Assessed impact on ecosystem services for land cover change scenarios: impervious cover, watershed health, habitat impact, food production. Analyzed limitations of NLCD impervious cover map as basis for scenarios of watershed health in New Hampshire's Great Bay watershed.

Postdoctoral Researcher, University of New Hampshire 2012 – 2015
Generalized the forest ecosystem model PnET for use in grasslands, shrublands, and savannas. With researchers at Harvard Forest, developed high resolution boosted regression tree models for forest conversion to development in New England. Collaborated with an interdisciplinary team to develop land cover change scenarios for New Hampshire and produced maps of land cover scenarios, population density, and impervious cover; independently developed and implemented models simulating future land cover change for each scenario.

Doctoral Research, Department of Biology, Tufts University 2005 – 2012
Integrated empirical research with modeling to study resource uptake and long-distance transport in plants.

Summer Research, Department of Public Health, Tufts University Summer 2005
Developed software for use in modeling cyclic annual disease outbreaks. Assembled Geographic Information Systems (GIS) data necessary for prediction of the possibility of an avian influenza outbreak in North America.

Masters Research, Agronomy and Range Science Dept., UC Davis 2001 - 2003
Constructed spatially explicit simulation models of waterfowl foraging using GRASS GIS. Analyzed outputs resulting from different assumptions.

Undergraduate Honors Research, Wellesley College 2000 - 2001
Compared output of equivalent simple population models constructed using RAMAS and STELLA modeling software packages and determined reasons for differing output.

Research Experience for Undergrads Intern, University of Virginia Summer 2000
Independent research: Mapped and analyzed spatial distribution of trees in an abandoned agricultural field undergoing succession, using GPS and ARCView GIS.

JOURNAL ARTICLES

Thorn, A., C. Peters, and M. Baker. 2021. Estimating Biological Capacity for Grass-finished Ruminant Meat Production in New England and New York. *Agricultural Systems* 189: 102958

Borsuk, M., G. Mavrommati, N. Samal, S. Zuidema, W. Wollheim, S. Rogers, **A. Thorn**, D. Lutz, M. Mineau, C. Grimm, C. Wake, R. Howarth, K. Gardner. 2019. Deliberative multiattribute valuation of ecosystem services across a range of regional land-use, socioeconomic, and climate scenarios the upper Merrimack River watershed, New Hampshire, USA. *Ecology and Society* 24: 11

Samal, N., W. Wollheim, S. Zuidema, R. Stewart, Z. Zhou, M. Mineau, M. Borsuk, K. Gardner, S. Glidden, T. Huang, D. Lutz, G. Mavrommati, **A. Thorn**, C. Wake. 2017. A coupled terrestrial and aquatic biogeophysical model of the Upper Merrimack River watershed, New Hampshire, to inform ecosystem services evaluation and management under climate and land-cover change. *Ecology and Society* 22: 18

Thorn, A., C. Wake, C. Grimm, C. Mitchell, M. Mineau, and S. Ollinger. 2017. Development of scenarios for land cover, population density, impervious cover, and conservation in New Hampshire, 2010–2100. *Ecology and Society* 22: 19

Thorn A., J. Thompson, J. Plisinski. 2016. Patterns and predictors of recent forest conversion in New England. *Land* 5: 30 doi:10.3390/land5030030

Morton, T.A.L., **A. Thorn**, J. M. Reed, R. Van Driesche, R. A. Casagrande, and F. S. Chew. 2015. Modeling the decline and potential recovery of a native butterfly following serial invasions by exotic species. *Biological Invasions* 17: 1683-1695

Thorn, A., J. Xiao, and S. Ollinger. 2015. Generalization and evaluation of the process-based forest ecosystem model PnET-CN for other biomes. *Ecosphere* doi: 10.1890/ES14-00542.1

Goring, S.J., K.C. Weathers, W. K. Dodds, P.A. Soranno, L.C. Sweet, K. S. Cheruvelil, J.S. Kominoski, J. Rüegg, **A. Thorn**, Utz, R.M. 2014. Improving the culture of interdisciplinary collaboration in ecology by expanding measures of success. *Frontiers in Ecology and the Environment* 12: 39-47

Thorn, A. and C. Orians. 2011. Modeling the influence of differential sectoriality on the photosynthetic responses of understory saplings to patchy light and water availability. *Trees – Structure and Function* 25: 833-845

Thorn, A. and C. Orians. 2011. Patchy nitrate promotes inter-sector flow and ^{15}N allocation in *Ocimum basilicum*: A model and an experiment. *Functional Plant Biology* 38: 879-887

Thorn, A. and C. Orians. 2011. Partial defoliation and hydraulic integration in *Ocimum basilicum*: Testing a model for sectored xylem flow using ^{15}N labeling. *American Journal of Botany* 98: 1816-1824

Orians, C., **A. Thorn**, and S. Gómez. 2011. Herbivore-induced resource sequestration in plants: Why bother? *Oecologia* 167: 1-9

OTHER PUBLICATIONS

Mitchell, C, J. Hammond-Rowan, C. Wake, **A. Thorn** and C. Grimm (in prep.) When is the Right Time for Rural Communities to Save Place? UNH Carsey School - Issue Brief, <http://carsey.unh.edu/publications>

Wake, C., C. Grimm, and **A. Thorn**. January 22, 2015. Blending natural resources and economic development. *Business NH Magazine*, 80-81

Thorn, A. 2013. What Will the Future Look Like? URL: <http://ecosystemsandsociety.blogspot.com/2013/07/what-will-future-look-like.html>

INVITED PRESENTATIONS

Thorn, A. What Will the Future Look Like? Scenarios for Land Cover in New Hampshire. Environmental Studies Lunch and Learn. Tufts University, Medford, MA, April 5, 2018 <https://www.youtube.com/watch?v=3EGWg3tQJ78&feature=youtu.be&t=1s>

CONTRIBUTED PRESENTATIONS

Thorn, A., C. Peters. Estimating Biological Capacity for Grass-Based Ruminant Meat Production in New England and New York. American Society of Agronomy Meeting. Tampa, FL, 2017

Thorn, A., C. Wake, F. Rubin, and D. Justice. Assessing the value of local data: Estimating current and future watershed health based on impervious cover estimates from the National Land Cover Database versus local data derived from aerial photography. Ecological Society of America Annual Meeting. Fort Lauderdale, FL, 2016

Zuidema, S., **A. Thorn**, W. Wollheim, C. Wake and M. Mineau. Understanding potential futures of riverine chloride impairment in New England USA Due to Climate Change, Groundwater Storage, and Human Activities. American Geophysical Union Fall Meeting, San Francisco, CA, 2015

Thorn, A., C. Wake, C. Grimm, B. Wauchope, C. Mitchell, and S. Ollinger. Quantitative scenarios for land cover change in New Hampshire: What is the potential impact on ecosystem services? Ecological Society of America Annual Meeting. Baltimore, MA, 2015

Thorn, A., C. Wake, C. Grimm, B. Wauchope, and C. Mitchell. What Will New Hampshire's Land Cover be in 2050? S3 RCN Workshop: Scenarios to Solutions. South Casco, ME, 2014

Thorn, A., J. Thompson, and J. Plisinski. Patterns and predictors of recent forest conversion in New England. S3 RCN Workshop: Scenarios to Solutions. South Casco, ME, 2014

Thorn, A. and C. Wake. Patterns of land-cover change in New Hampshire: Geographic drivers of logging and clearcuts in recent years. Ecological Society of America Annual Meeting. Sacramento, CA, 2014

Thorn, A., J. Xiao, and S. Ollinger. Generalizing a forest ecosystem model: Using PnET-CN to simulate carbon and water fluxes in grasslands and shrublands. Ecological Society of America Annual Meeting. Minneapolis, MN, 2013

Thorn, A. and C. Orians. Plumbing constrains root precision: A bottom-up model for the role of sectoriality in localized root proliferation. Ecological Society of America Annual Meeting. Austin, TX, 2011

Thorn, A. and C. Orians. Transpirational tug-o-war: Modeling vascular constraints to photosynthesis in patchy light and limited water supply. Ecological Society of America Annual Meeting. Pittsburgh, PA, 2010

Thorn, A. and C. Orians. Modeling growth consequences of induced defense responses in plants: Integrating herbivore-induced storage and resistance. Ecological Society of America Annual Meeting. Albuquerque NM, 2009

Thorn, A. and C. Orians. Modeling sectored resource allocation in patchy soils: A new perspective on root precision and nutrient foraging by plants. Ecological Society of America Annual Meeting. Milwaukee WI, 2008

Thorn, A. and C. Orians. Modeling Xylem Sectoriality with the Ohm's Law Analogy: Quantifying patterns and ecological consequences across species. Plant Biology and Botany Joint Congress. Chicago IL, 2007

Thorn, A. and C. Orians. Modeling Plant Sectoriality Using Markov Chains. Joint Annual meeting of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists. Boston MA, 2006

Thorn, A., J. M. Eadie, J. Schank and R. Plant. Spatially explicit, individual-based modeling of waterfowl foraging behavior. 3rd N. Am. Duck Symp. Sacramento CA, 2003

FELLOWSHIPS/AWARDS/HONORS

Graduate Student Research Awards, Tufts University, 2009
Graduate Student Research Awards, Tufts University, 2007
Block Grant Fellowship, UC Davis, 2002-2003
First Year University Fellowship, UC Davis, 2001-2002
Phi Beta Kappa, 2001
Sigma Xi, 2001