Dat Q. Tran

Office of Economic and Demographic Research, 111 W. Madison Street,
Florida Legislature Tallahassee, Florida
Email: tran.dat@leg.state.fl.us Website: https://dattran-hydroeco.github.io/

EDUCATION

Ph.D. Energy & Environmental Systems

North Carolina Agricultural and Technical State University, NC 12/2016

Concentration: Energy & Environmental Sciences & Economics

Dissertation title: Entropy Approach: An Application to Estimation of the Dynamics of Tillage Choice in Iowa

M.Eng. Infrastructure in Civil Engineering, Chulalongkorn University, Thailand 05/2011

B.S. Civil Engineering, Can Tho University, Vietnam 11/2007

B.S. Hydraulic Engineering, Can Tho University, Vietnam 09/2007

Master of Data Science (online), University of Texas, Austin 08/2021-Present

PROFESSIONAL CERTIFICATE

Data Science, Harvard University Expected: 12/2023

ArcGIS 2: Essential Workflows, ESRI 05/2015

WORK EXPERIENCE

Florida Legislature 08/2021-Present

Economist, Office of Economic and Demographic Research

- Work as an economist, focusing on water economics and policy topics. Main projects include developing statewide forecasting models for Florida water supply and demand management expenditure, analyzing costs and returns for alternative water supply options, and accounting and projecting water supply revenues and expenditures

University of California, Riverside 05/2020-07/2021

Postdoctoral Research Associate, School of Public Policy

- Worked with Drs. Bruce Babcock and Mehdi Nemati (University of California, Riverside) to (1) develop a method to estimate regional supply elasticities of major crops in the US, (2) develop an acreage supply model for different regions of California agriculture and simulate the effects of groundwater restrictions on acreage, production and crop price, and (3) use big urban water consumption data (about 700 million observations) to predict hourly water consumption and

estimate rebound effects in urban water conservation policies in California

University of Arkansas, Fayetteville, Arkansas 01/2018-04/2020

Postdoctoral Research Associate, Department of Agricultural Economics and Agribusiness

- Worked with Dr. Kent Kovacs (University of Arkansas), Drs. Helen E. Dahlke (UC Davis) and Ahmed Ali (California Department of Water Resources), and Dr. Steve Wallander (USDA-ERS) to develop economic models and then incorporate the models into the MODFLOW model to study the economics of Managed Aquifer Recharge for aquifers of the Mississippi Embayment under uncertainty of climate extremes
- Worked with Dr. Alvaro Durand-Morat (University of Arkansas), Hyunwoo Kang (Oregon State University), Drs. Bradford Mills and Venkataramana Sridhar (Virginia Tech) to develop models to study the implications of climate extremes and salinity intrusion in the Mekong Delta for rice production and trade

North Carolina A&T State University, Greensboro, North Carolina 01/2017-12/2017

Postdoctoral Research Associate, Department of Economics

- Developed an application of Network Flow to model optimal tillage-crop choices and to estimate opportunity costs and shadow prices of continuous conservation tillage
- Developed a statistical approach to test complementarity between the uses of continuous no-till and cover crops with aggregate data and incomplete data
- Incorporated tillage-crop choices dynamics into a process-based model, Soil and Water Assessment Tool (SWAT), to evaluate the impacts of periodic tillage and crop rotation choices on water quality in the Upper Mississippi River Basin
- Developed and wrote grant proposals

North Carolina A&T State University, Greensboro, North Carolina 07/2016-12/2016

Graduate Research Assistant, Department of Natural Resources and Environmental Design

- Developed a stochastic bundled tillage-crop choices model with aggregate data
- Analyzed the effect of Highly Erodible Land and crop rotation on the adoption of tillage

Texas A&M AgriLife Research & Extension Center, Temple, Texas 01/2016-06/2016

Visiting scholar

- Worked with the Texas A&M AgriLife Research modeling team (SWAT model team) to incorporate tillage dynamics into the SWAT model

USDA - ERS, Washington DC 09/2015-12/2015

Intern, Conservation and Environmental Branch of USDA-ERS

- Estimated conservation tillage adoption rates with the CEAP dataset
- Became familiar with the ARMS dataset

North Carolina A&T State University, Greensboro, North Carolina 09/2012-08/2015

Graduate Research Assistant, Department of Natural Resources and Environmental Design, Economics, and Energy and Environmental Systems

- Integrated Conservation Agriculture (CA) Systems and drip irrigation to study the provision of fresh, chemical-free foods in urban and agricultural landscapes, support curriculum development for high schools, and help solve food deserts
- Conducted plot experiments to study the effects of CA, floating island, agroforestry, and drip irrigation with high tunnels to increase farm income for small farmers and underserved population
- Worked with farmers and interacted with high school, early STEM, and undergraduate students to demonstrate how to apply rain gardens, floating islands, CA systems, and drip irrigation for increasing vegetable production, reducing run-off, and enhancing groundwater recharge
- Advised undergraduate and high school students conducting research projects
- Analyzed, visualized, and interpreted data for publications and reports
- Managed international project budgets and prepared paperwork for wire payments for sub-awardees
- Prepared paperwork for travel authorization and reimbursement
- Simulated the effects of different conservation tillage practices on run-off, sediment, nitrogen, and phosphorus loads, and carbon sequestration at the edge of the field using the APEX model

Can Tho University, Vietnam

Instructor, Department of Civil Engineering 09/2007-08/2012

- Taught undergraduate courses: Structures for Water Management, Fluid Mechanics and Hydraulics, Fluid Mechanics and Hydraulics Laboratory, and Pumps and Pumping Stations

---

PUBLICATIONS (link to my Google Scholar profile)

- Ali, A.M. A., **Tran, D.Q.,** Kovacs, K & Dahlke, H. Hydro-economic modeling of managed aquifer recharge in the lower Mississippi. *Journal of the American Water Resources Association. 00(0)[accepted], 1-22.*
- Nemati, M., **Tran, D.Q** & Schwabe, K. 2023. Residential Water Conservation and the

Rebound Effects: A Temporal Decomposition and Investigation. *Water Resources Research 59 (4), 1-18.*

- **Tran, D. Q**., Borisova, T & Beggs, K. 2023. The Cost of Alternative Water Supply and Efficiency Options under Uncertainty: An Application of Modern Portfolio Theory and Chebyshev's Inequality. *Earth 2023, 4(1), 40-65.*
- **Tran, D.** Q. 2023. Annual assessment of Florida's water resources: supply and demand. In: 2023 Annual assessment of Florida's water resources and conservation lands. Office of Economic and Demographic Research, Florida Legislature, Tallahassee, Florida.
- **Tran, D. Q.,** Beggs, K., Cosgray, C & MacPherson, D. 2022. Volume 2: Annual Assessment of Florida's Water Resources: Supply, Demand, and Quality. Office of Economic and Demographic Research, Florida Legislature, Tallahassee, Florida.
- Nemati, M & **Tran, D. Q**. 2022. The impact of COVID-19 on urban water consumption in the United States. *Water. 14(19), 3096.*
- Bairagi, S.K., Mishra, A. K & **Tran, D. Q**. 2021. Disentangling gender-differentiated impact on food security and poverty: empirical evidence from Vietnam. *Journal of International Development 34(3), 493– 511.*
- Babcock, B., Nemati, M., & **Tran, D. Q.** (2021). Will citrus survive SGMA? Understanding California grower crop choice. Citrograph, 12(4). 32–37.
- **Tran, D.Q.** & Kovacs, K. 2021. Climate uncertainty and optimal groundwater augmentation. *Water Resources Research. 57 (9), 1-19.*
- **Tran, D.Q.,** Kovacs, K & West, G. 2020. Spatial economic predictions of managed aquifer recharge for an agricultural landscape. *Agricultural Water Management. 66 (4), 666-682.*
- **Tran, D.Q.,** Kovacs, K & Wallander, S. 2020. Water conservation with managed aquifer recharge under increased drought risk**.** *Environmental Management***.** *241, 1-11*
- **Tran, D.Q.,** Kovacs, K & Wallander, S. 2019. Long-run optimization of landscape-level irrigation through managed aquifer recharge or expanded surface reservoirs. *Journal of Hydrology 579 (2019), 1-12.*
- **Tran, D.Q.** & Kurkalova, L.A. 2019. Persistence in tillage decisions: aggregate data analysis. *International Soil and Water Conservation Research 7 (2), 109-118.*
- Huynh, V. T. M., Avtar, M. R., Kumar, P., **Tran, D.Q.**, Tran, T. V., Behra, H. C & Masaaki, K. 2019. Groundwater Quality Assessment using Fuzzy-AHP in An Giang

province of Vietnam. *Geosciences 9 (330), 1-23.*

- Huynh, V. T. M., Masaaki, K., Tran, T. V., **Tran, D.Q.**, Le, K. N., Avtar, M. R & Osaki, M. 2019. Effects of Multi-Dike Protection Systems on Surface Water Quality in the Vietnamese Mekong Delta. *Water 11 (1010), 1-23.*
- Kurkalova, L.A & **Tran, D.Q**. "Impact of stover collection on Iowa land use." In: Li, R, and Monti, A (Eds.), Land Allocation for Biomass: Challenges and Opportunities, 2018.
- Le, K. N ., Manoj K. J., Jeong, J., Gassman, P, W., Reyes, M, R., Doro, L., **Tran, D.Q**. & Hok, L. 2018. Evaluation of long-term SOC and crop productivity within conservation systems using GFDL CM2.1 and EPIC. *Sustainability 10 (2665), 1-18.*
- Kurkalova, L.A. & **Tran, D.Q.** 2017. Is the use of no-till continuous or rotational? Quantifying tillage dynamics from time-ordered spatially aggregated data. *Journal of Soil and Water Conservation, 72(2), 131-138.*

PUBLICATIONS IN REVIEW AND PREPARATION

- **Tran, D. Q** & Kurkalova, L.A. Testing for complementary between the use of continuous no-till and cover crops: an application of Entropy and Bayesian approaches. *Revise and resubmit.*
- Pathak, S., Wang H., **Tran, D. Q** & Adusumilli, N., C. Quantifying the adoption dynamics of sustainable agricultural practices in the Mississippi Delta region. *In review.*
- Kovacs, K., **Tran, D. Q** & Durand-Morat, A. Managing water and long run aquifer abundance with climate uncertainty. *In review.*
- Babcock, B., Nemati, M & **Tran, D. Q**. Estimation of supply elasticities for non-exchange traded commodities. *In review.*
- **Tran, D.Q**., Nguyen, N.T. N., Huynh, V.T. M., Bairagi, S., Kieu, N. L., Tran, V. T & Durand-Morat, A. Modeling Saltwater Intrusion Risk in the Presence of Uncertainty. *Revise and resubmit (minor revisions): Science of The Total Environment.*
- **Tran, D. Q** & Borisova, T. Effects of future climatic and socioeconomic changes on Florida water demand. *In preparation.*
- **Tran, D.Q.,** Kovacs, K & Wallander, S. The buffer value of groundwater augmentation through managed aquifer recharge with stochastic stream flows. *In preparation.*
- **Tran, D.Q**., Nguyen, N.T. N., Bairagi, S., Kieu, N. L., Huynh, V.T. M. A regional hydro-economic model for estimating the costs of increased saltwater intrusion risk on

agriculture. *In preparation.*

- **Tran, D.Q.** & Kurkalova, L.A. Entropy approach: an application to the estimation of the changes in the dynamics of tillage choice. *In preparation.*
- **Tran, D.Q.** & Kurkalova, L.A. Cost of continuous conservation tillage: an application of Network Flow. *In preparation.*

CONFERENCE PRESENTATIONS

- Kovacs, K & **Tran, D.Q**. Irrigation choice through water supply augmentation in the presence of climate risk and uncertainty. Selected paper, 2023 Agricultural & Applied Economics Association Annual Meeting, Washington DC, 07/2023
- **Tran, D. Q**., Borisova, T., Beggs, K & Khakzad-Knight, S. Water Demand and Supply in Florida: Past, Current, and Future Trends. 2022. UF Water Institute Symposium - Sustainable Water Resources: Complex Challenges, Integrated Solutions, Gainesville, Florida, 02/2022.
- Kovacs, K & **Tran, D.Q**. Groundwater augmentation choice under surface water uncertainty. Selected paper, 2021 Annual Southern Agricultural Economics Association, Virtual, 02/2021
- **Tran, D.Q**., Kovacs, F. K., Ali, A.M. A & Dahlke, E. H. Hydro-economic modeling of Managed Aquifer Recharge for an agricultural landscape. Selected paper, 2020 Annual AGU Conference, Virtual, 12/2020
- **Tran, D.Q**., Kovacs, K & Wallander, S. Optimal groundwater augmentation through managed aquifer recharge and on-farm reservoir under uncertainty and risk. Selected paper, 2020 AAEA annual meeting, Virtual, 08/2020
- Ali, A.M. A., Dahlke, E. H., **Tran, D.Q.** & Kovacs, K. Simulation of Managed Aquifer Recharge (MAR) in the Mississippi Embayment Aquifer Using a Coupled Hydro-economic Model. Selected paper, 2019 Annual AGU Conference, San Francisco, CA, 12/2019
- **Tran, D.Q.** & Kovacs, K. Regional Economic Performance of an Agricultural Landscape with Optimal Groundwater Augmentation using Managed Aquifer Recharge. Selected paper, 2019 Annual Water Resources Conference, Salt Lake City, UT, 11/2019
- **Tran, D.Q**., Kovacs, K & Wallander, S. Slippage effects of managed aquifer recharge within agricultural lands: evidence from a landscape-level model. Selected paper, 2019

ISMAR10 symposium, Madrid, 05/2019

- **Tran, D.Q.** & Kovacs, K. A landscape-level approach to assessing the economic feasibility of managed aquifer recharge. Selected paper, 2019 SAEA annual meetings, Birmingham, Alabama, 02/2019
- **Tran, D.Q.** & Kurkalova, L.A. The cost of continuous conservation tillage compliance: an application of Network Flow approach. Selected paper, 2018 AERE-MEA annual meeting, Evanston, Illinois, 03/2018
- **Tran, D.Q.** & Kurkalova, L.A. The cost of continuous conservation tillage: An Application of Network Flows Approach. Selected paper, 2017 SEA annual meeting, Tampa, FL, 11/2017
- **Tran, D.Q.** & Kurkalova, L.A. Testing for complementarity between the use of continuous no-till and cover crops: an application of Entropy approach. Selected paper, 2017 AAEA annual meeting, Chicago, IL, 07-08/2017
- **Tran, D.Q.** & Kurkalova, L.A. Estimation of the changes in the dynamics of tillage choices in Iowa, 1992-2008. Selected paper, 2017 AAEA annual meeting, Chicago, IL, 07-08/2017
- **Tran, D.Q.** & Kurkalova, L.A. Modelling optimal field-level tillage choices: an application of network flows approach. Selected paper, 2017 NAREA annual meeting, Arlington, VA, 06/2017
- **Tran, D.Q.** & Kurkalova, L.A. Dynamic modeling of bundled tillage-crop choices: impact of soil erodibility on the interactions between continuous conservation tillage and crop rotations in Iowa. Selected paper, 2016 AAEA annual meeting, Boston, MA, 07-08/2016
- **Tran, D.Q.** & Kurkalova, L.A. Modeling the dynamics of conservation tillage adoption: effects of crop rotation and erodibility of the soil on continuous conservation tillage adoption in Iowa. Selected paper, 2016 SWCS annual meeting, Louisville, KY, 07/2016
- **Tran, D.Q.** & Kurkalova, L.A. The dynamics of farmers' tillage-crop choices: an application of Markov chain model using aggregate data for water quality modeling and management. Selected paper, 2016 ASABE annual meeting, Orlando, FL, 07/2016
- Kurkalova, L.A. & **Tran, D.Q**. Estimation of the crop-tillage choices with aggregate data: an application to modeling conservation tillage frequency. Selected paper, 2015 SWCS annual meeting, Greensboro, NC, 07/2015

- Edralin, D.I. A., Le, K.N., **Tran, D.Q**., Creason, S. & Reyes, M.R. Urban conservation agriculture with vegetables. 2014 SANREM-USAID annual meeting, Arlington, VA, 05/2014
- Edralin, D. I.A., Creason, S., Le, K. N., **Tran, D.Q.** & Reyes, M. R. Conservation Agriculture Oasissofa's for Urban Homes in North Carolina. 2014 ASABE annual meeting, Montreal, Canada, 07/2014
- Edralin, D.I.A., Joyce, A., Le, K.N., **Tran, D.Q**. & Reyes, M. R. Offseason production of vegetables in conservation agriculture with high tunnels. 2014 ASABE annual conference. Montreal, Canada 11/2014
- Reyes, M.R., Edralin, D.I.A., Creason, S., **Tran, D.Q**., Le, K.N. & Joyce, A. 2014. Engaging young students to agriculture STEM through Conservation Agriculture. Selected paper, 2014 ASA, CSSA, & SSSA international annual meeting, Long Beach, CA, 11/2014
- **Tran, D.Q**., Kurkalova, L.A., Reyes, M.R., Line, D., Hoyt, G., Osmond, D., Kieu, L.N. & Edgell, J. Cost-effectiveness analysis of agricultural pollution reduction at the farm scale using APEX. 2013 ASABE annual meeting, Kansas, KS, 07/2013
- Williams, M., **Tran, D.Q**., Edralin, D.I.A., Kieu, L.N., Reyes, M.R., Yeboah, A. & Hok, L. Natuculture: the benefits of practicing conservation agriculture in urban landscapes. 17th Biennial Research Symposium, Jacksonville, FL, 04/2013
- **Tran, D.Q**., Likitdecharote K., Srisatit, T, & Trung, H.N. Modeling the influence of river discharge and sea-level rise on salinity intrusion in Mekong Delta. Selected paper, The 1st Environment Asia International Conference "Environmental Supporting in Food and Energy Security: Crisis and Opportunity." Bangkok, Thailand, 03/2011
- **Tran, D.Q**. & Likitdecharote, K. Effect of sea-level rise and low flow on salinity intrusion in Mekong Delta. 2010 GMSTECH: International Conference for a Sustainable Greater Mekong Sub-region. Bangkok, Thailand, 08/2010

ONGOING STUDIES

- Projections of water demand in the Southeast U.S., with Dr. Tatiana Borisova (USDA-ERS)
- Effect of conservation easements on surrounding property values, with Natural Resources and Infrastructure Research Team at Florida Legislative Office of Economic and Demographic Research
- Estimation of regional supply elasticities using remote-sensing data, with Drs. Bruce Babcock & Mehdi Nemati (University of California, Riverside).

- Economics of managed aquifer recharge in the Mississippi Embayment: An integration of MODFLOW with an economic model, with Dr. Kent Kovacs (University of Arkansas), Drs. Helen E. Dahlke (UC Davis) and Ahmed Ali (California Department of Water Resources), and Dr. Steve Wallander (USDA-ERS)
- The economic impacts of salinity intrusion on coastal rice production: a comprehensive micro-macro analysis, with Dr. Alvaro Durand-Morat (University of Arkansas), Hyunwoo Kang (Oregon State University), Drs. Bradford Mills and Venkataramana Sridhar (Virginia Tech)
- Solar Energy Evolution and Diffusion in Mekong Delta, Vietnam, with Dr. Kieu Le (University of Arkansas and Can Tho University, Vietnam)
- An integrated tillage choice dynamics and biophysical modeling framework–impacts of periodic tillage on water quality in Upper Mississippi River Basin, with Lyubov A. Kurkalova (North Carolina A&T State)., Jaehak Jeong (Texas A&M) & Philip W. Gassman (Iowa State University)
- Modeling field level tillage dynamics with cropland data layer (CDL): an application of Entropy approach to evaluate the effect of shifting production toward corn monoculture on farmer's tillage choices in Iowa, with Lyubov A. Kurkalova (North Carolina A&T State) and Silvia Secchi (University of Iowa)

RESEARCH GRANTS

- $76,141, California Citrus Board, PI: Babcock, B (UCR). Impact of SGMA on Crop Mix in California, 2020-2021 (Funded).
- $149,994, USDA-AFRI, **PI: Tran, D.Q. (NCA&T)**, co-PIs: Kurkalova, L.A (NCA&T), Secchi, S (UI). Crop and tillage rotations: incorporating Cropland Data Layer in the meta-analysis of conservation tillage dynamics, Jan. 2018-Dec.2018. Not funded (medium priority).
- $499,988, USDA-AFRI, PI: Kurkalova, L.A (NCA&T), **co-PIs: Tran, D.Q. (NCA&T)**, Gassman, P (CARD-ISU), Jeong, J (Texas A&M, AgriLife), collaborators: Arnold, J (USDA-ARS), White, M (USDA-ARS), Campbell (CARD-ISU). Nutrient cycling in the Upper Mississippi River Basin: incorporating enhanced soil carbon cycling and tillage dynamics in the SWAT model, Jan. 2018-Dec.2019. Not funded (medium priority).
- $234,112, USGS, PI: Kovacs, K (UARK), co-PIs: O'Geen, A (UC Davis), Dahlke, H (UC Davis). Agricultural Water Supply Augmentation with Managed Aquifer Recharge, Sep 01, 2019-Sep 01, 2020 (not funded, **my role: draft the proposal**)

TEACHING EXPERIENCE

- Worked as an instructor at the Can Tho University in Vietnam and taught undergraduate courses (total students: more than 400 students).
- Co-taught and co-mentored students of 11 high school and early STEM students how to build raised beds to plant vegetables with conservation agriculture (CA) principles applied and conduct research projects on the effect of CA, horticulture, agroforestry, and high tunnel on soil health and crop productivity, North Carolina A&T (total students: more than 100 students).

COMPUTER SKILLS

- SAS, R, Stata, Python, ArcGIS
- MATLAB, GAMS
- Biophysical process-based models: APEX, SWAT
- Hydrodynamic models: MIKE 11, WUP-FIN
- Groundwater model: iMOD
- Engineering software: SAP, AutoCAD

AWARDS

- AAEA-ENV Travel Grant ($400) 2017
- Doctoral Honor Students 4.0 GPA, NCA&T 2016
- Honorable Mention, P3 student design competition, US EPA 2015
- Award for 3rd place poster presentation, 17th Biennial Research Symposium of the Association of 1890 Research Directors, Inc. (ARD) 2013
- Graduate Assistantship, NCA&T (about $30,784/year of support) 2012-2016
- Excellent Master Thesis, Chulalongkorn University, Thailand 2011
- Excellent Poster Presentation Award, International Conference for a Sustainable Greater Mekong Sub-region 2011
- Graduate Scholarship Program, Chulalongkorn University ($20,967) 2009-2011
- Fellowship, Asian Institute of Technology ($5,419) 2008

LEADERSHIP AND SERVICE

Mentoring experiences

- **Academic advisor of following students**

Name	Project	Level	Time
Luong, N	Saltwater Intrusion in Mekong Delta under uncertainty	M.S.	Graduated, 2022

Nguyen, N	Economic Impacts of saltwater intrusion in the Mekong Delta	M.S.	06/21-Present

- **Had opportunities to mentor/teach undergraduate and graduate students**

Name	Project	Level	Time
Pathak, S	Adoption dynamics of sustainable agricultural practices in the Mississippi region	Ph.D.	07/22-Present

Professional services

- Chair - Section 1.C. Agriculture I, 2017 NAREA annual meeting
- Chair - Section 2.B.15. Econometric Methods II, 2017 SEA annual meeting
- Peer reviewer: Utilities Policy, Journal of Agricultural and Resources Economics, Journal of Agribusiness in Developing and Emerging Economies. Scientific committee member of 2019 SWAT-SEA Conference and Workshops, Reviewer Board for Sustainability, International Sustainable Agriculture Intensification and Nutrition (SAIN) conference, Agricultural and Applied Economics Association (AAEA) conference, Journal of Hydro-environment Research, Engineering Journal, Journal of Environmental Management, Water and Applied Sciences, Sustainability, Water, Land.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- AAEA: Agricultural and Applied Economics Association
- AGU: American Geophysical Union
- AAEA-ENV: AAEA-Land, Water and Environmental Economics Section
- SWCS: Soil and Water Conservation Society
- ASABE: American Society of Agricultural and Biological Engineers

MEDIA COVERAGE

- UCR News, PHYS.ORG, and THE HILL (Forced water-use cuts made California more water-wise)