Curriculum vitae

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BIOSKETCH

I am a Principal Scientist at Regrow, based in Brisbane, Australia. My specialization includes ecosystem modeling, remote sensing, spatial analysis, life cycle assessment, big data, and machine learning for agricultural systems. I was a Fulbright Scholar and a U.S. National Science Foundation Graduate Fellow at the Natural Resource Ecology Laboratory at Colorado State University, a leading institution in the U.S. for soil carbon and sustainability research. I served as one of the main developers of the DayCent ecosystem model at Colorado State University (CSU). Throughout my career, I have developed multiple decision-support applications using process-based ecosystem models. These include Comet Farm (used by the USDA), Soil Metrics (used by Indigo Ag), Ag-EcoSOpt (used by Shell Oil Company), and DayCent-AU and SOCRATES soil carbon models (currently under development at the Queensland University of Technology (QUT)). I also possess exemplary leadership experience, having led integrated environmental assessment projects at the Shell Technology Centre in Houston (USA), CSU, and QUT. Additionally, I have contributed to the development of the Australian Carbon Credit Methodology Determination 2021, the official Australian soil carbon credit calculators, and am currently leading the development of the grazingDNDC model at Regrow (see my full biosketch **HERE**).

EDUCATION

B.Sc. (Agricultural Science), 2008, Hue University of Agriculture and Forestry (HUAF), Vietnam.
Ph.D. (Soil and Crop Sciences), 2018, Colorado State University (CSU), Fort Collins, CO, USA.

PROFESSIONAL EXPERIENCE

2023-	Principal Scientist, Regrow.ag
2020-23	Senior Research Scientist, Biology and Environmental Sciences School, Faculty of Science, Queensland University of Technology (QUT),
2018-20	Postdoctoral researcher, Natural Resource Ecology Laboratory, Colorado State Univ. Fort Collins, CO, USA.
2014-15	Postgrad Intern, Shell Technology Center Houston (STCH), Shell Oil Company.
2011-18	Graduate research assistant, Department of Soil and Crop Sciences, Colorado State Univ. Fort Collins, CO, USA.
2009-11	Researcher, Australian Centre for International Agriculture Research (ACIAR), Vietnam.
2008-11	Lecturer, Hue University of Agriculture and Forestry, Hue City, Vietnam.
2005-08	Research Assistant, Center for Climate Change Study in Central Vietnam (CCCSC), Hue University of Agriculture and Forestry, Hue City, Vietnam.

RELEVANT PROFESSIONAL ACTIVITIES

2023	Principal scientist, leading the development of grazingDNDC model for use in Regrow's MRV platform and MRVsolution for small holder rice systems.
2022	Principal investigator of the National Soil Carbon Innovation Challenge – Development and Demonstration Grants, by Department of Industry, Science and Resources.
2022	Chief investigator of the National Soil Carbon Innovation Challenge – Feasibility Study Grants, by Department of Industry, Science and Resources.
2022	Developer of the 2021 soil carbon credit calculator for the Clean Energy Regulator.
2021	Chief investigator of the Meat & Livestock Australia's pasture dieback project.
2021	Technical reviewer for the 2021 Carbon Credits (Carbon Farming Initiative—Estimation of Soil Organic Carbon Sequestration using Measurement and Models) Methodology Determination for the Clean Energy Regulator, Australian Government.
2021	Developer of the 2014 soil carbon credit calculator for the Clean Energy Regulator.
2021	Lecturer for School of Biology and Environmental Science, QUT; guest lecturer for Faculty of Land Resources and Agricultural Environment, Hue University, Vietnam.
2020	Consultant for Soil Metrics, Indigo Agriculture (the largest participant in the US agricultural carbon market)
2019-20	Developer of a multi-product landscape life-cycle assessment framework, a joint project between Colorado State University (CSU) and U.S. Department of Energy's Argonne National Laboratory.
2018-19	Panel service & proposal reviewer for US National Institute of Food & Agriculture (NIFA), and Ministry of Agriculture and Rural Development, Vietnam.
2017-18	Ambassador for CSU Ventures, the Technology Transfer Office that supports and promotes the transfer of CSU research and innovations.
2015-18	Developer of Agroforestry model for the USDA's COMET-Farm™, whole farm and range carbon and greenhouse gas accounting system.
2015-18	Developer of the Agricultural Ecosystem Service Optimization (Ag-EcoSOpt) decision support tool for Shell oil company.
2015-18	Modelling team member of EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks
2015-18	Instructor for Soil carbon model training workshops at CSU.
2015-17	Lecturer/guest lecturer for Introductory Soil Science (SOCR201) and Soil-Plant-Nutrient Relations (SOCR540), Dept. of Soil and Crop Sciences, CSU.
2014-15	Project lead, Shell's Ecosystem Services and Land Use Change Optimization (ESLUCO) project.
2012+	Reviewers for academic journals (e.g. Applied Energy, Remote Sensing, Global Change Biology, Global Change Biology Bioenergy, Management of Environmental Quality)

TOP RESEARCH OUTPUTS

1. *Model development* – **Nguyen, T.H.** (2023). Development of the grazingDNDC module for Regrow Ag's MRV platform. https://www.regrow.ag/platform/mrv
2. *Model development* – **Nguyen, T.H.** (2021). Development of the automated baseline spinup module for the Soil Metrics Global Greenhouse Inventory Tool. https://soilmetrics.eco/technology/
3. *Model development* – **Nguyen, T.H.** (2018). Development of Ecosystem Services and Land Use

Change Optimization tool (ESLUCO) and the Agricultural Ecosystem Service Optimization (Ag-EcoSOpt) tool for Shell Oil Company to optimise land use change and feedstock production for biofuels.

4. *Model development* – **Nguyen, T.H.** (2018). Development of the Agroforestry module for the COMET-Farm™ platform. http://comet-farm.com/
5. *Journal paper* – **Nguyen, T.H.,** Field, J.L., Kwon, H., Hawkins, T.R., Paustian, K., Wang, M.Q., (2022). A multi-product landscape life-cycle assessment approach for evaluating local climate mitigation potential. Journal of Cleaner Production 354, 131691. https://doi.org/10.1016/j.jclepro.2022.131691
6. *Journal paper* – **Nguyen, T.H.,** Nong, D., Paustian, K., (2019). Surrogate-based multi-objective optimization of management options for agricultural landscapes using artificial neural networks. Ecol. Model. 400, 1–13. https://doi.org/10.1016/j.ecolmodel.2019.02.018
7. *Journal paper* – **Nguyen, T.H.,** Granger, J., Pandya, D., Paustian, K., (2019). High-resolution multi-objective optimization of feedstock landscape design for hybrid first and second generation biorefineries. Appl. Energy 238, 1484–1496. https://doi.org/10.1016/j.apenergy.2019.01.117
8. *Journal paper* – **Nguyen, T.H.,** Cook, M., Field, J.L., Khuc, Q.V., Paustian, K., (2018). High-resolution trade-off analysis and optimization of ecosystem services and disservices in agricultural landscapes. Environ. Model. Softw. 107, 105–118. https://doi.org/10.1016/j.envsoft.2018.06.006
9. *Journal paper* – **Nguyen, T.H.,** Williams, S., Paustian, K., (2017). Impact of ecosystem carbon stock change on greenhouse gas emissions and carbon payback periods of cassava-based ethanol in Vietnam. Biomass Bioenergy 100, 126–137. https://doi.org/10.1016/j.biombioe.2017.02.009
10. *Final Report* – **Nguyen, T.H.**, Grace, P., (2022). Filling the spatial gaps for low-cost soil carbon measurement in rangelands. Department of Industry, Science and Resources. https://doi.org/10.6084/m9.figshare.21393177.v1
11. *Final Report* – **Nguyen, T.H.,** Grace, P., (2021). Spatio-temporal prediction of pasture dieback using UAVs and remote sensing. Meat & Livestock Australia. https://doi.org/10.6084/m9.figshare.21393114.v1

BEST SCHOLARSHIPS AND FELLOWSHIPS

2016	Sustainability Leadership Fellowship for Global Environmental Sustainability (SoGES), Colorado State University
2014	Shell Technology Center - Houston Award for excellent postgrad interns
2013	National Science Foundation Fellowship for Multidisciplinary Approaches to Sustainable Bioenergy program, USA.
2011	Exceptional Fulbright scholarship for a Ph.D. program (Fulbright Vietnam only sponsors master's degrees)
2007	Kyoto University scholarship

AWARDED COMPETITIVE GRANTS

2023 **Next generation soil carbon satellite-based measurement for carbon markets.**
Award date: 1/5/23
Award: ARC Industry Fellowships
Funder: Australian Research Council
Awarded: $660,000 AUD

Using Queensland's vast rangelands to mitigate climate change.
Award date: 3/2/23
Award: Advance Queensland Industry Research Fellowships
Funder: Queensland Government
Awarded: $744,000 AUD

2022 **National Soil Carbon Innovation Challenge—Development and Demonstration Grants.**
Award date: 17/11/22
Award: Competitive Research Grant
Funder: Department of Industry, Science, Energy and Resources
Awarded: $4,142,157 AUD

Agricultural waste for biomethane
Award date: 28/04/22
Award: Commercial Research
Funder: Department of Industry, Science, Energy and Resources
Awarded: $187,928.81 AUD

Keeping carbon, ensuring soil carbon gains through improved grazing management persist through drought in Australians tropical and semi-arid grasslands.
Award date: 27/04/22
Award: Competitive Research Grant
Funder: Department of Agriculture, Water and the Environment (AUS)
Awarded: $803,198.00 AUD

Tool to assist in assurance on calculations under the 2021 soil carbon method.
Award date: 16/06/22
Award: Consultancy
Funder: Clean Energy Regulator
Awarded: $98,070.00 AUD

Filling the spatial gaps for low-cost soil carbon measurement in rangelands
Award date: 22/03/22
Award: Competitive Research Grant
Funder: Department of Industry, Science, Energy and Resources
Awarded: $30,000.00 AUD

Pilot soil carbon study at Cungellela
Award date: 1/12/21
Award: Commercial Research
Funder: Agrimix Pastures Pty Ltd, North Australian Pastoral Company

Awarded: $32,500.00 AUD

2021 **CSP - Time controlled grazing for soil C sequestration and improved ecosystem services**
Award date: 9/07/21
Award: Commercial Research
Funder: Meat and Livestock Australia, McDonald's Australia Ltd, World Wildlife Fund Netherlands, Turosi Pty Ltd, Queensland University of Technology
Awarded: $1,560,096.50 AUD

Tool to assist in assurance on calculations under the 2014 soil carbon method
Award date: 7/05/21
Award: Consultancy
Funder: Clean Energy Regulator
Awarded: $64,400.00 AUD

Upgrading APSIM nitrogen cycling and loss routines with data from the National Australian Nitrous Oxide Research Program
Award date: 17/03/21
Award: Competitive Research Grant
Funder: Australian Government, Grains Research and Development Corporation
Awarded: $96,000.00 AUD

2020 **Agrimix - Develop a soil carbon measurement, modelling and monitoring protocol to facilitate the delivery of soil carbon offset projects**
Award date: 6/11/20
Award: Commercial Research
Funder: Agrimix Pastures Pty Ltd,
Awarded: $2,895,385.00 AUD

Spatio-temporal prediction of pasture dieback using UAVs and remote sensing
Award date: 24/09/20
Award: Commercial Research
Funder: Meat and Livestock Australia
Awarded: $368,595.00 AUD

2019 Charting a path forward on land-based mitigation: Data-intensive synthesis of natural & technological landscape mitigation models to address sustainability critiques and identify 'no regrets' deployment sequencing (2019), sloan.org/NETZERO-LOI ($100,000)
Sustainable provisioning of ecosystem services in smallholder farming systems – A case study of Western Kenya, FLAIR Fellowships (2019), https://royalsociety.org/grants-schemes-awards/grants/flair/ ($50,000)

2014 Ecosystem services land use change optimization (ESLUCO). Shell Technology Center Houston, US ($100,000 total project + 14 month-internship support and stipend)

RELATED PROFESSIONAL SKILLS

Programming skills	• Python, Matlab, R, VBA, JavaScript, Google Apps Script, Html5, CSS, Perl, Fortran, C# • Image and audio signal processing, text-to-speech, computer vision using machine learning and deep learning.
Other software/programs competency	• GIS software: Google Earth Engine, ArcGIS, Open Jump, QGIS • Life cycle assessment software: GREET, SimaPro, and BioGrace, OpenLCA. • Process-based biophysical models: Century, DayCent, APSIM, DDSAT, EPIC, RothC, FullCAM, APEX, FVS. • Bayesian calibration and uncertainty estimation: PEST/PEST++ • Statistical software packages: Python, R, Minitab, SPSS, and SigmaPlot. • Data visualization software: Spotfire, Tableau, Power BI. • Optimization model/solvers: CPLEX, Gurobi, Matlab's optimization toolbox, Python's Pulp, Pyomo. • Data management: SQL server, Postgresql, SQLite, Microsoft Access.
Social media	Sample presentation videos at conferences, dissertation defense, ignite talks, fundraising events: https://bit.ly/2BqqdEe Model tutorials: http://bit.ly/41xpPuF

Examples of self-developed Applications applications	• Ecosystem Services and Land Use Change Optimization Tool (Lite-version)
	• Continuous Change Detection and Classification (CCDC) Google Earth Engine App (Link)
	• Spatial Balance Soil Sampling Shiny App (Link)
	• Perennial Growth Potential (Link)
	• Other PC-software:
	  ○ https://www.skill-express.com
	  ○ https://www.ytseoblaster.com
	  ○ https://digitalsellingtools.com
	• Github repository: https://github.com/Daniel-Trung-Nguyen

REFEREES

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Hoyoung Kwon, Ph.D. Principal Environmental Scientist Argonne National Laboratory, Argonne, IL 60439 USA Tel: +1-630-252-6519; Email: hkwon@anl.gov see **Letter of Recommendation from Dr. Kwon**	**Julien Granger, Ph.D.** Consultant, Hydrocarbon Supply Chain Management Shell Global Solutions (U.S.), Inc. 3333 Highway 6 South, Houston TX 77063, USA Tel: +1-832-540-8619; Email: Julien.granger@shell.com See **Letter of Recommendation from Dr. Granger**