Tadhg Moore

Research Support Officer, University College Cork
Environmental Research Institute, Ellen Hutchins Building,
Lee Road, Cork City

Education

Jul 2016 – Jun 2020 **Ph.D., Freshwater & Environmental Studies**
Thesis: Predicting in-lake responses to short and long-term changes using lake physical models
Dundalk Institute of Technology, Ireland
Advisors: Prof Eleanor Jennings; Dr Elvira de Eyto

Sep 2012 – May 2016 **B.Sc., Environmental Science**
University College of Cork, Ireland
Course Director: Dr Deborah Chapman

Research Experience

Jun 2022 – Present **Research Support Officer, Virginia Tech, Blacksburg, VA, USA**
Research advisors: Dr Timothy Sullivan
- Coordinated workshops
- Administered courses
- Developed materials

Sep 2020 – Jun 2022 **Postdoctoral Associate, Virginia Tech, Blacksburg, VA, USA**
Research advisors: Professor Cayelan Carey & Professor Quinn Thomas
- Developed teaching modules about Ecological Forecasting for undergraduate students
- Delivered modules to undergraduate students
- Integrated data science concepts into educational materials
- Collected data on how students understanding of ecological forecasting improves from delivery of the modules
- Built a modelling framework for a near-term iterative water quality forecasting framework
- Communicated research results through writing scientific publications, presenting at local, national, and international conferences and hosting workshops

Jul 2020 – Sep 2020 **Scientific Technological Officer, Marine Institute, Funace, Co. Mayo, Ireland**
Research advisor: Dr Elvira de Eyto

- Conducted research on the effects of climate change on lakes and reservoirs globally
- Collaborated with international researchers for lake modelling work

Sep 2015 – Apr 2016 **Undergraduate Research, University College of Cork, Ireland.**

Research advisor: Dr Fiona Cawkwell

Thesis: Analysis of Landsat Satellite Images to Monitor Glacial Changes in the Juneau Icefield, Alaska

- Satellite images from Landsat were analysed using ERDAS Imagine Software between 1975-2015
- Areas of the glaciers were measured along with the position of the terminus and the equilibrium line altitude
- Changes over the 40-year period were analysed along with local meteorological data

Publications

2021   **Moore, T. N.**, J. P. Mesman, R. Ladwig, J. Feldbauer, F. Olsson, R. M. Pilla, T. Shatwell, J. J. Venkiteswaran, A. D. Delany, H. Dugan, K. C. Rose, & J. S. Read. (2021). LakeEnsemblR: An R package that facilitates ensemble modelling of lakes. *Environmental Modelling & Software*, 143, 105101. https://doi.org/10.1016/j.envsoft.2021.105101

2021   Woolway, R. I., S. Sharma, G. A. Weyhenmeyer, A. Debolskiy, M. Golub, D. Mercado-Bettín, M. Perroud, V. Stepanenko, Z. Tan, L. Grant, R. Ladwig, J. Mesman, **T. N. Moore**, T. Shatwell, I. Vanderkelen, J. A. Austin, C. L. DeGasperi, M. Dokulil, S. La Fuente, … E. Jennings. Phenological shifts in lake stratification under climate change. *Nature Communications*, 12(1), 2318. https://doi.org/10.1038/s41467-021-22657-4

2021   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, … K. C. Weathers. 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), 1–11. https://doi.org/10.1002/lob.10431

2021   Mercado-Bettín, D., F. Clayer, M. Shikhani, **T. N. Moore**, M. D. Frías, L. Jackson-Blake, J. Sample, M. Iturbide, S. Herrera, A. S. French, M. D. Norling, K. Rinke, & R. Marcé. Forecasting water temperature in lakes and reservoirs using seasonal climate prediction. *Water Research*, 201, 117286. https://doi.org/10.1016/j.watres.2021.117286

2020   Kelly, S., **T. N. Moore**, E. de Eyto, M. Dillane, C. Goulon, J. Guillard, E. Lasne, P. McGinnity, R. Poole, I. K. Winfield, R. I. Woolway, & E. Jennings.

Warming winters threaten peripheral Arctic charr populations of Europe. *Climatic Change* 163, 599–618 (2020). https://doi.org/10.1007/s10584-020-02887-z

2020   Jennings, E.; de Eyto, E.; **Moore, T. N.**; Dillane, M.; Ryder, E.; Allott, N.; Nic Aonghusa, C.; Rouen, M.; Poole, R.; Pierson, D.C. From Highs to Lows: Changes in Dissolved Organic Carbon in a Peatland Catchment and Lake Following Extreme Flow Events. *Water 2020*, 12, 2843. https://doi.org/10.3390/w12102843

Publications (in review)

2022   Woolway, R. I., J. Jansen, B. M. Kraemer, C. Albergel, D. Bastviken, G. A. Weyhenmeyer, R. Marcé, S. Sharma, S. Sobek, L. Tranvik, M. Perroud, M. Golub, **T. N. Moore**, … E. Jennings. *In review* Global increases in lake methane production under future warming of bottom waters. In review at *Science Advances*.

2022   Jackson-Blake, L. A., F. Clayer, E. de Eyto, A. French, M. Dolores Frías, D. Mercado-Bettín, **T. N. Moore**, L. Puértolas, R. Poole, K. Rinke, M. Shikhani, L. van der Linden, R. Marcé. Opportunities for seasonal forecasting to support water management outside the tropics. In review at *Hydrology and Earth System Sciences*.

2022   Olsson, F., E. B. Mackay; **T. N. Moore**; P. Barker; S. Davies; R. Hall; B. Spears; J. Wilkinson; I. D. Jones. Annual water residence time effects on thermal structure: a potential lake restoration measure? In review at *Journal of Environmental Management*.

2022   Golub, M., E. B. W. Thiery, R. Marcé, D. Pierson, I. Vanderkelen, D. Mercado, R. I. Woolway, L. Grant, E. Jennings, J. Schewe, F. Zhao, K. Frieler, M. Mengel, V. Y. Bogomolov, D. Bouffard, R. M. Couture, A. V. Debolskiy, B. Droppers, G. Gal, M. Guo, A. B. G. Janssen, G. Kirillin, R. Ladwig, M. Magee, **T. N. Moore**, …, G. Zdorovennova. A framework for ensemble modelling of climate change impacts on lakes worldwide: the ISIMIP Lake Sector. In review at *Geoscientific Model Development*.

Publications (in preparation)

2022   **Moore, T. N.**, R. Q. Thomas, W. M. Woelmer and C. C. Carey. A road map for integrating ecological forecasting into undergraduate ecology curricula. *In preparation*.

2022	**Moore, T. N.**, C. C. Carey, and R. Q. Thomas. A multi-model ensemble improves the accuracy of hydrodynamic forecasts in a reservoir. *In preparation*.
2022	Thomas, R.Q., Carey, C.C. R. P. McClure, **T.N. Moore**, W. M. Woelmer, C. Boettiger, R. J. Figueiredo. Near-term forecasts of NEON lakes reveal gradients of environmental predictability across the U.S. *In preparation*.
2022	Wynne, J., **T.N. Moore**, W. M. Woelmer, R. Q. Thomas, C. C. Carey. Uncertainty in future lake thermal metrics driven by global climate models and lake models. *In preparation*.

Presentations (underline indicates presenting author)

Sep 2021	<u>**Moore, T. N.**</u> Human Threats to Environmental Security. BIT 2164 Foundations of Security Environments, Virginia Tech, VA, USA.
June 2021	<u>**Moore, T. N.**</u>, Mesman, J.P., Ladwig, R., Feldbauer, J., Olsson, F., Pilla, R.M., Shatwell, T., Venkiteswaran, J.J., Delany, A.D., Dugan, H. and Rose, K.C., 2021. LakeEnsemblR: An R package that facilitates ensemble modelling of lakes. Association for the Sciences of Limnology and Oceanography.
May 2021	<u>Carey, C.C.</u>, and <u>**T.N. Moore**</u>. Macrosystems EDDIE: Using NEON data to teach ecological forecasting to undergraduates. Invited seminar, National Ecological Observatory Network (NEON) Science Monthly Series, Boulder, Colorado, USA.
Jan 2021	<u>Carey, C.C.</u>, A. G. Hounshell and **T. N. Moore**. MSA: Macrosystems EDDIE: An undergraduate training program in macrosystems science and ecological forecasting. National Science Foundation Macrosystems Biology Meeting,
Oct 2020	<u>Feldbauer, J.</u>, J. P. Mesman, R. Ladwig, **T. N. Moore**. LakeEnsemblR: An R package that facilitates ensemble modelling of lakes. Poster, Virtual GLEON 21.5.
Nov 2019	<u>**Moore, T. N.**</u>, R. Ladwig, E. de Eyto, M. Golub, R. Marcé, D. Pierson, W. Thiery, E. Jennings. Global Ensemble Lake Modelling of the effects of Climate Change on 60 lakes. GLEON 20.
Dec 2018	<u>**Moore, T. N.**</u>, K. Bolding, J. Bruggeman, F. Clayer, R. M.Couture, M. Dillane, M. Estroti, E. de Eyto, G. Gal, J. L. Guerrero, E. Jennings, E. Jeppesen, A. Nielsen, D. Trolle, and D. Pierson. Modelling in-lake DOC events using a newly developed DOC model coupled with a 1-D hydrodynamic model. GLEON 19.

Workshops (<u>underline</u> indicates presenting author)

Aug 2021   **<u>Moore, T. N.</u>**, C. C. Carey, W. M. Woelmer, R. Q. Thomas. Macrosystems EDDIE: Teaching Ecological Forecasting to Undergraduates - Workshop. Ecological Society of America.

May 2021   <u>W. M. Woelmer</u>, **T.N. Moore**, R.Q. Thomas, and C.C. Carey. Macrosystems EDDIE: Using ecological forecasts to guide decision-making. Ecological Forecasting Initiative Early Career Meeting.

May 2021   **<u>Moore, T. N.</u>**, and <u>C.C. Carey</u>. Macrosystems EDDIE: Introduction to Ecological Forecasting. GLEON Limnoseries.

Oct 2020   <u>Mesman, J.P.</u>, R. Ladwig, J. Feldbauer, **T. N. Moore**. Ensemble lake modelling with *LakeEnsemblR*. Workshop, GLEON 21.5. October 2020.

Teaching Experience

Feb 2021 - **Guest Lecture**

      Reproducible and Collaborative Data Science, University of California-Berkeley, CA, USA
- Introduced graduate students to the concepts in Ecological Forecasting
- Guided them through a set of activities using the R Shiny platform
- Led discussions when students presented their results to the class

Spring 2019 – **Teaching Assistant**

      Physics: Problem Based Learning, Dundalk Institute of Technology, Co. Louth, Ireland
- Physics lab planning and preparation
- Experiment demonstration
- Lecturing and teaching Excel

Spring 2018 – **Teaching Assistant**

      Environmental Microbiology, Dundalk Institute of Technology, Co. Louth, Ireland
- Programme development and student assessment
- Demonstrating and teaching lab-based microbiology skills

Autumn 2017 – **Instructor**

      Introduction to R – Data Handling & Visualizations, Dundalk Institute of Technology, Co. Louth, Ireland
- Planned workshop to introduce R and the language through lake-specific research questions
- Prepared materials and worked with students on problem sets

Spring 2016 – **Teaching Assistant**

Mathematical Modelling for Biological and Environmental Sciences, University College Cork, Co. Cork, Ireland
- Prepared material for class tutorials
- Taught tutorials on a weekly basis
- Corrected in-class assessments

Professional Organizations

- Member of the Environmental Sciences Association of Ireland
- Member of GLEON (Global Lake Ecological Observatory Network)
- Member of ESA (Ecological Society of America)
- Member of ASLO (Associated Sciences of Limnology and Oceanography)

Scholarships, Honors, and Awards

2019   Network and Travel grant from the Marine Institute for working visit to Virginia Tech: €1,200

2019   Travel Scholarship from Ecological Forecasting Initiative (EFI) to attend the EFI conference in Washing DC: $600

2019   EPA Event Support grant to fund Aquatic Ecological Modellers Network – Junior (AEMON-J) workshop in DkIT: €1,286

2019   Marine Institute Workshop grant to fund AEMON-J workshop: €1,286

2018   GLEON Student Travel Award to attend GLEON 20 meeting in Rottnest Island, Australia: $1,980

2017   GLEON Student Travel Award to attend GLEON 19 meeting in Mohonk, New York, USA: $1,240

2017   GLEON 19 Bayesian Workshop at the Cary Institute, New York, USA: $250

Skills

- **Computer programs/models:** Data analysis and visualization in R, processed-based water quality simulation models, knowledge and use of Git version control software, R Shiny application development
- **Scientific skills/technologies:** experience with design of water quality monitoring programs in groundwater, lakes and streams, collecting and processing water samples