

CAROLE DALIN

Institute for Sustainable Resources
Bartlett School of Environment, Energy & Resources
University College London, U.K.

Email: c.dalin@ucl.ac.uk
Phone: +44 (0)203 108 9857
Office: 325, Central House

PROFESSIONAL EXPERIENCE

Research Principal Investigator (PI) Sustainable Food Systems Department of Geosciences, Ecole Normale Supérieure	since 2022
Associate Professor in Sustainable Food Systems Institute for Sustainable Resources, University College London	since 2021
Principal Research Fellow (Associate Prof 2021) Research on food sustainability Institute for Sustainable Resources, University College London	2019-2021
Senior Research Fellow (Faculty from 2021) Research on food sustainability Institute for Sustainable Resources, University College London	2016-2019
Postdoctoral Researcher African Hydro-Economy & Water Security Grantham Research Institute on Climate and the Environment, LSE	2014-2016
Research Assistant Doctoral research on policy & water resources for food Environmental Engineering & Water Resources, Princeton University	2009-2014

EDUCATION

Princeton University 2009-2014

Ph.D. (2014) and M.A. (2011) in Environmental Engineering & Water Resources
Certificate in Science, Technology & Environmental Policy (2014)

École Centrale de Paris 2007-2011

Diplôme d'Ingénieur de l'École Centrale de Paris (2011) and Bachelor of Sciences (2009)
Majors: Environmental Sciences, Energy. Minors: Physics, Economics, Finance & Management.

Lycée Louis le Grand, Paris (PCSI/PC*) 2005-2007

GRANTS AND AWARDS

PI , "Sustainable and healthy food solutions: system dynamics and trade-offs" <i>European Research Council</i> ERC Starting Grant (€1.500K)	2022-2027
co-PI , "Revealing the interactions between global biodiversity change and food security" <i>Natural Environment Research Council</i> (£606K)	2018-2021
Named Research Collaborator , "Sustainable and Healthy Food Systems" <i>Wellcome Trust</i> (Total value: £5,000K)	2017-2021
PI , NERC Independent Research Fellowship: "Developing integrated environmental indicators for sustainable global food production and trade" <i>Natural Environment Research Council</i> (£586K)	2016-2021
Postdoctoral Researcher , "Southern Africa Hydro-Economy and Water Security" <i>Belmont Forum (NRF, NERC & ESRC, NSF)</i> (€679K)	2013-2016
PI , Hack '69 Graduate Award, <i>Princeton Environmental Institute</i> (\$8K)	2013-14
Scholar in Global Systemic Risk, <i>Princeton Institute for International Studies</i> (\$10K)	2013-14
Prize Awardee , Wu Prize for Excellence, <i>Princeton University</i> (\$4K)	2013
PI , Science Technology and Environmental Policy Fellowship	2012-14

Princeton Environmental Institute (\$80K)
Scholar and Project Chair, Princeton Energy & Climate Scholars (\$16K) 2012-14

RESEARCH EXPERIENCE

- Institute for Sustainable Resources, University College London** since 2016
PI and research group leader on the environmental sustainability of global food systems
- Institute for Sustainable Resources, University College London** 2016-2021
NERC fellowship work on the environmental sustainability of global food production and trade
- Grantham Research Institute, London School of Economics** 2014-2016
Postdoctoral work on climate & water-energy-food nexus in southern Africa, with Prof. D. Conway
- School of Engineering & Applied Sciences and Woodrow Wilson School of Public & International Affairs, Princeton University** 2009-2014
Ph.D. Thesis: "Water for food: evolution and projections of water transfers through international and domestic agricultural trade.", supervised by Prof. I. Rodríguez-Iturbe and Prof. D. Mauzerall
- École Centrale de Paris** 2007-2008
Project on domestic cogeneration using Bioethanol for *Company for Hydrogen Technologies*
Group leader of 5 students, supervised by Prof. Marie-Laurence Giorgi
- Lycée Louis le Grand, Paris and Institut Curie, Paris** 2006-2007
Study on Two photons absorption: laser experiments with Prof. François Amblard

REFEREED PUBLICATIONS

Published articles:

34. Romanello M, , ..., **C Dalin** et al. (2022) The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. *The Lancet*.
33. Davis, K. F., **C Dalin**, Kummu, M., Marston, L., Pingali, P., & Tuninetti, M. (2022). Beyond the Green Revolution: A roadmap for sustainable food systems research and action. *Environmental Research Letters* 17(10).
32. Jwaideh, M. A. A., Sutanudjaja, E. H., & **C Dalin** (2022). **Global impacts of nitrogen and phosphorus fertiliser use for major cropson aquatic biodiversity.** *International Journal of Life Cycle Assessment*.
31. Bonetti, S, EH Sutanudjaja, T Mabhaudhi, R Slotow and **C Dalin** (2022) **Climate change impacts on water sustainability of South African crop production.** *Environmental Research Letters*.
30. Outhwaite C, M Ortiz, F Spooner, **C Dalin** and T Newbold (2022) Availability and proximity of natural habitat influences cropland biodiversity in forest biomes. *Global Ecology and Biogeography*.
29. Falloon P, D. Bebbber, **C Dalin** et al. (2022) What do changing weather and climate shocks and stresses mean for the UK food system? *Environmental Research Letters*.
28. Romanello M, ..., **C Dalin** et al. (2021) The 2021 report of the Lancet Countdown on health & climate change: code red for a healthy future. *The Lancet*.
27. Zhang X., G. Yao, S. Vishwakarma, **C. Dalin** et al. (2021) Quantitative assessment of agricultural sustainability reveals divergent priorities among nations. *One Earth* 4 (9).

26. Mugiyo H, ..., **C. Dalin**, et al. (2021) Multi-criteria suitability analysis for neglected and underutilised crop species in South Africa. *PLoS One*.
25. Ortiz M., C. Outhwaite, **C. Dalin** and T. Newbold (2021) A review of the interactions between biodiversity, agriculture, climate change, and international trade: research and policy priorities. *One Earth* 4 (1).
24. Harris F., **C. Dalin** et al. (2020) Trading water: virtual water flows through interstate cereal trade in India. *Environmental Research Letters* 15.
23. Watts N, ... , **C Dalin** et al. (2020) The 2020 report of The Lancet Countdown on health and climate change. *The Lancet* 397 (10269).
22. Siderius C., D. Conway, M. Yassine, L. Murken, P. Lostis & **C. Dalin** (2020) **Multi-scale analysis of the water-energy-food nexus in the Gulf region.** *Environ Res Lett* 15.
21. Gumidyala, S., Ruess, P. J., Konar, M., Marston, L., **Dalin, C.** & Wada, Y. (2020). Groundwater depletion embedded in domestic transfers and international exports of the United States. *Water Resources Research* 56.
20. **Dalin, C.**, C. Outhwaite (2019) **Impacts of global food systems on biodiversity and water: the vision of two reports and future aims.** *One Earth*, Cell Press 1 (3) 298-302. Invited
19. Watts N, ... , **C Dalin** et al. (2019) The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. *The Lancet* 394 (10211) 1836-78.
18. Vanham, D., (...) **C. Dalin** et al. (2019) Environmental footprint family to address local to planetary sustainability and deliver on the SDGs. *Science of the Total Environment* 693.
17. **Dalin, C.**, M. Taniguchi and T. Green (2019) **Unsustainable groundwater use for global food production and related international trade.** *Global Sustainability*, Cambridge University Press Invited
16. Kayatz, B., F. Harris, J. Hillier, T. Adhya, **C. Dalin**, D. Nayak, R. Green, P. Smith and A. Dangour (2019) More crop per drop: Exploring India's cereal water use since 2005. *Science of the Total Environment* 673, 207-217.
15. Tuninetti, M., S. Tamea and **C. Dalin** (2019) **Water Debt indicator reveals where agricultural water use exceeds sustainable levels.** *Water Resources Research* 19 Feb 2019.
14. D'Odorico, P., **C. Dalin**, Carr, J., DellAngelo, J., Konar, M., Laio, F., Ridolfi, L., Rosa, L., Suweis, S., Tamea, S. and Tuninetti, M. (2019) Global virtual water trade and the hydrological cycle: Patterns, drivers, and socio-environmental impacts. *Environmental Research Letters* 11 February 2019.
13. Peng, W., Wagner F, Ramana MV, Zhai H, Small M, **C. Dalin**, Zhang X and Mauzerall D (2018) Managing China's coal-dominated power system for CO2, air pollution and water objectives. *Nature Sustainability* 1, 693-701.
12. Conway, D., W. Landman, **C. Dalin** and T. Osborn (2017) Hydropower plans in eastern and southern Africa increase risk of concurrent climate-related electricity supply disruption. *Nature Energy* 2, 946-953.
11. **Dalin, C.**, Y. Wada, T. Kastner and M. Puma (2017) **Groundwater depletion embedded in international food trade.** *Nature* 543, 700-704.
10. **Dalin, C.** and I. Rodriguez-Iturbe (2016) **Environmental impacts of food trade via resource use and greenhouse gas emissions** *Environmental Research Letters* 11, 3, 5012 Invited
9. **Dalin, C.** and D. Conway (2016) **Water resources transfers through southern African food trade: water efficiency & climate signals.** *Environmental Research Letters* 11, 1, 5005.

8. Conway, D., E. Archer, D. Deryng, S. Dorling, T. Krueger, W. Landman, B. Lankford, K. Lebek, T. J. Osborn, C. Ringler, J. Thurlow, T. Zhu and **C. Dalin** (2015) Climate and southern Africa's water-energy-food nexus. *Nature Climate Change* 5, 837-846.
7. **Dalin, C.**, H. Qiu, N. Hanasaki, D. Mauzerall and I. Rodriguez-Iturbe (2015) **Balancing water resource conservation and food security in China**. *Proceedings of the National Academy of Sciences* Early Edition March 30, 2015
6. **Dalin, C.**, N. Hanasaki, H. Qiu, D. Mauzerall and I. Rodriguez-Iturbe (2014) **Water resources transfers through Chinese interprovincial and foreign food trade**. *Proceedings of the National Academy of Sciences* 111, 27, 9774-97794.
5. **Dalin, C.**, M. Konar, S. Suweis, N. Hanasaki and I. Rodriguez-Iturbe (2012) **Modeling past and future structure of the global virtual water trade network**. *Geophysical Research Letters* 39, L24402.
4. **Dalin, C.**, M. Konar, N. Hanasaki, A. Rinaldo and I. Rodriguez-Iturbe (2012) **Evolution of the global virtual water trade network**. *Proceedings of the National Academy of Sciences* 109, 16, 5989-5994.
3. Konar, M., **C. Dalin**, N. Hanasaki, A. Rinaldo and I. Rodriguez-Iturbe (2012) Temporal dynamics of blue and green virtual water trade networks. *Water Resources Research* 48, W07509.
2. Suweis, S., M. Konar, **C. Dalin**, N. Hanasaki, A. Rinaldo, and I. Rodriguez-Iturbe (2011) Structure and controls of the global virtual water trade network. *Geophysical Research Letters* 38, L10403.
1. Konar, M., **C. Dalin**, S. Suweis, N. Hanasaki, A. Rinaldo and I. Rodriguez-Iturbe (2011) Water for food: The global virtual water trade network. *Water Resources Research* 47, W05520.

Published book chapters:

5. **Dalin, C.** **Groundwater global sustainability and agricultural trade**. in Global Groundwater: Source, Scarcity, Sustainability, Security and Solutions (2020) ed. by Mukherjee A., B. Scanlon et al. *Elsevier* ISBN 9780128181720 Invited
4. **Dalin, C.** **A water perspective on the water-energy-food nexus**. in Handbook of Nature, edited by T. Marsden, *SAGE* (2018) Invited
3. **Dalin, C.** and M.Konar (2018) **Virtual water trade among world countries associated with food trade** in Encyclopedia of Food Security and Sustainability, edited by A. Galli et al., *Elsevier* Invited
2. Davis, K., **C. Dalin**, R. DeFries, J. Galloway, A. Leach and N. Mueller (2018) Sustainable Pathways for Meeting Future Food Demand in Encyclopedia of Food Security and Sustainability, edited by A. Galli et al., *Elsevier* Invited
1. Andrews-Speed, P. and **C. Dalin** (2017) Elements of the Water-Energy-Food nexus in China. in Handbook on the Resource Nexus, edited by R. Bleischwitz, *Routledge/Earthscan*

SELECTED PRESENTATIONS (*=invited)

Environmental stressors from food production worldwide: Geography Seminar, University of Delaware (USA) 11/22; Environmental Policy Seminar, Princeton (USA) 02/22; LEAP Conference, Oxford (UK) 11/18; AGU Fall Meeting (USA) 12/18; IIASA seminar series (Austria) 03/19; EGU General Assembly (Austria) 04/19.

Sustainability of agricultural water use worldwide:

EGU Assembly (Austria) 04/18; GEWEX Science Conference (Canada) 05/18; AGU Chapman on Aquifer Sustainability (Spain) 10/19* Invited keynote speaker.

Agriculture & global biodiversity change: OSM Global Land Programme (Switzerland) 04/19*.

Who is eating up the world's aquifers?: European Commission Joint Research Centre (Italy), 01/17*; AGU Fall Meeting (USA) 12/16; OECD Water Workshop (USA) 09/16*; ETH Zurich (Switzerland) 09/16*; EGU Assembly (Austria) 04/16; Agriwat (Netherlands) 03/16.

Water for food: drivers and impacts of virtual water trade, *Food, Climate and Society Seminar Series*, University of Sussex (U.K.) 02/16*.

Water resources transfers through southern African food trade: water efficiency and climate signals: AGU Fall Meeting (USA) 12/15; EGU Assembly (Austria) 04/15; Climate Smart Agriculture (France) 03/15.

Climate and the water-energy-food nexus, *Our Common Future Under Climate Change International Scientific Conference*, Paris, France, July 2015. Invited keynote speaker

Balancing water resources conservation and food security in China, *Annual Conference of the European Association of Environmental and Resource Economists* (Finland) 06/15; *Earth System Science Seminar Series*, University of California, Irvine (USA) 04/15*.

Projections of virtual water trade under agricultural policy scenarios in China, *AGU Fall Meeting* (USA) 12/14.*

China's agriculture, water resources and trade: policy implications, *Hydrological & Food Security Forecasting Workshop*, Princeton Global Collaborative Network (Kenya) 08/14.*

Modeling past and future structure of the global virtual water trade network, *AGU Fall Meeting* (USA) 12/12.

The growing role of China in global virtual water transfers, BNU-Princeton Workshop on Water, Climate Change & Food Security; Tsinghua University (China) 05/12.*

Dynamics of the global virtual water trade network, AGU Fall Meeting (USA) 12/11.

Lead Convener Scientific Session **Sustainable Food Systems**, *EGU* 04/23, *EGU* 04/21, *EGU* 05/20, *AGU* 12/20.

Co-convener Scientific Session **The Human-Climate-Water Nexus, Climate Change and Water Security**, *GEWEX Science Conference* 05/18.*

Scientific Session Chair **Food security and the water-energy-food nexus**, *AGU* 12/15.

Invited Panelist **"The thirsty 10 billion" Great Debate**, EGU Assembly (Austria) 04/15.

Lead Convener Scientific Session **Trade & the Environment**, *AGU* 12/12.

EDITORIAL ACTIVITY

Editor of *Earth's Future*, AGU/Wiley, since 04/2020.

Reviewer for:

Journals:

Advances in Water Resources Research

Environmental Research Letters

Environment, Development and Sustainability

Food Security

Global Environmental Change

Hydrology & Earth System Sciences

Journal of Hydrology

· *Nature*; *Nature Geosciences*; *Nature Sustainability*; *Nature Reports*

PLOS-ONE

· *Science*; *Science Advances*

Sustainability

Water

Water Resources Research

World Development

Funding bodies:

NERC (U.K. Natural Environment Research Council)
NSERC (Natural Sciences and Engineering Research Council of Canada)
NSF (U.S.A. National Science Foundation)

RESEARCH ADMINISTRATION AND TEACHING

- **Research Director**, Institute for Sustainable Resources, University College London, since 2021
Deputy Research Director 2019-2021 - research strategy, preparation of the Faculty's submission to the U.K. national Research Excellence Framework (REF) assessment
- Ph.D. in Sustainable Resources, University College London, 2017-now - **Ph.D. supervisor**
Mark Jwaideh (started Sept. 2017) - EPSRC Studentship on Freshwater and marine impacts of fertiliser used in agriculture worldwide (main supervisor, co-supervised w/ Paul Ekins, UCL ISR)
Manuscript presented at *AGU Fall Meeting 2019* and in submitted for publication: 'Globally Quantifying the Spatially-Explicit Environmental Impact of Major Crops from Nitrogen and Phosphorus Fertiliser-Use'
Arianna Buratto (started Sept. 2019) - EPSRC Studentship on Behavioral economics of food production and consumption for environmental sustainability (secondary supervisor, co-supervised with Paolo Agnolucci and Lorenzo Lotti, UCL ISR)
Carolina Campos (started Nov. 2020) - Graduate Studies on The impacts of human activities on global biodiversity.
- MSc. in Sustainable Resources, University College London, 2016-now - Master thesis supervisor
- MSc. in Sustainable Resources, University College London, 2016-now - Invited lecturer
- Scholarship on Sustainability & Global Justice, Humboldt University, 2015/2016 - Invited lecturer
- MSc. in Environmental Policy and Regulation, London School of Economics, 2015 - Master thesis supervisor
- Geography and the Environment - "Sustainable development." (GY121), London School of Economics Lent Term 2015 - Invited lecturer
- Freshman Seminar - "Water, keystone for sustainable development.", Princeton University, Fall 2012 - Invited lecturer
- Interview Panel - Institute for Sustainable Resources, UCL, 2016-now - Member
- Research Seminar Series - Grantham Research Institute, LSE, 2015-2016 - Committee member
- Events Task Force - Grantham Research Institute, LSE, 2015-2016 - Member
- Princeton Energy and Climate Scholars - Princeton University, 2013-2014 - Special Project Chair (led outreach trip and workshops in India with 7 graduate students)

SKILLS

French - Native language
English - Full proficiency
Spanish - Good level

IT Matlab, Mathematica,
ArcGIS, R (beginner), Adobe Illustrator,
L^AT_EX, HTML, Microsoft Office

EXTRACURRICULAR

Organizations: Princeton Energy & Climate Scholars, Centrale Microfinance, Centrale Paris Sailing Club

Activities: Yoga, Cycling, Sailing. *Tour de France à la Voile 2009* fundraising, logistics, training and sailing for a 4 week-regatta on Mumm30 in a team of 14.