

Dr Timothy Foster

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Professional Preparation

Imperial College London	Water Management & Policy	Ph.D., 2015
Imperial College London	Hydrology	M.Sc. (Distinction), 2011
University College London	Physical Geography	B.Sc. (First Class Honors), 2010

Appointments

2020-Present	Senior Lecturer (Associate Professor) in Water-Food Security, Department of Mechanical, Aerospace and Civil Engineering, University of Manchester, UK
2016-2020	Lecturer (Assistant Professor) in Water-Food Security, Department of Mechanical, Aerospace and Civil Engineering, University of Manchester, UK
2015-2016	Postdoctoral Research Fellow, Robert B. Daugherty Water for Food Global Institute, University of Nebraska, Lincoln, NE, USA

Selected Publications

1. Higginbottom, T., Adhikari, R., Dimova, R., Redicker, S. & **Foster, T.** "Performance of large-scale irrigation projects in sub-Saharan Africa. 2021. *Nature Sustainability*, 1-8.
2. Afshar, M.H., **Foster, T.**, Higginbottom, T.P., Parkes, B., Hufkens, K., Mansabdar, S., Ceballos, F. and Kramer, B. 2021. Improving the performance of index Insurance Using Crop Models and Phenological Monitoring. *Remote Sensing*, 13(5): 924.
3. Young, R., **Foster, T.**, Mieno, T., Valocchi, A., & Brozović, N. 2021. Hydrologic-economic trade-offs in groundwater allocation policy design. *Water Resources Research*, 57(1), e2020WR027941.
4. **Foster, T.**, Mieno, T., & Brozović, N. 2020. Satellite-Based Monitoring of Irrigation Water Use: Assessing Measurement Errors and Their Implications for Agricultural Water Management Policy. *Water Resources Research*, 56(11), e2020WR028378.
5. Parkes, B., Higginbottom, T., Hufkens, K., Ceballos, F., Kramer, B., & **Foster, T.** 2020. "Weather Dataset Choice Introduces Uncertainty to Estimates of Crop Yield Responses to Climate Variability and Change". *Environmental Research Letters*. 14, 124809.
6. **Foster, T.**, Goncalves, I.Z., Campos, I., Neale, C.M.U., & Brozovic, N. 2019. "Assessing landscape scale heterogeneity in irrigation water use with remote sensing and in-situ monitoring". *Environmental Research Letters*. 14, 024004.
7. Hufkens, K., Melaas, E.K., Mann, M.L., **Foster, T.**, Ceballos, F., Robles, M., & Kramer, B. 2019. "Monitoring crop phenology using a smartphone based near-surface remote sensing approach". *Agricultural and Forest Meteorology*. 265, 327-337.
8. **Foster, T.**, Brozovic, N., Butler, A.P, Neale, C., Raes, D., Steduto, P., Fereres, E., & Hsiao, T.C. 2017. "AquaCrop-OS: An open source version of FAO's crop-water productivity model". *Agricultural Water Management*, 181, 18-22.
9. **Foster, T.**, Brozovic, N., & Butler, A. 2016. "Effects of initial aquifer conditions on economic benefits from groundwater conservation" *Water Resources Research*, 53(1), 744-762.
10. **Foster, T.**, Brozovic, N., & Butler, A.P. 2015. "Analysis of the impacts of well yield and groundwater depth on irrigated agriculture". *Journal of Hydrology*, 523, 86-96.

Selected Working Papers

1. **Foster, T.**, Adhikari, R., Urfels, A., Adhikari, S. & Krupnik, T.J. "Efficient pumping technologies to enable sustainable intensification of groundwater irrigation in the eastern Indo-Gangetic Plains"

2. Adhikari, R., **Foster, T.**, Urfels, A., Adhikari, S. & Krupnik, T.J. “Tackling irrigation-based poverty traps in South Asia”
3. Urfels, A., ..., **Foster, T.**, Singh, V. & Krupnik, T.J. “Poverty reduction potential irrigation-led rice-wheat system intensification in Eastern India”

Recent Grant Funding

- Pumpset efficiency and groundwater irrigator livelihoods in Nepal’s Terai, *PI*, USAID Cereal Systems Initiative for South Asia Program, £79,500, 2019-2020.
- Designing Resilient and Adaptable Water management - Integrated & Interactive Tools, *Co-I*, UKRI Strategic Priorities Fund, £306,703, 2019-2020.
- Assessing alternative models for irrigation development in Sub-Saharan Africa, *PI*, Research England GCRF QR Pump Priming Fund, £66,701, 2019.
- Sustainable intensification of groundwater irrigation in the Nepal Terai, *PI*, N8 Agri-Food Pump Priming Fund Grant, £16,416, 2018-2019.
- Mitigating basis in weather-index crop insurance: harnessing models and big data to enable climate-resilient agriculture in India, *PI*, NERC-ESRC-DFID Innovation Grant, £346,999, 2018-2020.
- Design and assessment of resilient and sustainable interventions in water-energy-food-environment Mega-Systems, *Co-I & Agricultural Lead*, GCRF Grant, £9,846,866, 2017-21.
- Water Stewardship Portal, *Co-I*, NERC Innovation Grant, £199,796, 2017-20.

Software Development

Lead developer of AquaCrop-OS, an open-source crop model for assessing and managing agricultural water use (www.aquacropos.com) developed in collaboration with the U.N. Food and Agriculture Organization. AquaCrop-OS is programmed in Matlab and Python, and has been downloaded by over 4,000 users in 85+ countries since 2016. The model is accompanied by interactive user guides and online training materials, which have been used to support capacity development amongst academics, practitioners and industry

Selected Invited Talks

- Role of satellite data in groundwater use monitoring and policy enforcement. *California Annual Groundwater Conference* (2021)
- Monitoring irrigation from space: what role for management and policy? *University of Newcastle* (2019) and *Universitat Politècnica de Valencia* (2019)
- Lessons in sustainable agricultural groundwater management, *Irrigation and Water Forum* (2019)
- How much do we know about agricultural water use? *University of Bristol* (2018)
- Challenges and opportunities for managing agricultural groundwater use, *ETH Zurich* (2018)
- Economics of agricultural groundwater management. *University of Tübingen* (2017)
- Economic value of aquifers for irrigation, *Rothamsted Research* (2017)
- Irrigation decision-making and the water-energy-food nexus, *U.S. National Science Foundation* (2016)

Recent Awards and Leadership

- Associate Editor, *Water Resources Research* (2021-Present)
- AquaCrop Development Group, Member of core model development team (2019-Present)
- International Advisory Board Member, Sino-Swiss Project on Rehabilitation and Management Strategy for Over-Pumped Aquifers under Changing Climate (2019-2020)
- Top 10 paper – Foster et al. 2016, *Agricultural Water Management* (2018-2020)
- Best Paper Award – Foster et al. 2016, *Open Modelling Interface Association* (2017)