Samuel Valman

PhD Researcher

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Personal Research Statement

I am a PhD student at the University of Nottingham in a multidisciplinary research group. I come from an environmental applications background with a BSc and a MSc in Geography focused on river systems. I now combine these applications with an engineering-based knowledge of Earth Observation (EO), AI and computing. I aim to continue in this vein working with new collaborations where possible at the intersection of water resources and geospatial technology.

Education

PhD Candidate ***September 2021 – December 2023***
Universities of Nottingham
Multi-institutional and interdisciplinary between the Universities of Nottingham and Newcastle and the departments of Geography and Engineering. Thesis title: An Earth Observation powered Digital Twin of river systems using Artificial Intelligence and high-resolution satellite imagery.

Master of Research: Geospatial Data Science ***September 2020 – September 2021***
University of Nottingham
Dissertation title: Satellite monitored river surface temperature using Google Earth Engine Cloud Computing.

MSc by Research in Geography (Distinction) ***September 2019 – December 2020***
University of Nottingham
Dissertation title: Hydrological, ecological, chemical, and morphological environmental variables result in inconsistent classifications of Anthropogenic streams.

BSc Geography Hons (2:1) **September 2015 – July 2019**
University of Nottingham
Dissertation title: Adaptation of the inter-dam sequence for small dams in the UK.

Publications

Pugh, B. E., Colley, M., Dugdale, S. J., Edwards, P., Flitcroft, R., Holz, A., Johnson, M., Mariani, M., Means-Brous, M., Meyer, K., Moffett, K. B., Renan, L., Schrodt, F., Thorne, C., **Valman, S.,** Wijayratne, U., & Field, R. (2022). A possible role for river restoration enhancing biodiversity through interaction with wildfire. *Global Ecology and Biogeography*, 31, 1990– 2004. https://doi.org/10.1111/geb.13555

Guiney, R., Santucci, E., **Valman, S.,** Booth, A., Birley, A., Haynes, I., Marsh, S. and Mills, J. (2021). Integration and Analysis of Multi-Modal Geospatial Secondary Data to Inform Management of at-Risk Archaeological Sites. ISPRS International Journal of Geo-Information 10(9), 575.

In progress:

Valman, S., Ives, C., Dugdale, S. and Johnson, M. The criteria conundrum: Hydrological, ecological, chemical, and morphological environmental variables result in inconsistent classifications of Anthropogenic streams. *River Research and Applications.*

Jackson, B., Rodríguez Huerta, E. **Valman, S.,** Blair, B., Boyd, D. and Sparks, J. Aquaculture, labour, and emissions in the Southwest Bangladesh and the Sundarbans Reserve Forest. *Marine Studies Journal*.

Sjogersten, S., Siewert, M., **Valman, S.,** Ledger, M. and Boyd, D. Regional Analysis of Swedish Permafrost Subsidence. *Global Change Biology.*

Grants

UKRI / MiTACS UK-Canada Globalink exchange scheme **2022**
Three month internship at the Institut National de la Recherche Scientifique in Québec 2023. Working with Professor André St-Hilaire and Professor Normand Bergeron on satellite monitored ice-melt flood risk. (£15,000)

PhD Studentship, Geospatial Systems CDT **2020-2024**
UKRI funded 4-year PhD and MRes studentship. (£18,550 stipend and £3,300 research budget p/a)

Postgraduate fieldwork fund **2019**
University of Nottingham School of Geography fund to enable fieldwork and data collection. (£750)

MSc Studentship **2019**
University of Nottingham School of Geography funded studentship. (£4,850)

Research employment

Research Associate, University of Nottingham School of Biosciences **May 2022-present**
UK Space Agency-funded project measuring permafrost subsidence in Northern Sweden using InSAR and an Artificial Neural Network land classifier trained with drone imagery. *(UoN Bioscience / UKSA/ Umeå University).*

Research Associate, University of Nottingham School of Geography **December 2021-Present**
NERC Urgency Grant-funded project on Synergistic Fire and Floodplain Solutions. A Multi-disciplinary international team of researchers and data fieldwork assistants are looking at how a restored river floodplain has coped with fire. Using Avian, aquatic, vegetation, soil, and remotely sensed data sources. Second paper scheduled to be submitted in 2023. *(University of Nottingham, Portland University, USFS)*

Research Associate, University of Nottingham School of Geography **July 2019-Present**
Research and outreach about Stage Zero river restoration. Wrote and collated www.StageZeroRiverRestoration.com with an international group of contributors, including webinar, and crowd sourced sitemap. Carried out fieldwork on Whychus Creek, USA Stage Zero project: Lidar total stations surveys, macro-invertebrates, and vegetation surveys. Provided fieldwork assistance on the Holincote, UK monitoring Stage Zero sediment dynamics. *(UoN, Portland University, NOAA, USFS, EA, Deschutes Watershed Council)*

Research Associate, University of Nottingham Rights lab **2021-2022**
UK Space Agency project on Slavery from Space creating a Slavery Risk Calculator using satellite data. Satellite monitoring of illegal palm oil plantations in Malaysia and Indonesia, high resolution monitoring of illegal burn scars, and international forest loss estimates using cloud computing. *(UK Space Agency, UoN Rights Lab)*

Research Associate, University of Nottingham Rights Lab **2021-2022**
World Wildlife Fund US project on the social and ecological impacts of supply chains. Focusing on illegal shrimp farms and development within Bangladeshi Nature Reserves using high resolution satellite imagery and cloud computing. *(WWF, UK Space Agency, UoN Rights Lab)*

Research Associate, University of Nottingham Rights Lab **2021-2022**
Templeton World Charity Fund disaster assessment in the Bahamas, batch processing and downloading of PlanetScope high resolution imagery to measure before and after impacts of hurricane Dorian using Google Earth Engine. *(UoN Rights Lab, Templeton Charity)*

Research Associate, University of Nottingham School of Geography **2020-2022**
Mendrop Engineering Resources project developing FRAME – Channel change and sediment balance model. Developing new techniques for data analysis and visualisation of model success for the Mississippi river. US Army Core of Engineers paper in progress. (USGS, US Army Core of Engineers, UoN Geography)

Conferences

Valman, S., Dugdale, S.J. and Boyd, D. (2022). Earth Observation and Artificial Intelligence for a river digital twin: first steps. *UK National Earth Observation conference. 6-8th September, National Space Centre, Leicester.*

Jackson, B., Boyd, D., Sparks, J., Huerta, E.R., Blackstone, N., **Valman, S**., Blair, B., Perrat, B. and Foody, G. (2022). Emissions, Modern Slavery and Identifying Avenues to Mitigate Climate Change. *UK Earth Observation conference. 6-8th September, National Space Centre, Leicester.*

Research Skills and Training

- Python: (Artificial intelligence, Neural Networks, Tensorflow, statistics)
- Google Earth Engine
- HTML and CSS (https://github.com/SamValman)
- GIS – QGIS, ArcOnline, ArcPro, Survey123
- Total station LiDAR
- RTK GPS

Academic and Environmental outreach

- Produced Wikipedia entries for the Blue-Green Cities water management to help increase public engagement
- Demonstrated fluvial processes to visiting Secondary school students using the UoN Geography's flume facility.
- Demonstrated Cloud Computing introduction for Geospatial Data Science Masters students at the University of Nottingham.
- Presented a tutorial for Cloud Computing using Google Earth Engine to Freshwater post-graduate lab group at University of Nottingham.
- Clean Rivers Trust Tar Pit restoration monitoring
- Nottingham Wildlife Trust Volunteer (2019-2020)
- Major to Minor Lizard monitoring (2019)

Interests

- International Team Athlete (Great Britain) Kayaking (2016-2021)
- Helped organise 2022 Kayaking World Championships Nottingham (July 2022)
- Coached Junior Development Squad kayaking (July 2021)

References

Academic Supervisor:
Dr. Stephen Dugdale
Stephen.Dugdale@nottingham.ac.uk
University of Nottingham
Assistant Professor

Academic Supervisor:
Prof. Doreen Boyd
Doreen.Boyd@nottingham.ac.uk
University of Nottingham
Professor of Earth Observation

Employer/Research Associate Project Manager:
Prof. Colin Thorne:
CThorne@wolfwaterresources.com
Wolf Water Resources Consultancy (Oregon USA)
Consultant River Scientist