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

Universities of Nottingham and Newcastle

September 2021 – December 2023

Fully funded studentship from the Engineering and Physical Sciences Research council at the Geospatial Systems Centre of Doctoral Training.

Multi-institutional and interdisciplinary between the Universities of Nottingham and Newcastle and the departments of Geography and Engineering.

Writing a thesis on "An Earth Observation powered Digital Twin of river systems" using Artificial Intelligence, Python and high-resolution satellite imagery.

Master of Research: Geospatial Data Science

Universities of Nottingham and Newcastle

September 2020 – September 2021

Fully funded studentship at the Geospatial Systems Centre of Doctoral Training

Dissertation on Satellite monitored river surface temperature using Google Earth Engine Cloud Computing.

MSc by Research in Geography (Distinction)

University of Nottingham

September 2019 – December 2020

Tuition fee fully funded by the University of Nottingham, School of Geography.

Dissertation in “Hydrological, ecological, chemical, and morphological environmental variables result in inconsistent classifications of Anthropogenic streams”

BSc Geography Hons (2:1)
University of Nottingham
September 2015 – July 2019

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.

Accepted:
Thorne, C., Biedenham, D., Dahl, T., Valman, S., Mayne, C., Cox, A., Chris, H., Little, C. and Soar, P. The Alluvial Phase Space Diagram (APSD) and its potential application in the FRAME-RUBRIC model. Conference Paper SEDHYD 2023

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

£15,000 awarded by MiTACS and UKRI for a 3 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.

£18,550 stipend and £3,300 research budget PA for 4 years awarded by UKRI for studentship in the Geospatial Systems CDT.

£750 awarded by University of Nottingham School of Geography Postgraduate research fund 2019.

£4,850 awarded by the University of Nottingham School of Geography for Master of Research tuition fee.

Research employment

Research associate on UK Space Agency-funded project: Permafrost in Sweden

May 2022 – Present (UoN Bioscience / UKSA/ Umeå University)

- Artificial Neural Network for satellite land use classification (trained with drone data)
- Comparison with Radar land deformation to measure pollution from melting permafrost

Research associate on NERC Urgency Grant-funded project: Synergistic Fire and Floodplain Solutions

December 2021 – Present (University of Nottingham, Portland University, USFS)

http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FV021443%2F1&cookieConsent=A

Multi-disciplinary international team of researchers and data fieldwork assistants 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.

Research associate on Stage Zero River Restoration database/website

July 2019 – Present (UoN, Portland University, NOAA, USFS, EA, Deschutes Watershed Council)

- 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.

Research associate on UK Space Agency project: Slavery from Space - Slavery Risk Calculator
September 2021 – May 2022 (UK Space Agency, UoN Rights Lab)

- Satellite monitoring palm oil plantations in Malaysia and Indonesia
- Monitoring illegal burn scars using high resolution imagery
- International forest loss estimates using cloud computing
- Ordering and processing proprietary high resolution satellite data

Research associate World Wildlife Fund US: The Social and Ecological Impacts of Supply Chains
September 2021 – May 2022 (WWF, UK Space Agency, UoN Rights Lab)

- Finding illegal shrimp farms and development in Bangladeshi nature reserves using high resolution satellites and cloud computing
- Paper in process of being submitted to Marine Studies Journal

Research associate Templeton World Charity fund: Disaster assessment Bahamas
January 2021 – May 2022 (UoN Rights Lab, Templeton Charity)

- Batch processing and downloading Planet High Resolution imagery to monitor pre and post hurricane Dorian damage using Google Earth Engine.

Research associate Mendrop Engineering Resources: FRAME – Channel change Model
February 2020 – Present (USGS, US Army Core of Engineers, UoN Geography)

- Worked in an international group creating a sediment balance and channel change model primarily for the Mississippi River
- Primarily data analysis and visualisation of model success through adapting the Alluvial Phase Space Diagram to enable its use in future projects.
- Conference paper accepted, US Army Core of Engineers report in progress.

Research associate Research Excellence Framework (REF) Reports
January 2020 to May 2020 (UoN Geography)

- Impact statement collation to two REF Report applications.

Conferences

Samuel Valman[1], Stephen J Dugdale[2], Doreen S Boyd. (2022). Earth Observation and Artificial Intelligence for a river digital twin: first steps. UK Earth Observation conference poster.

Bethany Jackson[1,2], Doreen S. Boyd[1,2], Jess L. Decker Sparks[1], Edgar Rodríguez Huerta[1], Nicole Tichenor Blackstone[3], Sam Valman[4], Bobbie Blair[2], Bertrand Perrat[5], Giles M. Foody. (2022). Emissions, Modern Slavery and Identifying Avenues to Mitigate Climate Change. UK Earth Observation conference.

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

- Team Great Britain Kayaking (2016-2021)

- Helping organise Nottingham World Championships (July 2022)
- Coached Junior Development Squad kayaking (July 2021)

References

Dr. Stephen Dugdale: Stephen.Dugdale@nottingham.ac.uk

Prof. Doreen Boyd: Doreen.Boyd@nottingham.ac.uk

Prof. Colin Thorne: CThorne@wolfwaterresources.com