

I turn geospatial and remote sensing data and models into solutions for ecosystem monitoring and freshwater management. With a background in geology and GIS/EO and as a co-author and presenter of published research, my versatility connects remote sensing to real-world environmental applications. I have contributed to ESA projects, collaborated with the WWF, and consulted UK-Water utilities.

Skills

GIS

Geospatial Analysis, Database Management/RDBMS, QGIS, ESRI-ArcGIS, Post-GIS

Remote Sensing & EO

Optical/SAR, Spectroradiometry, ESA-SNAP, Google Earth Engine, ENVI, ERDAS, Copernicus CDSE, ACOLITE, SEN-ET/ET4FAO

Geology

Fieldmapping, Hydrogeology, Glaciology, Soil Mechanics, Structural Geology, Geomorphology

Data Science

Analysis & Statistics, Regression & Environmental Modelling, Power BI, OpenRefine, ETL

Programming

Git, GEE-JavaScript, BASH, SQL, Markdown, HTML/CSS, basic Python/geemap

Soft Skills

MSOffice/LibreOffice, Windows, Linux, FOSS, VScode, Presentations

Professional Experience

GIS & Remote Sensing Specialist - [Aquascope](#) | UK (Remote)

- Plans, designs, and implements catchment modelling workflows using National & Global Datasets and satellite products, developing catchment basins for UK and EU rivers.
- Generates discharge and water quality model parameter sets, performing statistical analysis comparing model results against local river monitoring data to calibrate models.
- Builds GEE scripts for daily realtime meteorological inputs for catchment simulations, deployed to 11 modelled catchments. Creates and maintains geodatabase structures, maintaining catchment model and spatial file organisation alongside technical documentation. Develops novel applications of remote sensing data for environmental applications.

Projects

[ESA - APPS](#) - *Autonomous, Proven, Predictive, Scaleable*

- Combining Meteorological data from satellite sources in Google Earth Engine to model River Discharge and Nitrate/Phosphate transport (as inputs in [PERSIST/INCA](#)), displayed on an interactive dashboard. Used IFS forecast data for predictive river quality forecasting for 10 UK Rivers, including the Thames and Wye.
- Demonstrated predictive modelling abilities of PERSIST/INCA for the first time in a [research publication](#), achieving 87% fitting to observations.
- Collaboration with the [World Wildlife Fund](#) and [CarbonClear](#) to develop and scale further projects, assisting Catchment Management Plans to improve river water quality, and mitigate future climate trends with scenario modelling.

Masters' Dissertation - *Feasibility of monitoring ocean plastic debris using satellite imagery*

- Studied and applied spectral and radiometric calibration procedures using plastic fishing net samples and an ASD field Spectroradiometer.
- Implemented research-derived novel indices and compared against previous peer-reviewed indices used in plastic and debris detection in coastal waters.
- Performed atmospheric correction methods using Sen2Cor and ACOLITE pre-processing of Sentinel-2 imagery for use in marine and coastal monitoring.
- Produced a Research Paper and Technical Manual, receiving a 76% mark and Distinction in Degree. Research Paper recommended for peer-review publication.

Education

MSc Geographic Information Science *with Distinction* | University of Edinburgh, 2020 - 2021

- Thesis & Technical Document: "[Evaluating the Suitability of Sentinel-2 Imagery for Marine Macro-plastic Detection in Coastal Areas](#)". *In Review for Publication*
- Modules: GIS, Remote Sensing, Earth Observation, Environmental & Spatial Modelling, Technological Infrastructures, Database Management, Coding (SQL/Python).

BSc (Honours) Geology 2:1 | Cardiff University, 2014 - 2017

- Thesis & 17km² Field-map: "The Geology of St. Davids Coastline, South West Wales"
- Modules: Geological Fieldwork (Cyprus, England, Scotland, Spain, Wales), Structural Geology & Geotechnical Engineering, Resource Mapping, Hydrology & Glaciology, GIS, Geomorphology, Hazard Safety & Risk Assessment.

Certifications

- 15+ Courses on Land & Coastal Applications of Earth Observation - [NASA ARSET](#)
- 4 Courses on the Copernicus Remote Sensing Ecosystem - [University of Luxembourg CC](#), [WEkEO Essentials](#) & [Earth Sessions](#).
- 2 Courses on GIS Programming - [ESRI](#), [Udemy](#)
- 2 Courses in Machine Learning and Automation – [ECMWF](#)
- CPD course Structural Geology for Exploration & Mining - [Cardiff University](#)
- Additional Certifications, Trainings, and details on [LinkedIn](#)

Research Publications

Whitehead, P. G., Edmunds, P., Bussi, G., O'Donnell, S., Futter, M., 2024. "Real-time Water Quality Forecasting in Rivers Using Satellite Data and Dynamic Models: An Online System for Operational Management, Control and Citizen Science". *Frontiers in Environmental Science*, 12:1331783. <https://doi.org/10.3389/fenvs.2024.1331783>

Memberships & Conference Attendances

- iEMSs [13th Congress on Environmental Modelling & Software](#), Dublin 2026
- Google [Geo For Good](#), Online 2021-2022, Mountain View CA 2023, Dublin 2024
- ESA [ECSECO 1st General Meeting](#), Vienna 2022
- Association for Geographic Information (AGI) - *Network Member*, 2020 - Present
- Royal Geographic Society of London (GSL) - *Fellow (FGS)*, 2014 - 2021