Maddie Grady, PhD

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Remote Sensing & Spatial Data Specialist with over 5 years experience and a passion for unpicking stories from data and understanding our world.

Spatial Scientist, Forest Research

2020 - Present

- Coordinated work mapping new woodland resources. Collaborated with ecological and social scientists to inform creation of new woodland. Secured funding and handled project administration and finance in coordination with project managers.
- Spearheaded development of reproducible and scalable software in the python scripting language (e.g. numpy, pandas, machine learning, scikit learn, GDAL, OGR, Keras, ArcPy, Tensorflow, rasterio, rsgislib, Anaconda and Docker). Developed and documented software to map individual trees and hedgerows across England, this data is being used by DEFRA to deliver valuable insights into woodland state, development, and carbon storage
- Promoted communication between ecological, forestry and remote sensing experts. Headed workshops on larch disease surveying requirements which led to the development of a 'fuzzy heat map' of larch locations. This product is being used by the Welsh Government, Natural Resources Wales, Forestry Commission, and Scottish Forestry to target flights to monitor larch disease spread.
- Actively sought opportunities to grow my experience and advance my skills. Forged new links with academic institutions (e.g. Cambridge University, Aberdeen University and Plymouth Marine Laboratory) to develop deep learning approaches. Initiated modernisation of computational practises, piloting the use of high performance cloud computing environments (e.g. Amazon Web Services, Geoserver).
- Initiated bimonthly meetings with Remote Sensing colleagues, fostered collaboration and improved dissemination of Remote Sensing ideas and increased efficiency. For example, spearheading adoption of formalised code and version control (git and github).
- Showcased complicated data sources and processes to a non-specialist audience. Visualised data in graphs, videos and maps in both 2D and 3D (e.g. Matplotlib, ESRI Arc and QGIS, Blender and rayshader). Shared key findings at conferences and government policy meetings.
- Mentored and developed remote sensing and machine learning expertise within the team of Forest Research graduate data scientists.
- Experience with a range of specialist Remote Sensing, GIS and data science software, including ESRI Arc, eCognition, ERDAS, ENVI, R, Excel, SQL and QGIS.

PhD Researcher in Earth Observation, Aberystwyth University

Earth Observation and Ecosystem Dynamics Research Group
2016-2020

- Orchestrated collaboration between Aber Uni EOED, Welsh Government and Geosmart Decisions, to devise an innovative new method for automatically identifying changes in

land cover in a large series of satellite image data. This work delivered results being used to inform further mapping (Living Wales Project) and government policy.

- Initiated quarterly meetings of all companies to communicate progress. Fostered a collaborative, strategic direction as an implementer and shaper of ideas, to balance the unique requirements of the multi-disciplinary group and ensure the optimal result for all parties.
- Conceptualised and communicated results, presented key findings at conferences, Welsh Government policy meetings, and STEM Ambassador events. Awarded best oral presentation at Aber Uni Postgrad Research Conference.
- Handled project administration and finance in conjunction with the funder (KESS 2 - European Social and Development Fund).
- Collaborated with colleagues to deliver innovative teaching and training to undergraduate students on GIS and remote sensing techniques. Spoke about analysis in a GIS, statistical tests and techniques and classification of different land cover types in a satellite image, and prepared demonstrations of the technical processes.

Associate Lecturer, Aberystwyth University

Based at Hohai University, Nanjing, China (Short-term Contract)
October 2019 – December 2019

- Assembled a series of lectures (12 lectures of 1.5 hours) and instructed Hohai university students in the basics of GIS implementation, spatial data analysis techniques and different types of spatial data sources. Utilised problem-solving, resource and time-management skills to ensure successful delivery of new, jargon heavy, content to Chinese students with mixed English language proficiency.
- Fostered collaboration with Hohai University staff to ensure the lecture content was successfully conveyed to the students.
- Adapted quickly to a different work system in a foreign language.

MSc Remote Sensing and Geographical Information Systems

Distinction *Aberystwyth University 2015-2016*

- Collaborated with the National Plant Phenomics Centre to analyse and model the relationship between grass yield and UAV aerial image productivity statistics. Results of the regression analysis performed in R were used in further study at the Centre.
- Formulated analysis techniques for a variety of data types and problems including; SAR, InSAR, DEM, optical and UAV data, regression modelling, spatial statistics, species distribution modelling, and rule-based classification systems.
- Achieved a Distinction, highlighting an excellent track record of high quality presentations, essays and technical reports both individually and as part of a team.

BSc Physical Geography

1st Class (Hons) *Aberystwyth University 2012-2015*

- Drove dissertation research project successfully identifying bird biodiversity hotspots using maximum entropy species distribution modelling and LiDAR forest structure data.
- Built a strong understanding of field data collection, quantitative and qualitative research methodologies, geomorphological processes and basic statistics (e.g. testing hypothesis)