

CVs

GCRF Underutilised Plants of Tropical Africa Hub

Harness plant diversity in sub-Saharan Africa to drive development and halt biodiversity loss

DR JUSTIN MOAT

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Academic qualifications

2018 **PhD** Geography, Nottingham University, UK
1995 **MSc** GIS (Spatial Analysis), UCL, UK
1989 **BSc** Exploration Geophysics, UCL, UK

Membership: IUCN Red list of Ecosystems, IUCN Red list Informatic group, DEFRA group on RPAS (Remotely Piloted Aircraft Systems), DEFRA geo and Earth Observation group. Steering committee for STFC/NERC Futures Network - Remote sensing technology to support sustainability and conservation - <http://environmentalomics.org/remote-sensing/>

Employment

2015-current **Research Leader Spatial Analysis**, Biodiversity Informatics and Spatial Analysis, Royal Botanic Gardens, Kew
1999-2015 **Head of GIS Unit**, Royal Botanic Gardens, Kew
1994-1996 **GIS Analysis (Madagascar)**, Royal Botanic Gardens, Kew
1993-1994 **ICAS analysis**, Ministry of Agriculture Fisheries and Food. Exeter, UK

Editorial Board of Remote Sensing in Ecology and Conservation (2017-present) and Journal of Madagascar conservation and development (2008-present).

Statement

I am a specialist in the application of GIS and Remote Sensing (RS) with regards to plants and habitats. I have specialist interests in species modelling, online mapping, the spatial distribution of vegetation and species and conservation assessments algorithms. Specialist research interests and expertise are in:

- Spatial distribution of and mapping of vegetation (core research areas include: Madagascar, Africa, South America and South East Asia) and area conservation assessments, using RS and GIS techniques to give up-to-date and accurate vegetation mapping and vegetation change (temporally). I am the lead on many mapping projects and author of the Atlas of the Vegetation of Madagascar and the Coffee Atlas of Ethiopia.
- Species Conservation assessments: Developing tools using herbarium specimens and GIS techniques (see geocat.kew.org, for which I am the lead and founder of) to produce quantifiable, preliminary conservation assessments, for use in global assessments; taxon treatments; area assessments and the facilitation of full IUCN conservation assessments.
- Spatial analysis and modelling for species and climate modelling to pinpoint vulnerable habitats, species and areas of resilience. I am the spatial analysis lead (co-PI) on the SCIP funded project Building a climate resilient coffee economy for Ethiopia. Heading up a team working on vegetation mapping and climate modelling for coffee production and wild coffee in Ethiopia.
- Unmanned Aerial Vehicles (UAV aka drones). I have been pioneering the use of UAV's for habitat assessment and tree assessment (including health), running UAV's for over 5 years in the dry forests of Peru, Coffee forests of Ethiopia and karst forests of the Caribbean.

Track Record

Dr. Justin Moat is the research leader of the Spatial Analysis team, with over twenty years of experience in delivering spatial for conservation and academic projects across the globe. He is a Key member of the IUCN committee's delivery experience in the application of spatial analysis for plant and habitat conservation. Justin has over 20 years of experience in managing research projects and supervising students and postdocs. He has authored over 40 peer review research papers (h-index 24), four books, four book chapters numerous reports and media coverage. He is presently involved in many projects

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Harness plant diversity in sub-Saharan Africa to drive development and halt biodiversity loss (in Peru, Brazil and Africa), including Co-PI the very successful SCIP project (£400k) in Ethiopia, which is building a climate resilient coffee economy for Ethiopia under climate change, using the latest climate models and distribution models to predict the fate of *Coffea arabica* in the future. He is also Kew PI on the Science and Technology Facilities Council (STFC) futures project which aims to Integrating remote sensing and ground-based spectral analysis to investigate biodiversity of archaeological sites in Amazonia. Finally, Justin has been involved in much publicly and outreach from his science appearing in multiple printed and visual press, including BBC's radios inside science and BBC news.

Major grant funding and awards (Highlights since 2012)

PI and Co-PI on over £3m worth of grants and projects since 2012. Highlights below

2016-2018	DEFRA (PI), Equipment for the new future of Spatial Analysis for plant metrics (£120k)
2016-2017	STFC futures (PI). Integrating remote sensing and ground-based spectral analysis to investigate biodiversity of archaeological sites in Amazonia
2016-2018	Darwin (Co-PI). Coffee, main streaming conservation and coffee production in Yayu, Ethiopia
2014-2016	SCIP (Co-PI) Building a climate resilient coffee economy for Ethiopia (£405k)
2014-2015	NERC big data (PI). Development and enhancement of GeoCAT geospatial tool for Red List assessments (£82k)

Selected relevant publications

1. Davis, A.P., Wilkinson, T., Challa, Z.K., Williams, J., Baena, S., Gole, T.W. & **Moat, J.** (2018). Coffee Atlas of Ethiopia. Royal Botanic Gardens, Kew (UK). 148 pp
2. Forest, F., **Moat, J.**, Baloch, E., Brummitt, N.A., Bachman, S.P., Ickert-Bond, S., Hollingsworth, P.M., Liston, A., Little, D.P., Mathews, S., Rai, H., Rydin, C., Stevenson, D.W., Thomas, P. & Buerki, S. (2018). Gymnosperms on the EDGE. Scientific Reports 8:6053. DOI:10.1038/s41598-018-24365-4
3. **Moat, J.**, Williams, J., Baena, S., Wilkinson, T., Gole, T. W., Challa, Z. K., ... & Davis, A. P. (2017). Resilience potential of the Ethiopian coffee sector under climate change. Nature plants, 3, 17081. <https://www.nature.com/articles/nplants201781>
4. Baena, S., **Moat J.**, Whaley O. & Boyd, D (2017) Identifying species from the air: UAVs and the very high-resolution challenge for plant conservation. PLOS ONE 12(11):e0188714 <https://doi.org/10.1371/journal.pone.0188714>
5. Brummitt, N.A., Bachman S.P.,... **Moat, J.**,... Nic Lughadha, E.M. (2015) Green plants in the red: a baseline global assessment for the Sampled Red List Index for Plants. PLoS One <http://dx.plos.org/10.1371/journal.pone.0135152>
6. Pritchard, H. W., **Moat, J. F.**, Ferraz, J. B., Marks, T. R., Camargo, J. L. C., Nadarajan, J., & Ferraz, I. D. (2014). Innovative approaches to the preservation of forest trees. *Forest Ecology and Management*.
7. Davis, A. P., Gole, T. W., Baena, S., & **Moat, J.** (2012). The impact of climate change on indigenous arabica coffee (*Coffea arabica*): predicting future trends and identifying priorities. *PloS one*, 7(11), e47981.
8. Bachman, S., **Moat, J.**, Hill, A. W., de Torre, J., & Scott, B. (2011). Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys*, (150), 117.
9. **Moat, J.**, Crouch, C., Smith, P. Milliken, W., Bachman, S., Baena, S., Hamilton, H. & Rivers, M. (2008) 'Rapid forest inventory and mapping. Monitoring forest cover and land use change' 151-155, in *Eliasch, J. (2008). Climate change: financing global forests: the Eliasch review. Earthscan.*
10. **Moat, J.**, & Smith, P. P. (2007). Atlas of the vegetation of Madagascar. Kew Publishing