

Arden Burrell

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<https://github.com/ArdenB>

Research Interests

My research focuses on understanding and monitoring how vegetation is responding to climate change through the use of remote sensing.

Current Employment

2019	Postdoctoral Research Associate - University of Leicester Centre for Landscape and Climate Research Part of the Fire REcovery and Forest Loss in Eastern Siberia (FIREFLIES) Project using remote sensing to look for climate change driven ecosystem collapse in the Siberian Boreal Forest region. Manager: Associate Professor Kirsten Barrett
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Education

2015 -2019	PhD - University of New South Wales, Climate Change Research Centre “Understand the role of Climate Change and Land Use on Dryland Degradation using Remote Sensing” – Supervisors: Professor Jason Evans and Dr Yi Liu. Awarded February 2019
2009 – 2012	Bachelor of Environmental Science (Honours, Class 1) University of Wollongong Dean's Merit List (top 5% of students) Honours Thesis “Mapping Changes of Saltmarsh and Mangrove Vegetation Communities in Wagonga Inlet, NSW South Coast” In collaboration with the NSW Office of Environment & Heritage – Supervisor: Professor Colin D. Woodroffe and Danny Wiecek

Publications

Published:

- **Burrell, A.L.**, Evans, J.P., Liu, Y., 2019. The Addition of Temperature to the TSS-RESTREND Methodology Significantly Improves the Detection of Dryland Degradation. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 1–7. <https://doi.org/10.1109/JSTARS.2019.2906466>
- **Burrell, A.L.**, Evans, J.P., Liu, Y., 2018. The impact of dataset selection on land degradation assessment. *ISPRS Journal of Photogrammetry and Remote Sensing* 146, 22–37. <https://doi.org/10.1016/j.isprsjprs.2018.08.017>
- **Burrell, A.L.**, Evans, J.P., Liu, Y., 2017. Detecting dryland degradation using Time Series Segmentation and Residual Trend analysis (TSS-RESTREND). *Remote Sensing of Environment* 197, 43–57. <https://doi.org/10.1016/j.rse.2017.05.018>
- Contributing author to the **IPCC special report on Climate Change and Land (2019)**, Chapter 3: Desertification.

In Review:

- **Arden L. Burrell**, Jason P. Evans, Martin De Kauwe "Climate change has driven over 5 million km² of drylands towards desertification" Nature. 2019
- **Arden L. Burrell**, Kirsten Barrett, Elena Kukavskaya. 2019. Post-fire recruitment failure as a driver of forest to non-forest ecosystem shifts in boreal regions. Chapter in Ecosystem Collapse, a book edited by Pep Canadell (In review)

Conference Proceedings:

- **Arden L. Burrell**, Jason P. Evans, Yi Liu, "The Addition of Temperature Significantly Improves the Detection of Land Degradation in Cold Drylands Using the TSS-RESTREND Methodology" 2018c IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Valencia, Spain

Past Employment History

2015 - 2018	<p>University of New South Wales Teaching Lab and Field Demonstration GEOS2821 - Remote Sensing and spatial science 2017-2018</p> <p>Field Trip Demonstration MSCI0501-The Marine Environment 2015-2016</p> <p>Guest Lecturer BEES6601 - Introduction to Climate Science</p> <p>Subject Auditor CLIM1001 - GENS0401-Introduction to Climate Change S2 2017</p> <p>Grading of Exams CLIM1001 - 2017 MSCI0501 - 2015-2016 CLIM1001 - 2016</p>
2011-2014	<p>Agurba Environmental Consultants</p> <p><u>Environmental Field Officer</u> Working for Illawarra Coal, employed to conduct environmental monitoring in the Cordeaux, Appin West and West Cliff Coal Mine Lease Areas and within the Georges and Nepean Rivers Catchment Areas.</p> <p>Responsibilities include:</p> <ul style="list-style-type: none">• Monitoring swamp sites to assess the health and structure of the vegetation communities to identify and assess any impacts of underground mining – base line data collection and mapping.• Extensive field monitoring of water and soil quality, as well as the identification and documentation of observable impacts of mining including rockfalls, land slip, rock fracture, soil cracking and changes in water flows, pondage and pool retention times.
NOV 2010 – JAN 2011	<p>BHP Billiton Mitsubishi Alliance (BMA) - (Vacation Program)</p> <p><u>Vacation Environmental Advisor</u></p>

	<p>Ten week program working at BMA Saraji Coal Mine in central Queensland. Responsibilities included:</p> <ul style="list-style-type: none"> • Water Quality monitoring to ensure that any water discharged from the Mine site does not damage the environment and is compliance with the standards in the Environmental Authority • GIS mapping of remotely sensed data and field observations as part of a site wide top soil stockpile reconciliation.
<p>2007 – 2015 (INTERMITTENT EMPLOYMENT – PROJECT BASED)</p>	<p>Jenny Rand & Associates – Management Consultants (Project feasibility studies, Tourism and Economic Development Planning, Town Planning, Business Plans, Market Research and Marketing Strategies)</p> <p>Research Officer</p> <ul style="list-style-type: none"> • Data collection, collation and analysis • Literature reviews • Land use surveys / photographic surveys • Mapping / GIS
<p>PROFESSIONAL DEVELOPMENT</p>	<p>ARC Centre of Excellence for Climate Extremes</p> <ul style="list-style-type: none"> • Winter School 2018 Climate Extremes and High Impact Weather • Winter School 2017 The Science of Climate Change • Winter School 2016 Tropical Meteorology • Winter School 2015 Biogeochemistry of the Earth System • CoE Scientific Paper Writing Workshop <p>Nature</p> <ul style="list-style-type: none"> • Nature Masterclass in Scientific Writing and Publishing <p>Australian Meteorological and Oceanographic Society</p> <ul style="list-style-type: none"> • Python Masterclass 2018 Python for Climate Scientists <p>Illawarra Coal</p> <ul style="list-style-type: none"> • Senior First Aid (Workplace Level 2) • Illawarra Coal Generic Surface Induction • Sydney Catchment Authority induction • 4wd and Boat Induction (Level 2) <p>Queensland Coal</p> <ul style="list-style-type: none"> • Certificate II – Surface Extraction Operations • RIIRIS201A - Local Risk Assessment • RIERR205A - Apply Initial Response First Aid • STAX Short course in Basic fire Fighting

Conference Presentations

Talks

- Increases in the frequency and severity of fires is putting the southern boreal forest at risk. **AGU Fall Meeting 2019**

Posters:

- Detecting dryland degradation through the use of Time Series Segmentation and Residual Trend analysis (TSS-RESTREND). **AGU Fall Meeting 2017**
- The impact of dataset selection on the separation of land degradation from natural climate variability using the TSS-RESTREND method. **AMOS-ICSHMO 2018**

Programming

Published Code:

Arden L. Burrell (2018). TSS.RESTREND: Time Series Segmented Residual Trends. R package <https://cran.r-project.org/web/packages/TSS.RESTREND/index.html>

Languages:

Python (Advanced), R (Advanced), Bash (Intermediate)

Tools:

Google Earth Engine (Intermediate), Git (Advanced), ArcGIS (Advanced), QGIS (Intermediate),

Awards and scholarships

The Climate Change Research Centre Prize for Science Communication, Outreach or Education for student achievement in Science Communication, Outreach or Education (2018)

UNSW Science thesis paper writing scholarship (2018)

References

Professor Jason Evans (PhD Supervisor)

University of New South Wales

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Associate Professor Kirsten Barrett

University of Leicester

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Dr Martin De Kauwe

University of New South Wales

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