Dan J. Dixon

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Current Position

2022 – present Postdoctoral Researcher, University of California, Davis. Remote Sensing and Ecosystem Change Lab. Research topics include fine-scale vegetation characterization with deep learning and effects of forest management on fire-induced tree mortality.

Education and Research Experience

2018 – 2022 Ph.D. University of Western Australia, Geography. Dissertation: A landscape-scale assessment of fire and eucalypt phenology of southwest Australia.

2015 – 2018 M.Sc. University of North Dakota, Earth System Science and Policy. Thesis: Merging land use change and insecticide applications to model threats to pollinators in North Dakota, USA.

2009 – 2013 B.A. West Chester University of Pennsylvania. Psychology and Spanish language. Senior project: A survey of socio-economic impacts of crop-raiding by chimpanzees around Gishwati National Park, Rwanda.

Recent Peer-Reviewed Publications

Dixon, D. J., Zhu, Y., Brown, C. F., & Jin, Y. (2023) Satellite detection of canopy-scale tree mortality and survival from California wildfires with spatio-temporal deep learning. *Remote Sensing of Environment.* https://doi.org/10.1016/j.rse.2023.113842

Dixon, D. J., Callow, J. N., Duncan, J. M. A., Setterfield, S. A., & Pauli, N. (2022). Regional-scale fire severity mapping of Eucalyptus forests with the Landsat archive. *Remote Sensing of Environment*, *270*, 112863. https://doi.org/10.1016/j.rse.2021.112863

Dixon, D. J., Zhu, Y., & Jin, Y. (2024) Canopy height estimation with PlanetScope time series and Sentinel-1 with Spatio-temporal deep learning. *Under Review.*

Dixon, D. J., Callow, J. N., Duncan, J. M. A., Setterfield, S. A., & Pauli, N. (2021). Satellite prediction of forest flowering phenology. *Remote Sensing of Environment*, *255*, 112197. https://doi.org/10.1016/j.rse.2020.112197

Dixon, D. J., Duncan, J. M. A., Callow, J. N., Setterfield, S. A., & Pauli, N. (2023). Fire reduces eucalypt forest flowering phenology at the landscape-scale. *Science of The Total Environment*, *894*, 164828. https://doi.org/10.1016/j.scitotenv.2023.164828

Rossiter-rachor, N. A., Adams, V. M., Canham, C. A., **Dixon, D. J.,** Cameron, T. N., & Setterfield, S. A. (2023). The cost of not acting: Delaying invasive grass management increases costs and threatens assets in a national park, northern Australia. *Journal of Environmental Management*, 333, 116785. https://doi.org/10.1016/j.jenvman.2022.116785

Dixon, D. J., Zheng, H., & Otto, C. R. V. (2021). Land conversion and pesticide use degrade forage areas for honey bees in America's beekeeping epicenter. *PLoS ONE*, 16(5 May), 1–15. https://doi.org/10.1371/journal.pone.0251043

Teaching Experience

2022 - 2024 Guest lecturer in *Remote Sensing Applications* at the University of California, Davis. Topics included Deep Learning Applications, Photogrammetry, and Foundations of Satellite Remote Sensing.

2018 - 2022 Teaching Assistant and GIS Instructor for *Introduction to GIS* and *Advanced Geospatial Analytics* at the University of Western Australia over eight semesters and 500 hours with undergraduate and graduate students.

Funding History

2024 CALFIRE Forest Health Research Program (Co-PI). Project: “Understanding daily fire dynamics with enhanced fine-scale vegetation inputs in the Wildland-Urban Interface (Not successful).

2023 NASA Commercial Small Sat Data Acquisition Program (Co-PI). Project: “Crown-scale tree mortality detection with deep learning from PlanetScope and other very high-resolution satellite imagery” (Not successful).

2023 CALFIRE Forest Health Research Program (Co-PI). Project: “Improved understanding and prediction of forest vulnerability to high severity burns with machine learning: from crown to landscape scales” (Not successful).

2018-2022 Scholarship: Cooperative Research Centre for Honeybee Products ($30k/year) Project: “Understanding the effects of fire and climate on flowering resources in southwest Australia”.

2015-2018 Scholarship: University of North Dakota / USDA ($30k/year). Project: “Understanding land-use threats to pollinators in the Northern Great Plains”.

Notable Conference Presentations

NASA Joint Science Workshop (2023) Satellite detection of crown-scale tree mortality from California wildfires with spatio-temporal deep learning (poster)

American Geophysical Union (2017, 2021, 2023)
- Satellite detection of crown-scale tree height across California with PlanetScope (poster)
- Monitoring intra-seasonal forest phenology with PlanetScope (talk)
- Understanding land-use threats to pollinators in the Northern Great Plains, USA (poster)

Geo for Good (Google) (2021) Machine learning-based detection of forest flowering phenology with PlanetScope time series (talk)

Free and Open Source Software for Geospatial (FOSS4G) (2020) Mapping fire severity using Landsat, MODIS and Google Earth Engine with Random Forest (talk)

Relavent Skills

- Programming (Python, R, JavaScript)
- Geospatial (QGIS, GDAL, Google Earth Engine)
- Machine Learning (TensorFlow, Scikit-learn)
- Drone pilot license > 150 hours flight time
- Spanish language