Dan J. Dixon

Postdoctoral Researcher
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EDUCATION

Ph.D., Geography **2018 – 2022**
School of Agriculture and Environment, *University of Western Australia (UWA)*

M.S., Earth System Science and Policy **2015 – 2018**
School of Aerospace Sciences, *University of North Dakota*

B.A., Psychology and Spanish language **2009 – 2013**
College of Sciences and Mathematics, *West Chester University of Pennsylvania*

RESEARCH INTEREST

I focus on applied geospatial remote sensing of the environment. My work incorporates machine learning and other statistics with Earth observation data to map and investigate relationships at local to regional scales. Research topics include quantifying wildfire impacts, forest structure estimation, forest phenology, invasive species management, and land use/land cover change.

RESEARCH EXPERIENCES & EMPOLYMENT

Postdoctoral Researcher **July 2022 – Present**
Advisor: Prof. Yufang Jin*, University of California Davis – Remote Sensing and Ecosystem Change Lab*

- Developed deep learning models using remote sensing data (e.g., satellite imagery, airborne LiDAR) to monitor individual tree structure and mortality state-wide in California
- Quantified the extent of wildfire-induced tree mortality with Bayesian casual inference tools and provided recommendations to forest management for increased ecosystem resilience

Doctoral Research **2018 – 2022**
Advisor: Dr. Nik Callow, *Centre for Water and Spatial Science, UWA*
Doctoral Dissertation: A landscape-scale assessment of fire history impacts on forest phenology of southwest Australia

- Built AI/ML time series models to track plant phenology (i.e., reproductive cycles) using satellite and drone imagery
- Developed a 20-year database of fire severity in Australia from Landsat and MODIS
- Used spatial econometrics to analyze the effects of fire history on plant phenological cycles on ~1 million eucalypt trees leading to improved biodiversity management

Master's Research **2015 – 2018**
Thesis: Modeling threats to honey bees in North Dakota from land-use change and pesticide applications

- Used Geographic Information Systems (GIS) to examine the effects of land use/land cover change on grassland habitat for pollinators in the Northern Great Plains, USA
- Developed Python workflows to integrate pesticide use survey data with remotely sensed land cover information

Research Assistanships & Field Work

Drone Pilot and Image Processing Technician, UWA, Australia **2020 – 2022**

- Obtained remote pilot license from Civil Aviation Safety Authority and logged > 500 hours of drone imaging/surveying. Processed imagery with photogrammetry software.

Research Assistant, *Think Elephants NGO, Chiang Rai, Thailand* **2014 – 2015**

- Carried out research on wildlife conservation and education programs in SE Asia

Research Assistant*, West Chester University / Gishwati Forest, Rwanda* **2013 – 2014**

- Conducted surveys with farmers affected by crop-raiding chimpanzees surrounding Gishwati National Park, Rwanda

PUBLICATIONS – bit.ly/djdixon-google-scholar

Journal Articles

Dixon, D. J., Zhu, Y., & Jin, Y. (2025) Canopy height estimation from PlanetScope time series with spatio-temporal deep learning. *Remote Sensing of Environment.* https://doi.org/10.1016/j.rse.2024.114518

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., 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*. 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*. https://doi.org/10.1016/j.jenvman.2022.116785

Patel, V., Boruff, B., Biggs, E., Pauli, N., & **Dixon, D.J.,** Temporally stacked bee forage species distribution modeling for flower abundance mapping. *Methods X.* https://doi.org/10.1016/j.mex.2023.102327

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*. https://doi.org/10.1016/j.rse.2021.112863

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*. https://doi.org/10.1016/j.rse.2020.112197

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*. https://doi.org/10.1371/journal.pone.0251043

Journal Articles (in preparation)

Dixon, D. J., Dong, X., & Jin, Y. (2025) Higher forest density and structural homogeneity increase giant sequoia mortality from wildfire.

Dixon, D. J., & Jin, Y. (2025) Annual canopy height data for California with Sentinel-2 time series and 3D-Convolutional Neural Networks.

Kozar, D.J., **Dixon, D. J.,** Zhang, Y., Weber, B., Jin, Y., Dong, X. (2025) Mapping Dryland Photo-autotrophic Communities using Spatiotemporal Signals in Satellite Imagery and Deep Learning.

Zhu, Y., **Dixon, D. J.,** & Jin, Y., (2025) Scalable mapping of fine-scale woody vegetation and building footprint from aerial imagery with deep learning.

PROPOSALS

Welbergen, J., Meade, J., Turbill, C., Boer, M., **Dixon, D. J.,** Australian Research Council Discovery Projects (2025). Resource tracking by nomadic wildlife in a land of boom and bust (In Review).

Jin, Y., **Dixon, D. J.** CALFIRE Forest Health Research Program (2024). Understanding daily fire dynamics with enhanced fine-scale vegetation inputs in the Wildland-Urban Interface (Not funded).

Jin, Y., **Dixon, D. J.,** NASA Commercial Small Sat Data Acquisition Program (2023), Crown-scale tree mortality detection with deep learning from PlanetScope and other very high-resolution satellite imagery (Not funded).

Jin, Y., **Dixon, D. J.,** CALFIRE Forest Health Research Program (2023). Improved understanding and prediction of forest vulnerability to high severity burns with machine learning: from crown to landscape scales (Not funded).

PRESENTATIONS

International Conferences

American Geophysical Union (AGU) Fall Meeting (2023) – **Dixon, D. J.,** Zhu, Y., & Jin, Y. Canopy height estimation from PlanetScope time series with spatio-temporal deep learning. American Geophysical Union, 2023, San Francisco, California.

AGU Fall Meeting (2023) – Zhu, Y., **Dixon, D. J.,** & Jin, Y. Scalable mapping of fine-scale woody vegetation and building footprint from aerial imagery with deep learning.

AGU Fall Meeting (2023) – Kozar, D.J., **Dixon, D. J.,** Zhang, Y., Weber, B., Jin, Y., Dong, X. (2025) Mapping Dryland Photo-autotrophic Communities using Spatiotemporal Signals in Satellite Imagery and Deep Learning.

International Fire Ecology and Management Congress (2023) – Zhu, Y., **Dixon, D. J.,** & Jin, Y., Scalable mapping of fine-scale woody vegetation and building footprint from aerial imagery with deep learning. Monterey, California.

NASA Joint Science Workshop (Land Cover / Land Use Change) (2023) – **Dixon, D. J.,** Zhu, Y. & Jin, Y., Satellite detection of crown-scale tree mortality from California wildfires. College Park, Maryland.

AGU Fall Meeting (2022) – Zhu, Y., **Dixon, D. J.,** & Jin, Y., Evaluation of Fine Scale Fuel Mapping in Wildland Urban Interface with Multi-sensor Remote Sensing. Chicago, Illinois.

Free and Open-Source Software for Geospatial (FOSS4G) (2022) – **Dixon, D. J.,** Callow, J. N., Duncan, J. M. A., Setterfield, S. A., & Pauli, N. Regional-scale fire severity mapping of Eucalyptus forests with the Landsat archive. Perth, Australia.

AGU Fall Meeting (2021) – **Dixon, D. J.,** Callow, J. N., Duncan, J. M. A., Setterfield, S. A., & Pauli, N. Satellite prediction of forest flowering phenology in session: Multi-scale Remote Sensing to Capture and Characterize Reproductive Phenology. New Orleans, Louisiana.

FOSS4G (2021) – **Dixon, D. J.,** Callow, J. N., Duncan, J. M. A., Setterfield, S. A., & Pauli, N. Detecting flowering phenology from CubeSat time series and machine learning. Perth, Australia.

North Dakota Chapter of the Wildlife Society (2018) – **Dixon, D. J.,** Zheng, H., & Otto, C. R. V.. Measuring Spatial Threats to Apiaries in the Prairie Pothole Region of North Dakota and South Dakota Using InVEST's Habitat Quality Model. Mandan, North Dakota.

AGU Fall Meeting (2017) – **Dixon, D. J.,** Zheng, H., & Otto, C. R. V.. Merging Land Use Change Trends and Insecticide Application to Understand Multiple Threats to Honey Bees in North Dakota. New Orleans, Louisiana.

Entomological Society of America conference (2017) – **Dixon, D. J.,** Zheng, H., & Otto, C. R. V.. Merging Land Use Change Trends and Insecticide Application to Understand Multiple Threats to Honeybees in North Dakota. Denver, Colorado.

Invited Talks and Lectures

Guest Lecture, Environmental Remote Sensing (EMS 186) "Deep Learning Applications in Remote Sensing", University of California Davis (Spring 2024)

Guest Lecture, Aerial Photo Interpretation & Remote Sensing (ESM 185) "Photogrammetry from Drone Imagery", University of California Davis (Fall 2023)

Guest Lecture, Environmental Remote Sensing (EMS 186) "Remote Sensing Applications in Forests of California", University of California Davis (Spring 2023)

NASA AMES Earth Science Division: Land Cover / Land Use Change Site Visit "Deep learning applications for fuels management in California's wildland urban interface" (2024)

Planet's Planetology Webinar Series on Forestry "Canopy-scale detection of tree mortality from wildfire" (2024)

Western Sydney University "Detecting canopy-scale tree mortality and survival from California wildfires with CubeSat image time series" (2024)

Department of Biodiversity Conservation and Attractions of Western Australia: Fire Severity and Fire Regime Workshop "Mapping fire severity and eucalypt flowering to understand large-scale effects of burning on forest phenology" (2024)

Planet Explore User Conference “Detecting flowering phenology from PlanetScope time series” (2021)

Google’s Geo for Good Lightning Talk Series: Nature Conservation “Detecting forest flowering events from PlanetScope time series” (2021)

Teaching Experience

Teaching Assistant, Geographic Information Systems (GEOG 2201) **2020 – 2022**
(undergraduate and graduate course) *University of Western Australia*

Teaching Assistant, Advanced Spatial Analytics (ENVT 5508) **2021**
(graduate course) *University of Western Australia*

Scholarships

Cooperative Research Centre for Honeybee Products ($35k/year) **2018 – 2022**
Project: “Understanding the effects of fire and climate on flowering resources in southwest Australia”.

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

Professional Service

Journal reviewer **2024**
- *Remote Sensing of Environment, Remote Sensing in Ecology and Conservation*

Thesis examiner **2024**
- Reviewed a Master’s thesis for a student at Western Sydney University

Panel member **2024**
- Participated in research collaboration sessions with UC Davis / University of Sydney “Building Resilient and Sustainable Food Systems” workshop.

Volunteer **2020 – 2024**
- Provided drone and remote sensing training at the UC Davis AI and Drone Camp for High School students
- Provided GIS tutoring sessions to graduate and understaduate students at University of Western Australia

Journal reviewer **2022 – 2023**
- *Methods in Ecology and Evolution, ISPRS Journal of Photogrammetry and Remote Sensing*

Professional Societies

- American Geophysical Union (AGU)
- AmericaView (USGS grant)
- Ecological Society of America
- Association for Fire Ecology