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Post-doctoral Fellowship: DATA-DRIVEN FOREST SCIENCE AT THE IMPACT OPEN-AIR LAB

*Integrating sensors, satellites, and data science to unlock new
insights into tree growth.*

THE RESEARCH PROJECT

South Africa has very few long-term, intensively monitored experiments in managed forest environments. Just such an experiment has been implemented as part of the Hans Merensky Chair in Advanced Modelling of Growth and Wood Formation in Eucalypts (EucXylo) at Stellenbosch University. This new experiment, called the IMPACT Open-Air Laboratory (OAL), is located at Somerset West in the Western Cape of South Africa. The experiment focuses on the world's most widely planted hardwoods: the fascinating genus *Eucalyptus*, some species of which are the largest flowering plants in the world! See <https://eucxylo.sun.ac.za/open-air-lab/> for more information. The focus of this new experimental facility and associated research program is the intensive monitoring of growth and ecophysiology of several eucalypt species experiencing varied levels of between-tree competition. A wide range of sensing equipment is, or will be, installed at the site, including dendrometers, sap flow sensors, and environmental sensors such as soil water probes. The experiment also makes extensive use of remote sensing systems. These systems are implemented across all plots in three replications on an 11-ha site.

This post-doctoral fellowship (PDF) will harness the large amount of data generated from this site using various remote sensing systems as well as ground-truth data from manual measurements and IoT sensors. The over-arching objective of the PDF will be to integrate these datasets for new insights into tree growth and response dynamics and trends, and to develop data flows and methods for using the data in simulation models. We are particularly keen to appoint a data-savvy researcher with strong Python and SQL skills to lead data integration, curation, and analysis across sensor and remote-sensing streams.

DUTIES

This post-doctoral fellowship will involve:

1. Coordinating students and service providers who are using or operating remote sensing platforms at the IMPACT OAL, and acquiring other RS products (e.g. satellite RS like Sentinel or Dragonette).
2. Leading or assisting with analyses of the remotely sensed data, often in collaboration with post-grad students.
3. Some data gathering, field work and assistance with site visits (with students or technical staff) at the IMPACT OAL.
4. Leading proposal development to bring in additional funds for research activities or travel wherever possible.
5. Co-supervision of at least one student.
6. Some assistance with undergraduate teaching.
7. Publication, as lead author, of at least two peer-reviewed papers reporting findings on the research topic, as well as co-authorship with students also working at IMPACT.
8. Design, build, and maintain reproducible data pipelines and databases (Python/SQL) to integrate IoT, field, and remote-sensing datasets (e.g., dendrometers, sap flow, soil water probes, Sentinel/UAS).
9. Experienced in good practice for version control, documentation, and data governance (Git, code review, metadata) to enable collaboration with colleagues, students, and partners.

LOCATION

The incumbent will be based full-time at Stellenbosch University (SU) in Stellenbosch. SU celebrated its centenary in 2018 and is widely acknowledged as one of Africa's premier tertiary education and research institutions (visit www.sun.ac.za for more information). Staff and students at the University enjoy a relaxed and pleasant lifestyle, close to the mountains and the sea. Attracting students from around the world, and particularly Africa, and with strong international linkages and collaborations, the DFWS prides itself on research excellence with a diverse, friendly culture.

REQUIREMENTS AND QUALIFICATIONS

- A recognized Ph.D. **completed within the last 5 years** in remote sensing, environmental monitoring, forest science, or another applicable field, but with demonstrable experience in GIS and proficiency in Python and SQL (e.g., pandas/geopandas, rasterio/GDAL; PostgreSQL/PostGIS or equivalent).
- Strong knowledge of remote sensing systems, applicable data formats and processing workflows.
- Up-to-date knowledge in modern scientific data collection, data management, and data/statistical analysis.
- Excellent communication and interpersonal skills to be able to interact effectively with students, scientists, and stakeholders.
- A high level of written and verbal communication skills in English are essential.
- Ability to function in a multicultural and multilingual environment, ability to work well both independently and as part of a team and take initiative.
- A valid driver's license.
- At least one high-quality paper has already been published in the scientific literature.
- Experience with data/statistical analysis, ideally including time-series or remote-sensing workflows; familiarity with Docker (or alternatives) and cloud/HPC is a plus.
- Experience using Git or similar for collaborative, reproducible research is desirable.

CONTRACT DURATION AND COMMENCEMENT

The research stipend is initially granted for a one-year period, which may be extended to at least a second year, contingent upon performance. The base stipend is R370,000 per annum (tax-free fellowship) + R10,000 for the purchase of a laptop computer. Although the project fully covers the stipend, the successful incumbent will be encouraged to apply for additional top-up funding to expand the scope of the research. All basic running and travel costs will, however, be borne by the project.

Please note that post-doctoral fellows are not appointed as employees in South Africa and their fellowships are awarded tax free, and they are not eligible for standard employee benefits. For more information about post-doctoral fellowships at Stellenbosch visit <http://www.sun.ac.za/english/research-innovation/Research-Development/postdocs>.

This position is based at the Stellenbosch campus. The incumbent is expected to work full time on campus or at the experimental field site during the workday, although some flexibility in working location can be negotiated.

Commencement: **February 2026** (*negotiable to accommodate visa timelines for international candidates*).

APPLICATION PROCEDURE

Application closing date: **End November 2025**

Please send by email to Dr. David Drew (drew@sun.ac.za) the following documents:

1. A brief cover letter providing motivation for your application.
2. Current, comprehensive CV with full publication list.
3. Copies of the doctoral degree certificate, other relevant degree certificates, and grades obtained.
4. Contact details of at least two professional referees.
5. Please include a link to your public code repository (e.g., GitHub/GitLab)

Any questions about the position can be addressed to Dr. Drew at the same email address. For questions about visas and international relocation to South Africa, please contact : Stellenbosch University International HR-IMMIGRATION@sun.ac.za and copy postdocinfo@sun.ac.za.

We welcome international applicants; visa and relocation guidance is provided via Stellenbosch University International Office.

Short-listed candidates may be asked to complete a brief, practical data task or similar assessment.

Applicants who have not received a response within 14 days of the closing date, please accept that your application has not been successful. Short-listed applicants will be contacted to arrange an interview. These candidates may be requested to provide additional information/submissions, and to undergo certain biometric/literacy/other tests.