



Environment Institute
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BREAKING THE BARRIERS

INNOVATING TO IMPROVE ECOLOGICAL OUTCOMES
ON TRANSPORT AND OTHER LINEAR INFRASTRUCTURE

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IMAGE CREDIT: ROB APPLEBY, WILDSPY/GRIFFITH UNIVERSITY



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ABSTRACT

Applied satellite-derived 4D environmental intelligence to support landscape-scale impact assessment of habitats along linear corridors across Australia.

We present a novel approach to landscape scale assessment incorporating 4D vegetation vertical structure information to identify habitats along linear corridors, at scale. Linear infrastructure projects utilise large swaths of land encompassing broad range of ecosystem types, in remote and complex regions, which cannot easily be sampled on the ground alone. Furthermore, land access and baseline data issues such as inconsistent, incongruent and out-of-date spatial datasets can be an issue at early project stages for infrastructure planning and environmental assessments. We demonstrate that we can break down data barriers with new and consistent environmental geospatial data, using cutting-edge multi-modal satellite data processing for improved ecological outcomes. Fusing multiple satellite sensors, we have developed a quantitative approach for defining fine-scale ecological niches, utilising 4D vegetation information, wall-to-wall across Australia. This innovative data fusion generates detailed spatial-temporal data characterising horizontal cover dynamics and vertical structure of diverse ecosystems. These are applied at a landscape-scale with our advanced analytics engine to provide a comprehensive view of infrastructure development corridors, adjacent habitat types and condition, and archetypal reference sites aligned to large-scale linear corridor projects. We have developed national-scale 4D vegetation datasets that describe habitats at local scales to enable enhanced desktop tools for regional impact and offset assessments. Environmental attributes (e.g., vegetation height, cover, structural complexity, habitat connectivity) at whole-of-project scale are now able to be applied to optimise ecological outcomes and limit biodiversity impacts, and support offset requirements with efficient landscape monitoring tools at every stage of linear infrastructure projects, regardless of state or catchment boundaries.

KEY TAKEAWAYS

1. Landscape-scale planning and impact assessment approaches can be supported by satellite data to produce fine-scale results needed for decision making.
2. Innovative cloud computing techniques, coupled with advance satellite data fusion techniques, artificial intelligence and visual language models provide a leap forward in the regional-scale analysis needed to capture environmental niches and dynamics across Australia with consistency.
3. Our approach enables efficient assessment of large linear corridors and their adjacent vegetation characteristics and habitats to enable new and fit-for-purpose landscape modelling techniques to be incorporated into large linear infrastructure projects.

SPEAKER BIOGRAPHY

Tim Hackwood is an environmental and operations management professional with extensive leadership and project management experience, including ecological restoration, vegetation assessments, and flora and fauna surveying in environmentally sensitive areas. Deeply passionate about Australia's natural environment, Tim's focus at Ozius is to help customers answer complex ecological questions using the power of artificial intelligence and remote sensing technologies.