

Title of the symposium:

Application of novel remote sensing data and techniques to habitat and biological assessments

Detail of organizer(s):

Responsible

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Symposium abstract

The rapid advancement of remote sensing technologies and increasing availability of open access data provides many opportunities to better understand landscape-species interactions and address complex questions which were previously not possible or very costly. In recent years satellite missions providing worldwide high spatial (<1-20m) and high temporal (daily) resolution have been launched, such as Worldview 4, Sentinel 2, PlanetLabs CubeSats, etc. Some of these missions (e.g. the European Space Agency's Sentinel missions) also offer the data free of charge through an open-access portal. In addition, there have been continued advancements in capture of laser scanning data, and very high resolution (spatial and spectral) aerial and terrestrial data including from unmanned vehicles. This wealth of new remotely sensed data remains under-utilised for spatially dynamic biological applications and within Landscape Ecology. These new advances and data sources are considered a game changer for the application of remote sensing data to address ecological questions. There are now possibilities to consider, for example, the three dimensional structure of vegetation and buildings over large spatial extents, to investigate the intensity of landscape management or disturbances, to determine the seasonal dynamics of vegetation. The high spatial and temporal resolution of remote sensing products allows for more continuous monitoring of indicators of land-use intensity and landscape function such as phenology, primary productivity, vegetation structure and fragmentation. This allows researchers to move beyond static 2D views of landscapes or small case study areas and consider the implications of structure, temporal dynamics and continuity at fine spatial resolution and wide extents for ecosystem function and the behaviour of species within a landscape. There are now excellent opportunities to gather data remotely in areas which have previously been understudied due to their remote or difficult to access locations.

There are greater opportunities for monitoring of temporal landscape dynamics, particularly within-season which was not previously possible. Open access data affords opportunities for more research in areas/by researchers with limited funding. This symposium will bring together experts from ecology and remote sensing to discuss and share experiences and ideas on how to best take advantage of modern remote sensing in assessment of habitats, species movement, and landscape-species interactions. We will also consider how utilising remote sensing data will help to achieve aims related to landscape management, ecosystem function and landscape protection and conservation goals particularly within dynamic and anthropogenic dominated landscapes. The symposium focuses on recent advances in remote sensing and the specific advantages of high resolution (spectral, spatial, temporal, vertical) data for addressing landscape ecology questions.

How your symposia will improve landscape ecology science?

Since 1983 the IALE World Congress has brought together researchers and practitioners from all over the world with a variety of expertise in, for example, ecological theory, technical data analysis and collection and application of research to practice, all with the overall goal of better understanding landscape processes and conservation of landscape function. This symposium will take advantage of this setting and bring together diverse experts from ecological and remote sensing fields to learn from each other about the opportunities recent remote sensing data offers landscape ecology. The diverse knowledge and expertise of the invited speakers will allow us to identify gaps in current applications of remote sensing data for landscape ecology questions and determine how well recent developments in remote sensing can fill those gaps. We will be able to determine the data needs of ecological researchers and the technical capabilities and limitations of the current remote sensing data to meet those needs. Contributions will include examples of successful integration of recent remote sensing to solve ecological problems, studies testing novel approaches, and opportunities for early career researchers to present their work and receive feedback. In this context the symposium aims to further the collaboration between remote sensing experts and ecologists and biologists under the general umbrella of Landscape Ecology. We hope to strengthen the networks of researchers and practitioners interested in this ecology-remote sensing interface and identify the most important research gaps and best way forward to improve the integration of remote sensing data for ecological applications within landscape sciences.

Broad thematic areas

Broad thematic areas 1st choice: Technologies and landscape ecology (remote sensing, geomatics, ...)

Broad thematic areas 2st choice: From landscape pattern to functions (variables, metrics, indicators, monitoring)