Multi-scale phenology of temperate grasslands

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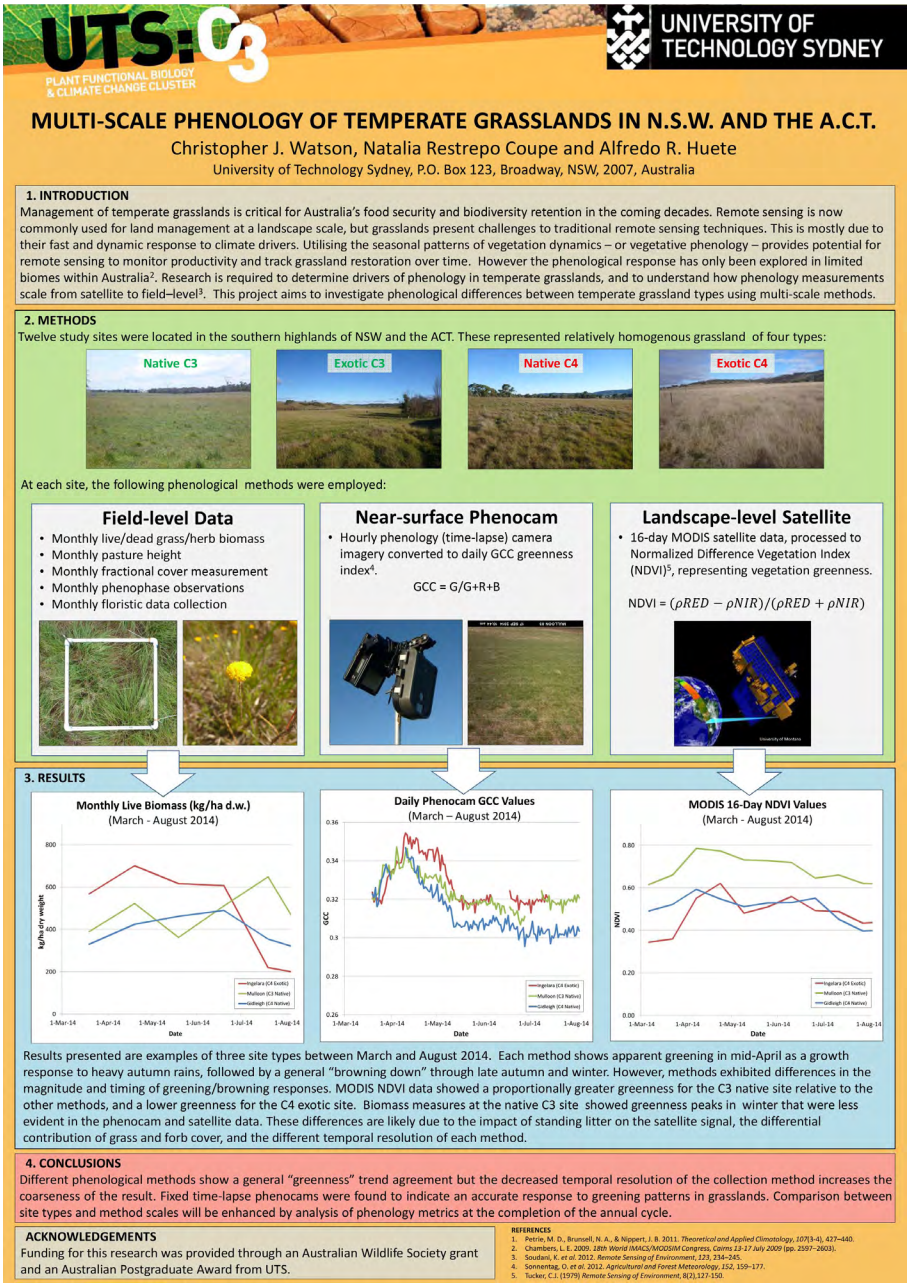
The management of temperate grasslands will be an economic and ecological challenge under future climate scenarios. One approach to monitoring is by using time-series satellite data to characterise the vegetation dynamics, known as phenology. Characterising the phenology of grasslands through remote sensing is difficult because of their dynamic response to rainfall and typical high quantities of litter. In particular, scaling phenology from the satellite to species-level remains a challenge. In this project, we aim to compare satellite phenology-estimation methods with time-lapse camera ('phenocam') imagery and field data across different temperate grassland communities in and around the ACT. Through this we will identify the drivers of phenological fluctuations and determine how different scales affect phenology estimates. Results to date suggest that different grassland communities exhibit differences in phenology metrics, particularly maximum greenness values and timing of key events (e.g. peak greenness). Phenocam and satellite data tend to be related, though the greater frequency of phenocam data collection (daily) provides advantages. Field data on species phenophase is instrumental in explaining the variability and trends observed in the coarser scales. This approach provides a different perspective to remote grassland monitoring, and will be expanded to incorporate native grassland recovery.



Chris Watson graduated from the University of Sydney with a strong interest in botany. After working throughout Australia with environmental and botanical consultants he moved to Canada for a position with the Ontario Ministry of the Environment. He was coordinator of the Ontario Forest Biomonitoring Program which examined the long-term effects on maple forests, and established Ontario's first carbon flux monitoring system in the far north. Chris returned to Australia and is currently investigating grassland phenology as part of his PhD project with the University of Technology Sydney.