

# Examining the resilience of mine rehabilitation using ground data with and high-resolution imagery

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Assessing the success of revegetation efforts over large areas is a time intensive and costly endeavour. Remote sensing techniques using satellite imagery can completely capture large areas and be used for generic measures of plant health (eg. normalised difference vegetation index or NDVI) but it is often difficult to collect on-the-ground data at the same time. Additionally, satellite data is generally not at a scale that can be easily used to distinguish plant types and different lifeforms. With recent advances in unmanned aerial vehicles (UAVs) and light-weight narrow band sensors, high resolution satellite-like imagery can now be captured across hundreds of hectares at an individual plant scale. Additionally, the collection of imagery by UAVs can easily occur simultaneously with ground sampling, to ensure that there is minimal temporal change in the data. The combination of high-resolution imagery with ground monitoring provides a clearly defined geospatial context to rehabilitated plant communities and the ability to measure resilience of individual plants exposed to disturbances. This talk will demonstrate how we measure plant types from field generated polygons and the extraction of vegetation plot data from imagery collected in conjunction with field observations. A range of band indices in the visible and near infrared spectra will then be used to identify the survival, growth and health of the vegetation. We examine these new broad scale methods to monitor the structure and composition of a plant community at a rehabilitated mine site and illustrate how these techniques could be used more widely to gauge the success and connectivity of restoration efforts.