

## Unmanned Aerial Systems (UAS): Redefining Vegetation Analysis

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**Background/Objectives.** Unmanned aerial system (UAS) technology is evolving rapidly and revolutionizing the way environmental industry professionals view their projects. Vegetation analysis was an early application identified for UAS, with the primary focus being the agricultural industry. While the agricultural industry has benefited tremendously from UAS technology, many of the same sensors and data analysis techniques are also applied to environmental remediation projects. UAS deployed true-color, multispectral, and thermal infrared sensors are allowing environmental professionals to collect vegetation data at scales and resolutions that were not readily attainable prior to UAS, because of cost and safety concerns.

**Approach/Activities.** High resolution UAS collected data allows for vegetation classification, density, health, and color analysis. Using these characteristics, a wide variety of environmental factors can be evaluated. These factors range from revegetation coverage to stressed vegetation impacted by subsurface contamination. GIS and photo processing tools allow for rapid automated data analysis and presentation.

**Results/Lessons Learned.** This discussion will cover an introduction to sensors, potential applications, example data products from a variety of projects, and an introduction to vegetation analysis tools and techniques.