Reclamation Certification Achieved using Remote Sensing Technology
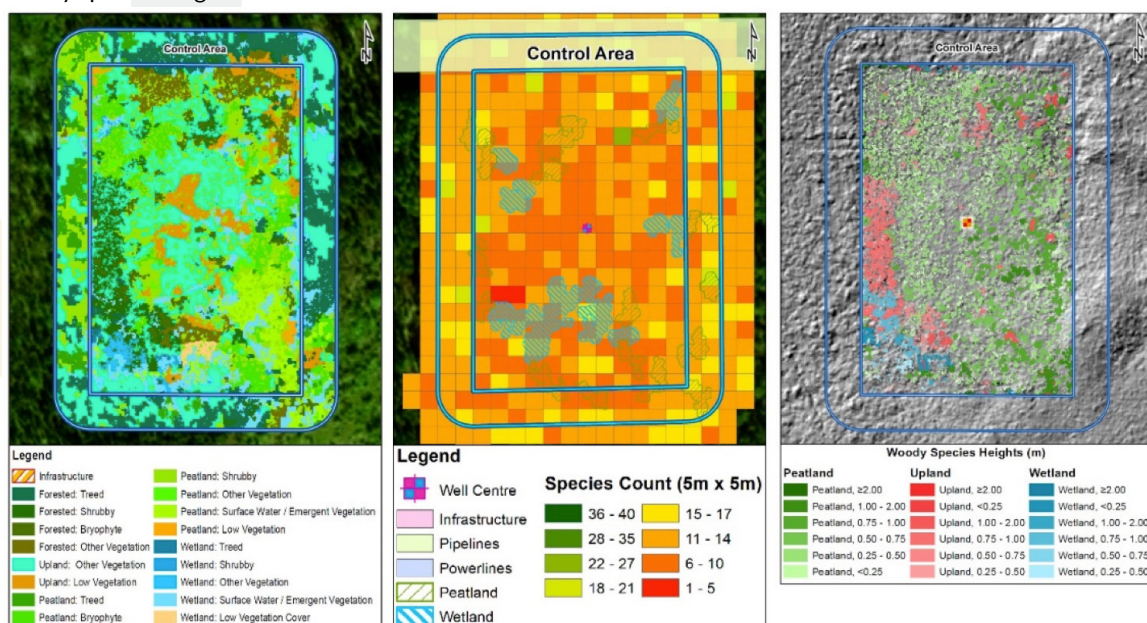
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The first Reclamation Certificates ever issued by the Alberta Energy Regulator for assessing sites using remote sensing technology as the primary technique were granted to Wood PLC in early 2021.

This presentation showcases the creation of an innovative remote sensing model and how it was used for assessing the reclamation status of the Oil Sands Exploration (OSE) programs located in remote areas in Northern Alberta. Due to the remote nature of OSE programs, sites are typically assessed using the human eye from a helicopter. This remote sensing model eliminated the need for helicopters facilitating safer, less expensive, and more accurate reclamation assessments.

This presentation will discuss the types of field data and remotes sensing imagery used to build the machine learning algorithms. It will also outline how the outputs of the algorithms were used to produce quantitative data such as the number of black spruces per a given area, types of land covers, and the areas and heights of woody species, and generate maps for interpretation by reclamation scientists. A summary will be provided of all the assessment parameters generated to meet the expectations of the regulatory criteria, with a description of them, and a discussion on methods and level of accuracy for each. Figure 1 illustrates three representative maps produced through this technology.

Chrissie Smith

Chrissie Smith is an environmental scientist with over 13 years of experience in all aspects of remediation and reclamation planning, execution, monitoring, management, and closure. She is the Reclamation Team Lead for the Wood Edmonton office and is the Sustainability Lead for Wood Canada Ltd.

Meisam Amani

Meisam Amani is a Senior Remote Sensing Engineer and Key Specialty Leader of Data Analytics at Wood. His work focuses on advanced remote sensing and machine learning applications in various environmental fields. He has over 11 years of experience processing, analyzing, and interpreting Earth Observation (EO) datasets (e.g., satellite and drone imagery) for different applications.

Patrick Borden

Patrick Borden has over 15 years of direct experience in consulting related to soil science and natural resource management and three years as an academic research assistant. Mr. Borden has served as a discipline lead for a wide range of government and private industry biophysical projects in Alaska, Yukon, Northwest Territories, British Columbia, and Alberta.

Figure 1: Landcover classification, species diversity and woody species heights