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ABSTRACT

Over the past decade the field of exploration remote sensing has undergone a fundamental transformation from processing images to extracting spectroscopic mineralogical information resulting in the broader field of Spectral Geology and Remote Sensing (SGRS), which encompasses technologies that contribute to the definition, confirmation, and characterization of mineral deposits. SGRS technologies provide information on the mineralogical and alteration characteristics of a mineral orebody by assisting with the identification of features on the surface, in field samples, and in the subsurface through core spectroscopic measurements and imaging. This contributes mineralogical composition for field mapping and orebody characterization with non-contact, non-destructive measurements at high sampling density that no other technology can accomplish. Application of spectral geology and remote sensing technologies varies depending on the scale of exploration, surface exposure, and alteration type, but may include the use of high resolution satellite multispectral imagery, airborne hyperspectral imagery, surface and core point spectral analysis, or hyperspectral core imaging. SGRS technologies augment human vision by making measurements far beyond the sensitivity of human eyes, providing accurate and densely sampled mineralogical information that contributes to more efficient and accurate field mapping and core logging. When integrated with other exploration data, geologic observation, and engineering and geometallurgical analyses, SGRS data contributes to both upstream and downstream efficiencies. Although the exploration and mining business cycle has impacted expenditures for research and develop of exploration related technologies, SGRS capabilities continue to grow based on demand for new instrumentation and capabilities from the broader geospatial and spectroscopy community.