

# **A BIOGEOPHYSICAL APPROACH FOR HYPERSPECTRAL ANALYSIS OF VEGETATION AND LAND USE: CASE STUDIES FROM THE SOUTHWEST U.S. AND BRAZILIAN AMAZON**

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Hyperspectral remote sensing data provides unique information about vegetation and soil properties that cannot be obtained using other data sources. However, non-unique combinations of plant structural and biochemical properties complicate the interpretation of vegetation spectral data. Therefore, new approaches are needed to convert hyperspectral reflectance data of vegetation to the physical quantities needed for ecological and biogeochemical research. The development of a physically-based approach requires integration of field measurements and radiative transfer modeling. The framework for such an approach is described, and case studies from projects in the Southwest U.S. and Brazilian Amazon Basin are highlighted. These case studies show that the breadth and accuracy of biogeophysical information obtained from hyperspectral data increases when a physical approach is employed across multiple spatial scales.