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ALTERNATIVE APPROACHES FOR UTILIZING LANDSAT DATA TO ADDRESS FOREST AND RANGE APPLICATIONS

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ABSTRACT IN LIEU OF MANUSCRIPT

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The use of maximum likelihood classification for mapping vegetation species with Landsat presupposes that a desired set of forest or range cover type conditions can be uniquely specified in multispectral measurement space. However, frequent occurrence of less than optimal classification results indicates that such an assumption is often not realized. More effective use of Landsat data may be realized through alternative approaches to addressing forest and range information needs.

The basic tenet of this paper is to suggest that the development and use of remote sensing technology can be advanced by developing alternative approaches to interpreting and processing Landsat data. There exists a need to consider alternative approaches in situations where the exclusive mapping of vegetation cover types (i.e., species composition) is incapable of providing information to an acceptable level of accuracy. Such situations occur when a variety of scene influences act in concert within a data set to sufficiently alter the spectral character of desired vegetation cover types such that consistent and unambiguous interpretation of Landsat response is precluded. In light of such circumstances, it becomes necessary to re-evaluate the capabilities of the data relative to the user's needs.

Alternative approaches for interpreting Landsat data that key on dominant scene influences and that detect and/or identify changes may have potential for providing more reliable and yet useful information for forest and range applications. Dominant influences frequently include such parameters as vegetation density, soil color, and soil brightness. Determining the relative amount of vegetation on the landscape provides information important in its own right and specific to its proper location. Such information; provided at critical seasons; should be useful information to grazing managers. It is also possible that variations in soil color and/or brightness mapped by Landsat can provide information that may be correlated with parameters such as soil type; erodability, or vegetative growth potential. Data processing approaches that include greenness/brightness types of transformations, data stratification, and digital scaling as well as maximum likelihood classification, should all be evaluated for their capability to provide such information. In areas where optimal scene classification is only accomplished with higher resolution photography and is perhaps only necessary at longer periodic intervals, the most appropriate use of Landsat data might involve the detection; identification and/or monitoring of more frequent changes.

It is suggested that the more reliable information associated with dominant scene influences and/or changes has the desirable benefit of being site-specific, and therefore appropriately useful within the context of a geographic information system.

AUTHOR BIOGRAPHICAL DATA

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