

Sampling Design For Assessing Accuracy Of Change Detection

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Biography

Associate Professor of Biometrics and Statistics, SUNY ESF, 1989 to present. Research interests in sampling strategies for assessing map accuracy, primary publications in *Remote Sensing of Environment*, *Photogrammetric Engineering and Remote Sensing*, and *International Journal of Remote Sensing*.

Abstract

The difficulties of thematic map accuracy assessment are compounded when the map is a change product. Although the fundamental issues of sampling design and analysis are similar for assessments of a single point in time map or a change product, the demands on the sampling design are much greater for the change assessment. Consequently, we need to seek innovative designs for these applications. The two main stumbling blocks for change detection accuracy are the many types of change possible, even for a simple classification scheme, and the rarity of change. Because the objectives of the assessment typically specify estimating both overall accuracy as well as class-specific accuracies (i.e., user's and producer's accuracies for each type of change), stratification is commonly recommended. Although stratification is generally appropriate, questions remain regarding the number and identity of these strata. Further, it is often desirable to provide accuracy information at multiple spatial scales. That is, if the change data are aggregated, for example to 5 km by 5 km blocks, how accurate are the change estimates for this analysis unit? In addition to introducing new criteria the sampling design must satisfy, a multi-scale assessment raises issues related to non-site-specific accuracy assessments. Sampling design and analysis protocols will be described for conducting a multi-scale accuracy assessment. A key development of the design protocol is accommodating a larger sampling unit (e.g., a 5 km by 5 km block) within a stratified design. The stratification process becomes more complex in this setting, so several alternatives may be considered. Lastly, it is important when developing the sampling design to conduct an a priori evaluation of design performance. Some suggestions will be offered for how to determine if a sampling design is likely to meet the performance characteristics desired for the accuracy assessment.