Quantitative Comparison of Two Soil Maps Produced from Landsat Images and Aerial Photographs Respectively

P. K. Titriku

Follow this and additional works at: http://docs.lib.purdue.edu/lars_symp

http://docs.lib.purdue.edu/lars_symp/362

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.
QUANTITATIVE COMPARISON OF TWO SOIL MAPS PRODUCED FROM LANDSAT IMAGES AND AERIAL PHOTOGRAPHS RESPECTIVELY

P. K. TTRIKU
Soil Research Institute, Ghana

A small scale soil survey (1:250,000) was carried out in Southern Spain with the aid of Landsat MSS images and medium scale aerial photographs. One of the objectives of the project was to give a quantitative comparison of the maps resulting from the interpretation of the two types of imagery with a view to testing the reliability of the soil boundaries interpreted from the Landsat imagery, using the API soil map as the standard.

The maps were purposely prepared in the following stages in order to facilitate comparison:

Visual interpretation of black and white prints and color composites of a spring and autumn scene of Landsat imagery without groundtruth documents. These were reinterpreted with the addition of geological and topographic information, followed by a three-week reconnaissance soil survey. The resulting soil map was shelved. This phase was succeeded by air photointerpretation of representative sample areas chosen on the basis of the Landsat soil map, followed by six-weeks detail field work in the sample areas. The last stage comprised, photointerpretation and three weeks general soil survey outside the sample areas and the final soil map compilation (API).

The map comparison consisted of the following:

(i) Planimetric measurement of the surface areas of equivalent map units followed by linear regression analysis, (Computer).

(ii) Dot-grid count of the overlaid maps. The counts were scored in a rectangular matrix with mapping units of one map against those of the other map.

A high correlation coefficient was obtained for the areas of the two maps by the regression analysis methods. This was tested statistically and was found to be highly significant.

According to the dot-grid count, more than 70% of most of the 9 landtypes on the Landsat soil map agreed with those on the API soil map. A few however indicated large areas of omission and commission. The agreement of Landunits on both maps were represented graphically by overlapping squares.

The dot-grid method of comparison was more efficient in that it indicated errors of omission and commission.