Development of a Practice Work Program for Non-Vocational High Schools: Using Anaglyph to Interpret Aerial Images

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Stereo aerial image interpretation enables us (almost instantly) to visually grasp the details of broad tracts of forests and land surface features such as ridges and valleys. This convenient technique has practical application in forest planning, and is taught in vocational high schools. Practice work in image interpretation would also be a valuable teaching tool in forest education classes conducted in non-vocational high schools. However, the procedures of interpretation need pre-requisite knowledge and skills. In this context, anaglyph images are useful teaching aids for non-vocational students. The anaglyph provides stereoscopic 3D effect viewing with 2 color glasses (usually red and cyan), which makes photo-interpretation easier.

The practice work with anaglyph images aims to teach students understand the details of terrain and forest crowns through stereo viewing. A trial lesson was given in a high school class, and the target area for photo interpretation was an experimental forest run by the school. A pair of monochrome aerial photographs was digitally scanned and processed into an anaglyph image using a free software. The scale of the image was about 1/22,000.

Students were taught the principal and theory of the technique in a 50 minute lecture. Practice work occupied a further 40 minutes Teaching materials were as follows: the anaglyph image, red and cyan glasses, a terrain map of the school forest, several colors of Dermatograph Pencils (to be used on various materials) and a transparent sheet. First, the students were shown how to superimpose the transparent sheet on the anaglyph images, which was then viewed with the 2 color glasses. Comparisons were made with the terrain map, allowing students to manually draw out ridges, valleys and outlines of coniferous and broadleaved trees stands. Maps of forest cover types obtained in this way were cross checked to evaluate student performance. A questionnaire survey was run to enable the class to express opinions on the methodology.

The majority of the students adapted to 3D viewing, started drawing within 5 minutes and made up maps well within the allotted time. However, some were unable to produce acceptable maps, even for ridges and valleys. For these students, the scale of 1/22,000 must be too small to recognize the forest stands. Furthermore, some parts of the aerial images were indistinct due to shadows (because they were taken in December). Finally, some of the Dermatograph Pencils colors were difficult to draw with when viewed through the red and cyan glasses.

In spite of these disadvantages, the ease of producing anaglyph images and their low cost are of some considerable advantage. There is also room for improvement (e.g. reducing costs and the time required to process anaglyph images) in developing a simple practice work program whereby vocational and non-vocational high school students learn how to interpret aerial photographs.