Photogrammetric Brief

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The Color Negative as a Multipurpose Tool*

ABSTRACT: *Color aerial photographs have been a valuable and viable medium for the Oregon State Highway Division, and the use of color negative products has generated more demand in every area. Although we began acquiring color photographs in 1965, we will cover only our current use and discuss what we have determined empirically to be some of the advantages and limitations of color for our purposes.*

Our experience is limited to only three types of aerial negatives — black-and-white, color, and color infrared. The color negative for our uses has become the most popular for multipurpose photography since the recent development in materials and equipment.

STEREO COMPILATION

OUR FIRST MAPPING PROJECT in color was in 1968, a 1:600 scale strip map for urban design using the old glass plate with color emulsion. This gave us a great appreciation for the advantages of color film diapositives for mapping. We believe color increases our mapping quality and efficiency, because it is easier to interpret, it has improved the planimetric detail; the shadows in color do not appear so dense as in black-and-white; and there is more detail in the lighter areas, resulting in some increase in vertical accuracy. Our present mapping program includes the use of color whenever weather conditions permit.

INFRARED COLOR

We have found infrared color film positives to be a good medium for hydrology studies and for mapping in urban areas where industrial haze exists. We found the stereomodel to be superior for detail because infrared color does cut through the haze better than any other medium we have used. However, we did not find infrared color to be a good medium for contouring where ground cover exists.

CONTACT PRINTS AND COLOR ENLARGEMENTS

The demand for color contact prints and enlarged color mosaics continues to increase within the Highway Division for planning, environmental impact, and location studies because of their superiority for determining land use and occupancy. Large-scale color mosaics are frequently used at hearings to facilitate local citizen participation in corridor designations and location studies.

A MULTIPURPOSE NEGATIVE

We frequently need a single negative that can be used for mapping, color enlargements, black-and-white contact prints, or black-and-white enlargements. Our experience shows that the color negative can be used for these several products. Our reproduction section has spent some time developing the necessary skills for the preparation of halftone film-positive enlargements from the

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color negative. Their conclusions are that they can make a better half-tone film-positive enlargement from the color negative than from a black-and-white negative. The color negative is also satisfactory for preparation of black-and-white continuous-tone enlargements and contact prints when necessary.

We are using color negatives to prepare half-tone film enlargements at five diameters for over 300 miles of Oregon beaches. This project updates some 1967 half-tone enlargements made from black-and-white negatives. The color negatives are giving us a better product with much more detail in the light sandy areas and an overall improvement in the tone quality.

Cost Considerations

We have found that the total cost of color aerial negatives is 30 per cent to 80 per cent higher than black-and-white negatives, depending on the size of the project and the flight time to and from the project site. The section requesting the photography must determine if the cost is justified.

Color enlargements are $4.25 to $7.25 per square foot. Here again the justification for the cost is in the eye of the beholder as compared to a cost of approximately $1.50 per square foot for black-and-white continuous-tone enlargements.

In 1974 we used color negatives on 50 per cent of the projects photographed when light conditions were adequate for good color. This was approximately 20 per cent of all photography for 1974.

Our total annual aerial photography volume is approximately 5,000 negatives — approximately 1,000 negatives are color. With this small volume, it is easy to see that it would not be possible to economically justify in-house color processing equipment or the development of the necessary skills to do our own color work.

We are fortunate to have in our area commercial sources for color photography and color print processing and enlarging. Through these sources we have been able to procure excellent color products prepared by skilled technicians with modern color processing equipment. We have recently experienced some reduction in cost for color products which is a concrete reason for being very optimistic about the future of color aerial photography for our use.

Limitations

Oregon lies between 42 degrees and 46 degrees north latitude and has a long rainy season which limits our aerial color photography season to four or five months. During this season we have a problem with hot spots or retro-reflection. In order to eliminate this we would have to schedule flights in a very narrow span of time, such as early morning and late afternoon. We have found such a time schedule unrealistic in practice so have learned to live with the varying degrees of retro-reflection. We have usually left the time-of-day flight scheduling to the aerial contractors, with excellent results.

We have found that flights above 10,000 feet are sometimes disappointing as compared to the larger-scale color negatives. They are occasionally flat in tone which give poor quality, particularly in enlargements.

INTERNATIONAL SYMPOSIUM ON COMPUTER ASSISTED CARTOGRAPHY

An International Symposium on Computer Assisted Cartography will be held in Washington, D. C. from September 21 through 25, 1975. The conference is sponsored by the American Congress on Surveying and Mapping, in cooperation with the U. S. Bureau of the Census.

The purpose of the meeting is to promote an international exchange of information about methodology application problems and software and hardware in the field of computerized cartography.

Computer mapping is playing an increasingly important role in planning and data analysis. Computer maps are especially effective for administrative and public information purposes since the visual impact and clarity of maps can make trends immediately apparent.

Workshops and panels will deal with the use of statistical mapping and cover such topics as map reading and perception, interactive map editing, and urban information systems. The registration fee for the conference is $60. Exhibit space will be available for commercial and non-commercial presentations. Special tours for interested participants will be provided by the U. S. Bureau of the Census and the U. S. Geological Survey.

For further information contact: Dorothy Bomberger, Symposium Secretariat, U. S. Bureau of the Census, Washington, D. C. 20233, Tel: (301) 763-7094.