Softcopy Photogrammetry: Assessment for GIS-based Geologic Mapping Applications

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Surficial-geologic mapping projects carried out by the Alaska Division of Geological & Geophysical Surveys (ADGGS) rely heavily on photointerpretation of high-altitude (nominal 1:60,000-scale), color-IR aerial photography. Traditionally, features were mapped onto acetate overlays on the photos, transferred to paper topographic base maps using a zoom transfer scope, and then digitized into a GIS. This process results in each originally-mapped feature being manually retraced twice (once during zoom transfer, and again when digitizing), giving rise to potential compounded errors since no retracing can be exact. There is also a significant time investment in retracing each feature multiple times. ADGGS is now using relatively inexpensive, stand-alone photogrammetric software to facilitate faster, more accurate transfer of photointerpreted features to the GIS environment without the need for additional new hardware. In this process, co-registered scanned acetate overlays and aerial photographs are simultaneously orthorectified to produce a planimetric digital overlay that can be heads-up digitized into a GIS. The original linework is thus only retraced once, during digitizing. Additional desirable byproducts of this process are digital orthophotos and orthophoto mosaics, which are highly useful and rarely available for most of Alaska.