

COMMENTS AND REPLIES

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Comment

Comment on T.L. Pavlis and K.A. Mason article, “The New World of Geologic Mapping”

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Now I may be called an atavist, a Cretaceous relic, and old fashioned. I hold a B.S. in geology from Rensselaer Polytechnic Institute, a master's in geology and geochemistry from Penn State (where I learned from luminaries such as Orville Tuttle and Hugh Barnes), and a Ph.D. from the University of New Mexico (which should be shared by the Hebrew University). I am a registered geologist in eight states and professional organizations. I was disturbed by the Pavlis and Mason article on “The New World of 3D Geologic Mapping” in the September 2017 issue of *GSA Today* (<https://doi.org/10.1130/GSATG313A.1>).

I have mapped about 110 square miles of complex alpine terrane inclusive of subduction zone ophiolites, Tethyan oceanic crust, and Messinian evaporites. Moreover, I mapped this area of western Cyprus at a scale of 1:5000. That is one square inch on the maps

represents a square of 416.67 feet on a side. I could easily place a geologic contact at ± 6 feet on the map. Any important observation was mapped. I traced the contact of the Cyprian Gravity Nappe (a tectonic contact between the base of serpentinites and underlying Cretaceous pillow lavas and flysch-like sediment) for 13 continuous miles. I had the benefit of aerial photography that was almost worthless. Even at the scale I used and the complexity of the geology, I could map about 1.5 square miles in two days.

I contend that the use of 3D mapping and computer-based GIS mapping would have slowed me down significantly with no increase in resolution and significant lack of detail. A specific example was the only difference between two lithologically comparable rock units is that one contained abundant marine miogypsinoides fossils. In mapping rock walls were used to locate formation contacts. The appearance of the miogypsinoides in the rock of the walls defined the boundary. Not something that multispectral imaging was likely to detect on a level field covered by several feet of soil. Another limitation is the DEM models with 30 to 90 m resolution. The resolution would have been far too large to make sense of the very small scale features that I mapped.

I will never believe that geologic mapping can be adequately done from an armchair. I will admit that seismic data processing has made great advances. And, by the way, multispectral imaging research was going on at the HRB Singer Corporation in the early 1960s and there is a rich literature on the subject.

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