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The Importance of Coherent Geologic Maps in Mineral Exploration

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The basis for most types of geologic investigation is fundamentally rooted in geologists' observations and interpretations made of landscapes, exposed rocks, and surficial materials in their natural habitat, "in the field". Coherent geologic maps, which take many years to create, represent assembled collections of observations in context of space and geologic time by teams of geologists. Such geologic maps are the foundation upon which mineral exploration programs and mineral resource developments are built. In today's mineral industry, geologic maps are largely digital compilations of publicly available regional/district scale GIS data (downloaded from geological survey websites) merged/overlain with detailed industry geologic mapping of prospects and/or project areas. For the most part, the mineral industry quickly compiles digital data into geologic maps and is seemingly always searching for new ways to quickly capture data in the field digitally. The ease in which the mineral industry can generate geologic map products today can be good, bad, or ugly.

The true strength of mineral exploration programs depends primarily on decisions based upon the integration of all pertinent information, large parts of which is housed in coherent digital geologic maps and the unseen GIS attribute table data behind these maps. Mineral deposit models have arisen as mental paradigms that act as guidebooks to help geologists process information, and effective development of models that enhance success rates and decrease costs is critically important to the mining industry as it explores new terrain and becomes constrained by stringent economic, environmental, and political bounds.

This talk will touch upon the creation of industry-based coherent digital geologic maps for use in mineral exploration programs with examples of how such maps can be used in targeting mineral exploration programs of orogenic gold, mafic magmatic, and volcanogenic massive sulfide mineral systems.