The interpretation of high-resolution airborne geophysical data integrated with field structural and lithological observations were employed in the creation of a litho-structural framework for the Gaoua region, Burkina Faso. The granite-greenstone domain of Paleoproterozoic age was affected by multiple deformation and mineralization events [1]. The early tectonic phase is characterized by the emplacement of voluminous tholeiitic and calc-alkaline lavas, probably in a volcanic arc setting. The copper mineralization in Gongondy, Dienemera and Mt Biri is concentrated in a diorite/andesite breccia, and is interpreted as porphyry-copper style formed at an early stage of the evolution of the area. Evidence for the first deformation event D1Ga corresponding to N-S shortening was only found in the E-W trending mafic unit bordering the Gaoua batholith to the south. A second deformation phase D2Ga occurred under greenschist facies conditions and lead to a development of more or less penetrative metamorphic foliation and its subsequent folding under overall E-W compression. At later stages, the D2Ga switched to a transcurrent regime characterized by intense N-S to NW-trending steeply dipping shear zones. The first significant gold mineralization event is related to this transcurrent tectonic phase. During subsequent D3Ga, intense network of brittle to brittle-ductile NW and NE faults developed. Economic gold concentrations are attributed to the D3Ga event and are associated with the remobilization of early disseminated low grade gold concentrations. Significant deposits in the area are Nassara, Gomblora, Batié West and Kampti. The last deformation event D4Ga resulted in E-W trending thrust faults and crenulation cleavage planes, under overall N-S compression. No mineralization events related to this stage have been seen.

References:


Figure 1: Summary diagram of the deformation and mineralization phases in the Gaoua area. Re-Os ages are from [2] and [3].