The development of field mapping skills is essential for any geologist. In the field, we push ourselves to capture the relevant data and be creative enough to connect the points and propose a geologic theory. Investing in the future of students and early-career industry professionals, SEG sponsored the first edition of the Porphyry and Skarn Mapping Course in northeast Turkey in September 2023. There were 24 participants working in pairs. The course was organized and led by Warren Pratt and Chris Gordon (Specialised Geological Mapping Ltd. [SGM]), with logistical support from Öylem Tilki (Demir Export).

The eight-day course aimed to train the geologists in different mapping techniques (e.g., the SGM Shotgun and Anaconda [M.T. Einaudi, unpub. report, 1997] methods) to help distinguish the various porphyry and mineralizing phases and place them in age order. Additional course goals were for students to learn vectoring toward higher grade using hydrothermal alteration and vein types, and to quickly log relevant drill holes using a graphic approach.

The Ulutaş deposit is in the southeastern part of eastern Pontides metallogenic belt and comprises a skarn, currently being mined by Demir Export, and an adjacent Cu-Mo porphyry, which has been drilled. The porphyry reserves are 73.6 Mt at a grade of 0.35 wt % Cu and 0.03 wt % Mo, whereas the neighboring skarn contains reserves of 3 Mt at 1.3 wt % Cu, 4.77 wt % Zn, and 33 ppm Ag (Delibaş, et al., 2019). The Cu-Mo porphyry deposit comprises a calc-alkaline porphyritic granite and porphyritic rhyolite to latitic intrusions. These cut metamorphic rocks of the basement (Paleozoic to early Mesozoic) and the overlying premineral sequence of Cretaceous dacitic to rhyolitic lava flows, basaltic hyaloclastites, mudstone, and conglomerate. The ore zones are characterized by stockwork-type quartz veins with pyrite, chalcopyrite, molybdenite, sphalerite, and hematite, associated with isolated quartz veins with mainly pyrite (Delibaş, et al., 2019). Sericitic alteration is widespread in the deposit and its intensity is linked with the density of the mineralized veins. Relatively little geologic mapping is available from this area. This is a common scenario in many current exploration projects because of the frequent rush to drill at the expense of (relatively cheap) geologic mapping. Therefore, it was an excellent location to develop essential mapping and prospecting skills. In total, four and a half days were focused on field mapping. It was a challenge to come into an area with no preconceptions and with only a short time available. We used the Shotgun mapping method, which involves the rapid collection of georeferenced data and walking along the important contacts with GPS. This allowed participants to focus on the most relevant features and to manage the time wisely. It also encouraged the group to discuss the stratigraphic sequence in the host rocks, the history of the porphyry system, and the secondary processes that contributed to the formation of the mineralization.

Half a day was allocated to Anaconda mapping training, performed in the open pit, in skarn mineralization. This method uses color codes to record key minerals formed by hydrothermal alterations and mineralization, as well as quantitative estimation of mineral and vein abundance, vein orientation, and relationships between the features (Einaudi, 1997). Several days were focused on graphic quick logging of three mineralized drill holes. This is the style of logging used in-house by SGM. As a result, the team captured the geologic context of the deposit including the country rock stratigraphy, structural features, and the different porphyry phases. We also learned how to make qualitative estimations of the critical pathfinder minerals whether they were primary or of hydrothermal origin. The combined in-house mapping and quick logging proved efficient and replicable.