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Türkiye field trip
2026

Acknowledgments

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Earth Sciences



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Introduction

The SEG University of Toronto Student Chapter organized a field excursion to western Türkiye from June 1 to June 7, 2026, to visit several mineral deposits representing porphyry, epithermal, and polymetallic hydrothermal systems. The trip aimed to provide students with practical exposure to ore deposit geology, mineral exploration, and mining operations through site visits and discussions with industry geologists.

Western Türkiye is part of the Tethyan Metallogenic Belt and hosts numerous economically significant mineral deposits formed during Miocene magmatism and subsequent hydrothermal activity. Throughout the excursion, participants examined the geological characteristics, alteration styles, structural controls, and mineralization of several deposits, while learning about exploration strategies, resource evaluation, and mine development.

The excursion also provided valuable opportunities for professional development. Students interacted with exploration geologists, mine geologists, and project managers from several mining companies operating in Türkiye, gaining insight into career opportunities, multidisciplinary collaboration, and the challenges of developing mineral resources in complex geological and regulatory environments. The combination of scientific learning, industry engagement, and field observations made the excursion an invaluable educational experience for all participants.

Guided geology and mine tours were led by multiple geologists including Sercan Bozan (TV Tower and Sarialan gold projects), Ahmet Basturk, Elif Ozel Sahin, Gizem Naz Gormez and Hasan Yilmaz (Balya Pb–Zn–Ag Project), Cem Cakan, Burak Karadag, Ozgur Akyurek (Efemcukuru Gold Project), Muhsin Aydin (Kisladag Gold Project). The trip was led by SEG student chapter executive team, along with Ass. Prof. Daniel Gregory from University of Toronto.



Trip Attendees

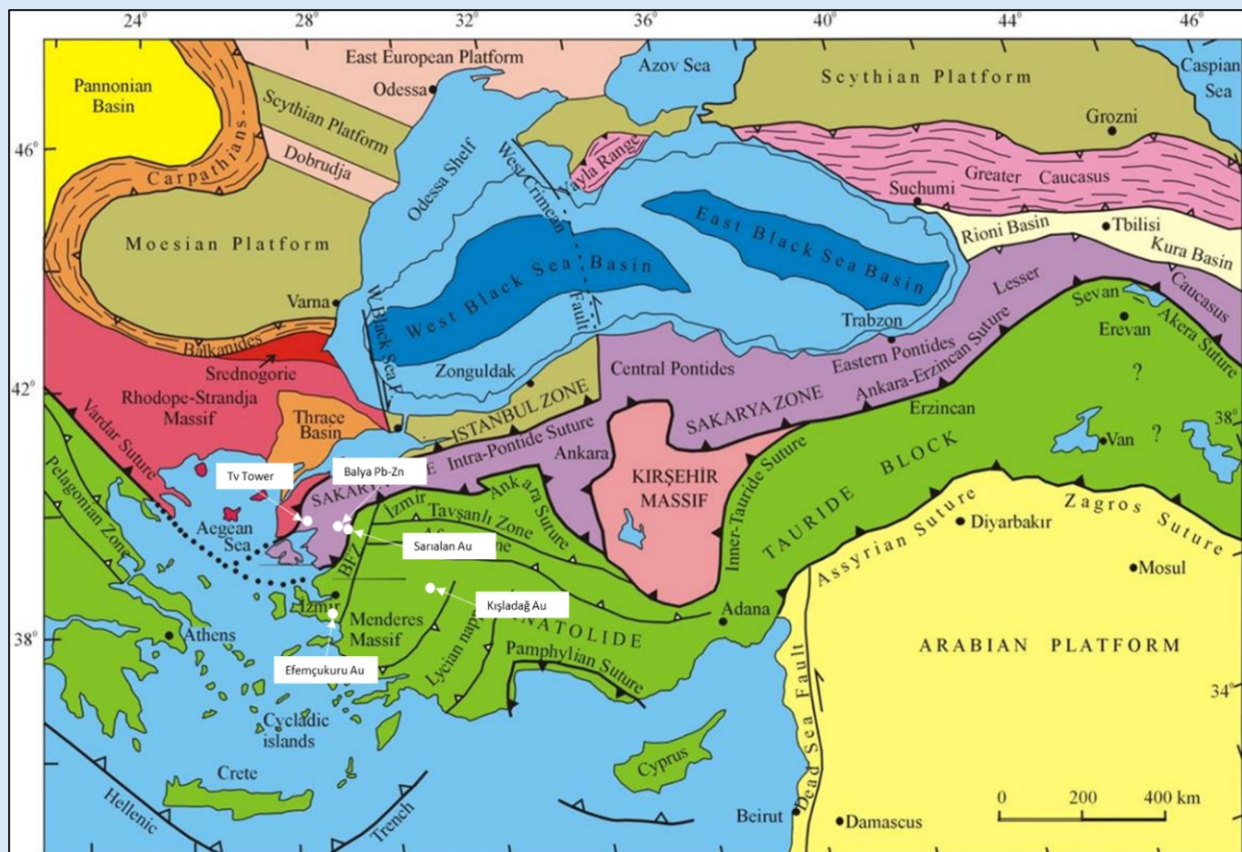
Fifteen participants from the department of Earth Sciences, University of Toronto, attended the field trip:

- **Daniel Gregory** - Assistant Professor and SEG chapter Academic Advisor
- **Juan David Bello Rodríguez** - PhD student and SEG chapter president
- **Oya Ak** - PhD student and SEG chapter graduate vice-president
- **Nyah Bay** - PhD student and SEG chapter treasurer
- **Nathan Mallia** - MSc student and SEG chapter fieldtrip coordinator
- **Zhongzheng Yuan** - PhD student and SEG chapter secretary
- **Leon Bonner** - BSc student and SEG chapter undergraduate vice-president
- **Sheila Ballantyne** - PhD student
- **Silvia Castilla** - PhD student
- **Haoran Chen** - PhD student
- **Daniel Giannotti** - MSc student
- **Jessica Tomacic** - MSc student
- **Akbar Halim** - BSc student
- **Bryn Cox** - BSc student
- **Heriberto Rochin** - Research Associate



Itinerary June 2026

- 2nd - TV Tower Project, Çanakkale
- 3rd - Sarialan Au Prospect, Balıkesir
- 4th - Balya Pb-Zn Deposit, Balıkesir
- 5th - Efemçukuru Au Deposit, İzmir
- 6th - Kışladağ Au Deposit, Uşak
- 7th - Pamukkale, Efes (Ephesus) Ancient City



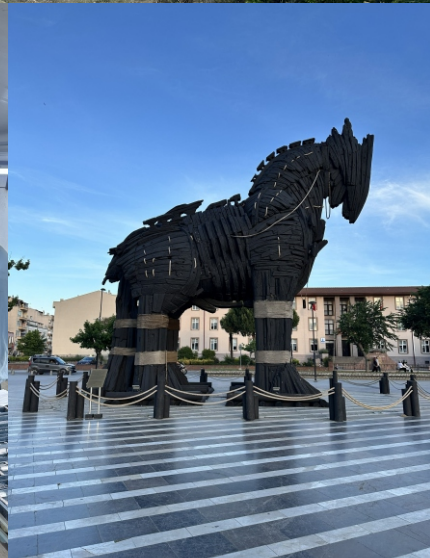
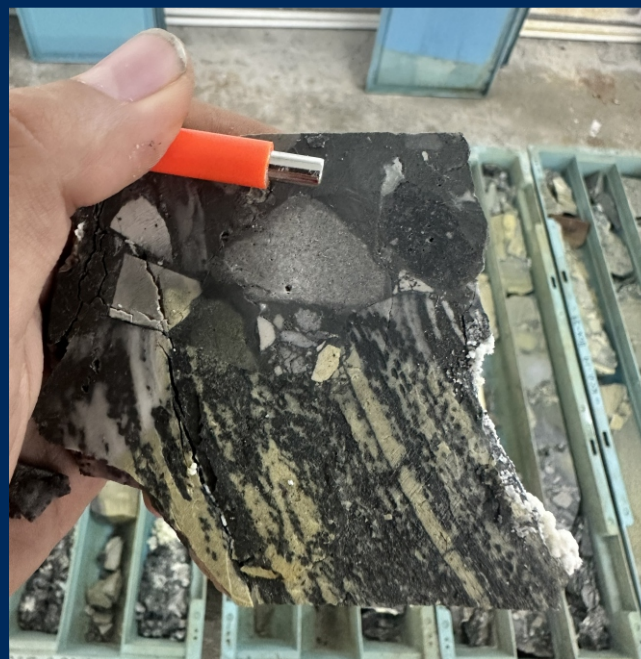
TV Tower Project, Çanakkale

June 2nd

The group arrived in Istanbul in the late afternoon on June 1st and spent the evening for a quick Istanbul tour. The next day, on June 2nd, the first technical visit was to the TV Tower Project in the Biga Peninsula, a district scale magmatic-hydrothermal system that hosts both porphyry and high sulfidation epithermal mineralization. Company geologist, Sercan Bozan introduced the regional geology, exploration history, and current development of the project before guiding the group through several mineralized prospects.

Participants examined the Küçükdağ high sulfidation epithermal deposit, where silicified ledges, hydrothermal breccias, and vuggy quartz illustrate the effects of advanced argillic alteration. The visit also highlighted the deeper porphyry style Au-Cu mineralization at the Hilltop, Valley, and Kolumbaz prospects, allowing students to observe the vertical transition between porphyry and epithermal environments.

Discussions focused on alteration zoning, structural controls on mineralization, exploration methods, and the evolution of the project from an early stage discovery into a multi million ounce gold equivalent resource. The visit provided an excellent introduction to the geological diversity of western Türkiye and the relationship between porphyry and epithermal mineral systems.



Sarialan Au Project

June 3rd

The Sarialan prospect, located in the İvrindi district of the Biga Peninsula, is a high sulfidation epithermal gold system hosted in Oligocene-Miocene volcanic rocks. The geological setting consists of dacitic volcanoclastic units overlying a Triassic basement, with mineralization controlled by NE-SW trending faults that acted as fluid pathways.

Field observations focused on extensive zones of vuggy silica and advanced argillic alteration, including alunite and kaolinite assemblages typical of acid sulfate systems. The most prominent feature of the system is a well-developed vuggy silica zone extending approximately 1.8 km in strike length (N60–70°E), forming the main mineralized structure; these silicified zones range from 10 to 60 m in width and are intersected in drilling with thicknesses typically between 10 and 50 m.

Mineralization occurs within silicified breccias and fracture zones, where gold is associated with pyrite, enargite, and covellite. The main mineralized structure extends over 1.8 km, reflecting strong structural control on fluid flow and alteration intensity.

Sercan Bozan discussed the exploration history, which included geochemical surveys, surface mapping, and systematic drilling that defined zones of variable gold grade. The project is currently in an advanced exploration stage under CVK Maden, with ongoing resource evaluation and expansion drilling. The visit highlighted the importance of advanced argillic alteration, vuggy silica, and structural permeability in identifying high-sulfidation epithermal systems.



Balya Pb-Zn-Ag Project

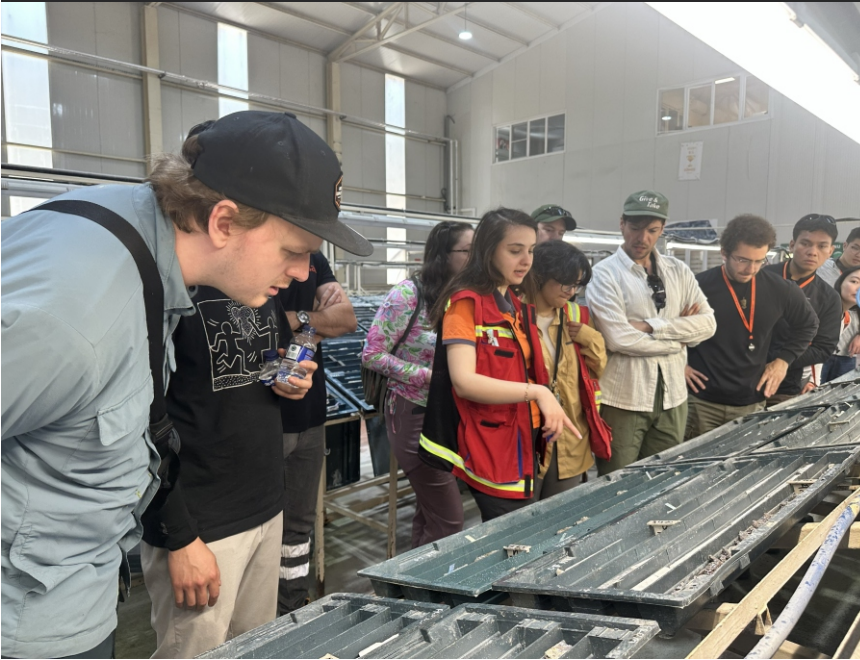
June 4th

The Balya district represents a historically significant Pb-Zn-Ag mining system. The deposit is hosted within Oligocene–Miocene volcanic and volcanoclastic rocks, including dacitic volcanics, dacite porphyry, and microdioritic intrusions, which are associated with post-collisional calc-alkaline magmatism. Mineralization is structurally controlled and occurs in hydrothermal vein systems, breccias, and locally replacement-style bodies within volcanic units, indicating a polymetallic skarn and vein deposits.

The deposit is dominated by galena and sphalerite, with pyrite and minor chalcopyrite, and locally significant silver content associated with galena. Alteration includes silicification, carbonatization, and calc-silicate assemblages, reflecting a well-developed hydrothermal system.

Modern exploration is focused on re-evaluating deeper extensions and structurally offset zones using updated geological and geophysical methods. The visit emphasized the potential for undiscovered mineralization at depth and along fault structures, despite the maturity of the district.

We visited the Ida Madra Geopark - Balya Industrial Mining Heritage. Balya has a long mining history dating back to the late 19th century with French companies, when it was one of the major Pb-Zn districts in the region. Surviving architecture, including old worker settlements, mining shafts and other buildings are observed in this geopark. Historical production is estimated at ~4-5 Mt of ore, largely extracted from shallow levels. In addition, lead objects found in Troy are likely to be considered from this mine site.



Efemçukuru Au Mine

June 5th

Efemçukuru is a fully developed underground low sulfidation epithermal gold deposit near İzmir, hosted in Late Cretaceous flysch sequences intruded by Neogene rhyolitic magmatism. Mineralization is controlled by NW–SE trending fault systems.

Gold occurs in quartz-adularia veins, stockworks, and breccias, with pyrite and electrum as the main ore minerals. Alteration includes silicification, adularia, and carbonate assemblages, consistent with boiling and fluid mixing processes in a low sulfidation system.

The modern history of Efemçukuru began in the late 1980s to early 1990s, when regional exploration programs in western Anatolia targeted epithermal gold systems. Initial exploration involved geological mapping, surface geochemistry, and the identification of quartz vein systems with anomalous gold values. These early discoveries highlighted the economic potential of the area and led to more advanced exploration efforts.

Students learned about the evolution of Efemçukuru from exploration in the 1990s to production in 2011 under Eldorado Gold. The deposit remains an active underground mine with ongoing drilling to extend known ore shoots, and the group had a chance to observe these characteristics underground.

The visit illustrated the full life cycle of a mineral deposit, from discovery to long term production, and highlighted the importance of structural control in high-grade epithermal vein systems.



Kışladağ Au Project

June 6th

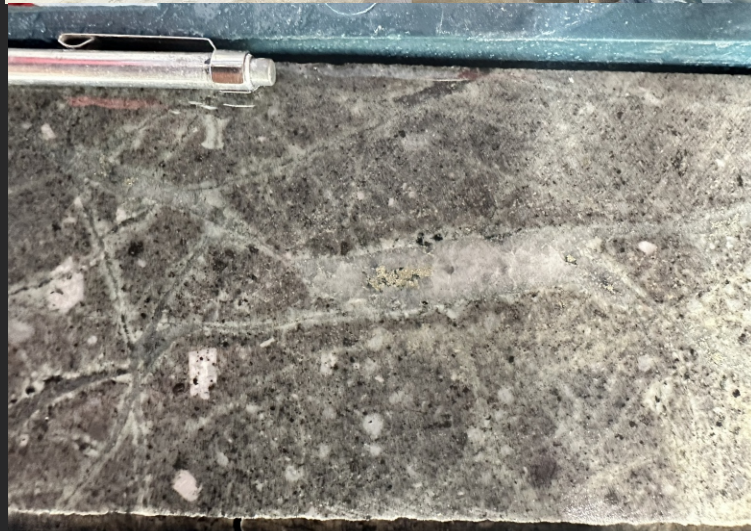
Kışladağ is one of the largest gold deposits in Turkey and represents a classic porphyry style gold system hosted in Miocene monzonitic intrusions. Mineralization is disseminated and occurs in stockwork veinlets associated with extensive hydrothermal alteration.

The alteration system is zoned, with potassic alteration at the core, overprinted by phyllic and argillic assemblages. Gold is fine grained and associated with pyrite, with very low base metal content.

The discovery of the Kışladağ deposit dates back to the late 1990s, when regional exploration programs targeting large-tonnage gold systems in western Anatolia identified anomalous geochemical signatures and favorable geological conditions. Initial exploration involved surface mapping, geochemical sampling, and geophysical surveys, which led to the identification of a large mineralized system.

The project was developed by Eldorado Gold and brought into production in 2006. Initially, the operation was designed as a heap leach open-pit mine, where low-grade ore is processed through cyanide leaching. This method is well suited to the deposit's characteristics: large tonnage and relatively low gold grades.

The visit emphasized the contrast between porphyry and epithermal systems, particularly the large-scale, low-grade nature of porphyry gold mineralization compared to high grade vein systems observed earlier in the trip.



Pamukkale Travertines and Ephesus - June 7th

The final day of the excursion combined geological and cultural visits to Pamukkale travertines and the ancient city of Ephesus in western Türkiye.

Pamukkale is one of the most well-known active carbonate depositional systems in the world, where thermal spring waters rich in calcium carbonate precipitate to form extensive travertine terraces. The site provided a clear example of ongoing hydrothermal surface processes, where degassing of CO_2 and cooling of Ca-rich waters leads to rapid calcite precipitation. The resulting terraced morphology highlights the interaction between fluid flow, surface topography, and carbonate deposition in an active geothermal environment.

Students observed active and inactive travertine platforms, illustrating how changes in spring activity and flow pathways influence terrace development over time. The site also emphasized the role of extensional tectonics in western Anatolia, which facilitates deep circulation of heated fluids and the formation of geothermal systems.

The group then visited Ephesus, an ancient Greco-Roman city located near the Aegean coast. While primarily an archaeological site, Ephesus provided additional context for understanding the long-term interaction between human settlements and geological landscapes. The preservation of the city reflects the region's stable tectonic setting in recent geological time, as well as the importance of local stone resources used in ancient construction.





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Thank you - Teşekkürler!



SEG Student Chapter Field Trip 2026