

Orange County Mineral Society Lecture – 12 May 2023; 6:30 PM

Senior Center, 81 Laroe Road, Chester, NY 10918

Geology and Mineralogy of the Hudson Highlands and Bear Mountain

Charles Merguerian, PhD, PG

www.Dukelabs.com



Dr. Merguerian's video-enriched PowerPoint lecture will discuss the history and current understanding of the age and geological development of the Bear Mountain region including the history of bedrock studies of the metasedimentary and metaigneous rocks, the classic mineral specimens from local mines, the emphatic structural controls on the zig-zag course of the Hudson River through the Hudson Highlands and the evidence for the multi-glacial history of the region. In addition, he will discuss his recent geotechnical work on the cable

strengthening project and historic one-year (1924) construction of the Bear Mountain Bridge – a unique engineering feat with both above- and sub-roadbed suspension.

Merguerian's 2003 mapping and analysis showed that the explanation for the shifting of bedrock cable ties and supports that resulted in measurable concrete bunker cracking, shifting and rupture of individual cable strands and stretching of the cables and the remedial efforts that took place to ensure safety of the anchorages, tiebacks, bridge towers and roadway. Detailed bridge anchorage area mapping showed the presence of deeply weathered NNE-trending, steep NW dipping brittle faults that reactivate older ductile structures in the rock mass and show opening and separation within the east anchorage. This unfavorable orientation, perpendicular to the cables, was the cause of great concern given the regional importance of this transportation connecting link and the seismic potential of the area.

