



JAMES MADISON
UNIVERSITY®

SEMINAR

Friday, September 29

3:50pm in King 159

Dr. Chiara Elmi

Department of Geology & Environmental Science
James Madison University
Harrisonburg, VA

Genesis of Mn oxides in the Shenandoah Valley

Manganese (Mn) is the tenth most abundant element in the Earth's lithosphere. Mn can form over thirty oxides because of its different oxidation states and octahedral coordination. Manganese oxides are minerals used for environmental purposes and industrial application. In spite of their economic and environmental significance, how manganese oxides form and what mechanisms determine which oxides are likely to form are still debated.

Deposits of manganese and iron oxides are abundant in the Shenandoah Valley and have been mined for over 100 years. However, the origin of manganese oxide deposits in the Shenandoah Valley is still uncertain and the clear mineralogical identification of the manganese oxides is limited. This research aims to identify the minerals belonging to the manganese oxide group in a Mn oxide sample from Crimora, VA and elucidate the origin of manganese deposits that occur in residual clays along the west foot of the Blue Ridge based on mineralogical, chemical, and morphological features. The manganese ore in Crimora, Augusta County (VA) was the largest manganese mine in the United States of America: over 160,000 tons of manganese were mined in the period of maximum production from 1882 to 1915. This research is the first detailed study on the genesis of the Crimora manganese deposit conducted since the mine was closed in the 1950s.