Statement of
Dr. Colin Williams
Mineral Resources Program Coordinator
United States Geological Survey
Department of the Interior

House Committee on Natural Resources
Subcommittee on Energy and Mineral Resources
Hearing on

"Beneath the Surface: Earth MRI and America's Resource Potential"

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Chairman Stauber, Ranking Member Ansari, and Members of the Subcommittee, thank you for the opportunity to testify on the U.S. Geological Survey's (USGS) Earth Mapping Resources Initiative, or Earth MRI.

The public lands and minerals stewarded by the Department of the Interior (Department) include more than 480 million acres of surface land, 750 million acres of subsurface and mineral estate, and more than 3.2 billion acres offshore. The mineral resources contained in these lands are critical to achieving American energy dominance, and their development will power our economy, bolster national defense, and support emerging technologies. Non-energy minerals produced from public lands generate billions of dollars to the economy and support tens of thousands of jobs.

The Organic Act of 1879 charged the USGS with examining the Nation's geological structure and mineral resources. Today, the USGS serves as a "one-stop shop" for important information on mineral supply chains and the mineral industry. Our data shows that over the last 60 years, demand for critical minerals has increased dramatically while U.S. production and processing have declined precipitously. A recent analysis in the U.S. indicated that geologic mapping alone provides an economic return on investment conservatively estimated at seven to ten times its cost and potentially as high as 35 times the cost.[1] Recognizing that mineral development is a national security priority, the Department is committed to ensuring the United States is the leading producer and processor of critical minerals, including rare earth elements, in order to create jobs and prosperity at home, strengthen domestic supply chains, and reduce the global influence of adversarial states.

Earth MRI Overview

The USGS launched Earth MRI in 2019 in response to President Trump's issuance of Executive Order 13817, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*, which called for modernizing geological, geophysical, and topographic mapping in areas with potential deposits of critical mineral resources. The USGS conceived Earth MRI as a partnership

[1] Berg, R. C., and Faulds, J. E., 2025, Economic analysis of the costs and benefits of geological mapping in the United States of America from 1994 to 2019: American Geosciences Institute, https://doi.org/10.62322/wra5.gs9v.

with state geological surveys, other Federal agencies, and the private sector. This partnering led directly to the first national map of areas with critical mineral potential,[2] which helps USGS prioritize new data collection efforts needed to quantify mineral resource potential, and provides land managers, industry, and other stakeholders with a shared understanding of the potential distribution of critical mineral resources.

At the time of Earth MRI's creation, less than seven percent of the nation was covered by magnetic and radiometric geophysical surveys at a resolution suited to characterizing mineral deposits. Today, Earth MRI has nearly quadrupled this coverage, and is on track to collect high-resolution data for over half of the areas in the U.S. with known potential for critical mineral deposits by the end of 2026. Earth MRI surveys have covered the Minnesota Iron Range, Alabama graphite belt, Idaho cobalt belt, Colorado mineral belt, and a region of Nebraska that may have the largest niobium deposit in the U.S. The program has also studied the world's largest lithium deposits in Nevada and Oregon, and areas near California's Mountain Pass mine, which produces 10 percent of the world's rare earth elements. However, much of the country still lacks the geologic data necessary to locate and quantify critical mineral resources at large.

Earth MRI Impacts

USGS Earth MRI is already accelerating the Nation's mineral economy. Since 2019, Earth MRI has contributed to a surge of about 100,000 new mineral claims on federal lands. Notable examples of Earth MRI supporting increased mineral exploration and development include a survey detecting previously unknown potential for niobium and rare earth elements in Maine; data on graphite and rare earth elements leading to new mining permits in Wyoming's Laramie Mountains; and mapping in the Yukon-Tanana Uplands in Alaska prompting companies to begin prospecting and sampling in the area.

Data from Earth MRI has also led to new mining claims tied to re-mining historic mine waste, a potential source for potentially 35 out of 60 of the minerals on the 2025 List of Critical Minerals. The program has also launched the National Mine Waste Inventory, trained states in characterizing minerals in mine waste, and collaborated with NASA on the world's largest airborne hyperspectral survey to examine critical minerals in mine waste as well as undiscovered mineral deposits.

Earth MRI has broader applications beyond mineral development. For example, Earth MRI geophysics data is helping reveal buried fault systems across Arkansas. In California, Earth MRI data is being used to assess potential coproduction of geothermal energy and critical minerals in the Salton Sea, and has revealed previously unknown faults in the San Andreas system. Earth MRI data has also supported Arizona Geological Survey's establishment of a new geologic core repository that has sparked innovative industry partnerships and is being used to train the next generation of economic geologists.

Future of Earth MRI

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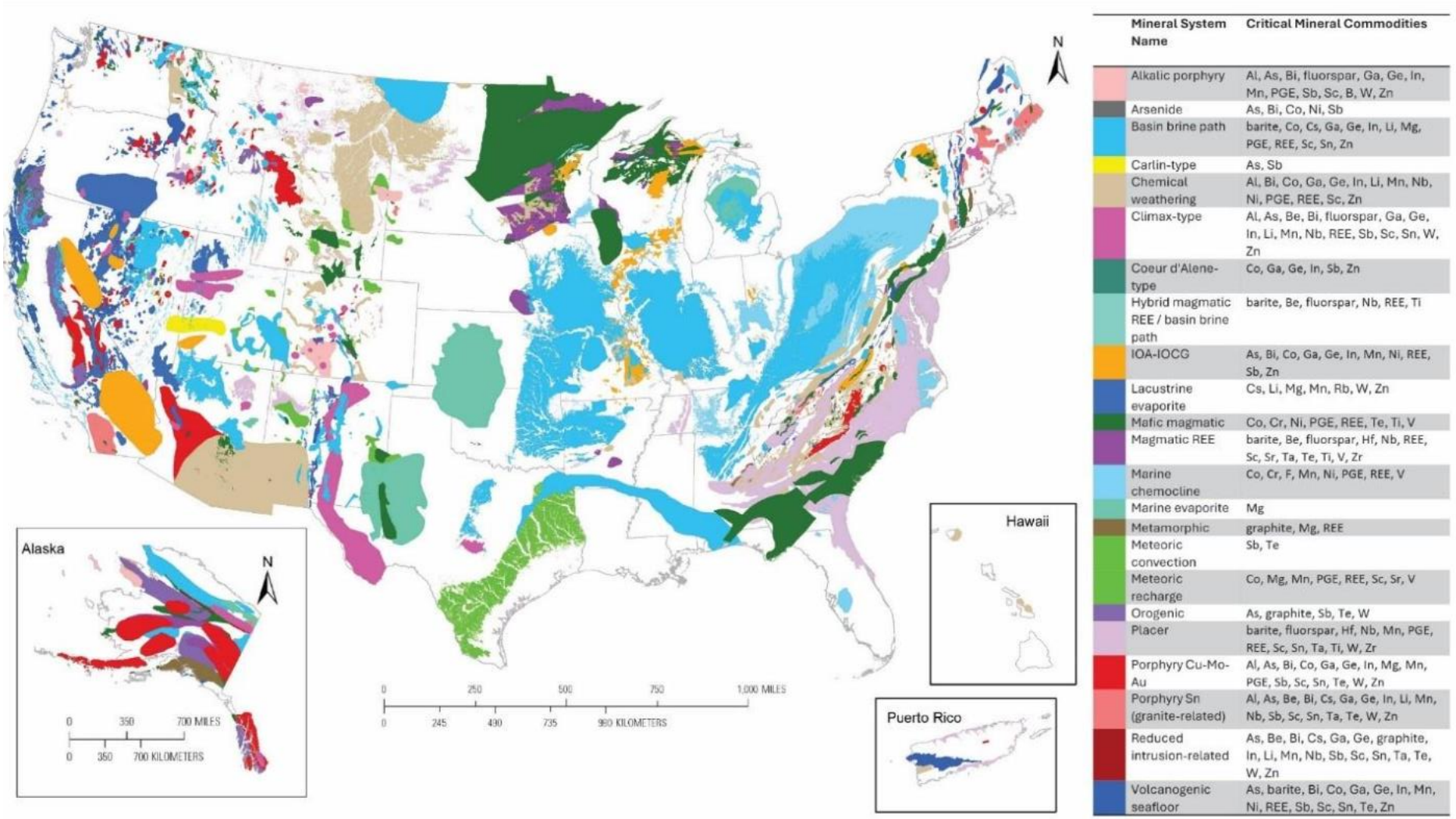
[2] Hammarstrom, J.M., Kreiner, D.C., Dicken, C.L., and Woodruff, L.G., 2023, National map of focus areas for potential critical mineral resources in the United States: U.S. Geological Survey Fact Sheet 2023-3007, 4 p., https://pubs.usgs.gov/publication/fs20233007

The USGS is committed to maintaining Earth MRI's collaborative approach moving forward. We continue to rely on the national map of critical mineral potential to prioritize and coordinate with partners as we modernize the nation's geologic mapping, geochemistry, and geophysical survey coverage. In addition to using airborne magnetic and radiometric surveys to identify and map buried mineral deposits, we are allocating funds to a small number of additional types of geophysical studies and tools. As the List of Critical Minerals has expanded, the USGS is actively evaluating areas of the country for further ore deposit research and discovery.

In 2026 and 2027, the USGS plans to advance data delivery and develop new products to make Earth MRI data immediately useful to industry, small businesses, permitting entities, and state, Tribal, and local governments. We also plan to expand artificial intelligence tools that we have piloted in collaboration with the Department of War's Defense Advanced Research Projects Agency and the Department of Energy to help a wider range of users interpret Earth MRI results.

Conclusion

As Earth MRI continues to modernize our mapping of the nation's minerals, it is providing insights that are essential for securing our mineral supply chains, strengthening our future economic and national security, and making clear, science-based decisions for responsible resource management. The USGS appreciates the Subcommittee's interest in the Earth MRI program, and looks forward to future collaboration on this important issue.



Mineral System Name	Critical Mineral Commodities
Alkalic porphyry	Al, As, Bi, fluorspar, Ga, Ge, In, Mn, PGE, Sb, Sc, B, W, Zn
Arsenide	As, Bi, Co, Ni, Sb
Basin brine path	barite, Co, Cs, Ga, Ge, In, Li, Mg, PGE, REE, Sc, Sn, Zn
Carlin-type	As, Sb
Chemical weathering	Al, Bi, Co, Ga, Ge, In, Li, Mn, Nb, Ni, PGE, REE, Sc, Zn
Climax-type	Al, As, Be, Bi, fluorspar, Ga, Ge, In, Li, Mn, Nb, REE, Sb, Sc, Sn, W, Zn
Coeur d'Alene-type	Co, Ga, Ge, In, Sb, Zn
Hybrid magmatic REE / basin brine path	barite, Be, fluorspar, Nb, REE, Ti
IOA-IOCG	As, Bi, Co, Ga, Ge, In, Mn, Ni, REE, Sb, Zn
Lacustrine evaporite	Cs, Li, Mg, Mn, Rb, W, Zn
Mafic magmatic	Co, Cr, Ni, PGE, REE, Te, Ti, V
Magmatic REE	barite, Be, fluorspar, Hf, Nb, REE, Sc, Sr, Ta, Te, Ti, V, Zr
Marine chemocline	Co, Cr, F, Mn, Ni, PGE, REE, V
Marine evaporite	Mg
Metamorphic	graphite, Mg, REE
Meteoric convection	Sb, Te
Meteoric recharge	Co, Mg, Mn, PGE, REE, Sc, Sr, V
Orogenic	As, graphite, Sb, Te, W
Placer	barite, fluorspar, Hf, Nb, Mn, PGE, REE, Sc, Sn, Ta, Ti, W, Zr
Porphyry Cu-Mo-Au	Al, As, Bi, Co, Ga, Ge, In, Mg, Mn, PGE, Sb, Sc, Sn, Te, W, Zn
Porphyry Sn (granite-related)	Al, As, Be, Bi, Cs, Ga, Ge, In, Li, Mn, Nb, Sb, Sc, Sn, Ta, Te, W, Zn
Reduced intrusion-related	As, Be, Bi, Cs, Ga, Ge, graphite, In, Li, Mn, Nb, Sb, Sc, Sn, Ta, Te, W, Zn
Volcanogenic seafloor	As, barite, Bi, Co, Ga, Ge, In, Mn, Ni, REE, Sb, Sc, Sn, Te, Zn

First National Map of Critical Mineral Potential. This map, an important early Earth MRI accomplishment, provides essential information about the potential distribution of critical mineral resources across the Nation's landscape and enables us to prioritize new data collection. This map is based off of the 2022 List and is currently being updated to include additional minerals from the 2025 List of Critical Minerals.