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Tracking Critical Minerals to Ensure National Preparedness

By Aleeza Wilkins



On an ordinary Tuesday in 2014, David Pineault, an economist at the Defense Logistics Agency (DLA), reviewed his specialized reports and came to a startling conclusion: the United States needed to increase its stockpile of a basic manufacturing material with military applications—yttrium oxide, a material used in laser rangefinders.

This shortfall meant that in 2014, the DLA had to submit a request to Congress to acquire new material for the National Defense Stockpile.

It's Pineault's job to find material shortfalls, and he embraces the challenge.

Early Warning for Critical Minerals

Pineault has a watch list of about 160 materials. Four years ago, he developed an early warning system that let him concentrate on high-priority materials. "In other words, we don't want to walk past a ten dollar bill looking for a dime," he says.

However, the concern over adequate supplies of mineral resources, especially critical minerals, is one that stretches across many agencies. Critical minerals are minerals that have a supply chain vulnerable to disruption and are essential to manufacturing.

For example, rare-earth elements are used in devices such as smartphones and flat-screen televisions; indium is present in the liquid crystal displays of many of the same devices. Manganese is essential for the process of turning iron into steel, yet its global mining industry is dominated by only a few nations.

Since Pineault's early warning system was designed for use by the National Defense Stockpile, a new, more inclusive system was

necessary for allowing other government projects to conduct analyses of critical minerals. Therefore, in 2015, the U.S. Geological Survey (USGS) developed an early warning screening tool Federal agencies can use to identify critical minerals of concern for economic and national security.



Bastnaesite—rare-earth element used to produce magnets in speakers, microphones, and vibration motors in mobile phones and other high-technology communications devices.

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Pineault and his team at the DLA will continue to use the USGS early warning screening tool to keep the United States prepared.

More Inclusive System

The system accounts for several variables in identifying critical minerals, including how vulnerable the supply chain is to disruption, how much production growth is expected for the material, and market dynamics.

Once the system has filtered out minerals that are not “potentially critical,” the remaining minerals receive further analysis. In-depth studies allow users to rank each mineral from lower to higher potential criticality. The resultant rankings are used by the DLA to define a cutoff point for analyzing potentially critical materials for shortfalls.

The DLA now uses this USGS tool because, as Pineault explains, it is “mathematically

rigorous and elegant.” Tom Rasmussen, the Director of Strategic Plans for the Defense Logistics Agency, agrees. “The USGS is world renowned as having an incredible reputation for providing mineral information. Having the USGS brand name on this early warning system lends [it] a great deal of credibility,” said Rasmussen.

As technology changes and geopolitical unrest shifts, different mineral commodities may become “critical.” To stay ahead of the curve, Pineault and his team at the DLA will continue to use the USGS early warning screening tool to keep the United States prepared.



A pair of U.S. Air Force F-15E Strike Eagles fly over northern Iraq. U.S. Air Force photograph by Senior Airman Matthew Bruch



A U.S. Army sergeant looks through a long-distance laser rangefinder. Photograph credit: U.S. Department of Defense

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