



Carbon
Removal
Alliance

Enhanced rock weathering

Soil acidification directly threatens agricultural productivity across the United States, with approximately half of U.S. cropland falling below optimal pH levels. Today, agricultural lime is the primary tool farmers use to address soil acidification, but costs and regional supply chain limitations have created availability gaps and made it a major expense for American farmers. Enhanced rock weathering (ERW) is a soil pH management practice that can provide farmers with low- or no-cost pH management solutions, permanently remove carbon dioxide, and complement existing agricultural lime use.

Photo courtesy of Lithos

How does enhanced rock weathering work?

Farmers apply finely ground rocks to fields — as they would with agricultural lime or any other soil pH amendment — where they react naturally with atmospheric carbon dioxide to form new minerals. These minerals eventually flow into the ocean, where they are stored for millennia.

There is vast potential for this practice on American farmland — by 2030, ERW could remove 100 million tons of carbon dioxide each year. ERW companies are operating across the country, but primarily in the Southeast and the Corn Belt. Farmers in states like Virginia, Mississippi, and North Carolina are already adopting this practice with demonstrable benefits.

WHAT IS CARBON REMOVAL?

Carbon removal consists of activities that are intended to remove carbon dioxide from the atmosphere or ocean and store it in a stable and durable form in order to develop American leadership in the carbon removal industry while creating domestic jobs and economic opportunities

CRA MEMBER COMPANIES



Potential impacts

Enhanced rock weathering can provide substantial benefits to the agricultural and mining industries, create thousands of in-demand jobs in rural areas, and protect American farmers from rising fertilizer costs.

- **Increase cost savings for farmers:** ERW can provide cost savings for farmers by reducing fertilizer and other agricultural inputs. Depending on the size of the farm, this can save farmers hundreds of thousands of dollars annually.
- **Enhance crop productivity:** ERW has been shown to improve the availability of essential crop nutrients like calcium, magnesium, phosphorus, potassium, and micronutrients which can lead to increased crop yields.
- **Create local jobs:** The economic activity generated by ERW will stimulate local job growth, especially in the agricultural sector. It is estimated that ERW could create 25,000 jobs nationwide in the coming decade.
- **Generate new revenue streams for local quarries:** ERW can use rocks sourced from local quarries that are close to the farmers. Frequently, these rocks are the waste products of these quarries — material that is usually too fine to sell. ERW provides a new market for this finely ground material, stimulating the local mining industry.
- **Reduce foreign fertilizer dependence and increase supply chain resilience:** ERW can reduce farmers' reliance on synthetic fertilizers that are largely manufactured outside the United States. This has potential to reduce the U.S. agricultural sector's dependence on foreign fertilizer imports, much of which come from geopolitically unstable regions.
- **Generate new revenue streams for farmers:** ERW safely removes carbon dioxide from the atmosphere, creating opportunities for farmers to get compensated via carbon markets without major practice changes.



ENHANCED ROCK WEATHERING IN PRACTICE

Agricultural lime costs roughly \$90/ton to purchase and apply, and each acre of farmland needs upwards of four tons of it per year, depending on the soil. Enhanced rock weathering partnerships can save farmers hundreds of thousands of dollars annually.

Photo courtesy of Lithos



Lithos, a CRA member company, has partnered with farmers, quarries, and other independent businesses across the state of North Carolina to deploy enhanced rock weathering. These partnerships have saved farmers hundreds of thousands of dollars in crop amendments, created a new market for mining byproducts, and increased revenue for local trucking companies with a model that can be applied to other areas across the United States.



100M tons

The amount of carbon dioxide ERW could remove per year beginning in 2030



25K jobs

The number of jobs ERW could create nationwide by 2030



\$90/ton

The average cost of traditional agricultural lime

Policy recommendations

- Support large-scale field trials across geographic regions to understand agronomic impacts on soil health, crop yields, and drought and pest resistance
- Develop and expand education and incentives for farmers, such as Soil Carbon Amendment (336) Conservation Practice Standard
- Advance research on measuring and verifying removals across agricultural supply chains
- Investigate industry partnerships between mining and agriculture for suitable feedstock
- Establish guidelines for safe and effective ERW projects

