

Blue Evolution Launches Orca Minerals: First U.S. Platform for Regenerative Biomining of Critical Minerals

New initiative builds on a decade of seaweed infrastructure to deliver mineral sourcing via photosynthetic systems

SAN JOSE, CA, UNITED STATES, May 6, 2025 /EINPresswire.com/ -- In response to growing global urgency around strategic mineral supply, [Blue Evolution](#) has launched [Orca Minerals](#): the first U.S.-based platform to deliver regenerative biomining of critical minerals using cultivated seaweed. Orca builds on over a decade of seaweed farming, bioprocessing, and climate innovation led by Blue Evolution.



Blue Evolution is a natural capital company, dedicated to harnessing the power of seaweed to create sustainable solutions for a carbon-negative future.

Orca Minerals aims to help set a new global standard for critical mineral recovery—one that restores rather than extracts. By cultivating seaweed to absorb trace elements like rare earth elements and strategic metals, Orca introduces Blue Evolution's Zero+ framework into the mineral economy: no waste, no depletion, no human exploitation—and measurable co-benefits for ecosystems and communities alike.

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Orca Minerals is launching a regenerative platform to harvest critical minerals from seaweed—offering a sustainable, U.S.-based alternative to conventional and deep-sea mining.”

Beau Perry, CEO, Blue Evolution

“Orca’s platform spans both offshore and controlled onshore cultivation, tailored to species, site, and mineral profile,” said Matt McGarvey, initiative lead for Orca Minerals. “Its modular systems enable localized production in alignment with biodiversity goals and ocean stewardship

protocols.”

:: A science-driven alternative to conventional mining ::

The launch of Orca Minerals comes at a time when the U.S. is grappling with how to secure and refine critical minerals without relying on overseas processing. While traditional mining remains dependent on global supply chains for refining—Orca’s approach explores onshore, nature-based mineral harvesting and processing. By using seaweed to absorb trace elements from seawater and applying green chemistry to refine them domestically, Orca supports national goals to strengthen resource security while reducing environmental impact.

Backed by a major grant from the Advanced Research Projects Agency–Energy (ARPA-E) and a strategic collaboration with Pacific Northwest National Laboratory, the Orca team is working with leading U.S. research institutions—including CSU, UAF, UC Davis, and Virginia Tech—to develop processes that:

- Use seaweed to optimally absorb minerals from seawater
- Refine extraction techniques to efficiently recover those minerals
- Ensure economic viability in local and global supply chains
- Can be implemented both offshore and in controlled onshore environments

Alongside these scientific collaborators, Orca is also pioneering next-generation measurement, reporting, and verification (MRV) systems and carbon accounting protocols—including new frameworks for nature-based blue carbon capture, utilization, and storage (NBCCUS)—to transparently track and monetize ecological co-benefits.

“This research is about understanding how marine plants like seaweed can be harnessed to bioconcentrate rare earth elements from seawater and thus solve a complex mineral sourcing

O ORCA

Orca Minerals is developing regenerative biomining as a photosynthetic alternative to traditional mineral extraction.



By using seaweed to absorb trace elements from seawater and applying green chemistry to refine them domestically, Orca supports national goals to strengthen resource security while reducing environmental impact. PC: Rachelle Hacmac

challenge,” said Dr. Michael Huesemann, Algae Research Team Lead at PNNL. “In our partnership with Blue Evolution, we’ll explore scalable, non-extractive and sustainable solutions that may one day complement or even reduce the need for traditional mining.”

“Our work with Pacific Northwest National Laboratory uncovered something we hadn’t seen before—rare earth elements and platinum group metals in our seaweed. That discovery, backed by the Department of Energy, opened the door to something bigger. It’s what led us to launch Orca Minerals—a focused platform built to advance regenerative mineral recovery at scale,” added Beau Perry, CEO of Blue Evolution.

Blue Evolution estimates that a first working prototype will be operational by 2027, with commercial viability targeted for 2028. Early work includes development of an onshore grow facility where seaweed strains can be optimized for mineral uptake. Initial development is focused on red, green and brown seaweed species already in production through Blue Evolution’s Alaska and Mexico operations.

:: Equity and inclusion at the core::

Orca Minerals is committed to ensuring Indigenous and coastal communities are not just included but positioned as co-creators of the new mineral economy. The company is building equity structures to enable ownership, R&D collaboration, revenue sharing, and leadership across its global partnerships.

ABOUT ORCA MINERALS

Orca Minerals is developing regenerative biomining as a photosynthetic alternative to traditional mineral extraction. A strategic platform launched by Blue Evolution, Orca builds on over a decade of seaweed cultivation, bioprocessing, and ocean science to deliver Zero+ solutions to the world’s most pressing material challenges. To learn more, visit orcaminerals.com.

ABOUT BLUE EVOLUTION

Blue Evolution is advancing seaweed-based solutions to meet the world’s most pressing challenges. Founded in 2013, the California-based climate-tech company develops and markets nature-based products across health, agriculture, materials, minerals, and climate. With over a century of combined expertise in seaweed and mariculture, the team brings deep capability in biotech R&D, ocean big data, AI, and supply chain optimization. Blue Evolution works in close partnership with indigenous and coastal communities to drive restoration, resilience, and shared value at scale. To learn more, visit blueevolution.com.

ABOUT PACIFIC NORTHWEST NATIONAL LABORATORY

Pacific Northwest National Laboratory draws on its distinguishing strengths in chemistry, Earth sciences, biology and data science to advance scientific knowledge and address challenges in energy resiliency and national security. Founded in 1965, PNNL is operated by Battelle and supported by the Office of Science of the U.S. Department of Energy. The Office of Science is the

single largest supporter of basic research in the physical sciences in the United States and is working to address some of the most pressing challenges of our time. For more information, visit the DOE Office of Science website. For more information on PNNL, visit PNNL's News Center.

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