



Can sinking seaweed in the ocean help the climate crisis?

The need for solutions to the climate crisis has never been more urgent. Halting and eventually reversing the impacts of climate change require that we both stop emitting carbon dioxide and remove existing carbon dioxide from the atmosphere and ocean. Ocean-based pathways hold promise as climate solutions due to the sheer size of the ocean, its natural carbon sequestering abilities, and the potential for highly durable pathways.

Growing and sinking macroalgae (seaweed) in the deep ocean has received widespread attention and early-stage investment as a potential strategy to sequester carbon dioxide. However, this strategy lacks a body of scientific evidence from which to evaluate the effectiveness of carbon sequestration, risks to ecosystems, and any co-benefits that may occur.

This report presents a framework for a coordinated global research effort dedicated to investigating the efficacy of carbon sequestration and environmental impacts of growing and sinking macroalgae into the deep ocean as a carbon dioxide removal strategy.

Included in the report:

- A detailed list of 23 scientific questions that need to be answered, alongside recommended approaches for answering the questions
- Detailed guidance on the design and execution of controlled field trials that can be completed in approximately two to five years
- Estimates on the cost of a single controlled field trial as well as a budgeting tool to support resource allocation for field experiments
- Collection of oceanographic assets, infrastructure, and pilot projects to support research efforts

This brief is based on the report “Answering Critical Questions About Sinking Macroalgae for Carbon Dioxide Removal: A Research Framework to Investigate Sequestration Efficacy and Environmental Impacts” (2022).

TO READ THE REPORT AND GET MORE INFORMATION, VISIT:
oceanvisions.org/seaweedresearch

Key Points for Decision-Making

- **Scientific information to answer key questions about the efficacy and impacts of sinking macroalgae (seaweed) into the deep ocean for carbon dioxide removal is scarce.** This report lays out a framework for accelerating scientific research so that the best science is available to inform policy about solutions to the climate crisis.
- **A complete research program to answer all relevant questions about the efficacy and impacts of sinking seaweed for carbon dioxide removal must include controlled field trials.** Controlled field trials (i.e., in ocean experiments) are an irreplaceable component of a well-designed research program because they can provide information about real-world performance and impacts of sinking seaweed. This report provides specific guidance on the design and execution of such field trials.
- **Accelerated research into the efficacy and impacts of sinking seaweed for carbon dioxide removal must be a global effort and needs additional investment.** This report recommends approximately 10 field trials in different locations around the world, with an estimated total cost of \$1 billion (USD).