The National Academies of
SCIENCES • ENGINEERING • MEDICINE

A Workshop on Ocean-based CDR Opportunities and Challenges,
Part 2: Technological and Natural Approaches to Ocean Alkalinity Enhancement and CO_2 Removal
January 27, 2021
1pm – 5:30pm EST

AGENDA

Purpose: This is the second of four workshops designed to explore the most important scientific and technical questions, as well as questions surrounding governance, needed to assess the benefits, risks, and potential scale for the responsible ocean-based carbon dioxide removal and sequestration approaches. This series of workshops is an activity in support of the NASEM Committee on A Research Strategy for Ocean-based Carbon Dioxide Removal (CDR) and Sequestration. Committee members will use this platform as one mechanism to gather information and converse with a diverse set of experts in the field, for the purpose of progressing the consensus study process.

During this workshop, we will examine opportunities and challenges associated with two ocean-based CDR approaches: Ocean Alkalinity Enhancement & Electrochemical Approaches. The discussion of the two strategies is broken into two main sessions, one covering technological approaches and one covering natural approaches to ocean alkalinity enhancement and CO_2 removal. Discussions are meant to inform understanding of the knowledge base, efficacy, scale, and viability to each approach.

To Join the Workshop: All panelists will be provided unique IDs to log in to the Zoom meeting as speakers; a public link will be sent out to registered viewers. Questions? Please email Trent Cummings, tcummings@nas.edu

Communications / SLACK Workspace: There is a much larger pool of expertise to draw from than we are able to include in the workshop discussions. To cast a wider net of information gathering and promote additional communication before, during, and after the workshop, please use our slack workspace. This workspace was created to promote discussion and to share resources and references with committee members and the greater ocean-CDR community. Within the workspace, we have created a channel for each of the 4 workshop dates. Questions? Please email Trent Cummings, tcummings@nas.edu

*This public meeting will be recorded and posted on our project website for the duration of the study.

1:00 PM **Welcome and Workshop Overview**
Scott Doney**,** Committee Chair & University of Virginia

1:05 PM **Technological Approaches to Increase Alkalinity / Remove CO2:** This session will include the current approaches and technologies to enhance alkalinity and remove CO2 from seawater. The objective of this session is to identify opportunities for research and challenges with scaling and implementation.
Moderated by: Phil Renforth, Committee Member, Heriot-Watt University

Keynote: Ken Caldeira, Carnegie Institution for Science (25 min)

Panelists: (5 min each followed by discussion, Q&A)

Greg Rau, University of California, Santa Cruz
Heather Willauer, U.S. Naval Research Laboratory
Matt Eisaman, Stony Brook University
David Babson, ARPA-e
Tim Kruger, Oxford Martin School
Jess Adkins, California Institute of Technology
Robert Zeller, Occidental
Niall Mac Dowell, Imperial College

2:45 PM **BREAK**

3:00 PM **Natural Approaches to Alkalinity Enhancement:** This session will provide an overview of emerging research using laboratory, mesocosm and field approaches to enhance alkalinity and remove CO2 from seawater. The objective of this session is to identify opportunities for research and potential risks for ecosystems.
Moderated by: Debora Iglesias-Rodriquez, Committee Member, University of California, Santa Barbara

Keynote: Richard Zeebe, University of Hawai'i (25 min)

Panelists: (5 min each followed by discussion, Q&A)
Ulf Riebesell, GEOMAR, Kiel
Rosalind Rickaby, Oxford University
Lennart Bach, University of Tasmania
George Waldbusser, Oregon State University
Bärbel Hönisch, Lamont-Doherty Earth Observatory
Andy Ridgwell, University of California, Riverside

4:45 PM **Validation & Monitoring and Environmental Risk:** This session will include talks on the latest technologies and approaches for wide-area mapping of alkalinity and pH using sensors and bench top instrumentation, and will offer perspectives on ensuring the scientific robustness of research, and implementation approaches related to ocean-based climate intervention technologies.
Moderated by: Gaurav Sant, Committee Member, University of California, Los Angeles

Panelists: (5 min each followed by discussion, Q&A)
Ellen Briggs, University of Hawai'i
Chris Sabine, University of Hawai'i
Andrew Dickson, Scripps Institution of Oceanography
Albert Plueddemann, Woods Hole Oceanographic Institution

5:30 PM **Closing comments and Adjourn**