

February 2026

u^b UNIVERSITÄT
BERN

Carbon to Sea
Initiative

OAEMIP

The Ocean Alkalinity Enhancement Model Intercomparison Project

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A close-up photograph of a server rack. The scene is dominated by numerous blue network cables plugged into ports. The cables are bundled and organized, with some having white labels. In the background, rows of small, glowing yellow lights are visible, indicating active network connections or power. The overall lighting is dark, with the primary light sources being the yellow LEDs and the blue of the cables.

No data, yet...

**100% open
to your
ideas**





OAEMIP gathering

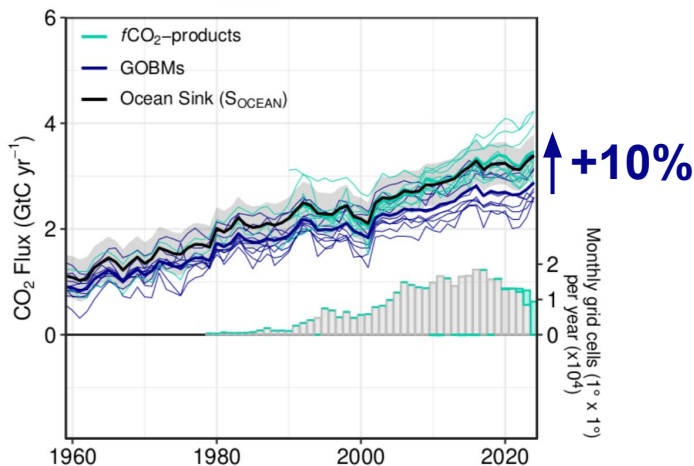
Wednesday evening at the Finnieston oyster bar

Do we need a MIP for OAE?



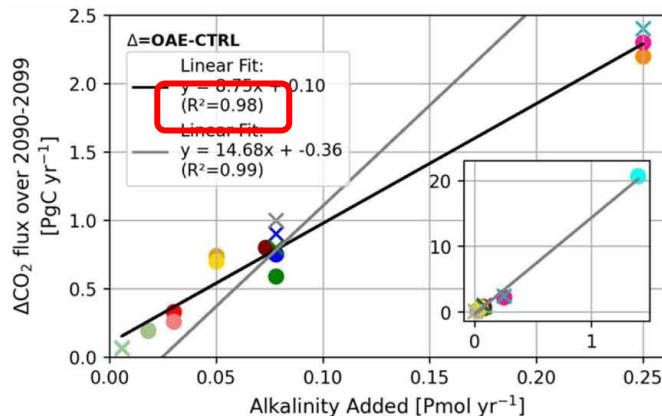
David Ho ✓
@davidho.bsky.social

Each mCDR deployment aims to remove a tiny fraction of that, so if people think we have the methodology to do proper MRV for mCDR right now, they're delusional. 🌊



Judith Hauck
@jhauck.bsky.social

We can essentially predict 🌊 ocean CO₂ uptake and atm CO₂ reduction based on amount of alkalinity added (R² > 0.98).

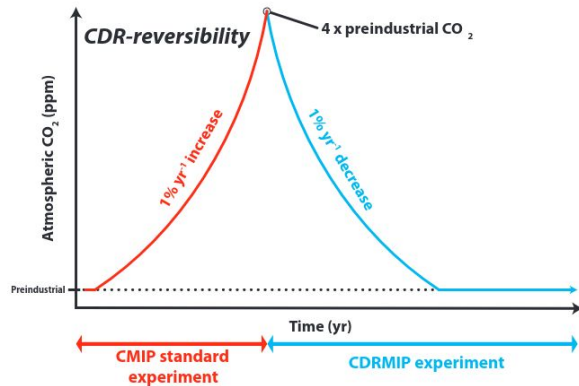


What do we have already?

CDRMIP

Global, idealized CDR assessment

□ *CDR-induced climate reversibility*

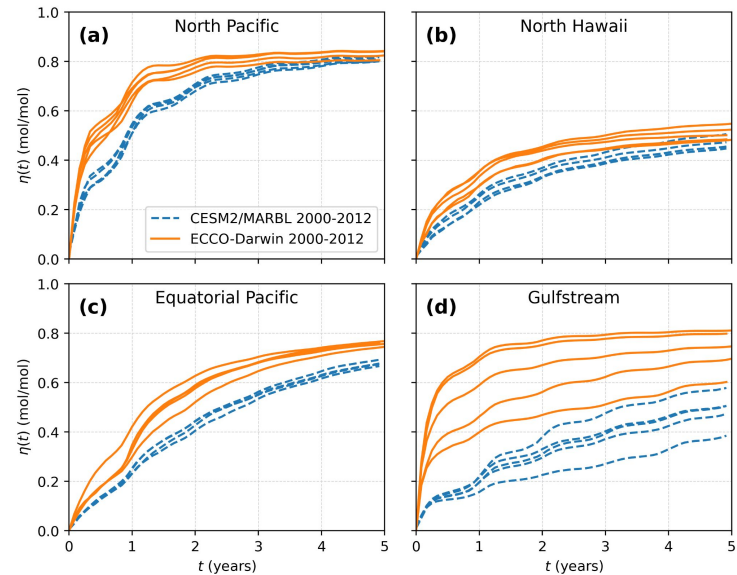


Keller et al. (2018)

Two-model comparison

Local OAE pulse injections

□ *Quantify and attribute OAE efficiency differences*



Tyka et al. (2025)

OAEMIP Experimental Design

A multi-model comparison of OAE efficiency in the **present** and **future**

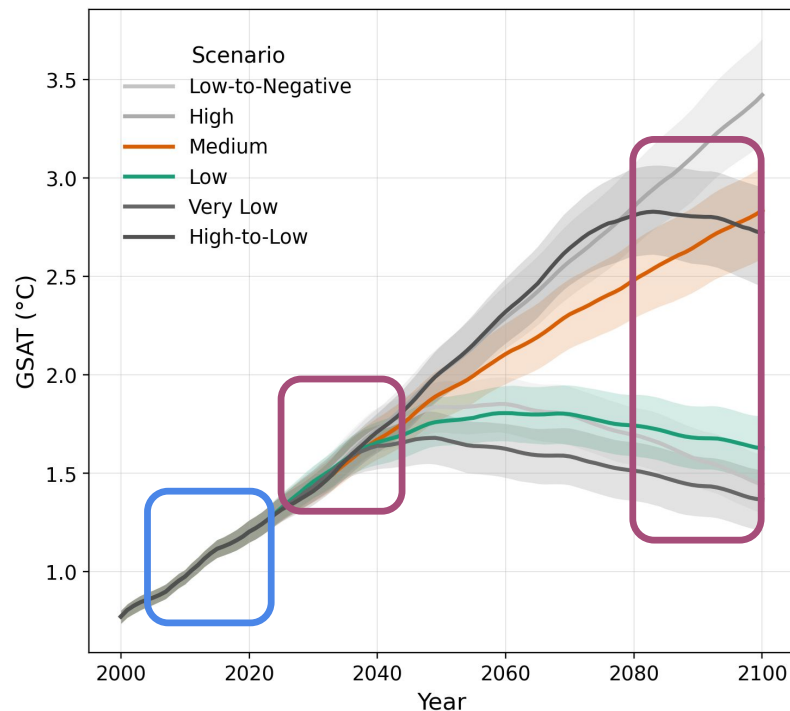
Present perspective

How much CDR does OAE achieve under current conditions?

Inform ex-post carbon crediting

□ *Forced ocean-only models*

CMIP7 emission scenarios



Future perspective

How efficient is OAE under climate change?

Support mitigation strategy design

□ *Emission-driven Earth System Models (ESMs)*

The present perspective

How does model consistency depend on oceanographic regimes?

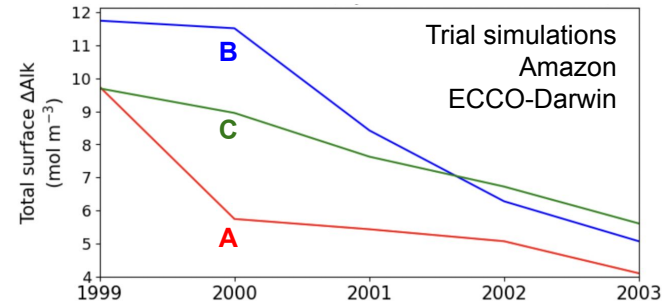
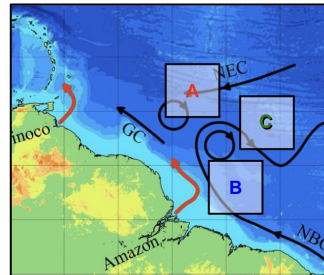
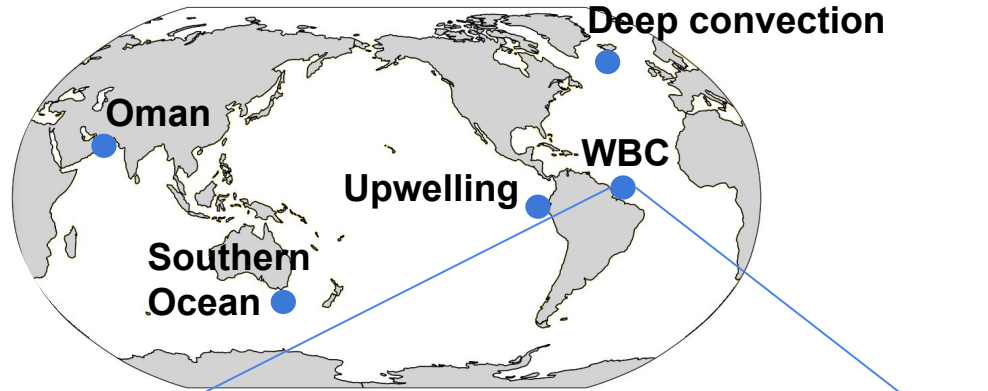
- 5 injection patches, roughly $4 \times 4^\circ$
- Total alkalinity injection: 0.1 Tmol/yr

Do simulated OAE efficiencies converge over time?

- 1 year OAE pulse
- 19 years continued simulation

Does model spread vary from year to year?

- Starting years: 2003 (+1997, 1998)



The future perspective

Can we consistently project OAE efficiency under climate change?

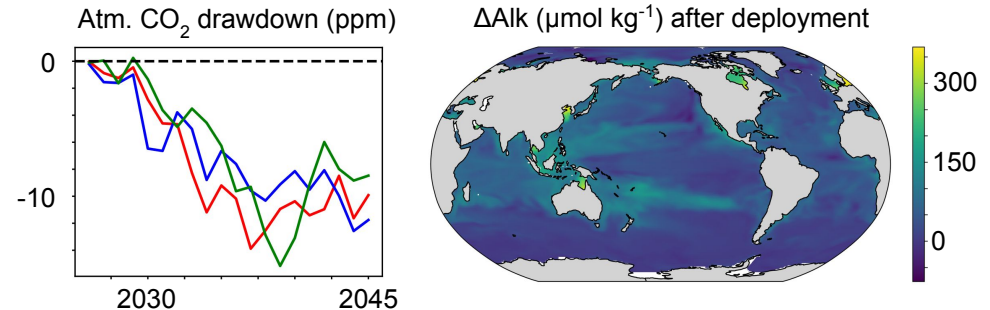
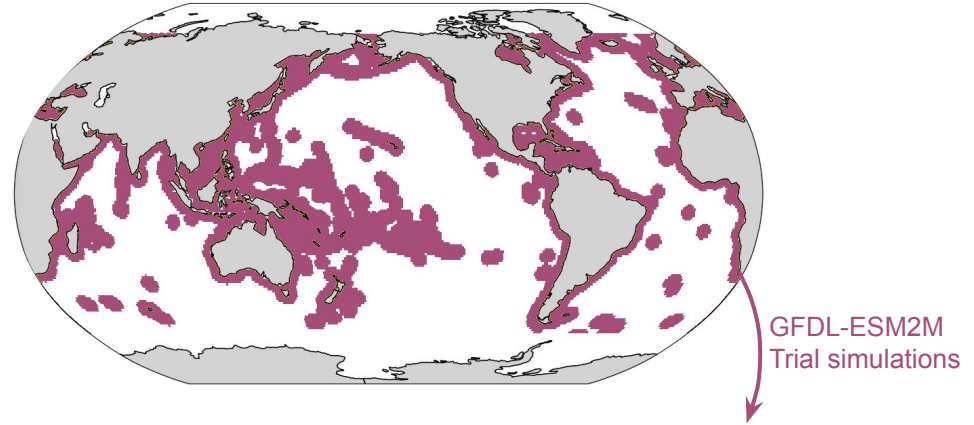
- 10 year OAE pulse
- 10 years continued simulation
- Starting years: 2025, 2080

Do climate scenarios matters?

- CMIP7 emission scenarios: Medium (+Low)

How do carbon cycle feedbacks vary across models?

- Global EEZ around continents
- Total alkalinity injection: 365 Tmol/yr
- Min. 3 ensemble members



The OAEMIP Team



Dr. Lauren Moseley
OAEMIP Research Fellow



Dr. Jens Daniel Müller
OAEMIP Research Fellow



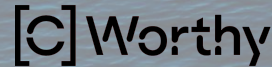
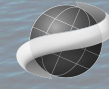
Dr. David Keller
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