SEAWEED CULTIVATION AS A CLIMATE POSITIVE SOLUTION

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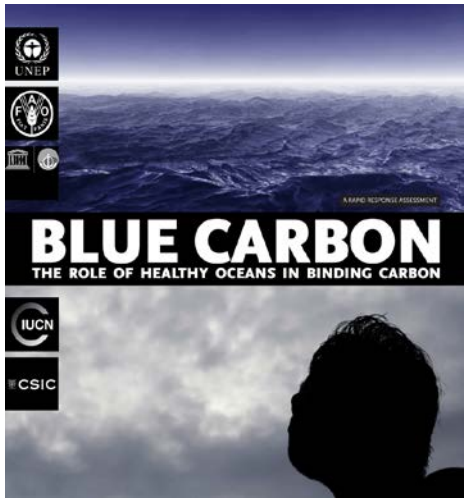
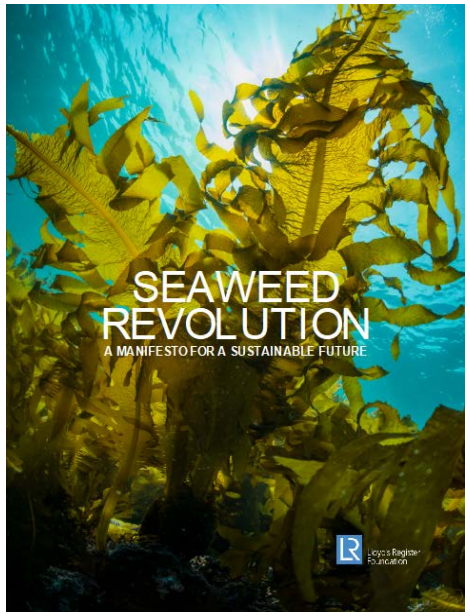
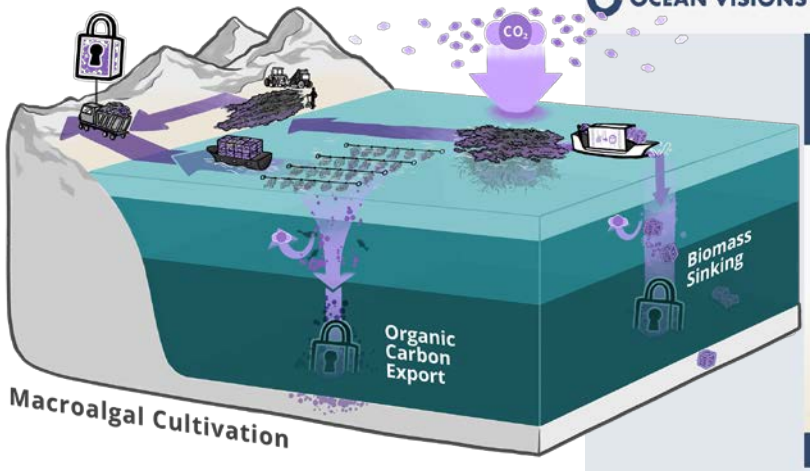
PhD candidate at SINTEF Ocean/NTNU

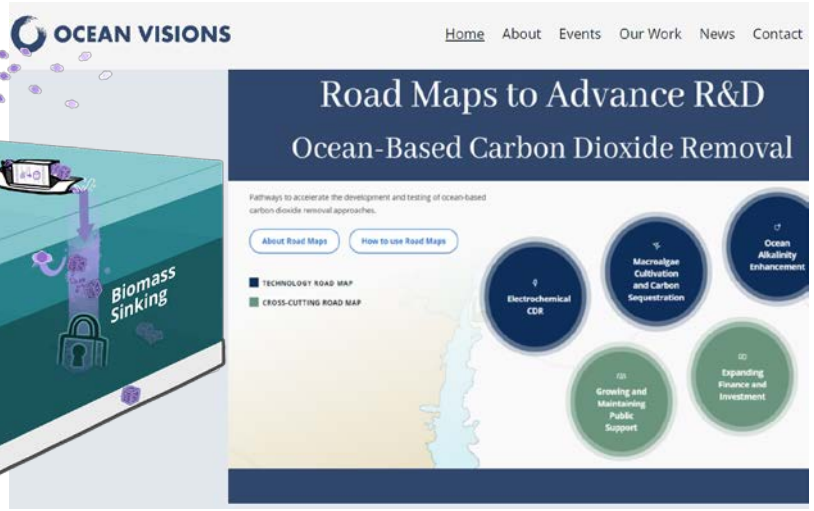
SIG Seaweed conference, Trondheim. 26 November 2021.

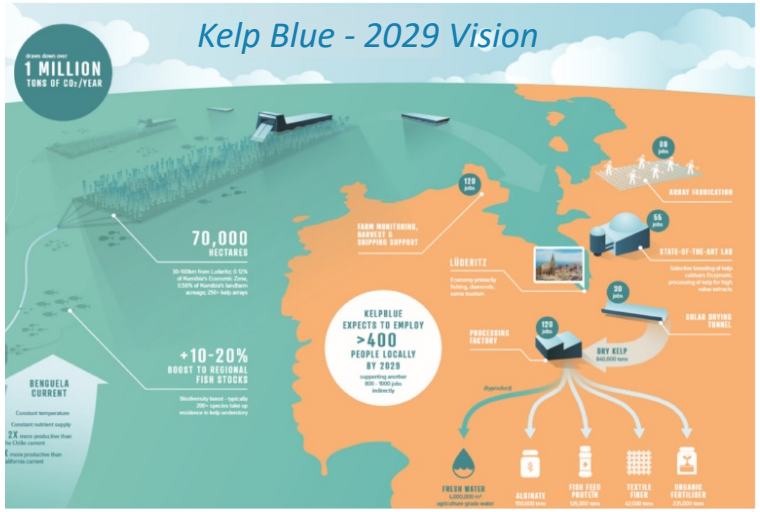
Turn of the tide for seaweeds



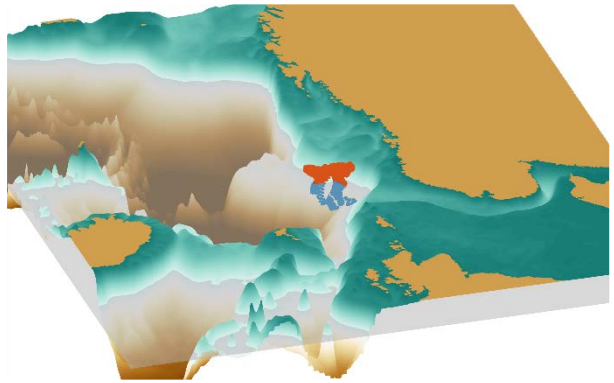








4 ways Seaweed can help in Climate Mitigation



Seaweed products
CO_2 avoided, replacement effect

Seaweed biochar
CDR

Biomass sinking
CDR

Restoration/ creation of habitat

PURPOSE

Commercial uses

Commercial uses, with C-seq. as added value

C-seq. with other market uses as added value

Target is C-seq & climate mitigation

Ecosystem Services

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Credits

Tradable credits, 'justified' subsidies/grants, tax alleviation, coverage of % operational costs, other forms…
…helping sustainable growth of farming companies

Carbon credits	• C in standing stock • C-sequestered in sediments • CDR
Nutrient credits	• Bioremediation service
Biodiversity credits	• Increased biodiversity in farms • Increased fish biomass

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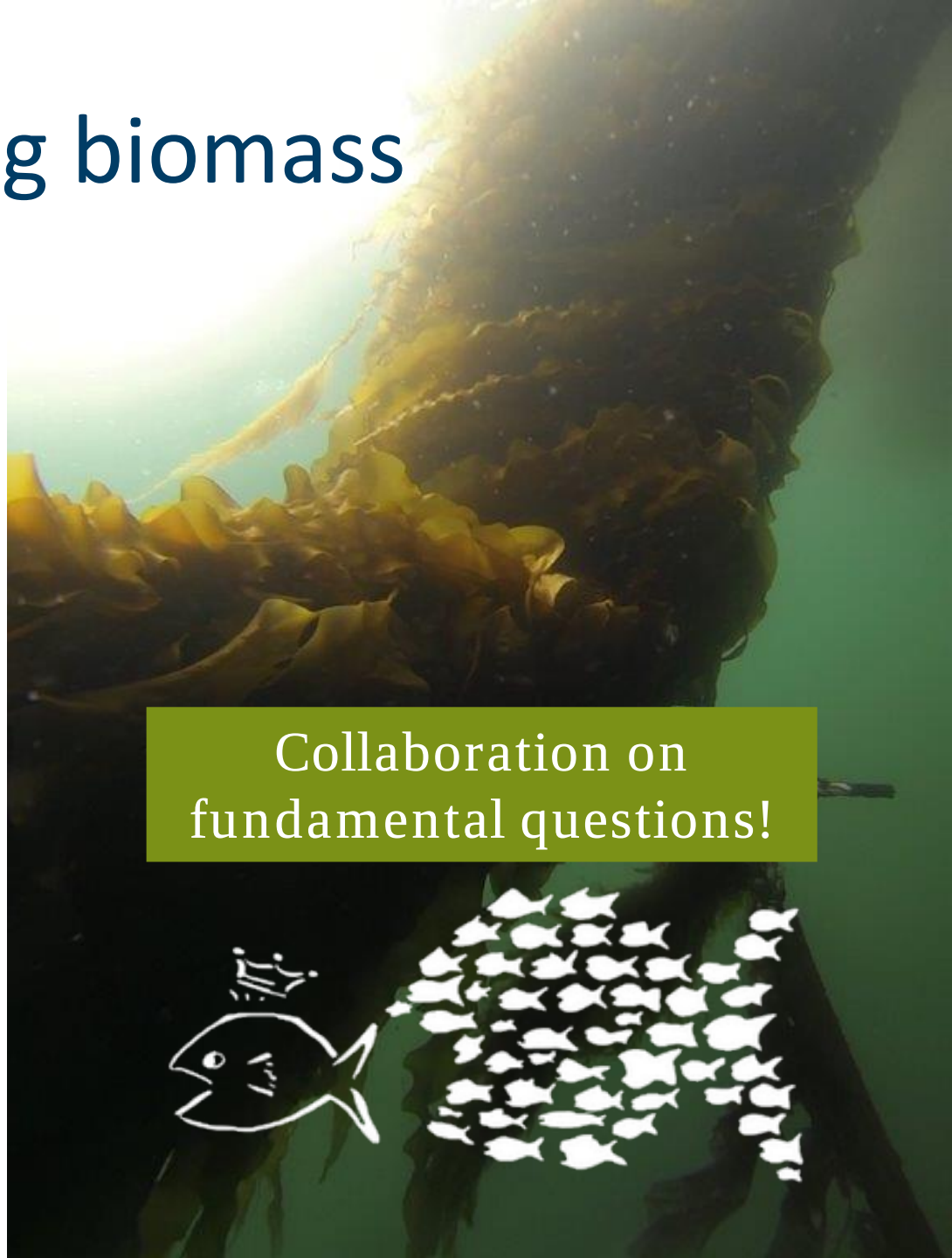
Elephant in the room: sinking biomass

1. What are the environmental effects/impacts of sinking seaweed biomass?
2. What are possible mitigation measures eg. via operations
3. What are the thresholds above which impacts are unacceptable and/or not possible to mitigate?
4. Technology needs for ongoing monitoring & in-situ trials (opportunity to develop NEW methods, automated)
5. Opportunity to help industry SCALE up



PhD

2021-2024

Quantify and evaluate the role of seaweed farms in carbon capture and sequestration via select passive and active processes.

Seaweed cultivation industry

Environmental monitoring

Seaweed CDR
Algae4Clay
Carbon Links
Oceans 2050
Monitare
Macrosea
Kelppro

Blue Carbon

Biogeochemistry

Link to projects

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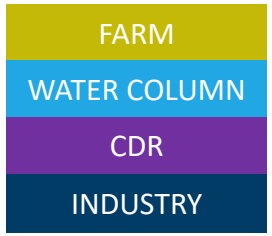
Research approach



1. Carbon capture & losses from farm

2. DOC/ POC production in *situ*

3. DOM characterization (lab)

4. Kelp-C: how labile/refractory

5. Kelp sedimentation below farm (UHI/eDNA)

6. Degradation of kelp-C in deep sea conditions → Environmental impact

7. Case study: extend harvest season and optimize yields for high value applications AND carbon removal

8. Summarize the potential, C-budgets, credits, recommendations on risks

SINTEF

New installation in Skarvøya

The potential is real!

…question is how and how much

The science is immature and must catch up!

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