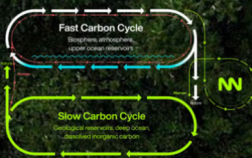


Forest Floor to Ocean Floor

Researching Terrestrial Biomass from Forests to utilize it for Carbon Sequestration at Sea

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Introduction

Running Tide's goal is to improve ocean health by reducing the amount of carbon currently in the fast carbon cycle (atmosphere, upper layers of the ocean, biosphere). To that end, Running Tide is developing a system where small, passively floating drifters, made from terrestrial biomass, alkaline materials, and seeded with algae seeds, are deployed in the open ocean. The alkaline materials enhance ocean alkalinity, the algae grows and binds CO₂ via photosynthesis, and the entire drifter sinks after a predetermined duration to the deep sea, where the carbon is durably sequestered in the slow carbon cycle.

For this purpose, Running Tide seeks to source biomass that isn't being used for infrastructure and would in most cases release carbon back to the atmosphere in near future through decaying or burning.

Biomass Sources

We mainly seek biomass from trees, prioritizing forest conservation and biodiversity. Our preferred sources include:

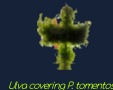
- First Thinnings: improving the timber quality of trees left standing e.g.: Iceland Pine, Spruce, Larch etc.
- Preventive thinnings: Cutting firelines or disease barriers
- Hurricane Salvage: Preventing fire hazard & removing decaying biomass
- Invasive species: species that have started to alter biodiversity e.g.: Casuarina equisetifolia (Bermuda Island)
- Infective trees: Insects, fungi etc.
- Fast growing species: Species that are grown in the purpose of storing carbon (Paulownia)
- Side products of milling and other biomass industry

Running Tide Biomass Research

In our work we map out globally the possible resources of biomass. We're advised by **Richard Donovan** who sits on our independent science advisory board.

World Wide Sourcing

- Mapping out possible sources
- Carbon footprint of sourcing it
- Material and process cost



Biomass analysis and characteristic research

- Density
- Carbon content
- Moisture content
- Buoyancy
- Floating time
- Interaction with algae



Pelagic Impact

- Acid and other leaching in lab setting
- Biodiversity impact and evaluations with outside parties (Akvaplan Niva in Norway, for example)

Benthic Impact

- Ocean Networks Canada project in XXX
- Alfred Wegener Institute project in YYY
- Internal project in Hvalfjörður, Iceland.
- Modeling of impact of biomass over larger areas with Niva in Norway.

SeaTube

Carbon impact

- Carbon Efflux from forest thinnings: litter decaying, possible soil carbon loss etc.
- Impact of plantations and different types of sources on carbon account and carbon efficiency.

Suitability of biomass as ingredient into other types of substrates:

- Using different types of binders and materials - mycelium, cementitious materials, starch, others - to create long-floating form factors for algae growth.

Through these research and development efforts, the product (substrate) is developed based on multiple attributes:

- Wood Algae Buoy or Sinking Substrate
- Size, Shape and Form to give the optimal floating, sinking time and algae growth of each available biomass
- Treatments needed to obtain our goals:
 - a. Ocean Alkalinity Enhancement
 - b. Stable Characteristics of the Biomass
 - c. Sparking Algae Growth
- Adjustment and development on scientific research objects to look into, technology, machine learning and quantification of carbon sequestration

The development leads to constant interplay between research and development

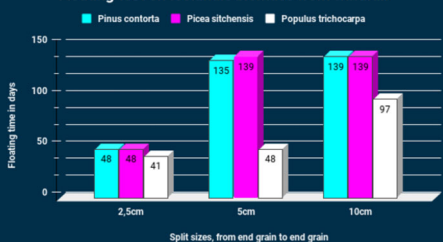


Learn more at the Running Tide Document Library

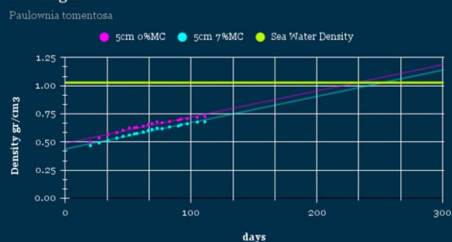
Running Tide Responsible Sourcing Strategy



Floating test on Icelandic biomass from windfall



Floating Test



Our Future Vision

Developing a model and database on forest biomass where Running Tide can process and utilize biomass sources to capture more carbon through photosynthesis with algae and alkalinity enhancement at sea. At the same time, sinking biomass to sequester its carbon for centuries to millennia that would otherwise be effluxing carbon to the atmosphere if burned or left to decay in the nature

