Measurement efficacy and cost curves associated with natural carbon solutions

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Co-founder/CEO @ FlowCommand: Measure fluid behavior through entire systems using connected ultrasonic sensors

Previously: Index products at Barclay’s
Background
“In many spheres of human endeavor, from science to business to education to economic policy, good decisions depend on good measurement.”

Ben Bernanke
Cost Curves: DCC vs. Natural

Capital Allocation For Carbon Capture

- **Direct Carbon Capture**: $750 million
- **Biological Carbon Capture**: ???

1) [https://www.globalccsinstitute.com/resources/publications-reports/research/](https://www.globalccsinstitute.com/resources/publications-reports/research/)
2) [https://sequestration.mit.edu/tools/projects/boundary_dam.html](https://sequestration.mit.edu/tools/projects/boundary_dam.html)
How Do We Measure Now?

- Experiment Scale
- Project Scale
- Global Scale
How Do We Measure Now?

Experiment Scale

Project Scale

Global Scale
Measurement at Experiment Scale
Measurement at Project Scale

Direct
Sampling and Weighing Biomass

Indirect
Monitoring Air PPM
Direct measurement challenges

- Respiratory organisms consume decaying biomass, producing CO2
- Extra carbon stored in the soil can be released
- Changing temperatures can affect how much CO2 is released
- Expensive to scale

Indirect measurement challenges

- Difficult in different ways
- Requires many sensors for very cheap
- Sophisticated dispersion modeling
- Faint signal in tons of noise
- But...universal and scalable
Monitoring CO2 PPM
Why Hasn’t Anyone Done It?

- Low-Cost Remote Sensors
- Technical Components

| Software & Algorithms | Accurate Measurements | Demand for bio CC |
The Feedback Loop Hasn’t Begun

Demand for Sensors

Data → Algorithms

Measurement

Demand for Bio CC

Demand for bio CC
What’s Needed to Measure?

- CO2 Sensors
- IOT
- Fleets of Sensors
Follow air quality lead
Monitoring CO2 PPM
Adaptations

- Time exposure required
- Quantity and layout of sensors
- Dispersion models more relevant
Use Case Framework

Identify Best Methods
Measuring entire dispersion patterns would help speed up the proliferation of successful projects.

Iteration Pace
Having real-time accurate data would allow us to iterate on our experiments.
Example: Easy, Cheap, Scalable

Proposed by a Customer: Produced water, where they have land rights and necessary materials.
Closing

- Networked CO2 monitoring is now ‘in-the-money’
- Can be particularly impactful for nature-based CO2 capture
- Will still require repeated experimentation