

Internal Review of Soil Organic Carbon Estimation

Partner: Ecometric

Submission Date: August 29, 2022

Summary of Internal Review Process

The intent of the [Regen Registry Internal Review](#) is to ensure methodologies submitted to the Regen Registry meet the integrity expected by our community and ensure the document is sufficient to warrant review by Expert Peer Reviewers. The task of an Internal Reviewer is to act as an ally to methodology developers by providing critical feedback to help facilitate an understanding of how to improve the methodology to best serve Earth Stewards while maintaining scientific and community integrity.

The Regen Network Science Team has reviewed the *Soil Organic Carbon Estimation* to facilitate the creation of a strong methodology which can be submitted to External Peer Reviewers. Our feedback has been provided in two ways:

- 1) **Direct Comments:** To provide targeted constructive feedback to specific sections of your methodology, our team commented directly in your methodology document on what we found confusing, thought needed more definition, or what we thought was out of scope for this methodology. The comments can be found in this [document](#).
- 2) **Overall Reflections:** To provide more generalized feedback to your methodology as a whole, our team provided the additional reflections in this document. Reflections were categorized by reviewers, each of whom had different thoughts on how to improve the methodology. A final combined summary of comments, feedback and suggestions is found in the Combined Summary section.

Internal Review:

Reviewer 1 - Ned Horning:

General Comments:

This is pretty much ready for Expert Peer Review. I made some minor comments that should be easy to address. The issue with sampling every year is primarily expense. From the peer-reviewed literature I read the error in model prediction accuracy will typically be high enough so detecting change in SOC at an annual frequency will not provide an accurate representation of what's going on. There isn't anything inherently wrong with high frequency sampling and it certainly provides a richer dataset from a research perspective but it comes at a cost.

In the "Additional Comments" document there are significant credit class/methodology questions that I prefer to defer to Gisel, Sam or someone on the Registry team.

The other general comment is that I suggest they replace "ML" with "ANN" if they indeed will be using ANN models. Machine learning is a very broad term and they seem focused on using only ANNs.

Comments by Sections:

Methodology Overview:

Minor inline comments

Project Boundaries:

Minor inline comments

Calculating Carbon Sequestration using Remote Sensed...:

They need to add information about the sampling framework after the first (baseline) year. They also need to define what they mean by "ancillary data" since they seem to be using two interpretations of the term but not differentiating between them.

Calculating the Creditable Carbon Exchange:

They do not appear to be adding model uncertainty into their uncertainty calculation.

Data Reporting:

No comments

Data Storage:

.No comments

Data Verification:

They should provide the final model used for predictions to the verification team. That does not compromise IP since an ANN model is binary and nearly impossible to reverse engineer.

Final Decision: - Pass or Suggested for another round of Internal Review

Pass after addressing comments

Reviewer 2 - Gisel Booman:

General Comments:

This is ready for Expert Peer Review. But I'd like to read the associated credit class before deciding to submit to registry.

Comments by Sections:

Methodology Overview: I think in the methodology scope there's a missing mention to the systems where this method would be implemented (crops? Cattle management? Both? Agroforestry? All AFOLU?). At least at a high level. Also, I would argue that the scope is to track the changes in carbon stocks, not to monitor the stocks.

Project Boundaries: They can request annual samplings at minimum, that is their decision. I would just argue that for certain areas sequestration rates could be low and/or the error or intra-annual variability be too high for just one year to be able to detect or confirm any trend. So it might result in unnecessary higher sampling cost. It is a big request to sample every year and won't necessarily result in an improvement of the quality of the results. Maybe there is a simple way to pre-identify high-potential versus low-potential sequestration areas to define the frequency.

Calculating Carbon Sequestration using Remote Sensed...: My previous comments have been well addressed.

Calculating the Creditable Carbon Exchange: no comments

Data Reporting: No comments

Data Storage: No comments

Data Verification:

It is unclear to me if Ecometric would be open to share their predicting models to the verifiers, otherwise I'm afraid the results wouldn't be replicable and really verified.

Final Decision:

I think this is ready for peer review as is. I left some comments on both the text and the additional comments doc. I would expect some clarity on when an accompanying credit class could be submitted.

Combined Summary/Feedback/Suggestions**General Comments:**

This document is ready for Expert Peer Review but we highly recommend addressing the few comments that have been provided. We are also eager to see the Credit Class document to gain clarity on a few issues.