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Soil Enrichment Protocol Workgroup Meeting 4

Friday June 19, 2020

Housekeeping

- Workgroup members may actively participate throughout the meeting
 - Ask that you keep yourselves muted unless / until would like to speak
- We will ask and take questions throughout the session
- All other attendees/observers are in listen-only mode
- We will follow up via email to answer any significant questions from workgroup members not addressed during the meeting
- The slides and a recording of the presentation will be posted online

Agenda

- I. Introductions
- II. Updated Process Overview
- III. Discussion of Public Comments and Reserve Thinking in Response;
and Proposed Changes
- IV. Questions / Further Discussion
- V. Next Steps



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INTRODUCTIONS

Reserve Staff:

- Craig Ebert, President
- Sami Osman, Senior Policy Manager
 - Protocol development lead
- Heather Raven, Senior Project Coordinator
 - Development process coordinator
- Jon Remucal, Senior Forest Policy Manager
 - Protocol development
- Sarah Wescott, Senior Forest Program Manager
 - Protocol development

Workgroup Members

Name (alphabetical)	Organization
Adam Chambers	USDA Natural Resources Conservation Service
Amrith Gunasekara	California Department of Food & Agriculture
Dan Kammen	UC Berkeley
Dorn Cox	Wolfe's Neck Center for Agriculture & the Environment
Christian Davies	Shell
Jacqueline Gehrig-Fasel	TREES Consulting LLC
Grayson Badgley	Columbia University
Jon Sanderman	Woods Hole Research Center
Justin Allen	Salk Institute of Biological Studies
Karen Haugen-Kozyra	Viresco Solutions
Keith Paustian	Colorado State University

Name (alphabetical)	Organization
Ken Newcombe	C-Quest Capital
Matt Ramlow	World Resources Institute
Max DuBuisson	Indigo Ag
Mitchell Hora	ContinuumAg LLC
Nicholas Goeser	Alliance of Crop, Soil and Environmental Science Societies
Patrick Splichal	SES, Inc.
Robert Parkhurst	Sierra View Consulting
Stephen Wood	The Nature Conservancy
Tom Cannon	Goodson Ranch
Tom Stoddard	NativeEnergy
William Schleizer	Delta Institute

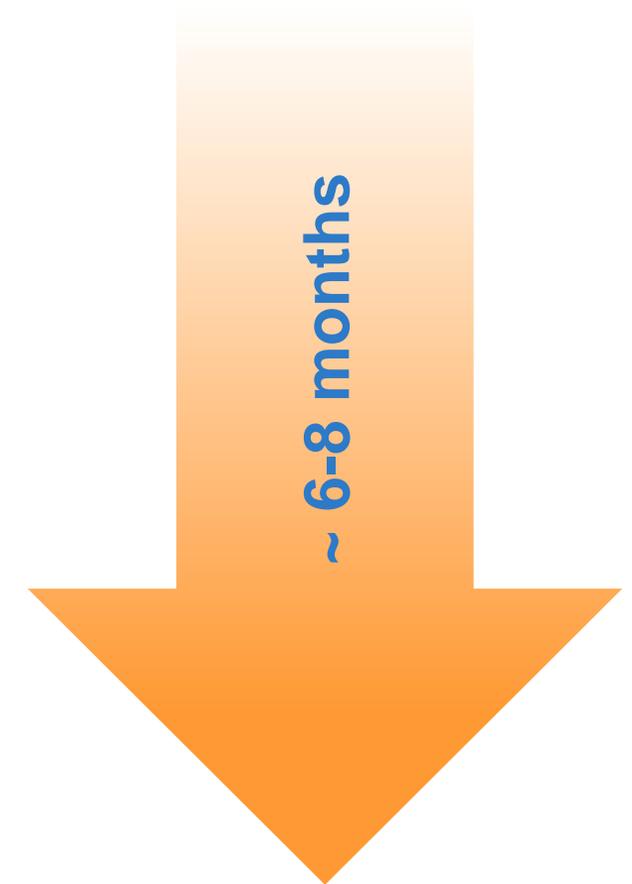


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PROCESS OVERVIEW

Protocol Development Timeline

1. *Scoping meeting (January 15, 2020)*
2. *Workgroup process (Jan – May 2020)*
 - *Formation (Jan 2020)*
 - *Meeting 1 (Feb 6, 2020)*
 - *Meeting 2 (Mar 6, 2020)*
 - *Meeting 3 (April 3, 2020)*
 - *30-day public comment period (Apr – May 2020)*
3. Updated process following public comment period:
 - **Meeting 4 (June 19, 2020)**
 - **Second public comment period (TBD - July 2020)**
 - **Board adoption (TBD)**





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SUMMARY OF PUBLIC COMMENTS & PROPOSED PROTOCOL REVISIONS

Summary of Commenters

American Carbon Registry (ACR)	Sally Brown, Research Professor (affiliated with University of Washington)
California Association of Sanitation Agencies	CalRecycle
CarbonPlan et al.*	Carbon Cycle Institute
Climate Smart Group and CCSI (CSG and CCSI)	Ducks Unlimited
Environmental Defense Fund (EDF)	Evergreen Carbon
Florian Forster	Erika Foster, Postdoctoral Research Assistant (affiliated with Purdue University)
Hancock Natural Resources Group (HNRG)	Kyle Hemes, Postdoctoral Fellow (affiliated with Woods Institute for the Environment, Stanford University)
Natural Capital Partners	Patagonia
Ruby Canyon Environmental	Richard Scharf (affiliated with Aster Global Services)
World Resources Institute* (Food Program at WRI)	Xuesong Zhang, Research Scientist (affiliated with Pacific Northwest Laboratory and University of Maryland)

**denotes comment letters that included a workgroup member*

Major Topics Raised in Public Comments

Key areas of concern and proposed solutions will be discussed in greater detail in upcoming slides:

- Conflict of Interest
 - Additionality / Performance standard
 - Baseline setting
 - GHG boundary
 - Leakage
 - Quantification
 - Model guidance/validation
 - Permanence
 - Verification
- All public comments were posted online upon receipt
 - A comprehensive summary of comments and Reserve responses will be posted online before the next public comment period – Reserve currently engaging with each public commenter

Conflict of Interest – Fairness of Process

- **Comment:** Indigo’s sponsorship of protocol development process, and their past financial relationship with some WG members represents COI that compromises the process. Reserve accepting payment from Indigo compromises the Reserve’s independence and integrity. Process itself was unduly influenced by Indigo, and Reserve staff.
- **Reserve Response:**
- We soundly reject that notion. Throughout our history we have been committed to the development of protocols that reflect the highest level of environmental integrity and market acceptance. Our approach stresses the importance of the use of standardized baselines to allow for the widest applicability of the protocol, not a project-specific approach often to the narrow benefit of individual market players (project-specific methodologies have been fostered by other efforts, such as the Clean Development Mechanism).
- External funding: Almost all our protocol development efforts have been externally funded. We are a small non-profit and such funding is necessary. Our entire offset development process is a very transparent, public, diverse stakeholder-driven process.
- Fairness of process: We have spoken with all WG members on this subject, with virtually all advising they thought the Reserve process was fair.
- Intent for WG: The Reserve uses the WG process as a source of expert technical input (unpaid) from a variety of different sources, including academics, scientists, project developers, verifiers, etc. While we are not specifically seeking your endorsement of the whole protocol, we welcome your input on any important matters, including the overall fairness of the process.

Conflict of Interest – Fairness of Process

Jonathan Sanderman	Woods Hole Research Center	WHRC soil lab processed samples from some of Indigo's research sites. Dr. Sanderman also consulted on experimental designs for our research teams. Both activities were compensated
Ken Newcombe	C-Quest Capital	Informal advisor to Indigo as it builds its carbon business
Max DuBuisson	Indigo Ag, Inc.	Employee
Mitchell Hora	Continuum Ag	Participant in Indigo Carbon, recent small cash prize in the Carbon Cup competition
Robert Parkhurst	Sierra View Consulting	Paid for consulting services on a topic unrelated to the SEP
Tom Cannon	Goodson Ranch LP	Participant in the Indigo Research Partners program, no cash payments

Summary of Proposed Changes

We are proposing changes to the protocol in response to public comments – color coded in these slides based on

responses to public comments | workgroup feedback | internal to Reserve

Key areas where we are proposing changes to the protocol include:

- Project definition
- Ownership
- Crediting periods
- Baseline setting
- Performance standard
- Leakage
- Model guidance/validation
- Uncertainty
- Soil sampling
- Permanence
- Verification

Project Definition & Ownership

- **Comment:** Should expand prohibition on clearing native ecosystem to include prohibition on land use change (DU – similar issues raised by WRI)
 - **Proposed change:** Agreed. We'll consider excluding fields where there has been land use change (i.e., change from cropping to grazing) – perhaps with exception of marginal cropped lands?
- **Comment:** Add eligibility for range of other practices – including composting, biosolids, agroforestry (Patagonia, CalRecycle, CASA, CCI)
 - **Proposed change:** Will add further protocol guidance re eligible activities. NOTE: All such practices are already eligible, as the protocol allows for any activity whatsoever, provided covered by appropriate model.
- **Comment:** Should require at least some basic acknowledgement from the landowner (DU)
 - **Proposed change:** Update guidance to encourage PD to include land title holder in relevant contracts, to mitigate risks to PD and Reserve.

Performance Standard / Additionality / Crediting Period

- **Comment:** Is a single practice change enough? Consider requiring multiple changes. (ACR, NCP)
 - **Reserve thinking:** Single practice adoption is safest for farmers – as way to encourage practice change. Bundling multiple practices over broad geographic scale will be critical for project feasibility and likely will occur within first years.
- **Comment:** The protocol should consider a common practice/regional performance standard type evaluation. (ACR, DU, Hemes, NCP)
 - **Reserve thinking:** Data availability will be significant limitation here, likely resulting in regional analysis for only very small subset of combinations. Peers are considering newer kind of additionality assessment for agricultural practices – where common practice is much higher threshold, focusing on combined practices, at large geographical scale.
- Interested in WG feedback.

Performance Standard / Additionality / Crediting Period

- **Comment:** Is a 30 year crediting period appropriate (e.g., allowing the baseline to be valid for 30 years)? Consider shorter crediting periods. (NCP, DU)
 - **Proposed change:** Agreed. We will move to 10 year crediting periods, with an optional potential renewal for up to 30 years.
- **Comment:** Include evaluation of financial feasibility to demonstrate additionality (CarbonPlan)
 - **Reserve thinking:** Based on our previous experience in this sector, we expect a financial feasibility assessment to add little value in agricultural setting. Likely result in inclusion of almost every conceivable practice change (as most practices do not reduce input costs or immediately raise production, but instead would add resource requirements). We would also expect such an assessment to result in the exclusion of nitrogen-use efficiency. However, with NUE there are significant opportunities for improvement around US so excluding this practice could leave significant environmental benefits on the table. We don't expect the results to be representative of actual conditions, and would likely contrast sharply to a common practice assessment.

- **Comment:** The baseline lookback approach may not be appropriate for newly cultivated lands or transitioning crop types. (Evergreen Carbon)
 - **Reserve thinking:** We will not allow land use change such as from non-cropping to cropping, so significant transitioning should not be an issue. We think it will be more accurate to model the actual historical practices than a counter-factual representation of current practices.
 - The current approach represents somewhat of an opportunity cost style analysis of GHG impacts – something advocated for in public comments.

GHG Assessment Boundary

- **Comment:** Consider fossil fuel emissions associated with production of inorganic nitrogen fertilizers (CASA); consider fossil fuel emissions associated with manure production/transportation (Patagonia)
 - **Proposed change:** We do not anticipate material changes in production of inorganic fertilizer or movement of manure, as a result of the project. Project-level GHG accounting best practice dictates such potential GHG sources reasonably be excluded from the project boundary.
- **Comment:** Incomplete accounting for off-site impacts of soil amendments (for instance, manure has a limited global supply, or shifting of crop residues which may have been used for animal feed). (WRI)
 - **Reserve thinking:** We do not anticipate movement of manure/waste any long distances, therefore this risk is minimal. Project-level GHG accounting best practice dictates such potential GHG sources should be excluded from the project boundary.

GHG Assessment Boundary

- **Comment:** Consider lateral C fluxes (from terrestrial to aquatic systems via erosion and runoff. (Zhang)
 - **Reserve thinking:** Regenerative practices should reduce erosion. Such impacts are included in reporting for potential environmental co-benefits as described in section 2.4. Where the risk of negative GHG impacts is low, and positive GHG impacts are foreseeable, it is conservative and appropriate to exclude such sources.

- **Comment:** Shouldn't assume no loss in yields, and associated leakage should be accounted for. (WRI); assuming a drop in yield will result in market-shifting leakage isn't always true/depends on project activity (Patagonia)
 - **Reserve thinking:** Yield declines are not ignored, and field/project level declines in yield must be accounted for via deduction to overall credit issuance. We feel this represents industry best practice, but that it's unlikely to significantly burden projects, as we are advised to expect yield stabilization/increase over a crediting period.
- **Comment:** Projects shouldn't have an impact on livestock populations, consider removing livestock leakage. (DU); Livestock leakage should instead be based on animal/hectare instead of grazing days (WRI)
 - **Reserve thinking:** We have robust leakage mechanism that does account for animal population and time spent grazing. We believe this represents industry best practice.

- **Comment:** Consider use of default factors for a number of practices based on available literature (ex: cover crops, manure, compost, use of municipal solids) as direct samples may have high variability. (Brown)
 - **Reserve thinking:** Current quant approach includes default factors, where IPCC/USEPA equations and factors are available. The quant approach then also uses a hybrid direct measurement/modelling approach. If further examples of well accepted default equations / EFs are available, we'd welcome such information.
- **Comment:** Default emission factors change over time. A dynamic approach factoring in soil texture, cropping, and rainfall for N₂O emissions would better reflect actual emissions (Brown)
 - **Reserve thinking:** Protocol allows for default equations/EFs, but also modelling for such emissions. We anticipate the latter will be used more often. We will update both, when updates available.
- **Comment:** Consider moving to AR5 instead of AR4 (Patagonia)
 - **Reserve thinking:** No change proposed. Use of AR4 is a decision made for the entire Reserve program. If and when we move to AR5, it will be updated across the entirety of our program.

Model Guidance and Validation

- **Comment:** Insufficient model validation for field-level application (EDF)
 - **Reserve thinking:** We allow for projects of any size, but anticipate projects to be at broader landscape scale in order to be feasible. The model calibration and validation guidance document takes several steps to ensure rigorous model validation. Model validation requirements specify that the model must be validated using statistically robust datasets separate from those used in model calibration. The model validation report must receive independent expert review and will be a public document. The model must be shown to be unbiased or conservatively biased in its predictions. Model prediction error, generated using validation data sets, reflecting model accuracy and precision, are used in the quantification of credits. In the SEP protocol, repeat measures of soils will also be used to adjust model-estimated changes in SOC so that modeled results are confirmed or adjusted as needed with measured values. NOTE: This model validation guidance has recently undergone significant further review and refinement with inputs from developers of two most well respected models (CSU and Dagan), and other scientific experts.
- **Comment:** Provide a list of acceptable models – some proposed models may be unfamiliar to the Reserve; not enough transparency/clarity around models (ACR, NCP, Patagonia)
 - **Proposed change:** Noted. Our general approach is not to be prescriptive, but instead to prescribe minimum conditions for model acceptability (such as peer review, and the extensive validation guidance discussed above). However, we will now write in explicit examples, such as DNDC and COMET-Farm.

Model Guidance and Validation

- **Comment:** Qualifications for model acceptability are inadequate and there's not enough transparency to allow for independent replication. Too much reliance on modeling team without enough oversight by verifiers. (CarbonPlan)
 - **Reserve thinking:** Regarding the notion that there is no guidance for verifiers to confirm model performance in terms of accuracy, precision, predictive ability, and under future conditions, we assert that the quantifiable impact of model performance is, by requirement, accounted for in the calculation of model prediction error. Thus, a verifier is not required to assess model performance beyond the bias calculation. We also believe it is not possible to set performance benchmarks (e.g. coefficient of determination) that would meaningfully apply to all possible model applications. Model validation should be expected to be model-specific and site-specific, and in the case of peer-review (detailed in Section 4), should be judged within the relevant context by an expert.
 - **Proposed changes:** We have also rewritten the guidance in Section 4 "Satisfying the Model Validation Requirements: Reporting and Peer-Review" to better clarify the use of peer-review in approving model validation and to require a third party review of any unpublished model validation reports. NOTE: The model validation guidance has recently undergone significant further review and refinement with inputs from developers of two most well respected models (CSU and Dagan), and other scientific experts.

- **Comment:** Uncertainty approach is overly complex, and model uncertainty will be difficult to determine (DU). Insufficient and not useful unless applied at landscape scale (EDF)
 - **Reserve thinking:** We believe the uncertainty requirements are very comprehensive and robust, more so than any we've developed or seen before.
 - **Proposed changes:** Regarding complexity, yes, we are engaging with WG to try to develop an Excel-based tool to automate these calculations.

Soil Sampling Guidance

- **Comment:** Insufficient guidance (CarbonPlan / Foster). Need to be clear about requiring bulk density sampling (Brown). Need number of samples/acre (Foster/EDF). Need to sample down to 1m (EDF/Foster).
- **Reserve thinking:**
 - **Proposed changes:** We will add clarity around bulk density, which is already required for both direct sampling and model inputs. Also new guidance to require verifying that persons undertaking such testing have requisite skill/training. New guidance to ensure sampling randomly selected according to sample design. New guidance for lab proficiency, following WG feedback. Updated model validation guidance, following WG feedback. Updated Table 6.1 and parameters spreadsheet, following WG feedback;
 - Re 1m sampling: Following extensive WG discussion/input we decided current approach is robust, notwithstanding emerging alternative scientific views on SOC impacts at deeper depths.
 - Protocol uses multiple checks to ensure conservativeness and robustness when using 30cm samples to run models, including: choice of peer reviewed model, model validation, requirement to update models when available, robust uncertainty calculations.
 - Also will provide guidance encouraging deeper depths where feasible, and noting larger-scale projects likely to have lower uncertainty and be more feasible. New guidance re sample depth, directing can take samples deeper than 30cm at outset, verify them, then potentially come back and be credited to such deeper depths once model employed is capable.
 - Re sampling intensity: We generally leave sampling frequency to the PD, noting they must account for associated uncertainty impacts.

- **Comment:** There should be more transparency around acceptable alternative mechanisms to the 100 year post-crediting period MRV (ACR, CSG and CCSI)
 - **Proposed change:** The Reserve may consider putting alternative mechanism proposals out for public comment and/or publishing a list of approved approaches once they are accepted by the program. We will also seek to add further guidance Consider regarding monitoring requirements for the permanence period.
- **Comment:** 5 years of post-crediting period MRV is not sufficient, even if the practices have been maintained (ACR, DU, Hemes, NCP); supportive of 5 year post-crediting period MRV because growers are risk-averse (HNRG)
 - **Proposed change:** We will remove the provision allowing for early termination of monitoring automatically upon demonstrating 5 years of practice retention post-end of crediting period, but will likely retain some option of this nature, without specifying specific period of time over which must demonstrate continued activity post ending of crediting period. Note: This mechanism was crafted following requests and guidance from WG during workgroup discussions.

- **Comment:** Confusion over how TYA works and relates to permanence, and how it is used with a PIA of less than 100 years (CSG and CCSI, DU); Concern that TYA provides immediate benefits with the expense of heightened future climate impacts (EDF)
 - **Proposed changes:** Only ex-post credits will be issued pursuant to TYA approach, in amounts commensurate with the associated time commitment, which in no way will represent anything less permanent than traditional ex-post issuances. We're planning to add additional clarifying language in the protocol in this section.
- **Comment:** Buffer pool: Parameters aren't justified, means to reduce contributions aren't appropriate (CarbonPlan)
 - **Proposed response:** Note: the Reserve's Program Manual at Section 2.8, makes it clear that the Reserve will cover reversals should the buffer pool be insufficient to cover those.
 - The Reserve implements a buffer pool across several of its protocols. While use of the buffer pool is designed to make the program whole following unintentional reversals, it has long been our approach to consider a wide-range of factors that contribute to reversal risk, including social and financial drivers. Unfortunately, the exact level of risk for a given project type is largely unknown, particularly when developing a new protocol. Thus, these parameters, and the means for reducing risk-based contributions, must largely be policy decisions. The approach taken for SEP is consistent with our approaches taken for buffer pool contributions under the forest and grassland protocols.

- **Comment:** Verifiers should replicate randomized soil samples. (CarbonPlan, Scharf)
 - **Reserve thinking:** We are considering this and appreciate workgroup feedback.
- **Comment:** Modeling exercises should be reviewed by verifiers and replicated if possible (ACR, NCP)
 - **Proposed response:** The Reserve defers to verifiers to determine appropriate level of risk and thus review, with any given item including model runs. Thus a verifier may choose re-run a model at their discretion.
- **Comment:** Number of fields visited should be increased. (CarbonPlan); Site visits should be based on farms instead of fields (CSG and CCSI); prefer performing site visits to at least one concentrated area of fields per verification – visiting a large number of fields across multiple states makes site visit costs unreasonable (RCE)
 - **Proposed changes:** We are considering increased sample size, specifically for larger projects. Considering mandating inclusion of modelling expert on verification team. Considering verification minimums based on farms not fields. Updated guidance regarding potential use of remote site visits. Note: We have added extensive new verification guidance, identifying many more verification activities, with specific protocol references.



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NEXT STEPS

Remaining Development Process & Timeline

Milestone	Date
Continued outreach to commenters	Through end of June, as needed
Second public comment period	July, TBD
Protocol presented to Reserve Board for approval	<i>TBD, goal by September 30</i>

- **Workgroup members:**
 - **Email written comments, organized by protocol section**
 - Send to policy@climateactionreserve.org
 - Reach out if you'd like to set up 1:1 chat with staff
 - Submit feedback at any time, but the sooner the better for us to be able to incorporate changes
 - Note: Workgroup members may also submit comments during the second public comment period
- **For Reserve staff:**
 - Respond to workgroup feedback
 - Prepare for second public comment period

Key Contacts

- General questions or assistance:
 - Policy@climateactionreserve.org
- Protocol development lead:
 - Sami Osman, Senior Policy Manager, Climate Action Reserve
 - sosman@climateactionreserve.org