CLIMATE ACTION RESERVE

Soil Enrichment Protocol Workgroup Meeting 3

Friday April 3rd, 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. Process Overview
III. Protocol Overview
IV. Key Issues
V. Open Discussion
VI. Next Steps

INTRODUCTIONS

Introductions

Reserve Staff:

- 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

PROCESS OVERVIEW

Protocol Development Timeline

1. *Scoping meeting (January 15, 2020)*
2. *Workgroup process (Jan – Feb 2020)*
   - *Formation (Jan 2020)*
   - *Meeting 1 (Feb 6, 2020)*
   - *Meeting 2 (Mar 6, 2020)*
   - **Meeting 3 (Friday April 3rd 2020)**
   - 30-day public comment period (*Apr – May 2020*)
3. Board adoption *(Jun 10, 2020)*

PROTOCOL OVERVIEW

Protocol overview

1) Introduction
2) Project definition
   - Activities, area, aggregation, ownership, leakage
3) Eligibility
   - Start date, crediting period, additionality, permanence, payment stacking
4) GHG Assessment Boundary
5) Quantification
   - Baseline modeling, reversible/non-reversible emission reductions
6) Monitoring
   - Permanence, grazing, project emissions, soil sampling/testing, modeling, parameters
7) Reporting
   - Documentation, reporting periods
8) Verification
   - Monitoring plan, verification activities
9) Glossary
10) References

Appx A) Rationale for Additionality
Appx B) Illustrative List of Practices
Appx C) Assessing Leakage
Appx D) Quantifying Uncertainty

Items in gray are not planned for discussion on the call today

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2) PROJECT DEFINITION

Project definition

- Cropland or grassland, not cleared of native ecosystem w/in prior 10 years
- Leakage: No removal of woody biomass, significant displacement of livestock, or sustained displacement of any other pre-existing productive activity
- Adopt one or more new practices which result in change(s) to:
  - Fertilizer (organic or inorganic) application
  - Water management/irrigation
  - Tillage and/or residue management
  - Crop planting and harvesting (e.g., crop rotations, cover crops, etc.)
  - Fossil fuel usage
  - Application of synthetic inputs other than fertilizer
  - Grazing practices and emissions

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3) ELIGIBILITY

Additionality

- Practices must not be legally mandated
- Growers must implement at least one ***new*** practice change
  - Existing practices will be considered as the baseline
  - Growers adopt regenerative ag practices one at a time, so we cannot scale to many growers doing multiple practices if we don't start with growers adopting one new practice
  - Rationale for Performance Standard:
    - Growers are risk averse
    - Growers are not making decisions solely to maximize long-term profits
    - There are cultural, financial, and systemic barriers to regen ag adoption
    - While some practices have seen some measure of success in some regions, regen ag overall is not common practice
      - Protocols which focus on single practices have not seen much success
    - This protocol goes further than existing incentives by crediting for quantified performance, rather than simple practice adoption, and requires permanence of the SOC pool

Permanence

- Assess permanence at the **project level**
  - Risk and liability are placed on the aggregator, rather than the grower
- Buffer pool for unavoidable (nature-based) reversals
  - 10% or 19% contribution, depending on "risk of financial failure" ($Risk_{FF}$)
  - $Risk_{FF}$ mitigated through land trust accreditation or financial protection (e.g., surety bond)
- Avoidable reversals compensated by the project developer
- Legal commitment via Project Implementation Agreement (PIA)
- Tonne-year accounting **option** to only credit atmospheric benefit for the term of the PIA
- If PIA term is <100 years after crediting, and tonne-tonne accounting used, then at end:
  - PIA is extended; or,
  - Reserve approves alternative mechanism to ensure permanence (next slide); or,
  - Reserve declares reversal

Alternative mechanisms to ensure permanence

- Option 1: Demonstrate that risk of reversal acceptably low for remainder of permanence period
  - Example: monitor grower practice for 5 years *after* the crediting period and ensure that at least 95% of practices are maintained
- Option 2: Provide method to monitor project area and compensate for reversals
  - Example: Develop system to use remote sensing and trained algorithms to identify specific reversal indicators, and secure financial mechanism to compensate for reversal (e.g., surety bond)
- No specific methods have been approved at this time
- Reserve must review and approve any alternative to legal commitment through the PIA

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Section 5

QUANTIFICATION

Quantification overview

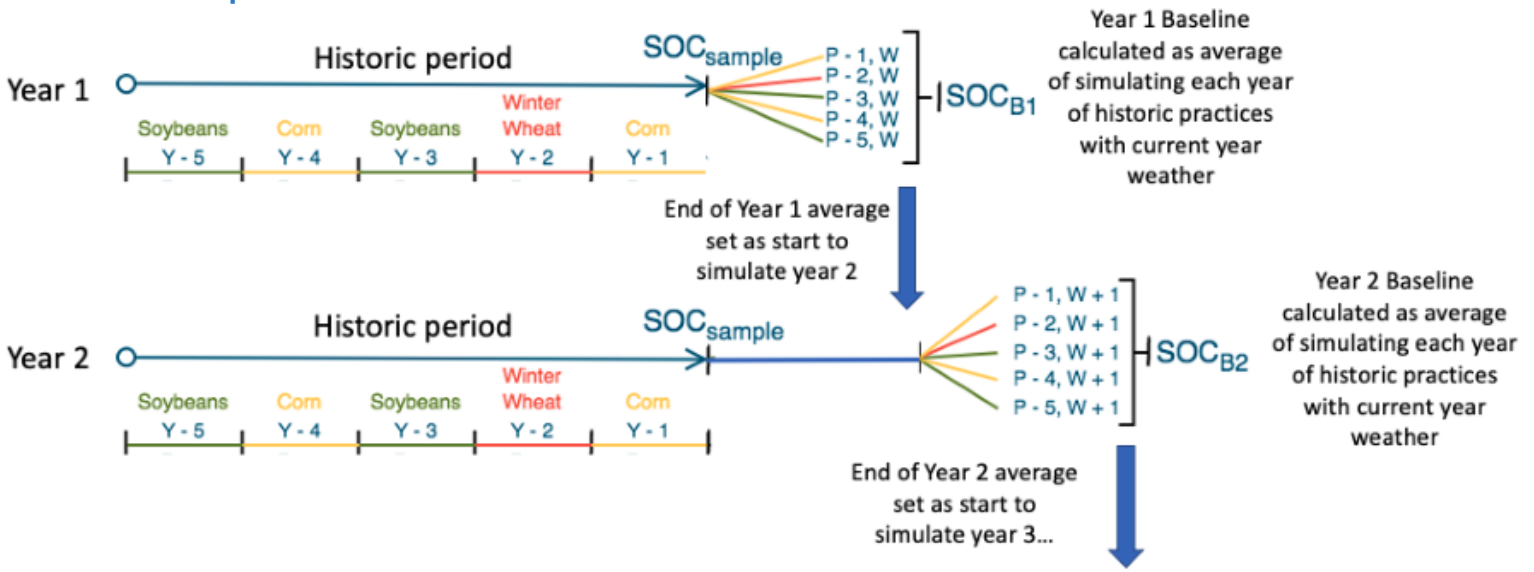
- Initial SOC is directly measured
- Historical baseline period used to set the crops and management that defines baseline
- Baseline SOC is modeled for each reporting period
- Project SOC may be modeled or directly measured
- Other project GHG sources may be either modeled or quantified using default equations
- Projects may employ a mix of modeling, measurement, and default equations
- Separate quantification of reversible and non-reversible emission reductions
- Comprehensive quantification of uncertainty, with deduction applied to reversible and non-reversible emission reductions

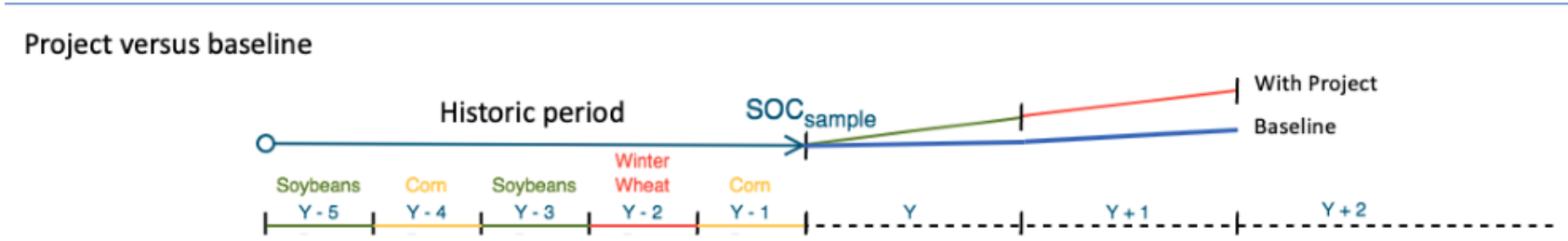
Reversible vs non-reversible emission reductions

- Issued separately in the registry
- Reversible emission reductions
  - SOC stock increases
  - Source of buffer pool contribution
- Non-reversible emission reductions
  - Fertilizer use
  - Grazing
  - Use of N-fixing species
  - Biomass burning
  - Fossil fuel combustion
- Uncertainty deduction is applied across both categories

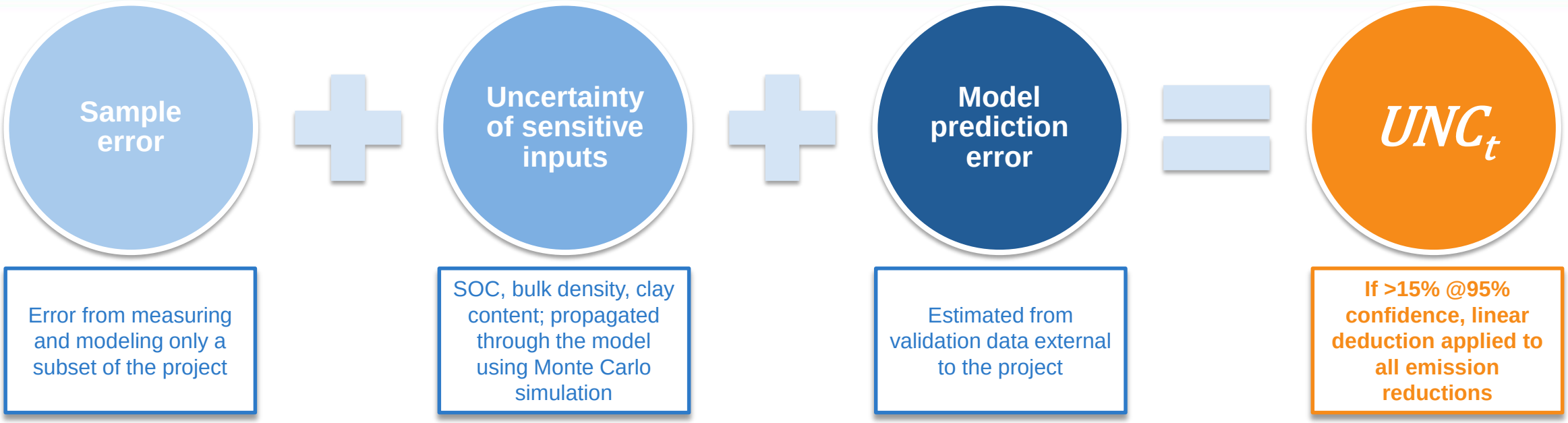
Modeling the baseline

- Historical period of at least 3 years, covering at least one full rotation of historical crops and management practices
  - Encourage use of longer historical baseline periods
- Each project year, conduct model run for each year of baseline, using current weather, then average the results
- Same approach for use of default equations





Uncertainty



- More robust approach than employed in other soil methodologies
- Uncertainty deduction applied if total uncertainty exceeds 15% at 95% confidence
- Design-based approach, with flexibility in:
  - Choice of sample units (and, relatedly, whether to cluster sampling at the level of fields or farms)
  - Whether and how to stratify
- Thorough appendix provided to walk the user through the uncertainty calculations

Section 6

MONITORING

Monitoring

- Monitoring for land use change
  - Use remote sensing or other means to identify land use
- Monitoring for project emissions
  - Direct data collection from grower
  - Allow for machine data and remote sensing where available and reliable
- Monitoring for permanence
  - Assess land use
  - Allow for remote sensing
- Additional guidance for soil sampling, testing, and modeling

Soil sampling guidance

- Stratification required, should consider the following:
  - Practice change(s), soil texture, soil series, precipitation, temperature, climate zone, aridity index, soil wetness index, indicator variable for flooding, slope, aspect
- Minimum sample depth 30 cm
  - If deeper, suggest splitting into depth increments
- Geographic locations established prior to sampling, with records and geotagged photographs after the fact
- Organic material cleared from soil surface
- If multiple cores composited, they must be from same depth
- Shipped w/in 5 days of collection, and kept cool until shipping
- Sample error goes into the quantification of uncertainty

Soil testing guidance

- Monitoring plan must provide detail on soil testing procedures used
- Soils dried w/in 48 hours of arrival or kept in refrigeration
- Aggregates broken and sieved to <2 mm, with SOC analysis on this fine fraction
  - Coarse content correction required for bulk density estimates
- May use dry combustion or spectroscopy
  - Loss on ignition and Walkley-Black excluded due to subpar accuracy and precision
- For dry combustion, must account for inorganic carbonates
- Standards and duplicate samples should be run routinely to characterize within-run and between-run precision
- For spectroscopy, accuracy and precision of the device across range of geographies and soil types within the project must be accounted for in the uncertainty deduction.
  - Includes any measurement errors related to calibration transfer between different devices

Modeling guidance

Models must be:

- Publicly-available (free or for a fee)
- Peer-reviewed by a recognized, competent organization, or an appropriate peer review group
- The model must incorporate one or more input variables that are monitored *ex post*
- Calibrated and validated according to requirements set forth in an external guidance document (next slide)

Model calibration & validation guidance document

- Provided as external guidance document to allow for updates over time
- Four steps proposed*:
  1) Declare practice categories
  2) Define the project domain
     a. Unique crop type bins
     b. Soil textural classes
     c. Climate zones
  3) Gather validation data that meet minimum requirements
     a. Minimum data requirements
     b. At least 10 measurements for combination of practice category, soil textural class, crop type, and climate zone
     c. At least 30 measurements covering highest/lowest clay-content classes (+1 other class), all IPCC climate zones, all crop types
  4) Use model performance criteria to demonstrate lack of bias or conservative bias for each practice
     - Calculation of *Average Relative Error (ARE)* ≤ 0

*Current proposal incorporates Reserve expert group feedback in 3/11/20 meeting and written feedback received before 3/20/20

Plan for updating model guidance document

- Next update will come out with the public comment draft
- Update will be based on
  - Working group expert feedback received 3/20/20 – 4/10/20
  - Test of original proposal using collected data
- Anticipated updates in next version
  - **Adding model calibration guidance – external to SEP**
  - Revising measurement requirements based on test of proposal
  - Refining statistical approach (including assessment for lack of bias) based on test of proposal
  - Adding option to demonstrate calibration via peer-reviewed publication, w/requirements for demonstrating appropriate use in the project domain
- We are updating this document on same schedule as protocol, but are happy to provide a **preview** of the changes **prior to public comment** to any WG members who are interested

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Section 7

REPORTING

Reporting periods

- Each field will have a defined cultivation year
  - More or less than 12 months, with start/end dates that align with agronomic cycles in order to most accurately capture full growing seasons
  - May include multiple growing seasons in single cultivation year
- Initial reporting period may include multiple cultivation years
- Verification period may include multiple reporting periods

Section 8

VERIFICATION

Verification

- Risk-based sampling approach
  - No need to visit thousands of fields or review 100% of data/evidence
- Allow the use of proxies for site visits or to otherwise supplement verification activities
  - Minimum of 5% of all fields will receive site-visit
  - Existing government programs that involve outside review and/or records of farm activities
  - Leverage expertise of trusted 3rd parties (e.g., university extension, NRCS)
    - Consider COI review for such 3rd parties
  - Remote sensing
  - Existing data capture systems/tools
- External guidance document with model verification guidance
  - Example: BGC model results and input files packaged with a digital signature to verify they have not been tampered with since the model run can preclude need for verifier to rerun the model

Verification activities

- Combination of risk-based and random sampling of project fields for deeper assessment
- Confirmation of eligibility
- Assessment of soil sampling and testing practices (for years when relevant)
- Assessment of use of biogeochemical models (where relevant)
- Assessment of use of default factor-based equations (where relevant)
- Desk review and recalculation of subset of project data
- Site visits of selected fields based on risk assessment
  - e.g., higher risk at larger fields or those with larger contribution to overall emission reductions
  - Minimum of 5% of fields subjected to site-visit

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NEXT STEPS

Remaining Development Process & Timeline

Milestone	Date
Third workgroup meeting (webinar)	**Friday, April 3rd, 8:00 am – 12:00 pm PT**
Workgroup comment period	April 3 – 10
Public comment period	April 17 – May 18
Protocol presented to Reserve Board for approval	*Expected June 10*

Next Steps

- **Workgroup members:**
  - **Email written comments, organized by protocol section**
  - Send to policy@climateactionreserve.org by **Friday, Apr 10**
  - Reach out if you'd like to set up 1:1 chat with staff
  - Note: Workgroup members may also submit comments during the public comment period
- **For Reserve staff:**
  - Respond to workgroup feedback
  - Prepare for 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