

Meeting 1: SESYNC Soil as a Social-Ecological Feedback Inaugural Meeting

Overarching goal: Overall, the modeling and synthesis activities proposed in this project will **improve our understanding of the complex processes** that are in place at human institutional as well as diverse spatial scales, which are **impacting soil health** and encouraging (or, in some instances, discouraging) **adoption of conservation practices across the United States**.

Meeting 1: During the first meeting, emphasis will be on initial group collaboration, and providing feedback on and revisions to the SEM modeling effort (**a beta version will be developed prior to the meeting so we have something to work with**). The team will initially discuss whether we have all the requisite datasets, and assess whether model construction, model design and framework adequately represent the relationships of interest as we tease out this notion of soil acting as a social-ecological feedback loop.

DAY ONE: BIG PICTURE AND TEAM BUILDING

9am-10:30am: (Session One) Outline rest of the day and get into team-building effort

Goal: Introductions and set expectations for the meeting (collaborative team-building (Gabrielle and Andrea facilitate; Notetaker: Erich))

-Name tags and folders provided by SESYNC

- Outline day- Gabrielle (10 minutes)
 - Agenda PPT
- SESYNC Intro- Nicole/Jonathan and Ian (15 minutes)
- Get to know each other- Andrea to facilitate (45 minutes)
 - Introductions: don't talk about your job/expertise/pedigree, make it human
 - Drawing game
 - Ice breakers of some sort (This or That, other "games")
- Set expectations for meeting- Gabrielle (10 minutes)
 - PPT with some ideas: "rules"/codes of conduct- have discussion with group
 - Introduce parking lot (introduce that and revisit at end of day)

10:30am-10:45am: Morning Break

10:45am-12:30pm: 105 minutes-(Session Two) (Project overview (PI's to facilitate; Notetaker: Gabrielle))

Goal: Overview of the project, discussion of goals

- Gabrielle: (15 minutes) Overview of the entire project: Review one-pager, discuss aims and scope, raise some questions we will come back to
 - Spend some time on SES science, revisit it again in Toolbox exercise

- Erich (10 minutes) to facilitate conversation on modeling, discuss data sources, modeling goals, preliminary plan of attack
 - Big questions
- Andrea facilitate conversation on meta review project (10 minutes)
- Gabrielle to facilitate conversation about qualitative data/Story Map effort (5 minutes)
- Andrea to facilitate conversation about Advisory Board and actionable science (15 minutes)
 - Brainstorming on actionable science
- Group discussion (20 minutes for questions)

12:30pm-1:30pm: Lunch provided by SESYNC

1:30pm-3:30pm: (Session Three) Toolbox activity (Facilitated by Nicole Motzer; Notetaker: Nicole)

Goal: Get to know each other, break down disciplinary walls, explore working epistemologies and working definitions, identify problem statement and conceptual mapping of soil as a SES Feedback

- Toolbox dialogue (Do whole survey first online (20 minutes); See revised toolbox questionnaire using Google Forms (provide paper copy) and group discussion)

3:30pm-3:45pm: Break

3:45 pm-4:45 pm: (Session Three) Continue with toolbox activities (Facilitated by Nicole Motzer; Notetaker: Nicole)

Goal: Develop individual and group conceptual mapping of soil as a SES Feedback and foreshadow the conceptual framework and variables we are using to shape our modeling work.

- poster sized paper, lots of colored markers for activity
- take photos for remote participants (document and share)

- Integrating conceptual frameworks:
 - What does the Soil Health SES look like?
 - What are the main components in this system? What are the main relationships?
 - Individual effort:
 - Each draw model to describe “soil as a social-ecological feedback”-map out relationships and interactions between key variables
 - Break into 3-4 small groups to harmonize conceptual models (integrate remote participants)

- Describe your conceptual model, what relationships were most important to this
- What is the scale? Cross-scale interactions- what are the relationships and at what scale?
- Return to full group with frameworks
 - Link up models
 - Link up problem statement theme
 - Come to some general consensus?

4:45pm-5pm: Parking lot issues (Facilitated by Gabrielle; Notetaker: Erich)

5:30pm- 6:30pm: PI's debrief and discuss modifications for next day

Optional- 6:30pm: Dinner

DAY TWO: MODELING

9am-10:30am: (Session Four) Discuss conceptual framework using slides and original CM developed for the proposal, build off of conversation from yesterday (using good notes) (Erich and Gabrielle to facilitate; Notetaker: Andrea)

Goal: Deepen conceptual framework discussion from yesterday, settle on good working model to inform SEM

- Gabrielle: Review yesterday's conceptual framework and compare to Conceptual Framework developed (60 minutes)- Develop PPT with team input (discuss and present)
 - Discuss model framework and hypothesized relationships
 - Discuss observed versus latent variables (lay these out in detail for group, based on our conceptual framework and group Concept Mapping from day before)
 - Soil health metric, what are the potential dependent variables?
 - Tier one and Tier two (practices versus indicators- align with Andrea's meta-review)
 - Tie in some thoughts on meta-review and how this can be used in our Conceptual FMK and in our modeling (Andrea to help with this)
 - Tie in lots of conversation/dialogue
- Erich: Data management and SEM modeling and GIS- how they can be used in this context- discussion- (30 minutes)-Develop PPT with team input (discuss and present)
 - Review data sources- tie back to conceptual framework : Use website data manager dashboard to explore (tie into data management tools conversation)

- what is missing?;
- what else do we need?;
- what transformations are necessary?
- Discuss scale (temporal and spatial)- how can we harmonize?

10:30am-10:45am: Break

10:45am-12:30pm: (Session Five) Modeling Tools and Data: Explore modeling options and techniques, also explore data management tools (Erich and Ian facilitate; Notetaker: Gabrielle)

Goal: Explore modeling techniques and options; Discuss portal, software, tools, website, how will we work together in online environment

- Wrap up discussion from previous session on data sources and conceptual framework
- Modeling approaches (60 minutes)
 - Tie back to literature on why SEM works for SES work, how it ties well with our Conceptual FMK
 - Other modeling techniques: Multilevel modeling? Neural networks? Other spatial tools? Bayesian tools? Spatial weighted regression?
- SESYNC: Review data management tools- if necessary (20 mins)
 - Gitlab process
 - Rstudio submitting runs to the cluster
 - File server migration to nextcloud
 - Use of jupyterhub. Is it ready or is a prototype?
 - Give detail on group Metadata form (to be shared via Google or other tool)
 - SESYNC support documents(?)
 - Mention webinar option for future training

12:30pm-1:30pm: Lunch

1:30pm-3:30pm: (Session Six) Advisory Group meeting: (Facilitator: Andrea Basche; Notetaker: Gabrielle)

Goal: Introductions of team to advisory group, discussion of actionable science resulting from the project

- Provide abbreviated overview of project again
- Introductions of team and advisory board
- Recap of outputs as they exist now

- Our strategy for connecting science to end-users (don't want our work to be "useless")
- How can we get traction with our work, science, sustainability, influence of "policy"?
 - Story Map Tool, utility/usefulness
 - Policy influence
 - Invite them to give us feedback on what we are doing and provide a process for doing so (regular quarterly meetings outside of sponsored meetings)

3:30pm-3:45pm: Break

3:45pm-4:45pm: (Session Seven) Beta version of SEM (Facilitators: Erich and Gabrielle; Notetaker: Andrea)

Goal: Run beta model and go over SEM as a tool, discuss methodology, explore benefits, challenges, and other options for modeling

- Gabrielle: Carry over discussion from Session Four/Five: assess where we are at and what issues still need covering (20 minutes)
- Erich: Draft SEM model review and data review-**regional analysis?**- (40 minutes)
 - What is missing? What do else do we want to incorporate? What other scales/analyses could we do?
 - Chosen package for SEM in R (SAS options?)
 - Choose slimmed down variables to beta test model
 - Web interface via R, change some variables, etc.

4:45pm-5:15pm: Parking lot issues and check-in before last day (Gabrielle to facilitate; Notetaker: Erich)

5:30pm- 6:30pm: PI's debrief and discuss modifications for next day

Optional- 6:30pm-8pm: (Session Eight) Group Event

- Due to weather, we are going to focus on dinner (make reservation on Sunday evening)

DAY THREE: WORKING GROUPS

9am-10:30am: (Session Nine) Big picture vision of the project and planned outputs (All PI's contribute; Notetaker: Erich)

Goal: Discuss outputs and working group process, group buy-in, group process for staying engaged, timeline, roles, and expectations

- Review (recap conversation from day 1): Could be summary slide for each of these bullet items- Gabrielle (10 minutes)
 - Visual timeline of project for next stages
 - **Between meetings 1 and 2:** Efforts will be made to work on two manuscripts outlined in our pursuit proposal: 1. Meta-review linking soil health outcomes to conservation practices and 2. Summary of the structural equation modeling and spatial analysis based on an integration of multiple factors outlined above. Additionally, during this time, we will work to revise the model based on the group discussion as there may be additional editing that will need to be done. For example, input information from workshop attendees may enable more effective modeling outputs, by including additional datasets, refining modeling parameters, or extending/limiting spatial and/or temporal extents. This engagement will be supported by online team interaction between workshops using collaboration tools (website, social media).
 - **Meeting 2:** The second meeting will focus on review and evaluation of modeling results that were refined during Meeting 1 and between meetings; however, the focus will move towards creating the narrative content within the StoryMap structure. We will emphasize the development of a publicly facing website using a Story Map framework which would be used as an online educational and visualization tool. The Story Map also allows for the integration of regional case studies already developed via various conservation networks (e.g., National Association of Conservation District Soil Health Champions and NRCS Soil Health leaders). The StoryMap refinement process will also include identifying differing visualization/data pathways of information for scientists, farmers/practitioners and policymakers, all based on the common SEM modeling output
 - Next steps for Modeling
 - Next steps for Meta- review
 - Foreshadow Story Map
 - Foreshadow Policy/Ed Briefs
- Setting roles/expectations for how we are going to work together- Andrea (30 minutes)
 - Collaborative effort, how we want to work together, authorship, intentional engagement, rules of engagement
 - What do you need to ensure your participation (e.g., publications, grants, leadership roles, etc.)?
 - What are you going to need to sustain this moving forward?

- Team operational logistics, how will we get it done- Gabrielle (15 minutes)
 - Discuss each item with group
 - Reminder about website and slack (other options beyond slack for working as a team, what works for people?)
 - Project planning- what works for people? Google doc or website? Trello?
 - Regular meetings- discuss what group wants to do (meetings should be useful)
 - Full group meetings
 - Small working group meetings
 - Discuss the topics/foci for the breakout groups- Gabrielle lead (15 minutes)
 - Meta Review
 - Modeling- methods and data
 - Modeling- relationships and theory

10:30am-10:45am: Break

10:45am-12:30pm: (Session ten) Break-out sessions: Discuss working group concept, workload, visual timeline (All PI's to lead portion; Notetaker: Each breakout group should have notetaker)

Goal: Get some work done on the different aspects of project, consolidate working groups

- Charlene Brooks on travel reimbursement from SESYNC (10 minutes)
- Discuss the topics/foci for the breakout groups- Gabrielle lead (15 minutes)
 - Meta Review
 - Modeling- methods and data
 - Modeling- relationships and theory
- Breakout Groups: Get into groups or finish previous conversation from Session nine if more time is needed to discuss (90 minutes)

Groups can be modified as we revise our process and folks should feel free to self-select

Soil Health Meta Review

Andrea Basche (lead PI)

Stefan Gailans

Dave Huggins

Jen Moore-Kucera

Stephen Machado

Kate Tully

Maria (?)

Modeling- Data manipulation and management (methods-based)

Erich Seamon (lead PI)

Nora Alvarez-Berrios

Andrea Basche

Gabrielle RM

Julian Reyes

Modeling- Relationships, variables, conceptual integration (theory-based)

Gabrielle Roesch-McNally (lead PI)

J. Arbuckle

Tabitha Brown

Laura Lengnick

Rachel Schattman

Jen Moore Kucera

12:30pm-1:30pm: Working Lunch

1:30pm – 2:30pm: (Session Ten) Reporting back from breakout groups (Facilitator: Andrea;
Notetaker: Gabrielle)

Goal: Get some work done on the different aspects of project, consolidate working groups

- Each breakout group will discuss progress made, action items/next steps, leadership roles

2:30pm- 3:30pm: (Session Ten) Get back to break-out groups and keep working

Goal: Get some work done on the different aspects of project, consolidate working groups

3:30pm-3:45pm: Break

3:45pm-4:45 pm: (Final Session) Parking lot issues and wrap-up (Facilitator: Gabrielle;
Notetaker: Andrea)

Goal: Debrief full meeting and think about what needs to be changed, consider PI next steps

- Discussion of outstanding issues/concerns, etc. (40 minutes)
 - Branding: Provide input on logo-how to proceed?- (10 minutes)
- Sincere appreciation and acknowledgement of team (provide some kind of team gift? Card with sticker (consider other branded schwaag for a later meeting) (10 minutes)
- Plan next meeting

5:00pm: Group departs

DAY FOUR

9am- 12:30pm: (Debrief Session) Erich, Andrea and Gabrielle, debrief and set plan of attack on next steps