**W1196 Workgroup**

**Implementing and Correlating Soil Health Management and Assessment in Western States**

**Virtual Meeting Minutes from 12/20/21**

**Attendees:**

Jim Ippolito, Colorado State University

Jay Norton, University of Wyoming

Sutie Xu, South Dakota State University

Manbir Rakkar, Montana State University

Tarah Sullivan, Washington State University

Jonathan Deenik, University of Hawaii

Liana Alane Boggs Lynch, University of Wyoming

Clain Jones, Montana State University

Caley Gasch, North Dakota State University

Dan Liptzin, Soil Health Institute

Shannon Cappellazi, Grassland Oregon – Director of Research

Zach Kayler, University of Idaho

Walia Maninder, University of Nevada – Extension

Augustine Obour, Kansas State University

John Idowu, New Mexico State University

Robert Dungan, USDA-ARS-NWISRL, Kimberly Idaho

Joey Blankenship, University of Arizona

Frieda Eivazi, Lincoln University

Matt Yost, Utah State University

Steve Blecker, Colorado State University

Markus Kleber, Oregon State University

Jodi Johnson-Maynard, University of Idaho

**Discussion: W1196 Objective #1 - Identify best soil health management practices for western US agroecosystems or knowledge gaps that prevent identification. How should we ‘bin’ data?**

*Agricultural Lands:*

Markus – In OR, binning begins with soil texture, and includes production system, irrigated vs. dryland, tillage.

Jonathan – Bin by mineralogy, which affects the Hawaiian Islands to a great degree (e.g., highly active, moderately active, low active clay containing soils; crystalline vs poorly crystalline/amorphous mineral soils)

Tarah – Irrigated, tillage

Shannon – Follow texture, mineralogy, drainage status (e.g., poorly, moderately, excessively drained). Also consider ecoregions

Jay – production systems and management practices; irrigated or dryland cropping systems

John – Major land resources areas. We should also georeferenced sample locations and index management history

Augustine – precipitation gradients

Dan – Site characteristics (e.g., MLRA), combined with cropping systems and management techniques (e.g., annual crops, (non)irrigated, perennial crops, livestock)

Sutie – What do we do with marginal lands that are not in production agricultural settings? Consider.

Matt – Questioned whether the Soil Health Institute would be willing to share (or show) their database with our group. Perhaps we should look at both the SHI database and the database at Oregon State University (see Markus Kleber)

*Rangelands:*

Jay – Rainfall gradients, cover, and consider that livestock is actually the “crop”.

John – Stocking density. Also questioned whether we should have a separate database for rangelands.

Zach – Suggested we keep the databases together (they can be queried for specific uses actually).

Shannon – Followed up with the suggestion of using high-level binning into one database.

*The above discussions led to:*

Caley – suggested and took the lead on assembling a Google doc list of what systems all members work in. She has accomplished this by 12/31/21.

John – we should consider defining on-site management goals.

BREAK

**Discussion: W1196 Objective #2 - Identify best soil health assessment approaches for western agroecosystems.**

Dan – Some soil health interpretations are different when soil carbonates are present. Soil C changes with ppt, temp, management practice, especially in very dry areas. We also do not have enough rangeland soil health data from the western US.

Joey – Mentioned that in AZ, no-till can actually lower organic C content in soils.

John – Focus some on salinity in the western US. Also, think about agroecosystem constraints and our minimum dataset needs, which need to align accordingly.

Caley – What about system resiliency? We should be proactively thinking about indicators that we may not be characterizing currently.

Augustine and Manbir – What about soil sampling depth? Everyone obtains different sampling depths.

John – How do we standardize across different methods? (perhaps this is part of our group’s efforts???) What about wind stability/erodibility?

Jay – Especially for rangeland settings, what in-field measurements should be obtained?

Steve – Followed up with suggesting we look at BLM’s Rangeland Health indicator list. They use 17 indicators. Perhaps these could be used as a starting point. Then we utilize the Land PKS app to reduce to a minimum dataset?

Jodi – We also need to consider how these properties vary from year to year; there is a tie-in to climatic conditions.

Markus – Followed up, that we need to repeat our observations over time so we can position ourselves to get to the point of supporting the statement that soil health leads to system resiliency.

Tarah – In terms of the microbiome, 16S or 18S indicators or direct taxa measurements could be used. She also mentioned pathogen issues in agroecosystems and quantifying presence, abundance, pressure.

Liana – Enzymatic activities should be quantified.

John – Consider weed seed banks, and that we should be careful relating soil health with crop yield.

Jay – What about expert opinion? Perhaps from producers themselves.

Caley – Followed up with, what about practitioner knowledge and feedback. And feedback from the NRCS, BLM, etc.

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**Items to Tackle:**

1. Jim to send full proposal to all W1196 members. [Done]

2. Caley to create Google Docs spreadsheet for membership input, in order for members to see what other members are doing. This will create a more cohesive workgroup. [Done]

a. Need to distribute to members. All members enter data before April 1, 2022. [In progress]

3. Jim, Jay to follow up with Markus Kleber and Dan Liptzin regarding the OR and SHI databases. We do not want to reinvent the wheel [In progress]