

# Data Stewardship and Data Governance

Discussing Data Protocols for Agricultural Research

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UBC Institute for Resources, Environment and Sustainability (Vancouver, Canada)



THE UNIVERSITY OF BRITISH COLUMBIA

Unceded *xʷməθkʷəy̓əm* (Musqueam) Territory

Pictured: UBC Farm

## Presentation Outline

1. Introduction: What's the big deal about data governance?
2. Chasing Data at UBC Farm...
3. What actually is "Data Governance"?
4. Principles and Best Practice
5. Options for LL Data Stewardship
6. Scenarios and Discussion!

*“none of this works if we don't get the confidence of the farmers”*  
*TRUST*



# What's the big deal about data governance?

Emerging Trends

Counter-Movements

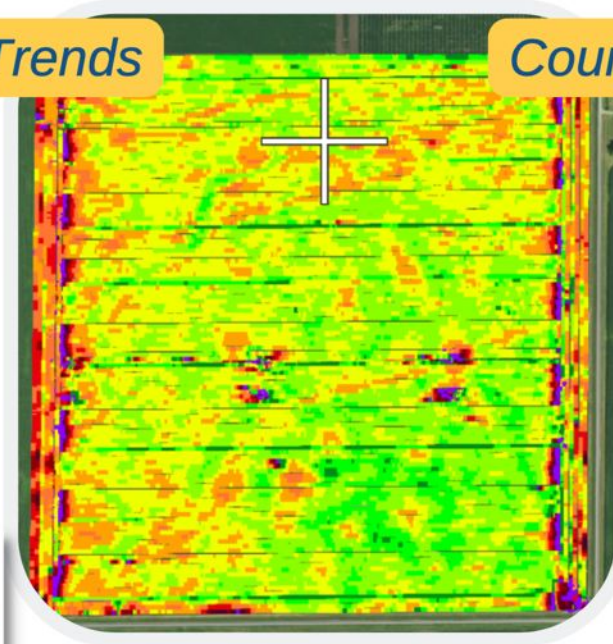
**RBC Thought Leadership**  
**Farmer 4.0**  
How the coming skills revolution can transform agriculture

**AGRICULTURE AND FOOD SERIES**  
**What's Cooking: Digital Transformation of the Agrifood System**

**WORLD ECONOMIC FORUM**  
COMMITTED TO IMPROVING THE STATE OF THE WORLD  
System Initiative on Shaping the Future of Food Security and Agriculture  
**Innovation with a Purpose: The role of technology innovation in accelerating food systems transformation**  
Kateryna Schrodter, Julian Lampert, and Ghada Eladad  
Prepared in collaboration with McKinsey & Company

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INCLUSIVITY SUSTAINABILITY EFFICIENCY NUTRITION AND HEALTH



**nyeléni newsletter**  
Number 37, September 2019  
www.nyeleni.org - info@nyeleni.org

editorial  
**the digitalization of the food system**

Today, more than 820 million people suffer from hunger while obesity also continues to increase across the world'. Biodiversity in food and agriculture is being eroded at an alarming rate by the destruction of eco-systems'. Climate change is accelerating: temperatures this July were the highest ever recorded; glaciers are melting much faster than predicted; and millions of young people are demanding urgent action to address the climate crisis'.

Meanwhile governments are showing little initiative to change the industrial, fossil-fuel driven food and agricultural system. Instead, a new "silver bullet" is being presented by corporations, governments and international institutions to tackle hunger, malnutrition and climate change: digitalization, which refers to the adoption of information-communication technologies (ICT) and artificial intelligence (AI) into everyday life and across societal activities.

Digital technologies have the potential to be beneficial or harmful depending on the context. Small-scale food producers have their own technologies, innovations and knowledge'. However, so do corporations, who seek monopoly controls on technology. Also, digitalization is happening in an era of increasing inequalities, authoritarianism and oppression.

Marc Rosenthal - www.r...

**FARM HACK**  
We are a worldwide community of farmers that build and modify our own tools. We share our hacks online and meet ups because we become better farmers when we work together. Watch our movie. Get started here.

Tool Library **+** Add a tool

tags "Smart Farm" tools (71) Universal term

**farmOS**

**Food for All or Feeding the Data Colossus? The Future of Food in a Digital World**

Action Group on Erosion, Technology and Concentration (ETC Group)



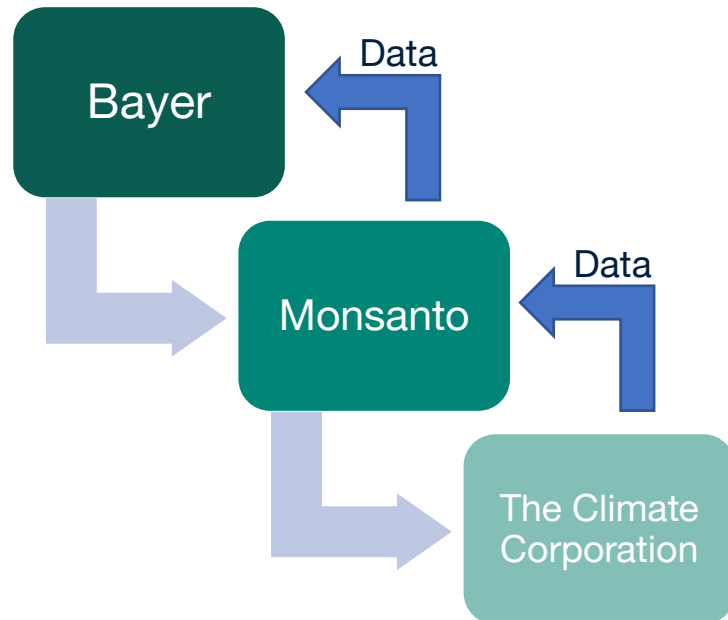
# FEEL THE PULSE OF THE LAND IN THE PALM OF YOUR HAND

Those with **power** over the development and governance of agricultural data **influence** **policy, innovation, and which systems of crop production and labor configurations may become dominant.**

(Stock and Gardezi 2021;  
Wittman, James, and Mehrabi 2020)

# Farmers and (and researchers) are concerned about which entities have **ownership and control over agricultural data.**

(Bronson 2022; Clapp & Ruder 2020; ETC 2019)



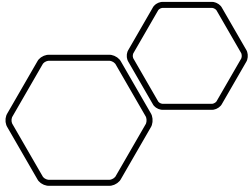
*For example...*

**2006:** **The Climate Corporation** is founded as a start-up, then grows quickly to develop farm management software and insurance services

**2013:** **Monsanto** acquires **The Climate Corporation**, and their farm management app, *Climate Fieldview*, for **\$930 million**

**2014:** **The Climate Corporation** acquires 640 Labs and Solum

**2018:** **Bayer** acquires **Monsanto** for **\$66 billion**  
...with **The Climate Corporation** as a subsidiary



Success for the BC Living Lab and Canada-wide network of Living Labs (**\$185 million**, 10-year program) depends on ***sharing knowledge and information (data)***

***which means proactively creating a data stewardship plan that addresses known technical and social challenges***

Government of Canada / Gouvernement du Canada

Search website agriculture.canada.ca

Franglais

MENU

Canada.ca > Agriculture and Agri-Food Canada > Environment

## Agricultural Climate Solutions

### AGRICULTURAL CLIMATE SOLUTIONS

#AgClimateSolutions

Agricultural Climate Solutions (ACS) is a multi-stream program that will help to develop and implement farming practices to tackle climate change. Through agricultural practices, such as shelterbelts or cover crops, farmland can store carbon and reduce greenhouse gas emissions.

AGRICULTURAL CLIMATE SOLUTIONS BC LIVING LAB

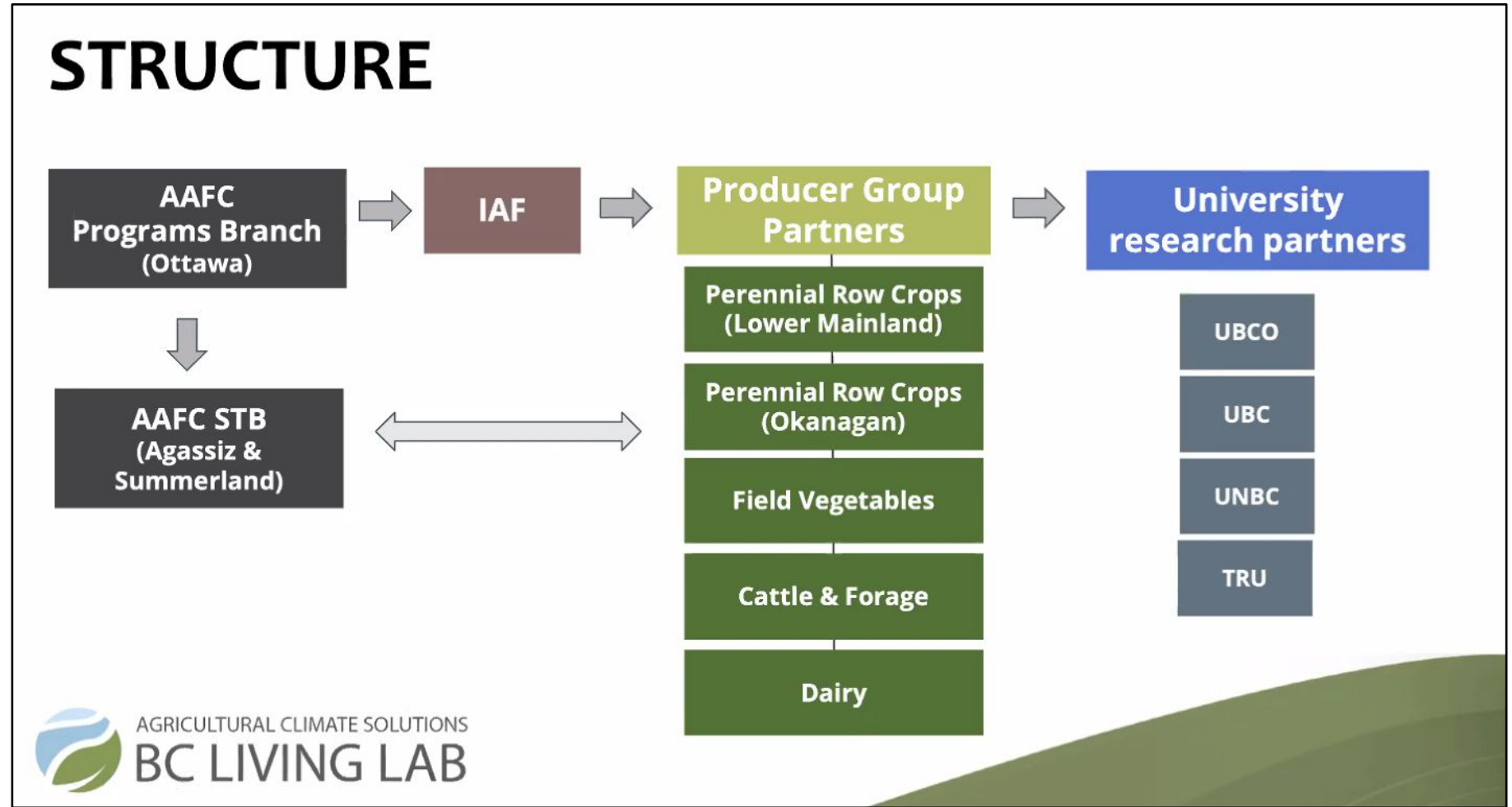
HOME ABOUT AREAS OF FOCUS RESOURCES & NEWS EVENTS CONTACT

## AGRICULTURAL CLIMATE SOLUTIONS

# BC LIVING LAB

HELPING BC FARMERS CONTRIBUTE TO CLIMATE CHANGE MITIGATION WHILE IMPROVING THE PRODUCTIVITY AND ECOLOGICAL BENEFITS OF FARMLAND FOR FUTURE GENERATIONS.

# Consider the number of groups and people involved...



Slide from the BC Living Lab webinar on Tuesday, February 21

**Consultants and private laboratories, students, FARMERS, BC MAF... who else is at the table (or wants to be)?**

# ...and the variety of data types and collection approaches

The BC Living Lab uses a production systems approach to define and develop practices that farmers are ready and willing to implement.

The ACS program, designed by AAFC, focuses on soil-based beneficial management practices (BMPs) that can help reduce greenhouse gas emissions and sequester carbon. As a result, we have worked closely with the following commodity groups to assemble the Living Lab:



PERIRENAL ROW CROPS



DAIRY



FIELD VEGETABLES



FORAGE & CATTLE

These commodity groups were confirmed through industry consultation and a review of existing research on climate mitigation practices. Representation from the commodities within each identified focus and across relevant growing regions in BC is an important aspect for all stages of the Living Lab.



Areas of Focus from the BC LL website





What data or information is involved?

What is agricultural data?

MENU

Canada.ca > Agriculture and Agri-Food Canada > Environment

## Agricultural Climate Solutions



Agricultural Climate Solutions (ACS) is a multi-stream program that will help to develop and implement farming practices to tackle climate change. Through agricultural practices, such as shelterbelts or cover crops, farmland can store carbon and reduce greenhouse gas emissions.

AGRICULTURAL CLIMATE SOLUTIONS BC LIVING LAB

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AGRICULTURAL CLIMATE SOLUTIONS

# BC LIVING LAB

HELPING BC FARMERS CONTRIBUTE TO CLIMATE CHANGE MITIGATION WHILE IMPROVING THE PRODUCTIVITY AND ECOLOGICAL BENEFITS OF FARMLAND FOR FUTURE GENERATIONS.



COMBRAMA, S.A. DE C.V. FECHAS DATE

**Arenullo PoPact**

Bordo 1	Cedro, Capulin 2 Años
Bordo 2	Sabinos 20 Años
Bordo 3	Maguey, Sabino 6 Años
Bordo 4	Pisano, Sabino, Frutal, Manzana y Chivoano, 6h
Bordo 5	Sabino 15 Años, Capulin, Nopal 7 Años y medio
Bordo 6	Maguey 80 días, Nopal tunero 7 Años y medio
Bordo 7	Ocaña, Cedro 17 Años
Bordo 8	120 Arboles Durazno - 6 meses
Bordo 9	Durazno 60 Arboles
Bordo 10	Durazno 120 Arboles
Bordo 11	Durazno 60 Arboles 6 Bordes
Bordo 12	Cedro 1 Año, Pisano, Ocaña, Sabino
Bordo 13	Sabino, Nopal, Maguey, Arbol Frutal Manzana
Bordo 14	Nopal
Bordo 15	No Pa
Bordo 16	No Pa
Bordo 17	
Bordo 18	
Bordo 19	
Bordo 20	

Escuela - extractos.

COMBRAMA, S.A. DE C.V. FECHAS DATE

**<El Rancho el abuelo - Arenullo PoPact>**

(Campo 1)	Plan de cultivo tercio valles
(Campo 2)	Plan de cultivo tercio valles
(Campo 3)	Plan de cultivo tercio valles
(Campo 4)	Plan de cultivo (Cebada y Maíz Amarillo) <b>Jaguay 1</b>
(Campo 5)	Plan de cultivo Maíz Amarillo
(Campo 6)	Plan de cultivo Maíz Blanco <b>Jaguay 2</b>
(Campo 7)	Plan de cultivo (Maíz y Maíz)
(Campo 8)	Plan de cultivo (Maíz)
(Campo 9)	Planos de cultivo (Maíz híbrido)

Interradas verduras - **Baboy**

Maíz híbrido

COMBRAMA, S.A. DE C.V. FECHAS DATE

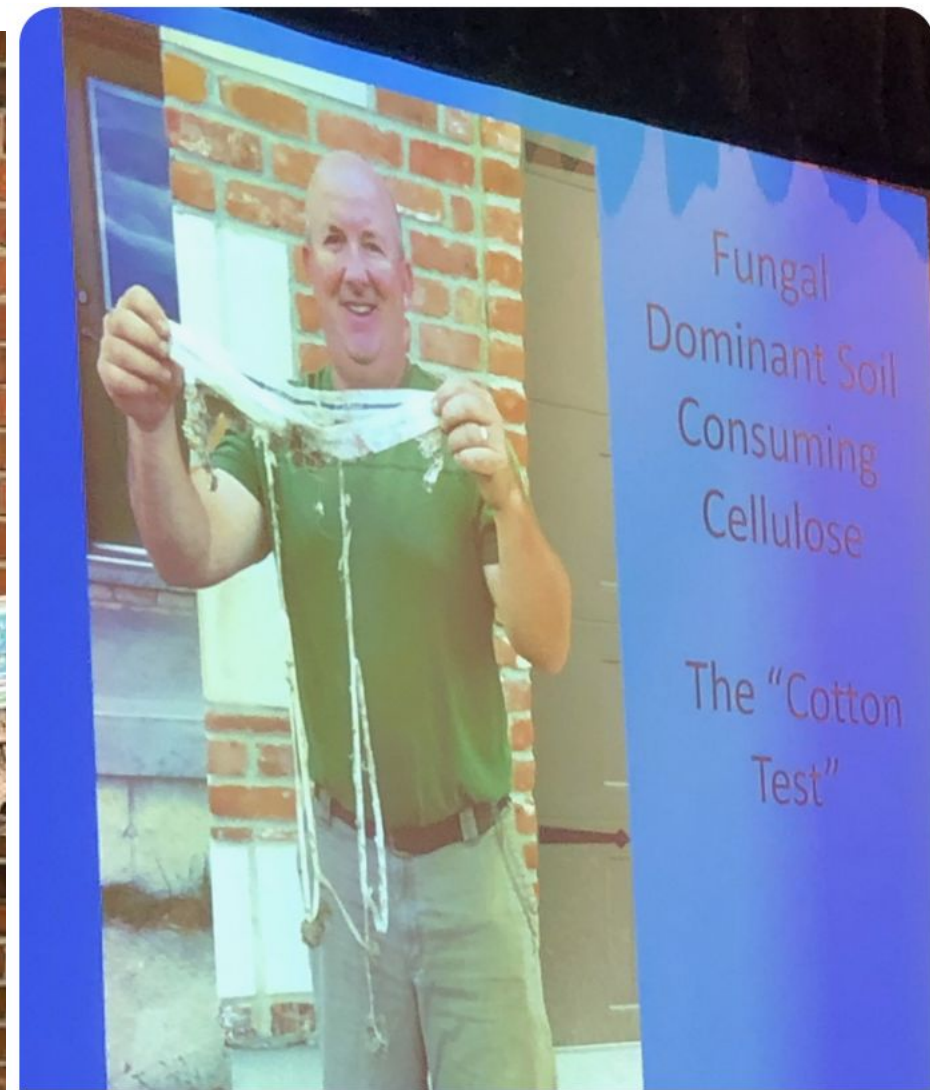
Data	hora	Tarifa	Reserva
19/02	16:30	30 min	Val Verde, Sabino, Nopal, Maguey, Nopal, Maguey, Nopal
20/02	13:30	1h	DIATRO
21/02	17:00	1h	DIATRO
22/02	17:30	1h	DIATRO
23/02	17:30	1h	DIATRO
24/02	17:30	1h	DIATRO
25/02	17:30	1h	DIATRO
26/02	17:30	1h	DIATRO
27/02	17:30	1h	DIATRO
28/02	17:30	1h	DIATRO
29/02	17:30	1h	DIATRO
30/02	17:30	1h	DIATRO

COMBRAMA, S.A. DE C.V. FECHAS DATE

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24/02	17:00	1h	DIATRO
25/02	17:00	1h	DIATRO
26/02	17:00	1h	DIATRO
27/02	17:00	1h	DIATRO
28/02	17:00	1h	DIATRO
29/02	17:00	1h	DIATRO
30/02	17:00	1h	DIATRO



**Including: Farmers' stories / perceptions / regulatory data / EFP / Assessment / geospatial....**



#soilyourundies #rootsnotiron @blake\_vince

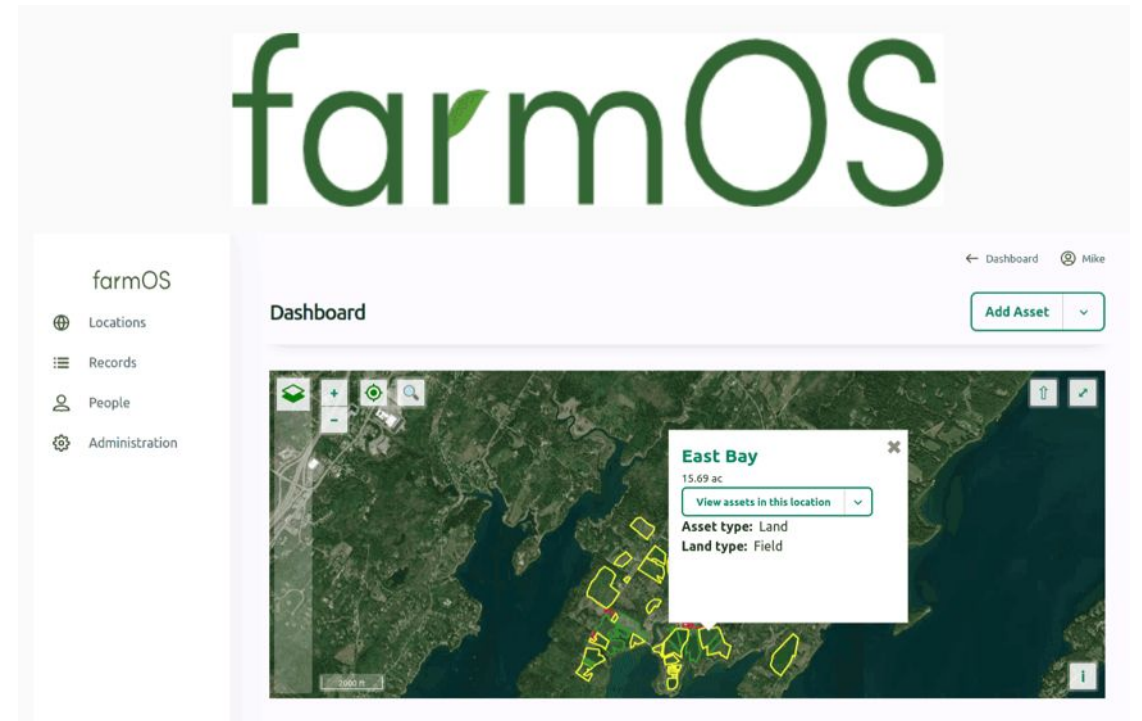


**Notill on the Plains**

twitter.com

# Free / Open-Source Data Integrators

## Made for Farmers and User-friendly



## Farm Data Collected by LiteFarm

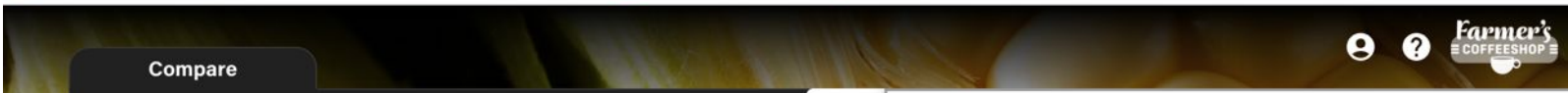
### “Farm Management Information:

LiteFarm uses the management information that you enter into the app to generate insights about the financial, environmental, and social benefits or impacts of your management decisions.”

This data includes:

- **Fields:** field size; location; area; crops planted
- **Soil analysis:** field; depth; texture; percentage potassium, phosphorus, nitrogen, organic carbon, inorganic carbon, etc.; cation exchange capacity (CEC); pH; bulk density
- **Crops:** species, genus; crop group; common name; estimated price of crops; estimated yield of crops; start and end dates of growing
- **Harvest:** field harvested; crop harvested; quantity harvested
- **Seeding:** field seeded; crop seeded; spacing depth, length, width, and rate
- **Pest control:** products; amount applied; application target (i.e., pest or disease name), active ingredient concentration
- **Irrigation:** irrigation type (drip, sprinkler, subsurface, flood); flow rate; total time flowing
- **Field work:** type of work (plow, ridge till, zone till, mulch)
- **Scouting:** field; crop; type (harvest, pest, disease, weed, other); action needed (yes/no)
- **Expenses:** date; type (equipment, fertilizer, fuel, machinery, seeds, pesticides, land); amount; association with crops
- **Sales:** date; name of buyer/market; crop; amount sold (kg); revenue (\$)
- **Worker details:** names, contact, number of registered workers; salary/pay





**Compare**

Crop Type  
Beet

DIRECT SALES

**WEATHER**

TEMPERATURE

RAINFALL

**INDICATORS**

SOIL STRUCTURE

SOIL BIOLOGY

PRODUCT QUALITY

OTHER

**MANAGEMENT**

WEED CONTROL

TILLAGE

TILLAGE INDEX

AMENDMENT

IRRIGATION

**SOIL**

CLAY %

SAND %

PH

PERSONAL All My Groups

All My Groups  
1 Groups

Hi Hannah, what's on your mind?

Latest activity All Posts

**How do we respond to / engage with ChatGPT?**  
Hey folks, I imagine like me most of you are playing with ChatGPT a lot, thinking about it.  
Tibet Spr... yesterday

**NAP Apprenticeships Apps Closed**  
Genna - ...2 mos ago

**Fruit & Nut Compass-- New "Compass" Tool!**  
Happy Friday Quivira Coalition friends and fellow OpenTEAM's (Open Technology Ecosystem for...  
Genna - Qui... 6d ago

**Open for Feedback: Ag Data Oath of Care!**  
After several months of iterating and collecting feedback, the OpenTEAM Community has released  
Sienna Zuco 3d ago

**Greetings!**  
Joshua Brock 1w ago

**USDA Deputy Secretary**  
Newsworthy! Xochitl Torres Small nominated to serve as USDA Deputy Secretary. Glad to see a few women from NM  
Amy Larsen 4d ago

# Information collected and managed by others



Government of Canada / Gouvernement du Canada

Search Canada.ca

MENU

Home > Environment and natural resources > Weather information > Weather > Local forecasts > British Columbia

### Current Conditions

Observed at: Abbotsford Airport  
Date: 4:00 PM PST Wednesday 22 February 2023

Condition: <b>Mostly Cloudy</b>	Temperature: <b>-1.9°C</b>	Wind: <b>NE 21 gust 40 km/h</b>
Pressure: <b>100.5 kPa</b>	Dew point: <b>-13.5°C</b>	Wind Chill: <b>-8</b>
Tendency: <b>Falling</b>	Humidity: <b>41%</b>	Visibility: <b>24 km</b>

Government of Canada / Gouvernement du Canada

Search Canada.ca

MENU

Canada.ca > Agriculture and Agri-Food Canada > Agriculture and the environment > Soil and land > CanSIS

## The National Soil Database

The NSDB is a collection of geospatial datasets which contain soil, landscape, and climatic data for all of Canada. It serves as the national archive for land resources information that was collected by federal and provincial field surveys, or created by land data analysis projects.

Datasets that have been superseded have been made available in the [National Soil Database Archive](#).

The NSDB includes GIS datasets at a variety of scales, and the characteristics of each named soil series. The principal types of data holdings (ordered by scale) are as follows.

Get data | How-to | Tools | Community | About

GBIF | Global Biodiversity Information Facility

## Free and open access to biodiversity data

OCCURRENCES | SPECIES | DATASETS | PUBLISHERS | RESOURCES

Search

What is GBIF? | About GBIF Canada



# Chasing Data at UBC Farm...



**UBC FARM**  
Centre for Sustainable Food Systems



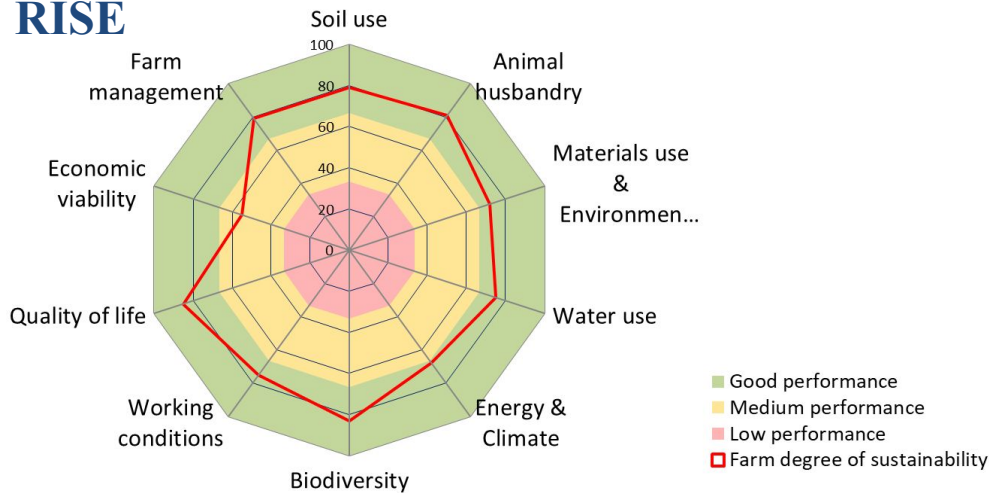
# UBC Farm research data sharing policy ☐ interoperability

- Researchers using UBC Farm facilities now required to share data within 6 months of project completion (no matter how it was collected)
- Data will be released publicly on Dataverse repository 3\* years after completion
- PIs are encouraged to use a Creative Commons License for datasets
- Indigenous and Traditional Ecological Knowledge data exempt from data sharing policy (see <https://irsi.ubc.ca/transforming-research/indigenous-data-governance> )
- Any member of the public may download the dataset

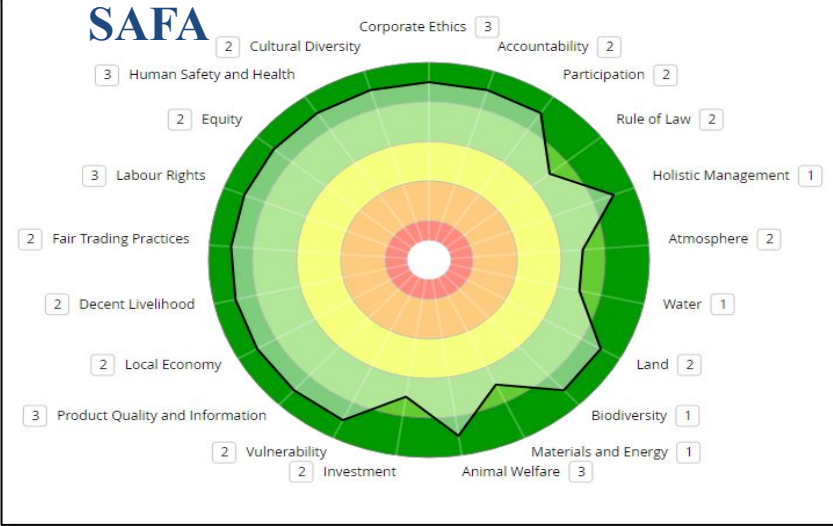


**UBC FARM**  
Centre for Sustainable Food Systems

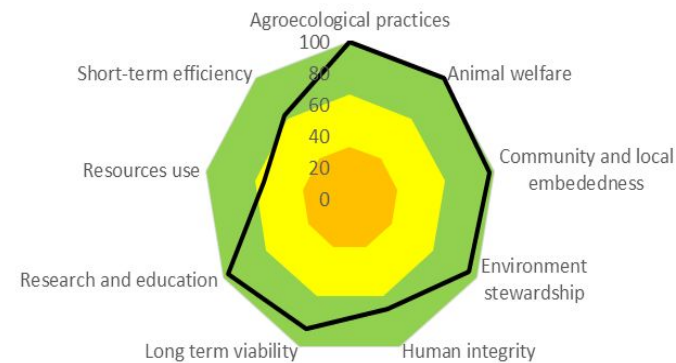
# RISE



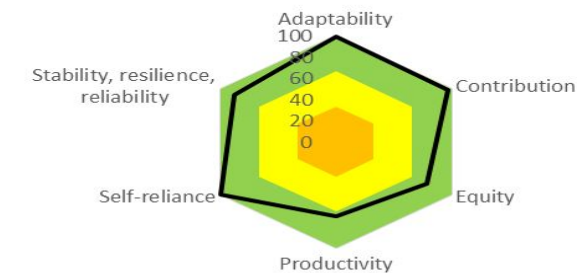
# SAFA



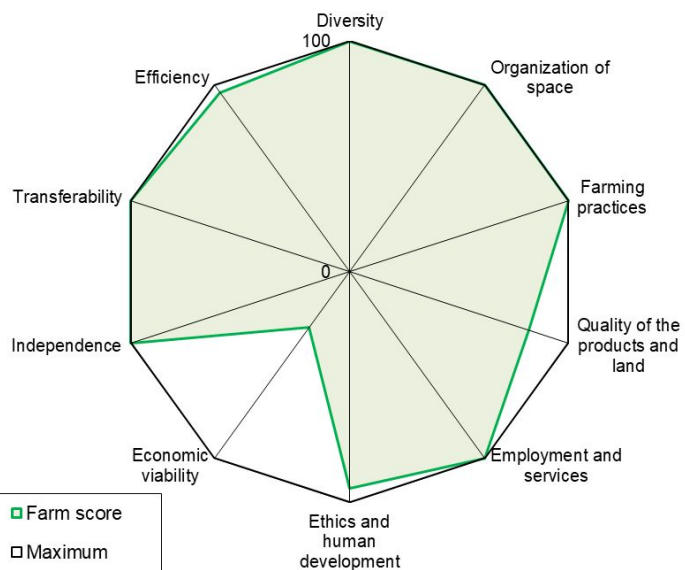
# Mesmis: score on sustainability criteria



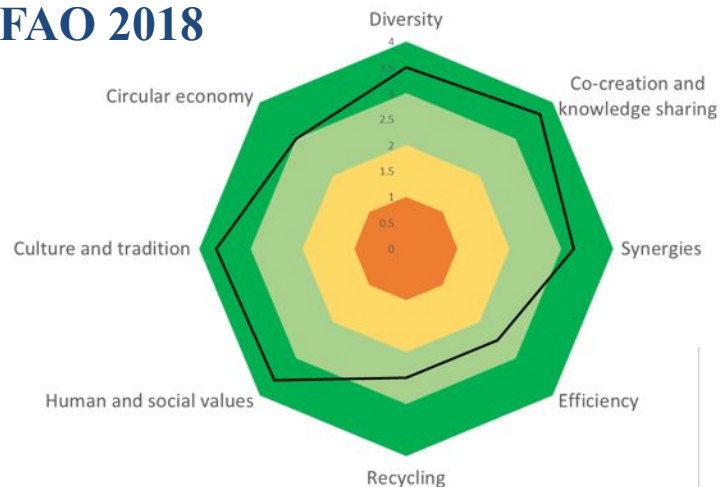
# MESMIS: score on properties of sustainable systems



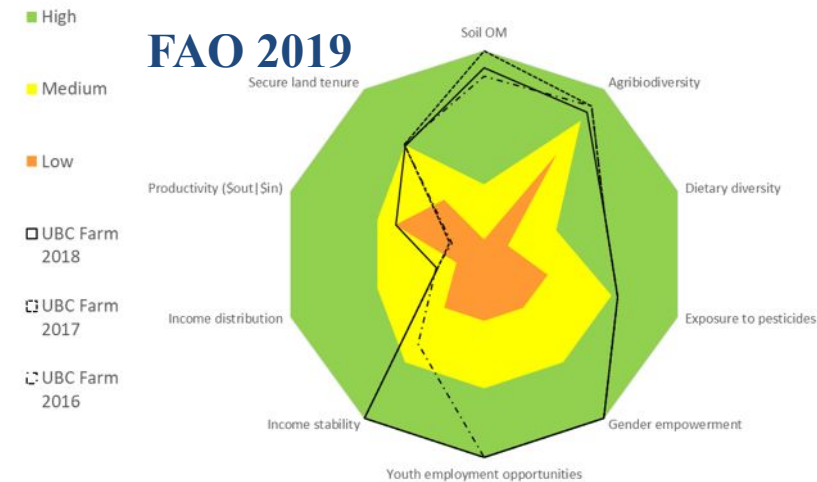
# IDEA



# FAO 2018



# FAO 2019



# UBC Farm Operations, 2018

(Kroese et al, 2019)

# What is an Open Data Framework?

**Open data** is data that anyone can access, use and share.

In practice, that means making data accessible online, putting in standard digital forms which are machine-readable and having terms or licenses that allow anyone to reuse the data for anything.

(Note: it does not mean sharing private data)

<https://www.godan.info/documents/open-data-farming-101>



**UBC FARM**  
Centre for Sustainable Food Systems

# Why do we promote Open Data?

- To unlock the power of data-driven solutions for agriculture
- To better understand the diversity of challenges faced by farmers
- To design and disseminate context-adapted solutions
- To make it easier for farmers to access data related to: weather, agricultural inputs (fertilizer, water, insurance, mechanisation, crop protection), soil data, market price data (among others).



**UBC FARM**  
Centre for Sustainable Food Systems

# CSFS Dataverse portal (public data repository)

- Open-source academic data repository
- Includes Research and Operations Data
- Allows for version control across datasets
- Includes complete metadata for each dataset

[https://dataverse.scholarsportal.info/dataverse/UBC\\_CSFS](https://dataverse.scholarsportal.info/dataverse/UBC_CSFS)



**UBC FARM**  
Centre for Sustainable Food Systems

# However!

UBC Farm is a Research Farm. LL are “real farms”, run by “real people”, that may or may not be interested in an “open data policy”.

**Therefore, a transparent and open process for data governance and stewardship – for both ecological and socio-economic data – is needed to build trust and enable cross-sectoral research for climate solutions!**



**UBC FARM**

Centre for Sustainable Food Systems

# What are some concerns we have heard from BC Farmers?

- Data Sovereignty (control over access to use of data, esp by govt or entities that wish to sell farmer data)
- Privacy (potential identification of individuals within open data sets)
- Interoperability (can data be accessed and utilized via multiple platforms, or used in different kinds of analysis/use-cases)
- Others? (discuss in breakout)



**UBC FARM**  
Centre for Sustainable Food Systems

**The BC Living Lab: thinking proactively about  
Data Stewardship and Data Governance**



# What is "Data Governance"?

Data governance involves both:

- the **technical and logistical management of data** within an application, organization or network (i.e., directing data collection, analysis, storage, and security) and
- the transparent **clarification and communication of relationships that direct the data management** within or across organizations.

# Who is involved in "Data Governance"?

## **Data Controller or Data Owner**

determines the purpose and means of the processing of data.

## **Data Custodian** *(Technical expert)*

responsible for building and maintaining the database structure to ensure the safe custody, storage, and transport of data.

## **Data Steward** *(Subject expert)*

responsible for quality assurance of data, adherence to government and organizational policy, and tailoring data management for the intended (re)use.

## **Data Processor**

processes data on behalf of another (includes third-party contractors)

# Who is involved in "Data Ownership"?

- **Farmers** – should always own and have immediate access to data about their farms.
- **Producer Groups** -- what capacity does each group have to manage datasets for interoperability, anonymization, etc.?
- **Consultants and Researchers** – what data sharing and privacy agreements are signed between farmers, researchers, producer groups, and consultants? (and eventually, the Living Labs repository?)
- **AAFC** - at various levels from individual projects to Living Lab
- **Other considerations:** Who 'owns' geo-spatial data or aerial imagery?



ACS\_DMP\_Template\_Ver\_1.0 -

7  
8  
9  
10  
11  
12

## Who is going to use the DMP?

all living labs participants;  
living labs division - Scientific Integration team;  
CALL-Net working groups members.

how are "participants" defined?

??

??

# Principles and Best Practices



OpenTEAM



# FAIR Principles



<b>Findable</b>	Data (or any digital object), metadata (i.e., information about that digital object), and infrastructure (e.g., data registered or indexed in a searchable resource) <b>should be easy to find for both humans and computers</b>
<b>Accessible</b>	Once found, <b>there should be clear means of accessing</b> data, metadata, or infrastructure of interest
<b>Interoperable</b>	Data should <b>interoperate with applications or workflows</b> for analysis, storage, and processing
<b>Reusable</b>	Metadata and data should be well-described so that they <b>can be (re)used, replicated, or combined</b> in different settings.

# CARE Principles of Indigenous Data Sovereignty

## **Collective Benefit**

Data management must ensure that Indigenous Peoples benefit from the data and its use, as defined by Indigenous Peoples.

## **Authority to Control**

Indigenous Peoples' rights and interests in Indigenous data must be recognized; Indigenous Peoples and governing bodies determine how Indigenous Peoples are represented and identified within data (also applies to Indigenous lands, territories, resources, knowledges, etc.).

## **Responsibility**

Those working with Indigenous data are accountable to Indigenous Peoples and have a responsibility to share how those data are used to support Indigenous Peoples' self-determination and collective benefit.

## **Ethics**

Indigenous Peoples' rights, their current and future wellbeing, and justice should be prioritized at all components and stages of the data management.

# First Nations Principles of OCAP®

<b>Ownership</b>	Whether the knowledge, data, and information of interest <b>belong to First Nations communities, groups, or individuals</b>
<b>Control</b>	Whether First Nations communities and individuals, or their representatives, <b>have control over data management, with authority to make decisions</b>
<b>Access</b>	Whether First Nations communities, groups, or individuals can <b>access information and data about them and the ability to decide who else can access it</b>
<b>Possession</b>	How First Nations communities and individuals, or their representatives, <b>assert and maintain their ownership</b> of knowledge, information, and data



# Ag Data Oath of Care OpenTEAM looking for Input!

OpenTEAM Ag Data Oath of Care

Data Fiduciary Oath of Care for Agricultural Professionals

Feedback & Enrollment Process



**A Farmer-Driven Community Advancing Agriculture's Ability to Become a Solution to Climate Change Through a More Sustainable Agricultural Technology Ecosystem**

<https://openteam.community/>

» Data Fiduciary Oath of Care for Agricultural Professionals



## Preamble

This oath means to protect the collaborative integrity of land stewards and advisors. It is meant to uphold the intellectual property of land stewards and support a commitment to the long term collaborative well being of the land we all rely on.

We believe that farmers, ranchers and other land stewards have a right to know that their advisor is acting on their behalf to represent their best interests. For those land stewards, the following is an oath declaring an advisor's commitment to adhere to a fiduciary ethic, act in good faith, and maintain a signed copy of this oath when they enter into an advisory relationship with a client. Similarly, we recommend that land stewards insist the oath be signed by their advisors before entering into a relationship.

Advising from agricultural professionals impacts a system that affects not just the health of a single

<https://openteamag.gitlab.io/codesign/oath-of-care/>

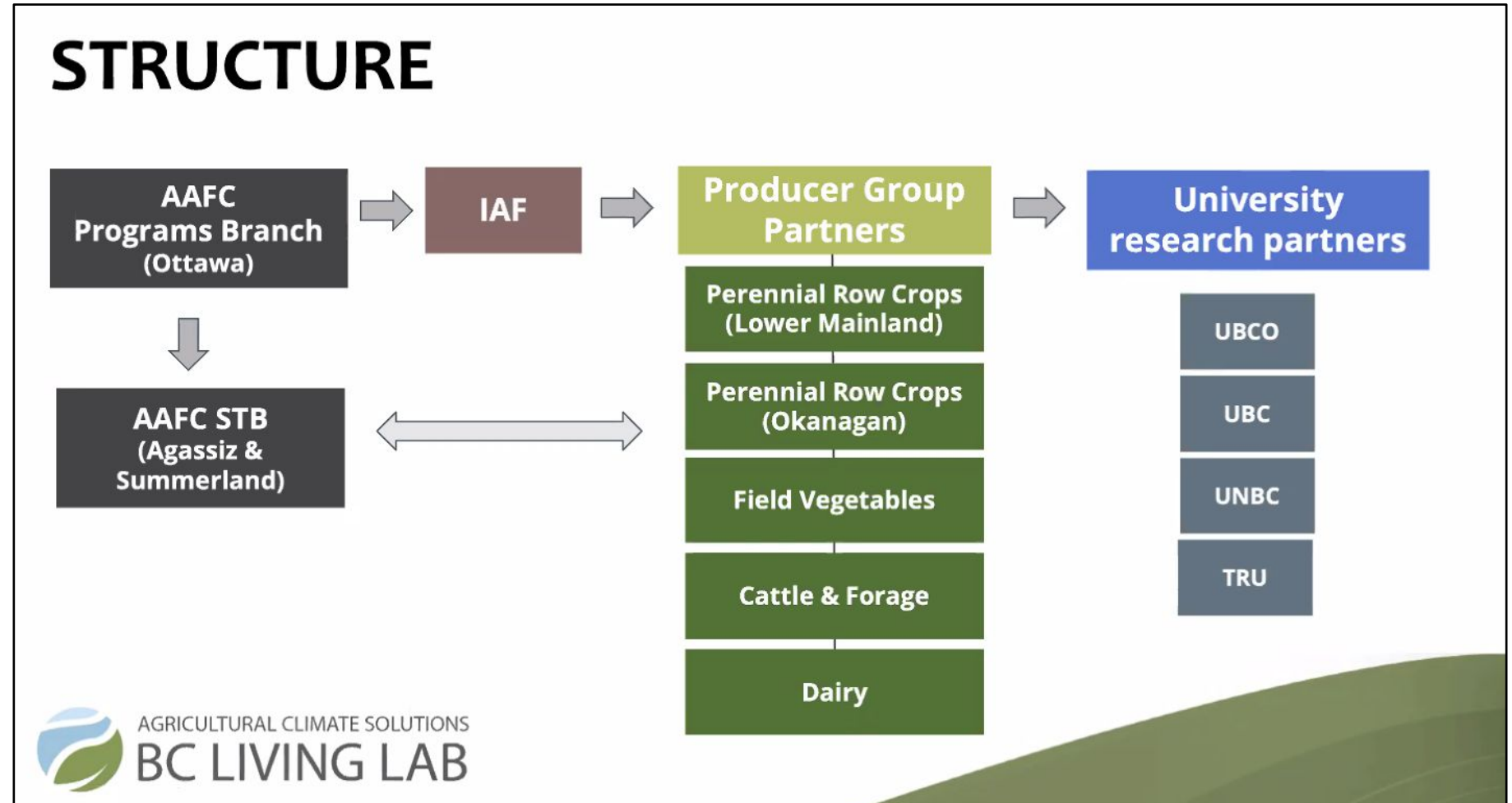


# Options for LL Data Governance



**Who will be responsible for cleaning,  
managing, storing, and sharing the data?  
How? Where?**

# Consider the number of groups and people involved...



Slide from the BC Living Lab webinar on Tuesday, February 21

# Status Quo

## Independent silos



Getty Images

# LL New Brunswick

## Survey123 with ArcGIS – subscription/proprietary software

**Data Collection – LLNB 2022**

**NB ACS Data Collection**


Submitted by: Anonymous user  
Submitted time: Sep 27, 2022, 3:43:43 PM

**Collector Information:**

First Name: T  
Last Name: A

**Location Attributes:**

Location: Lab 47.506718 Lon: -65.158229



Date & Time Observed:  
Sep 27, 2022, 3:44:00 PM

**Site Information:**

Province: NB

Site ID:  
HOLOS Site 6 - Tilley Road

Data Collection Activity:  
HOLOS Blueberry Sampling

**Site ID**  
HOLOS Site 6 - Tilley Road

Data Collection Activity:  
HOLOS Blueberry Sampling

**Blueberry Attributes:**

Year of blueberry crop:  
**Vegetative Growth**

Sampling Location:  
4

Above ground biomass collected:  
**Yes**






Below ground biomass collected:  
**Yes**

Soil sample collected:  
**Yes**

Is the sampling location representative of the immediate field condition:  
**Yes**

Field Technician:  
**Thomas Alberet**

Comments:  
Blueberry



Slide from the New Brunswick Living Lab webinar on Tuesday, February 21

# Options for Data Governance

## Living Labs NB data management strategy

Slide from the New  
Brunswick Living Lab  
webinar on Tuesday,  
February 21



Data Management

- LL NB will adopt the Living Labs data management strategy:
  - File Naming Standards
  - Standardized Folder Structure
  - Data Template
  - Cloud Data Storage Platform
  - Data Portal
  - ACGEO Data Warehouse

**Goal:**  
*Facilitate data  
sharing*

3

## ONFARM Soil Health Data

Data from 2020-2022

The 25 ONFARM sites comparing soil health BMPs are spread across Southern and Eastern Ontario, and are reflective of Ontario's wide range in farming operations, soil types, topography, and climate. Each year the sites were sampled in June by Soil Resource Group to monitor soil health indicators. This dataset serves to show the range in results for several soil tests that includes organic matter as a standard lab analysis, and some more novel indicators to demonstrate the variability that Ontario farms might expect to see, and tracks potential impacts from BMP use over time.

The filters below are interactive and will add or remove data from all of the visuals and calculations of mean and standard deviation (as shown in the bar plots). Selecting multiple filter options, such as a single year and a landscape position will stack to further narrow in on the data presented. When either all **or** no boxes are selected for a filter, all of the data are shown in the visuals.

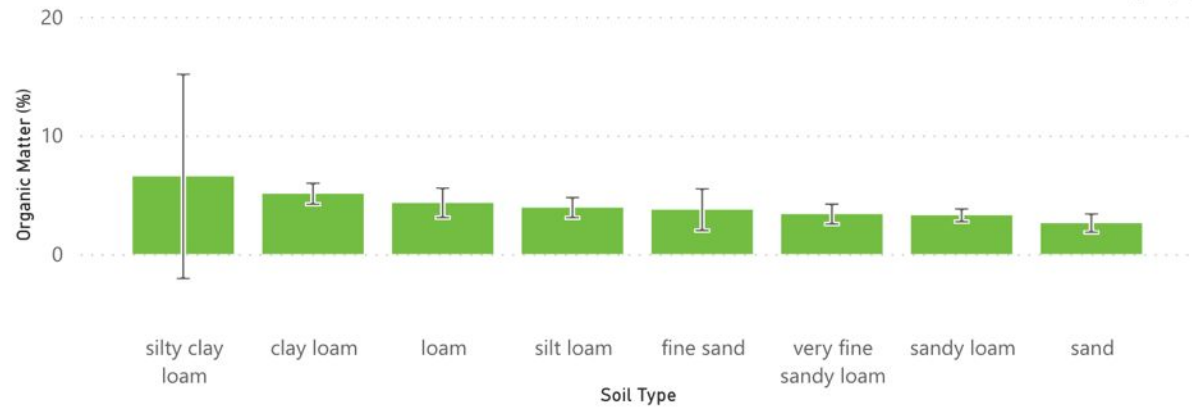
**Year**

2020

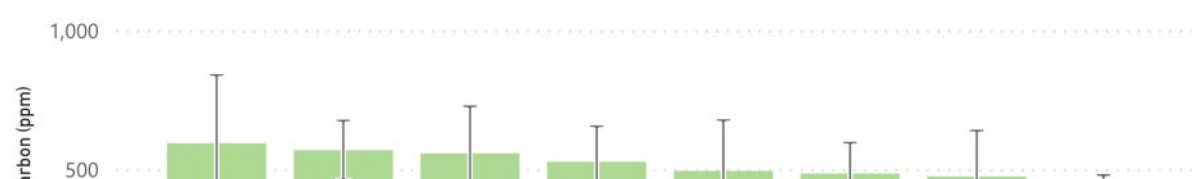
2021

2022

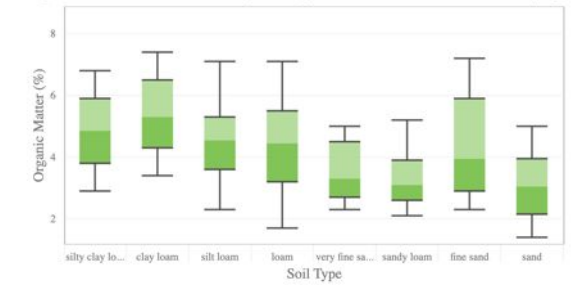
Average Organic Matter by Soil Type



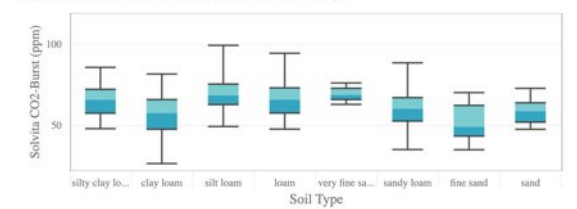
Average Active Carbon by Soil Type



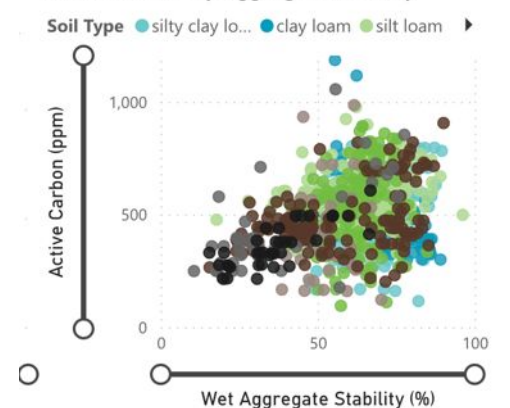
Organic Matter Distribution by Soil Type



Solvita CO2-Burst Distribution by Soil Type



Active Carbon by Aggregate Stability



**“Some” Data to be uploaded in anonymized form to the LL CDSP – still a silo....**

## Canada-wide ACS Living Labs Portal



### **CALL-Net Portal Registration / Inscription au portail du Rés-CLVA**

All new participants of the Agricultural Climate Solutions (ACS) - Living Labs are invited to fill this registration form to create an account for the CALL-Net Portal and grant them access to other available tools.

*Tous les nouveaux participants du programme Solutions agricoles pour le climat (SAC) - Laboratoires vivants sont invités à remplir ce formulaire d'inscription afin que nous puissions créer un compte pour le portail Rés-CLVA et attribuer des autorisations aux autres outils disponibles.*





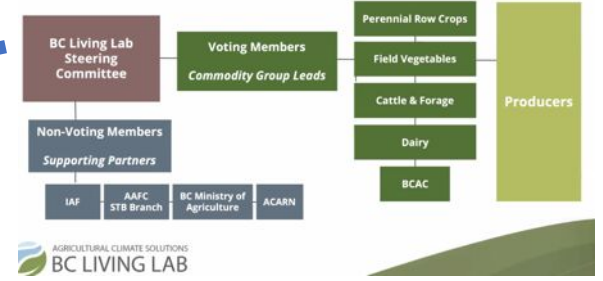
Biophysical and socio-economic data

Biophysical and socio-economic data

Steering Committee

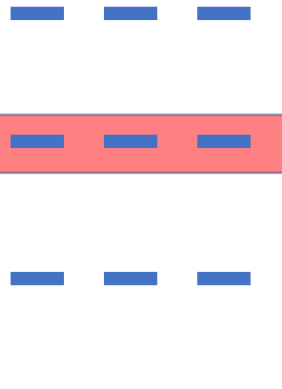
BC Agricultural Climate Action  
Long Term  
Data Repository  
(Data Steward/  
Custodian) \$\$?

GOVERNANCE



Living Labs/  
AAFC / ACS  
Reporting  
**Integrated  
Analyses**

Baselines  
for Future  
research





# Considerations for a trustworthy data governance plan

## **Responsibilities:**

- Who is managing the data in the short and long term? Who is controlling the governance of collated data?

## **Data Sharing:**

- Who has access to data, in what formats? What data will be shared with whom and under what conditions?

## **Consent:**

- How are farmers providing consent, esp for ongoing use of data? Can they 'opt out' later?

## **Privacy:**

- What is personal and/or sensitive data? What additional conditions are needed to protect this information?
- What is necessary to be considered anonymous?

# Discussion

- What is your “dream design” for data governance and data stewardship? Who needs to be involved in initial and ongoing decisions?
- What needs does each Producer Group have for integrated analyses?
- What are the pros and cons of a consolidated BC repository for agricultural climate action data (beyond just the data required for LL reporting...)
- What happens with all this data after the Living Labs project is “over”? – long term stewardship/repository options

# Further resources

Recording available via BC  
ACARN

October 25, 2022

The flyer features the BC Agricultural Climate Adaptation Research Network logo in the top left. A yellow banner at the top center reads 'Fall/Winter SKILL-BUILDING SERIES' with a crossed fork and shovel icon. Below this, a white box contains the event title 'Addressing Farmer Data Protection in the Era of Big Data in Agriculture' and the speaker 'with Sarah-Louise Ruder, UBC PhD candidate'. On the left side, the date and time are listed: 'OCT 25, 10 AM, Pacific, Online workshop'. The background has a faint pattern of yellow leaves.

BC Agricultural Climate Adaptation  
Research Network

Fall/Winter  
SKILL-BUILDING SERIES

OCT 25  
10 AM, Pacific  
Online workshop

Addressing Farmer Data Protection  
in the Era of Big Data in Agriculture

with Sarah-Louise Ruder, UBC PhD candidate

As digitalization and big data tools become more available for BC farmers, researchers and governments, new issues of data ownership and privacy need to be considered.

This interactive 90-minute workshop is a must for researchers and government staff working with farm data as well as farmers or agricultural organizations who collect or share data.

**New innovations--big data climate forecasts, massive robotic tractors, satellite pest control, and precision agriculture drones--offer ways to support farm productivity and climate resilience, but what are the best approaches for data collection and governance to respect the priorities, rights, and sovereignty of farmers?**

The workshop will cover:

- Key opportunities, challenges and tensions involved in the digitalization of agriculture
- What to consider to protect data rights and data governance in agriculture in BC and Canada
- Practical examples and tools to navigate data protection issues

### Bring your questions

Attendees are invited to come with their data questions and challenges. Or they can be sent ahead of time to [sarah.louise.ruder@ubc.ca](mailto:sarah.louise.ruder@ubc.ca)

# Further resources

Participate in our ongoing work and capacity building

## Core Team:

- Sarah-Louise Ruder (UBC)
- Hannah Wittman (UBC)
- Shauna MacKinnon (BC ACARN)
- Dana James (UBC)
- Asha Wareham (UBC)



## Advisory Group

- Isabelle Piot-Lepetit (INRAe #DigitAg)
- Zoé Mangin (INRAe #DigitAg)
- John Janmaat (UBC Okanagan)
- Sean Smukler (UBC)
- Gregory Rekken (BC Ministry of Ag)
- Jonathon McIntyre (Agrilyze)
- Kevin Cussen (LiteFarm)
- Kelly Bronson (uOttawa)



## Invited:

- Greg Austic (Our-Sci.net)
- Dorn Cox (OpenTEAM)
- Evan Fraser (University of Guelph)

## 1 Project Overview

# Exploring Ethical Data Governance for Climate Adaptation and Mitigation in Canadian Agriculture

## Why?

Growing interest in climate change adaptation+mitigation in agriculture

Researchers and policymakers want to leverage agricultural data collection and sharing

Farmers want to participate in and benefit from research related to climate change mitigation and adaptation

Farmers want control over their use of digital technologies and agricultural data to support their own goals

## Project Objectives

Facilitate interdisciplinary and cross-sectoral dialogue on agricultural data management and governance

Create a "toolkit" of resources to build capacity for ethical agricultural data governance

# Further resources

**Table 2.** Summary of data governance models.

Model	Key actors	Goals	Mechanisms
<b>Data sharing pools (DSPs)</b>	<ul style="list-style-type: none"> <li>• Business entities</li> <li>• Public bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Fill knowledge gaps through data sharing</li> <li>• Innovate and develop new services</li> </ul>	<ul style="list-style-type: none"> <li>• Principle of ‘data as a commodity’</li> <li>• Partnerships</li> <li>• Contracts (e.g. repeatable frameworks)</li> </ul>
<b>Data cooperatives (DCs)</b>	<ul style="list-style-type: none"> <li>• Civic organisations</li> <li>• Data subjects</li> </ul>	<ul style="list-style-type: none"> <li>• Rebalance power unbalances of the current data economy</li> <li>• Address societal challenges</li> <li>• Foster social justice and fairer conditions for value production</li> </ul>	<ul style="list-style-type: none"> <li>• Principles from the cooperative movement</li> <li>• Data commons</li> <li>• ‘Bottom-up’ data trusts</li> <li>• GDPR Right to data portability</li> </ul>
<b>Public data trusts (PDTs)</b>	<ul style="list-style-type: none"> <li>• Public bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Inform policy-making</li> <li>• Address societal challenges</li> <li>• Innovate</li> <li>• Adopt a responsible approach to data</li> </ul>	<ul style="list-style-type: none"> <li>• Principle of ‘data as a public infrastructure’</li> <li>• Trust building initiatives</li> <li>• Trusted intermediaries</li> <li>• Enabling legal framework</li> </ul>
<b>Personal data sovereignty (PDS)</b>	<ul style="list-style-type: none"> <li>• Business entities</li> <li>• Data subjects</li> </ul>	<ul style="list-style-type: none"> <li>• Data subjects self-determination</li> <li>• Rebalance power unbalances of the current data economy</li> <li>• Develop new digital services</li> <li>• centred on users need</li> </ul>	<ul style="list-style-type: none"> <li>• Principle of ‘technological sovereignty’</li> <li>• Communities and movements (e.g. MyData)</li> <li>• Intermediary digital services (personal data spaces)</li> <li>• GDPR Right to data portability</li> </ul>

Micheli, Marina, Marisa Ponti, Max Craglia, and Anna Berti Suman. 2020. “Emerging Models of Data Governance in the Age of Datafication.” *Big Data and Society* 7 (2). <https://doi.org/10.1177/2053951720948087>.