

OPEN DATA & OPEN KNOWLEDGE Workshop

- GEOGLAM in situ data coordination driven by Essential Agriculture Variables (EAVs)

GEOGLAM?

- GEOGLAM is an open, cooperative initiative bound together by common interest and good intent
- Low overhead, driven primarily by in-kind work contributions towards a common vision for food security decision support
- Authoritative provider of independent, timely, science based information for decision support



Essential Agricultural Variables for GEOGLAM

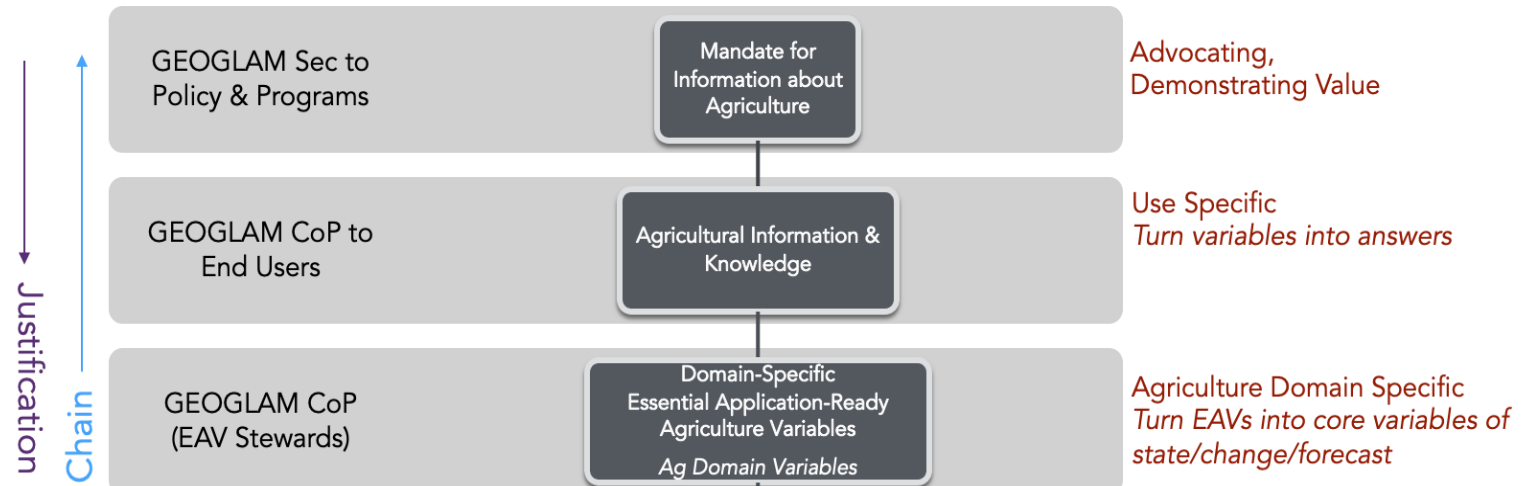
Co-leads: Whitcraft (UMD/NASA Harvest) & Gilliams (VITO)



Essential: key 'building blocks' to produce relevant and timely information products

Agriculture: related to agricultural productivity and land use

Variables: they can be measured or inferred, and change over space

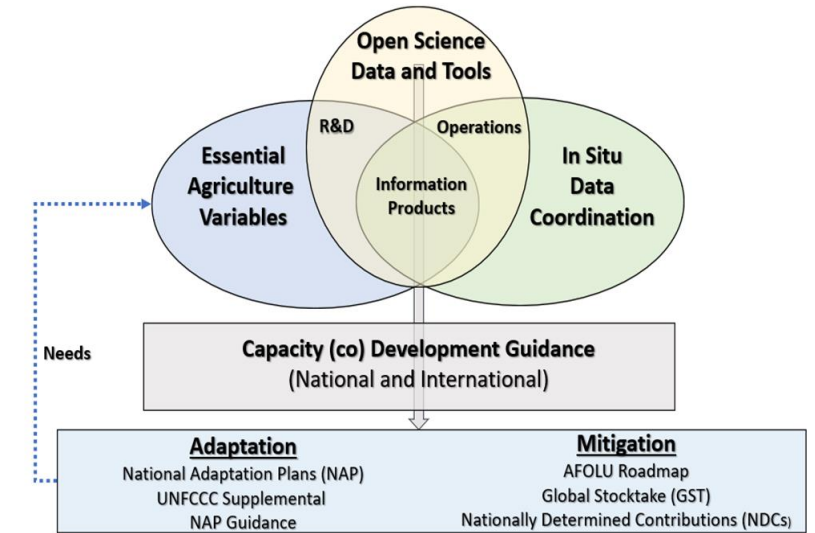


				Systematic Acquisitions (Wall-to-Wall, Year-Round Monitoring)				Tasked Acquisitions (Small Croplands, Hotspots; Refining via Sampling)					
Spatial Resolution (Goal to Threshold)				50 - 500 m	500 m - 10 km	10 - 30 m	10 - 30 m	3 - 10 m	3 - 10 m	<3 m	<3 m		
Spectral Range and/or Mode (Goal = Threshold, except where noted)				VIS RE NIR SWIR Thermal + Cloud Bands	Passive Microwave	VIS RE NIR SWIR Thermal + Cloud Bands	SAR dual (Threshold) to quad (Goal) polarization; multifrequency (Threshold: L,S,C; Goal: L,S,C,X,P)	VIS RE NIR SWIR (+ Thermal + Cloud Bands)	SAR dual (Threshold) to quad (Goal) polarization; multifrequency (Threshold: L,S,C; Goal: L,S,C,X,P)	Goal: VIS RE NIR SWIR; Threshold: VIS NIR		SAR Multifrequency	
Cloud Free Obs. Frequency (Goal to Threshold)				1-2x daily	daily	weekly	2-4x weekly	1-2x weekly	2-4x weekly	1-2x yearly	1-2x monthly	weekly	
Coverage Notes				Wall-to-Wall				Cropland Extent	Cropland extent (cloudy & rice)	Cropland Extent (non-cloudy)	Refined Sample of All Fields	Cloudy Croplands	
				Goal Update Frequency	Threshold Update Frequency								
Agriculture Mask				Monthly		X	X	X	X	M/S	S	S	
Cropland Mask				Monthly		X	X	X	X	M/S	S	S	

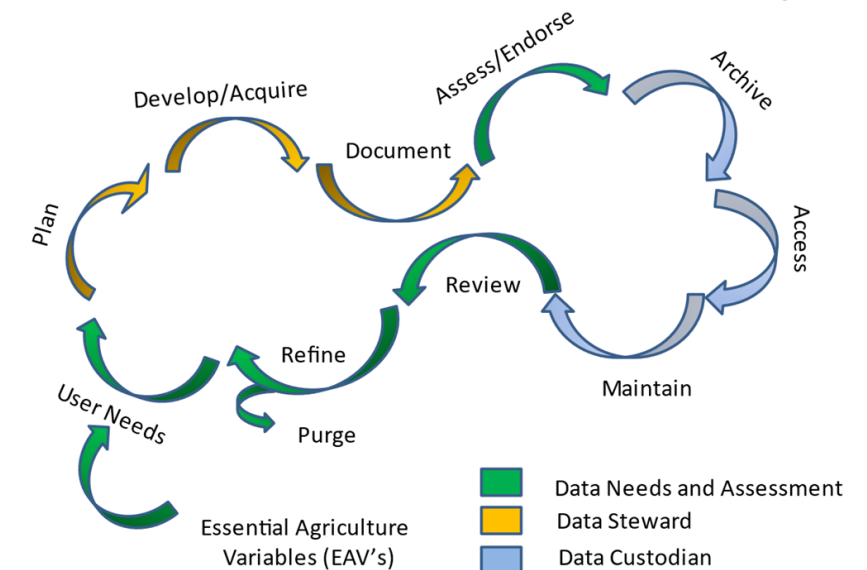
In Situ data Coordination GEOGLAM

- A decade ago the major constraint to operational monitoring was access to free and open EO data, then the major hurdle became the cost and availability of big data analytics; the next constraint was access to mature, reproducible analytical tools. Great progress has been in all these areas...
- One of the last major constraints to progress:
- Open access to high quality, well managed in situ data for training and validation
- Current in situ data access is insufficient for the development of systematic operational monitoring capacities required to address our policy priorities
- Some incremental coordination leveraging our existing activities could have a major impact at relatively low cost

“the whole can be greater than the sum of the parts”



In-situ data life cycle



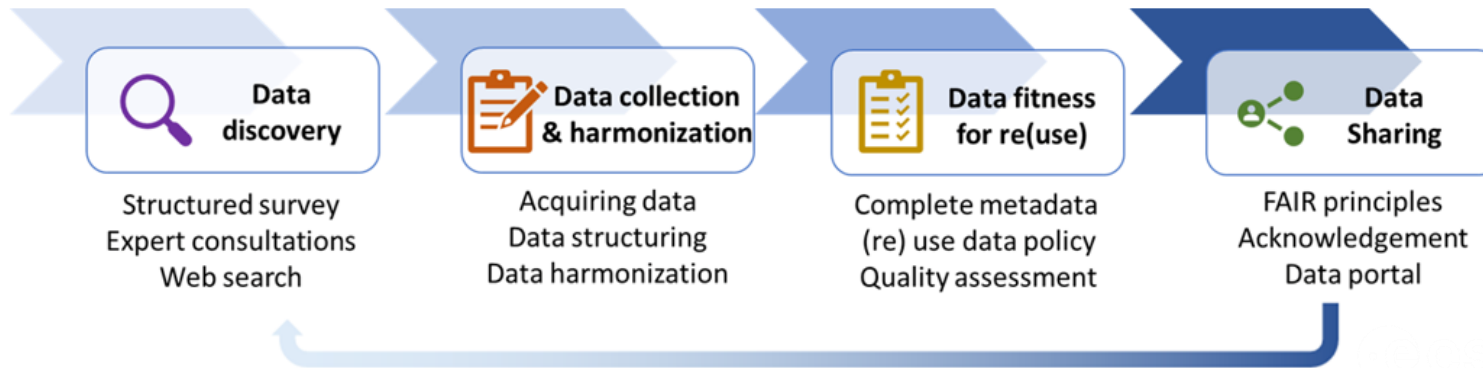
In Situ data Coordination GEOGLAM

- *GEOGLAM initiated a working group on in situ data in 2021*
- *Early 2022 an initial workplan and guidance document was developed by the WkGrp*
- *GEOGLAM was able to leverage significant effort by WorldCereal to create a global reference data set for crop mapping*
- *November 2022 GEOGLAM convened a workshop in Geneva to review and refine the workplan towards the development of a detailed action plan (currently in draft)*
- *Key actions were developed, some in development, within existing resources and capacities, some require incremental support (i.e. funding, staff time, technical resources)*

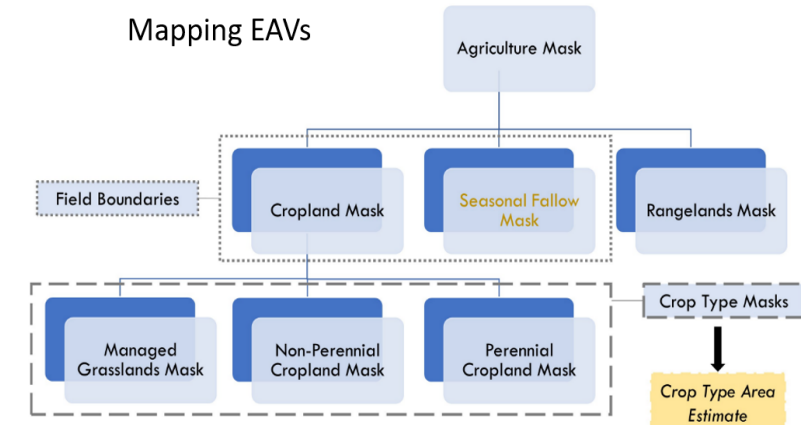


The case of cropland and crop type mapping

- Need for a global, extensive, open reference data repository with recent data on crop types and land cover
- No current solution of sufficient, high quality (open) reference data so started a journey...



Community engagement



World Cereal
Project Objectives

- Demonstrate feasibility of global open-source and transparent crop mapping at field scale based on open EO datasets
- Use existing cloud data providers, cloud computing capabilities and ICT infrastructure
- Interact and collaborate with the global agricultural user community
- Collaborate with local and global experts in the field to demonstrate WorldCereal

Reference Data Module

To generate accurate cropland and crop type maps, high quality reference data is indispensable for both training classification algorithms and validation of the final products. Therefore, WorldCereal would like to engage with global agricultural community to stimulate and facilitate opening and sharing of reference data.

[Explore](#) [Contribute](#)

Reference Data Collections

Public Collections available as input for processing

Collections: 26 | Features: 4353436

Search: []

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A crop type dataset on Central Asia, 2018 (Remelgado et al., 2020)

Collection ID: 2018asremelgadopoly111 | Geometry Type: Polygon

Description: A crop type dataset for consistent land cover classification in Central Asia, 2018 (Remelgado et al. 2020)

Country: [] | Continent: AS

Geometry Accuracy: 10 | Geometry type: Polygon

Observation Time: Real Date | Date Range of Observations: 2018-06-01 to 2018-06-25

List Of LandCovers: No information, Cropland, Annual cropland, Perennial cropland

List Of IrrigationCodes: no information, irrigated

List Of CropTypes: Unknown, Wheat, Maize, Rice, Vegetables and melons, Fruit and nuts, Grapes, Other Leguminous crops - Permanent, Cotton

Curation By WorldCereal: 2018_AS_Remelgado_POLY_111.pdf

Downloads: [Metadata.xlsx](#) [Download](#)

Citation: Remelgado, R., Zaitov, S., Kenjabaev, S., Stulina, G., Sultanov, M., Ibrakhimov, M., Akhmedov, M., Dukhovny, V. and Conrad, C., 2020. A crop type dataset for consistent land cover classification in

User Collections

Collection of user uploaded datasets

[Upload New](#)

Search: []

Details Instructions

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Upload Validation Provision Private Use Public

[Delete](#) [Make public](#) [Edit](#)

A test user dataset | AvailabilityModule: Automated Classification

test101

Title: A test user dataset

Collection ID: test101

Type of Observation Method: Automated Classification

Land Cover Type Confidence: 80

Crop Type Confidence: 80

Irrigation Type Confidence: 0

Reference Data Collections

Public Collections available as input for processing

Collections: 87 | Features: 74797108

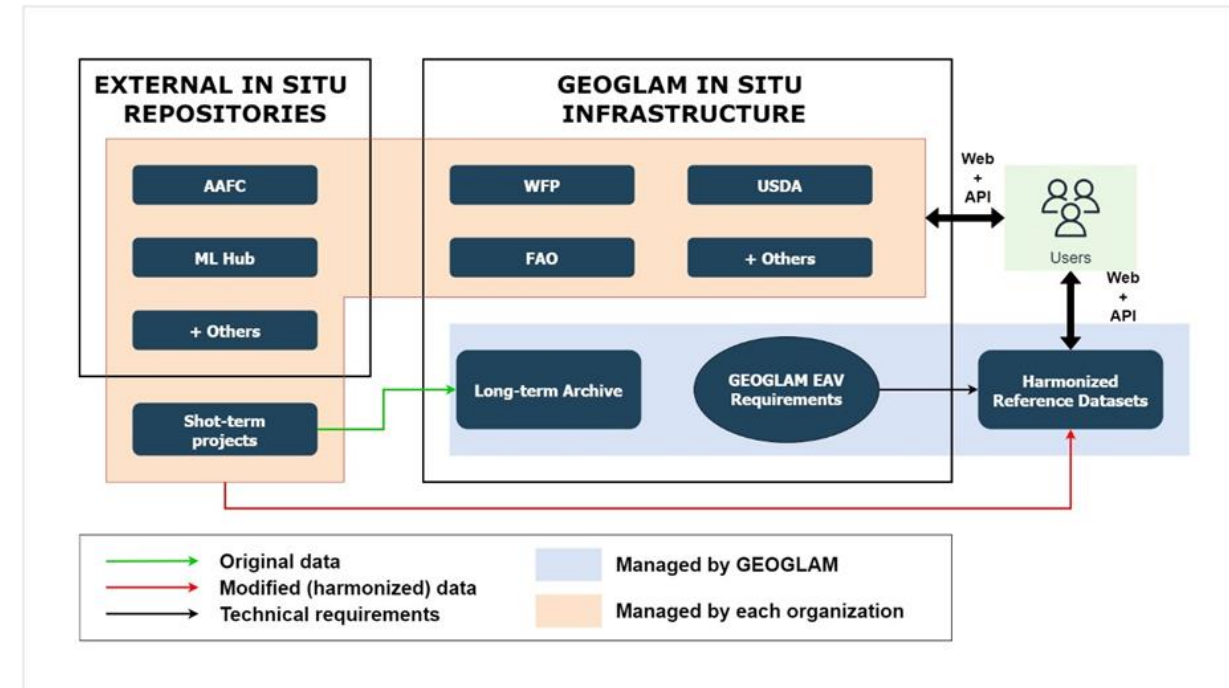
Reference Details: [] | All: []

World map showing location pins for various datasets.

EUROCROPS, Slovenia, 2021
ClassifiedMap Count: 828157

Next steps

- Gaps assessment for EAVs implementation, including in situ data needs
- Institutionalize, sustain, and update the WorldCereal reference data repository and Encourage and Enable the community to share data following the open science and open data principles
- Explore business models to strengthen and sustain harmonization hubs (data holdings)
- Implement a demo distributed architecture with hosting capability using the open source CKAN solution under the neutral GEO/GEOGLAM umbrella, with an implementation of STAC, and common API to query the data



Joint Workshop: Community-led good-practices for cropland and crop type validation

12-14 September 2023 | USDA National Agricultural Library Beltsville, MD

- **Supports CEOS AFOLU Stocktake**

- **Jointly organized by GEOGLAM & CEOS:**

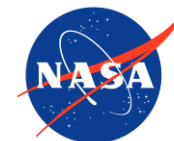
LPV Leadership: Sophie Bontemps (UCL) & Sasha Tyukavina (UMD)

EAV Leadership: Sven Gilliams (VITO) & Alyssa Whitcraft (UMD)

- **Supported by:**

NASA Land Cover & Land Use Change Program

NASA Applied Sciences Agriculture Program



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