2025 ITU Geo-AI Challenge

GEOAI Challenge for Cropland Mapping in Dry Environments

PENGYU HAO, FAO

Background

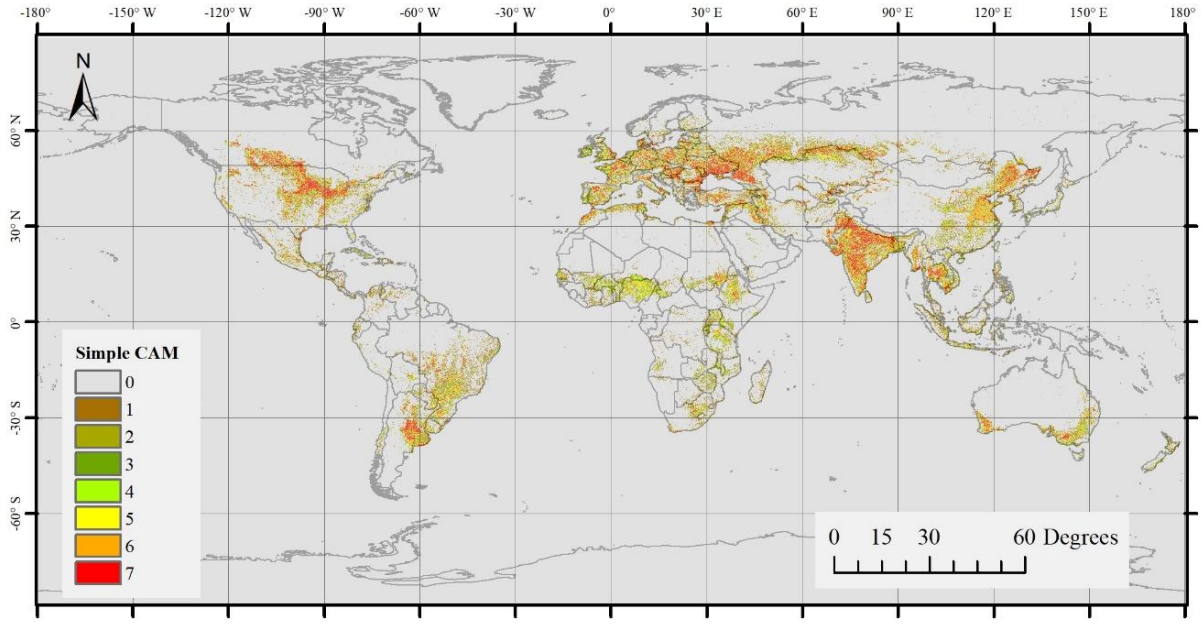
Agricultural Remote Sensing applications with AI

- ✓Extensive application of remote sensing in agricultural community
- ✓Use of satellite imagery for cropland and crop type mapping
- ✓Cropland extent/intensity provide basic information for crop growth monitor and yield forecast and land cover change monitor
- ✓Artificial intelligence and machine learning are promising to improve crop mapping and land cover classification accuracy and robustness with time-series satellite images and remote sensing big data

Background

Disagreement among existing cropland maps at global level

- ✓Serious disagreement of the existing cropland extent maps
- ✓Land surface patterns are not well-described
- ✓“Cropland” are not of the same definition
- ✓The major land cover type of the pilot regions are **cropland, pastures, meadows** with **similar NDVI time series**, discriminating these land cover types with satellite is a challenge



Spatial distribution of Simple CAM7

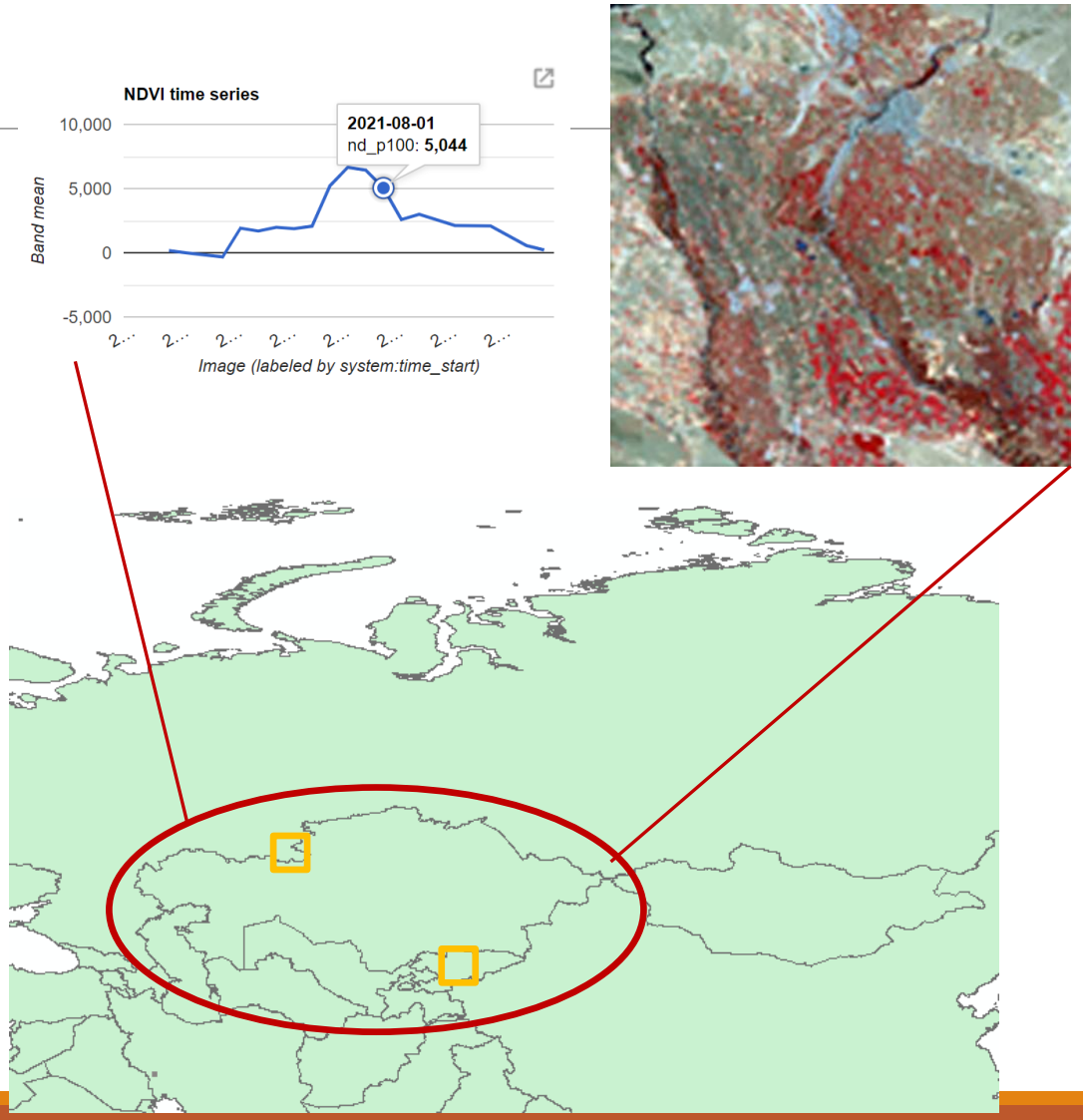
Objectives

Challenge participants will be challenged to develop an accurate, cost-effective classification for **cropland mapping** in two **test regions** located in Central Asia.

- ✓Developing machine-learning-based extendable algorithms for cropland extent mapping
- ✓Enrich GEO-AI algorithms and use cases
- ✓Contribute to UN GEO-AI community

Pilot regions: 1) Fergana, Uzbekistan,
2) Orengurg region, Russia

Size: 2 degree by 2 degree



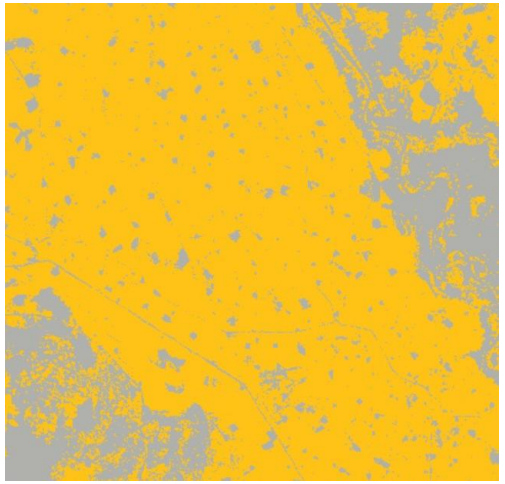
Materials

Cropland definition used in this Challenge: “Temporary crops” of FAOSTAT

Land used for crops with a less-than-one-year growing cycle, which must be newly sown or planted for further production after the harvest. Some crops that remain in the field for more than one year may also be considered as temporary crops e.g., asparagus, strawberries, pineapples, bananas and sugar cane. Multiple-cropped areas are counted only once.

We provide:

- ✓Pilot Regions
- ✓A part of the training data
- ✓Classification labels



Participants’ tasks:

- ✓Cropland mapping of the target time period
- ✓Sharing script and document of proposed workflow

Overall Plan and important dates

Submission checklist:

First-round

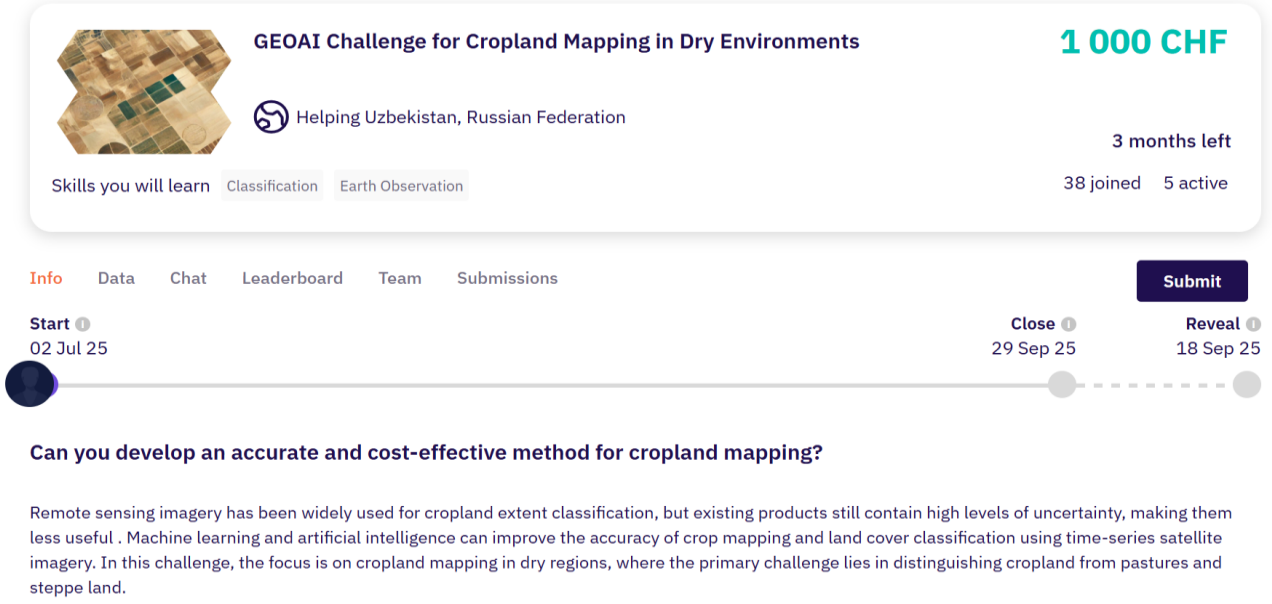
✓Samples with cropland label

Second-round

✓Script for the solution (2nd round)

✓Technical document explaining the solution

https://zindi.africa/competitions/geoai-challenge-for-cropland-mapping-in-dry-environments



✓Call for submission: **July 2nd, 2025**

✓Deadline of submission: **Sep 25th, 2025**

✓Deadline of 2nd-round submission: **end of Oct, 2025**

✓Award Ceremony: **Dec, 2025**

Thanks