



UNSC56 SIDE EVENT

OPERATIONAL APPLICATION OF EO DATA FOR AGRICULTURAL STATISTICS

FROM CROP CLASSIFICATION AND PARCEL
SEGMENTATION TO EARLY-SEASON YIELD
FORECASTING AND PADDY CROP PHENOLOGY
IDENTIFICATION

Monday, 3 February 2025

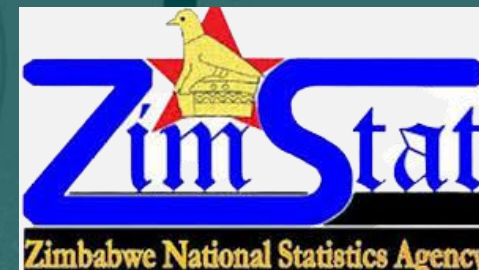
09:10–10:15 New York Time

15.10–16.15 Rome Time

Online



Food and Agriculture Organization
of the United Nations

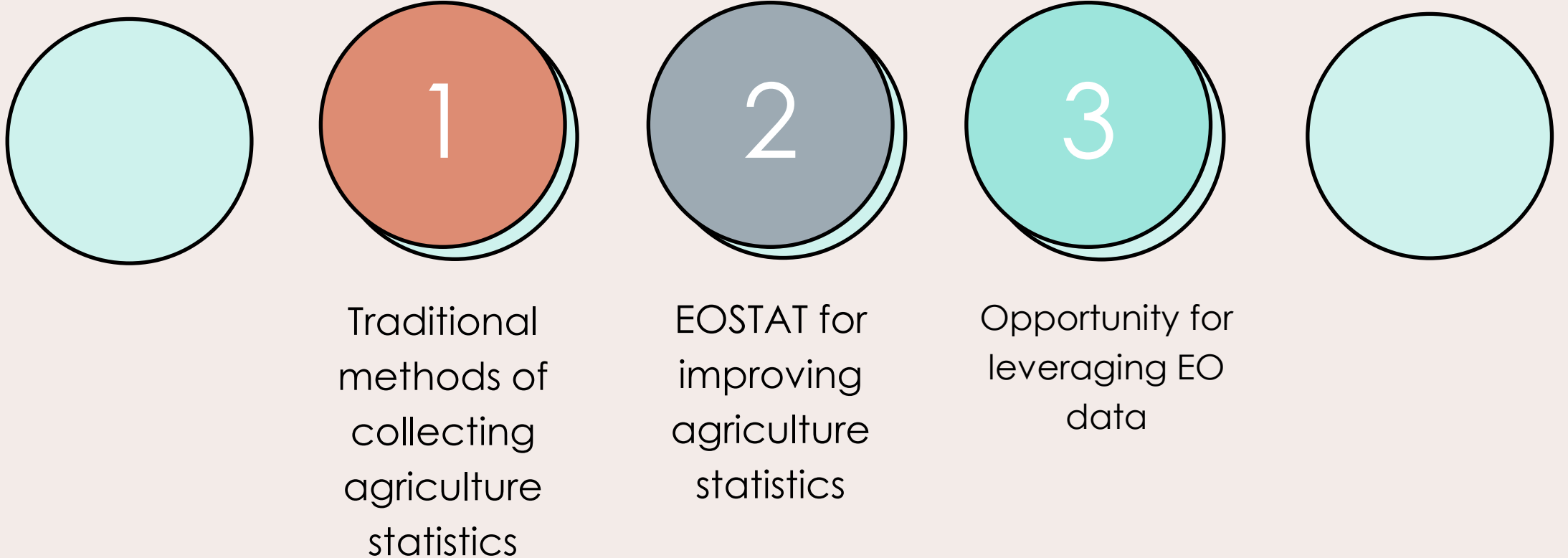


Use of EO data for agricultural statistics in Zimbabwe

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Outline



Traditional methods of collecting agriculture statistics

- Sampling frames
- Sampling methodology
- Estimating area under crop
- Estimating expected production



Traditional methods of collecting agriculture statistics

- **Sampling frames**

- The current agriculture surveys are using **list sampling frames** usually derived from Population and Housing Censuses
- In addition, the frames are also complemented by **registers of farms and plot holders** from the Ministry responsible for Agriculture
- Updating of these registers are normally done after the Population and Housing Census for the Communal Area sector
- In some cases register of farmers /plot holders may not have **sufficient information** required for sampling

Estimating area under crop

Farmer/Expert estimate

- In well organized farming sectors like the commercial farms, the farmer gives the estimate which is also verified by an expert or interviewer

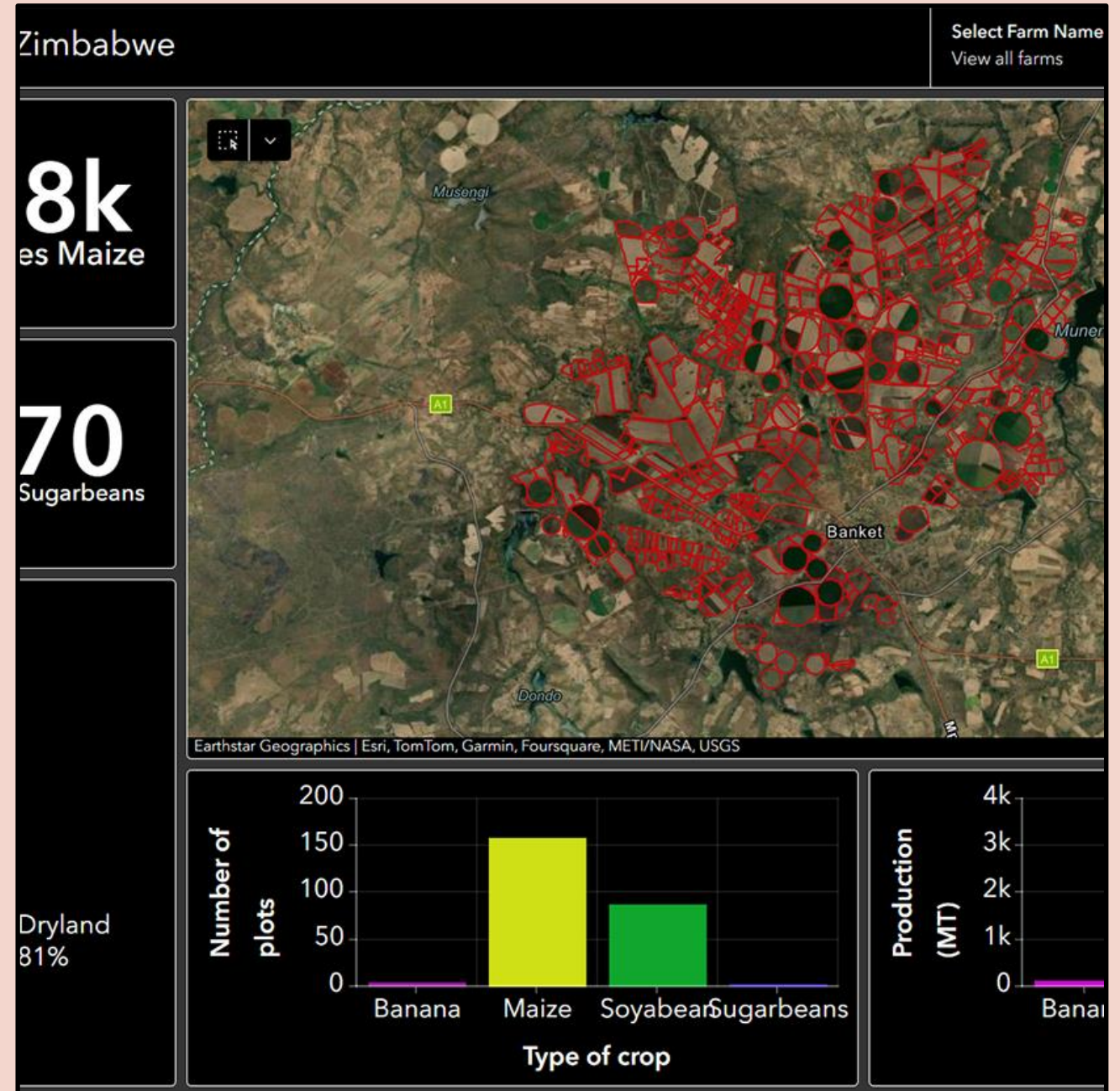
GPS Coordinates

- In cases where the farmers is not aware of the area planted, area is physically measured using GPS applications

Pacing method

- This was the old traditional method where the interview moves around the plot using the pacing and the calculates the area

EOSTAT project in Zimbabwe





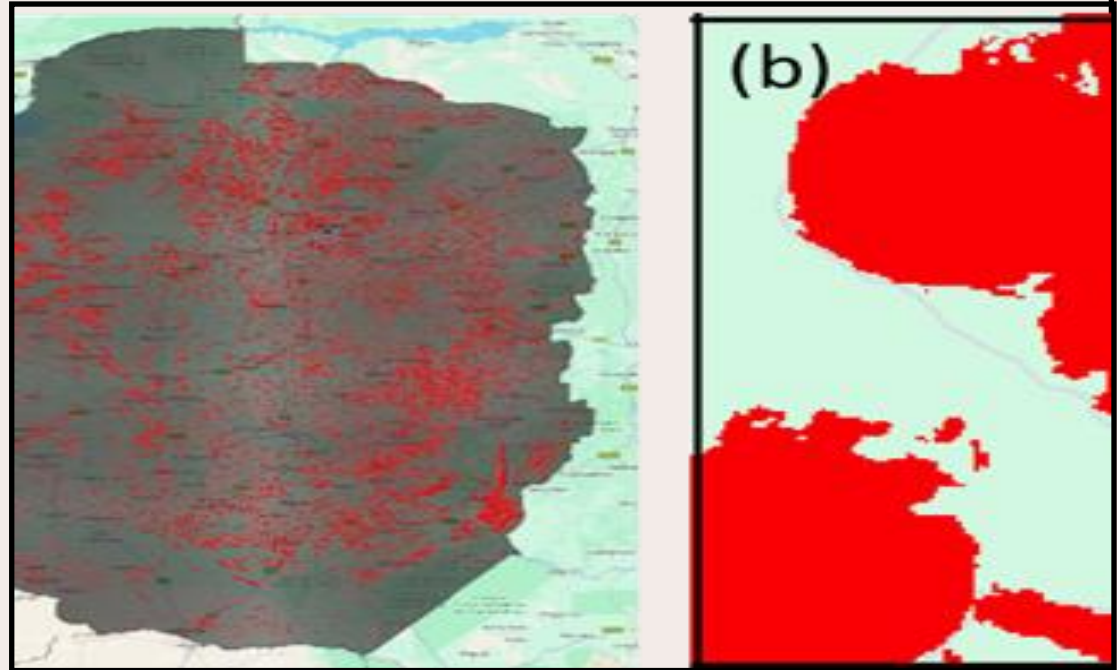
Crop type mapping in Zimbabwe under the EO Stat project

The EOSTAT Project, supported by FAO, aimed to measure the spatial distribution and acreage of crops across the summer and winter agricultural seasons in Zimbabwe.

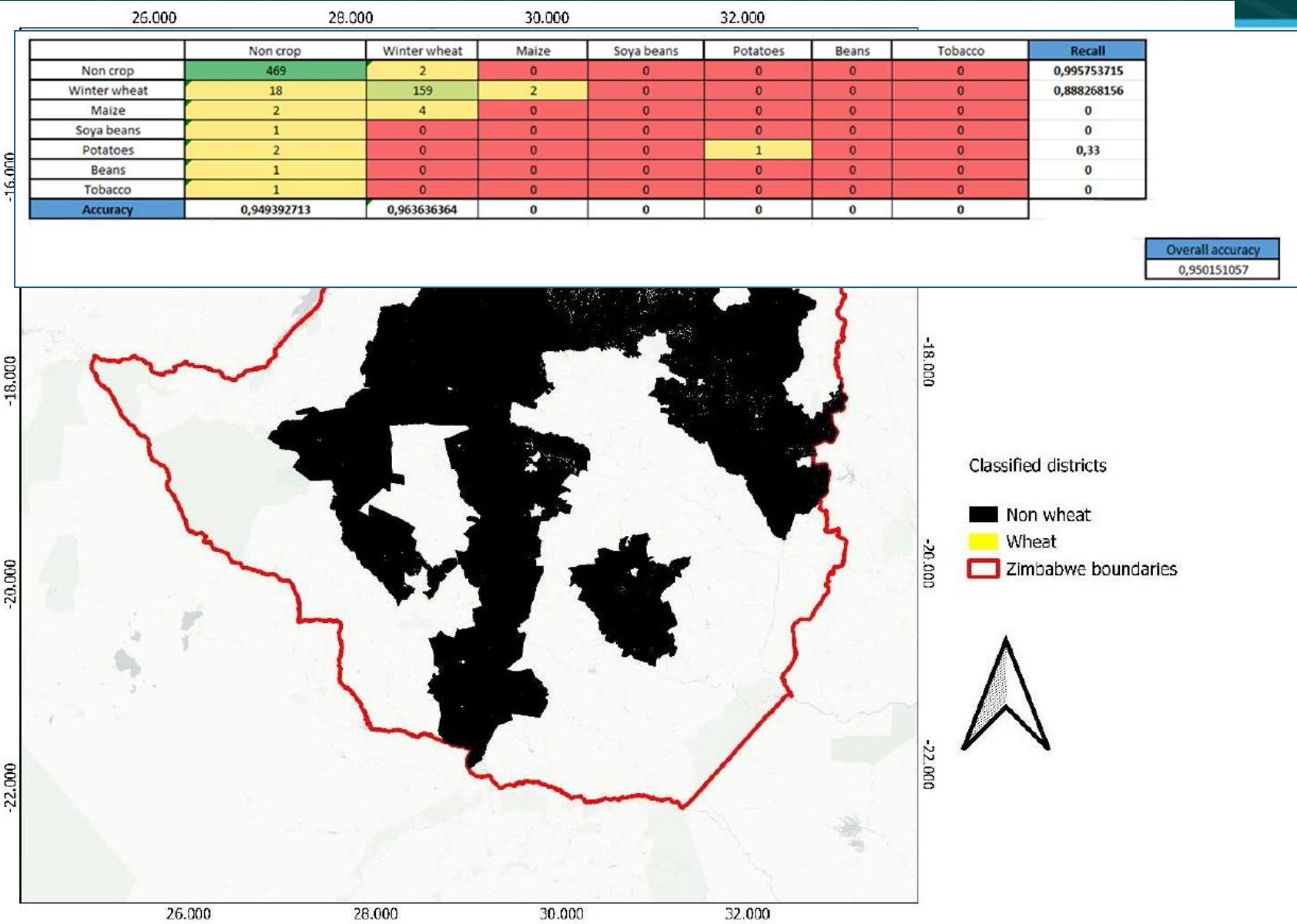
An open-source high resolution satellite imagery, cloud-based computing environments and in-situ data to produce wall-to-wall seasonal crop type maps was employed.

Survey Design

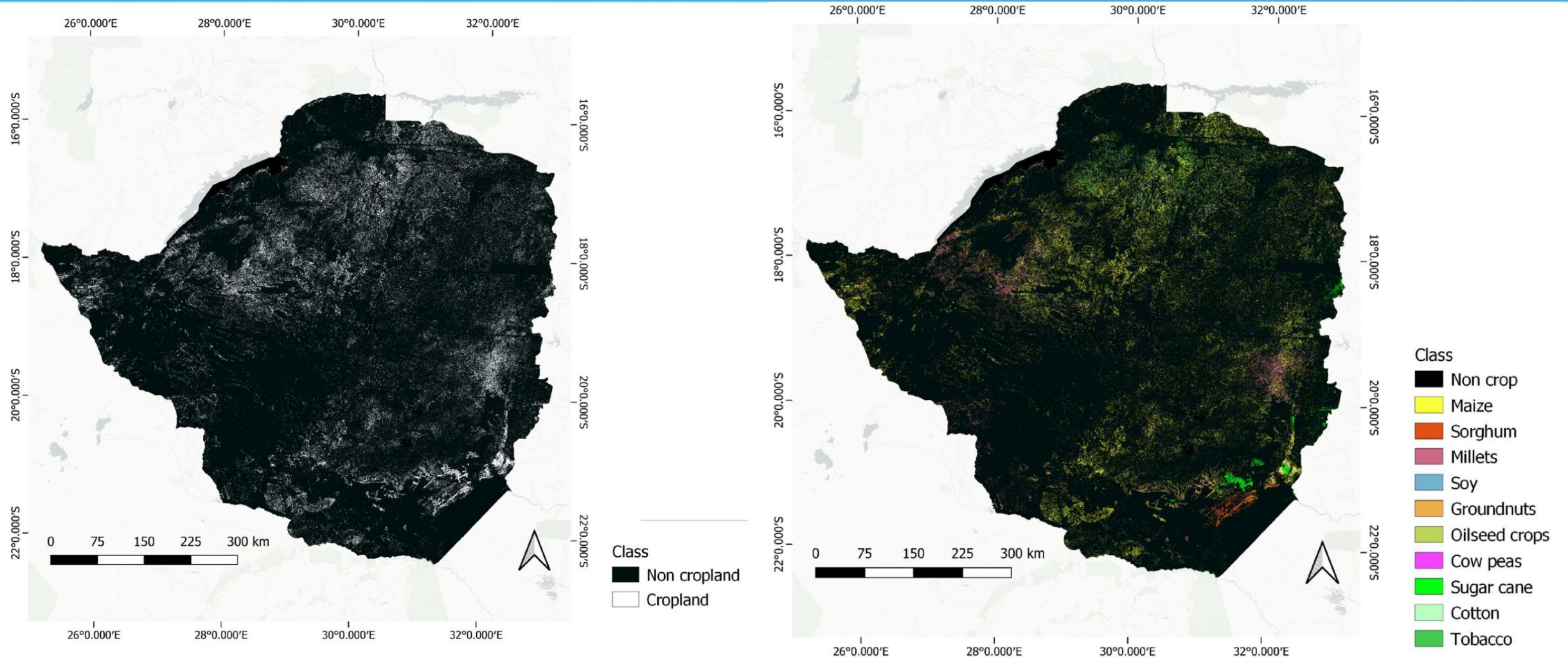
- An area frame was established across Zimbabwe by creating a regular grid with cells/blocks measuring 2km by 2km (4sq km).



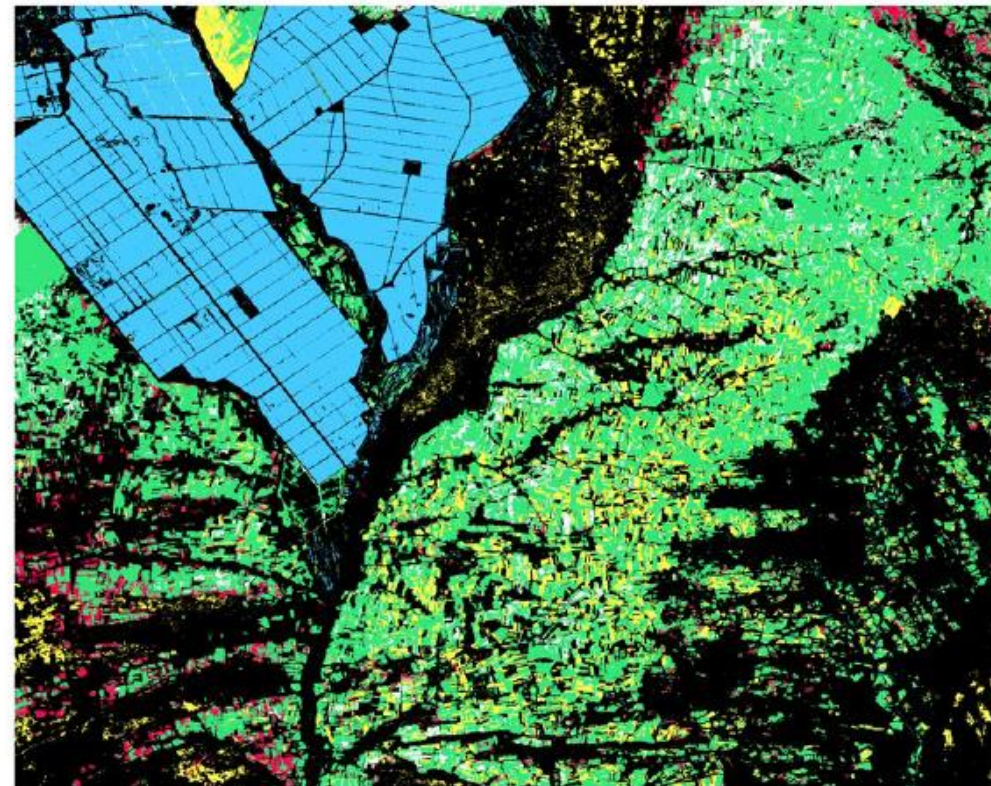
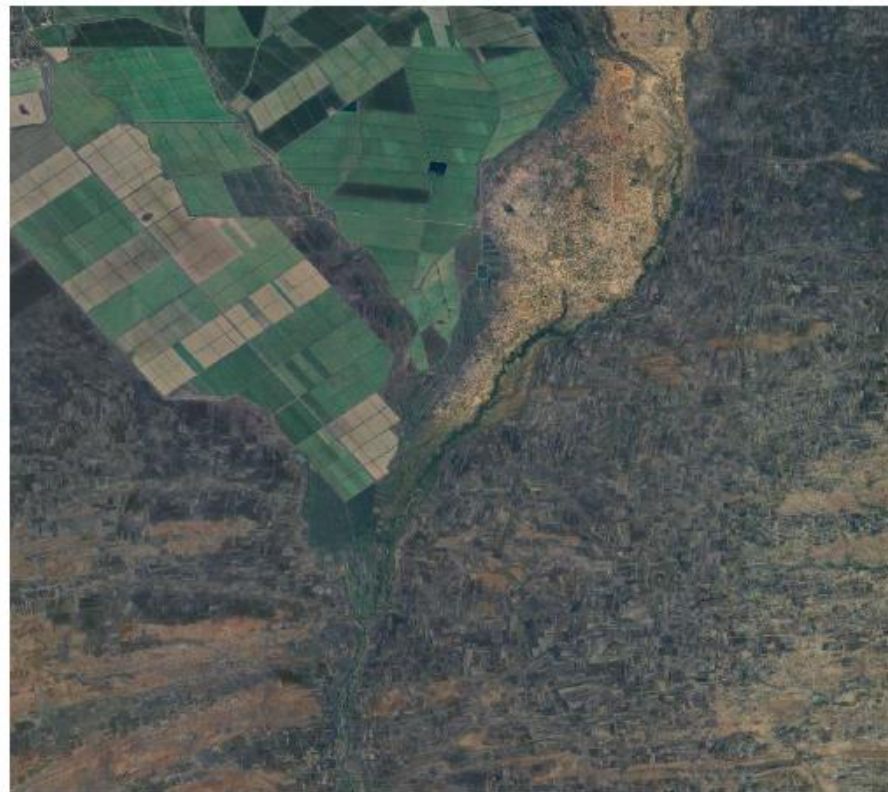
Winter Wheat Map 2023/2024



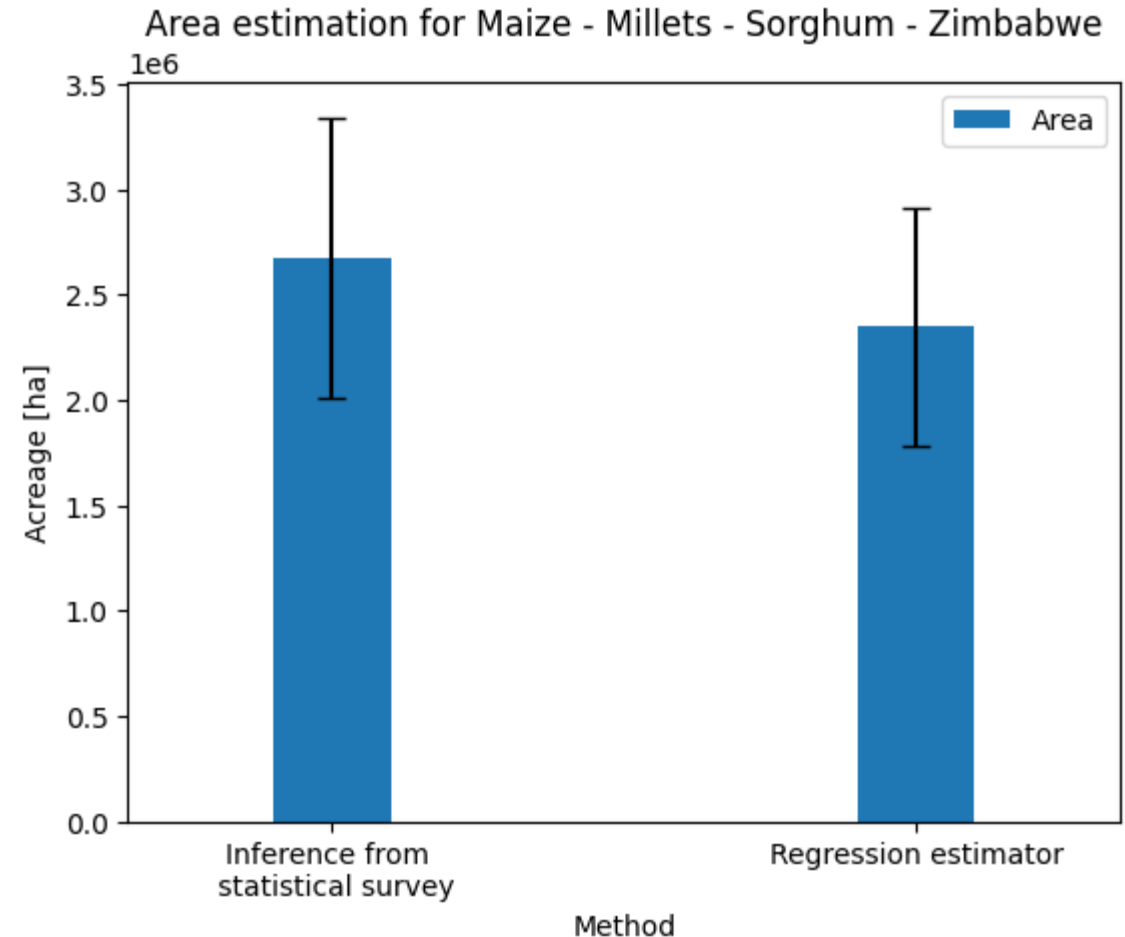
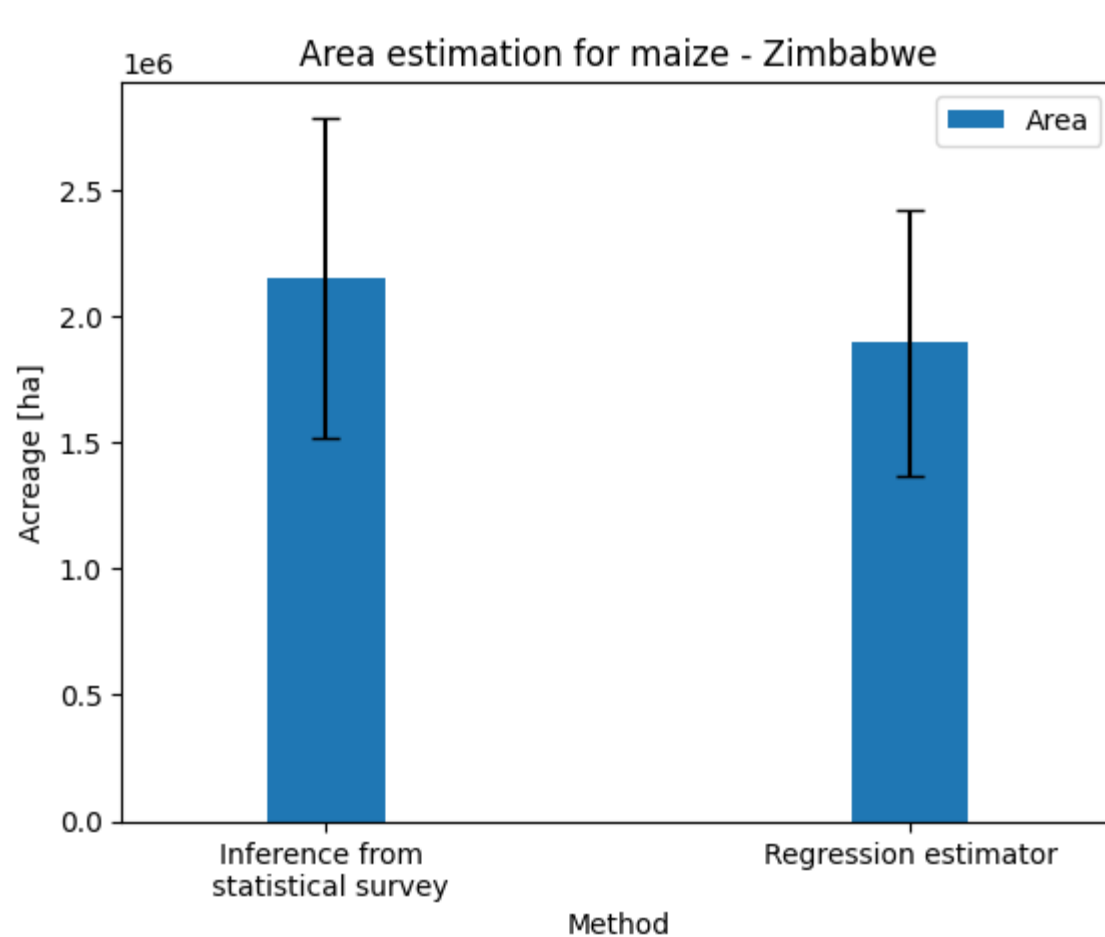
Summer Crop Mask and crop type Map 2024



Zoom on a maize and millets dominated area



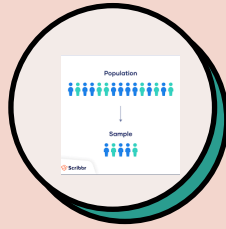
Acreage estimates for main crops in summer 2024



Cost efficiency

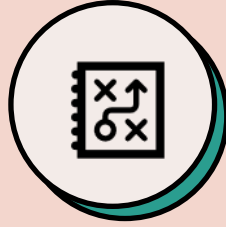
Improving design-based **acreage** estimators by reducing the standard error while providing unbiased estimates => reducing the CoV without increasing the number of samples.

Opportunity for leveraging EO data



SAMPLING DESIGN

Use of EO data to develop area sampling frame which is more reliable than list frames



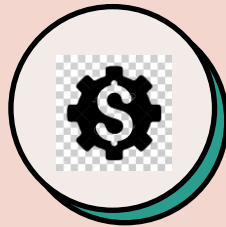
DISAGGREGATION

List frames lead to disaggregation at higher levels while EO has an opportunity to disaggregate at lowest levels



TIMELINESS

Statistics often available late after the end of the campaign and once a year => use EO data to forecast statistics and provide seasonal estimates



COST EFFICIENCY

Using EO data in the statistical framework to maximize the statistics accuracy



DATA QUALITY CONTROL

Improving the quality of the ground database (data collection protocol & quality control procedure)

Thank you