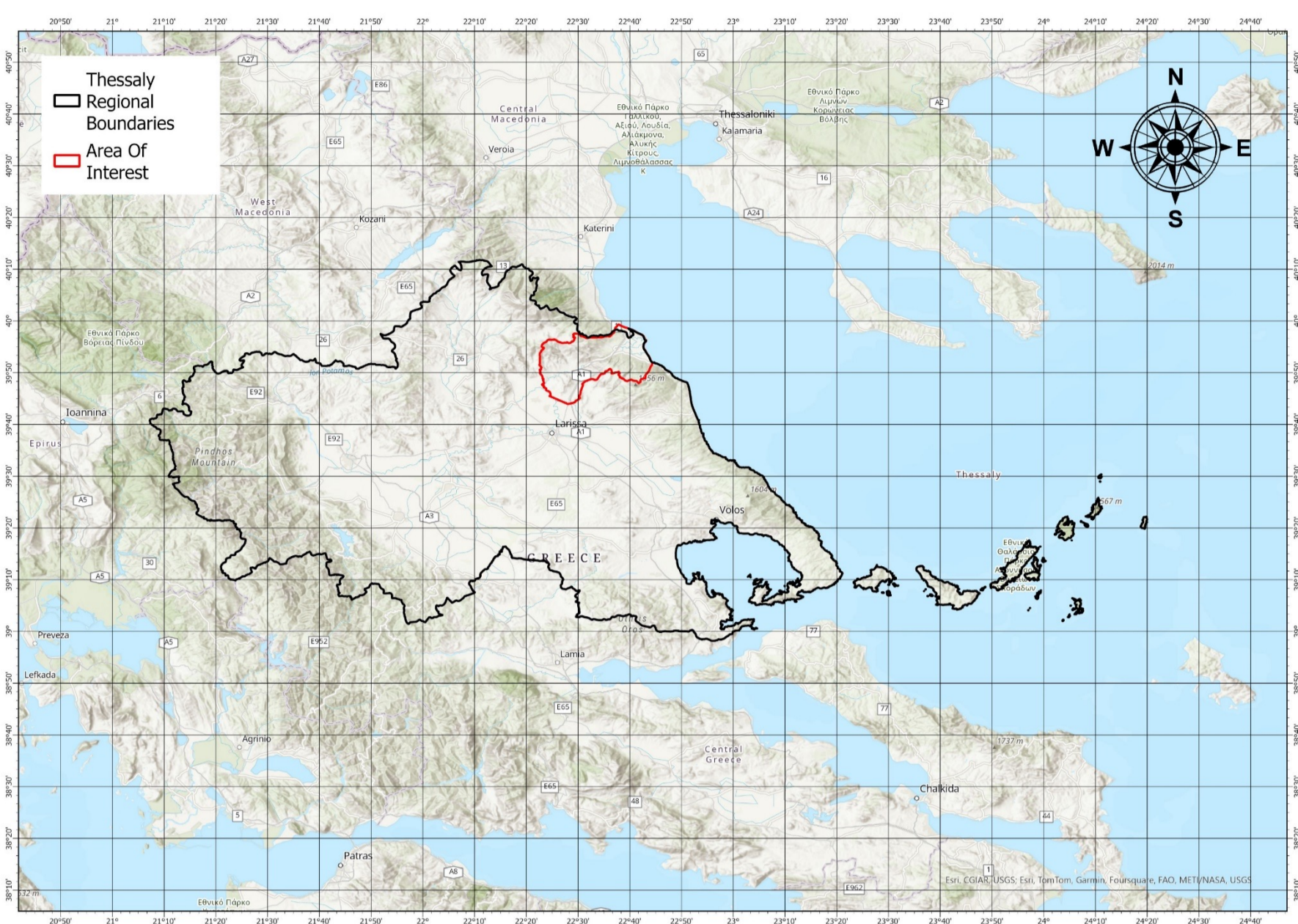




The 2023 Storm Daniel significantly affected the Pineios River estuaries, causing widespread flooding and impacting the agricultural landscape. This study aims to assess the floods' impact on the area, utilizing Sentinel-2 imagery for crop-type and inundation mapping.

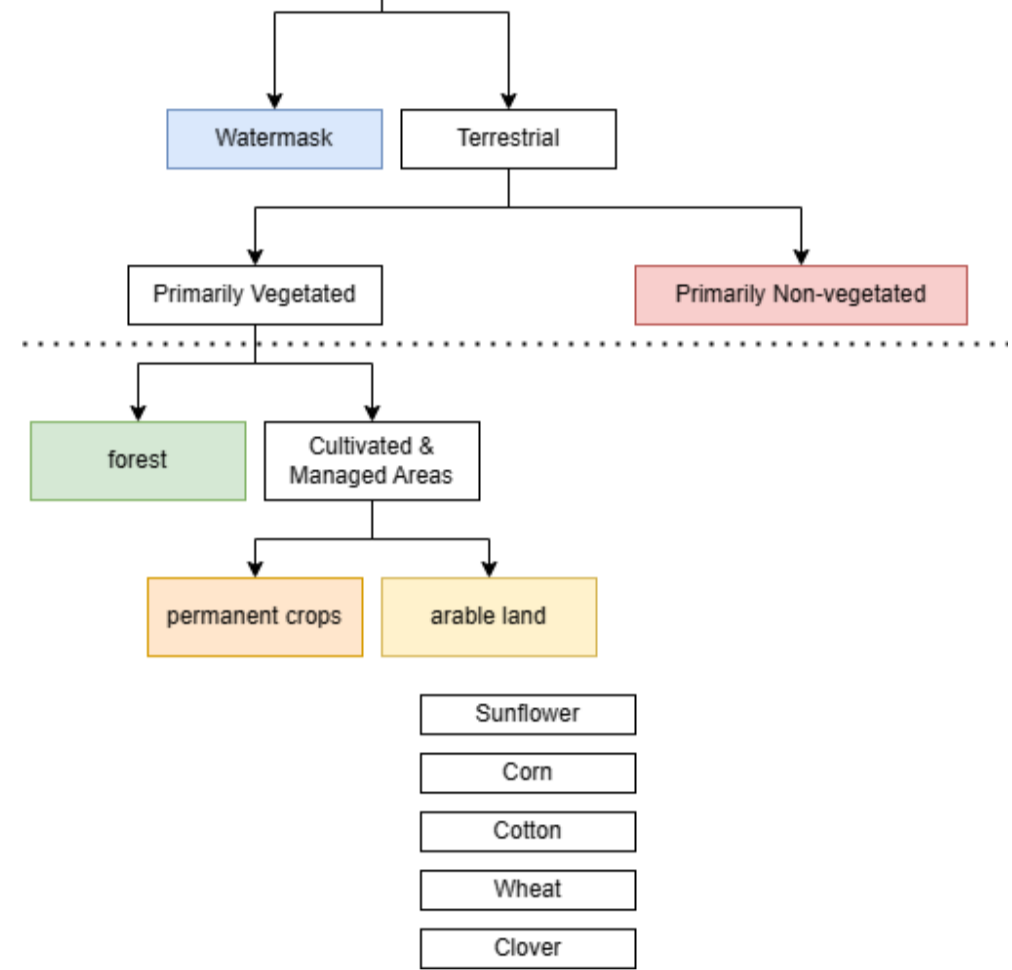
1. Area of Interest



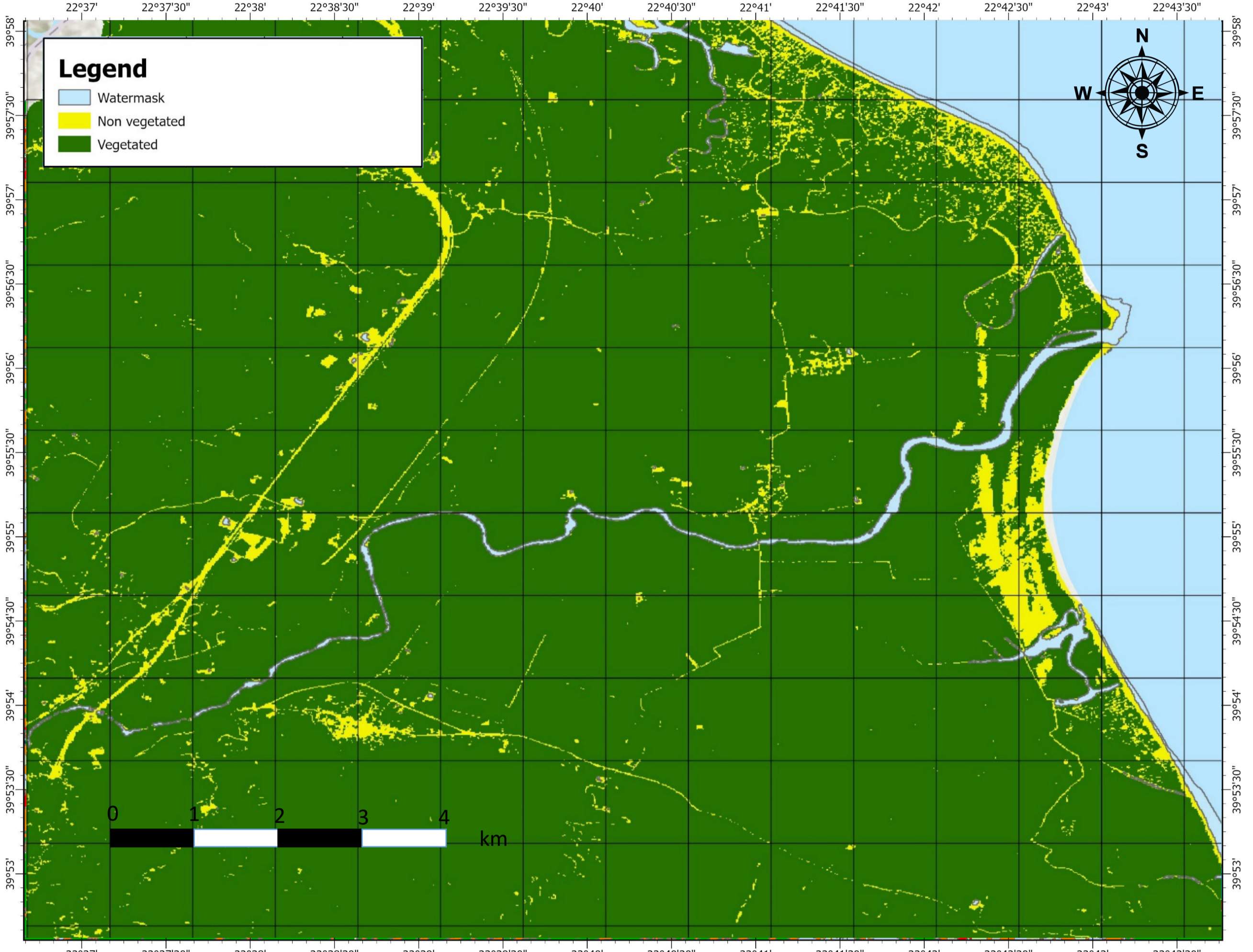
The alluvial soils of the Pineios Basin and its tributaries make Thessaly a vital agricultural area.

2.1. Taxonomy

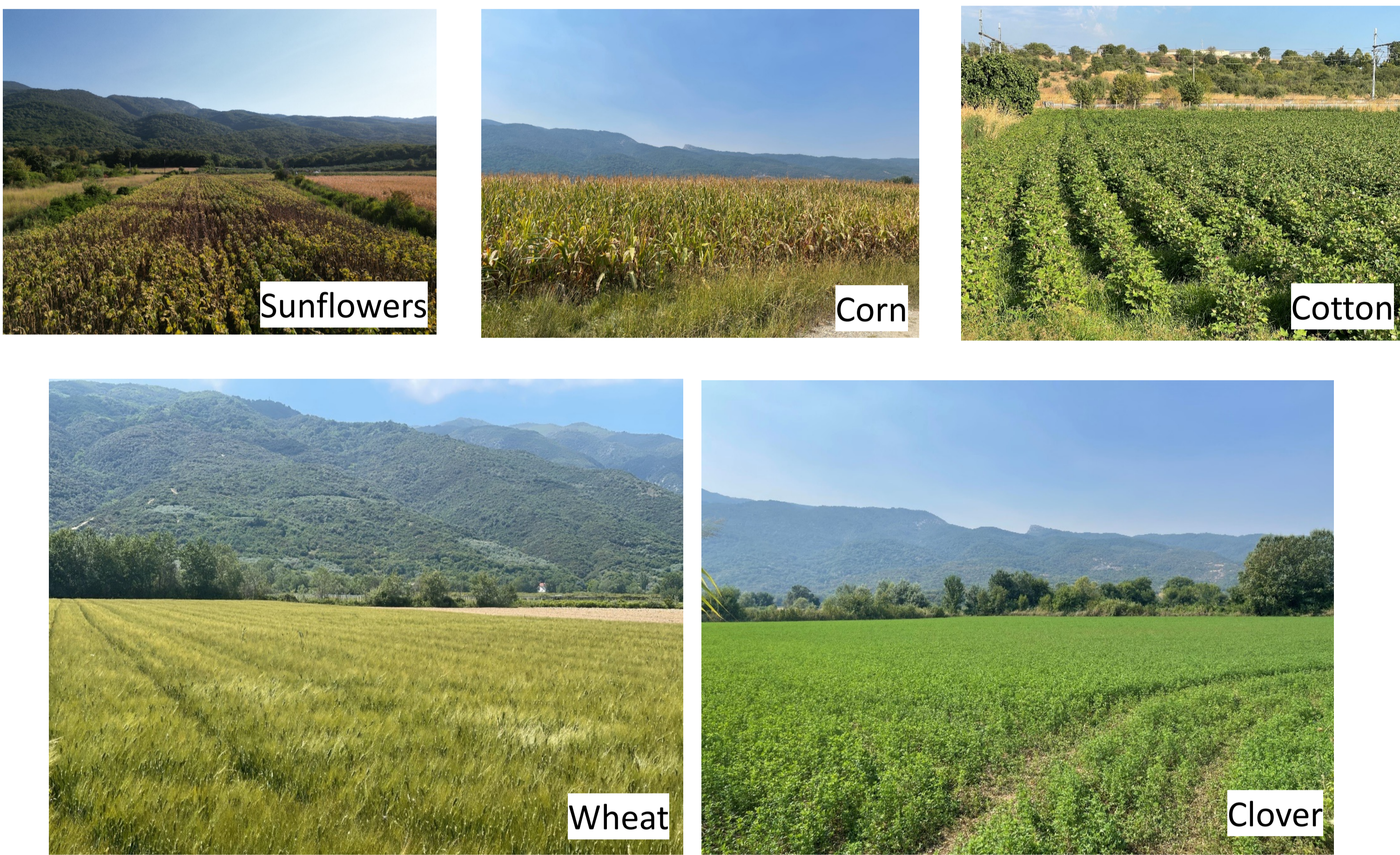
The taxonomy employed for the Land Cover/Crop Type Classification follows the binary logic of FAO's LCSS dichotomous phase.



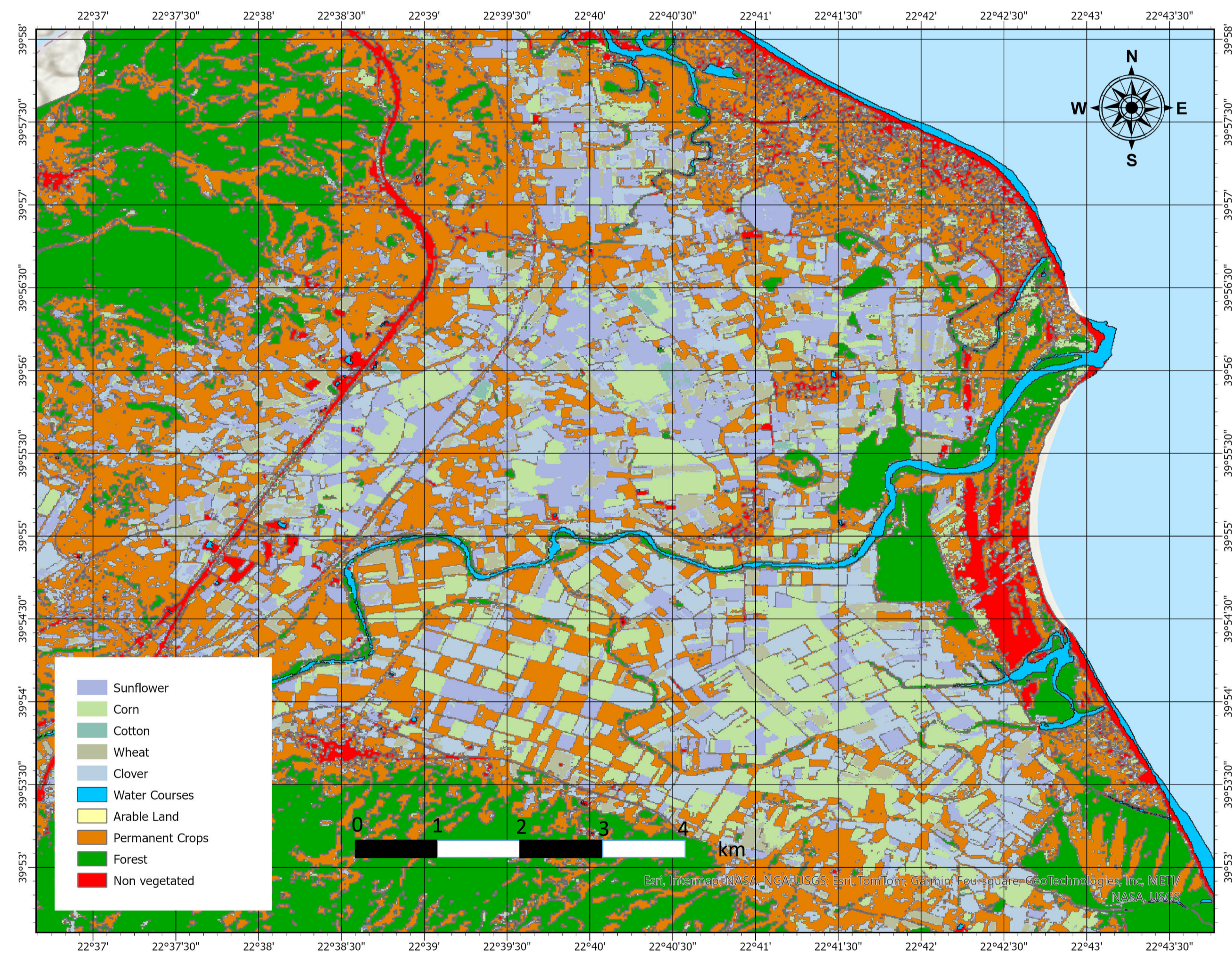
3.1. Primarily Vegetated vs Primarily Non-vegetated & water mask



2.2. Training data Collection (labeled field polygons)



3.2. Land Cover & Crop Type Map

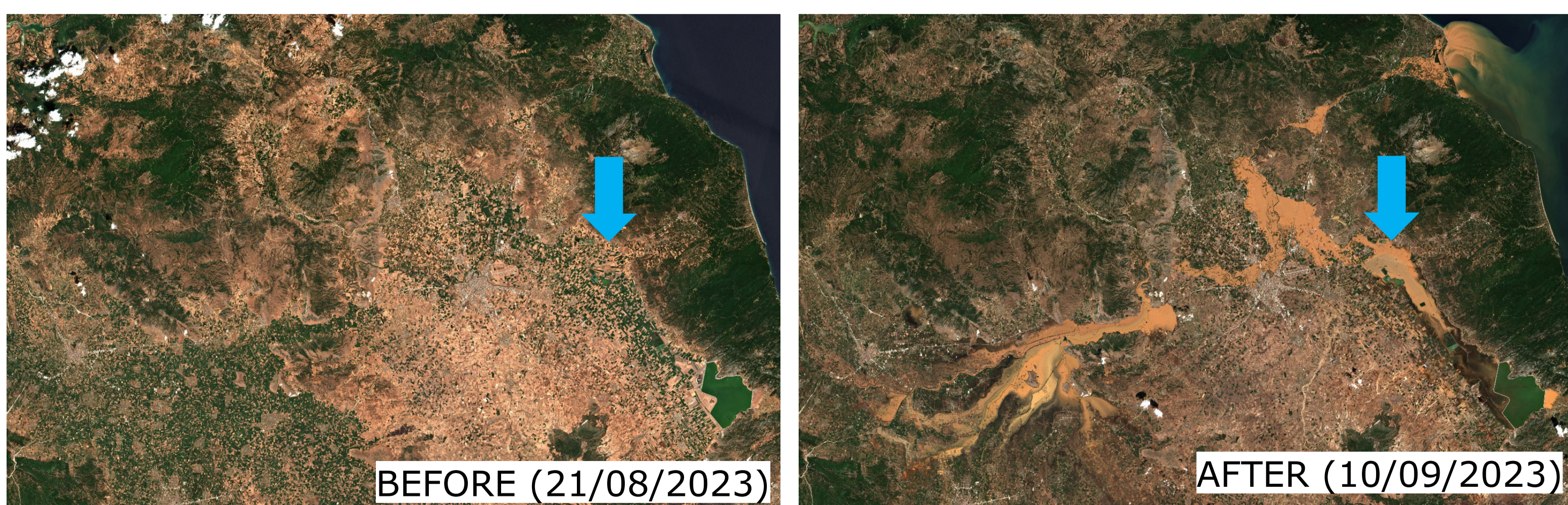


2.3. Land Cover/Crop Type Classification

- A Random Forest classifier with 100 trees was employed using Google Earth Engine.
- Summary statistics of the yearly time-series were employed as features.

Variable	Sentinel-2 Formula used in this study	Landsat ETM+ Formula used by Potapov et al.	Summary statistics
1	Blue	B_2	TM_1
2	Green	B_3	TM_2
3	Red	B_4	TM_3
4	Visible and Near Infrared (VNIR)	$B_5, B_6, B_7, B_8, B_{8A}$	TM_4
5	Short Wave Infrared (SWIR)	B_{11}, B_{12}	TM_5, TM_7
6	Normalized Difference NIR/Green Green NDVI	$B_0 - B_3$ $B_0 + B_3$	$TM_4 - TM_2$ $TM_4 + TM_2$
7	Normalized Difference NIR/Red Normalized Difference Vegetation Index, Calibrated NDVI - CDVI	$B_0 - B_4$ $B_0 + B_4$	$TM_4 - TM_3$ $TM_4 + TM_3$
8	Normalized Difference NIR/SWIR1	$B_0 - B_{11}$ $B_0 + B_{11}$	$TM_4 - TM_5$ $TM_4 + TM_5$
9	Normalized Difference NIR/SWIR2	$B_0 - B_{12}$ $B_0 + B_{12}$	$TM_4 - TM_7$ $TM_4 + TM_7$
10	Normalized Difference SWIR1/SWIR2	$B_{11} - B_{12}$ $B_{11} + B_{12}$	$TM_5 - TM_7$ $TM_5 + TM_7$

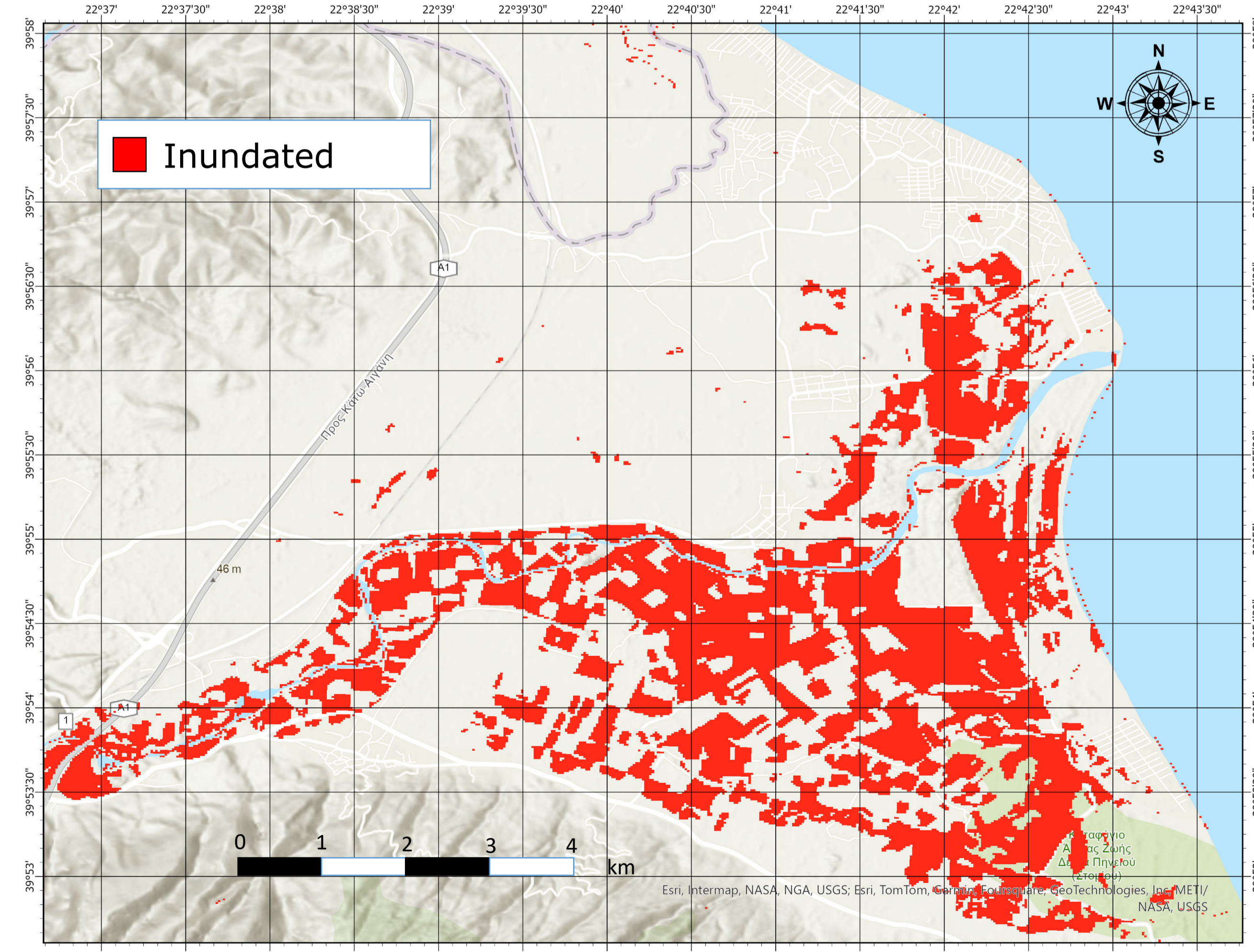
2.4. Inundation Mapping methodology



- 1) Sentinel-2 spaceborne multispectral images were acquired prior to and after the end of the precipitation events.
- 2) An automatic local thresholding* unsupervised methodology for separating inundated

*Kordelas, Georgios A., et al. "Fast and automatic data-driven thresholding for inundation mapping with Sentinel-2 data." Remote Sensing 10.6 (2018): 910.areas from non-inundated ones was employed

3.3. Inundated



4. Inundated VS Total Number of pixels per arable land crop-type

