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Goal: Assess the impacts of the war on vegetation in Gaza since the breakout of the 2023 Israel-Hamas War (October 7, 2023 – May 30, 2025).

We focus on four vegetation types:

- **Annual crops:** Fields planted with short-cycle crops such as grains and vegetables
- **Tree crops:** Perennial fruit-bearing trees (e.g., olives, orchards)
- **Woody vegetation:** Natural forests and shrublands
- **Fallow/grassland:** Idle cropland and natural grasslands

Satellite images: 3-m PlanetScope imagery © Planet Labs PBC obtained in 2023 and 2025

Approaches:

1. Mapping the pre-war vegetation using all available 3-m PlanetScope imagery obtained before October 2023, following the approach proposed by Yin et al., (2020). A machine-learning, Random Forest approach was used to map agricultural land use for each PlanetScope pixel. This map serves as the baseline before the war.

Yin, H., et al., 2020. Monitoring cropland abandonment with Landsat time series. *Remote Sensing of Environment*. 246, 111873. https://doi.org/10.1016/j.rse.2020.111873

2. Mapping the damage to the vegetation due to direct impacts of the war. We adapted a similar approach as Yin et al (2025) to map damages to annual crops, tree crops, woody vegetation, and fallow/grassland.

Yin, H., et al, 2025. Evaluating war-induced damage to agricultural land in the Gaza Strip since October 2023 using PlanetScope and SkySat imagery. *Science of Remote Sensing*. 100199. https://doi.org/10.1016/J.SRS.2025.100199

3. Accuracy assessment and area estimate: I randomly generated 20 samples per class across Gaza and each sample has a size of 3×3 m which matches the PlanetScope pixels. Each sample was labeled based on PlanetScope imagery itself as well as available very high resolution Planet Skysat imagery. Based on these validation samples, I generated 1) mapping accuracy, and 2) error-adjusted area estimates at a confidence interval of 95% for the damage of tree crops.

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Citation, attribution, use, and distribution

If you use these maps in your reporting, please include the following citation (with hyperlinks embedded):

Source: Damage analysis conducted by Dr. He Yin (Kent State University) using 3 m PlanetScope imagery (© Planet Labs PBC) and the methodology detailed in Yin et al. (2025), *Science of Remote Sensing*.

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Note: The data should not be distributed without obtaining permission from Dr. He Yin

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Results

1. Mapping accuracy: Our damage map has an overall accuracy of 91-94%

2. Damages:

    Annual crops: 71–98% likely damaged
    Tree crops: 90–94% likely damaged
    Woody vegetation: 78–98% likely damaged
    Fallow/grassland: 78–98% likely damaged

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References

Yin, H., et al, 2025. Evaluating war-induced damage to agricultural land in the Gaza Strip since October 2023 using PlanetScope and SkySat imagery. *Science of Remote Sensing*. 100199. https://doi.org/10.1016/J.SRS.2025.100199

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Damage map overview (*next page*)

Vegetation Damage Assessment
in the Gaza Strip
(October 2023 – May 2025)

Annual crops: 71–98% likely damaged

Tree crops: 90–94% likely damaged

Woody vegetation: 78–98% likely damaged

Fallow/grassland: 78–98% likely damaged

Source: Analysis of 3 m PlanetScope imagery
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He Yin, Kent State University.

Undamaged annual crops
Undamaged tree crops
Undamaged woody vegetation
Undamaged fallow and grassland
Damaged annual crops
Damaged tree crops
Damaged woody vegetation
Damaged fallow and grassland
Non-vegetated land

0   6 km