

# Sentinel-2 for Forestry

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## Sentinel-2

- ESA Copernicus Mission
- **Spatial resolution:** 10–60 m (depending on band)
- **Spectral bands:** 13
- **Revisit time:** 5 days at the equator (with two satellites)
- **Swath width:** 290 km (wide area coverage)
- Free and open data policy

## Sensor fit for Forestry

### High revisit & wide swath

timely monitoring at regional to global scales.

### Red-edge bands

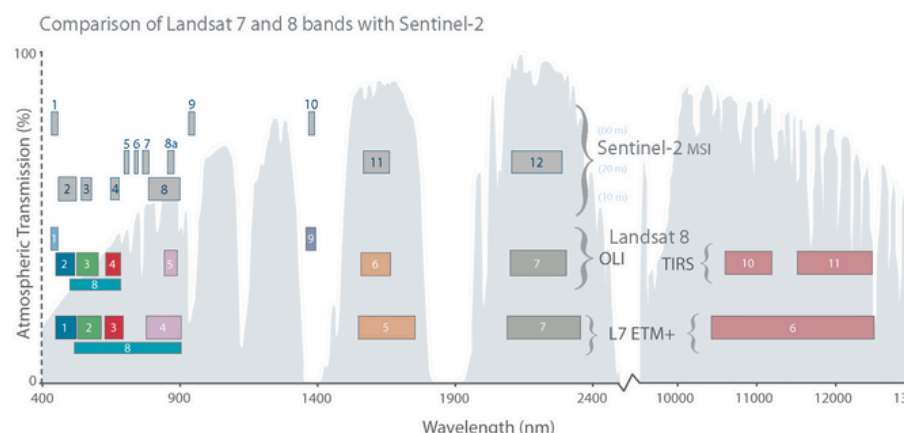
sensitive to chlorophyll, for vegetation stress detection.

### NIR & SWIR bands

useful for biomass, water content, and fire impact studies.

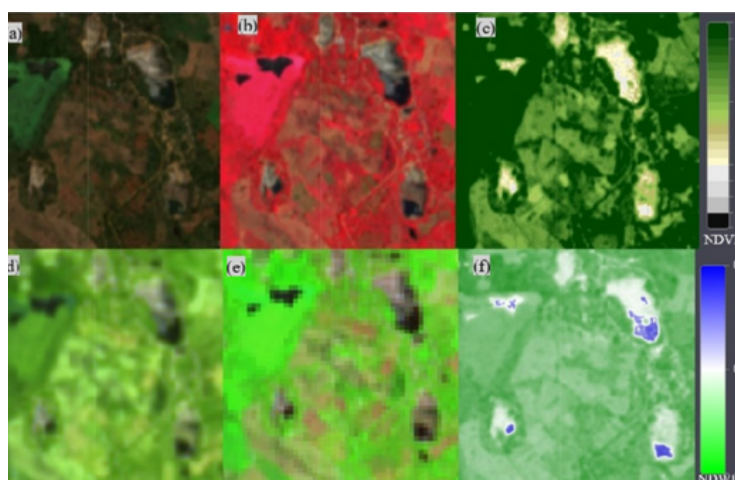
### 10 m resolution

sufficient for stand-level forest mapping.



## Studying Forestry

- Forests are dynamic and require **regular monitoring**.
- Sentinel-2 provides **multi-spectral data** suited to track vegetation health, structure, and extent.
- Key for sustainable management, biodiversity protection, and climate studies.



(a) True colour composite, (b) False colour composite for vegetation detection, (c) NDVI, (d) False color urban composite, (e) SWIR composite, (f) NDWI of sentinel 2 image

## Examples

### Vegetation Height Mapping in Switzerland

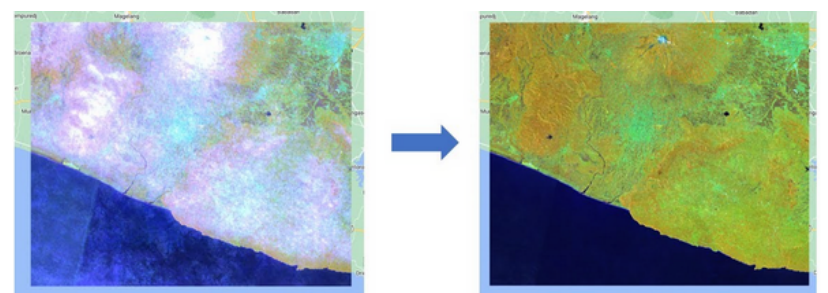
- **Location:** Switzerland
- **Method:** Deep learning-based vegetation height models (VHM)
- **Findings:** Generation of annual vegetation height maps at 10 m resolution, enabling large-scale analysis of forest structure and dynamics.

### Species Classification in the Qilian Mountains

- **Location:** Eastern Qilian Mountains, China
- **Method:** Random Forest classifier
- **Findings:** Effective classification of four tree species (Populus, Betula, Salix, Picea) in complex mountainous terrain, aiding forest management and ecological assessments.

## Challenges

- **Cloud cover** → limits optical data use.
- Mixed pixels in heterogeneous areas reduce accuracy.
- Requires **preprocessing**, e.g. atmospheric correction, cloud masking, geometric correction.
- **Integration** with other sensors (e.g., radar, LiDAR) is often needed for more complete insight.



## References

### Text Sources

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 Would you like me to make it even shorter (just author, year, title, link) so it fits neatly in a small references box on the poster?

### Image Sources

<https://en.wikipedia.org/wiki/Sentinel-2>, [https://www.researchgate.net/figure/a-True-colour-composite-b-False-colour-composite-for-vegetation-detection-c-NDVI\\_fig1\\_357201008](https://www.researchgate.net/figure/a-True-colour-composite-b-False-colour-composite-for-vegetation-detection-c-NDVI_fig1_357201008)  
<https://www.youtube.com/watch?v=mfeS1u8zblE>