

Forest Health Decline

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Description

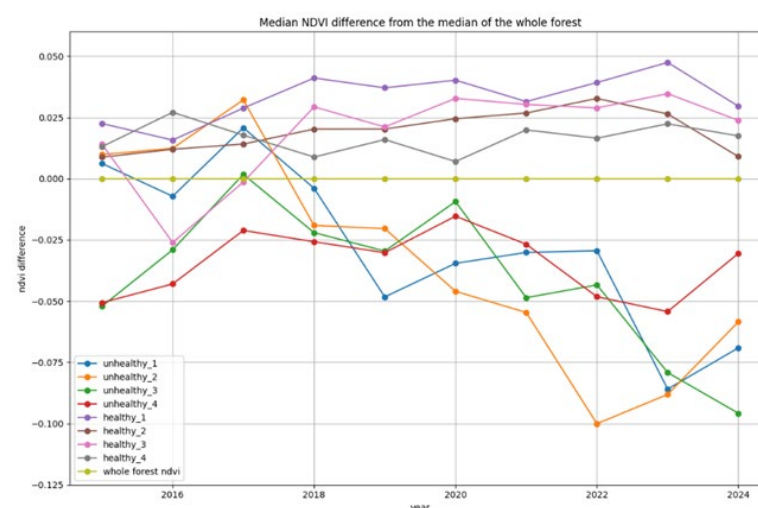
Climate change and disease are increasingly affecting forest ecosystems, leading to rising tree mortality. This project aimed to monitor forest health using Sentinel-2 satellite data by analyzing NDVI (Normalized Difference Vegetation Index) from 2015 to 2024. A LiDAR-derived vegetation mask was used to focus the analysis on forested areas. The goal was to detect early signs of tree stress and validate findings with high-resolution orthophotos.

Process

- Definition of objectives and selection of forest area
- Download and preprocessing of Sentinel-2 images
- Cloud filtering and NDVI calculation
- Application of LiDAR mask to isolate forest pixels
- Anomaly detection (annual and seasonal NDVI changes)
- Visual validation using orthophotos
- Results analysis and reporting

Results

We were able to map and monitor the dead trees.



NDVI differencing to detect dying trees



Dead trees

Discussion : conclusions and outlook

This project demonstrates that Sentinel-2 data and NDVI analysis are effective for monitoring forest health over time. Combining satellite data with LiDAR masking allows scalable and reproducible detection of stress signals. Some limitations include cloud interference and misalignment with orthophotos. Future improvements could include machine learning for tree classification and better co-registration methods. The method provides practical tools for forest managers.