MWP – Young Researcher Abstract 2026

Project title:
Remote Sensing of Solar Induced Chlorophyll Fluorescence for Early Stress Detection of Vegetation Stress and Photosynthetic activities.

Author:
Ameenat Kehinde Adesina

Affiliation:
Swedish University of Agricultural Sciences (SLU).

E-mail:
Ameenat.adesina@slu.se

Abstract (approx. 200 words)**:**

Forests worldwide are facing increasing disturbances from climate change, such as droughts, flooding, and bark beetle outbreaks which can alter forest structure, productivity, and carbon dynamics. To better forecast how these disturbances affect ecosystem resilience, we need more effective ways to monitor forest health. Solar-induced chlorophyll fluorescence (SIF) is a promising optical indicator of photosynthetic status and related stress effects in terrestrial vegetation. Fluorescence Imaging Spectrometer (FLORIS) is a remote sensing tool that tracks vegetation health from the canopy to the ecosystem level. However, detecting stress before physical damage occurs remains a practical challenge. In this study we use the European Space Agency's high-resolution FLORIS imaging spectrometer to measure SIF and detect early-stage tree and vegetation stress. By capturing weak fluorescence signals directly from reflected sunlight, we evaluate SIF as a tool for the large-scale, early detection of bark beetle infestations in Norway Spruce. This approach aims to support sustainable forest management, reduce industrial losses, and clarify how vegetation dynamics connect to broader carbon and water cycles.

Key words:
Stress, Terrestrial Vegetation, SIF, Remote sensing