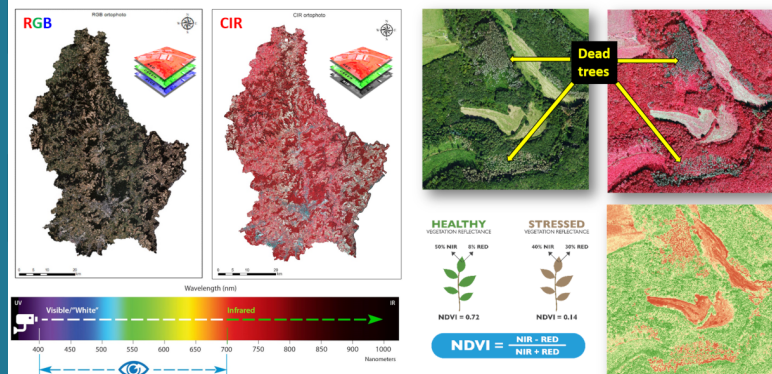


FORFUS-RT3.3

The PhD project on assessing the exposure of forest trees to air pollution is part of the "Forest function under stress" doctoral training unit (FORFUS).

Ortophotomaps: data - RGB and CIR aerial images (2021; 10cm)



This project is part of the doctoral training unit [FORFUS: Forest function under stress](#) and is led by the [Luxembourg Institute of Socio-Economic Research](#).

Inspiration

Air pollution is continuing to rise. It harms human health, crops and species, and will harm forest trees in the coming decades (up to 2040 and beyond). Despite this, the exposure of forest trees to ozone (O₃) and methane (CH₄) has not yet been evaluated in Luxembourg at a fine spatial and temporal scale.

Innovation

The objectives of FORFUS-RT3.3 are: (a) to quantify O₃ and CH₄ across Luxembourg at a very fine spatial (e.g. 100m) and temporal resolution (daily/monthly), (b) to assess the temporal and spatial distribution and identify hotspots of O₃/CH₄ pollution in forested areas across Luxembourg, (c) to create a geospatial database of O₃/CH₄, crops, and (dead) forest trees by combining different complementary sources of information (e.g. remote sensing, satellite imagery, LiDAR, orthophotomaps), and (d) to build a decision support system (Dashboard) to evaluate the exposure of forests to O₃/CH₄ and thereby stakeholders in developing public policies to protect forests.

Impact

The scientific knowledge generated in this project will help identify the exposure of forest trees to air pollution, and overall, the causes of tree death. The understanding and methods developed as part of the project are expected to be useful for similar studies at different sites around the world, in order to provide a policy recommendation (action plan) for mitigating forest exposure to air pollution. In a nutshell, we will contribute to: (a) increasing scientific knowledge by sensing the environment in a new way using mobile-based technology (satellite S5P) and fixed-based sensor network (field work), (b) societal impact by developing a dashboard DSS tool for stakeholders and the research community, and (c) a new data input for the PRIDE-DTU, as well as to the national digital twin initiative.

Partners

Administration de la nature et des forêts (LU) , BOKU (AT) , Center for International Climate Research , Delft University of Technology (NL) , Groupement des Sylviculteurs a.s.b.l (LU) , INRAE (FR) , Luxembourg Institute of Socio-Economic Research (LU) , Musée national d'histoire naturelle Luxembourg , National Institute of Statistics and Economic Studies (LU) , Sapienza University Rome (IT) , Swedish University of Agricultural Sciences (SWE) , The National Institute for Public Health and the Environment (NL) , Université Catholique de Louvain (BE) , University Göttingen (DE) , University of Edinburgh (UK) , University of Naples (IT) , University of Tartu (EE) , University of Trier (DE) , University of Agriculture Krakow (PL) , Ville de Luxembourg , Wageningen University (NL)

Financial Support

Fonds National de la Recherche Luxembourg , Luxembourg Institute of Science and Technology

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