



HYPI

Assessment of isoprene emission by hyperspectral data

Project team: Reinhart Ceulemans, Manuela Balzarolo, Miguel Portillo Estrada, Nicola Arriga, Terenzio Zenone, Luc Bertels, Stephanie Delalieux, Jean-Francois Muller, Martine De Mazière, Trissevgeni Stavrakou, Josep Peñuelas and Iolanda Filella

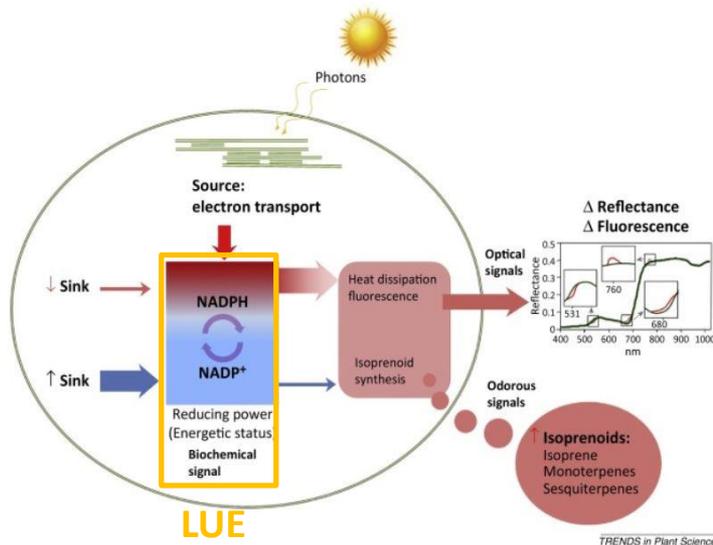
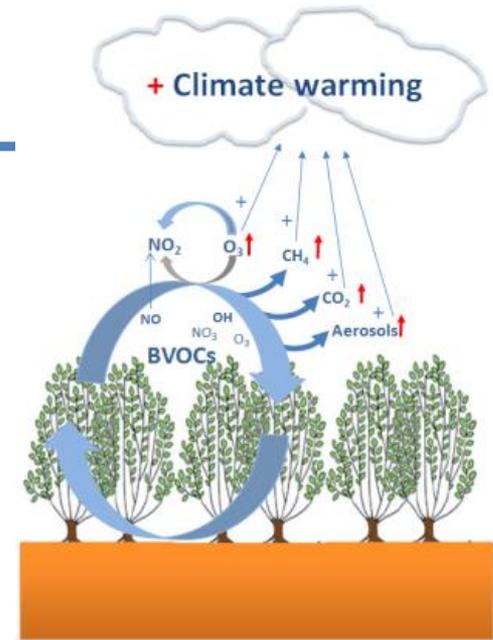


Motivation

Plant isoprene emissions > lead to formation of smog & ozone > contribute to increase global warming

Quantification of isoprene emissions is still uncertain:

- ✓ Few field campaigns at leaf & canopy level
- ✓ Models are based on fixed leaf emission factors



Hypothesis:
Isoprene emissions ⇔ Plant light use efficiency (LUE)

$$PRI = \frac{\rho_{531} - \rho_{570}}{\rho_{531} + \rho_{570}}$$

PRI: Photochemical Reflectance Index
(Gamon et al., 1992)

- To identify the best vegetation index to determine isoprene emissions, with focus on PRI
- To incorporate PRI and/or new vegetation indices into a global emission model (MEGAN*)

Test site: Lochristi poplar plantation

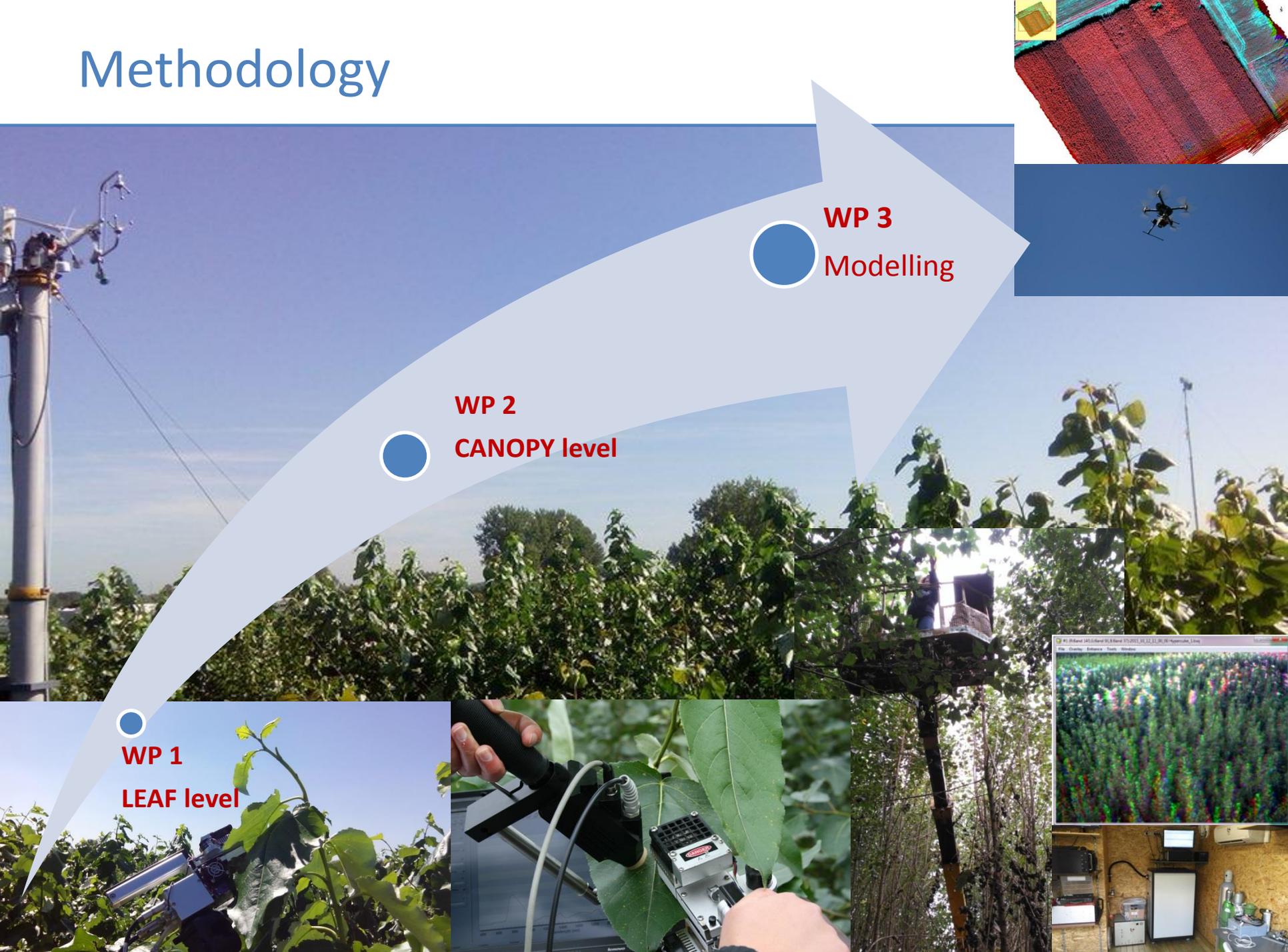
Period: growing season 2016



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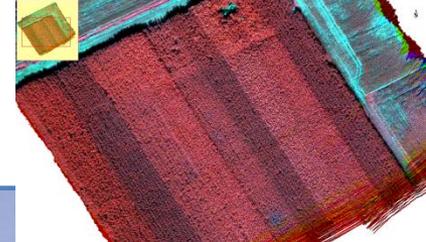
Methodology



WP 1
LEAF level

WP 2
CANOPY level

WP 3
Modelling



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Assessment of Isoprene emission by HYperSpectral data (HYPI)

OVERALL AIM: In the HYPI project we link isoprene flux measurements at leaf and canopy levels to hyperspectral vegetation indices. We aim to demonstrate whether hyperspectral vegetation indices offer the possibility for an improved estimation of the spatial and temporal variability of isoprene emissions of ecosystems.

BACKGROUND: Isoprenoids represent an important class of Biogenic Volatile Organic Compounds (BVOCs). Among plant BVOCs, isoprenoids form the most abundant class, with isoprene representing about half of the total BVOCs emitted globally. The presence of BVOCs, and in particular of isoprene, alters the cycle NO–NO₂–O₃ responsible for O₃ formation - degradation leading to the formation of other secondary pollutants such as peroxyacyl nitrates (PAN's) and particulate matter.

Contact

HYPI project

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www.tinyurl.com/ua-hypi



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Thanks for the attention!

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