



A new method to monitor and define limits of ozone pollution to protect European forests

THE PROBLEM

At present, ozone (O_3) is the greenhouse gas and air pollutant which is most dangerous for forests. The traditional O_3 monitoring system produces limits based on the O_3 concentration in the air (AOT40 index). This is not accurate enough to avoid damage to forests.

The right threshold to protect forests should be based on what is actually uptaken by plants (stomatal O₃ flux).

Must be calculated on the basis of hourly values of environmental variables (e.g. O_3 concentrations, soil moisture, solar radiation, relative humidity, wind, air temperature)



STOMATAL FLUXES

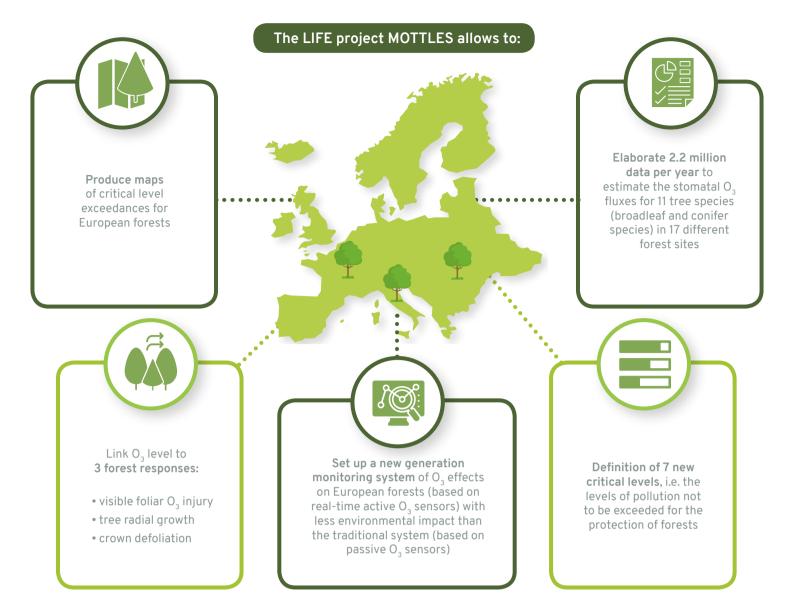
Require an ACTIVE monitoring approach (real-time sensors with 1-h resolution) rather than a PASSIVE approach (long-term sensors with 2-3 week resolution). •



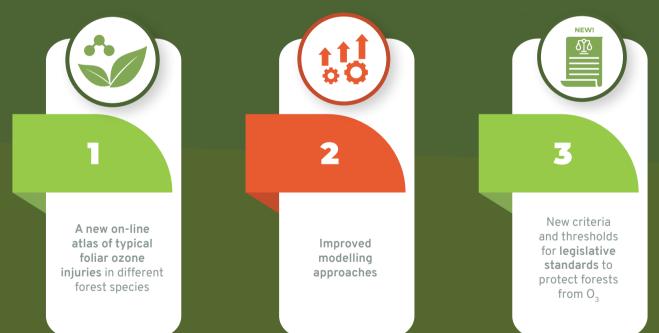
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THE SOLUTIONS

Given that different tree species and environmental conditions have different sensitivity to ozone, the solution is to define the right species-specific PODY, i.e. a Phytotoxic Ozone Dose absorbed into the tree leaves, and accumulated over a species-specific detoxification "Y" threshold.



THE RESULTS



Solid support for EU air quality decision making Contribution of LIFE MOTTLES sites to the NEC implementation (National Emission Ceiling - EU Directive 2016/2284)

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Definition of the best forest response to O₃: visible foliar O₃ injury

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