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OPENEARTH CONFERENCE PROCEEDINGS-ABSTRACTS

Contribution of the planted fields of the lignite center of western Macedonia to climate change mitigation: Dynamic and long-term approaches

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Abstract

Forest plantations generally act as a net sink for CO_2, thus contributing to climate change mitigation by removing atmospheric CO_2 and storing it into different carbon pools (i.e plant biomass, soil, dead organic matter, litter). The accurate estimation of the carbon pools identified by Intergovernmental Panel of Climate Change (IPCC) Good Practice Guidance for Land Use, Land Use Change and Forestry (IPCC-GPG) along with the ecosystem CO_2 fluxes is fundamental for the assessment of tree plantations' contribution to the global carbon cycle. The Lignite Center of Western Macedonia initiated planting activities for restoration purposes in the 80s and nowadays the established tree plantations occupy an area of about 2,000 hectares. The dominant planted species is the black locust (*Robinia pseudoacacia*).

The aim of the COFORMIT project is the estimation of the carbon dioxide assimilation and storage from the plantations of the Lignite Center of Western Macedonia for both long term and dynamic time periods. To this direction, a holistic approach is being used. First, we estimate total carbon in the five carbon sinks (aboveground and belowground biomass, standing and lying dead wood, fallen leaves and soil carbon) by performing a systematic sampling. Moreover, we estimate CO_2 and H_2O fluxes based on micrometeorological methods (eddy covariance technique), as well as remote sensing using field cameras and satellite images.

The five carbon pools will be quantified in a number of already established monitoring plots. The above ground biomass has been estimated by building an allometric model for black locust. Furthermore, its distribution along the planted areas was determined using geostatistics and kriging regression. The belowground biomass will be estimated both by means of direct measuring of excavated root systems in selected trees as well as by indirect calculation by means of applying established allometric equations, based on aboveground tree traits.

The dead wood carbon pool was measured in all monitoring plots used for the aboveground biomass. Moreover, litter traps have been established at 1m above ground and litterfall will be selected on a regular basis during one year. Accumulation of the litter on the forest floor will also be determined by conducting litter sampling

close to the litter traps. Therefore, leaf dry mass per unit of ground area will be estimated. Soil organic C pool will be measured in samples obtained from the upper 60 cm of soil which will be collected close to each litter trap.

The seasonal fluctuation of primary productivity of the studied tree plantations, in terms of CO_2 assimilation, will be assessed with the eddy covariance technique for a six months' period.

Analysis of the main environmental factors' effect, i.e. photosynthetically active radiation (PAR), air temperature and vapour pressure deficit (VPD), on primary productivity will also be performed, in order to assess the way these abiotic parameters affect ecosystem fluxes.

Acknowledgements

Sources of particulate matter pollution in Limassol coast area

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Abstract

The necessity of the present study arises from the frequent and disastrous occurrence of airborne particulate matter (PM) incidents and aims to help reduce their impact on the natural and anthropogenic environment. The specific objective of the present work is to identify, study and assess the degree of PM pollution incidences, with the ultimate aim of preventing and reducing them.

The study is being implemented on the coastal front of Limassol, a developing city in the sensitive Mediterranean region that finds it difficult to follow the EU standards for air quality. Initially, there was a need to identify locations in areas of interest at the coastal front at specific times, showing increased levels of PM concentrations at the three aerodynamic diameters of 10μm, 2,5μm and 1μm (PM_{10}, $PM_{2,5}$ and PM_1). Towards this, outdoor surveys were scheduled using a manual