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Urban park effects on Naples air quality

Gabriele Guidolotti, Emanuele Pallozzi, Corrado Leone, Michele Mattioni, and Carlo Calfapietra
Institute of Agro-Environmental & Forest Biology (CNR-IBAF), National Research Council (CNR), Italy
(guidolotti.job@gmail.com)

The concentration of primary and secondary pollutants strongly affect the air quality of highly anthropic areas. Urban parks are living systems integrated in these anthropic areas where they provide several environmental services such as carbon sequestration, regulation of microclimatic conditions, and the absorption of air pollutants. The main consequence is the effect on local air quality and thus the improvement of the urban environment. Despite their importance, experimental sites monitoring trace gases fluxes in these ecosystems are still scarce.
We take advantage of an innovative eddy-covariance (EC) station the "Real Bosco di Capodimonte", a large urban park within the large city of Naples in Italy, to quantify its effects on the local air quality. The site is mainly composed by Quercus ilex and meadow areas and equipped with the state of the art to measure the exchange of CO_2, H_2O, CH4, O_3, PM and NO_x by means of EC technique.
Results demonstrate that, despite the large amount of carbon released from the residential area around the site, the vegetation of the Capodimonte Park can buffer and offset these carbon losses. In addition, our results suggest that trace gas fluxes are affected by park spatial variability, especially because of the gradient between meadow and forest, and by the seasonality highlighting the role of physiological status of the vegetation.
Finally, the concurrent measurement of many pollutants fluxes resulted fundamental to better understand the biosphere atmosphere interactions and the resulting effects of urban green forest on urban air quality and on the citizens' quality of life.