

GC43B-03 Seasonal Variability of Carbon, Water and Energy Fluxes in a University Campus in Ciudad Juarez, Mexico

 Thursday, 14 December 2023

 14:30 - 14:40

 2006 - West (Level 2, West, MC)

Abstract

Urbanization-related surface changes have a significant impact on surface-atmosphere interactions, primarily because natural materials are substituted with higher thermal and impermeability capacities, and there is an imbalance between the sources and sinks of matter and energy. We examine the seasonal variability of carbon, water, and energy fluxes on a university campus in Ciudad Juarez, Mexico (MX-lit: Instituto de Ingenieria y Tecnologia – UACJ), in order to comprehend the dynamics of fluxes in urban ecosystems. An Eddy Covariance system that was deployed at a total height of 22 m was used to measure fluxes between January 2020 and October 2023. Diurnal cycles and daily values of fluxes for the whole study period and all four seasons were also acquired. The high natural gas consumption throughout the cold seasons (autumn and winter) led to positive values (emission) of FC and low values of heat fluxes, which dominated the flux behavior during those times. In contrast, significant levels of energy fluxes were observed during warm seasons (spring and summer), not only because of the rise in temperature but also because of the rise in water fluxes brought on by the greening of the vegetation and the continuous irrigation of green areas. The latter resulted in extended periods during which vegetative activity was able to offset carbon emissions, especially during seasons when anthropogenic activity was at a minimum. Emissions at the location decreased while the area was under lockdown in 2021 because to the COVID-19 epidemic. The findings in this urban ecosystem demonstrate a combined effect of anthropogenic and natural factors on the dynamics of fluxes, as well as a significant impact of the COVID-19 pandemic; however, longer-term data are required to identify distinct patterns of behavior and elucidate the factors that primarily

influence fluxes.

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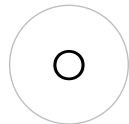
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