# Article information:

Large and seasonally varying biospheric CO2 fluxes in the Los Angeles megacity revealed by atmospheric radiocarbon | PNAS
<https://www.pnas.org/doi/full/10.1073/pnas.2005253117>

# Article summary:

1. Measurements of CO2 and 14CO2 in air around Los Angeles reveal a significant and seasonally varying contribution of CO2 from the urban biosphere, which is likely originating from urban vegetation.

2. The urban biospheric component is a source in winter and a sink in summer, with an estimated amplitude of 4.3 parts per million (ppm), equivalent to 33% of the observed annual mean fossil fuel contribution of 13 ppm.

3. The presence of a large and seasonally varying biospheric signal even in the relatively dry climate of Los Angeles implies that atmospheric estimates of fossil fuel–CO2 emissions in other, potentially wetter, urban areas will be biased in the absence of reliable methods to separate fossil and biogenic CO2.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Large and seasonally varying biospheric CO2 fluxes in the Los Angeles megacity revealed by atmospheric radiocarbon" published in PNAS provides insights into the contribution of urban biospheric CO2 to the carbon budget of Los Angeles. The study uses measurements of CO2 and 14CO2 to distinguish between biogenic and fossil fuel contributions to observed CO2 enhancements above background. The findings suggest that even for highly urbanized and arid environments such as Los Angeles, the managed urban biosphere contributes significantly to the local carbon budget.

The article highlights the need to understand and quantify urban biospheric CO2 in order to more accurately measure and track fossil fuel–CO2 emissions and the impact of urban greening campaigns, as needed to evaluate and optimize emissions mitigation strategies. However, there are some potential biases in the study that need consideration.

One potential bias is that the study only focuses on one megacity, Los Angeles, which may not be representative of other megacities with different environmental conditions. Additionally, while the study suggests that managed urban water use drives the observed biospheric signal, it does not consider other factors such as land use changes or air pollution that may also affect urban vegetation.

Furthermore, while the study acknowledges that top-down estimates may be subject to systematic errors in atmospheric transport, it does not explore potential sources of error or uncertainty in their own measurements. Additionally, there is no discussion on how these findings could be used to inform policy decisions or mitigate carbon emissions.

Overall, while this study provides valuable insights into urban biospheric CO2 fluxes in Los Angeles, further research is needed to determine if these findings can be generalized across other megacities with different environmental conditions. Additionally, more consideration should be given to potential sources of error or uncertainty in measurements and how these findings can inform policy decisions related to carbon emissions mitigation.

# Topics for further research:

* Factors affecting urban vegetation in megacities
* Land use changes and urban biospheric CO2 fluxes
* Air pollution and urban biospheric CO2 fluxes
* Sources of error in atmospheric transport measurements
* Policy decisions related to carbon emissions mitigation in megacities
* Generalizability of urban biospheric CO2 flux findings to other megacities

# Report location:

<https://www.fullpicture.app/item/fcf343a3260a17118d008a77d382d73e>