



How much CO₂ is taken up by the European terrestrial biosphere?

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Europe covers an area of approximately $1.0 \cdot 10^{13} \text{m}^2$ from the Atlantic to the Urals and is in large parts covered by active vegetation. This makes its biosphere a potentially important contributor to the global carbon cycle so that reliable estimates of the European carbon sink are relevant for climate projections, emission trading, and international climate negotiations.

The conventional and established methods estimate that $0.40 \pm 0.42 \text{ GtC/a}$ or less are absorbed by Europe's vegetation. These methods rely on in situ measurements of atmospheric CO₂ concentrations on the one hand and on bottom up estimates of surface carbon fluxes obtained from field measurements on the other hand.

In contrast to this, inversions of atmospheric CO₂ concentrations obtained from satellite near and thermal infrared data indicate that the European carbon sink could be considerably larger. This hypothesis is supported by a recent estimate of above ground biomass carbon (ABC) obtained from passive microwave satellite measurements.

In other words, there is currently no consensus on how much CO₂ is taken up by the European terrestrial biosphere and discrepancies between the different estimates are poorly understood.

We will summarize and compare estimates of the European carbon sink of various disciplines published in the peer reviewed literature. As a new aspect, this comparison will include trends of microwave remotely sensed ABC measurements. Finally, we will outline future cross-disciplinary efforts that are needed to come to a commonly accepted estimate.