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Seasonal and Interannual Variability of Australian Carbon Fluxes Seen by GOSAT

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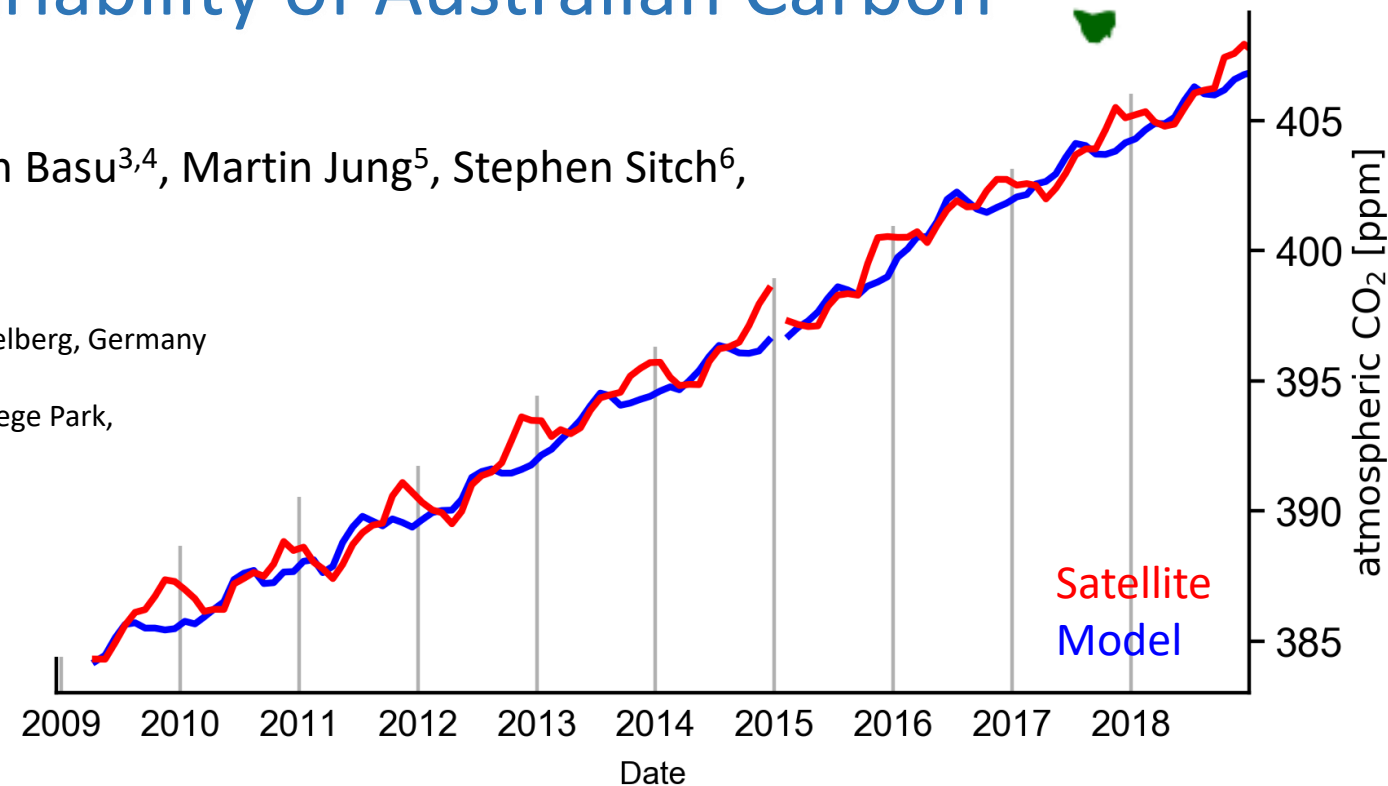
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Satellite data reveals enhanced atmospheric CO₂ concentrations caused by CO₂ emission pulses



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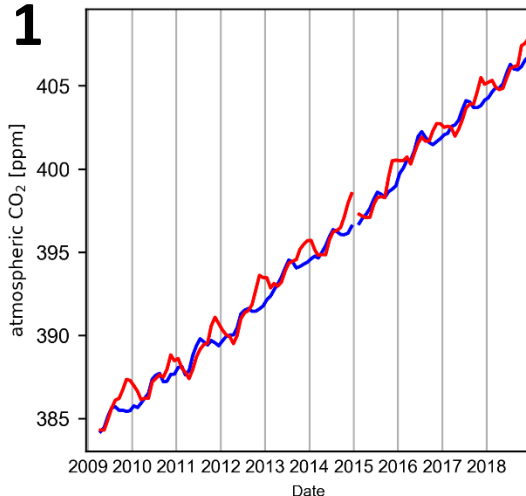


CO₂ concentrations

Atmospheric inverse model

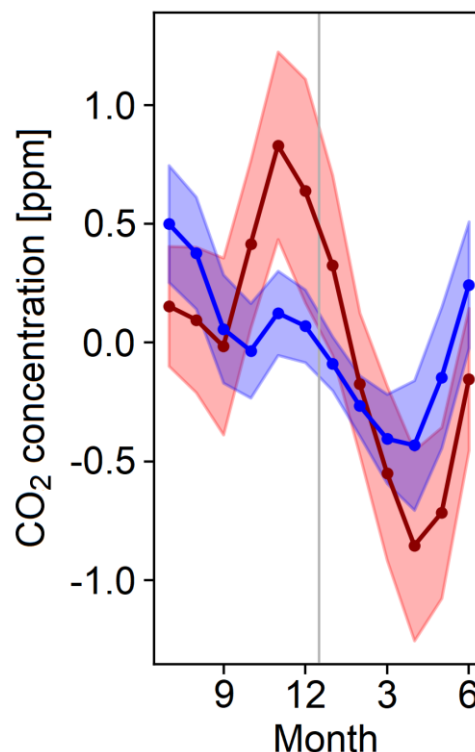
CO₂ fluxes

1



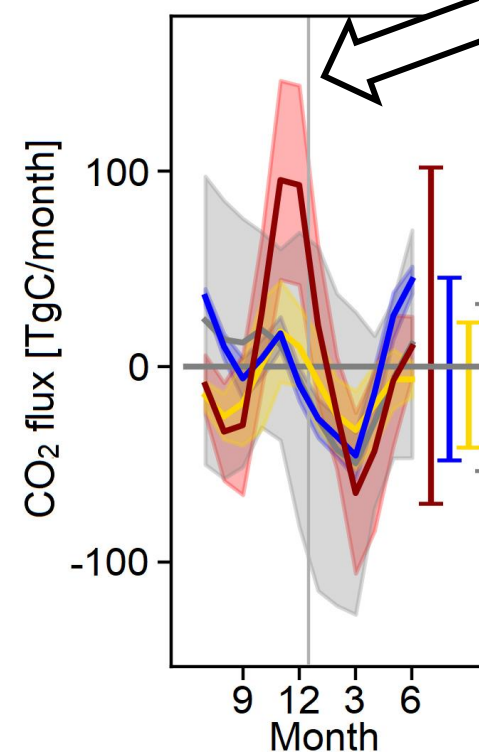
GOSAT Satellite shows enhanced CO₂ concentration compared to **in-situ based inverse models** at the end of the year.

Mean seasonal cycle



2

Mean seasonal cycle



Large CO₂ emissions: are shown by: **satellite based CO₂ fluxes** but - not captured by: **In-situ based inverse models** **Machine learning approaches FLUXCOM** and the mean **TRENDY** ensemble of dynamic global vegetation models.



Respiration followed by delayed GPP causes emission pulse



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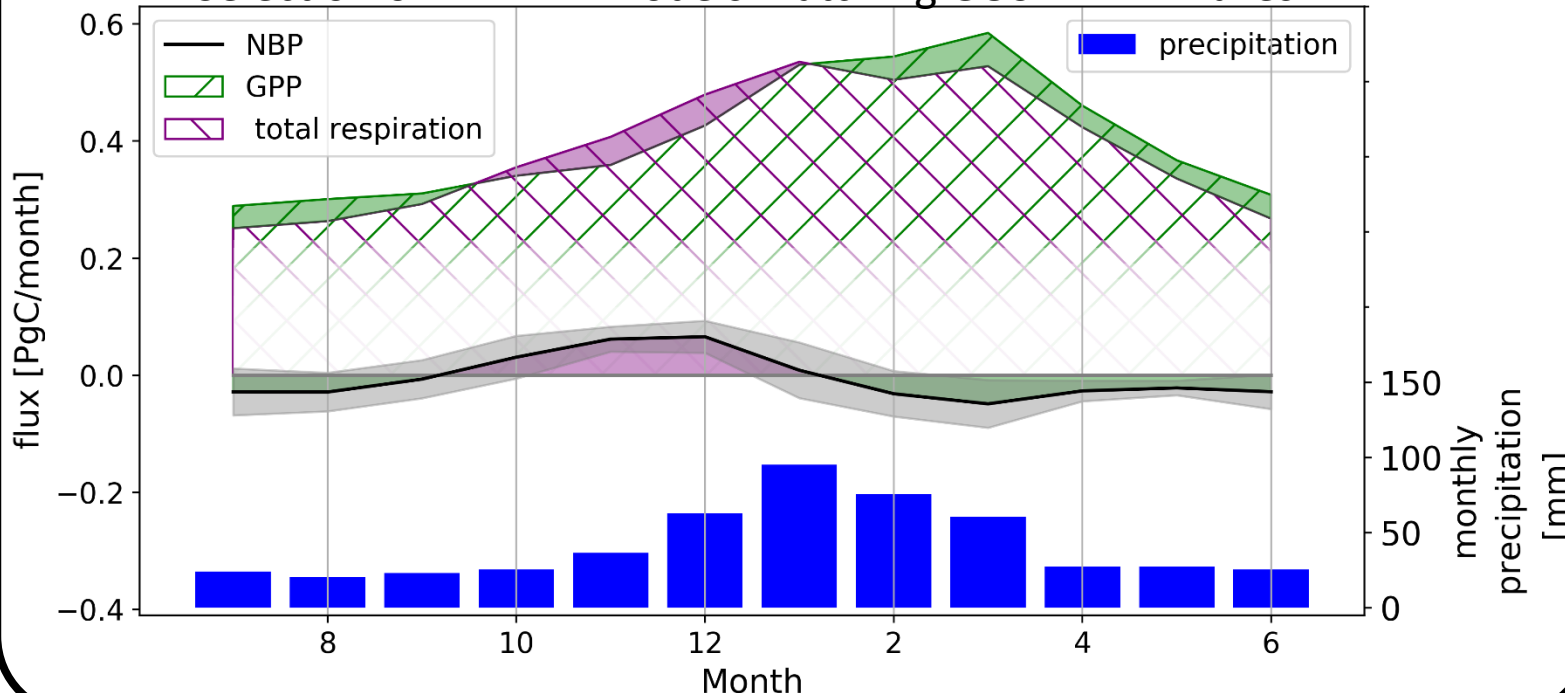
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Net Biome Productivity (NBP)

= Emissions - Uptake

≈ Respiration - Gross Primary Productivity (GPP)

Selection of TRENDY models matching GOSAT NBP fluxes



Summary:

- GOSAT shows enhanced CO₂ concentrations and emission pulse at the end of the dry-season over Australia
- Models do not capture the magnitude of these variations



Satellite CO₂ data combined with inverse modelling helps to better constrain land-atmosphere CO₂ fluxes in Australia

For any questions or a meet-up at the EGU contact me.