

Net Zero

<https://www.beefcentral.com/wp-content/uploads/2022/05/Australia-is-already-a-net-zero-CO2-emitter-thanks-to-our-forests-and-rangelands-2.pdf>

Update (26 July 2023): Additional citation & data inserted in Table 1 from the Beef Central essay linked above

Table 1. Natural CO₂ flux (withdrawal from the atmosphere above the Australian land mass – expressed in common units (Mt CO₂-e/year)) and based on retrievals from three different satellite platforms, combined with inversion procedures [See reference links for methods and attributed uncertainty estimates].

<u>Reference</u>	<u>GOSAT</u>	<u>OCO-2</u>	<u>TanSat</u>	<u>Retrieval Year</u>
Detmers et al. 2015*	770	-	-	2010-11
Wang et al. 2019	958	806	-	2015
Villalobos et al. 2021	-	1500	-	2015
Chevallier et al. 2019	-	697	-	2017
Yang et al. 2021	-	205**	770	2017-18

GRAND MEAN (over all retrieval platforms and sampling years, n=7) ≈ 815 Mt CO₂-e /year***

*The flux is from the 2017 corrected version of this paper. See:

<https://doi.org/10.1002/2015GL065161>

**See Table 1 in the Beef Central essay for possible reasons for this seemingly low value.

***Mean fossil fuel/cement manufacturing emissions for the retrieval years cited approximated 447 Mt CO₂-e/year. This results in the continent being a **net sink** of 815 – 447 = **368** Mt CO₂-e/year, well in excess of current reporting which claims Australia is a net emissions source.

[Digital hyperlinks for the above references (except for Villalobos et.al. 2021) can be found in the Beef Central essay. Link for the Villalobos paper: <https://doi.org/10.5194/acp-21-17453-2021>; [All reference links cited here were accessible on 15 Jun 2023]

Some known additional[#] carbon sinks in Australia's 'pristine' grasslands and 'intact' open woodlands

[[#]These sinks are **additional** to what was present in all remnant vegetation communities when Europeans first arrived in these lands. If this is not the case then the accumulating carbon store in the so-called remnant communities would be suggestive of an infinite biomass potential – Jack's beanstalk? And while it has been claimed that the increasing land

sinks are solely due to vegetation recovery following widespread droughts, many examples of increasing carbon store over monitoring periods that encompass both wet & dry periods (La Niña & El Niño years) are extant for these communities. Likewise the range science literature is replete with examples of fence-line contrasts where vegetation growing under similar rainfall, the same atmospheric CO₂ concentrations and on 'identical' soil types & topography is notably different in structure and/or composition either side of the fence. i.e. vegetation on both sides of the fence are responding differently to different **management** impacts, while conditions for plant growth are more or less the same on either side of the fence!].

Consider:

1. Mitchell grasslands – invaded by gidgee (e.g. 'Strathdarr', Longreach and by Prickly Acacia in the Richmond, Winton and Barcaldine districts
2. Mitchell and Bluegrass downs invaded by blackwood, gidgee and boree on Moorinya National Park [established to preserve the most eastern extent of Mitchell grasslands (from invading native *Acacia* trees!)]].
3. Cape York grasslands – variously invaded in modern times by ti-tree and rainforest.
4. Patchy Plain Brigalow – invading/thickening/coalescing clumps in Bauhinia Downs area (analogously at 'South Terrick', SW of Blackall).
5. Open woodland invaded by INS (invasive native species) in the Cobar-Byrock area of NSW (Royal Commission 1901)
6. Thickening of the Pilliga scrub in NSW (Eric Rolls (1981) 'A million wild acres')
7. Thickening and invasion of White Cypress Pine in NSW and southern Queensland (Binnington, K. (1997). Australian Forest Profiles 6. White Cypress Pine.)
8. The disappearing grassy balds of the Bunya Mountains – Fensham
9. Thickening mulga – Boatman & Thrushton N.P. (Rosemary Purdie)
10. Invasion of trees into the grasslands of the VRD, NT (Darrell Lewis – 'Slower than the eye can see').

[Citable references are available for all 10 examples of tree-shrub thickening listed here].

Bill Burrows (26 July 2023)