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## Reconciling ice core CO<sub>2</sub> and land-use change following New World-Old World contact

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Ice core records of carbon dioxide (CO<sub>2</sub>) over the last 2000 years are critical to our understanding of global carbon cycle dynamics on centennial and multidecadal timescales. They also provide context for the unprecedented anthropogenic rise in atmospheric CO<sub>2</sub>. Yet for some time intervals throughout the period, the true atmospheric history of CO<sub>2</sub> remains uncertain. One such example is the decrease in atmospheric CO<sub>2</sub> after 1550 CE, for which the timing and magnitude is debated. To resolve this case, we measure CO<sub>2</sub> and methane (CH<sub>4</sub>) in the new Skytrain Ice Rise ice core from 1450 to 1700 CE, presented alongside firn smoothing analysis and land carbon modelling. Our results suggest that a sudden decrease in ice core CO<sub>2</sub> around 1610 CE in one widely used record is most likely an artefact of a small number of anomalously low values. Instead, we observe a more gradual decrease in CO<sub>2</sub>, with our analysis suggesting 0.5 ppm per decade between 1516 and 1670 CE. The resulting inferred land carbon sink of 2.6 PgC per decade agrees with modelled scenarios of large-scale reorganization of land use in the Americas following New World-Old World contact, for which a larger and more rapid CO<sub>2</sub> decrease is incompatible.