

A temporal comparison of ice core and boron isotope records of atmospheric CO₂

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Ice core records of past CO₂ span the last 800,000 years in a continuous fashion, and within the last 2 million years through discontinuous snapshots of ‘blue ice’. Marine records comprising boron isotope ratios from planktic foraminifera have the proven potential to substitute for direct measurements of ice trapped CO₂ in the geological past, and have especially powerful resolving power in the Pleistocene. Here we explore the comparison of existing ice core, and multiple sites of δ¹¹B-derived records of past CO₂, both where they co-exist in the latest Pleistocene but also exploring potential implications arising from this close comparison – in particular over the interval of the discontinuous ‘blue ice’. Marine records are capable of providing high fidelity reconstructions of pH and therefore atmospheric CO₂, and they can add much needed context and information on the mechanisms of CO₂ change when and where they diverge from the atmosphere. There is much to be learned via the extensive proxy-training period with the ice core interval, and we apply these lessons over existing Pleistocene records.