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Methane source reconstructions for the last 300 years from Law Dome δ13CH4 and their relation to past climate

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The ratio of stable carbon isotopes in methane (δ13CH4) constrains the relative magnitudes of different methane source and sink types. Using the Law Dome δ13CH4 ice core record and published reconstructions of historic anthropogenic methane emissions (EDGAR-HYDE) we specifically model the natural variability of biogenic versus pyrogenic methane sources since 1700 C.E. In order to examine the influence of short-term climate variability on these sources, we quantify our findings against maps of proxie-based global temperature reconstructions to identify crucial regions for methane production. Independent δ13CH4 data from Mount Erebus Saddle, Ross Island, Antarctica, are used to verify the variability observed in the Law Dome record.