

**General response to revisions:** I think that M. Menoud and co-authors have done a thorough job responding to my suggestions and edits. I appreciate the additions to the methods, which help clarify the results later on, and provide relevant analytical uncertainty. The extra keeling plot table is helpful, as is the wind direction in the Miller-Tans analysis (though see comment below about the axes labels). I think that the verbiage in discussing isotopes needs a bit more cleaning up (see “enriched” and “depleted” comments below), but overall the edits have made for a paper that is easier to understand and follow. I have a few more suggestions for edits below, but this is almost ready for publication and will be well received.

**Text:**

L6: “to the east”?

L25: gases not gasses, here and throughout.

See <https://writingexplained.org/gases-or-gasses-difference>

L111: “filled with air with ...” is a bit awkward

L113: delete the “of” in “measurements is of 16 ppb”

L171: see comment about the equation for miller-tans plots in the figures section

L180: there is a redundant phrase in here

L182: standard deviation \*was\* lower

L262: “Depleted and enriched: I wasn’t clear enough in my suggestion as to the use of “Depleted” and ‘enriched”. You’re not supposed to use the words without defining the isotope specifically (see Coplen 2011 reference below). So, instead of saying “microbial sources are more depleted than thermogenic ones” you need to say “microbial sources are more depleted in <sup>13</sup>C than thermogenic ones”. If it is clear that you’re talking about carbon isotopes, you could say “microbial sources are more depleted in the heavy isotope than thermogenic ones”. With all of your discussions, it might start to feel wordy, in which case you can talk about delta values being more negative or positive. Please fix these throughout your text. For instance,

L356: not only \*do\*

L373: “shifted toward values more depleted in heavy isotopes” or “shifted toward more negative values”

Coplen, T. B. (2011). Guidelines and recommended terms for expression of stable-isotope-ratio and gas-ratio measurement results. *Rapid communications in mass spectrometry*, 25(17), 2538-2560.

L315: Of the CH<sub>4</sub> peaks, 40.5 % were more enriched in <sup>13</sup>C than the background values of -47.8 ‰.

L451: “The wind directions pointed toward Silesian mines” might confuse your readers ..

L457: Is dD=-225 Galkowski’s value? Please clarify

L457: “helps constrain”

**Figures:**

Figure S2: Legend should say fall and winter.

Figure S5: I like this analysis. But, I just want to make sure I understand you correctly – do you subtract a background? As I understand it, the equation for MT plots is

$$(d_{\text{obs}} * C_{\text{obs}}) - (d_{\text{bg}} * C_{\text{bg}}) = d_s (C_{\text{obs}} - C_{\text{bg}})$$

(where d=delta)

I assume that you are doing this right, but if so, your Y axis would be  $(d_{\text{obs}} * C_{\text{obs}}) - (d_{\text{bg}} * C_{\text{bg}})$  and your x axis would be  $(C_{\text{obs}} - C_{\text{bg}})$ .

Figure S6. I like the improvements – seems more clear. I don’t see a label for the triangle – are you still plotting by date?

Table S1: Thanks for showing the original data. Why do you have negative r<sup>2</sup> values? Also, there is a typo in the title: “This happens when the sampled source and background δ<sup>13</sup>C values \*are\* very close, so that the slope of the fit line is close to 0.”