

CORRIGENDUM

Corrigendum to “A Three End-member Mixing Model Based on Isotopic Composition and Elemental Ratio”

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Liu and Kao (2007) reported on a three end-member mixing model based on nitrogen isotopic composition and organic carbon to nitrogen ratio of suspended particulate matter in an aquatic environment. The calculation was based on the following two mass balance equations:

$$r = f_1 r_1 + f_2 r_2 + f_3 r_3 \quad (1)$$

$$\delta = f_1 \delta_1 + f_2 \delta_2 + f_3 \delta_3 \quad (2)$$

where r is the C/N atomic ratio, δ is the $\delta^{15}\text{N}$ value of the suspended particulate matter and f is the fraction of each end member, denoted by the numerals 1, 2, and 3, respectively. The end-member fractions fulfill the following mathematical condition by definition:

$$1 = f_1 + f_2 + f_3 \quad (3)$$

The fractions may then be determined by solving the set of simultaneous equations, Eqs. (1) - (3). In the original report, the following results were presented:

$$f_1 = [Q(r - r_2) - (\delta - \delta_2)] / [r(r_3 - r_2) - (\delta_3 - \delta_2)] \quad (4)$$

$$f_3 = (\delta - \delta_2) / (\delta_1 - \delta_2) - f_1(\delta_3 - \delta_2) / (\delta_1 - \delta_2) \quad (5)$$

$$f_2 = 1 - f_1 - f_3 \quad (6)$$

The parameter, Q , is defined as follows:

$$Q = (\delta_1 - \delta_2) / (r_1 - r_2) \quad (7)$$

Unfortunately there are errors in Eqs. (4) and (5) which should be replaced by the following:

$$f_3 = [Q(r - r_2) - (\delta - \delta_2)] / [Q(r_3 - r_2) - (\delta_3 - \delta_2)] \quad (4')$$

$$f_1 = (\delta - \delta_2) / (\delta_1 - \delta_2) - f_3(\delta_3 - \delta_2) / (\delta_1 - \delta_2) \quad (5')$$

Equation (4') may be expanded by substituting Q with the relationship expressed in Eq. (7) yielding the following relationship:

$$f_3 = [(\delta_1 - \delta_2)(r - r_2) - (\delta - \delta_2)(r_1 - r_2)] / [(\delta_1 - \delta_2)(r_3 - r_2) - (\delta_3 - \delta_2)(r_1 - r_2)] \quad (4'')$$

These equations were checked for validity using numerical tests.

REFERENCES

Liu, K. K. and S. J. Kao, 2007: A three end-member mixing model based on isotopic composition and elemental ratio. *Terr. Atmos. Ocean. Sci.*, **18**, 1067-1075.

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