

The error of equation (viii) derived in our comment is:

$$\frac{\sigma_{C_{stock}}^2}{C_{stock}^2} = \frac{\sigma_{C_{content,fine}}^2}{C_{content,fine}^2} + \frac{\sigma_{Mass\ proportion_{Rock}}^2}{Mass\ proportion_{Rock}^2} + \frac{\sigma_{\rho_{Sample}}^2}{\rho_{Sample}^2} + \frac{\sigma_{Depth}^2}{Depth^2}$$

With $Mass\ proportion_{Rock} = \frac{Mass_{Rock}}{Mass_{Sample}}$ and $\rho_{Sample} = \frac{Mass_{Sample}}{Volume_{Sample}}$ we obtain:

$$= \frac{\sigma_{C_{content,fine}}^2}{C_{content,fine}^2} + \frac{\sigma_{Mass_{Rock}}^2}{Mass_{Rock}^2} + 2 \frac{\sigma_{Mass_{Sample}}^2}{Mass_{Sample}^2} + \frac{\sigma_{Volume_{Sample}}^2}{Volume_{Sample}^2} + \frac{\sigma_{Depth}^2}{Depth^2}$$

The error of M4 in Poeplau et al. is:

$$\frac{\sigma_{C_{stock}}^2}{C_{stock}^2} = \frac{\sigma_{C_{content,fine}}^2}{C_{content,fine}^2} + \frac{\sigma_{Volume\ proportion_{Rock}}^2}{Volume\ proportion_{Rock}^2} + \frac{\sigma_{\rho_{fine}}^2}{\rho_{fine}^2} + \frac{\sigma_{Depth}^2}{Depth^2}$$

Using the equation 3 in Poeplau et al. for ρ_{fine} and with $Volume\ proportion_{Rock} = \frac{Volume_{Rock}}{Volume_{Sample}}$

we obtain:

$$\begin{aligned} &= \frac{\sigma_{C_{content,fine}}^2}{C_{content,fine}^2} + \frac{\sigma_{Volume_{Rock}}^2}{Volume_{Rock}^2} + \frac{\sigma_{Volume_{Sample}}^2}{Volume_{Sample}^2} + \frac{\sigma_{Mass_{Sample}}^2}{Mass_{Sample}^2} + \frac{\sigma_{Volume_{Sample}}^2}{Volume_{Sample}^2} \\ &\quad + 2 \frac{\sigma_{Mass_{Rock}}^2}{Mass_{Rock}^2} + \frac{\sigma_{\rho_{Rock}}^2}{\rho_{Rock}^2} + \frac{\sigma_{Depth}^2}{Depth^2} \end{aligned}$$

With $\rho_{Rock} = \frac{Mass_{Rock}}{Volume_{Rock}}$ the error of M4 in Poeplau et al. is therefore:

$$= \frac{\sigma_{C_{content,fine}}^2}{C_{content,fine}^2} + 2 \frac{\sigma_{Volume_{Rock}}^2}{Volume_{Rock}^2} + 2 \frac{\sigma_{Volume_{Sample}}^2}{Volume_{Sample}^2} + \frac{\sigma_{Mass_{Sample}}^2}{Mass_{Sample}^2} + 3 \frac{\sigma_{Mass_{Rock}}^2}{Mass_{Rock}^2} + \frac{\sigma_{Depth}^2}{Depth^2}$$

Therefore, there are extra and more numerous errors associated with the Poeplau M4 than with equation (viii).