AWC calculated using pedotransfer functions of Saxton & Rawls (2006)

Available water capacity (AWC) was derived from volumetric water contents at field capacity (θ_{33}) and permanent wilting point (θ_{1500}), both estimated using the pedotransfer functions of Saxton and Rawls (2006). The implementation is provided in Supplementary Material (script C12 + C13 + C14) -> https://github.com/knierzy/cantor_grids

(1) *Field capacity (33 kPa)*

$$\theta_{33} = -0.251 \cdot Sand + 0.195 \cdot Clay + 0.011 \cdot OM + 0.006 \cdot (Sand \cdot OM) - 0.027 (Clay \cdot OM) + 0.452 \cdot (Sand \cdot Clay) + 0.299$$

(2) *Non-linear correction*

$$\theta_{33} = \theta_{33} + (1.283\theta_{33}^{2} - 0.374\theta_{33} - 0.015)$$

(3) *Wilting point (1500 kPa):*

$$\theta_{1500} = 0.024 \cdot Sand + 0.487 \cdot Clay + 0.006 \cdot OM + 0.005 \cdot (Sand \cdot OM) - 0.013(Clay \cdot OM) + 0.068 \cdot (Sand \cdot Clay) + 0.031$$

(4) *Non-linear correction*

$$\theta_{1500} = \theta_{1500} + (0.14\theta_{1500} - 0.02)$$

(5) *Available Water Capacity (AWC)*

$$\mathrm{AWC} = \max(\theta_{33} - \theta_{1500}, 0) \cdot 100$$

References

Saxton, K.E., Rawls, W.J., 2006. Soil water characteristic estimates by texture and organic matter for hydrologic solutions. Soil Science Society of America Journal 70, 1569–1578. https://doi.org/10.2136/sssaj2005.0117