Estimation of groundwater recharge using water balance coupled with base-flow-record estimation and stable-base-flow analysis

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Unfortunately, the right column of page 76 contained two inadequate citations about references to Szilagyi et al. (2003). The manuscript is given correctly below.

Baseflow (Q_b) is obtained by employed the base-flow-record estimation and the stable-base-flow analysis. As a consequence, the drainage area value of the gauging station is used for the calculation of N , and Eq. 2 is employed through the introduction of the dimensionless base-flow index (BFI), which is the ratio of baseflow and total stream runoff ($Q = Q_b + Q_s$) over time:

$$\text{BFI} = \frac{Q_b}{Q_b + Q_s}. \quad (4)$$

Inserting Eq. 4 into Eq. 2 yields the following equation from Szilagyi et al. (2003):

$$\text{BFI} \times (P - ET) = \text{BFI} \times q = q_b \approx R, \quad (5)$$

where R (LT^{-1}) is the yet unknown groundwater recharge, and $q = Q/A_d$, with A_d denoting the contributing drainage area. Szilagyi et al. (2003) mentioned that the base-flow separation technique is only used to calculate BFI, but neither q nor q_b were used in Eq. 5, because they require the extent of the contributing drainage area, A_d , whereas BFI does not. When the two contributing areas for surface runoff and groundwater are known to be fairly close, then q can be used in Eq. 5, eliminating the need for the P and ET measurements.

Reference

Szilagyi J, Harvey FE, Ayers JF (2003) Regional estimation of base recharge to ground water using water balance and a base-flow index. *Ground Water* 41:504–513

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