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Errata

The authors regret that errors in the equations in the original manuscripts of two papers published in previous issues of HESS escaped detection at the proof stage so the following Errata should be consulted in using these papers.

Wade, A.J., Durand, P., Beaujouan, V., Wessel,W.W., Raat, K.J., Whitehead, P.G., Butterfield, D., Rankinen,K. and Lepisto, A., 2002a. A nitrogen model for European catchments:INCA. new model structure and equations. *Hydrol. Earth Syst. Sci.* **6**, 559–582.

1. Table 3. The symbol for the Base Flow Index is β.

2. Table 4. The unit of soil temperature is degrees-centigrade, (°C).

3. Table 5. The in-stream nitrification rate is parameter, C_{10}

4. Table 5. The in-stream denitrification rate is parameter, C_{11}.

5. Eqn. (8) should read

$$\frac{dx_5}{dt} = U_3.100 - \frac{x_1 x_5.86400}{V_r + x_{11}} - C_7 S_1 S_2 \frac{x_5}{V_r + x_{11}} 10^6 - C_4 S_1 \frac{x_5}{V_r + x_{11}} 10^6 + C_5 S_1 100 - C_6 S_1 \frac{x_5}{V_r + x_{11}} 10^6$$

6. Eqn. (16) should read

$$\text{Immobilisation} = -C_6 S_1 \frac{x_5}{V_r + x_{11}} 10^6$$

7. Eqn. (17) should read

$$\text{Denitrification} = -C_1 S_1 \frac{x_3}{V_r + x_{11}} 10^6$$

8. Appendix B should read

Instream component: equations to track the water volume and N mass balance

Change in NO_3 mass input into reach, x_{25} (kg N)

$$\frac{dx_{25}}{dt} = S_5 \qquad \text{(B.1)}$$

Change in NH_4 mass input into reach, x_{26} (kg N)

$$\frac{dx_{26}}{dt} = S_6 \qquad \text{(B.2)}$$

Change in NO_3 mass output from reach, x_{27} (kg N)

$$\frac{dx_{27}}{dt} = \frac{x_{22} x_{23}.86400}{x_{29}} \qquad \text{(B.3)}$$

Change in NH_4 mass output from reach, x_{28} (kg N)

$$\frac{dx_{28}}{dt} = \frac{x_{22} x_{24}.86400}{x_{29}} \qquad \text{(B.4)}$$

Change in reach volume, x_{29} (m^3)

$$\frac{dx_{29}}{dt} = (S_4 - x_{22}).86400 \qquad \text{(B.5)}$$

Change in water flow input to reach, x_{30} (m^3)

$$\frac{dx_{30}}{dt} = S_4.86400 \qquad \text{(B.6)}$$

Change in water flow output from reach, x_{31} (m^3)

$$\frac{dx_{31}}{dt} = x_{22}.86400 \qquad \text{(B.7)}$$

Accumulated N mass associated with denitrification, x_{32} (kg N), is calculated by integrating the change in denitrification, dx_{32}/dt

$$\frac{dx_{32}}{dt} = \frac{C_{11} a_{5,t-1} x_{29}}{1000} \qquad \text{(B.8)}$$

Accumulated N mass associated with nitrification, x_{33} (kg N), is calculated by integrating the change in nitrification, dx_{33}/dt

$$\frac{dx_{33}}{dt} = \frac{C_{10} a_{6,t-1} x_{29}}{1000} \qquad \text{(B.9)}$$

The N mass-balance within the in-stream component is calculated and the results are displayed on the load charts in INCAv1.6. The input to reach, *i* is calculated as:

$$Input_i = x_{25,i} + x_{26,i} \qquad \text{(B.10)}$$

The output from reach, *i* is calculated as:

$$Output_i = x_{27,i} + x_{28,i} \qquad \text{(B.11)}$$

The N stored in reach, i is calculated as:

$$Storage_i = x_{23,i} + x_{24,i} \quad \text{(B.12)}$$

where the terms are as defined previously.

The initial N mass stored in reach, i is calculated as:

$$Initial_i = x_{23,0,i} + x_{24,0,i} \quad \text{(B.13)}$$

where

$x_{23,0,i}$ = NO_3 stored in the reach at time, t = 0 (kg N);
$x_{24,0,i}$ = NH_4 stored in the reach at time, t = 0 (kg N);
The user supplies all the initial values as input.

The N mass-balance for reach, i is calculated as:

$$Bal_i = Initial_i + Input_i - Output_i - Storage_i \quad \text{(B.14)}$$

Thus, if mass-balance is achieved then the balance will equal zero.

The water balance for reach, i is expressed as

$$Bal_i = x_{29,0,i} + x_{30,i} - x_{31,i} - x_{29,i} \quad \text{(B.15)}$$

where $x_{29,0,i}$ is the initial volume of reach, i, and all the other terms are as previously defined.

Wade, A.J., Whitehead, P.G. and Butterfield, D., 2002d. The Integrated Catchments Model of Phosphorus Dynamics (INCA-P), a new approach for multiple source assessment in heteorogenous river systems: model structure and equations. *Hydrol. Earth Syst. Sci.* **6**, 583–606.

1. Eqn (28) should read

$$\frac{dx_{28}}{dt} = -\frac{1}{Lw}\frac{dx_{27}}{dt} \quad (28)$$

2. Table 8 and Eqn (33). ρ_s is the bed sediment particle density (kg m^{-3}). The symbol is actually given as r_s in the description of Eqn (33), even though ρ_s is correctly used in the equation itself.

3. Eqn (37) should read

$$\frac{dx_{34}}{dt} = -\begin{Bmatrix} gain \\ loss \end{Bmatrix} - \frac{C_{19}}{1000}(a_{12} - a_{11}) - \frac{C_{22}C_{11}\theta_M^{(U_4-20)}x_{31}U_{11}C_{12}a_{12}Lw}{(C_{13} + a_{12})(C_{12} + x_{31})1000} + \frac{C_{20}a_{11}}{1000} \quad (37)$$

Fortunately, the errors are in these publications only and do not change any of the main results or conclusions in these papers or related work.

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