According to Beven 1979

$$\frac{\partial Q}{\partial t} + C \frac{\partial Q}{\partial x} = C\, q_{lat}(x)$$

where c is celerity (speed ~~at which~~ of propagation of disturbances)

Our equation derived from continuity and $V = V_0 \left(\frac{q}{q_{ref}}\right)^{\lambda_1} \left(\frac{A}{A_{ref}}\right)^{\lambda_2}$ where A is upstream basin area

$$\frac{dQ}{dt} = \frac{V_0 \left(q/q_{ref}\right)^{\lambda_1} \left(A/A_{ref}\right)^{\lambda_2}}{(1-\lambda_1)\, l} \left(q_{lat} - Q + \sum Q_{up}\right)$$

Note that our equation integrates over the reach length (~ 500m), but can be rewritten as

$$\frac{dQ}{dt} = \frac{V_0 \left(q/q_{ref}\right)^{\lambda_1} \left(A/A_{ref}\right)^{\lambda_2}}{(1-\lambda_1)} \left(\frac{[q_{lat} + \sum Q_{up}] - Q}{l}\right)$$

the term in the parentheses can be interpreted as $\frac{\partial Q}{\partial x}$ ~~or $\frac{dQ}{dx}$~~

$$\Rightarrow C = \frac{V}{1-\lambda_1}$$

* in our study $\lambda_1 = 0.3$ therefore $\underline{C = 1.43\, V}$