Dear Editor,

In their reply to our short comment, the authors provide a plot (which we refer to as Interactive Comment Figure 1, or IC Fig. 1 for short) showing the relationship between the characteristic recession timescale T and the recession parameter $1/a$ as estimated from a large number of basins. They argue that because there is a strong linear relationship (high correlation) between T and $1/a$, T can substitute for $1/a$.

We interpret IC Fig. 1 somewhat differently.

First, we note how the slope of T vs. $1/a$, for fixed Q_0 and b, is given by their Equation 5:

$$\text{slope} = \frac{Q_0^{1-b}}{(b-1)}\left(2^{-\frac{1-b}{2-b}} - 1\right) \tag{1}$$

In the upper panel of IC Fig. 1, where Q_0 is conveniently held constant at 10 mm/day, the points cluster around a line with slope ~0.6. This is a result of most of the values of b falling between 1 and 1.5 (see Figure 2b), where the slope given by (1) ranges from 0.58 and 0.69. Therefore, the high correlation reflects both the particular shape of the frequency distribution of b and a fixed Q_0, and as such is not a generalizable result.

However, the lower panel in IC Fig. 1 is the more relevant one given all basins will not share the same "characteristic discharge at the start of the recession" Q_0. Here there is more scatter between T and $1/a$ (and lower correlation) because Q_0 is also varied by basin. The authors chose to ignore this scatter, even though it shows T varying by roughly a factor of 2 for a given value of $1/a$.

We believe it is *more* defensible to characterize these basins by the timescale T and not $1/a$, though this is still not without its problems. For one, it adds difficulty by having to come up with some justifiable manner of deciding upon a characteristic recession discharge Q_0.

We are grateful that the authors demonstrated the effect of using T instead of $1/a$ for a given Q_0. They show already that 20% fewer basins show a trend in T compared to $1/a$ when Q_0 is held constant across all basins.

We emphasize that the use of T instead of $1/a$ still does not guarantee that the effects of the non-physical correlation of $1/a$ and b are removed when examining trends in T *within* a basin. This is because the particular choice of Q_0 matters.

Lastly, we still maintain that Figure 4 is inappropriate. Firstly, we ask again: what does it mean to order values along an axis when all the values do not share the same units? Secondly, the common direction of the arrows (lower left to upper right) points to an artifact. As b increases, $1/a$ increases (a decreases), as nicely illustrated by Figure 5, given the y-intercept, $\ln(a)$, is to left of the axis of rotation. Note, however, that $1/a$ can instead decrease (a increase) under the same rotation by a *simple conversion of units* that

moves the y-intercept to right of the axis of rotation! Unless the change in a due purely to the rotation illustrated in Figure 5 is removed, there is no point ascribing any physical significance to a trend in a.

Sincerely,
David Rupp & Ross Woods