Geomorphic signatures in recession curves: consequences for modelling

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This contribution concerns the identification of the properties of recession curves for baseflow modelling based on purely geomorphological information derived from Digital Terrain Models (DTMs). We analyse, as proposed in the classic Brutsaert and Nieber paper, the slope, α, of $ln(dQ/dt)$ vs $ln(Q)$, as the defining property of recession curves. We then link α to observable topological properties of channel networks derived from DTM analyses. The comparison of α values derived from measured recession curves and from DTM analyses agree well for a large set of study basins with different areas and characteristics. We then use the DTM-inferred information to produce modelled recession curves, which also well reproduce observed recession curves. Finally, we relate recession curves characteristics with Hack's law, a well-known channel-network morphological property, which highlights the presence of a 'universal' component in recession curves, stemming from the general topological organization of river networks.