

Interactive comment on “Bringing it all together” by J. C. I. Dooge

J. C. I. Dooge

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Response by J.C.I. Dooge (author) to comment by A. Montanari

I am grateful for this comment which raises the question of the relationship between the concept of the mass balance as a fundamental theorem of hydrology and the practical problem of handling the multiple uncertainties that complicate the practical problem of simulating catchment response. The latter problem lies at the end of the long road of hydrological speculation that begins with basic principles and ends with practical applications. The original paper was concerned with an attempt to summarise the progress to date along that journey in a manner that would facilitate the completion of the long journey as expeditiously as possible.

The lesson drawn by the author from his own experience was the benefits of starting with the simplification of a specific component of the hydrological cycle in order to gain a useful insight into its operation and then using a step by step relaxation of the simplifying assumptions in order to make progress (Dooge 1995, 2001). The relaxation of the mass balance equation may in the short term improve the simulation of any

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individual event in an individual catchment but makes little contribution to the overall advancement of hydrology as a discipline.

In order to advance both hydrologic science and hydrologic practice in a systematic fashion it is necessary to progress from preliminary correlation to basic causality in a meaningful manner. There is still a lot of work to be done in this regard and it offers a real challenge to the rising generation of hydrologists.

References: 1995 “Searching for simplicity in hydrology” Society Lecture to Hamburg General Assembly of European Geophysical Society, April 1995. Surveys in Geophysics, Vol.18, No. 5, pp. 511-534 1997.

2001 “Simplification plus rigorous analysis: the modus operandi of John Philip”. In: Environmental Mechanical Mechanics. Water mass and energy transfer in the biosphere. The Philip Volume edited by P.A.C. Raats, D. Smiles, A.W. Warrick, pp 35-45. Geophysical Monograph 129. American Geophysical Union. Washington DC.

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