Hydrology and Earth System Sciences

Open Access

Discussions

Interactive comment on "Determination of cost coefficients of priority-based water allocation linear programming model – a network flow approach" *by* F. N.-F. Chou and C.-W. Wu

F. N.-F. Chou and C.-W. Wu

chiawenwu1977@gmail.com

We sincerely appreciate the suggestions given by the second Anonymous Referee, from which this paper benefits greatly.

This study indeed was inspired by the paper of Israel and Lund (1999) and the subsequent discussion by Labadie and Baldo (2001), which represent two counterparts of priority-based water allocation using optimization engines. While network flow programming (NFP) possesses the advantages of higher computing efficiency and easier comprehension of the priority-based allocation mechanism, linear programming (LP)

can directly incorporate side constraints in the formulation to prevent the need for iterations commonly required in NFP models. Nonetheless, the priorities in LP-based models may be impaired due to the influence of side constraints, thus necessitating special consideration when establishing the objective function of the LP formulation. Conversely, NFP-based models are free of side constraints, thus simplifying the task of assigning cost coefficients.

Our position with respect to the present study recognizes the respective benefits of both LP and NFP models. While this research utilizes an NFP model, we also find situations when assigning cost coefficients can be complex and challenging, especially when trans-basin surplus water diversion and storage allocation among multiple reservoirs are involved. This scenario is where this study originates.

According to the reviewer's suggestions, the manuscript has been revised as follows: 1.The Introduction concludes with greater detail pertaining to the lineage of this study. 2.Our opinion regarding the NFP- and LP-based water allocation models is given in the "Alternative approaches: linear programming versus network flow programming" sub-section. 3.In addition to Ferreira (2007), four other articles associated with LP-based allocation models have been added in the references.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/10/C8145/2014/hessd-10-C8145-2014-supplement.pdf

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 15033, 2013.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper