

## ***Interactive comment on “Definition of efficient scarcity-based water pricing policies through stochastic programming” by H. Macian-Sorribes et al.***

### **Anonymous Referee #2**

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This paper addresses an interesting concept, that of establishing an externally-imposed marginal pricing scheme, to encourage more efficient water use. Results suggest that a more dynamic approach to modeling may have value in determining these prices.

The paper is well written and addresses an area of increasing interest, that being the promotion of more efficient water allocation. I believe that this work makes some contribution to the literature, but have a few questions.

(1) The authors have published several related papers in this area in recent years, and

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it is not entirely clear to me how they are distinguishing this work from their earlier work. I understand that previous papers, or at least Pulido-Valazquez et al. 2013, used an assumption of perfect hydrologic foresight, which certainly represents a limitation, but is the elimination of this assumption the primary difference between that paper and this one? Please elaborate.

(2) While I understand the idea of marginal cost pricing in theory, I have many questions regarding how it would be implemented in practice. Estimates of marginal (or market) prices are notoriously poor in many contexts, and the same is likely to be the case here, so how does the system respond to a poor estimate? If prices are set too low and demand outstrips supply, what happens? Is there a cap on supply, and if so, how and on whom is it enforced? If prices are set too high, there is no physical limitation, but there could be significant economic losses. Given that most of the demand is agricultural, and therefore likely to be very elastic, it would seem that small errors in the estimated prices could give rise to very large discrepancies between the amounts of water demanded (at the MROC) and those estimated. How would this be managed?

(3) Along similar lines, one of the largest obstacles to implementing some form of water market is the concern over high prices that would limit some activities' (i.e. agricultural) consumption of water. In order for this MROC pricing approach to be used, the obstacle of rising prices would have already been overcome, yet there would still be huge information requirements on the part of the administering water agency if it were going to accurately estimate the MROC month-after-month and year-after-year. Given that concerns over higher prices would have been overcome, why not just implement a market instead of the MROC pricing approach, it would certainly be more efficient given that the users would make decisions based on their own valuations, and probably easier to administer? I would like to better understand the circumstances under which the authors' feel that the MROC approach is preferable to a market, as these are not clear to me.

These are my primary comments, a couple of other small suggestions are below:

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(a) I think that the orientation of the reservoirs in Figure 3 may be incorrect. Aren't the wide ends of the reservoir symbols supposed to be at the downstream side and the narrow ends at the upstream side?

(b) pg 785, line 6 has several typos.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 771, 2015.