

## ***Interactive comment on “Climate change impact assessment as function of model inaccuracy” by P. Droogers et al.***

### **Anonymous Referee #1**

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Both title and abstract are too general. This is a case study on impact model inaccuracy and climate change impact. I would rather like to see a title like "A case study on the influence of impact model inaccuracy on climate change assesment using the SWAP model." The abstract should at least mention that this is a case study using SWAP.

I would like to strongly support the notion to measure impact model (in)accuracy against climate reponse. As such, the paper deserves publication. However, I also have strong doubts about the definition of MSR.

At least the definition of MSR misses an absolute sign. Values above 1 are possible.

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The other concern is that the MSR does not seem to measure what the authors claim. If the "reference" value is large compared to the climate response, MSR is always close to one. Conversely, if the reference (line 20 on page 2884) is small, MSR values are small or negative. For example, no or a small loss for the reference state, and a 100 E loss for the future in the accurate model and 200 E loss in the inaccurate model, would yield undefined or strongly negative values for MSR. I am not convinced that this is a desired property of MSR. In this case, I would say that the influence of the impact model is considerable, but certainly not dominant since a reasonably well defined response can be derived from the two integrations (i.e. a loss of the order of 100 E).

As an alternative measure I would suggest (e.g.):

$MSR = \text{Change\_mod} / \text{Change\_ref}$  for  $\text{abs}(\text{Change\_ref}) > \text{abs}(\text{Change\_mod})$  and same sign

$MSR = \text{Change\_ref} / \text{Change\_mod}$  for  $\text{abs}(\text{Change\_ref}) < \text{abs}(\text{Change\_mod})$  and same sign

$MSR = 0$  for  $\text{Change\_ref} * \text{Change\_mod} < 0$

where  $\text{Change\_ref/mod}$  is the change in the reference (accurate) and modified (inaccurate) model, respectively. This definition has the advantage that the modified and reference model can be interchanged without affecting the MSR.

this formulation can be written as:

$MSR = \exp(1 - \text{abs}(\ln(\text{Change\_mod} / \text{Change\_ref}))) / \exp(1)$

If the authors claim that this is "a novel approach" they should at least make more clear why they defined MSR the way they do.

I would appreciate if the authors could comment on this first, before submitting other comments.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 2875, 2007.