Hydrol. Earth Syst. Sci. Discuss., 8, C1635–C1638, 2011
www.hydrol-earth-syst-sci-discuss.net/8/C1635/2011/
© Author(s) 2011. This work is distributed under
the Creative Commons Attribute 3.0 License.

Hydrology and Earth System Sciences Discussions

Interactive comment on "Modelling irrigated maize with a combination of coupled-model simulation and ensemble forecasting, in the west of China" *by* Y. Li et al.

Anonymous Referee #2

Received and published: 20 May 2011

The paper refers to coupling the soil water flux model HYDRUS-1D and the crop growth model WOFOST for predicting maize yields under various water management conditions in northwest China's Heihe River basin. In addition a combination of model simulation and ensemble forecasting is adopted to analyse and predict the probability of crop production avoiding the uncertainty of model boundary conditions and parameters when data are insufficient.

The Introduction refers to a variety of model approaches but that review would gain if including more recent, updated references, as well as references to modelling studies

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

in China. Those are now abundant and adopt both mechanistic and water balance models; some are published in this journal. In fact, it is good that a study identifies advances relative to former research and to former studies applied to the country or region. In addition, the paper would gain if references would be better selected, e.g., the paper by Smith et al., 1997 does not refers to the subject of this study but to soil organic matter modelling. Other references have such type of limitation, i.e., do not directly concern the objectives of the study while several others do (case of various papers using soil water mechanistic models such as Hydrus and crop growth and yield models such as Wofost.

References to ensemble studies could also be of interest.

I do not understand the opportunity of the discussion in lines 1-14 of page 3845

2 Study region and experimental field description

Fig. 1 would gain if the represented river basin would be located relative to the NW of China

Climatic data acquisition is very insufficiently described, particularly referring to eddy covariance measurements. It is known they have a trend to underestimate actual ET and nothing is referred to the energy balance and the closure errors, or relative to required fetch. A couple of papers recently published (Agric. Water Manage. 2011),doi:10.1016/j.agwat.2010.12.015 describes the possible sources of errors in measuring ET by various methods and recommendations for presenting results in journal papers when accuracy is required, as for the case under appreciation.

Soil data in Table 1 are insufficient for using with a water flux model. The characteristics of the soil water retention curve and the soil hydraulic conductivity curve needed for solving the Richards equation are required

In section 2.2 is referred that soil water content were measured with TDR with a hourly time step. However, it is not said where and at which depths observations were made

HESSD

8, C1635–C1638, 2011

and how soil water potential was obtained, which is required for solving the Richards equation (eq. 1). The advantage of hourly measurements is not evident. Observations of soil hydraulic conductivity, also required for the Richards equation, are not mentioned.

The crop description should be performed including the variables observed, how observations were performed and data used for modeling

It is written: "The field was irrigated 9 times throughout the period of crop growth. The water amount of irrigation is approximately 100mm each time." This is a very exaggerated water application, approximately doubling the crop requirements. In a study aimed at improving irrigation performance it is strange that such an irrigation management was applied. Anyway, it would have been necessary to explain how the management scenarios were set, the crop calendar in the various years of experimentation (not clear if only one year was adopted), and how irrigation decisions were taken. Also necessary to express how irrigation water was measured and how accurate this was.

In Section 3, the Wofost model is summarized. However, it was required that information be given about input data requirements, how these data were collected and checked as well as requirements for parameterization and model calibration and validation.

In the same section, model Hydrus is summarized. Input data requirements, parameterization, calibration and validation should have been described

Apparently, an only one year observation was used. There is no evidence of an experimental design aimed at distinct/independent calibration and validation of the parameters of both models

There is no description of the ensemble estimation adopted and of its validation

Under these circumstances, the paper is not publishable. If there are independent observations in a couple years than the paper may be deeply revised and reviewed

HESSD

8, C1635–C1638, 2011

again. Anyway, a modelling paper without independent calibration and validation is not publishable in a peer reviewed journal and certainly not in HESS.

Considering the limitations on material and methods in Sections 2 and 3, it is not appropriate to comment on results ad conclusions

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 3841, 2011.