Hydrol. Earth Syst. Sci. Discuss., 8, C3765–C3768, 2011
www.hydrol-earth-syst-sci-discuss.net/8/C3765/2011/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Applying PUB to the real world: rapid data assessment" *by* C. Jackisch et al.

Anonymous Referee #1

Received and published: 1 September 2011

1. Introduction:

Basically the MS addresses a very important topic: How can enough information be obtained to employ a DSS in a data scarce, semi-arid environment? However, at present the MS is only the first part of a scientific study and unfortunately its real value cannot be evaluated, since quantitative results are absent. Only when the following concerns are handled, a publication could be possible. A more detailed review is therefore not done at present.

2. General style:

The style of the MS appears rather as a narrative epic than a scientific paper. It con-

tains experiences every scientist has already made when working in the real world of limited data: Language problems, missing geographic reference, outdated maps, etc. Repetitions are common, e.g. the general PUB problem, problem of interdisziplinary work, scale discussion, description of rainfall and runoff data appear several times in the MS. Hence the paper can and must be condensed (at least to one third of its present size). With an adequate structure (see 4. below) it then will contain the first part of a scientific study with space for the second part to be added (see 5. below).

3. Existing information and classification of "ungauged":

The MS lacks an overview of existing knowledge in semi arid hydrology. This is an important aspect also for PUB, because process knowledge from similar environments may be transferred to guide data collection in "ungauged" basins. There are many studies world-wide (Brazil (WASA- model), southern Europe (mainly Spain), Middle East, Northern and Southern Africa) but also local (Luni and Anas rivers) that deal with hydrological modeling and hydrological process description in these areas. These cover a variety of scales, some of them have a scarce, some of them a rich data set. Walnut Gulch is not mentioned here, because this exceptional data wealth does not fit to the present case. But a daily 20-year record of precipitation together with 4 years of flow data that fall into this period (uncertainties are normal in these environments) is not exceptionally bad and one may argue why the Mod catchment is regarded as an "ungauged basin". this issue needs to be discussed in comparison with other sites, etc.

4. Structure:

Throughout the paper different pieces of the approach and methodology are outlined, but the MS lacks a clear structure. If the reader tries to grasp the structure in chapter 1.7 (which is called "structure of the paper") he only gets a short summary of the MS and is asked to be patient for a forthcoming paper where the results of the DSS will be presented. So the MS has to be condensed (see above) and structured in

the following way: 1.) Give an introduction (very short) of the PUB problem, existing hydrological information and model applications 2.) From that formulate your aims and what is really new about your approach 3.) In a condense and systematic form state the methods (identification of landscape units, sampling procedure, hierarchical scaling, remote sensing, etc., 4.) Describe the models you use (this is missing now) 5.) Describe the study site and how you acquire the data 6.) IMPORTANT: Present the modeling results and the DSS results (Now missing) 7.) Validate results, discuss and conclude (now missing)

5. Missing results:

The is perhaps the main drawback of the present MS. Only the approach for data collection is outlined. Results are limited to descriptions of collected data and obtained soil, landuse classifications. Real quantitative results are missing and hence it cannot be evaluated if such an approach is really a valuable avenue. Without real quantitative results (for this the reader is presently put off to a forthcoming paper) the MS remains purely speculative and is not ripe to be published in a scientific journal of the HESS caliber. What happens if the entire approach fails (e.g. the promised forthcoming paper is never published)? So two important parts need to be included and the entire MS then needs to be re-reviewed: (a) description of the two models used and (b) presentation, validation and adequate discussion of the results of the model and DSS application to the Mod catchment. Also the model choice needs to be discussed: at present no details about the WASA application are given (scale, landscape units, etc.). From existing model applications one could learn about required parameters and required information for the models. This will also influence data collection strategies which are the focus of the present MS.

6. Scale discussion:

Apart from the fact that this discussion is done several times throughout the paper, there are some general drawbacks here. The MS states that Mod (512 km2) is “neither

small enough for proper instrumentation nor big enough for simplified approaches or remote sensing” (P.7501-7502). While the first part of this statement is surely true but rather philosophic (in a way you never reach a proper instrumentation in a basin. . .), the second part does not hold: In principle simplified approaches and remote sensing CAN be applied to any catchment, especially at a size of 500 km2. Surprisingly, remote sensing and simplifications during regionalization are important parts also of the present study, so this scale statement is unfortunate and totally misleading. In a later chapter (2.2) the scale question is discussed again and arbitrarily selected, well instrumented small experimental catchments are outlined. There are also bigger research catchments with good instrumentation, Walnut Gulch is the most prominent example for the semi arid case, but there are also others. For sure scale is important as it drives dominating processes and methods for data collection, but one should distinguish between laboratory, plot, hillslope, first order catchment, mesoscale and macro- up to global scale. Many scientists agree that the hillslope scale is the most important scale for hydrology where runoff generation processes take place. This is also inherent in the present approach, since the landscape is represented based on soil catenas and mapping is done along transects. Scale discussions in semi arid hydrology have a long tradition and they present collected data in different scales, e.g. in Spain (Bergkamp 1998, and most recently by Y. Cantón (2011). Also here the MS could benefit from existing knowledge.

7. Final recommendation:

As stated above, the present MS deals with an interesting topic. When it is adequately structured, largely shortened and results of the model- and DSS application are adequately presented/validated and discussed, publication could be possible in HESS. However, then the MS needs thorough re-review, as only by real quantitative data the success of the entire approach can be evaluated.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7499, 2011.