

Interactive comment on “The Hydrological Open Air Laboratory (HOAL) in Petzenkirchen: a hypotheses driven observatory” by G. Blöschl et al.

Anonymous Referee #2

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I thought this was a useful experience to share with the hydrologic community and personally found the hypothesis-driven approach refreshing. The goal of such an exercise might inspire other experimental sites to move toward a similar approach. I enjoyed reading the paper and recommend it for publication. I have some comments and recommendations to tighten the paper.

Substantive Comments

1. I am not clear about the main difference between the traditional experimental catchments, the recent CZOs, and the HOAL. Is it the hypothesis driven approach
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versus lets instrument the whole catchment and go on a fishing expedition? Are they the same?

2. The authors have glossed over the site selection other than to say that it was found to be suitable because of the range of runoff generation mechanisms, long term stream record and proximity to IKT. I understand opportunism often plays a role in this but wonder if there were other candidate catchments that were under consideration which didn't meet the bar. Again if the goal is to present the *thinking* behind such an effort this would be useful to document. For instance, the issue of scale is mentioned in passing but the catchment scale of 66 Ha is not mentioned till Section 3. Yet surely the types of questions being pursued dictated the scale of research.
3. I felt that perhaps there might be more lessons to be got out of this sort of thing that the authors have not gleaned yet. For instance, very few failures are mentioned. I was wondering:
 - Is authorship ever an issue if so many students are working on a single site? Or does the pursuit of specific hypothesis right from the beginning offer clarity of roles, which a more general fishing expedition might not?
 - Have there been failures? For instance where the scale of the question was found to be unsuitable for the catchment size because the effects of things happening outside the catchment outweighed the catchment-level effects?
 - Likewise were there unexpected successes where two student who discussed their work together ended up changing their conclusions that might not have happened if they were not collaborating. The authors mention the benefits of collaborative work in a general way but concrete examples of "eureka moments" in Section 5 would be nice if the students can think of some.

- One could imagine this working out the opposite way if students didn't collaborate because they are focused too narrowly on a specific hypothesis and missing some piece of the bigger picture. Does having the students all physically in the same space matter as much as the existence of a common experimental site? Might be useful to mention this explicitly if the authors believe so.
4. Section 4 was a rich section and I felt more could be drawn out of it by tying it with Section 3.2.2 as I have suggested below.
 5. Would it be possible to give a sense for the total budget for this sort of thing? Initial set-up cost and then annual operational costs including the manager but not including students? Did students raise money separately for experiments to test specific hypotheses or did HOAL have a built-in budget for that type of thing? If so, how was it doled out? This might be useful to people trying to replicate in other places.

Comments on structure I think the paper Section 2 onwards could be slightly improved in structure. I'll try and explain my confusion with the current structure and then suggest a more linear one.

At the moment, Section 2 and 5 each are organized along the "HOAL Science Strategy" which is 1) long term experimental infrastructure, 2) interdisciplinary collaborations, and 3) wider networks. (This is completely fine by me.)

It's the structure of Section 2 and its relation to Section 3 and 4 which I found a bit confusing.

Within Section 2, Section 2.1 is further categorized into 2.1.1 Overarching Science Questions (which discusses three activities Site-Selection, Base Monitoring, Dissertation topics), and 2.1.2 Specific Hypotheses.

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- I found it odd that the overarching science questions were nested within a section called "Long-term experimental infrastructure". If the authors are trying to promote thinking about the big-picture science questions first and then set up a HOAL as a long-term experimental site rather than the other way round - it would make sense to move the three overarching science questions to before Section 2.1. Then the whole thing would make logical sense.
- I was also confused by the use of many different terms – specific hypotheses, detailed experiments, dissertation research – for the essentially same set of activities. Sections 3 and 4 sort of follow the same ideas presented in Section 2.1 but not quite the same terms so it is hard to track.
- Finally, Section 3.2.2 is a little unnecessarily detailed and I felt belied the spirit of the paper. At the moment its four pages on description of detailed experiments which don't really follow a structure or form part of the larger story. I am wondering if this could be integrated into Section 4 to tie up the hypotheses to the experiments conducted and findings. After all the experiments in 3.2.2 are not generic experiments but experiments which were pursued to test specific hypotheses as I understand it.

Suggested Structure I am going to suggest a more linear structure. Please note - this is only a very slight rewording and organization not a drastic rewrite except for the recommended merger of the current Sections 3.2.2 and 4.

Section 2 Motivation for HOAL Overarching science questions that drive it.

2.1 Long term experimental infrastructure Consists of Selecting the site (described in Section 3), Setting up a basic monitoring infrastructure (described in Section 4) and Pursuing specific hypothesis through student dissertation research (described in Section 5).

1.2 Interdisciplinary collaborations

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1.3 Wider networks

Section 3: Site selection and catchment description Section 4: Setting up the HOAL basic monitoring infrastructure Section 5: Specific hypothesis and experiments Section 6: Lessons Learned Section 7: Outlook

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