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Hydrology and Earth System Sciences
Discussions

Interactive comment on "HESS Opinions "Integration of groundwater and surface water research: an interdisciplinary problem?"" *by* R. Barthel

Anonymous Referee #1

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This paper discusses the need for more integration between surface water and groundwater research. It also discusses some of the reasons for the lack of integration to date, including differences between the types of problems confronting groundwater and surface water, and institutional barriers. Although many of the issues discussed would be familiar to researchers within these fields, it is very useful to see these issues brought together in an opinion piece. In a general sense, it is difficult to argue against most of the authors proposals.

In my view, the weakest parts of the paper are the three specific examples presented of different perspectives. Although the rest of the paper presents a high level overview

of the different fields, these sections discuss very specific issues of terminology and research focus. Although each example is interesting in its own right, I did not feel that this section fitted well with the rest of the paper. Moreover, it is not clear that these three examples relate specifically to the groundwater – surface water divide. The first two examples ('groundwater recharge' and 'baseflow') are grouped together as 'Example 1'. The author argues that groundwater scientists consider 'groundwater recharge' to be water that enters the saturated zone, whereas surface water scientists consider it to be water leaving the root zone. The author rightly points at that these can be quite different – both in terms of timing and in terms of absolute magnitude. However, the choice of this example is somewhat surprising since this really relates to a difference between groundwater scientists and soil or agricultural scientists, and surface water scientists (at least as the term is used in the rest of the paper) concern themselves with river flow and do not really consider diffuse groundwater recharge at all. The third example presented is the approach to hillslope hydrology. The authors suggest that this has perhaps been the domain of surface water scientists rather than groundwater scientists, but again it has probably been the soil physicists who have made important contributions in this area. Notwithstanding these issues, it was not clear how these differences in perspectives had caused significant problems and caused a barrier to integration.

Although it is difficult to argue against a greater integration between surface water and groundwater researchers, perhaps the need for this integration depends upon the problem under consideration. The author explains how problems confronting groundwater and surface water scientists are often quite different. It is not clear therefore when it is important for the research to be cross-disciplinary and when it is not. The first step of the 12-step process for interdisciplinary research presented by the author (from Szostak, 2002), is 'Start with an interdisciplinary question'. The author might like to give some thought to which questions in surface water and groundwater science are interdisciplinary, and hence require the input of both disciplines, and which are not.