

Interactive comment on “Measuring methods for groundwater, surface water and their interactions: a review” by E. Kalbus et al.

Anonymous Referee #2

Received and published: 7 August 2006

General comments

This is a review paper on methods for measuring water and solute fluxes at or near the interface between surface water and groundwater. It is an ambitious undertaking as indicated by the exhaustive list of references. The authors are commended for conducting a comprehensive literature review covering a wide range of topics, which could fill up an entire textbook. However, due to the space limitation, the manuscript does not successfully present the information in a manner that is useful to the readers who actually want to use these methods in the field. A substantial part of the manuscript is introductory materials (e.g. Darcy equation) that are found in standard textbooks, while the information specific to the surface-groundwater interface (e.g. seepage meter) receives relatively little attention. In order to make this an excellent and useful

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

review paper, I suggest that the authors refocus and reorganize the paper so that important materials can be presented in sufficient details to achieve the objectives; i.e. “to provide an overview of the methods that are currently state-of-the-art for measuring INTERACTION between groundwater and surface water” (page 1812, lines 18-20).

Specific comments

(1) Who are the intended readers? Hydrogeologists who already know the Darcy equation and pumping tests? Surface-water hydrologists with some background knowledge on groundwater from introductory hydrology courses? Aquatic ecologists? Environmental managers? This does not have to be narrowly defined, but having a clear idea on the intended audience will help the authors decide what material should be kept (and expanded) and what should be omitted.

(2) In page 1811, line 2. This sentence implies that the transition zone is synonymous with the hyporheic zone. The same impression is given by Fig. 2 and another sentence in page 1811, line 29, “Our aim was to study the stream-aquifer system as a whole”. However, there are many groundwater-surface water interfaces that do not meet the definition of the hyporheic zone. Does this manuscript focus primarily on the hyporheic exchange? If so, it will be good to state that scope explicitly, and change the title to reflect the scope.

(3) The material presented in pages 1813-1818 is found in standard textbooks. I would suggest that the authors condense this section and make room for the information specific to surface-groundwater interaction, unless this paper is intended for the readers with no background in hydrology.

(4) Section 2.5.3. I am not sure if this method is relevant to the scope of the manuscript.

(5) Section 3.1.2 and 3.1.3. Hydrograph separation is covered in many textbooks, and this section is too short to present a useful review of the method. I suggest that the author condense this section to make room for other topics, or expand the section to

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

be more useful.

(6) Section 3.1.4. This method is probably not as well known as the Darcy equation or hydrograph separation, but may be very useful for studying the hyporheic exchange. However, the section is too short to be useful to the readers. Can it be expanded to cover the basic principles behind various methods?

(7) Section 4. Most of the materials in this section, except for 4.2.5, 4.4 and 4.5, are the duplication of the materials presented in Section 2. Can the authors reorganize the manuscript to avoid duplication?

(8) Sections 4.2.5, 4.4 and 4.5. These are the topics most relevant to the objective of this review. Can the authors expand these sections?

(9) Tracer tests are only briefly touched in Section 2.4.2, even though it has been frequently used in the studies of hyporheic exchange. In many cases, the tracer data interpretation needs to take into account the 'transient storage' (page 1835, line 11). I understand that the authors wanted to stay out of the transient storage (page 1812, line 24). However, I am not sure if it is fair to say that the transient storage does not relate to groundwater-surface water exchange (page 1812, line 24). I believe that at least a part of the transient storage does occur in the hyporheic zone.

(10) Section 5.3. This is a nice section.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 1809, 2006.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper