

Interactive comment on “HESS Opinions: Repeatable research: what hydrologists can learn from the Duke cancer research scandal” by Michael N. Fienen and Mark Bakker

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It is good to see a robust discussion developing around this opinion piece. Dr. Nowak agreed with our point that archiving data and processing through scripting is worthwhile even if not everyone will examine every step. We are glad he sees this point.

Dr. Nowak also raises another point that repeatability transcends a need for transparency and is useful for future researchers to revisit work done in the past. This is an excellent point! We respond here with a bit of discussion but will also briefly highlight that issue in the revised manuscript. In this context, however, we would like to reply more substantially.

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When the public pays for research At the US Geological Survey, where the first author is employed, there are policies in place in groundwater hydrology (and rapidly expanding to other research) to maintain rigorous archives of models and data analysis. These archives are designed to make it possible for the taxpayers to obtain copies of models that are operational and match the results published in papers and USGS technical reports. These archives require a fair bit of work to assemble, require a peer review which takes time and energy, and many languish for years without any interest—until there *is* interest. Recent projects have focused on automatically scraping the archives to assemble, for example, all published USGS models in a large region of the United States. Without maintaining the archive, such new meta-projects would be impossible. Many consultants and researchers also, upon learning that USGS has created a model of an area they are interested in, request the archive and thus have a working model and (as we stated in the manuscript, possibly of more interest) the supporting data to launch their new project from. Using a scripting approach to also make the steps of data processing and analysis available serves two purposes: it makes the process of archiving easier and more transparent, and it provides the context of interpretations made by the original researchers as they evaluated the data and made the model.

Marketing We also agree that trying to enforce more rules and extra work is likely to be met with skepticism and disdain (indeed, the authors have experienced that both in conversations with colleagues and in discussion in this forum). However, Dr. Nowak makes a good point that even voluntary standards and protocols are of value if researchers can market their work as following them. Consumers of the results—be they other researchers, consultants, or the public—can demand higher standards even as they remain voluntary.

It is true that we are wandering into a different topic than the original intent of the piece, but these issues are useful and important so we will make mention of them briefly in

the revisions to the manuscript.

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