

Interactive comment on “How can geologic decision making under uncertainty be improved?” **by Cristina G. Wilson et al.**

Anonymous Referee #3

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This manuscript discusses a very interesting and important topic, namely how to improve decision making processes in the geosciences. It does a very nice job of reviewing the most common bias types known to affect geologists, giving excellent examples that make it easy to learn about those bias types. I found Section 1-3 a pleasure to read, learned a lot, and thought that this would be excellent reading for scientists in our field.

However, Section 4 did not convince me. I still followed the arguments in Sections 4.1 and 4.2, describing why it is more successful to work on changing the environment, rather than teaching the decision maker new skills. But I found it hard to truly understand how the two case studies in Section 4.2 truly connect with the biases outlined in the earlier sessions. In particular, Case 2, which focuses on sub-surface geology had

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so many details related to sub-surface geology that I found it generally hard to follow. Both cases seemed to be examples that show that one should provide the user with as much useful information and software support as possible. Obviously, it's always useful to provide as much reliable, comprehensive information as possible to a decision maker, and such information will improve the decision process, and the software should be as transparent as possible. What am I missing here? Maybe the new point is that the biases are to be detected and software is to be designed specifically to overcome these specific biases. Is that the key point? But how do you identify all these holes and biases? How do you design software to fill these holes? How do you make sure the software solution is reliable in all cases and does not "nudge" the expert into the wrong correction?

In terms of style, the first 3 sections are a pleasure to read, but include some repetitions, e.g., many statements are made in Section 1 and then repeated in more detail in later sections. So I suggest to look for redundant statements and shorten those sections a bit. For Section 4 my main suggestions would be to 1) work hard on clarity in the case studies of how exactly they connect to the biases discussed earlier; 2) spell out the way forward, i.e. how could the lessons learned here be generalized to other applications.

In fact, I might even suggest to drastically shorten + de-emphasize the case studies to be only 1-2 paragraphs each, and maybe moving the rest to an appendix, then to focus on the main message of the paper in terms of fighting general biases and how to do that instead. I don't know, however, whether the remaining material warrants publication in this venue.

Minor comments: P. 5, Line 16-17: Mentions the three types of biases for the 3rd time. Too much repetition. P. 5, Line 30. There's something missing here. "Over ??? have found ... " P. 11. There is a Section 4.1.1, but no 4.1.2. P. 14, Line 24. "of of"

So, in summary, I really like the general topic and coverage of the paper, and think

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topics like this are truly important to bring to the forefront, discuss and find solutions for. Section 1-3 are excellent for this purpose. However, I find Section 4.2 in its current form rather confusing, so IMHO the way forward is not clear.

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-70>, 2019.