

## ***Interactive comment on “The Future of Earth Observation in Hydrology” by Matthew F. McCabe et al.***

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Received and published: 8 March 2017

We thank Dr Fisher for his interactive discussion on our paper.

The key criticism raised by Dr Fisher is that our paper is somehow framed in an “us-versus-them” context. Given the strong links that have long existed between the commercial and government sectors (and further evidenced by recent joint-ventures such as rocket launches, space-station supply and equipment delivery, sensor design-and-build partnerships etc.) an “us-versus-them” position would not be a strong one to advocate. Likewise, we are certainly not seeking to prosecute any particular case through this manuscript, nor is there any desire to act as ‘marketing agents’ to the commercial sector. Regardless, we will certainly review the manuscript to assess any claim of perceived bias closely. We would note that commercial satellite systems rep-

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resent just one (relatively small) facet of a number of exciting EO opportunities that are discussed throughout the paper. Others include: a) advances in UAVs; b) citizen science; c) stratospheric balloons; d) opportunistic sensing; e) CubeSats; and of course f) government-driven satellite systems, which form the backbone of our EO capability. Given that the entirety of Section 3 (which comprises approximately 50% of the paper) is focused on detailing the emergence of these new approaches to EO, we can only assume that the suggested title change has been made somewhat facetiously.

In our assessment of the “Changing Earth Observation Landscape” detailed throughout Section 4, we seek to provide a rational assessment of traditional space agency approaches in the light of some recent (and planned) commercial sector activities. We do not focus this comparison through any particular lens, or seek to convey some preconceived bias, but rather offer a statement of documented experiences together with supporting evidence. That the commercial and government sectors may be approaching the delivery of satellites and sensors in different ways is a function of many contributing elements, most of which are detailed in the paper. Nowhere do we suggest that there is an equivalence of launched sensors: indeed, we clearly identify and highlight some of the limitations of commercial activities, along with areas of potential concern. While the opportunities being afforded by the emergence of commercial platforms are exciting and potentially game-changing, there are very clear scientific and access issues that will need to be addressed for these to impact on research-based EO investigations. As is noted by Dr Fisher, these are well discussed and described: but it seems that further effort needs to be made to draw attention to these issues in the text.

We agree with Dr Fisher that detailing “the key science and applications needs, the necessary observational requirements, the associated technological capabilities, and then map those onto commercial capabilities” is something that is “desperately needed”. However, this is neither the intent or purpose of our manuscript, which is described quite concisely in the abstract and encapsulated well within the title. Fortunately,

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the much anticipated National Academies Earth Science and Applications from Space Decadal Survey, to be released later in 2017, will likely cover many of these suggested topics.

We look forward to incorporating some of Dr Fisher's thoughtful comments in a revised manuscript.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2017-54, 2017.

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