

## Reply on RC2

Anahi Ocampo-Melgar et al.

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Author comment on "Cooperation under conflict: participatory hydrological modeling for science policy dialogues for the Aculeo Lake" by Anahi Ocampo-Melgar et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-643-AC2>, 2022

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### Responses to RC2

**Response to general comment Reviewer 2:** As suggested by the reviewer, in a revised manuscript we will better clarify the scientific ambition and contribution of this article by framing the results using the 5-steps recommendations previously on the discussion section. As suggested by RC2, we have also included in the introduction a succinct description of best-practices recommendations for participatory modeling. As we better clarify in the introduction: and mentioning the point about the main characteristic of this research that contributes to the participatory modeling and transdisciplinary science conversation. With these changes, page 3: "Best practices for participatory hydrological modeling include: Having a clear problem that all recognize and embrace; selecting an appropriate, simple, and flexible modeling tool for the question complexity, funding, and time; engaging different types of local knowledge from a diverse group of participants as early, as frequent, and as long (all stages of the process) as possible; in a neutral, transparent (in its uncertainties) and scientifically sound process that recognizes local historical disagreements; and incorporates facilitation and negotiation (Voinov and Gaddis, 2008; Voinov and Bousquet, 2010; Basco-Carrera et al., 2017). These participatory hydrological modeling recommendations are usually focused on situations in which there is time and disposition for a long engagement between academia and participants. However, as we experienced in our case, the context in which these tools are applied can deeply vary, impacting the success of these best practices and frustrating these complex science-society efforts". Following, in a next paragraph we mention: "In this article we will explore these participatory modeling best practices recommendations in a case study that was 1) not originally intended as participatory, 2) in a community experiencing conflict over an environmental catastrophe and 3) during other governmentally-lead attempts at finding collaborative solutions"

**Response to specific comment 1.** Indeed. As we will better explain, although these two processes were designed to be implemented in separately, giving the level of conflict and large number of uncertainties, we saw an opportunity actively participate in the AVGC process and move towards a more transdisciplinary hydrological modeling. In a new version we use the word "coincided in time", and later in section 3.2 we further explain: "As it was explained earlier, a Voluntary Agreement for Watershed Management process initiated at the same time as the hydrological modeling exploring the potential causes and possible solutions to restore the Aculeo Lake. Authors of this paper were in charge of the hydrological study, but at the same time, guest participants of the AVGC discussion acting as potential academia partners for the resulting agreement. As this study was conducted

independently, but simultaneously with the AVGC process, there was a synergy that resulted in increased participation in the hydrological modeling, and consideration of the model in the discussions about the lake rehabilitation measures.”

**Response to specific comment 2:** Reviewer is right that the sentence was not clear. The new paragraph reads: “This is important in Chile, as the combination of surface and underground hydrological WEAP modeling described in this article is being implemented in National watershed management to develop the first set of 101 Strategic Planning at the Watershed Level throughout Chile. Therefore, this study also contributes to show how a WEAP modelling process can also be used for collaboration and mutual learning in water resources management.”

**Response to Technical correction 1:** The reviewer is right that the clarity and the location of the sentence was not correct. In a new version we have changed the paragraph location and rewritten the sentence that now reads: “Both the decision context and decision result are connected, as a legitimate scientific product, should an outcome of a credible and salient science collaboration process (Cash and Clark, 2001). In the case of hydrological modelling, there are best practices recommendations on the level of involvement of participants in the design and testing of hydrological models (Voinov and Gaddis, 2008), that prove how process has a key role in the sense of co-authorship over the product and results of this collaboration (Basco-Carrera et al., 2017)..”

**Response to Technical correction 2:** The sentence has been rephrased to “Therefore, this study also contributes to show how a WEAP modelling process can also be used for collaboration and mutual learning in water resources management.”

**Response to Technical correction 3:** The sentence has been rephrased to “we saw an opportunity to actively participate in the AVGC process and advance towards a more transdisciplinary hydrological modeling.”

**Response to Technical correction 4:** The sentence that is now in a different location, has been changed to: “These instances were used to identify additionally questions that were pressing and causing suspicion and conflict among participants, such as belief that water diversions upstream was not only illegal, but also causing the lake desiccation.”