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Hydrology and Earth System Sciences
Discussions

# *Interactive comment on* "Monitoring surface water quality using social media in the context of citizen science" *by* Hang Zheng et al.

**M. Gharesifard**

m.gharesifard@unesco-ihe.org

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General comments

This manuscript introduces an innovative way of monitoring surface water quality using citizen contributed observations and social media. The study falls in an emerging category of research in environmental management that focuses on combining the potentials of Information Communication Technologies (ICTs) and citizen science activities. The text is rather well-written and structured (with minor exceptions that are discussed in the 'technical corrections' section of this review). There are some references missing along the text (see specific comments). The higher objective of the research is to propose a "framework and method" that "can provide a mechanism to collect water quality data from citizens and offer a primary foundation for big data analysis in future



research", however, there are a number of methodological and data analysis ambiguities that for sure can benefit from further clarification and discussions (see specific comments in the next section). Thus, it is very much important that the authors explain the assumptions and choices made in interpreting the citizen contributed data.

Specific comments

1- There are a number of arguments along the text that tend to oversimplify numerous social and technical difficulties of citizen engagement in environmental monitoring, here are some examples:

Page 2 (line#9) authors claim that "If a sufficient number of volunteer reporters (e.g., the two citizens) come forward, then the hidden sewage dumping and pollution can be detected with considerably low cost"; It should be noted that 'coming forward' and getting engaged in environmental monitoring, does not necessarily mean that the volunteers will remain engaged in the activity in long run. Quality Control measures should also be studied, and discussed carefully before making such claims; false data may result in poor, costly, and sometimes irreversible decisions.

Page 6 (line#9) authors claim that "If these people log in and submit reports, then they become volunteers. Thereafter, they may share their reports and attract numerous volunteers to be involved"; this sentence sound like a claim by the authors, and can also benefit from a 'more careful' restatement as it (perhaps unintentionally) undermines the difficulties involved in citizen engagement.

2- On Page 6 (line#9) authors mention that "Professionals who work for environmental authorities and organizations were interviewed and convinced to register in TEMP"; is it possible to provide a brief conclusion from the findings of these interviews? For example, what were their incentives for participation? Or, how they were 'convinced'?

3- I find it difficult to understand the concept behind formulating the equation (1) on page 7. I found this equation problematic as according to the formula S, T, and F (that

are among the physical characteristics of the water) are 3 times less important than 'Ia' that is solely based on data collector's perspective. The authors should explain more about the assumptions behind formulating this equation as they highly affect the final results of this research.

4- On page 10 (line#15) authors conclude that "this difference may be attributed to that citizens tend to overrate the water quality". In line with the previous comment; how does this conclusion change if we gave the same weight to all attributes in formula (1) on page 7?

5- All of the attributes discussed in the graphs on page 11 (floats, water smell, and turbidity) are highly dependent on the time of observation, and also the location. How did the authors include the 'time of observation' and 'location of the samples' in comparing official and volunteer data?

6- On Page 19 (line#10) authors refer to the concept of feedback loop in participatory processes without introducing it earlier in the paper. This concept needs to be introduced at an earlier stage in the paper.

7- References are missing in the following sections:

Page 1 (line#28); "Currently, collecting a single sample at a site costs between US$4,000 and US$6,000"; reference is missing

Page 9 (Line#7); "Among the 83 cross-sections surveyed during the Yellow River quality assessment in 2004, 72.3% felt into the Grade III quality standard"; reference is missing

Page 9 (Line#15); "The hydrological regime at this station represents an overview of the hydrological regime of the entire river basin"; Authors' claim, without reference

Technical corrections

Page 5(Line#29); change "WeChat in their mobile devices" to "WeChat on their mobile



devices".

Page 10(Line#6); Typo; should be Figure 3.

Figure 3(a) on Page 10; add vertical axes title/unit.

Check section 4.2 on page 11 for typos and errors, here are some examples ( (1) Beijing has 29 reports not 30; (2) Table 3 shows the overview of the 172 validated reports, not the reports themselves; (3) Based on the content of Table3 this statement is not true: "A total of 10 provinces have under 10 reports"; (4) Based on the content of Table3 this statement is not true:"A total of 13 provinces have only 1 report during the period" ).

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