**Reviewer 1**

**Lorraine Wolf’s** **review of BSSA-D-10-00009, “Intermediate Field Water Level Changes Observed From the Wenchuan Earthquake,” by Zhang and Huang**

We appreciate having your answers to the following questions.  At the end of the list, please include any comments for the Editor that should not go to the authors.

Select the statement that best describes the paper (replace the \_\_ with an X):

It is suitable for publication in BSSA in its present form  \_\_

The conclusions are likely correct, but it requires revision primarily to the presentation (writing, figures)  \_\_

The conclusions are likely correct, but it requires additional research or tests to support them  \_\_

The validity of the conclusions cannot be judged without additional research or tests \_x\_

It cannot be made suitable for publication in BSSA \_\_

For the following questions, delete the Yes or No to leave your desired response.

Does the paper contain new and interesting results?   [Yes] new well data are shown

Did you check the mathematics?     No

Would you be willing to review a major revision of this manuscript?   Yes

If you answer yes to any of the following block of questions, please explain in your commentary:

   Does the manuscript contain technical errors?   Yes

   Do the title or abstract need changes to make them representative of the contents of the paper?   No

   Does the paper need improvements in grammar?   Yes

   Could the paper be shortened without loss of information and clarity?  No

   Does the paper use SI units unless common practice dictates an exception? No

   Is the citation list incomplete and/or does it contain inappropriate entries?   Yes

   Are there irrelevant or unnecessary figures?     No

   Does the artwork need improvements to make it well designed, clear, and understandable?  Yes

   Could the paper benefit from having electronic supplements?   Yes

   If the paper has an electronic supplement, is it required to understand the paper? Yes, if the data are not presented in the text

   If the paper has an electronic supplement, does it have any technical problems? No

Please give a frank account of the strengths and weaknesses of the article:

Confidential Comments to AE:

My comments and concerns on the paper's strengths and weaknesses are summarized in the comments to the reviewer (included below). Although this is a very interesting topic, the data presented are not verifiable and the main conclusions (e.g., about confining conditions) are not supported. I noticed the authors state that the "data used in this paper were collected from a classified source for restricted use only." However, the author's interpretation and conclusions cannot be independently verified without the data. If the authors cannot provide a precise location (e.g., lat/long) for the wells, they should at least supply a generalized map showing the locations of the wells. Also, without calculation the coseismic strain field, they cannot show that the water-level change is not just a response to the strain field.

Comments to authors below:

This paper presents some interesting data and observations about the relation between water levels and coseismic strain in the intermediate distances from the Wenchuan China earthquake. The authors contend that water-level changes observed at these distances can be explained by variations in Skempton's coefficient, which really reflects the confining condition around the wells. The authors use an established method for estimating Skempton's coefficient using pre-earthquake tidal strains and associated water-level changes. The estimated value is then compared to water-level changes observed during the Wenchuan earthquake. I have two major concerns and one suggestion:

My first concern is that the paper has been submitted as a short note and is therefore limited in length. However, the paper, as such, lacks enough supporting evidence to convince the reader of the author's interpretations and conclusions. This supporting material should be included either by expanding the paper to a full-length article or by including an electronic supplement containing the data. Most important among the needed information are the following:

1. A map showing the location of the Wenchuan earthquake (including the date.)(Perhaps this could replace the current Fig 1).

2. A map showing the calculated coseismic strain field plotted with the location of the observation wells, labeled to correspond to the information in Table 1 and Figure 2. One might speculate that the sign of water-level change would correspond to whether the well was located in an extensional or compressional field. If not, then it would emphasize that another mechanism was operating (e.g., confining conditions, compaction, etc.)

3. Figure 2 should include the well names that are being plotted within each subplot. These should correspond to the Table 1 listing and the map (see #2).

4. Some information on the stratigraphy at the wells should be included (like major regional aquifers being tapped by the wells and information on their confining conditions in the vicinity of each well). This is necessary to support the contention that higher B values correspond to areas with confined aquifers.

5. All the information contained in Figure 1 seems to be in Figure 2. Is Figure 1 really necessary?

My second concern focuses on the calculation of Skempton's coefficient. Although the background equations are provided, the actual method applied is not clearly explained (see p 5, first paragraph after equation (5)). The description of the method should be entirely rewritten for clarity. Define the M2 wave. Use SI units. What do you mean by "disposing the obtained frequency parts"?

My suggestion to the authors is that the discussion of the far-field effects and possible explanations be eliminated. It detracts from the main focus of the paper (intermediate field response) and is very poorly supported by data.