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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Effect of land use/land cover and climate changes on surface runoff in a semi-humid and semi-arid transition zone in Northwest China" *by* Jing Yin et al.

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Dear Editor and Reviewers:

Thank you for carefully reading the manuscript and providing constructive suggestions and comments. We appreciate your time and effort in considering the manuscript for publication.

All of the questions/comments will be carefully addressed in the revised manuscript.

The following are point-by-point answers to each question/comment.

Reviewer (s) Comments and our Responses

Reviewer #2

This MS investigates both the combined and isolated impacts of land use/land cover and climate changes on surface runoff in a semi-humid and semi-arid transition zone. I reviewed the discussion paper and a revised version by Xiong on behalf of the authors on Agu. 31, 2016. Most of my concerns are similar to that of the previous reviewer. I found that the authors have addressed most of the previous comments/suggestions and made significant changes to the paper, which has improved its quality considerably. The methods, results, and discussion are now rather well described, and the manuscript may be considered for publication after addressing the following minor concerns.

Specific comments

1. Page 21, line 442. The sentence contains misleading statement because resolution of the soil map is 1:1 000 000 whereas the LULC map has a resolution of 30 m.

Responses: Thank you for the valuable comments. We rewrote the sentence to improve clarity as follows:

In addition, the coarse vegetation information provided by the LULC data in this study can lead to uncertainty in the simulations because vegetation distinction is required in SWAT modelling. Although the LULC data had a relatively high resolution of 30 m, we can only provide a general vegetation categorization, such as forest, due to the data limitation.

2. Citation and reference list. I found last name and publication year of some citations were the same; however, the full citations in the reference section showed different first names, e.g., Wang et al., 2014. In addition, some citations in the reference section were repeated (e.g., page 24 line 521). The authors should proof read the manuscript to avoid such confusions or repetitions.

Responses: Thank you for the valuable comments. We will check the citations carefully,

delete repeate citations, and correct mistakes. For example, the citations of 'Wang et al., 2014' in the text and reference section were revised as follows:

Both climate and land use/land cover (LULC) changes are key factors that can modify flow regimes and water availability (Oki and Kanae, 2006; Piao et al., 2007; Sherwood and Fu, 2014; Wang et al., 2014a).

Nonetheless, the above results indicate that LULC change contributed considerably to decreased runoff, as reported in other studies (e.g., Zhang et al., 2011; Zuo et al., 2014; Wang et al., 2014b; Wang et al., 2016).

Wang, R., Kalin, L., Kuang, W., and Tian, H.: Individual and combined effects of land use/cover and climate change on Wolf Bay watershed streamflow in southern Alabama, Hydrological Processes, 28, 5530–5546, 2014a.

Wang, G., Yang, H., Wang, L., Xu, Z., Xue, B.: Using the SWAT model to assess impacts of land use changes on runoff generation in headwaters, Hydrological Processes, 28, 1032–1042, 2014b.

3. If possible, can you separate the result and discussion sections.

Responses: Thank you for the valuable comments. Combined with comments from another reviewer and the Editor, we will separate section 3 ('Results and Discussion') into two sections as follows, including section 3 ('Results') and section 4 ('Discussion'), and related context will also be revised.

3 Results

3.1 Climate change

3.2 LULC change

3.3 Performance of the SWAT model

3.4 Simulated surface runoff

4 Discussion

4.1 Impacts of LULC and climate changes on surface runoff

4.1.1 Isolated impacts of LULC change

4.1.2 Isolated impacts of climate change

4.2 Uncertainty in SWAT model simulations

4. In the line 19, I don't think the Jinghe river is a "large" basin.

Responses: We agree that the term "large" is difficult to determine quantitatively. According to this comment, we revised the sentence as follows:

However, conflicting results regarding the effects of LULC and climate changes on runoff have been reported in relatively large basins such as the Jinghe River Basin (JRB), a typical catchment (> 45000 km2) located in a semi-humid and arid transition zone on the central Loess Plateau, Northwest China.

5. suggest change the "cropland to forest and grassland program (CCFGP)" to "Grain for Green" program.

Responses: Thank you for this comment. We replaced "cropland to forest and grassland program (CCFGP)" with "Grain for Green Program" in the entire manuscript.

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