

## (1) comments from Referees

Interactive comment on “Land use and land cover change based on historical space-time model” by Qiong Sun et al.

Anonymous Referee #2

Received and published: 12 July 2016

Review of “Land use and land cover change based on historical space-time model” by Sun et al.

This paper presents results from the automatic classification of land use using remote sensing technology with the aim of analyzing spatial and temporal patterns of land use changes in the Qiantang River catchment. The manuscript deals with a potentially interesting topic but several critical points must be addressed before making it suitable for publication. My main concern is related to the fact that clear objectives of this study are not clearly stated. The authors claim that “. . . case study of typical areas is an important approach understanding global environmental changes” but a case study is not an “approach”, it just, if well presented and discussed, could help to improve the knowledge on consequences of environmental changes. This study needs at least one clear objective (e.g., development of a new methodological approach to investigate

land use changes using remote sensing technique) to justify the case study otherwise the contribution to the scientific community can not be considered sufficiently original. Furthermore, the automatic classification method based on multi-source data in combination with SAM is defined highly accurate and precise (L. 270-271) but a critical comparison with a non-automatic land use changes maps has not been carried out to support this consideration.

Specific comments:

The manuscript presents only two figures and both, especially Fig. 2, require a strong editing. Fig. 1 is not referenced along the text, green, pink and yellow portions of the catchment are not described in legend or caption and a north arrow is missing. Fig. 2 that is probably the most important figure of the paper is unreadable and land use classification differences can not be appreciated because of the small size of individual images of the catchment. I suggest to modify this figure from an horizontal to a vertical combined image (with a, b, c labels) to enlarge the extent of single images. Legend, scale bar and north arrow are completely missing.

In the introduction more international references are needed. You could reference some relevant works using static and dynamic approaches and provide also some example of application of these techniques to different fields of investigation.

L. 41-42: this paragraph is written in poor English. Please consider to reformulate it.

L. 48-52: Here the objective\’s of your work must be clearly stated highlighting also the novelty of your study.

L. 55: a title of the sub chapter is required (i.e., 2.1 Study area)

L. 56-62: here some basic information on the studied catchment are missing. Which is the area? And the mean slope?

L. 56: “complicated landforms” -> “complex morphology”

How long is Qiantang River? 605 km (L.74) or 583 km (L. 77)?

L. 75-77: English must be revised here and the discharge is usually expressed in  $m^3/s$  L. 92: which is the DEM resolution?

L. 256: remove “area” after increase

L. 260: “is seldom researched” -> “has been seldom studied in the past” .

Discussion: This section needs to be strengthened by better discussing your results and comparing your findings with literature.

## (2) author's response

The objectives of the paper have been clarified. Besides, multi-source data based automation classification method in combination with SAM was analyzed.

The content has been corrected according to the above suggestions: Figure 2 has been reedited; literature, illustration and arrow pointing at north have been added for figure 1; literatures in the introduction part have been corrected. But we are sorry that we are unable to correct figure 2 according to the suggestions, but we have demonstrated a map for the Qiantang River basin.

L. 41-42: The language of this section has been revised.

L. 48-52: The research objectives and innovation of the study have been emphasized in that section.

L. 55: A subtitle has been added.

L. 56-62: The relevant information has been supplemented.

L. 56: “Complicated landforms” has been replaced by “complex morphology”. The length of Qiantang River has been revised.

The former one refers to the whole length and the latter one refers to the whole length of the main stream. They are different.

L. 75-77: The data listed was about average annual runoff, thus the unit is correct and remained unchanged. The language has been revised.

L.92: It has been pointed out in the study.

L. 256: The word “area” has been removed.

L. 260: “is seldom researched” has been replaced by “has been seldom studied in the past”.

The content in the discussion part has been improved.