Response to Reviewer 1 Comments

**Point 1:** Urban forests are a significant social and economic resource for urban residents (urban ecology and nature, food, medicine, aesthetics, cultural value and human wellbeing). Urban forest loss, therefore, threatens people’s livelihoods as well as biodiversity in the urban landscape. A brief discussion of the consequences of urban expansion is not mentioned in the manuscript and should be discussed. Particularly since multitemporal images of the cities were used to monitor changes in urban extent, such expansion threatens natural landscapes, which are valuable in maintaining rich urban biodiversity.

**Response 1:** Thank you for your suggestion and we accept it. Analysis of land use change and a discussion of the consequences of urban expansion are added in Chapter 5. We find that the urbanization has destroyed forest and grassland two size of Beijing urban area. About 10% of the sprawl area is at the cost of forest and grassland. More than half of the sprawl area consists of cultivated land. And water area and unutilized land also suffer great losses. Urbanization of China is at the expense of nature and arable land. It seriously threatens people’s livelihoods and biodiversity in the urban landscape.

**Point 2:** The authors did not mention if the semi-automatic approach is rule-based, which needs to be constantly crafted and can be challenging on its own.

**Response 2:** Thank you. The automatic part is based on features and the manual part is based on rule. First, a method fusing right-angled and right-angled features which we proposed in 2017\(^1\) is used to automatic extract residential polygons from high-resolution remote sensing images. The correctness, completeness, and quality of this method is higher 6.76%, 10.12%, 12.14% respectively than the existed method. The flow chart is shown below.

![Flow chart of the proposed method](image)

Figure 1. Flow chart of the proposed method.
Then, the polygons of the settlements are superimposed with the location of the district government, whereas the polygons of the concentrated contiguous settlements, where the district government is located, are used as the initial urban area. The classification system and standards for geographic country monitoring indicate that the original urban area should be manually interpreted and modified in accordance with the urban area extraction principles and rules to obtain the final urban area.

The automatic part has been testing in [1]. The manual part has been examined quality inspection station of each province and the result has been applied to many government departments.


**Point 3:** It is innovative to develop or explore new information extraction techniques to efficiently extract urban footprint from very-high-resolution satellite imageries as the authors attempted (i.e. conceptualization, development and implementation of the new method as they claim). However, the authors did not consider the transferability of the semi-automatic method developed on very-high-resolution satellite images of similar or slightly different regions to test the robustness of the newly developed approach and potential applications.

**Response 3:** Thank you for your question. The test of robustness in different regions must be done before extracting of the 337 cities' urban. These so many cities have their own characteristics and are more or less different from each other. The keys of obtaining a standardized result are the principles which are summarized from the rich experience of many different cities' urban extraction using different satellite images in a long time. And the result is examined by professional inspectors and users. So, we think our method is robust and can be tested.

**Point 4:** The authors did not also provide evidence of comparison of the new methods with other existing approaches to address questions inconsistency in concepts and extraction standards, low precision, and poor comparability existing in urban monitoring which may lead to the wrong conclusion as opined.

**Response 4:** Thank you for your suggestion and we have compared the proposed method with some existing approaches in Chapter 4. The result is compared with other results such as the result of MODIS in the report "East Asia's Changing Urban Landscape" and the result of manual extraction by Landsat images.

**Point 5:** The table does not include the month images were collected?

**Response 5:** Thank you for your question. The months of images are introduced above the table, Satellite imagery was mainly obtained from September to December and small number (about 5%) of imagery is obtained in other months.

**Point 6:** The figure is not visible.

**Response 6:** I'm so sorry for that. We have added the Figure 2 by .jpg rather than .vsdx so that the online system can correctly transfer a docx to a pdf.
Point 7: Figure 3 (a) depicts building instead of high rise or tall buildings, since (b) shows low-rise buildings.

Response 7: Thank you for your suggestion and we accept it.