Earth Syst. Sci. Data Discuss.,
https://doi.org/10.5194/essd-2019-65-AC4, 2019

Earth System Science Data Discussions

Interactive comment on "A 30-meter resolution national urban land-cover dataset of China, 2000–2015" *by* Wenhui Kuang et al.

Wenhui Kuang et al.

kuangwh@igsnrr.ac.cn

Received and published: 8 November 2019

Point 1: Page 4 line 4-10: Please explain how the method used by CLUD to extract urban area by Machine learning or manual interpretation? How does the errors on the boundary affect the analysis results of the proposed data set?
Response:
Our previous publications have detailed the approach for developing CLUD (Liu, Liu, Tian et al., 2005, RSE; Liu et al., 2009, JGS; Liu et al., 2014; JGS): This approach can be briefly summarized as following: (1) build the interpretation symbols of cities in Landsat images, (2) the polygons in GIS were used to depict urban boundaries. When human-computer visual interpretation was conducted, polygons were created and labelled as urban area, (3) the urban boundaries were revised according to urban

features like concentrated contiguously.
The accuracy of the proposed dataset includes two parts: the accuracy of urban boundaries and the accuracy of urban land-cover classification. The average accuracy of urban land was 95.48 %. The accuracy of urban boundaries reflects the accuracy of urban land extraction. As the manual interpretation was adopted, the urban boundaries are more accurate than others (Liu, Liu, Tian et al., 2005; Liu et al., 2009, JGS, Liu et al., 2014; JGS).
Changes in manuscript:
We added texts to briefly explain the method to produce CLUD, see page 4, lines 22-25.

Point 2: Page 4 line 4-10: "With prior knowledge of image classification and human computer visual interpretation, we extracted urban land in Suzhou by detecting the city's boundaries", the authors used CLUD to extract the city boundary, but the prior knowledge and visual interpretation were used to extract the boundary of Suzhou. Do all cities in the dataset used the boundaries with visual interpretation?
Response:
Yes, we used visual interpretation to identify all city boundaries. We took Suzhou city as an example to show how the method worked. We revised the manuscript to make the expression clearer.
Changes in manuscript:
In Page 4 line 21, we replaced "urban land in Suzhou" to "China's urban land".

Point 3: Page 4 line 13: What's ISA fraction? The fraction should be appeared in the manuscript.
Response:
ISA fraction refers to the percentage of ISA in a pixel. We added texts to explain ISA

fraction.
Changes in manuscript:
In Page 4 lines 28-29, we added a sentence to explain ISA and UGS fraction.

Point 4: Page 4 line 24-25: "In addition, the input parameters required by logistic regression via ISA classification data and NDVI maximum data can be obtained through existing methods and datasets", It would be better to explain what parameters they are.
Response:
ISA classification data refers to ISA in land-cover classification data. NDVI maximum data refers to NDVI composite data which is the maximum NDVI value from all Landsat images in a year. We added texts to explain this term.
Changes in manuscript:
In page 5 lines 9-11, we added texts to explain ISA classification data and NDVI maximum data.

Point 5: Page 5 line23-25: "The spectral unmixing method was employed to unmix the Landsat multispectral bands into the four endmembers. A decision tree was built to classify the high-albedo surfaces, low-albedo surfaces, water, vegetation and bare soil based on the fractions after unmixing and the calculation of indexes", how did the authors use the MNF to process different remote sensing images which have different atmospheric conditions?
Response:
The atmospheric correction using FLAASH was done before MNF. In reality, MNF was used to support the endmember selection for each image separately, so atmospheric condition for individual images will not affect the selection of endmembers.
Changes in manuscript:
In page 5 lines 29-30, we added some texts to describe the image preprocessing (atmospheric calibration) in the revised manuscript.

Point 6: Page 6 line 11-22: It is would be better to use high resolution images to interpret the green space and then verify the accuracy of UGS.
Response:
Yes, we interpreted green space from high spatial resolution images for some typical areas, and then used these data as a reference to evaluate the UGS from Landsat.

Point 7: Page 6, line 29-30: "Because of its relatively high accuracy...", how high is the accuracy?
Response:
The accuracy assessment was conducted for each year. The RMSE values for 2000, 2005, 2010, and 2015 results are 0.12, 0.11, 0.11, and 0.10, respectively. We revised the relevant part by adding the exact RMSE values.
Changes in manuscript:
In page 5, lines 3-4, we revised the manuscript by adding RMSE values for 2000, 2005, 2010, and 2015 results.

Point 8: Page 8 line 11-19: "In our dataset, the urban and rural areas are well distinguished because of a good definition of urban area", the authors should provide more convincing evidence to prove the good definition of urban area.
Response:
In our study, urban area is characterized as land for residential, commercial, industrial, recreational, and transportation in cities and towns. Rural area refers to other human settlement in countryside (Liu, Liu, Tian et al., 2005, RSE; Kuang et al., 2016, Landscape and Urban Planning). They showed different features in remote sensing images, as shown in Figure 1. The urban land-cover area is more complex than rural area (Figure 1, shown below).
Changes in manuscript:

We revised the manuscript in page 8, lines 26-29.

Please also note the supplement to this comment:
https://www.earth-syst-sci-data-discuss.net/essd-2019-65/essd-2019-65-AC4-supplement.pdf

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2019-65, 2019.

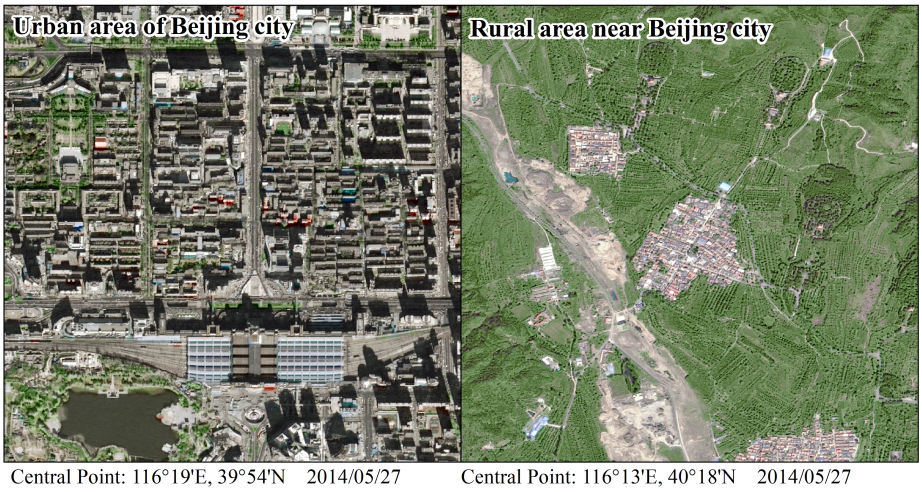

Fig. 1. Figure 1: Comparison of urban and rural areas in remote sensing images.