

Time series of Inland Surface Water Dataset in China (ISWDC) for 2000-2016 derived from MODIS archives

Lu, S., Ma, J., Ma, X., Tang, H., Zhao, H., and Hasan Ali Baig, M., 2018: Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-134>.

Overview

This paper describes the derivation of a dataset, the Inland Surface Water Data in China (ISWDC), from MODIS imagery. The dataset indicates the presence (as 1) or absence (0) of surface water in China for the period from 2000 to 2016 at a spatial resolution of 250 m and temporal resolution of 8 days.

The paper has been reviewed. The main points from the two reviews were:

1. The significant overlap with an earlier paper by the same authors, especially the methodology section (cited paper by Lu et al., 2017): Reviewer 1.
2. Simplistic and superficial treatment of uncertainties: Reviewers 1 & 2
3. Incorrect and/or general statements: Reviewer 1
4. The wider and long-term application of the approach: Reviewer 2

This review of the revised manuscript will indicate the extent to which these points have been addressed. In so doing, I take account of the key criteria for acceptance in this journal: (a) uniqueness; (b) usefulness and (c) completeness.

This is an improved version. I recommend a further revision to address the outstanding points raised in the Specific and Technical Comments below.

Specific Comments

1. Overlap

This is now much reduced.

2. Simplistic and superficial treatment of uncertainties

The author response to Reviewer 1 states “On the issue of accuracy evaluation, we have increased the accuracy analysis of temporal process data” and Reviewer 2 “In the new final section, we added a paragraph to discuss the overall uncertainties”.

There is certainly more material and discussion on the comparison with other datasets (national and the Global Surface Water (GSW) product) and on the uncertainties in the revised manuscript. However, this still needs further work.

- a. Some of the material in the author response should be included in the paper. For example in the response to Reviewer 1:

“As the national land cover data in 2000, 2005, 2010 are based on 30 m Landsat images that mainly obtained in summer season. The water surface in these datasets can be equated with annual maximum water surface results. So we compared them with our maximum ISWDC of corresponding year. The calculated R^2 is based on the area of different size of water bodies. The larger the R^2 , the better the consistency and the smaller the area error between the two

datasets. Furthermore, the results of confusion matrix are equivalent to pixel scale analysis although it's not as intuitive as visual contrast.”

This makes it clearer why the maximum/summertime values are used, especially when there is a factor of 2 change in the total surface area during the course of the year (Figure 7).

- b. The comparison of the ISWDC and GSW data products has been extended to include time series of the annual size of permanent water bodies in China between 2000 and 2015 (new Figure 4 on page 12). It is not clear if water bodies below an area of 0.0625 km² in the GWS product have been included or not. This needs clarification.

Further, as performed by Klein et al., 2017 (cited reference), an analysis could and should be made of the performance of the product for pure and mixed water pixels.

- c. The paragraph in the final section on the overall uncertainties is simply a restatement of the results presented in Table 2.

Finally, there would be real merit in comparing the ISWDC dataset with the Global WaterPack product of Klein et al., 2017 (cited reference) over China, especially as they are both based on MODIS imagery.

3. Incorrect and/or general statements

These have been addressed in the author response to the review comments and in the revised manuscript.

4. The wider and long-term application of the approach

A paragraph has been added on the global applicability of the approach and its extension to other water body indices and other sensors (e.g., Sentinel-2).

Data Availability

The dataset is available from <http://doi.org/10.5281/zenodo.2616035>. The dataset comprises a large number of files in 2 archive files. Read me files are included.

Technical Comments

Page 3: A new Table 1 has been included here in the revised manuscript. All the following Tables (Table 1, Page 7; Table 2, Page 11 and Table 3, page 16) need to be renumbered and the references to the tables revised.

Page 4, line 13: “China is one of the countries that have the highest densities of rivers and lakes in the world” should be replaced by “China has one of the highest densities of rivers and lakes in the world”.

Page 7, Table 1: The final entry for 2015 (28) is either out of place or incorrect. Please check and amend as needed.

Page 10, lines 6-8: The 4 occurrences of “lesser than” should be the original “less than”.

Page 10, line 10: The “determinant coefficients (R^2)” should be the “coefficient of determination (R^2)”

Page 11: Table 2. The table second part of the caption (“the assess results”) does not make sense.

Page 11, line 4: Replace “whole China” with “the whole of China”. Also Page 12, caption of Figure 4.

Page 15, Figure 6: It is still hard to distinguish the individual years. The use of coloured lines might provide some discrimination.

Page 15, Figure 7: The label for the y-axis is not the “Average annual area”. It is the “area of surface water” of each region for the particular 8-day period (or similar). The precision of the numbers on the y-axis needs to be increased (0,1,1,2,2,3,3,4) -> (0,0.5,1,1.5,2,2.5,3.3.5,4).

Page 19, line 18: The Gao reference is missing the journal (Remote Sensing of the Environment).

The paper could do with a careful proof read of the English as there are other non-English constructions, e.g., neglect of the definite (the) and indefinite article (a/an).