A Big Earth Data Platform for Three Poles

**Water clarity annual dynamics dataset across China (1990-2018)**

1、Description

Water clarity, as a first-order indicator that reflects the optical characteristics of water bodies, represents a comprehensive proxy for aquatic ecosystems’ trophic state. Optical remote sensing technology makes it possible to monitor water clarity changes of lakes (including reservoirs) at large scales. Water clarity annual dynamics dataset of lakes (>1 ha) across China covers the period from 1990 to 2018, with a time resolution of 5-year and spatial resolution of 30 meters, which sources from the Landsat top of air reflectance data embedded in the GEE platform. Three in-situ SDD measurement datasets were used for model calibration and validation. The first dataset was obtained from 37 field campaigns by our team during 2004-2018. Three quarters of this dataset (N= 976) were used to calibrate the model, for which the R2 and rRMSE were 0.79 and 61.9%, respectively; the remaining dataset (N= 325) was used to validate the model, and the validation results indicated stable performance by showing comparative errors (R2=0.80, rRMSE = 57.6%). The second and the third datasets were both used to validate model performance with a major focus on testing the temporal transferability of the model. The second dataset (340 samples), collected as part of the Chinese lakes survey conducted by Nanjing Institute of Geography and Limnology from 2007 to 2009, also indicated a good model performance (R2=0.78, rRMSE% = 59.1%); the third dataset (229 samples) was assembled by the first lake surveys conducted in the 1980s, demonstrating a stable performance for lake SDD before 1990s (R2=0.81, rRMSE = 50.6%). Comparison of validation results for these different periods and datasets demonstrated the stable performance of the SDD model. Finally, based on the water clarity estimation model, the algorithms of cloud mask and water index were conducted on the GEE platform to accomplish the water clarity of lakes across China. The water clarity information could assist local, provincial or even national level decision-making on policies/management for protecting or improving inland water quality.

2、Keywords

Theme：Landsat,Surface Water,Water clarity,Remote Sensing Technology,Visible remote sensing,Terrestrial Surface Remote Sensing,Lakes
Discipline：Terrestrial Surface,Remote Sensing Technology
Places：China
Time：1990-2018

3、Data details

1.Scale：None

2.Projection：Albers

3.Filesize：2.47MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：53.55 | - |
| west：73.66 | - | east：135.05 |
| - | south：3.86 | - |

5、Time frame:None--None

6、Reference method

References to data:

WEN Zhidan, LIU Ge, TAO Hui, SONG Kaishan, WANG Qiang. Water clarity annual dynamics dataset across China (1990-2018). A Big Earth Data Platform for Three Poles, doi:10.11888/Hydro.tpdc.2715712021

References to articles:

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）

8、Data resource provider

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