Water Cover Information Extracting with Multi-days Synthetize Method from MODIS Data

LUO Jin, GAO Dan
Key Laboratory of Poyang Lake Wetland and Watershed Research, Ministry of Education;
School of Geography and Environment, Jiangxi Normal University, Nanchang, China
Email:gislj@126.com

Abstract
By using the RS images to extract the water covering information makes the efficiently and dynamically monitoring of the water information come true. This research sets the Poyang Lake as the research area, makes the MODIS RS images as the data source and uses the IDL which is object-oriented and the forth generation computer language and the ENVI software which is powerful on the graphic processing, finally designs and completes the synthetic method of several days. This research chooses the EnviSAT ASAR to test the precision of the extraction results of the MODIS data. There are following results: we can extract the water covering information with the use of the mono temporal method when there is little influence from the cloud and the result is approximated to the facts. The method of synthesize with several days could reduce the influence of the cloud and rain and makes the results perfect.

Introduction
In fact, the Poyang Lake is on its flood period during May to August and in this time, the weather is cloudy and rainy which makes the mono temporal unsatisfactory. Considering the different covers coverage cope of the cloud in different date and in order to solve the cloud cover impact of the result of the data, we finally designs and completes the synthetic method of several days. The method of synthesize with several days could reduce the influence of the cloud and rain and makes the results perfect.

Study Area
The geographical location map of the Poyang Lake
Poyang Lake wetland changes very large with the water level changes. The landscape is completely different during wet season and dry season.

Methods
1) Mono Temporal Method. The computation equation is such as the following Eq:

\[ \text{NDVI} = \frac{(\text{CH2}-\text{CH1})}{(\text{CH2}+\text{CH1})} \]

In Eq.1, CH1 and CH2 are the surface reflectance of band 1 and band 2 of the MODIS. In NDVI images, the NDVI value of the water is usually negative; therefore threshold value method can be used to establish the discriminant conditions to differentiate the water bodies and other features.

2) Multi-days Synthetize Method. The Multi-days Synthetize Method is equal to five days synthesis algorithm.

Result

Mono Temporal Method

Multi-days Synthetize Method

Conclusion
We can extract the water covering information with the use of the mono temporal method when there is little influence from the cloud and the result is approximated to the facts. The method of synthesize with several days could reduce the influence of the cloud and rain and makes the results perfect. By using EnviSAT ASAR radar image data on the extraction result accuracy verification, we know that the surface cover information extraction accuracy of 94% by using the mono temporal method, and the water covers information extraction to extract accuracy as high as 97% by using the method of synthesize.

Acknowledgment
Supported by the Collaborative Innovation Center for Major Ecological Security Issues of Jiangxi Province and Monitoring Implementation. (No. JXS-EW-00)