

HJ

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**Technical specifications for monitoring and evaluating algal
bloom based on remote sensing and field monitoring**

水华遥感与地面监测评价技术规范（试行）

(English Translation)

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Foreword

To implement the Environmental Protection Law of the People's Republic of China and the Water Pollution Prevention Law of the People's Republic of China, and protect the ecology the environment, safeguard human health, regulate and guide the monitoring and evaluation of algae blooms in freshwater bodies in my country, and formulate this standard.

This standard specifies remote sensing monitoring methods for algae blooms in freshwater bodies, ground monitoring methods, and evaluation methods for the degree of blooms, etc. content.

This standard is issued for the first time.

This standard was formulated by the Department of Ecological Environment Monitoring and the Department of Regulations and Standards of the Ministry of Ecology and Environment.

Drafting organizations of this standard. China Environmental Monitoring Center, Satellite Environment Application Center of Ministry of Ecology and Environment.

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This standard is interpreted by the Ministry of Ecology and Environment.

Technical specifications for water bloom remote sensing and ground monitoring and evaluation

1 Scope of application

This standard specifies the remote sensing monitoring methods for cyanobacteria blooms in freshwater bodies, ground monitoring methods, and the evaluation methods for water bloom levels.

Content. The monitoring and evaluation of dinoflagellate, diatom and other algae blooms can refer to this standard.

This standard applies to the monitoring, evaluation and management of water blooms in freshwater lakes and reservoirs in my country. Water bloom monitoring and evaluation of other freshwater bodies can be refer to this standard.

2 Normative references

The content of this standard refers to the following documents or their clauses. For undated references, the latest version is suitable Used in this standard.

GB/T 14950 Terminology for Photogrammetry and Remote Sensing GB/T 30115 Satellite Remote Sensing Image Vegetation Index Product Specification

3 Terms and definitions

The following terms and definitions defined in GB/T 14950 and GB/T 30115 apply to this standard.

Algal bloom

A natural ecological phenomenon in which algae bloom in large quantities in freshwater bodies. The apparent feature is that there are algae aggregation or algae on the surface of the water body.

The particles are suspended in a body of water.

Algal density

The number of algae cells per unit volume of water sample. Unit. Pieces/L.

Algal bloom area

The area covered by algae when floating on the water.

Algal bloom area proportion the percentage (%) of water bloom area in the monitored water body area.

Algal bloom level

Reflecting the strong and weak characteristics of water bloom, it is judged according to the density of algae in the water body or the proportion of water bloom area.

Standard false color composite image According to the principle of additive color synthesis, the near red, red, and green bands of remote sensing images are passed through the red, green, and blue filter systems respectively the color image produced by the system synthesis.

Spatial resolution

Refers to the size of the ground area represented by the pixel.

Temporal resolution

The shortest time interval during which the sensor can repeatedly obtain images of the same area.

Radiometric calibration According to the calibration equation and calibration coefficient of the remote sensor, the quantized digital gray value recorded by it is converted into the corresponding field appearance the process of radiance.

3.10

Geometric correction in order to eliminate the geometric distortion of the image, the correction work such as projection transformation and the matching of different band images.

3.11

Atmosphere correction Eliminate or weaken the radiation distortion caused by absorption or scattering in atmospheric transmission when satellite remote sensing images are acquired.

3.12

Digital gray value digital number (DN) the gray level quantified by the reflected or radiated energy obtained by the remote sensor in each band.

3.13

Apparent radiance

The radiance at the top of the atmosphere is the radiance at the entrance pupil of the satellite remote sensor.

3.14

Apparent reflectance the ratio between the apparent radiance and the absolute white body assumption of the scene without atmospheric level should be obtained by the remote sensor.

3.15

Surface reflectance

The ratio of the reflected energy from the surface of the feature to the incident energy that reaches the surface of the feature.

3.16

Normalized difference vegetation index (NDVI) the ratio of the difference between the values of the near-infrared band and the red band of visible light to the sum of the values of the two bands.

3.17

Normalized difference vegetation index of digital number (NDVIDN) the normalized vegetation index calculated based on the digital gray value (DN).

3.18

Normalized difference vegetation index of top of atmospheric reflectance (NDVITOA) the normalized vegetation index calculated using the apparent reflectivity of the top of the atmosphere.

3.19

Normalized difference vegetation index of bottom of atmosphere atmospheric reflectance (NDVIBOA) the normalized vegetation index calculated using atmospherically corrected surface reflectance.

3.20

Routine monitoring

Routine monitoring behavior for the purpose of systematically mastering and monitoring the condition of algae in water bodies.

3.21

Warning monitoring

During the sensitive period of water bloom, the purpose of monitoring the growth and development of algae in the water body in time, and judging the risk of water bloom occurrence Monitor behavior.

3.22

Emergency monitoring During the blooming period, the monitoring behavior for the purpose of tracking and monitoring the algae bloom in the water body.

4.6.1 Selection of remote sensing data

Select satellite remote sensing images with red light (630 nm ~ 690 nm) and near infrared (760 nm ~ 900 nm) bands data. The spatial resolution should depend on the size of the