



Environment and Agriculture Monitoring Using MODIS in Xinjiang, China

Xinjiang Institute of Ecology and Geography
Chinese Academy of Sciences
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1 General Situation of the MODIS Receiving Station

Located at the Fukang Station, 80km away from Urumqi, and affiliated with the China Ecological Research Network(CERN).



1 General Situation of the MODIS Receiving Station

Supported by the Asia-pacific Environmental
Innovation Strategy Project(APEIS)



1 General Situation of the MODIS Receiving Station

1.5 TB data has been received so far, the daily-received data are 4GB~6GB including the products of L0, 1A, and 1B.



2 Characteristics of the MODIS Receiving Station

Characteristics

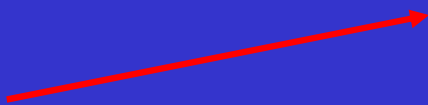
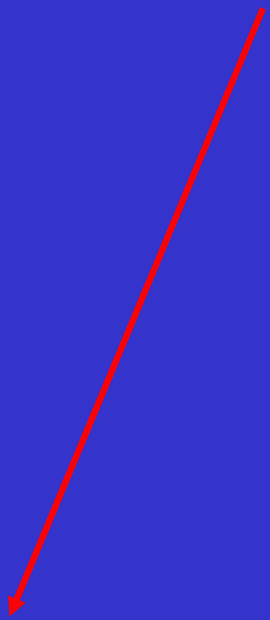
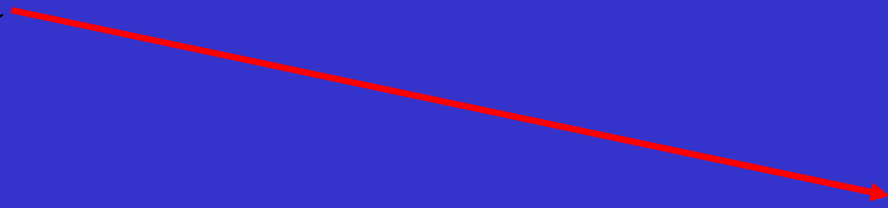
- a. MODIS data can be received daily on real time;
- b. Beginning at 4° of elevation angle. At present, the receiving scale covers:
 - Beijing eastward,**
 - the Caspian Sea westward,**
 - the Indian Peninsula southward,**
 - and Siberia northward.**

Siberia

Beijing

Caspian Sea

Himalayas



2 Characteristics of the MODIS Receiving Station

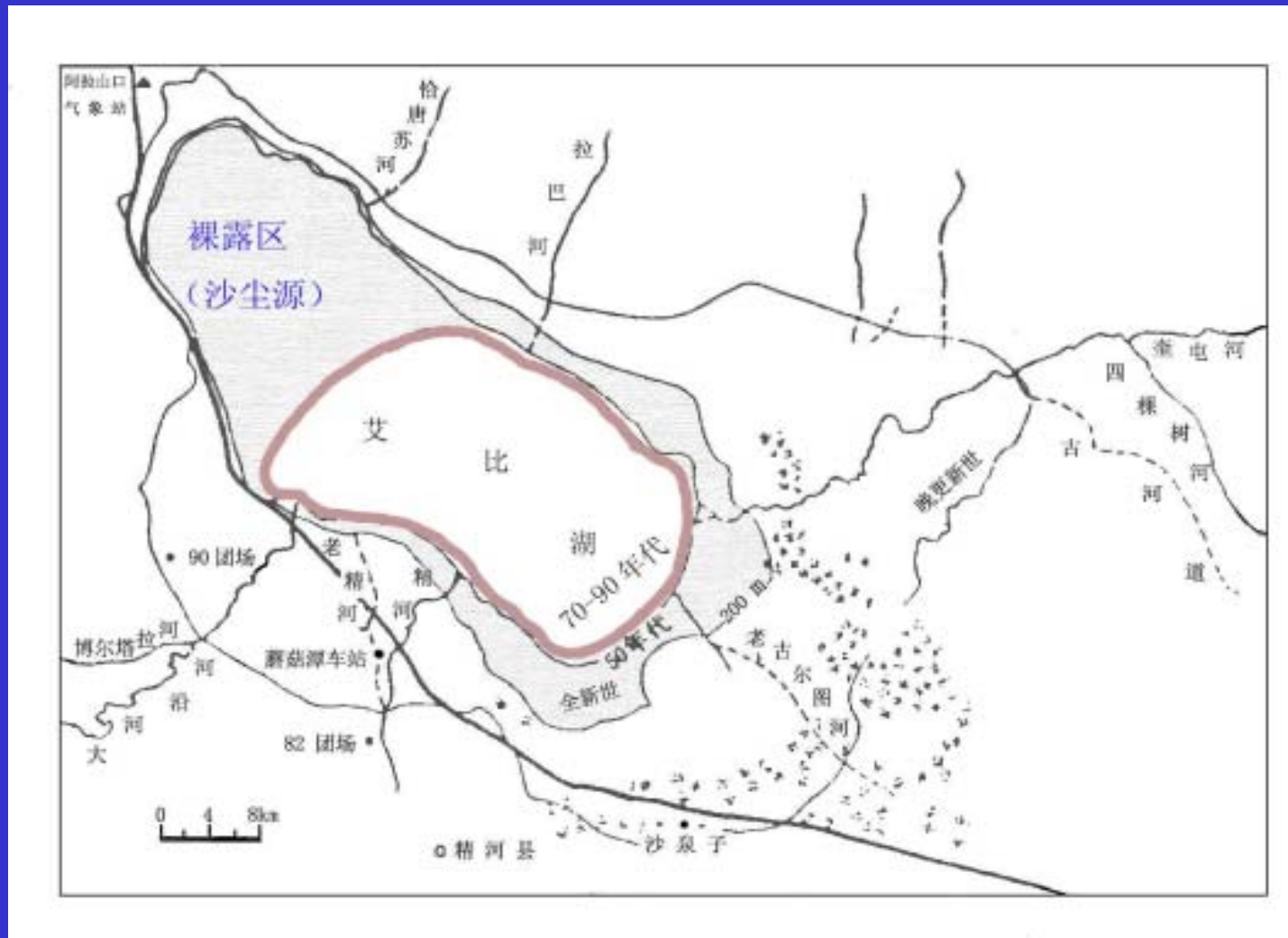
- c. Supplemented by The land surface validation facilities;
- d. International data formats;
- e. Strong support on the operation, maintenance and application facilities from the Key Laboratory of RS and GIS, the only key laboratory in Xinjiang .



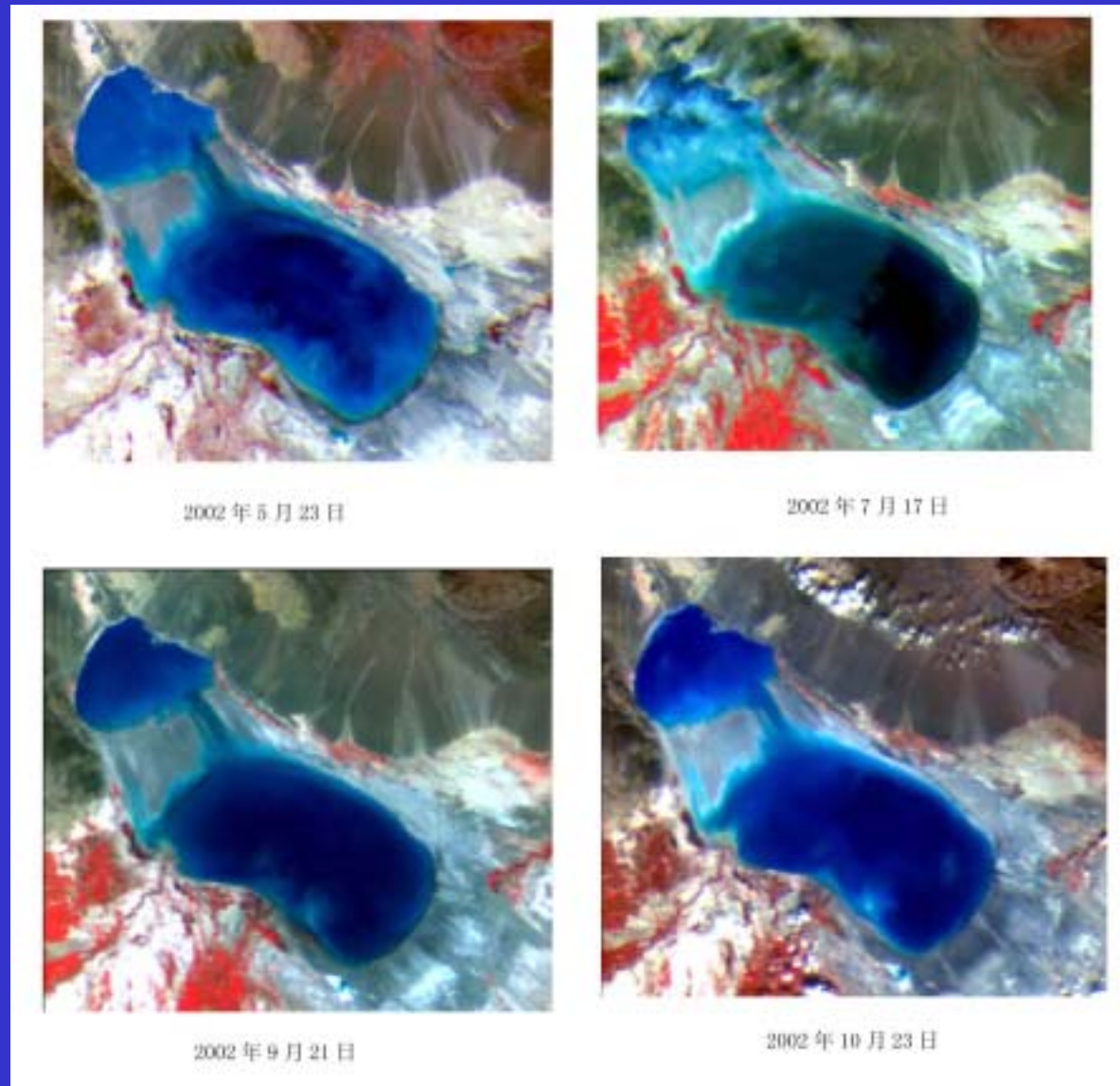
3 Application of MODIS Data : Lake area change of the Ebinur Lake

History:

1070 km² in the beginning of the 1950's, 824 km² in 1959, 522 km² in 1997



3 Application of the MODIS Data



Monitoring on the change of water area of the Ebinur Lake

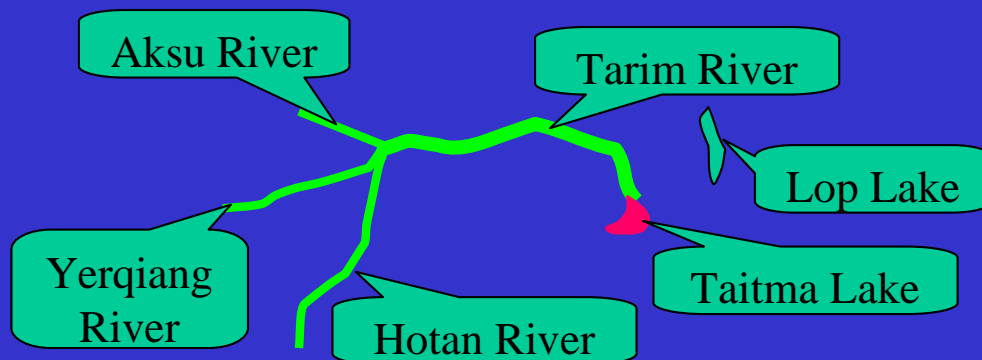
3 Application of the MODIS Data

Results:

- November 2001 -- November 2002
- The water area of the Ebinur Lake -- over 800 km² in average.
- The dried-up lake bottom has been covered with water.
- The serious sandstorms did not occur in 2002.
- The ecological environment of the Ebinur Lake has been obviously improved
- It is the basic object for improving the environment in the Ebinur Lake basin to maintain the lake water area over 800 km².

4. Application of the MODIS Data in Tarim River

2347 km ,mainstream 1320 km,
catchment area $1.04 \times 10^6 \text{ km}^2$,
total volume of water resources in
the watershed is $4.368 \times 10^{10} \text{ m}^3$,
farmland $1.33 \times 10^6 \text{ hm}^2$ in area,
8.26 million people

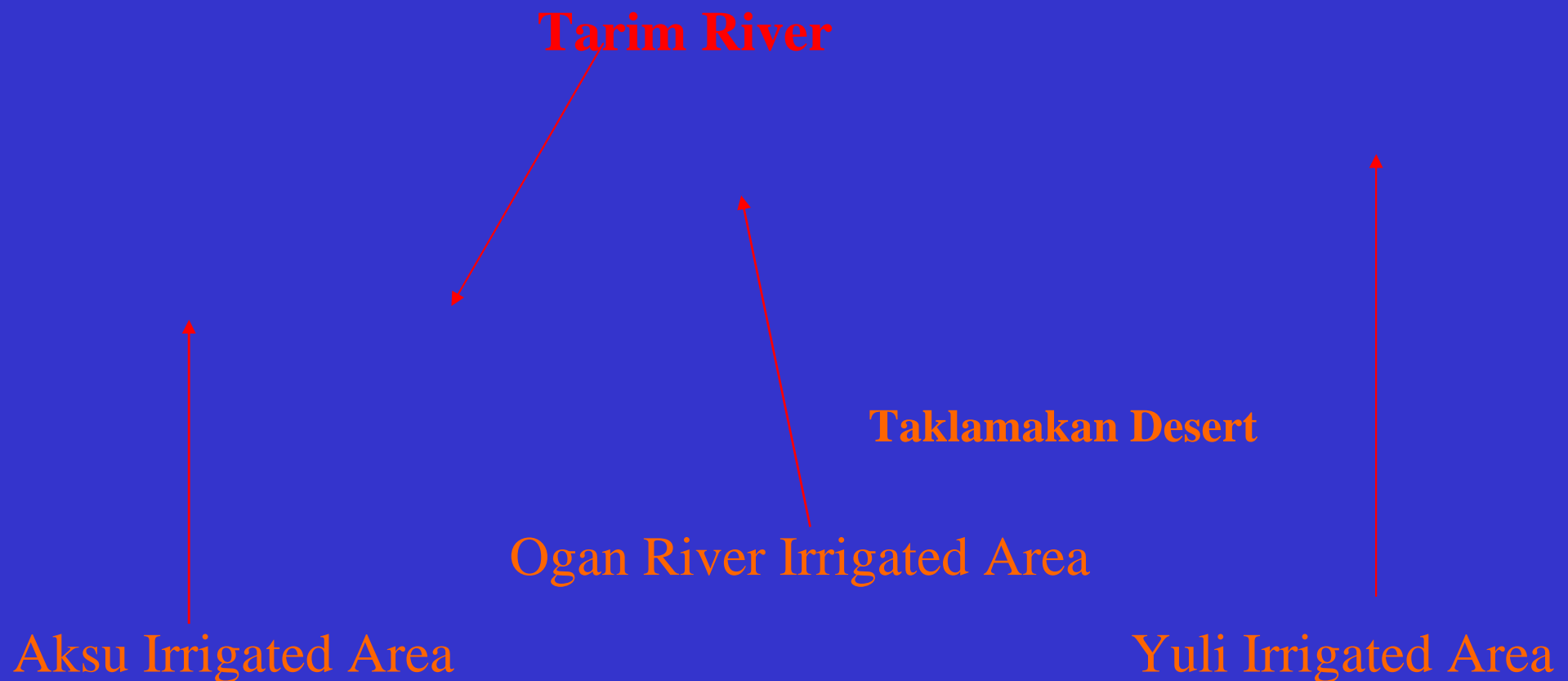


4. Application of the MODIS Data



The remote sensing monitoring on the environment in the Tarim River watershed, Xinjiang (July 7, 2002)

4. Application of the MODIS Data



**The remote sensing monitoring on the environment
in the Tarim River watershed, Xinjiang
(August 27, 2002)**

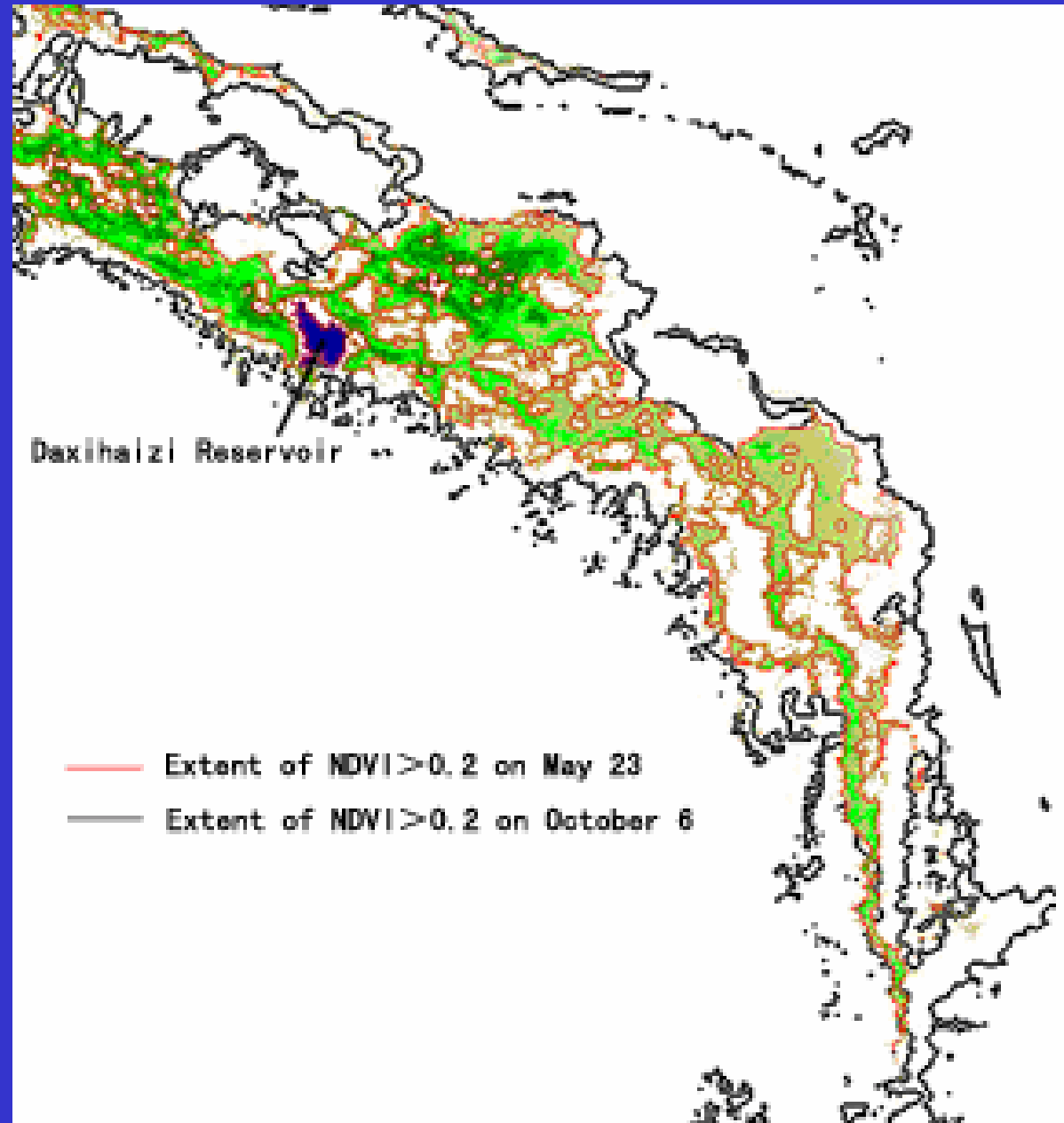
4. Application of the MODIS Data

The MODIS images in the lower reaches of Tarim River in 2002

4. Application of the MODIS Data

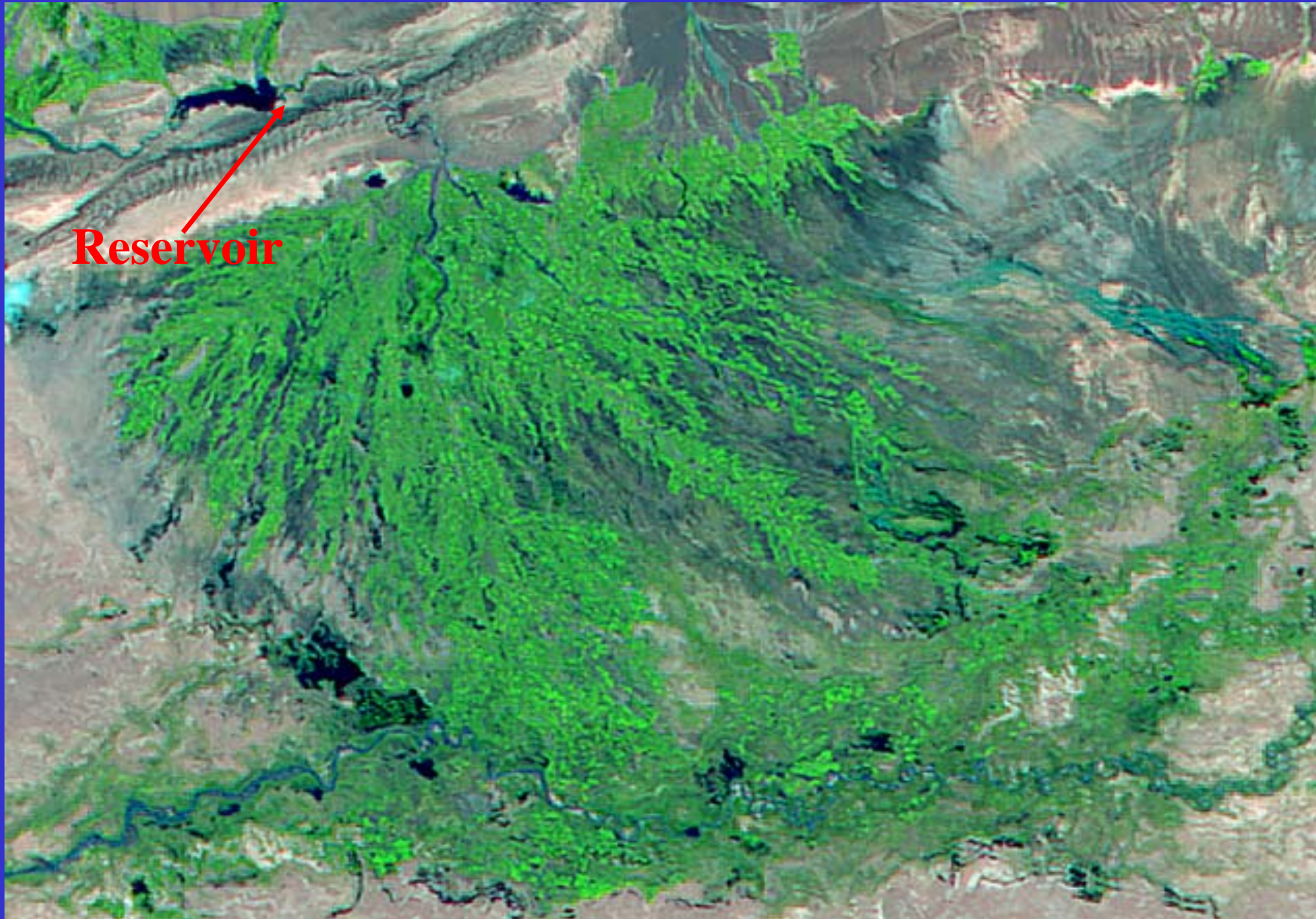
Monthly and seasonal change of the vegetation indexes of the MODIS data in the Tarim River watershed in 2002

4. Application of the MODIS Data



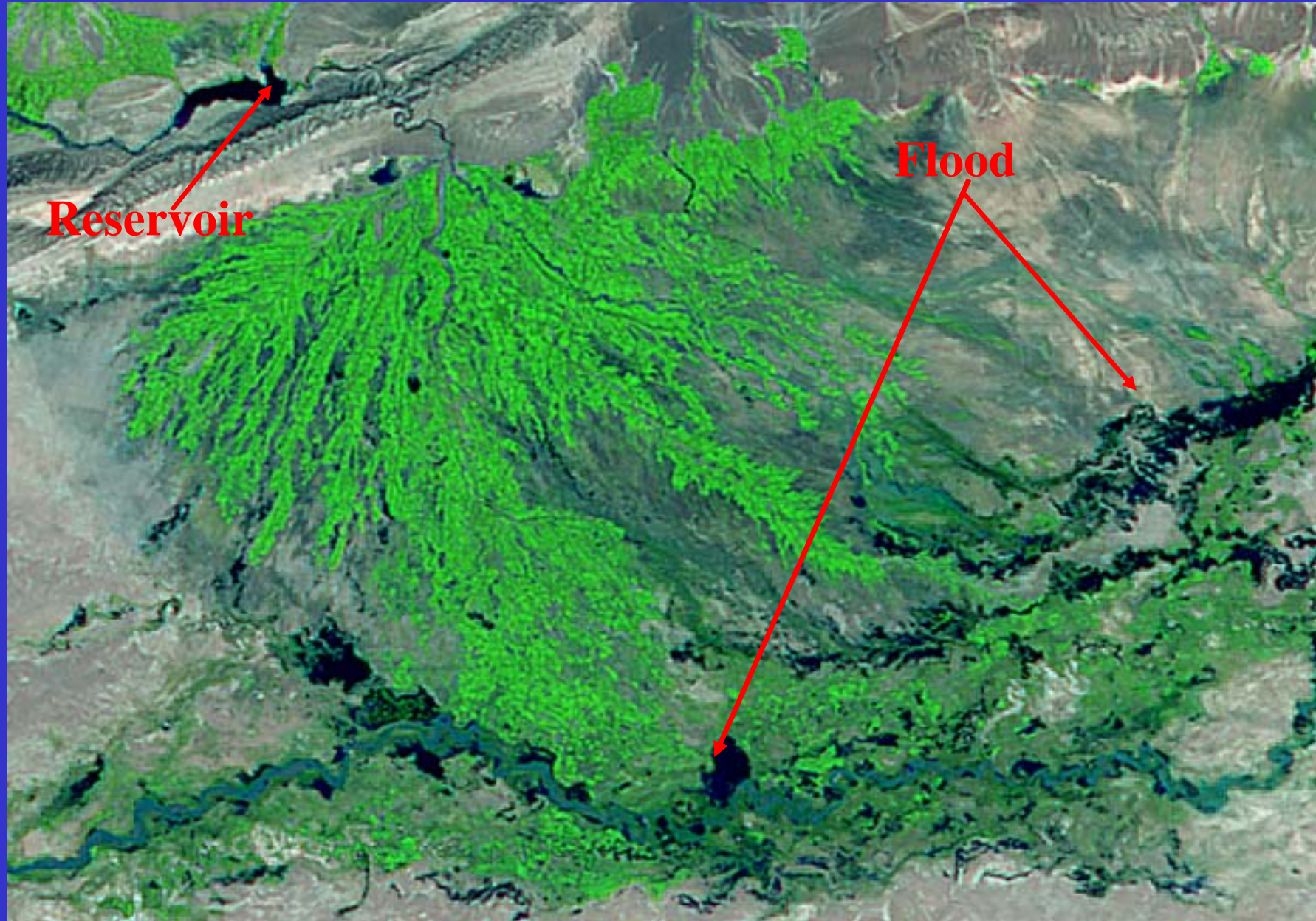
The derived results are applied to analyze the monthly change of NDVI and to monitor the growth status of the vegetation. The vegetation coverage in October was obviously higher than that in May.

4. Application of the MODIS Data



**Monitoring on the flood in the Ogan River irrigated Area
(before the flood occurrence, July 17, 2002)**

4. Application of the MODIS Data



Monitoring on the flood in the Ogan River irrigated Area
(after the flood, August 27, 2002)

Flood disaster

The production of an oilfield
was impacted by flood.

An oilfield road was destroyed by flood.

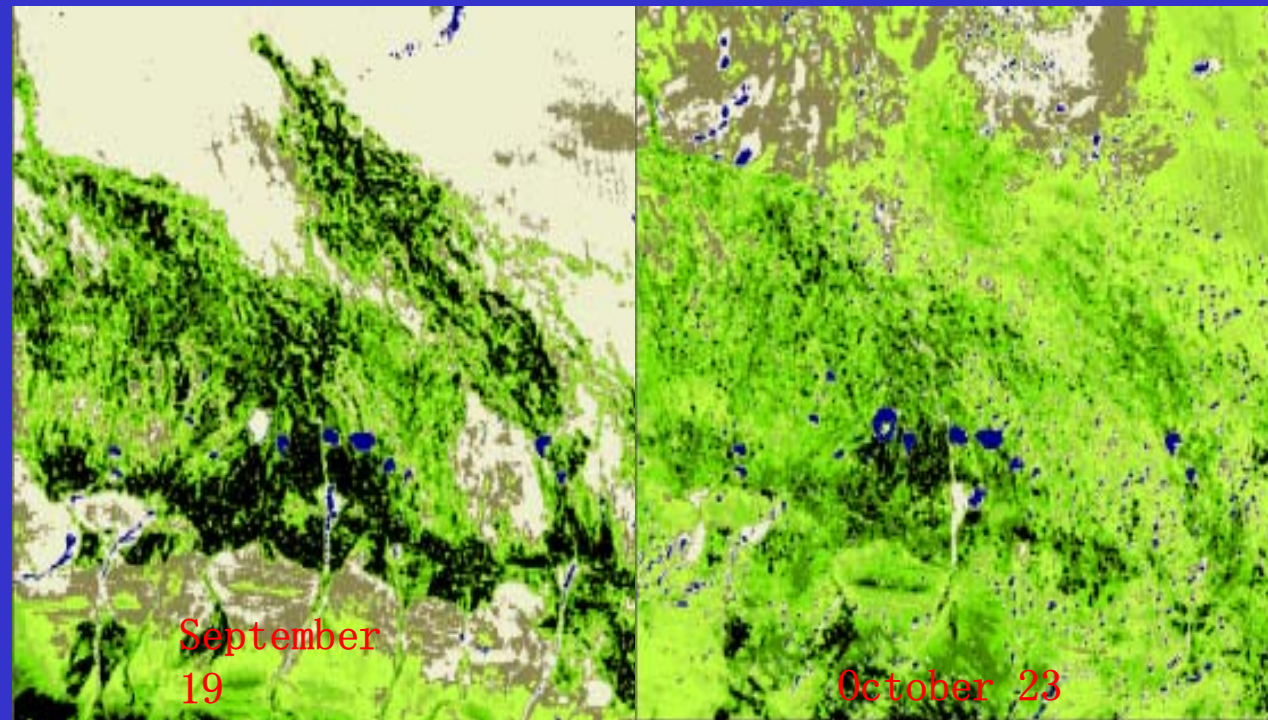
Dealing with the flood emergencies

5. Monitoring on the growth status of crops in north Xinjiang

May 23

June 8

July 17



August 19

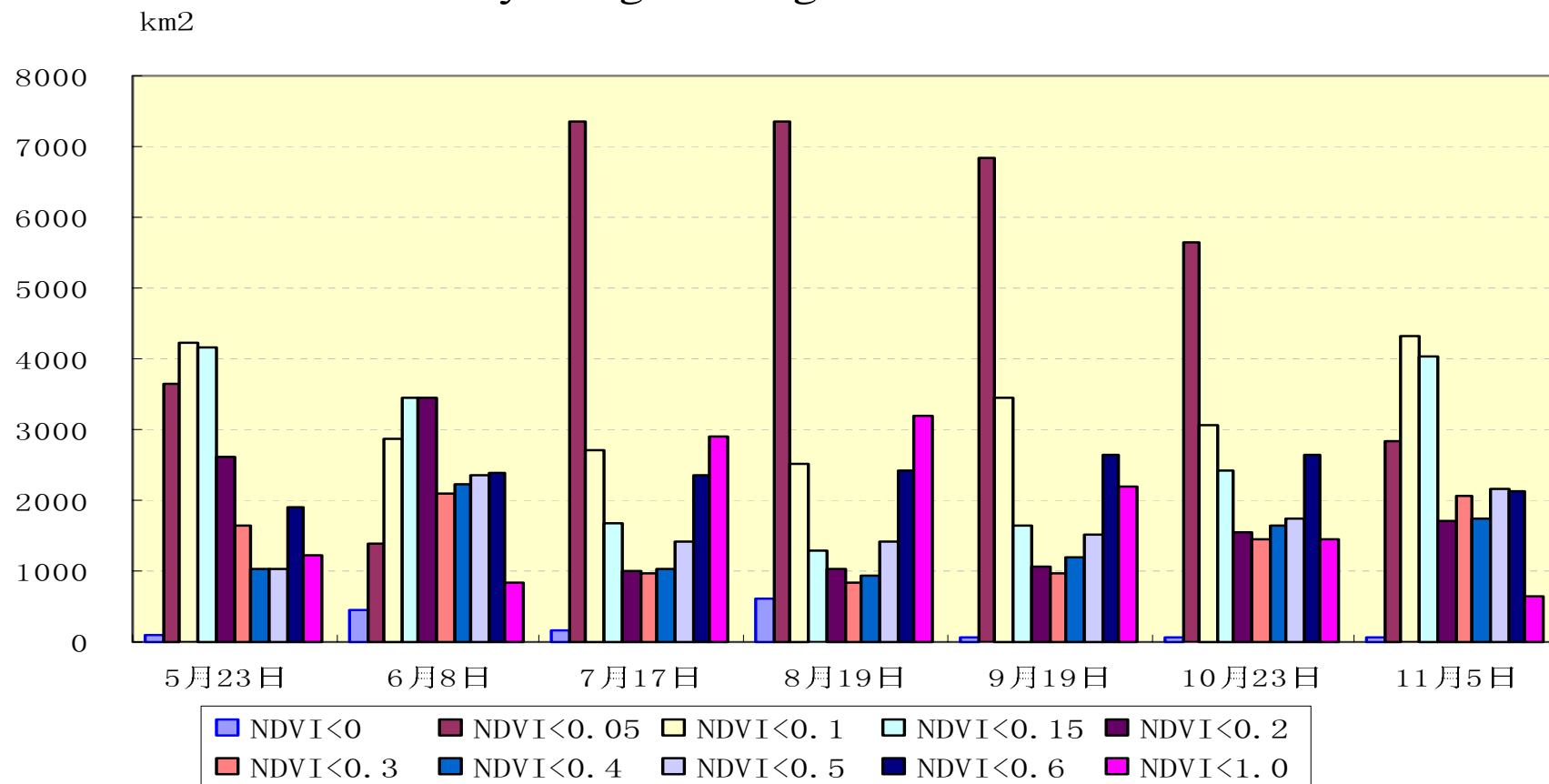
October 23

Derived NDVI results in north Xinjiang

5. Monitoring on the growth status of crops in north Xinjiang

The value increases with the growth of cotton, it is up to the peak value in July and August, and then it decreases gradually.

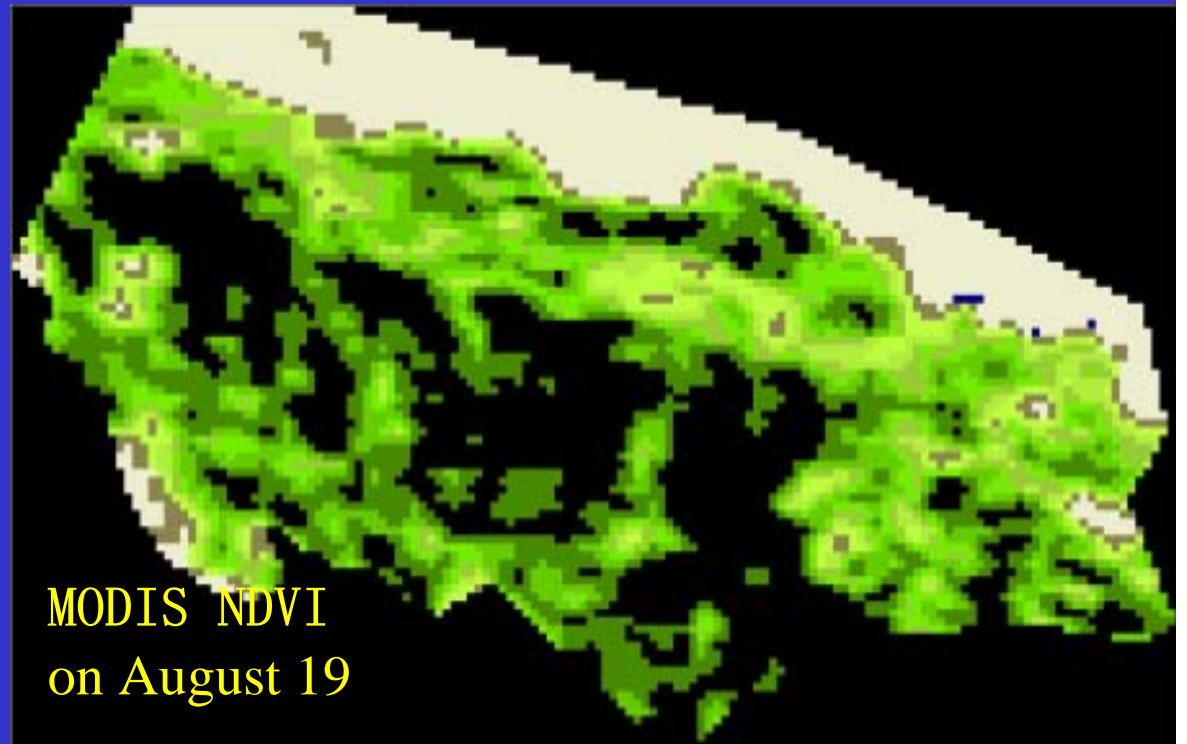
Monthly change of the graded NDVI values



5. Monitoring on the growth status of crops in north Xinjiang

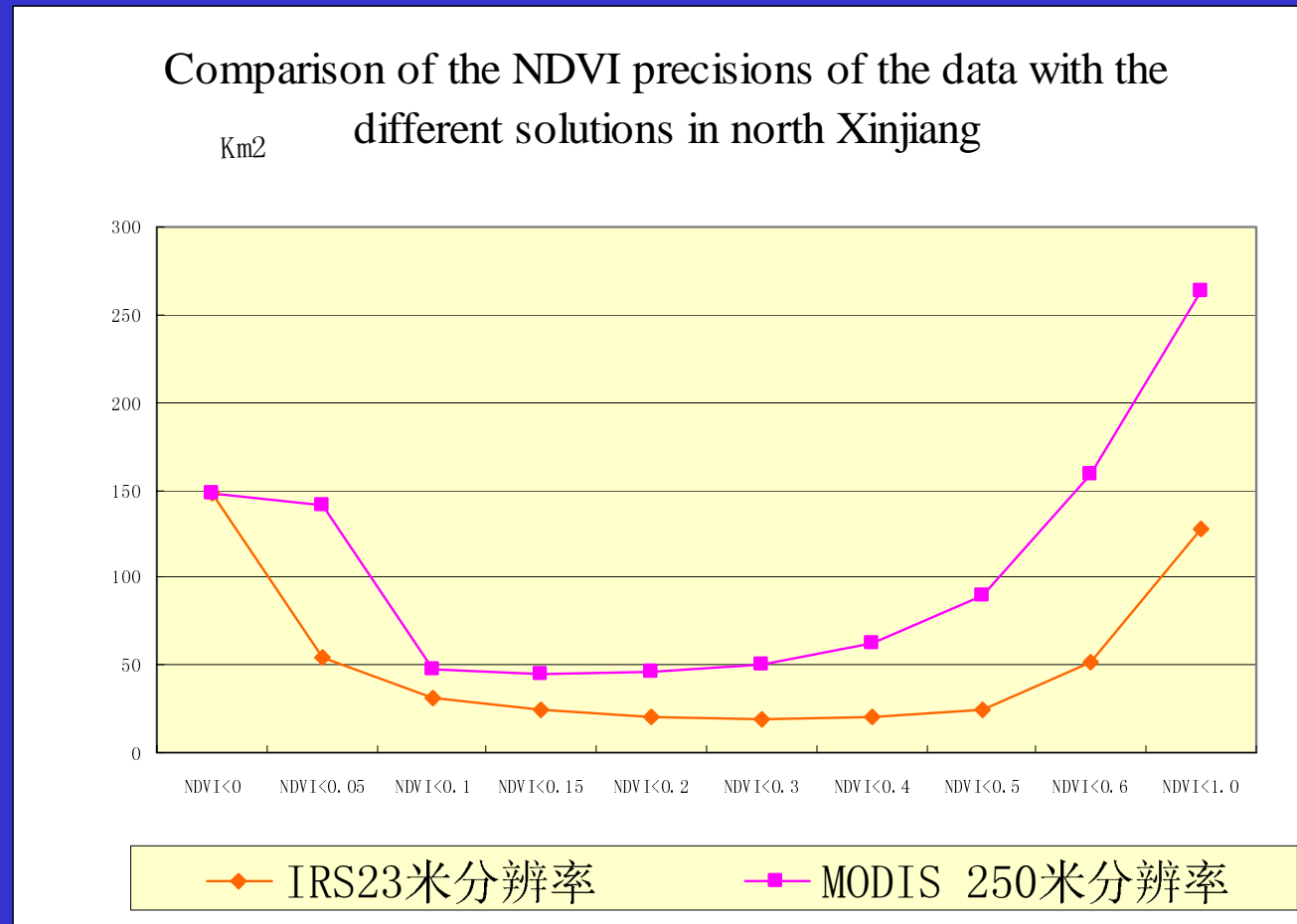
ISR MODIS on
August 11

**Analysis on the
growth status of
cotton by using the
NDVI products with
the different solutions**



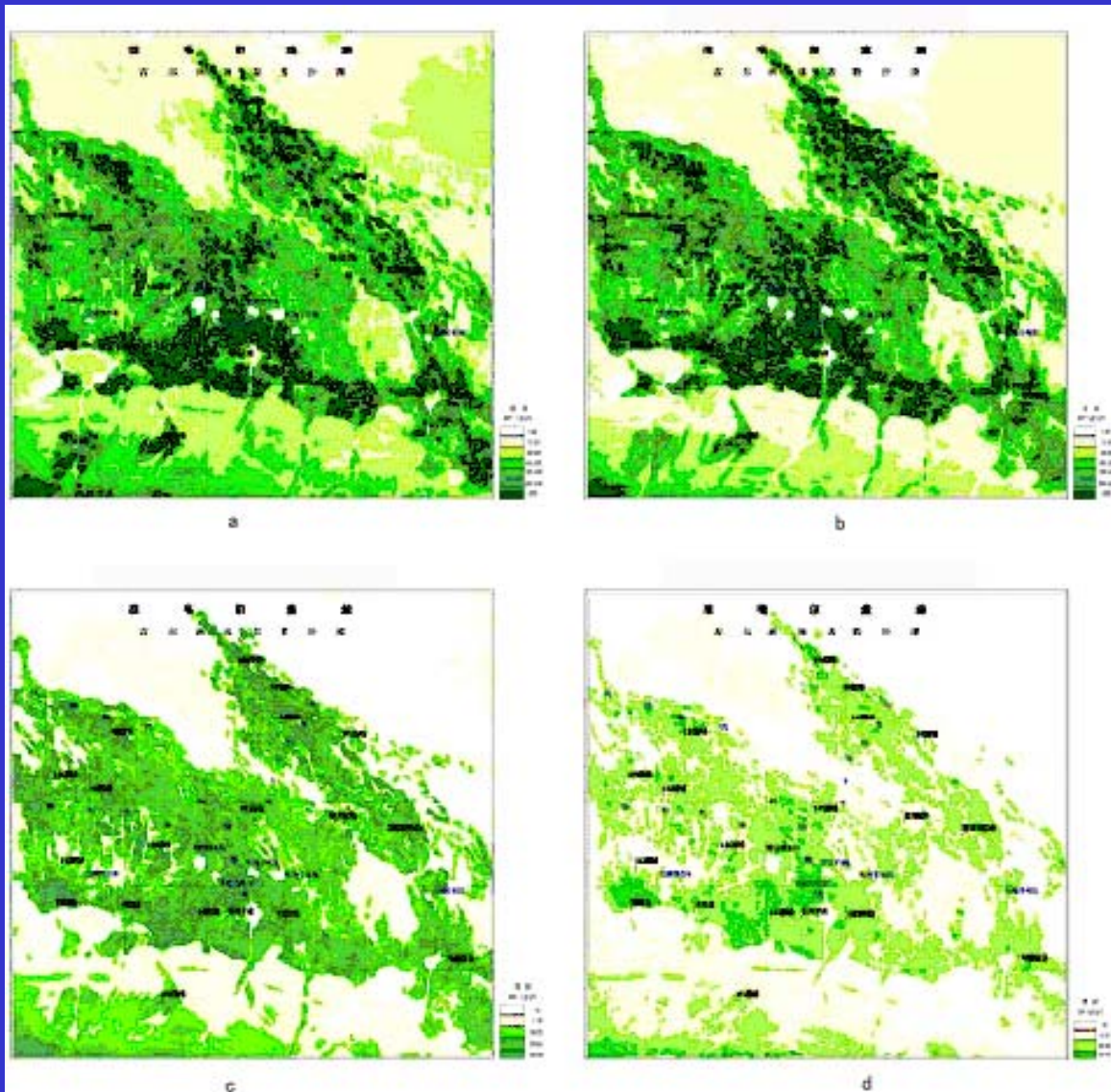
MODIS NDVI
on August 19

5. Monitoring on the growth status of crops in north Xinjiang



although the statistical areas of NDVI based on the MODIS data are larger than that based on the IRS data , the change trends of the areas divided by the two kinds of NDVI values are very similar

5. Monitoring on the growth status of crops in north Xinjiang



Change of NPP based on MODIS data in north Xinjiang

The calculated results show that the average NPP value in the Shihezi region was $469.06\text{gC}/\text{m}^2$ in 2002, in which it was $810.37\text{gC}/\text{m}^2$ in the oases and $170.31\text{gC}/\text{m}^2$ in the deserts.

Conclusion:

Application of the MODIS data in Xiinjiang include monitoring, analysis and assessment of agricultural , natural disasters, soil moisture , desertification , atmospheric environment, exploitation and utilization of water resources, regional ecological restoration, etc.,.

Thanks

