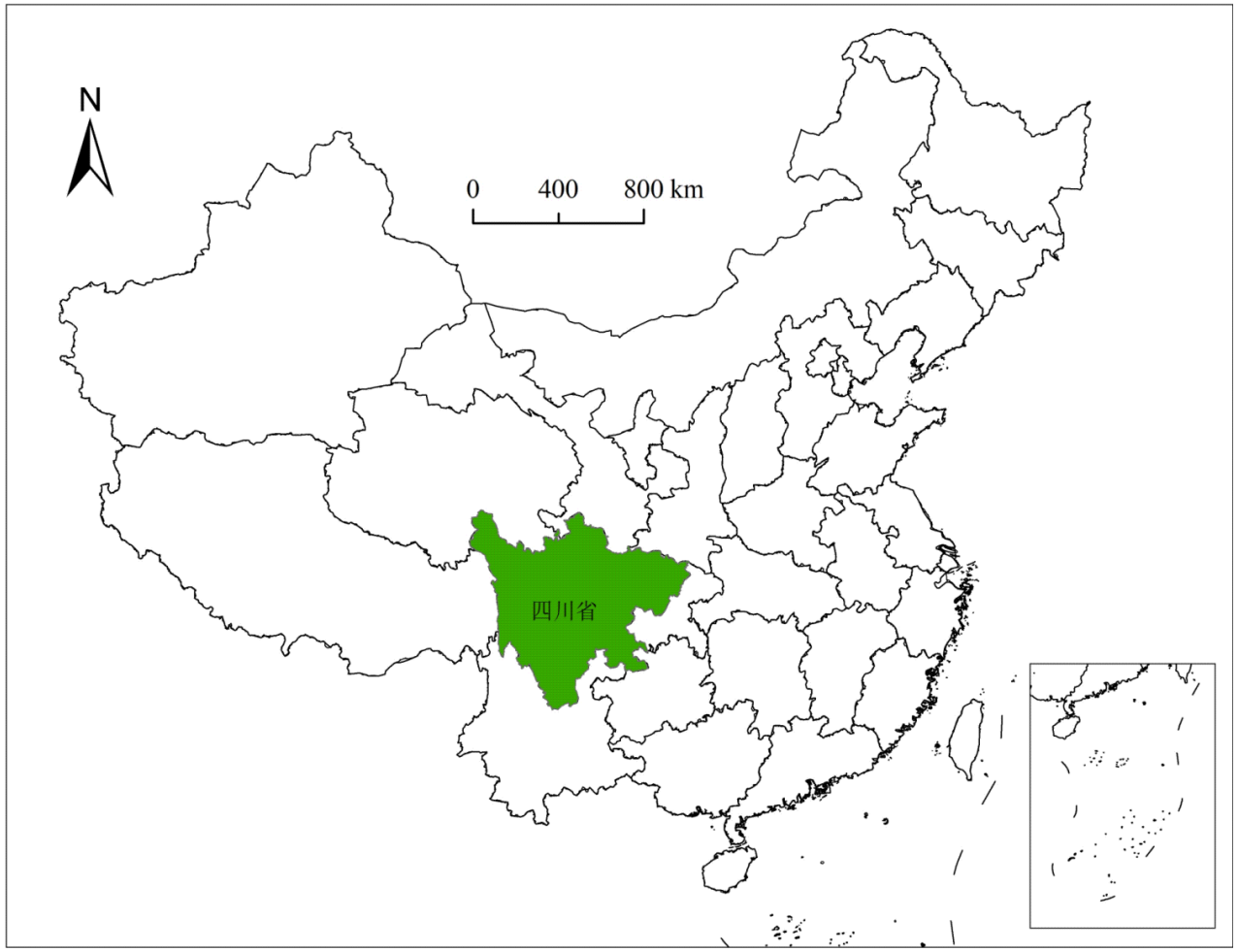
GNSS-based Big Data of Agricultural Machinery Operation

Caicong Wu, Ph.D., Professor
China Agricultural University

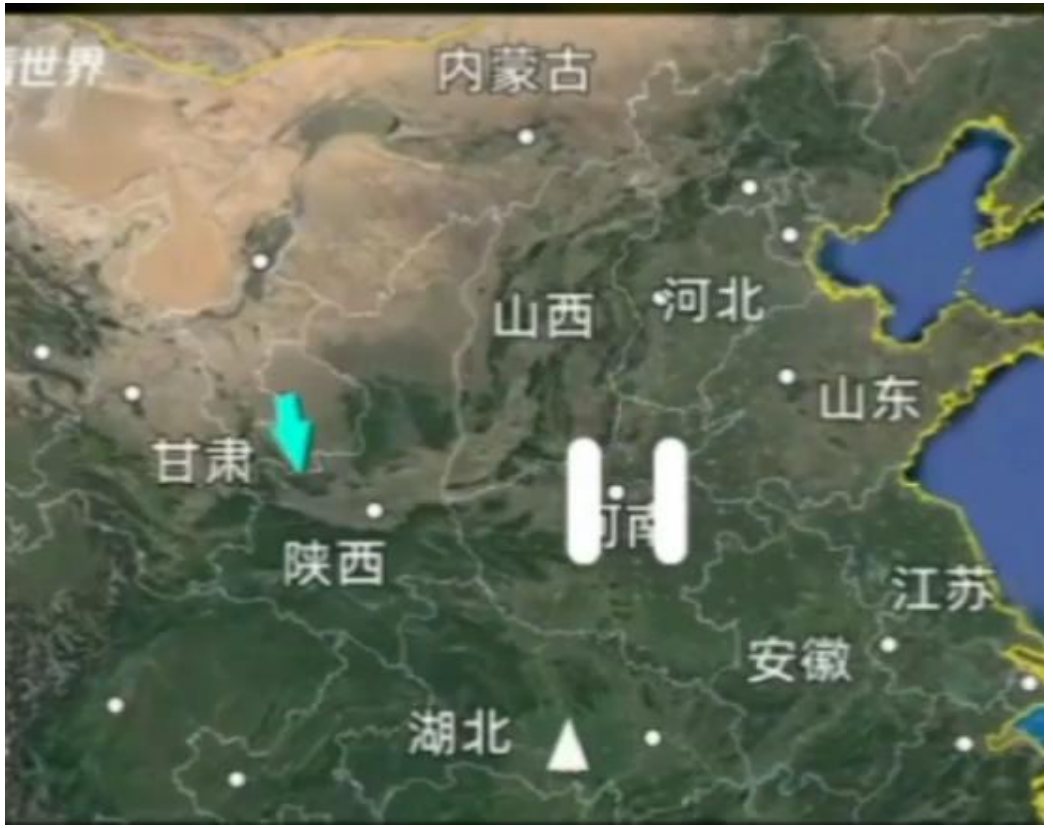
1. Background

☐ The wheat matures from south to north in China, duration is 30 d.



1. Background

☐ Combine harvesters：45,000 pcs



1. Background

☐ Problems

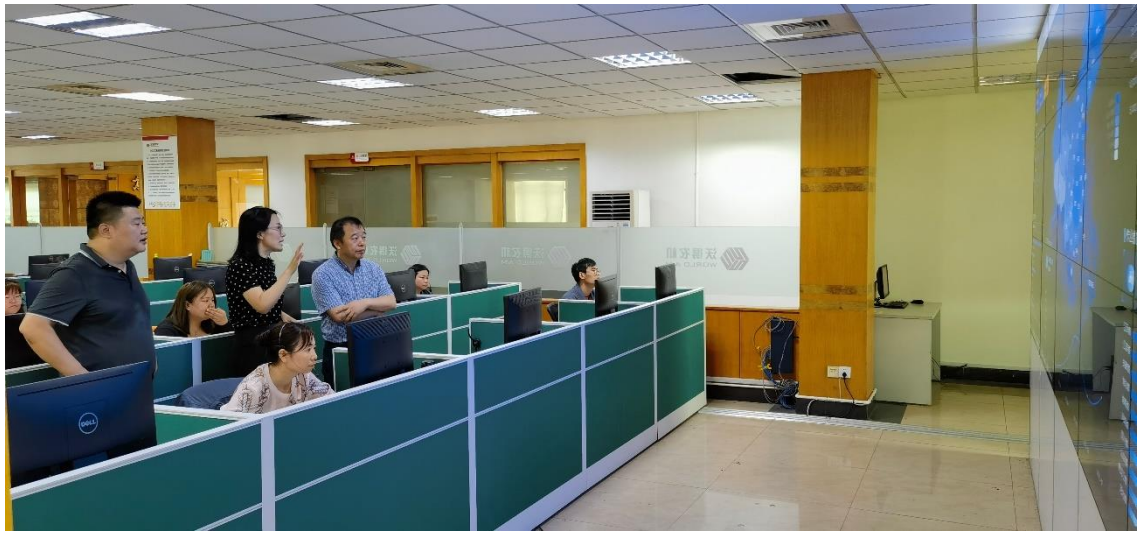
- **Manufactory: it's difficult to provide maintenance service for customers.**
- **Operators: it's difficult to get the fuel in the field.**
- **Governments: do not know the harvesting progress and adjust the policy.**

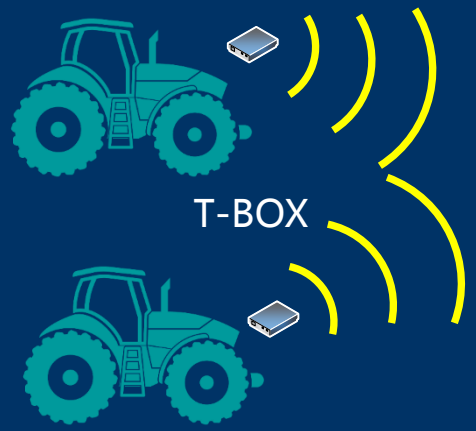
2. GNSS Project for Agriculture

GNSS terminal equipped on the machinery

2. GNSS Project for Agriculture

☐ Call-center of manufacturer





Cellular Network

Manufacturer

Key Lab

Servers

Informatica Products

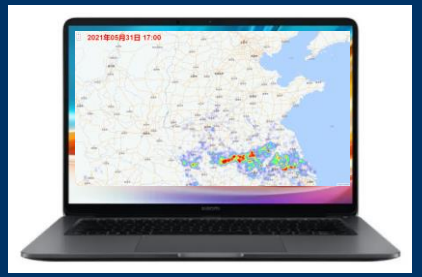
数据挖掘

数据报表

作业情况

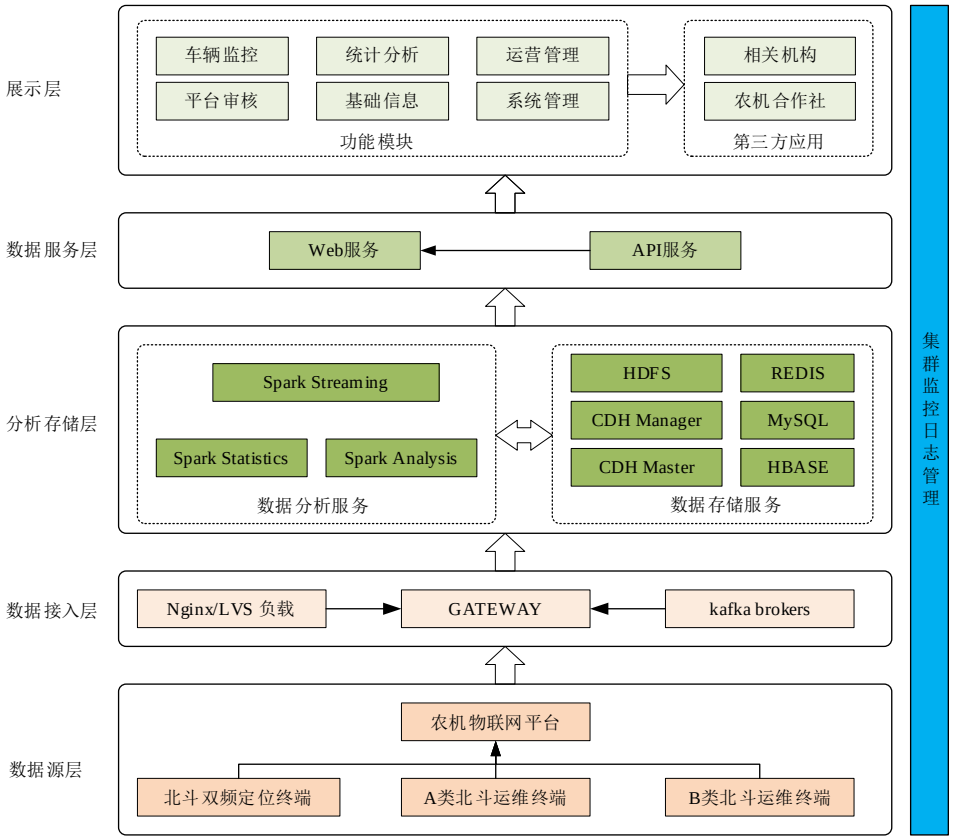
信息发布

地图可视化



2. GNSS Project for Agriculture

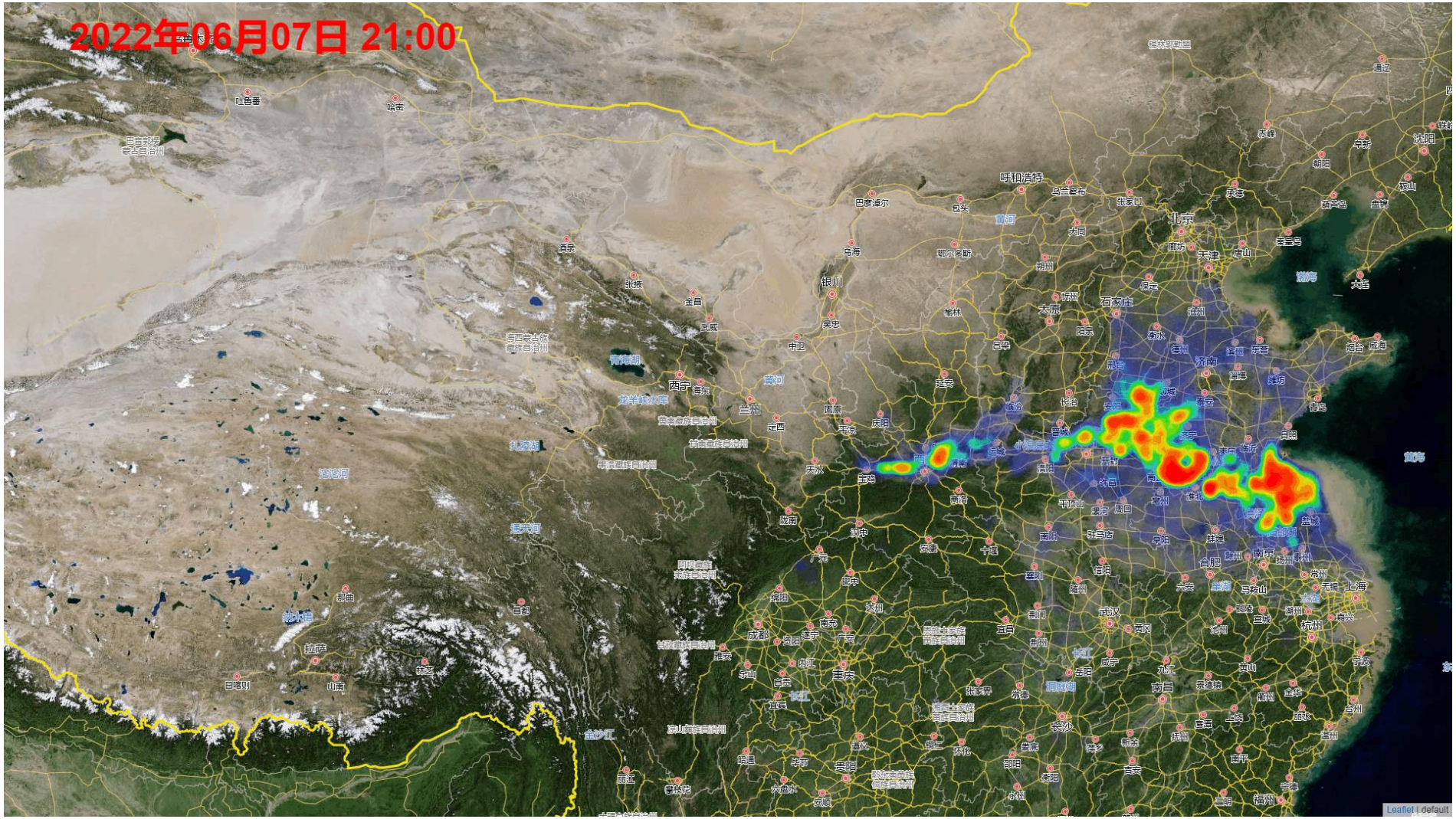
☐ Big data computer room: 102 units of servers and 3 GPUs.



2. GNSS Project for Agriculture

3. Big Data Application: *Wheat Harvesting Newsletter*

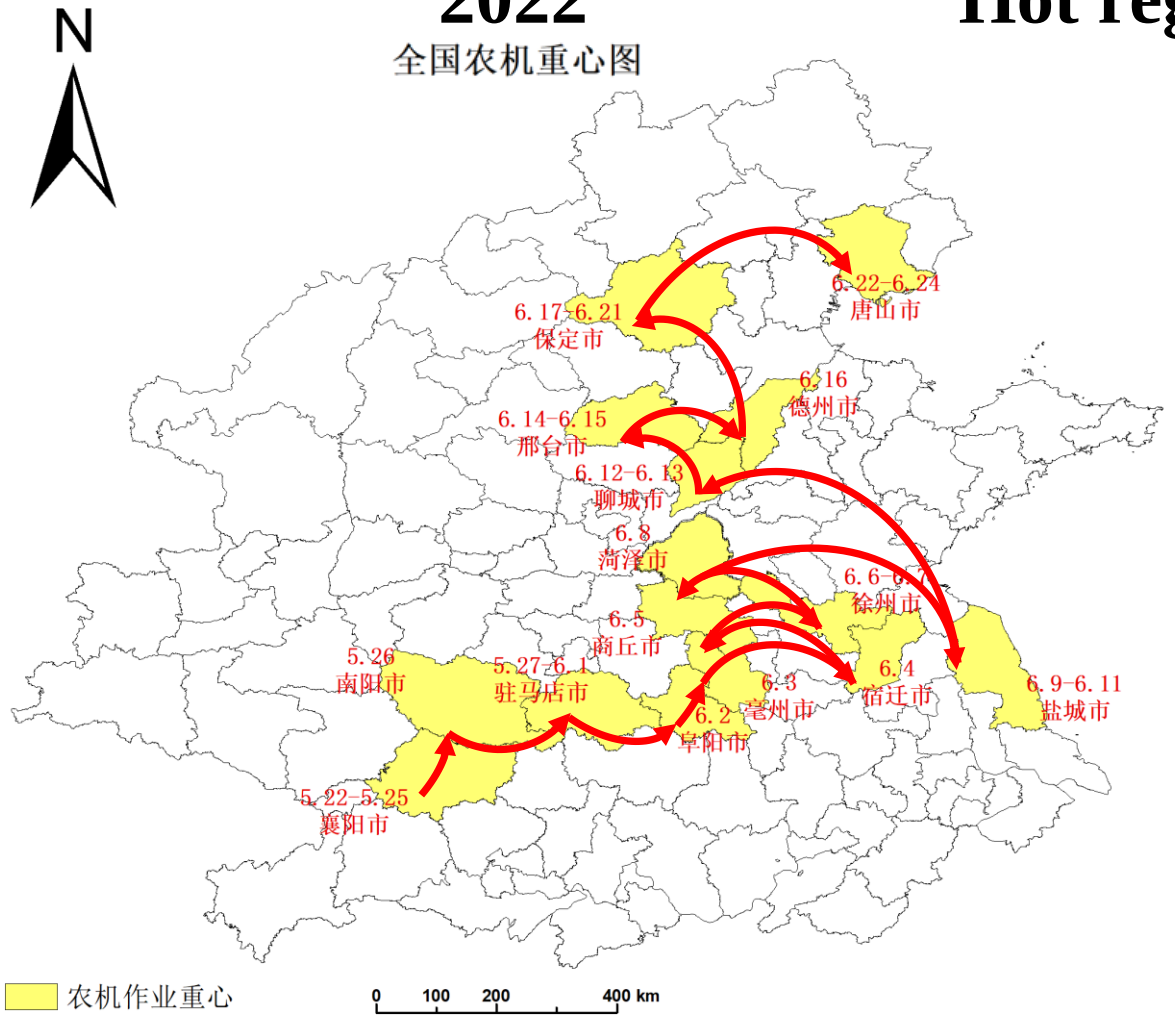
- The wheat matures from south to north, duration is 30 d.



3. Big Data Application: *Wheat Harvesting Newsletter*

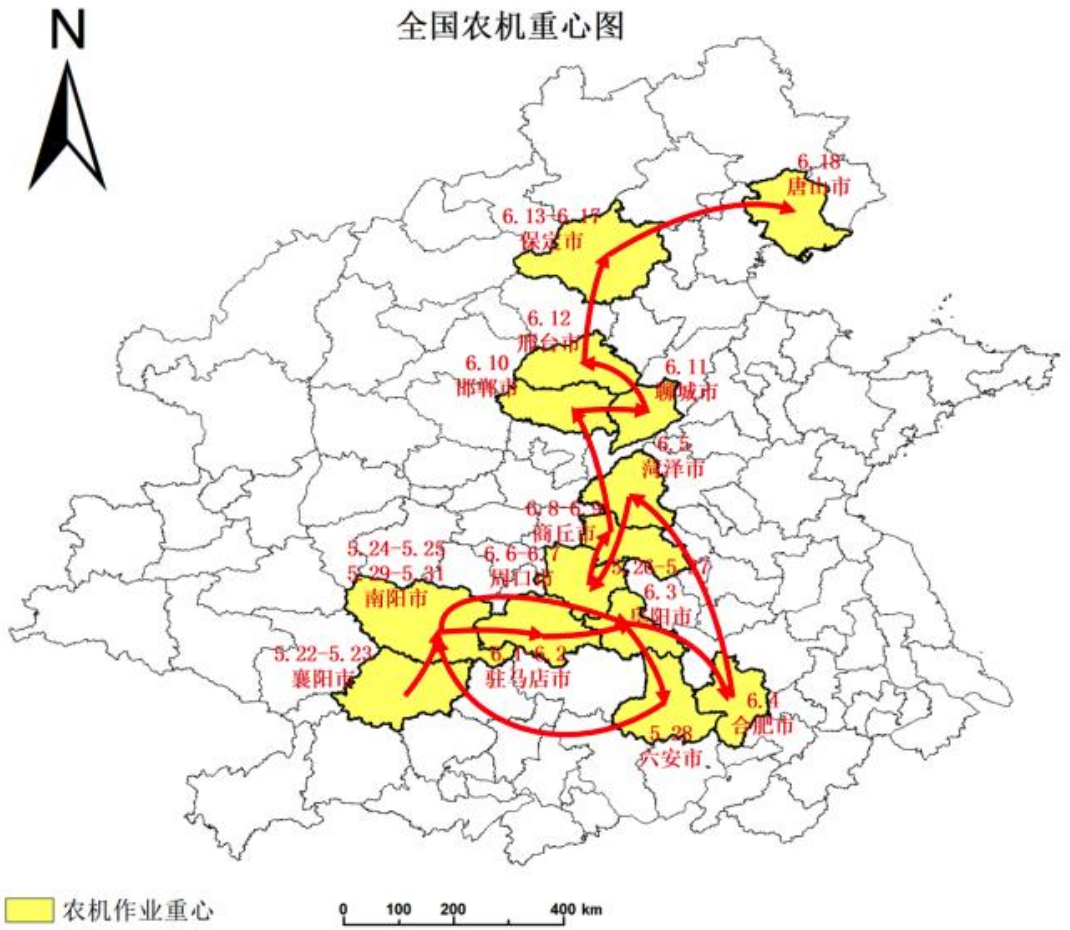
- Harvesters will move first in the east-west direction and then turn to the north.

2022



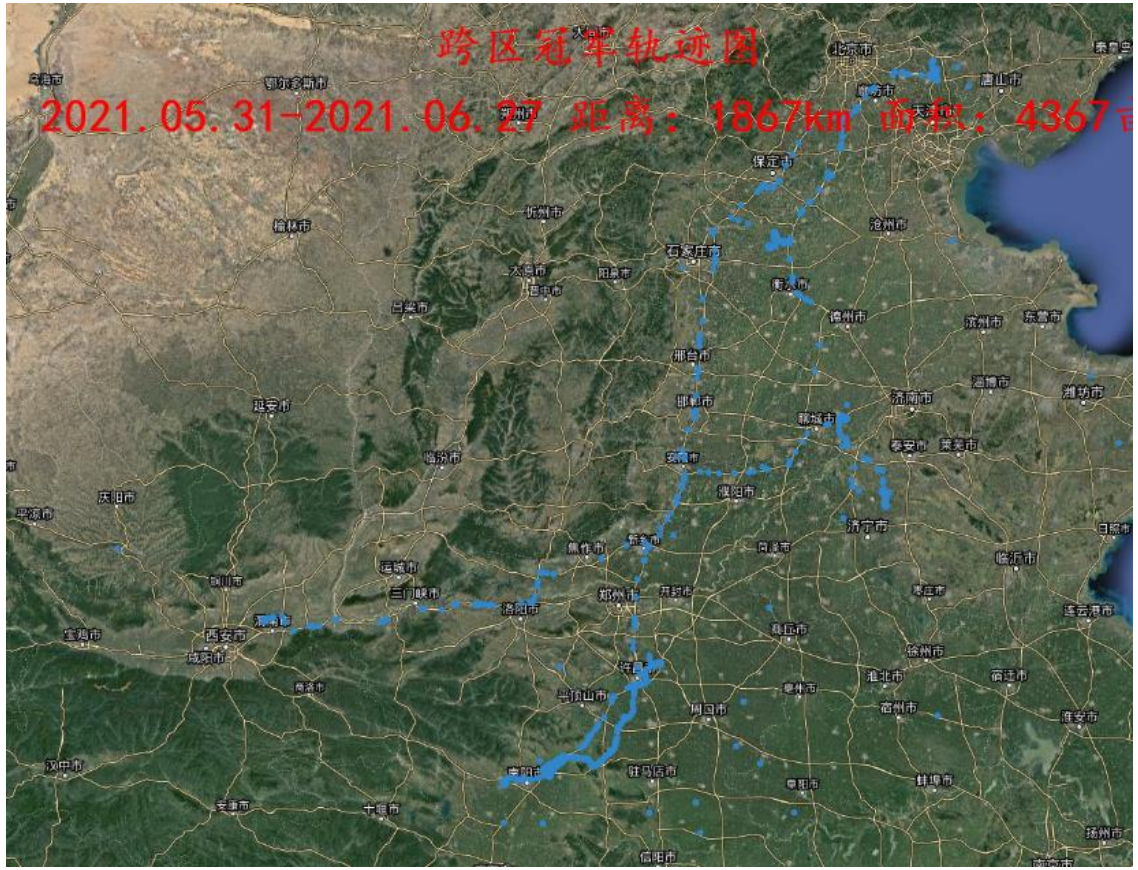
Hot regions

2023

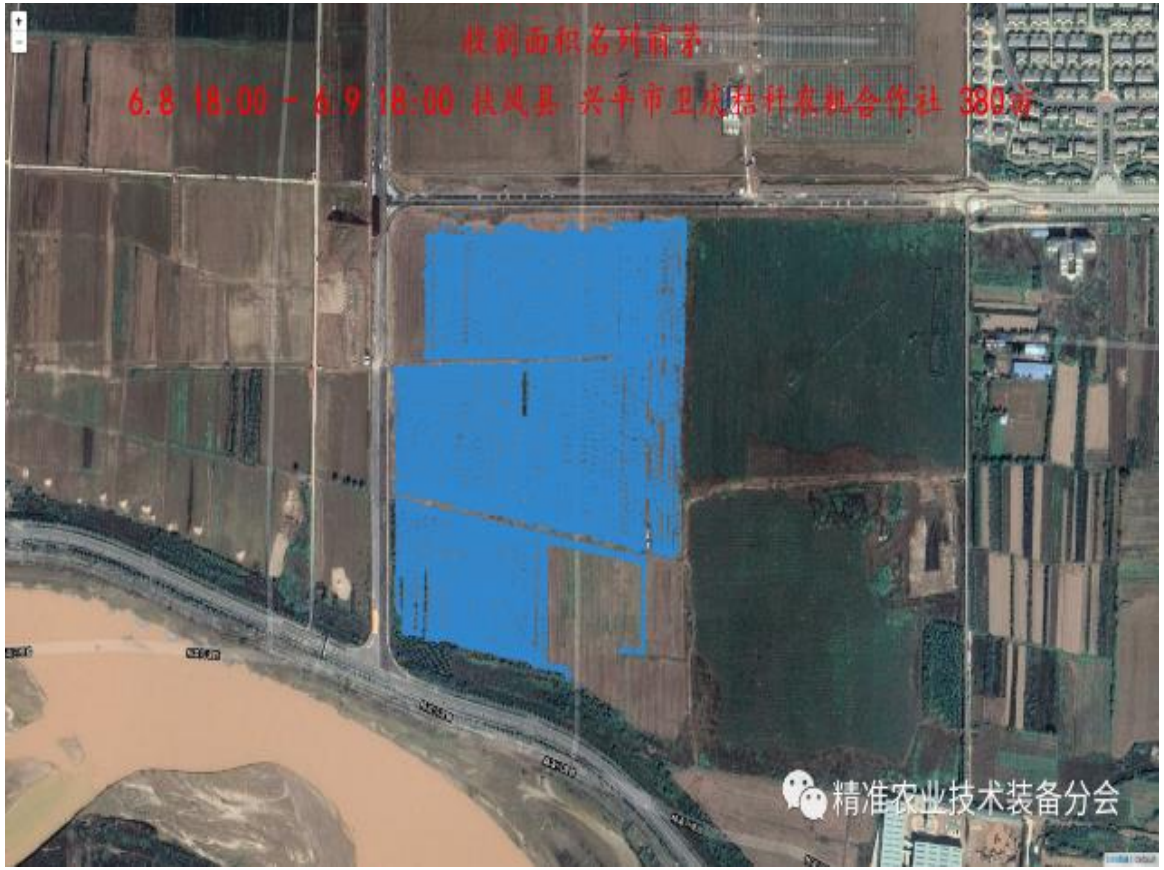


3. Big Data Application: *Wheat Harvesting Newsletter*

Champion of whole season



Champion of single day



3. Big Data Application: *Wheat Harvesting Newsletter*

☐ CCTV gave a special report on our work

3. Big Data Application: *Harvester Refueling in the Field*

- This action eliminates the need for the harvester to stop working.

3. Big Data Application: *Harvester Refueling in the Field*

- This action greatly improving its continuous operation ability and helping to harvest wheat quickly.

4. Conclusions

☐ GNSS-based big data application improves:

- **The after-sales service capability of enterprises and reducing the losses of farmers.**
- **The government's dynamic monitoring and macroeconomic regulation capabilities.**
- **The working hours of agricultural machinery operators and increased their income.**

Thank you for listening ！

Caicong Wu: wucc@cau.edu.cn