

Figure 6. Map of illegal mining distribution hotspots

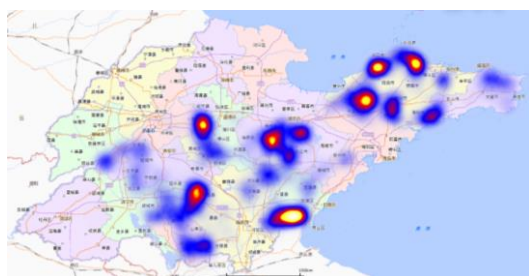


Figure 7. Map of illegal mining prone spots between 2013-2016

## 5. CONCLUSIONS

Remote sensing dynamic monitoring information system of mineral development is successfully built by integrated application of geographic information system, global positioning system and mobile Internet technology tightly around the actual application needs of mine remote sensing dynamic monitoring, and is practically applied in Shandong Province. The establishment of the system effectively improves the timeliness and accuracy of remote sensing dynamic monitoring in Shandong Province. Rapid response mechanism of "fast data acquisition, timely target detection, fast handling and timely feedback" is constructed, and transformation from traditional manual supervision to informational monitoring is achieved, thereby improving the efficiency of mining legal supervision and enhancing the informational management level of land and resource authorities, which are of great significance for the establishment of good mineral development order, promotion of safety production, and protection of mining ecological environment in Shandong Province.

## REFERENCES

- Datcu, M. , 2003. Information mining in remote sensing image archives: system concepts. *IEEE Trans.Geoscience and Remote Sensing*, 41(12), pp.2923-2936.
- Nie Hongfeng, 2007. The problems in the remote sensing monitoring technology for the exploration of mineral resources and the counter measures. *Remote Sensing for Land & Resources*, 74(4),pp.11-13.
- Chen Weitao,2009. Advances in remote sensing-based detecting of mine exploitation and mine environment.*Remote Sensing for Land & Resources*,80(2),pp.1-8.
- Nan Junxiang, 2012. Remote sensing investigation of coal mines in Xuanwei of Yunnan province for their

development.*Remote Sensing for Land & Resources*,93(2),pp.121-124.

Wang Yonggang, 2008. Remote sensing and GIS technology based monitoring of the mineral exploitation in Beijing area.*Land and Resources Informatization*,6,pp.6-11.

Cao Hongsong,2007. Study on application of remote sensing and GIS technologies in dynamic monitoring in cangshan mine exploration.*Shandong Land and Resources*,23(6-7),pp.43-47.

National Geomatics Center of China, 2011. Basic Geomatics Information Center of Heilongjiang, Integrated geographic information center of Shanxi Province,etal..CH/Z9011-2011,Platform for geo- -information common services Data specification for electronic map. Beijing: Surveying and mapping press.

Yu Tao, 2002. Mobile computing environment the development and application of GIS technology.*Bulletin of Surveying and Mapping*,2,pp.40-42.

Zhang Ergang, 2013. Research and implementation of data acquisition system based on mobile GIS technology. *AnHui University of Science and Technology*,pp.6-8.

Xu Lihua, 2012. The research and experiment on the mobile field data collection system based on iPad. *Bulletin of Surveying and Mapping*,12,pp.75-78.

Li Yao, 2012. Design and Implementation of Picture Information Acquisition Management system based on Exif.*Computer and Modernization*, 9,pp.134-1.