

Multi-temporal Landsat Images Dynamicly Monitoring Indigenous Coking Sites in China

Xiangsheng Kong, Fang Miao, Hongfu Liu, Yuyang Dong
chengdu university of technology china

emails305@163.com

In recent years the Chinese government has carried out some serious investigations and expended considerable effort to shut down indigenous coking sites, but effective control has not been achieved. There are still many problems and the situation is still severe. One important measure in tackling this problem has been improvements in the level of monitoring. These indigenous coking sites are essentially characterized by high temperatures and often release aerosols and greenhouse gases into the atmosphere. In the present article, an attempt has been made to study the applications of Thematic Mapper (TM) Short Wavelength Infrared (SWIR) bands (4, 5 and 7) data for the detection and monitoring of these high temperature related geoenvironmental features. The largest producing province, southeast of Shanxi in China, was chosen as the study area for this paper. Using two multi-temporal Landsat5 images of this area acquired in 1999 and 2004, information about indigenous coking sites was extracted through digital image process. The analysis of TM channels showed that TM7 was the most sensitive to indigenous coking sites, where the reflectance value manifested the 'peak' configuration as a flag for indigenous coking sites. TM5 was the second most sensitive to coking sites. Using the spectral profiles, TM7 and TM5 critical values for areas of indigenous coking sites were discovered. The higher the coking temperature, the nearer the band was to TM5 channel. These coking sites are showing red color in the TM721 RGB (Red, Green, Blue) false color images and can be used to interpret indigenous coking sites with 95% accuracy, confirmed by ground checking. Over a period of 5 years (1999-2004), the quantity of new indigenous coking sites, distributed mainly on the plain in districts of population concentration, increased by 10 times and the indigenous coking sites has caused serious pollution to the environment. Some control strategy was proposed in the last paper. These findings contributed to the scientific foundation for accurately monitoring the dynamics of indigenous coking sites at large scale, and offered a kind of brand-new, quick technological method for the Chinese government monitoring indigenous coking sites.