University of New South Wales

UNSW
AUSTRALIA

Assignment 2

GMAT9600

Monitoring the 2009 Victorian Bushfires with Optical Satellite Remote Sensing

Jinghao Zhang(z5032618)

OCT 16, 2017

a. Add all HJ and MODIS data into ArcMap and compare the difference between them. Refer to the "Raster Dataset Properties" for detailed information.
Questions: The CCD images of HJ-1B were taken at the same time of its infrared images. Why their spatial coverage is not the same? Why the coverage of infrared images is larger?

Answer:

Although the CCD images of HJ-1B were taken at the same time of its infrared images, their swath widths are different. To be more specific, CCD camera's swath width is 360 km, however, infrared camera's swath width is 720 km. As a result, even they are at the same altitude, the photos taken by infrared camera will have larger spatial coverage than the photos taken by CCD camera.

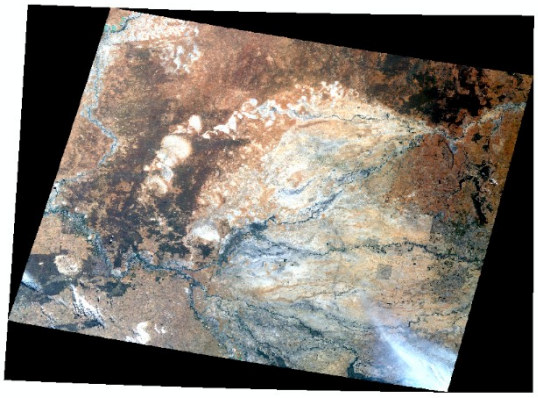
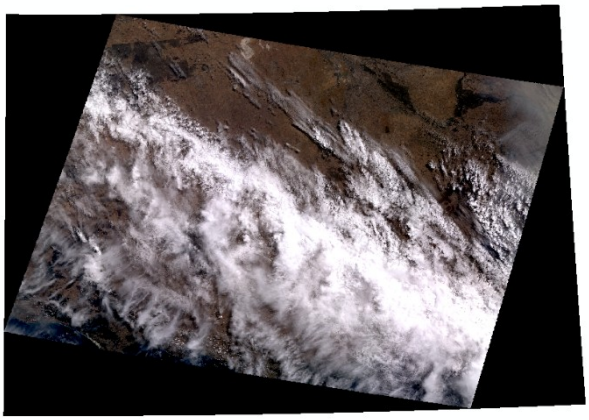
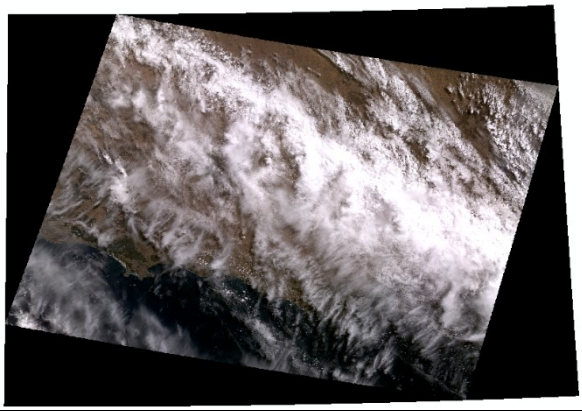
b. Produce true colour images for both HJ CCD data and MODIS images.
Questions: What is the band combination of true colour images for HJ and MODIS? What is the key problem of identifying bushfires from these images directly?

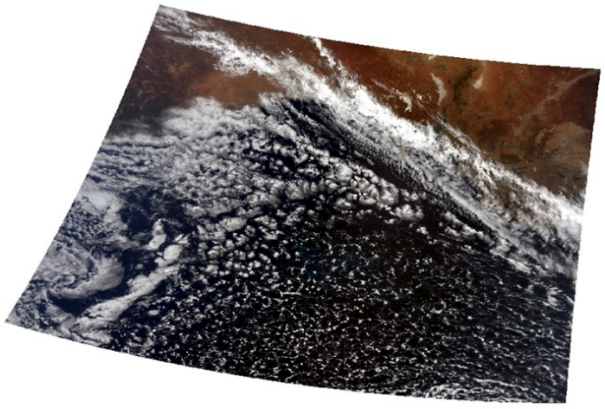
Answer:

True colour images for HJ CCD data are shown in below images.

For HJ, band 3, 2, 1 are Red, Green and Blue respectively. For MODIS, band 1, 4, 3 is Red, Green and Blue respectively.

The key problem of identifying bushfires from these images directly is that smoke or clouds will block ground features. It is unable for Optical satellite to penetrate clouds.

	**CCD166**
	**CCD170**
	**CCD171**

	**MODIS**

c. Try to find out bushfires by observing each band of HJ data or combining different bands for true-colour and false-colour results. Questions: How can you identify the bushfires? What is the principle of your method?

Answer:

HJ-1B IRS band 3, 2, 1 are Red, Green and Blue respectively.

The bushfires are shown in the red colour, black circles are used to mark them in the below images.

The principle of my method is that mid infrared technology can be able to detect the high temperature objects, bushfires can be shown in red colour in the image.