Monitoring the 2009 Victorian Bushfires with
Optical Satellite Remote Sensing

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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:

The CCD images of HJ-1B and its infrared images were taken at the same time, but their scan widths are different. The mapping width of the CCD camera is 360 km, while the mapping width of the infrared camera is 720 km. Therefore, even if they are shooting at the same height and at the same time, the photos taken with the infrared camera will have a larger spatial coverage than the photos taken by the 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?
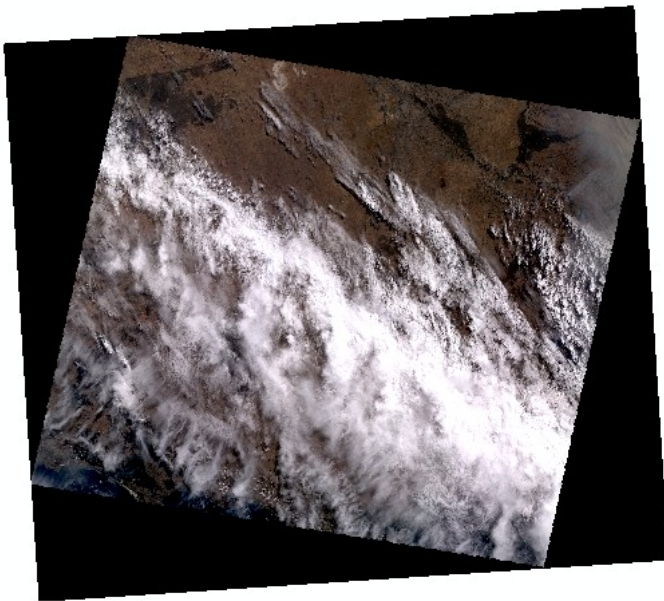
   Answer:

   The following images are true colour images of HJ CCD data.

   For HJ, bands 1, 2 and 3 are blue, green and red, respectively. For MODIS, bands 3, 4, and 1 are blue, green, and red, respectively.
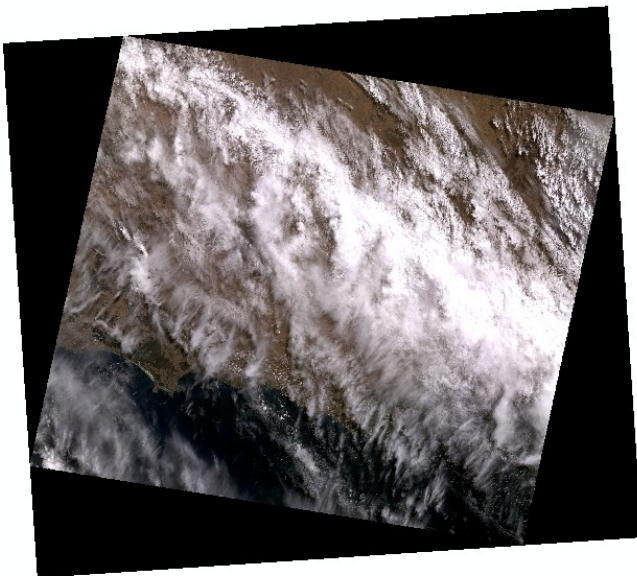
   The key problem of identifying bushfires from these images is that the smoke generated by the fire and the cloud will obscure the ground features, while the optical satellite cannot penetrate the clouds.
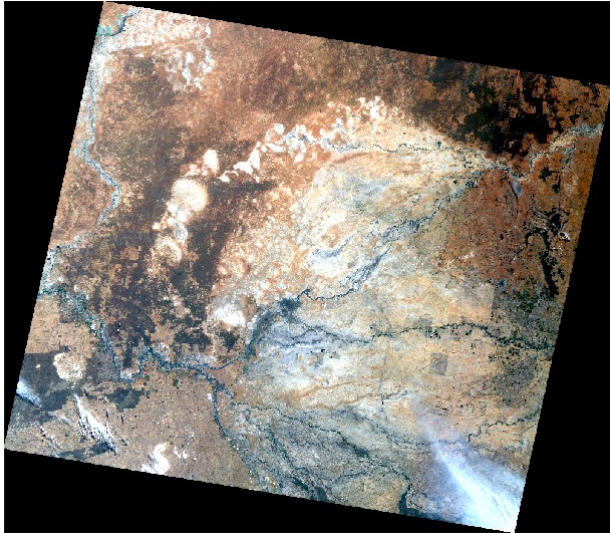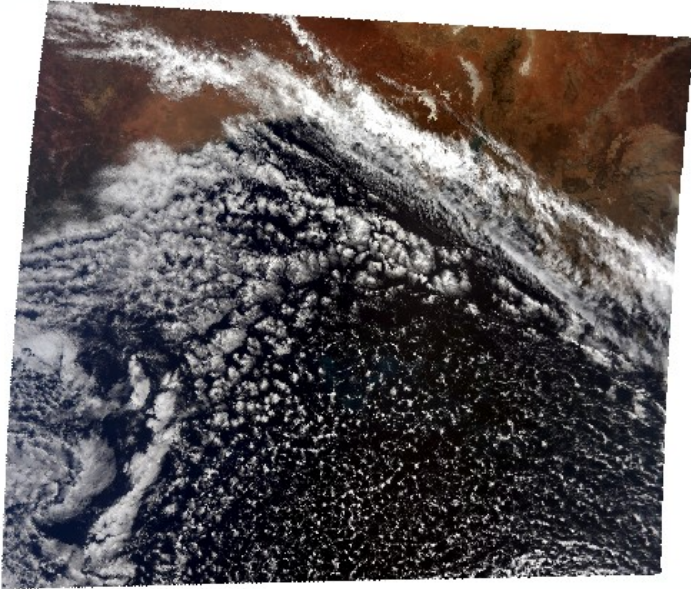
	# CCD166
	# CCD170
	# CCD171

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.

Mid infrared technology detects high temperature objects, and forest fires can be displayed in red in the image. Therefore, the red positions in the figure below are mountain fire point, which is marked with a black circle.