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Earthquake Tectonics and Hazards on the Continents

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Remote sensing practical /2

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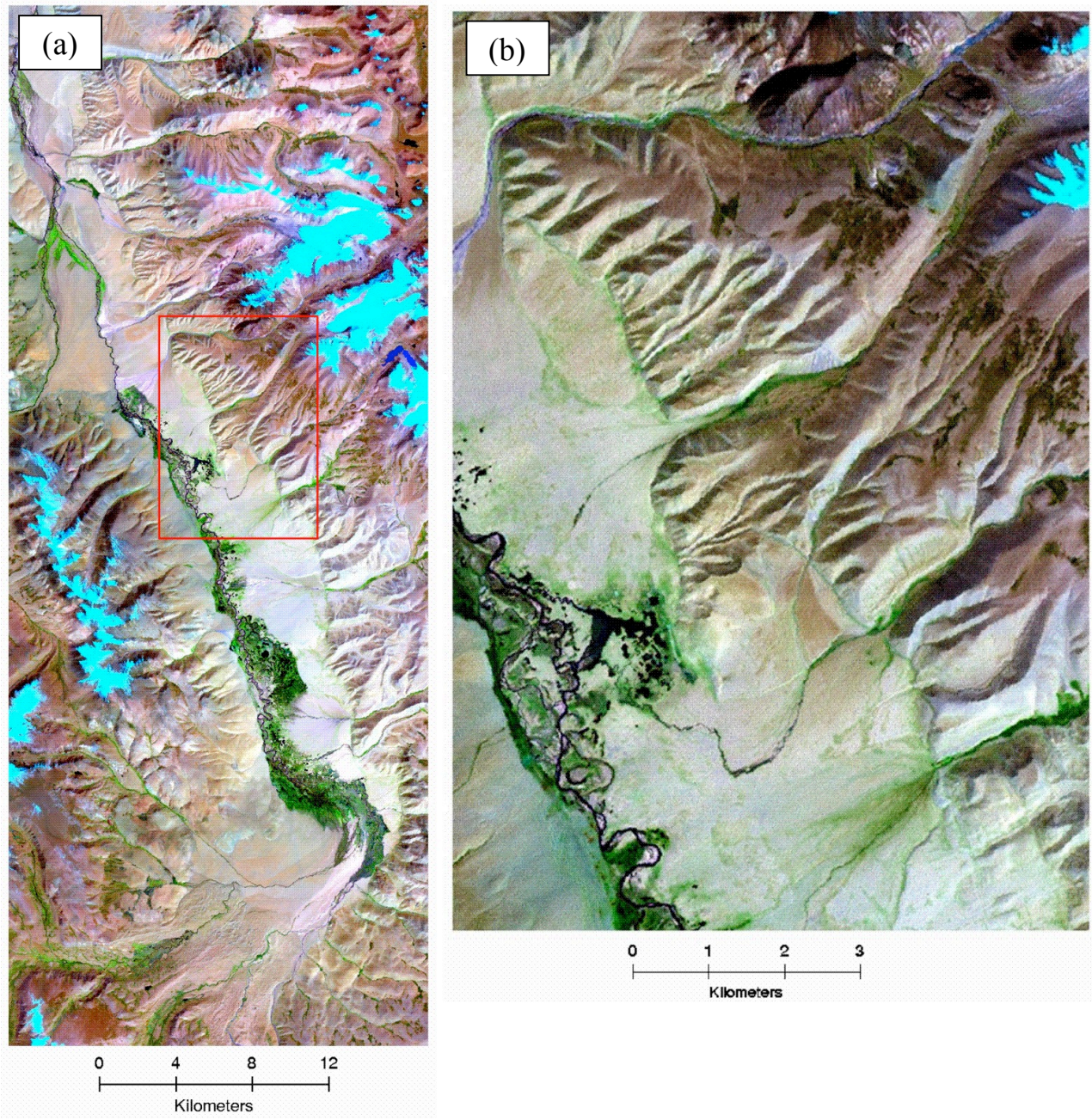

Figure 1. Landsat-7 images (RGB 742) of an area of active normal faulting. Image (b) is an enlargement of the area in the red rectangle in (a).

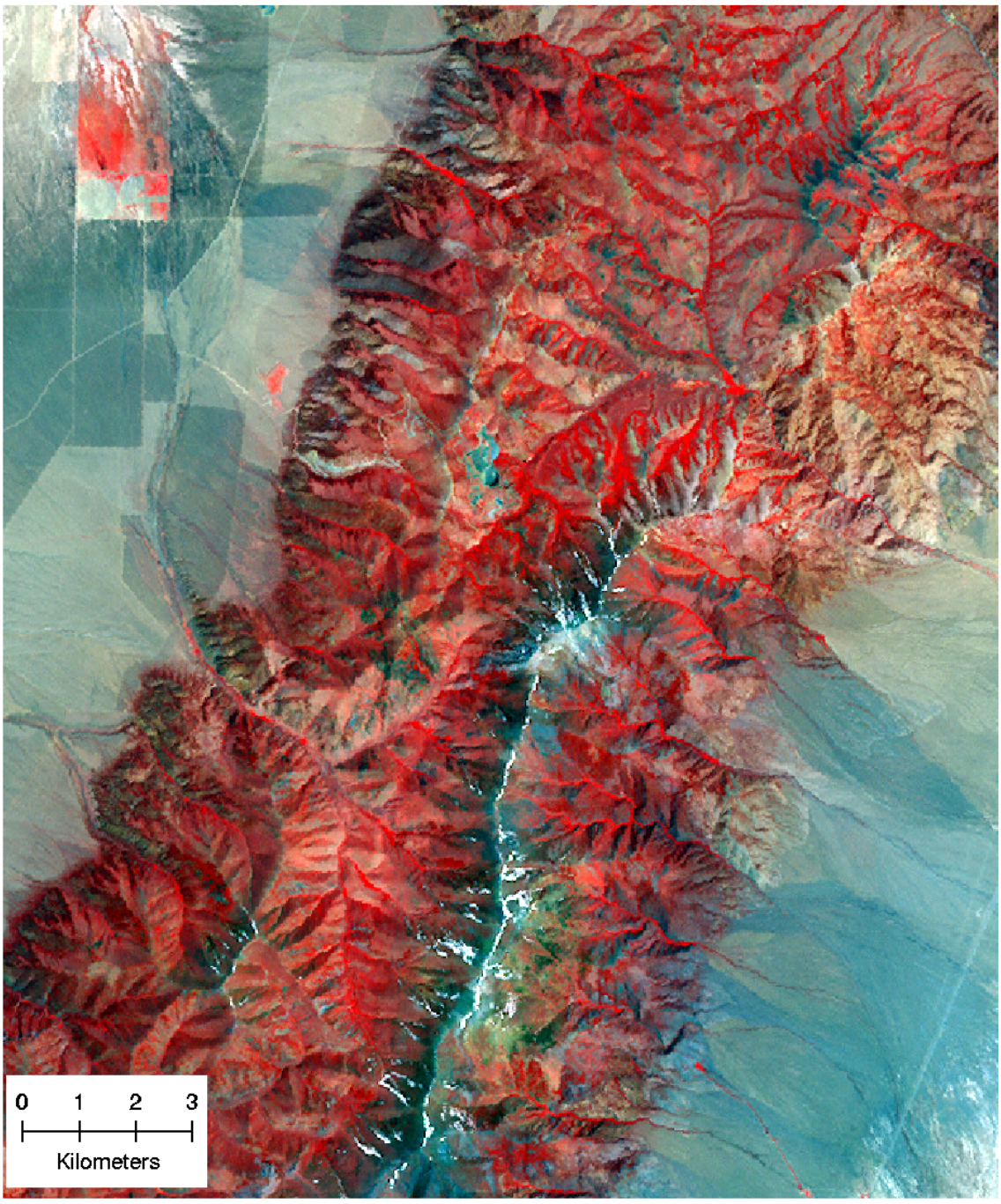

Figure 2. Landsat image (RGB 431) of area of active normal faulting.

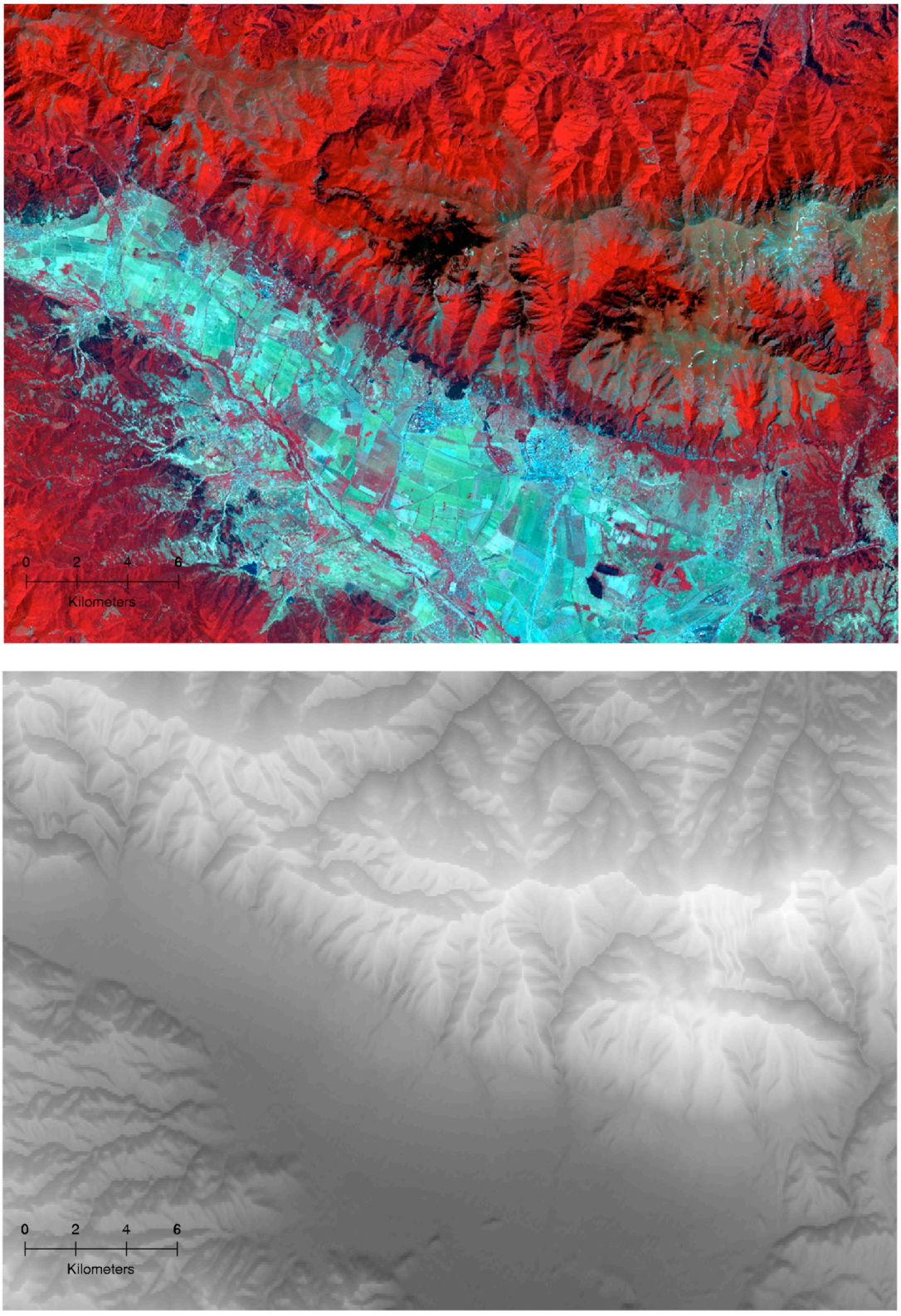

Figure 3. (top) Landsat image (RGB 431) of an area of active normal faulting. (bottom) Topography for the same area illuminated from the SW.

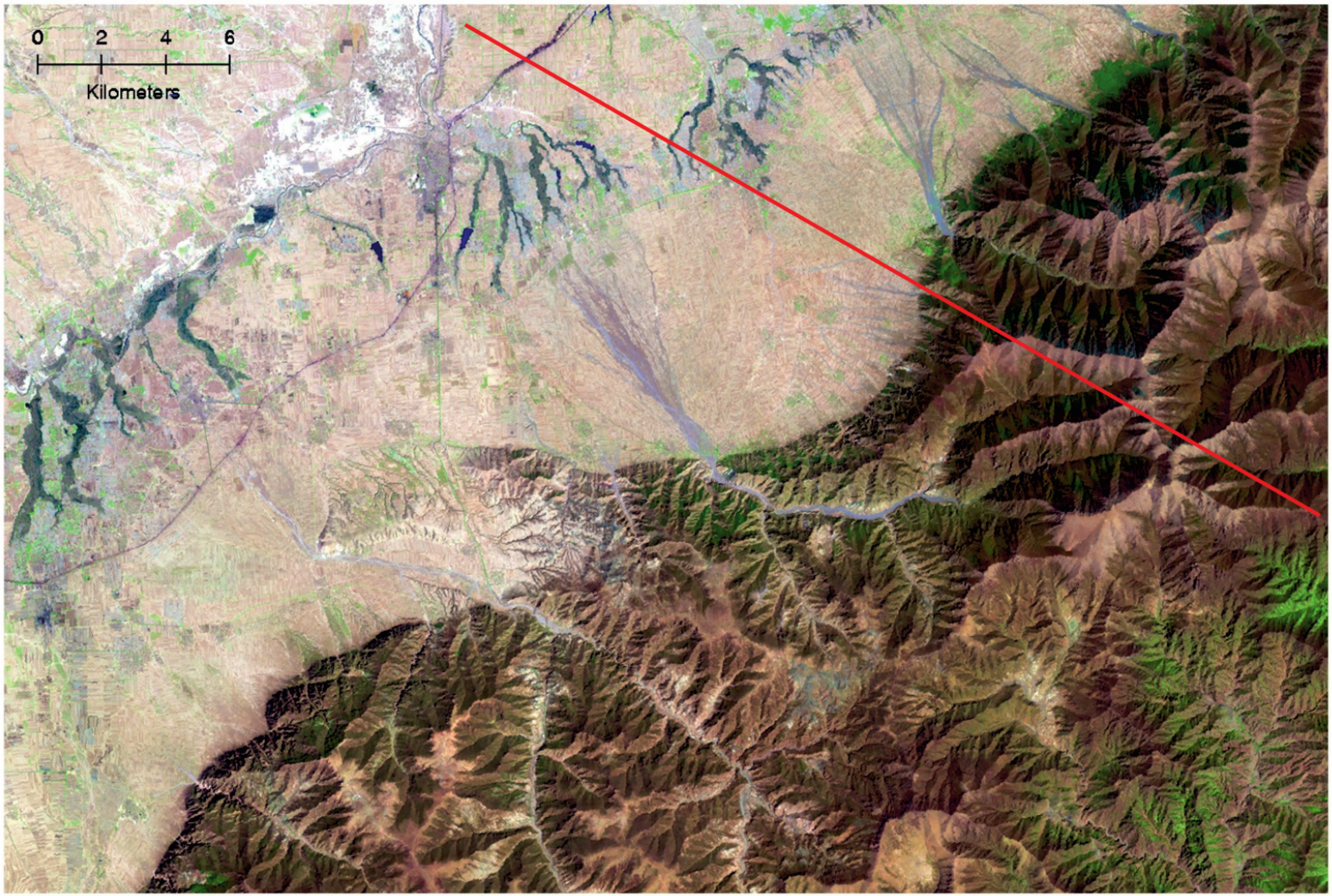

Figure 4. Landsat image (RGB 542) of an area of active normal faulting. The red line shows the location of the topographic profile in Figure 5.

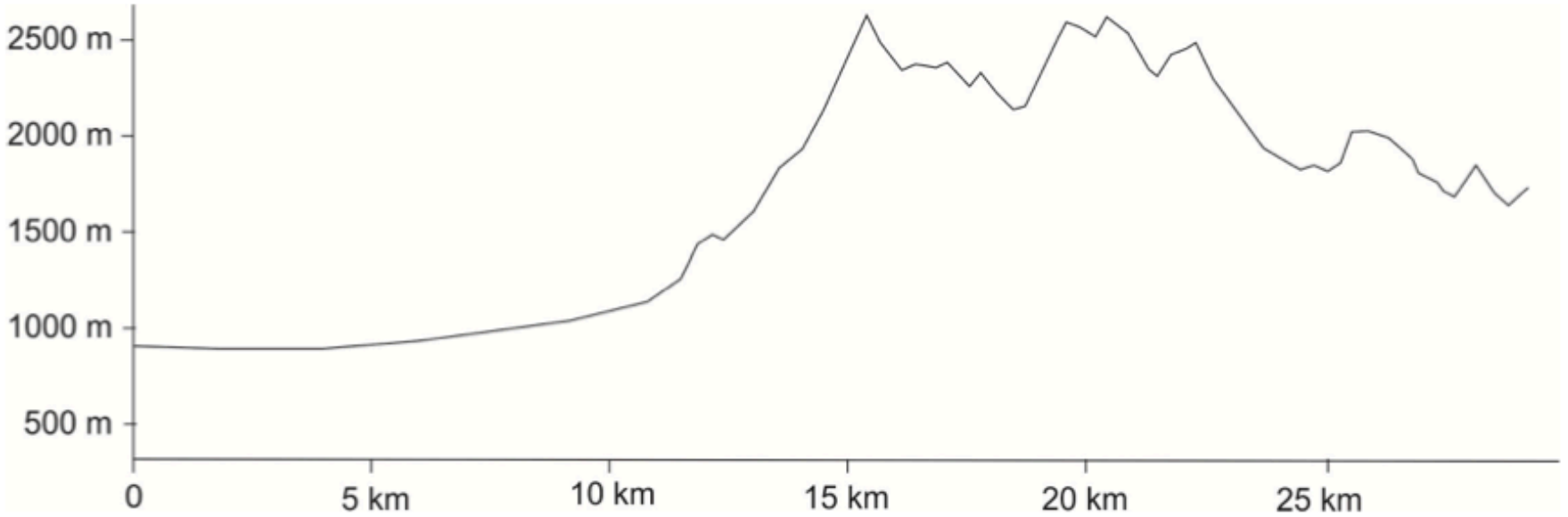

Figure 5. Topographic profile along the red line shown in Figure 4

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Remote Sensing of Normal Faults

Figures 1-4 shows false colour composite Landsat images of four areas of active normal faulting. North is at the top of the image in each case.

1. In at least one of the images, mark an example of the following features: (i) a wine-glass canyon, (ii) a triangular facet or flat-iron, (iii) a main drainage divide, (iv) an alluvial fan, (v) axial drainage, (vi) deflected drainage, and (vii) a dry valley or wind gap.

2. Draw the location of the faults on the images, and note which is the footwall and which the hanging wall.

3. Look at the topographic profile across the fault in image 4 shown in Figure 5. Estimate roughly what has been the total slip on the fault.

4. In one of the images, there is evidence for growth in length of the fault. Try to identify this location and all the observations that point towards lateral growth of the fault.

We will talk about where the images are located at the end of the practical.

N.B. The false colour images are constructed so that vegetation will have a characteristic colour. Wavelengths in the very-near infrared (VNIR: wavelengths in the approximate range 0.7-0.8 μm) are highly reflected by actively growing vegetation compared to the visible. Vegetation will therefore have the colour – red (R), green (G) or blue(B) – according to which of the primary colours of the display device the VNIR band is input

Image 1 has band 7 (2.09-2.35 μm) displayed as red, band 4 (0.76-0.90 μm) as green, and band 2 (0.52-0.60 μm) as blue; images 2 and 3 have band 4 (0.76-0.9 μm) displayed as red, band 3 (0.63-0.69 μm) as green, and band 1 (0.45-0.52 μm) as blue; image 4 has band 5 (1.55-1.75 μm) displayed as red, band 4 (0.76-0.90 μm) as green, and band 2 (0.52-0.60 μm) as blue.