3. Vector and Raster Approaches

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The terms **raster** and **vector** were introduced back in Chapter 1 to denote two fundamentally different strategies for representing geographic phenomena. Both strategies involve simplifying the infinite complexity of the Earth's surface. As it relates to elevation data, the raster approach involves *measuring elevation at a sample of locations*. The vector approach, on the other hand, involves *measuring the locations of a sample of elevations*. I hope that this distinction will be clear to you by the end of this chapter.

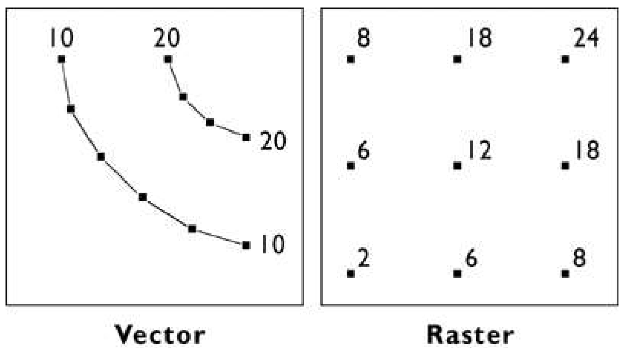

Figure 7.4.1 Vector and raster representations of the same terrain surface.

Figure 7.4.1 compares how elevation data are represented in vector and raster data. On the left are elevation **contours**, a vector representation that is familiar with anyone who has used a USGS topographic map. The technical term for an elevation contour is *isarithm*, from the Greek words for "same" and "number." The terms *isoline*, *isogram*, and *isopleth* all mean more or less the same thing. (See any cartography text for the distinctions.)

As you will see later in this chapter, when you explore Digital Line Graph hypsography data using Global Mapper or dlgv 32 Pro, elevations in vector data are encoded as attributes of line features. The distribution of elevation points across the quadrangle is therefore irregular. Raster elevation data, by contrast, consist of grids of points at which elevation is encoded at regular intervals. Raster elevation data are what's called for by the NSDI Framework and the USGS National Map. Digital contours can now be rendered easily from raster data. However, much of the raster elevation data used in the National Map was produced from digital vector contours and hydrography (streams and shorelines). For this reason, we'll consider the vector approach to terrain representation first.

‹ 2. Theme: Elevation up 4. Contours ›

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