1. Overview

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As you recall from Chapter 1, geographic data represent spatial locations and non-spatial attributes measured at certain times. We defined "feature" as a set of positions that specifies the location and extent of an entity. Positions, then, are a fundamental element of geographic data. Like the letters that make up these words, positions are the building blocks from which features are constructed. A property boundary, for example, is made up of a set of positions connected by line segments.

In theory, a single position is a "0-dimensional" feature: an infinitesimally small point from which 1-dimensional, 2-dimensional, and 3-dimensional features (lines, areas, and volumes) are formed. In practice, positions occupy 2- or 3-dimensional areas as a result of the limited resolution of measurement technologies and the limited precision of location coordinates. Resolution and precision are two aspects of data quality. This chapter explores the technologies and procedures used to produce positional data, and the factors that determine its quality.

Objectives

Students who successfully complete Chapter 5 should be able to:

1. identify and define the key aspects of data quality, including resolution, precision, and accuracy;
2. list and explain the procedures land surveyors use to produce positional data, including traversing, triangulation, and trilateration;
3. calculate plane coordinates by open traverse;
4. calculate elevations by leveling;
5. explain how radio signals broadcast by Global Positioning System satellites are used to calculate positions on the surface of the Earth;
6. state the kinds and magnitude of error associated with uncorrected GPS positioning; and
7. identify and explain methods used to improve the accuracy of GPS positioning.

"Try This!" Activities

Take a minute to complete any of the Try This activities that you encounter throughout the chapter. These are fun, thought-provoking exercises to help you better understand the ideas presented in the chapter.

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