1. Overview

Print

Chapter 1 outlined several of the distinguishing properties of geographic data. One is that geographic data are necessarily generalized, and that generalization tends to vary with scale. A second distinguishing property is that the Earth's complex, nearly-spherical shape complicates efforts to specify exact positions on Earth's surface. This chapter explores implications of these properties by illuminating concepts of scale, Earth geometry, coordinate systems, the "horizontal datums" that define the relationship between coordinate systems and the Earth's shape, and the various methods for transforming coordinate data between 3D and 2D grids, and from one datum to another.

Compared to Chapter 1, Chapter 2 may seem long, technical, and abstract, particularly to those for whom these concepts are new.

Objectives

Students who successfully complete Chapter 2 should be able to:

1. demonstrate your ability to specify geospatial locations using geographic coordinates;
2. convert geographic coordinates between two different formats;
3. explain the concept of a horizontal datum;
4. calculate the change in a coordinate location due to a change from one horizontal datum to another;
5. estimate the magnitude of "datum shift" associated with the adjustment from NAD 27 to NAD 83;
6. recognize the kind of transformation that is appropriate to georegister two or more data sets;
7. describe the characteristics of the UTM coordinate system, including its basis in the Transverse Mercator map projection;
8. plot UTM coordinates on a map;
9. describe the characteristics of the SPC system, including map projection on which it is based;
10. convert geographic coordinates to SPC coordinates;
11. interpret distortion diagrams to identify geometric properties of the sphere that are preserved by a particular projection; and
12. classify projected graticules by projection family.

"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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The Nature of Geographic Information

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