2. Theme: Elevation

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The NSDI *Framework Introduction and Guide* (FGDC, 1997, p. 19) points out that "elevation data are used in many different applications." Civilian applications include flood plain delineation, road planning and construction, drainage, runoff, and soil loss calculations, and cell tower placement, among many others. Elevation data are also used to depict the terrain surface by a variety of means, from contours to relief shading and three-dimensional perspective views.

The NSDI Framework calls for an "elevation matrix" for land surfaces. That is, the terrain is to be represented as a grid of elevation values. The spacing (or resolution) of the elevation grid may vary between areas of high and low relief (i.e., hilly and flat). Specifically, the Framework Introduction states that

> *Elevation values will be collected at a post-spacing of 2 arc-seconds (approximately 47.4 meters at 40° latitude) or finer. In areas of low relief, a spacing of 1/2 arc-second (approximately 11.8 meters at 40° latitude) or finer will be sought (FGDC, 1997, p. 18).*

The elevation theme also includes bathymetry--depths below water surfaces–for coastal zones and inland water bodies. Specifically,

> *For depths, the framework consists of soundings and a gridded bottom model. Water depth is determined relative to a specific vertical reference surface, usually derived from tidal observations. In the future, this vertical reference may be based on a global model of the geoid or the ellipsoid, which is the reference for expressing height measurements in the Global Positioning System (Ibid).*

USGS has lead responsibility for the elevation theme. Elevation is also a key component of USGS' National Map. The next several pages consider how heights and depths are created, how they are represented in digital geographic data, and how they may be depicted cartographically.

‹ 1. Overview up 3. Vector and Raster Approaches ›

The Nature of Geographic Information

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