Mastering ArcGIS Pro 1st edition Price Solutions Manual

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Chapter 1

Answers to Review Questions 1

1. Discrete data are objects that exist in one place and not another, such as rivers, states, or wells. Continuous data store a value that could be measured anywhere, such as rainfall, temperature, or slope.
2. The length of the pool in the map is 2 cm = 0.02 meters. Set up the ratio 0.02 m/50 m = 1/x and solve for x, obtaining x = 2500. The scale is thus 1:2,500.
3. A map scale is established by drawing a map on paper or a screen. GIS data can be viewed at many different scales by zooming in/out, so it has no map scale, only locations. However, a data set inherits a source scale from the original paper map on which it is based.
4. Originally, GIS data were primarily stored on a local or network hard drive, used in a GIS program, and obtained by downloads or CD/DVD media. Now, live Internet sources are increasingly used and can be consumed by a wider variety of devices.
5. The uncertainty of 25-50 meters in location, at the typical scale needed to navigate a hiking train, would not be considered precise in this example, nor would his map be highly accurate.
6. Smartphones can be variable in accuracy depending on location and service. Plus, the location of the bird-watcher will often not be the exact location of the bird, so the positional accuracy of this data set is likely 10-50 meters overall. The attribute accuracy will be affected by each contributor's expertise in recognizing species and how well the bird is seen or heard. The resolution will be variable; she may get more sightings on weekends or during pleasant weather. Some areas will be visited frequently by many bird-watchers and other areas may have no data at all, and the availability of roads and trails will also affect where data are collected. The temporal resolution is coarse, as she will be collecting data over many days and possibly seasons that may affect which birds are present.
7. Mastering ArcGIS Pro Tutorial Data, 1st edition (2018) [download]. McGraw-Hill Higher Ed: Dubuque, Iowa.
8. Windows are work areas that may hold either views or panes. A view is an object that the user is working with, like a map or a table. A pane contains commands or settings that affect the current view object.
9. Tools are small programs that perform a specific task. Parameters are settings that affect how the tool executes.
10. Core ribbons are always shown in the ribbon interface, but contextual ribbons only appear when the corresponding object is selected or being used.

Answers to Tutorial Questions 1

1. The lake area is 5,412 hectares.
2. Vents contains point data, faults and bathymetry contain line data, and the polygon data sets include floorgeology, geologyunits, lake, ParkBoundary, and topocliparea. The rasters are dem30m and hillshade10m.
3. No, the name did not update in the 3D scene.

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4. USA Mean Temperature (2016) [imagery layer]. US Geological Survey on ArcGIS Online. URL: https://landscape3.arcgis.com/arcgis/rest/services/USA_Mean_Temperature /ImageServer [August, 2017].
5. There are 36 counties, with an average population of 108,964.
6. Wheeler has 1460 and Multnomah has 759,000.

Answers to Exercises 1

Answers will vary.

Chapter 2

Answers to Review Questions 2

1. The answers are:
   - **arsenic concentration in mg/L**—ratio, because concentration is measured on a regular scale with a natural zero point indicating no arsenic is present.
   - **vegetation type**—categorical, because they are text symbols for different categories of vegetation
   - **annual precipitation in inches**—ratio, because rainfall is measured on a regular scale of inches or cm, and zero indicates that no precipitation fell
   - **customer zip codes**—nominal, because they signify a unique polygon; but might also be considered categorical, because zip codes group mailing addresses
   - **social security numbers**—nominal, because each number uniquely identifies one person
   - **elevations of climate stations**—interval, because elevation is measured on a regular scale but the zero point is arbitrary and negative values are possible.
   - **football team rankings**—ordinal, because the rankings are ordered but are not measured on a regular scale
   - **number of students in universities**—ratio, because the scale (people counts) is regular and zero indicates no students are attending the university
   - **letter grades given to students**—ordinal because it ranks students by performance and the scale may not be regular.
   - **college student majors**—categorical, because the majors group students into separate categories of study
2. The best map types are:
   - **political party chosen by voting districts**—unique values, because it includes only three text categories
   - **lung cancer rates by county**—graduated color, because quantities for polygons are being mapped and color ramps work well, although a graduated symbol map might be used to minimize visual MAUP
   - **flow rates of wells in gallons per minute**—graduated symbol, because quantities for points are being mapped, so varying symbol size works best
   - **river flow volumes**—graduated symbol, quantities for lines are being mapping, and making the symbol thicker with increasing quantity works well
   - **restaurant locations**— single symbol map, because you are only interested in showing the location. No attributes are being displayed.
   - **soil class**—unique values map, because categories for polygons are being displayed
3. Average annual snowfall, home vacancy rate, and median home price are not affected by the aggregation scheme areas and do not need to be normalized. Native American population would usually be normalized by total population, although by area would make sense in some

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instances. The number of crimes reported should be normalized by the population of the county. The number of car accidents might be normalized by population, county area, or county road miles.

4. The appropriate raster display type is:
   Land cover classes—unique values, because they represent discrete categories
   Black and white aerial photo—stretched, because a single band is available
   7-band satellite image—RGB composite, because multiple bands are availabler
   Tree canopy percent—classified, because the value range is small and the resolution of the data collection values is approximate
   Elevation—usually stretched to represent the full range of values, but possibly classified to make a contour-like map
   city zoning codes—unique values, because they represent discrete categories
5. Selecting a classification scheme, whether Jenks, defined interval, or another, introduces subjectivity and potential bias into the presentation, and maps may look quite different based on the choice. Unclassed maps remove the subjective aspect and present the data without bias.
6. A geospatial data set is stored on a disk or accessed through a portal, and contains actual stored features and their attributes (or rasters). A layer stores the location where the data set may be accessed and properties that control how it is displayed; it does not store actual feature or raster data.
7. Thematic rasters contain map quantities or features. Image rasters show brightness values and are typically photographs or satellite data.
8. Answers will vary.

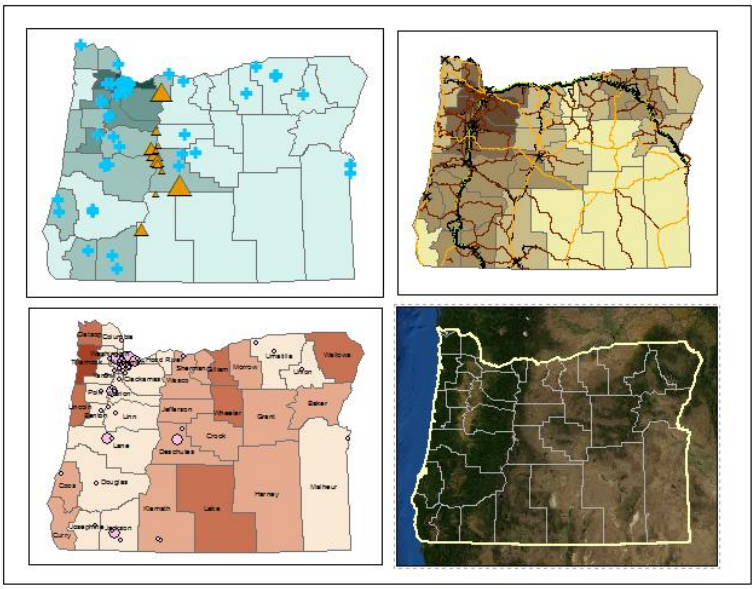
Answers to Tutorial Questions 2

1. ELEVATION contains interval data and TYPE contains categorical data.
2. Click FEATURE LAYER: APPEARANCE: Drawing: Symbology or click the layer symbol in the Contents pane.
3. I stands for Interstates, U for US highways, and S for state highways.
4. Population is ratio data and requires a graduated color map for polygons.
5. Elevation is interval data. Stretched or classified raster map types would work.
6. The slope class raster contains ordinal data. A unique values with a monochromatic ramp would work best.

Answers to Exercises 2

The answers are the maps and the legends. Students should be given feedback on choice of colors and symbols, use of informative legend text, use of appropriate formatting for legend values, and choice of classification methods and normalization, etc.

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Source: Esri

Chapter 3

Answers to Review Questions 3

Answers will vary.

Answers to Tutorial Questions 3

1. A map is a container in the project that organizes layers and properties for display. A map frame is a map that has been placed in a layout; its layer properties match that of the source map, but it has an independent extent.
2. The boxes should read from left to right: subdivision, division, division units.

Answers to Exercises 3

1. Answers should look like the map under the question.
2. Answers will vary.

Chapter 4

Answers to Review Questions 4

1. The data are using a geographic coordinate system, and the units are in degrees.
2. The UTM projection is designed to preserve accuracy in a narrow band running north-south. The contiguous United States is elongated east-west and is thus better suited to a conic projection.
3. A local datum creates a best fit between the mapping figure (the spheroid) and the earth's true shape, often with custom fitting based on surveyed bench marks. An earth-centered datum seeks the best overall fit between the mapping figure and the earth's true shape.

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