

Conceptual Design: Data

Error Tolerance Questions

Step 1: Determine the minimum area to be mapped:

The parks and recreation staff in your city are looking for a 25 acre site for a minor league baseball field and stadium.

Minimum mapping unit: **10 hectares**

25/2.471

Step 2: Identify map scale:

Your city has three source maps for you to use: Parcels, Park and Recreation Facilities, and Slope. The map scale of the Parcels map is 1:5,000, the map scale of the Park and Recreation Facilities map is 1:24,000, and the map scale of the Slope map is 1:24,000.

Which source map will most accurately show the smallest areas?

1: 5,000

Step 3: Determine the appropriate error table to use:

Review the two error tables below.

TABLE A:

Minimum Area (ha)	% Error in Area Measurement				
	1	3	5	8	10
0.01	1:100	300	500	800	1,000
0.1	300	900	1,500	2,400	3,000
1	1,000	3,000	5,000	8,000	10,000
10	3,000	9,000	15,000	24,000	30,000
100	10,000	30,000	50,000	80,000	100,000
1,000	30,000	90,000	150,000	240,000	300,000

1 hectare (ha) = 10,000 m² = 2.471 acres

Map scale for a given area and error tolerance

TABLE B:

Minimum Area (ha)	Map Scale				
	1:1,000	1:5,000	1:10,000	1:50,000	1:100,000
0.01	10.0	50.0	INVALID		
0.1	3.3	16.6	33.3		
1	1.0	5.0	10.0	50.0	
10		1.6	3.3	16.6	33.3
100	INSIGNIFICANT		1.0	5.0	10.0
1,000				1.6	3.3

1 hectare (ha) = 10,000 m² = 2.471 acres

Percent error in area measurement for a given area and map scale

Which table (A or B) should you use to find sites for the baseball field? **B**

Step 4: Estimating error tolerance

Using the table you selected in step 3, estimate the error tolerance for the maps of the proposed baseball stadium sites:

Place your value here:
Minimum area: **10**
Scale **1: 5,000**
Error Tolerance **1.6**

Map Scale Determination Questions

Step 1: Determine the minimum area to be mapped

One of your information products is a statewide map showing water bodies. The map needs to show lakes larger than 25 acres, reservoirs larger than 25 acres, and playas larger than 50 acres.

What is the minimum size water body (in hectares) that needs to be mapped to create this information product?

Minimum size: **10 hectares**
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Step 2: Determine the percent error in an area

The information product description for the statewide water body map requires that the area of the water bodies being mapped needs to be accurate to within +/- 1 hectare. Using the minimum area to be mapped from step 1, determine the percent error in area that is acceptable.

What is the acceptable percent error in area?
10 percent

Step 3: Determine which error table to use

Review the two error tables in the previous set of questions (Tables A and B).

Which table should you use to find the appropriate scale for mapping water bodies
A

Step 4: Determine the map scale

Using the table you chose in step 3, determine the smallest map scale for the water bodies information product.

What is the smallest scale map that should be used?

1: 30,000

Create a Data Error Tolerance Exercise

As with the previous exercise, create an exercise that mimics the assignment above (minus the use of the discussion channel on blackboard). Select one or two data types that you want to use to create the questions regarding error tolerance and map scale. (use the space below).

Error Tolerance:

The VCNP wants to designate an area within the preserve that is 25 acres that will be used for grazing.

Step 1: Determine the minimum area to be mapped

Identify the minimum mapping unit:

(Answer)

Approximately 10 hectares

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Step 2: Identify map scale:

The VCNP has three source maps for you to use. They include the Valles Caldera National Parks boundaries, vegetation, and roads. The boundaries map is 1: 10,000, the map scale for the vegetation is 1: 50,000 and the roads map scale is 1: 60,000.

Which source map will most accurately show the smallest areas?

(Answer: 1: 10,000, boundaries map)

Step 3: Determine the appropriate error table to use:

Review the two tables from above.

Which table from above (A or B in) should be used to find sites for the potential grazing area?

(Answer: B. Percent error in area measurement for a given area and map scale)

Step 4: Estimating error tolerance

Using the table you selected in step 3, estimate the error tolerance for the maps of the proposed grazing area site:

(Answers)

Minimum area: 10

Scale: 1: 10,000

Error tolerance: 3.3

Map Scale Determination

Step 1: Determine the minimum area to be mapped

One of your information products is a boundary map showing vegetation types. The map needs to show forested areas larger than 25 acres, grasslands larger than 25 acres and shrublands larger than 50 acres.

What is the minimum size vegetation type (in hectares) that needs to be mapped to create this information product?

Minimum size:

(Answer: 10 hectares)

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Step 2: Determine the percent error in an area.

The information product description for the boundary vegetation types map requires that the area of vegetation being mapped needs to be accurate to within +/- 1 hectare. Using the minimum area to be mapped from step one, determine the percent error that is acceptable.

What is the acceptable percent error in area?

(Answer: 10 percent)

Step 3: Determine which error table to use

Review the two error tables in the previous set of questions (Table A and B).

Which table should you use to find the appropriate scale for mapping the vegetation types?

(Answer: A. Map scale for a given area and error tolerance)

Step 4: Determine the map scale

Using the table you chose in step 3, determine the smallest map scale for the vegetated area types information product.

What is the smallest scale map that should be used?

(Answer: 1: 30,000)

Review of Metadata

There are many sets of metadata for GIS data. Select a set of metadata from either the internet (e.g. TIGER/Line metadata) or any other source of data you can find (including the Valles Caldera).

Answer the following from the metadata. Place the name of the data in the line below:

DATASEST NAME (e.g. 1995 TIGER/Line data) :

2013 TIGER/Line shapefile U.S Current County and Equivalent National

Step 1: Determine the source

What is the source of the data for this dataset?

Census Bureau /MAF (Master Address File)/TIGER database

Step 2: Determine the scale

What is the scale of the dataset?

N/A

Step 3: Determine the map projection

What is the horizontal coordinate system for the dataset?

Coordinate system: GCS_North_American_1983

Step 4: Determine the map accuracy

What is the positional accuracy of the dataset?

N/A

Step 5: Determine the data format

What is the format of the data?

Polygonal features

