



Rocky Mountain Mapping Center

Locating a Fire Tower Using GIS - Answer Key

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- 1) [Approximately 17,034.95 meters]
 - 2) [Approximately 16,941.13 meters]
 - 3) [Approximately 295,021,998.52 sq meters]
 - 4) [Approximately 295.02 km]
 - 5) [4,776,391.85 m]
 - 6) [4,776.39 km]
 - 7) [Approximately 10.6 km]
 - 8) [A41]
 - 9) [lakes]
 - 10) [Along H12 features - creeks]
 - 11) [H11]
 - 12) [9 classes]
 - 13) [Highest elevations in the Southern portion and Northeast]
- [Lowest elevations follow major rivers]

[St Francis at a higher elevation than Rosebud]

14) **[9 classes]**

15) **[Steeper slopes surround creeks]**

[Steeper slopes are in the South West quadrant]

[St Francis is in a flat area]

[Lower Southern area is quite flat]

16) **[16,275]**

17) **[14 classes]**

18) **[landcoverc]**

19) **[St Francis is surrounded by type 81 (pasture) except for type 71 (grassland) on the East]**

[Type 43 (Mixed forest) is found at lower elevations]

[Type 71 (grasslands) is most prevalent in the study area]

[Types 81, 82, 83 (agricultural) are mostly in the Southern area]

20) **[Type 43 (mixed forest)]**

21) **[Type 81 (pasture)]**

22) **[more moisture for more natural vegetation]**

[not cultivated due to higher degree of slopes]

23) [**41 Deciduous forest, 43 Mixed forest, 92 wetlands**]

24) [**grasslands , pasture, small grains**]

25) [**No, because southern South Dakota is predominately grasslands**]

26) [**number of polygons**]

27) [**area of each polygon**]

28) [**largest landcover is, by far, grasslands**]

[**Smallest landcover is urban**]

29) [**grasslands, mixed forest, deciduous forest**]

30) [**not exactly, as it is difficult visually to add up the small polygons of forest**]

[**create buffer and query distance**]

31) [**596/627 x 100 = 95.056 %**]

32) [**Includes the towns**]

[**evenly distributed throughout the study area**]

33) [**from the road to the edge of the buffer zone**]

34) [**72/305 x 100 = 23.6 %**]

35) [**polygon**]

36) [**gridcode > 6**]

37) [**1172**]

38) [**South East and North West**]

39) [**only the polygons selected were copied over to the new elevhigh table**]

40) [**gridcode < 3**]

41) [**22,339**]

42) [**Northwest and Southeast**]

43) [**number of records = 2**]

[**encompasses Rosebud but not near St Francis**]

44) [**64 records**]

[**pattern from southwest to northeast**]

[**medium to small shapes**]

45) [**43**]

46) [**43 records**]

[**Largest area is west of Rosebud**]

[**Three other areas almost equidistant from St Francis**]

47) [**Cluster of three sites are South of Little White River and Northwest of St Francis**]

[**Another site is Northeast of the intersection of Little White River and Beads Creek**]

[**Largest site is West of Rosebud and the West Branch of the Rosebud Creek**]

48) [**16,275**]

49) [987]

50)

Site	UTM	Distance from St Francis	Direction from St Francis
#1	347,377.17 E 4,786,142.41W	12 km	NE
#2	337,485.24 E 4,778,310.78 W	7.8 km	W
#3	335,549.04 E 4,786,007.72 W	7.77 km	NW

[Answers may vary]

51) [The three sites were chosen because they are spread out within the study area and are each near a large grassland area.]

52) Layout.

52) [Fire towers should consider elevation, slope, land use/land cover, and proximity to features. GIS enables the analyst to consider many factors when deciding the best locations for anything spatial in nature, such as fire towers.]

53) [Answers will vary, and may include buffering, intersecting, sorting, printing, and using GIS to make an informed decision.]

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Maintainer: webmaster@rockyweb.cr.usgs.gov

URL: http://rockyweb.cr.usgs.gov/public/outreach/sgu/firetowerlesson_answers.html

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