

GEOMORPHOLOGY LAB EXERCISE INTRODUCTION TO TOPOGRAPHIC MAPS

All of the following questions refer to the Monmouth, OR Quadrangle.

- 1) What is the fractional scale, contour interval, and magnetic declination of this map?
 a) Scale: 1:24,000 b) Contour Interval: 10 ft c) Declination: 20 1/2° E.
- 2) What quadrangle maps are located immediately adjacent to the Monmouth Quad?
 a) North: RICHFIELD b) South: LEWISDALE c) East: SIONEY d) West: ARKLE NORTH
- 3) What is the quadrangle size series of this map (in long. and lat.)? 7.5 min
- 4) What is the date of publication of this map? 1970
- 5) What does the tick with 4956000m N. mean? (lower right of map) UTM - GRID - in meters
UNIVERSAL TRANSVERSE MERCATOR
- 6) What is the name of the major fluvial system flowing through this area. Of What larger drainage basin(s) does this river form a part of? WILLAMETTE RIVER, COLUMBIA
- 7) What is the approximate elevation of the Natural Sciences Building based on the map representation? 210-212 ft AMLL
- 8) Given the fractional scale determine the following $1 \text{ in} = 2000 \text{ FT} = 609.6 \text{ m}$

5 inches on the map = $\frac{10,000}{5} = 2000$ Feet on ground = $\frac{1.289}{5} = 0.2578$ Miles on ground.
 10 inches on the map = $\frac{6095.7}{10} = 609.57$ Meters on ground = $\frac{6.1}{10} = 0.61$ Kilometers on ground.

- 9) A. What is the road distance in miles along Rt. 99 between Helmick State Park and Monmouth city limits? 4.18 mi
 B. What is the distance in kilometers? $4.18 \text{ mi} \left(\frac{1 \text{ km}}{0.62 \text{ mi}} \right) = 6.74$
- 10) A. Determine the average stream gradients (in FT/Mi) for the following drainages:
 A. Willamette River: Gradient: $\frac{5 \text{ FT}}{2.48 \text{ mi}} = 2.02 \text{ FT/mi} = 0.00015$
 B. Luckiamute River: Gradient: $\frac{19 \text{ FT}}{4.89 \text{ mi}} = 2.04 \text{ FT/mi} = 0.00039$
- 11) A. What is the highest point of elevation represented on this map? $\Delta E = 10 \text{ FT}$ $\Delta H = 4.89 \text{ mi}$
 B. What is the lowest point of elevation represented on this map? 955 FT (KNOB 0.55 mi SE of VITTE SPG)
 -140 FT (WILLAMETTE RUM - N.)
 C. What is the maximum relief? 815 FT

- 12) A. What is the longitude and latitude location of the road intersection at Buena Vista
 Long = 123° 9' 8" W LAT. = 44° 46' 9" N
 B. What is the longitude and latitude location of Davidson Hill?
 Long = 123° 11' 26" W. LAT. = 44° 45' 59" N

MUST CREATE A CONVERSION SCALE

Long. 1 $5.4 \text{ in} = 2.5 \text{ min}$ $1 \text{ in} = 0.463 \text{ min}$	MAP INTERPOLATION LAT. $7.575 \text{ in} = 2.5 \text{ min}$ $1 \text{ in} = 0.33 \text{ min}$
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C. What is the straight line distance in miles between these two points?

1.9 mi

D. What is the azimuth bearing FROM Davidson Hill TOWARDS Buena Vista?

84°

E. What is the quadrant bearing FROM Buena Vista TOWARDS Davidson Hill?

S. 84° W.

13) A. What is the nature of the topographic slope in the vicinity of the town of Monmouth?

BROAD, GENTLY SLOPING - HORIZONTAL TERRACE

C. What is the local relief between WOU and the Willamette adjacent to Independence?

210 FT - 136 FT = 74 FT

D. Is the outline of the topography east of Independence relatively arcuate or irregular in outline?

ARCULATE

E. What processes might have formed the pattern in D above?

LATERAL CHANNEL MIGRATION

14) Examine the cultural activity immediately north of Monmouth and Independence.

A. Write a brief assessment of the potential for environmental degradation to the surface and groundwater of this area. List three types of water quality degradation (i.e. contamination) problems that may exist in this area.

SEWAGE DISPOSAL

AGRICULTURAL RUNOFF

CITY STORM WATER RUNOFF
PETROLEUM OILS

POTENTIAL
SURFACE
AND
GROUNDWATER
CONTAMINATION

18. Determine the elevations of the following locations:

A. Wigrich - 170 FT AMSL

B. Oak Hill (SC) 476 FT AMSL

C. Dicker Reservoir (NE) ~ 395 FT AMSL

D. Davidson Bridge (SC) ~ 155 FT AMSL

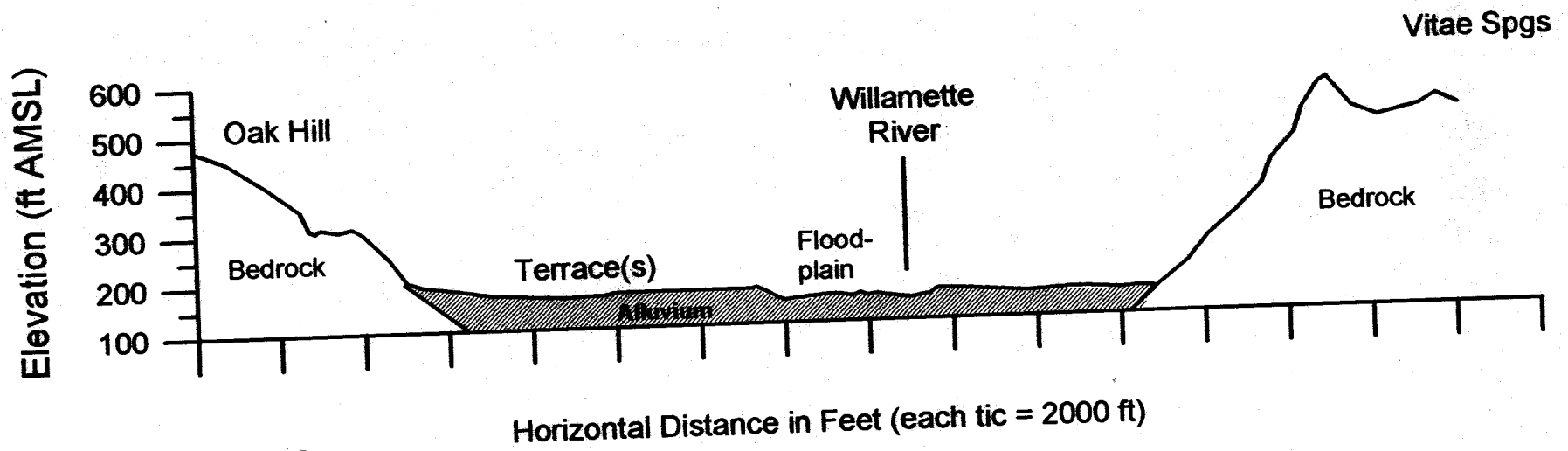
19. Draw a topographic profile along a line connecting Oak Hill (SC) to Vitae Springs. Use a horizontal scale of 1 in = 2000 Ft, and a vertical exaggeration of x 3.

- 0.2% → A. Determine the minimum slope grade represented on the profile in percent. $\Delta V/\Delta H = 5 \text{ FT} / 3240 \text{ FT} \times 100 = 0.2$
- 25% → B. Determine the maximum slope grade represented on the profile in percent. $\Delta V/\Delta H = 50 \text{ FT} / 198 \text{ FT} \times 100 = 25$
- C. Where are the areas most likely associated with flooding?

ADJACENT TO WILLAMETTE

SEE PROFILE

Topographic Profile from Oak Hill to Vitae Springs, Monmouth, OR Quad.



Horizontal Scale: 1 in = 4000 ft
Vertical Scale: 1 in = 333.33 ft

V.E. = H/V = 4000 ft / 333.33 ft = x12