

ES322 Geomorphology
Introduction to Landscape Observations and Physiography of Oregon
Observing, Describing and Classifying Landscape Domains

Introduction:

The goals of this exercise are to:

- (1) Observe landscape patterns at the Earth’s surface, (2) Familiarize yourself with the regional topography, geology and geomorphology of Oregon, and (3) Develop skills in observation and classification.

Procedure:

You will work in groups of three (or two), examining topographic aspects of the state of Oregon. Observations will be based on the large Oregon raised relief map in the hallway to the Jackson Street entrance to the Natural Science Building and Figures 1-3 (attached; Fig. 1 Oregon base map with major rivers and counties,, Fig. 2 a 10-m digital elevation model of Oregon, Fig. 3 a 10-m hillshade model of Oregon. Figure 4 is a blank Oregon base map that you will use to draw physiographic/topographic boundaries based on your observations and classification scheme. Each person will turn in their own written answers and base maps, as part of their lab portfolios. Team thinking and discussion are encouraged.

The Earth’s surface can be divided into physiographic provinces based on the topography, hydrology, climate, vegetation, geology, soils, and human land use. Your objective is to observe and classify similar physiographic regions in the state of Oregon, using Fig. 4 as your base map on which to draw boundaries.

Make and record your observations for each province you identify, using the following landscape criteria:

- 1. Topography
 - a. River drainage patterns (dendritic, parallel, radial; densely or sparsely spaced tributaries?)
 - b. Presence or absence of canyon topography?
 - c. Equi-dimensional or elongated drainage basins?
 - d. High relief, rugged steep mountain slopes? Vs. subdued low-relief hills
 - e. Elongated ridges/mountains? Vs. Cone-shaped mountains? vs. flat / low-relief planar uplands?
- 2. Hydrography
 - a. rivers
 - b. lakes
 - c. glaciers
 - d. playas
- 3. Vegetation
 - a. green shaded relief areas: forest cover
 - b. shrub-steppe-grasslands
 - c. agricultural lands
 - d. high-altitude alpine (above tree line)
- 4. Landuse
 - a. urban
 - b. rural/agricultural
 - c. rural / range land
 - d. forest/timberland

Task 1: Using the raised relief map and attached figures, fill out Table 1 data sheets with observations organized according to the above criteria.

Task 2: Using Figure 4 blank base map, draw physiographic landscape boundaries covering the state of Oregon. Each of your landscape zones should be comprised of approximately the same type of topography, hydrography, vegetation, and land-use. Label your physiographic provinces as “Zone 1”, “Zone 2”, “Zone 3”, etc., as many as you need.

Task 3: Compare your observations and physiographic maps to the Oregon State geologic map on the wall in NS218 and on the wall next to the raised relief map at the Jackson St. hallway on first floor of NSB. Make some interpretations as to which bedrock/geologic map units are associated with each of your physiographic domains.

Task 4: Write a 1-page summary (600-800 words) with a discussion of your observations, the physiographic provinces you identified and an interpretation of the geologic controls on the provinces.

Table 1. Landscape observations. For each of your physiographic provinces you identify in the state, provide a written record of the landscape observations and criteria you used to define them. Use extra sheets as needed.

ZONE ID.	Topography	Hydrography	Vegetation	Landuse	Geology
1	HIGH DESERT	RIVERS	SHRUB STEPPES GRASSLAND	RURAL RANGELAND	VOLCANIC YELLOWSTONE HOT SPOT
2	FLOOD PLAINS SUBDUIN LOW RELIEF HILLS	RIVERS	SHRUB STEPPES GRASSLAND	RURAL RANGELAND	COLUMBIA RIVER BASIN
3	BLUETAINED ROCK MOUNTAINS	RIVERS	FOREST COVER	FOREST TIMBERLAND	EMERALD MOUNTAINS PLATEAUS
4	CANYON TOPOGRAPHY	RIVERS	SHRUB STEPPES GRASSLAND	RURAL RANGELAND	HIGH DESERT VOLCANOS / VOLCANIC FROM YELLOWSTONE HOTSPOT / COLUMBIA RIVER BASIN
5	LOW RELIEF PLAIN / UPLANDS	RIVERS	AGRICULTURAL LANDS	RURAL / AGRICULTURAL	ICE AGE FLUVIAL / GLACIAL DEPOSITS
6	HIGH RELIEF RUGGED STEEP MOUNTAIN SLOPE	GLACIERS RIVERS	HIGH ALTITUDE SUIPINE + FOREST COVER	FOREST TIMBERLAND	EARLY VOLCANIC ACTIVITY
7	HIGH RELIEF DENSELY SPACED DRAINAGE PATTERNS	RIVERS	FOREST COVER	FOREST TIMBERLAND	SHALE + BASALTS, PUMPKIN BASALTS
8	HIGH RELIEF DENSELY SPACED DRAINAGE PATTERNS BLUETAINED RIVERS	RIVERS	FOREST COVER	FOREST TIMBERLAND	COAST RANGE SEDIMENTS COAST RANGE VOLCANOS

Figure 1. Oregon Base Map Showing Rivers and Counties.

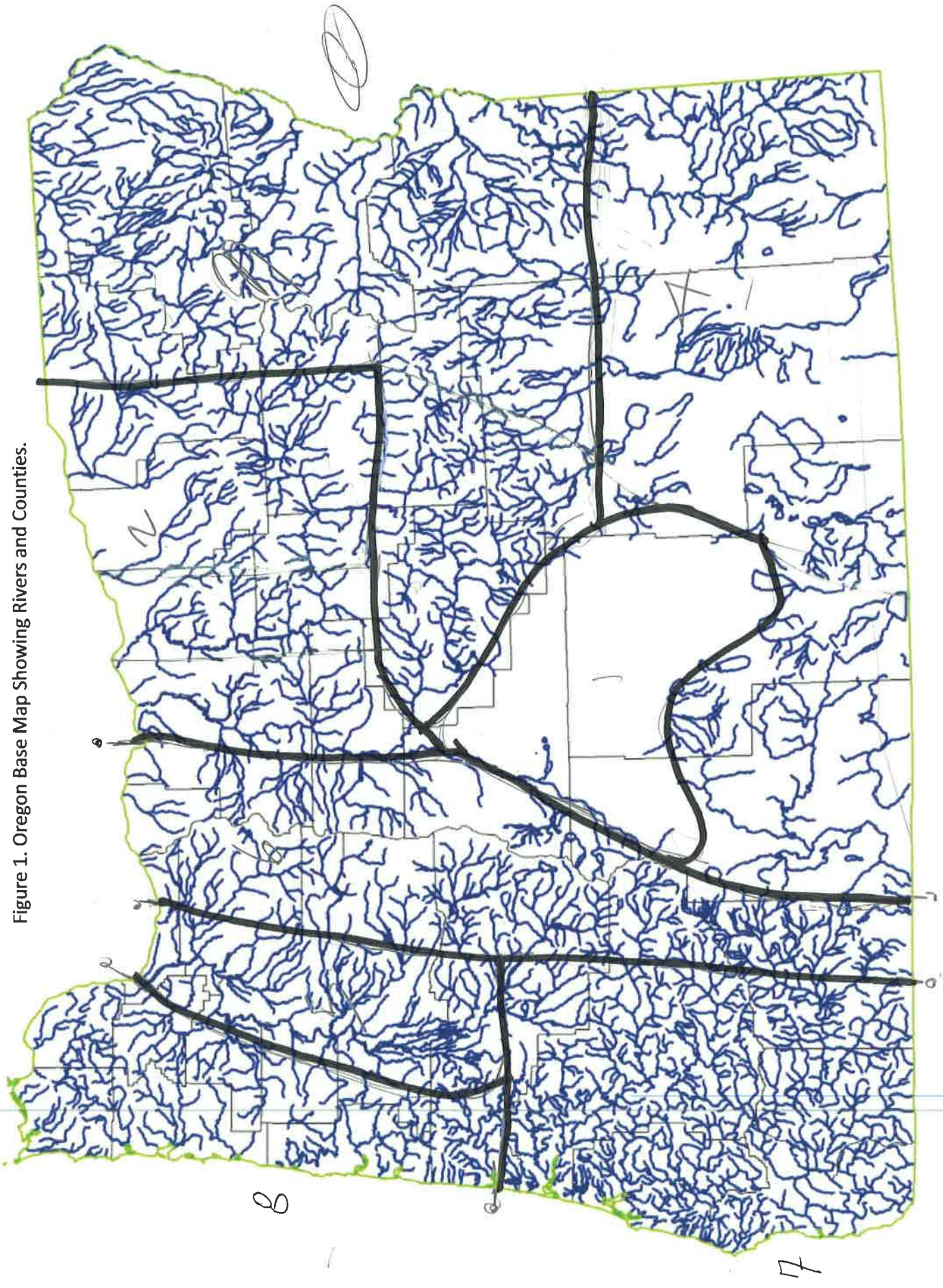


Figure 2. Oregon 10-m Digital Elevation Model.

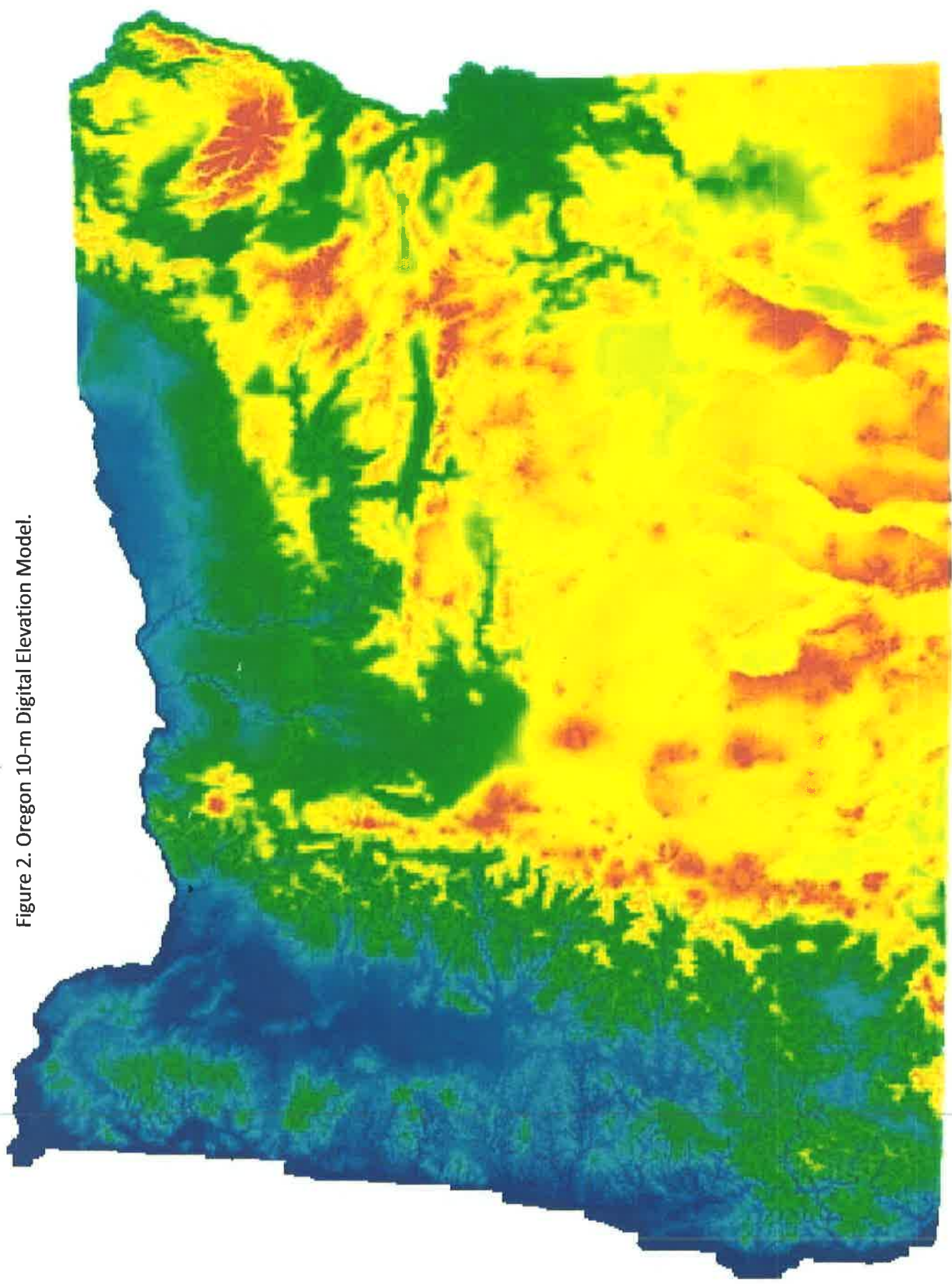
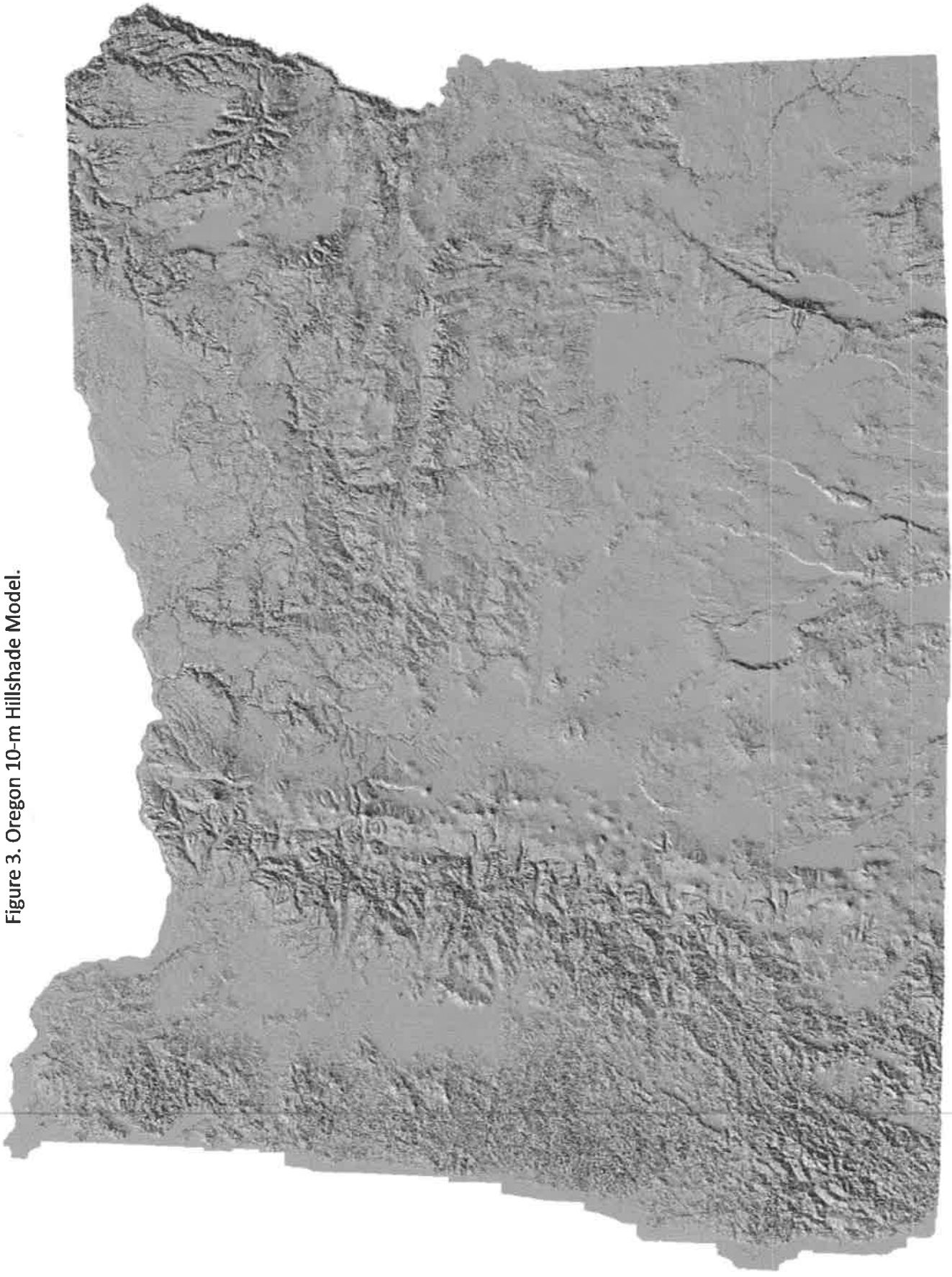


Figure 3. Oregon 10-m Hillshade Model.



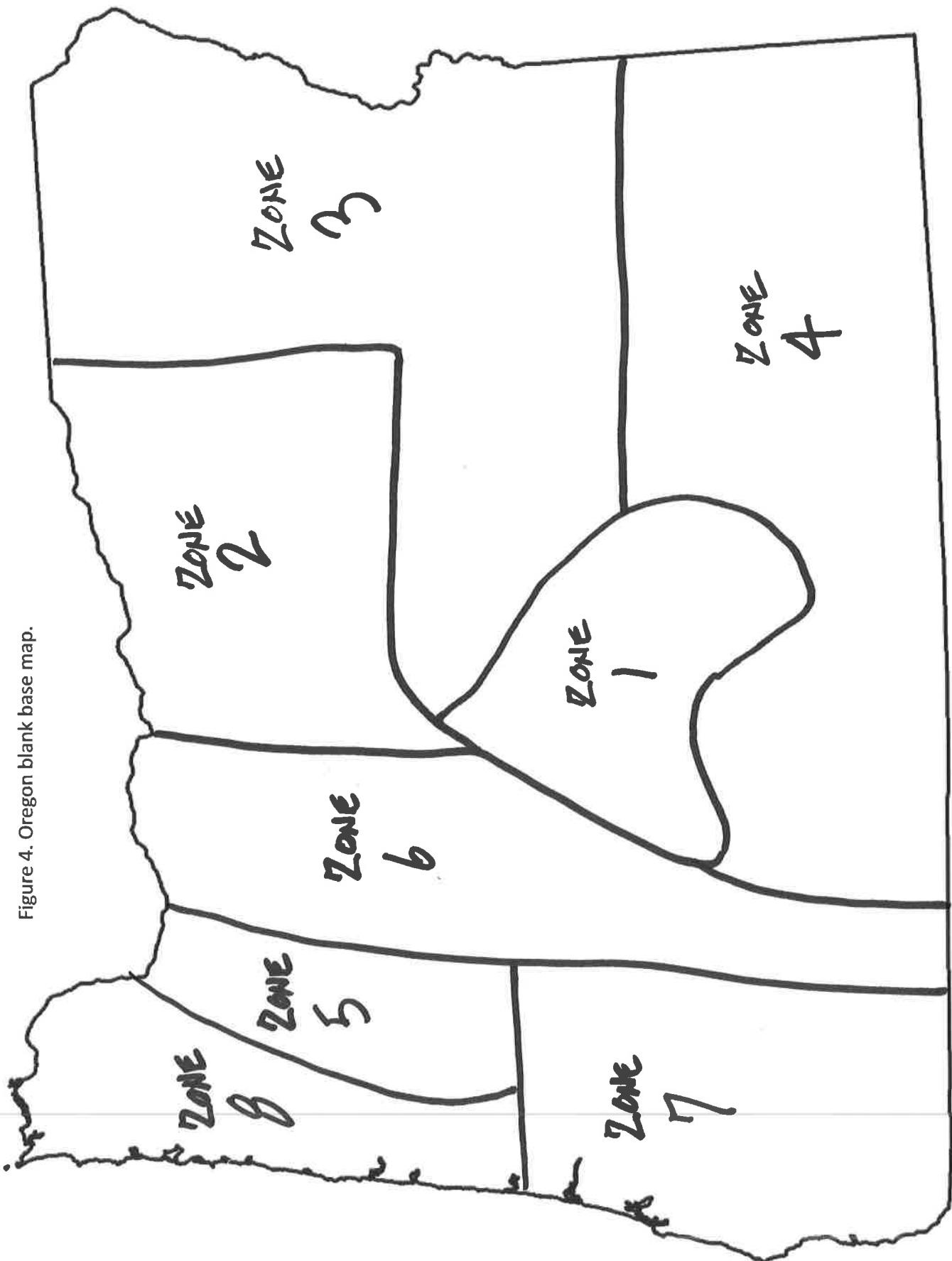


Figure 4. Oregon blank base map.

Task 4

Introduction:

The zone identifications as interpreted by myself in conjunction with the interpretations of my fellow colleges are separated into 8 zones highlighting various geologic features including: topography, hydrography, vegetation, and land use.

Zone 1:

This zone is recognized as high desert playas with a virtually absent river system. The vegetation is considered shrub steppe grassland used possibly as rural range land. The geology of the zone is dominated by Yellowstone volcanic hot spots.

Zone 2:

The topography of this zone is subdued low relief hills including a vast floodplain. The hydrography is inundated with a system of moderate sized rivers. The vegetation is shrub steppe grassland used as rural range land. The geology of the zone is dominated by Columbia river basalt.

Zone 3:

Elongated Ridge Mountains make up the topography of this zone. As with most of Oregon's Hydrography, a network of rivers adds to the geology of the area. The vegetation is predominantly Forest Timberland. The geology of the zone stems from Batholiths and Plutons.

Zone 4:

This zone's topography includes a vast network of canyons, including many rivers which have assisted in the carving out of the canyons. This zones vegetation is predominantly shrub steppe grass lands. The land use is rural range land. The geology of this zone is that of high desert volcanoes, volcanics from Yellowstone hotspots, as well as some Columbia River basalts.

Zone 5:

The topography of this zone is low relief planer uplands. Rivers make up this zones hydrography. The vegetation is agricultural land used as rural agricultural. The geology is shaped by ice age floods and glacial deposits.

Zone 6:

The topography of this zone is high relief rugged steep mountain slope. The hydrography is comprised of glaciers and rivers. The vegetation is High altitude alpine and forest cover. The land is used as forest timberland. The geology of this zone is early volcanic ark.

Zone 7:

The topography of this zone is a high relief, densely spaced drainage pattern. Rivers make up the hydrography of this zone. The vegetation is forest cover used as forest timberlands. The geology of this zone is shale, basalts, and pillow basalts.

Zone 8:

As with zone 7, this zones topography is also a high relief, densely spaced drainage pattern, but has elongated ridges. Rivers also make up the hydrography of this zone. The vegetation is forest cover used as forest timberland. The geology of this zone is coast range sediments and coast range volcanoes.