PART II: People and their Physical Environment

- ✓ I. Introduction to the Physical Environment
- ✓ II. Earth-Sun Relationship
- III. Earth Systems
  - ✓ A. The Hydrosphere: Oceans
  - ✓ B. The Atmosphere: Weather and Climate
  - ➢ C. The Lithosphere: Geologic Influences and Landscape Development
- IV. Earth Habitat
  - A. Biosphere
  - B. Natural Controls and Cycles
  - C. Human Impact
  - D. Natural Hazards
  - E. Earth Resources

1

GEOG 101 Part II People and their Physical Environment

15: The Lithosphere Landscape Development Chapter 3

Prof. Anthony Grande
Hunter College Geography

LANDFORMS + PEOPLE = LAND USE

Tectonic and gradational forces *combine* to create unique surface features: topography.

Natural processes (geologic, atmospheric, and hydrologic) are constantly at work altering them.

Topographic regions are the result.

People live within these regions and need to be aware of/deal with these **on-going processes**.

3

LANDFORMS and LAND USE

TOPOGRAPHIC REGIONS have unique characteristics that can be analyzed:

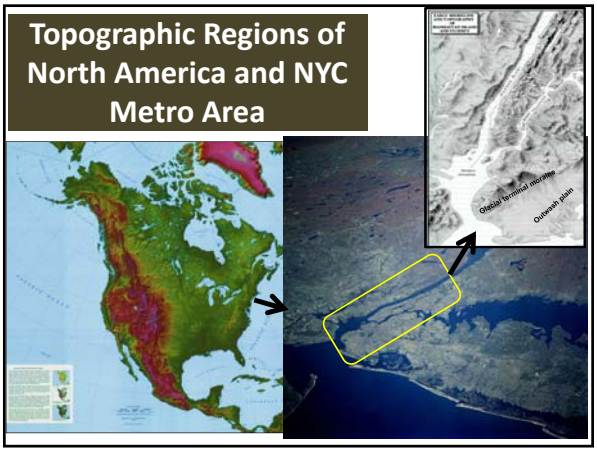
- **Elevation**
- **Relief**
- **Slope**
- **Valley shape**
- **Climate zones**

Within these regions are sub-regions called **TERRAIN:** *areas of distinct local elevation and shape.*

- ➢ **Each region has advantages and disadvantages to human land use and settlement.**
- ✓ *Especially true when climate is added.*

4

Topographic Regions of North America and NYC Metro Area



KNOWLEGDE of LANDFORMS

Why do we need to measure, monitor, map and analyze topographic regions?

- ✓1. Selective land use
- ✓2. Avoidance of harmful natural processes
- ✓3. Planning future activities
- ✓4. Insurance coverage
- ✓5. Access to and/or removal of resources

WHY?

Because of the possible effect on people.

6

Physical Landscape Analysis

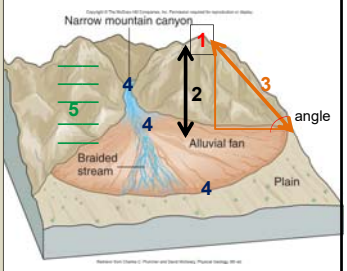
When doing a landscape analysis, we look at these physical factors:

1. **Elevation** (height above sea level)
2. **Relief** (vertical difference in elevation of a topographic feature)
3. **Slope angle** (horizontal difference in elevation)
4. **Valley shape** (work of running water and gravity; V-shape or U-shape)
5. **Climate zones** (climate conditions and vegetation biomes change with elevation)

7

Components of Landscape Analysis

1. **Elevation** (height above sea level)
2. **Relief** (vertical difference in elevation between the high and low points of a topographic feature)
3. **Slope angle** (horizontal difference in elevation between the high and low points of a topographic feature)
4. **Valley shape** (work of running water and gravity; resulting V-shape or U-shape)
5. **Climate zones** (climate conditions and vegetation biomes change with elevation; **vertical zonation)**



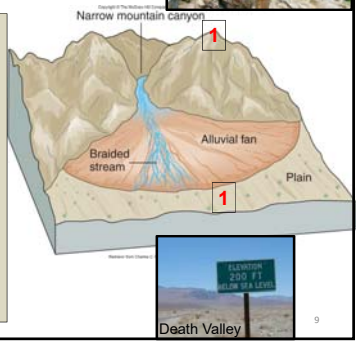
8

Components of Landscape Analysis

1. Elevation.
This is altitude or height above sea level.

Elevation influences items 2, 3, 4 and 5 on the list.

The temperature change rate is 3.5°F/1,000 ft of elevation (colder or warmer) and that affects the types of flora and fauna found on a landform and the also human land use decisions made, thus creating unique landscapes.

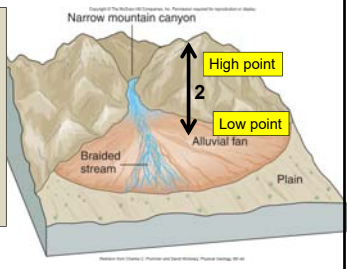


9

Components of Landscape Analysis

2. Relief.
This is the vertical difference in elevation between the high and low points of a topographic feature.

It can be measured from sea level to an elevation marker on the landform or between two markers on a landform.

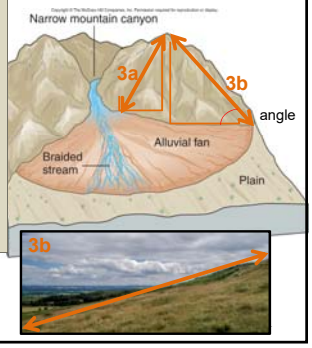


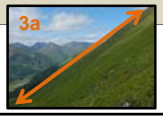
10

Components of Landscape Analysis

3. Slope angle.
This is the horizontal difference in elevation between the high and low points of a topographic feature.

As in geometry, the closer the base points are to each other the steeper, the slope. Likewise, the further apart the base points are, the gentler the slope. **On the diagram, 3a is a steeper slope than 3b.**

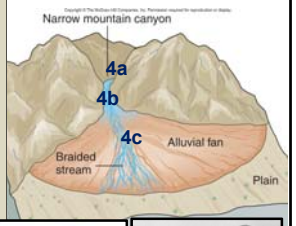




Components of Landscape Analysis

4. Valley shape.
This is the result of the work of running water and gravity. It results in the creation of narrow or wide valleys (review V-shape and U-shape valleys from last lecture). *The steeper the slope the more power water is as an eroding agent.*

4a is a narrow valley where downcutting is dominant. At **4b** the valley begins to widen as water slows and erodes the valley walls (lateral cutting). **4c** is widest where erosion is weakest and deposition of sediment from **4a** and **4b** occurs, creating shallow silt clogged streams, alluvial fans and flood plains.

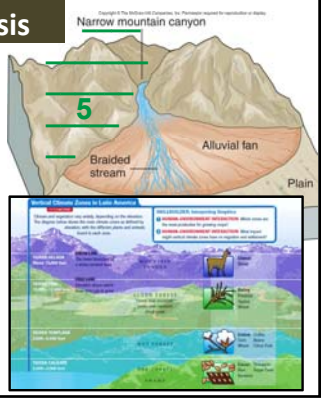


Components of Landscape Analysis

5. Climate zones.
Climate conditions and vegetation biomes change with elevation.

As you go up the side of a landform and conditions change with elevation, different plants and animals will be found. The greatest number of zones is in tropical areas with the least in the polar region.

Review **vertical zonation in the climate lecture.**



Components of Landscape Analysis

1. Elevation (height above sea level)
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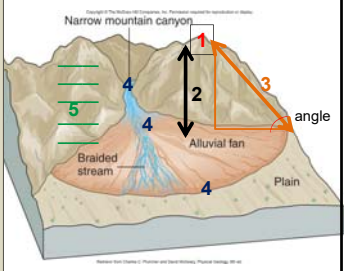
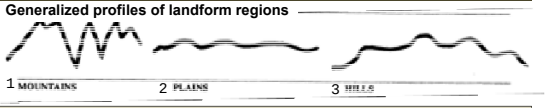


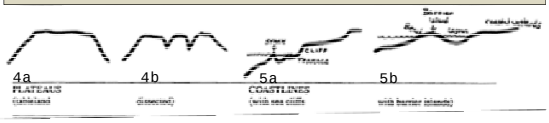
14

LANDFORMS PROFILES

Generalized profiles of landform regions



Each topographic region has unique features. Each has advantages and disadvantages to human land use. They have influenced people's decision-making and helped to create, with the addition of climate, **cultural landscapes.**



15

LANDFORMS and LAND USE

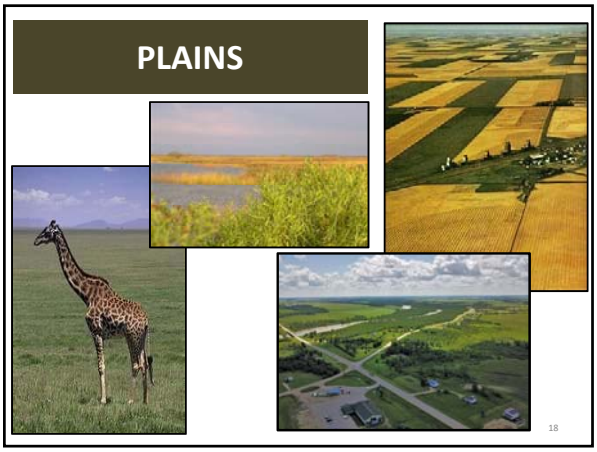
When doing a landscape analysis, we look at the following human factors:

- ✓**1. Unifier or barrier** (people interacting)
- ✓**2. Assimilation or distinction** (cultural development)
- ✓**3. Transportation and communication** (ease/cost)
- ✓**4. Population density** (concentrations of people)
- ✓**5. Economic utilization** (farming, grazing, industry, mining, recreation, etc.)
- ✓**6. Hazards** (natural and man-made)

16

MOUNTAINS

PLAINS



18

HILLS




PLATEAUS


DISSECTED PLATEAU



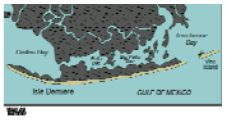

TABLELAND


COASTLINES

Rocky shoreline with sea cliffs	Sandy shoreline with barrier beach


21

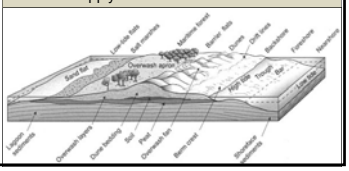
COASTS in CRISIS



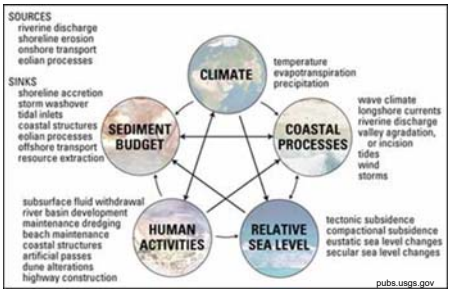
https://www.youtube.com/watch?v=QiAXn-mu2s4 if all the ice melted. 2 min

Coastal formations depend on a number of things happening at the same time, including:

1. Supply of sediment, both from interior and other coastal areas.
2. Climatic conditions, including weather and aspects of climate change.
3. Coastal processes, including currents, waves, tides, storm surges, river discharge.
4. Relative sea level, including ocean levels and local changes caused by subsidence or a tectonic process.
5. Human activities, both coastal and inland, affect the supply and movement of sediment.



Coasts in Crisis: Interrelationships



23

COASTS in CRISIS: Mississippi Delta Islands

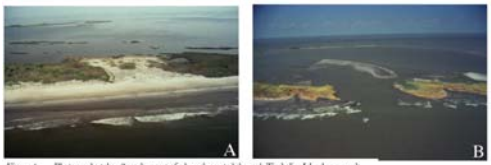
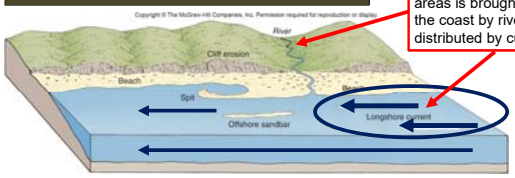


Figure 4. Photographs taken 7 weeks apart of a breach created through Timbalier Island as a result of Hurricane Andrew: A) Before - taken July 9, 1992, and B) After - taken August 30, 1992.

Figure 5. Photographs taken 7 weeks apart of the east end of Timbalier Island illustrating the severe erosion that occurred along the margin of Little Pass Timbalier during Hurricane Andrew: A) Before - taken July 9, 1992, and B) After - taken August 30, 1992.

24

Longshore Currents



Longshore currents, combined with waves and wind, constantly move sand to create, alter and destroy shoreline features.

25

N E X T

B I O S P H E R E chapter 4

and

E A R T H R E S O U R C E S chapter 5

26