

GLG 101 – CHAPTER 19 - DESERTS AND WINDS

- **Deserts** are areas that experience little precipitation during the year (<25 cm/year). Both **low-** and **mid-latitude deserts** exist. The former are primarily due to atmospheric circulation patterns that force dry air to descend and warm at 20-30° north and south of the equator. The latter exist primarily due to their positions deep in the interior of continents, far from the oceans that provide most of the moisture to form clouds.
- Semi-arid regions at the edges of deserts are called **steppes**.
- Because of a lack of moisture and the vegetation it could support, **weathering rates** (particularly chemical weathering) **are greatly reduced in deserts**. Nevertheless, **running water is still the most important erosional force** in shaping most desert landscapes. Although wind erosion is more important in deserts than other areas, the main role of wind in a desert is in transportation and deposition of sediment.
- **Alluvial fans, playas, and playa lakes** are common features in desert environments. Alluvial fans are the sloping piles of sediment that fan out from steep canyons exiting desert mountain ranges. Playa lakes are short-lived shallow bodies of water produced when infrequent desert rains produce flash floods in the mountains, which drain out into the closed desert basin centers. These lakes then evaporate to form large white playas composed of evaporite minerals (like halite and gypsum) in the valley centers.
- Desert winds can carry only small sediment particles, with sand being the “bed load” that bounces along the ground, and dust being the “suspended load” that can move long distances while airborne.
- Although wind is not a very effective erosional agent, it can produce **blowouts** and wind abrasion (using saltating sand grains as tools) can sculpt rocks into **ventifacts**. Deflation (removal of smaller particles by blowing wind) can leave behind a protective cap of coarser gravels on the desert floor, known as a “**desert pavement**”.
- Wind deposits make take the form of mounds of windblown sand, called **dunes**, or of layers of fine windblown silt, called **loess**. Loess is produced either by erosion in deserts or as a byproduct of glacial erosion. The windward or “**stoss**” side of a dune has a shallow slope, whereas the downwind or “**slipface**” side has a steeper slope (typically 33-34°). Types of sand dunes include **barchan**, barchanoid, **longitudinal**, **transverse**, parabolic and star.