CHAPTER 15 HYDROLOGICAL CYCLE AND CITIES

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Introduction

The hydrologic cycle is a probably better known to lay persons as the water cycle. It is really a conceptual model that describes the changing phases of water from liquid to gas (evaporation), gas to liquid (condensation), liquid to solid (freezing), solid to liquid (melting), gas to solid and solid to gas (both termed sublimation).All these changing of phases of water is often termed as the recycling of water. In nature, water is probably the only matter that can exist in natural conditions in all three phases as liquid, gas and solid. On the global scale, the three phases of water can be seen in the various spheres. Hence, when water moves or is stored temporarily in either the atmosphere, biosphere, cryosphere, lithosphere, and hydrosphere in a cyclic form, it is referred to as the hydrological cycle (Figure 15.1). Although water on earth can be stored in any one of the following major reservoirs such as the atmosphere, oceans, lakes, rivers, soils, glaciers, snowfields, and groundwater, it can also move from one reservoir to another by many natural processes such as evaporation, transpiration, evapotranspiration, condensation, precipitation, deposition, runoff, infiltration, sublimation, melting, and groundwater flow. The oceans supply most of the evaporated water found in the atmosphere. Of this evaporated water, only 91% of it is returned to the oceans by way of precipitation. The remaining 9% is transported to areas over landmasses where climatological factors induce the formation of precipitation. The resulting imbalance between rates of evaporation and precipitation over land and ocean is corrected by runoff and groundwater flow to the oceans. The hydrological cycle is dynamic resulting in earth's water being always in a state of movement. The hydrological cycle, which is also known as the natural water cycle, describes the continuous movement of water on, above, and below the surface of the Earth. Furthermore, water is always changing states between liquid, vapor, and ice, with these processes happening in the blink of an eye and over millions of years (Source: http://water.usgs.gov/edu/watercycle.html Accessed 10 Aug 2015).

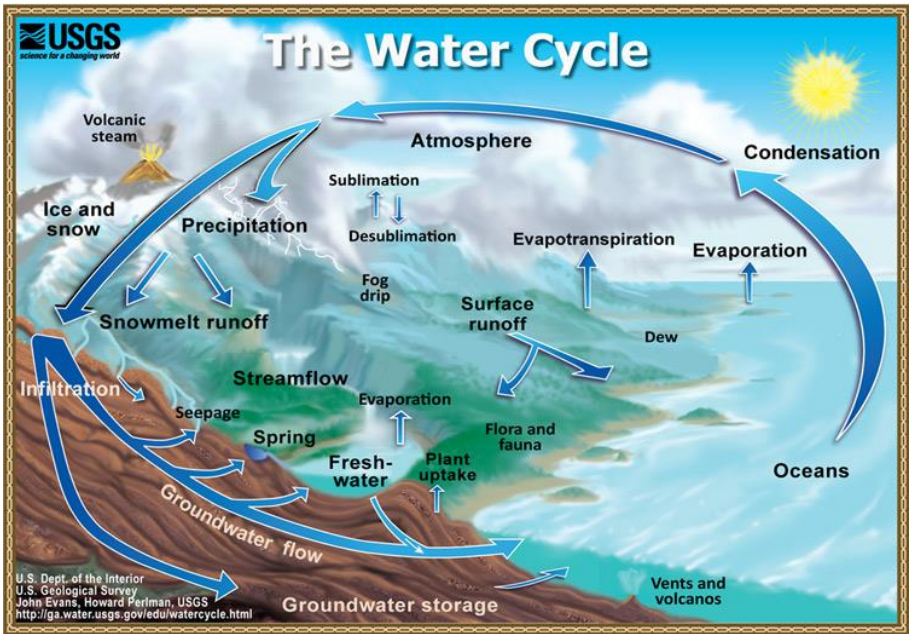

Figure 15.1: The Hydrological Cycle depicts a cyclical movement and change of phase of water between the various spheres (Source: http://water.usgs.gov/edu/watercycle.html Accessed 10 Aug 2015).