HİDROLOJİK ÇEVRİM

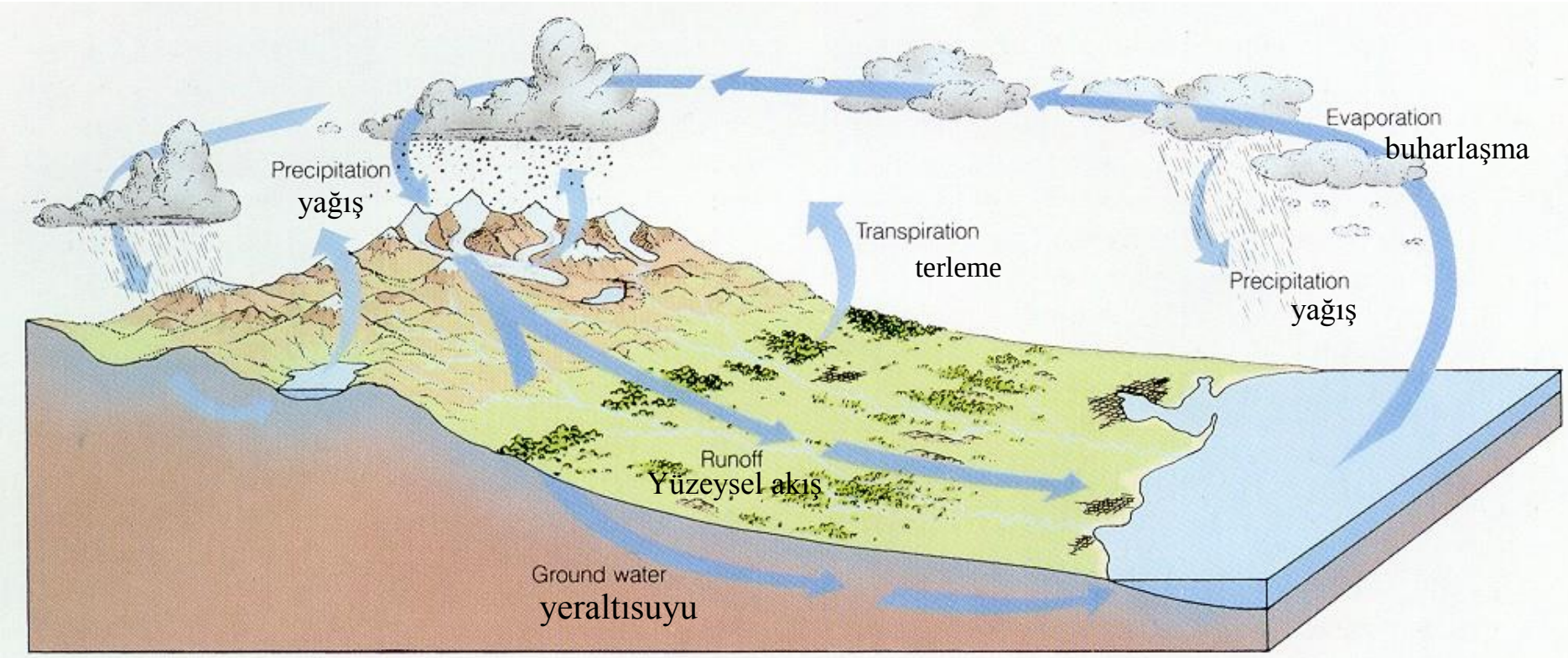


Figure 2.2
The circulation of water in the hydrologic system operates by solar energy. Water evaporates from the oceans, circulates with the atmosphere, and is eventually precipitated as rain or snow. Most of the water that falls on the land returns to the oceans by surface runoff and groundwater seepage. Variations in the major flow patterns of the system include the temporary storage of water in lakes and glaciers. Within this major system are many smaller cycles, or shortcuts, such as evaporation from lakes and transpiration from plants.

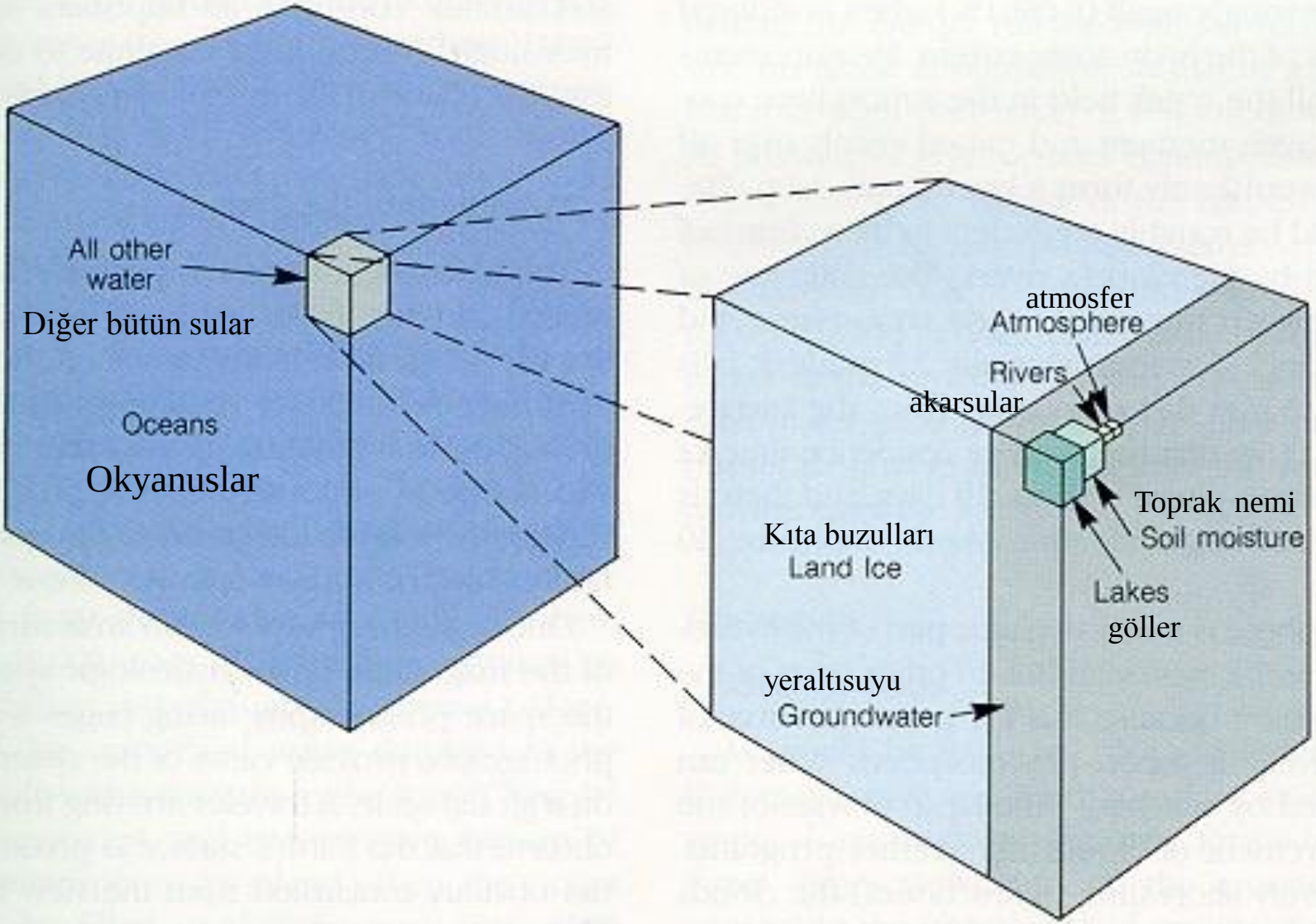


Figure 2.4
The relative amounts of water in each of the major parts of the hydrologic system can be best appreciated when shown graphically. More than 97% of the water on or near the Earth's surface is in the oceans. Glaciers contain about 1.9%, groundwater—0.5%, rivers and lakes—0.02%, and the atmosphere—0.0001%.

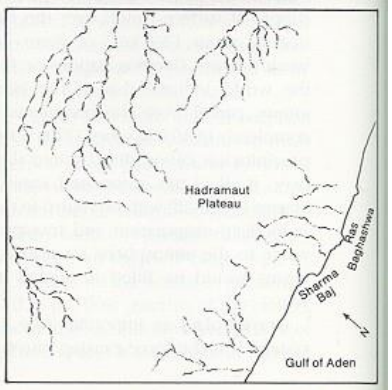


Figure 2.5
Drainage systems are a clear record of how surface runoff has sculptured the land. They testify to the magnitude of the Earth's hydrologic system, for few areas of the land are untouched by stream erosion. In this photograph of a desert region, details of the delicate network of tributaries are clearly shown. On the Moon, Mercury, and Mars, craters dominate the landscape, but on the continents of the Earth, stream valleys are the most abundant landform.

Figure 2.6
The Mississippi Delta, like deltas of other major rivers, is a record of erosion due to the hydrologic system. Sediment eroded from the land is transported by a river system and deposited in the sea. The dynamics of delta building are displayed vividly in this photograph. The cloud of mud and silt delivered to the ocean colors the water a lighter tone around the mouth of the river. This material is deposited as banks of mud, sand, and clay over the continental shelf as the delta grows seaward at a rate of nearly 20 km per 100 years. Measurements indicate that the Mississippi River pours more than a million metric tons of sediment into the Gulf of Mexico each day. In the process of deltaic growth, the river builds up a projection of new land into the ocean. Eventually, the river finds a shorter route to the ocean and abandons its active distributary channel for the shorter course. The abandoned distributary ceases to grow and is eroded back by wave action. Abandoned river channels and inactive subdeltas can be seen clearly on each side of the present river.

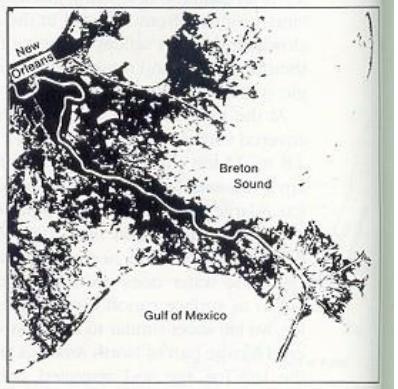


Figure 2.7
Valley glaciers, such as these in Alaska, occur where more snow accumulates each year than is melted during the summer months. Valley glaciers originate in the snowfields of high mountain ranges and flow as large tongues of ice down preexisting stream valleys. The moving ice is an effective agent of erosion and modifies the valleys in which it flows; thus glaciers cause local modifications of the normal hydrologic system. The dark lines on the glaciers are rock debris derived from the valley walls.

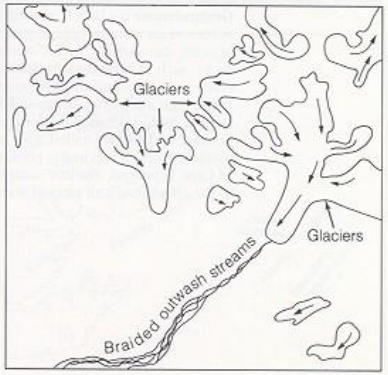
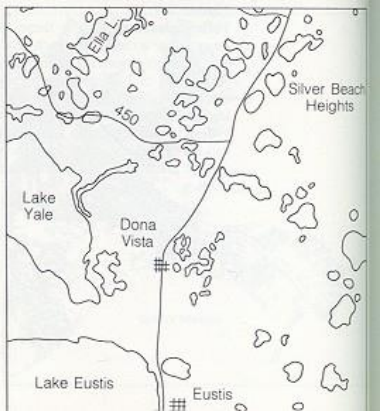


Figure 2.8
Groundwater is a largely invisible part of the hydrologic system, since it occupies pore spaces in the soil and rocks beneath the surface. It can, however, dissolve soluble rocks, such as limestone, to form complex networks of caves and subterranean passageways. As the caverns enlarge, their roofs may collapse, so that circular depressions called sinkholes are formed. Sinkholes create a pockmarked surface called karst topography. The hundreds of lakes shown in this photograph of the area west of Cape Canaveral, Florida, occupy sinkholes and testify to the effectiveness of ground water as a geologic agent.



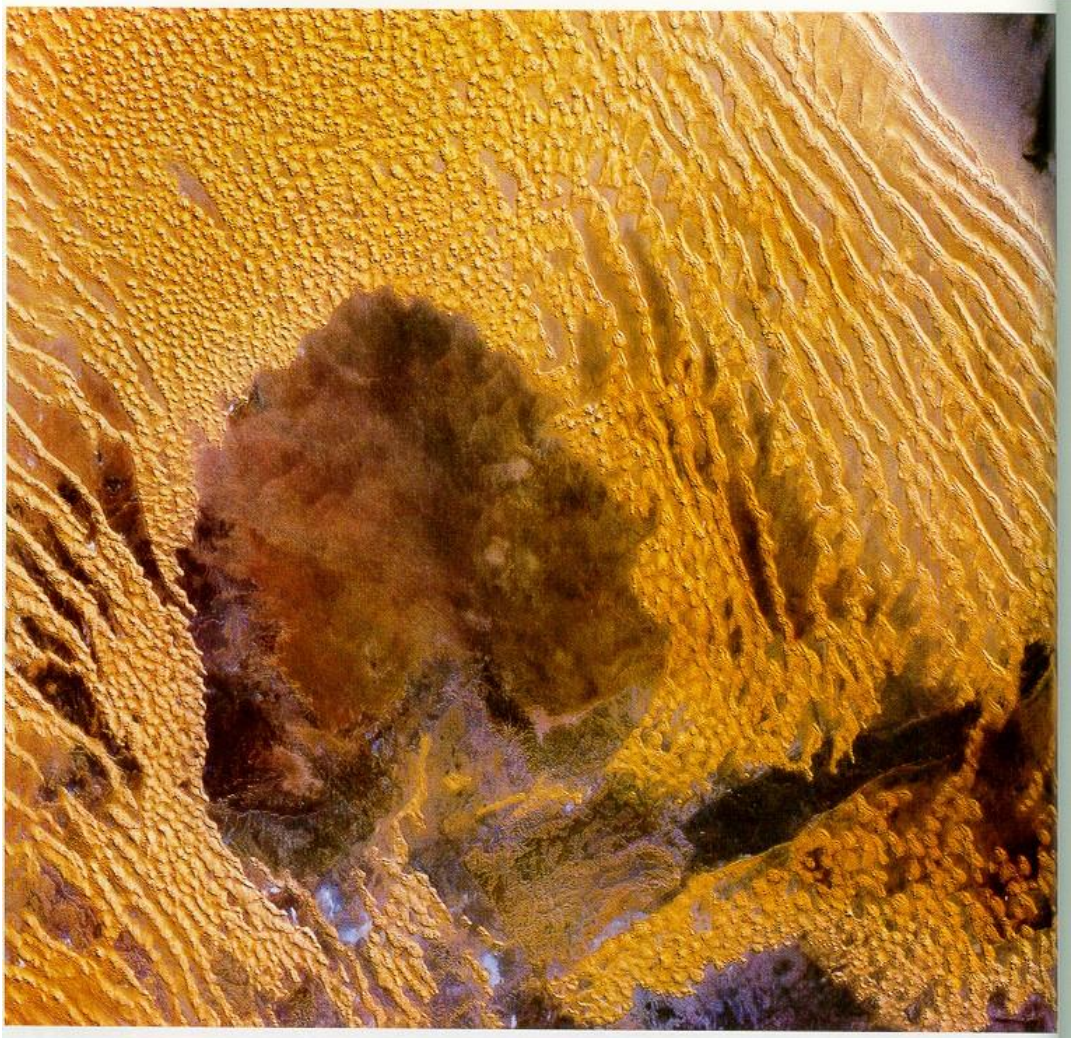


Figure 2.10
"Sand seas" of the great deserts of the Earth form in arid low-latitude regions where there is not enough precipitation for the hydrologic system to operate in its normal manner. The vast areas of migrating sand dunes in the world's deserts illustrate the effectiveness of the circulating atmosphere as a geologic agent, continually transporting enormous quantities of sediment over the surface of the Earth.