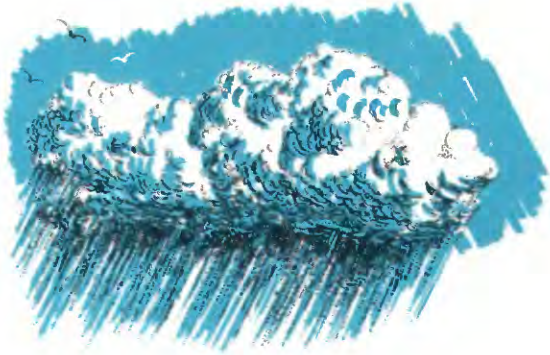


Introduction

?Do forests reduce floods?
?Where does my well water come from?
?What is the temperature of the water that will be found in a well on my farm?
?Will salt or fresh water be found if I drill a well?
?Is the water table falling in my State?

These and similar problems are discussed in this book. The section on "The supply of water" concerns the occurrence of water in Alabama, and some aspects of climate and land which affect the supply of water. The section "The use of water" is about the use of water in Alabama, and problems associated with water supply and flood control. The "Tomorrow's water" section discusses opportunities for further development.

The three authors are a geologist, an engineer, and a chemist of the U.S. Geological Survey. Together, they have devoted half a century to the technical and scientific study of water resources. Their work in Alabama has been supported cooperatively by the U.S. Geological Survey, the Geological Survey of Alabama, and several Federal, State, and local agencies.



THE SUPPLY OF WATER

The Water Cycle

Our water comes from the ocean, as shown on figure 1, and returns to the ocean in a never-ending cycle. Water evaporates from the ocean and becomes vapor in the air. Carried overland by winds, it condenses and falls as rain or snow, part of which is absorbed by soil, part evaporated, and part used by trees and plants. The remainder returns to the ocean through streams that drain the land. During its journey, water modifies the face of the earth by erosion and other processes. The cycle moves at a varying pace (sometimes there is drought, occasionally flood), but move it does and thus replenishes the supply for land and people.

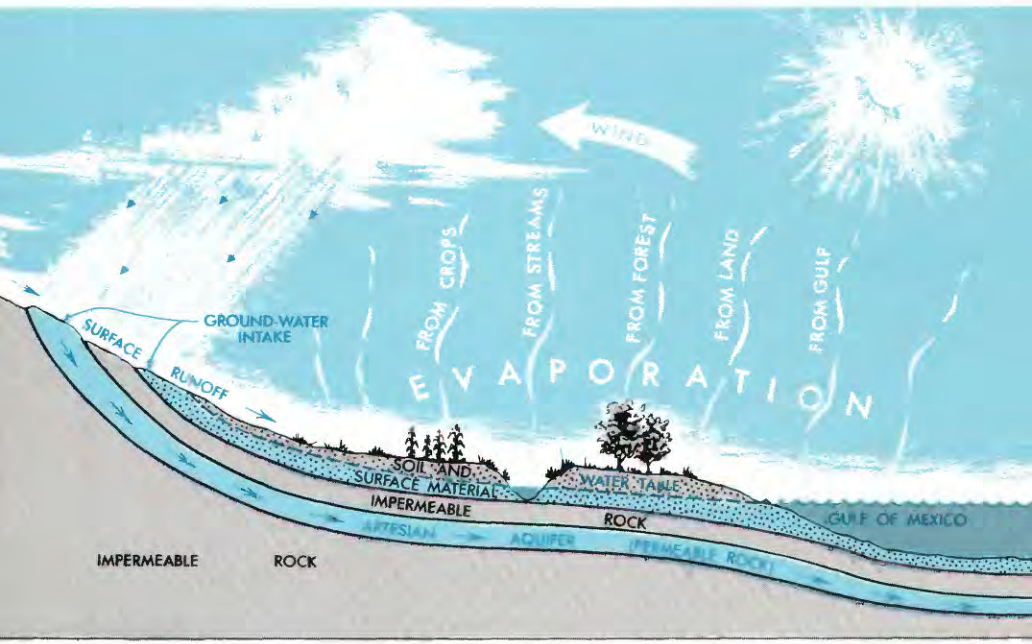


FIGURE 1.—Water, a renewable resource. Moisture from the Gulf of Mexico is carried by winds over the land and falls as rain. Part is absorbed by the ground, part is used by vegetation, part again evaporates, and part runs back to the Gulf in streams.

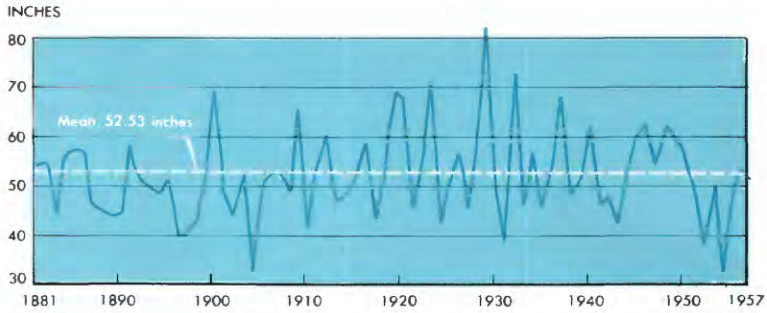


FIGURE 3.—Annual rainfall at Tuscaloosa.

If we consider individual storms, extreme variations are evident: First, the amount of rain can vary from a mere trace to a great deal; about 30 inches fell at Elba in the great storm of 1929. Second, the area covered by a storm may be very small or it may be many thousands of square miles.

About 15,000 cubic miles of water evaporates each year from the lakes and land surfaces of the continents. Water evaporates

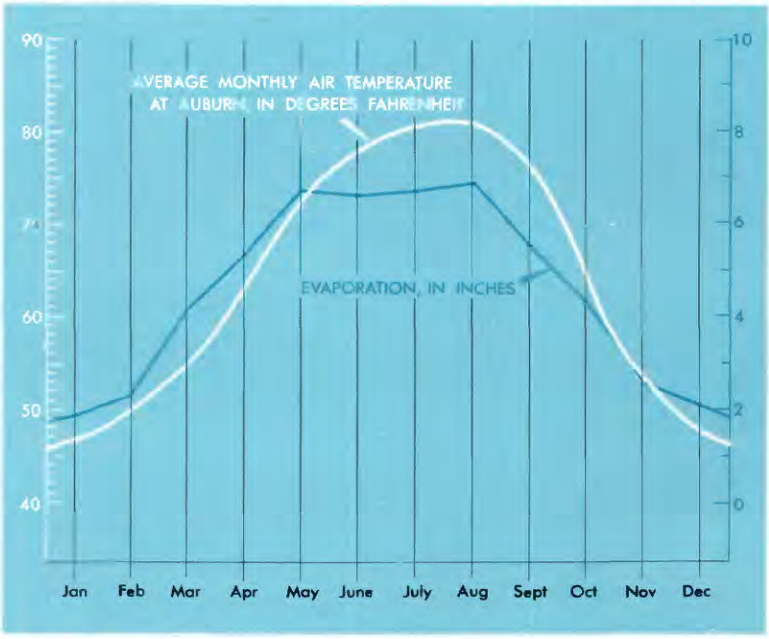


FIGURE 4.—Monthly evaporation from a pan at Lake Martin and air temperature at Auburn.