

Groundwater Recharge

Although a rock formation may have properties favorable for storage of water, it must be in contact with a source of water for replenishment (recharge) to provide a continual supply of water. Groundwater is derived from two origins: (1) fossil, which receives no or only a very small amount of recharge; or (2) recent and renewable.

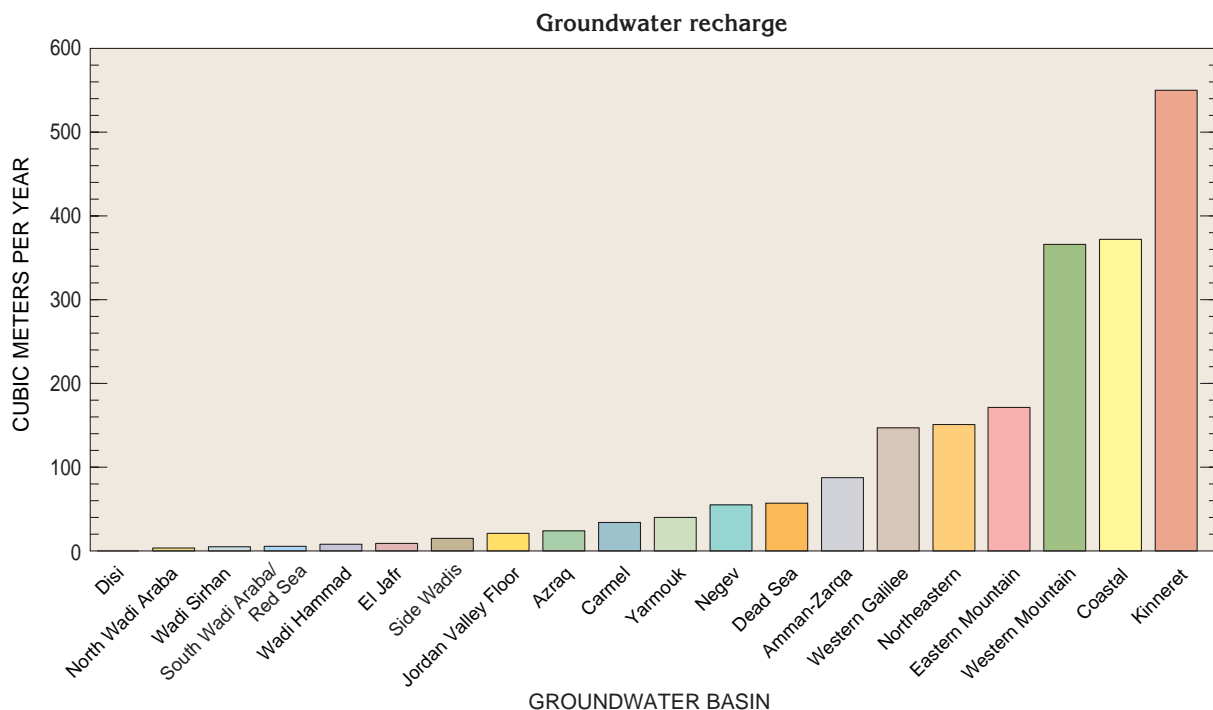
Fossil aquifers are non-renewable and are found mostly in the southern and eastern parts of the region. Water probably infiltrated the fossil aquifers tens of thousands of years ago, when the prevailing climate was more humid. Because water pumped from fossil aquifers is not replenished, groundwater levels show a continual decline as the water is “mined” from beneath the ground.

Recent and renewable recharge is derived naturally from precipitation, or from streams, wadis, lakes, ponds, or other impoundments that seep through soil into the aquifers. In addition, recharge may be induced by anthropogenic activities that are intentional, such as injection wells or seepage ponds, or unintentional, such as irrigation seepage, wastewater infiltration, or pipe leakage.

Estimates of annual ground-water recharge for the 20 groundwater basins were derived by the various water-resources agencies of the region and are illustrated below. Estimates were determined by summing all points of discharge, with the assumption that this sum equals aquifer recharge. For each groundwater basin estimated recharge includes:

- discharge into surface runoff, including measured spring discharge and estimated discharge into surface-water bodies;
- pumped discharge from wells (measured);
- evapotranspiration (roughly estimated from regional setting and estimation from other areas); and
- underground outflow to adjacent basins.

Recharge is generally highest in the mountainous northern part of the region where precipitation is greatest. The percentage of annual precipitation recharging the aquifers is dependent on the rates of evaporation, transpiration to plants, runoff, and soil permeability.



Estimated recharge rates are highest in the coastal and mountain basins, and least in the southern and eastern basins. These patterns generally correspond to the distribution of precipitation in the region.