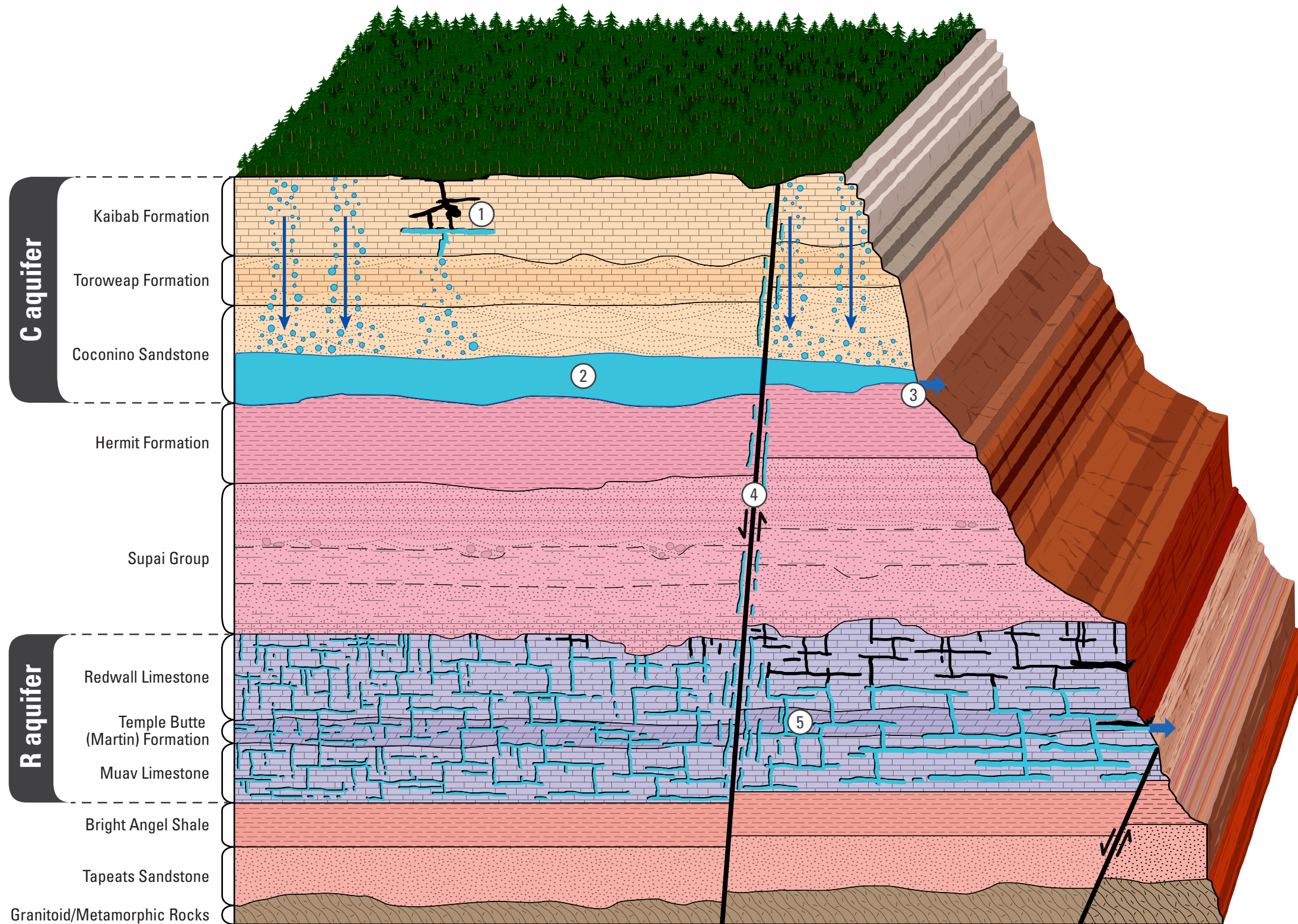


Conceptual Model of Groundwater Flow in the Grand Canyon Region



- ① The plateaus surrounding the Grand Canyon generally receive less than 15 inches per year of precipitation. Kaibab Plateau (North Rim) is an exception, receiving more than 30 inches per year. Very few perennial streams flow from the plateaus, so most of this precipitation is lost to evapotranspiration or infiltrates the sub-surface as groundwater recharge. Karst surface features such as sink holes and dissolution-widened joints and fractures facilitate recharge to the groundwater system.
- ② Perched saturated zones develop in the Coconino Sandstone above the low-permeability Hermit Formation and Supai Group. The C-aquifer is discontinuous and often completely dewatered adjacent to the Grand Canyon.
- ③ Groundwater in the C-aquifer flows laterally to seeps at the base of the Coconino Sandstone along the canyon walls or to extensional fault zones that allow the water to descend vertically past the underlying low-permeability strata.
- ④ “Damage zones” of open fractures associated with extensional faults are highly permeable and serve as high-capacity conduits for vertical and horizontal groundwater flow.
- ⑤ The regional R-aquifer is a karst aquifer, in which groundwater flows predominantly through a conduit network of interconnected voids and caves. The network is hierarchical, that is, it is organized in a down-gradient direction much like surface streams. The largest springs in the Grand Canyon all discharge from the R-aquifer.