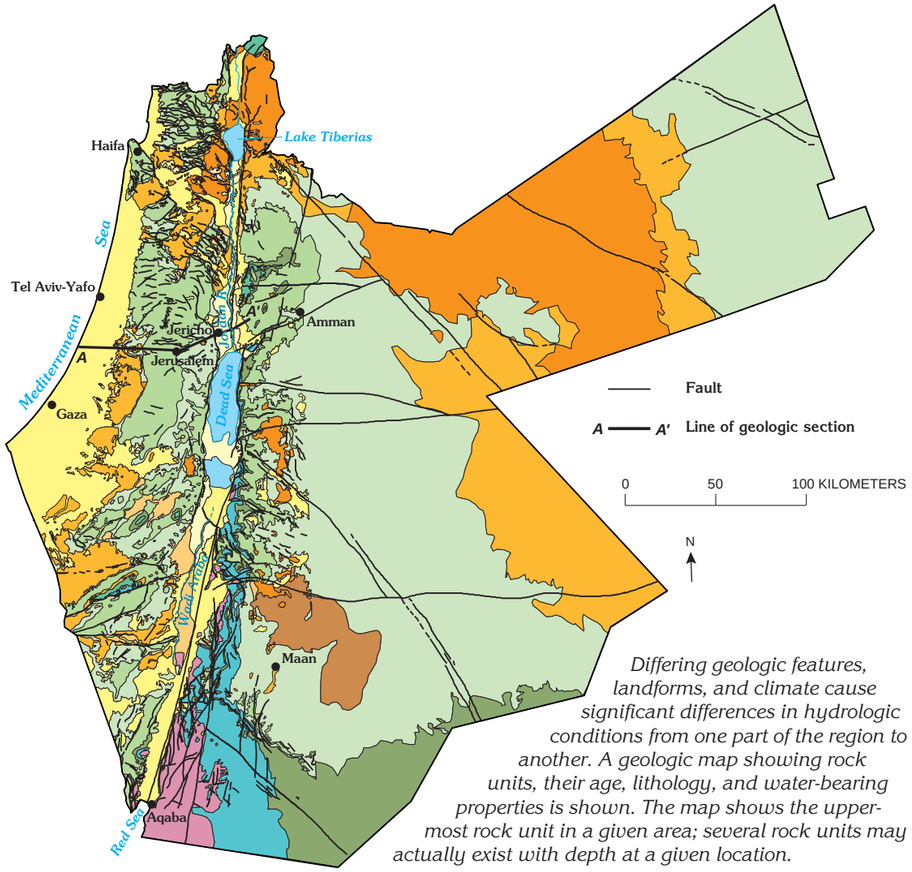
Geology



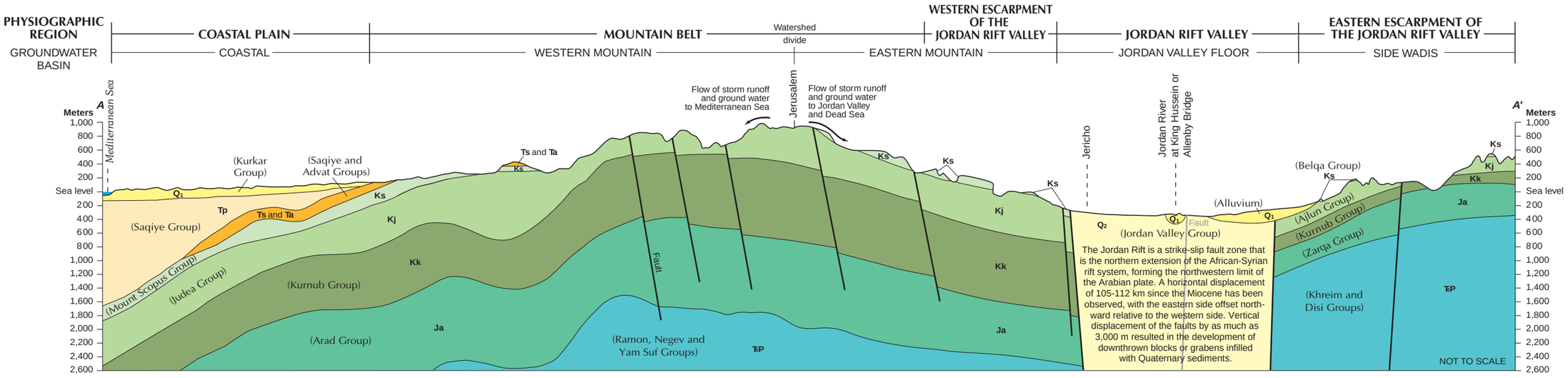
Differing geologic features, landforms, and climate cause significant differences in hydrologic conditions from one part of the region to another. A geologic map showing rock units, their age, lithology, and water-bearing properties is shown. The map shows the uppermost rock unit in a given area; several rock units may actually exist with depth at a given location.

Generalized geologic units and water-bearing properties

System/Series	Stage	West of Jordan River and Wadi Araba Group	West of Jordan River and Wadi Araba Unit	East of Jordan River and Wadi Araba Group	East of Jordan River and Wadi Araba Unit	This report	SEDIMENTARY ROCKS Unit description
Quaternary Holocene		Kurkar	Qa	Jordan Valley	Aluvium and Lisan Series	Q_1	Soil, sand, gravel, sandstone, and conglomerate. Comprise prolific aquifer in Coastal Plain Basin. In Jordan Valley Floor Basin, alluvial fan deposits along flanks form aquifers that contain most of the freshwater of the basin.
Quaternary Pleistocene		Kurkar	Qd	Jordan Valley	Aluvium and Lisan Series	Q_1	
Quaternary Pleistocene		Kurkar	Qk	Jordan Valley	Aluvium and Lisan Series	Q_2	In Jordan Valley Floor Basin, upper part includes marl, clay, and evaporites that inhibit groundwater flow. Lower part consists of water-bearing conglomerate, sand, and gravel.
Tertiary Pliocene		Saqiye	Ql	Jordan Valley	Absent	Q_2	
Tertiary Pliocene		Saqiye	Qs	Jordan Valley	Absent	Q_2	
Tertiary Pliocene		Saqiye	Tp	Jordan Valley	Absent	Tp	In Coastal Plain Basin, consists mainly of clay and marl, that inhibit groundwater flow.
Tertiary Miocene		Saqiye	Ts	Jordan Valley	Absent	Ts	Marl, limestone, sandstone, conglomerate. Generally an aquitard; limestone and sandstone layers are water bearing.
Tertiary Oligocene		Advat	Ta	Belqa	B5	Ta	Chalk, limestone, chert, marl. Generally aquitard; limestone layers are water bearing.
Tertiary Eocene		Mount Scopus	Ks	Belqa	B4	Ks	Chalk, chert, limestone, marl. Limestone and chert layers are prolific aquifers in much of Jordan. Well yields are highly variable and are controlled largely by cavernous zones in the limestone that are affected by geologic structure. Flowing wells common in areas of low elevation. Salinity increases in an eastward direction in Jordan.
Tertiary Paleocene		Mount Scopus	Ks	Belqa	B3 B2/A7	Ks	
Cretaceous Upper	Senonian	Mount Scopus	Ks	Belqa	B3 B2/A7	Ks	
Cretaceous Upper	Turonian	Judea	Kj	Ajlun	A1/A6	Kj	Limestone, dolomite, marl, shale. Limestone and dolomite layers are prolific aquifers in Eastern and Western Mountain Basins.
Cretaceous Upper	Cenomanian	Judea	Kc	Ajlun	A1/A6	Kj	
Cretaceous Lower	Albain	Kurnub	Kk	Kurnub	K	Kk	Sandstone, dolomite, marl, sand, shale, clay, sandy limestone. Upper part mostly consists of shale and carbonates forming aquiclude; lower part mostly consists of water-bearing sandstone. High salinity in vicinity of Jordan Rift Valley.
Cretaceous Lower	Aptian	Kurnub	Kk	Kurnub	K	Kk	
Jurassic		Arad	Ja	Zarqa	Z	Ja	Limestone, dolomite, sandstone, marl, shale. Limestone, dolomite and sandstone layers water bearing. Important source of water in Negev, north and south Wadi Araba, and south Jordan Desert Basins. High salinity in parts of region. Groundwater development is limited by drilling depths, high pumping lifts, and mineralization of groundwater.
Triassic		Ramon	Tr	Zarqa	Absent	TrP	Limestone, sandstone, shale, clay, dolomite, gypsum. Limestone, dolomite and sandstone layers water bearing. Important source of water in Negev, north and south Wadi Araba, and south Jordan Desert Basins. High salinity in parts of region. Upper part largely aquiclude. Groundwater development is limited by drilling depths, high pumping lifts, and mineralization of groundwater.
Triassic		Ramon	Pn	Zarqa	Absent	TrP	
Paleozoic		Negev and Yam Suf	Py	Khreim and Disi	R	TrP	

System/Series	Stage	West of Jordan River and Wadi Araba Unit	East of Jordan River and Wadi Araba Unit	This report	IGNEOUS AND METAMORPHIC ROCKS Unit description
Quaternary Holocene		B4	BA	Ba	Basalt, tuff, and alkaline magmatic rocks. Major source of water in northern and northeastern part of region. Basalt is hydraulically connected with conglomerate, sandstone, marl, and chalk. Basalt and coarse grained clastics form aquifers that are separated by layers of marl and chalk. Water is generally of very good quality and high well yields are common.
Quaternary Pleistocene		B4	BA	Ba	
Tertiary Pliocene		B4	BA	Ba	
Tertiary Miocene		B4	BA	Ba	
Cretaceous Upper	Senonian	B3	Absent	Ba	
Cretaceous Upper	Turonian	B3	Absent	Ba	
Cretaceous Upper	Cenomanian	B3	Absent	Ba	
Cretaceous Lower	Albain	B2	Absent	Ba	
Cretaceous Lower	Aptian	B2	Absent	Ba	
Jurassic		B1	Absent	Ba	
Triassic		B1	Absent	Ba	
Precambrian		p€3	Absent	p€	Metamorphic rocks, volcanic intrusives. Water occurs in fractures in crystalline bedrock. Generally not utilized as water source.
Precambrian		p€2	G	p€	
Precambrian		p€1	Absent	p€	

Volcanic plug rising through eroded sandstone of geologic unit Kk, near Wadi Hasa



A schematic cross section shows the arrangement of rock units along a vertical slice through the earth's surface from the Mediterranean Sea to east of the Jordan River and illustrates the relative vertical positions of the rock units. In general, rock units thicken west of the Jordan River and continue to thicken toward the Mediterranean Sea. Rock units have been faulted and folded. Volcanic deposits occur as surficial flows and as volcanic necks in subsurface areas. (Local names are in parentheses.)