

CLIMATE: Large Changes in Small Distances

Natural replenishment of water resources in the Middle East varies greatly, as shown below on the map of average annual rainfall which exhibits large changes in relatively small distances across the region. A Mediterranean-type climate, characterized by a hot, dry summer and cool winter with short transitional seasons predominates in the northern, central, and western parts of the region. The eastern and southern parts of the region have a semi-arid to arid climate. Winter begins around mid-November and summer begins around the end of May. Rainfall occurs mainly during the winter months.

The Middle East experiences extreme seasonal variations in climate, as shown below in graphs of average monthly rainfall, potential evaporation, and average daily maximum and minimum temperatures for various

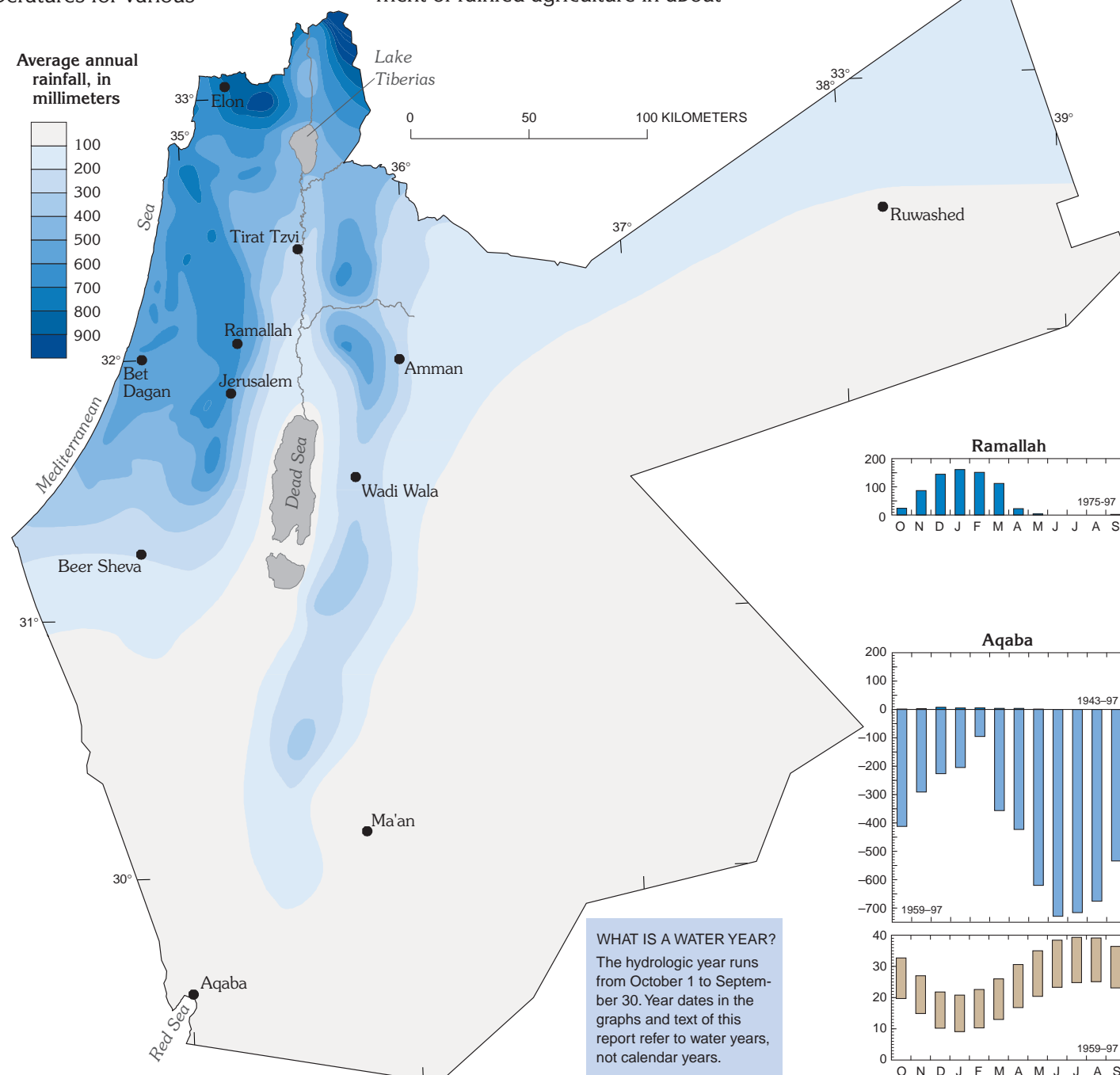
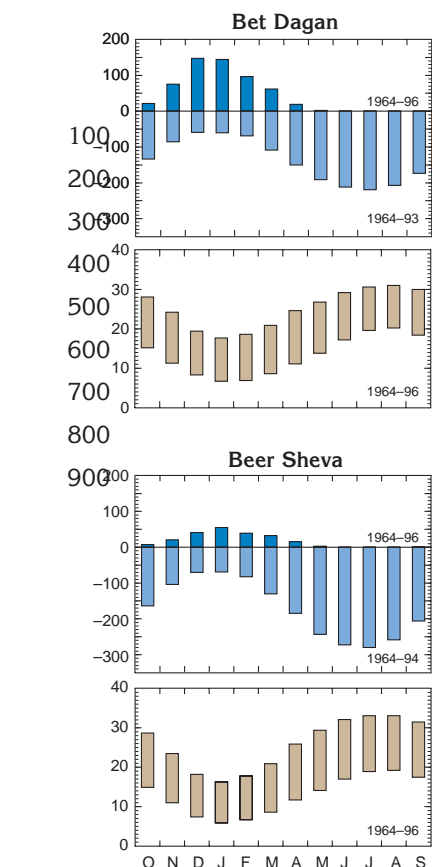
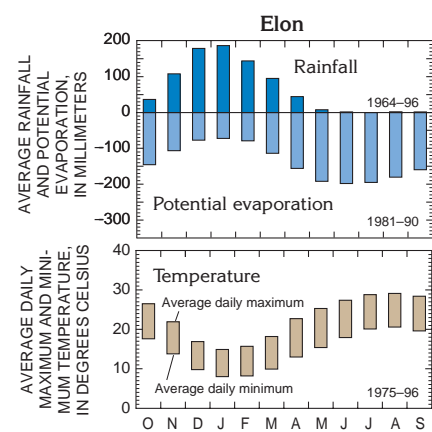
locations. Large rainfall variations also occur from year to year, as shown in the graph of annual rainfall for Jerusalem. Consecutive years of relatively high or low annual rainfall have an enormous effect on the region and, in the case of dry years, present the greatest challenge to manage the region's precious water resources. These consecutive-year patterns also may affect water-use practices, policies, and expectations. Climate characteristics exhibit large changes from one area to another and across seasons and years. As shown on the rainfall map, average rainfall decreases from west to east and from north to south, ranging from 1,200 millimeters (mm) at the northern tip of the region to less than 50 mm in the desert areas. Rainfall less than 200 millimeters per year (mm/yr) constrains development of rainfed agriculture in about

half of the area on the western side, and 90% of the area on the eastern side of the Jordan Rift Valley.

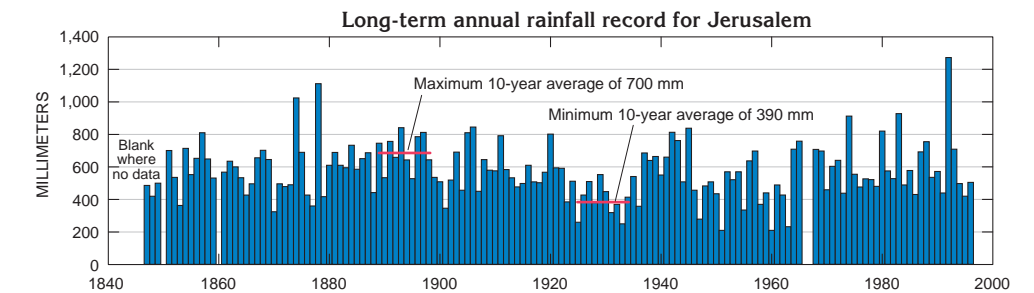
Temperature also varies across the area, generally according to latitude and altitude and by physiographic province (see next pages for description of provinces). The hilly areas of the Mountain Belt and Jordan Highland and Plateau experience cold winters and hot summers. In Amman and Jerusalem, average daily mean temperatures for January range from about 7 to 9 degrees Celsius (°C), whereas, in summer, the average mean temperature is about 24 °C. Average daily mean temperatures in the Jordan Rift Valley area range from about about 15 °C in the winter to about 31 °C in the summer. In the Coastal Plain, average

daily temperatures are between 16 and 22 °C in the winter and between 20 and 31 °C in the summer.

The desert region has a continental climate with a wide range of temperatures. In August average daily maximum temperatures are between 34 and 38 °C. In winter, the air is very cold and dry with an average daily minimum temperature between 2 and 9 °C. When air from a cold, polar origin penetrates the region, temperatures decrease to below the freezing point. The region periodically experiences very hot days during the spring and autumn, called Sharav or Khamasini, that may produce temperature rises from 10 to 20 °C above average, and reach from 40 to 45 °C in many areas.



WHAT IS A WATER YEAR?
 The hydrologic year runs from October 1 to September 30. Year dates in the graphs and text of this report refer to water years, not calendar years.



At Jerusalem, the wettest year of record, 1992, had six times more rainfall than 1960, the driest year of record. Consecutive wet years provide sustained increases in flow to springs and streams, and groundwater recharge. Conversely, consecutive dry years produce hydrological droughts. For example, the wettest 10-year period on record, 1889-98, had 1.8 times more average annual rainfall than the driest 10-year period, 1925-34.

