1.2 Climatic conditions

Precipitation and runoff

Climatic conditions influence the state of nature and the environment. Thus variations in precipitation and evaporation are important determinants of the amount of water that can flow towards the groundwater and watercourses, and variations in temperature and wind power can greatly influence the development of such phenomena as oxygen deficit in the lakes and fjords. In warm, calm summers, nitrogen and phosphorus loading of these water bodies might cause particularly serious and protracted oxygen deficit. When environmental state and trends are to be assessed it is therefore important to be able to differentiate between the variation in state attributable to climatic variations, and that attributable to the impact of anthropogenic pollution and other pressures.

The annual precipitation in Fyn County varies considerably, typically being 200–300 mm greater over central Fyn than over the coastal areas (Figure 1.2.1). There is therefore a marked precipitation gradient across Odense River Basin, precipitation being highest in the upper (southern) parts of the basin and least near Odense Fjord.

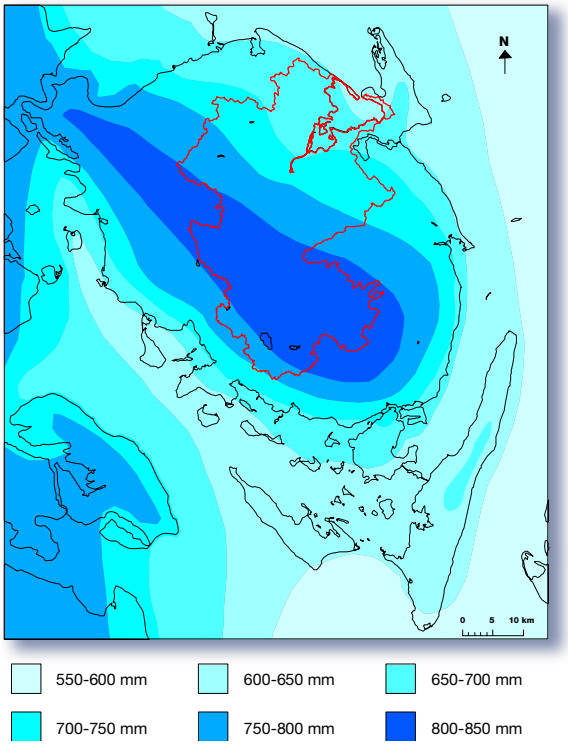

Figure 1.2.1 Average annual precipitation over Fyn County (1961–1990). Odense River Basin is indicated.

Over the period 1981/82 to 2001/02, average total annual precipitation for Odense River Basin varied from 400 mm to just under 1 100 mm (Figure 1.2.2, left), and riverine runoff to the fjord varied correspondingly (Figure 1.2.2, right). Particularly noteworthy is the very dry year 1995/96, when riverine runoff was exceptionally low. In that "drought year", the runoff mainly consisted of water flowing into the watercourses from groundwater and of wastewater discharged from the wastewater treatment plants in the basin.

The average monthly precipitation in Odense River Basin varied between approx. 40 mm (April) and 90 mm (December/January) (Figure 1.2.3, left). A large part of the precipitation evaporates, especially in summer, and only a minor share reaches the watercourses. As a consequence, the variation in monthly riverine runoff is considerably greater than the variation in precipitation. In summer the riverine runoff is therefore typically only around 20% of that in the winter months (Figure 1.2.3, right).

In order to lead the water rapidly away from the typically clayey soils in wet periods, drainage has been established in a considerable part of the farmland in Odense River Basin. Although subject to some uncertainty, it is estimated that approx. 50% of the basin is drained. This has an (unknown) impact on the natural water cycle.

Temperature and wind

The average air temperature in Fyn County is 8.2°C (1961–1990), and the typical variation during the year is illustrated in Figure 1.2.4. The wind usually blows from the west, and the power/energy with which the wind affects (stirs up) the water bodies varies (Figure 1.2.5).

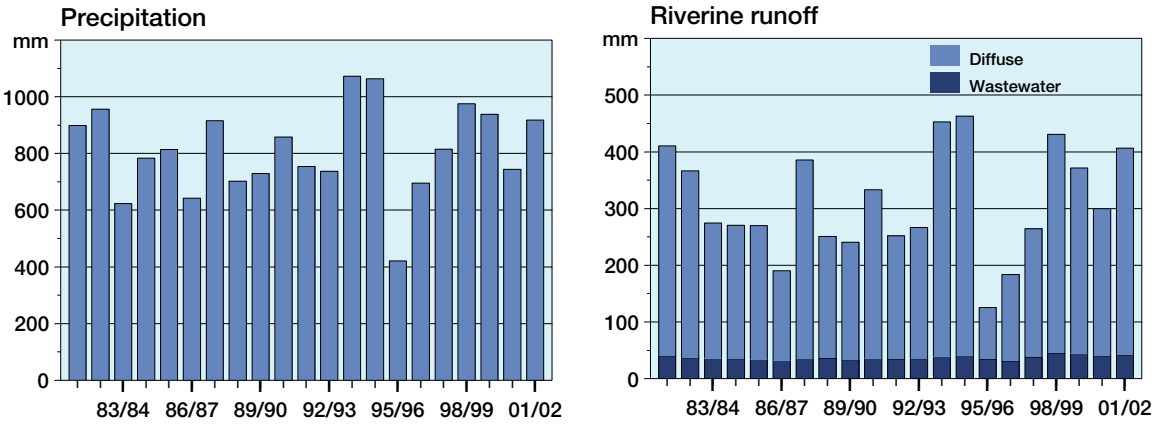

Figure 1.2.2 Precipitation over Odense River Basin and riverine runoff to Odense Fjord (annual values).

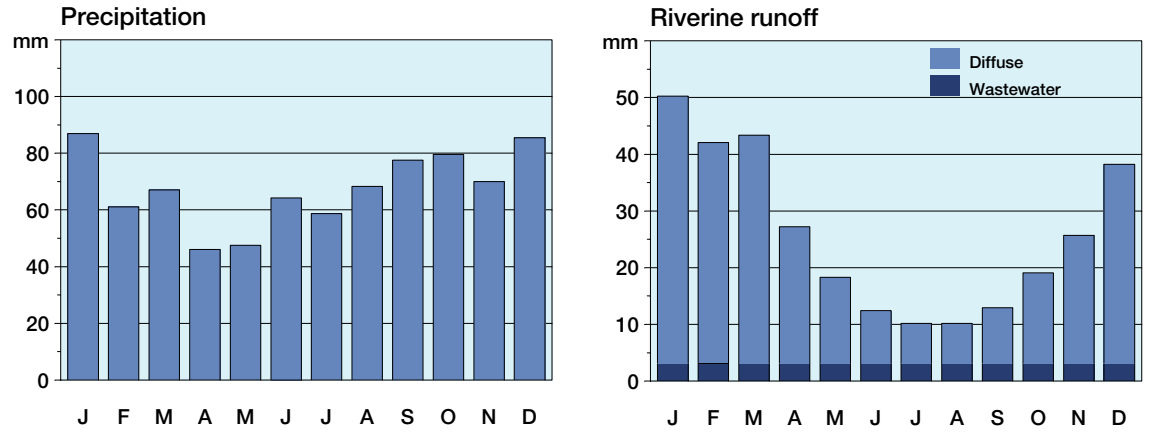

Figure 1.2.3 Average monthly precipitation over Odense River Basin and riverine runoff to Odense Fjord (1981/82–2001/02).

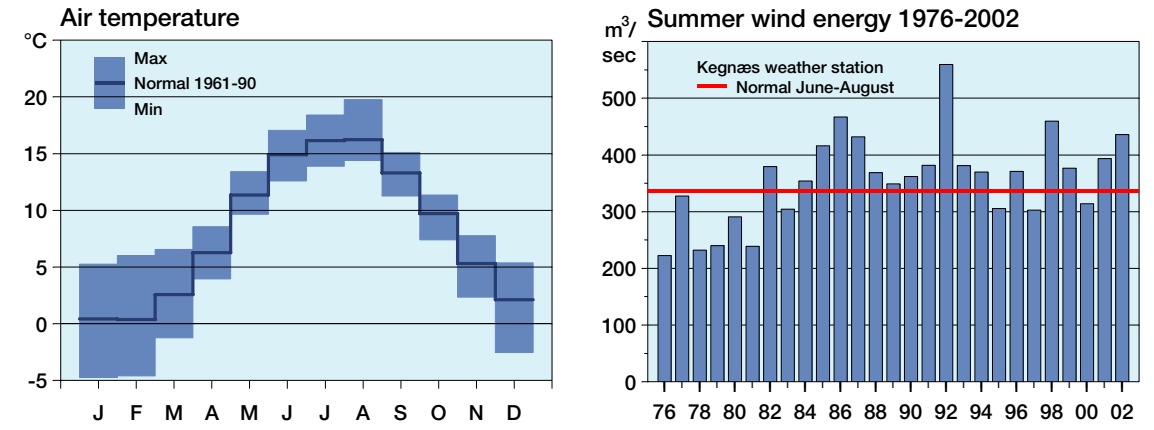

Figure 1.2.4 Air temperature, Fyn County (monthly values).

Figure 1.2.5 Wind energy in the summer months (June–August).