

4.3. Temperature

The Arabian Peninsula is warm. More than 90% of its area has a mean annual temperature of 20°C. A small area (shown in red) has a mean annual temperature exceeding 30°C. The cooler areas are shown in magenta in figure 11. They correspond with the western Yemen highlands, the Asir mountains, and the sandstone and limestone plateaux bordering Jordan.

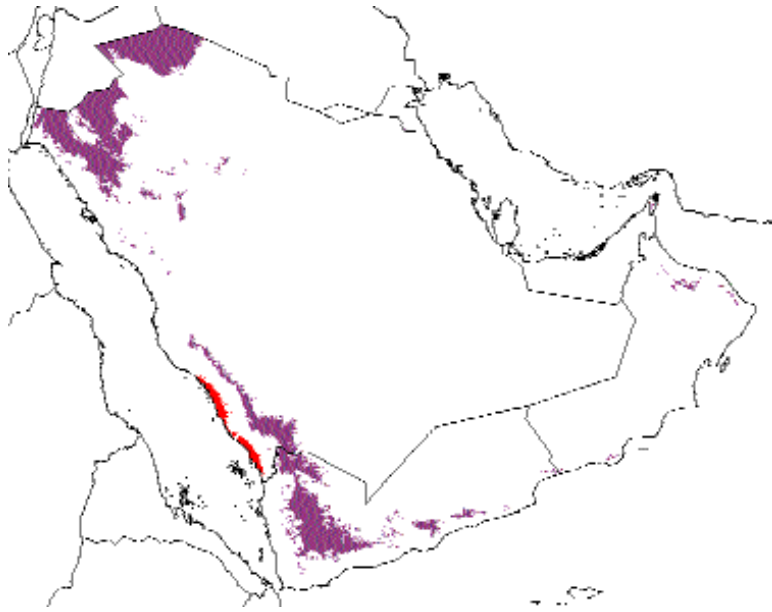


Fig. 11: Areas of the Arabian Peninsula with mean annual temperature exceeding 30°C (in red), or below 20°C (in magenta)

The major factors controlling temperature are elevation and latitude. From south to north there is a clear cooling trend, owing to increased exposure to cold continental air masses in winter. The map of mean annual temperature (Figure 12) illustrates these controls on temperature.

Temperature is strongly seasonal, with the lowest temperatures in the period December-February and the highest in the period June-September. The areas exposed to the Indian monsoon are an exception. These show a noticeable temperature drop in July-August, as illustrated by the climate diagram for Salalah (Figure 13).

Figures 14 and 15 show the temperature of the coldest and the warmest month, respectively.

Temperature seasonality tends to increase from the southeast to the northwest. The variability of temperature between years, in contrast with rainfall variability, is very low.

Temperature patterns can also be represented as the distribution of available atmospheric energy, which evaporates water or makes plants grow faster, for example. This representation of temperature as a source of energy for plant growth and biomass production can be done through the concept of *accumulated heat units* or *growing degree days*, which sum the daily

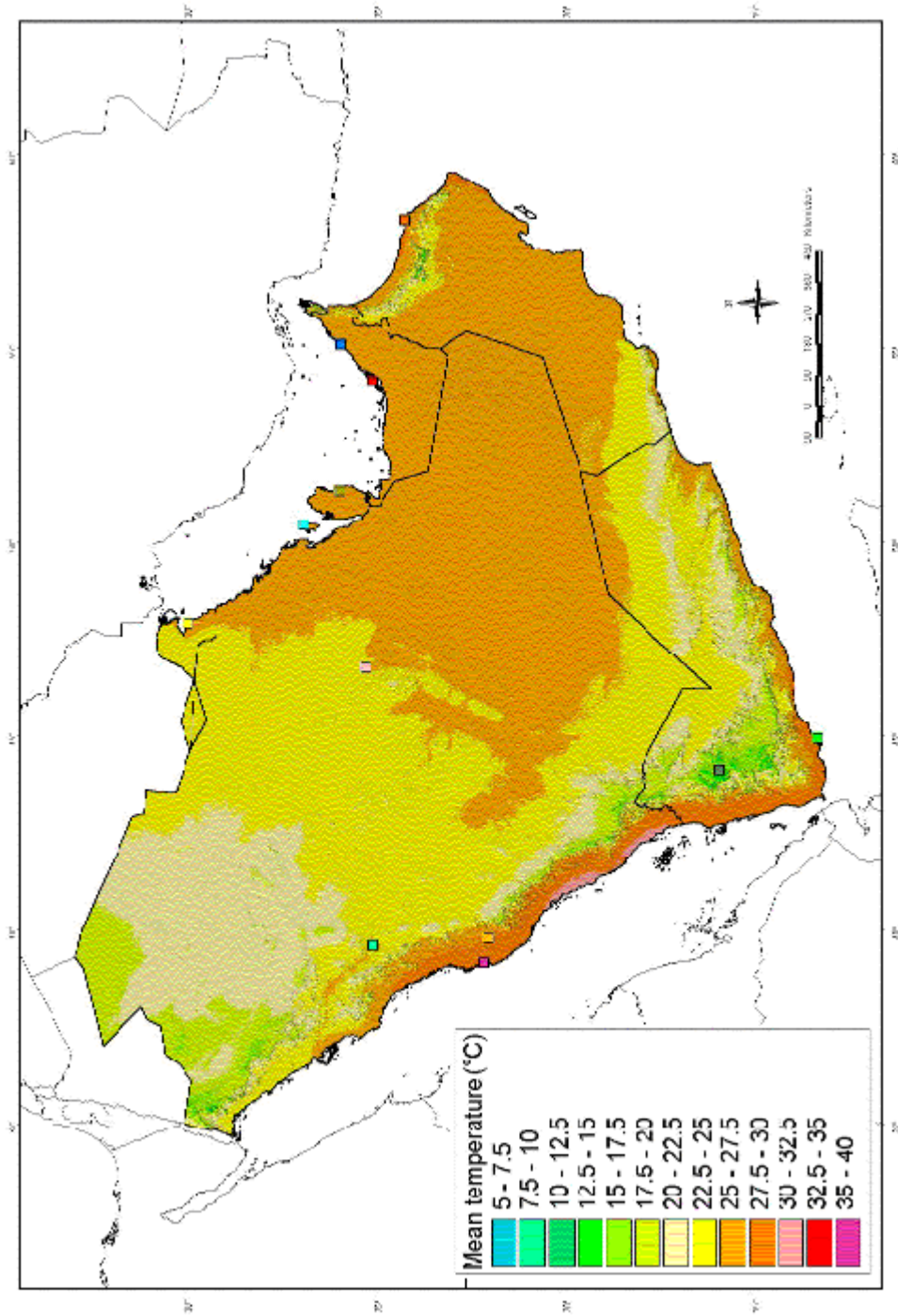


Fig. 12: Mean annual temperature

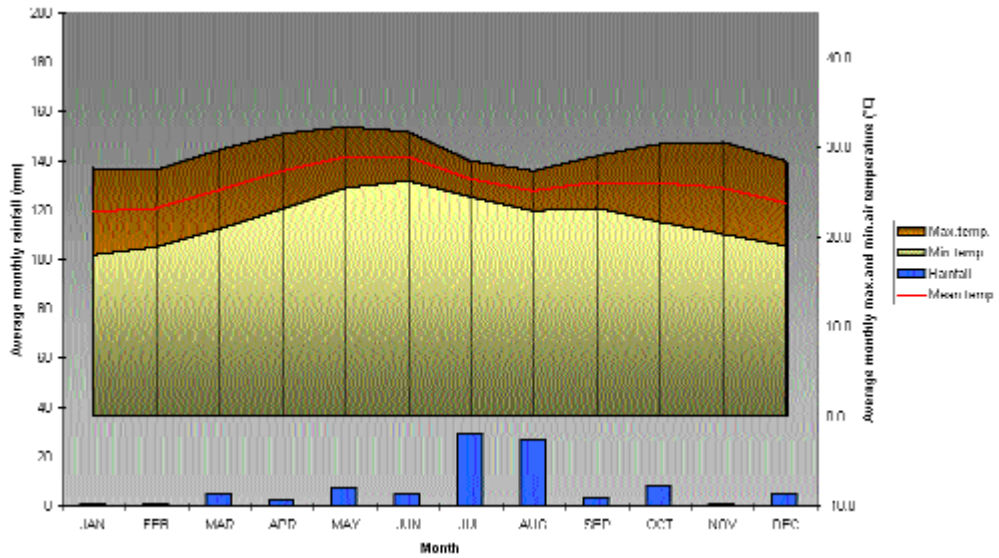


Fig. 13: Climate diagram for Salalah, Oman

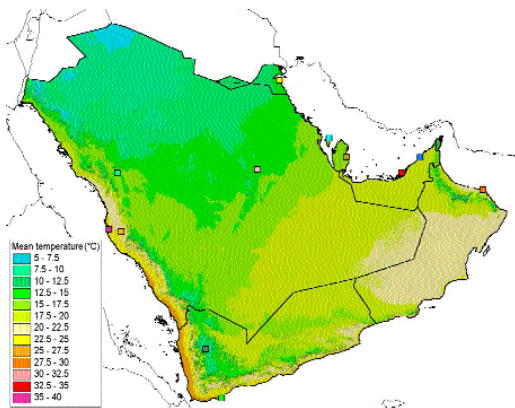


Fig. 14: Mean temperature of the coldest month

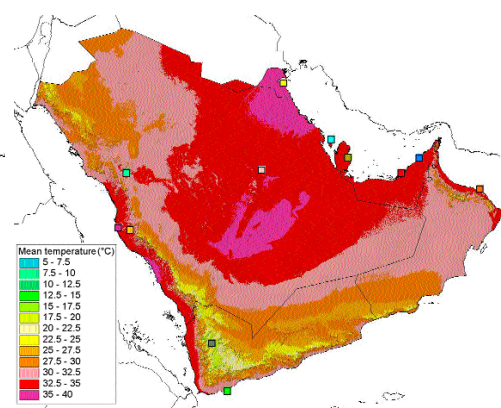


Fig. 15: Mean temperature of the warmest month

temperatures above a threshold (e.g., 0 °C) for a specified period (e.g., one year). The map of accumulated heat units in Figure 16 shows, unsurprisingly, the same pattern as the map of mean annual temperature, only the units (°C days) are different. It will be used later (see Section 4.7) to assess by proxy the potential productivity of natural vegetation.

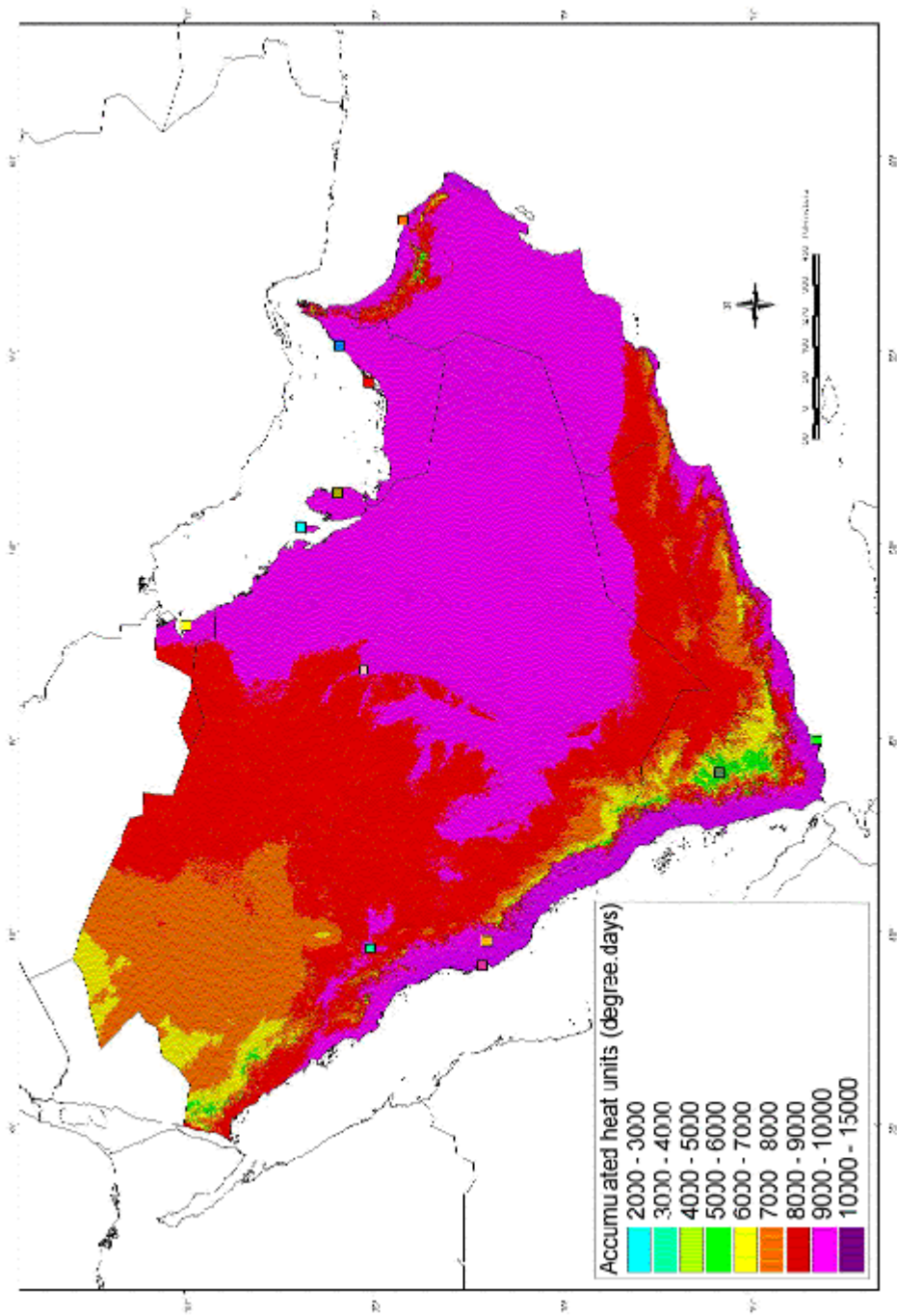


Fig. 16: Mean annual heat units