3. DESCRIPTION OF THE MODEL AREA

This section collects a general description of the features of the study area.

3.1. LOCATION

As mentioned before, the aquifer under study is located in the Yucatan Peninsula. The Yucatan Peninsula is situated in the southwest of Mexico and is surrounded by the Gulf of Mexico in the North and the Caribbean Sea in the East. The study area is exactly located in the northeastern coast of the Yucatan Peninsula, in the regional state of Quintana Roo. This area, known as Rivera Maya, comprises important tourist towns such as Cancun (Figure 3.1).

![Location of the model area](Modified from Alcocer et al., 1998)

3.2. GEOLOGY

The Yucatan Peninsula is the surface part of a large limestone platform (Neuman & Rahbek, 2006). Thus, the most abundant entity is the sedimentary rock, both from the Tertiary and from the Quaternary periods that belong to the Cenozoic age, i.e. 63 million years. Indeed, a thick sequence of late Tertiary and Quaternary underlie the Peninsula. The soil cover is negligible (Graniel et al., 1999). The gradual deposition of the carbonates caused the overlapping of successively younger deposits. Consequently, the eldest formations are situated in the interior part of the Peninsula while the younger limestones appear near the coast (Beddows, 2004), as it can be observed in Figure 3.2. According to data from INEGI (2008), in the state of Quintana Roo the percentage of Tertiary rocks is 89.5% and the percentage of Quaternary formations is 10.1%.
3. Description of the Model Area

3.3. TOPOGRAPHY

The topography of the Yucatan Peninsula is nearly flat, with maximum elevations around 300 m above sea level (INEGI, 2008). The most important features are three fault systems: Sierrita de Ticul, Rio Hondo and Holbox Fracture. The last one is the only one in the study area. As it can be appreciated in Figure 3.3, the Holbox Fracture extends from the northeastern part of the Peninsula towards the southwest. It is estimated to have a length of 100-130 km (Neuman & Rahbek, 2006).
3.4. CLIMATE

The Yucatan Peninsula lies between latitudes 20° and 21°. Thus, in most of its area the climate is tropical. Specifically, in the state of Quintana Roo the climate is subhumid. The rainy season is brief and coincides with the summer (Doehring & Butler, 1974). The mean annual temperature within the state varies between 24° and 28° C and the mean annual precipitation fluctuates between 700 mm and more than 1500 mm (INEGI, 2008), as shown in Figure 3.4. It has been estimated that 85% of this precipitation returns to the atmosphere by evapotranspiration (Alcocer et al., 1998).

Figure 3.4. Isohyetal map displaying spatial variation of the mean annual precipitation in the state of Quintana Roo (INEGI, 2008).

It is worthy mentioning the hurricanes and tropical storms, which are characteristic aspects of the Yucatan’s climate. Storms usually affect to the Caribbean coast of the Yucatan Peninsula. As for hurricanes, during the last century there was an average of 5.8 hurricanes per decade in the region (Neuman & Rahbek, 2006).