CHAPTER 1

INTRODUCTION

1.1  GENERAL

The geography of Malaysia deals with the tropical climate of Malaysia, a country located in southeast Asia. There are two distinct parts to this country being peninsular Malaysia to the West and East Malaysia to the East. Peninsular Malaysia is located south of Thailand, North of Singapore and East of the Indonesian island of Sumatra. East Malaysia comprises most of the northern part of Borneo and shares borders with Brunei and Indonesia.

Malaysia has an equatorial climate with uniformly high temperatures, high humidity, relatively light winds, and abundant rainfall throughout the year. Malaysia faces two monsoon winds seasons, the Southwest Monsoon from April to September, and the Northeast Monsoon from November to February. The Northeast Monsoon brings in more rainfall compared to the Southwest Monsoon, originating in China and the north pacific. Malaysia is located near the coast, land and sea breezes can affect wind flow pattern.

Precipitation is high in most part of Malaysia. Kuala Lumpur has receives over 2400 mm per year, Penang over 2700 mm per year, Kuching in Sarawak over 3900 mm per year, and Labuan in Sabah over 3500 mm per year of percipitation. During the northeast monsoon, western Sarawak and the northeast coast of Sabah experience heavy
rain. In the state of the East Coast, the wettest months was November, December, and January. Meanwhile, the driest months was June and July. Most of the rest of the peninsula has peaks of high rainfall (October through November and April through May) followed by periods of lower rainfall (January through February and June through July). On average Kuala Lumpur receives 195 days and Penang receives 154 days of rain each year.

Pahang basin receives high total rainfall during the northeast monsoon period amounting to almost 40% of Pahang’s total annual rainfall. The consequence of the extreme rainfall has an impact on Pahang river where it results in higher river flow and water level and finally contributing to serious flood event along the river in the basin. It is the longest river in peninsular Malaysia with a length of 459 km. The upstream of this river is located at the Titiwangsa Main Range. Pahang river starts with two rivers, namely the Tembeling and Jelai rivers which meet at a confluence in Kuala Tembeling located 300 km away from the estuary of Pahang river. The river meanders though townships such as Jerantut, Temerloh, Maran, Bera, as well as Pekan and lastly flows into the South China Sea which is located on the east coast of Peninsular Malaysia.

The isohyetal method is used to estimate the mean precipitation across an area by drawing line of equal precipitation. The method uses topographic and other data to yield reliable estimates. Based on McCuen (1998) the isohyetal method allow the hydrologist to consider factor, such as topography, that can affect the catch at the gage. Isohyets are contours of equal precipitation analogous to contour lines on a topographic map. In the isohyetal method, precipitation values are plotted at their respective stations on a suitable base map, and isohyets are drawn to create an isohyetal map. Isohyetal lines are based on interpolation between rain gauge stations. While constructing isohyets, it is assumed that rainfall between two stations varies linearly, unless abrupt changes in topography indicate otherwise.

Effective and good rainfall data is vital in many human system. It is importance in hydrological analysis and also in the management of water resources. In malaysia, an important issue with regards to the rainfall data records is the absence of rain gauge stations in particular regions. This is an important issue in hydrology because
hydrologist utilizes the rainfall data as the input in most of their researches. Due to high cost and too many procedures that have been listed by World Meteorological Organization (WMO) in constructing rain gauge stations, it is quite impossible to solve this problem by constructing them in the regions involved in the research. Thus, it is important to estimate rainfall data in those unsampled locations. In order to estimate those data, spatial interpolation method is utilized. One of the spatial interpolation methods is Kriging.

Kriging technique is preferable because most of the researches identified that kriging can give a more accurate results for interpolation of daily rainfall data. Based on Antonic (2008) results indicate that grid and line isohyets data obtained by the Kriging method are much more representative. There are many advantages of applying kriging technique. The benefits include it provide some measures of the certainty or accuracy of the predictions data, and also be able to produce a prediction surface. Based on ESRI (2009) Kriging is a multistep process, it includes exploratory statistical analysis of the data, variogram modelling, creating the surface, and exploring a variance surface. By using kriging method, the capability of obtaining high efficiency estimation in rainfall data is highly possible to be achieved.

1.2 PROBLEM STATEMENT

Rainfall pattern in Malaysia are variable and effected by Monsoon winds. Therefore, rainfall that are not same in every area are suitable to be investigate to know what will happen in the future. It is also difficult to draw a consistent picture of changes in the tropics and subtropics, where many areas are not analyzed and data are not readily available. The study including analysis of rainfall pattern for all 11 districts in Pahang.

Isohyets maps can help the hydrologist to design the drainage and to predict flood may be happen at certain place in particular time. To draw isohyets maps, it needs a complete rainfall data especially for topography with a very large area but there are missing data in the rainfall data collected. Because of that, a systematic data management and planning are needed to produces a map that are more interesting and effective. All the data need to be analyzed to get the best result because most of the data