

## CHAPTER 5

### CONCLUSIONS AND DISCUSSION

In this chapter, the conclusions are presented and discussed. The research objective is to study the relationship between rainfall and salinity in Pattani Bay. In this study the rainfall data are recorded at three stations: the Science Building of Prince of Songkla University, Pattani Campus, (2) Yaring River mouth, and (3) Laem Tachi between January 1995 and December 1996 were used. The data on salinity were collected by the Pattani Coastal Aquaculture Station at Yaring for 14 stations around the Bay, measured at intervals from two to six weeks during 1995 and 1996. These stations are as follow: (1) Dato, (2) Yaring River mouth, (3) Middle of the Bay, (4) Parae, (5) Cockle bed, (6) Tanyong Lulo, (7) Prince of Songkla University, (8) Talo Samilae, (9) Laem Nok (10) Industry zone, (11) Barn Num, (12) Budi, (13) Pattani River mouth, and (14) Bana.

#### 1. Conclusion and Discussion

(A) Salinity is affected by (1) location in the Bay, (2) time of year, and by (3) rainfall. Salinity is strongly related to time of year as well as rainfall content.

(B) *Before adjusting for rainfall*, the residual sum of squares of salinity at 14 stations, *adjusted only for location* (station effect) is 27460 (df = 336).

*After adjusting for rainfall*, the residual sum of squares of salinity at 14 stations, *adjusted only for location* (station effect) is 10770 (df = 322).

To assess the statistical significance, F-test may be used, as follows:

$$\begin{aligned} F &= \frac{(SS_1 - SS_2) / (df_1 - df_2)}{SS_2 / df_2} \\ &= \frac{(27460 - 10770) / (336 - 322)}{10770 / 322} \end{aligned}$$

$$= 19.27796$$

$$p = 0.0, df = 25/322$$

The proportion of residual variance in salinity accounted for by rainfall is thus

$$r^2 = \frac{(27460 - 10770)}{27460}$$

$$= 0.668$$

(C) *After adjusting for rainfall* the residual sum of squares of salinity at 14 stations, adjusted for both location and season (day effect) is 5704 (df = 312).

*After adjusting for rainfall* the residual sum of squares of salinity at 14 stations, *adjusted both for location and season* (day effect) is 4614 (df = 298).

Again using the F-test, it was found that

$$F = \frac{(5704 - 4616) / (312 - 298)}{4616 / 298}$$

$$= 5.017083$$

$$p = 0.0, df = 14/298$$

So the result is statistically significant. The proportion of the residual variation in salinity accounted for by the rainfall is thus

$$r^2 = \frac{(5704 - 4616)}{5704}$$

$$= 0.191$$

(D) The effect of rainfall on salinity depends largely on the location in the Bay in which the effect of rainfall on salinity at PSU is found to be greater than that at Laem Tachi. (as shown by Tables 4 and 5).

## **2. Limitations**

(1) Measurement of salinity was taken over a period of only 18 months. It would be better to conduct the measurement over a period at least 2 years, corresponding to two seasons.

(2) Not taking into account the flow of water into the Bay (discharges) reduces the relevant information.

(3) It would be useful to know the salinity at different depths of water in Pattani Bay.

(4) It would be useful to conduct measurements on successive days to find out the best way of smoothing the rainfall.

## **3. Further Questions that Need to be Answered**

(1) What is the model relating rainfall and salinity at various locations?

Regression analysis could be used to answer this.

(2) What is the effect of salinity and rainfall on other variables and how are the fish affected? Are there species more or less affected by salinity?

(3) What are the effects of other variables? (such as the current in Pattani and from other river, current tides)