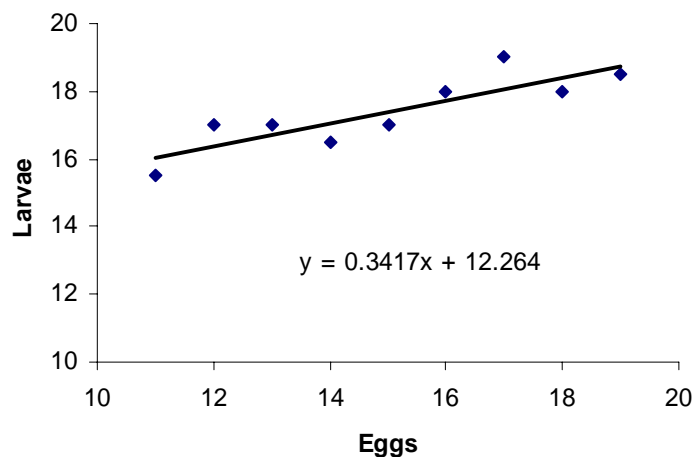


Exercise – Eggs and Larvae

Evaluating Ecological Models, W. Silvert

Water & Coastal Management MSc Programme

In fisheries management one of the key tools is to look at juvenile stages in order to predict the probable recruitment to the fishable adult population. There is a great deal of interest in studying the relationship between the concentrations of eggs, larvae, juveniles and eventually recruits.



The above figure shows a sample plot of larval concentrations vs. egg concentrations. While this is a simulated plot, it is similar to one published for mackerel (*Scomber scombris*) in the Gulf of St. Lawrence in the 1970s and is typical of the kind of curve obtained in these studies. The units in this plot are arbitrary, but can be interpreted as numbers per cubic meter. The data are collected in two cruises, one just after spawning to measure the egg concentrations and the second a week or so later to count larvae after the eggs have hatched.

The data appear to be linear and have been fit by the regression line

$$\text{Larvae} = 0.34 \times \text{Eggs} + 12.26$$

Where Larvae and Eggs refer to the concentrations of each.

If you are managing a fishery where the projected catch statistics are based on this model, are there any concerns you might have about its applicability? In particular, if the stock has been overfished so that egg concentrations are low, say around 4 m^{-3} , do you feel that this model is a reliable guide for predicting the number of larvae that will hatch?