

UCP

informatics

System



CAREERS

UNIVERSITY OF CANTERBURY

From 1990 to 1996 fishery production has been sufficient to meet demand.

Time series production by region

The model

As in Jones et al. [1] the Trueman-Broadley model [2] was combined with a model for the fish larvae phytoplankton dynamics.

Differential equations for phytoplankton biomass, P , and zooplankton biomass, Z :

$$\frac{dP}{dt} = r_1 P \left(1 - \frac{P}{P_{max}}\right) - r_2 P \frac{Z}{Z + K_1}$$

$$\frac{dZ}{dt} = r_2 P \frac{Z}{Z + K_1} - r_3 Z$$

Differential equation for the weight of one fish larva, W :

$$\frac{dW}{dt} = r_4 W \left(1 - \frac{W}{W_{max}}\right) - r_5 W$$

The fish larvae biomass is the number of larvae times the weight of one larva.

The recruitment is defined as the percentage of fish larvae that reach recruitment.

The graph shows a significant increase in recruitment in 1990. The value for the recruitment parameter, r_4 , was set at 0.0001 and the value for the mortality parameter, r_5 , was set at 0.0001.