$$\frac{dX_k}{dt} = -X_{k-1}\left(X_{k-2} - X_{k+1}\right) - X_k + F - hc\bar{Y}_k$$

$$\frac{1}{c}\frac{dY_{j,k}}{dt} = -bY_{j+1,k}\left(Y_{j+2,k} - Y_{j-1,k}\right) - Y_{j,k} + \frac{h}{J}X_k$$