

Thampi et al. 2017

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9/28/2021

Model Setup

```
closed.coral.model1 <- function (t, y, params) {  
  ## first extract the state variables  
  M <- y[1]  
  C <- y[2]  
  P <- y[3]  
  X <- y[4]  
  #TT <- y[5]  
  
  ## now extract the parameters  
  alpha <- params["alpha"]  
  gamma <- params["gamma"]  
  r <- params["r"]  
  d <- params["d"]  
  kappa <- params["kappa"]  
  sigma <- params["sigma"]  
  s <- params["s"]  
  j <- params["j"]  
  phi <- params["phi"]  
  TT <- 1 - M - C  
  
  ## now code the model equations  
  dMdt <- alpha*M*C - (P*M)/(M+TT) + gamma*M*TT  
  dCdt <- r*TT*C - d*C - alpha*M*C  
  #dTTdt <- (P*M)/(M+TT) - gamma*M*TT - r*TT*C + d*C  
  dPdt <- s*P*(1-(P/C)) - sigma*P*(1-X)  
  dXdt <- kappa*X*(1-X)*(-1+j*(1-C)-sigma*P*(1-X)+phi *(2*X-1))  
  
  ## combine results into a single vector  
  dydt <- c(dMdt,dCdt, dPdt, dXdt)  
  ## return result as a list!  
  
  list(dydt)  
}  
  
closed.coral.model2 <- function (t, y, params) {  
  ## first extract the state variables  
  M <- y[1]  
  C <- y[2]
```

```

P <- y[3]
X <- y[4]
#TT <- y[5]

## now extract the parameters
alpha <- params["alpha"]
gamma <- params["gamma"]
r <- params["r"]
d <- params["d"]
kappa <- params["kappa"]
sigma <- params["sigma"]
s <- params["s"]
j <- params["j"]
phi <- params["phi"]
z <- params["z"]
TT <- 1 - M - C

## now code the model equations
dMdt <- alpha*M*C - (P*M)/(M+TT) + gamma*M*TT
dCdt <- r*TT*C - d*C - alpha*M*C
#dTdt <- (P*M)/(M+TT) - gamma*M*TT - r*TT*C + d*C
dPdt <- s*P*(1-(P/(1-z*C))) - sigma*P*(1-X)
dXdtd <- kappa*X*(1-X)*(-1+j*(1-C)-sigma*P*(1-X)+phi*(2*X-1))

## combine results into a single vector
dydt <- c(dMdt,dCdt, dPdt, dXdtd)

## return result as a list!
list(dydt)
}

```

Graphs included in paper

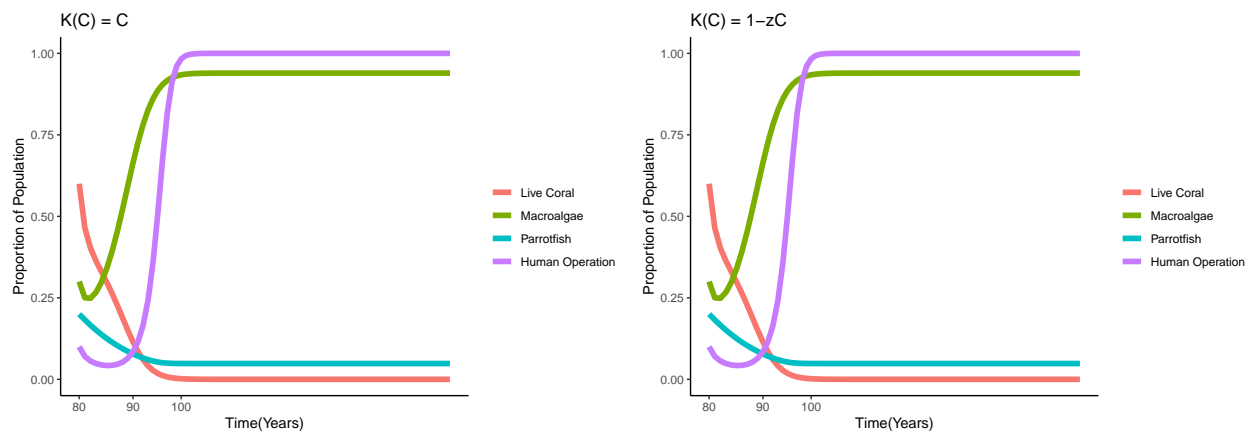


Figure 1: Fig 3a in Thampi paper. $S = 0$, $\sigma = 0.1$

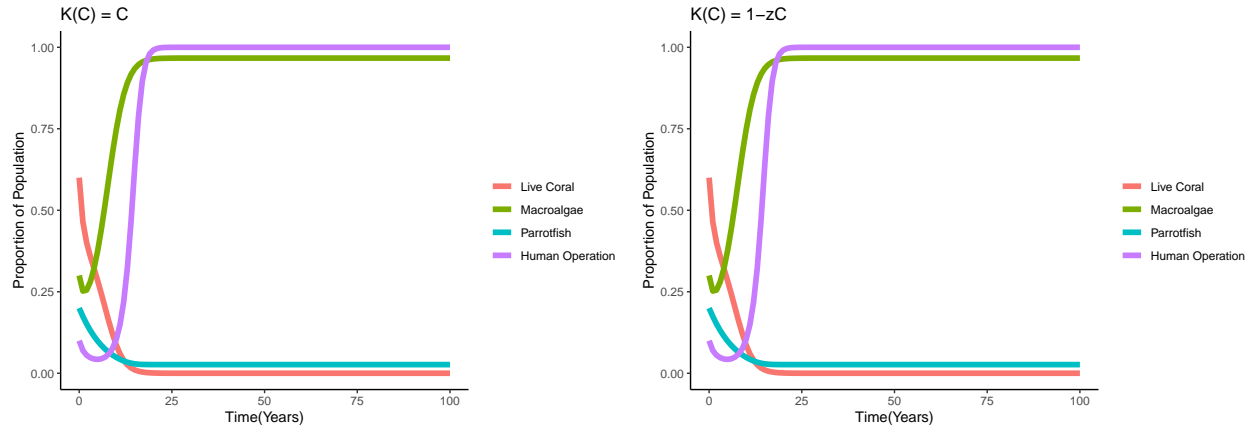


Figure 2: Fig 3b in Thampi paper. $S = 0$, $\sigma = 0.15$

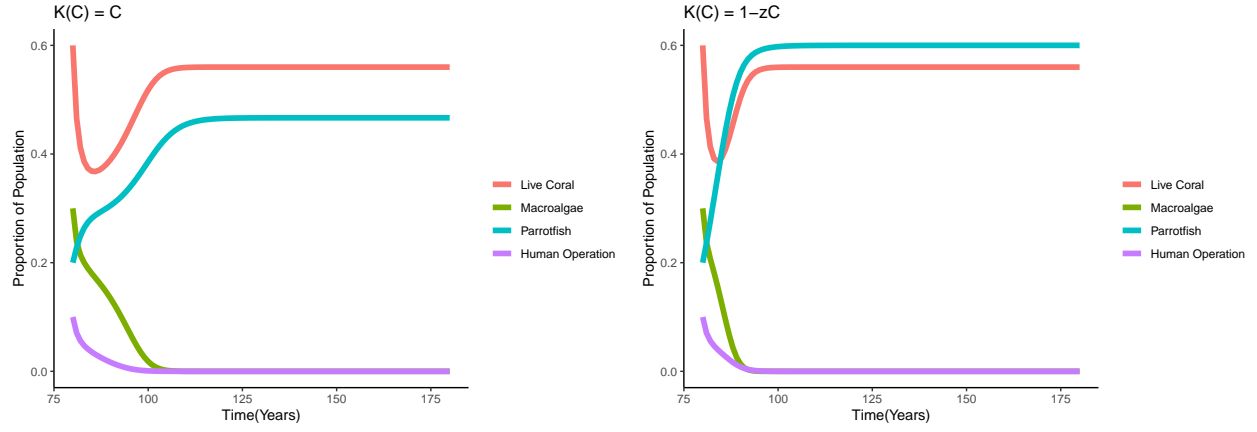


Figure 3: Fig 3c in Thampi paper. $S = 0.3$, $\sigma = 0.05$

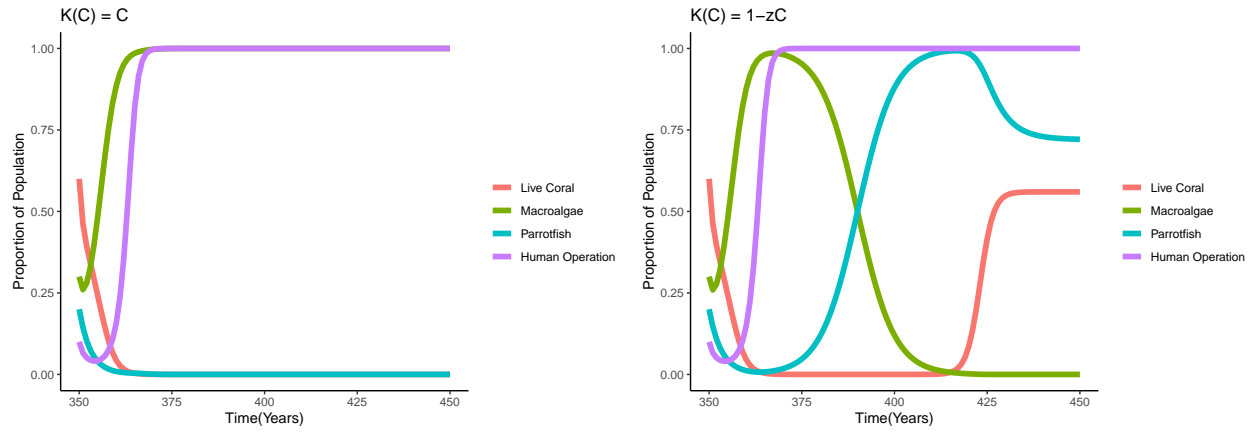


Figure 4: Fig 3d in Thampi paper. $S = 0.2$, $\sigma = 0.5$

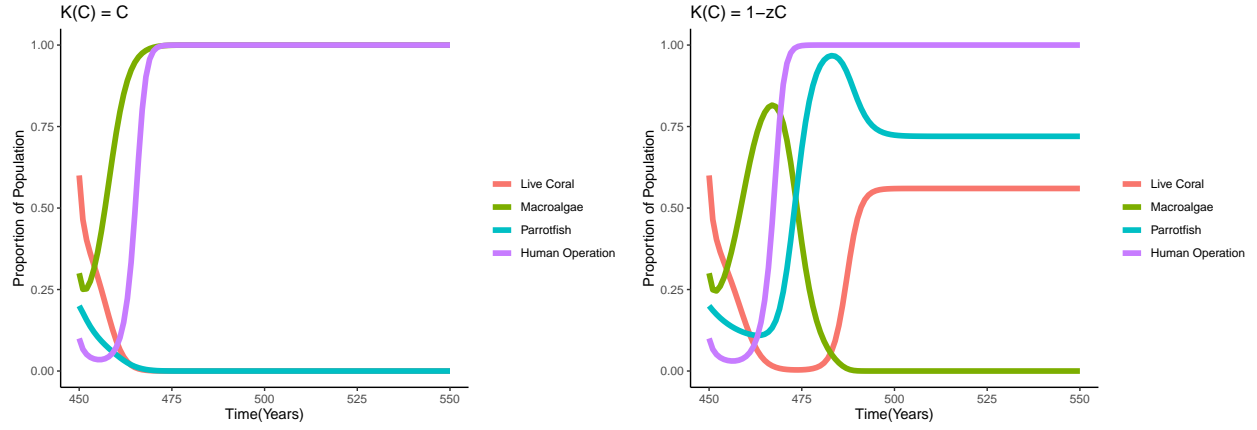


Figure 5: Fig 3e in Thampi paper. $S = 0.4$, $\sigma = 0.4$

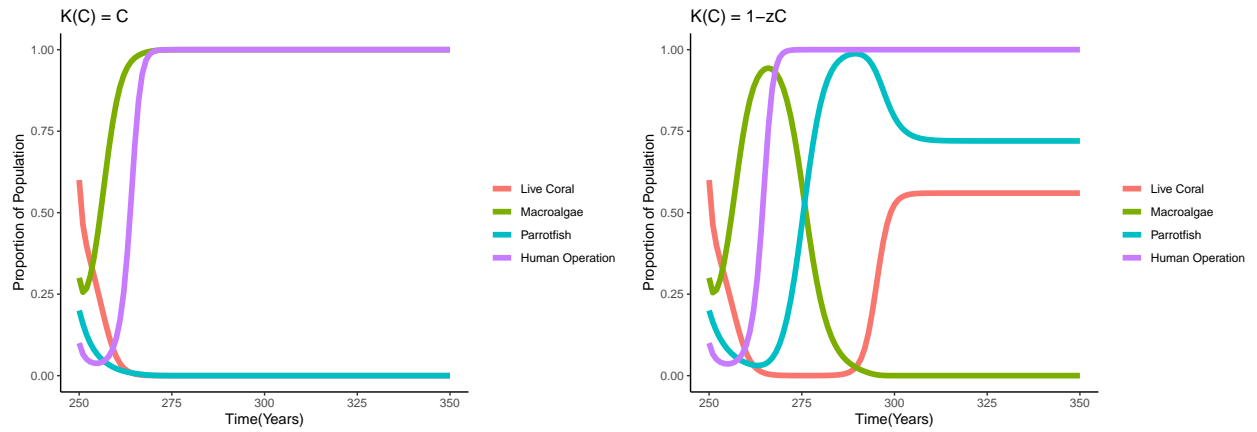


Figure 6: Fig 3f in Thampi paper. $S = 0.35$, $\sigma = 0.5$