

# N to P

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9/20/2016

Simple dynamics: nutrient concentrations through time

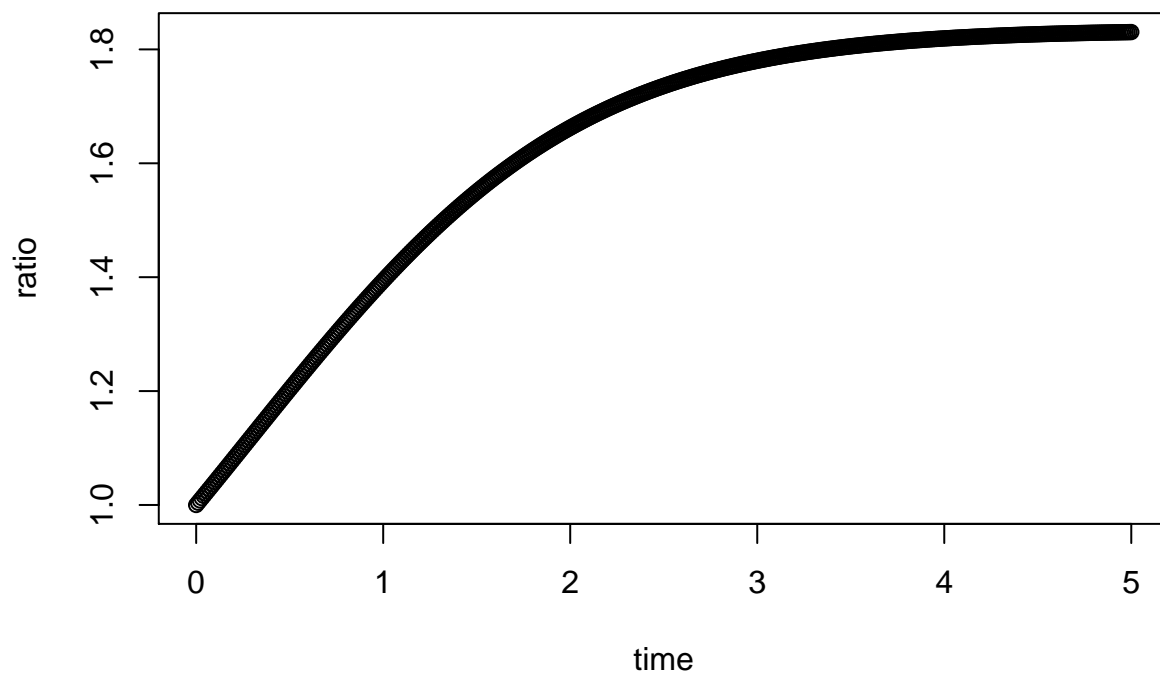
## Model 1

```
library(deSolve)
N2Pv1<-function(t,x,params){
  with(as.list(c(x,params)),{

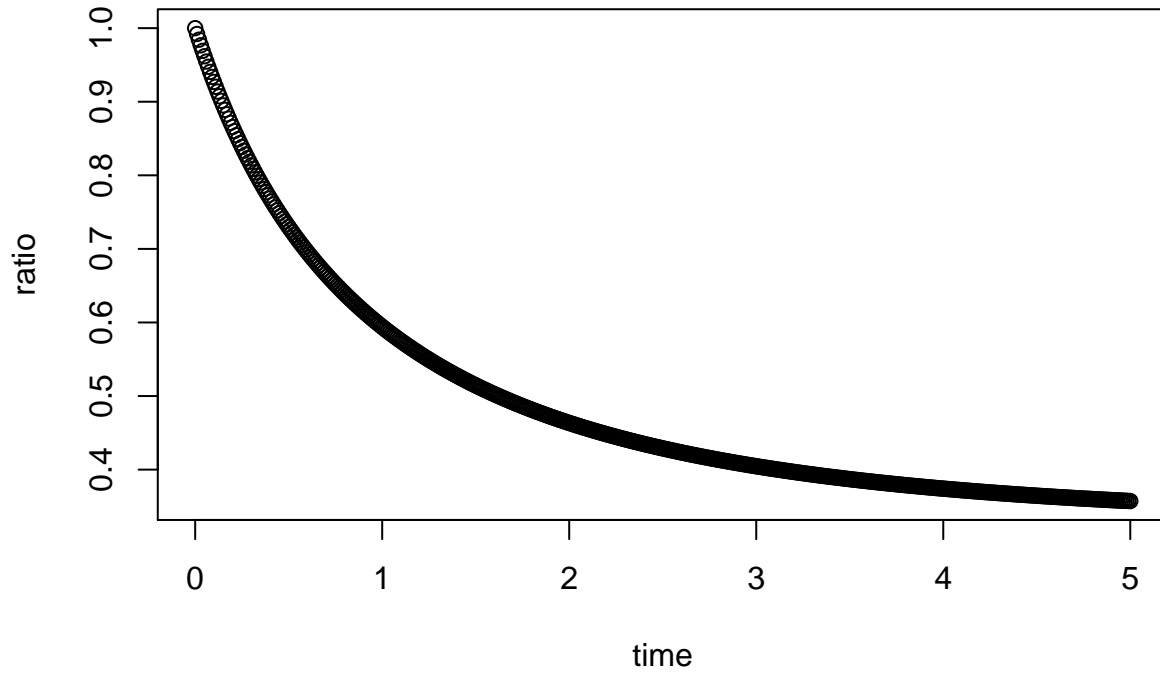
    dz.n<-phi1*phyto.n-m.n*z.n-phi3*z.n
    dz.p<-phi1*phyto.p-m.p*z.p-phi3*z.p

    return(list(c(dz.n,dz.p)))
  })
}

params<-c(phi1=1,phyto.n=0.6,phyto.p=0.4,phi3=0.5, m.n=0.4, m.p=0.6)
z0<-c(z.n=1,z.p=1)
t<-seq(0,5,0.01)
out<-as.data.frame(ode(z0,t,N2Pv1,params))
names(out)<-c("time","z.n","z.p")
out$ratio<-out$z.n/out$z.p
with(out,plot(time,ratio))
```



## Model 2



Equilibrium N:P ratio as a function of model parameters

## Model 2

**constant accumulation efficiency**

