Testing multi models to data

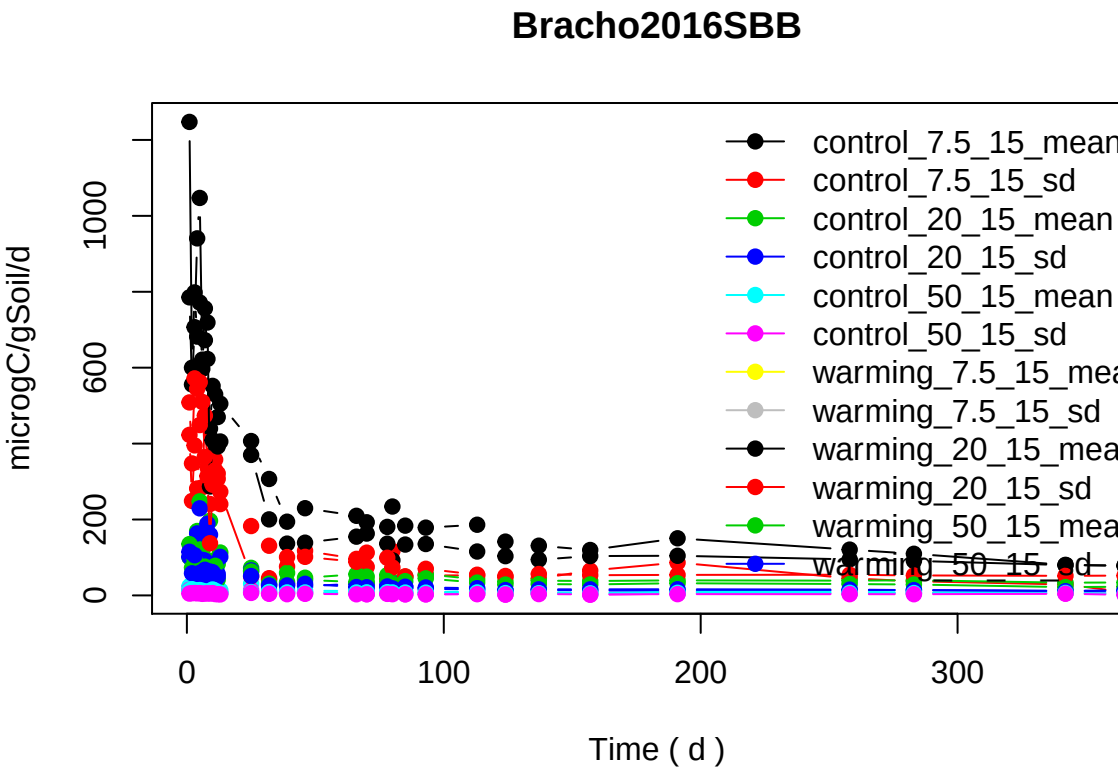
Testing multi models to the dataset of SidB database

Here we test three different two-pool model to each individual datasets. As a start we test each time series separately to asses the available information.

-

Dataset Bracho2016SBB

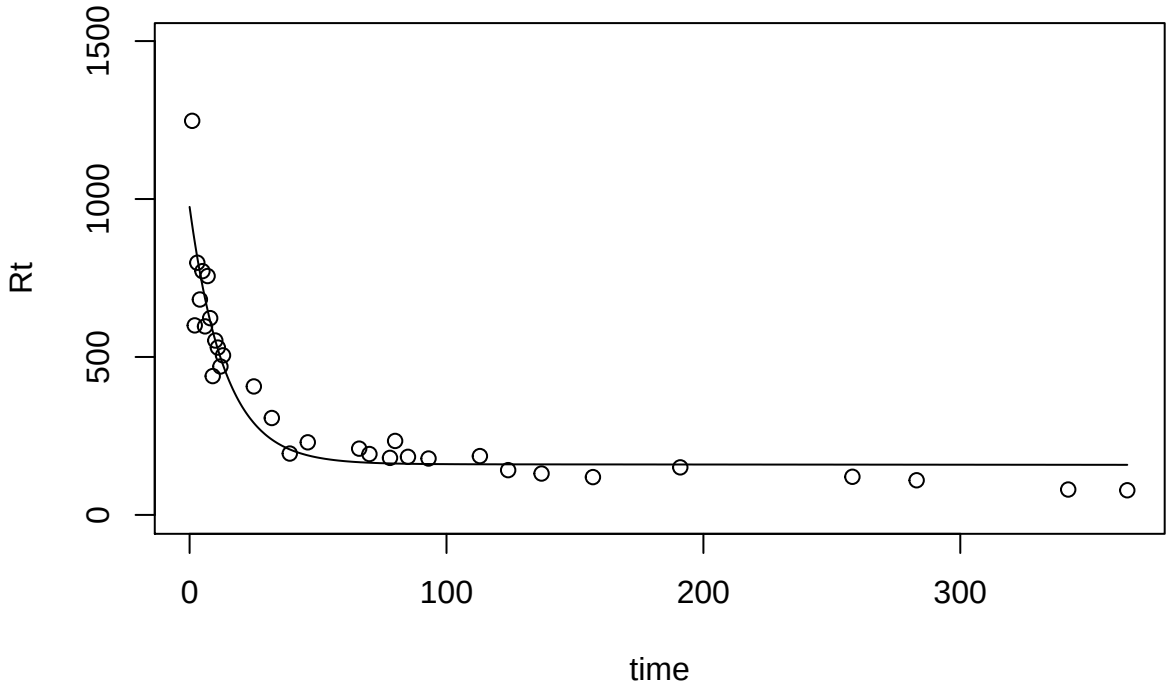
This is the results of a depth-warming experiment with two levels of Control and warming. The dataset has 9 column of time, three depth on each warming and control. The variables V3, V5, V7, V9, V11 and V15 are the sd.



initial carbon unit is percent

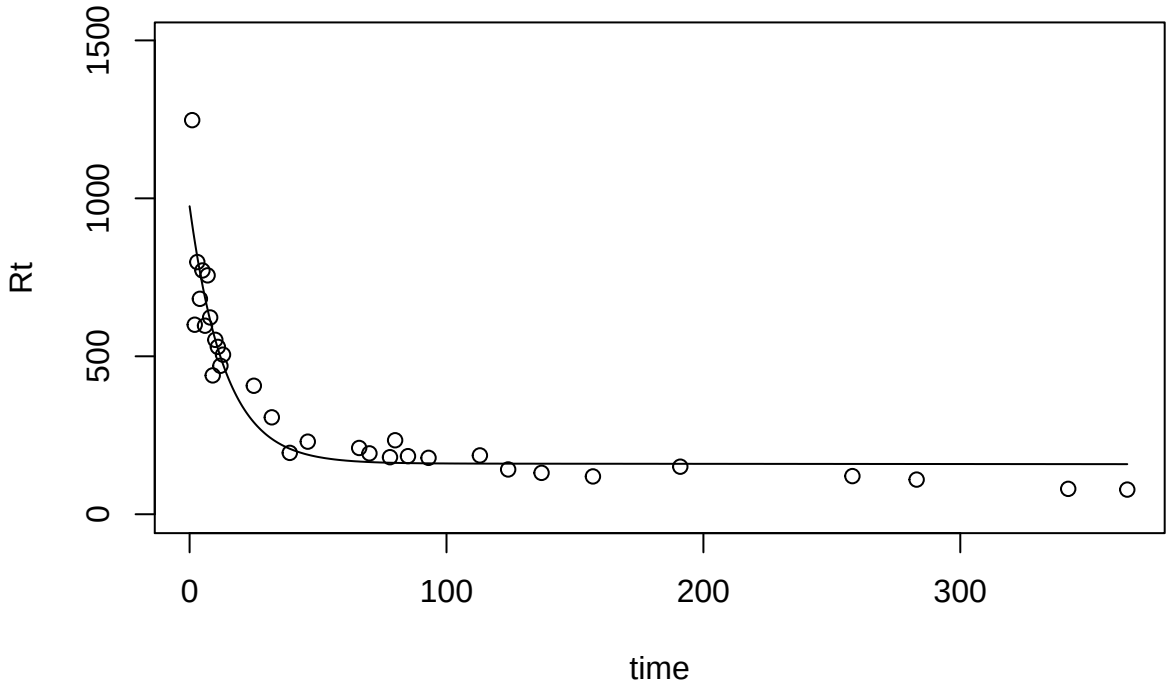
V1: Dataset Bracho2016SBB, variable control_7.5_15_mean, site 15, depth 7.5

```
## [1] "k1= 0.0732633945588067"
## [2] "k2= 3.85640257531122e-05"
## [3] "proportion of C0 in pool 1= 0.00265881046995375"
```




```
## [1] "AIC =  -12.1458755845537"
```

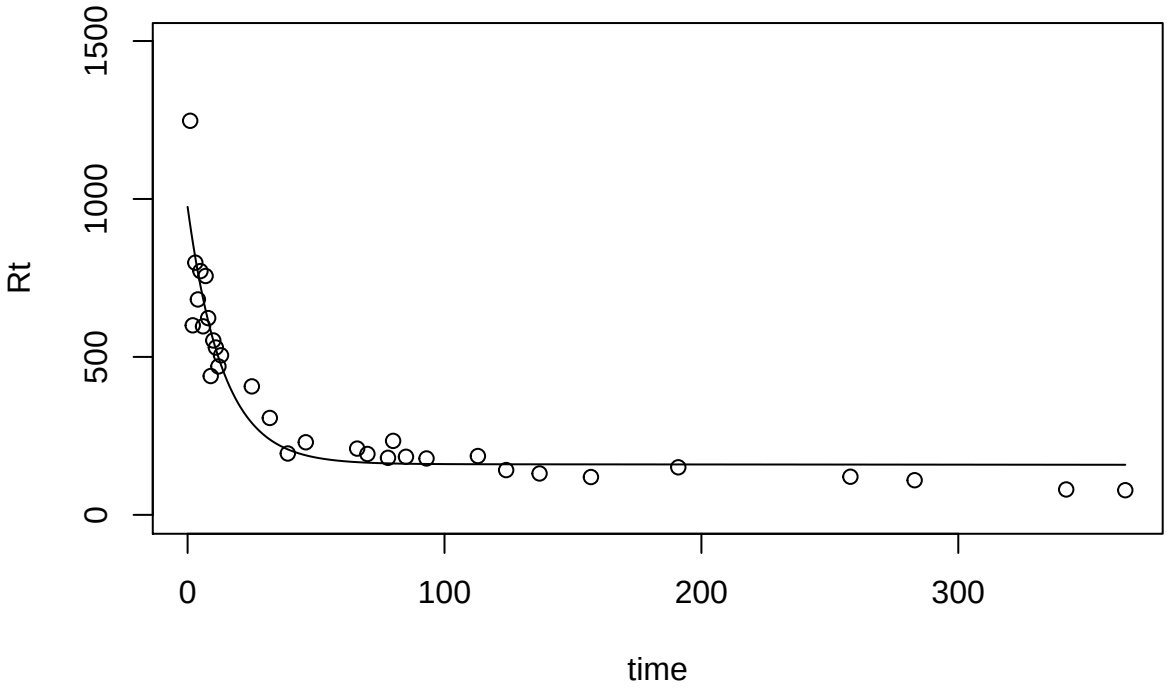
```
## [1] "k1= 0.0732650937595586"
## [2] "k2= 3.85645700239924e-05"
## [3] "a21= 0.72086715654104"
## [4] "a12= 8.1152272936591e-06"
## [5] "Proportion of C0 in pool 1= 0.00953806497394005"
```



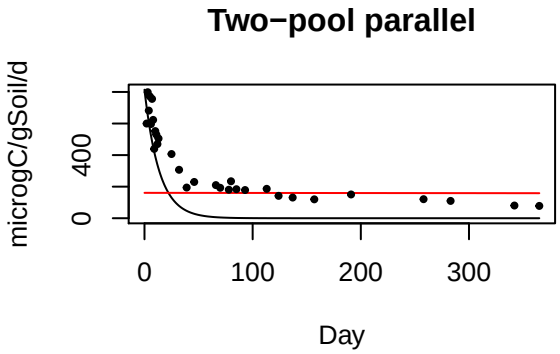

```
## [1] "AIC =  -8.14587558340254"
```

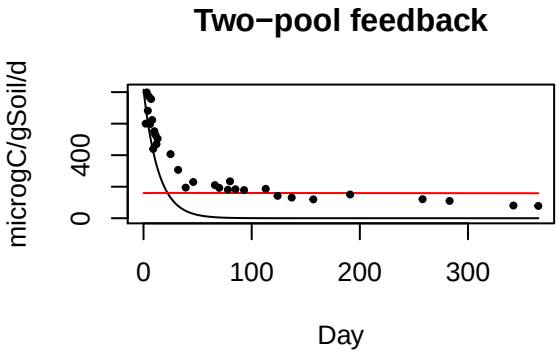
```
## [1] "k1= 0.0732659542643693"
## [2] "k2= 3.8564509041901e-05"
```

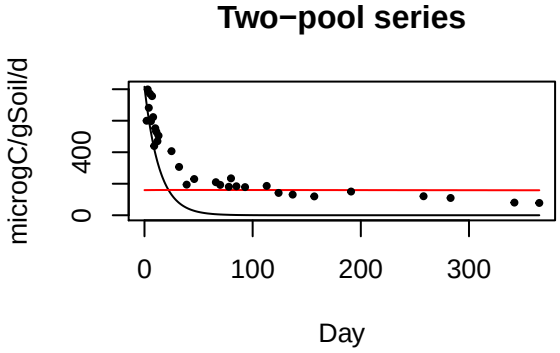
```
## [3] "a21= 0.768887132455099"
## [4] "Proportion of C0 in pool 1= 0.011524307515807"
```




```
## [1] "AIC =  -10.1458755836345"
```





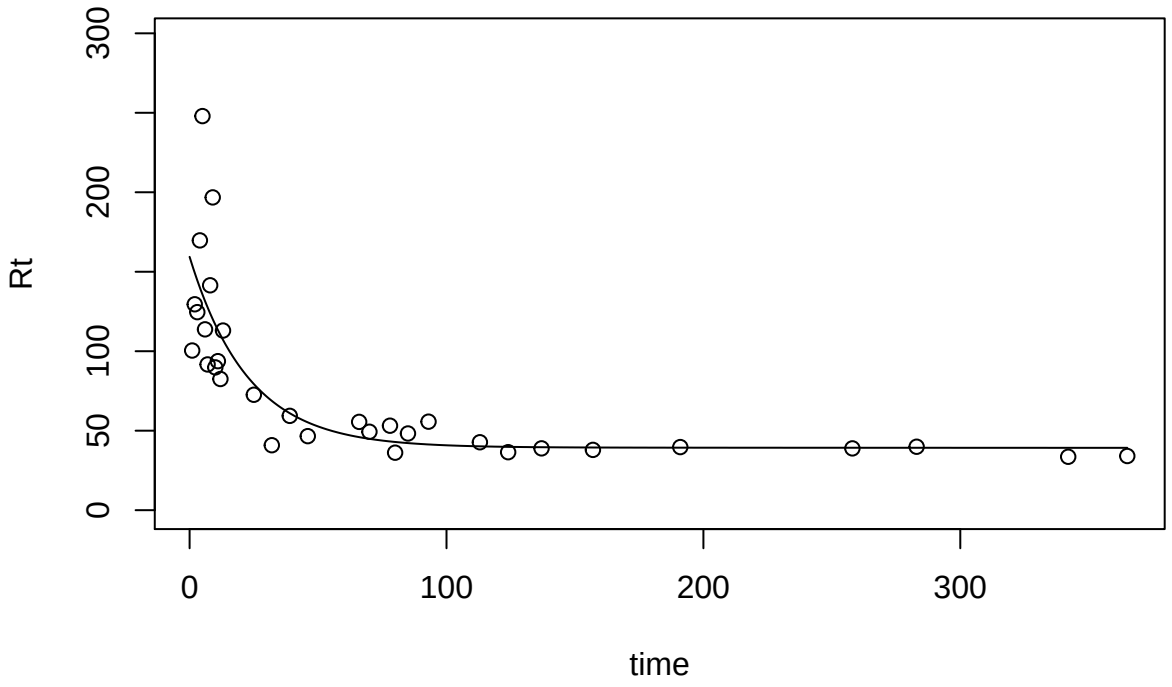


model	AIC
Two-pool parallel	-12.145876

model	AIC
Two-pool feedback	-8.145876
Two-pool series	-10.145876

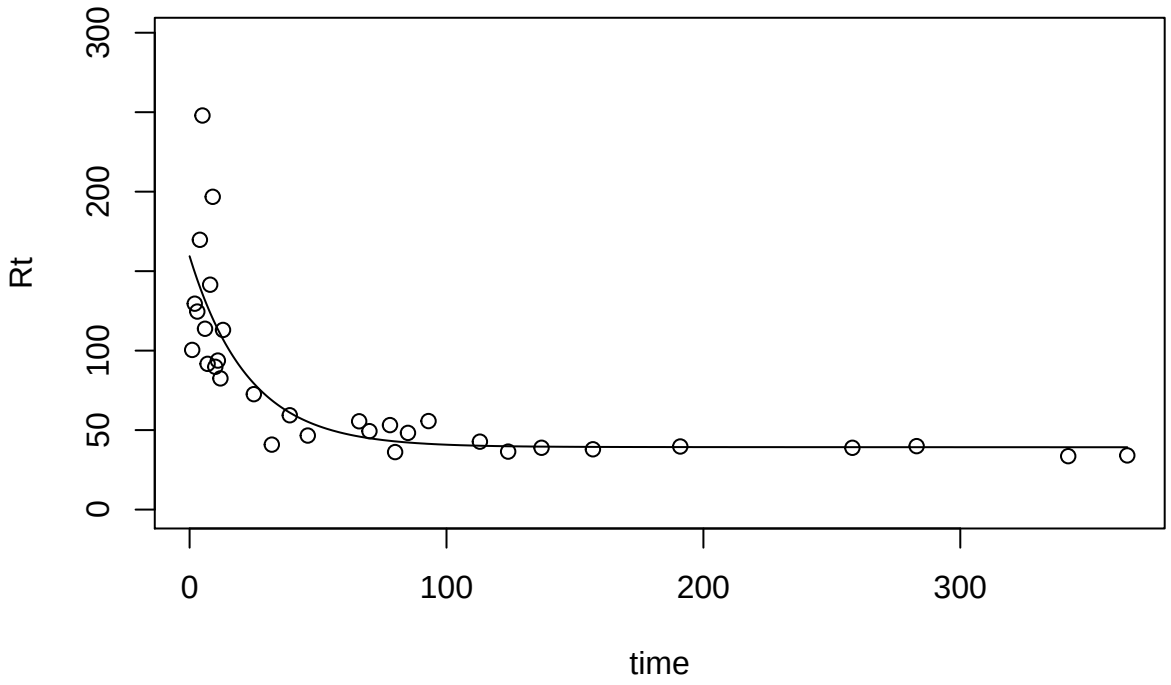
V4: Dataset Bracho2016SBB, variable control_20_15_mean, site 15, depth 20

```
## [1] "k1= 0.0439510036613616"
## [2] "k2= 1.13137275312385e-05"
## [3] "proportion of C0 in pool 1= 0.000783926724108652"
```



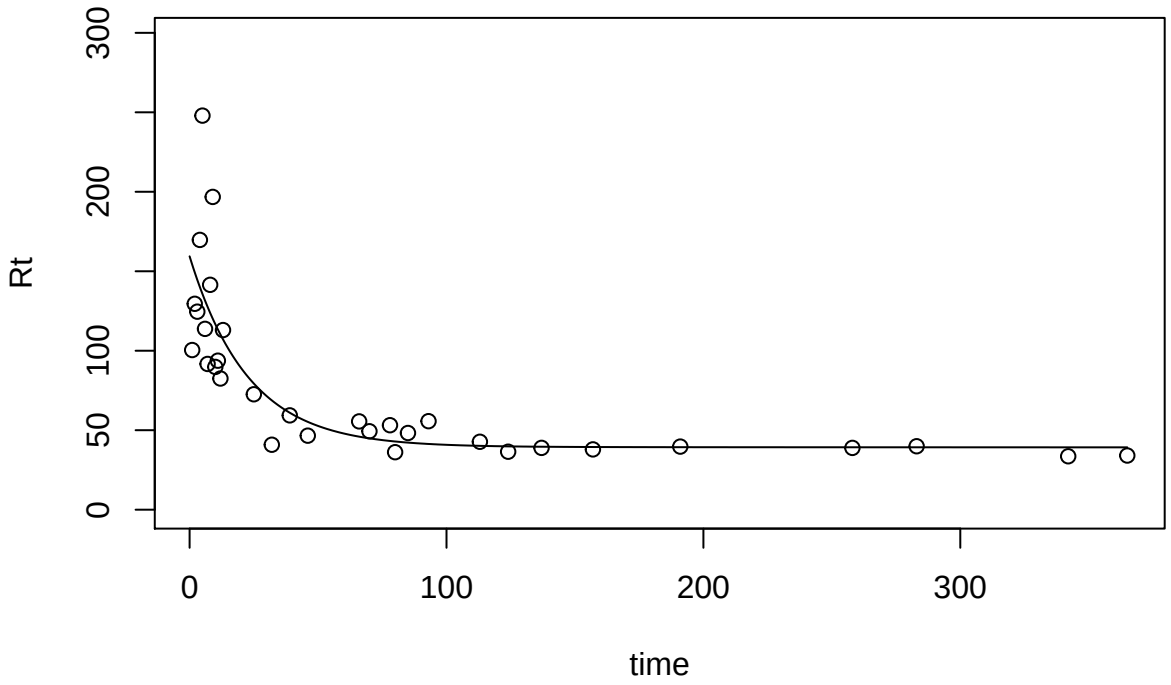

```
## [1] "AIC =  -7.571830114275"
```

```
## [1] "k1= 0.043899245164576"
## [2] "k2= 6.32107363354298e-05"
## [3] "a21= 0.820821164196925"
## [4] "a12= 0.999978210662885"
## [5] "Proportion of C0 in pool 1= 0.00581735566910335"
```

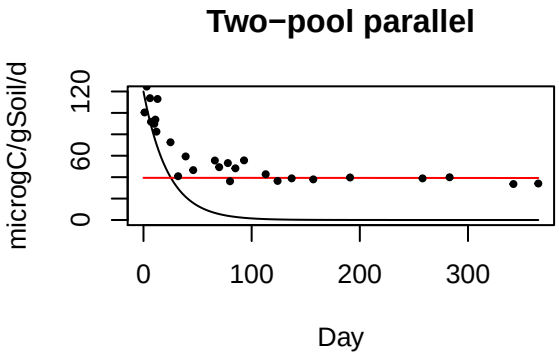


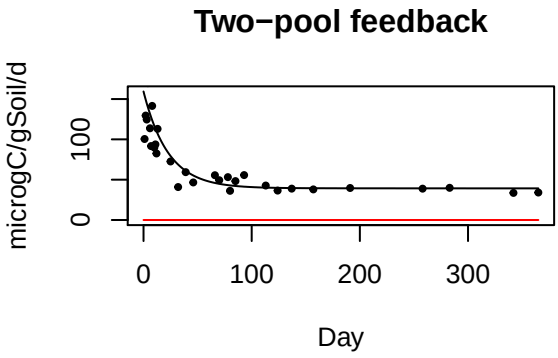

```
## [1] "AIC =  -3.57183007494485"
```

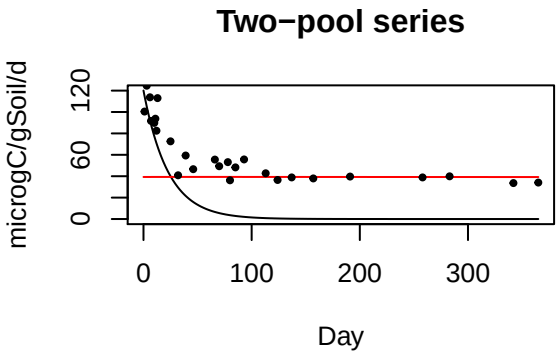
```
## [1] "k1= 0.0439513836939281"
## [2] "k2= 1.13137602855708e-05"
## [3] "a21= 0.735851808908667"
## [4] "Proportion of C0 in pool 1= 0.00296987165966861"
```




```
## [1] "AIC =  -5.57183011441464"
```



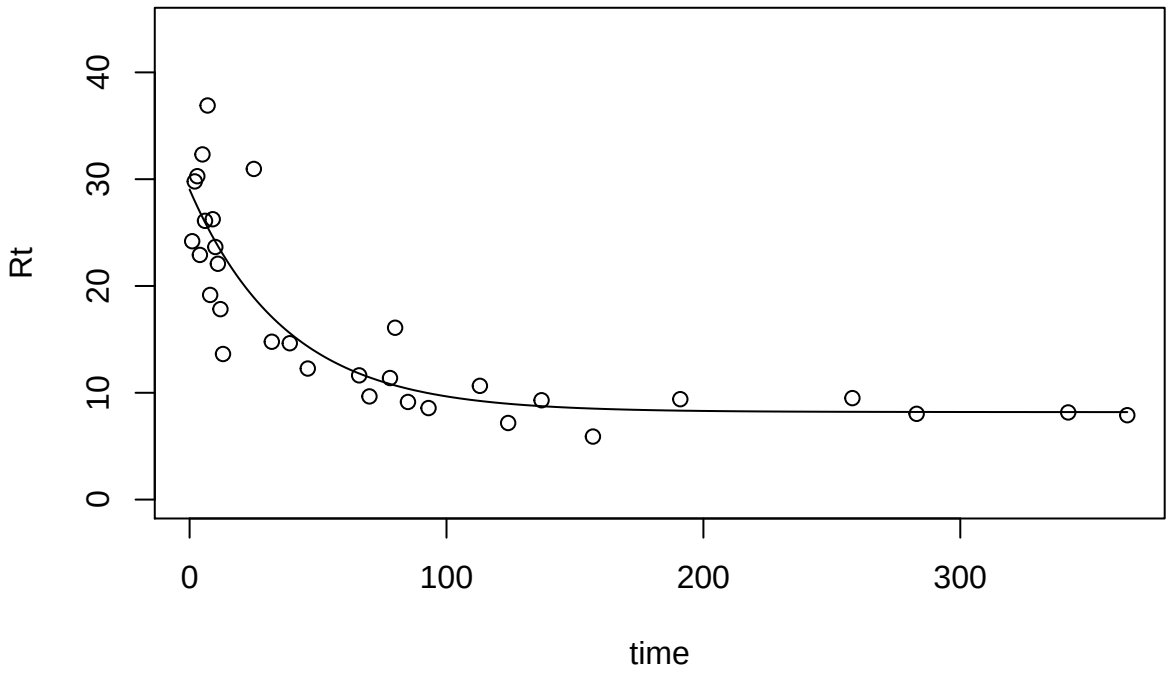




model	AIC
Two-pool parallel	-7.57
Two-pool feedback	-3.57
Two-pool series	-5.57

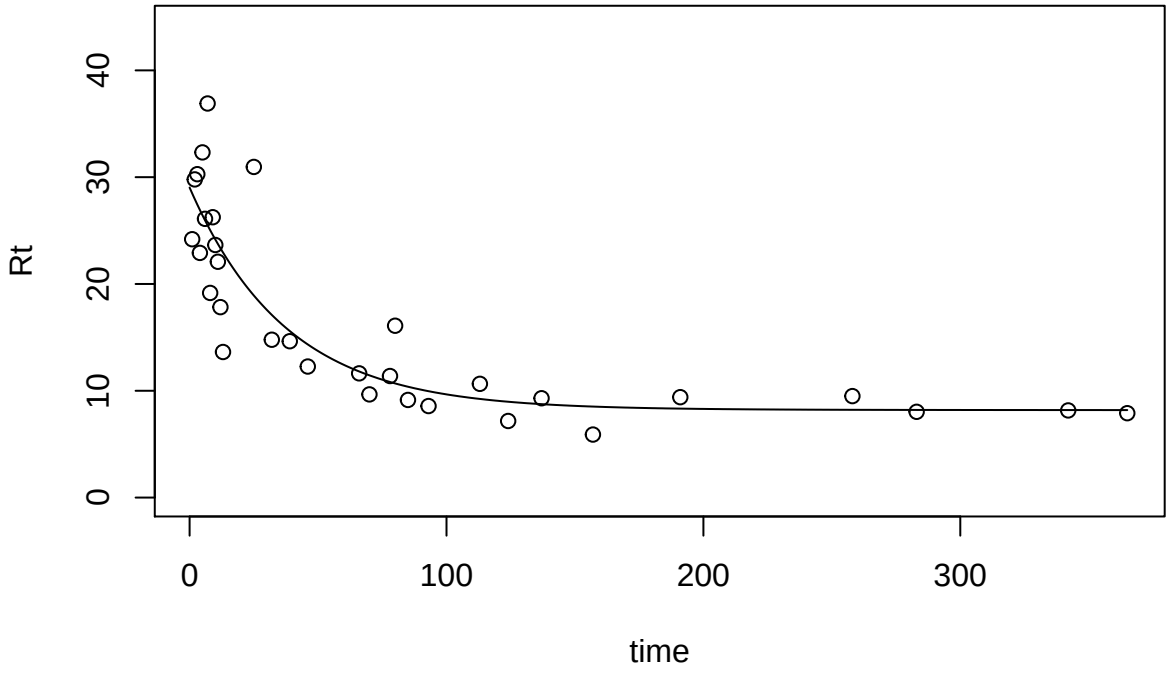
V6: Dataset Bracho2016SBB, variable control_50_15_mean, site 15, depth 50

```
## [1] "k1= 0.0265687752217546"
## [2] "k2= 4.63732354133169e-06"
## [3] "proportion of C0 in pool 1= 0.000442838060020823"
```




```
## [1] "AIC =  0.221503060532193"
```

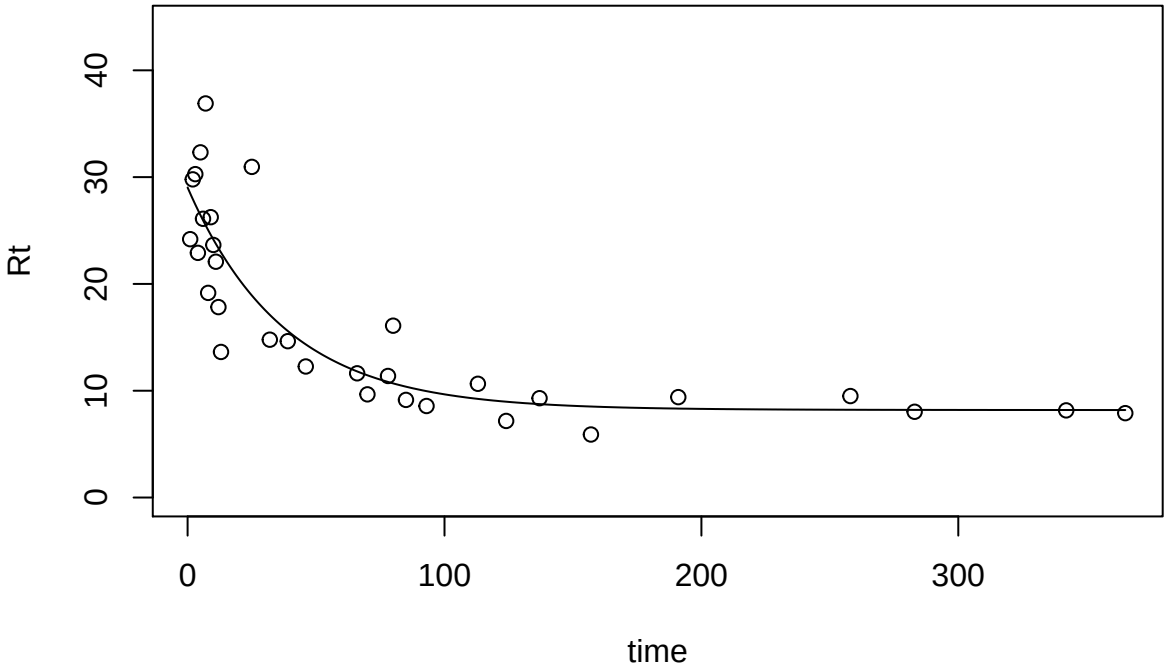
```
## [1] "k1= 0.0265720308927443"
## [2] "k2= 4.6375682986799e-06"
## [3] "a21= 0.999382727259065"
## [4] "a12= 2.29345301638872e-08"
## [5] "Proportion of C0 in pool 1= 0.999912306024313"
```



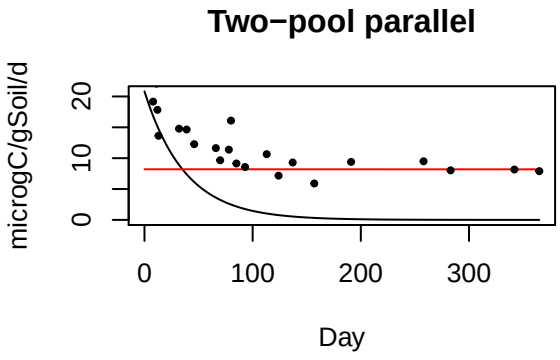

```
## [1] "AIC =  4.22150326210197"
```

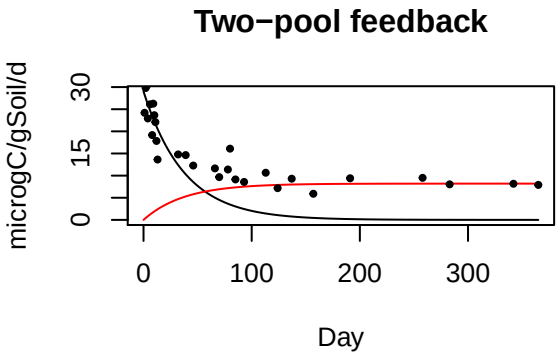
```
## [1] "k1= 0.0265698306145051"
## [2] "k2= 4.6374018827659e-06"
```

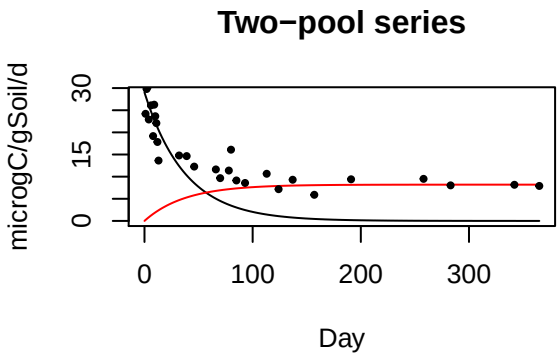
```
## [3] "a21= 0.999382557518606"
## [4] "Proportion of C0 in pool 1= 0.999629881180551"
```




```
## [1] "AIC =  2.22150326969481"
```





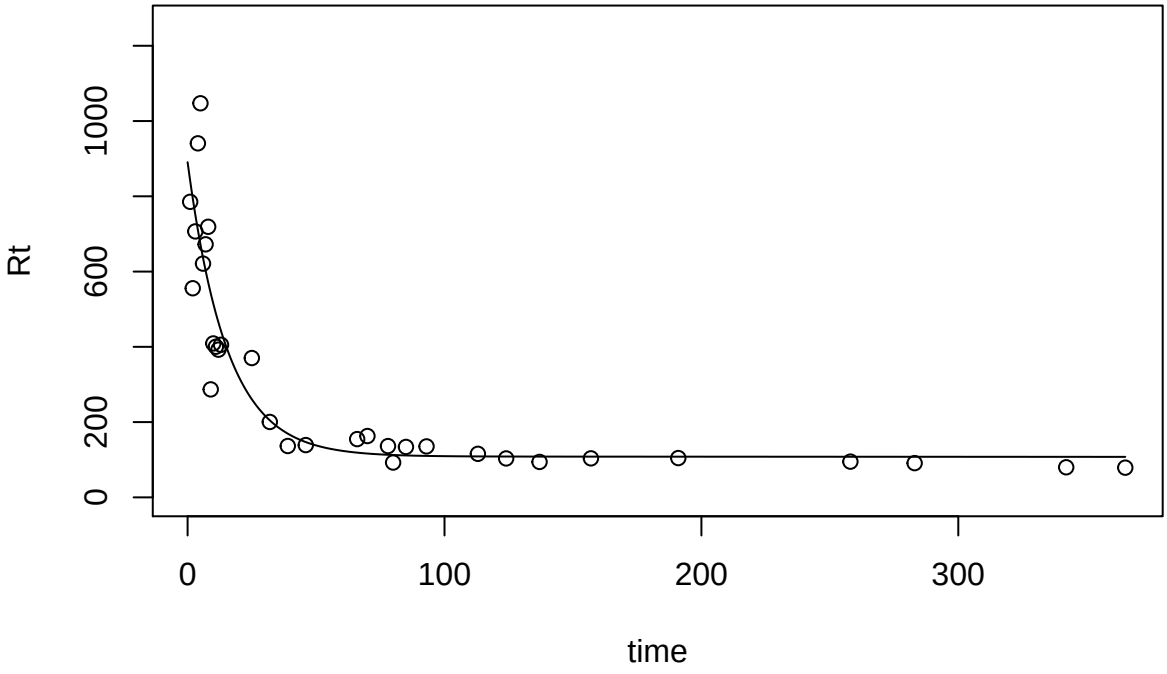


model	AIC
Two-pool parallel	0.22

model	AIC
Two-pool feedback	4.22
Two-pool series	2.22

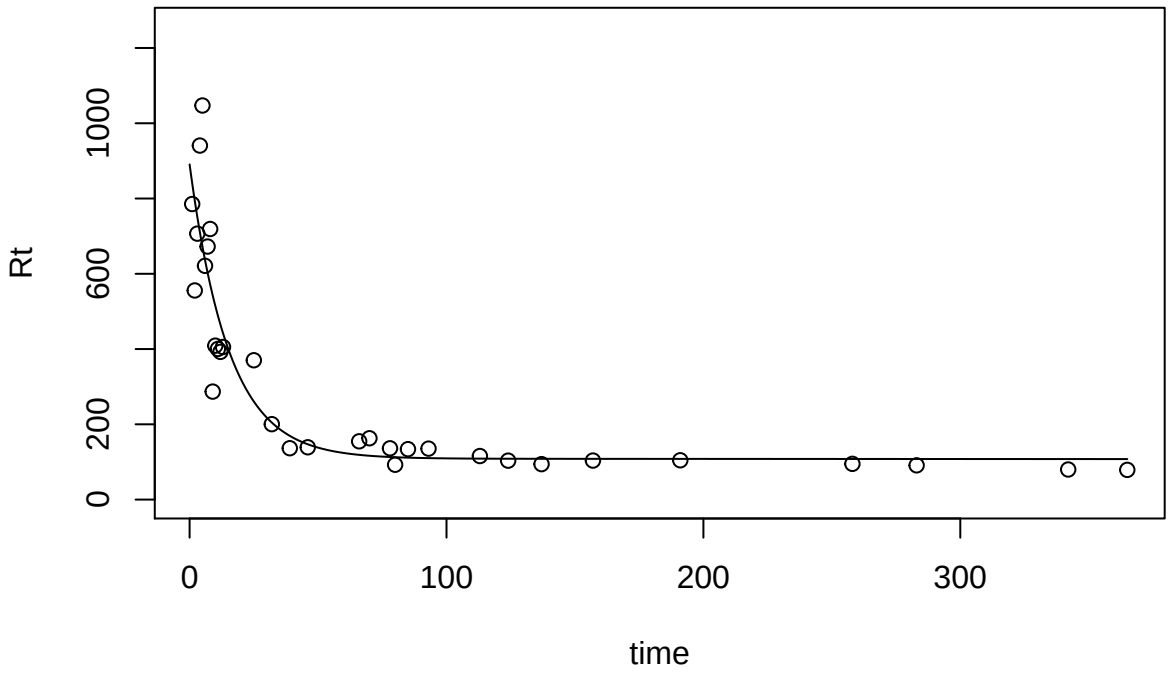
V8: Dataset Bracho2016SBB, variable warming_7.5_15_mean, site 15, depth 7.5

```
## [1] "k1= 0.06551806960121"
## [2] "k2= 2.60661943795857e-05"
## [3] "proportion of C0 in pool 1= 0.00285530627202851"
```



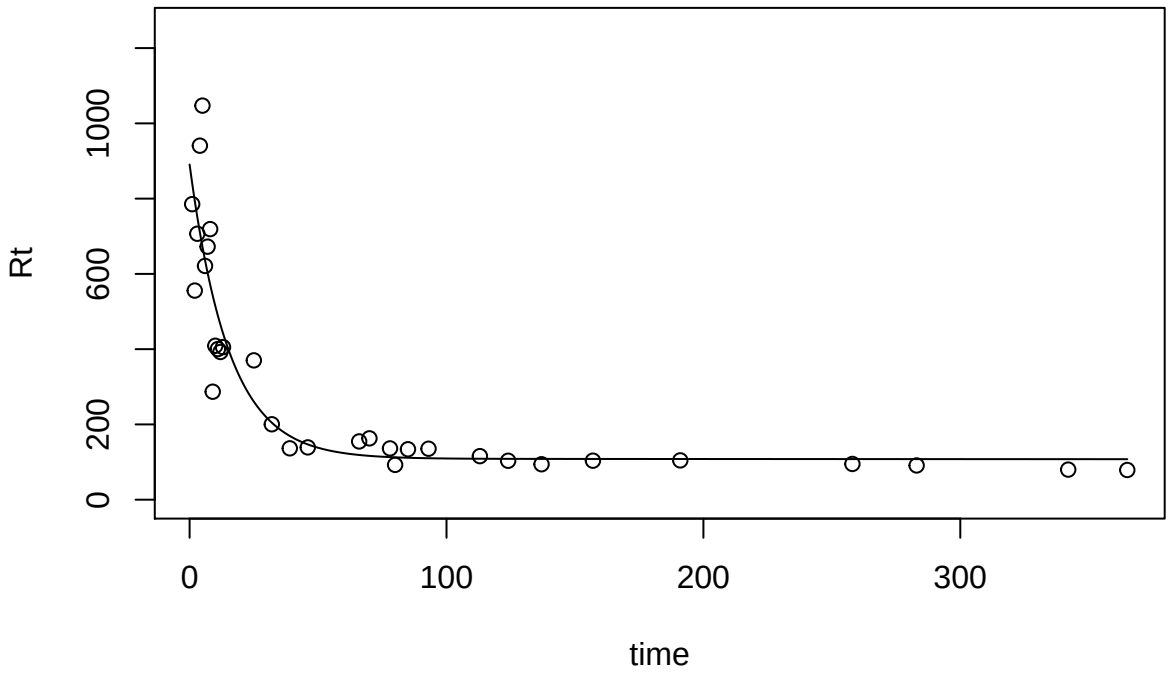

```
## [1] "AIC =  -12.8397045833618"
```

```
## [1] "k1= 0.0655180689327772"
## [2] "k2= 2.60662696638422e-05"
## [3] "a21= 0.66533941315117"
## [4] "a12= 4.36043386153884e-06"
## [5] "Proportion of C0 in pool 1= 0.00853873277156408"
```

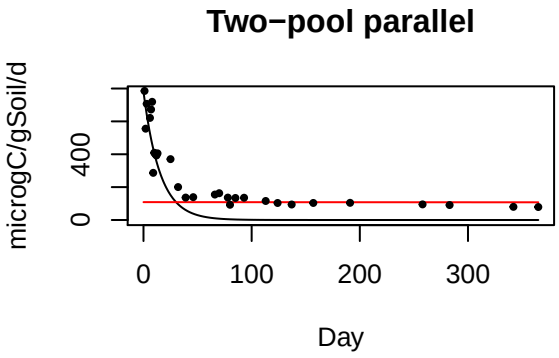


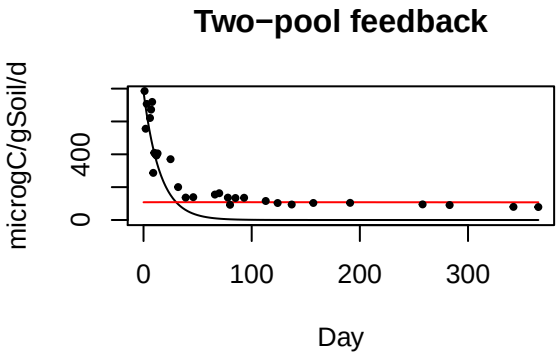

```
## [1] "AIC =  -8.8397045836095"
```

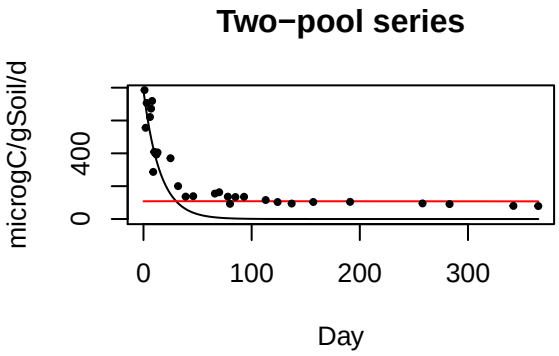
```
## [1] "k1= 0.0655180631978325"
## [2] "k2= 2.60661924181109e-05"
## [3] "a21= 0.70202317998001"
## [4] "Proportion of C0 in pool 1= 0.00959131344315284"
```




```
## [1] "AIC =  -10.8397045834347"
```



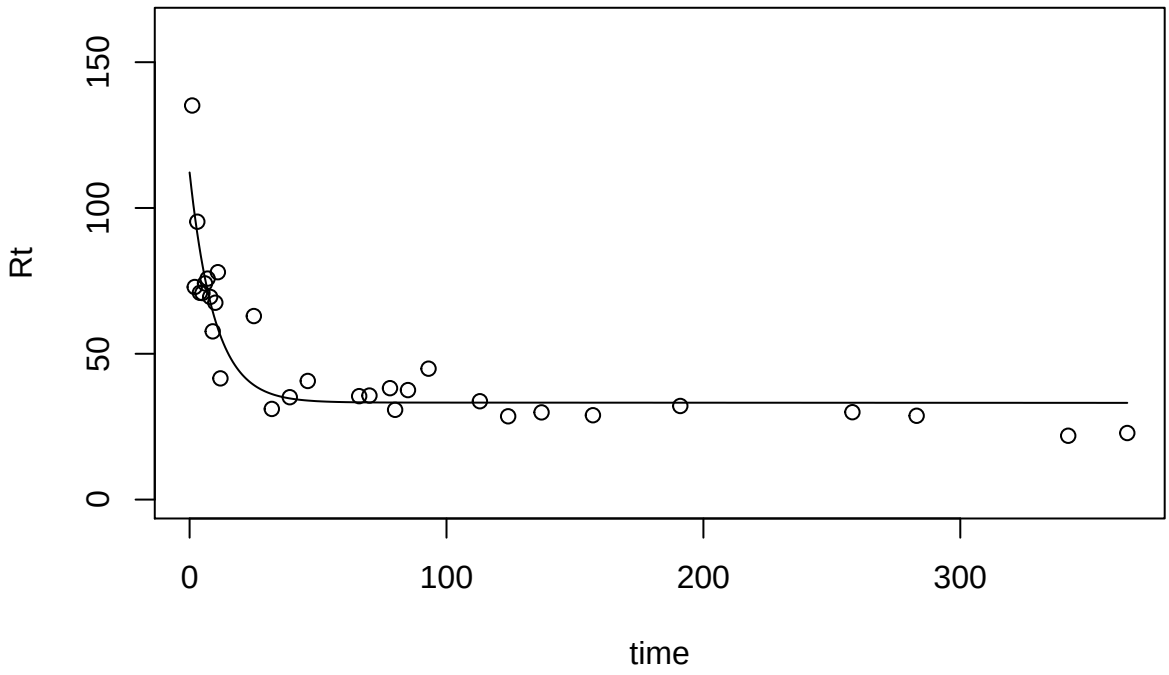




model	AIC
Two-pool parallel	-12.84
Two-pool feedback	-8.84
Two-pool series	-10.84

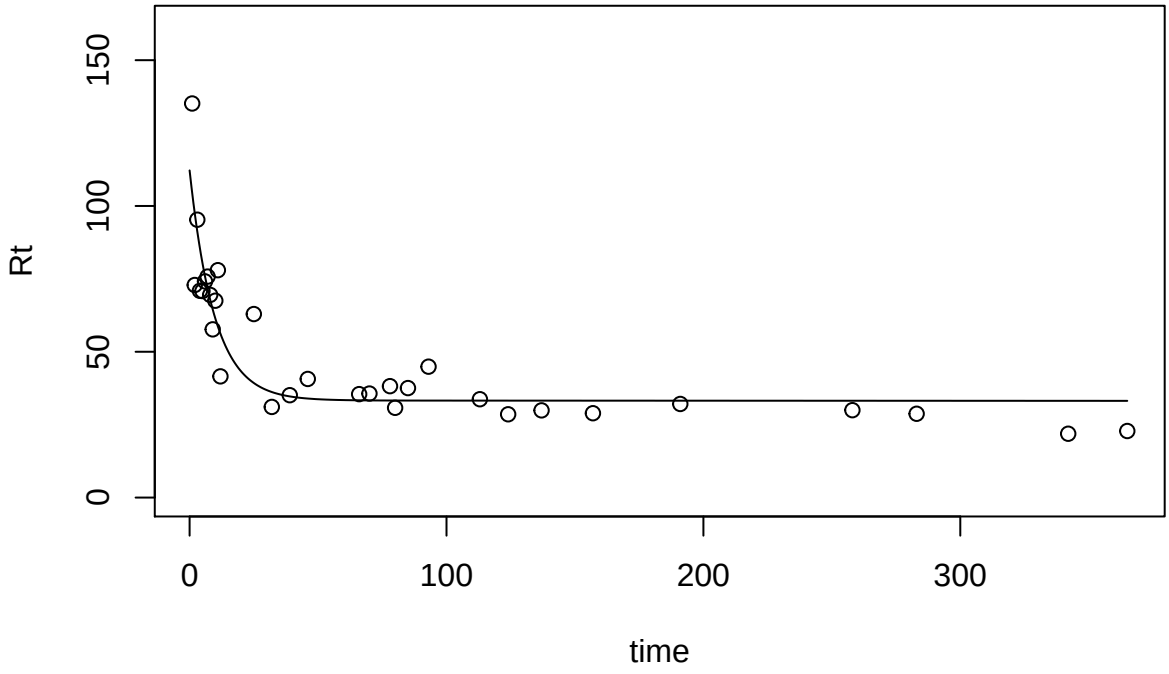
V10: Dataset Bracho2016SBB, variable warming_20_15_mean, site 15, depth 20

```
## [1] "k1= 0.103011006343888"
## [2] "k2= 9.55835079732912e-06"
## [3] "proportion of C0 in pool 1= 0.000219918334904312"
```




```
## [1] "AIC =  -3.56696731882473"
```

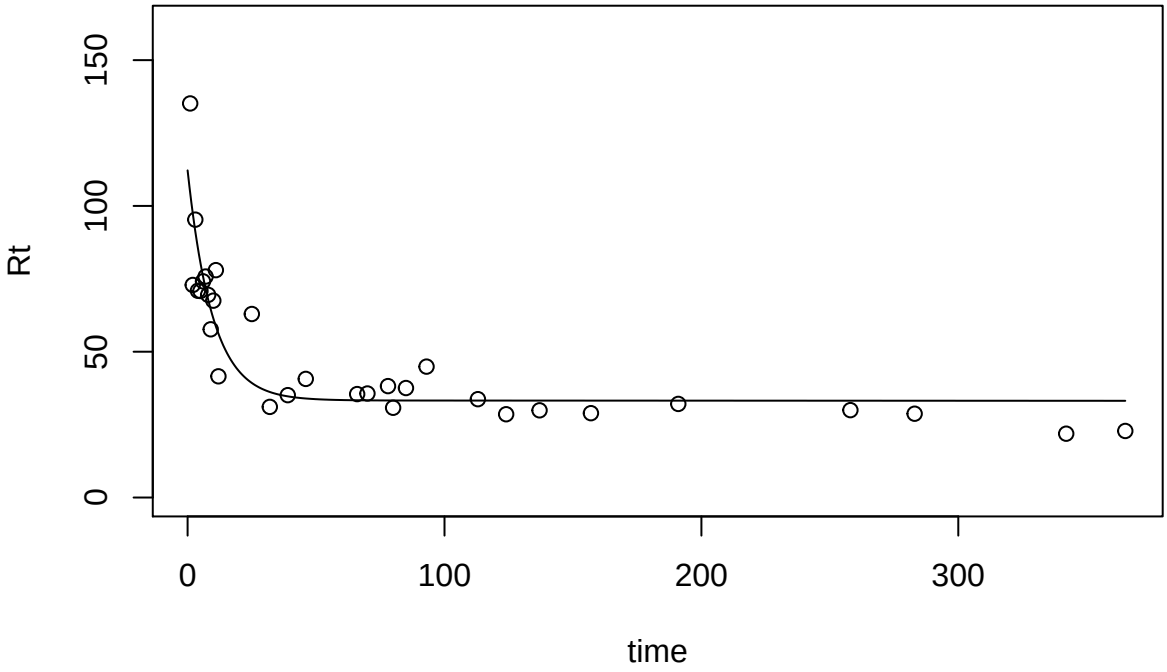
```
## [1] "k1= 0.102855327901244"
## [2] "k2= 0.000171378229613133"
## [3] "a21= 0.944157274539601"
## [4] "a12= 0.999980006719602"
## [5] "Proportion of C0 in pool 1= 0.00560741464856418"
```



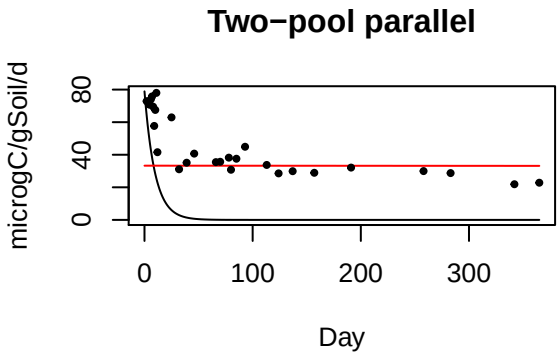

```
## [1] "AIC =  0.433031015108229"
```

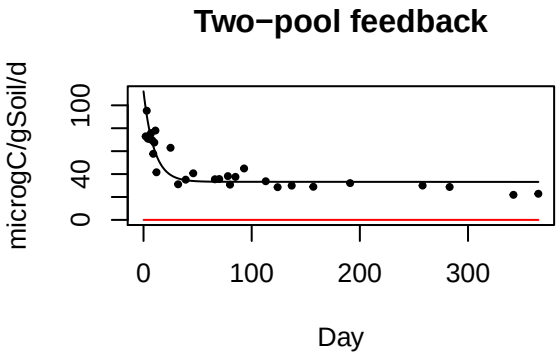
```
## [1] "k1= 0.103022970877232"
## [2] "k2= 9.55863879031544e-06"
```

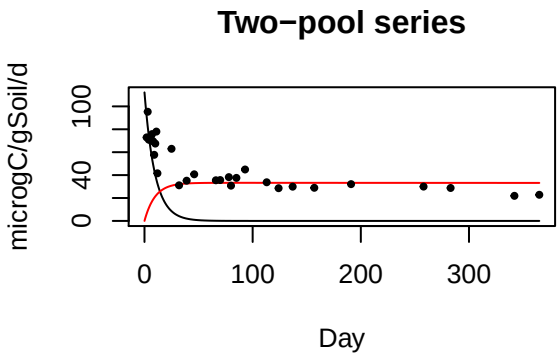
```
## [3] "a21= 0.999687309126747"
## [4] "Proportion of C0 in pool 1= 0.999863661073006"
```




```
## [1] "AIC =  -1.56696556496821"
```





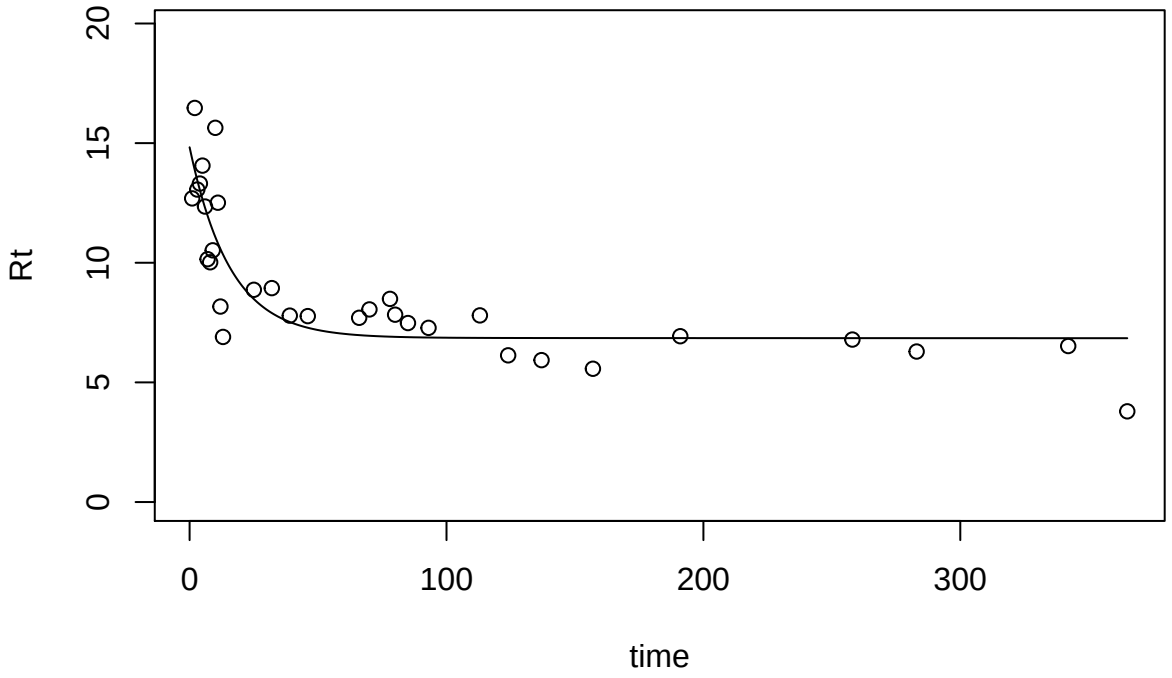


model	AIC
Two-pool parallel	-3.57

model	AIC
Two-pool feedback	0.43
Two-pool series	-1.57

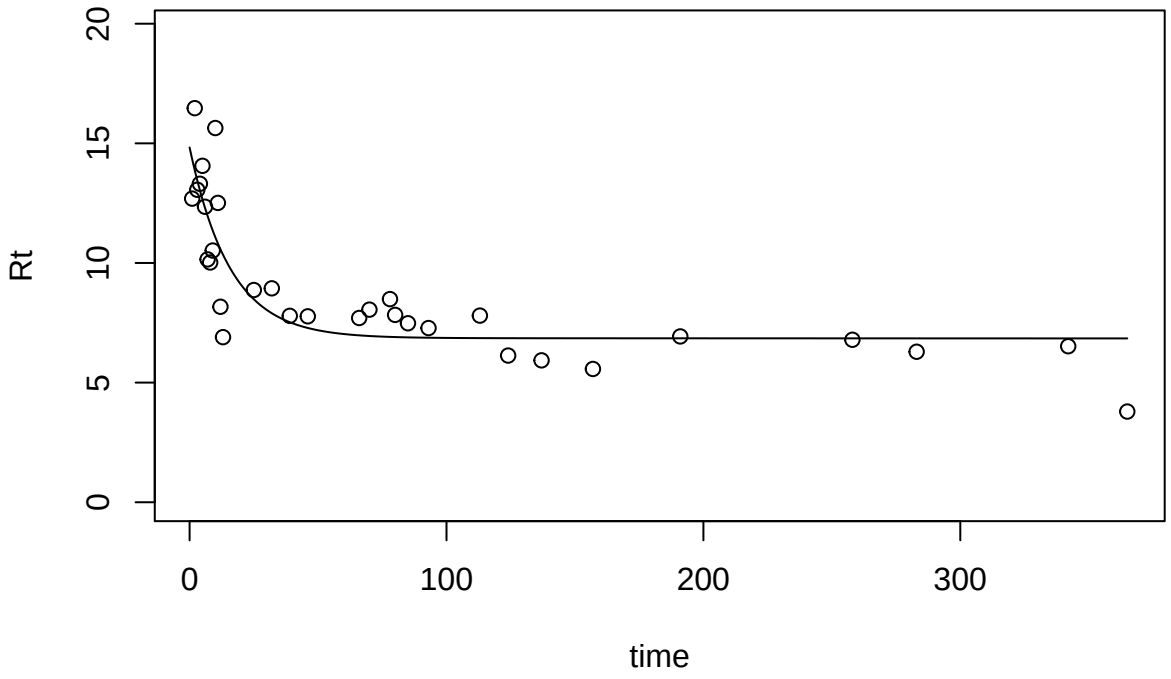
V12: Dataset Bracho2016SBB, variable warming_50_15_mean, site 15, depth 50

```
## [1] "k1= 0.0635329704683749"
## [2] "k2= 3.8738889467918e-06"
## [3] "proportion of C0 in pool 1= 7.087612600154e-05"
```



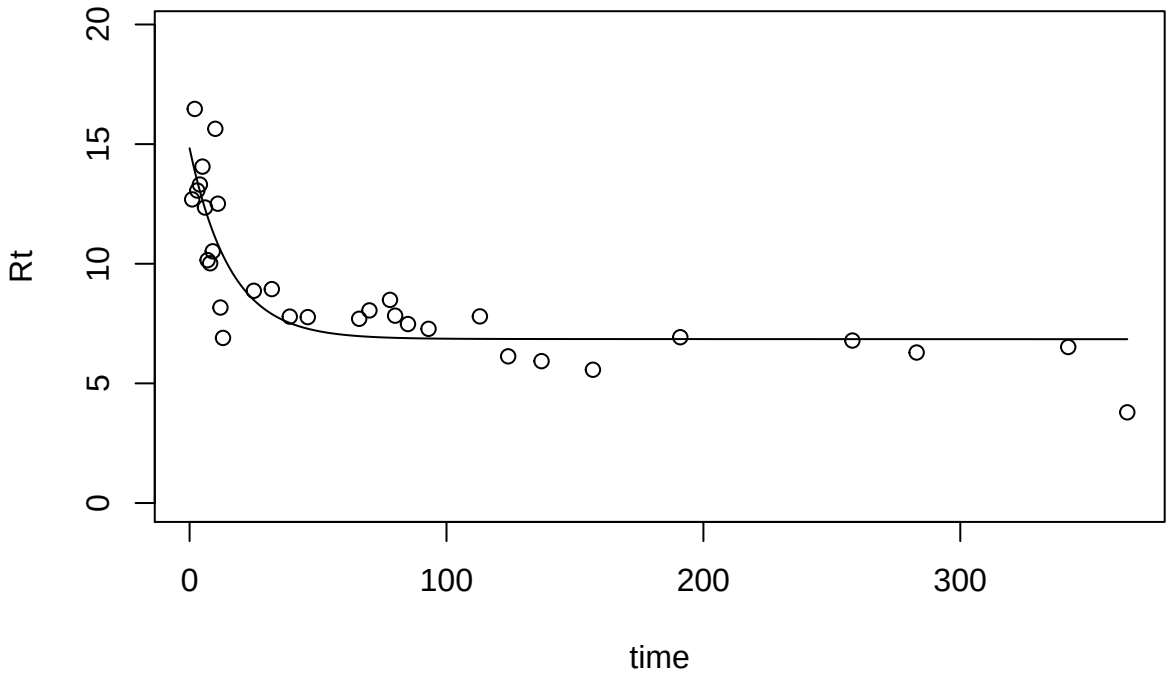

```
## [1] "AIC =  4.15656136207627"
```

```
## [1] "k1= 0.0635472814909347"
## [2] "k2= 3.87419753513117e-06"
## [3] "a21= 6.10877250469266e-05"
## [4] "a12= 0.999999508042425"
## [5] "Proportion of C0 in pool 1= 0.000131829752232526"
```



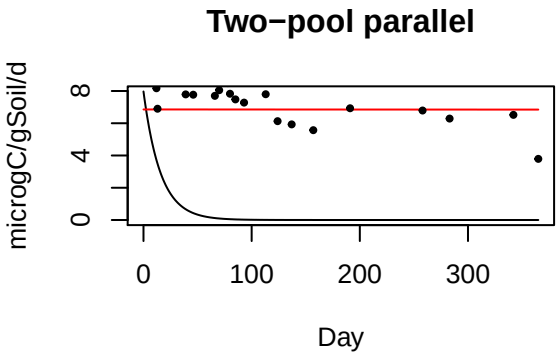

```
## [1] "AIC =  8.15656110037191"
```

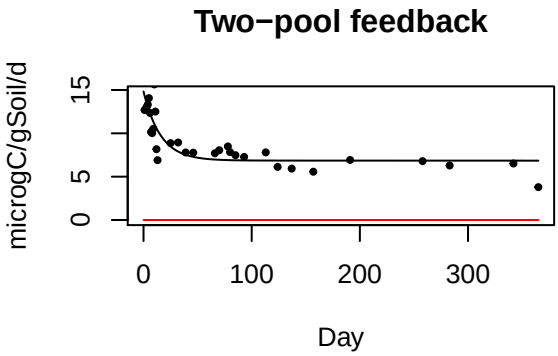
```
## [1] "k1= 0.0635493076496213"
## [2] "k2= 3.87397131835409e-06"
## [3] "a21= 1.90618772455409e-05"
## [4] "Proportion of C0 in pool 1= 7.08636685542441e-05"
```

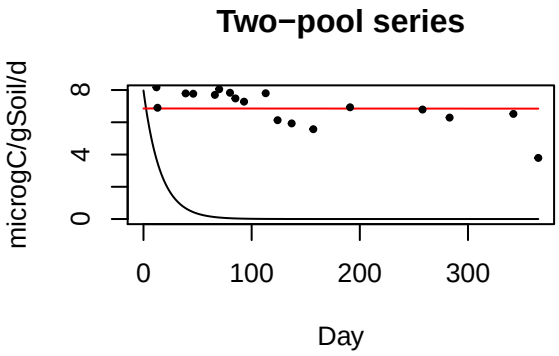



```
## [1] "AIC =  6.15656136480812"
```

```
## [1] 5e-03 1e-05 1e-01 1e-02
```





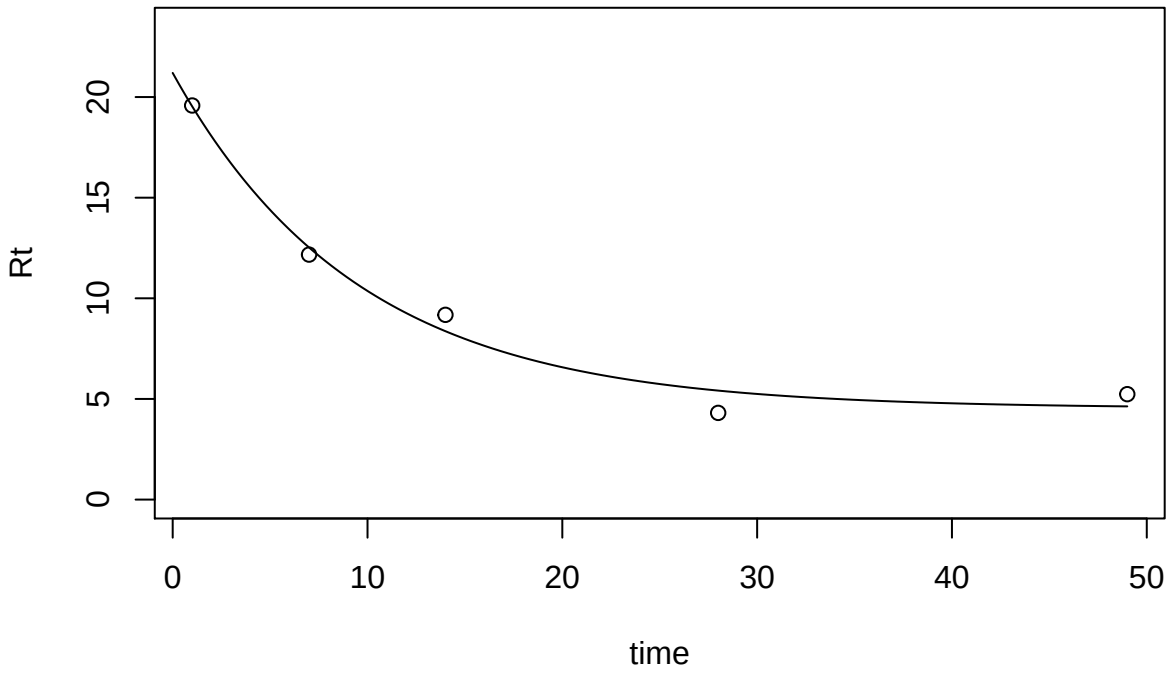


model	AIC
Two-pool parallel	4.16
Two-pool feedback	8.16
Two-pool series	6.16

V2: Dataset BradleyCook2016CCR, variable SG_40_4.5, site 4.5, depth 10

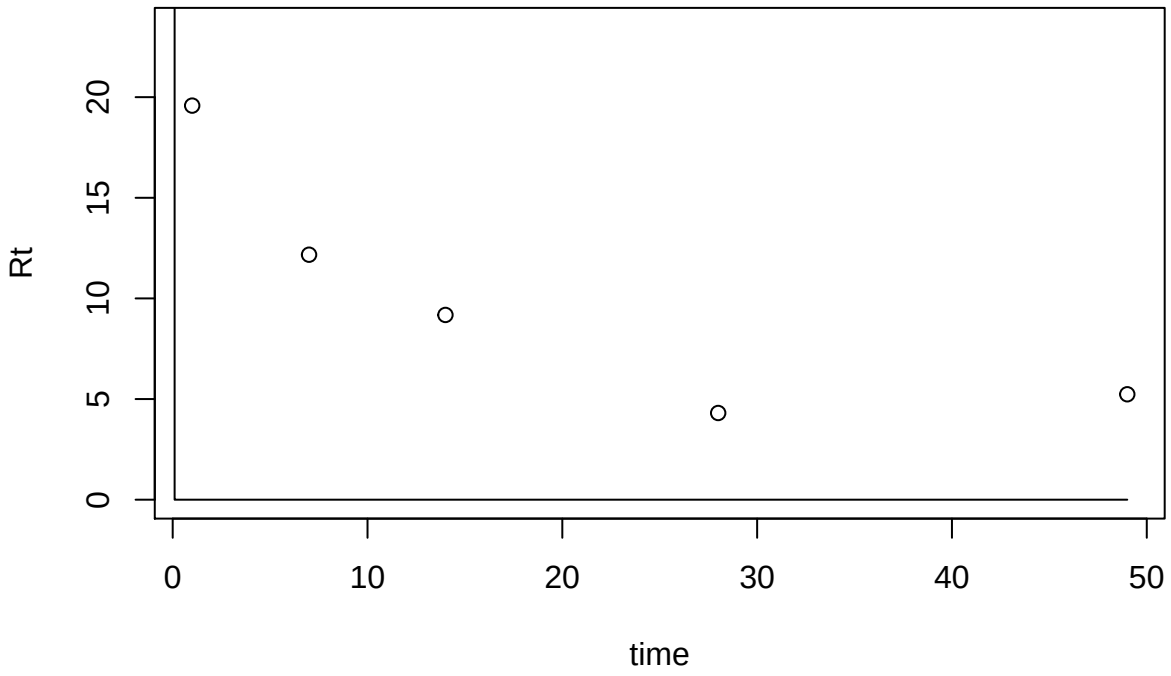
Time series is too short for two-pool feedback model and two-pool series model

```
## [1] "k1= 0.104997090626352"
## [2] "k2= 7.08692439393919e-06"
## [3] "proportion of C0 in pool 1= 0.000247994142501207"
```




```
## [1] "AIC =  7.48103440165802"
```

```
## [1] "k1= 624441743974730"
## [2] "k2= 7.98180480298763e+59"
## [3] "a21= 2.93568513078935e-05"
## [4] "Proportion of C0 in pool 1= 2.26761313651958e-05"
```

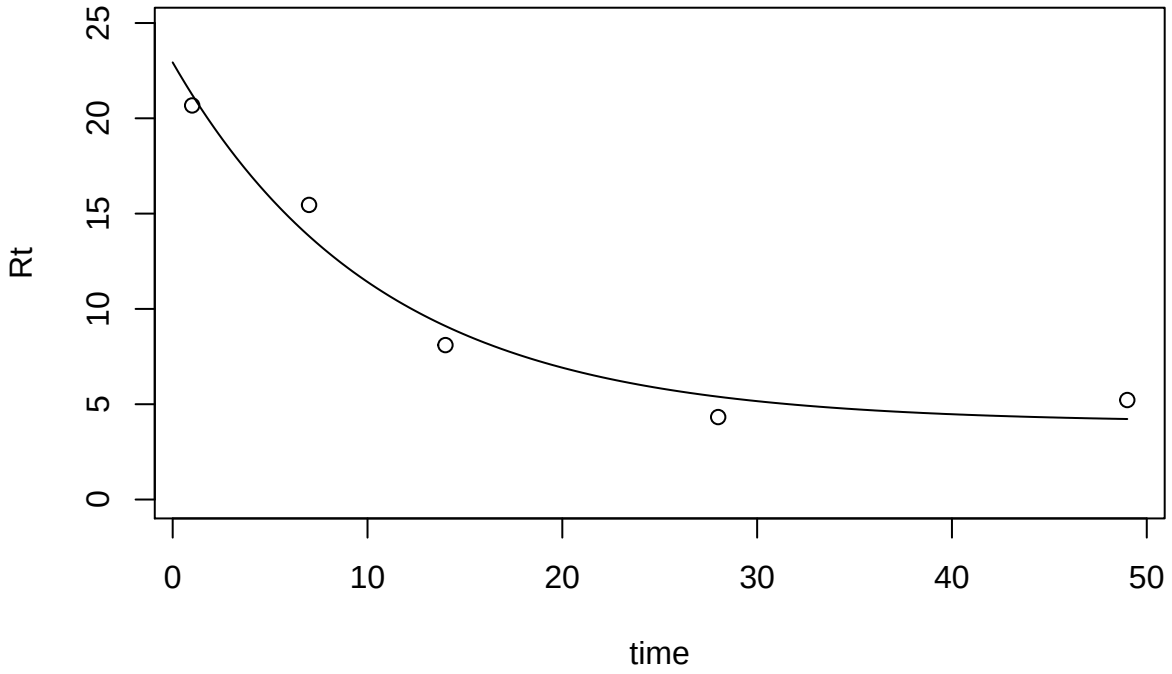



```
## [1] "AIC =  -1.7709303313527"
```

V3: Dataset BradleyCook2016CCR, variable SG_60_4.5, site 4.5, depth 10

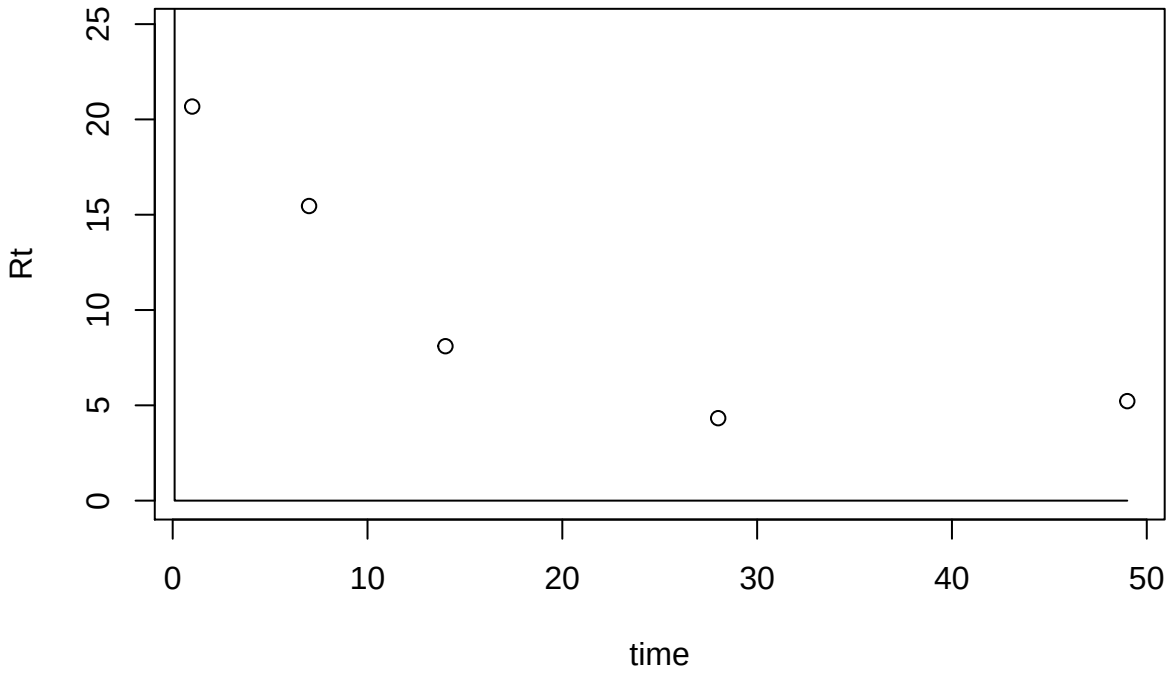
```
## [1] "k1= 0.094032830727244"
```

```
## [2] "k2= 6.30850656069119e-06"
## [3] "proportion of C0 in pool 1= 0.000314009281464134"
```




```
## [1] "AIC =  5.5942199356848"
```

```
## [1] "k1= 256404041082538368"
## [2] "k2= 7.13779334141958e+69"
## [3] "a21= 0.999975801526222"
## [4] "Proportion of C0 in pool 1= 0.999972262182771"
```

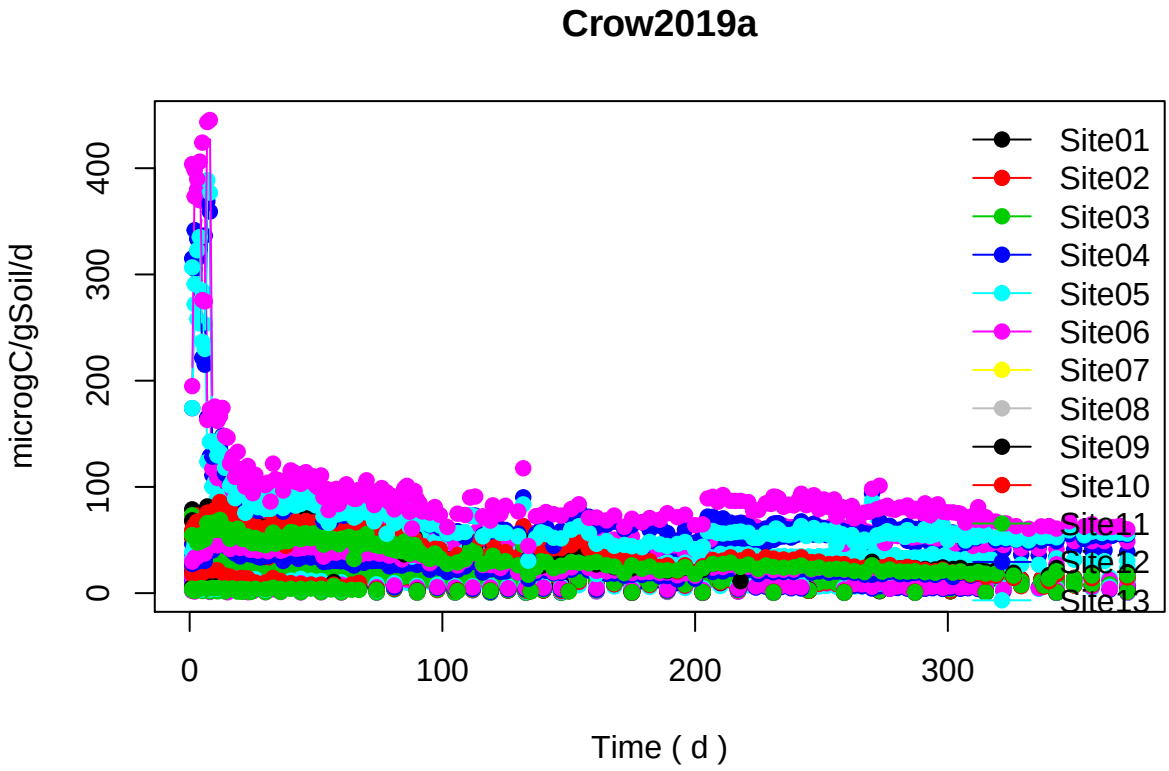



```
## [1] "AIC =  -2.09443501446917"
```

—>

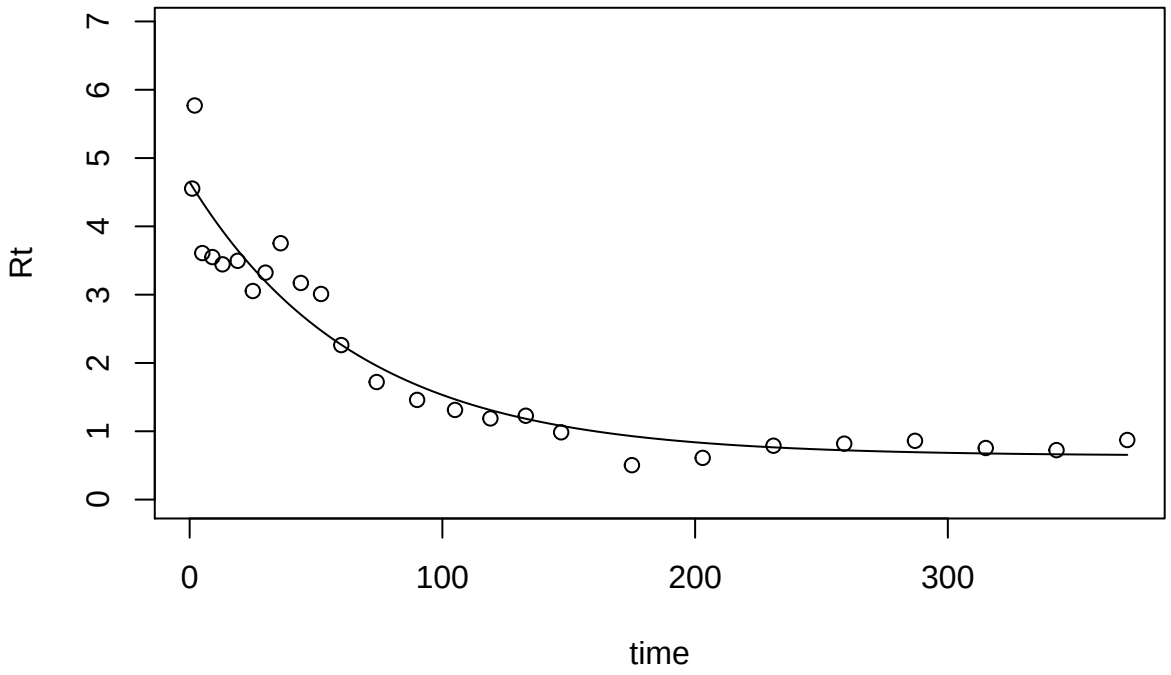
Dataset Crow2019a

A dataset with 79 variables of 25g oven-dry equivalent sample of air-dried soil was rewetted to 60% water holding capacity, placed into a 610 mL airtight container at a controlled temperature. Soils were sampled on different days depending on the amount of CO2 acumulating to avoid concentration over 7K ppm. After sampling, headspace was purged, caps resealed, intitial concentration taken, then left to accumulate. A subset (sites 67-78) were never air-dried and correspond to sites 34-36, 46-54.



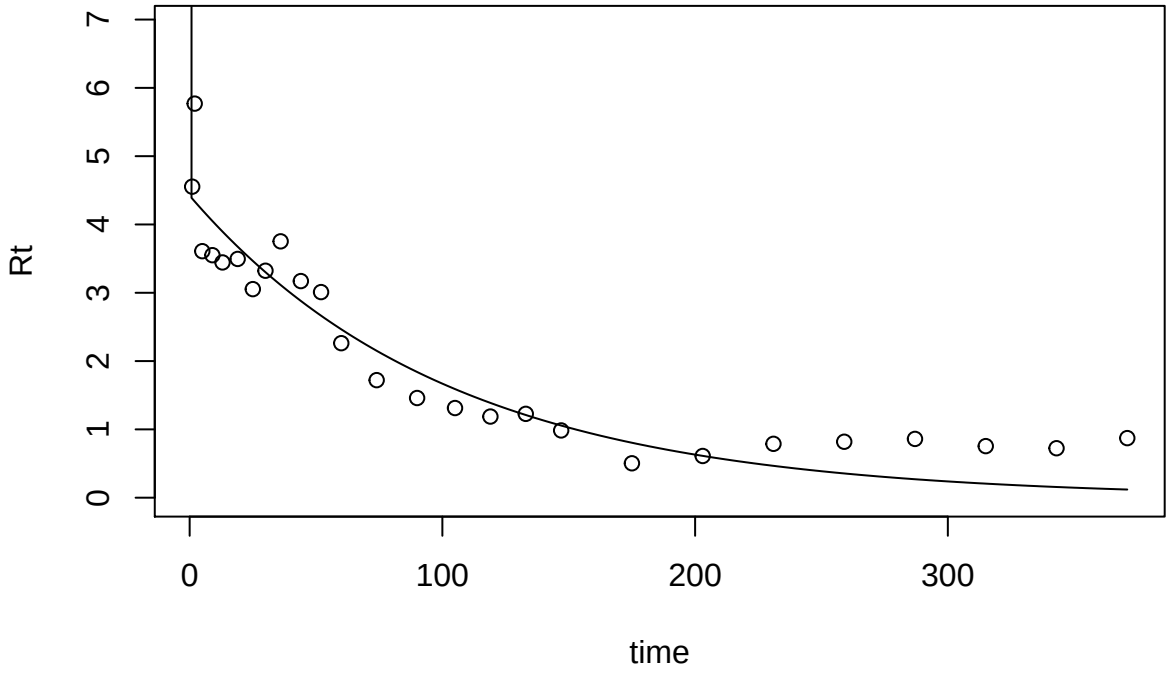
V2: Dataset Crow2019a, variable Site01, site 1_Organic Cropland Mollisol

```
## [1] "k1= 0.0150257373212587"
## [2] "k2= 3.81987783103312e-06"
## [3] "proportion of C0 in pool 1= 0.00158702946454525"
```




```
## [1] "AIC =  9.53739515319199"
```

```
## [1] "k1= 1.00959144452113e+99"
## [2] "k2= 0.00973994453440852"
## [3] "a21= 2.58462888792499e-05"
## [4] "Proportion of C0 in pool 1= 0.997323406774787"
```

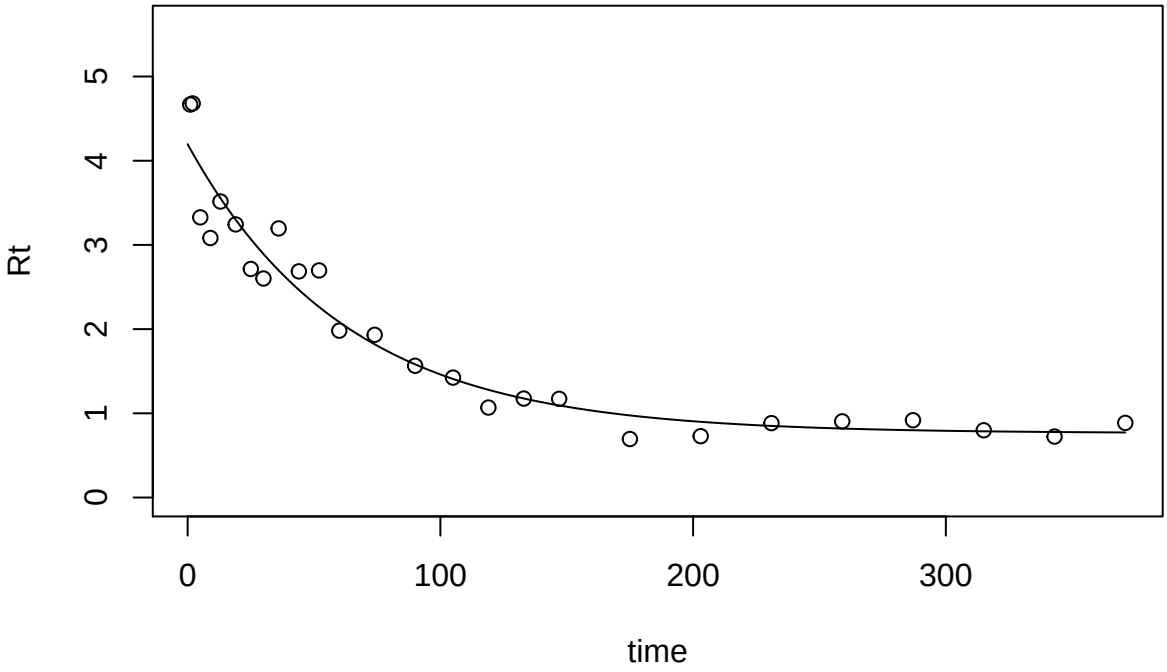



```
## [1] "AIC =  10.8803138822477"
```

V3: Dataset Crow2019a, variable Site02, site 2_Organic Cropland_Mollisol

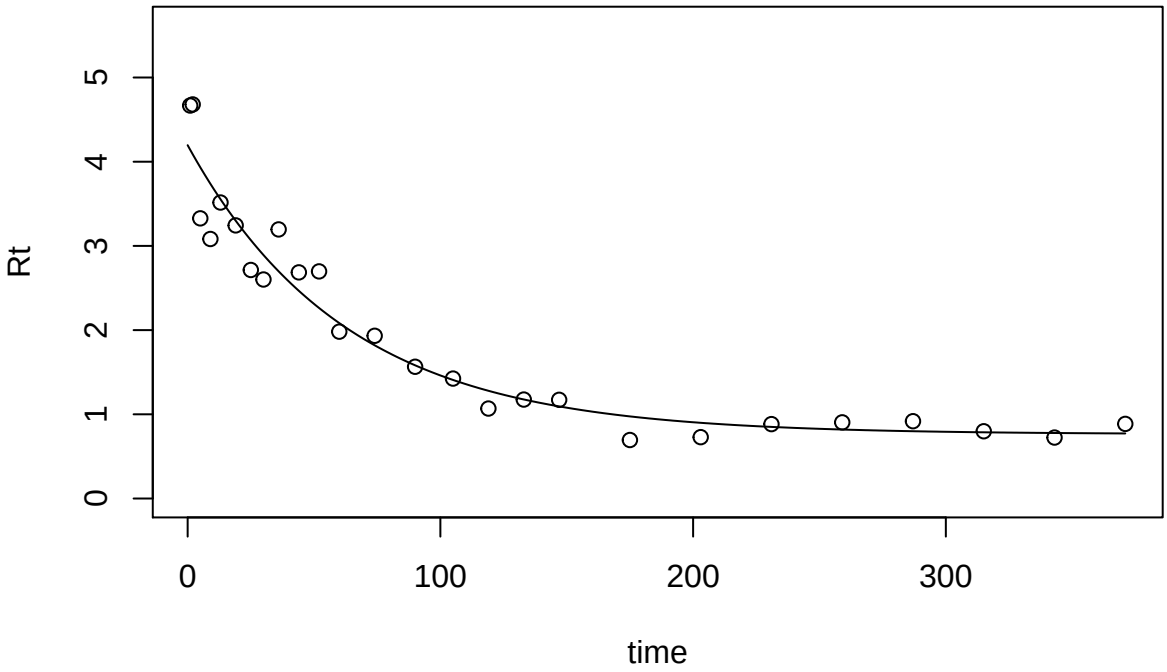
```
## [1] "k1= 0.0159365661526237"
```

```
## [2] "k2= 4.84703613524489e-06"
## [3] "proportion of C0 in pool 1= 0.00136272901335716"
```



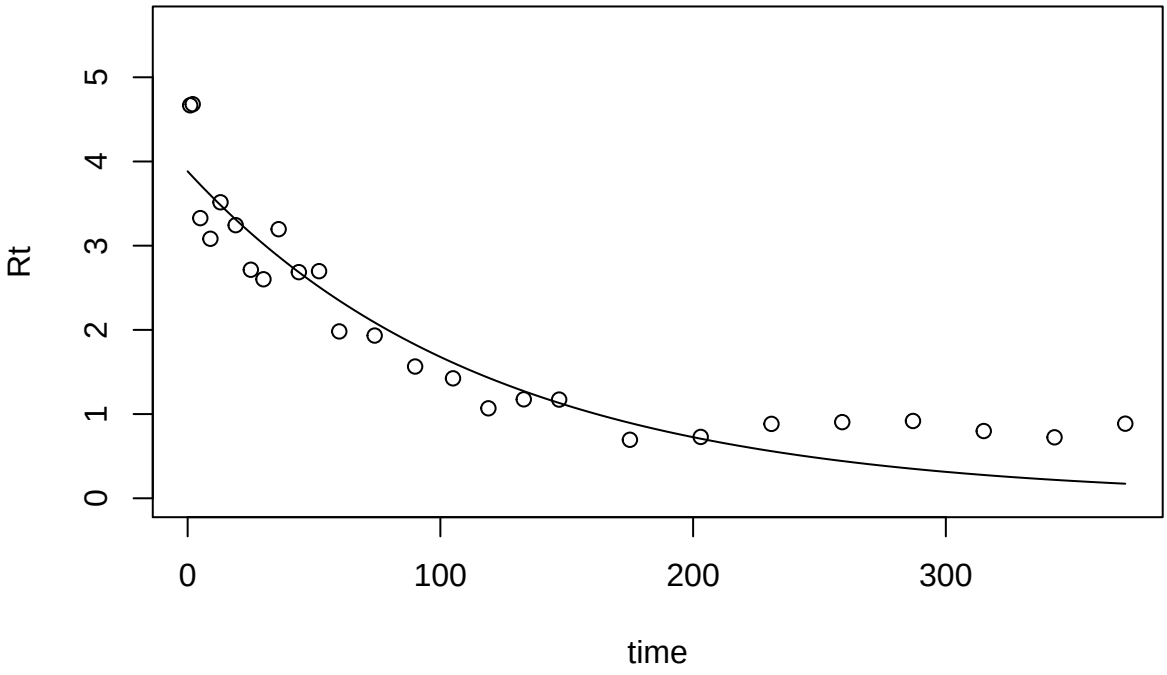

```
## [1] "AIC =  10.8132614855341"
```

```
## [1] "k1= 0.0159235486417974"
## [2] "k2= 1.78640469473323e-05"
## [3] "a21= 0.728470740614785"
## [4] "a12= 0.999970240604666"
## [5] "Proportion of C0 in pool 1= 0.00614220995299819"
```




```
## [1] "AIC =  14.8132614855263"
```

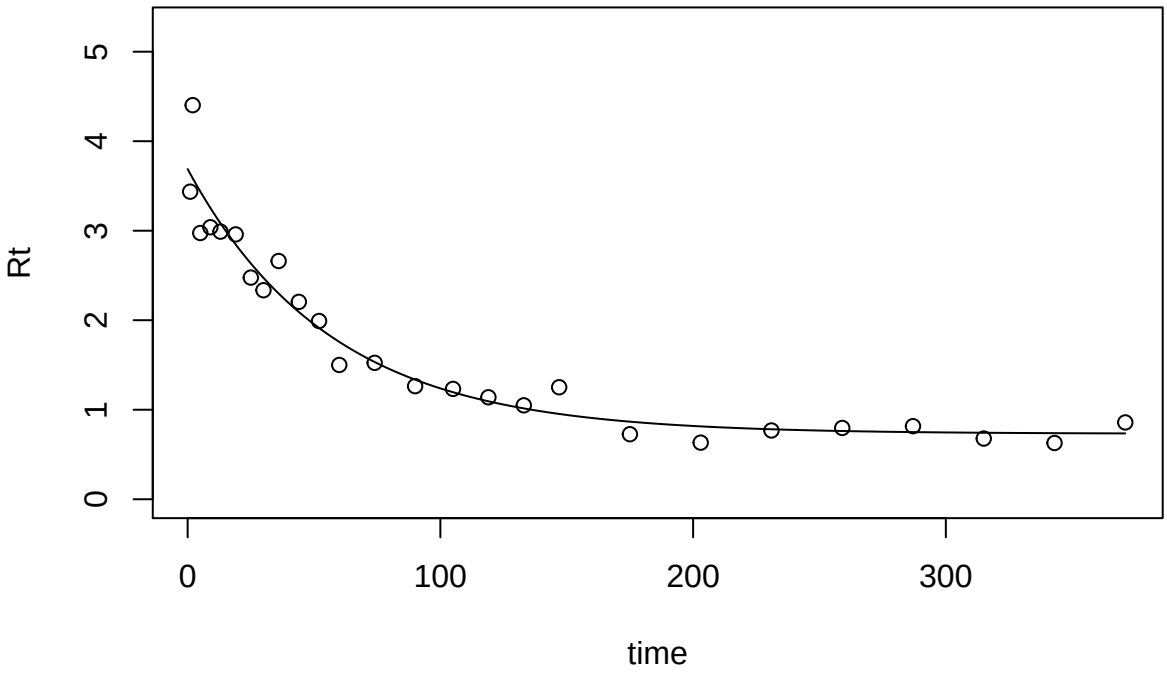
```
## [1] "k1= 5.16635298874617e-44"
## [2] "k2= 0.00838618098430706"
## [3] "a21= 2.62560313074589e-05"
## [4] "Proportion of C0 in pool 1= 0.997069507209221"
```




```
## [1] "AIC =  11.5229222887285"
```

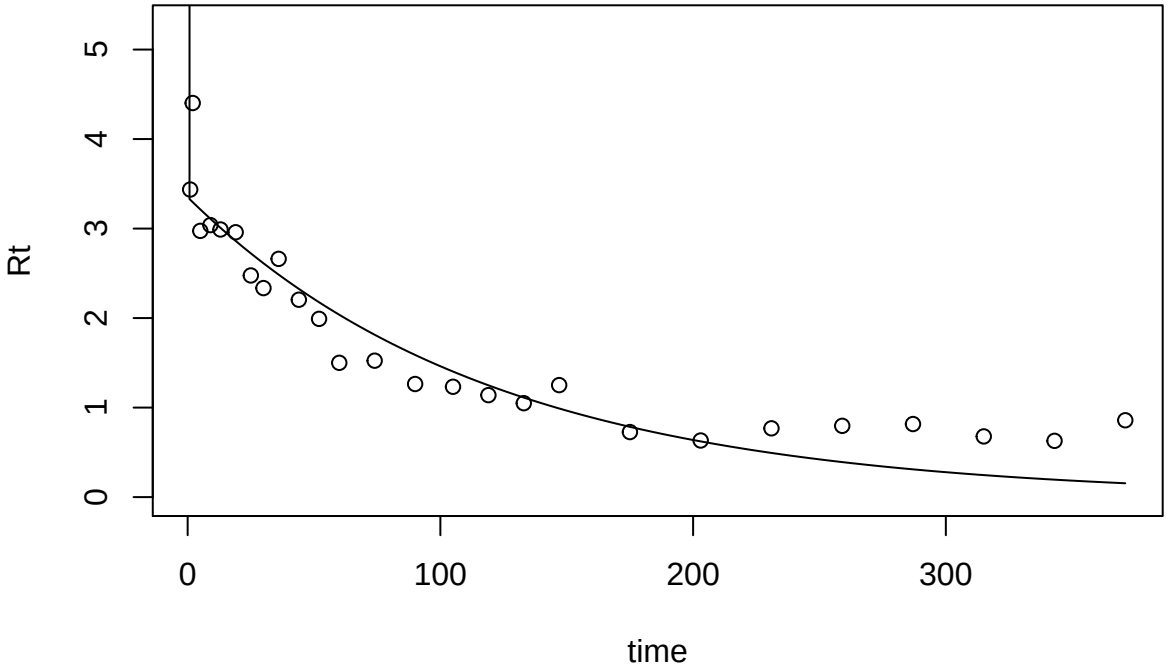
V4: Dataset Crow2019a, variable Site03, site 3_Organic Cropland_Mollisol

```
## [1] "k1= 0.0176431267362942"
## [2] "k2= 4.85659912194482e-06"
## [3] "proportion of C0 in pool 1= 0.00110947008962126"
```



```
## [1] "AIC =  11.7863749784639"
```

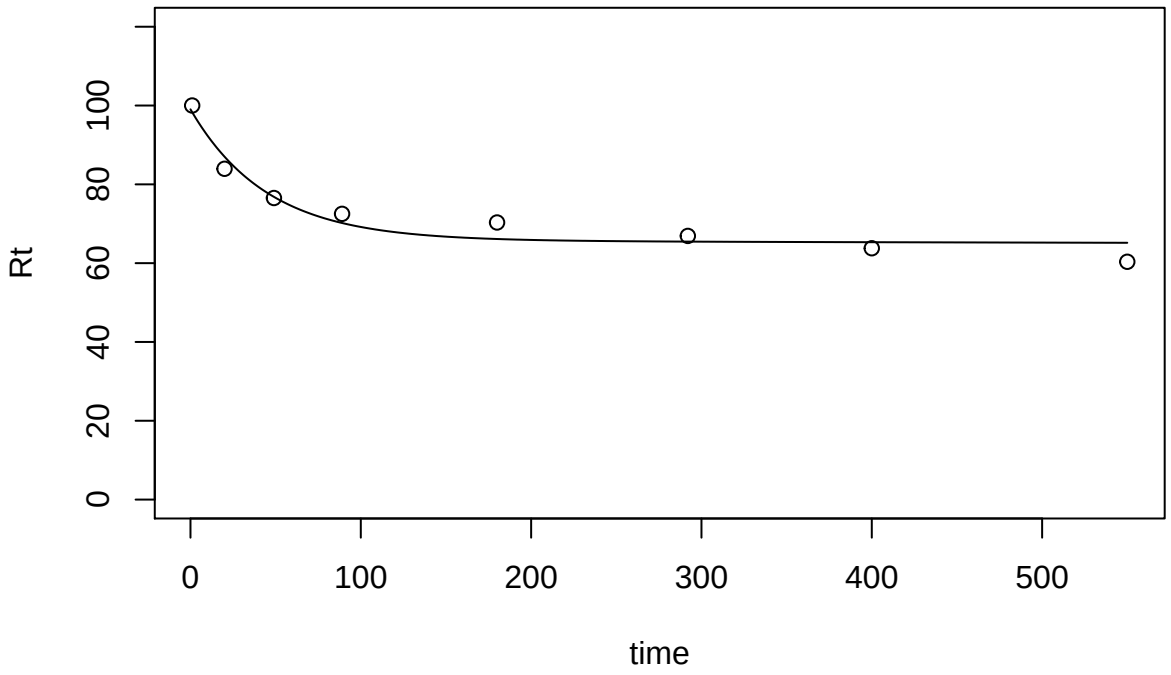
```
## [1] "k1= 75.5280783507886"
## [2] "k2= 0.00829263327650589"
## [3] "a21= 4.27636273861998e-05"
## [4] "Proportion of C0 in pool 1= 0.997367052730472"
```




```
## [1] "AIC =  12.016648654126"
```

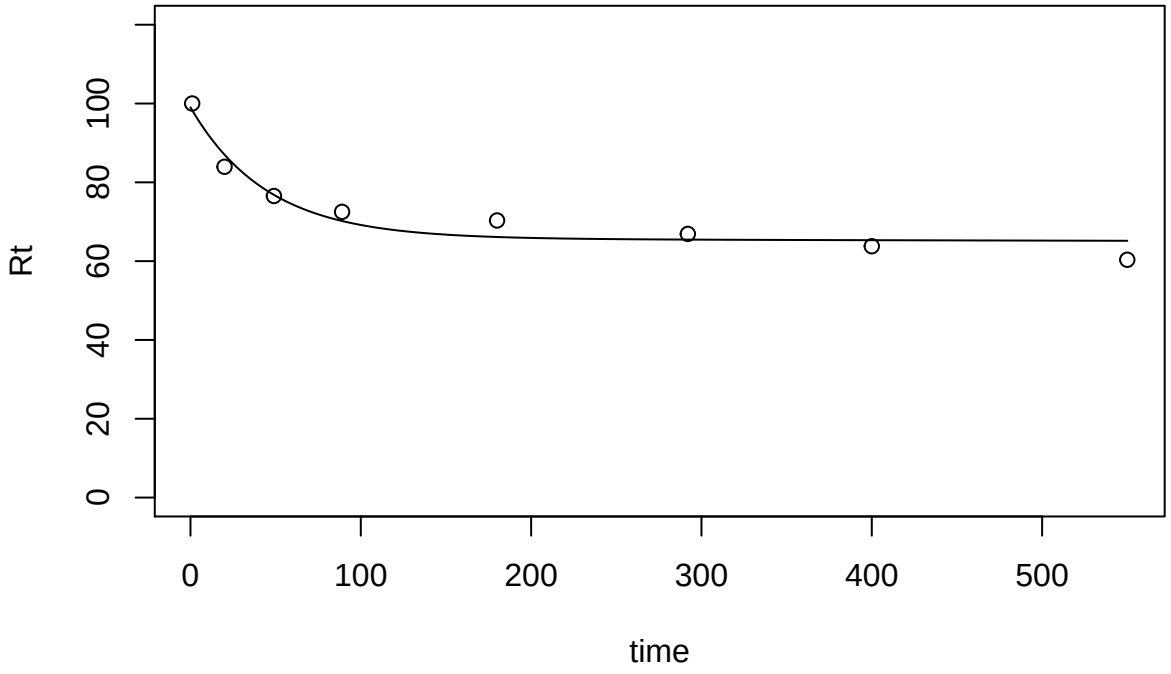
V2: Dataset Dalias2001b, variable C14_Vin_30, site Vindeln, temperature

```
## [1] "k1= 0.022320696390154"
## [2] "k2= 1.49378562021867e-05"
## [3] "proportion of C0 in pool 1= 0.000339447627341671"
```




```
## [1] "AIC =  1.87227759819744"
```

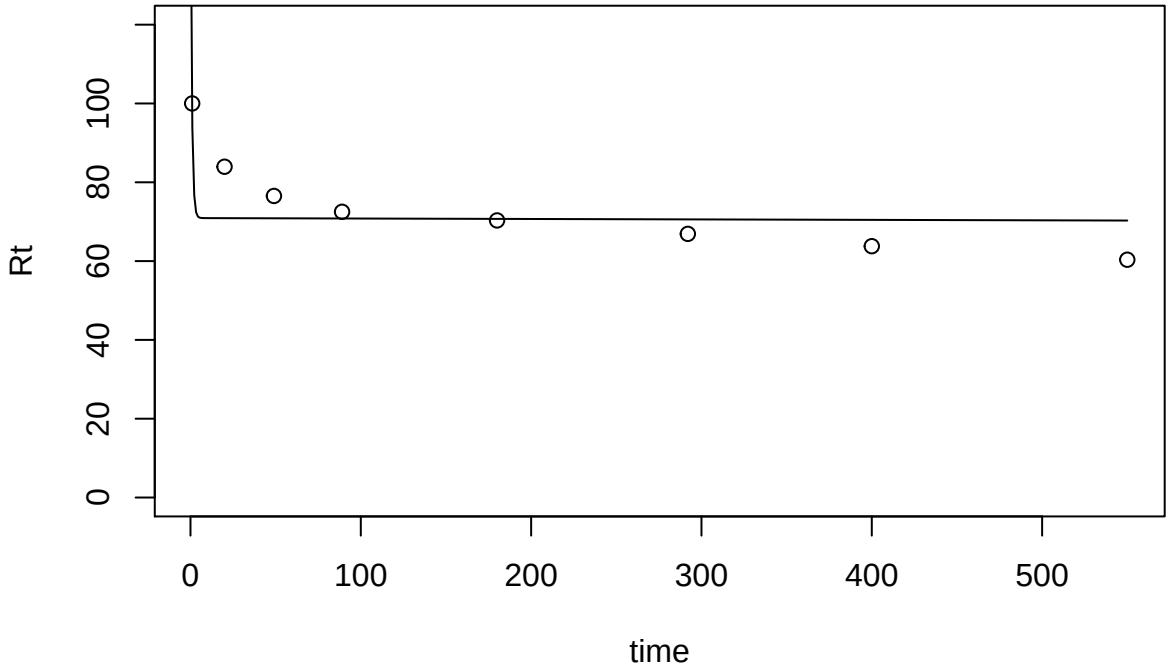
```
## [1] "k1= 0.0222506836892706"
## [2] "k2= 8.47014327429927e-05"
## [3] "a21= 0.823119295547229"
## [4] "a12= 0.999962169225777"
## [5] "Proportion of C0 in pool 1= 0.00571847438628414"
```




```
## [1] "AIC =  5.87228276093052"
```

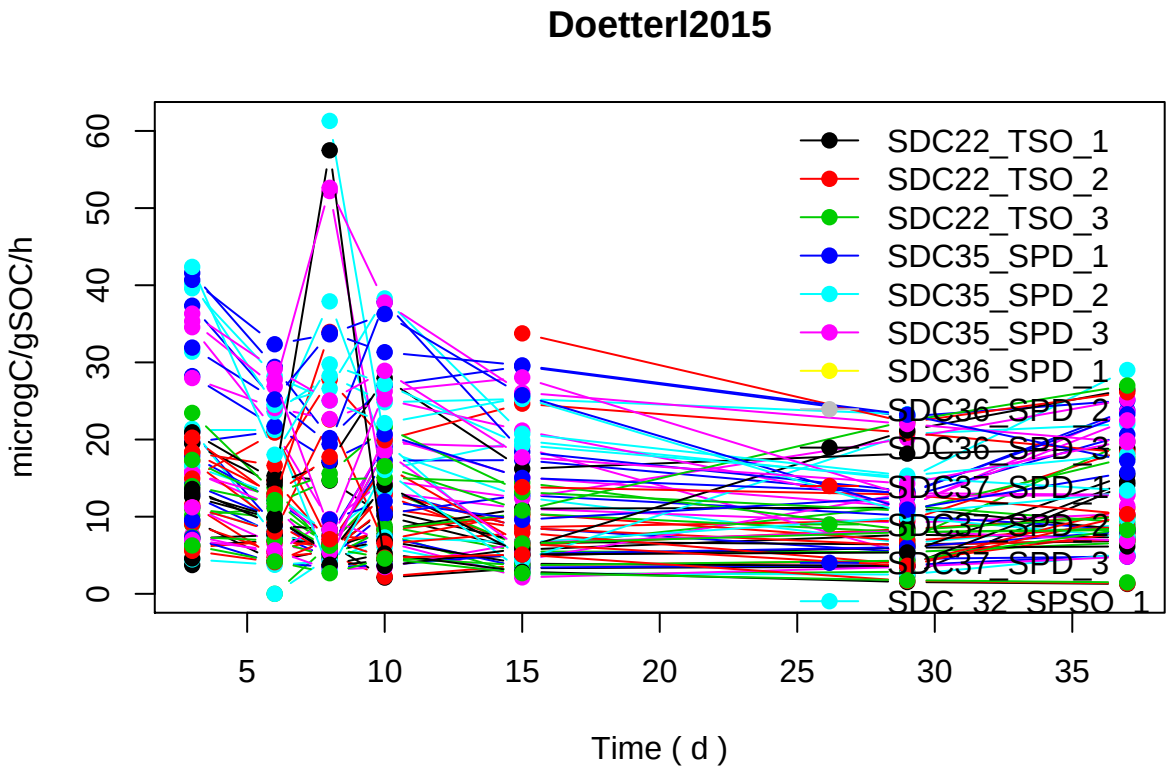
```
## [1] "k1= 1.24543376935371"
## [2] "k2= 1.61179915598316e-05"
```

```
## [3] "a21= 0.999970603355441"
## [4] "Proportion of C0 in pool 1= 0.99997679940136"
```

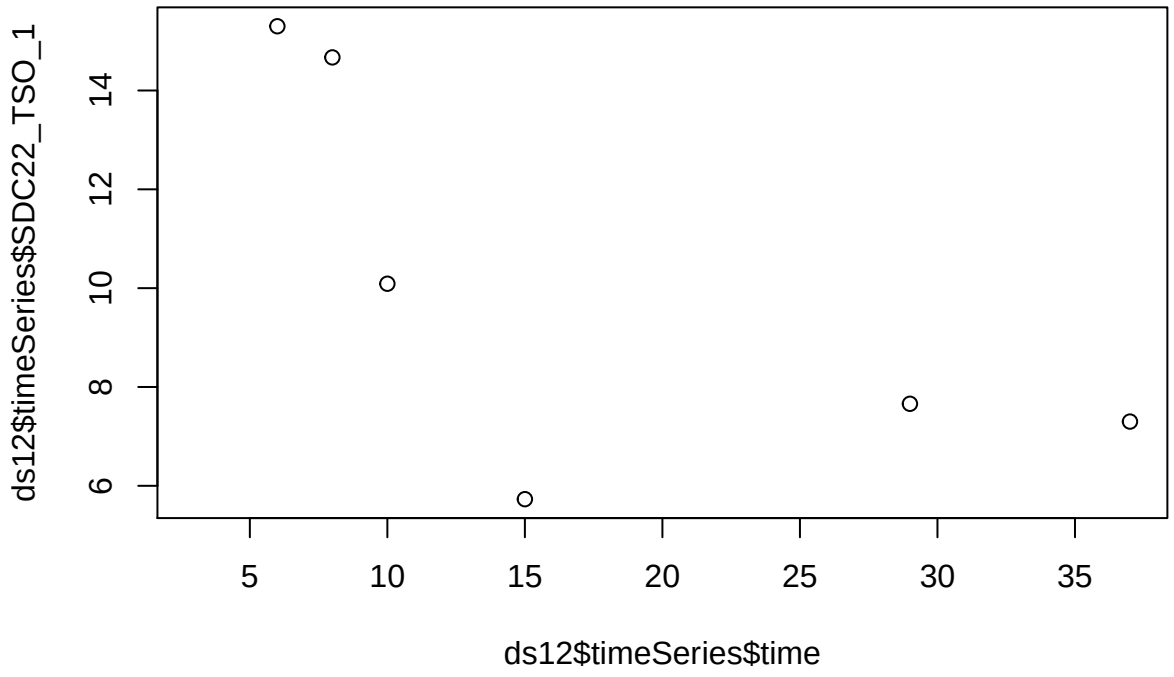



```
## [1] "AIC =  0.372384931826803"
```

—>



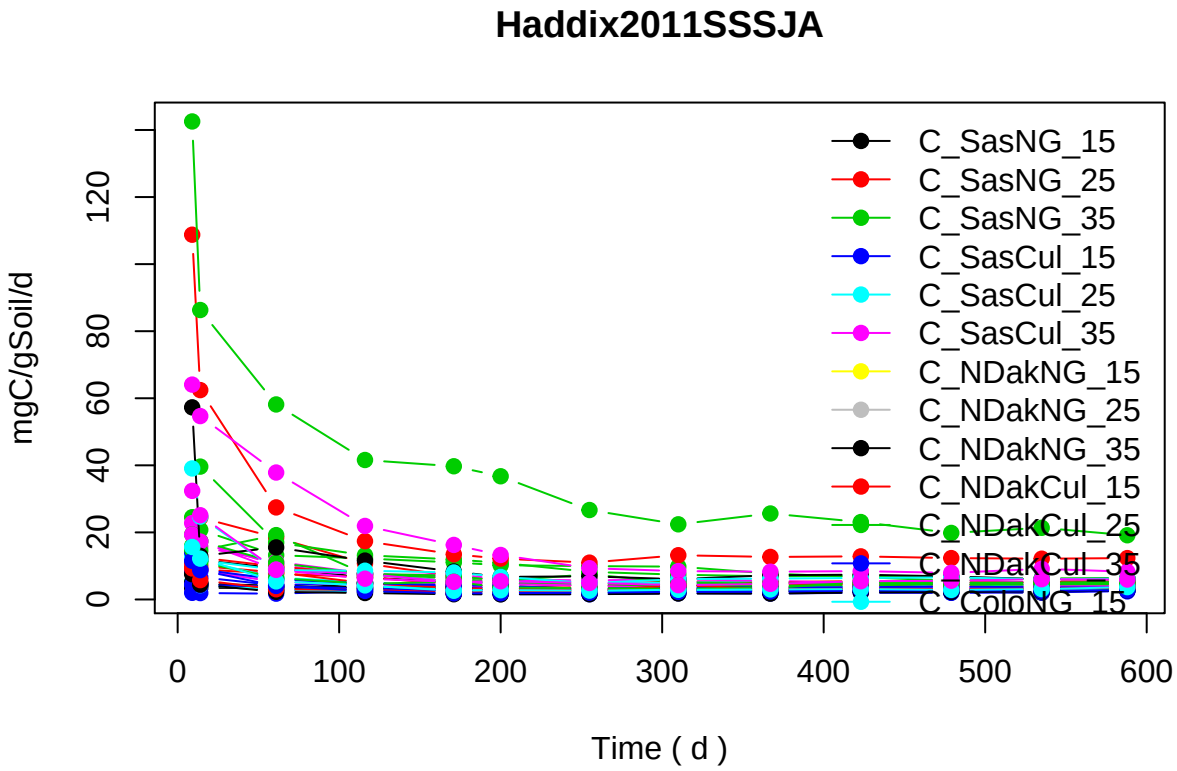
V2: Dataset Doetterl2015, variable SDC22_TSO_1, site SDC22 replicate 1



—>

Dataset Haddix2011SSSJA

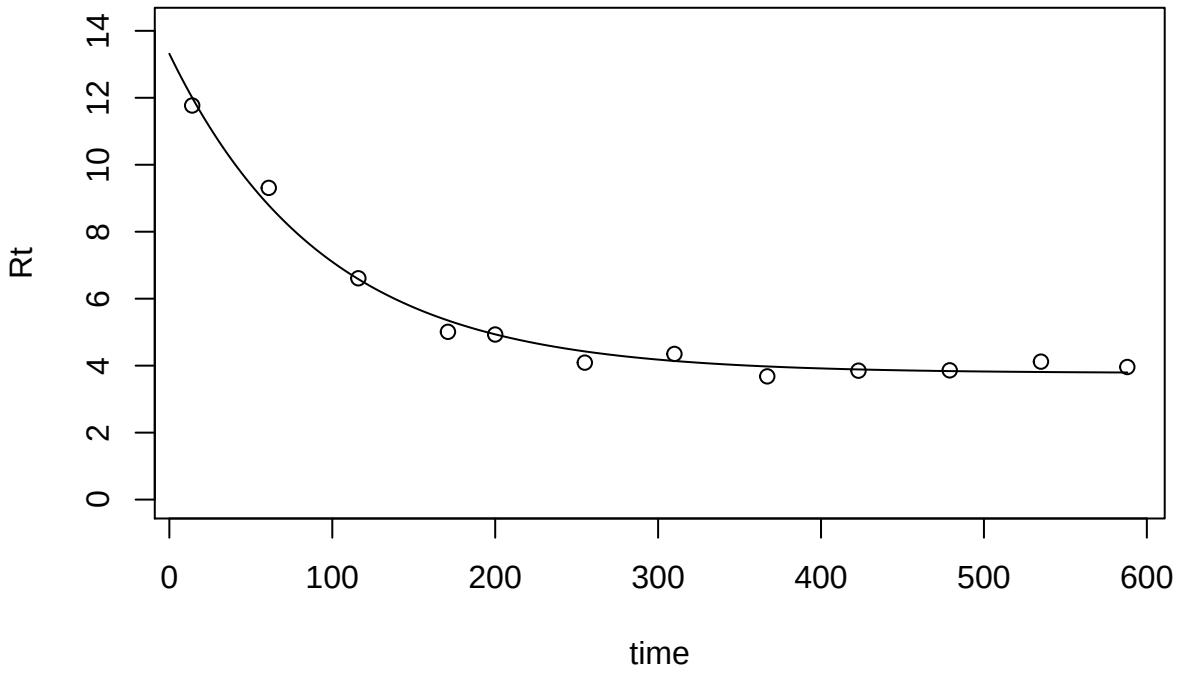
A dataset with 37 variables of 6 different sites each two levels of vegetation (Native grassland and cultivated). and three levels of temperature (15, 25, 35)



Units of initial carbon is g/kg and the fluxes reported as mgC/gSoil/d

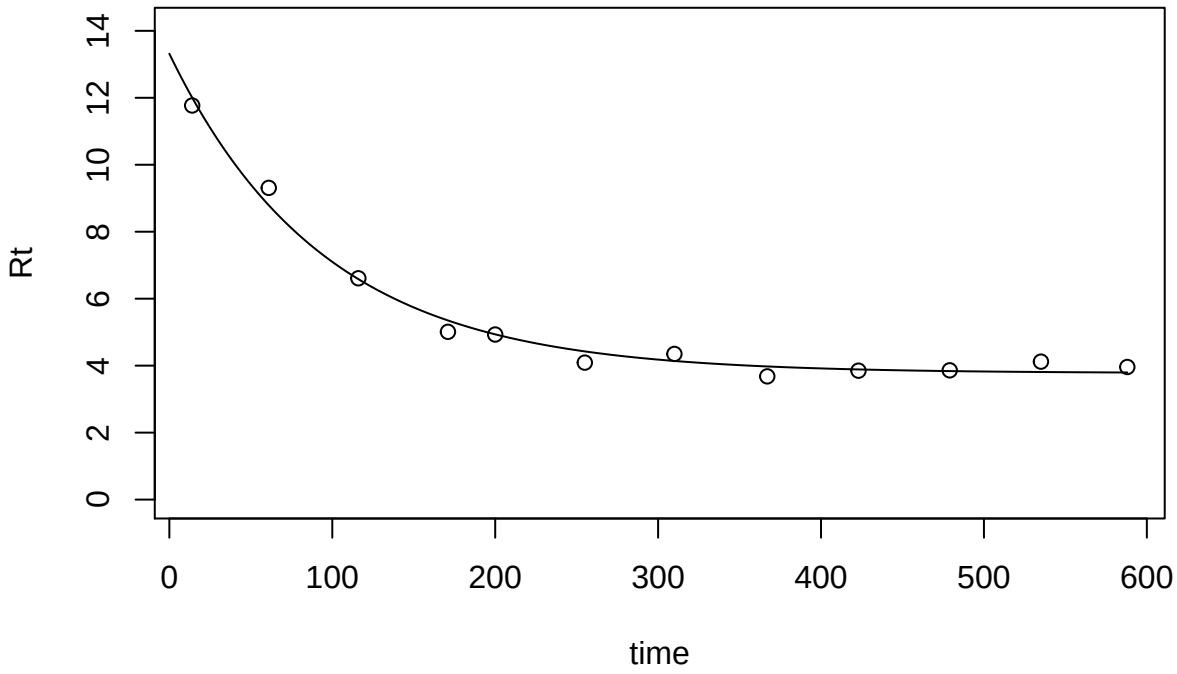
V2: Dataset Haddix2011SSSJA, variable C_SasNG_15, site Indian Head , Vegetation native grassland,temperature 15

```
## [1] "k1= 0.0105431907237802"
## [2] "k2= 1.01869758662223e-06"
## [3] "proportion of C0 in pool 1= 0.000243799543322654"
```




```
## [1] "AIC =  11.3903079619834"
```

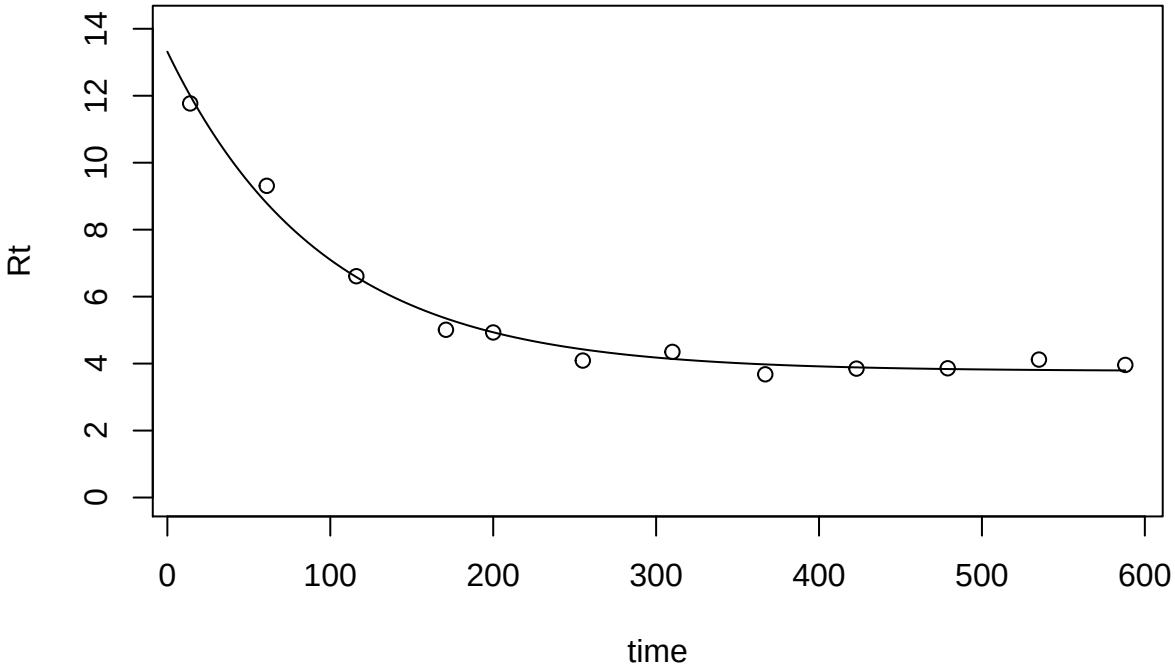
```
## [1] "k1= 0.0105177403688452"
## [2] "k2= 2.64762615650916e-05"
## [3] "a21= 0.961450162697548"
## [4] "a12= 0.999980041392808"
## [5] "Proportion of C0 in pool 1= 0.00885013814540586"
```



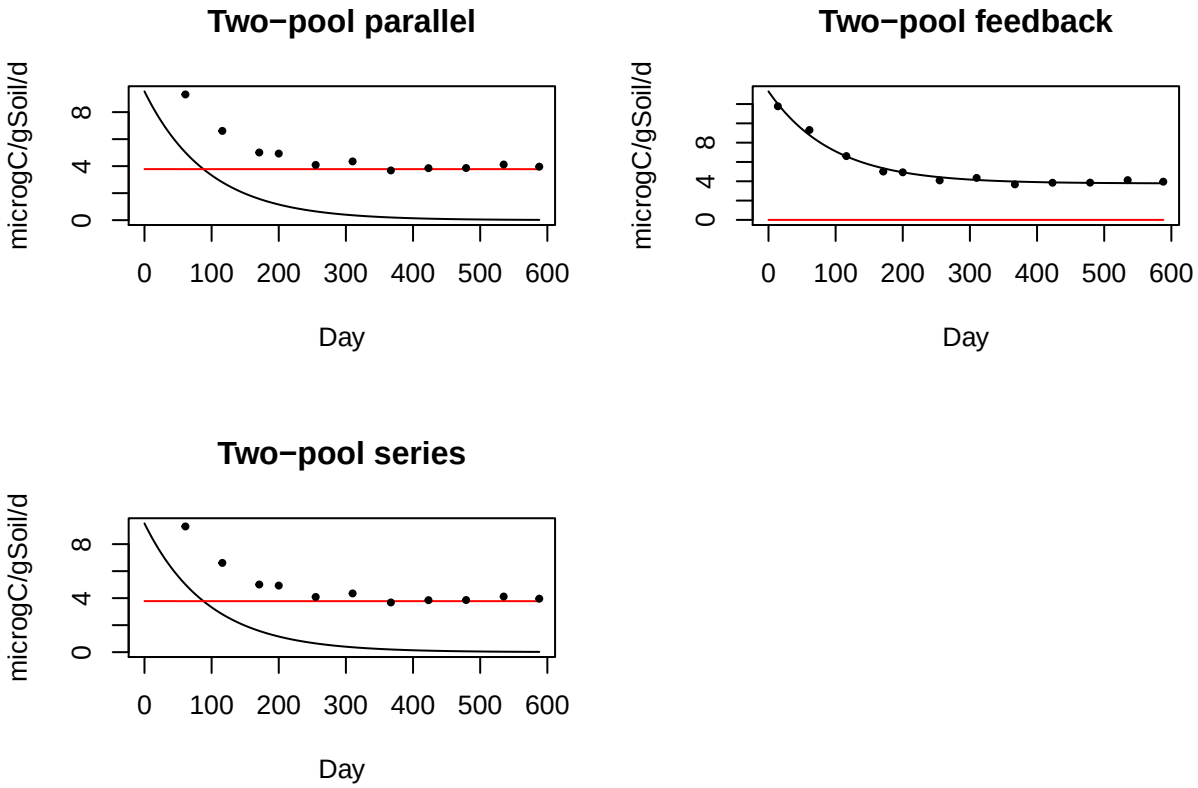

```
## [1] "AIC =  15.3903079619931"
```

```
## [1] "k1= 0.0105432026531141"
## [2] "k2= 1.01869793849904e-06"
```

```
## [3] "a21= 0.000118469615829009"
## [4] "Proportion of C0 in pool 1= 0.000243828022348069"
```




```
## [1] "AIC =  13.3903079618992"
```

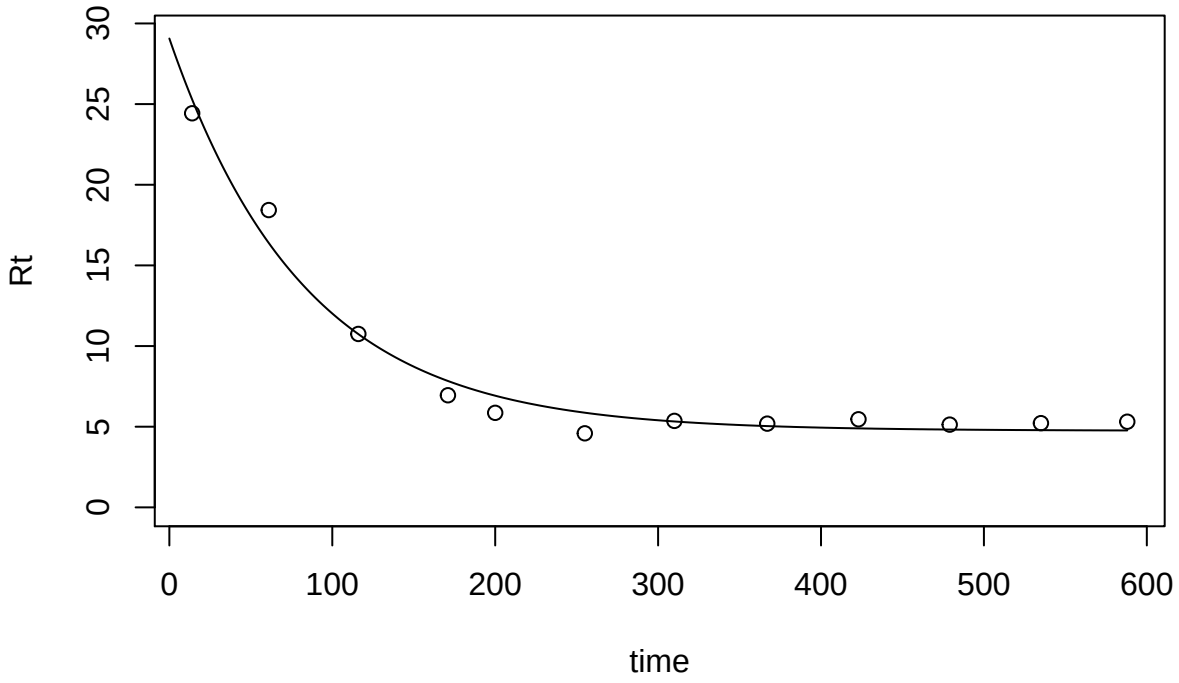


model	AIC
Two-pool parallel	11.39

model	AIC
Two-pool feedback	15.39
Two-pool series	13.39

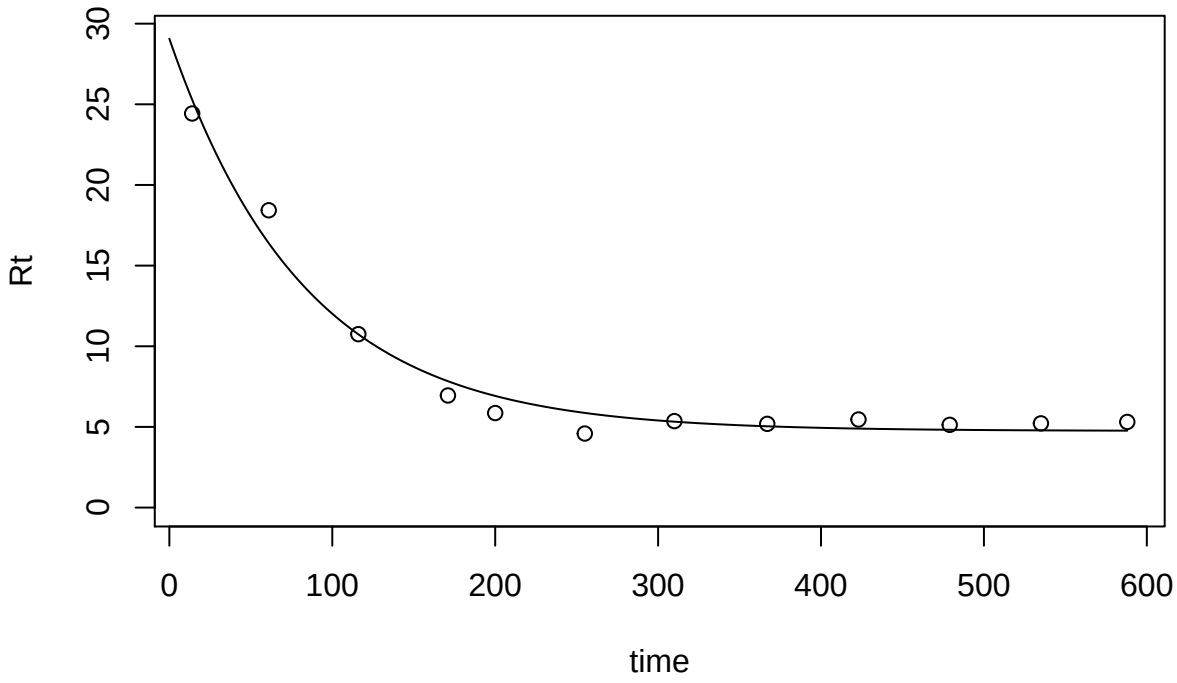
V3: Dataset Haddix2011SSSJA, variable C_SasNG_25, site Indian Head , Vegetation native grassland,temperature 25

```
## [1] "k1= 0.0120767124213779"
## [2] "k2= 1.28150621094005e-06"
## [3] "proportion of C0 in pool 1= 0.000542657905436561"
```



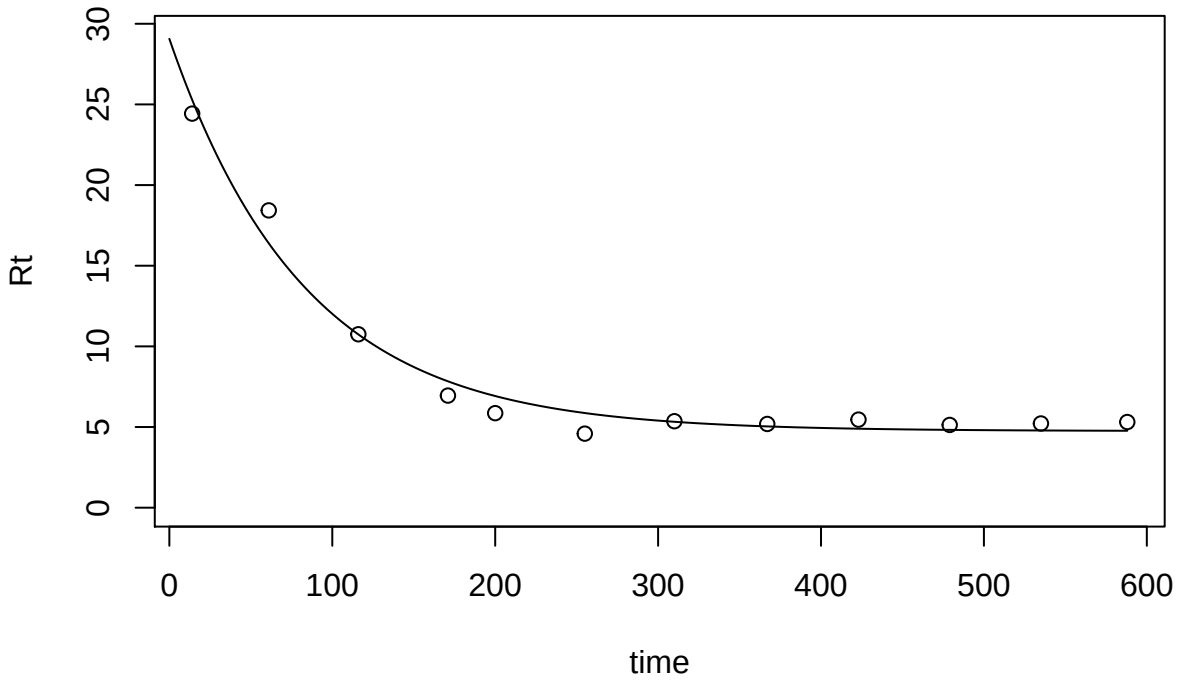

```
## [1] "AIC =  6.4992204264905"
```

```
## [1] "k1= 0.0120527066319555"
## [2] "k2= 2.53299071753444e-05"
## [3] "a21= 0.949312524026641"
## [4] "a12= 0.999993486081339"
## [5] "Proportion of C0 in pool 1= 0.0128235530914947"
```

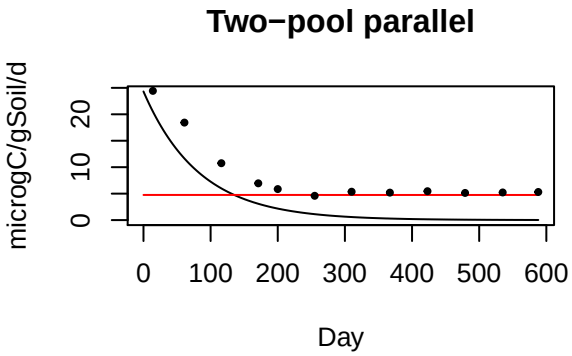


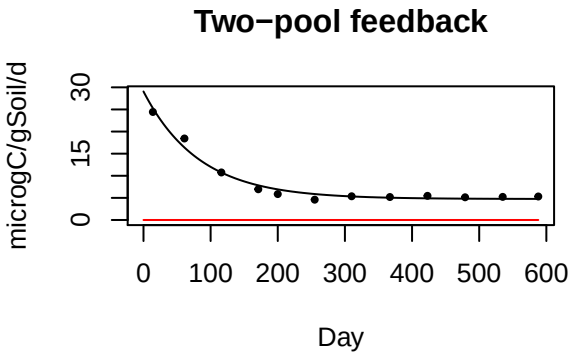

```
## [1] "AIC =  10.4992204268721"
```

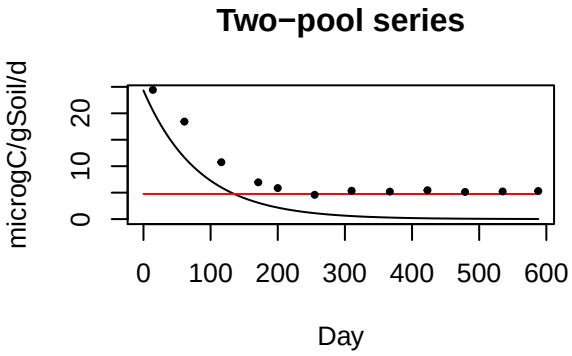
```
## [1] "k1= 0.0120767043205072"
## [2] "k2= 1.28150576608358e-06"
## [3] "a21= 9.27300735142911e-07"
## [4] "Proportion of C0 in pool 1= 0.000542658675615038"
```




```
## [1] "AIC =  8.49922042635298"
```



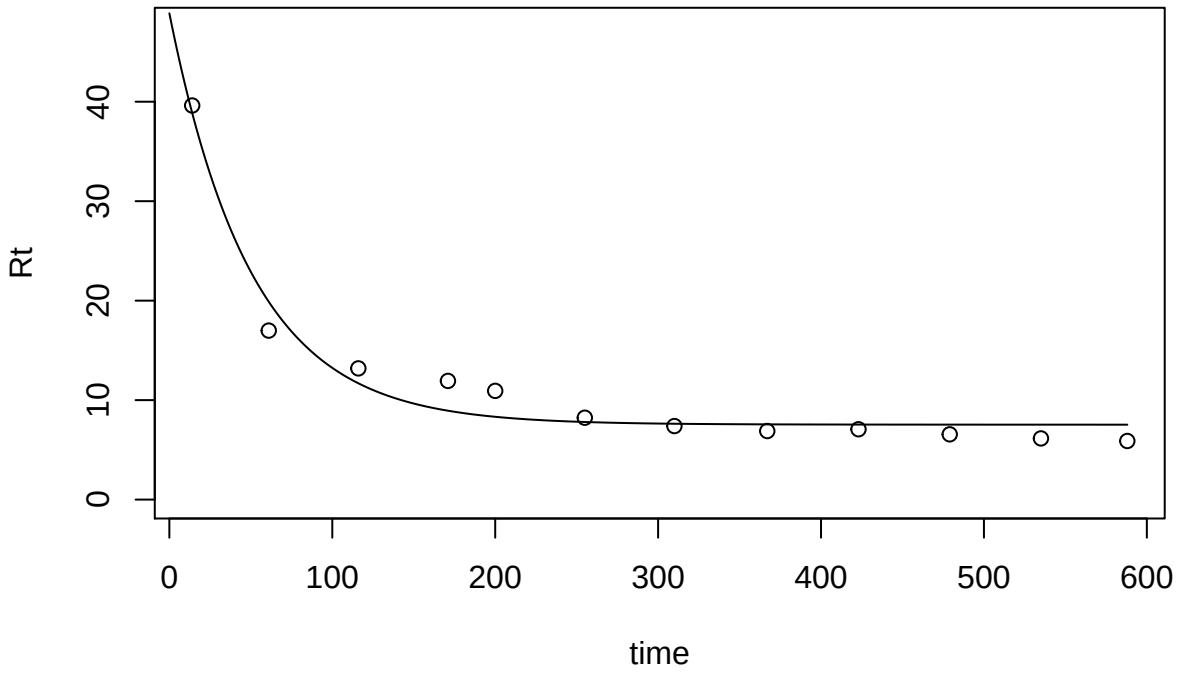




model	AIC
Two-pool parallel	6.5
Two-pool feedback	10.5
Two-pool series	8.5

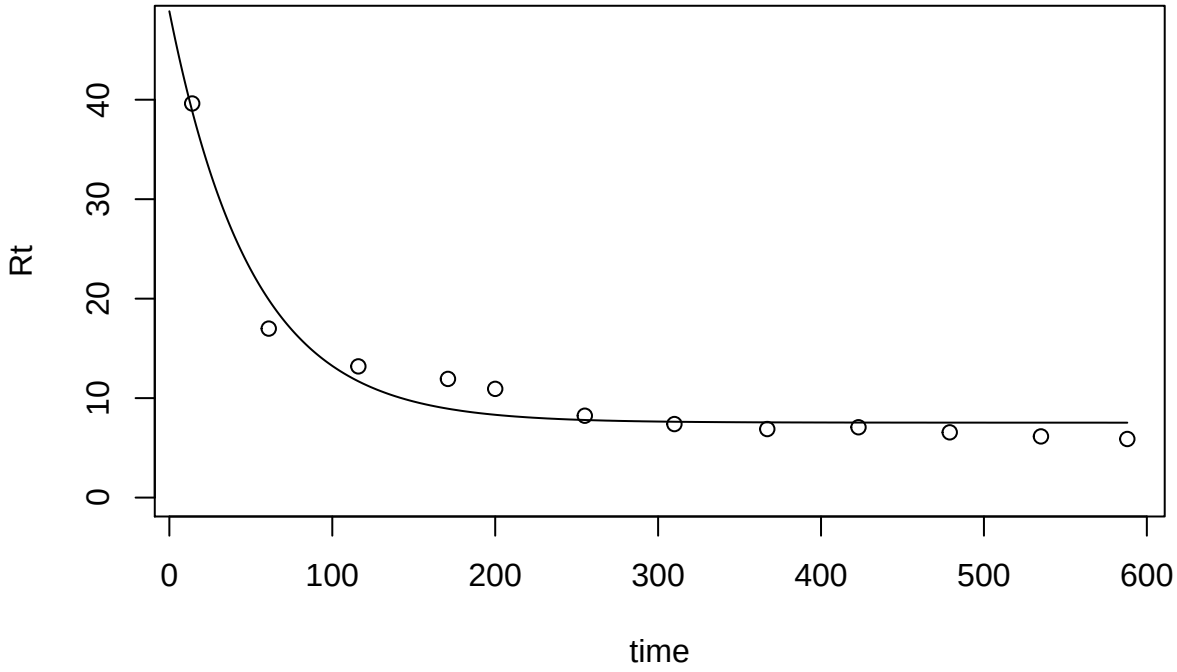
V4: Dataset Haddix2011SSSJA, variable C_SasNG_35, site Indian Head , Vegetation native grassland,temperature 35

```
## [1] "k1= 0.0198102436855348"
## [2] "k2= 2.03342126231577e-06"
## [3] "proportion of C0 in pool 1= 0.000562641478774273"
```




```
## [1] "AIC =  3.95008763740975"
```

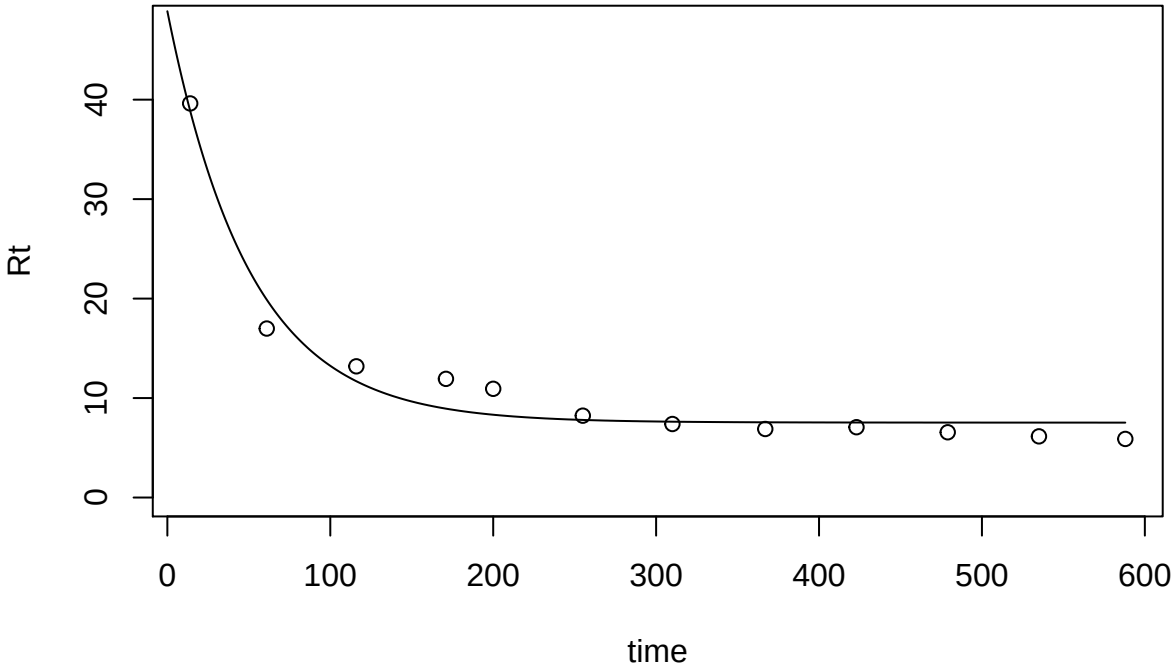
```
## [1] "k1= 0.0197777258124659"
## [2] "k2= 3.56162669487407e-05"
## [3] "a21= 0.942819849015159"
## [4] "a12= 0.99998918467109"
## [5] "Proportion of C0 in pool 1= 0.0116529264355223"
```



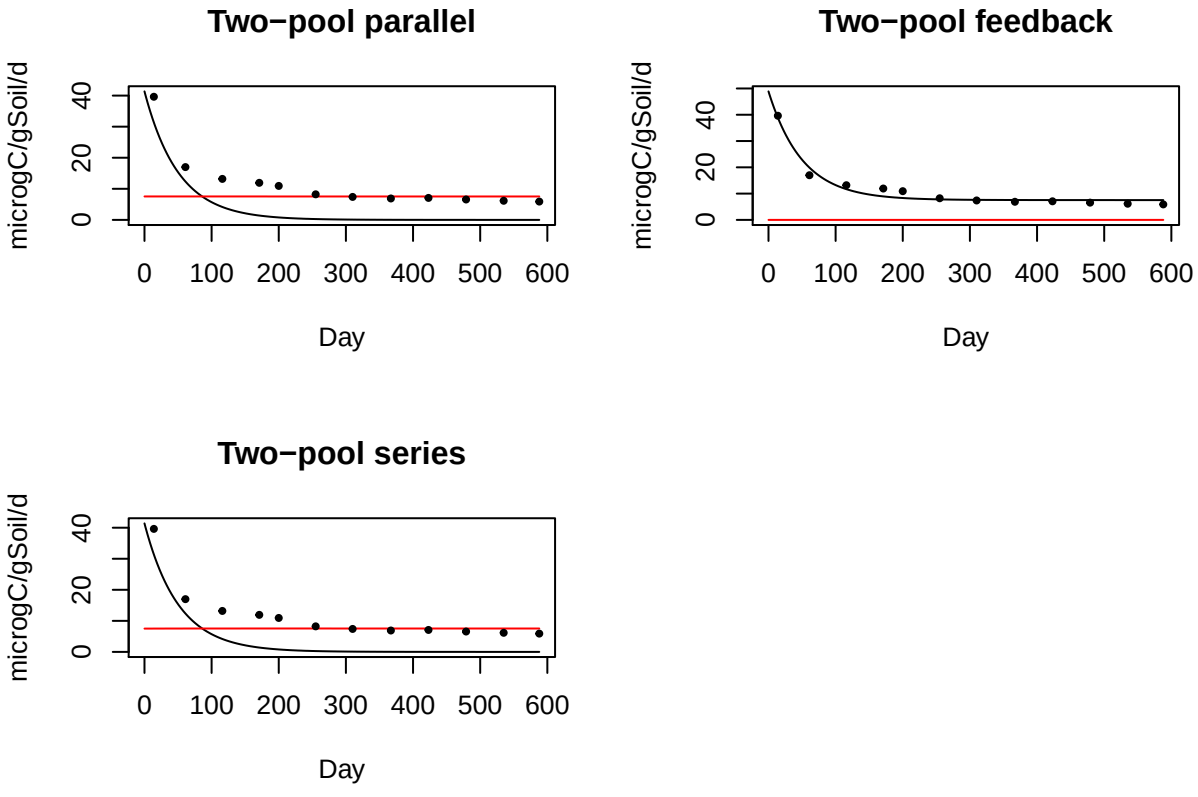

```
## [1] "AIC =  7.95008763223513"
```

```
## [1] "k1= 0.0198104736597595"
## [2] "k2= 2.033428020691e-06"
```

```
## [3] "a21= 0.89958858416135"
## [4] "Proportion of C0 in pool 1= 0.00560849368975158"
```




```
## [1] "AIC =  5.95008763847828"
```

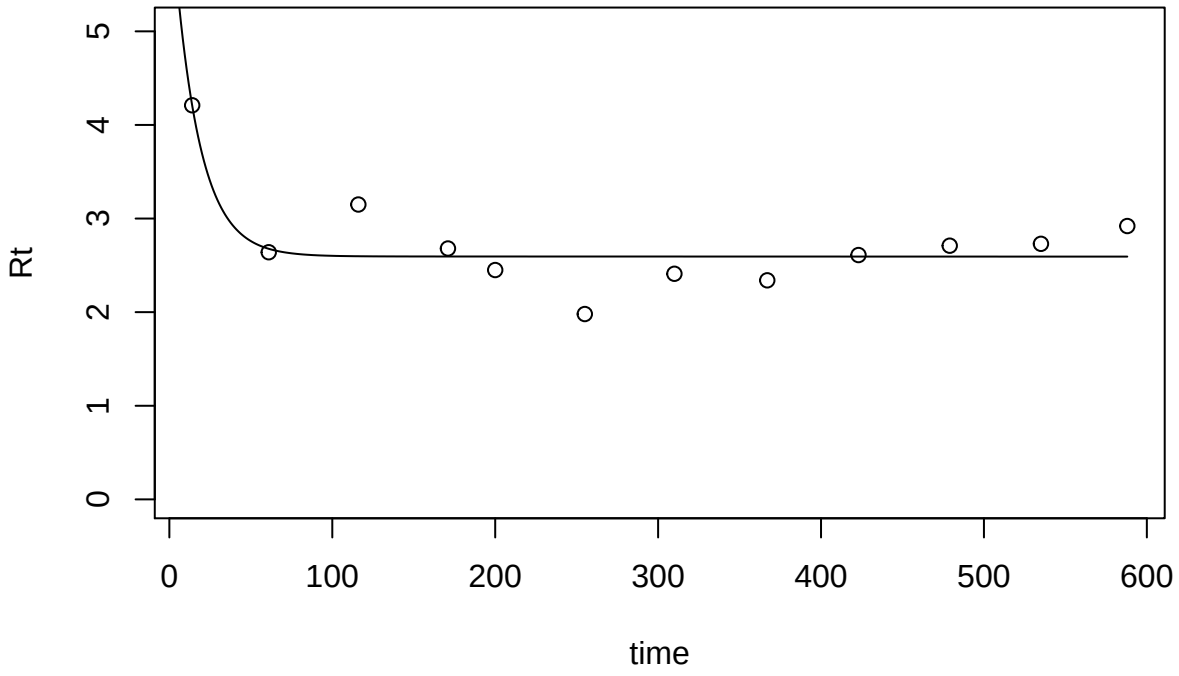


model	AIC
Two-pool parallel	3.95

model	AIC
Two-pool feedback	7.95
Two-pool series	5.95

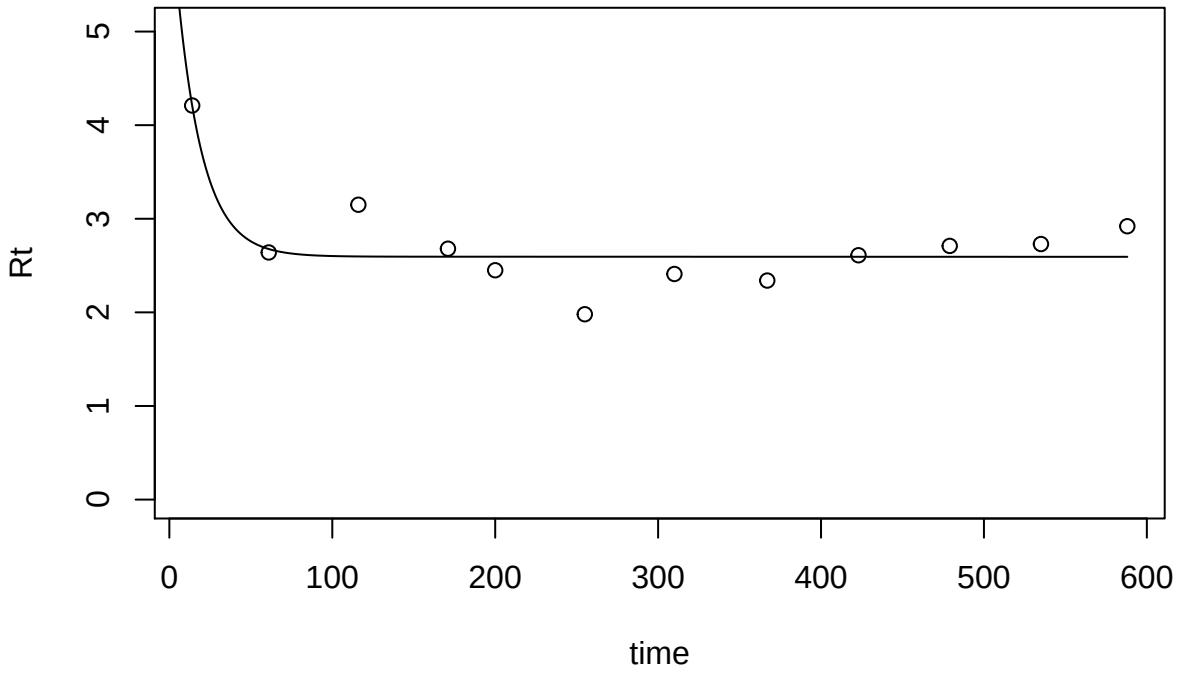
V5: Dataset Haddix2011SSSJA, variable C_SasCul_15, site Indian Head , Vegetation cultivated,temperature 15

```
## [1] "k1= 0.0634398123506801"
## [2] "k2= 1.13328665513039e-06"
## [3] "proportion of C0 in pool 1= 2.69938265660685e-05"
```



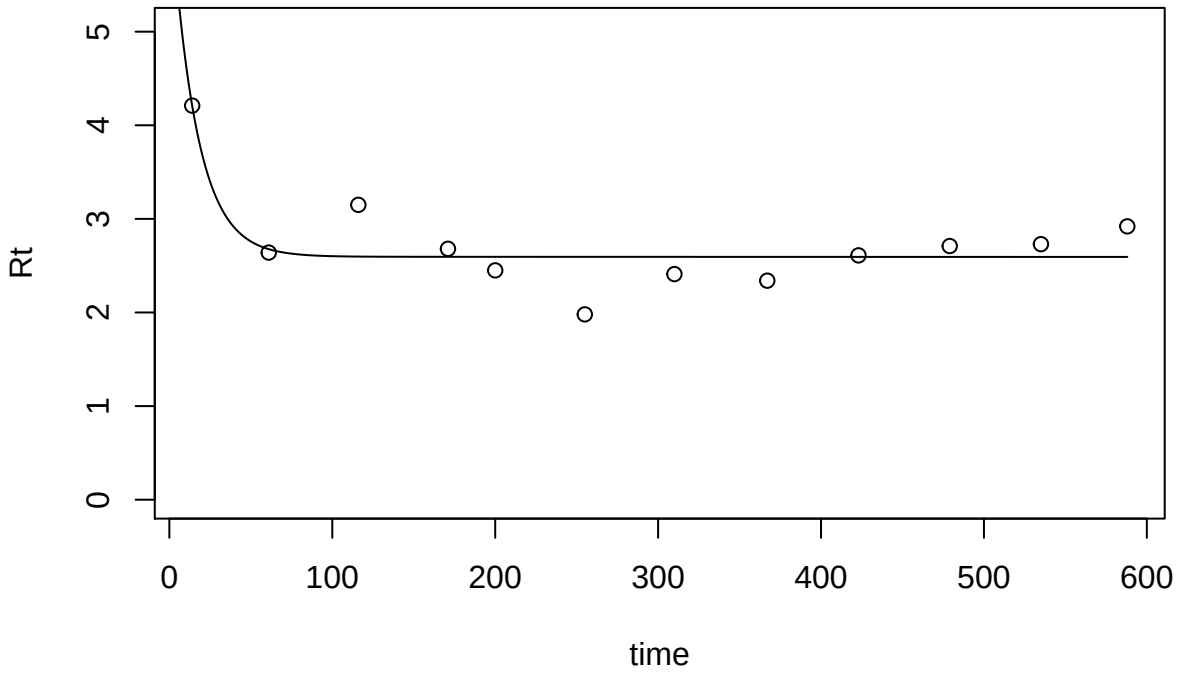

```
## [1] "AIC =  11.0723514250156"
```

```
## [1] "k1= 0.0633863534267679"
## [2] "k2= 0.000100447168193787"
## [3] "a21= 0.988714790670446"
## [4] "a12= 0.99998486909287"
## [5] "Proportion of C0 in pool 1= 0.00397764845451237"
```

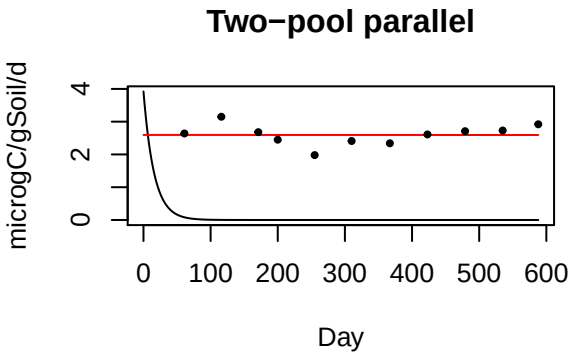


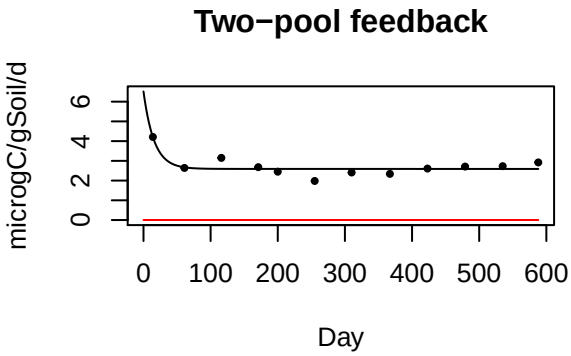

```
## [1] "AIC =  15.0723514376601"
```

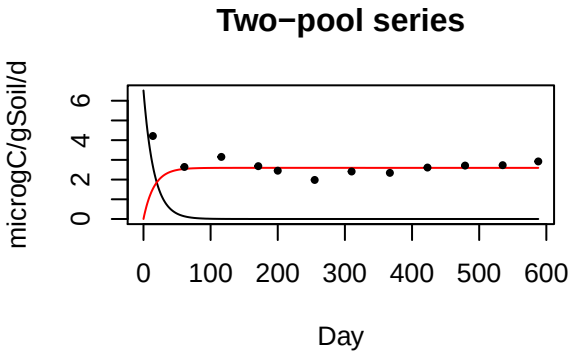
```
## [1] "k1= 0.0635012336298459"
## [2] "k2= 1.13329627773761e-06"
## [3] "a21= 0.99995515969554"
## [4] "Proportion of C0 in pool 1= 0.999931964124084"
```




```
## [1] "AIC =  13.0723514080363"
```



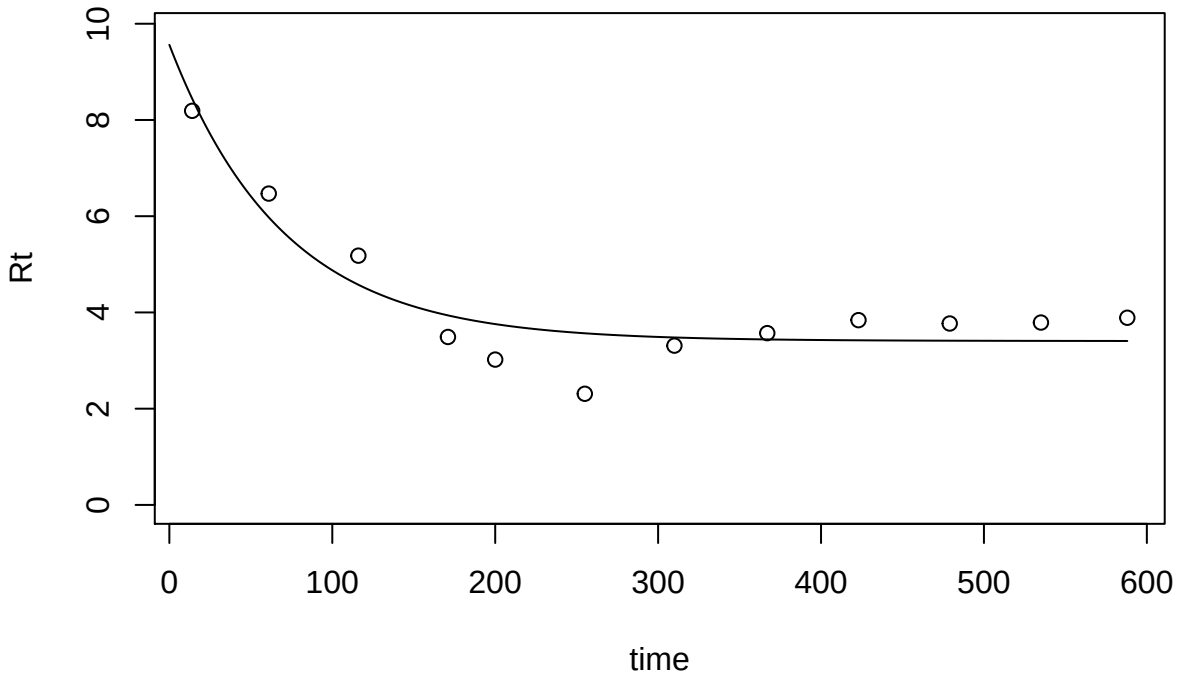




model	AIC
Two-pool parallel	11.07
Two-pool feedback	15.07
Two-pool series	13.07

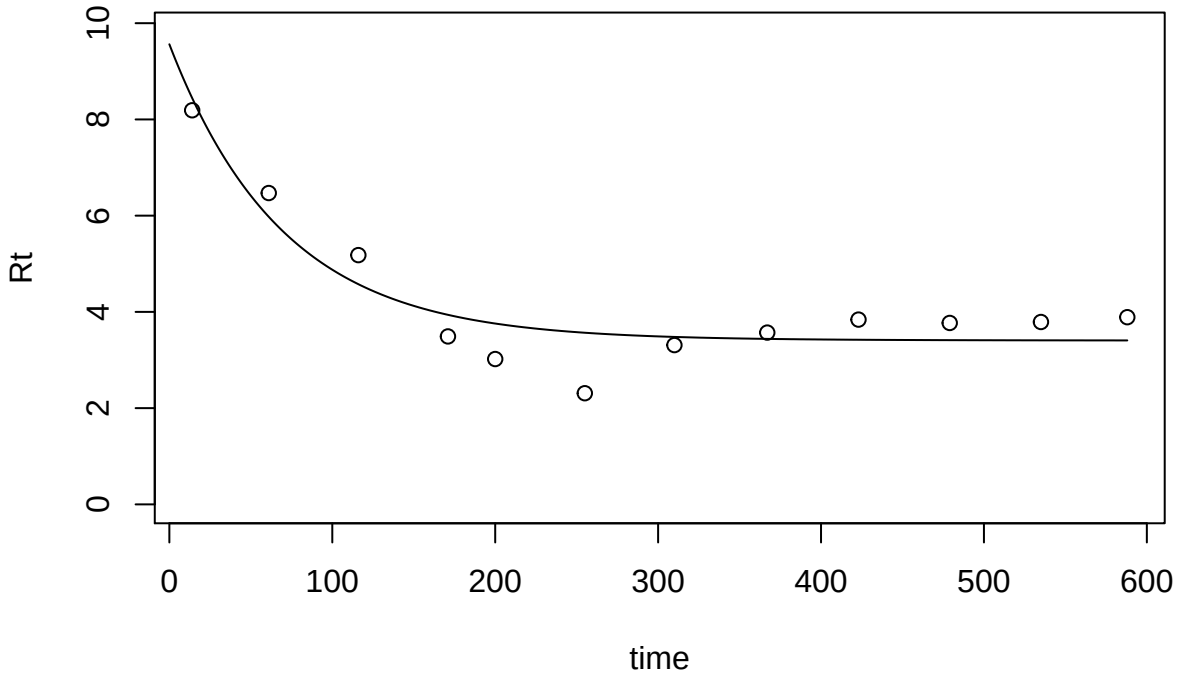
V6: Dataset Haddix2011SSSJA, variable C_SasCul_25, site Indian Head , Vegetation cultivated,temperature 25

```
## [1] "k1= 0.0143276135064684"
## [2] "k2= 1.48885094694036e-06"
## [3] "proportion of C0 in pool 1= 0.000187541738556729"
```




```
## [1] "AIC =  8.3386987335773"
```

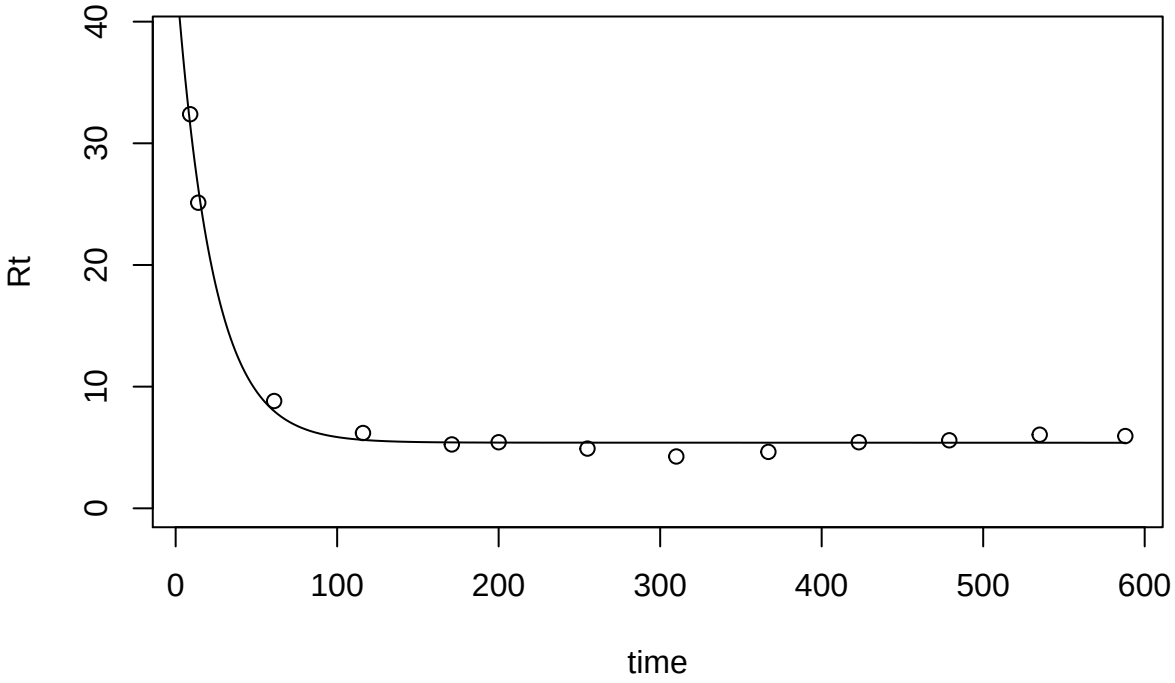
```
## [1] "k1= 0.014326833384169"
## [2] "k2= 1.48883905853847e-06"
## [3] "a21= 0.999708547295063"
## [4] "Proportion of C0 in pool 1= 0.999980768905454"
```




```
## [1] "AIC =  10.3386987381613"
```

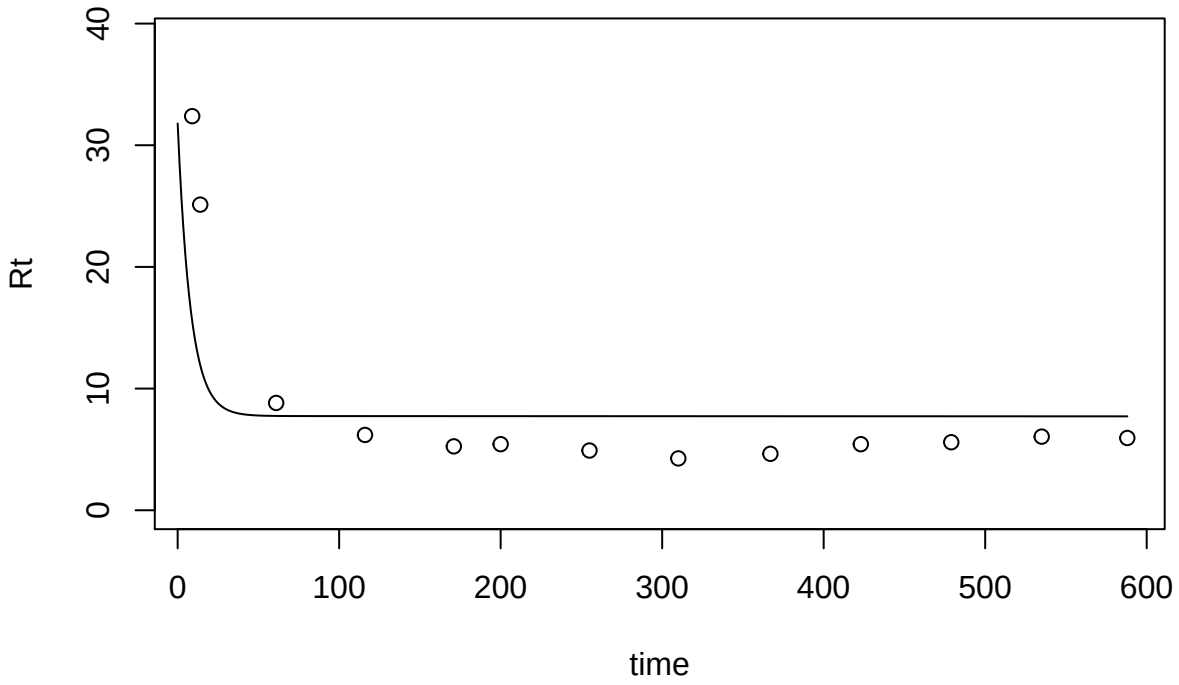
V37: Dataset Haddix2011SSSJA, variable C_BrazilPas_35, site Rondonia , Vegetation Pasture,temperature 35

```
## [1] "k1= 0.0444523368932189"
## [2] "k2= 3.83333670829487e-06"
## [3] "proportion of C0 in pool 1= 0.000621557912692583"
```




```
## [1] "AIC =  7.51701927229652"
```

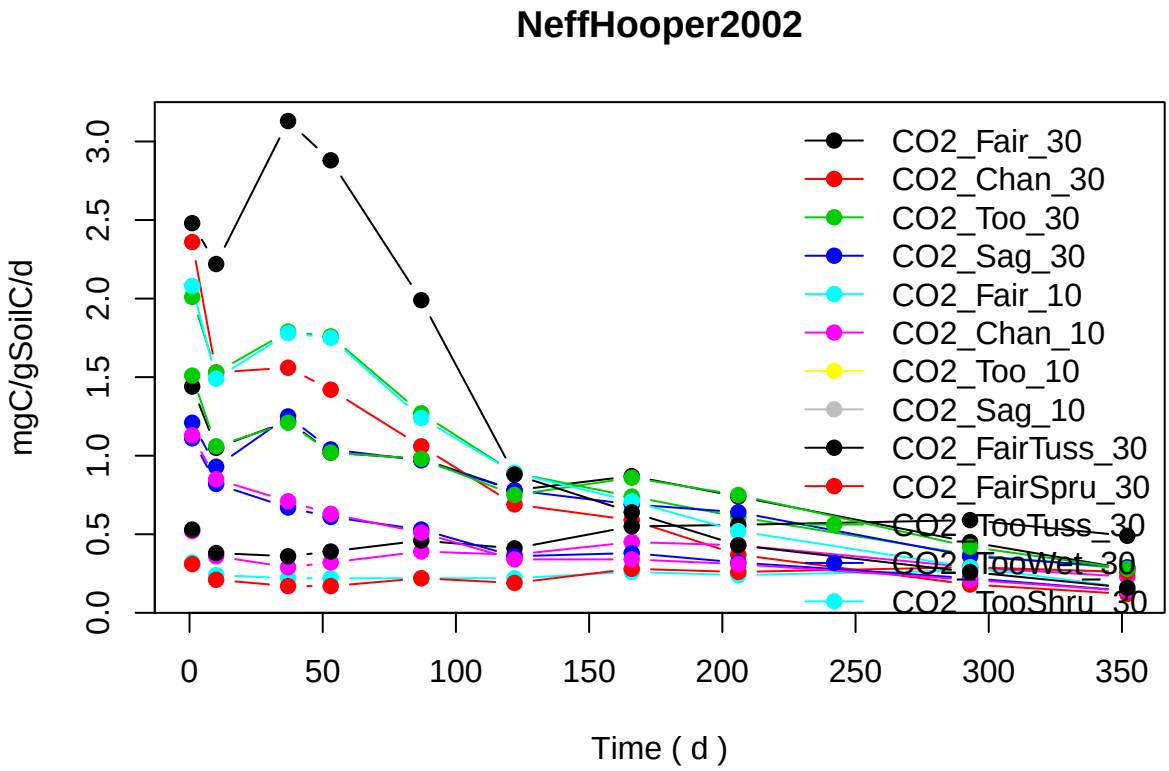
```
## [1] "k1= 0.125034199512043"
## [2] "k2= 5.49173250369876e-06"
## [3] "a21= 0.999819678678341"
## [4] "Proportion of C0 in pool 1= 0.999978977580547"
```




```
## [1] "AIC =  0.631963735559095"
```

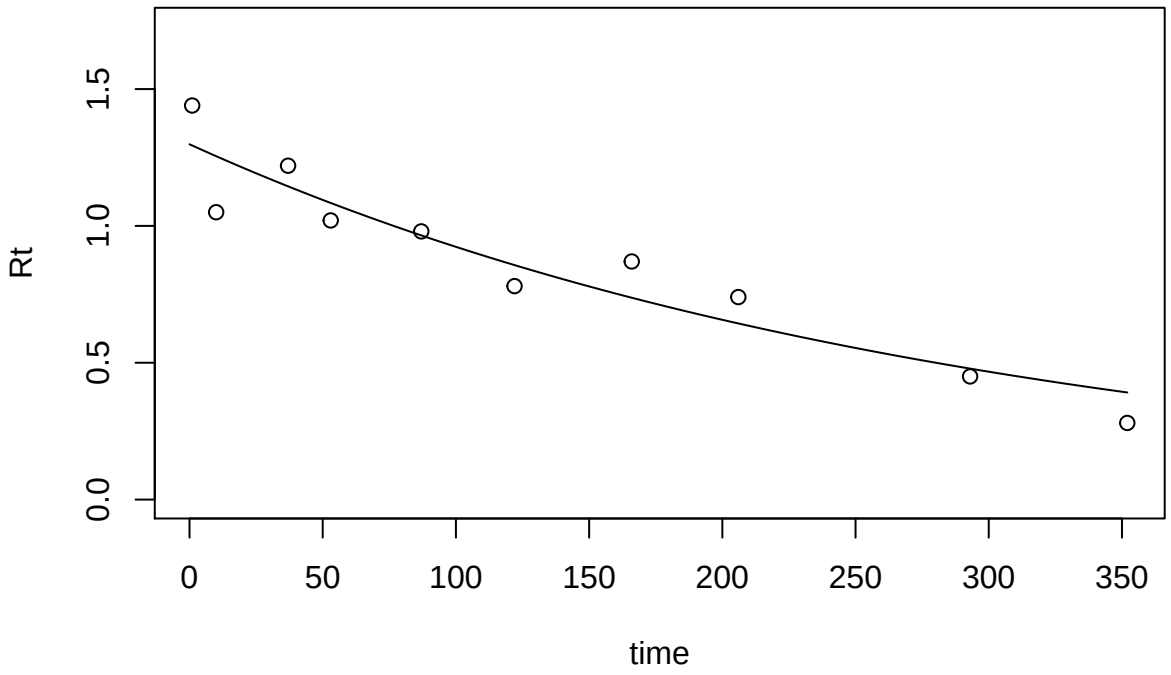
Dataset NeffHooper2002

A dataset with 14 variables of Five laboratory replicates from composite field samples from each site and treatment combination were incubated at 10 and 30deg for 352 d. Air samples were taken at time 0 and at 24 h by syringe through a septum in the Mason jar lid, and injected into a sealed jar attached to the LI-COR 6200 Infrared gas analyser 6 different soil types



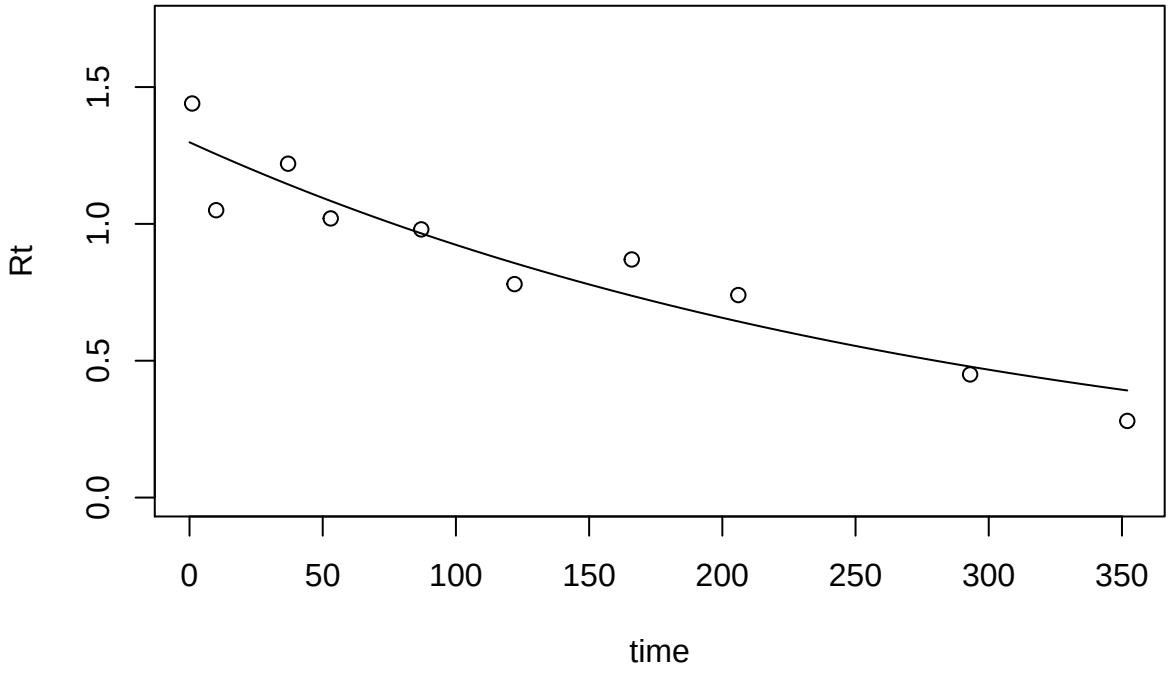
V2: Dataset of NeffHooper2002 variable CO2 Flux of Fairbanks soils incubated at 30deg measures as CO2 mgC/gSoilC/d

```
## [1] "k1= 0.003406527532391"
## [2] "k2= 7.5476160084926e-119"
## [3] "proportion of C0 in pool 1= 8.7313719547788e-05"
```




```
## [1] "AIC =  14.8583451315546"
```

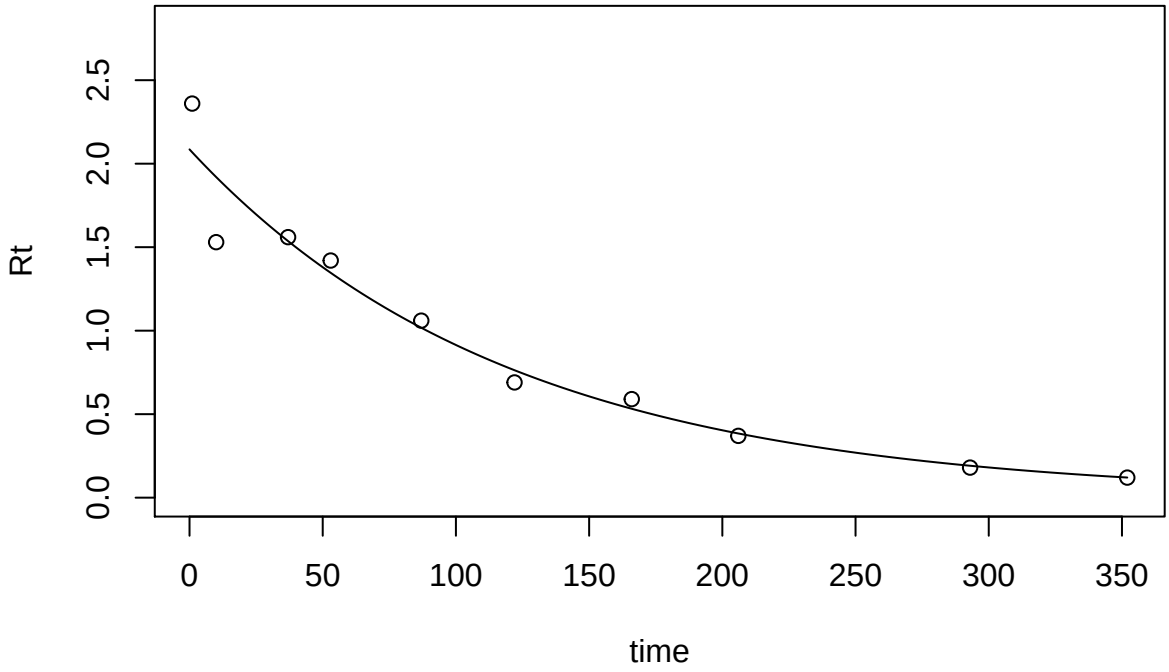
```
## [1] "k1= 0.00340652793684436"
## [2] "k2= 4.35687659033754e-25"
## [3] "a21= 0.999912680246811"
## [4] "a12= 2.0155926255816e-07"
## [5] "Proportion of C0 in pool 1= 0.999930199658614"
```




```
## [1] "AIC =  18.8583451230894"
```

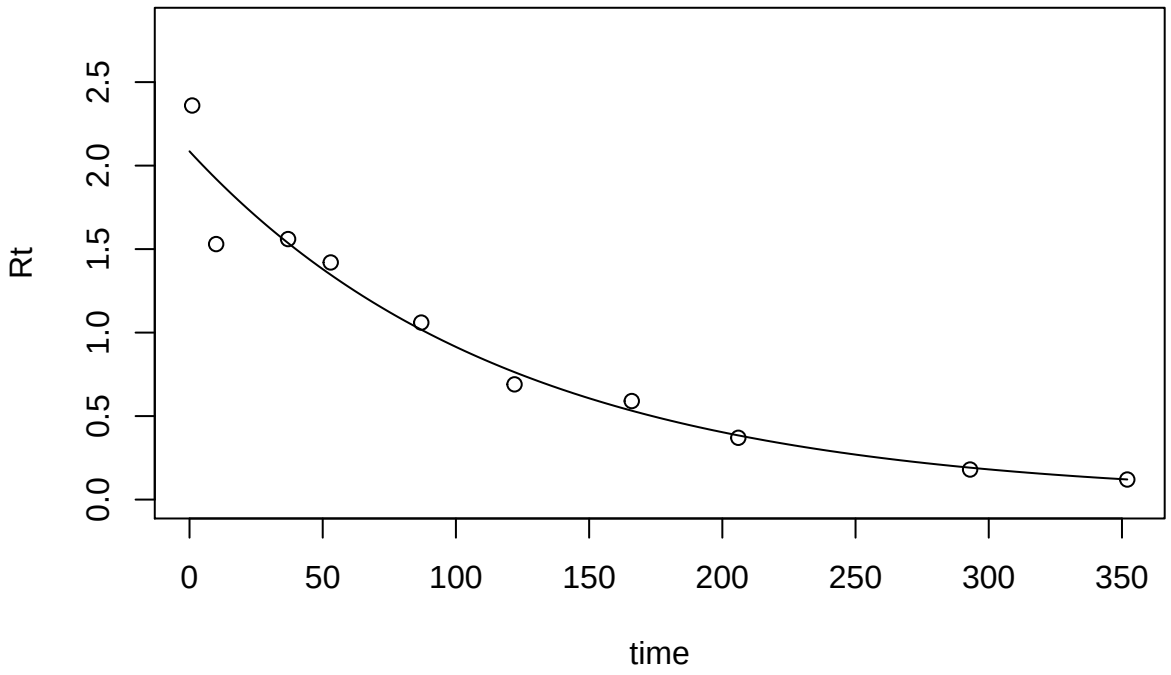
V3: Dataset of NeffHooper2002 variable CO2 Flux of Chandalar soils incubated at 30deg measures as CO2 mgC/gSoilC/d

```
## [1] "k1= 0.00829983923325063"
## [2] "k2= 2.00526449909537e-09"
## [3] "proportion of C0 in pool 1= 5.83993602529254e-05"
```




```
## [1] "AIC =  13.3457578930508"
```

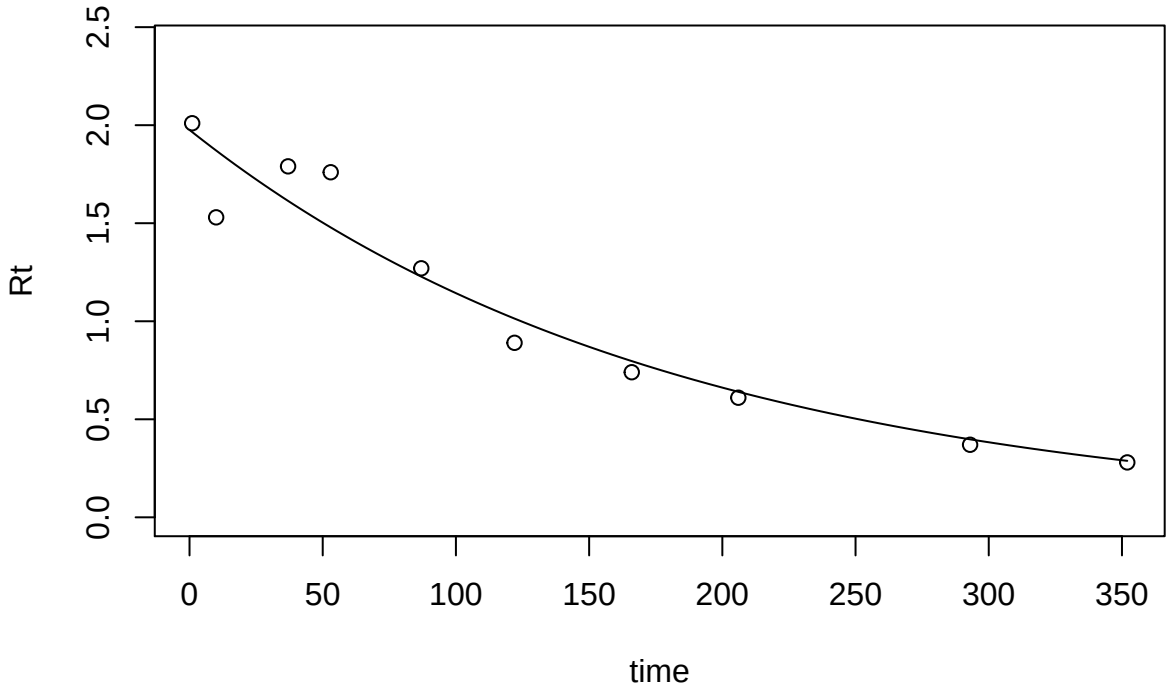
```
## [1] "k1= 0.00829955350036243"
## [2] "k2= 3.06881722143625e-07"
## [3] "a21= 0.993482105814204"
## [4] "a12= 0.99998182591671"
## [5] "Proportion of C0 in pool 1= 0.00899719609205746"
```




```
## [1] "AIC =  17.3457578862838"
```

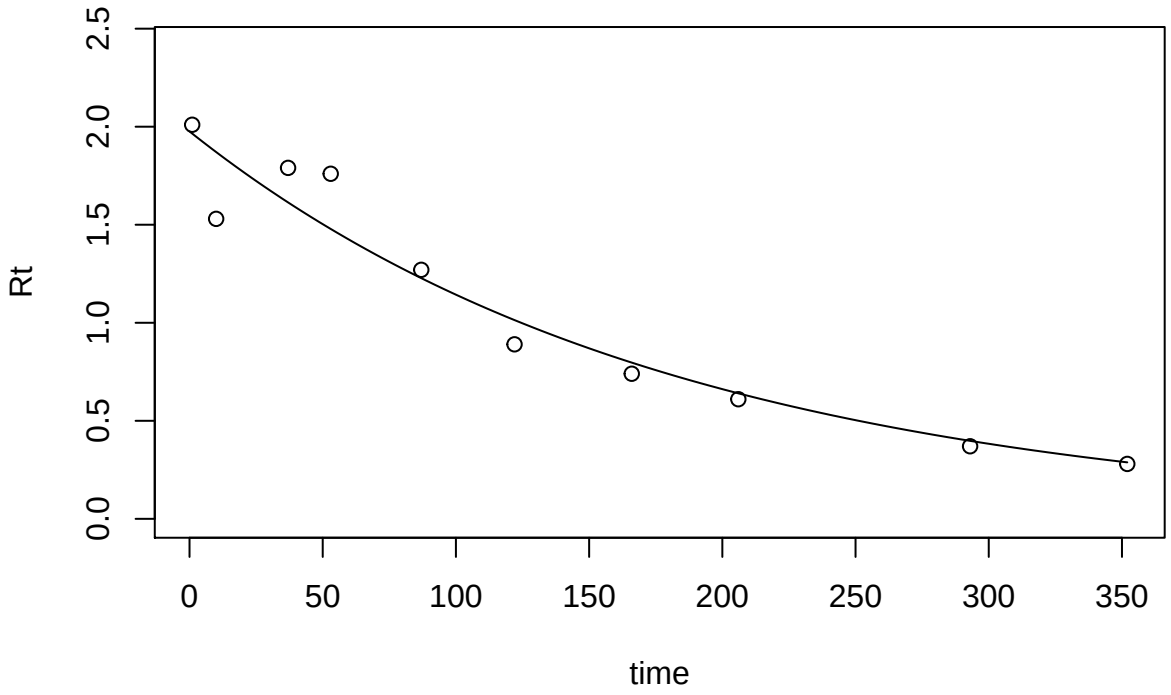
V4: Dataset of NeffHooper2002 variable CO2 Flux of Toolik Lake soils incubated at 30deg measures as CO2 mgC/gSoilC/d

```
## [1] "k1= 0.00547121684560564"
## [2] "k2= 4.75573132911444e-35"
## [3] "proportion of C0 in pool 1= 8.37160414307037e-05"
```



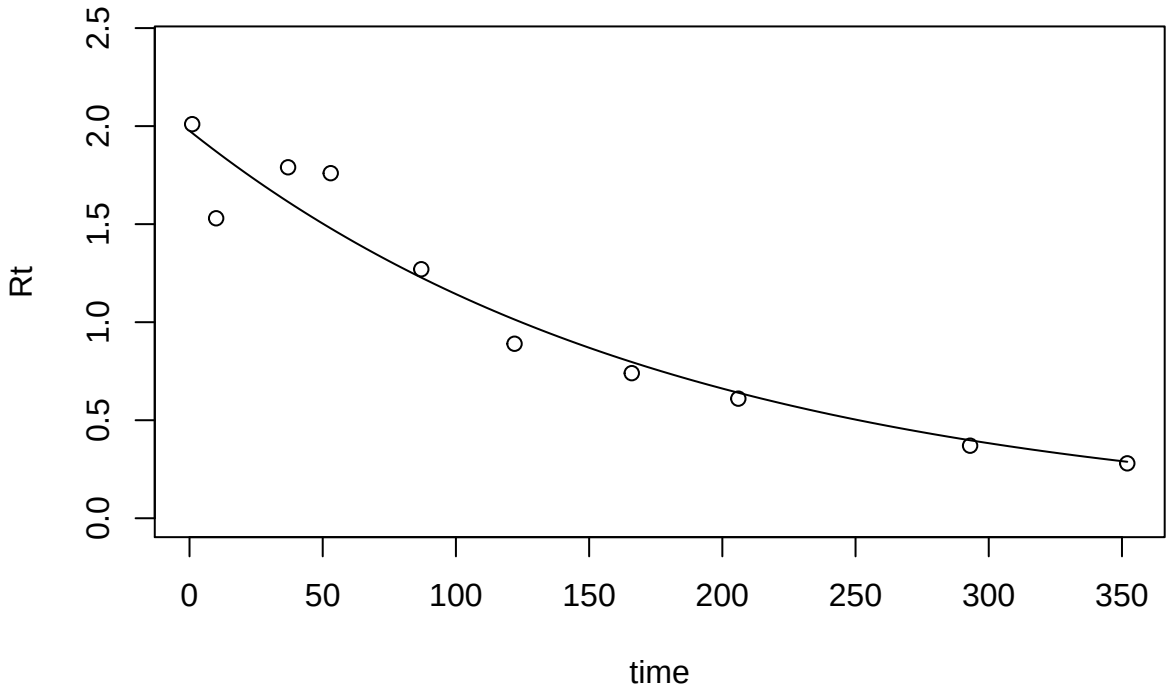

```
## [1] "AIC =  13.3744887704802"
```

```
## [1] "k1= 0.00547121689014112"
## [2] "k2= 0"
## [3] "a21= 0.999916282030672"
## [4] "a12= 6.75774253222627e-08"
## [5] "Proportion of C0 in pool 1= 0.999976680593702"
```




```
## [1] "AIC =  17.3744887632303"
```

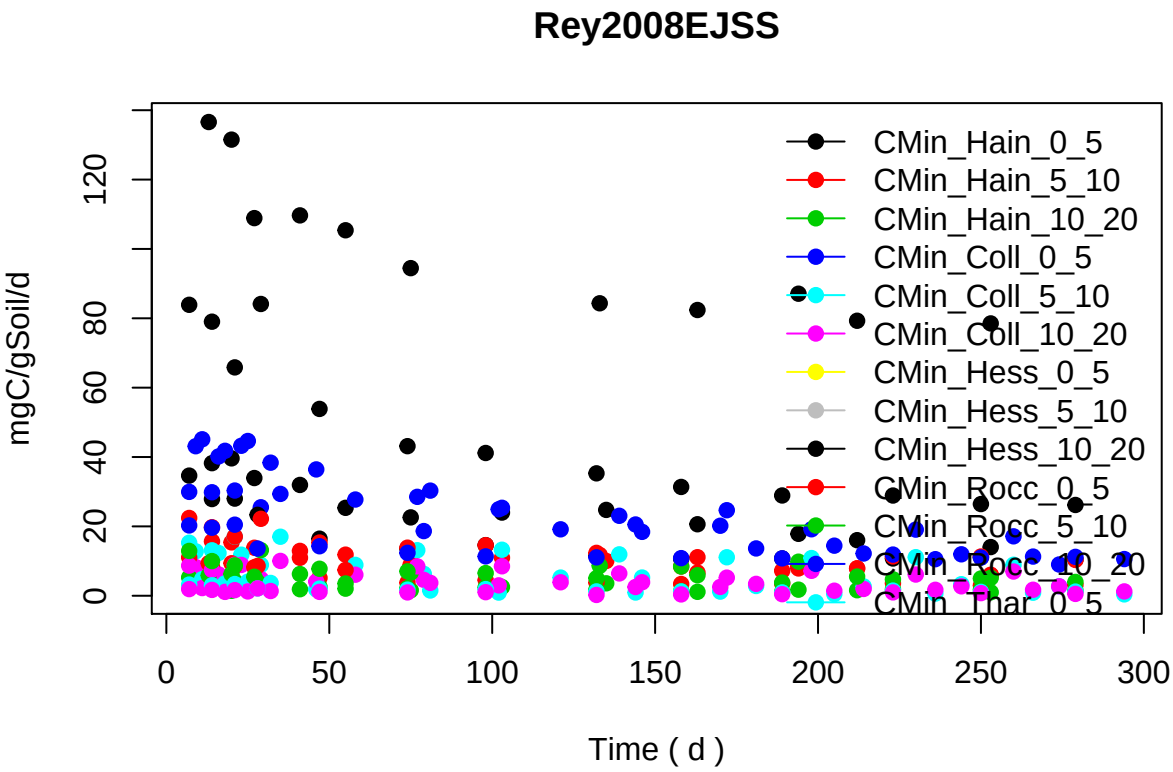
```
## [1] "k1= 0.005471214992418"
## [2] "k2= 4.47436566064243e-28"
## [3] "a21= 0.999916282221723"
## [4] "Proportion of C0 in pool 1= 0.999978857248766"
```




```
## [1] "AIC =  15.3744887631878"
```

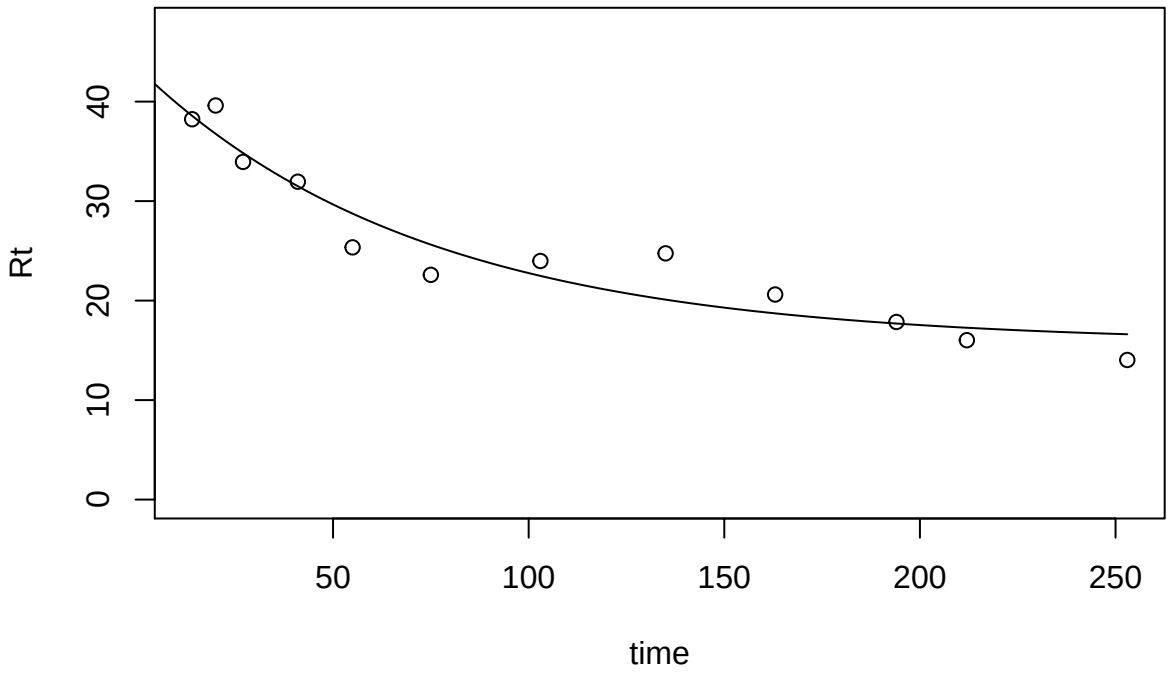
Dataset Rey2008EJSS

A dataset with 25 variables of 8 different study sites, 3 different depth (midDepth: 2.5, 7.5, 15). 58 observation



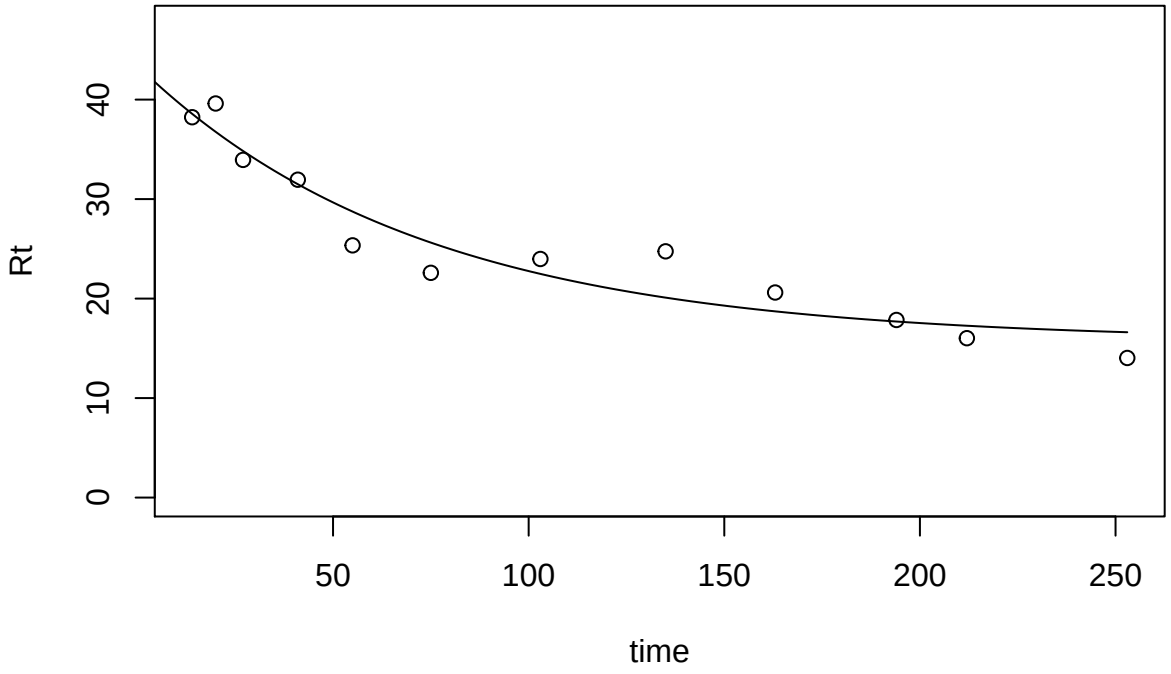
V2: Dataset of Rey2008EJSS variable Carbon mineralization rates for the 0–5 cm soil layer at the Hainich site measures as CO2 mgC/gSoil/d

```
## [1] "k1= 0.0137987820753446"
## [2] "k2= 2.34797000299885e-05"
## [3] "proportion of C0 in pool 1= 0.00294365008159442"
```




```
## [1] "AIC =  2.59823726180533"
```

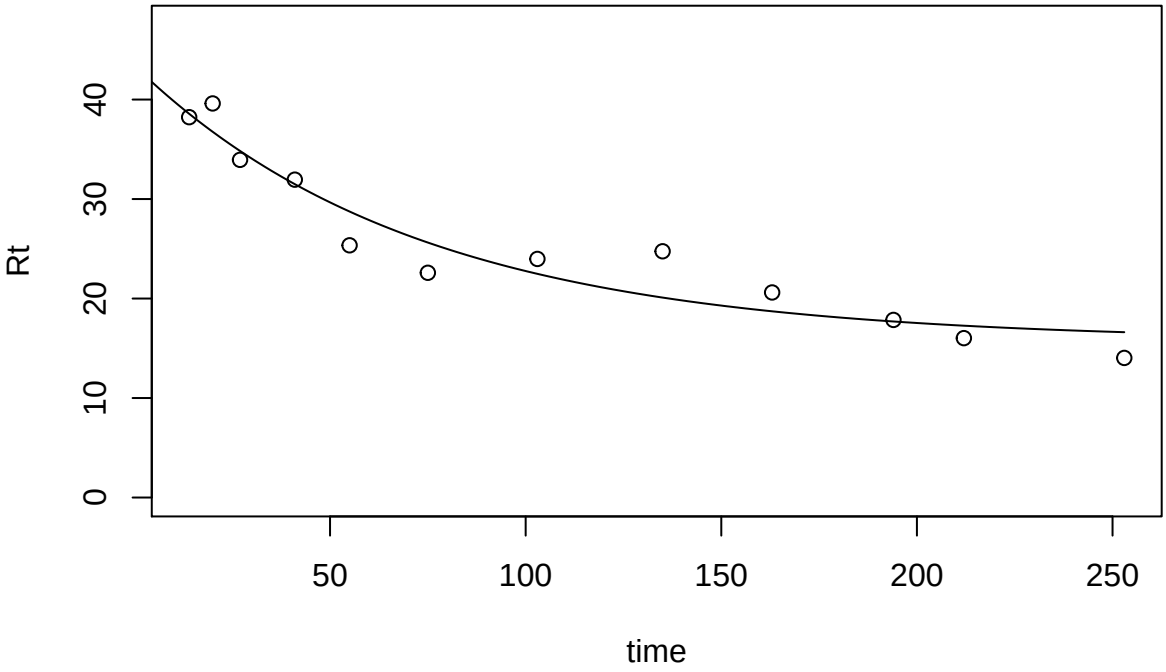
```
## [1] "k1= 0.013787916434305"
## [2] "k2= 3.46681257969815e-05"
## [3] "a21= 0.396142550617464"
## [4] "a12= 0.813276216383406"
## [5] "Proportion of C0 in pool 1= 0.00691827027472935"
```




```
## [1] "AIC =  6.59823726383587"
```

```
## [1] "k1= 0.0137988822256469"
## [2] "k2= 2.34797690901441e-05"
```

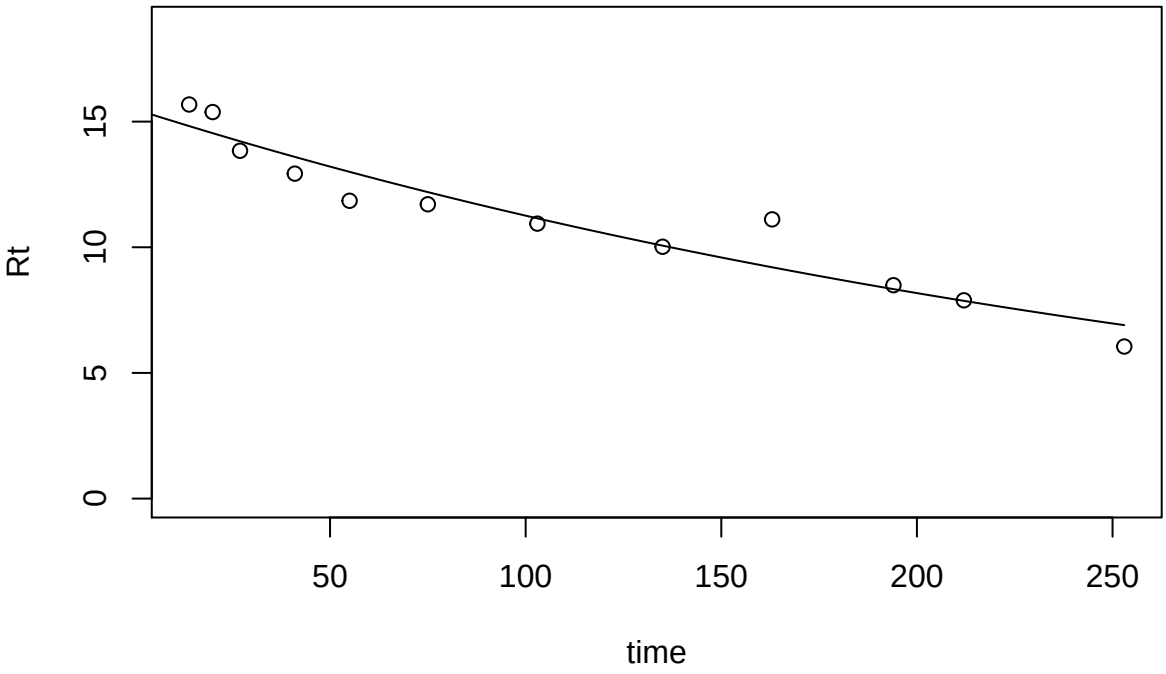
```
## [3] "a21= 0.63438638220072"
## [4] "Proportion of C0 in pool 1= 0.00807510006140261"
```




```
## [1] "AIC =  4.59823726238626"
```

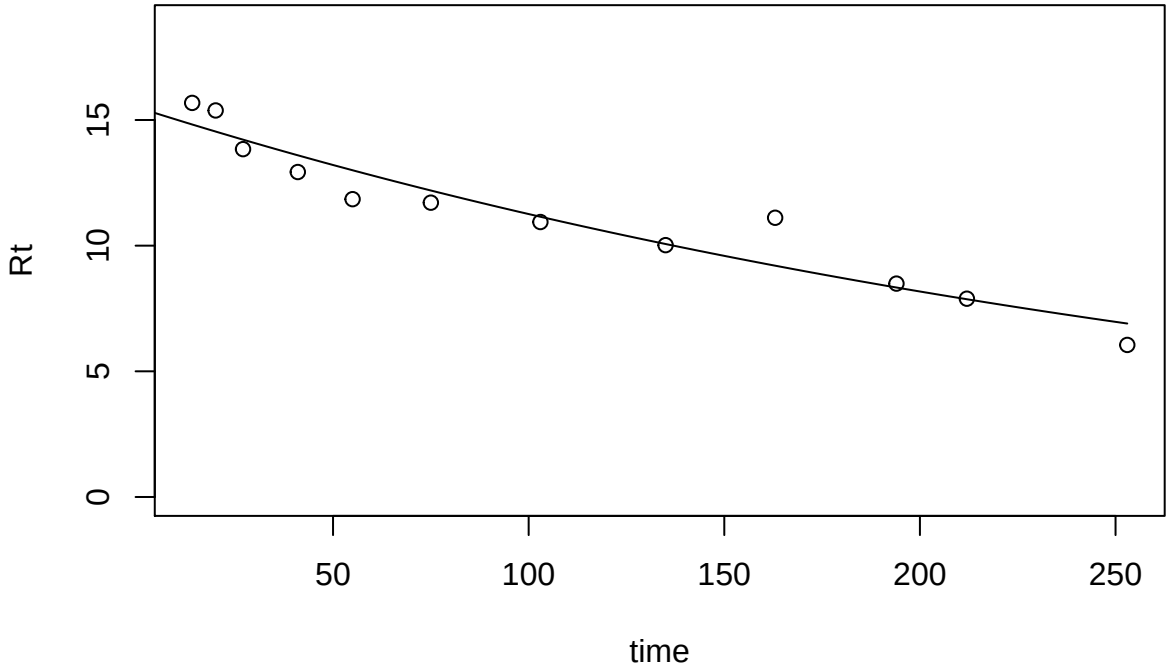
V3: Dataset of Rey2008EJSS variable Carbon mineralization rates for the 5–10 cm soil layer at the Hainich site measures as CO2 mgC/gSoil/d

```
## [1] "k1= 0.00319824558888046"
## [2] "k2= 2.69852446115395e-11"
## [3] "proportion of C0 in pool 1= 0.012458879089112"
```



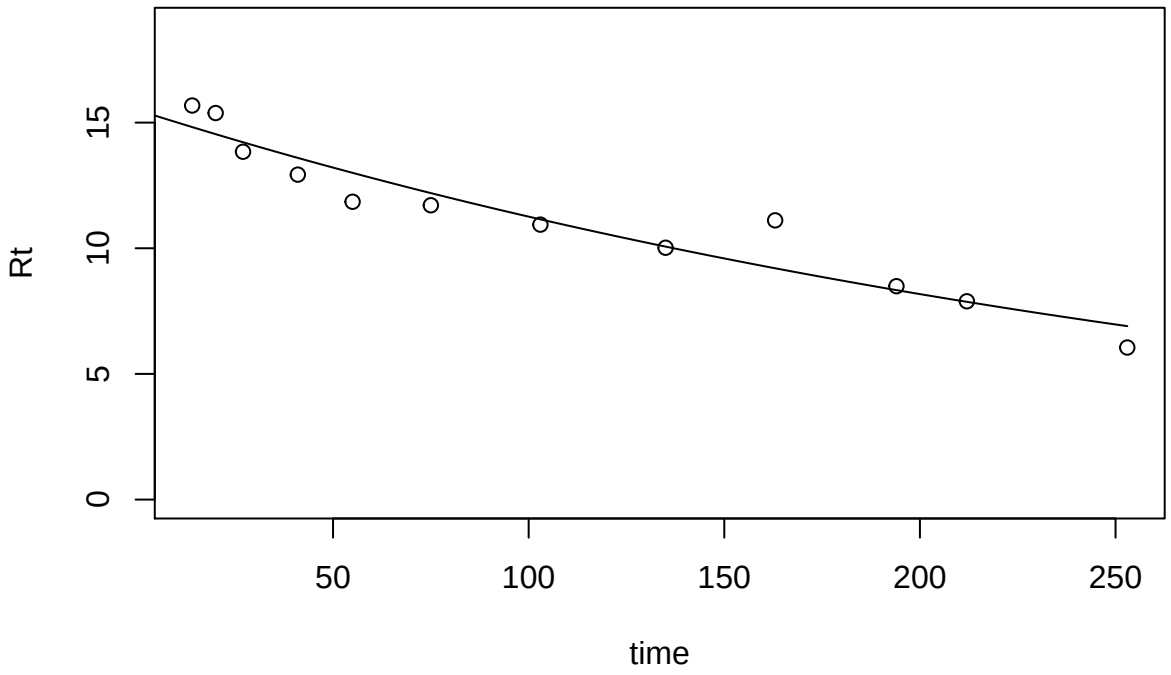
```
## [1] "AIC =  6.80659190754428"
```

```
## [1] "k1= 0.00319890138683521"
## [2] "k2= 7.77561018792222e-09"
## [3] "a21= 0.268367448316798"
## [4] "a12= 0.999143566883617"
## [5] "Proportion of C0 in pool 1= 0.0170255011073855"
```




```
## [1] "AIC =  10.8065896572173"
```

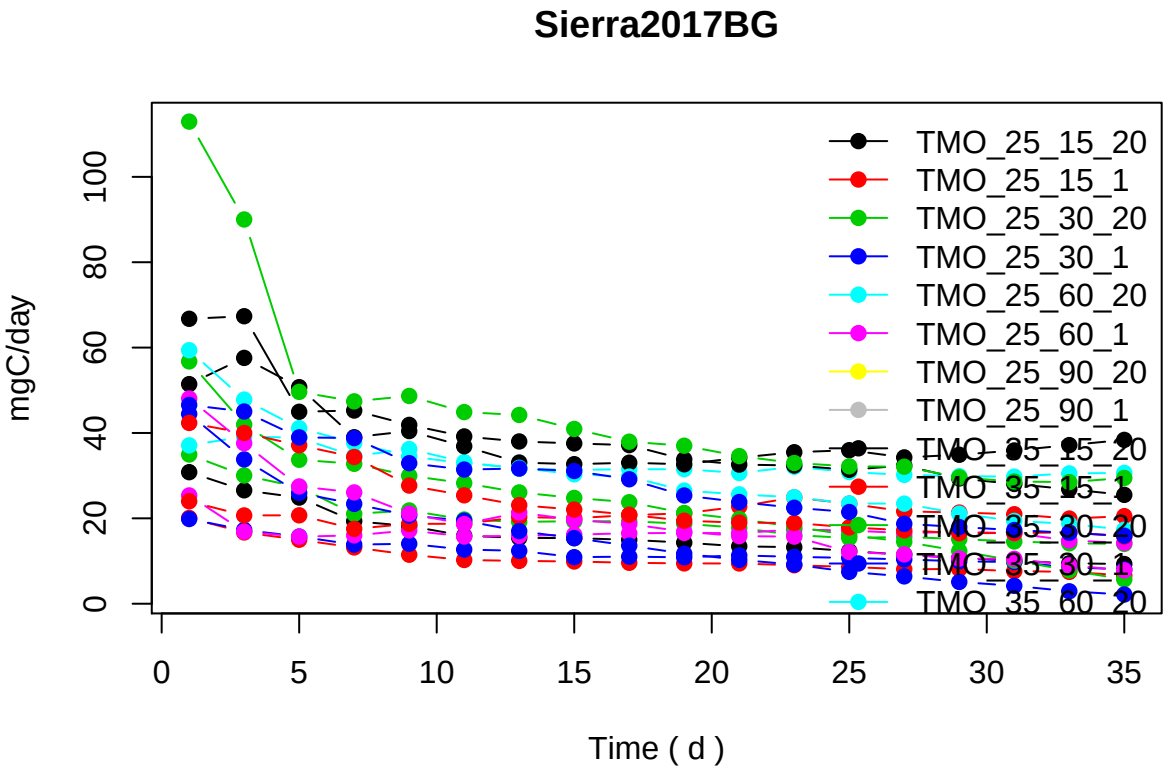
```
## [1] "k1= 0.003198399293552"
## [2] "k2= 1.34177070083016e-09"
## [3] "a21= 0.0959958698926048"
## [4] "Proportion of C0 in pool 1= 0.0137807873403177"
```




```
## [1] "AIC =  8.8065913861672"
```

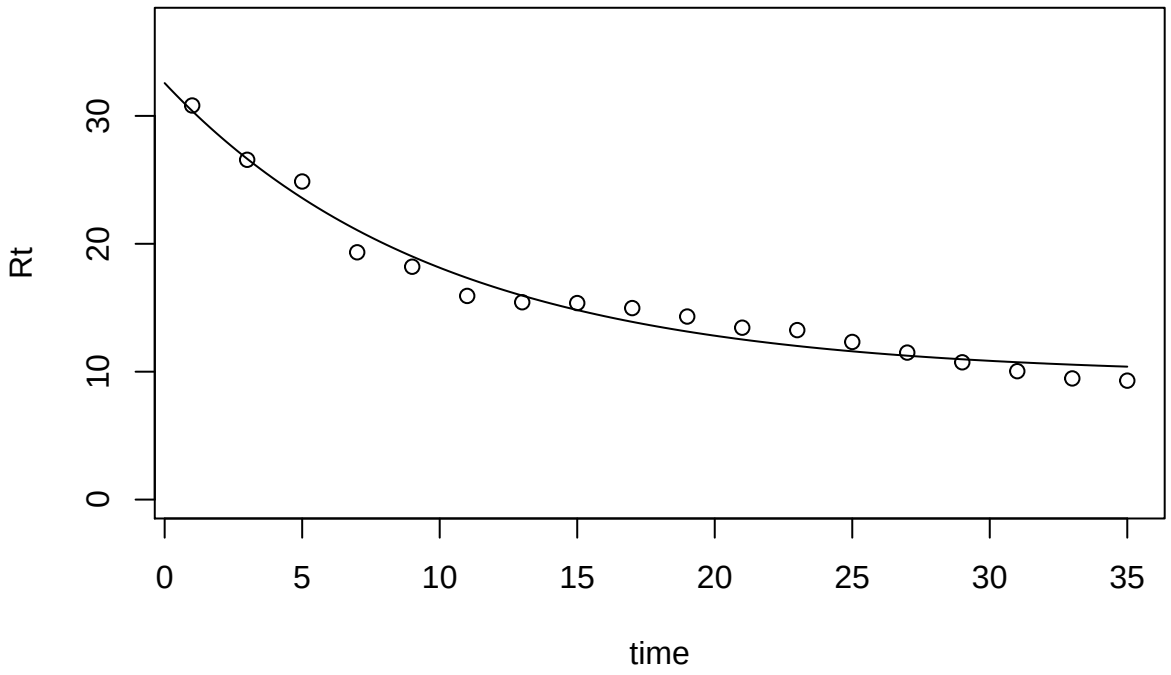
Dataset Sierra2017BG

A dataset with 17 variables of Full factorial incubation experiment with the manipulated treatments being temperature (25, 35 C), soil water content (15, 30, 60 90% water-filled pore space), and oxygen concentration in the pore space (1 and 20%), with soils enclosed in PVC cylinders (10 cm diameter and 20 cm height) containing in about half of their volume 450 g of homogenized soil. The approximate bulk density within each cylinder was 0.6 g cm-3. Organic soil was collected from the A horizon of a boreal forest dominated by black spruce at the Caribou Poker watershed in central Alaska, USA, two levels of temperature, 4 levels of soil moisture and 2 levels of oxygen as treatments



V2: Dataset of Sierra2017BG variable Respiration rates measures as CO2 mgC/day

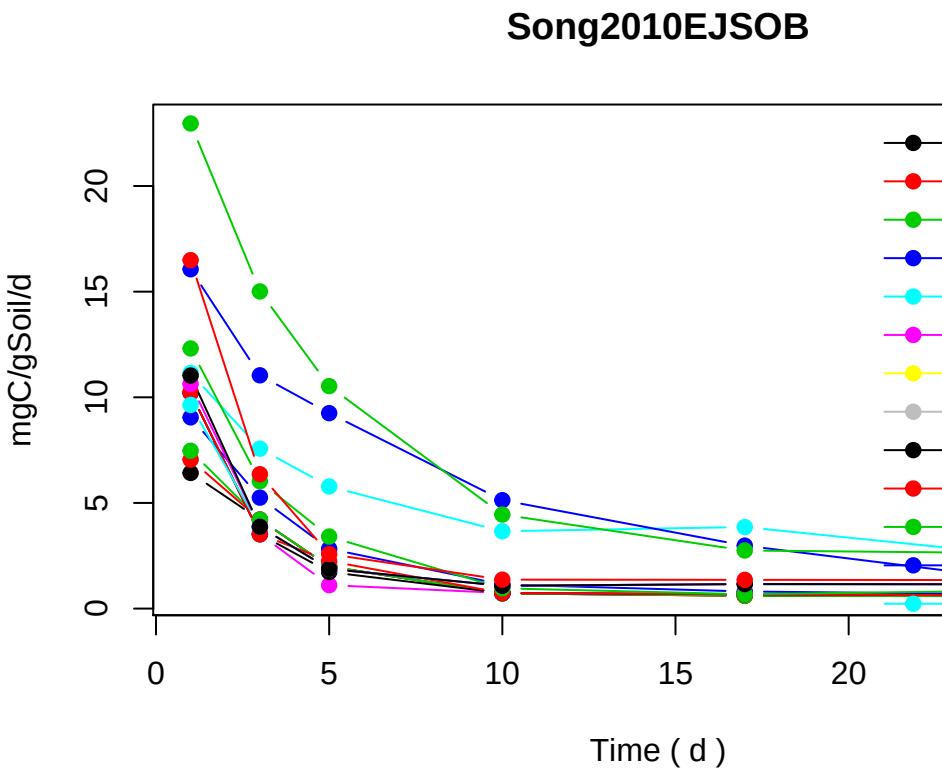
```
## [1] "k1= 0.100167201419967"
## [2] "k2= 0.000209567412244594"
## [3] "proportion of C0 in pool 1= 0.00484992277584095"
```




```
## [1] "AIC =  6.17807371951957"
```

Dataset Song2010EJSOB

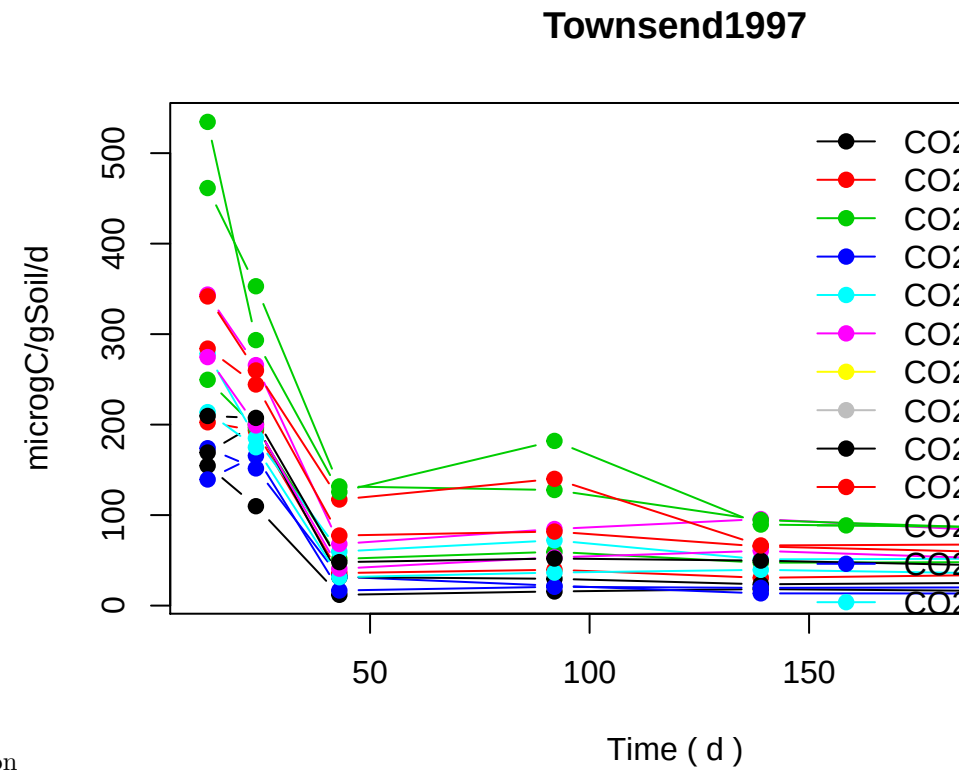
A dataset with 16 variables of .



** The dataset is short ** only 7 observation

Dataset Townsend1997

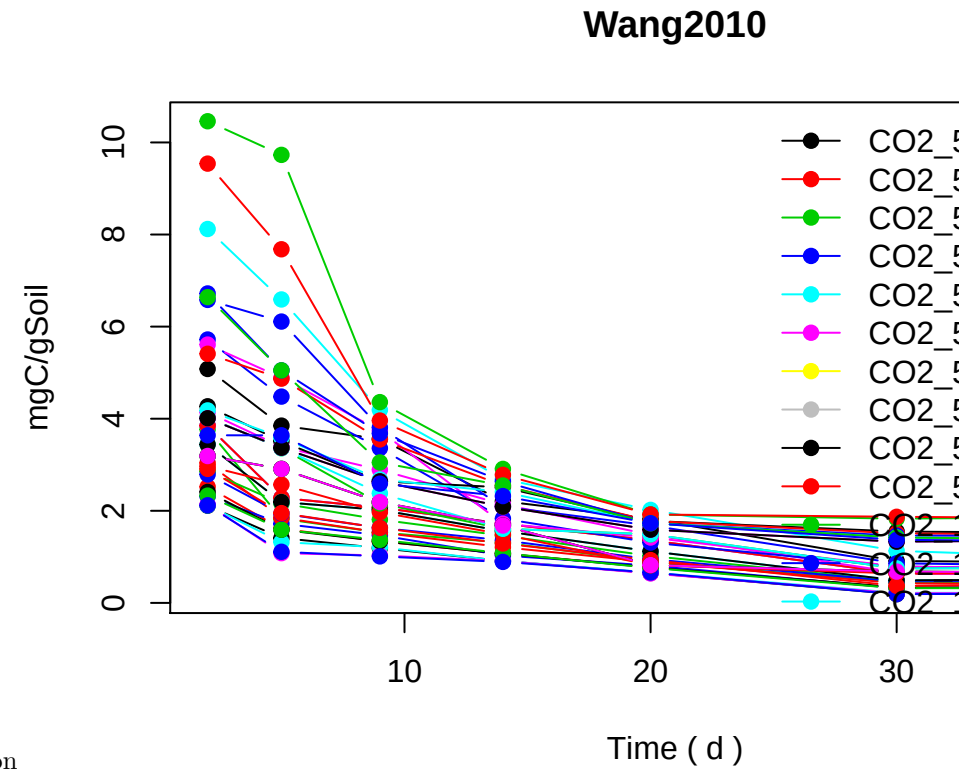
A dataset with 16 variables of eight 10g laboratory replicates were incubated at 20, 30 and 40deg for ca. 225 d..



** The dataset is short ** only 6 observation

Dataset Wang2010

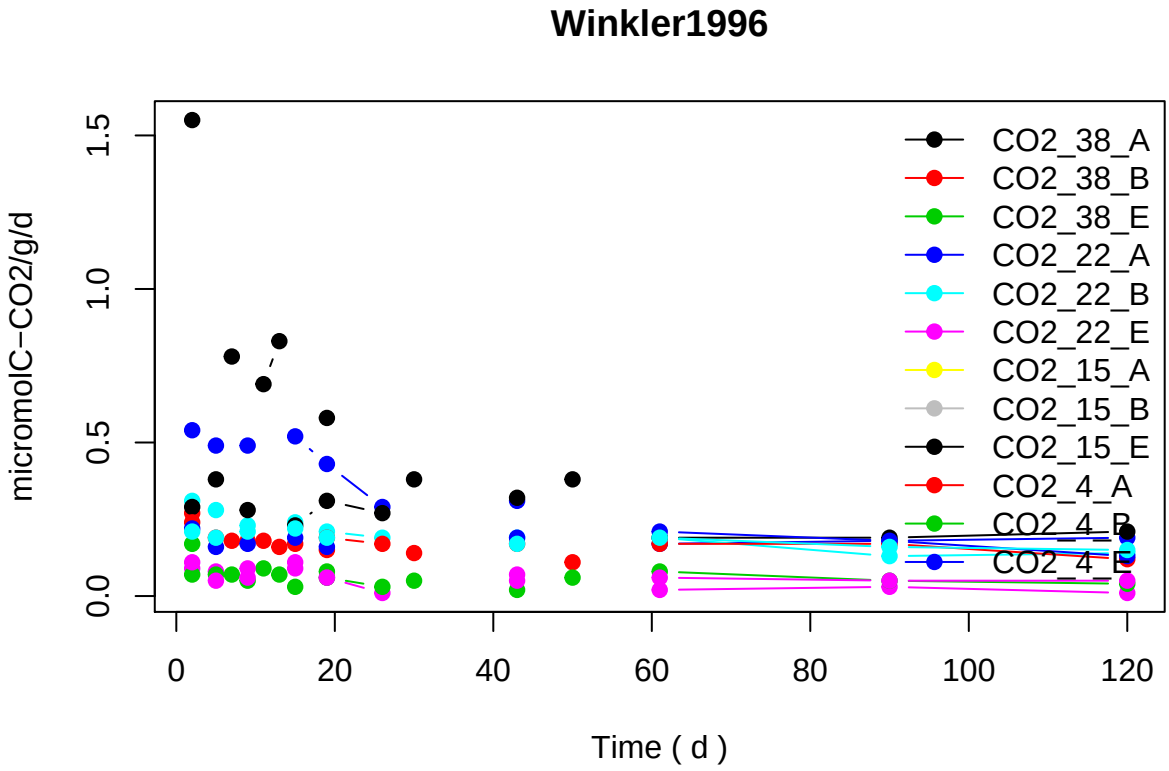
A dataset with 16 variables of three laboratory replicates were incubated for 40 days at 5, 10, 15 and 20 degrees and under different moisture contents (0, 30, 60, 100 percent, CS- completely water saturated)..



** The dataset is short ** only 7 observation

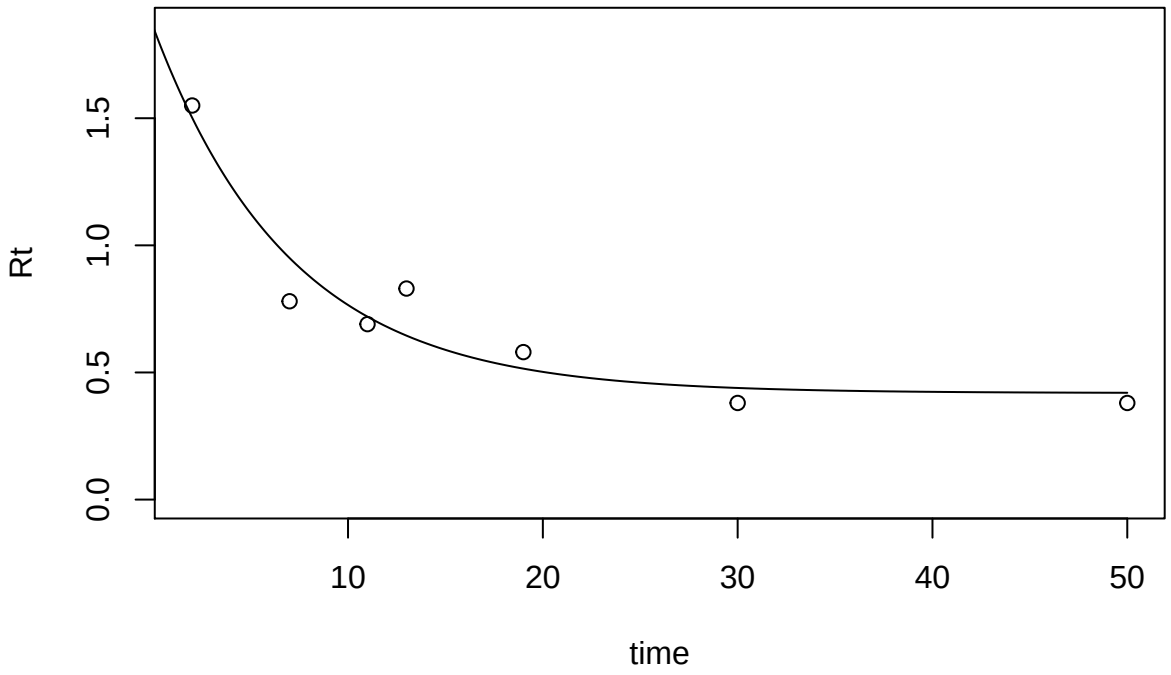
Dataset Winkler1996

A dataset with 13 variables of Ten A-, eight E-, and ten B-horizon samples were incubated at 4, 15 and 22deg for 120 d and at 38deg for 50 d.. 15 observation



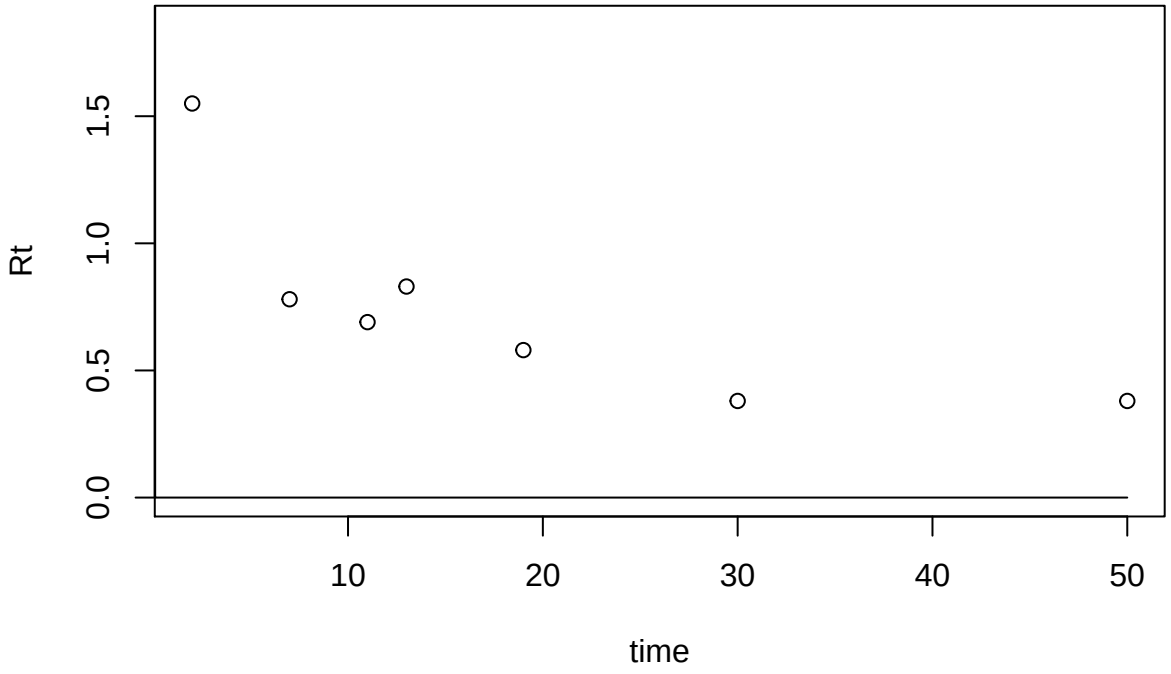
V2: Dataset of Winkler1996 variable Mean rate of CO2 evolution for A-horizon soils at 38 degrees during the incubation. measures as CO2 micromolC-CO2/g/d

```
## [1] "k1= 0.142465631534389"
## [2] "k2= 4.19015032614352e-06"
## [3] "proportion of C0 in pool 1= 0.000101054747935925"
```




```
## [1] "AIC =  15.0541042821694"
```

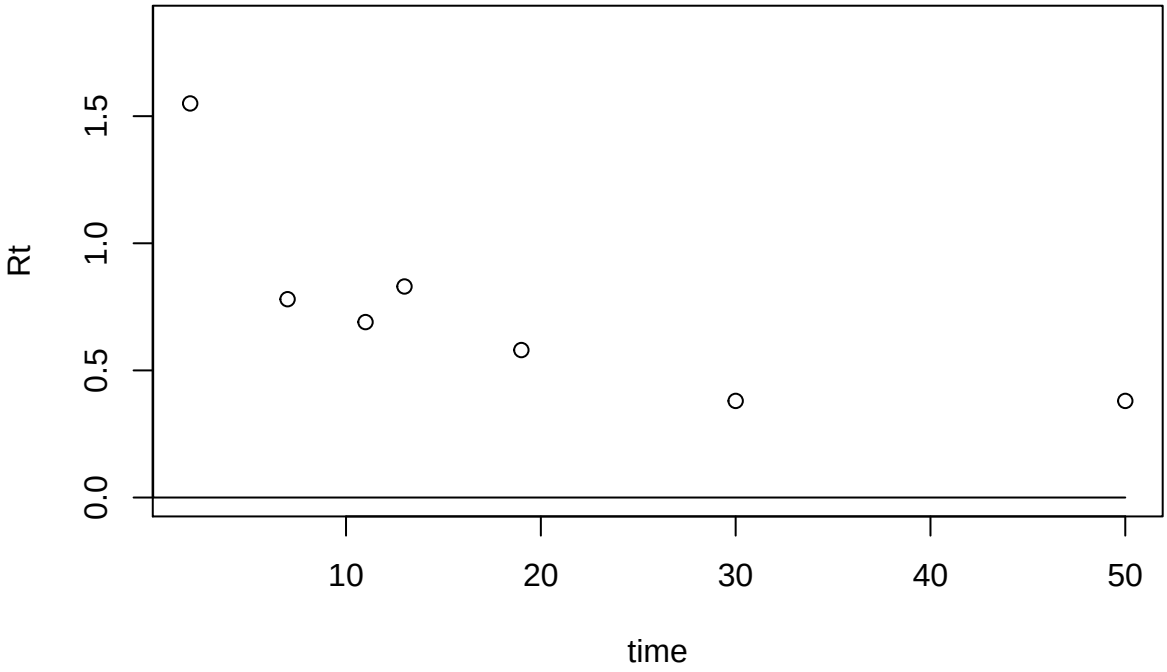
```
## [1] "k1= 144294.418714285"
## [2] "k2= 2.72597781221236e+118"
## [3] "a21= 5.45597964545785e-05"
## [4] "a12= 0.999999954509656"
## [5] "Proportion of C0 in pool 1= 0.999951476919897"
```




```
## [1] "AIC =  10.7541301814589"
```

```
## [1] "k1= 186492.793868081"
## [2] "k2= 2.29229305135061e+23"
```

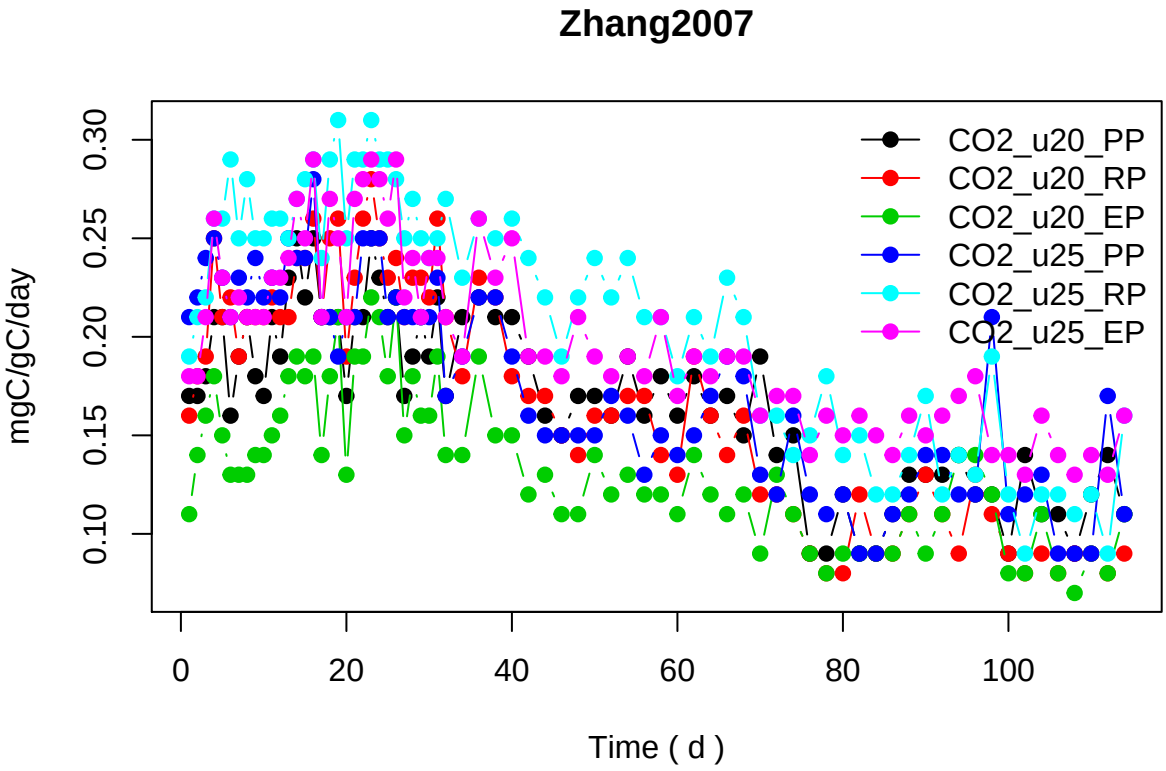
```
## [3] "a21= 0.999974321315191"
## [4] "Proportion of C0 in pool 1= 0.999974096455973"
```




```
## [1] "AIC =  8.75413018145894"
```

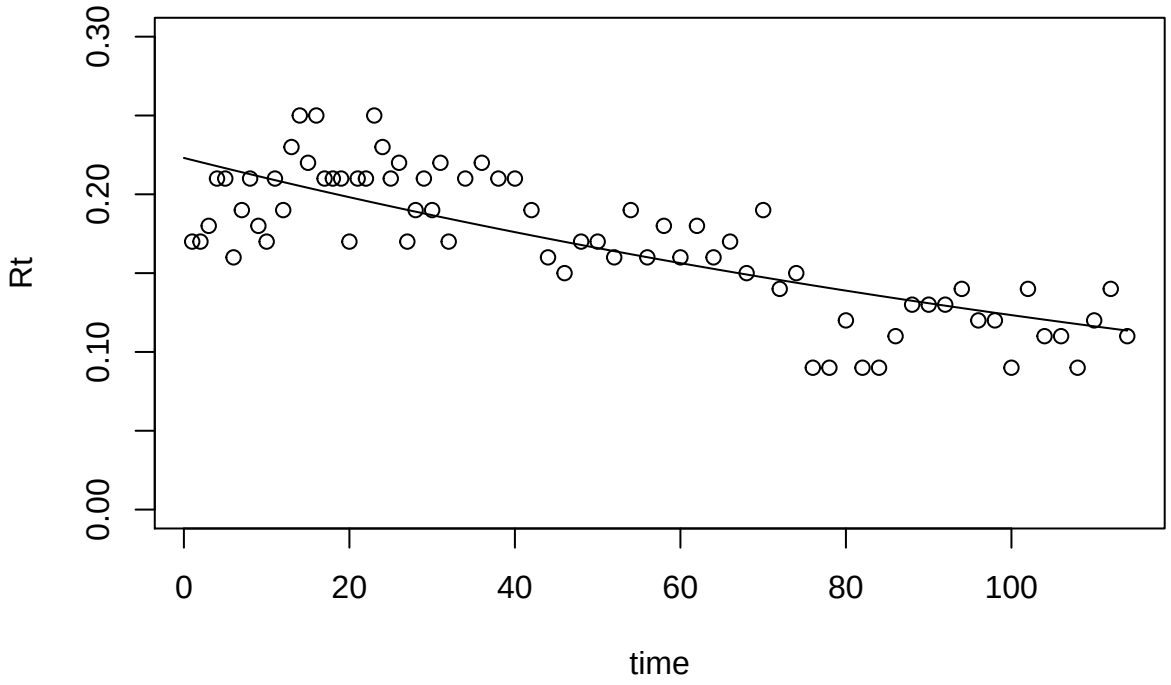
Dataset Zhang2007

A dataset with 13 variables of Ten A-, eight E-, and ten B-horizon samples were incubated at 4, 15 and 22deg for 120 d and at 38deg for 50 d.. 15 observation



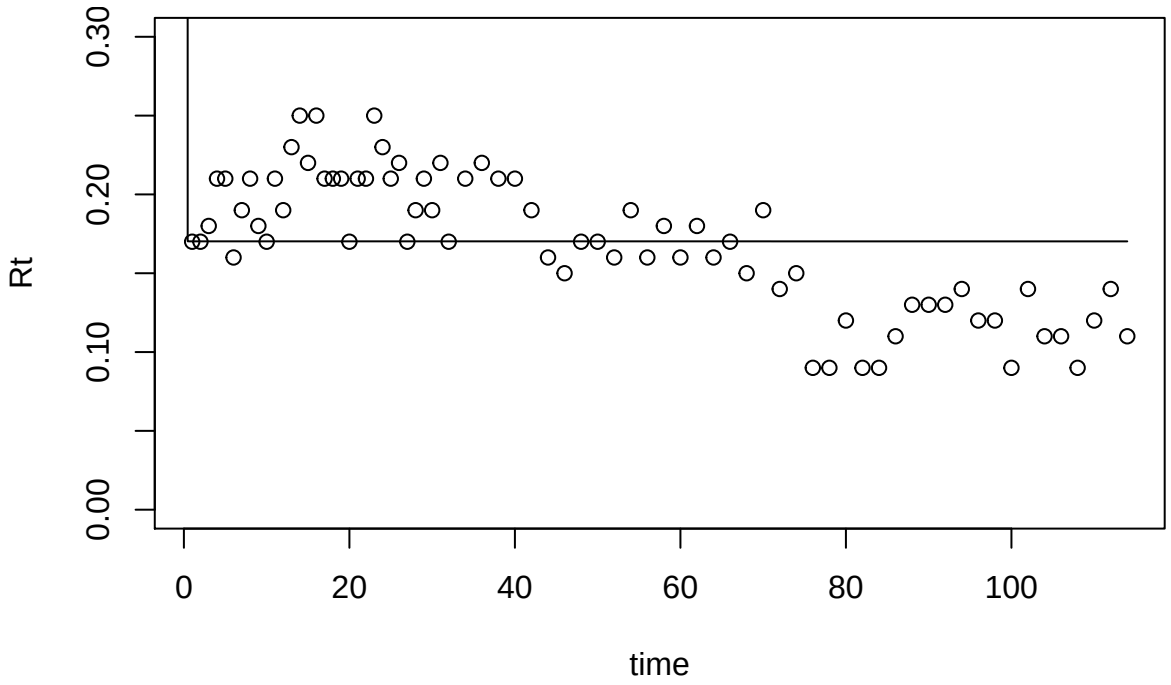
V2: Dataset of Zhang2007 variable Dynamics of C mineralization as CO2 evolution during the incubation under 20 degrees for soil sample PP measures as CO2 mgC/gC/day

```
## [1] "k1= 0.00592340680240672"
## [2] "k2= 6.09795496529495e-18"
## [3] "proportion of C0 in pool 1= 0.000215447984766248"
```




```
## [1] "AIC =  20.5293443770638"
```

```
## [1] "k1= 53.7345857795404"
## [2] "k2= 1.3139240370164e-06"
## [3] "a21= 2.781694752374e-05"
## [4] "Proportion of C0 in pool 1= 0.258780342622321"
```




```
## [1] "AIC =  20.586529673025"
```