# data-print

February 9, 2021

[1]:
```
%pylab inline
import numpy as np
import matplotlib.pyplot as plt
from sko.GA import GA
import warnings
import xlrd
warnings.filterwarnings('ignore')
```

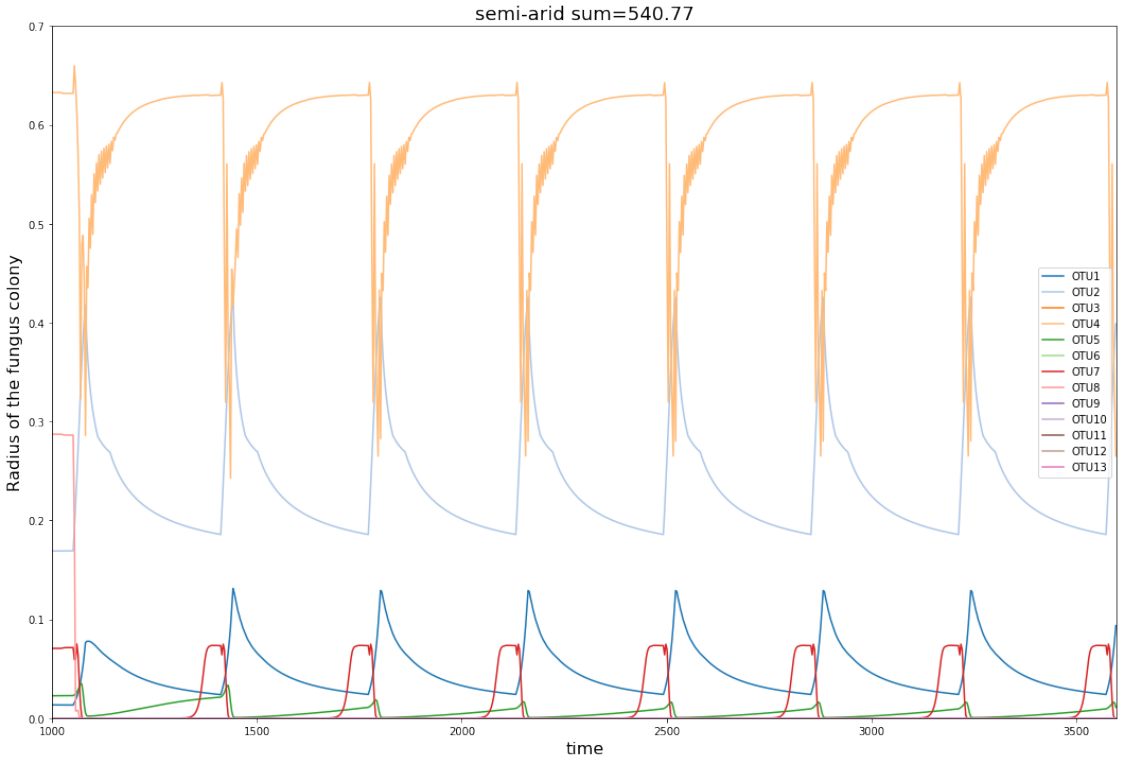
```
Populating the interactive namespace from numpy and matplotlib
```

[2]:
```
tableau20 = [(31, 119, 180), (174, 199, 232), (255, 127, 14), (255, 187, 120),
             (44, 160, 44), (152, 223, 138), (214, 39, 40), (255, 152, 150),
             (148, 103, 189), (197, 176, 213), (140, 86, 75), (196, 156, 148),
             (227, 119, 194), (247, 182, 210), (127, 127, 127), (199, 199, 199),
             (188, 189, 34), (219, 219, 141), (23, 190, 207), (158, 218, 229)]
for i in range(len(tableau20)):
    r, g, b = tableau20[i]
    tableau20[i] = (r / 255., g / 255., b / 255.)
```

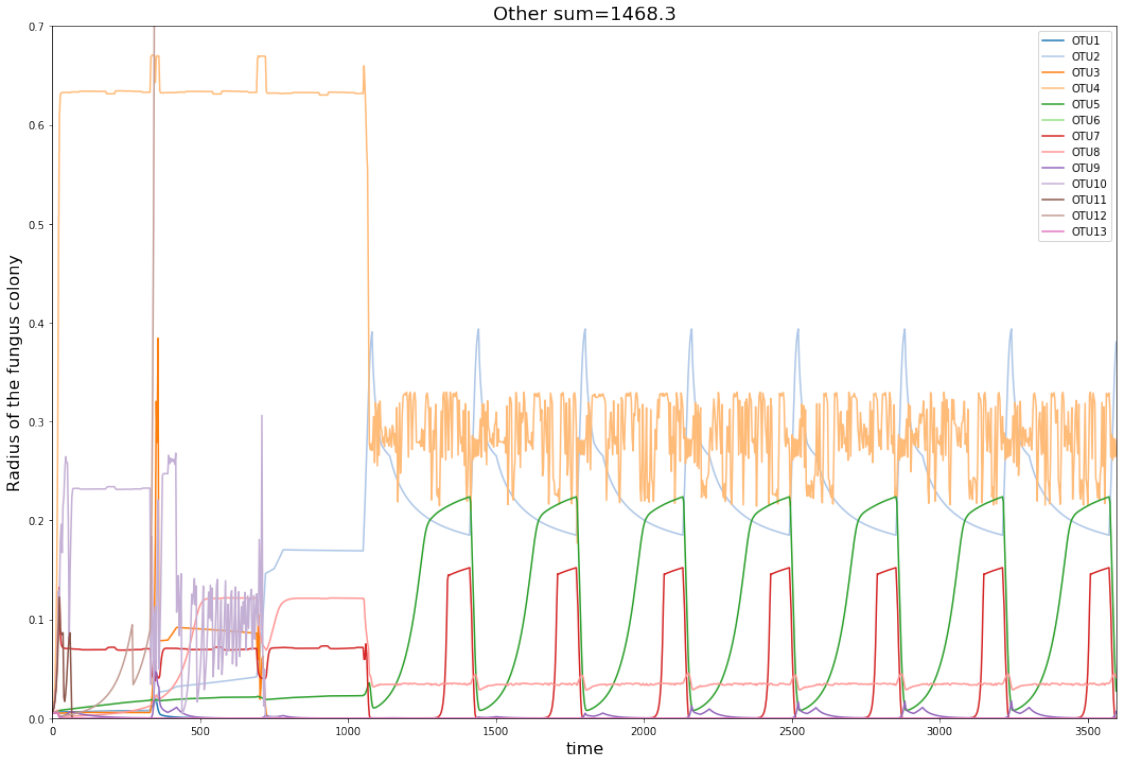
[43]:
```
def printf(num,st):
    xl=xlrd.open_workbook(r'C:\Users\29691\data-for_pic.xlsx')
    table=xl.sheets()[num]
    day=3597
    t=np.linspace(1,day,day/3)
    x=np.zeros((13,3599))
    for i in range(13):
        x[i]=np.array(table.row_values(i))
    xx=np.zeros((13,1199))
    for i in range(1199):
        xx[:,i]=x[:,i*3];
    plt.figure(figsize=(18,12))
    ax = plt.subplot(111)
    plt.ylim(0,0.7)
    plt.xlim(0,3600)
    for i in range(13):
        plt.plot(t,xx[i],color=tableau20[i],label='OTU'+str(i+1))
    plt.ylabel("Radius of the fungus colony",fontsize=16)
    plt.xlabel("time",fontsize=16)
```

```
    plt.title(st,fontsize=18)
    plt.legend()
```

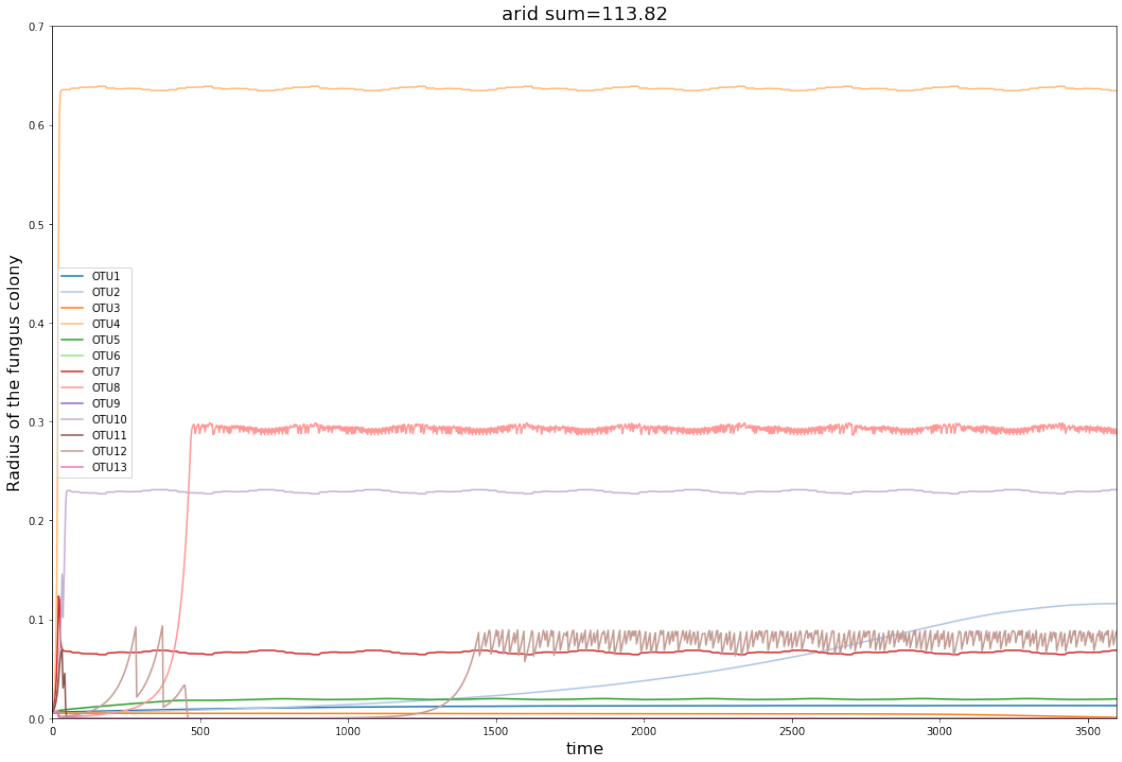
[42]:
```
printf(0,"semi-arid sum=540.77")
```



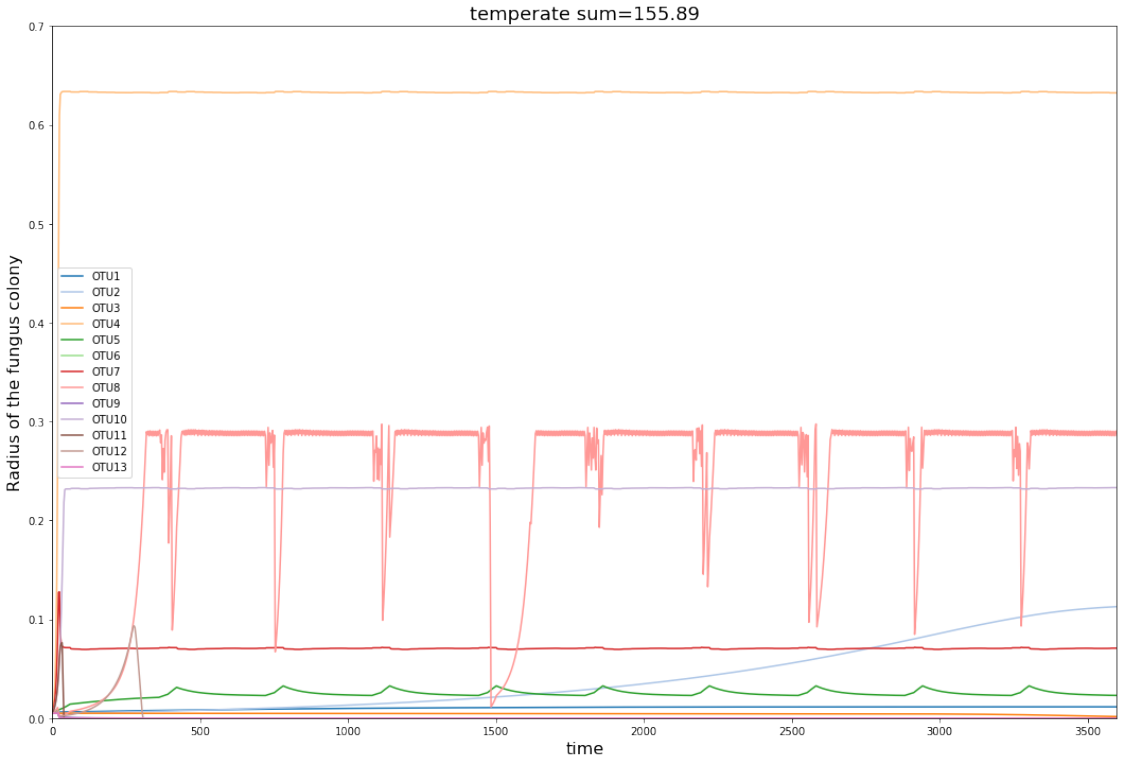

[44]:
```
printf(1,"Other sum=1468.3")
```



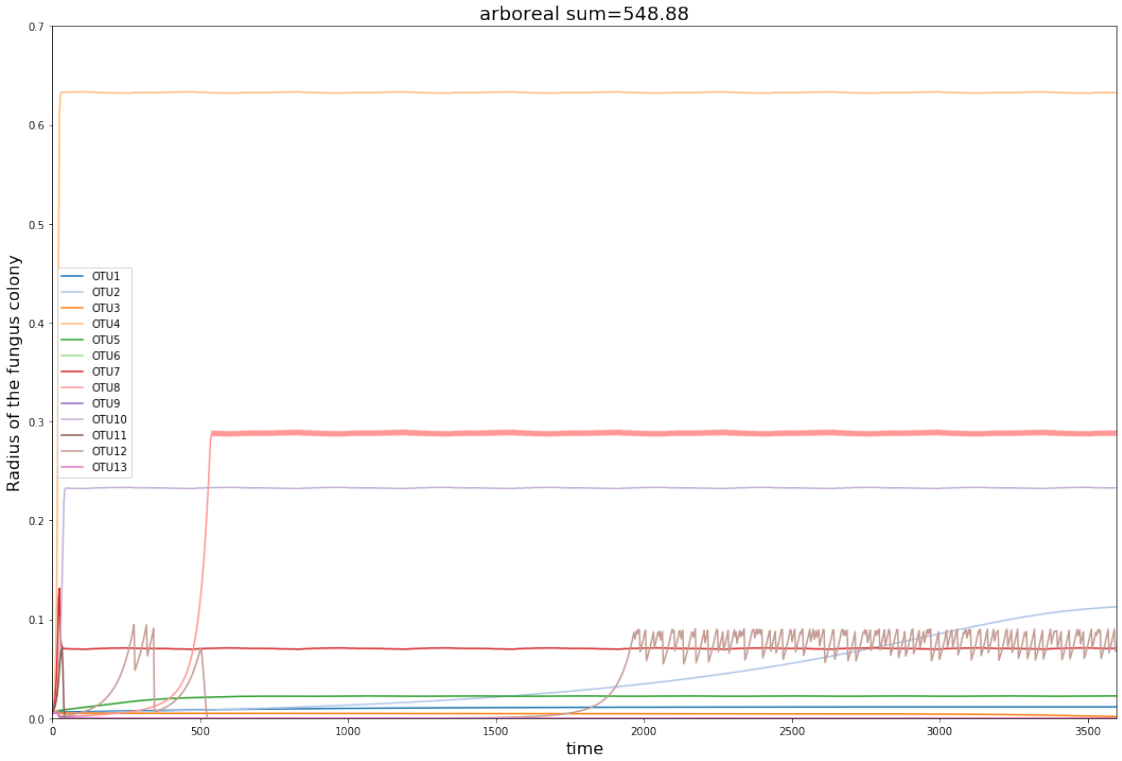

[45]:
```
printf(2,"arid sum=113.82")
```



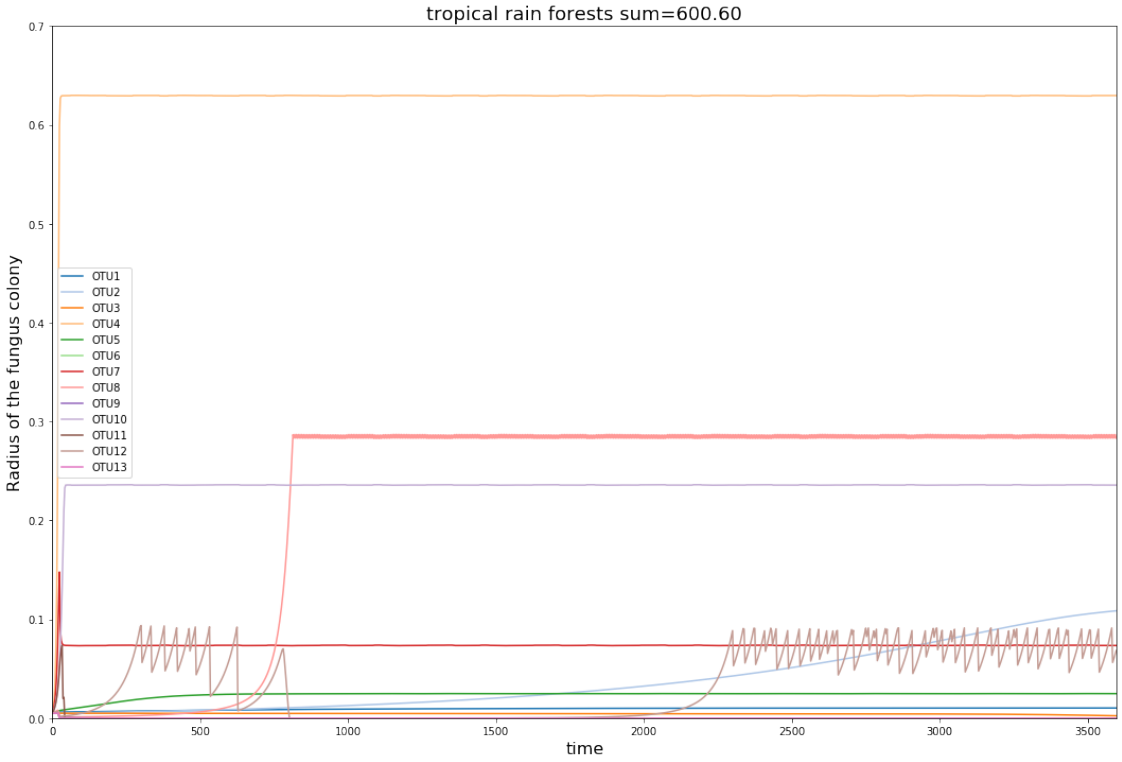
[46]:
```
printf(3,"temperate sum=155.89")
```



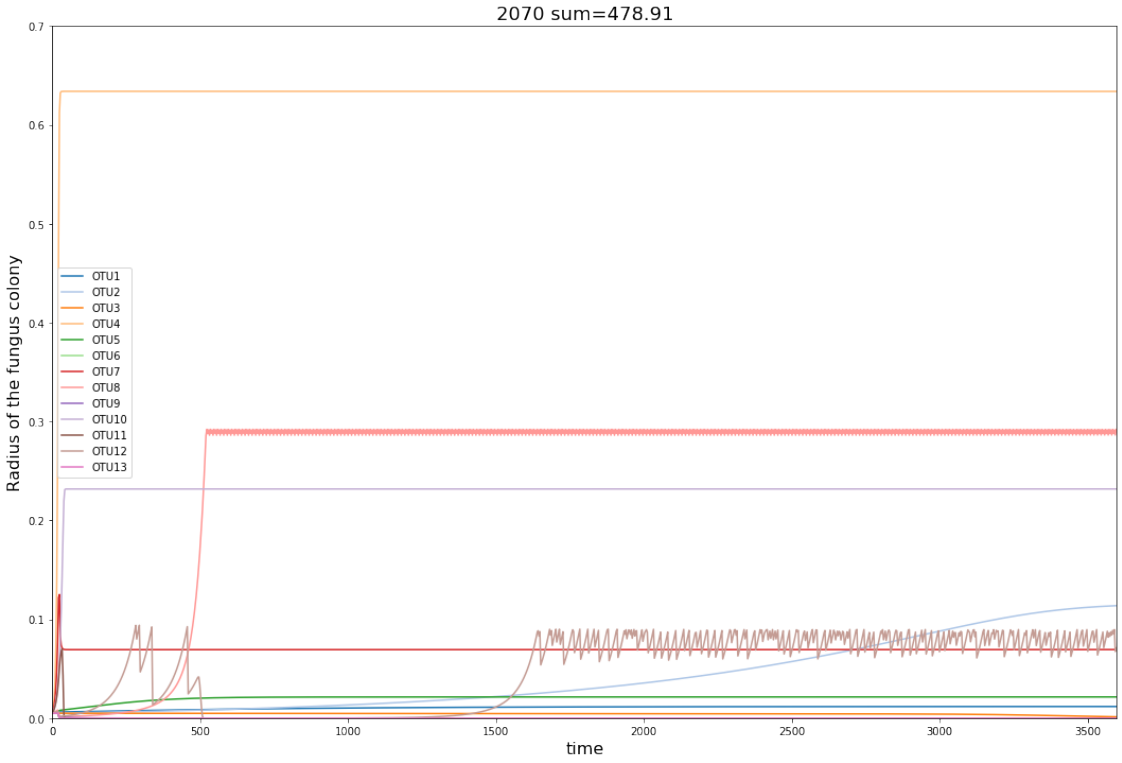

[47]:
```
printf(4,"arboreal sum=548.88")
```



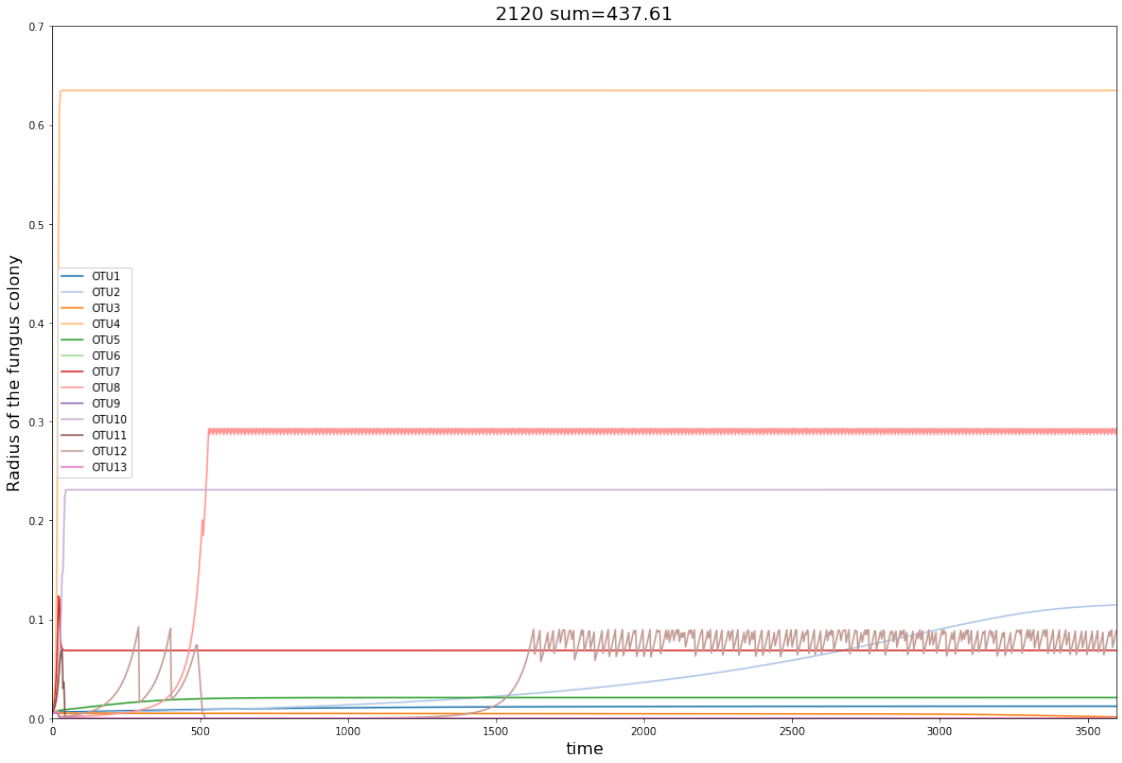

[48]:
```
printf(5,"tropical rain forests sum=600.60")
```



[49]:
```
printf(6,"2070 sum=478.91")
```

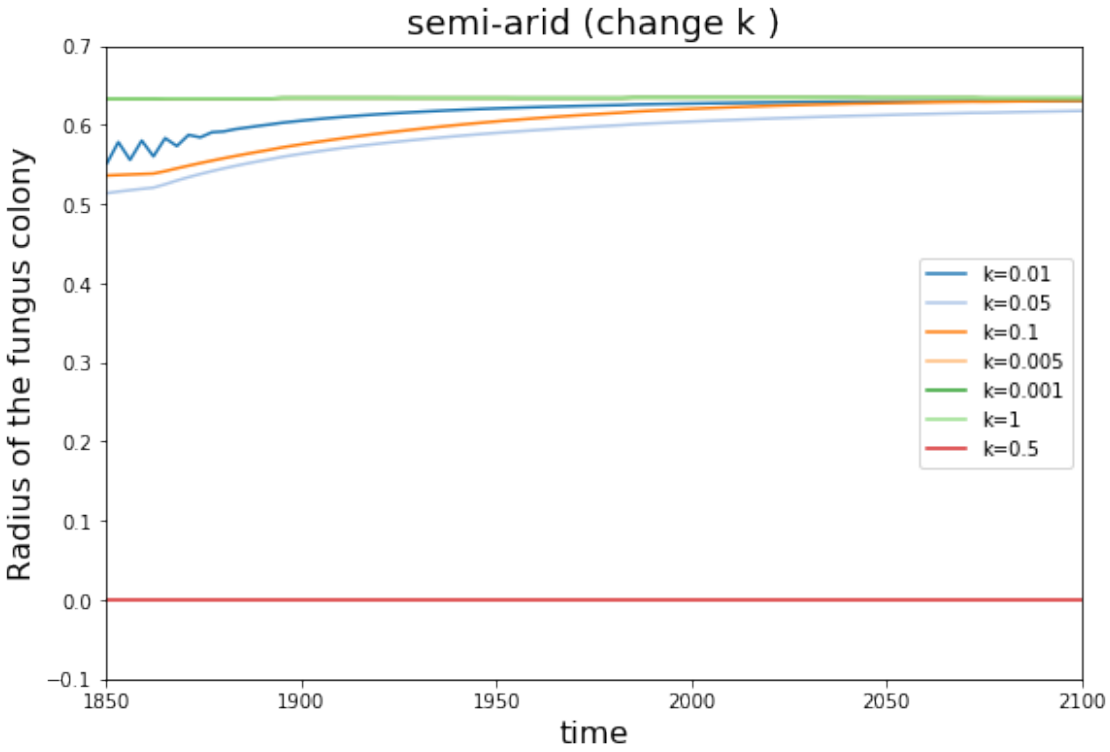



[50]:
```
printf(7,"2120 sum=437.61")
```




[37]:
```
xl=xlrd.open_workbook(r'C:\Users\29691\data-for_pic.xlsx')
table=xl.sheets()[8]
day=3597
t=np.linspace(1,day,day/3)
x=np.zeros((7,3599))
for i in range(6):
    x[i]=np.array(table.row_values(i))
xx=np.zeros((7,1199))
for i in range(1199):
    xx[:,i]=x[:,i*3];
plt.figure(figsize=(9,6))
ax = plt.subplot(111)
plt.ylim(-0.1,0.7)
plt.xlim(1850,2100)
st=["k=0.01","k=0.05","k=0.1","k=0.005","k=0.001","k=1","k=0.5"]
for i in range(7):
    plt.plot(t,xx[i],color=tableau20[i],label=st[i])
plt.ylabel("Radius of the fungus colony",fontsize=16)
plt.xlabel("time",fontsize=16)
plt.title("semi-arid (change k )",fontsize=18)
plt.legend()
```

[37]:
```
<matplotlib.legend.Legend at 0x210b37e8188>
```


semi-arid (change k )
Radius of the fungus colony
time
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
−0.1
1850
1900
1950
2000
2050
2100
k=0.01
k=0.05
k=0.1
k=0.005
k=0.001
k=1
k=0.5