Comparing SLA Default vs. Plastic

This is some digging that I've done realted to https://github.com/FoRTExperiment/PestED/issues/2 so depending on the ED configuration the SLA is fixed or is adjusted by light levels an such. I see this potenitally as another reason why the intercomparison between ED and SEM would is useful. But it turns out that SLA returned as ED output so it is constant over time.

Set Up

```
library(magrittr)
library(data.table)
library(ggplot2)
library(ed4forte)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:data.table':
##
##     between, first, last

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(knitr)

base_dir <-  "/Users/dorh012/Documents/2020/FoRTE/pracitceED"
```

Download the results from PIC.

```
library(ssh)
```

```
## Linking to libssh v0.8.6
#Create a session
#Use username@server (letters+ numbers for username. constance03 is our server)
session<-ssh_connect("dorh012@constance03")

scp_download(session = session,
             files = '/people/dorh012/forte-workflow/testing-ensemble/forte-ed-runs/cases/test_runs/plas
             to = '/Users/dorh012/Documents/2020/FoRTE/pracitceED/Ensemble-SetUP/ed_outputs/')
```

```
## Warning: SSH warning: scp: /people/dorh012/forte-workflow/testing-ensemble/forte-ed-runs/cases/test_r
```

```
## NULL
```

```
scp_download(session = session,
             files = '/people/dorh012/forte-workflow/testing-ensemble/forte-ed-runs/cases/test_runs/def
             to = '/Users/dorh012/Documents/2020/FoRTE/pracitceED/Ensemble-SetUP/ed_outputs/')
```

```
##      73272 /Users/dorh012/Documents/2020/FoRTE/pracitceED/Ensemble-SetUP/ed_outputs/default_config_20
```

```
## NULL
```

```
ssh_disconnect(session)
```

Import and format ed outputs

```
default <- readRDS(file.path(base_dir, 'Ensemble-SetUP', 'ed_outputs', 'default_config_2000_2002.rds'))
plastic <- readRDS(file.path(base_dir, 'Ensemble-SetUP', 'ed_outputs', 'plasticity_config_2000_2002.rds

SLA_data <- bind_rows(default$df_cohort[[1]] %>%
                        select(datetime, PFT, SLA) %>%
                        mutate(scenario = 'default'),
                      plastic$df_cohort[[1]] %>%
                        select(datetime, PFT, SLA) %>%
                        mutate(scenario = 'plastic'))

NPP_data <- bind_rows(default$df_scalar[[1]] %>%
                        select(datetime, MMEAN_NPPDAILY_PY) %>%
                        mutate(scenario = 'default'),
                      plastic$df_scalar[[1]] %>%
                        select(datetime, MMEAN_NPPDAILY_PY) %>%
                        mutate(scenario = 'plastic'))
```
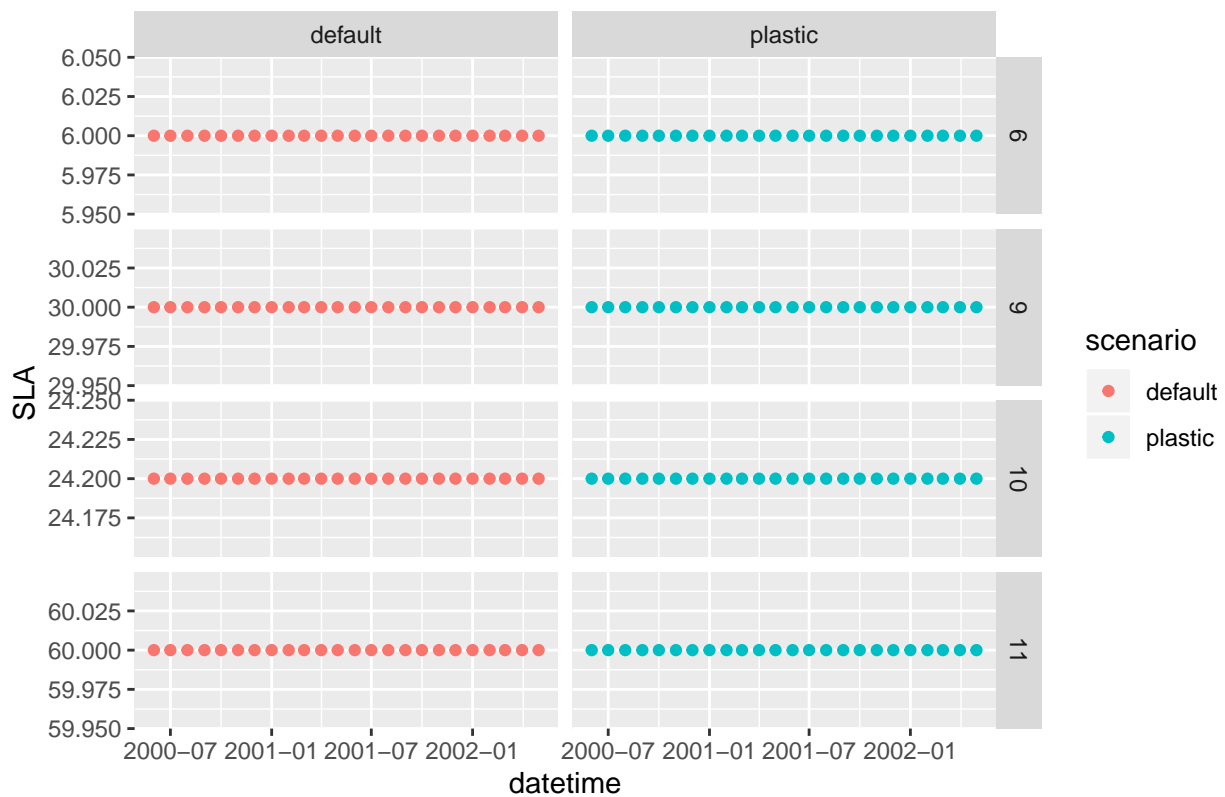
SLA

SLA is constant over time even in the plastic scenario.

```
ggplot(data  = SLA_data) +
  geom_point(aes(datetime, SLA, color = scenario)) +
  facet_grid(PFT~scenario, scales = 'free') +
  labs(title = 'SLA from ED with default and plastic trait representation')
```
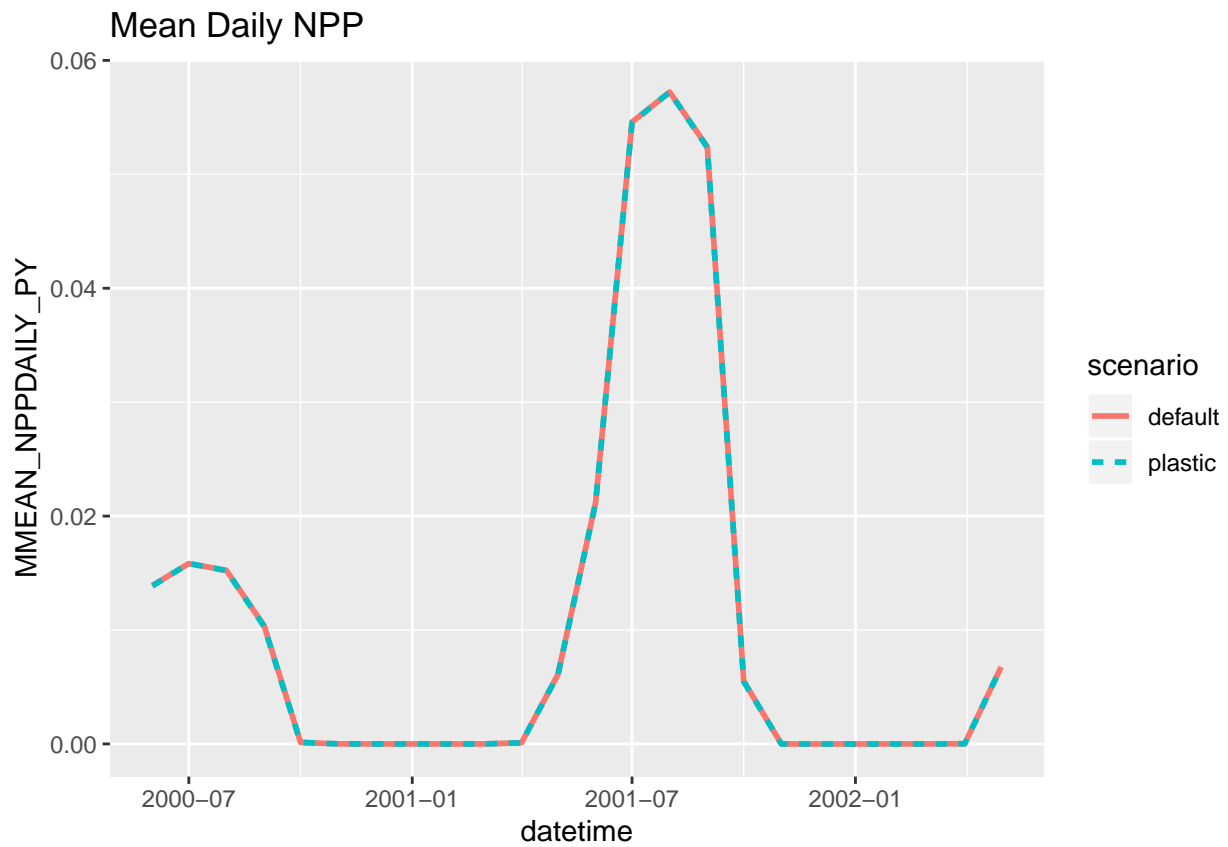
SLA from ED with default and plastic trait representation

NPP

The difference in the NPP is small between these runs, which makes me wonder if I should be looking at different output variables or is the plasticity to SLA not that sensitive? Is that something that Alexey looked at GCB?

```
ggplot(data  = NPP_data) +
  geom_line(aes(datetime, MMEAN_NPPDAILY_PY, color = scenario, linetype = scenario), size = 1) +
  labs(title = 'Mean Daily NPP')
```

Mean Daily NPP


```
NPP_data %>%
  tidyr::spread(scenario, MMEAN_NPPDAILY_PY) %>%
  dplyr::mutate(dif = 100 * (plastic - default)/default) %>%
  ggplot() +
  geom_line(aes(datetime, dif)) +
  labs(title = 'Percent Difference Between Default and Plastic Run NPP')
```

Percent Difference Between Default and Plastic Run NPP