04_Main

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R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 3.6.3
```

```
## -- Attaching packages --------------------------------- tidyverse 1.3.0 --
```

```
## v ggplot2 3.3.3     v purrr   0.3.3
## v tibble  2.1.3     v dplyr   0.8.3
## v tidyr   1.0.0     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.4.0
```

```
## Warning: package 'ggplot2' was built under R version 3.6.3
```

```
## -- Conflicts ------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'
```

```
## The following object is masked from 'package:base':
##
##     date
```

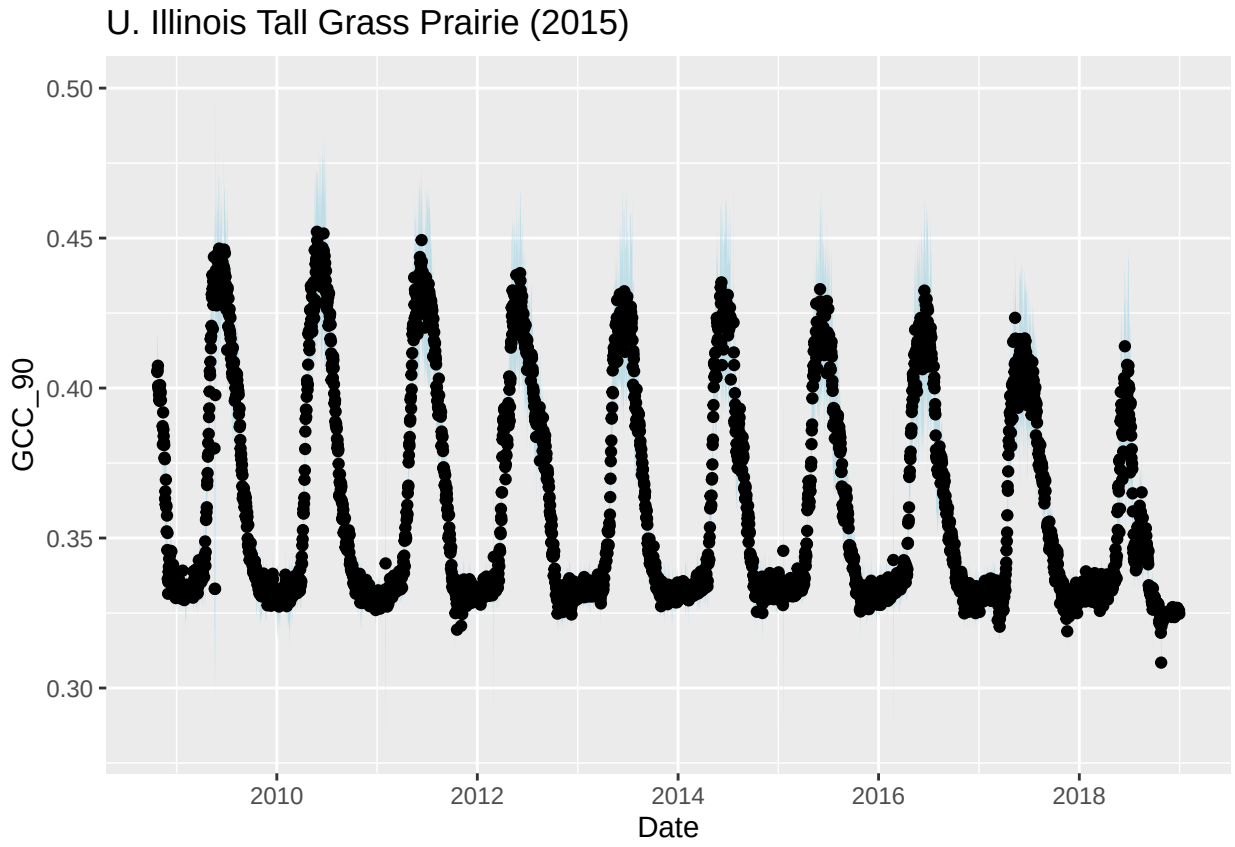
```
## Main script for phenology analysis

## Load required functions
if(file.exists("01_download_phenocam.R")) source("01_download_phenocam.R")
if(file.exists("02_plot_phenocam.R"))     source("02_plot_phenocam.R")
if(file.exists("03_logistic.R"))          source("03_logistic.R")

## Download phenology data
URL <- "http://phenocam.sr.unh.edu/data/archive/uiefprairie/ROI/uiefprairie_GR_1000_1day.csv"
prairie_pheno <- download_phenocam(URL)
```

```
## Parsed with column specification:
## cols(
##   .default = col_double(),
##   date = col_date(format = ""),
##   midday_filename = col_character(),
##   snow_flag = col_logical(),
##   outlierflag_gcc_mean = col_logical(),
##   outlierflag_gcc_50 = col_logical(),
##   outlierflag_gcc_75 = col_logical(),
##   outlierflag_gcc_90 = col_logical()
## )
```

```
## See spec(...) for full column specifications.
```

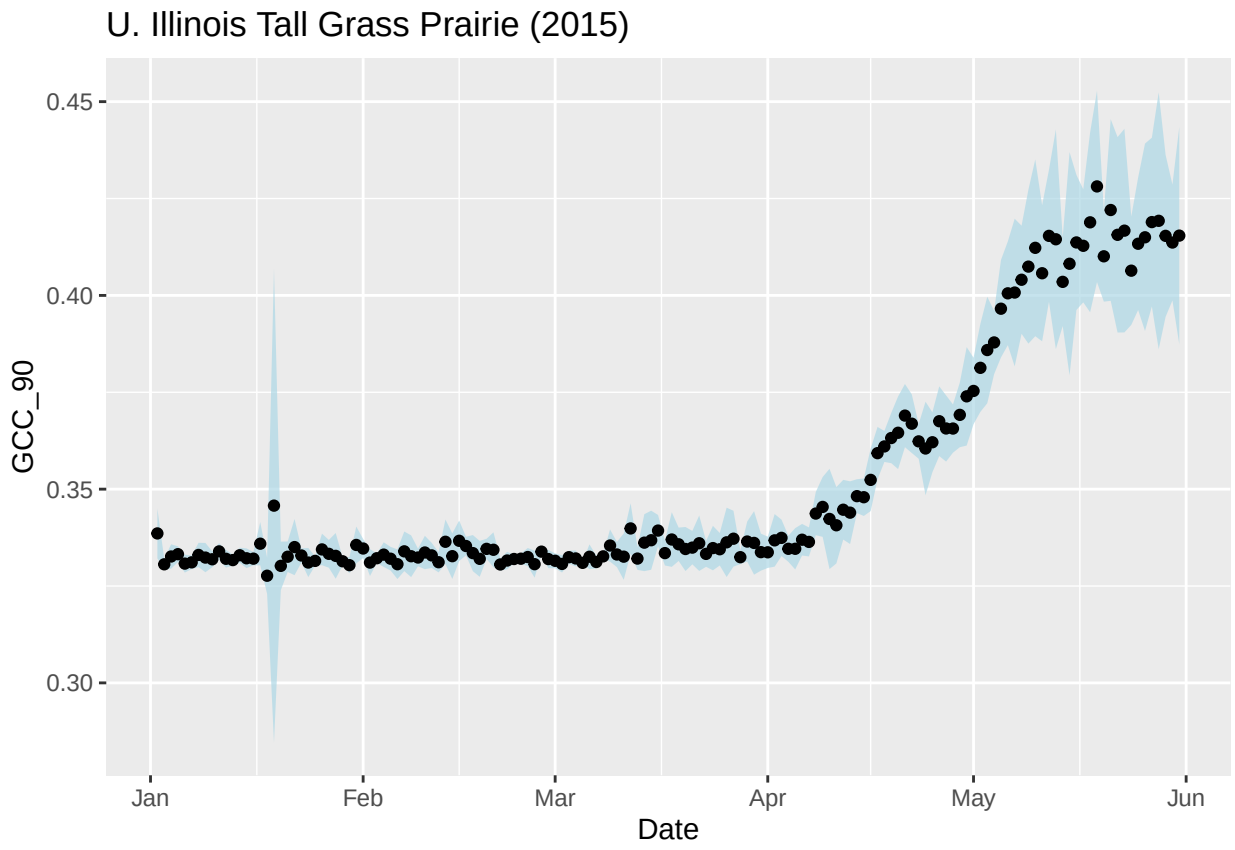
```
## Plot overall phenology data
plot_phenocam(prairie_pheno)
```

```
## Warning: Removed 65 rows containing missing values (geom_point).
```

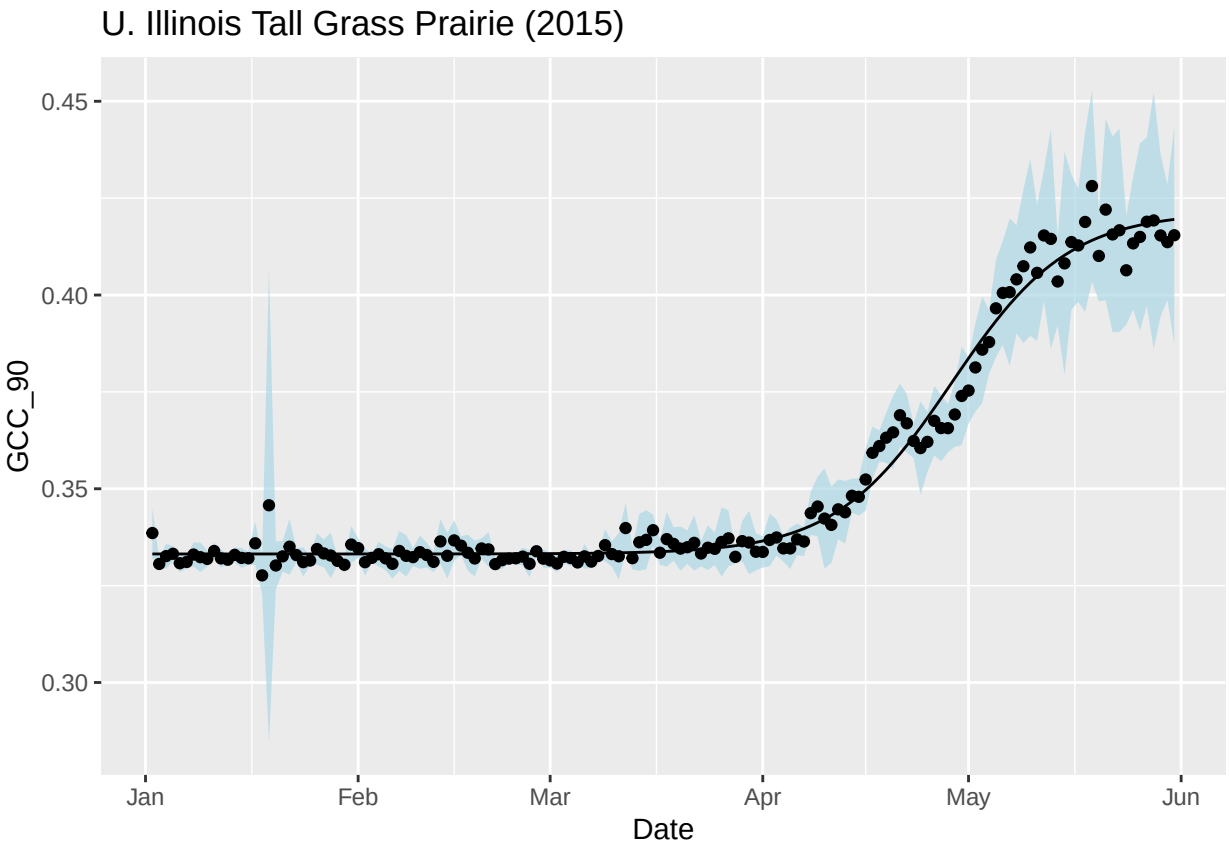



```
## Create and visualize subset of data for leaf out
spring <- as_date(c("2015-01-01","2015-06-01"))
dat <- prairie_pheno %>%
  filter(date > spring[1],
         date < spring[2]) %>%
```

```
  select(date, gcc_mean, gcc_std)

plot_phenocam(dat)
```




```
## Fit logistic model
dat <- dat %>%
  mutate(doy = yday(date))
par <- c(0.33,0.11,-10,0.1)
fit_pars <- fit_logistic(dat, par)
pred <- tibble(date = dat$date,
               pred = pred_logistic(fit_pars, dat$doy))

## Visualize model and data
plot_phenocam(dat, pred = pred)
```


U. Illinois Tall Grass Prairie (2015)
0.45
0.40
0.35
0.30
GCC_90
Jan
Feb
Mar
Apr
May
Jun
Date