Assignment2

Michelle Lam and Alex Reed

2023-04-25

Conceptual Model

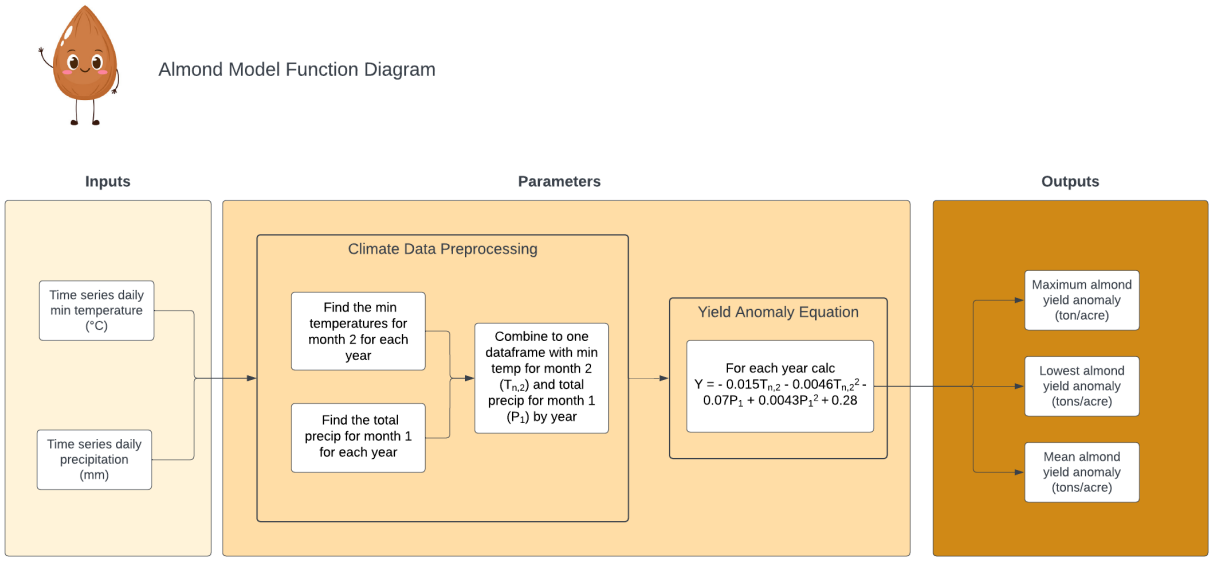

Figure 1: Almond Model Function Diagram

Application of Function

```
source("almond_model.R")

almond_model("clim.txt")
```

```
## `summarise()` has grouped output by 'year'. You can override using the
## `.groups` argument.
## `summarise()` has grouped output by 'year'. You can override using the
## `.groups` argument.
## Joining, by = "year"

##       min_val  max_val mean_val
## 1 -0.02682371 1920.308  181.759
```

Creating Function Variables/Exploration

The below chunks outline the steps inside the function that we created.

```
#read in climate data
clim_df <- read.table("clim.txt", header = TRUE)
```

Setting Coefficient defaults

```
Tmincoeff1 = -0.015
Tmincoeff2 = -0.0046
Pcoeff1 = -0.07
Pcoeff2 = 0.0043
intercept = 0.28
```

Pre-processing data

```
#Tn2: temp min for each year for February
yearly_tmin_feb <- clim_df |>
  group_by(year, month) |>
  summarize(min_temp_2 = min(tmin_c)) |>
  filter(month == 2) |>
  select(-month)
```

```
## `summarise()` has grouped output by 'year'. You can override using the
## `.groups` argument.
```

```
tlist<- as.list(yearly_tmin_feb)

#P1: precip sum for each year for January
yearly_precip_jan <- clim_df |>
  group_by(year, month) |>
  summarize(precip_sum_1 = sum(precip)) |>
  filter(month == 1) |>
  select(-month)
```

```
## `summarise()` has grouped output by 'year'. You can override using the
## `.groups` argument.
```

```
plist <- as.list(yearly_precip_jan)

tmin_precip_df <- left_join(yearly_tmin_feb, yearly_precip_jan)
```

```
## Joining, by = "year"
```

Calculate anomaly values

```r
anomaly_value <- Tmincoeff1 * tmin_precip_df$min_temp_2 + Tmincoeff2 * (tmin_precip_df$min_temp_2**2) +

#add anomaly values to tmin_precip_df
yield_df <- tmin_precip_df |>
  cbind(anomaly_value = anomaly_value)
```

Results

```r
#minimum value in the vect
min_val <- min(yield_df$anomaly_value)

#maximum value in the vect
max_val <- max(yield_df$anomaly_value)

#mean value in the vect
mean_val <- mean(yield_df$anomaly_value)

results_df <- data.frame(min_val, max_val, mean_val)
```