# EDS 230 / ESM 232 Assignment - Almond Anomaly Summary

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## Almond Anomaly Summary

**Data and model sourced from Lobell et all. 2006**

Read in the almond yield data:

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr   1.0.7
## v tidyr   1.2.0     v stringr 1.4.0
## v readr   2.1.1     v forcats 0.5.1
```

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

```
library(gt)

data <- read.table("clim.txt", sep = " ", header = T)
```

Run function `almond_anomaly()` on the data:

```
almond_anom <- almond_anomaly(data = data)
```

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

```
## [1] "The data is now wrangled. Starting anomaly calculation."
```

```
## Warning: `data_frame()` was deprecated in tibble 1.1.0.
## Please use `tibble()` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was generated.
```

```
almond_anom_table <- almond_anom %>%
  gt() %>%
  tab_header(
    title = md("**Almond Anomalies 1989 - 2010**")
  ) %>%
  fmt_passthrough(
  columns = c(year)
  ) %>%
  fmt_number(
```

```
  columns = c(almond_anomaly)
  ) %>%
  cols_label(year = "Year" ,
             almond_anomaly = "Almond Anomaly") %>%
  tab_style(
    style = list(
      cell_fill(color = "deepskyblue"),
      cell_text(weight = "bold")
      ),
    locations = cells_body(
      columns = c(year, almond_anomaly))
  ) %>%
tab_style(
  style = list(
    cell_fill(color = "coral2"),
    cell_text(weight = "bold")
    ),
  locations = cells_body(
    columns = c(year, almond_anomaly),
    rows = year == "1995")
 ) %>%
  tab_source_note(source_note = "Data Source: Lobell et all. 2006: https://naomitague.github.io/ESM232_
  opt_align_table_header(align = "center") %>%
  cols_width(
    year ~ px(150),
    almond_anomaly ~ px(150)
  ) %>%
  cols_align(align = "center")

almond_anom_table
```

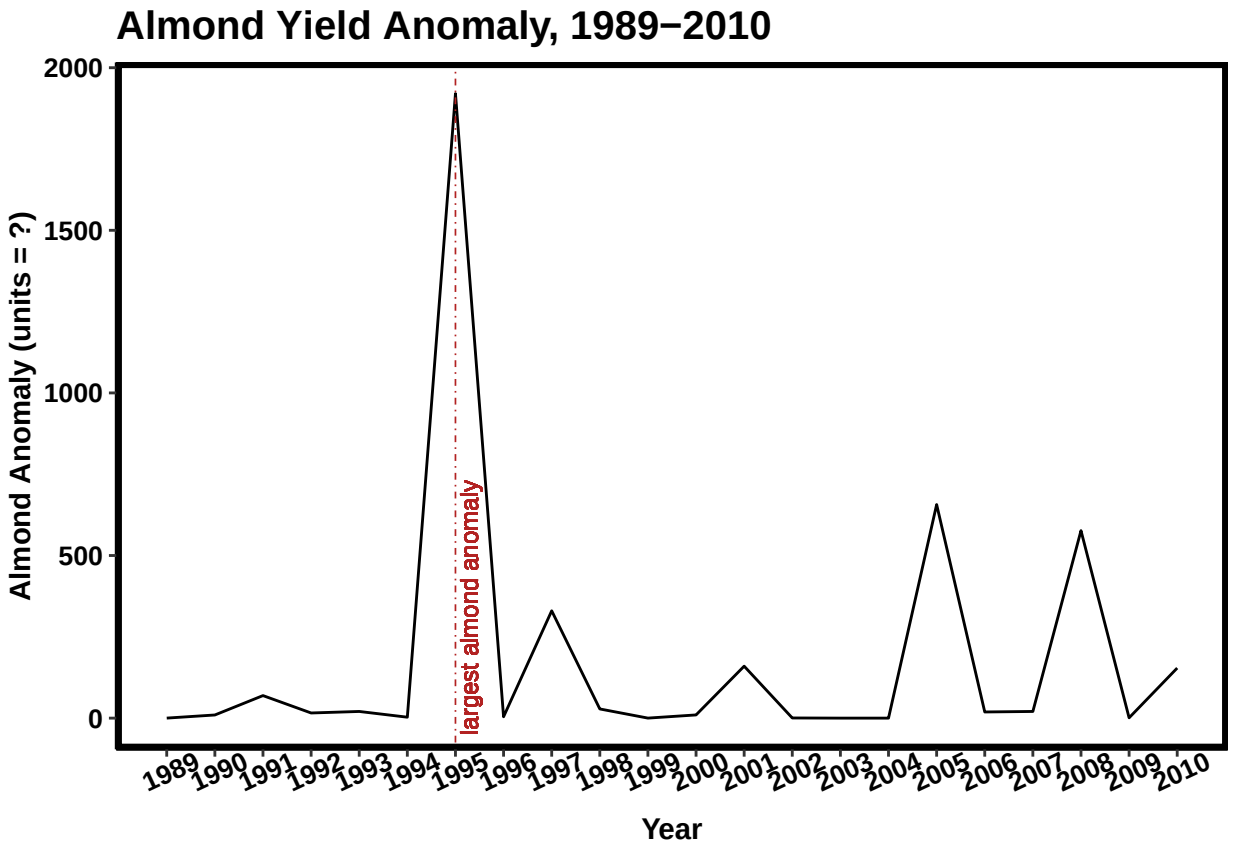
**Almond Anomalies 1989 - 2010**

| Year | Almond Anomaly |
|---|---|
| 1989 | 0.04 |
| 1990 | 9.67 |
| 1991 | 69.32 |
| 1992 | 15.82 |
| 1993 | 20.49 |
| 1994 | 2.86 |
| 1995 | 1,920.31 |
| 1996 | 4.19 |
| 1997 | 329.98 |
| 1998 | 28.20 |
| 1999 | 0.11 |
| 2000 | 9.81 |
| 2001 | 159.75 |
| 2002 | 0.46 |
| 2003 | −0.03 |
| 2004 | −0.01 |
| 2005 | 656.72 |
| 2006 | 18.96 |
| 2007 | 20.51 |
| 2008 | 576.54 |

| | |
|---|---|
| 2009 | 0.98 |
| 2010 | 154.00 |

Data Source: Lobell et all. 2006: https://naomitague.github.io/ESM232_course/assignments/lobell.2006.pdf

```
ggplot(data = almond_anom, aes(x = year, y = almond_anomaly)) +
  geom_line() +
  theme_classic() +
  ggtitle("Almond Yield Anomaly, 1989-2010") +
   xlab("Year") +
   ylab("Almond Anomaly (units = ?)") +
   theme(axis.title.x = element_text(color = "black", size = 11, face = "bold"),
         axis.text.x = element_text(face = "bold", color = "black", size = 10, angle = 25),
         axis.title.y = element_text(color = "black", size = 11, face = "bold"),
         axis.text.y = element_text(face = "bold", color = "black", size = 10),
         plot.title = element_text(color="black", size = 15, face = "bold"),
         panel.border = element_rect(colour = "black", fill = NA, size = 2)) +
  scale_x_continuous(breaks = seq(1989, 2010, by = 1)) +
  geom_vline(xintercept = 1995,
             size = 0.3,
            color = "firebrick",
            linetype = "dotdash") +
   geom_text(aes(x = 1995,
                 label = "largest almond anomaly",
                 y = 340),
            angle = 90,
            vjust = 1.3,
            size = 3,
            color = "firebrick")
```


Almond Yield Anomaly, 1989−2010
Almond Anomaly (units = ?)
2000
1500
1000
500
0
largest almond anomaly
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year