

# Ebola Forecasting Analysis

Andy Shen

8/13/2020

## Data Input and Cleaning

```
rm(list=ls())
source("outbreak_vis.R")

## -- Attaching packages -----
## v ggplot2 3.3.2      v purrr  0.3.4
## v tibble  3.0.1      v dplyr  1.0.0
## v tidyr   1.1.0      v stringr 1.4.0
## v readr   1.3.1      v forcats 0.5.0

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

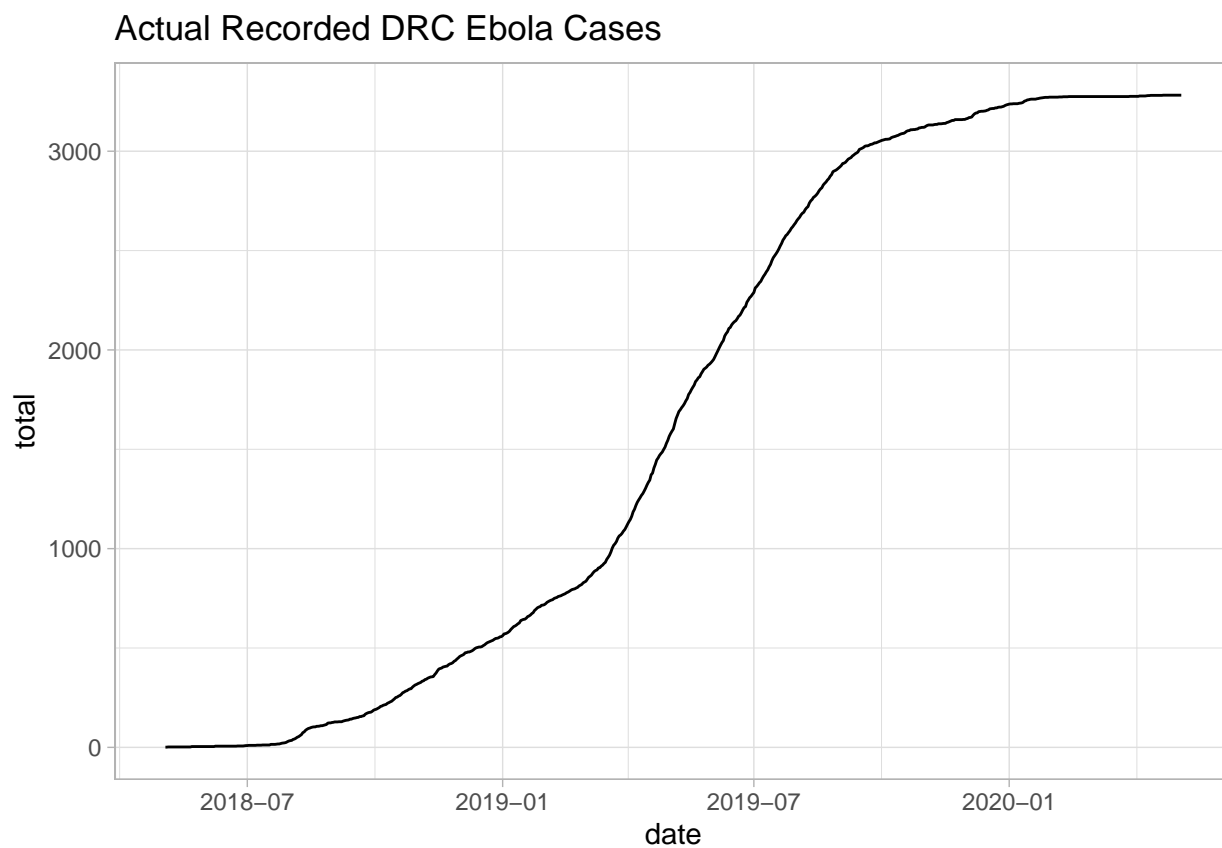
##
## Attaching package: 'lubridate'

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

final_index <- 733 #last row with a date or any information
true <- read.csv("/Volumes/GoogleDrive/.shortcut-targets-by-id/15UGkfREtfqH3LdfHmCsSpFJ5SrTnSeyt/ebola/")
true <- true[1:final_index,] #the final_index might be changed
colnames(true) <- c("date", "cases")
true$date <- mdy(true$date)
true$cases[is.na(true$cases)] <- 0
true <- true %>% mutate(total = cumsum(cases))
last_date <- true$date[length(true$date)]
last_case <- true$total[length(true$total)]
```

## Actual Recorded DRC Ebola Cases

```
p <- ggplot(data = true,  
            mapping = aes(x = date, y = total)) +  
  geom_line() + theme_light() # graph of runinng total of cases  
  
p + labs(title = "Actual Recorded DRC Ebola Cases")
```

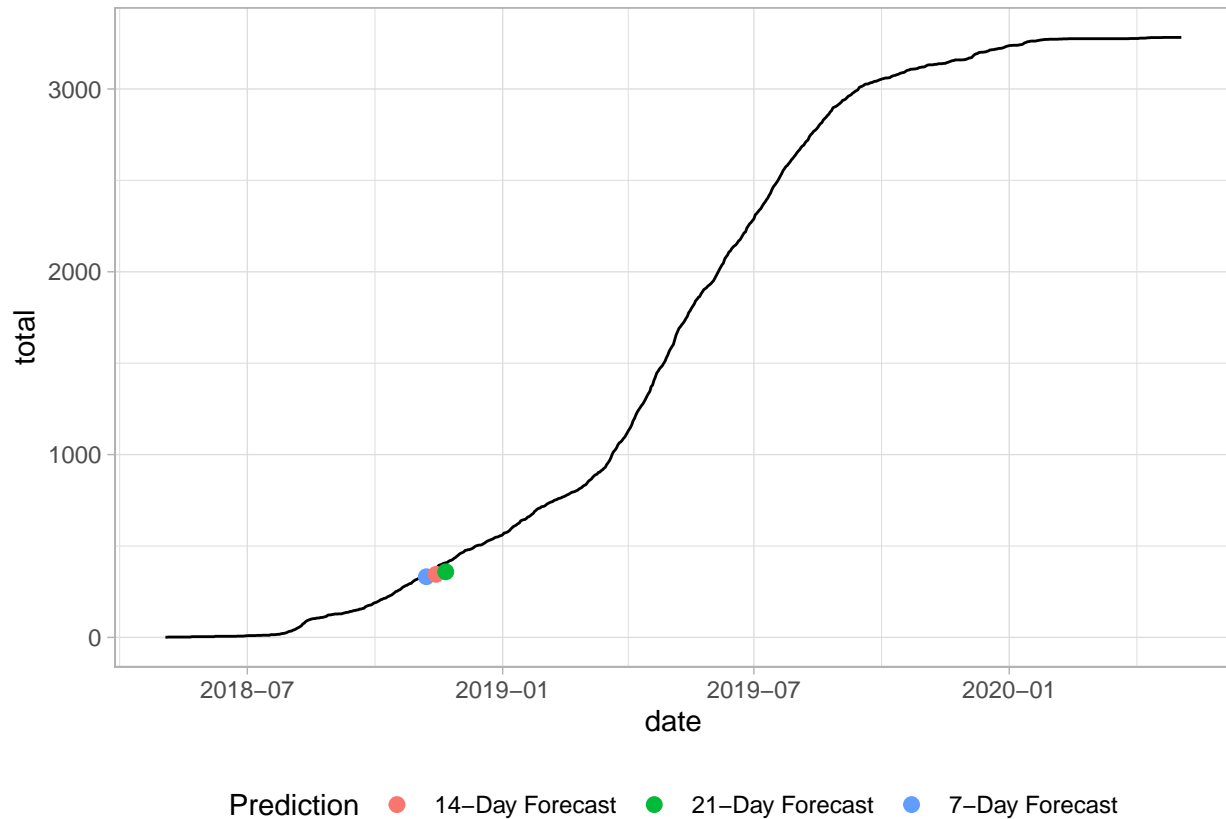


## Accuracy of Hawkes Projections

### Single Forecast Visualization for Entire Outbreak

Shows predicted vs actual for one forecast with respect to entire outbreak.

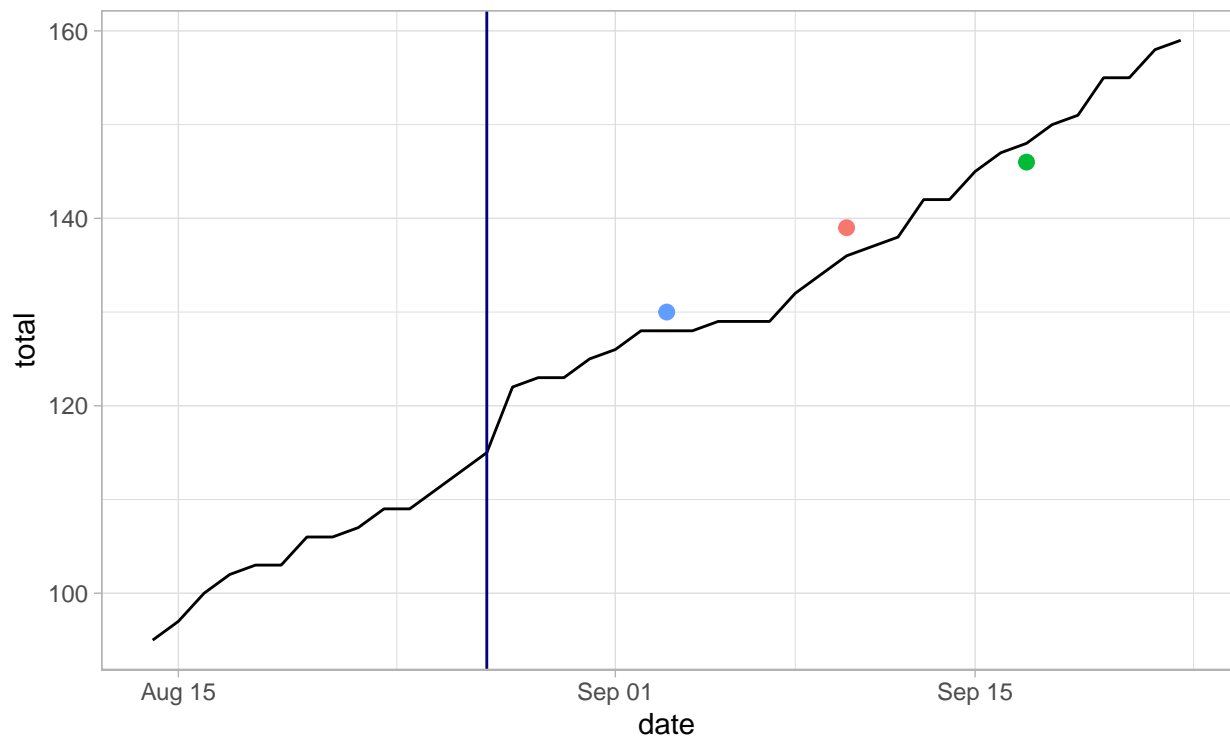
```
full_forecast("2018-10-31",c(15,28,42))
```



### Single Forecast Visualization

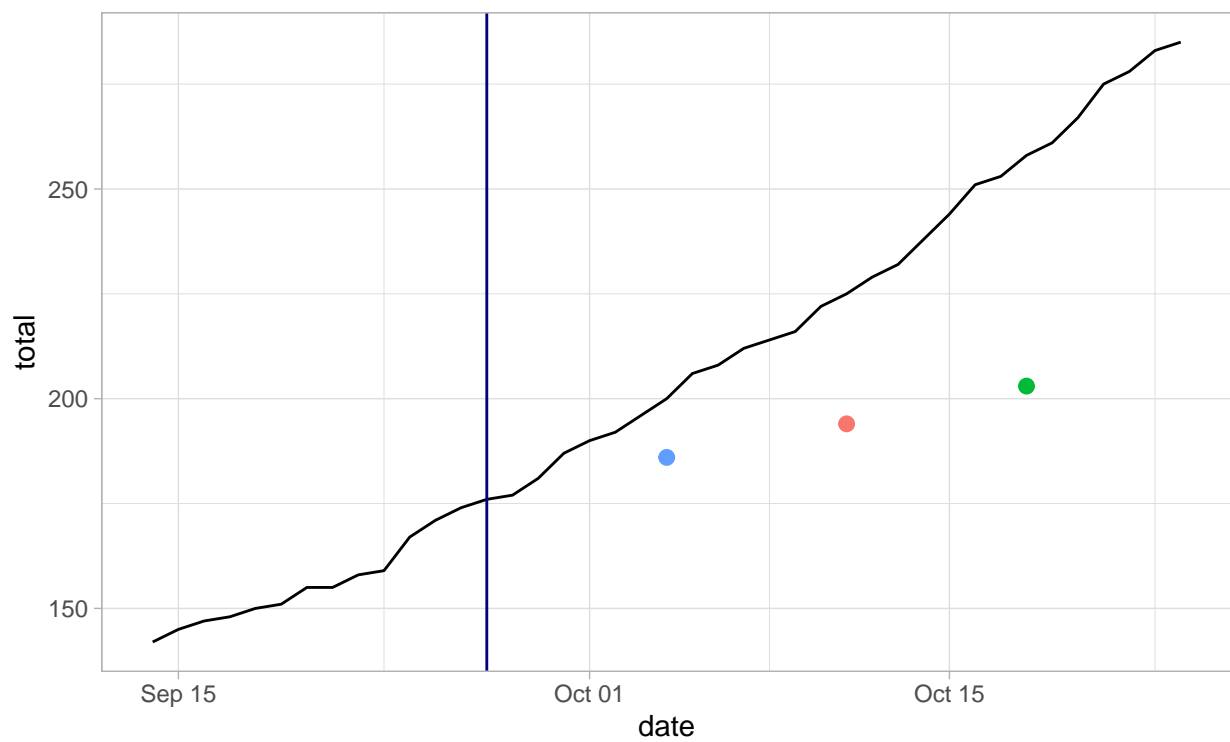
Shows predicted vs actual for one forecast with respect to that date range.

```
multi_forecast("2018-08-27",c(15,24,31)) #shows predicted vs actual for one forecast
```



Prediction    ● 14-Day Forecast    ● 21-Day Forecast    ● 7-Day Forecast

`multi_forecast("2018-09-27",c(10,18,27))` *#shows predicted vs actual for one forecast*

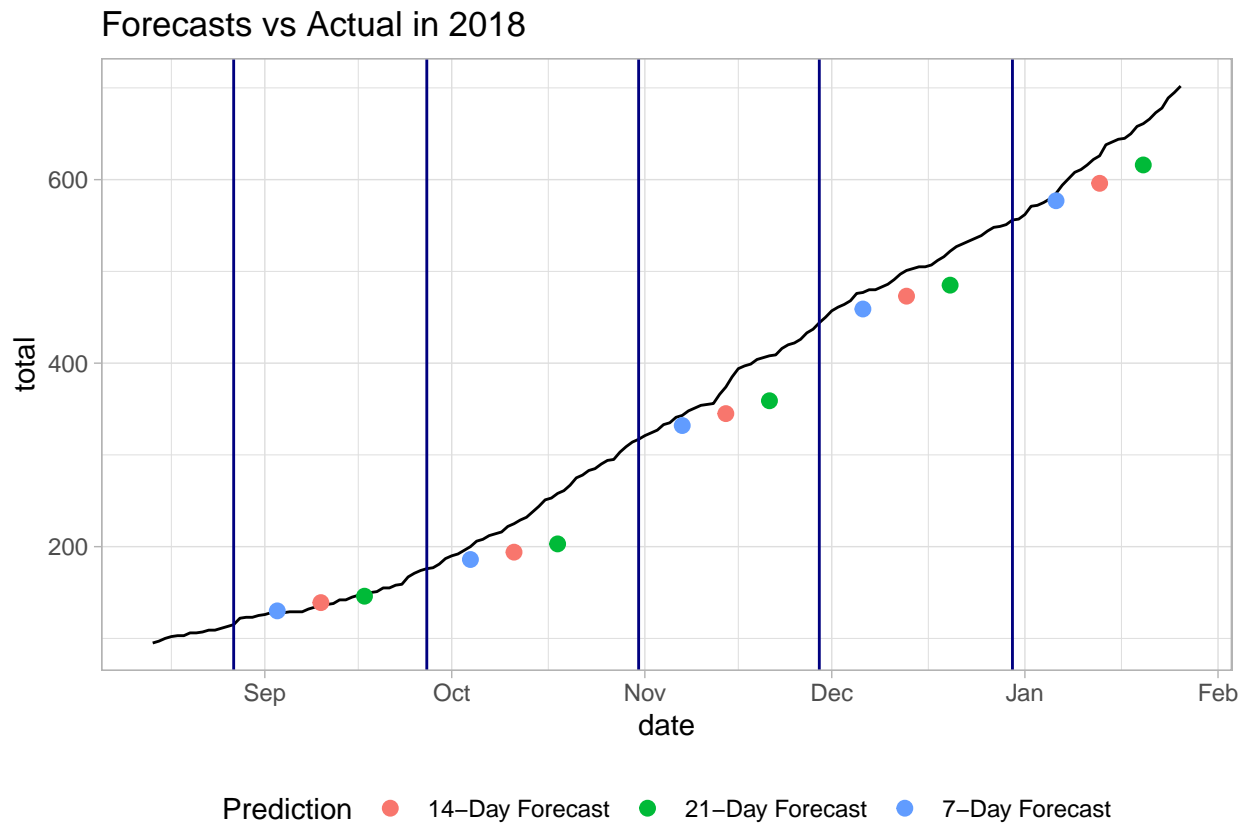


Prediction    ● 14-Day Forecast    ● 21-Day Forecast    ● 7-Day Forecast

## Forecasts vs Actual in 2018

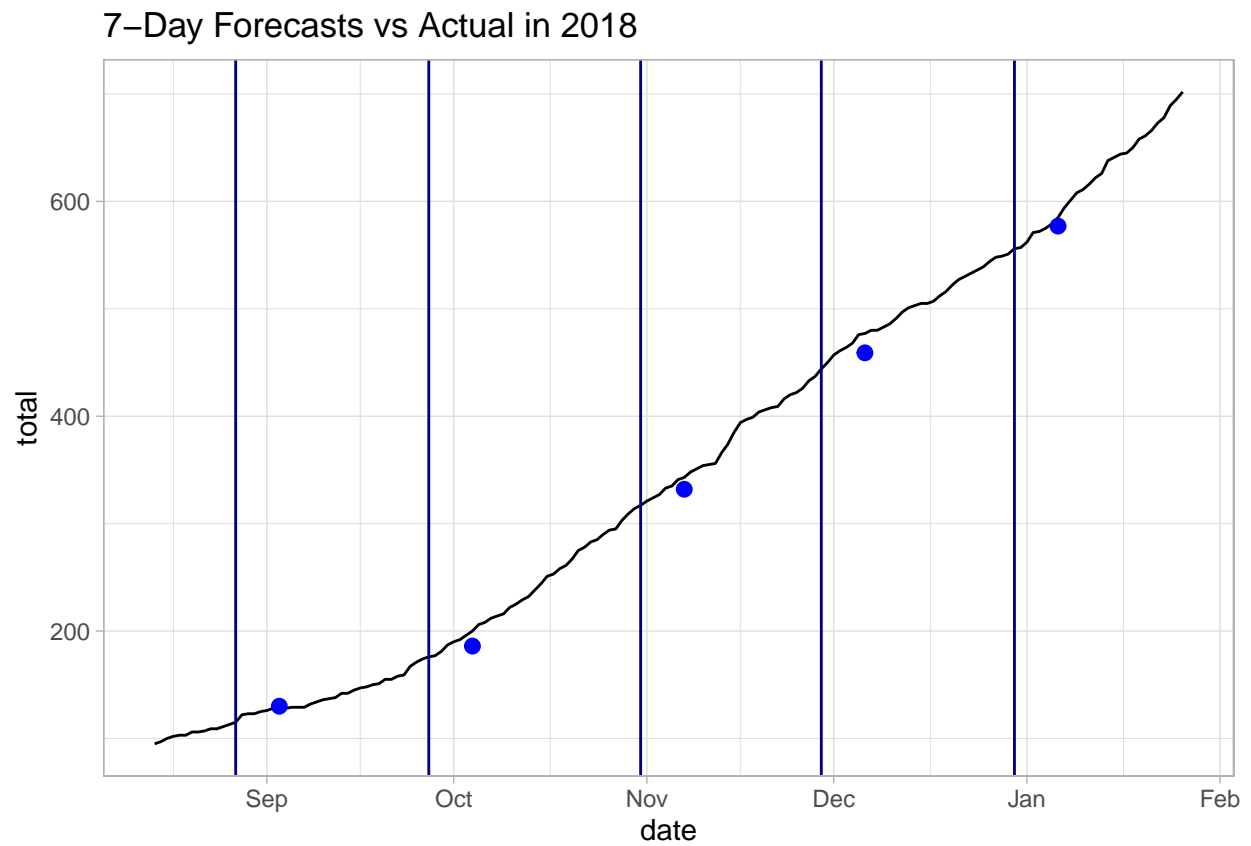
Monthly forecasts during all available data in 2018.

```
title <- "Forecasts vs Actual in 2018"
dv <- c("2018-08-27", "2018-09-27", "2018-10-31", "2018-11-29", "2018-12-30")
mt <- cbind(c(15, 24, 31), c(10, 18, 27), c(15, 28, 42), c(15, 29, 41), c(21, 40, 60))
multi_forecast(dv, mt, title = title)
```



## 2018 7-day Forecasts

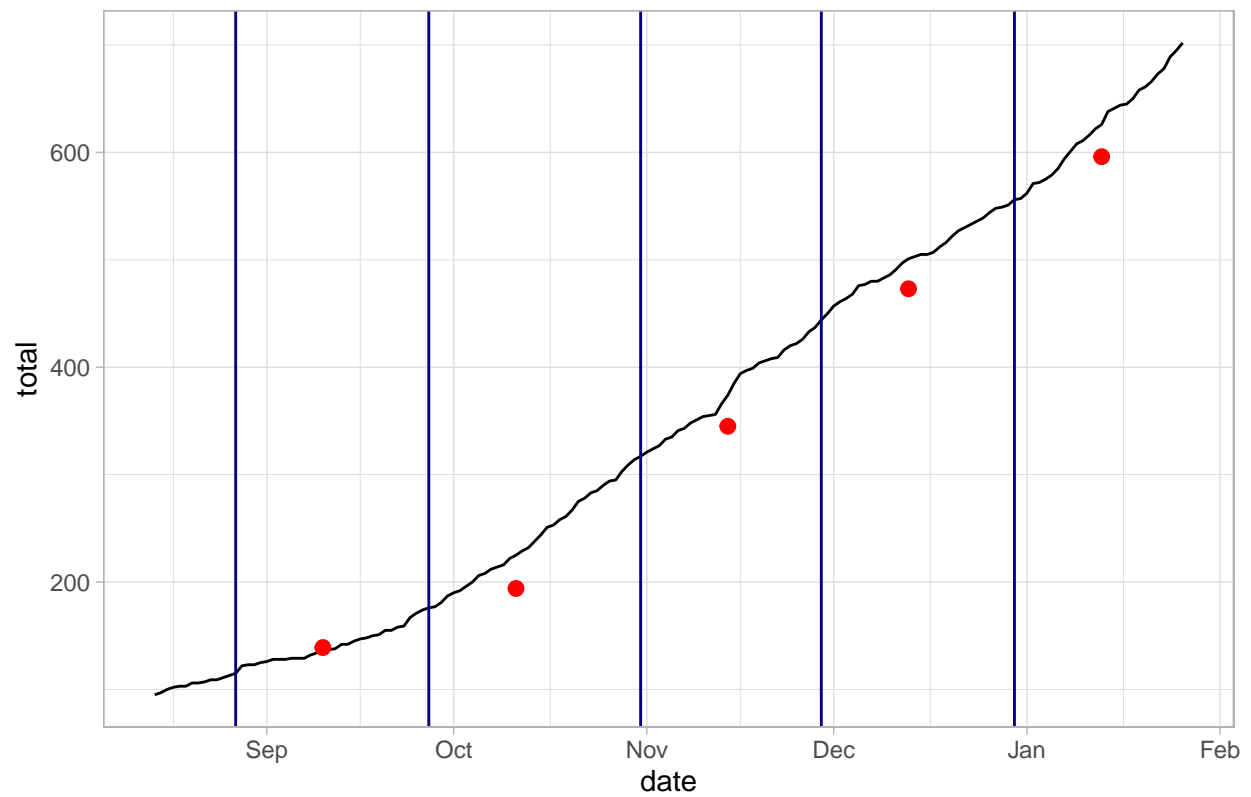
```
title <- "7-Day Forecasts vs Actual in 2018"  
single_forecast(dv, mt, days = 7, title = title)
```



## 2018 14-day Forecasts

```
title <- "14-Day Forecasts vs Actual in 2018"  
single_forecast(dv, mt, days = 14, title = title)
```

14-Day Forecasts vs Actual in 2018



## 2018 21-day Forecasts

```
title <- "21-Day Forecasts vs Actual in 2018"  
single_forecast(dv, mt, days = 21, title = title)
```

