

P8160 - Project 3

Bayesian modeling of hurricane trajectories

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Deaths and Damages Data Exploration

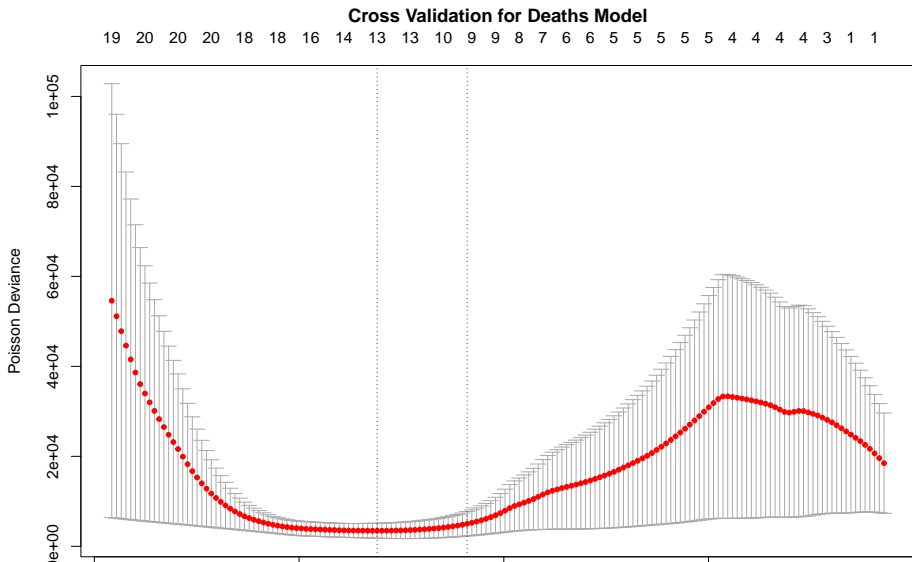
```
load("q6charts.RData")
load("q6output.RData")
hurr <-
  read_csv("hurricaneoutcome2.csv", show_col_types = FALSE) %>%
  janitor::clean_names() %>%
  mutate(damage = as.numeric(str_replace(damage, "\\$", "")))
  dplyr::select(-c(hurricane_id, season, month, nature))

gtsummary::tbl_summary(
  as_tibble(apply(hurr, 2, scale))
  , statistic = list(all_continuous() ~ "{min}, {p25}, {p50},
  )
```

```
## Table printed with `knitr::kable()` , not {gt}. Learn why at
## https://www.danielsjoberg.com/gtsummary/articles/rmarkdown
## To suppress this message, include `message = FALSE` in code
```

Hurricane Deaths - Model Selection

```
plot(cv_deaths, main = "Cross Validation for Deaths Model\n")
```



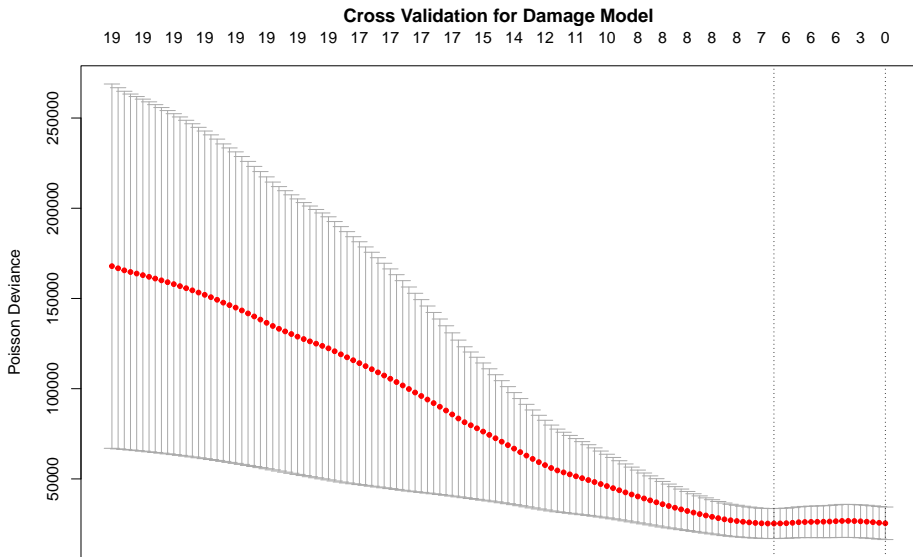
Hurricane Deaths - Inference

```
output_deaths %>%
  slice(-1) %>%
  dplyr::select(-c(zscore)) %>%
  mutate(pvalue = 2 * (1 - pnorm(abs(estimate / smoothsd)))) %>%
  mutate(pvalue = replace(pvalue, estimate == 0, NA)) %>%
  relocate(variable, estimate, smoothsd, pvalue) %>%
  filter(estimate != 0) %>%
  knitr::kable(
    col.names = c("Covariate", "Estimate", "SE", "p-value", "Left CI", "Right CI"),
    #, format = "simple"
    , d = 4
  )
```

Covariate	Estimate	SE	p-value	Left CI	Right CI
season	0.0385	0.0013	0.0000	0.0359	0.0410
monthJuly	-3.7255	0.1095	0.0000	-3.9401	-3.5108
monthOctober	0.8073	0.0484	0.0000	0.7124	0.9022

Hurricane Damages - Model Selection

```
plot(cv_damage, main = "Cross Validation for Damage Model\n")
```



Hurricane Damages - Inference

```
output_damage %>%
  slice(-1) %>%
  dplyr::select(-c(zscore)) %>%
  mutate(pvalue = 2 * (1 - pnorm(abs(estimate / smoothsd)))) %>%
  mutate(pvalue = replace(pvalue, estimate == 0, NA)) %>%
  relocate(variable, estimate, smoothsd, pvalue) %>%
  filter(estimate != 0) %>%
  knitr::kable(
    col.names = c("Covariate", "Estimate", "SE", "p-value", "Left CI", "Right CI"),
    #, format = "simple"
    , d = 4
  )
```

Covariate	Estimate	SE	p-value	Left CI	Right CI
season	0.0399	0.0004	0.0000	0.0392	0.0406
monthJuly	-0.5762	0.0192	0.0000	-0.6137	-0.5386
monthOctober	0.4680	0.0074	0.0000	0.4536	0.4824