Manuscript Numbers

Numbers included in text of manuscript.

Rows in src data

ICS209

Rows in ics-minimal data set post 2000.

```
nrow(event_ics209)
```

```
[1] 35961
```

Non-Missing POO Lat/long

```
sum(!is.na(event_ics209$wildfire_poo_lat))
```

```
[1] 35093
```

```
sum(!is.na(event_ics209$wildfire_poo_lat)) / nrow(event_ics209)
```

```
[1] 0.9758627
```

Non-Missing County Name (N, pct):

```
sum(!is.na(event_ics209$wildfire_counties))
```

```
[1] 32981
```

```
sum(!is.na(event_ics209$wildfire_counties)) / nrow(event_ics209)
```

```
[1] 0.9171324
```

Red Books

```
sum(!is.na(event_redbook$wildfire_counties))
```

```
[1] 1126
```

```
sum(!is.na(event_redbook$wildfire_counties)) / nrow(event_redbook)
```

```
[1] 1
```

FEMA

```
nrow(event_fema)
```

```
[1] 1731
```

```
sum(!is.na(event_fema$wildfire_counties))
```

```
[1] 1693
```

```
sum(!is.na(event_fema$wildfire_counties)) / nrow(event_fema)
```

```
[1] 0.9780474
```

Count in Final Data

total count

```
final <- final %>% filter(wildfire_community_intersect)
nrow(final)
```

```
[1] 6249
```

met criteria

```
sum(final$wildfire_community_intersect)
```

```
[1] 6249
```

met criteria pct

```
sum(final$wildfire_community_intersect) / nrow(final)
```

```
[1] 1
```

BZ types

```
final %>% st_drop_geometry() %>% group_by(geometry_method) %>% summarize(n())
```

```
# A tibble: 7 x 2
  geometry_method                `n()`
  <chr>                          <int>
1 FIRED by Place/Time              469
2 ICS by Point of Origin, POO-only   124
3 ICS by Point of Origin, Size     3721
4 MTBS by ID                       483
5 MTBS by Name/Place/Time          989
6 NIFC by ID                        87
7 NIFC by Name/Place/Time          376
```

with burn zones from spatial files

```
sum(str_detect(final$geometry_src, '(FIRED|MTBS|NIFC)'))
```

```
[1] 2404
```

Time trend

fluctuated from

```
final %>% st_drop_geometry() %>% group_by(wildfire_year) %>% summarize(n=n()) %>%
    filter(n %in% range(n))
```

```
# A tibble: 2 x 2
  wildfire_year     n
          <dbl> <int>
1          2001    62
2          2011   570
```

Compared to 2000-2009, the years between 2010 and 2019 had more wildfire burn disasters

```
final %>% st_drop_geometry() %>% filter(between(wildfire_year, 2000, 2019)) %>%
    group_by(wildfire_year < 2010) %>%
    summarize(n=n())
```

```
# A tibble: 2 x 2
  `wildfire_year < 2010`     n
  <lgl>                  <int>
1 FALSE                   2637
2 TRUE                    2335
```

more fires that met FMAG

```
final %>% st_drop_geometry() %>% filter(between(wildfire_year, 2000, 2019)) %>%
    group_by(wildfire_year < 2010) %>%
    summarize(n=sum(wildfire_fema_dec, na.rm=TRUE))
```

```
# A tibble: 2 x 2
  `wildfire_year < 2010`     n
  <lgl>                  <int>
1 FALSE                    373
2 TRUE                     319
```

More fires that met structure criterion

```
final %>% st_drop_geometry() %>% filter(between(wildfire_year, 2000, 2019)) %>%
    group_by(wildfire_year < 2010) %>%
    summarize(n=sum(str_detect(wildfire_disaster_criteria_met, 'struct'), na.rm=TRUE))
```

```
# A tibble: 2 x 2
  `wildfire_year < 2010`     n
  <lgl>                  <int>
1 FALSE                   2360
2 TRUE                    2192
```

```
final %>% st_drop_geometry() %>% filter(between(wildfire_year, 2000, 2019)) %>%
    group_by(wildfire_year < 2010) %>%
    summarize(n=sum(str_detect(wildfire_disaster_criteria_met, 'death'), na.rm=TRUE))
```

```
# A tibble: 2 x 2
  `wildfire_year < 2010`     n
  <lgl>                  <int>
1 FALSE                     59
2 TRUE                      44
```

States

States with greated number of fires each by year were...

```
final %>% st_drop_geometry() %>% unnest(wildfire_states) %>% group_by(wildfire_states, wildfi
    group_by(wildfire_year) %>%
    filter(n == max(n)) %>%
    arrange(wildfire_year)
```

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

```
# A tibble: 26 x 3
# Groups:   wildfire_year [26]
   wildfire_states wildfire_year     n
   <chr>                  <dbl> <int>
 1 OK                      2000    19
 2 CA                      2001    17
 3 CA                      2002    48
```

```
 4 CA                        2003    40
 5 CA                        2004    55
 6 OK                        2005    50
 7 TX                        2006    67
 8 SC                        2007    79
 9 TX                        2008    61
10 FL                        2009    44
# i 16 more rows
```

Criteria

structure

```
paste(
    sum(str_detect(final$wildfire_disaster_criteria_met, 'struct')),
    100*round(sum(str_detect(final$wildfire_disaster_criteria_met, 'struct')) / nrow(final),
)
```

```
[1] "5717 91.5 %"
```

fema

```
paste(
    sum(str_detect(final$wildfire_disaster_criteria_met, 'dec')),
    100*round(sum(str_detect(final$wildfire_disaster_criteria_met, 'dec')) / nrow(final), dig
)
```

```
[1] "930 14.9 %"
```

fatal

```
paste(
    sum(str_detect(final$wildfire_disaster_criteria_met, 'death')),
    100*round(sum(str_detect(final$wildfire_disaster_criteria_met, 'death')) / nrow(final), d
)
```

```
[1] "139 2.2 %"
```

total struct

```r
sum(final$wildfire_struct_destroyed,na.rm=T)
```

```
[1] 120634
```

total death

```r
sum(final$wildfire_max_civil_fatalities,na.rm=T)
```

```
[1] 450
```

California only

cali had the most disasters...

```r
paste(
    nrow(final %>% filter(str_detect(wildfire_states, 'CA'))),
    format(100*nrow(final %>% filter(str_detect(wildfire_states, 'CA'))) / nrow(final), digi
)
```

```
[1] "878 14.1 %"
```

fatalities

```r
paste(
    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_max_civil_fatalities) %>%
        sum(na.rm=T),
    format(
        100*    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_max_civil_fatalities) %>%
        sum(na.rm=T) %>%
        `/`(sum(final$wildfire_max_civil_fatalities,na.rm=T))
    , digits = 3), '%'
)
```

```
[1] "213 47.3 %"
```

and structures

```
paste(
    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_struct_destroyed) %>%
        sum(na.rm=T),
    format(
        100*    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_struct_destroyed) %>%
        sum(na.rm=T) %>%
        `/`(sum(final$wildfire_struct_destroyed,na.rm=T))
    , digits = 3), '%'
)
```

```
[1] "84417 70 %"
```

... and fmags

```
paste(
    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_fema_dec) %>%
        sum(na.rm=T),
    format(
        100*    final %>%
        filter(str_detect(wildfire_states, 'CA')) %>%
        pull(wildfire_fema_dec) %>%
        sum(na.rm=T) %>%
        `/`(sum(final$wildfire_fema_dec,na.rm=T))
    , digits = 3), '%'
)
```

```
[1] "228 24.5 %"
```

Among structure destroying fires

this many destroyed fewer than 5

```
    final %>%
        filter(str_detect(wildfire_disaster_criteria_met, 'struct')) %>%
        st_drop_geometry() %>%
        summarize(
         gt4 = sum(coalesce(wildfire_struct_destroyed, 0)<= 4, na.rm = T),
         gt4 / n()
        )
```

```
# A tibble: 1 x 2
    gt4 `gt4/n()`
  <int>     <dbl>
1  4611     0.807
```

Of fatal fires

only this many resulted in 10 fatalities or 10 structures destroeyd

```
    final %>%
        st_drop_geometry() %>%
        summarize(
            gt10 = sum((coalesce(wildfire_struct_destroyed, 0) > 10) | (coalesce(wildfire_ma
            gt10 / n()
        )
```

```
# A tibble: 1 x 2
   gt10 `gt10/n()`
  <int>      <dbl>
1   636      0.102
```

however these fires accounted for...

```
final %>%
    filter((coalesce(wildfire_struct_destroyed, 0) > 10) | (coalesce(wildfire_max_civil_fata
    nrow()
```

```
[1] 636
```

```r
final %>%
    st_drop_geometry() %>%
    filter((coalesce(wildfire_struct_destroyed, 0) > 10) | (coalesce(wildfire_max_civil_fatal
    summarize(
        n = paste(n(), '(',  100* n() / nrow(final), ')'),
        struct = paste(sum(wildfire_struct_destroyed, na.rm =T), '(', 100*sum(wildfire_struct
    fatal = paste(sum(wildfire_max_civil_fatalities, na.rm =T), '(', 100*sum(wildfire_max_civ
```

```
# A tibble: 1 x 3
  n                        struct                    fatal
  <chr>                    <chr>                     <chr>
1 636 ( 10.1776284205473 ) 110274 ( 91.412039723461 ) 344 ( 76.4444444444444 )
```

Unmatched Events

```r
matched_events <- spatial$event_id %>% unlist(recursive = T) %>% unique()
unmatched_events <- event %>% filter(!(event_id %in% matched_events)) %>%
    mutate( # add in criteria just like we did in spatial
            civ_crit    = if_else(
                coalesce(wildfire_max_civil_fatalities, wildfire_civil_fatalities, 0) > 0 |
                'civilian_death',
                NA_character_
            ),
            struct_crit = if_else(
                coalesce(wildfire_struct_destroyed, 0) > 0,
                'structures_destroyed',
                NA_character_
            ),
            fema_crit   = if_else(wildfire_fema_dec, 'fema_fmag_declaration', NA_character_)
        ) %>%
        unite(wildfire_disaster_criteria_met, c(civ_crit, struct_crit, fema_crit), sep = '|'
    filter(wildfire_disaster_criteria_met != '')
```

unmatched events total: 0

By criteria met:

```r
unmatched_events %>%
    group_by(wildfire_disaster_criteria_met) %>%
    summarize(n = n())
```

```
# A tibble: 0 x 2
# i 2 variables: wildfire_disaster_criteria_met <chr>, n <int>
```

Of the actual lat longs provided (n = 0), none fall in the united states.

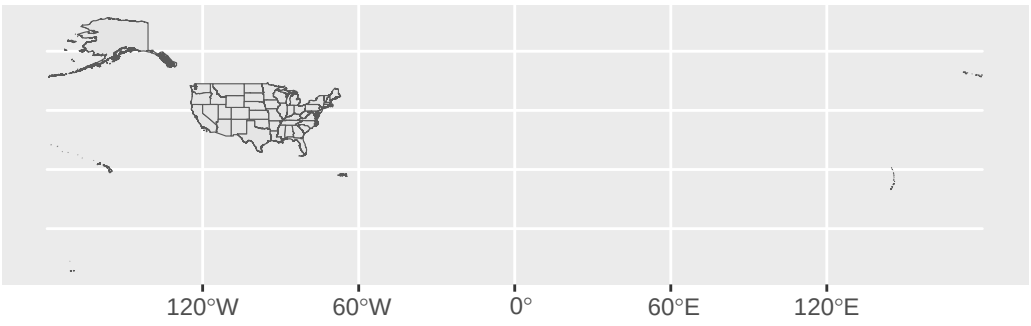
```
ggplot() +
    geom_sf(data = tigris::states(cb = TRUE, year = 2024, progress_bar = FALSE)) +
    geom_sf(data = st_as_sf(unmatched_events, coords = c('wildfire_poo_lon_ics209', 'wildfire
```

```
Warning in min(cc[[1]], na.rm = TRUE): no non-missing arguments to min;
returning Inf
```

```
Warning in min(cc[[2]], na.rm = TRUE): no non-missing arguments to min;
returning Inf
```

```
Warning in max(cc[[1]], na.rm = TRUE): no non-missing arguments to max;
returning -Inf
```

```
Warning in max(cc[[2]], na.rm = TRUE): no non-missing arguments to max;
returning -Inf
```



0 Had no state information or invalid state information

Of the ones that did have a recoverable state:

```
unmatched_events %>%
    filter(wildfire_states %in% c(state.abb, 'DC', 'PR', 'GU', 'VI')) %>%
    group_by(wildfire_states) %>%
    summarize(n = n()) %>%
    arrange(desc(n), wildfire_states) %>%
    print(n = 40)
```

```
# A tibble: 0 x 2
# i 2 variables: wildfire_states <chr>, n <int>
```

The data sources for the unmatched events were:

```
unmatched_events %>%
    group_by(match_ics209 = !is.na(ics_id), match_redbook = !is.na(redbook_id), match_fema =
    summarize(n())
```

```
`summarise()` has grouped output by 'match_ics209', 'match_redbook'. You can
override using the `.groups` argument.

# A tibble: 0 x 4
# Groups:   match_ics209, match_redbook [0]
# i 4 variables: match_ics209 <lgl>, match_redbook <lgl>, match_fema <lgl>,
#   n() <int>
```

max pop den summary

```
summary(final$wildfire_max_pop_den)
```

```
     Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
    10.81   1160.98   2688.34   6476.03   6806.87 179186.72
```

```
sd(final$wildfire_max_pop_den)
```

```
[1] 11403.45
```

cost

```r
sum(is.na(final$wildfire_cost))
```

```
[1] 3859
```

```r
summary(final$wildfire_cost[final$wildfire_cost > 0])
```

```
     Min.   1st Qu.    Median      Mean   3rd Qu.      Max.      NA's
        1      1200     40000   4903549   2000000 542539952      3859
```

```r
sd(final$wildfire_cost[final$wildfire_cost > 0] , na.rm = TRUE)
```

```
[1] 20343215
```

evac

```r
sum(is.na(final$wildfire_civil_evacuation))
```

```
[1] 5916
```

```r
summary(final$wildfire_civil_evacuation[final$wildfire_civil_evacuation > 0])
```

```
    Min.  1st Qu.   Median     Mean  3rd Qu.     Max.     NA's
     1.0     50.0    209.5   3202.5   1175.0 104621.0     5916
```

```r
sd(final$wildfire_civil_evacuation[final$wildfire_civil_evacuation > 0] , na.rm = TRUE)
```

```
[1] 12530.83
```