Precipitation Analysis for Asheville, NC

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Wrangling Asheville Precipitation Data

```
#formatting date as date
Asheville_precip_data$LocalDateTime <- as.Date(Asheville_precip_data$LocalDateTime, format = "%m/%d/%Y")

#checking date class
class(Asheville_precip_data$LocalDateTime)
```

```
## [1] "Date"
```

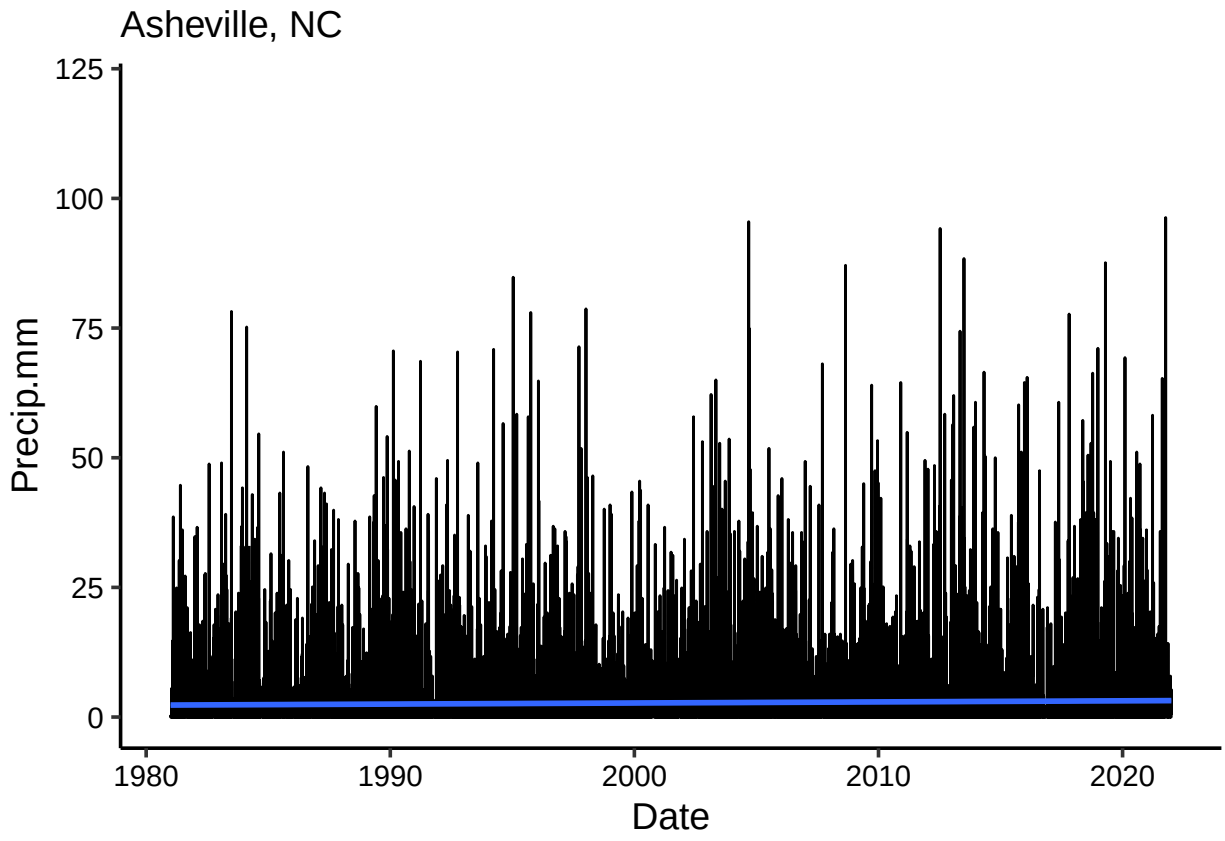
```
Ash_Precip_processed <-
  Asheville_precip_data %>%
  select(LocalDateTime, DataValue)%>%
  mutate(Month = month(LocalDateTime),
         Year = year(LocalDateTime))%>%
  rename(Date = LocalDateTime, Precip.mm = DataValue)

#Saving new processed data to processed folder
write.csv(Ash_Precip_processed, file = "../Diamond_Navarro_Von_Turkovich_ENV872_EDA_FinalProject/Precip
```

Plotting Daily Precipitation for Asheville

```
ggplot(Ash_Precip_processed, aes(x = Date, y = Precip.mm))+
  geom_line()+
  ylim(0,120)+
  geom_smooth(method = lm)+
  labs(Title = "Daily Precipitation (mm) over time",
       subtitle = "Asheville, NC",
       xlab = "Daily Precipitation (mm)")
```

```
## `geom_smooth()` using formula 'y ~ x'
```

```
## Warning: Removed 3 rows containing non-finite values (stat_smooth).
```



Looking at Significant Precipitation Events for Asheville

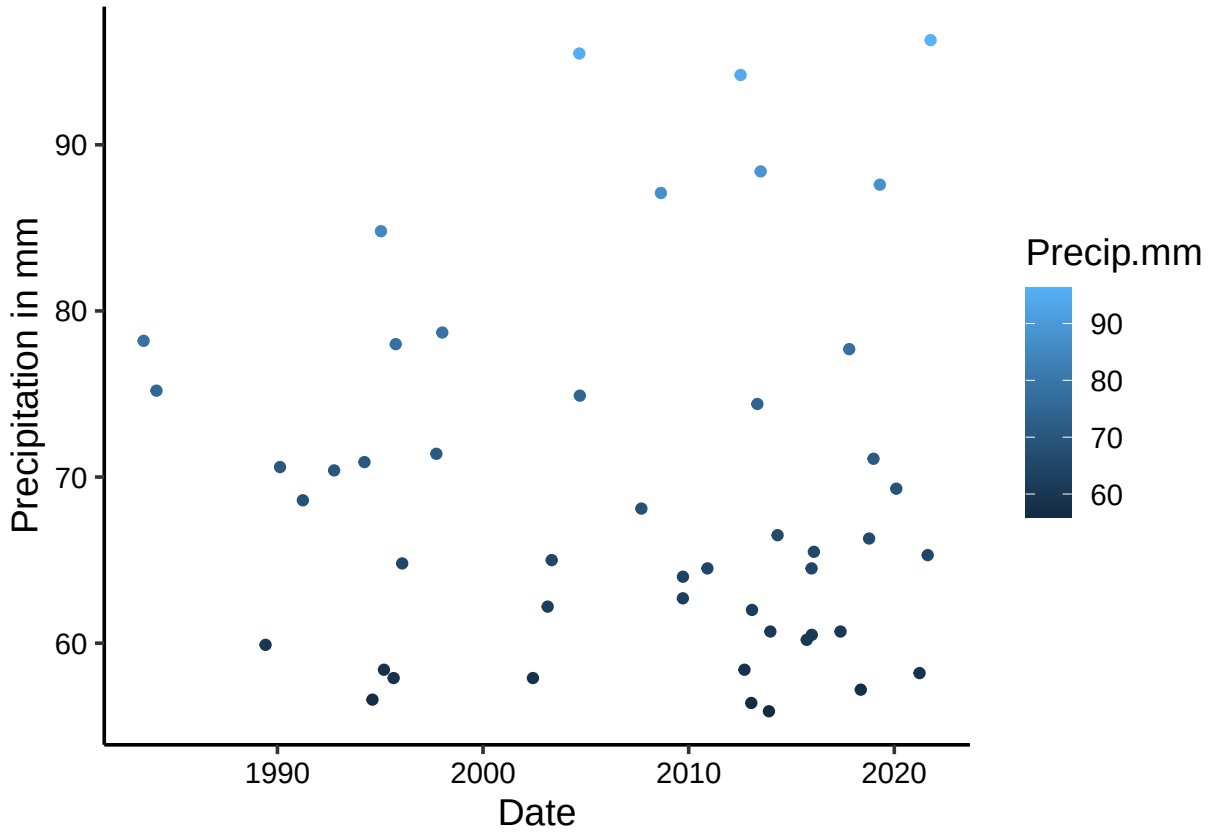
```
#pulling in significant rainfall in millimeters
Significant_rainfall <- read.csv("../Diamond_Navarro_Von_Turkovich_ENV872_EDA_FinalProject/Precip Data/

#creating table for significant precipitation in mm
knitr::kable(Significant_rainfall, caption = "Significant Precipitation Events for Asheville in mm",
             col.names = c("Duration", "1 year", "2 year", "5 year", "10 year", "25 year", "50 year", "
```

Table 1: Significant Precipitation Events for Asheville in mm

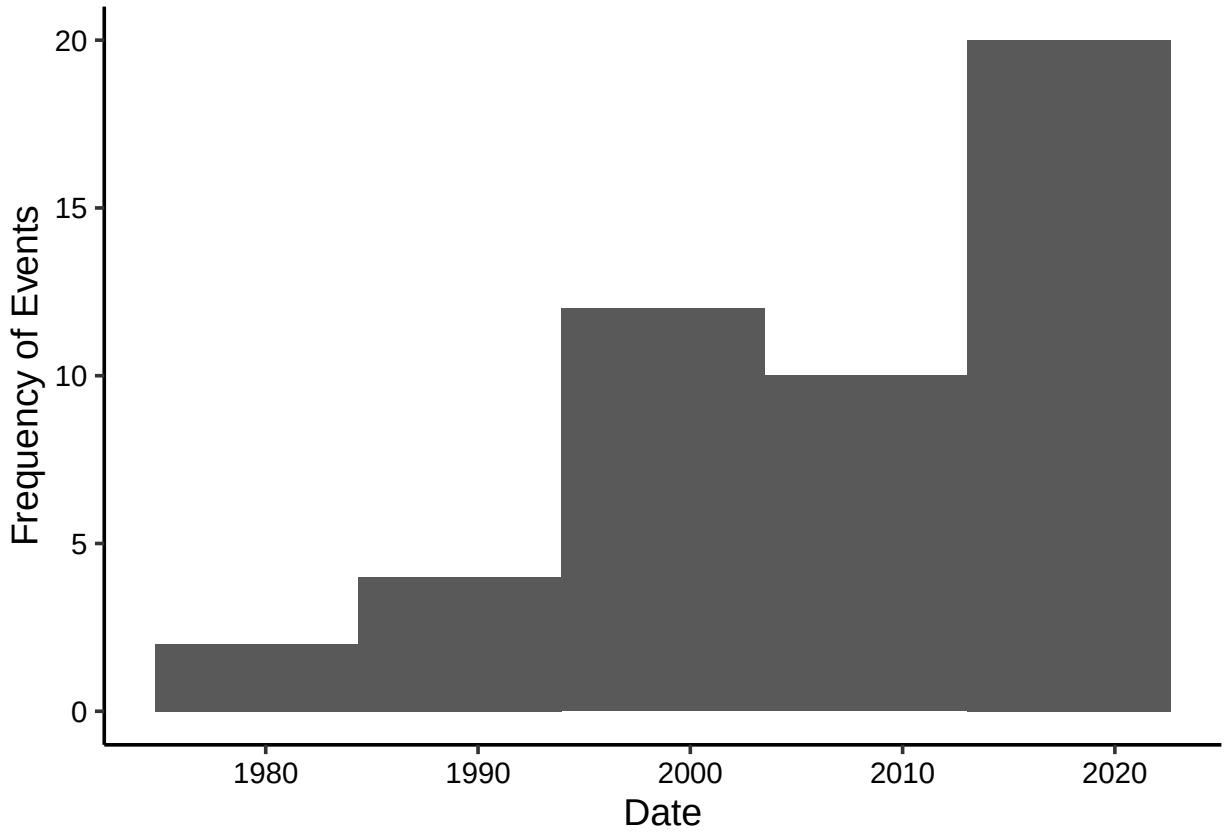
Duration	1 year	2 year	5 year	10 year	25 year	50 year	100 year	200 year	500 year	1000 year
5-min:	8	10	12	14	16	17	19	20	22	24
10-min:	14	16	19	22	25	28	30	32	35	38
15-min:	17	20	25	28	32	35	38	41	44	47
30-min:	23	28	35	40	47	52	58	63	71	77
60-min:	29	35	45	52	63	71	80	89	102	112
2-hr:	33	40	51	59	71	81	91	102	117	129
3-hr:	35	41	52	61	74	85	96	108	125	139
6-hr:	41	48	60	70	84	96	109	123	143	159
12-hr:	50	59	73	84	99	111	124	136	153	166
24-hr:	55	66	82	95	112	125	139	153	171	184
2-day:	66	79	97	111	130	145	160	175	194	209
3-day:	70	84	102	116	136	151	165	180	199	213
4-day:	74	89	107	122	141	156	171	185	204	217
7-day:	87	104	125	141	163	180	196	213	234	249
10-day:	100	118	141	158	181	199	216	234	255	271
20-day:	138	162	189	210	237	258	278	297	321	338
30-day:	172	201	230	252	279	299	318	335	357	371
45-day:	218	255	286	310	338	358	376	393	412	424
60-day:	262	305	341	366	398	420	439	457	477	490

Graphing significant precipitation events in Asheville

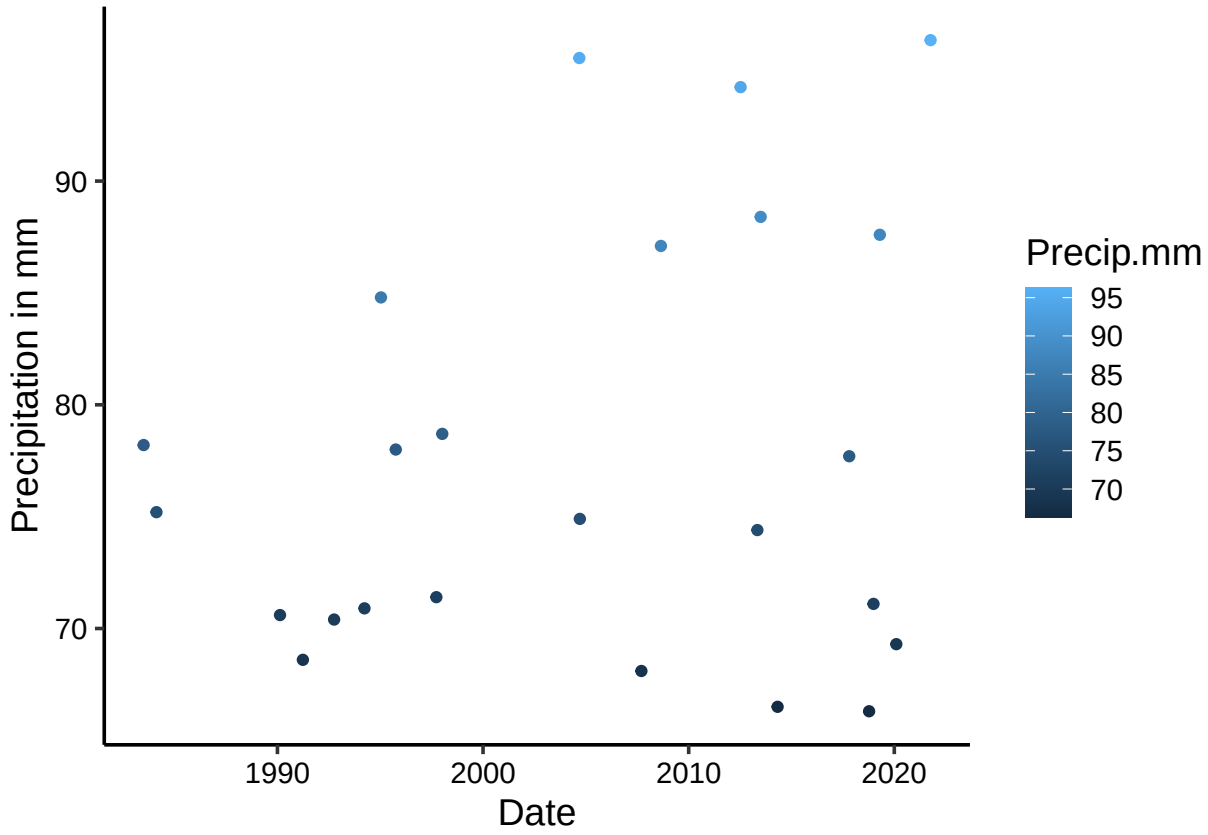
```
#1 year rain event
one_year.df <-
  Ash_Precip_processed %>%
  filter(Precip.mm > 55)

ggplot(one_year.df, aes(x = Date, y = Precip.mm, color = Precip.mm))+
  geom_point()+
  labs(Title = "Rainfall Events over 1-year Threshold",
       y = "Precipitation in mm",
       x = "Date")
```



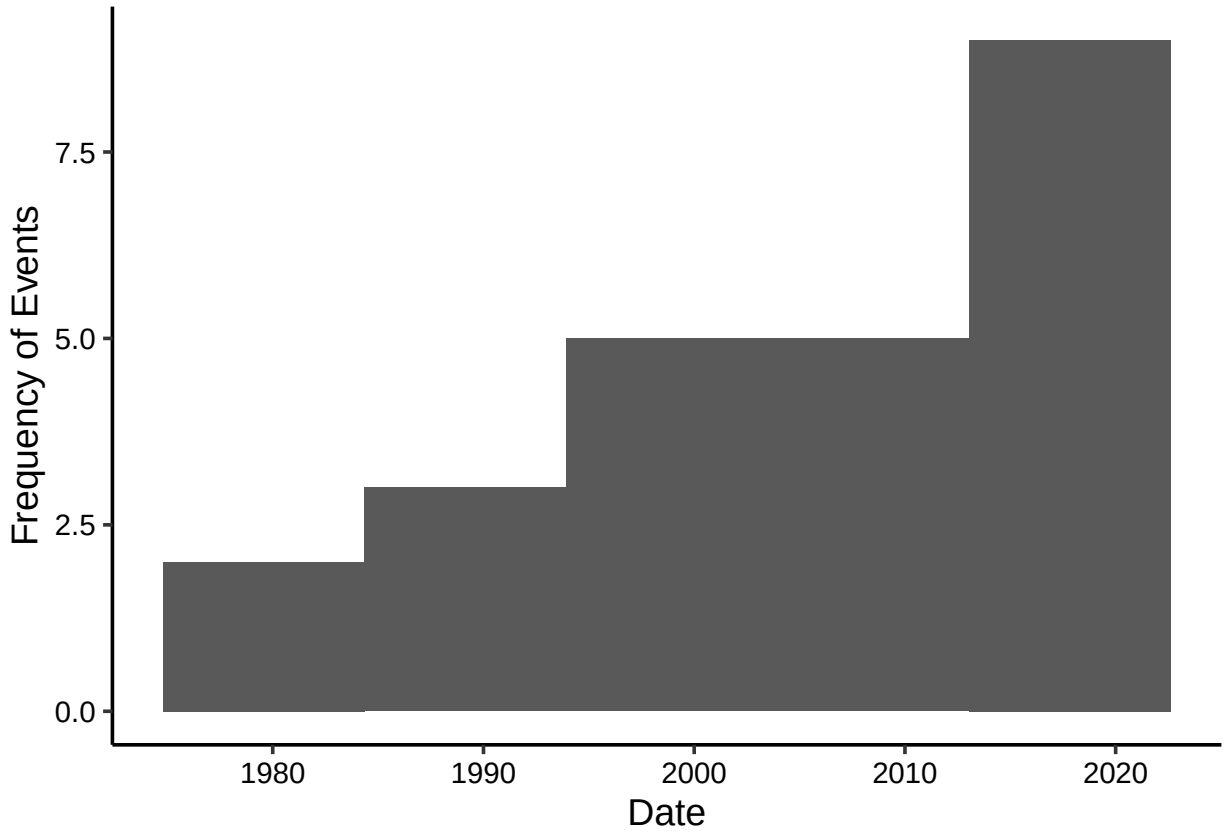

```
ggplot(one_year.df, aes(x = Date))+
  geom_histogram(bins = 5)+
    labs(Title = "Frequency of Rainfall Events over 1-year Threshold",
       y = "Frequency of Events",
       x = "Date")
```



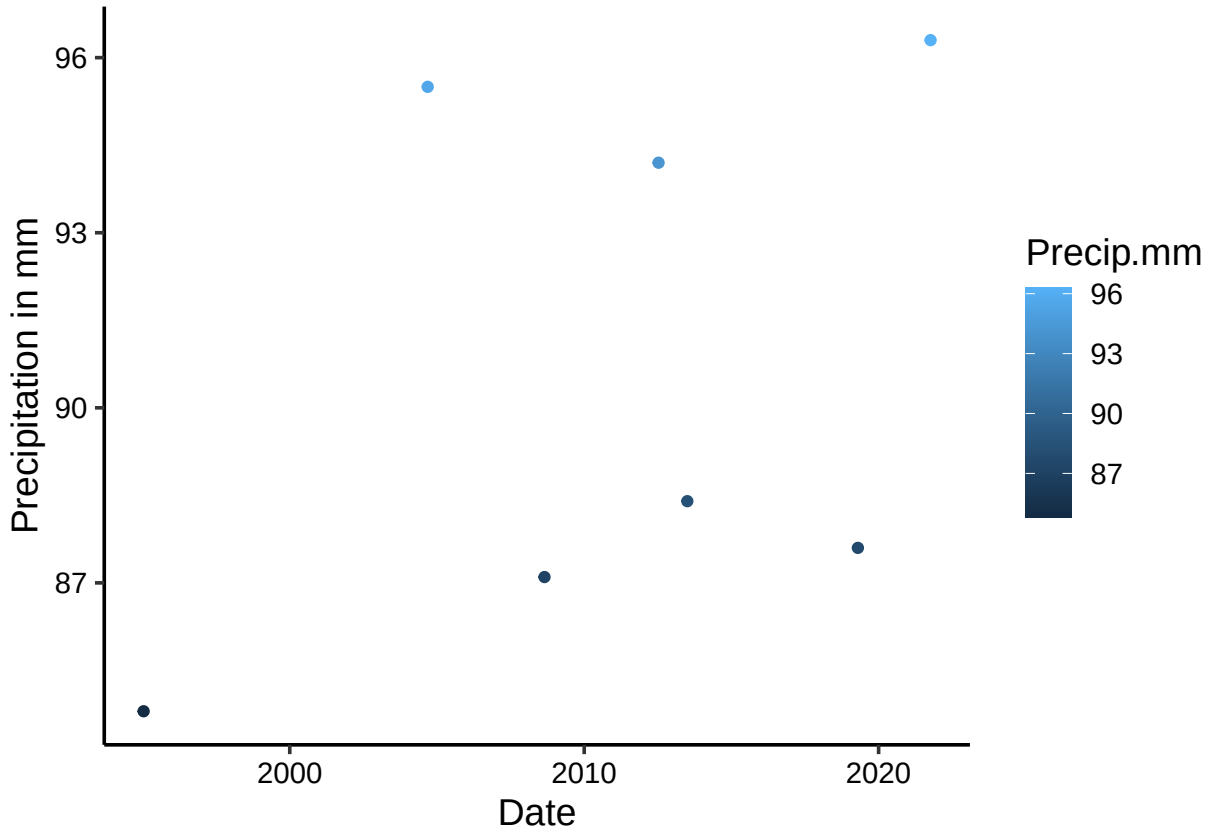

```
#2 year rain event
two_year.df <-
  Ash_Precip_processed %>%
  filter(Precip.mm > 66)

ggplot(two_year.df, aes(x = Date, y = Precip.mm, color = Precip.mm))+
  geom_point()+
  labs(Title = "Rainfall Events over 2-year Threshold",
       y = "Precipitation in mm",
       x = "Date")
```



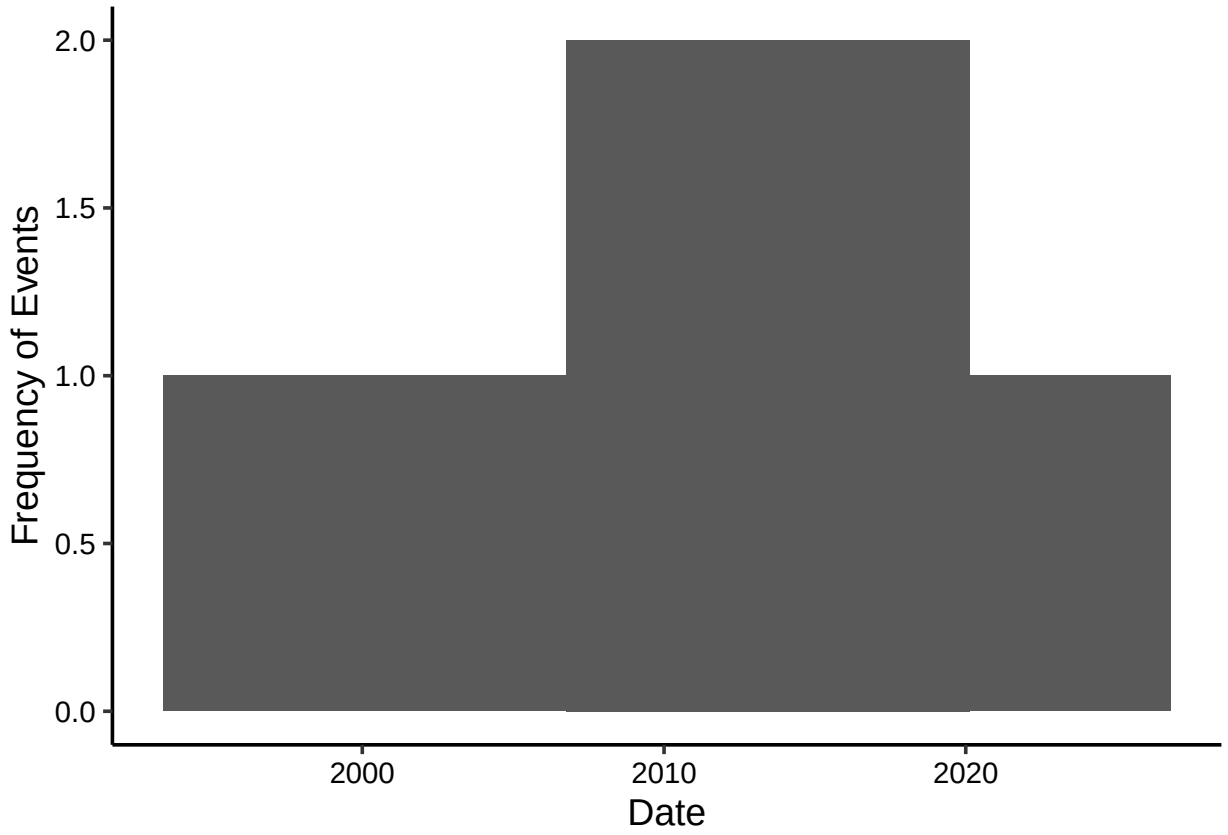

```
ggplot(two_year.df, aes(x = Date))+
  geom_histogram(bins = 5)+
  labs(Title = "Frequency of Rainfall Events over 2-year Threshold",
       y = "Frequency of Events",
       x = "Date")
```




```
#5 year rain event
five_year.df <-
  Ash_Precip_processed %>%
  filter(Precip.mm > 82)

ggplot(five_year.df, aes(x = Date, y = Precip.mm, color = Precip.mm))+
  geom_point()+
    labs(Title = "Rainfall Events over 5-year Threshold",
       y = "Precipitation in mm",
       x = "Date")
```




```
ggplot(five_year.df, aes(x = Date))+
  geom_histogram(bins = 5)+
    labs(Title = "Frequency of Rainfall Events over 5-year Threshold",
       y = "Frequency of Events",
       x = "Date")
```


2.0
1.5
1.0
0.5
0.0
Frequency of Events
2000
2010
2020
Date