Maria\_Ignacio\_flow\_analysis

Sam Bankston

December 11, 2018

Load packages

library(tidyverse)  
library(lubridate)

Read in data

all\_flow <- read\_csv("maria\_ygnacio\_flow.csv") %>% mutate(date\_time = paste(Date, " ", Time), date\_time = mdy\_hms(date\_time)) %>% rename(flow = Flow) %>% select(date\_time, flow) %>% mutate(Day = date(date\_time), Year = year(date\_time))

Summary of daily flow values

daily\_flow\_summary <- all\_flow %>% filter(month(date\_time) >= 1 & month(date\_time) < 6) %>% group\_by(Year, Day) %>% summarize(mean\_daily\_flow = mean(flow, na.rm = TRUE)) %>% ungroup()

Calculate low and high flow thresholds

low\_high <- daily\_flow\_summary %>% summarize(low\_flow = quantile(.$mean\_daily\_flow, probs = .50, na.rm = TRUE), high\_flow = quantile(.$mean\_daily\_flow, probs = 0.99, na.rm = TRUE)) %>% print()

## # A tibble: 1 x 2  
## low\_flow high\_flow  
## <dbl> <dbl>  
## 1 0. 146.

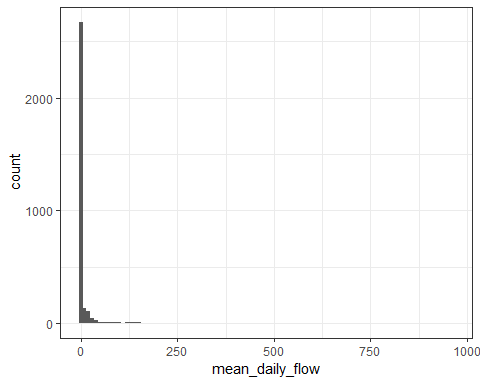
top 20 mean daily flow values

top\_20 <- daily\_flow\_summary %>% top\_n(n = 20, wt = mean\_daily\_flow) %>% arrange(desc(mean\_daily\_flow))   
  
top\_20

## # A tibble: 20 x 3  
## Year Day mean\_daily\_flow  
## <dbl> <date> <dbl>  
## 1 1995. 1995-03-10 958.  
## 2 1992. 1992-02-15 632.  
## 3 1995. 1995-01-10 628.  
## 4 2001. 2001-03-05 581.  
## 5 2005. 2005-01-09 558.  
## 6 1992. 1992-02-12 492.  
## 7 2001. 2001-03-04 468.  
## 8 2011. 2011-03-20 446.  
## 9 2017. 2017-02-17 399.  
## 10 1993. 1993-03-25 378.  
## 11 2005. 2005-01-10 367.  
## 12 1991. 1991-03-18 339.  
## 13 1998. 1998-02-23 324.  
## 14 1998. 1998-02-03 322.  
## 15 2008. 2008-01-27 302.  
## 16 1991. 1991-03-17 277.  
## 17 1998. 1998-02-07 270.  
## 18 1995. 1995-01-24 256.  
## 19 2005. 2005-02-21 250.  
## 20 1998. 1998-02-02 226.

histogram of mean daily flow

daily\_flow\_summary %>% ggplot(aes(x = mean\_daily\_flow)) + geom\_histogram(binwidth = 10) + theme\_bw()



Flow summary statistics

mean\_daily\_flow <- mean(daily\_flow\_summary$mean\_daily\_flow, na.rm = TRUE) %>% print()

## [1] 7.164166

percent\_days\_zero <- mean(daily\_flow\_summary$mean\_daily\_flow == "0") %>% print()

## [1] 0.5880049

num\_days\_zero <- sum(daily\_flow\_summary$mean\_daily\_flow == "0") %>% print()

## [1] 2402

num\_days\_total <- n\_distinct(daily\_flow\_summary$Day) %>% print()

## [1] 4085

num\_years <- n\_distinct(daily\_flow\_summary$Year) %>% print()

## [1] 30