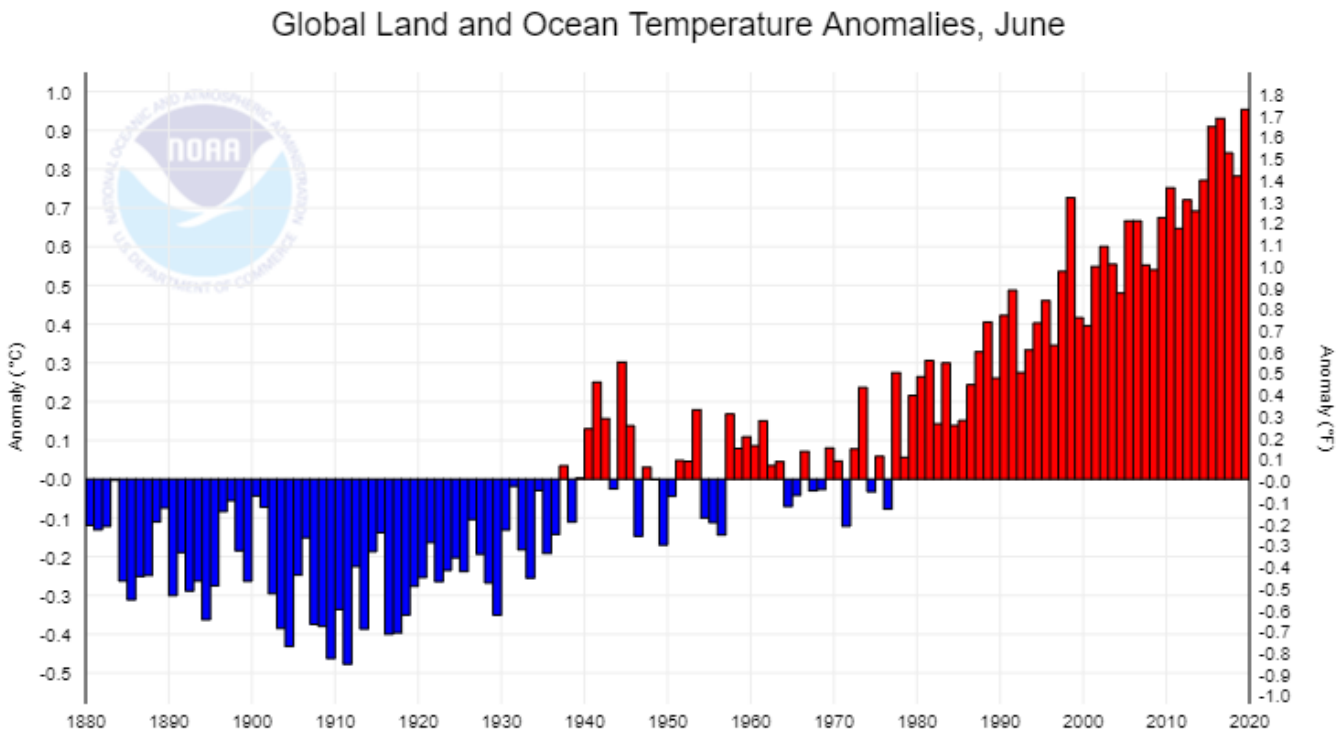
Math 595MP
Spring 2020 Hmwk 6

Problem 1. The bar graph below shows the global average temperature anomalies relative to the 20th century global average, for the month of June for each of the years 1880 to 2019.



Assume that these temperature anomalies are the values of continuous independent identically distributed random variables $X_1, X_2, \ldots$ (with unknown probability distribution).

a) find the number of exceedances between the years 2001 to 2019 of the maximum June temperature anomaly that occurred before 2001.

b) find the probability of exactly the number of exceedances of part a).

c) find the probability of at least the number of exceedances of part a).

d) What do your findings suggest in terms of the climate?

Problem 2. Verify the equation at the bottom of page 242 of the textbook,

$$E(X_i|X_i \geq M) = \frac{1}{G(M)} \int_M^\infty x f(x) dx = M + \frac{1}{G(M)} \int_M^\infty G(s) ds$$

What assumptions do you make?

Problem 3. Solve Exercises 5 and 6 on page 249 of the textbook.