Tree Rings: Precipitation and Fire

Name _____

This activity uses data from trees located at latitude 39°09'N and longitude 105°07'W. This is near Westcreek, Colorado in Douglas County. The trees sampled were douglas fir. The data averages multiple trees growing close together, representing up to 25 trees. You can see the datapage online here: https://doi.org/10.25921/bshz-3075

You will be graphing yearly tree growth in order to determine which years had more precipitation and which years had less precipitation. Annual tree growth is measured in:

RWI = ring width index

RWI is a measure of expected growth, given differences in tree sizes through time and between trees.

Making the Graph

1) **Find** the data of tree ring standardized growth index on the next page and the two pages for your graph.
2) On your graph pages: give your graph a title and **label** the X axis and Y axis.
3) Decide if you want to make a **line graph** or a **bar graph**.
4) **Graph** the amount of tree ring growth for every year from 1830-1878.

Analyzing the Graph

5) Which years did the trees grow a lot?

_____

6) Which years did trees grow the least?

_____

7) Which years were driest in Westcreek, CO?

_____

8) Which years were wettest in Westcreek, CO?

_____

9) When were there dry cycles? (two or more years of drought)

_____

10) When were there wet cycles? (two or more years of wetter than average)

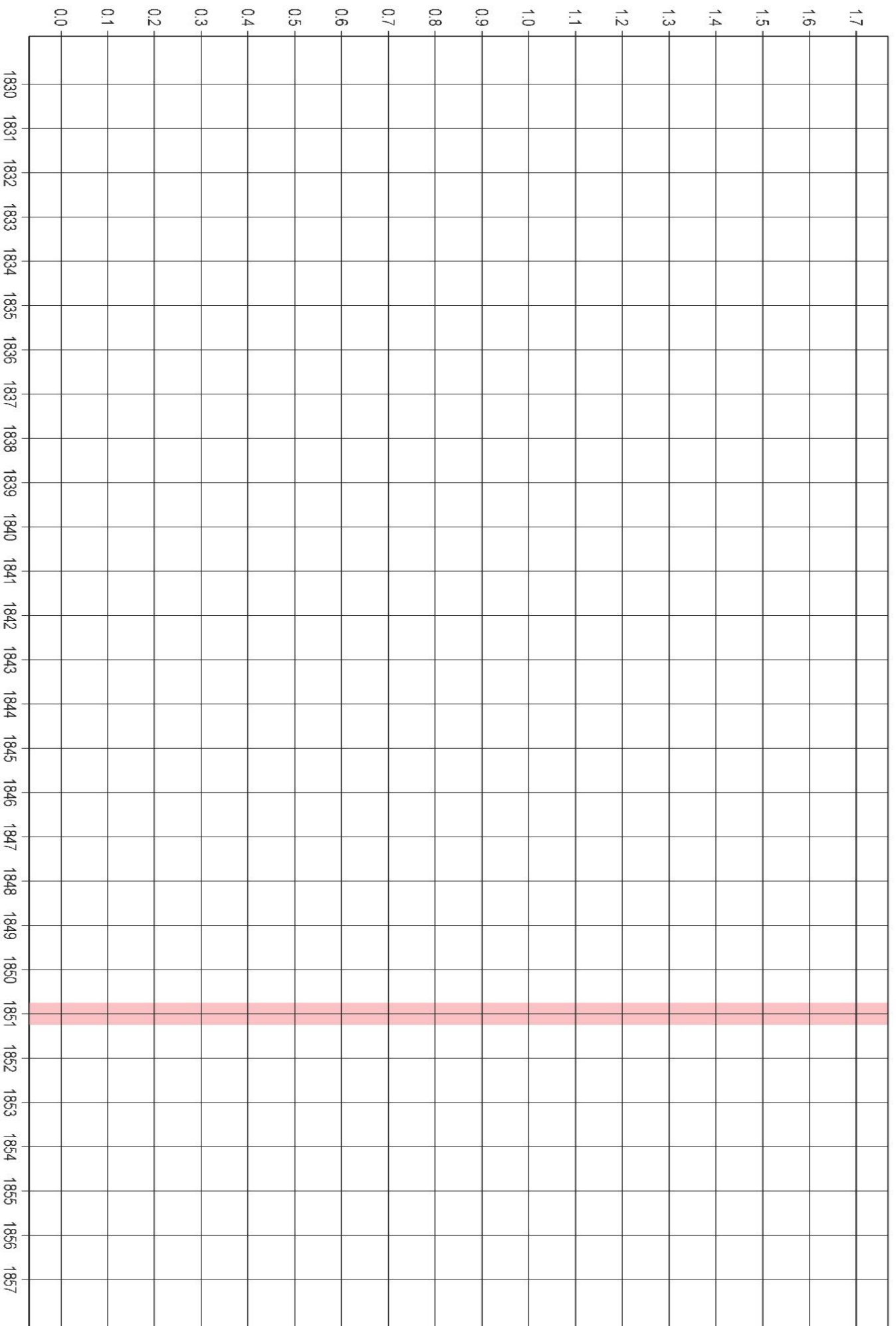_____

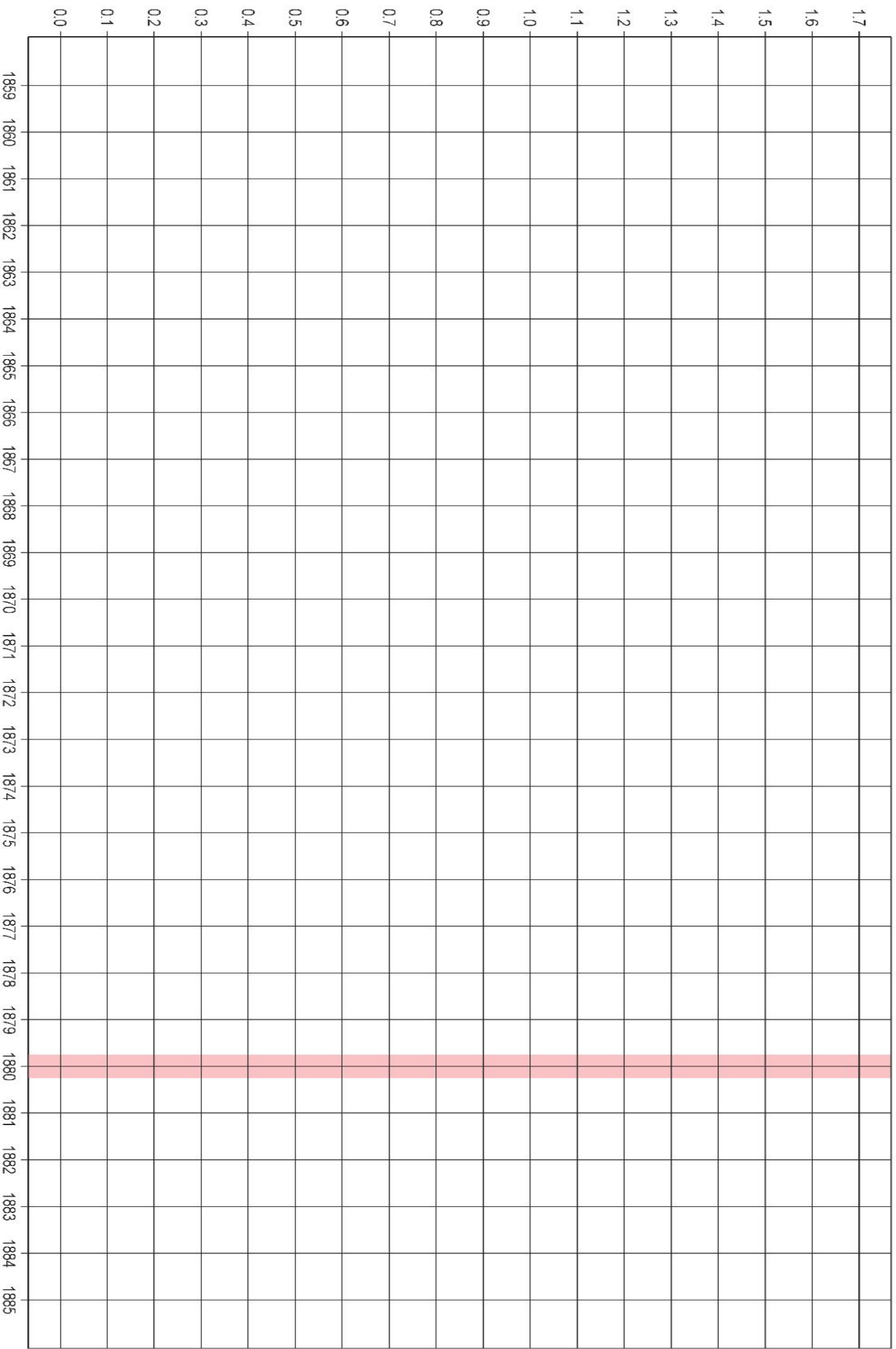## Tree Ring Data, Westcreek, CO, Kassler Recollect

| Year	RWI	Year	RWI	Year	RWI	Year	RWI
1830	0.902	1844	1.721	1858	0.915	1873	1.22
1831	1.364	1845	0.897	1859	0.892	1874	0.627
1832	0.947	1846	1.012	1861	0.718	1875	0.454
1833	1.032	1847	0.701	1862	0.837	1876	0.74
1834	1.024	1848	0.828	1863	0.329	1877	0.984
1835	1.142	1849	0.694	1864	0.899	1878	1.061
1836	1.387	1850	1.157	1865	0.867	1879	1.011
1837	1.385	1851	0.605	1866	1.29	1880	0.27
1838	1.861	1852	0.584	1867	1.345	1881	1.158
1839	1.559	1853	0.948	1868	1.159	1882	1.131
1840	1.272	1854	0.898	1869	1.558	1883	1.235
1841	1.319	1855	0.462	1870	0.9	1884	0.975
1842	0.534	1856	0.374	1871	1.12	1885	0.525
1843	1.463	1857	0.466	1872	1.16	1886	0.644

This activity uses data from trees located at latitude 39°19'N and longitude 105°07'W. This is on the north side of Cheesman Lake in Jefferson County, Colorado. The trees sampled were douglas fir, ponderosa pine. You can see the datapage online here:
https://doi.org/10.25921/x13s-rp10
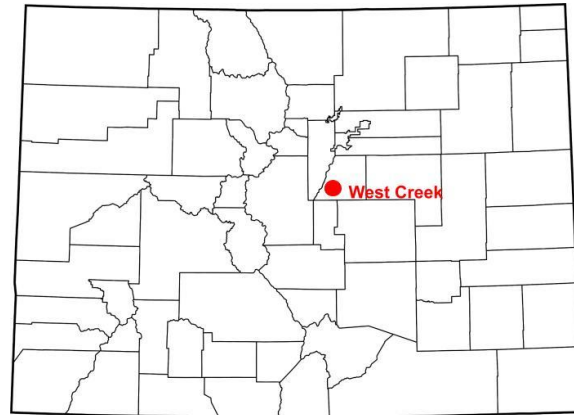
Fire Scars in Cheesman Lake Tree Rings
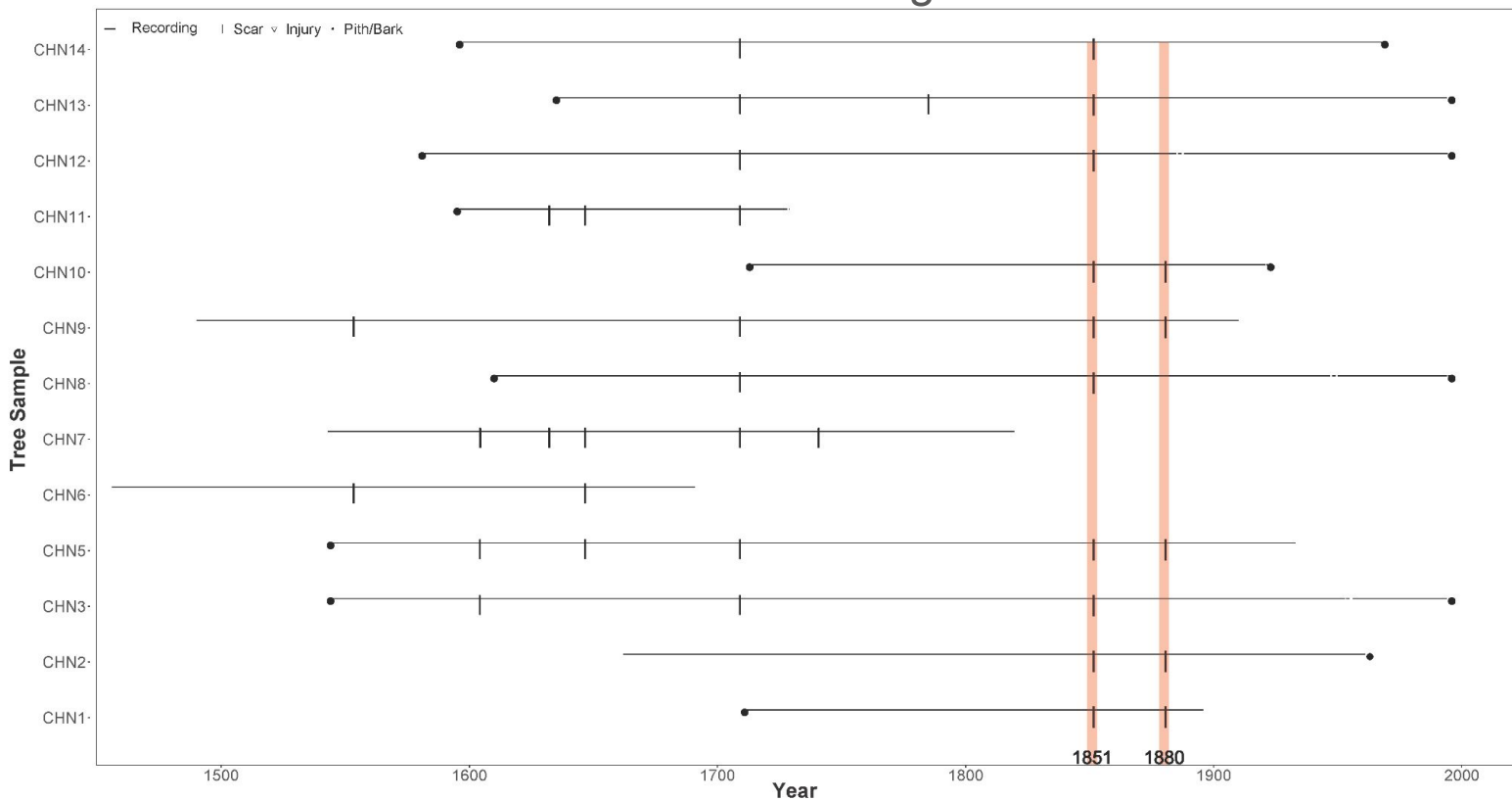
Understanding Fire Data

11) **Look** at the Fire Scars in Cheesman Lake tree rings. This information also comes from tree rings. The **Y axis** shows each sampled tree from the Cheesman Lake area. The **X axis** shows the years recorded in the tree rings. Each tree ring is represented by a horizontal line, and burn scars in the tree rings are represented by short vertical lines.

12) The Colorado maps show you the location the trees sampled in the two tree ring datasets. **Where** are these locations in relation to each other?

_____

_____

13) Which years have fire scars in most trees sampled?

_____

_____

14) The trees sampled were burned when the fires occurred, but still survived. What do you think this tells us about the fires?

_____

_____

Compare Fire and Precipitation

15) Which years are there fire scars between 1830 and 1878?

_____

16) **Look at your graph** for the years you answered in #13. Were there dry, average or wet years around the time of the fires?

_____

_____

17) There are a number of fires that occurred before 1830. What do you think precipitation conditions were like before those fires?

_____

_____

Tree Rings:
Historic Fires in Colorado

The graph below shows evidence of fires in Colorado from the years 1500-2000. The **Y axis** shows the percentage of tree core sampling sites that show burns scars out of all Colorado sampling sites. The X axis shows the year the burn scars are from.
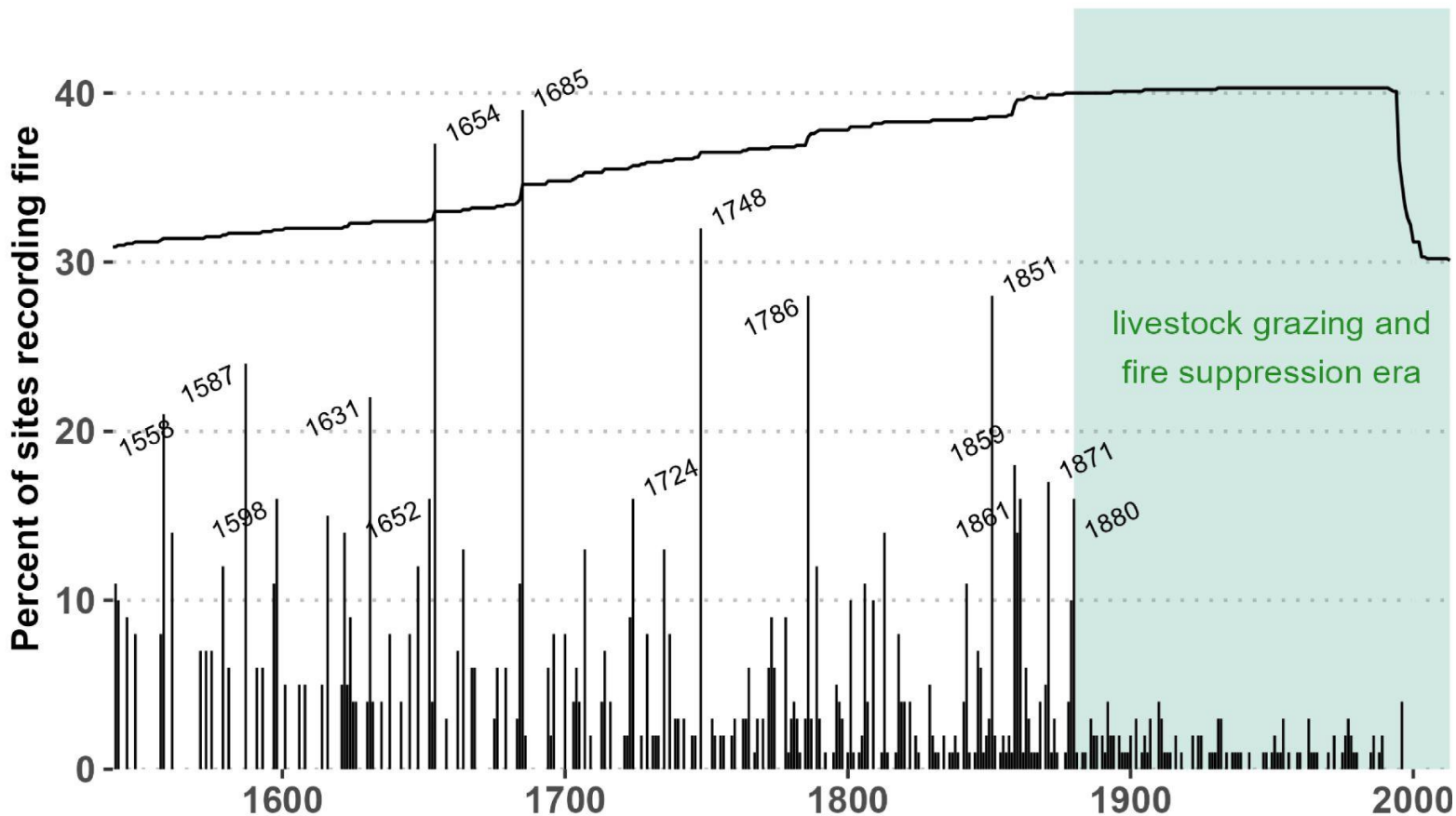
Graph credit: CIRES and NOAA NCEI

Write some of your observations after looking at the data.

1)   Compare the amount of fire between 1500 and 1871, and then between 1871 and 2000.

_____

_____

_____

_____

2)   The graph labels the green section as "livestock grazing and fire suppression era". How do you think livestock grazing can change the amount of fire in an area?

_____

_____

_____

3)   What are other ways people have suppressed fire?

_____

_____

_____

4)   What do you think caused the high fire years on the graph (1654, 1748, etc)?

_____

_____

_____

5)   How do you think less fire has changed the environment?

_____

_____

_____

6)   What are pros and cons of increasing fire again?

_____

_____

_____