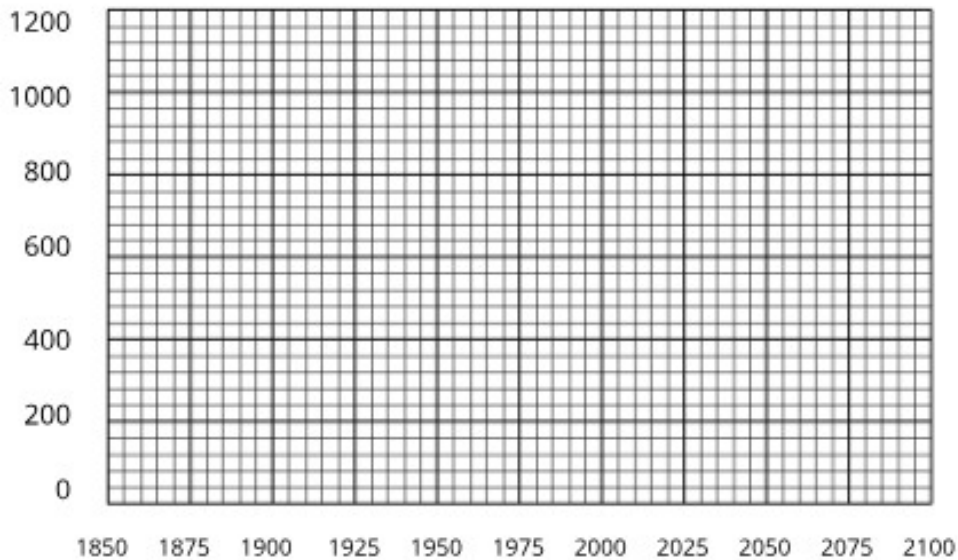


## 9 Glaciers

We will be working in class with a map of the Grinnell Glacier, originally from *Johnson, Arthur (1980). Grinnell and Sperry glaciers, Glacier National Park, Montana, a record of vanishing ice, USGS Professional Paper 1180*, and annotated at

[http://serc.carleton.edu/quantskills/activities/glacial\\_retreat.html](http://serc.carleton.edu/quantskills/activities/glacial_retreat.html)

- On the map at the end, note the outline of the extent of the Grinnell Glacier in 1850. This is the first part of approximating the area of the glacier.
- Count the number of squares covered by the glacier. (Count partial squares part of the timee—this isn't perfect!)
- Repeat this for 1937, 1968, and 1993. (Each number gets smaller, as the area of the glacier shrinks. For 1850, you should get more than a thousand.)
- On the graph below plot the number of squares versus the year of the measurement.
- Based on the trend you observe, approximately when will the glacier melt completely (area= 0)? \_\_\_\_\_





# Grinell Glacier 1850-1993

## Aerial View

