

Instructor preparation:

- Visit http://www.tufts.edu/as/wright_center/iecws/materials.html and print one or more copies of each glacial stage. Label each map outline with the appropriate date range as you print them. We suggest you laminate them for long term use.
- Use acetate graph paper that has been adjusted (photocopy – reduced) so that one unit = 1/10th kilometer. Print out up to twelve transparencies of the grid, the actual number depending upon the number of participants.
- You may distribute the various glacial stages to different groups, and have participants record their results on the board.
- Individual data may vary due to imprecise data gathering.

TABLE I: Wasting of the Grinnell Glacier

Year	Number of years between readings	Area in Km ²	Actual loss or gain in area	Average loss or gain in area per year
1860	---	2.25 Km ²	-----	-----
1890	30 Years	2.03 Km ²	-0.22 Km ²	-0.0073 Km ²
1911	21 Years	1.87 Km ²	-1.16 Km ²	-0.0076 Km ²
1920	9 Years	1.55 Km ²	-0.32 Km ²	-0.0356 Km ²
1927	17 Years	1.50 Km ²	-0.05 Km ²	-1.0029 Km ²
1945	8 Years	1.38 Km ²	-0.12 Km ²	-0.0150 Km ²
1950	5 Years	1.41 Km ²	+0.03 Km ²	+0.0060 Km ²
1960	10 Years	1.28 Km ²	-1.13 Km ²	-0.1131 Km ²
1966	6 Years	1.32 Km ²	+0.04 Km ²	+0.0067 Km ²
1970	4 Years	1.10 Km ²	-0.22 Km ²	-0.0550 Km ²
1985	14 Years	0.95 Km ²	-0.15 Km ²	-0.0107 Km ²
1993	9 Years	0.85 Km ²	-0.10 Km ²	-0.0111 Km ²

1. a. Land. b. “Continental Divide” label; different elevations
2. 100 squares
3. 0.01 Km²
4. Approximately 37% ± 3%
5. a. 1945-1950 and 1960-1966. b. cooler summers during those years
6. Almanacs, books on weather, etc.
7. No. Other factors come into play; too little data for too short of a time
8. No. Other factors come into play, too little data for too short of a time
9. 1960-1966
10. 1950-1960

11. a. The northeastern portion of the glacier has melted (wasted) most.
- b. It could be that this part of the glacier is at a lower elevation. From this map outline this is difficult to determine because the only elevations provided are those along the Continental Divide. We do know that elevations increase as we approach the Continental Divide.

Visit <http://www.otherworlds-edu.com> to review the contents of the Earth's Dynamic Surface CD. Most of the topics on this CD are addressed during some year of this event.

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