Analizing trends in Canadian glacier mass

Eugene Oldman

Introduction

The data used in study is taken from http://open.canada.ca/en/open-data[1].

The data set contains 518 measurements of 6 Canadian glacier mass balans, collected from 1960 till 2007. Namely, the file includes these glaciers:

```
> [1] "Devon Ice Cap NW - Devon Island, Nunavut"
> [2] "Helm Glacier - southern Coast Mountains (Garibaldi Provincial Park), British Columbia"
> [3] "Meighen Ice Cap - Meighen Island, Nunavut"
> [4] "Peyto Glacier - Rocky Mountain eastern slopes (Banff National Park), Alberta"
> [5] "Place Glacier - southern Coast Mountains, British Columbia"
> [6] "White Glacier - Axel Heiberg Island, Nunavut"
```

Hypothesis

We are interested in finding out whether there is statistically signification change in mass balance over the observed time period. For this purpose we use **R** (version 3.3.2) and an appropriate statistical test clled *t-test*:

$$t = \frac{\overline{x} - \mu_0}{s/\sqrt{n}}.$$

The workflow is as follows:

1. Read file file
2. Run t-test for each glacier and collect p-values
3. Support the evidence with
    - a table of result;
    - a plot than coulde help demonstrate the effect.

[1] Here is the direct link to data download.