

1992) certainly shows that precipitation plays a role, as might be expected. However the published micrometeorological works cited by Oerlemans do not discuss precipitation and so do not bear on the question, which remains open. There is no global precipitation dataset of a quality comparable to that available for temperature, and large-scale analysis is therefore not straightforward.

Oerlemans claims that “The temperature sensitivity of mass balance as a function of glacier size cannot be determined by comparing a *hemispheric mean* temperature signal with unevenly distributed mass-balance measurements”. Why not? Standard temperature climatologies are based on measurements which, though far more numerous, are no less unevenly distributed than the mass-balance measurements. Improving the glaciological estimates deserves high priority, but dismissing what is currently available would not be a good first step. The mass-balance measurements, as assembled by CA and DM, constitute the best observational estimates glaciology has to offer for comparison with large-scale measures of climatic change.

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*Comments on “Mass balance of glaciers other than the ice sheets”
by Cogley and Adams*

Cogley and Adams (1998) provided a statistical analysis of mass-balance data from 251 glaciers for 1961–90. To my surprise, the mass-balance data from Stubacher Sonnblickkees (SSK), Austrian Alps, were excluded because the methods used to obtain them were deemed to be “cartographical or statistical estimates”.

I believe the omission of these data is unwarranted, considering some of the data that were used, and suggest that the SSK data should be included in any subsequent analysis for the following reasons.

1. The methodologies used for mass-balance measurement

are seldom explained (as I have done for SSK), so the accuracy of the data used often cannot be properly assessed.

2. Similarly, there are several datasets used by Cogley and Adams for which the quality of measurement cannot be adequately estimated due to lack of supporting information.
3. On SSK a very good relationship has been established between the accumulation-area ratio (AAR) and the mass balance, based on 17 previous years of “direct” measurement. If the AAR can be “measured” every year through an accurate survey of the “Ausaperung” (accumulation–ablation patterns) it suggests the accuracy is certainly adequate for the determination of the mass balance.
4. The Ausaperung method is certainly as accurate as “direct” mass-balance measurements on SSK since several statistical analyses have shown that the results, from a glacier with an extremely complicated topography, are very accurate. The “semi-direct” method here is as accurate, or inaccurate, as the “direct” measurements.
5. Of the many possible sources of error, one seems to have been overlooked by Cogley and Adams. This is the length of the balance year for which data are compared, which can make a big difference, sometimes much more than ± 200 mm a⁻¹. On SSK the natural system is used.
6. In the 1960s, much effort was made to achieve time- and labour-saving methods to ensure continuation of long-term mass-balance series. This is still important and will be more so in the future. Do Cogley and Adams mean to imply that the series from SSK, and those from many other glaciers, are intrinsically inaccurate and therefore useless?
7. The previous point will need to be addressed as more modellers and statisticians take advantage of the long-term data series collected by fewer and fewer field workers.
8. If the efforts being made to sustain long-term series by applying less direct measurement techniques mean that the resulting data are discounted, then more such series will be interrupted or discontinued. We will all be the losers if this happens.

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