

## ***Interactive comment on “Reconstructing the glacier contribution to sea-level rise back to 1850” by J. Oerlemans et al.***

**J. Oerlemans et al.**

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1) It is virtually impossible to study the relation between volume and length for an individual glacier from observational data, because we do not have estimates of the mean thickness of individual glaciers of 50, 100, 150 years ago. It has been well established that longer glaciers are thicker, and the theoretical explanation for this is sound. The fact that ice thickness is roughly proportional to the square root of glacier length (or ice-cap radius) does not depend on the details of the ice mechanics and is a robust feature. It is clear that on shorter time scales, with extremely rapid climatic forcing or in the case of surging glaciers, the relation does not hold. We are confident that this does not affect our results in a significant way, because we consider global changes on the decadal to century time scale. 2) The more glaciers in the dataset the better, of course. During the search for data the glaciers mentioned by Dr. Pelto were

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obviously not encountered. It would be very valuable if these data would be compiled and published or submitted to one of the regular data centers (WGMS, NSIDC, etc). The glacier length records from North America (Canada and U.S.) are problematical in general, because they haven't been kept up to date. However, it appears that several initiatives have now been taken to use satellite imagery to improve the situation. When selecting target glaciers for remote sensing studies it would be advisable to check for the amount of historical data available. One may criticize glacier length as being a rather primitive parameter to characterise the state of a glacier, but it provides the only link with the past!

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Interactive comment on The Cryosphere Discuss., 1, 77, 2007.

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