

REVIEWS

G. ØSTREM and T. ZIEGLER. Atlas over breer i Sør-Norge: Atlas of glaciers in south Norway. *Norges Vassdrags- og Elektrisitetsvesen. Meddelelse fra Hydrologisk Afdeling*, Nr. 20, 1969, [1], 207 p. + map in end-pocket. N. kr. 20.

GLACIER inventories and glacier atlases offer mines of information that can be systematically arranged in a manner to bring joy to the heart of any bureaucrat. They are also useful to glaciologists and hydrologists. The compilers of this one deserve congratulation for combining the best of both—atlas and inventory—in a single volume. While the International Hydrological Decade 1964–74 has acted as stimulus for the recording and mapping of perennial ice and snow all over the world, we can expect to see very few glacier atlases published before 1974. That this one appeared so early is due not only to the energy of the authors but to the special significance of glaciers in Norway's hydro-electric power system. The IHD guide ([IHD], 1970) sets out clear standards that are worth striving for but will not be achieved in many areas because of the size of the task. Atlases like this always represent a compromise between rapid publication using available data and belated publication after years of field study to obtain the data. Østrem and Ziegler chose to limit themselves to material available in 1968. In this they did right, because with the inexpensive offset printing method used it will not be difficult to bring out a more precise inventory and atlas in a few years' time. Owing to insufficient air-photo coverage at the end of the ablation season, no attempt was made to include perennial snow-fields in the inventory.

The principal dimensional data were taken by planimeter from existing published topographical maps at scales of 1 : 50 000 and 1 : 100 000 together with air photographs mainly from the period 1958–68. Transient snow lines were taken from all suitable photographs. The type classification of each glacier, the elevation of the equilibrium line, and hence the accumulation area ratios were not included. The available information was collected on data sheets which were organized into groups belonging to the major drainage basins. The data were then transferred to punch cards for processing and for tabulated print-out in the atlas. The computation yielded total glacier area, total ice volume (based on estimates of ice thickness), and glacier area expressed as a percentage of the total area of each drainage basin.

Maps at three main scales are included in the atlas. All identified glaciers are shown at 1 : 250 000 for each drainage basin. There are four regional maps at 1 : 600 000 showing the extent of drainage basins and the location of glaciers whose mass balance or snout position is regularly observed. Finally there is a folding glacier map covering the whole of southern Norway at 1 : 500 000. Special maps show the position of meteorological stations, mean annual precipitation, specific discharge in litres per second, mean glacier elevation, the transient snow line in June 1966, the glaciation limit, and the discharge coefficient (run-off/precipitation). There are essays on glacier fluctuations (by O. Liestøl), physiography, and climate, together with a select bibliography. Seventeen oblique and five vertical air photographs add a pleasant dimension to a work that otherwise consists largely of green-tinted maps and dry statistics describing 921 glacier units.

All the text is printed not only in Norwegian but also in English. Because of this, because of their clear presentation, and because of their adherence wherever possible to the IHD guide, Østrem and Ziegler have made a fine contribution to the world inventory. They have set an example of how to do it without dallying, the more creditable because there is every reason to believe that what they have left out this time they will put in a later edition.

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REFERENCE

[International Hydrological Decade.] 1970. *Perennial ice and snow masses: a guide for compilation and assemblage of data for a world inventory*. Paris, UNESCO/IASH. (Technical Papers in Hydrology, 1.)