Book Reviews

Desbois, M., Desalmand, F. (eds.): Global Precipitations and Climate Change. Proceedings of the NATO Advanced Research Workshop on Global Precipitations and Climate Change, held at l'Agelonde, F-83250 La Londe les Maures, France, September 27–October 1, 1993. (NATO ASI Series I, Global Environmental Change, Vol. 26). XI, 466 pp. Springer, Berlin Heidelberg New York Tokyo, 1994. Hardbound DM 280,–, sFr 275,–, öS 2184,–.

From September 27 to October 1, 1993, a Research Workshop on Global Precipitations and Climate Change was held at La Londe les Maures, France. The Proceedings of this Workshop are available in form of this book. The individual contributions are summarised thematically in chapters, which is not simple, because of the wide range of the themes. Therefore, the present book gives the reader not only a complete survey of *Global Precipitation and Climate Change*, but a multitude of interesting contributions with partly extensive references.

The first chapter contains contributions to the natural variability of the monsoon regimes during the last 170,000 years. The large scale changes in the Asian, Indian and African monsoons match the global temperature changes and the astronomical forcing recorded in ice and deep-sea cores. The study of deep-sea sediments is demonstrated by a selected core site. By means of salinity variation changes in the evaporation-precipitation balance can be estimated and ultimately to the relative intensity between the monsoons. A further contribution is concerned with modelling and observing of precipitation over the polar ice sheets. Finally, attempts are made to fill in the gap between instrumental observations and paleodata during the last 3,000 years. This was done by reconstruction of historical data from Chinese and Russian sources.

The second chapter contains articles relating to recent precipitation history and existing climatologies, restricted to the Northern Hemisphere. The durations of the presented precipitation time series are between 30 and 100 years. Particular attention is made about the homogeneity of the observational data. For this reason the summary of some important precipitation discontinuities over the past 100 years at primary observing stations is of particular interest.

The third chapter, methodologies of large scale estimation of precipitation from conventional data, includes five contributions. From meteorological point of view, first of all the comparison of different methods of estimating monthly aerial-mean precipitation totals is worth to mention. Four methods, gauge based analysis (GPCC), weather forecast model (ECMWF-T106), IR satellite estimates (CAC) and climatology (Legates, nc) are compared each other. The correction of precipitation measurements is discussed in this chapter in the same way as the consideration of the regional topography by statistical interpolation techniques (kriging). Furthermore results of the WMO solid precipitation measurement intercomparison campaign are discussed. The wind-induced errors yield the main contribution to the observational error. For instance, the difference in wind-induced error for Slovak gauges and Finnish gauges is 60% (for wind speed of 5 m/s), whereby the Scandinavian and Russian gauges show the smallest wind-induced losses. In this connection flow simulations over the orifice of gauges are of interest. Further approaches for regionalization of precipitation climates in the context global climate change monitoring are introduced.

Beside conventional data, satellite data are of fundamental importance over the oceans. For that reason a separate chapter is contributed to methodologies of global scale precipitation from satellite data. Precipitation estimation techniques from satellite data may be divided into three categories: those that use infrared (and/or visible) data from geosynchronous satellites, those that use passive microwave data from polar orbiting satellites, and future techniques that will use satellite-borne radar (TRMM-Tropical Rainfall Measuring Mission). In this chapter contributions to the first two techniques and one contribution to the estimation of precipitation by combination of infrared and microwave measurements are presented. With the latter technique a trial was undertaken to overcome the limitations of the two kinds of data, that is the lack of physical connection between infrared measurements and precipitation as well as the low temporal resolution of microwave measurements.

Not represented are contributions about precipitation measurement with ground-based radar. However, in the *recommendations of working groups at the end of the workshop* the advantages of radar networks are discussed. It can be expected, that future climatological applications will use this observational technology.

The next chapter summarises contributions at validation and initialisation of numerical models. There are two possible strategies for the use of precipitation measurements in connection with models. The first favours the use of real time precipitation data in the model assimilation, the second the improvement of the physical parameterizations, precipitation data being used only as validations. Examples of validation procedures of GCM's are shown.

In the last chapter the status of precipitation climatologies and current programs is reviewed. Present programs are the *Global Precipitation Climatology Project* (GPCP) and the *Tropical Rainfall Measuring Mission* (TRMM).

This book concentrates mainly on measuring, analysis and modelling of global scale precipitation and reviews the present status of knowledge. Accordingly, it is recommended to scientists who are interested at this subject.

Franz Rubel, Vienna