

MEASURED PRECIPITATION DISTRIBUTIONS IN THE LAKE PUKAKAI CATCHMENT, NEW ZEALAND

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Precipitation distribution is a crucial component of a region's hydrology. In mountainous regions this distribution is highly variable because of the influence of extreme topography on weather systems. The difficulties in operating rain gauges in such an environment have left New Zealand with a poor understanding of precipitation distributions at a catchment scale for much of the Southern Alps. Compounding this is that few regions in the world match New Zealand's Southern Alps as a barrier to global circulation (Ibbitt *et al.*, 2005). This means distributions found in other regions of the world may be inappropriate when applied to New Zealand. In 2002, the Intergovernmental Panel on Climate Change (IPCC) recommended a catchment approach to analysis of precipitation as a specific area of research requiring attention (IPCC 2002).

As a step towards alleviating this situation, a network of ten logging storage rain gauges was installed in the upper Lake Pukaki catchment in early 2006. As part of the preliminary data analysis, comparison of the measured precipitation distribution for a small number of storm events against climate model output and interpolated distributions has been made. Each storm event selected for description was associated with a different synoptic type. The precipitation distributions are shown to vary widely between the different storm events. The results provide evidence for the need to consider the synoptic situation when estimating precipitation distributions, the limitations of using annual average rainfall distributions for describing single storm events, and the need for multiple gauge output to identify precipitation magnitude for a particular distribution.

References

- IPCC (2002). IPCC Workshop on Changes in Extreme Weather and Climate Events. Beijing, Intergovernmental Panel on Climate Change.
- Ibbitt, R.; Thompson, C.; Turner, R. 2005. Skill assessment of a linked precipitation-runoff flood forecasting system. *Journal of Hydrology (NZ)* 44(2): 91-104.