

Data Needs For Regional Climate Research

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Often a serious problem in RCM evaluation is the lack of good quality high-resolution observed data. In many regions observations are extremely sparse or not readily available. In addition, only little work has been carried out on how to use point measurements to evaluate the grid-box mean values from a climate model, especially when using sparse station networks or stations in complex topographical terrain (e.g. Osborn and Hulme, 1997). Most of the observational data available at typical RCM resolution (order of 50 km) is for precipitation and daily minimum and maximum temperature. While these fields have been shown to be useful for evaluating model performance, they are also the end product of a series of complex processes, so that the evaluation of individual model dynamical and physical processes is necessarily limited. Additional fields need to be examined in model evaluation to broaden the perspective on model performance and to help delineate sources of model error. Examples are the surface energy and water fluxes.

Despite these problems, the situation is steadily improving in terms of grid-cell climatologies (Daly *et al.*, 1994; New *et al.*, 1999, 2000; Widman and Bretherton, 2000), with various groups developing high-resolution regional climatologies (e.g. Frei and Schär, 1998; Christensen *et al.*, 1998). In addition, regional programs such as the Global Energy and Water Cycle Experiment (GEWEX) Continental-Scale International Program (GCIP) have been designed with the purpose of developing sets of observation databases at the regional scale for model evaluation (GCIP, 1998).

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