

Do large-scale models capture reported drought events?

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Abstract Large-scale hydrological models are used to determine drought on a global scale. However, it is important to know how well these large-scale models can reproduce major drought events in the past before projections can be made. This study presents a comparison between a multi-model ensemble and reported drought events in the literature to assess the performance of large-scale models. Major drought events in the selected period (1963–2000) were reproduced by the model ensemble median, although the duration and spatial extent differed substantially from reported events. The major drought events are caused by precipitation deficits linked to oscillations in climatic patterns, such as ENSO. This implies that major drought events were simulated if these were included in the forcing data. Spatial extent and duration of simulated drought events differed from extent and duration of reported ones due to a fast runoff response in some models.

Key words hydrological drought; large-scale models; global; runoff