

Issues in dynamical downscaling: added value and spatial resolution

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The key purpose of dynamical downscaling is to infer knowledge about smaller scale dynamics from information about larger scale dynamics and regional physiographic details (such as land-sea contrasts). While limited area models certainly generate more detail, the question is if this detail is mostly trivial (i.e., may be derived by considerably cheaper geostatistical methods) or adds nontrivial “correct” detail (e.g., polar lows or land-sea effects near coasts), and what the spatial resolution in describing smaller scale phenomena is.

The former issue has been addressed to some extent; with the result that nontrivial added value is clearly added in (re-analyses-driven) reconstructions, in particular when the driving large scale conditions are constrained. For scenarios, Big Brother experiments have shed some light on this question. The latter question, on the spatial resolution (which is not the same as the grid resolution), has hardly been addressed systematically; instead mostly hand-waving vague guesses have been made.

In the presentation, added value concerning dynamics phenomena, scales and local physiographic influences is reviewed. A strategy for examining the additional skill of a dynamical downscaling step in scenario post-processing is sketched. First ideas concerning the issue of determining the spatial resolution are discussed.