Up- and downscaling models for driving GCMs with paleoclimatic proxy-evidence.

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Abstract

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The task of reconstructing paleoclimatic and historic climate conditions may be formulated conveniently with the help of state space models. The "state" of the system is described by dynamical equations (the GCM). A set of downscaling models serves as "observation equations". For forcing the partly uncertain proxy-data into the dynamical equations, the observation model need to be inverted to an "upscaling model".

The general concept is outlined, the specific requirements for the downscaling model are discussed. Examples of suitable downscaling models are presented, and the efficieny of forcing the GCM to adapt to the empirical evidence is demonstrated.