Interactive comment on “Evaluation of seasonal climates of the Mediterranean and northern Africa in the CMIP5 simulations” by A. Perez-Sanz et al.

Anonymous Referee #1

Received and published: 9 December 2013

Previous climate model experiments have correctly simulated the direction but not the amplitude of precipitation change in the Sahel-Saharan region of Africa during the early-mid Holocene. This paper reviews results from the latest (CMIP5) generation of GCMs and expands the geographical coverage to include the Mediterranean basin. The authors find no improvement in the model results and they also conclude that failure to correctly simulate past climates is not due to any systematic bias in the ability of the models to simulate modern climate. Results are clearly presented in a series of informative diagrams and the authors’ interpretations and conclusions are sound and well-balanced. I would be happy to see full publication of this manuscript after only minor modifications, as set out below. 1. Title. In addition to "r" being missing from "northern", the title makes no mention of past climates which is the main focus of the paper. Perhaps it could be rephrased at “Evaluation of modern and mid-Holocene cli-...
of geological evidence and numerical simulations for 9,000 yr BP, Transactions of the Royal Society of Edinburgh, Earth Science, 81, 407-27). The 6 ka BP time horizon used for comparison was just before a major mid-Holocene climate transition in both the Sahara-Sahel and in the Mediterranean, and some features of the climate at this time may be “relict” from the early Holocene, when boundary conditions were more strongly different from the present-day than at 6 ka. In the Mediterranean, pollen evidence of deciduous forests (e.g. at Banyoles) would also have led to moisture recycling through evapo-transpiration during the mid-Holocene. 8. Conclusions. These are fine, but the authors could go one stage further and make explicit the implications of their study, namely that the failure of GCMs to simulate the amplitude of $\Delta P$ in the mid-Holocene in N African and the Mediterranean implies they may also significantly under-estimate the magnitude of future changes in rainfall in these regions. At the very least, only limited confidence can be placed in the model-based predictions of greenhouse-gas warmed climate in these dryland regions.

Interactive comment on Clim. Past Discuss., 9, 5347, 2013.