

REQUEST FOR A SPECIAL PROJECT 2013–2015

MEMBER STATE: The Netherlands

Principal Investigator¹: dr. J. J. Attema

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Project Title: Evaluation of model precipitation for the current climate when using imperfect (GCM) boundaries.

If this is a continuation of an existing project, please state the computer project account assigned previously.	SP _nlatte_____	
Starting year: <small>(Each project will have a well defined duration, up to a maximum of 3 years, agreed at the beginning of the project.)</small>	2012	
Would you accept support for 1 year only, if necessary?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>

Computer resources required for 2013-2015: <small>(The maximum project duration is 3 years, therefore a continuation project cannot request resources for 2015.)</small>	2013	2014	2015
High Performance Computing Facility (units)	499000	499000	
Data storage capacity (total archive volume) (gigabytes)	3000	3000	

An electronic copy of this form **must be sent** via e-mail to: *special_projects@ecmwf.int*

Electronic copy of the form sent on (please specify date):
April 5 2012

Continue overleaf

¹ The Principal Investigator will act as contact person for this Special Project and, in particular, will be asked to register the project, provide an annual progress report of the project's activities, etc.

Principal Investigator:

dr. J. J. Attema

Project Title:

Evaluation of model precipitation for the current climate when using imperfect (GCM) boundaries.

Extended abstract

The precipitation climate of the Netherlands shows several local/regional features, even despite the fact that the terrain of the Netherlands is quite homogeneous. Variations in extremes of daily precipitation are approximately 30 % over the Netherlands. Also there is a pronounced seasonal cycle in mean precipitation with over 40 % more precipitation in the coastal zone (compared to inland areas) in autumn, and approximately 20 % less in spring. For weather- and climate prediction it is important to model these regional differences correctly.

There is an increasing demand for high resolution scenarios of climate change. However, it is not clear whether present-day regional climate models provide realistic information on the scale requested by the users. This is in particular so when the regional climate model is forced by imperfect boundaries from global climate model simulations. Forcing from global climate model output is common practise when performing long climate change integrations with regional models. Here, we aim to asses to ability of the regional climate model RACMO to simulate local and regional features in precipitation over the Netherlands when forced by imperfect boundaries from a GCM.

For this special project, we will perform a high resolution (12km) model evaluation for the current climate (30 year) using the KNMI regional climate model RACMO2 [2]. The model is based on the ECMWF physics package (Cy31), and uses dynamics of HIRLAM. This model version also includes a newly implemented single-layer interactive slab ocean for the North-Sea.[3] The ocean model is implemented to improve on the sea surface temperatures derived from the coarse resolution global climate model output. The main focus will be on precipitation distribution and extremes. The runs will be forced using ECHAM5r3 boundaries, either directly or using a double nesting approach.

References:

- [1] G. Lenderink, E. van Meijgaard, F. Selten: *Intense coastal rainfall in the Netherlands in response to high sea surface temperatures: analysis of the event of August 2006 from the perspective of a changing climate*, Clim. Dyn **32** 19-33 (2009)
- [2] E. van Meijgaard, L.H. van Uft, W.J. van de Berg, F.C. Bosveld, B.J.J.M. van den Hurk, G. Lenderink, A.P. Siebesma, 2008: *The regional atmospheric climate model RACMO, version 2.1*, KNMI-Technical report-302, pp. 43 (2008)
- [3] J. J. Attema, G. Lenderink, *The effect of a warming North-Sea on coastal precipitation* poster presented at CORDEX meeting ICTP (March 2011)