



FACCE-MACSUR

## DC-3.5 Report on results of application of scaling methods for integrated modelling

Holger Hoffmann <sup>a,\*</sup>, Frank Ewert <sup>a</sup> and members of workpackage 3

<sup>a</sup> Institute of Crop Science and Resource Conservation, University of Bonn, Katzenburgweg 5, D-53115 Bonn, Germany

\*[hhoffmann@uni-bonn.de](mailto:hhoffmann@uni-bonn.de)

---

Instrument:	Joint Programming Initiative
Topic:	Agriculture, Food Security, and Climate Change
Project:	Modelling European Agriculture with Climate Change for Food Security (FACCE-MACSUR)
Start date of project:	1 June 2015
Duration:	24 month
Theme, Work Package:	CropM
Deliverable reference num.:	D-C 3.5
Deliverable lead partner:	University of Bonn
Due date of deliverable:	M 18
Submission date:	2016-04
<b>Confidential till:</b>	<b>Contains parts from published journal articles, only the abstract may be published</b>

---

Revision	Changes	Date
1.0	First Release	2016-04

**Abstract/Executive summary**

Defining and estimating uncertainty in simulations is essential in order to quantify the reliability of the outcomes or when model improvement is sought. Several general definitions of uncertainty are given for model-based simulations. By defining the uncertainty from different sources, these can be quantified and assessed separately, as well as eventually their absolute or relative contribution to the total uncertainty. Therefore, different types and sources of uncertainty are given. Furthermore, the choice of method when assessing the uncertainty of a given simulation may depend on the purpose and the type of uncertainty to be assessed. Approaches of assessing uncertainty in process-based models are described in general and more specifically for crop models. As a simplistic method, the already established approach of variance decomposition is suggested.

**Table of Contents**

- Introduction on uncertainty ..... 3
- Sources of uncertainty in process-based model simulations ..... 3
- Assessment of uncertainty in process-based model simulations in general ..... 3
- Assessment of uncertainty in application of scaling methods with crop models ..... 5
- References..... 6