

COST

Domain Committee ESSEM

COST Action ES1102

Start Date 12/12/2011

VALUE – Validating and Integrating Downscaling Methods for Climate Change Research

MONITORING PROGRESS REPORT

Reporting Period: 12/12/2011 – 01/05/2012

This Report is presented to the relevant Domain Committee.
It contains three parts:

- I. Management Report** prepared by the COST Office/Grant Holder
- II. Scientific Report** prepared by the Chair of the Management Committee of the Action
- III. Previous versions of the Scientific Report;** i.e., part II of past reporting periods

The report is a “cumulative” report, i.e. it is updated annually and covers the entire period of the Action.

Confidentiality: the documents will be made available to the public via the COST Action web page except for chapter *II.D. Self evaluation*.

Based on the monitoring results, the COST Office will decide on the following year’s budget allocation.

Executive summary (max.250 words):

In the first months after the start of the COST Action VALUE an international workshop on End User Needs for Regional Climate Change Scenarios has been organised, inventories of end users of downscaling information as well as downscaling methods have been initiated, a questionnaire on end user requirements has been set up and a review of existing reports on end user requirements has been started. The workshop attracted a wide spectrum of researchers and stakeholders and successfully provided a platform to exchange knowledge between the diverse disciplines involved in the Action and to start a stakeholder dialogue. Since the beginning of the Action and in particular in response to the workshop, several experts joined the working groups. Currently VALUE comprises 38 Management Committee members (plus 15 substitutes) from 21 European countries plus 30 experts contributing to the working groups. The overall rate of female members is 36%, that of Early stage researchers 25%. VALUE coordinates the validation work of about 30 national and international research projects. Two spin-off projects have been started already, one is currently under review. An open call for Short Term Scientific Missions has been issued and the concept for a training school is under development. A webpage has been set up as a means for internal discussion and dissemination of the Action's results.

I. Management Report prepared by the COST Office/Grant Holder



I.A. COST Action Fact Sheet

Title
VALUE - Validating and Integrating Downscaling Methods for Climate Change Research

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Details
Draft Mou: oc-2010-2-8525
Start of Action: 12/12/2011
End of Action: 11/12/2015
Mou: 4122/11
Entry into force: 13/07/2011
CSO approval date: 17/05/2011

Objectives
Our understanding of global climate change is mainly based on General Circulation Models (GCMs) with a relatively coarse resolution. Since climate change impacts are mainly experienced on regional scales, high-resolution climate change scenarios need to be derived from GCM simulations by downscaling. Validation of downscaling methods is crucial, but several aspects have not been systematically assessed: variability on sub-daily, decadal and longer time-scales, extreme events, spatial variability and inter-variable relationships. Different downscaling approaches such as dynamical downscaling, perfect prog statistical downscaling and model output statistics have not been systematically compared. Furthermore, collaboration between different communities, in particular regional climate modellers, statistical downscalers and statisticians has been limited. VALUE will provide a European network to validate and develop downscaling methods and improve the collaboration between the dispersed research communities and with stakeholders. The Action will systematically compare the different downscaling approaches and assess the aspects listed above. VALUE will deliver an assessment of end-user needs, a benchmark data set and pseudo reality for the validation, a set of validation measures, the validation of state-of-the-art methods and guidelines for stakeholders. It will guide the development of improved regional climate change scenarios for Europe and thereby be relevant for European societies and politics.

Parties							
Country	Date	Country	Date	Country	Date	Country	Date
Austria	09/11/2011	Bulgaria	26/10/2011	Czech Republic	13/07/2011	Denmark	11/11/2011
Finland	10/08/2011	France	12/08/2011	Germany	27/06/2011	Greece	02/08/2011
Hungary	03/08/2011	Italy	23/09/2011	Malta	14/12/2011	Netherlands	02/02/2012
Norway	19/09/2011	Poland	22/06/2011	Portugal	06/01/2012	Romania	26/07/2011
Serbia	03/10/2011	Spain	18/07/2011	Sweden	16/09/2011	Switzerland	05/07/2011
United Kingdom	24/06/2011						

Total: 21

Intentions to accept the MoU

Country	Date	Country	Date	Country	Date	Country	Date
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Total: 0

Working Groups

(Only WG members who are not Management Committee member are listed.)

WG1: Synthesis

Coordination, stakeholder dialogue, review end user needs, guide the simulation of improved scenarios.

Leader: Rasmus Benestad

Members: Heike Hübener, Ole Rössler, Hideki Kanamaru

WG2: Data

Set up the benchmark data set; gather and post- process the RCM simulations for pseudo-reality experiments.

Leader: Sven Kotlarski

Members: Christian Pagé, Thomas Bosshard, Barbara Brzoska, Krystyna Pianko-Kluczynska, Swen Brands

WG3: Spatial and temporal variability and inter-variable relationships

Review, validate and improve methods.

Leader: Radan Huth

Members: Richard Chandler, Denise Keller, Andreas Philipp, Christoph Beck, Kean Foster, Stefan Hagemann, Renate Wilcke

WG4: Extremes

Review, validate and improve methods.

Leader: Elke Hertig

Members: Bartosz Czernecki, Geraldine Wong, Jonathan Eden, Malaak Kallache, Maria Antonia Sunyer Pinya, Yves Trambly, Julie Carreau, Christoph Beck

WG5: Sub-daily scales

Review, validate and improve methods.

Leader: Joanna Wibig

Members: Henning Rust, Christian Onof, Petr Stepanek, Alrun Tessorndorf, Krystyna Konca-Kedzierska, Rita Cardoso, Pedro Soares

Website

<http://www.value-cost.eu>

I.B. Management Committee member list**Country**

Austria

Austria

Bulgaria

Bulgaria

MC Member

Dr Matthias THEMESSEL

Dr Christoph MATULLA

[Prof. Neyko Mateev NEYKOV](#)

[Vesselin ALEXANDROV](#)

Czech Republic	Dr Radan HUTH
Czech Republic	Dr Martin DUBROVSKY
Denmark	Dr Henrik MADSEN
Denmark	Dr Jens CHRISTENSEN
Finland	Dr Jouni RAISANEN
Finland	Mr Stefan FRONZEK
France	Dr Mathieu VRAC
France	Dr Jun-Ichi YANO
Germany	Dr Elke HERTIG
Greece	Dr Diamando VLACHOGIANNIS
Greece	Dr Theodoros MAVROMMATIS
Hungary	Ms Gabriella SZEPSZO
Hungary	Dr Judit BARTHOLY
Italy	Dr Erika COPPOLA
Italy	Dr Valentina PAVAN
Malta	Dr Noel AQUILINA
Malta	Prof. Lino SANT
Netherlands	Dr Albert KLEIN TANK
Norway	Dr Rasmus BENESTAD
Norway	Dr Ida SCHEEL
Poland	Dr Adam JACZEWSKI
Poland	Prof. Joanna WIBIG
Portugal	Prof. Ana MONTEIRO SOUSA
Romania	Dr Ileana MARES
Romania	Dr Mihaela MIHAILESCU
Serbia	Prof. Bojan SRDJEVIC
Spain	Ms Maria Jesus CASADO
Spain	Prof. Jose Manuel GUTIERREZ
Sweden	Prof. Cintia BERTACCHI UVO
Sweden	Dr Jonas OLSSON
Switzerland	Dr Sven KOTLARSKI
Switzerland	Dr Mark LINIGER
United Kingdom	Dr Martin WIDMANN
United Kingdom	Prof. Phil JONES

Country

Denmark	Dr Ole B. CHRISTENSEN
Denmark	Prof. Thomas BLUNIER
Finland	Dr Kirsti JYLHA
Finland	Dr Timothy CARTER
Germany	Dr Tobias SAUTER
Italy	Dr Rodica TOMOZEIU

MC Substitute

Norway	Prof. Arnaldo FRIGESSI
Norway	Dr Michel Dos Santos MESQUITA
Poland	Dr Malgorzata LISZEWSKA
Romania	Dr Constantin MARES
Spain	Dr Jorge BATLLE-SALES
Spain	Prof. Maria Belen RODRIGUEZ DE FONSECA
Sweden	Prof. Lars BARRING
Switzerland	Mr Andreas FISCHER
United Kingdom	Dr Hayley FOWLER



I.C. Overview activities and expenditure

Instrument		Event					Total
Type	Action	Start Date	End Date	City	Cntr	Title	Total
MEETING	ES110 2	03/07/2012	09/03/2012	Kiel	DE	COST ES1102 Conference & WG meetings	27033,75
MEETING	ES110 2	12/12/2011	12/12/2011	Brussels	DE	Kick Off	18481,51

(the expenditure for the Kiel meeting is preliminary – the number still has to be approved by the GEOMAR administration)

II. Scientific Report

II.A. Innovative networking

The COST Action VALUE just started less than half a year ago. Nevertheless, already several of its objectives have been addressed by

- ▲ organising an international workshop on End User Needs for Regional Climate Change Scenarios (7-9 March, GEOMAR, Kiel, Germany) (Deliverable 1)
- ▲ starting an inventory of end users of downscaling information
- ▲ setting up a questionnaire on end user requirements (Deliverable 1)
- ▲ starting a review of existing reports on end user requirements (Deliverable 1)
- ▲ starting an inventory of existing downscaling methods (Deliverable 2)

The Kiel workshop provided a fruitful basis to integrate the different research communities involved in VALUE (Objective 1) and to improve the dialogue with stakeholders (Objective 5). Both, scientists from the VALUE disciplines (Meteorology/Climatology/Hydrology and Statistics) as well as end users, e.g., from the World Bank or the UN Food and Agricultural Institution and private companies, took part. Presentations were given by end users of downscaling products about their needs, and by climate scientists and statisticians about the state of the art of dynamical and statistical downscaling and its applications. Breakout discussions identified key requirements as well as uncertainties and gaps of knowledge.

The inventory of end users already comprises some 60 addresses and is continually updated. It serves as a basis for our stakeholder interaction.

The first responses of the questionnaire are currently reviewed. Together with an evaluation of the conference results and the review of existing reports, the results will be summarised and discussed in a report. Late submissions of the questionnaire will subsequently be fed into the report.

The inventory of existing downscaling methods is currently carried out and will be finished for the autumn meeting in Trieste.

Both the assessment of end user requirements and the downscaling inventory contribute to the improvement and development of downscaling methods (Objective 2).

Due to the early stage of VALUE, no EU spin off proposals have been prepared yet. However, the Czech spin off projects "Downscaling the Global Climate Models with use of the Stochastic Weather Generator" by Martin Dubrovsky and "Development, validation, and implementation of statistical downscaling methods" by Radan Huth are already being funded. Currently, the Swiss spin-off project proposal "ELAPSE" (Enhanced local and regional climate change projections for Switzerland) by Christoph Appenzeller, Mark Liniger, Andreas Fischer, Christoph Schär and Sven Kotlarski is under review.

Since the work in the COST Action VALUE has just began, no scientific breakthroughs can be expected yet. Nevertheless, developments over the last months on stochastic downscaling (in particular of extreme events) of several groups within the COST Action as well as the research on new validation techniques for the comparison of probabilistic and deterministic downscaling products has been promising; corresponding publications are in preparation and expected to be submitted later this year.

The close interaction with stakeholders has provided the basis for tangible medium term socio-economic impacts. In particular the Kiel meeting has established a discussion with stakeholders (also as part of working group 1), that has already identified existing communication problems between disciplines, research requirements and limitations of the knowledge that currently and in principle can be provided to stakeholders. In particular we expect a better communication of the possibilities, uncertainties and limitations of downscaling products to stakeholders. This might help to overcome the sometimes naïve interpretation of regional climate change scenarios in regional planning and thereby greatly improve the applicability of downscaling for the local adaptation to climate change.

II.B. Inter-disciplinary networking

The Kiel workshop served as a means for cross-disciplinary exchange within VALUE and with stakeholders. Each block of presentations was introduced by a broader introductory lecture. Thereby, the different communities were provided with state-of-the-art knowledge across the whole spectrum of VALUE disciplines. Important examples are the presentations by Heike Hübener (Environment Agency of Hesse) on the requirements of end users and the danger of too many promises by the downscaling community; the presentation by Ian Noble (World Bank) on how climate scenarios are actually handled by stakeholders; the presentation by Erik Kjellström (SMHI) on the uncertainties in regional climate modelling, the presentation of

Richard Chandler (UC London) on the potential role of modern statistics in climate science, and the presentation by Petra Friederichs (U Bonn) on validation techniques developed in the field of weather forecasting. The end user questionnaire and the downscaling inventory will further contribute to the exchange of knowledge between disciplines.

VALUE has a high level of inter-disciplinarity to potentially provide scientific impacts. Apart from some individual researchers, the climate science community has little contact with modern statistical approaches, a fact that has recently been criticised, e.g., by in the report by Lord Oxburgh for the British Royal Society. A key feature of VALUE is to directly involve statisticians to overcome the shortcomings of current downscaling methods. Specific examples where modern statistics provides potential solutions are the representation of day to day variability, the representation of extreme events and the representation of spatial variability. Several methods are currently under development.

Furthermore, VALUE has a high level of inter-disciplinarity to potentially provide socio-economic impacts. Stakeholders have been invited to the Kiel workshop, an end user questionnaire has been setup and stakeholders actively participate in working group 1. However, to ensure the best possible knowledge transfer, the stakeholder dialogue still could be and will be improved. First, stakeholders have recently been confronted with end user questionnaires from various national and European projects, and the quality and quantity of the response probably suffers from this flood of requests. Here, the interchange with other projects (e.g. the already started review of existing literature) is important as well as a more direct and personal approach of selected stakeholders. Second, the view of downscalers and stakeholders of downscaling requirements is often quite different. For instance, the information provided by downscalers on required variables is often too general to be helpful for the improvement of downscaling methods. Here, awareness of the different problems has to be raised and a common language has to be established.

II.C. New networking

After the start of the action, in particular after the Kiel workshop, several new working group members have entered the action:

WG1: Ole Rössler, Hideki Kanamaru

WG2: Christian Pagé, Thomas Bosshard, Barbara Brzoska, Krystyna Pianko-Kluczynska, Swen Brands

WG3: Denise Keller, Kean Foster, Stefan Hagemann, Renate Wilcke

WG4: Bartosz Czernecki, Geraldine Wong, Jonathan Eden, Malaak Kallache, Maria Antonia Sunyer Pinya, Yves Trambly, Julie Carreau

WG5: Petr Stepanek, Alrun Tessendorf, Krystyna Konca-Kedzierska, Rita Cardoso, Pedro Soares

Additionally, the Netherlands, represented by Albert Klein Tank from KNMI, have entered VALUE. These new entries contribute to the total number of participants:

	Total	Female	Early Stage
Chair	1	0	1
MC	38	13 (34%)	6 (16%)
MC substitutes	15	5 (33%)	2 (13%)
WG members	30	12 (40%)	12 (40%)
Total	84	30 (36%)	21 (25%)

Early stage researchers were particularly encouraged to enter the working groups, resulting in a fraction of 40%. The first call for short term scientific missions, issued at the Kiel workshop was not well received; probably because the networking between different VALUE groups still has to be developed. A second open call has been issued and several researchers on the postdoc level are now preparing applications. A cross-disciplinary training school will be held in Autumn – a final concept will be presented on June 15th, shortly followed by a call for applications.

Two researchers from Australia have expressed their interest to enter COST – they will apply with their national funding agency as soon as new funds will be provided. Furthermore, Ian Noble from the World Bank/New York has participated as external expert at the Kiel workshop and will guide VALUE with his expertise.

As VALUE has started less than half a year ago, obviously no scientific publications are available yet. However, as part of our internal communication as well as our outreach activities, a VALUE website has

been set up. On the webpage, publications in scientific journals related to VALUE as well as reports and guidelines will be made available for the public.

Partners from VALUE are involved in the following national and international research projects. This list clearly demonstrates the capacity of the action's partners to raise research funds:

ACQWA (EU FP7; U Graz, MPI-M, ICTP), CLIMRUN (EU FP7; ICTP), EURO4M (EU FP7; MeteoSwiss), CM SAF (EUMETSAT; MeteoSwiss), ECLISE (EU FP7; U Newcastle), SUDPLAN (EU FP7; SMHI), WEATHER (EU FP7; ARPA), IMPACT2C (EU FP7; DMI, SMHI, Met.no, U Graz, KNMI), PLEIADES (Volkswagen Foundation; GEOMAR, U Birmingham, LSCE), Research for climate protection: century climate simulations (Austrian Climate Research Programme; U Graz), Next Generation Regional Climate Scenarios for the Greater Alpine Region (Austrian Climate Research Programme; U Graz), Impact-targeted validation of statistical and dynamical downscaling models (Czech Science Foundation; Inst. of Atmos. Physics, Prague), Probabilistic climate change scenarios for the Czech Republic (Academy of Sciences of the Czech Republic; Inst. of Atmos. Physics, Prague), REGYNA (Groupement d'Intérêt Scientifique – Climat; LSCE), MedUP (French Research Agency; LSCE), Climate change and extreme weather in Hesse (Hessian environment agency; GEOMAR), Climate change and extreme events in the Mediterranean region (German research foundation; U Augsburg), AGROSCENARI (Ministero dell'Agricoltura; ARPA-SIMC), Statistical Approaches to Regional Climate Models for Adaptation (A Nordic Top-level Research Initiative; U Oslo, met.no, SMHI), Insuring Future Climate Change (Norw. Research Council; U Oslo, met.no), Empirical-Statistical Downscaling in USA (Norw. Research Council; met.no), Projections of climate change in Poland for the period 2021-2050 (Ministry of Science and Higher Education; U Lodz), Swedish research programme on Climate, Impacts and Adaptation (Foundation for Strategic Environmental Research; SMHI), Hydroimpacts 2.0 (Swedish Research Council; SMHI), NCCR Climate (Swiss Nat. Science Foundation; MeteoSwiss, ETH Zurich), CH2011 (Swiss Confederation; MeteoSwiss, ETH Zurich), Hydrological extremes and feedbacks in the changing water cycle (NERC; UCL), Using Observational Evidence and Process Understanding to Improve Predictions of Extreme Rainfall Change (NERC; U Newcastle), SWERVE (EPSRC; U Newcastle, U Birmingham).