



ICTS (Inter-CSE Transferability Study) of regional climate models within CEOP/GEWEX

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1. Introduction

Within GEWEX the CEOP (Coordinated Enhanced Observing Period initiative has been started, see also WEB page <http://monsoon.t.u-tokyo.ac.jp/ceop/index.html>) . A major goal of CEOP is to bring together data sets from satellite measurements, synoptic observations (at reference sites) and analyses of numerical weather prediction centers. Primary focus is a two years annual data set 2003/2004. Three data centers had been established to store the data. Reference site data archive is at UCAR which is also the focus point of the overall data management (<http://www.joss.ucar.edu/ghp/ceopdm>). Satellite data archive is at the University of Tokyo (<http://monsoon.t.u-tokyo.ac.jp/ceop>). Model data are stored in the CERA data bank at the German Climate Research Centre (DKRZ) <http://www.mad.zmaw.de/CEOP/>.

The Inter-CSE Transferability Study (ICTS) <http://w3.gkss.de/ICTS> makes use of the CEOP data archive and contributes to the transferability working group (TWG) <http://rcmlab.agron.iastate.edu/twg/> within the GEWEX Hydrological Panel (GHP).

2. ICTS

In the ICTS regional models from different Continental Scale Experiments (CSEs) are transferred from their “home” CSE to other CSEs involved in GEWEX. The models are initialized and forced at their boundaries by several state of the art Global Circula-

tion Models (GCMs). A list of global analyses data and associated data centers is in the internet on the WEB site at <http://www.joss.ucar.edu/ghp/ceopdm/model/model.html>. In the first step data from global NCEP2 re-analysis will be used. Later other global data sets from the CEOP model data archive will be taken into account to include the effect of different driving data sets on regional model performance. For evaluation CEOP data from the CEOP reference site data archive and the CEOP satellite data archive will be considered. This study contributes to two different types of the transferability studies defined in CEOP:

- “Home-based” global model; Embedded Regional Model Comparative Evaluation with “Home-based” Regional Model Output during CEOP plus CEOP Validation Data,
- Regional Model embedded in different global models to evaluate the effects of initial and boundary conditions from the different global models.

There are three major benefits of this study within WESP (Water and Energy Simulation and Prediction):

- It is an example for application of CEOP data (model data, satellite data, and reference site data).
- It fulfills the requirement of transferring regional models to other regions.
- It contributes to water and energy budget studies.

3. Model Areas

Presently three centers (ECPC, GKSS, and Iowa State University) cooperate in ICTS. They participate with the regional spectral model (RSM), the climate version of the Lokalmodell (CLM), and the Regional Climate Model (RegCM3), respectively. The first step in the model set-up was to find the appropriate computation area over the different CSEs. Several points have to be taken into account in this process (e.g. orography at the boundaries of the simulation areas; inclusion of main typical synoptic features). With the expertise of regional modelers from each CSE currently seven areas has been defined.

One area is over the MAGS (Mackenzie GEWEX Study). A second covers GAPP (GEWEX Americas Prediction Project) and was defined within the PIRCS(Project to Intercompare Regional Climate Simulations) group. Another area is based on the Eta-model area. It covers both the LBA (Large-Scale-Biosphere-Atmosphere Experiment

in Amazonia) and the LaPlata region. Over Europe we choose an area that includes the BALTEX catchment area. It is taken from the definition of the CLM area within the EU-project PRUDENCE (Prediction of Regional scenarios and Uncertainties for Defining European Climate change risks and Effects). Two areas cover the AMMA (African Monsoon Multidisciplinary Analysis) and the GAME (GEWEX Asian Monsoon Experiment) region. The selection for the MDB (Murray-Darling-Basin Water Budget Project) area is based on experiences during a case study in the GEWEX Cloud System Study (GCSS).

4. First Steps

In the first step the regional models are driven by NCEP2 global reanalysis data. Each participating model is transferred to each of the seven domains. Simulations with forcing from other GCM analyses, and at higher resolution are options for future activities in ICTS.

The horizontal resolution of the regional models is about 50 km. Simulation period is from July 1999 to December 2004 (spin-up time is included). This covers all three CEOP measurement periods.

A major point at this stage of the transferability process is to keep the models setup the same for all regions. That means without any retuning or changing of any parameters. Thus these simulations will be a control run for the models. After that each modeler may re-calibrate his model for each region, recording every detail that is changed.

Main focus in the comparison and interpretation of the results are the components of the energy and water cycle for all regions. Besides this each modeler will certainly look into processes that are specific for his models "home" region.

At the conference we will present the current status of the simulations and first results.

We have already carried out some comparison to CEOP 1 data for the three months period July 2001 to September 2001. Snapshots of the results can be found in the WWW on the ICTS home page.