ICTS (INTER-CSE TRANSFERABILITY STUDY): AN APPLICATION OF CEOP DATA

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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 Circulation 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 stets 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 (see figure).
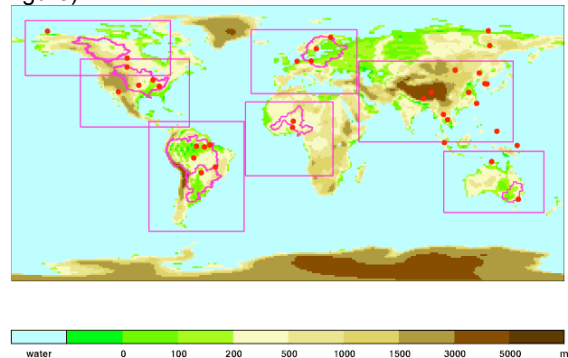

Figure 1. Model areas (magenta outlines) and reference sites (red dots)

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).