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On the Transition of GHP to CEOP and Realignment of CEOP with GEWEX

A draft rationale and proposed implementation.

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I. Introduction

When the Global Energy and Water cycle Experiment (GEWEX) commenced in 1988 with a focus on global products, its lead scientists recognized that the global data sets needed to be evaluated at regional scales. At the same time significant improvements were being made to land surface models as a result of intensive regional experiments being carried out by the International Satellite Land Surface Climatology Project (ISLSCP) and the Biospheric Aspects of the Hydrologic Cycle (BAHC) initiative under the International Geosphere-Biosphere Programme (IGBP). In particular, ISLSCP carried out intensive field campaigns focused on relatively homogeneous areas of 10,000 km² (approximately the size of a climate model grid square) and involved intensive observational periods for (generally) two to four weeks several times a year. This concept continued to be developed by the US Dept. of Energy Atmospheric Radiation Model (ARM) program, who initially proposed world wide coverage with a number of sites, but ultimately, due to cost constraints, focused first on one site in Oklahoma, US and then later additional sites in Alaska and the western Pacific - sites which are still operating today.

As a result of the convergence of GEWEX interests for a regional test bed, the need to scale up ISLSCP land surface studies to larger geographical areas, and the desire of the International Association for Hydrologic Sciences (IAHS) to involve hydrology more actively in climate research, the concept of a continental scale hydrologic experiment was developed in 1990. The proposed regional experiment was based on the hypothesis that water and energy budgets over a large basin would not be as sensitive to random errors as they are at a point or for a small watershed, but they could still be examined in a meaningful way because there was an increasing likelihood of closing continental-scale water and energy budgets to acceptable limits using the newly available data sets and models.

Development of CSE's and Inception/Organization of GHP

In 1990, a group of international experts recommended the Mississippi River Basin as a focus area and then worked with others to draw up a science plan for the GEWEX Continental-scale International Project (GCIP). As planning progressed, however, a consensus emerged that areas with other important processes such as permafrost and tropical forests should also be studied. In addition, a number of countries could make stronger national contributions to GEWEX if they studied a basin that included their national territories. As a result several experiments were developed to cover large land areas. Continental Scale Experiments (CSEs) have included:

- MAGS (MAcKenzie GEWEX Study)

- GCIP/GAPP/CPPA (GEWEX Continental-scale International Project / GEWEX Americas Prediction Project / Climate Prediction Program for the Americas)
- LBA (Large-scale Biosphere Atmosphere experiment in Amazonia)
- LPB (La Plata Basin)
- BALTEX (BALTic sea EXperiment)
- GAME/MAHASRI (GEWEX Asia Monsoon Experiment / Monsoon Atmospheric Hydrologic Study Research Initiative)
- MDB (Murray Darling Basin)
- AMMA (African Monsoon Multidisciplinary Analysis)

These CSEs have different start and end dates. For example, AMMA was approved as a CSE beginning in 2005 and MAGS, which began in 1994, ended in 2005. Another CSE, NEESPI (Northern Eurasia Earth Science Partnership Initiative) may eventually be proposed in 2006/2007.

GEWEX established the GHP beginning in 1994 to coordinate the wide range of regional interests and activities involved in these CSEs. GHP also took responsibility for coordinating the activities of the International Satellite Land Surface Climatology Project (ISLSCP), the Global Runoff Data Center (GRDC), and the Global Precipitation Climatology Center (GPCC). The overall GHP mission was to “demonstrate the capability to predict changes in water resources and soil moisture at time scales up to seasonal and interannual as a component of the World Climate Research Program’s prediction goals for the climate system.” To this end GHP influenced the priorities of each CSE and global project. The GHP further promoted and coordinated interactions with the GEWEX Radiation Panel (GRP) and the GEWEX Modeling and Prediction Panel (GMPP). The GHP also initiated, synthesized, reviewed and recommended joint activities that promoted a common research agenda for each of the CSEs. CSE representatives agreed to a set of technical and scientific requirements.

GHP set up several international working groups composed of CSE representatives, which would attempt to globally coordinate diverse regional activities happening within each of the CSEs. These working groups have included:

- DM (Data Management)
- WEBS (Water and Energy Budget Studies)
- WISE (World-wide Integrated Study of Extremes)
- SWING (Stable Water Isotope Working Group)
- TWG (Transferability Working Group)
- WRAP (Water Resources Applications Program)
- HAP (Hydrologic Applications Project)
- CEOP (Coordinated Enhanced Observing Period).

II. Inception of CEOP

CEOP, which began as a discussion item at the 2nd GHP meeting in 1995, eventually became such a successful working group that it was moved from GHP to become a program that was recognized by WCRP as an element of WCRP initiated by GEWEX. CEOP was strongly supported by GHP and many GHP activities soon became actively entrained within CEOP, in part through the CEOP data management and modeling activities, and in part through cross

linkages of some of the CSEs and GHP science working groups within the CEOP Monsoon Panel (MP) and the Water and Energy Simulation and Prediction panel (WESP), Examples of current parallel CEOP and GHP activities include

GHP	CEOP
WEBS	WESP/WEBS
TWG	WESP/ICTS
WISE	Extremes
HAP	Watershed
DM	Reference Sites / Basins

Initially, CEOP was looked on as somewhat of a pilot experiment, designed to intensively study a limited time period, 7/1/2001-12/31/2004, a period when many CSEs would likely have corresponding intensive observation periods to complement CEOP and a time when many of the new Earth Observing Satellites would be providing a wealth of new information about the earth. This pilot experiment was formulated and guided by a formal Science and Implementation Plan and involved a number of technical and science driven working groups that were reviewed and received direction and oversight from a Science Steering Committee and an Advisory and Oversight Committee.

However, with the demonstrated success of CEOP Phase 1 and advent of CEOP Phase 2, it is clear that CEOP will contribute to the scientific objectives of GEWEX and to integrated data management activities of WCRP on a longer term.

As a result, GEWEX, in full agreement with the GHP, and with CEOP, has decided to merge GHP within CEOP. This formal merger is meant to enhance the efforts of both GHP and CEOP and will not lose sight of any of the GHP goals or any of the ongoing GHP work since the same scientists and more are already working on closely related projects and goals in CEOP. It does mean, however, a refocusing of the CSE and GHP agendas toward the CEOP program.

III. Administrative/Technical Recommendations/Actions of a GHP/CEOP Merger

The following items have been considered, discussed, and resolved as draft recommendations:

1. The former GHP working groups will continue to function, but under the CEOP structure. For example, WESP already has WEBS, ICTS, and GLDAS working groups and other GHP working groups, such as the SWING and developing HAP groups could be added.
2. The CSEs will be a central element of CEOP and will contribute as cross-cutting efforts to CEOP and GEWEX as well as to other WCRP core project activities interested in advancing global climate research. The CSEs will work closely with the semi-arid and cold regions working groups in CEOP to form a CSE organization that reflects the key role of these Experiments in Global climate studies. Terms of reference for the new CSE group will need to be developed.

3. The former GHP global projects will come under the auspices of the other GEWEX panels. This has already begun to happen, for example, ISLSCP has now finished two highly successful phases and will begin to focus on land flux issues under the GRP. GPCP and GRDC will also report to GRP.

3. CEOP will adjust its current organizational structure by disbanding its Advisory and Oversight and Science Steering Committees.

4. A CEOP Science Advisory Group or SAG, will be constituted in the place of the CEOP Advisory and Oversight and Science Steering Committees. Initially, therefore, the membership of the WGs and SAG are proposed to be set as:

WG Co-Chairs:

- CSEs: H-J. Isemer, C. Fu
- Monsoon studies: J. Matsumoto, W. Lau
- WESP: J. Roads, M. Rodell
- Cross-Cutting Studies (CCS): M. Bosilovich, R. Stewart, E. Wood
- Reference Sites/Basins: S. Williams, K. Tamagawa
- Satellite: P. Houser, N. Matsuura
- Model Output: M. Lautenschlager, K. Mitchell, S. Miura
- Data Integration & Dissemination: T. Koike, K. McDonald

SAG Members(12)

- CEOs: J. Kaye (NASA), E. Herland (ESA), A. Sumi (JAXA)
- NWPs: K. Mitchell
- IGWCO: R. Lawford
- CliC/IPY: T. Ohata
- Data Centers: M. Claussen (to be confirmed), K. Sawyer, T. Koike
- Hydroclimate Sciences: W. Lau, J. Roads, H-J. Isemer

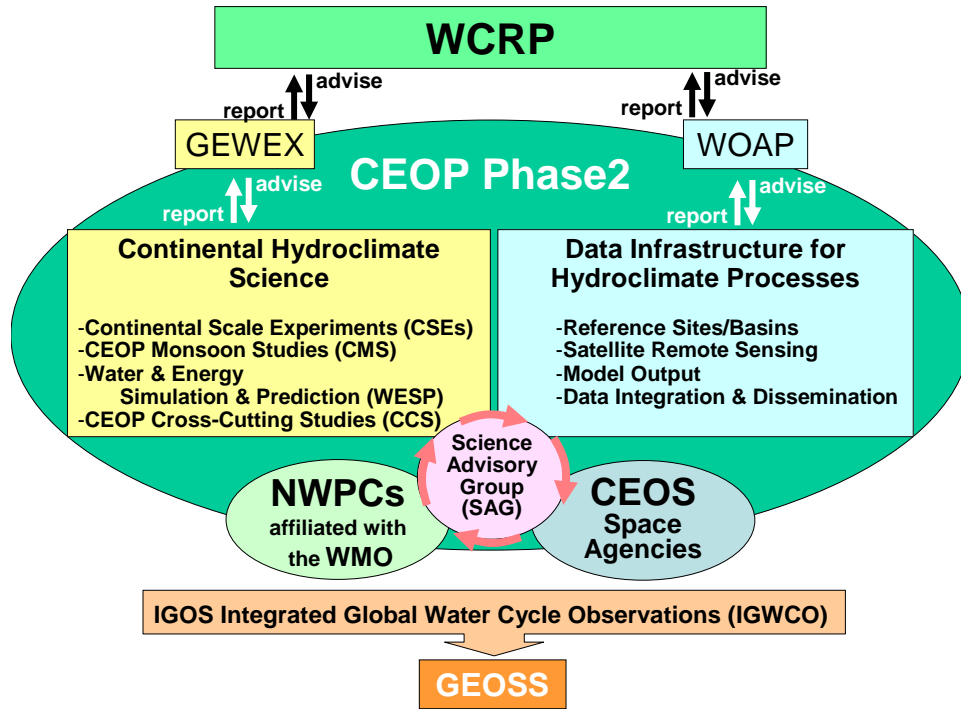
A Chair and Vice-Chair of the CEOP SAG will be selected and their terms set by the SAG members at the first SAG Meeting to be held in conjunction with the next CEOP International Implementation Planning Meeting (12-17 March 2007, Washington D.C.).

5. As directed by the Joint Scientific Committee (JSC) for WCRP, CEOP will seek advice and review of its Hydroclimate Processes Science Goals from the GEWEX SSG. This will be done in the same way that CEOP has been directed by the JSC to seek review and advice of its Hydroclimate Processes Data Infrastructure Goals, from the WCRP Observation and Assimilation Panel (WOAP), which reports to the JSC. In cases where decisions by these boards are made with respect to its Science and Data Goals CEOP will address such matters through its SAG to arrive at final conclusions and courses of action that are scientifically and technically accurate and mutually acceptable to all concerned.

6. CEOP will conduct its routine day to day activities and implementation development, in an independent manner as a collaborative body with WOAP, GEWEX and the other WCRP Core Projects. CEOP will, therefore, have a formal representative at the WCRP JSC meeting to report

on CEOP progress/status. Nevertheless, CEOP will remain responsive to both GEWEX and WOAP requests for inputs and will look to the infrastructure associated with those groups, such as the International GEWEX Project Office (IGPO), for support in the same way as other elements of the organization do.

7. A graphical representation of these concepts is given in the diagram below:



8. As an initial action related to this merger, CEOP has reviewed the set of technical and scientific requirements that the CSE representatives previously agreed to in 1995 and is recommending a change to those to fit the new CEOP focuses;

TECHNICAL CRITERIA (Proposed for 2006)

- NWP centre atmospheric and surface data assimilation and estimates of hydro-meteorological properties.
- Suitable atmospheric-hydrological models for studying transferability and climate change.
- Mechanism for collecting and managing adequate hydrometeorological data sets.
- Participate in the open international exchange of scientific information and data.
- Evaluation of GEWEX global data products
- Contributions to CEOP in situ, remote sensing, and model output databases.

SCIENTIFIC CRITERIA (Proposed for 2006)

- Simulate the diurnal, seasonal, annual and interannual cycles.
- Close water and energy budgets.
- Determine and understand climate system variability and critical feedbacks.
- Demonstrate improvements in predictions of water-related climate parameters.
- Demonstrate the applicability of techniques and models for other regions.

Again, this is just an initial recommendation and the criteria to become a CEOP CSE will need to be considered at the first meeting of the CEOP CSE representatives. Still to be resolved are how the CSEs will interact with WESP, CMS, and CCS.